

Table of Contents Section II – Soil and Site Information

	Issue Date	Date of Last Review	Responsible Staff
<i>Use and Explanation of Soil Interpretations</i>			
<i>Explanation of Key Phrases Used in Soil Interpretations</i>			
Soils Legends	1/02	1/02	SOI
<i>* Acreage and Proportionate Extent of the Soils</i>			
Soil Descriptions - Nontechnical	1/02	1/93	SOI
<i>Use and Explanation of Nontechnical Descriptions</i>			
<i>*Nontechnical Soils Description Report</i>			
Soil Descriptions - Technical	1/02	1/02	SOI
<i>*Map Unit Description Report</i>			
Cropland Interpretations - Technical	1/02	1/02	SOI
<i>*Prime Farmland Report</i>			
<i>* Kansas Soil Rating for Plant Growth Index</i>			
<i>*Soil Properties for Conservation Planning</i>			
Rangeland, Grazed Forestland, Native Pastureland Interpretations	1/02	1/02	SOI
<i>*Rangeland Productivity Report</i>			
<i>*Range Site Descriptions</i>			
Forestland Interpretations	1/93	1/93	SOI
<i>Use and Explanation of Forestland Interpretations</i>			
<i>*Woodland Management and Productivity</i>			
Nonagricultural Interpretations	1/02	1/02	SOI
<i>*Building Site Development Report</i>			
<i>*Construction Materials Report</i>			
Recreation Interpretations	1/02	1/02	SOI
<i>*Recreational Interpretations</i>			
Wildlife Interpretations	1/02	1/02	SOI
<i>*Wildlife Interpretations Report</i>			
Pastureland and Hayland Interpretations	1/02	1/02	SOI
<i>*Yields Per Acre of Pasture and Hayland</i>			

	Issue Date	Date of Last Review	Responsible Staff
Mined Land Interpretations <i>Use and Explanation of Mined Land Interpretations</i>	1/93	1/93	SOI
Windbreak Interpretations <i>*Conservation Tree and Shrub Management Report</i>	1/02	1/02	SOI
Engineering Interpretations <i>*Engineering Index Properties</i> <i>*Physical Properties of the Soils</i> <i>*Chemical Properties of the Soils</i> <i>*Water Features</i> <i>*Soil Features</i> <i>*Water Management Report</i>	1/02	1/02	SOI
Waste Disposal Interpretations <i>*Sanitary Facilities Report</i> <i>*Agricultural Waste Management Report</i>	1/02	1/02	SOI
Water Quantity and Quality Interpretations <i>Use and Explanation of Water Quantity and Quality Interpretations</i> <i>*Appendix A – Soils Potential For Surface Loss and Leaching</i> <i>*Appendix B – Pesticide Selected Properties Database</i> <i>*Appendix C – Herbicide Selected Properties Database</i> <i>*Soil-Pesticide Interaction Screening Procedure Worksheet (Blank)</i> <i>*WIN-PST SPISP II Soil Sensitivity to Pesticide Loss Rating Report</i>	1/02	1/02	SOI
Hydric Soil Interpretations <i>Use and Explanation of Hydric Soil Interpretations</i> <i>*Hydric Soils List</i>	1/02	1/02	SOI
HEL Interpretations <i>Use and Explanation of Highly Erodible Land Interpretations</i> <i>*Highly Erodible Lands Report</i> <i>*LS and Supporting Data for 1990 Frozen HEL List</i> <i>*CRP 20 Soil Supporting Data for 1990 Frozen HEL List</i>	7/95	1/00	SOI

**County specific computer generated reports.*

ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS
Leavenworth and Wyandotte Counties, Kansas: Published

Map symbol	Soil name	Acres	Percent
005AQ	Fluvaquents, Ponded-----	23	*
005AR	Armster Clay Loam, 6 To 12 Percent Slopes-----	102	*
005GO	Gosport Silty Clay Loam, 25 To 45 Percent Slopes-----	6	*
005HN	Haynie Silt Loam, 0 To 2 Percent Slopes, Occasionally Flooded-----	110	*
005HO	Haynie-Onawa Complex, 0 To 2 Percent Slopes, Occasionally Flooded-----	155	*
005KG	Kennebec-Colo Silt Loams, 0 To 2 Percent Slopes, Occasionally Flooded-----	44	*
005KY	Knox-Gosport Complex, 10 To 30 Percent Slopes-----	245	*
005OD	Onawa Loam, 0 To 2 Percent Slopes, Occasionally Flooded, Overwash-----	191	*
005OW	Onawet Silty Clay Loam, Depressionnal, 0 To 1 Percent Slopes, Frequently Flooded-----	25	*
005PA	Palermo-Knox Complex, 10 To 18 Percent Slopes-----	314	*
005PB	Palermo Silty Clay Loam, 18 To 30 Percent Slopes-----	245	*
005SH	Shelby Clay Loam, 5 To 10 Percent Slopes-----	2	*
005WA	Wabash Silty Clay Loam, 0 To 2 Percent Slopes, Occasionally Flooded-----	36	*
005WH	Wathena-Haynie Complex, 0 To 2 Percent Slopes, Occasionally Flooded-----	74	*
045ET	Eudora Silt Loam, Rarely Flooded-----	2	*
045EV	Eudora-Kimo Complex, Rarely Flooded-----	548	0.1
045KM	Kimo Silty Clay Loam, Rarely Flooded-----	154	*
045MR	Morrill Clay Loam, 3 To 7 Percent Slopes-----	26	*
045RO	Riverwash-----	2	*
045SB	Sarpy-Eudora Complex, Overwash, Occasionally Flooded-----	437	0.1
045VM	Vinland-Martin Complex, 7 To 15 Percent Slopes-----	15	*
045WC	Wabash Silty Clay Loam, Occasionally Flooded-----	19	*
087RE	Reading Silt Loam, 0 To 2 Percent Slopes, Very Rarely Flooded, Moderately Wet-----	17	*
087SS	Sibleyville Complex, 3 To 7 Percent Slopes-----	31	*
087SV	Sibleyville Complex, 7 To 12 Percent Slopes-----	1	*
087VO	Vinland Complex, 7 To 15 Percent Slopes-----	168	*
087WC	Wabash Silty Clay Loam, 0 To 1 Percent Slopes, Very Rarely Flooded-----	17	*
091ED	Eudora-Kimo Complex, Overwash, Rarely Flooded-----	1	*
091LB	Ladoga Silt Loam, 8 To 15 Percent Slopes-----	1,180	0.3
091RA	Reading Silt Loam, 0 To 2 Percent Slopes, Rarely Flooded-----	55	*
091SB	Sharpsburg-Urban Land Complex, 3 To 8 Percent Slopes-----	1,076	0.3
Aa	Kennebec Silt Loam, Channeled-----	12,539	3.1
Ac	Armster Loam, 3 To 8 Percent Slopes-----	4,318	1.1
Ad	Armster Loam, 8 To 12 Percent Slopes-----	5,946	1.5
Ae	Armster Clay Loam, 8 To 12 Percent Slopes, Eroded-----	2,906	0.7
AED	Arents, Earthen Dam-----	20	*
Ba	Basehor Complex, 5 To 30 Percent Slopes-----	7,579	1.9
Br	Bremer Silty Clay Loam, 0 To 2 Percent Slopes, Rarely Flooded-----	10,947	2.7
Cf	Cut And Fill-----	2,802	0.7
Ec	Elmont Silt Loam, 3 To 7 Percent Slopes-----	13,589	3.4
Ed	Elmont Silt Loam, 7 To 12 Percent Slopes-----	927	0.2
Eu	Eudora Complex, 0 To 1 Percent Slopes, Rarely Flooded, Overwash-----	5,828	1.5
Gc	Gosport Complex, 10 To 30 Percent Slopes-----	10,391	2.6
Gp	Gravel Pits-----	82	*
Gs	Gosport-Sogn Complex, 7 To 35 Percent Slopes-----	28,727	7.2
Gt	Grundy Silty Clay Loam, 1 To 3 Percent Slopes-----	13,963	3.5
Gu	Grundy Silty Clay Loam, 3 To 7 Percent Slopes-----	18,198	4.6
Gy	Gymer Silt Loam, 3 To 7 Percent Slopes-----	742	0.2
Hg	Haig Silty Clay Loam, 0 To 1 Percent Slopes-----	1,382	0.3
Hy	Haynie Silt Loam, 0 To 1 Percent Slopes, Occasionally Flooded-----	7,819	2.0
Ju	Judson Silt Loam, 0 To 1 Percent Slopes-----	2,226	0.6
Ke	Kennebec Silt Loam, 0 To 1 Percent Slopes, Occasionally Flooded-----	14,097	3.5
Kh	Knox Silt Loam, 7 To 12 Percent Slopes-----	17,863	4.5
Kk	Knox Silt Loam, 12 To 18 Percent Slopes-----	6,632	1.7
Km	Knox Silty Clay Loam, 7 To 12 Percent Slopes, Eroded-----	3,807	1.0
Kn	Knox Complex, 18 To 30 Percent Slopes-----	7,579	1.9
Ko	Konawa Fine Sandy Loam, 3 To 8 Percent Slopes-----	1,054	0.3
Kw	Konawa Fine Sandy Loam, 8 To 20 Percent Slopes-----	2,181	0.5
La	Ladoga Silt Loam, 4 To 7 Percent Slopes-----	22,468	5.6
M-W	Miscellaneous Water-----	11	*
Mb	Marshall Silt Loam, 1 To 4 Percent Slopes-----	864	0.2
Mc	Marshall Silt Loam, 4 To 9 Percent Slopes-----	5,013	1.3
Md	Marshall Silt Loam, 9 To 15 Percent Slopes-----	482	0.1
Mn	Martin Silty Clay Loam, 4 To 7 Percent Slopes-----	14,927	3.7
Mr	Martin Silty Clay Loam, 7 To 12 Percent Slopes-----	2,780	0.7
Ms	Martin Soils, 6 To 12 Percent Slopes, Eroded-----	1,572	0.4
On	Onawa Silty Clay Loam, 0 To 1 Percent Slopes, Occasionally Flooded-----	6,236	1.6
Oo	Onawa Soils, 0 To 1 Percent Slopes, Occasionally Flooded, Overwash-----	5,634	1.4
Os	Oska Silty Clay Loam, 3 To 8 Percent Slopes-----	2,255	0.6
Pb	Pawnee Clay Loam, 1 To 4 Percent Slopes-----	2,097	0.5
Pc	Pawnee Clay Loam, 4 To 8 Percent Slopes-----	14,209	3.6
Pe	Pawnee Clay Loam, 4 To 8 Percent Slopes, Eroded-----	2,493	0.6
Qu	Quarries-----	573	0.1
Rs	River Sand-----	79	*
Sa	Sarpy-Haynie Complex, 0 To 3 Percent Slopes, Occasionally Flooded-----	2,793	0.7
Sb	Sharpsburg Silty Clay Loam, 1 To 4 Percent Slopes-----	5,548	1.4
Sc	Sharpsburg Silty Clay Loam, 4 To 8 Percent Slopes-----	21,270	5.3
Se	Shelby Loam, 1 To 4 Percent Slopes-----	1,956	0.5
Sh	Shelby Loam, 4 To 8 Percent Slopes-----	15,353	3.8
Sm	Shelby Loam, 8 To 12 Percent Slopes-----	10,468	2.6
Ss	Shelby-Pawnee Complex, 4 To 8 Percent Slopes-----	17,345	4.3
Ss	Shelby-Pawnee Complex, 4 To 8 Percent Slopes, Eroded-----	1,127	0.3
Sy	Sibleyville Loam, 4 To 8 Percent Slopes-----	2,019	0.5
SZ	Sogn-Vinland Complex, 5 To 20 Percent Slopes-----	1,565	0.4
Uc	Unclassified-----	44	*
Un	Unknown-----	60	*
VR	Vinland-Rock Outcrop Complex, 20 To 40 Percent Slopes-----	3,104	0.8
Vs	Vinland-Sibleyville Complex, 5 To 12 Percent Slopes-----	8,254	2.1
W	Water-----	6,859	1.7
Wa	Wabash Silty Clay, 0 To 1 Percent Slopes, Occasionally Flooded-----	3,712	0.9

ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

Leavenworth and Wyandotte Counties, Kansas: Published

Map symbol	Soil name	Acres	Percent
Wc	Welda Silt Loam, 4 To 9 Percent Slopes-----	2,490	0.6
Wd	Welda Silt Loam, 9 To 15 Percent Slopes-----	855	0.2
Zo	Zook Silty Clay Loam, 0 To 1 Percent Slopes, Occasionally Flooded-----	3,905	1.0
	Total-----	399,885	100.0

* Less than 0.1 percent.

NONTECHNICAL SOIL DESCRIPTIONS
Leavenworth and Wyandotte Counties, Kansas

Nontechnical soil descriptions describe soil properties or management considerations specific to a soil map unit or group of map units, shown in the NonTechnical Descriptions report. These descriptions are written in terminology that Non-technical users of soil survey information can understand. Nontechnical soil descriptions are a powerful tool for creating reports. These high quality, easy to read reports can be generated by conservation planners and other NRCS employees for distribution to land users. Soil map unit descriptions and National Soil Information System records are the basis for these descriptions.

005AQ Fluvaquents, Pondered

Fluvaquents soil makes up 95 percent of the map unit. This map unit is in the Iowa and Missouri Deep Loess Hills Major Land Resource Area. This soil occurs on a nearly level to gently sloping depression on flood plain on river valley. The runoff class is negligible. The parent material consists of silty and clayey alluvium. This soil is poorly drained. It has a very low available water capacity and a low shrink swell potential. This soil is occasionally flooded and is frequent ponded. The top of the seasonal high water table is at 0 inches. It is in the nonirrigated land capability classification 8w.

005AR Armster Clay Loam, 6 To 12 Percent Slopes

Armster soil makes up 85 percent of the map unit. This map unit is in the Iowa and Missouri Deep Loess Hills Major Land Resource Area. This soil occurs on a moderately sloping to strongly sloping hillslope on upland. The runoff class is high. The parent material consists of silty and clayey pediment over clayey till. This soil is moderately well drained. The slowest permeability is moderately slow. It has a moderate available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The top of the seasonal high water table is at 15 inches. This soil is in the Clay Upland (pe30-37) range site. It is in the nonirrigated land capability classification 4e.

005GO Gosport Silty Clay Loam, 25 To 45 Percent Slopes

Gosport soil makes up 85 percent of the map unit. This map unit is in the Iowa and Missouri Deep Loess Hills Major Land Resource Area. This soil occurs on a steep to steep hillslope on upland. The runoff class is very high. The parent material consists of clayey residuum weathered from shale. The soil is 20 to 40 inches deep to bedrock (paralithic). This soil is moderately well drained. The slowest permeability is very slow. It has a low available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. It is in the nonirrigated land capability classification 7e.

005HN Haynie Silt Loam, 0 To 2 Percent Slopes, Occasionally Flooded

Haynie soil makes up 96 percent of the map unit. This map unit is in the Iowa and Missouri Deep Loess Hills Major Land Resource Area. This soil occurs on a nearly level to gently sloping alluvial flat on river valley. The runoff class is low. The parent material consists of coarse-silty alluvium. This soil is well drained. The slowest permeability is moderate. It has a very high available water capacity and a low shrink swell potential. This soil is occasionally flooded and is not ponded. The top of the seasonal high water table is at 24 inches. The soil contains a maximum amount of 30 percent calcium carbonate. This soil is in the Loamy Lowland (pe35-37) range site. This soil is in the irrigated land capability class 2w. It is in the nonirrigated land capability classification 2w.

005HO Haynie-Onawa Complex, 0 To 2 Percent Slopes, Occasionally Flooded

Haynie soil makes up 60 percent of the map unit. This map unit is in the Iowa and Missouri Deep Loess Hills Major Land Resource Area. This soil occurs on a nearly level to gently sloping alluvial flat on river valley. The runoff class is low. The parent material consists of coarse-silty alluvium. This soil is well drained. The slowest permeability is moderate. It has a very high available water capacity and a low shrink swell potential. This soil is occasionally flooded and is not ponded. The top of the seasonal high water table is at 24 inches. The soil contains a maximum amount of 30 percent calcium carbonate. This soil is in the Loamy Lowland (pe35-37) range site. This soil is in the irrigated land capability class 2w. It is in the nonirrigated land capability classification 2w.

Onawa soil makes up 30 percent of the map unit. This map unit is in the Iowa and Missouri Deep Loess Hills Major Land Resource Area. This soil occurs on a nearly level to gently sloping flood plain on river valley. The runoff class is medium. The parent material consists of clayey alluvium. This soil is somewhat poorly drained. The slowest permeability is slow. It has a high available water capacity and a high shrink swell potential. This soil is occasionally flooded and is occasional ponded. The top of the seasonal high water table is at 24 inches. This soil is in the Clay Lowland (pe35-37) range site. This soil is in the irrigated land capability class 2w. It is in the nonirrigated land capability classification 2w.

005KG Kennebec-Colo Silt Loams, 0 To 2 Percent Slopes, Occasionally Flooded

Kennebec soil makes up 60 percent of the map unit. This map unit is in the Iowa and Missouri Deep Loess Hills Major Land Resource Area. This soil occurs on a nearly level to gently sloping flood plain on river valley. The runoff class is low. The parent material consists of fine-silty alluvium. This soil is moderately well drained. The slowest permeability is moderate. It has a very high available water capacity and a moderate shrink swell potential. This soil is occasionally flooded and is not ponded. The top of the seasonal high water table is at 48 inches. This soil is in the Loamy Lowland (pe30-37) range site. It is in the nonirrigated land capability classification 2w.

NONTECHNICAL SOIL DESCRIPTIONS--Continued
Leavenworth and Wyandotte Counties, Kansas

Colo soil makes up 30 percent of the map unit. This map unit is in the Iowa and Missouri Deep Loess Hills Major Land Resource Area. This soil occurs on a nearly level to gently sloping flood plain on valley. The runoff class is low. The parent material consists of fine-silty alluvium. This soil is poorly drained. The slowest permeability is moderate. It has a high available water capacity and a moderate shrink swell potential. This soil is occasionally flooded and is not ponded. The top of the seasonal high water table is at 24 inches. It is in the nonirrigated land capability classification .

005KY Knox-Gosport Complex, 10 To 30 Percent Slopes

Knox soil makes up 60 percent of the map unit. This map unit is in the Iowa and Missouri Deep Loess Hills Major Land Resource Area. This soil occurs on a strongly sloping to steep hillslope on upland. The runoff class is high. The parent material consists of fine-silty loess. This soil is well drained. The slowest permeability is moderate. It has a high available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. It is in the nonirrigated land capability classification 6e.

Gosport soil makes up 30 percent of the map unit. This map unit is in the Iowa and Missouri Deep Loess Hills Major Land Resource Area. This soil occurs on a strongly sloping to steep hillslope on upland. The runoff class is very high. The parent material consists of clayey residuum weathered from shale. The soil is 20 to 40 inches deep to bedrock (paralithic). This soil is moderately well drained. The slowest permeability is very slow. It has a low available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. It is in the nonirrigated land capability classification .

0050D Onawa Loam, 0 To 2 Percent Slopes, Occasionally Flooded, Overwash

Onawa soil makes up 95 percent of the map unit. This map unit is in the Iowa and Missouri Deep Loess Hills Major Land Resource Area. This soil occurs on a nearly level to gently sloping flood plain on river valley. The runoff class is medium. The parent material consists of clayey alluvium over loamy alluvium. This soil is somewhat poorly drained. The slowest permeability is slow. It has a high available water capacity and a high shrink swell potential. This soil is occasionally flooded and is occasional ponded. The top of the seasonal high water table is at 36 inches. The soil contains a maximum amount of 10 percent calcium carbonate. This soil is in the Clay Lowland (pe35-37) range site. This soil is in the irrigated land capability class 2w. It is in the nonirrigated land capability classification 2w.

0050W Onawet Silty Clay Loam, Depressional, 0 To 1 Percent Slopes, Frequently Flooded

Onawet soil makes up 95 percent of the map unit. This map unit is in the Iowa and Missouri Deep Loess Hills Major Land Resource Area. This soil occurs on a nearly level flood plain on river valley. The runoff class is negligible. The parent material consists of clayey alluvium over loamy alluvium. This soil is very poorly drained. The slowest permeability is slow. It has a high available water capacity and a high shrink swell potential. This soil is frequently flooded and is frequent ponded. The top of the seasonal high water table is at 30 inches. The soil contains a maximum amount of 30 percent calcium carbonate. It is in the nonirrigated land capability classification 5w.

005PA Palermo-Knox Complex, 10 To 18 Percent Slopes

Knox soil makes up 50 percent of the map unit. This map unit is in the Iowa and Missouri Deep Loess Hills Major Land Resource Area. This soil occurs on a strongly sloping to moderately steep backslope, summit, shoulder hillslope on upland. The runoff class is high. The parent material consists of loess. This soil is well drained. The slowest permeability is moderate. It has a very high available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. It is in the nonirrigated land capability classification 3e.

Palermo soil makes up 50 percent of the map unit. This map unit is in the Iowa and Missouri Deep Loess Hills Major Land Resource Area. This soil occurs on a strongly sloping to moderately steep shoulder, backslope, summit hillslope on upland. The runoff class is high. The parent material consists of loess. This soil is well drained. It has a very high available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. It is in the nonirrigated land capability classification 4e.

005PB Palermo Silty Clay Loam, 18 To 30 Percent Slopes

Palermo soil makes up 95 percent of the map unit. This map unit is in the Iowa and Missouri Deep Loess Hills Major Land Resource Area. This soil occurs on a moderately steep to steep shoulder, summit, backslope hillslope on upland. The runoff class is high. The parent material consists of loess. This soil is well drained. It has a very high available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. It is in the nonirrigated land capability classification 4e.

005SH Shelby Clay Loam, 5 To 10 Percent Slopes

Shelby soil makes up 85 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a moderately sloping to strongly sloping hillslope on upland. The runoff class is high. The parent material consists of fine-loamy drift. This soil is moderately well drained. The slowest permeability is moderately slow. It has a high available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 30 percent calcium carbonate. This soil is in the Loamy Upland (pe30-37) range site. It is in the nonirrigated land capability classification 3e.

NONTECHNICAL SOIL DESCRIPTIONS--Continued
Leavenworth and Wyandotte Counties, Kansas

005WA Wabash Silty Clay Loam, 0 To 2 Percent Slopes, Occasionally Flooded

Wabash soil makes up 85 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a nearly level to gently sloping flood plain on valley. The runoff class is very high. The parent material consists of clayey alluvium. This soil is poorly drained. The slowest permeability is very slow. It has a moderate available water capacity and a very high shrink swell potential. This soil is occasionally flooded and is not ponded. The top of the seasonal high water table is at 6 inches. This soil is in the Clay Lowland (pe30-37) range site. It is in the nonirrigated land capability classification 3w.

005WH Wathena-Haynie Complex, 0 To 2 Percent Slopes, Occasionally Flooded

Wathena soil makes up 55 percent of the map unit. This map unit is in the Iowa and Missouri Deep Loess Hills Major Land Resource Area. This soil occurs on a nearly level to gently sloping natural levee on flood plain. The runoff class is negligible. The parent material consists of sandy alluvium. This soil is moderately well drained. The slowest permeability is rapid. It has a moderate available water capacity and a moderate shrink swell potential. This soil is occasionally flooded and is occasional ponded. The top of the seasonal high water table is at 31 inches. This soil is in the Sandy Lowland (pe35-37) range site. It is in the nonirrigated land capability classification 4w.

Haynie soil makes up 40 percent of the map unit. This map unit is in the Iowa and Missouri Deep Loess Hills Major Land Resource Area. This soil occurs on a nearly level to gently sloping alluvial flat on river valley. The runoff class is negligible. The parent material consists of silty alluvium. This soil is well drained. The slowest permeability is moderate. It has a very high available water capacity and a low shrink swell potential. This soil is occasionally flooded and is not ponded. The top of the seasonal high water table is at 24 inches. The soil contains a maximum amount of 30 percent calcium carbonate. This soil is in the Loamy Lowland (pe35-37) range site. This soil is in the irrigated land capability class 2w. It is in the nonirrigated land capability classification 2w.

045ET Eudora Silt Loam, Rarely Flooded

Eudora soil makes up 90 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a nearly level flood plain on river valley. The runoff class is low. The parent material consists of coarse-silty alluvium. This soil is well drained. The slowest permeability is moderate. It has a very high available water capacity and a low shrink swell potential. This soil is rarely flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Lowland (pe30-37) range site. It is in the nonirrigated land capability classification 1.

045EV Eudora-Kimo Complex, Rarely Flooded

Eudora soil makes up 60 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a nearly level to gently sloping flood plain on river valley. The runoff class is low. The parent material consists of coarse-silty alluvium. This soil is well drained. The slowest permeability is moderate. It has a very high available water capacity and a low shrink swell potential. This soil is rarely flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Lowland (pe30-37) range site. It is in the nonirrigated land capability classification 2w.

Kimo soil makes up 30 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a nearly level flood plain on river valley. The runoff class is medium. The parent material consists of clayey over loamy alluvium. This soil is somewhat poorly drained. The slowest permeability is slow. It has a high available water capacity and a high shrink swell potential. This soil is rarely flooded and is not ponded. The top of the seasonal high water table is at 24 inches. This soil is in the Clay Lowland (pe30-37) range site. It is in the nonirrigated land capability classification 2w.

045KM Kimo Silty Clay Loam, Rarely Flooded

Kimo soil makes up 90 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a nearly level flood plain on river valley. The runoff class is medium. The parent material consists of clayey over loamy alluvium. This soil is somewhat poorly drained. The slowest permeability is slow. It has a high available water capacity and a high shrink swell potential. This soil is rarely flooded and is not ponded. The top of the seasonal high water table is at 24 inches. This soil is in the Clay Lowland (pe30-37) range site. It is in the nonirrigated land capability classification 2w.

045MR Morrill Clay Loam, 3 To 7 Percent Slopes

Morrill soil makes up 90 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a moderately sloping hillslope on upland. The runoff class is medium. The parent material consists of fine-loamy glaciofluvial deposits. This soil is well drained. The slowest permeability is moderately slow. It has a high available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe30-37) range site. It is in the nonirrigated land capability classification 3e.

045SB Sarpy-Eudora Complex, Overwash, Occasionally Flooded

Sarpy soil makes up 55 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a nearly level flood plain on river valley. The runoff class is negligible. The parent material consists of sandy alluvium. This soil is excessively drained. The slowest permeability is rapid. It has a low available water capacity and a low shrink swell potential. This soil is occasionally flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Sandy Lowland (pe30-37) range site. It is in the nonirrigated land capability classification 3w.

NONTECHNICAL SOIL DESCRIPTIONS--Continued
Leavenworth and Wyandotte Counties, Kansas

Eudora soil makes up 45 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a nearly level flood plain on river valley. The runoff class is low. The parent material consists of coarse-silty alluvium. This soil is well drained. The slowest permeability is moderate. It has a high available water capacity and a low shrink swell potential. This soil is occasionally flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Lowland (pe30-37) range site. It is in the nonirrigated land capability classification 3w.

045VM Vinland-Martin Complex, 7 To 15 Percent Slopes

Vinland soil makes up 40 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a strongly sloping to moderately steep hillslope on upland. The runoff class is medium. The parent material consists of sandy and silty residuum weathered from shale. The soil is 10 to 20 inches deep to bedrock (paralithic). This soil is somewhat excessively drained. The slowest permeability is moderate. It has a low available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe35-42) range site. It is in the nonirrigated land capability classification 6e.

Martin soil makes up 25 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a strongly sloping hillslope on upland. The runoff class is very high. The parent material consists of silty and clayey colluvium derived from limestone and shale over silty and clayey residuum weathered from limestone and shale. This soil is moderately well drained. The slowest permeability is slow. It has a high available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The top of the seasonal high water table is at 24 inches. The soil contains a maximum amount of 1 percent calcium carbonate. This soil is in the Loamy Upland (pe35-42) range site. It is in the nonirrigated land capability classification 4e.

045WC Wabash Silty Clay Loam, Occasionally Flooded

Wabash soil makes up 88 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a nearly level terrace on river valley. The runoff class is very high. The parent material consists of clayey alluvium. This soil is poorly drained. The slowest permeability is very slow. It has a moderate available water capacity and a very high shrink swell potential. This soil is occasionally flooded and is not ponded. The top of the seasonal high water table is at 6 inches. This soil is in the Clay Lowland (pe30-37) range site. It is in the nonirrigated land capability classification 3w.

087RE Reading Silt Loam, 0 To 2 Percent Slopes, Very Rarely Flooded, Moderately Wet

Reading soil makes up 85 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a nearly level to gently sloping terrace on river valley. The runoff class is medium. The parent material consists of fine-silty alluvium. This soil is moderately well drained. The slowest permeability is moderately slow. It has a high available water capacity and a moderate shrink swell potential. This soil is very rare flooded and is not ponded. The top of the seasonal high water table is at 57 inches. It is in the nonirrigated land capability classification 2w.

087SS Sibleyville Complex, 3 To 7 Percent Slopes

Sibleyville soil makes up 60 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a moderately sloping hillslope on upland. The runoff class is medium. The parent material consists of sandy and silty residuum weathered from sandstone and shale. The soil is 20 to 40 inches deep to bedrock (paralithic). This soil is well drained. The slowest permeability is moderate. It has a low available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe35-42) range site. It is in the nonirrigated land capability classification 4e.

087SV Sibleyville Complex, 7 To 12 Percent Slopes

Sibleyville soil makes up 50 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a strongly sloping hillslope on upland. The runoff class is medium. The parent material consists of sandy and silty residuum weathered from sandstone and shale. The soil is 20 to 40 inches deep to bedrock (paralithic). This soil is well drained. The slowest permeability is moderate. It has a low available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe30-37) range site. It is in the nonirrigated land capability classification 6e.

087VO Vinland Complex, 7 To 15 Percent Slopes

Vinland soil makes up 55 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a strongly sloping to moderately steep hillslope on upland. The runoff class is medium. The parent material consists of sandy and silty residuum weathered from shale. The soil is 10 to 20 inches deep to bedrock (paralithic). This soil is moderately well drained. The slowest permeability is moderate. It has a low available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe30-37) range site. It is in the nonirrigated land capability classification 6e.

087WC Wabash Silty Clay Loam, 0 To 1 Percent Slopes, Very Rarely Flooded

Wabash soil makes up 94 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a nearly level terrace on river valley. The runoff class is very high. The parent material consists of clayey alluvium. This soil is poorly drained. The slowest permeability is very slow. It has a moderate available water capacity and a very high shrink swell potential. This soil is very rare flooded and is not ponded. The top of the seasonal high water table is at 6 inches. This soil is in the Clay Lowland (pe30-37) range site. It is in the nonirrigated land capability classification 3w.

NONTECHNICAL SOIL DESCRIPTIONS--Continued
Leavenworth and Wyandotte Counties, Kansas

091ED Eudora-Kimo Complex, Overwash, Rarely Flooded

Eudora soil makes up 75 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a nearly level to gently sloping flood-plain step on river valley. The runoff class is low. The parent material consists of coarse-silty alluvium. This soil is well drained. The slowest permeability is moderate. It has a very high available water capacity and a low shrink swell potential. This soil is rarely flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Lowland (pe30-37) range site. It is in the nonirrigated land capability classification 1.

Kimo soil makes up 25 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a nearly level flood-plain step on river valley. The runoff class is high. The parent material consists of clayey alluvium over loamy alluvium. This soil is poorly drained. The slowest permeability is slow. It has a high available water capacity and a high shrink swell potential. This soil is rarely flooded and is not ponded. The top of the seasonal high water table is at 48 inches. This soil is in the Clay Lowland (pe30-37) range site. It is in the nonirrigated land capability classification 2w.

091LB Ladoga Silt Loam, 8 To 15 Percent Slopes

Ladoga soil makes up 85 percent of the map unit. This map unit is in the Iowa and Missouri Deep Loess Hills Major Land Resource Area. This soil occurs on a strongly sloping to moderately steep hillslope on upland. The runoff class is high. The parent material consists of silty and clayey loess. This soil is moderately well drained. The slowest permeability is moderately slow. It has a high available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. It is in the nonirrigated land capability classification 4e.

091RA Reading Silt Loam, 0 To 2 Percent Slopes, Rarely Flooded

Reading soil makes up 90 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a nearly level to gently sloping terrace on river valley. The runoff class is low. The parent material consists of fine-silty alluvium. This soil is well drained. The slowest permeability is moderately slow. It has a high available water capacity and a moderate shrink swell potential. This soil is rarely flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Lowland (pe35-42) range site. It is in the nonirrigated land capability classification 1.

091SB Sharpsburg-Urban Land Complex, 3 To 8 Percent Slopes

Sharpsburg soil makes up 55 percent of the map unit. This map unit is in the Iowa and Missouri Deep Loess Hills Major Land Resource Area. This soil occurs on a moderately sloping to strongly sloping hillslope on upland. The runoff class is medium. The parent material consists of silty and clayey loess. This soil is moderately well drained. The slowest permeability is moderately slow. It has a high available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe30-37) range site. It is in the nonirrigated land capability classification 3e.

Aa Kennebec Silt Loam, Channeled

Kennebec, CHANNELED, soil makes up 85 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a nearly level to gently sloping flood plain on valley. The runoff class is low. The parent material consists of silty alluvium. This soil is moderately well drained. The slowest permeability is moderate. It has a very high available water capacity and a moderate shrink swell potential. This soil is frequently flooded and is not ponded. The top of the seasonal high water table is at 42 inches. This soil is in the Loamy Lowland (pe30-37) range site. It is in the nonirrigated land capability classification 5w.

Ac Armster Loam, 3 To 8 Percent Slopes

Armster soil makes up 90 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a moderately sloping to strongly sloping hillslope on upland. The runoff class is high. The parent material consists of silty and clayey loess over clayey pedisidiment. This soil is moderately well drained. The slowest permeability is moderately slow. It has a moderate available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The top of the seasonal high water table is at 36 inches. This soil is in the Clay Upland (pe30-37) range site. It is in the nonirrigated land capability classification 3e.

Ad Armster Loam, 8 To 12 Percent Slopes

Armster soil makes up 90 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a strongly sloping hillslope on upland. The runoff class is high. The parent material consists of silty and clayey loess over clayey pedisidiment. This soil is moderately well drained. The slowest permeability is moderately slow. It has a moderate available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The top of the seasonal high water table is at 36 inches. This soil is in the Clay Upland (pe30-37) range site. It is in the nonirrigated land capability classification 4e.

NONTECHNICAL SOIL DESCRIPTIONS--Continued
Leavenworth and Wyandotte Counties, Kansas

Ae Armster Clay Loam, 8 To 12 Percent Slopes, Eroded

Armster, eroded, soil makes up 75 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a strongly sloping hillslope on upland. The runoff class is high. The parent material consists of silty and clayey loess over clayey pedimentation. This soil is moderately well drained. The slowest permeability is moderately slow. It has a moderate available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The top of the seasonal high water table is at 36 inches. This soil is in the Clay Upland (pe30-37) range site. It is in the nonirrigated land capability classification 4e.

Ba Basehor Complex, 5 To 30 Percent Slopes

Basehor soil makes up 55 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a moderately sloping to steep hillslope on upland. The runoff class is low. The parent material consists of loamy residuum weathered from sandstone. The soil is 10 to 20 inches deep to bedrock (lithic). This soil is well drained. The slowest permeability is moderately rapid. It has a very low available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Shallow Savannah (pe30-37) range site. It is in the nonirrigated land capability classification 6s.

Br Bremer Silty Clay Loam, 0 To 2 Percent Slopes, Rarely Flooded

Bremer soil makes up 95 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a nearly level to gently sloping flood-plain step on valley. The runoff class is medium. The parent material consists of silty and clayey alluvium. This soil is poorly drained. The slowest permeability is moderately slow. It has a high available water capacity and a high shrink swell potential. This soil is rarely flooded and is not ponded. The top of the seasonal high water table is at 18 inches. It is in the nonirrigated land capability classification 2w.

Ec Elmont Silt Loam, 3 To 7 Percent Slopes

Elmont soil makes up 85 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a moderately sloping hillslope on upland. The runoff class is medium. The parent material consists of silty and clayey residuum weathered from shale and siltstone. The soil is greater than 60 inches deep to bedrock. This soil is well drained. The slowest permeability is moderately slow. It has a high available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe30-37) range site. It is in the nonirrigated land capability classification 3e.

Ed Elmont Silt Loam, 7 To 12 Percent Slopes

Elmont soil makes up 85 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a strongly sloping hillslope on upland. The runoff class is high. The parent material consists of silty and clayey residuum weathered from shale and siltstone. The soil is greater than 60 inches deep to bedrock. This soil is well drained. The slowest permeability is moderately slow. It has a high available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe30-37) range site. It is in the nonirrigated land capability classification 4e.

Eu Eudora Complex, 0 To 1 Percent Slopes, Rarely Flooded, Overwash

Eudora soil makes up 70 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a nearly level flood-plain step on river valley. The runoff class is low. The parent material consists of coarse-silty alluvium. This soil is well drained. The slowest permeability is moderate. It has a very high available water capacity and a low shrink swell potential. This soil is rarely flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Lowland (pe30-37) range site. It is in the nonirrigated land capability classification 1.

Haynie soil makes up 20 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a nearly level alluvial flat on river valley. The runoff class is low. The parent material consists of coarse-silty alluvium. This soil is well drained. The slowest permeability is moderate. It has a very high available water capacity and a low shrink swell potential. This soil is occasionally flooded and is not ponded. The top of the seasonal high water table is at 24 inches. The soil contains a maximum amount of 30 percent calcium carbonate. This soil is in the Loamy Lowland (pe35-37) range site. This soil is in the irrigated land capability class 2w. It is in the nonirrigated land capability classification 2w.

Gc Gosport Complex, 10 To 30 Percent Slopes

Gosport soil makes up 50 percent of the map unit. This map unit is in the Iowa and Missouri Deep Loess Hills Major Land Resource Area. This soil occurs on a strongly sloping to steep hillslope on upland. The runoff class is very high. The parent material consists of clayey residuum weathered from shale. The soil is 20 to 40 inches deep to bedrock (paralithic). This soil is moderately well drained. The slowest permeability is very slow. It has a low available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. It is in the nonirrigated land capability classification 7e.

NONTECHNICAL SOIL DESCRIPTIONS--Continued
Leavenworth and Wyandotte Counties, Kansas

Gs Gosport-Sogn Complex, 7 To 35 Percent Slopes

Gosport soil makes up 50 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a strongly sloping to steep hillslope on upland. The runoff class is very high. The parent material consists of clayey residuum weathered from shale. The soil is 20 to 40 inches deep to bedrock (paralithic). This soil is moderately well drained. The slowest permeability is very slow. It has a low available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. It is in the nonirrigated land capability classification 7e.

Sogn soil makes up 35 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a strongly sloping to moderately steep hillslope on upland. The runoff class is medium. The parent material consists of loamy residuum weathered from limestone. The soil is 4 to 20 inches deep to bedrock (lithic). This soil is somewhat excessively drained. The slowest permeability is moderate. It has a very low available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Shallow Limy (pe30-37) range site. It is in the nonirrigated land capability classification .

Gt Grundy Silty Clay Loam, 1 To 3 Percent Slopes

Grundy soil makes up 90 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a gently sloping hillslope on upland. The runoff class is high. The parent material consists of silty and clayey loess. This soil is somewhat poorly drained. The slowest permeability is slow. It has a high available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The top of the seasonal high water table is at 18 inches. This soil is in the Clay Upland (pe30-37) range site. It is in the nonirrigated land capability classification 2e.

Gu Grundy Silty Clay Loam, 3 To 7 Percent Slopes

Grundy soil makes up 90 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a moderately sloping hillslope on upland. The runoff class is high. The parent material consists of silty and clayey loess. This soil is somewhat poorly drained. The slowest permeability is slow. It has a high available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The top of the seasonal high water table is at 18 inches. This soil is in the Clay Upland (pe30-37) range site. It is in the nonirrigated land capability classification 3e.

Gy Gymer Silt Loam, 3 To 7 Percent Slopes

Gymer soil makes up 85 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a moderately sloping hillslope on upland. The runoff class is medium. The parent material consists of fine-silty loess. This soil is well drained. The slowest permeability is moderately slow. It has a high available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe30-37) range site. It is in the nonirrigated land capability classification 3e.

Hg Haig Silty Clay Loam, 0 To 1 Percent Slopes

Haig soil makes up 90 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a nearly level depression on hillslope on upland. The runoff class is medium. The parent material consists of silty and clayey loess. This soil is poorly drained. The slowest permeability is slow. It has a high available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The top of the seasonal high water table is at 18 inches. This soil is in the Clay Upland (pe30-37) range site. It is in the nonirrigated land capability classification 2w.

Hy Haynie Silt Loam, 0 To 1 Percent Slopes, Occasionally Flooded

Haynie soil makes up 90 percent of the map unit. This map unit is in the Iowa and Missouri Deep Loess Hills Major Land Resource Area. This soil occurs on a nearly level alluvial flat on river valley. The runoff class is low. The parent material consists of coarse-silty alluvium. This soil is well drained. The slowest permeability is moderate. It has a very high available water capacity and a low shrink swell potential. This soil is occasionally flooded and is not ponded. The top of the seasonal high water table is at 24 inches. The soil contains a maximum amount of 30 percent calcium carbonate. This soil is in the Loamy Lowland (pe35-37) range site. This soil is in the irrigated land capability class 2w. It is in the nonirrigated land capability classification 2w.

Ju Judson Silt Loam, 0 To 1 Percent Slopes

Judson soil makes up 90 percent of the map unit. This map unit is in the Iowa and Missouri Deep Loess Hills Major Land Resource Area. This soil occurs on a nearly level terrace on valley. The runoff class is low. The parent material consists of fine-silty colluvium. This soil is well drained. The slowest permeability is moderate. It has a very high available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Lowland (pe35-37) range site. It is in the nonirrigated land capability classification 1.

Ke Kennebec Silt Loam, 0 To 1 Percent Slopes, Occasionally Flooded

Kennebec soil makes up 90 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a nearly level flood plain on valley. The runoff class is low. The parent material consists of fine-silty alluvium. This soil is moderately well drained. The slowest permeability is moderate. It has a very high available water capacity and a moderate shrink swell potential. This soil is occasionally flooded and is not ponded. The top of the seasonal high water table is at 48 inches. This soil is in the Loamy Lowland (pe30-37) range site. It is in the nonirrigated land capability classification 2w.

NONTECHNICAL SOIL DESCRIPTIONS--Continued
Leavenworth and Wyandotte Counties, Kansas

Kh Knox Silt Loam, 7 To 12 Percent Slopes

Knox soil makes up 80 percent of the map unit. This map unit is in the Iowa and Missouri Deep Loess Hills Major Land Resource Area. This soil occurs on a strongly sloping hillslope on upland. The runoff class is medium. The parent material consists of fine-silty loess. This soil is well drained. The slowest permeability is moderate. It has a high available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. It is in the nonirrigated land capability classification 3e.

Kk Knox Silt Loam, 12 To 18 Percent Slopes

Knox soil makes up 90 percent of the map unit. This map unit is in the Iowa and Missouri Deep Loess Hills Major Land Resource Area. This soil occurs on a moderately steep hillslope on upland. The runoff class is medium. The parent material consists of fine-silty loess. This soil is well drained. The slowest permeability is moderate. It has a high available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. It is in the nonirrigated land capability classification 4e.

Km Knox Silty Clay Loam, 7 To 12 Percent Slopes, Eroded

Knox, eroded, soil makes up 85 percent of the map unit. This map unit is in the Iowa and Missouri Deep Loess Hills Major Land Resource Area. This soil occurs on a strongly sloping hillslope on upland. The runoff class is medium. The parent material consists of fine-silty loess. This soil is well drained. The slowest permeability is moderate. It has a high available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. It is in the nonirrigated land capability classification 4e.

Kn Knox Complex, 18 To 30 Percent Slopes

Knox soil makes up 65 percent of the map unit. This map unit is in the Iowa and Missouri Deep Loess Hills Major Land Resource Area. This soil occurs on a moderately steep to steep hillslope on upland. The runoff class is high. The parent material consists of fine-silty loess. This soil is well drained. The slowest permeability is moderate. It has a high available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. It is in the nonirrigated land capability classification 6e.

Sogn soil makes up 35 percent of the map unit. This map unit is in the Iowa and Missouri Deep Loess Hills Major Land Resource Area. This soil occurs on a moderately steep hillslope on upland. The runoff class is very high. The parent material consists of loamy residuum weathered from limestone. The soil is 4 to 20 inches deep to bedrock (lithic). This soil is somewhat excessively drained. The slowest permeability is moderate. It has a very low available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Shallow Limy (pe35-37) range site. It is in the nonirrigated land capability classification .

Ko Konawa Fine Sandy Loam, 3 To 8 Percent Slopes

Konawa soil makes up 85 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a moderately sloping to strongly sloping hillslope on upland. The runoff class is medium. The parent material consists of fine-loamy glaciofluvial deposits. This soil is well drained. The slowest permeability is moderate. It has a moderate available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Savannah (pe30-37) range site. It is in the nonirrigated land capability classification 3e.

Kw Konawa Fine Sandy Loam, 8 To 20 Percent Slopes

Konawa soil makes up 90 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a strongly sloping to moderately steep hillslope on upland. The runoff class is medium. The parent material consists of fine-loamy glaciofluvial deposits. This soil is well drained. The slowest permeability is moderate. It has a moderate available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Savannah (pe30-37) range site. It is in the nonirrigated land capability classification 6e.

La Ladoga Silt Loam, 4 To 7 Percent Slopes

Ladoga soil makes up 80 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a moderately sloping hillslope on upland. The runoff class is high. The parent material consists of silty and clayey loess. This soil is moderately well drained. The slowest permeability is moderately slow. It has a high available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. It is in the nonirrigated land capability classification 3e.

Mb Marshall Silt Loam, 1 To 4 Percent Slopes

Marshall soil makes up 90 percent of the map unit. This map unit is in the Iowa and Missouri Deep Loess Hills Major Land Resource Area. This soil occurs on a gently sloping to moderately sloping summit, shoulder interfluvial, upland. The runoff class is low. The parent material consists of fine-silty loess. This soil is well drained. The slowest permeability is moderate. It has a very high available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe35-37) range site. It is in the nonirrigated land capability classification 2e.

NONTECHNICAL SOIL DESCRIPTIONS--Continued
Leavenworth and Wyandotte Counties, Kansas

Mc Marshall Silt Loam, 4 To 9 Percent Slopes

Marshall soil makes up 90 percent of the map unit. This map unit is in the Iowa and Missouri Deep Loess Hills Major Land Resource Area. This soil occurs on a moderately sloping to strongly sloping hillslope on upland. The runoff class is medium. The parent material consists of fine-silty loess. This soil is well drained. The slowest permeability is moderate. It has a very high available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe35-37) range site. It is in the nonirrigated land capability classification 3e.

Md Marshall Silt Loam, 9 To 15 Percent Slopes

Marshall soil makes up 90 percent of the map unit. This map unit is in the Iowa and Missouri Deep Loess Hills Major Land Resource Area. This soil occurs on a strongly sloping to moderately steep hillslope on upland. The runoff class is medium. The parent material consists of fine-silty loess. This soil is well drained. The slowest permeability is moderate. It has a very high available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe35-37) range site. It is in the nonirrigated land capability classification 4e.

Mn Martin Silty Clay Loam, 4 To 7 Percent Slopes

Martin soil makes up 90 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a moderately sloping hillslope on upland. The runoff class is very high. The parent material consists of silty and clayey colluvium derived from limestone and shale over silty and clayey residuum weathered from limestone and shale. This soil is moderately well drained. The slowest permeability is slow. It has a high available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe30-37) range site. It is in the nonirrigated land capability classification 3e.

Mr Martin Silty Clay Loam, 7 To 12 Percent Slopes

Martin soil makes up 85 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a strongly sloping hillslope on upland. The runoff class is very high. The parent material consists of silty and clayey colluvium derived from limestone and shale over silty and clayey residuum weathered from limestone and shale. This soil is moderately well drained. The slowest permeability is slow. It has a high available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe30-37) range site. It is in the nonirrigated land capability classification 4e.

Ms Martin Soils, 6 To 12 Percent Slopes, Eroded

Martin soil makes up 85 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a moderately sloping to strongly sloping hillslope on upland. The runoff class is very high. The parent material consists of silty and clayey colluvium derived from limestone and shale over silty and clayey residuum weathered from limestone and shale. This soil is moderately well drained. The slowest permeability is slow. It has a moderate available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe30-37) range site. It is in the nonirrigated land capability classification 6e.

On Onawa Silty Clay Loam, 0 To 1 Percent Slopes, Occasionally Flooded

Onawa soil makes up 95 percent of the map unit. This map unit is in the Iowa and Missouri Deep Loess Hills Major Land Resource Area. This soil occurs on a nearly level flood plain on river valley. The runoff class is medium. The parent material consists of clayey alluvium over loamy alluvium. This soil is somewhat poorly drained. The slowest permeability is slow. It has a high available water capacity and a high shrink swell potential. This soil is occasionally flooded and is not ponded. The top of the seasonal high water table is at 36 inches. The soil contains a maximum amount of 10 percent calcium carbonate. This soil is in the Clay Lowland (pe35-37) range site. This soil is in the irrigated land capability class 2w. It is in the nonirrigated land capability classification 2w.

Oo Onawa Soils, 0 To 1 Percent Slopes, Occasionally Flooded, Overwash

Onawa soil makes up 90 percent of the map unit. This map unit is in the Iowa and Missouri Deep Loess Hills Major Land Resource Area. This soil occurs on a nearly level flood plain on river valley. The runoff class is medium. The parent material consists of clayey alluvium over loamy alluvium. This soil is somewhat poorly drained. The slowest permeability is slow. It has a high available water capacity and a high shrink swell potential. This soil is occasionally flooded and is not ponded. The top of the seasonal high water table is at 36 inches. The soil contains a maximum amount of 10 percent calcium carbonate. This soil is in the Clay Lowland (pe35-37) range site. It is in the nonirrigated land capability classification 2w.

Os Oaska Silty Clay Loam, 3 To 8 Percent Slopes

Oaska soil makes up 80 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a moderately sloping to strongly sloping hillslope on upland. The runoff class is high. The parent material consists of silty and clayey residuum weathered from limestone and shale. The soil is 20 to 40 inches deep to bedrock (lithic). This soil is well drained. The slowest permeability is slow. It has a moderate available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe30-37) range site. It is in the nonirrigated land capability classification 3e.

NONTECHNICAL SOIL DESCRIPTIONS--Continued
Leavenworth and Wyandotte Counties, Kansas

Pb Pawnee Clay Loam, 1 To 4 Percent Slopes

Pawnee soil makes up 90 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a gently sloping to moderately sloping hillslope on upland. The runoff class is high. The parent material consists of clayey drift. This soil is moderately well drained. The slowest permeability is slow. It has a moderate available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The top of the seasonal high water table is at 12 inches. This soil is in the Clay Upland (pe30-37) range site. It is in the nonirrigated land capability classification 2e.

Pc Pawnee Clay Loam, 4 To 8 Percent Slopes

Pawnee soil makes up 85 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a moderately sloping to strongly sloping hillslope on upland. The runoff class is very high. The parent material consists of clayey drift. This soil is moderately well drained. The slowest permeability is slow. It has a moderate available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The top of the seasonal high water table is at 12 inches. This soil is in the Clay Upland (pe30-37) range site. It is in the nonirrigated land capability classification 3e.

Pe Pawnee Clay Loam, 4 To 8 Percent Slopes, Eroded

Pawnee, eroded, soil makes up 85 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a moderately sloping to strongly sloping hillslope on upland. The runoff class is very high. The parent material consists of clayey drift. This soil is moderately well drained. The slowest permeability is slow. It has a moderate available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The top of the seasonal high water table is at 12 inches. This soil is in the Clay Upland (pe30-37) range site. It is in the nonirrigated land capability classification 3e.

Sa Sarpy-Haynie Complex, 0 To 3 Percent Slopes, Occasionally Flooded

Sarpy soil makes up 55 percent of the map unit. This map unit is in the Iowa and Missouri Deep Loess Hills Major Land Resource Area. This soil occurs on a nearly level to gently sloping flood plain on river valley. The runoff class is negligible. The parent material consists of sandy alluvium. This soil is somewhat excessively drained. The slowest permeability is rapid. It has a low available water capacity and a low shrink swell potential. This soil is occasionally flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Sandy Lowland (pe35-37) range site. It is in the nonirrigated land capability classification 3w.

Haynie soil makes up 35 percent of the map unit. This map unit is in the Iowa and Missouri Deep Loess Hills Major Land Resource Area. This soil occurs on a nearly level to gently sloping flood plain on river valley. The runoff class is very low. The parent material consists of coarse-silty alluvium. This soil is well drained. The slowest permeability is moderate. It has a high available water capacity and a low shrink swell potential. This soil is occasionally flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 30 percent calcium carbonate. This soil is in the Loamy Lowland (pe35-37) range site. It is in the nonirrigated land capability classification 2w.

Sb Sharpsburg Silty Clay Loam, 1 To 4 Percent Slopes

Sharpsburg soil makes up 80 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a gently sloping to moderately sloping hillslope on upland. The runoff class is medium. The parent material consists of silty and clayey loess. This soil is moderately well drained. The slowest permeability is moderately slow. It has a high available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe30-37) range site. It is in the nonirrigated land capability classification 2e.

Sc Sharpsburg Silty Clay Loam, 4 To 8 Percent Slopes

Sharpsburg soil makes up 80 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a moderately sloping to strongly sloping hillslope on upland. The runoff class is medium. The parent material consists of silty and clayey loess. This soil is moderately well drained. The slowest permeability is moderately slow. It has a high available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe35-37) range site. It is in the nonirrigated land capability classification 3e.

Se Shelby Loam, 1 To 4 Percent Slopes

Shelby soil makes up 90 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a gently sloping to moderately sloping hillslope on upland. The runoff class is medium. The parent material consists of fine-loamy drift. This soil is moderately well drained. The slowest permeability is moderately slow. It has a high available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 30 percent calcium carbonate. This soil is in the Loamy Upland (pe30-37) range site. It is in the nonirrigated land capability classification 2e.

NONTECHNICAL SOIL DESCRIPTIONS--Continued
Leavenworth and Wyandotte Counties, Kansas

Sh Shelby Loam, 4 To 8 Percent Slopes

Shelby soil makes up 80 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a moderately sloping to strongly sloping hillslope on upland. The runoff class is high. The parent material consists of fine-loamy till. This soil is moderately well drained. The slowest permeability is moderately slow. It has a high available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 30 percent calcium carbonate. This soil is in the Loamy Upland (pe30-37) range site. It is in the nonirrigated land capability classification 3e.

Sm Shelby Loam, 8 To 12 Percent Slopes

Shelby soil makes up 90 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a strongly sloping hillslope on upland. The runoff class is high. The parent material consists of fine-loamy till. This soil is moderately well drained. The slowest permeability is moderately slow. It has a high available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 30 percent calcium carbonate. This soil is in the Loamy Upland (pe30-37) range site. It is in the nonirrigated land capability classification 4e.

Sp Shelby-Pawnee Complex, 4 To 8 Percent Slopes

Shelby soil makes up 50 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a moderately sloping to strongly sloping hillslope on upland. The runoff class is high. The parent material consists of fine-loamy drift. This soil is moderately well drained. The slowest permeability is moderately slow. It has a high available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 30 percent calcium carbonate. This soil is in the Loamy Upland (pe30-37) range site. It is in the nonirrigated land capability classification 3e.

Pawnee soil makes up 35 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a moderately sloping to strongly sloping hillslope on upland. The runoff class is very high. The parent material consists of clayey drift. This soil is moderately well drained. The slowest permeability is slow. It has a moderate available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The top of the seasonal high water table is at 12 inches. This soil is in the Clay Upland (pe30-37) range site. It is in the nonirrigated land capability classification 3e.

Ss Shelby-Pawnee Complex, 4 To 8 Percent Slopes, Eroded

Shelby, eroded, soil makes up 55 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a moderately sloping to strongly sloping hillslope on upland. The runoff class is high. The parent material consists of fine-loamy drift. This soil is moderately well drained. The slowest permeability is moderately slow. It has a high available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 30 percent calcium carbonate. This soil is in the Loamy Upland (pe30-37) range site. It is in the nonirrigated land capability classification 3e.

Pawnee, eroded, soil makes up 35 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a moderately sloping to strongly sloping hillslope on upland. The runoff class is very high. The parent material consists of clayey drift. This soil is moderately well drained. The slowest permeability is slow. It has a moderate available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The top of the seasonal high water table is at 12 inches. This soil is in the Clay Upland (pe30-37) range site. It is in the nonirrigated land capability classification 3e.

Sy Sibleyville Loam, 4 To 8 Percent Slopes

Sibleyville soil makes up 85 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a moderately sloping to strongly sloping hillslope on upland. The runoff class is medium. The parent material consists of sandy and silty residuum weathered from sandstone and shale. The soil is 20 to 40 inches deep to bedrock (paralithic). This soil is well drained. The slowest permeability is moderate. It has a moderate available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe30-37) range site. It is in the nonirrigated land capability classification 3e.

SZ Sogn-Vinland Complex, 5 To 20 Percent Slopes

Sogn soil makes up 55 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a moderately sloping to moderately steep hillslope on upland. The runoff class is medium. The parent material consists of loamy residuum weathered from limestone. The soil is 4 to 20 inches deep to bedrock (lithic). This soil is somewhat excessively drained. The slowest permeability is moderate. It has a very low available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Shallow Limy (pe30-37) range site. It is in the nonirrigated land capability classification 7s.

Vinland soil makes up 30 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a moderately sloping to moderately steep hillslope on upland. The runoff class is medium. The parent material consists of sandy and silty residuum weathered from shale. The soil is 10 to 20 inches deep to bedrock (paralithic). This soil is somewhat excessively drained. The slowest permeability is moderate. It has a low available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe30-37) range site. It is in the nonirrigated land capability classification 6s.

NONTECHNICAL SOIL DESCRIPTIONS--Continued
Leavenworth and Wyandotte Counties, Kansas

VR Vinland-Rock Outcrop Complex, 20 To 40 Percent Slopes

Vinland soil makes up 26 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a steep to steep hillslope on upland. The runoff class is high. The parent material consists of sandy and silty residuum weathered from shale. The soil is 10 to 20 inches deep to bedrock (paralithic). This soil is somewhat excessively drained. The slowest permeability is moderate. It has a low available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe35-42) range site. It is in the nonirrigated land capability classification 6e.

Vs Vinland-Sibleyville Complex, 5 To 12 Percent Slopes

Vinland soil makes up 55 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a moderately sloping to strongly sloping hillslope on upland. The runoff class is medium. The parent material consists of sandy and silty residuum weathered from shale. The soil is 10 to 20 inches deep to bedrock (paralithic). This soil is somewhat excessively drained. The slowest permeability is moderate. It has a low available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe30-37) range site. It is in the nonirrigated land capability classification 6e.

Sibleyville soil makes up 45 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a moderately sloping to strongly sloping hillslope on upland. The runoff class is medium. The parent material consists of sandy and silty residuum weathered from sandstone and shale. The soil is 20 to 40 inches deep to bedrock (paralithic). This soil is well drained. The slowest permeability is moderate. It has a moderate available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe30-37) range site. It is in the nonirrigated land capability classification 4e.

Wa Wabash Silty Clay, 0 To 1 Percent Slopes, Occasionally Flooded

Wabash soil makes up 90 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a nearly level flood plain on valley. The runoff class is very high. The parent material consists of clayey alluvium. This soil is poorly drained. The slowest permeability is very slow. It has a moderate available water capacity and a very high shrink swell potential. This soil is occasionally flooded and is not ponded. The top of the seasonal high water table is at 6 inches. This soil is in the Clay Lowland (pe30-37) range site. It is in the nonirrigated land capability classification 3w.

Wc Welda Silt Loam, 4 To 9 Percent Slopes

Welda soil makes up 85 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a moderately sloping to strongly sloping terrace on valley. The runoff class is high. The parent material consists of silty and clayey loess. This soil is well drained. The slowest permeability is moderately slow. It has a high available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Savannah (pe30-37) range site. It is in the nonirrigated land capability classification 3e.

Wd Welda Silt Loam, 9 To 15 Percent Slopes

Welda soil makes up 90 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a strongly sloping to moderately steep terrace on valley. The runoff class is high. The parent material consists of silty and clayey loess. This soil is well drained. The slowest permeability is moderately slow. It has a high available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Savannah (pe30-37) range site. It is in the nonirrigated land capability classification 4e.

Zo Zook Silty Clay Loam, 0 To 1 Percent Slopes, Occasionally Flooded

Zook soil makes up 90 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a nearly level flood plain on valley. The runoff class is medium. The parent material consists of silty and clayey alluvium. This soil is poorly drained. The slowest permeability is slow. It has a high available water capacity and a high shrink swell potential. This soil is occasionally flooded and is not ponded. The top of the seasonal high water table is at 18 inches. This soil is in the Clay Lowland (pe30-37) range site. It is in the nonirrigated land capability classification 2w.

005AQ—Fluvaquents, Ponged

Map Unit Composition

Fluvaquents: 95 percent
 Minor components: 5 percent

Component Descriptions

Fluvaquents

MLRA: 107 - Iowa and Missouri Deep Loess Hills

Landform: Depression on flood plain on river valley

Parent material: Silty and clayey alluvium

Slope: 0 to 2 percent

Drainage class: Poorly drained

Flooding hazard: Occasional

Ponding hazard: Frequent

Depth to seasonal water saturation: About 0 to 0 inches

Runoff class: Negligible

Land capability (nonirrigated): 8w

Typical Profile:

A—0 to 80 inches; stratified variable

Minor Components

Onawa

Phase: Occasionally Flooded Overwash

Composition: About 5 percent

Slope: 0 to 2 percent

Drainage class: Somewhat poorly drained

Ecological site: Clay Lowland (pe35-37)

005AR—Armster clay loam, 6 to 12 percent slopes

Map Unit Composition

Armster: 85 percent
 Minor components: 15 percent

Component Descriptions

Armster

MLRA: 107 - Iowa and Missouri Deep Loess Hills

Landform: Hillslope on upland

Parent material: Silty and clayey pedisidiment over clayey till

Slope: 6 to 12 percent

Drainage class: Moderately well drained

Slowest permeability: Moderately slow (About 0.20 in/hr)

Available water capacity: Moderate (About 8.3 inches)

Shrink-swell potential: High (About 7.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: About 12 to 18 inches

Runoff class: High

Ecological site: Clay Upland (pe30-37)

Land capability (nonirrigated): 4e

Typical Profile:

H1—0 to 7 inches; clay loam

H2—7 to 60 inches; clay loam

Minor Components

Knox

Composition: About 5 percent

Slope: 7 to 12 percent

Drainage class: Well drained

Martin

Composition: About 5 percent

Slope: 7 to 12 percent

Drainage class: Moderately well drained

Ecological site: Loamy Upland (pe30-37)

Sharpsburg

Composition: About 5 percent

Slope: 4 to 8 percent

Drainage class: Moderately well drained

Ecological site: Loamy Upland (pe35-37)

005GO—Gosport silty clay loam, 25 to 45 percent slopes

Map Unit Composition

Gosport: 85 percent
 Minor components: 15 percent

Component Descriptions

Gosport

MLRA: 107 - Iowa and Missouri Deep Loess Hills

Landform: Hillslope on upland

Parent material: Clayey residuum weathered from shale

Slope: 25 to 45 percent

Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)

Drainage class: Moderately well drained

Slowest permeability: Very slow (About 0.00 in/hr)
Available water capacity: Low (About 4.7 inches)
Shrink-swell potential: High (About 7.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Very high
Land capability (nonirrigated): 7e

Typical Profile:

H1—0 to 8 inches; silty clay loam
 H2—8 to 35 inches; silty clay
 Cr—35 to 39 inches; weathered bedrock

Minor Components**Armster**

Composition: About 5 percent
Slope: 6 to 12 percent
Drainage class: Moderately well drained
Ecological site: Clay Upland (pe30-37)

Knox

Composition: About 5 percent
Slope: 12 to 18 percent
Drainage class: Well drained

Martin

Composition: About 5 percent
Slope: 7 to 12 percent
Drainage class: Moderately well drained
Ecological site: Loamy Upland (pe30-37)

005HN—Haynie silt loam, 0 to 2 percent slopes, occasionally flooded

Map Unit Composition

Haynie: 96 percent
 Minor components: 4 percent

Component Descriptions

Haynie

MLRA: 107 - Iowa and Missouri Deep Loess Hills
Landform: Alluvial flat on river valley
Parent material: Coarse-silty alluvium
Slope: 0 to 2 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: Very high (About 12.4 inches)

Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: Occasional
Ponding hazard: None
Depth to seasonal water saturation: About 12 to 36 inches
Runoff class: Low
Ecological site: Loamy Lowland (pe35-37)
Land capability (irrigated): 2w
Land capability (nonirrigated): 2w

Typical Profile:

Ap—0 to 7 inches; silt loam
 C1—7 to 60 inches; stratified silt loam

Minor Components**Onawa**

Composition: About 2 percent
Slope: 0 to 2 percent
Drainage class: Somewhat poorly drained
Ecological site: Clay Lowland (pe35-37)

Wathena

Composition: About 2 percent
Slope: 0 to 3 percent
Drainage class: Moderately well drained
Ecological site: Sandy Lowland (pe35-37)

005HO—Haynie-Onawa complex, 0 to 2 percent slopes, occasionally flooded

Map Unit Composition

Haynie: 60 percent
 Onawa: 30 percent
 Minor components: 10 percent

Component Descriptions

Haynie

MLRA: 107 - Iowa and Missouri Deep Loess Hills
Landform: Alluvial flat on river valley
Parent material: Coarse-silty alluvium
Slope: 0 to 2 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: Very high (About 12.4 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: Occasional
Ponding hazard: None

Depth to seasonal water saturation: About 12 to 36 inches

Runoff class: Low

Ecological site: Loamy Lowland (pe35-37)

Land capability (irrigated): 2w

Land capability (nonirrigated): 2w

Typical Profile:

Ap—0 to 7 inches; silt loam

C1—7 to 60 inches; stratified silt loam

Onawa

MLRA: 107 - Iowa and Missouri Deep Loess Hills

Landform: Flood plain on river valley

Parent material: Clayey alluvium

Slope: 0 to 2 percent

Drainage class: Somewhat poorly drained

Slowest permeability: Slow (About 0.06 in/hr)

Available water capacity: High (About 11.3 inches)

Shrink-swell potential: High (About 7.5 LEP)

Flooding hazard: Occasional

Ponding hazard: Occasional

Depth to seasonal water saturation: About 12 to 36 inches

Runoff class: Medium

Ecological site: Clay Lowland (pe35-37)

Land capability (irrigated): 2w

Land capability (nonirrigated): 2w

Typical Profile:

Ap—0 to 7 inches; silty clay loam

C1—7 to 22 inches; silty clay, silty clay

2C2—22 to 60 inches; silt loam

Minor Components

Waldron

Composition: About 10 percent

Slope: 0 to 2 percent

Drainage class: Somewhat poorly drained

Ecological site: Clayey Overflow - Veg. Zone

3

005KG—Kennebec-Colo silt loams, 0 to 2 percent slopes, occasionally flooded

Map Unit Composition

Kennebec: 60 percent

Colo: 30 percent

Minor components: 10 percent

Component Descriptions

Kennebec

MLRA: 107 - Iowa and Missouri Deep Loess Hills

Landform: Flood plain on river valley

Parent material: Fine-silty alluvium

Slope: 0 to 2 percent

Drainage class: Moderately well drained

Slowest permeability: Moderate (About 0.60 in/hr)

Available water capacity: Very high (About 13.3 inches)

Shrink-swell potential: Moderate (About 4.5 LEP)

Flooding hazard: Occasional

Depth to seasonal water saturation: About 36 to 60 inches

Runoff class: Low

Ecological site: Loamy Lowland (pe30-37)

Land capability (nonirrigated): 2w

Typical Profile:

H1—0 to 47 inches; silt loam

H2—47 to 60 inches; silt loam

Colo

MLRA: 107 - Iowa and Missouri Deep Loess Hills

Landform: Flood plain on valley

Parent material: Fine-silty alluvium

Slope: 0 to 2 percent

Drainage class: Poorly drained

Slowest permeability: Moderate (About 0.60 in/hr)

Available water capacity: High (About 11.5 inches)

Shrink-swell potential: Moderate (About 4.5 LEP)

Flooding hazard: Occasional

Depth to seasonal water saturation: About 12 to 36 inches

Runoff class: Low

Typical Profile:

H1—0 to 8 inches; silt loam

H2—8 to 60 inches; silty clay loam

H3—60 to 64 inches; silty clay loam

Minor Components

Chase

Composition: About 10 percent

Slope: 0 to 2 percent

Drainage class: Somewhat poorly drained

Ecological site: Loamy Lowland (pe30-37)

005KY—Knox-Gosport complex, 10 to 30 percent slopes

Map Unit Composition

Knox: 60 percent
Gosport: 30 percent
Minor components: 10 percent

Component Descriptions

Knox

MLRA: 107 - Iowa and Missouri Deep Loess Hills

Landform: Hillslope on upland

Parent material: Fine-silty loess

Slope: 10 to 30 percent

Drainage class: Well drained

Slowest permeability: Moderate (About 0.60 in/hr)

Available water capacity: High (About 11.8 inches)

Shrink-swell potential: Moderate (About 4.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: High

Land capability (nonirrigated): 6e

Typical Profile:

H1—0 to 8 inches; silt loam

H2—8 to 45 inches; silty clay loam

H3—45 to 60 inches; silt loam

Gosport

MLRA: 107 - Iowa and Missouri Deep Loess Hills

Landform: Hillslope on upland

Parent material: Clayey residuum weathered from shale

Slope: 10 to 30 percent

Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)

Drainage class: Moderately well drained

Slowest permeability: Very slow (About 0.00 in/hr)

Available water capacity: Low (About 4.1 inches)

Shrink-swell potential: High (About 7.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Very high

Typical Profile:

H1—0 to 8 inches; silty clay loam

H2—8 to 35 inches; silty clay

Cr—35 to 39 inches; weathered bedrock

Minor Components

Armster

Composition: About 4 percent

Slope: 6 to 12 percent

Drainage class: Moderately well drained

Ecological site: Clay Upland (pe30-37)

Judson

Composition: About 3 percent

Slope: 0 to 1 percent

Drainage class: Well drained

Ecological site: Loamy Lowland (pe35-37)

Kennebec

Composition: About 3 percent

Slope: 0 to 1 percent

Drainage class: Moderately well drained

Ecological site: Loamy Lowland (pe30-37)

005OD—Onawa loam, 0 to 2 percent slopes, occasionally flooded, Overwash

Map Unit Composition

Onawa: 95 percent

Minor components: 5 percent

Component Descriptions

Onawa

MLRA: 107 - Iowa and Missouri Deep Loess Hills

Landform: Flood plain on river valley

Parent material: Clayey alluvium over loamy alluvium

Slope: 0 to 2 percent

Drainage class: Somewhat poorly drained

Slowest permeability: Slow (About 0.06 in/hr)

Available water capacity: High (About 10.3 inches)

Shrink-swell potential: High (About 7.5 LEP)

Flooding hazard: Occasional

Ponding hazard: Occasional

Depth to seasonal water saturation: About 24 to 48 inches

Runoff class: Medium

Ecological site: Clay Lowland (pe35-37)

Land capability (irrigated): 2w

Land capability (nonirrigated): 2w

Typical Profile:

A—0 to 10 inches; loam

AC—10 to 17 inches; silty clay loam

Cg1—17 to 32 inches; silty clay
2Cg2—32 to 70 inches; silt loam

Minor Components

Haynie

Composition: About 5 percent
Slope: 0 to 2 percent
Drainage class: Well drained
Ecological site: Loamy Lowland (pe35-37)

005OW—Onawet silty clay loam, depressional, 0 to 1 percent slopes, frequently flooded

Map Unit Composition

Onawet: 95 percent
Minor components: 5 percent

Component Descriptions

Onawet

MLRA: 107 - Iowa and Missouri Deep Loess Hills
Landform: Flood plain on river valley
Parent material: Clayey alluvium over loamy alluvium
Slope: 0 to 1 percent
Drainage class: Very poorly drained
Slowest permeability: Slow (About 0.06 in/hr)
Available water capacity: High (About 9.8 inches)
Shrink-swell potential: High (About 7.5 LEP)
Flooding hazard: Frequent
Ponding hazard: Frequent
Depth to seasonal water saturation: About 24 to 36 inches
Runoff class: Negligible
Land capability (nonirrigated): 5w

Typical Profile:

A—0 to 7 inches; silty clay loam
Cg—7 to 24 inches; silty clay
2Cg—24 to 56 inches; silt loam
3Cg—56 to 80 inches; loamy fine sand

Minor Components

Albaton

Composition: About 5 percent
Slope: 0 to 2 percent
Drainage class: Very poorly drained
Ecological site: Clayey Overflow - Veg. Zone

3

005PA—Palermo-Knox complex, 10 to 18 percent slopes

Map Unit Composition

Knox: 50 percent
Palermo: 50 percent

Component Descriptions

Knox

MLRA: 107 - Iowa and Missouri Deep Loess Hills
Landform: Hillslope on upland
Hillslope position: Backslope, summit, shoulder
Parent material: Loess
Slope: 10 to 18 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: Very high (About 12.4 inches)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: High
Land capability (nonirrigated): 3e

Typical Profile:

A—0 to 7 inches; silt loam
E—7 to 12 inches; silty clay loam, silt loam
Bt—12 to 23 inches; silty clay loam, silty clay loam
Bt2—23 to 35 inches; silty clay loam
Bt3—35 to 61 inches; silty clay loam
BC—61 to 70 inches; silt loam

Palermo

MLRA: 107 - Iowa and Missouri Deep Loess Hills
Landform: Hillslope on upland
Hillslope position: Shoulder, backslope, summit
Parent material: Loess
Slope: 10 to 18 percent
Drainage class: Well drained
Available water capacity: High (About 11.9 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: High
Land capability (nonirrigated): 4e

Typical Profile:

Ap—0 to 5 inches; silty clay loam
 Bt1—5 to 11 inches; silty clay loam
 Bt2—11 to 23 inches; silty clay loam
 Bt3—23 to 41 inches; silt loam
 C—41 to 80 inches; silt loam

005PB—Palermo silty clay loam, 18 to 30 percent slopes

Map Unit Composition

Palermo: 95 percent
 Minor components: 5 percent

Component Descriptions

Palermo

MLRA: 107 - Iowa and Missouri Deep Loess Hills

Landform: Hillslope on upland

Hillslope position: Shoulder, summit, backslope

Parent material: Loess

Slope: 18 to 30 percent

Drainage class: Well drained

Available water capacity: High (About 11.9 inches)

Shrink-swell potential: Low (About 1.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: High

Land capability (nonirrigated): 4e

Typical Profile:

Ap—0 to 5 inches; silty clay loam
 Bt1—5 to 11 inches; silty clay loam
 Bt2—11 to 23 inches; silty clay loam
 Bt3—23 to 41 inches; silt loam
 C—41 to 80 inches; silt loam

Minor Components

Knox

Composition: About 5 percent
Geomorphic Position: hillslope on upland
Slope: 4 to 10 percent
Drainage class: Well drained

005SH—Shelby clay loam, 5 to 10 percent slopes

Map Unit Composition

Shelby: 85 percent
 Minor components: 15 percent

Component Descriptions

Shelby

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills

Landform: Hillslope on upland

Parent material: Fine-loamy drift

Slope: 5 to 10 percent

Drainage class: Moderately well drained

Slowest permeability: Moderately slow (About 0.20 in/hr)

Available water capacity: High (About 10.0 inches)

Shrink-swell potential: Moderate (About 4.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: High

Ecological site: Loamy Upland (pe30-37)

Land capability (nonirrigated): 3e

Typical Profile:

H1—0 to 12 inches; clay loam
 H2—12 to 47 inches; clay loam
 H3—47 to 60 inches; clay loam

Minor Components

Sharpsburg

Composition: About 5 percent

Slope: 4 to 8 percent

Drainage class: Moderately well drained

Ecological site: Loamy Upland (pe30-37)

Kennebec

Composition: About 5 percent

Slope: 0 to 2 percent

Drainage class: Well drained

Ecological site: Loamy Lowland (pe30-37)

Pawnee

Phase: Eroded

Composition: About 5 percent

Slope: 3 to 7 percent

Drainage class: Moderately well drained

Ecological site: Clay Upland (pe30-37)

005WA—Wabash silty clay loam, 0 to 2 percent slopes, occasionally flooded**Map Unit Composition**

Wabash: 85 percent
 Minor components: 15 percent

Component Descriptions**Wabash**

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills

Landform: Flood plain on valley

Parent material: Clayey alluvium

Slope: 0 to 2 percent

Drainage class: Poorly drained

Slowest permeability: Very slow (About 0.00 in/hr)

Available water capacity: Moderate (About 6.9 inches)

Shrink-swell potential: Very high (About 17.0 LEP)

Flooding hazard: Occasional

Depth to seasonal water saturation: About 2 to 9 inches

Runoff class: Very high

Ecological site: Clay Lowland (pe30-37)

Land capability (nonirrigated): 3w

Typical Profile:

H1—0 to 8 inches; silty clay loam

H2—8 to 60 inches; silty clay

Minor Components**Chase**

Composition: About 8 percent

Slope: 0 to 2 percent

Drainage class: Somewhat poorly drained

Ecological site: Loamy Lowland (pe30-37)

Kennebec

Composition: About 7 percent

Slope: 0 to 2 percent

Drainage class: Well drained

Ecological site: Loamy Lowland (pe30-37)

005WH—Wathena-Haynie complex, 0 to 2 percent slopes, occasionally flooded**Map Unit Composition**

Wathena: 55 percent
 Haynie: 40 percent
 Minor components: 5 percent

Component Descriptions**Wathena**

MLRA: 107 - Iowa and Missouri Deep Loess Hills

Landform: Natural levee on flood plain

Parent material: Sandy alluvium

Slope: 0 to 3 percent

Drainage class: Moderately well drained

Slowest permeability: Rapid (About 5.95 in/hr)

Available water capacity: Moderate (About 7.1 inches)

Shrink-swell potential: Moderate (About 4.5 LEP)

Flooding hazard: Occasional

Ponding hazard: Occasional

Depth to seasonal water saturation: About 25 to 40 inches

Runoff class: Negligible

Ecological site: Sandy Lowland (pe35-37)

Land capability (nonirrigated): 4w

Typical Profile:

A—0 to 9 inches; loamy fine sand

C1—9 to 37 inches; stratified loamy fine sand

2C2—37 to 52 inches; stratified silt loam

2C3—52 to 64 inches; stratified silt loam

3C4—64 to 80 inches; fine sand

Haynie

MLRA: 107 - Iowa and Missouri Deep Loess Hills

Landform: Alluvial flat on river valley

Parent material: Silty alluvium

Slope: 0 to 2 percent

Drainage class: Well drained

Slowest permeability: Moderate (About 0.60 in/hr)

Available water capacity: Very high (About 12.4 inches)

Shrink-swell potential: Low (About 1.5 LEP)

Flooding hazard: Occasional

Ponding hazard: None

Depth to seasonal water saturation: About 12 to 36 inches

Runoff class: Negligible

Ecological site: Loamy Lowland (pe35-37)

Land capability (irrigated): 2w

Land capability (nonirrigated): 2w

Typical Profile:

Ap—0 to 7 inches; silt loam

C1—7 to 60 inches; stratified silt loam

Minor Components

Sarpy

Composition: About 5 percent

Slope: 0 to 3 percent

Drainage class: Excessively drained

Ecological site: Sandy Lowland (pe35-37)

045ET—Eudora silt loam, rarely flooded

Map Unit Composition

Eudora: 90 percent

Minor components: 10 percent

Component Descriptions

Eudora

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills

Landform: Flood plain on river valley

Parent material: Coarse-silty alluvium

Slope: 0 to 1 percent

Drainage class: Well drained

Slowest permeability: Moderate (About 0.60 in/hr)

Available water capacity: Very high (About 12.0 inches)

Shrink-swell potential: Low (About 1.5 LEP)

Flooding hazard: Rare

Depth to seasonal water saturation: More than 6 feet

Runoff class: Low

Ecological site: Loamy Lowland (pe30-37)

Land capability (nonirrigated): 1

Typical Profile:

H1—0 to 12 inches; silt loam

H2—12 to 72 inches; silt loam

Minor Components

Kimo

Composition: About 5 percent

Slope: 0 to 1 percent

Drainage class: Somewhat poorly drained

Ecological site: Clay Lowland (pe30-37)

Sarpy

Composition: About 5 percent

Slope: 0 to 2 percent

Drainage class: Somewhat excessively drained

Ecological site: Sandy Lowland (pe30-37)

Unnamed Hydric Soil

Drainage class: Poorly drained

045EV—Eudora-Kimo complex, rarely flooded

Map Unit Composition

Eudora: 60 percent

Kimo: 30 percent

Minor components: 10 percent

Component Descriptions

Eudora

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills

Landform: Flood plain on river valley

Parent material: Coarse-silty alluvium

Slope: 0 to 2 percent

Drainage class: Well drained

Slowest permeability: Moderate (About 0.60 in/hr)

Available water capacity: Very high (About 12.0 inches)

Shrink-swell potential: Low (About 1.5 LEP)

Flooding hazard: Rare

Depth to seasonal water saturation: More than 6 feet

Runoff class: Low

Ecological site: Loamy Lowland (pe30-37)

Land capability (nonirrigated): 2w

Typical Profile:

H1—0 to 12 inches; silt loam

H2—12 to 72 inches; silt loam

Kimo

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills

Landform: Flood plain on river valley

Parent material: Clayey over loamy alluvium

Slope: 0 to 1 percent

Drainage class: Somewhat poorly drained
Slowest permeability: Slow (About 0.06 in/hr)
Available water capacity: High (About 11.3 inches)
Shrink-swell potential: High (About 7.5 LEP)
Flooding hazard: Rare
Depth to seasonal water saturation: About 22 to 26 inches
Runoff class: Medium
Ecological site: Clay Lowland (pe30-37)
Land capability (nonirrigated): 2w

Typical Profile:
 H1—0 to 6 inches; silty clay loam
 H2—6 to 28 inches; silty clay
 H3—28 to 60 inches; silt loam

Minor Components

Sarpy

Composition: About 5 percent
Slope: 0 to 2 percent
Drainage class: Somewhat excessively drained
Ecological site: Sandy Lowland (pe30-37)

Wabash

Composition: About 5 percent
Slope: 0 to 1 percent
Drainage class: Poorly drained
Ecological site: Clay Lowland (pe30-37)

045KM—Kimo silty clay loam, rarely flooded

Map Unit Composition

Kimo: 90 percent
 Minor components: 10 percent

Component Descriptions

Kimo

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills
Landform: Flood plain on river valley
Parent material: Clayey over loamy alluvium
Slope: 0 to 1 percent
Drainage class: Somewhat poorly drained
Slowest permeability: Slow (About 0.06 in/hr)
Available water capacity: High (About 11.3 inches)
Shrink-swell potential: High (About 7.5 LEP)
Flooding hazard: Rare
Depth to seasonal water saturation: About 22 to 26 inches

Runoff class: Medium
Ecological site: Clay Lowland (pe30-37)
Land capability (nonirrigated): 2w

Typical Profile:

H1—0 to 6 inches; silty clay loam
 H2—6 to 28 inches; silty clay
 H3—28 to 60 inches; silt loam

Minor Components

Wabash

Composition: About 5 percent
Slope: 0 to 1 percent
Drainage class: Poorly drained
Ecological site: Clay Lowland (pe30-37)

Eudora

Composition: About 5 percent
Slope: 0 to 1 percent
Drainage class: Well drained
Ecological site: Loamy Lowland (pe30-37)

045MR—Morrill clay loam, 3 to 7 percent slopes

Map Unit Composition

Morrill: 90 percent
 Minor components: 10 percent

Component Descriptions

Morrill

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills
Landform: Hillslope on upland
Parent material: Fine-loamy glaciofluvial deposits
Slope: 3 to 7 percent
Drainage class: Well drained
Slowest permeability: Moderately slow (About 0.20 in/hr)
Available water capacity: High (About 10.1 inches)
Shrink-swell potential: Moderate (About 4.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Medium
Ecological site: Loamy Upland (pe30-37)
Land capability (nonirrigated): 3e

Typical Profile:
 H1—0 to 10 inches; clay loam

H2—10 to 56 inches; clay loam
H3—56 to 66 inches; clay loam

Minor Components

Oska

Composition: About 5 percent
Slope: 3 to 6 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Ecological site: Loamy Upland (pe35-42)

Pawnee

Composition: About 5 percent
Slope: 1 to 3 percent
Drainage class: Moderately well drained
Ecological site: Clay Upland (pe30-37)

045RO—Riverwash

045SB—Sarpy-Eudora complex, Overwash, occasionally flooded

Map Unit Composition

Sarpy: 55 percent
Eudora: 45 percent

Component Descriptions

Sarpy

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills
Landform: Flood plain on river valley
Parent material: Sandy alluvium
Slope: 0 to 1 percent
Drainage class: Excessively drained
Slowest permeability: Rapid (About 5.95 in/hr)
Available water capacity: Low (About 4.1 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: Occasional
Depth to seasonal water saturation: More than 6 feet
Runoff class: Negligible
Ecological site: Sandy Lowland (pe30-37)
Land capability (nonirrigated): 3w

Typical Profile:

H1—0 to 12 inches; loamy fine sand
H2—12 to 60 inches; fine sand

Eudora

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills

Landform: Flood plain on river valley
Parent material: Coarse-silty alluvium
Slope: 0 to 1 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: High (About 11.6 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: Occasional
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Loamy Lowland (pe30-37)
Land capability (nonirrigated): 3w

Typical Profile:

H1—0 to 8 inches; fine sandy loam
H2—8 to 60 inches; silt loam

045VM—Vinland-Martin complex, 7 to 15 percent slopes

Map Unit Composition

Vinland: 40 percent
Martin: 25 percent
Minor components: 35 percent

Component Descriptions

Vinland

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills
Landform: Hillslope on upland
Parent material: Sandy and silty residuum weathered from shale
Slope: 7 to 15 percent
Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)
Drainage class: Somewhat excessively drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: Low (About 3.5 inches)
Shrink-swell potential: Moderate (About 4.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Medium
Ecological site: Loamy Upland (pe35-42)
Land capability (nonirrigated): 6e

Typical Profile:

H1—0 to 7 inches; silty clay loam
 H2—7 to 17 inches; silty clay loam
 Cr—17 to 21 inches; weathered bedrock

Martin

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills

Landform: Hillslope on upland

Parent material: Silty and clayey colluvium derived from limestone and shale over silty and

clayey residuum weathered from limestone and shale

Slope: 7 to 11 percent

Drainage class: Moderately well drained

Slowest permeability: Slow (About 0.06 in/hr)

Available water capacity: High (About 9.7 inches)

Shrink-swell potential: High (About 7.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: About 22 to 26 inches

Runoff class: Very high

Ecological site: Loamy Upland (pe35-42)

Land capability (nonirrigated): 4e

Typical Profile:

H1—0 to 9 inches; silty clay loam
 H2—9 to 14 inches; silty clay loam
 H3—14 to 60 inches; silty clay

Minor Components**Unnamed Soil**

Composition: About 20 percent

Slope: 3 to 7 percent

Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)

Drainage class: Somewhat excessively drained

Ecological site: Loamy Upland (pe35-42)

Sibleyville

Composition: About 8 percent

Slope: 7 to 15 percent

Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)

Drainage class: Well drained

Ecological site: Loamy Upland (pe35-42)

Sogn

Composition: About 7 percent

Slope: 7 to 15 percent

Depth to restrictive feature: 4 to 20 inches to bedrock (lithic)

Drainage class: Somewhat excessively drained

Ecological site: Shallow Limy (pe30-37)

045WC—Wabash silty clay loam, occasionally flooded**Map Unit Composition**

Wabash: 88 percent

Minor components: 12 percent

Component Descriptions**Wabash**

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills

Landform: Terrace on river valley

Parent material: Clayey alluvium

Slope: 0 to 1 percent

Drainage class: Poorly drained

Slowest permeability: Very slow (About 0.00 in/hr)

Available water capacity: Moderate (About 8.0 inches)

Shrink-swell potential: Very high (About 17.0 LEP)

Flooding hazard: Occasional

Depth to seasonal water saturation: About 2 to 9 inches

Runoff class: Very high

Ecological site: Clay Lowland (pe30-37)

Land capability (nonirrigated): 3w

Typical Profile:

H1—0 to 16 inches; silty clay loam
 H2—16 to 70 inches; silty clay

Minor Components**Kennebec**

Composition: About 3 percent

Slope: 0 to 2 percent

Drainage class: Moderately well drained

Ecological site: Loamy Lowland (pe30-37)

Reading

Composition: About 3 percent

Slope: 0 to 2 percent

Drainage class: Well drained

Ecological site: Loamy Lowland (pe35-42)

Wabash

Composition: About 3 percent

Slope: 0 to 1 percent

Drainage class: Poorly drained

Ecological site: Clay Lowland (pe30-37)

Leanna

Composition: About 3 percent
Geomorphic Position: flood plain on valley
Slope: 0 to 2 percent
Drainage class: Somewhat poorly drained
Ecological site: Clay Lowland (pe35-42)

087RE—Reading silt loam, 0 to 2 percent slopes, very rarely flooded, moderately Wet

Map Unit Composition

Reading: 85 percent
 Minor components: 15 percent

Component Descriptions

Reading

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills

Landform: Terrace on river valley

Parent material: Fine-silty alluvium

Slope: 0 to 2 percent

Drainage class: Moderately well drained

Slowest permeability: Moderately slow (About 0.20 in/hr)

Available water capacity: High (About 10.6 inches)

Shrink-swell potential: Moderate (About 4.5 LEP)

Flooding hazard: Very Rare

Depth to seasonal water saturation: About 42 to 72 inches

Runoff class: Medium

Land capability (nonirrigated): 2w

Typical Profile:

Ap—0 to 8 inches; silt loam

A—8 to 14 inches; silt loam

BA—14 to 21 inches; silty clay loam

Bt1—21 to 29 inches; silty clay loam

Bt2—29 to 42 inches; silty clay loam

Bt3—42 to 60 inches; silty clay loam

BC—60 to 72 inches; silty clay loam

Minor Components

Muscotah

Composition: About 10 percent

Slope: 0 to 1 percent

Drainage class: Somewhat poorly drained

Rossville

Composition: About 5 percent

Slope: 0 to 2 percent

Drainage class: Well drained

Ecological site: Loamy Lowland (pe30-37)
 Unspecified

General Considerations: Most areas of this soil are cultivated. This soil is well suited to all major crops commonly grown in the valley. This soil has good potential for hay or tame grasses. Flooding limits the suitability of this soil for many engineering uses. The land capability classification is llw.

087SS—Sibleyville complex, 3 to 7 percent slopes

Map Unit Composition

Sibleyville: 60 percent
 Minor components: 40 percent

Component Descriptions

Sibleyville

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills

Landform: Hillslope on upland

Parent material: Sandy and silty residuum weathered from sandstone and shale

Slope: 3 to 7 percent

Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)

Drainage class: Well drained

Slowest permeability: Moderate (About 0.60 in/hr)

Available water capacity: Low (About 4.5 inches)

Shrink-swell potential: Low (About 1.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Medium

Ecological site: Loamy Upland (pe35-42)

Land capability (nonirrigated): 4e

Typical Profile:

H1—0 to 7 inches; loam

H2—7 to 15 inches; loam

H3—15 to 27 inches; channery loam

Cr—27 to 31 inches; weathered bedrock

Minor Components

Unnamed Series 1 - Shallow

Composition: About 25 percent

Slope: 3 to 7 percent

Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)

Drainage class: Well drained

Ecological site: Loamy Upland (pe35-42)

Unnamed Series 2 - Deep

Composition: About 15 percent
Slope: 3 to 7 percent
Depth to restrictive feature: 40 to 60 inches to bedrock (paralithic)
Drainage class: Well drained
Ecological site: Loamy Upland (pe35-42)

Vinland

Slope: 7 to 15 percent
Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)
Drainage class: Somewhat excessively drained
Ecological site: Loamy Upland (pe35-42)

Martin

Slope: 7 to 11 percent
Drainage class: Moderately well drained
Ecological site: Loamy Upland (pe35-42)

Woodson

Slope: 0 to 1 percent
Drainage class: Somewhat poorly drained
Ecological site: Clay Upland (pe35-42)

Basehor

Slope: 7 to 15 percent
Depth to restrictive feature: 8 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Ecological site: Shallow Savannah (pe30-37)

087SV—Sibleyville complex, 7 to 12 percent slopes

Map Unit Composition

Sibleyville: 50 percent
 Minor components: 50 percent

Component Descriptions

Sibleyville

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills
Landform: Hillslope on upland
Parent material: Sandy and silty residuum weathered from sandstone and shale
Slope: 7 to 12 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Well drained

Slowest permeability: Moderate (About 0.60 in/hr)

Available water capacity: Low (About 5.0 inches)

Shrink-swell potential: Low (About 1.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Medium

Ecological site: Loamy Upland (pe30-37)

Land capability (nonirrigated): 6e

Typical Profile:

H1—0 to 10 inches; loam

H2—10 to 18 inches; loam

H3—18 to 29 inches; channery loam

Cr—29 to 33 inches; weathered bedrock

Minor Components

Sibleyville

Phase: Shallow

Composition: About 25 percent

Slope: 7 to 12 percent

Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)

Drainage class: Well drained

Ecological site: Loamy Upland (pe30-37)

Sibleyville

Phase: Deep

Composition: About 15 percent

Slope: 7 to 12 percent

Depth to restrictive feature: 40 to 60 inches to bedrock (paralithic)

Drainage class: Well drained

Ecological site: Loamy Upland (pe30-37)

Gymer

Composition: About 3 percent

Slope: 3 to 7 percent

Drainage class: Well drained

Ecological site: Loamy Upland (pe30-37)

Martin

Composition: About 3 percent

Slope: 3 to 8 percent

Drainage class: Moderately well drained

Ecological site: Loamy Upland (pe30-37)

Pawnee

Composition: About 2 percent

Slope: 3 to 7 percent

Drainage class: Moderately well drained

Ecological site: Clay Upland (pe30-37)

Vinland

Composition: About 2 percent

Slope: 7 to 15 percent

Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)

Drainage class: Moderately well drained

Ecological site: Loamy Upland (pe30-37)

087VO—Vinland complex, 7 to 15 percent slopes

Map Unit Composition

Vinland: 55 percent
Minor components: 45 percent

Component Descriptions

Vinland

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills

Landform: Hillslope on upland

Parent material: Sandy and silty residuum weathered from shale

Slope: 7 to 15 percent

Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)

Drainage class: Moderately well drained

Slowest permeability: Moderate (About 0.60 in/hr)

Available water capacity: Low (About 3.5 inches)

Shrink-swell potential: Moderate (About 4.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Medium

Ecological site: Loamy Upland (pe30-37)

Land capability (nonirrigated): 6e

Typical Profile:

H1—0 to 12 inches; silty clay loam
H2—12 to 16 inches; silty clay loam
Cr—16 to 20 inches; weathered bedrock

Minor Components

Vinland

Phase: Moderately Deep

Composition: About 30 percent

Slope: 7 to 15 percent

Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)

Drainage class: Well drained

Ecological site: Loamy Upland (pe30-37)

Sogn

Composition: About 5 percent

Slope: 5 to 20 percent

Depth to restrictive feature: 4 to 20 inches to bedrock (lithic)

Drainage class: Somewhat excessively drained

Ecological site: Shallow Limy (pe30-37)

Martin

Composition: About 2 percent

Slope: 3 to 8 percent

Drainage class: Moderately well drained

Ecological site: Loamy Upland (pe30-37)

Pawnee

Composition: About 2 percent

Slope: 8 to 12 percent

Drainage class: Moderately well drained

Ecological site: Clay Upland (pe30-37)

Gymer

Composition: About 2 percent

Slope: 3 to 7 percent

Drainage class: Well drained

Ecological site: Loamy Upland (pe30-37)

Shelby

Composition: About 2 percent

Slope: 8 to 12 percent

Drainage class: Well drained

Ecological site: Loamy Upland (pe30-37)

Sibleyville

Composition: About 2 percent

Slope: 7 to 12 percent

Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)

Drainage class: Well drained

Ecological site: Loamy Upland (pe30-37)

087WC—Wabash silty clay loam, 0 to 1 percent slopes, very rarely flooded

Map Unit Composition

Wabash: 94 percent

Minor components: 6 percent

Component Descriptions

Wabash

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills

Landform: Terrace on river valley

Parent material: Clayey alluvium

Slope: 0 to 1 percent

Drainage class: Poorly drained

Slowest permeability: Very slow (About 0.00 in/hr)

Available water capacity: Moderate (About 8.4 inches)

Shrink-swell potential: Very high (About 17.0 LEP)

Flooding hazard: Very Rare
Depth to seasonal water saturation: About 2 to 9 inches
Runoff class: Very high
Ecological site: Clay Lowland (pe30-37)
Land capability (nonirrigated): 3w

Typical Profile:
 H1—0 to 19 inches; silty clay loam
 H2—19 to 60 inches; silty clay

Minor Components

Kennebec

Composition: About 3 percent
Slope: 0 to 2 percent
Drainage class: Moderately well drained
Ecological site: Loamy Lowland (pe30-37)

Reading

Composition: About 3 percent
Slope: 0 to 1 percent
Drainage class: Well drained
Ecological site: Loamy Lowland (pe30-37)

091ED—Eudora-Kimo complex, Overwash, rarely flooded

Map Unit Composition

Eudora: 75 percent
 Kimo: 25 percent

Component Descriptions

Eudora

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills
Landform: Flood-plain step on river valley
Parent material: Coarse-silty alluvium
Slope: 0 to 2 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: Very high (About 12.1 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: Rare
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Loamy Lowland (pe30-37)
Land capability (nonirrigated): 1

Typical Profile:
 H1—0 to 13 inches; silt loam
 H2—13 to 60 inches; very fine sandy loam

Kimo

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills
Landform: Flood-plain step on river valley
Parent material: Clayey alluvium over loamy alluvium
Slope: 0 to 1 percent
Drainage class: Poorly drained
Slowest permeability: Slow (About 0.06 in/hr)
Available water capacity: High (About 11.3 inches)
Shrink-swell potential: High (About 7.5 LEP)
Flooding hazard: Rare
Depth to seasonal water saturation: About 24 to 72 inches
Runoff class: High
Ecological site: Clay Lowland (pe30-37)
Land capability (nonirrigated): 2w

Typical Profile:
 H1—0 to 6 inches; silty clay loam
 H2—6 to 24 inches; silty clay loam
 H3—24 to 60 inches; silt loam

091LB—Ladoga silt loam, 8 to 15 percent slopes

Map Unit Composition

Ladoga: 85 percent

Component Descriptions

Ladoga

MLRA: 107 - Iowa and Missouri Deep Loess Hills
Landform: Hillslope on upland
Parent material: Silty and clayey loess
Slope: 8 to 15 percent
Drainage class: Moderately well drained
Slowest permeability: Moderately slow (About 0.20 in/hr)
Available water capacity: High (About 11.7 inches)
Shrink-swell potential: Moderate (About 4.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet

Runoff class: High

Land capability (nonirrigated): 4e

Typical Profile:

H1—0 to 13 inches; silt loam

H2—13 to 31 inches; silty clay loam

H3—31 to 60 inches; silty clay loam

091RA—Reading silt loam, 0 to 2 percent slopes, rarely flooded

Map Unit Composition

Reading: 90 percent

Minor components: 10 percent

Component Descriptions

Reading

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills

Landform: Terrace on river valley

Parent material: Fine-silty alluvium

Slope: 0 to 2 percent

Drainage class: Well drained

Slowest permeability: Moderately slow (About 0.20 in/hr)

Available water capacity: High (About 11.5 inches)

Shrink-swell potential: Moderate (About 4.5 LEP)

Flooding hazard: Rare

Depth to seasonal water saturation: More than 6 feet

Runoff class: Low

Ecological site: Loamy Lowland (pe35-42)

Land capability (nonirrigated): 1

Typical Profile:

H1—0 to 15 inches; silt loam

H2—15 to 41 inches; silty clay loam

H3—41 to 60 inches; silty clay

Minor Components

Wabash

Composition: About 5 percent

Slope: 0 to 1 percent

Drainage class: Poorly drained

Ecological site: Clay Lowland (pe30-37)

Chase

Composition: About 5 percent

Slope: 0 to 2 percent

Drainage class: Somewhat poorly drained

Ecological site: Loamy Lowland (pe35-42)

091SB—Sharpsburg-Urban land complex, 3 to 8 percent slopes

Map Unit Composition

Sharpsburg: 55 percent

Urban land: 45 percent

Component Descriptions

Sharpsburg

MLRA: 107 - Iowa and Missouri Deep Loess Hills

Landform: Hillslope on upland

Parent material: Silty and clayey loess

Slope: 3 to 8 percent

Drainage class: Moderately well drained

Slowest permeability: Moderately slow (About 0.20 in/hr)

Available water capacity: High (About 11.5 inches)

Shrink-swell potential: Moderate (About 4.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Medium

Ecological site: Loamy Upland (pe30-37)

Land capability (nonirrigated): 3e

Typical Profile:

H1—0 to 9 inches; silt loam

H2—9 to 35 inches; silty clay loam

H3—35 to 60 inches; silty clay loam

Urban land

MLRA: 107 - Iowa and Missouri Deep Loess Hills

Landform: Hillslope on upland

Depth to seasonal water saturation: More than 6 feet

Runoff class: Very high

Typical Profile:

Aa—Kennebec silt loam, channeled

Map Unit Composition

Kennebec: 85 percent

Minor components: 15 percent

Component Descriptions

Kennebec

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills

Landform: Flood plain on valley

Parent material: Silty alluvium

Slope: 0 to 2 percent

Drainage class: Moderately well drained

Slowest permeability: Moderate (About 0.60 in/hr)

Available water capacity: Very high (About 13.2 inches)

Shrink-swell potential: Moderate (About 4.5 LEP)

Flooding hazard: Frequent

Ponding hazard: None

Depth to seasonal water saturation: About 39 to 55 inches

Runoff class: Low

Ecological site: Loamy Lowland (pe30-37)

Land capability (nonirrigated): 5w

Typical Profile:

Ap—0 to 8 inches; silt loam
 A1—8 to 18 inches; silt loam
 A2—18 to 32 inches; silt loam
 A3—32 to 41 inches; silt loam
 AC—41 to 54 inches; silt loam
 C—54 to 60 inches; silt loam

Minor Components

Nodaway

Composition: About 8 percent

Slope: 0 to 2 percent

Drainage class: Moderately well drained

Ecological site: Loamy Lowland (pe30-37)

Kenridge

Composition: About 3 percent

Slope: 0 to 2 percent

Drainage class: Moderately well drained

Ecological site: Loamy Lowland (pe30-37)

Muscotah

Composition: About 3 percent

Slope: 0 to 2 percent

Drainage class: Somewhat poorly drained

Ecological site: Loamy Lowland (pe30-37)

Zook

Composition: About 1 percent

Slope: 0 to 2 percent

Drainage class: Poorly drained

Ecological site: Clay Lowland (pe30-37)

Ac—Armster loam, 3 to 8 percent slopes

Map Unit Composition

Armster: 90 percent

Minor components: 10 percent

Component Descriptions

Armster

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills

Landform: Hillslope on upland

Parent material: Silty and clayey loess over clayey pedisidiment

Slope: 3 to 8 percent

Drainage class: Moderately well drained

Slowest permeability: Moderately slow (About 0.20 in/hr)

Available water capacity: Moderate (About 8.8 inches)

Shrink-swell potential: High (About 7.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: About inches

Runoff class: High

Ecological site: Clay Upland (pe30-37)

Land capability (nonirrigated): 3e

Typical Profile:

H1—0 to 10 inches; loam
 H2—10 to 60 inches; clay loam

Minor Components

Ladoga

Composition: About 5 percent

Slope: 4 to 7 percent

Drainage class: Moderately well drained

Welda

Composition: About 5 percent

Slope: 4 to 9 percent

Drainage class: Well drained

Ecological site: Savannah (pe30-37)

Ad—Armster loam, 8 to 12 percent slopes

Map Unit Composition

Armster: 90 percent

Minor components: 10 percent

Component Descriptions

Armster

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills

Landform: Hillslope on upland

Parent material: Silty and clayey loess over clayey pedisodiment

Slope: 8 to 12 percent

Drainage class: Moderately well drained

Slowest permeability: Moderately slow (About 0.20 in/hr)

Available water capacity: Moderate (About 8.8 inches)

Shrink-swell potential: High (About 7.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: About inches

Runoff class: High

Ecological site: Clay Upland (pe30-37)

Land capability (nonirrigated): 4e

Typical Profile:

H1—0 to 10 inches; loam

H2—10 to 60 inches; clay loam

Minor Components

Unnamed Soil

Composition: About 10 percent

Slope: 8 to 12 percent

Depth to restrictive feature: inches to bedrock (lithic)

Drainage class: Moderately well drained

Ecological site: Clay Upland (pe30-37)

Ae—Armster clay loam, 8 to 12 percent slopes, eroded

Map Unit Composition

Armster: 75 percent

Minor components: 25 percent

Component Descriptions

Armster

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills

Landform: Hillslope on upland

Parent material: Silty and clayey loess over clayey pedisodiment

Slope: 8 to 12 percent

Drainage class: Moderately well drained

Slowest permeability: Moderately slow (About 0.20 in/hr)

Available water capacity: Moderate (About 8.3 inches)

Shrink-swell potential: High (About 7.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: About inches

Runoff class: High

Ecological site: Clay Upland (pe30-37)

Land capability (nonirrigated): 4e

Typical Profile:

H1—0 to 7 inches; clay loam

H2—7 to 60 inches; clay loam

Minor Components

Ladoga

Composition: About 10 percent

Slope: 4 to 7 percent

Drainage class: Moderately well drained

Unnamed Soil

Composition: About 10 percent

Slope: 8 to 12 percent

Depth to restrictive feature: inches to bedrock (lithic)

Drainage class: Moderately well drained

Ecological site: Clay Upland (pe30-37)

Welda

Composition: About 5 percent

Slope: 4 to 9 percent

Drainage class: Well drained

Ecological site: Savannah (pe30-37)

AED—Arents, Earthen Dam

Map Unit Composition

Arents, Earthen Dam: 100 percent

Component Descriptions

Arents, Earthen Dam

MLRA: -

Depth to seasonal water saturation: More than 6 feet

Land capability (nonirrigated): 8

Ba—Basehor complex, 5 to 30 percent slopes

Map Unit Composition

Basehor: 55 percent
Minor components: 45 percent

Component Descriptions

Basehor

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills

Landform: Hillslope on upland

Parent material: Loamy residuum weathered from sandstone

Slope: 5 to 30 percent

Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)

Drainage class: Well drained

Slowest permeability: Moderately rapid (About 2.00 in/hr)

Available water capacity: Very low (About 1.9 inches)

Shrink-swell potential: Low (About 1.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Low

Ecological site: Shallow Savannah (pe30-37)

Land capability (nonirrigated): 6s

Typical Profile:

H1—0 to 10 inches; loam

H2—10 to 13 inches; weathered bedrock

R—13 to 17 inches; unweathered bedrock

Minor Components

Unnamed Soil

Composition: About 30 percent

Slope: 5 to 30 percent

Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)

Drainage class: Well drained

Ecological site: Shallow Savannah (pe30-37)

Vinland

Composition: About 15 percent

Slope: 5 to 12 percent

Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)

Drainage class: Somewhat excessively drained

Ecological site: Loamy Upland (pe30-37)

Br—Bremer silty clay loam, 0 to 2 percent slopes, rarely flooded

Map Unit Composition

Bremer: 95 percent
Minor components: 5 percent

Component Descriptions

Bremer

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills

Landform: Flood-plain step on valley

Parent material: Silty and clayey alluvium

Slope: 0 to 2 percent

Drainage class: Poorly drained

Slowest permeability: Moderately slow (About 0.20 in/hr)

Available water capacity: High (About 10.5 inches)

Shrink-swell potential: High (About 7.5 LEP)

Flooding hazard: Rare

Depth to seasonal water saturation: About 12 to 24 inches

Runoff class: Medium

Land capability (nonirrigated): 2w

Typical Profile:

H1—0 to 13 inches; silty clay loam

H2—13 to 50 inches; silty clay

H3—50 to 60 inches; silty clay loam

Minor Components

Judson

Composition: About 5 percent

Slope: 0 to 1 percent

Drainage class: Well drained

Ecological site: Loamy Lowland (pe35-37)

Cf—Cut And Fill

Map Unit Composition

Borrow Pits: 100 percent

Component Descriptions

Borrow Pits

MLRA: -

Depth to seasonal water saturation: More than 6 feet

Ec—Elmont silt loam, 3 to 7 percent slopes

Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)
Drainage class: Somewhat excessively drained
Ecological site: Loamy Upland (pe30-37)

Map Unit Composition

Elmont: 85 percent
 Minor components: 15 percent

Component Descriptions**Elmont**

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills

Landform: Hillslope on upland

Parent material: Silty and clayey residuum weathered from shale and siltstone

Slope: 3 to 7 percent

Depth to restrictive feature: More than 60 inches to bedrock

Drainage class: Well drained

Slowest permeability: Moderately slow (About 0.20 in/hr)

Available water capacity: High (About 11.8 inches)

Shrink-swell potential: Moderate (About 4.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Medium

Ecological site: Loamy Upland (pe30-37)

Land capability (nonirrigated): 3e

Typical Profile:

H1—0 to 15 inches; silt loam
 H2—15 to 65 inches; silty clay loam
 Cr—65 to 69 inches;

Minor Components**Martin**

Composition: About 5 percent

Slope: 4 to 7 percent

Drainage class: Moderately well drained

Ecological site: Loamy Upland (pe30-37)

Sibleyville

Composition: About 5 percent

Slope: 4 to 8 percent

Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)

Drainage class: Well drained

Ecological site: Loamy Upland (pe30-37)

Vinland

Composition: About 5 percent

Slope: 5 to 12 percent

Ed—Elmont silt loam, 7 to 12 percent slopes

Elmont: 85 percent
 Minor components: 15 percent

Map Unit Composition**Component Descriptions****Elmont**

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills

Landform: Hillslope on upland

Parent material: Silty and clayey residuum weathered from shale and siltstone

Slope: 7 to 12 percent

Depth to restrictive feature: More than 60 inches to bedrock

Drainage class: Well drained

Slowest permeability: Moderately slow (About 0.20 in/hr)

Available water capacity: High (About 11.8 inches)

Shrink-swell potential: Moderate (About 4.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: High

Ecological site: Loamy Upland (pe30-37)

Land capability (nonirrigated): 4e

Typical Profile:

H1—0 to 15 inches; silt loam
 H2—15 to 65 inches; silty clay loam
 Cr—65 to 69 inches;

Minor Components**Martin**

Composition: About 5 percent

Slope: 4 to 7 percent

Drainage class: Moderately well drained

Ecological site: Loamy Upland (pe30-37)

Sibleyville

Composition: About 5 percent

Slope: 4 to 8 percent

Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Well drained
Ecological site: Loamy Upland (pe30-37)

Vinland

Composition: About 5 percent
Slope: 5 to 12 percent
Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)
Drainage class: Somewhat excessively drained
Ecological site: Loamy Upland (pe30-37)

Eu—Eudora complex, 0 to 1 percent slopes, rarely flooded, Overwash

Map Unit Composition

Eudora: 70 percent
 Haynie: 20 percent
 Minor components: 10 percent

Component Descriptions

Eudora

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills
Landform: Flood-plain step on river valley
Parent material: Coarse-silty alluvium
Slope: 0 to 1 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: Very high (About 12.0 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: Rare
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Loamy Lowland (pe30-37)
Land capability (nonirrigated): 1

Typical Profile:

H1—0 to 12 inches; very fine sandy loam
 H2—12 to 70 inches; very fine sandy loam

Haynie

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills
Landform: Alluvial flat on river valley
Parent material: Coarse-silty alluvium
Slope: 0 to 1 percent

Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: Very high (About 12.4 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: Occasional
Ponding hazard: None
Depth to seasonal water saturation: About 12 to 36 inches
Runoff class: Low
Ecological site: Loamy Lowland (pe35-37)
Land capability (irrigated): 2w
Land capability (nonirrigated): 2w

Typical Profile:

H1—0 to 8 inches; silt loam
 H2—8 to 60 inches; very fine sandy loam

Minor Components

Onawa

Composition: About 5 percent
Slope: 0 to 1 percent
Drainage class: Somewhat poorly drained
Ecological site: Clay Lowland (pe35-37)

Sarpy

Composition: About 5 percent
Slope: 0 to 3 percent
Drainage class: Somewhat excessively drained
Ecological site: Sandy Lowland (pe35-37)

Gc—Gosport complex, 10 to 30 percent slopes

Map Unit Composition

Gosport: 50 percent
 Minor components: 50 percent

Component Descriptions

Gosport

MLRA: 107 - Iowa and Missouri Deep Loess Hills
Landform: Hillslope on upland
Parent material: Clayey residuum weathered from shale
Slope: 10 to 30 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Moderately well drained
Slowest permeability: Very slow (About 0.00 in/hr)
Available water capacity: Low (About 4.7 inches)

Shrink-swell potential: High (About 7.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Very high
Land capability (nonirrigated): 7e

Typical Profile:

H1—0 to 6 inches; silt loam
 H2—6 to 33 inches; silty clay
 Cr—33 to 33 inches; weathered bedrock

Minor Components**Unnamed Soil**

Composition: About 30 percent
Slope: 10 to 30 percent
Depth to restrictive feature: 16 to 22 inches to bedrock (paralithic)
Drainage class: Moderately well drained

Martin

Composition: About 10 percent
Slope: 7 to 12 percent
Drainage class: Moderately well drained
Ecological site: Loamy Upland (pe30-37)

Elmont

Composition: About 10 percent
Slope: 7 to 12 percent
Depth to restrictive feature: More than 60 inches to bedrock
Drainage class: Well drained
Ecological site: Loamy Upland (pe30-37)

Gp—Gravel Pits**Gs—Gosport-Sogn complex, 7 to 35 percent slopes****Map Unit Composition**

Gosport: 50 percent
 Sogn: 35 percent
 Minor components: 15 percent

Component Descriptions**Gosport**

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills
Landform: Hillslope on upland
Parent material: Clayey residuum weathered from shale
Slope: 7 to 35 percent

Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)

Drainage class: Moderately well drained

Slowest permeability: Very slow (About 0.00 in/hr)

Available water capacity: Low (About 4.7 inches)

Shrink-swell potential: High (About 7.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Very high

Land capability (nonirrigated): 7e

Typical Profile:

H1—0 to 6 inches; silt loam
 H2—6 to 33 inches; silty clay
 Cr—33 to 33 inches; weathered bedrock

Sogn

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills

Landform: Hillslope on upland

Parent material: Loamy residuum weathered from limestone

Slope: 7 to 20 percent

Depth to restrictive feature: 4 to 20 inches to bedrock (lithic)

Drainage class: Somewhat excessively drained

Slowest permeability: Moderate (About 0.60 in/hr)

Available water capacity: Very low (About 2.4 inches)

Shrink-swell potential: Moderate (About 4.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Medium

Ecological site: Shallow Limy (pe30-37)

Typical Profile:

H1—0 to 16 inches; silty clay loam
 R—16 to 16 inches; unweathered bedrock

Minor Components**Martin**

Composition: About 5 percent
Slope: 7 to 12 percent
Drainage class: Moderately well drained
Ecological site: Loamy Upland (pe30-37)

Elmont

Composition: About 5 percent
Slope: 7 to 12 percent
Depth to restrictive feature: More than 60 inches to bedrock
Drainage class: Well drained
Ecological site: Loamy Upland (pe30-37)

Oska

Composition: About 5 percent
Slope: 3 to 8 percent
Depth to restrictive feature: 20 to 40 inches
to bedrock (lithic)
Drainage class: Well drained
Ecological site: Loamy Upland (pe30-37)

Gt—Grundy silty clay loam, 1 to 3 percent slopes**Map Unit Composition**

Grundy: 90 percent
 Minor components: 10 percent

Component Descriptions**Grundy**

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills

Landform: Hillslope on upland
Parent material: Silty and clayey loess
Slope: 1 to 3 percent
Drainage class: Somewhat poorly drained
Slowest permeability: Slow (About 0.06 in/hr)
Available water capacity: High (About 9.3 inches)
Shrink-swell potential: High (About 7.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: About 9 to 20 inches
Runoff class: High
Ecological site: Clay Upland (pe30-37)
Land capability (nonirrigated): 2e

Typical Profile:

H1—0 to 11 inches; silty clay loam
 H2—11 to 15 inches; silty clay loam
 H3—15 to 43 inches; silty clay
 H4—43 to 65 inches; silty clay loam

Minor Components**Sharpsburg**

Composition: About 10 percent
Slope: 1 to 4 percent
Drainage class: Moderately well drained
Ecological site: Loamy Upland (pe30-37)

Gu—Grundy silty clay loam, 3 to 7 percent slopes**Map Unit Composition**

Grundy: 90 percent
 Minor components: 10 percent

Component Descriptions**Grundy**

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills

Landform: Hillslope on upland
Parent material: Silty and clayey loess
Slope: 3 to 7 percent
Drainage class: Somewhat poorly drained
Slowest permeability: Slow (About 0.06 in/hr)
Available water capacity: High (About 9.3 inches)
Shrink-swell potential: High (About 7.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: About 9 to 20 inches
Runoff class: High
Ecological site: Clay Upland (pe30-37)
Land capability (nonirrigated): 3e

Typical Profile:

H1—0 to 11 inches; silty clay loam
 H2—11 to 15 inches; silty clay loam
 H3—15 to 43 inches; silty clay
 H4—43 to 65 inches; silty clay loam

Minor Components**Pawnee**

Composition: About 5 percent
Slope: 4 to 8 percent
Drainage class: Moderately well drained
Ecological site: Clay Upland (pe30-37)

Shelby

Composition: About 5 percent
Slope: 4 to 8 percent
Drainage class: Moderately well drained
Ecological site: Loamy Upland (pe30-37)

Gy—Gymer silt loam, 3 to 7 percent slopes**Map Unit Composition**

Gymer: 85 percent

Minor components: 15 percent

Component Descriptions

Gymer

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills

Landform: Hillslope on upland

Parent material: Fine-silty loess

Slope: 3 to 7 percent

Drainage class: Well drained

Slowest permeability: Moderately slow (About 0.20 in/hr)

Available water capacity: High (About 10.7 inches)

Shrink-swell potential: Moderate (About 4.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Medium

Ecological site: Loamy Upland (pe30-37)

Land capability (nonirrigated): 3e

Typical Profile:

H1—0 to 10 inches; silt loam

H2—10 to 39 inches; silty clay loam

H3—39 to 60 inches; silty clay loam

Minor Components

Konawa

Composition: About 5 percent

Slope: 3 to 8 percent

Drainage class: Well drained

Ecological site: Savannah (pe30-37)

Sharpsburg

Composition: About 5 percent

Slope: 4 to 8 percent

Drainage class: Moderately well drained

Ecological site: Loamy Upland (pe35-37)

Welda

Composition: About 5 percent

Slope: 4 to 9 percent

Drainage class: Well drained

Ecological site: Savannah (pe30-37)

Hg—Haig silty clay loam, 0 to 1 percent slopes

Map Unit Composition

Haig: 90 percent

Minor components: 10 percent

Component Descriptions

Haig

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills

Landform: Depression on hillslope on upland

Parent material: Silty and clayey loess

Slope: 0 to 1 percent

Drainage class: Poorly drained

Slowest permeability: Slow (About 0.06 in/hr)

Available water capacity: High (About 9.3 inches)

Shrink-swell potential: High (About 7.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: About 12 to 24 inches

Runoff class: Medium

Ecological site: Clay Upland (pe30-37)

Land capability (nonirrigated): 2w

Typical Profile:

H1—0 to 9 inches; silty clay loam

H2—9 to 45 inches; silty clay

H3—45 to 60 inches; silty clay loam

Minor Components

Grundy

Composition: About 5 percent

Slope: 1 to 3 percent

Drainage class: Somewhat poorly drained

Ecological site: Clay Upland (pe30-37)

Martin

Composition: About 5 percent

Slope: 4 to 7 percent

Drainage class: Moderately well drained

Ecological site: Loamy Upland (pe30-37)

Hy—Haynie silt loam, 0 to 1 percent slopes, occasionally flooded

Map Unit Composition

Haynie: 90 percent

Minor components: 10 percent

Component Descriptions

Haynie

MLRA: 107 - Iowa and Missouri Deep Loess Hills

Landform: Alluvial flat on river valley

Parent material: Coarse-silty alluvium

Slope: 0 to 1 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: Very high (About 12.4 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: Occasional
Ponding hazard: None
Depth to seasonal water saturation: About 12 to 36 inches
Runoff class: Low
Ecological site: Loamy Lowland (pe35-37)
Land capability (irrigated): 2w
Land capability (nonirrigated): 2w

Typical Profile:
 H1—0 to 8 inches; silt loam
 H2—8 to 60 inches; very fine sandy loam

Minor Components

Eudora

Composition: About 5 percent
Slope: 0 to 1 percent
Drainage class: Well drained
Ecological site: Loamy Lowland (pe30-37)

Sarpy

Composition: About 5 percent
Slope: 0 to 3 percent
Drainage class: Somewhat excessively drained
Ecological site: Sandy Lowland (pe35-37)

Ju—Judson silt loam, 0 to 1 percent slopes

Map Unit Composition

Judson: 90 percent
 Minor components: 10 percent

Component Descriptions

Judson

MLRA: 107 - Iowa and Missouri Deep Loess Hills
Landform: Terrace on valley
Parent material: Fine-silty colluvium
Slope: 0 to 1 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: Very high (About 13.0 inches)

Shrink-swell potential: Moderate (About 4.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Loamy Lowland (pe35-37)
Land capability (nonirrigated): 1

Typical Profile:

H1—0 to 30 inches; silt loam
 H2—30 to 50 inches; silty clay loam
 H3—50 to 70 inches; silt loam

Minor Components

Bremer

Composition: About 5 percent
Slope: 0 to 2 percent
Drainage class: Poorly drained

Kennebec

Composition: About 5 percent
Slope: 0 to 1 percent
Drainage class: Moderately well drained
Ecological site: Loamy Lowland (pe30-37)

Ke—Kennebec silt loam, 0 to 1 percent slopes, occasionally flooded

Map Unit Composition

Kennebec: 90 percent
 Minor components: 10 percent

Component Descriptions

Kennebec

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills
Landform: Flood plain on valley
Parent material: Fine-silty alluvium
Slope: 0 to 1 percent
Drainage class: Moderately well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: Very high (About 13.3 inches)
Shrink-swell potential: Moderate (About 4.5 LEP)
Flooding hazard: Occasional
Depth to seasonal water saturation: About 36 to 60 inches
Runoff class: Low

Ecological site: Loamy Lowland (pe30-37)
Land capability (nonirrigated): 2w

Typical Profile:

H1—0 to 45 inches; silt loam
 H2—45 to 72 inches; silty clay loam

Minor Components

Bremer

Composition: About 5 percent
Slope: 0 to 2 percent
Drainage class: Poorly drained

Wabash

Composition: About 5 percent
Slope: 0 to 1 percent
Drainage class: Poorly drained
Ecological site: Clay Lowland (pe30-37)

Kh—Knox silt loam, 7 to 12 percent slopes

Map Unit Composition

Knox: 80 percent
 Minor components: 20 percent

Component Descriptions

Knox

MLRA: 107 - Iowa and Missouri Deep Loess Hills

Landform: Hillslope on upland

Parent material: Fine-silty loess

Slope: 7 to 12 percent

Drainage class: Well drained

Slowest permeability: Moderate (About 0.60 in/hr)

Available water capacity: High (About 11.5 inches)

Shrink-swell potential: Moderate (About 4.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Medium

Land capability (nonirrigated): 3e

Typical Profile:

H1—0 to 6 inches; silt loam
 H2—6 to 60 inches; silty clay loam

Minor Components

Armster

Phase: Eroded

Composition: About 5 percent
Slope: 8 to 12 percent
Drainage class: Moderately well drained
Ecological site: Clay Upland (pe30-37)

Ladoga

Composition: About 5 percent
Slope: 4 to 7 percent
Drainage class: Moderately well drained

Welda

Composition: About 5 percent
Slope: 9 to 15 percent
Drainage class: Well drained
Ecological site: Savannah (pe30-37)

Similar Soil

Composition: About 5 percent
Geomorphic Position: hillslope on upland
Slope: 10 to 18 percent
Drainage class: Well drained

Kk—Knox silt loam, 12 to 18 percent slopes

Map Unit Composition

Knox: 90 percent
 Minor components: 10 percent

Component Descriptions

Knox

MLRA: 107 - Iowa and Missouri Deep Loess Hills

Landform: Hillslope on upland

Parent material: Fine-silty loess

Slope: 12 to 18 percent

Drainage class: Well drained

Slowest permeability: Moderate (About 0.60 in/hr)

Available water capacity: High (About 11.5 inches)

Shrink-swell potential: Moderate (About 4.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Medium

Land capability (nonirrigated): 4e

Typical Profile:

H1—0 to 6 inches; silt loam
 H2—6 to 60 inches; silty clay loam

Minor Components

Similar Soil

Composition: About 10 percent
Geomorphic Position: hillslope on upland
Slope: 10 to 18 percent
Drainage class: Well drained

Drainage class: Well drained
Ecological site: Savannah (pe30-37)

Km—Knox silty clay loam, 7 to 12 percent slopes, eroded

Map Unit Composition

Knox: 85 percent
 Minor components: 15 percent

Component Descriptions

Knox

MLRA: 107 - Iowa and Missouri Deep Loess Hills
Landform: Hillslope on upland
Parent material: Fine-silty loess
Slope: 7 to 12 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: High (About 11.2 inches)
Shrink-swell potential: Moderate (About 4.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Medium
Land capability (nonirrigated): 4e

Typical Profile:

H1—0 to 6 inches; silty clay loam
 H2—6 to 60 inches; silty clay loam

Minor Components

Armster

Composition: About 5 percent
Slope: 8 to 12 percent
Drainage class: Moderately well drained
Ecological site: Clay Upland (pe30-37)

Ladoga

Composition: About 5 percent
Slope: 4 to 7 percent
Drainage class: Moderately well drained

Welda

Composition: About 5 percent
Slope: 9 to 15 percent

Kn—Knox complex, 18 to 30 percent slopes

Map Unit Composition

Knox: 65 percent
 Sogn: 35 percent

Component Descriptions

Knox

MLRA: 107 - Iowa and Missouri Deep Loess Hills
Landform: Hillslope on upland
Parent material: Fine-silty loess
Slope: 18 to 30 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: High (About 11.5 inches)
Shrink-swell potential: Moderate (About 4.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: High
Land capability (nonirrigated): 6e

Typical Profile:

H1—0 to 6 inches; silt loam
 H2—6 to 60 inches; silty clay loam

Sogn

MLRA: 107 - Iowa and Missouri Deep Loess Hills
Landform: Hillslope on upland
Parent material: Loamy residuum weathered from limestone
Slope: 18 to 20 percent
Depth to restrictive feature: 4 to 20 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: Very low (About 2.4 inches)
Shrink-swell potential: Moderate (About 4.5 LEP)
Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Very high

Ecological site: Shallow Limy (pe35-37)

Typical Profile:

H1—0 to 16 inches; silt loam

R—16 to 20 inches; unweathered bedrock

Ko—Kamie fine sandy loam, 3 to 8 percent slopes

Map Unit Composition

Konawa: 85 percent

Minor components: 15 percent

Component Descriptions

Konawa

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills

Landform: Hillslope on upland

Parent material: Fine-loamy glaciofluvial deposits

Slope: 3 to 8 percent

Drainage class: Well drained

Slowest permeability: Moderate (About 0.60 in/hr)

Available water capacity: Moderate (About 8.6 inches)

Shrink-swell potential: Low (About 1.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Medium

Ecological site: Savannah (pe30-37)

Land capability (nonirrigated): 3e

Typical Profile:

H1—0 to 19 inches; fine sandy loam

H2—19 to 47 inches; clay loam

H3—47 to 60 inches; sandy clay loam

Minor Components

Gymer

Composition: About 5 percent

Slope: 3 to 7 percent

Drainage class: Well drained

Ecological site: Loamy Upland (pe30-37)

Ladoga

Composition: About 5 percent

Slope: 4 to 7 percent

Drainage class: Moderately well drained

Welda

Composition: About 5 percent

Slope: 4 to 9 percent

Drainage class: Well drained

Ecological site: Savannah (pe30-37)

Kw—Kamie fine sandy loam, 8 to 20 percent slopes

Map Unit Composition

Konawa: 90 percent

Minor components: 10 percent

Component Descriptions

Konawa

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills

Landform: Hillslope on upland

Parent material: Fine-loamy glaciofluvial deposits

Slope: 8 to 20 percent

Drainage class: Well drained

Slowest permeability: Moderate (About 0.60 in/hr)

Available water capacity: Moderate (About 8.6 inches)

Shrink-swell potential: Moderate (About 4.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Medium

Ecological site: Savannah (pe30-37)

Land capability (nonirrigated): 6e

Typical Profile:

H1—0 to 19 inches; fine sandy loam

H2—19 to 47 inches; clay loam

H3—47 to 60 inches; clay loam

Minor Components

Gymer

Composition: About 5 percent

Slope: 3 to 7 percent

Drainage class: Well drained

Ecological site: Loamy Upland (pe30-37)

Welda

Composition: About 5 percent

Slope: 4 to 9 percent

Drainage class: Well drained

Ecological site: Savannah (pe30-37)

La—Ladoga silt loam, 4 to 7 percent slopes**Map Unit Composition**

Ladoga: 80 percent
 Minor components: 20 percent

Component Descriptions**Ladoga**

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills

Landform: Hillslope on upland

Parent material: Silty and clayey loess

Slope: 4 to 7 percent

Drainage class: Moderately well drained

Slowest permeability: Moderately slow (About 0.20 in/hr)

Available water capacity: High (About 11.5 inches)

Shrink-swell potential: Moderate (About 4.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: High

Land capability (nonirrigated): 3e

Typical Profile:

H1—0 to 7 inches; silt loam

H2—7 to 49 inches; silty clay loam

H3—49 to 60 inches; silty clay loam

Minor Components**Knox**

Composition: About 10 percent

Slope: 7 to 12 percent

Drainage class: Well drained

Sharpsburg

Composition: About 10 percent

Slope: 4 to 8 percent

Drainage class: Moderately well drained

Ecological site: Loamy Upland (pe35-37)

M-W—Miscellaneous Water**Mb—Marshall silt loam, 1 to 4 percent slopes****Map Unit Composition**

Marshall: 90 percent
 Minor components: 10 percent

Component Descriptions**Marshall**

MLRA: 107 - Iowa and Missouri Deep Loess Hills

Landform: Interfluvial, upland

Hillslope position: Summit, shoulder

Parent material: Fine-silty loess

Slope: 1 to 4 percent

Drainage class: Well drained

Slowest permeability: Moderate (About 0.60 in/hr)

Available water capacity: High (About 11.9 inches)

Shrink-swell potential: Moderate (About 4.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Low

Ecological site: Loamy Upland (pe35-37)

Land capability (nonirrigated): 2e

Typical Profile:

H1—0 to 13 inches; silt loam

H2—13 to 46 inches; silty clay loam

H3—46 to 65 inches; silt loam

Minor Components**Sharpsburg**

Composition: About 10 percent

Slope: 1 to 4 percent

Drainage class: Moderately well drained

Ecological site: Loamy Upland (pe30-37)

Mc—Marshall silt loam, 4 to 9 percent slopes**Map Unit Composition**

Marshall: 90 percent
 Minor components: 10 percent

Component Descriptions

Marshall

MLRA: 107 - Iowa and Missouri Deep Loess Hills

Landform: Hillslope on upland

Parent material: Fine-silty loess

Slope: 4 to 9 percent

Drainage class: Well drained

Slowest permeability: Moderate (About 0.60 in/hr)

Available water capacity: High (About 11.9 inches)

Shrink-swell potential: Moderate (About 4.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Medium

Ecological site: Loamy Upland (pe35-37)

Land capability (nonirrigated): 3e

Typical Profile:

H1—0 to 13 inches; silt loam

H2—13 to 46 inches; silty clay loam

H3—46 to 65 inches; silt loam

Minor Components**Sharpsburg**

Composition: About 10 percent

Slope: 4 to 8 percent

Drainage class: Moderately well drained

Ecological site: Loamy Upland (pe35-37)

Md—Marshall silt loam, 9 to 15 percent slopes**Map Unit Composition**

Marshall: 90 percent

Minor components: 10 percent

Component Descriptions**Marshall**

MLRA: 107 - Iowa and Missouri Deep Loess Hills

Landform: Hillslope on upland

Parent material: Fine-silty loess

Slope: 9 to 15 percent

Drainage class: Well drained

Slowest permeability: Moderate (About 0.60 in/hr)

Available water capacity: High (About 11.9 inches)

Shrink-swell potential: Moderate (About 4.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Medium

Ecological site: Loamy Upland (pe35-37)

Land capability (nonirrigated): 4e

Typical Profile:

H1—0 to 13 inches; silt loam

H2—13 to 46 inches; silty clay loam

H3—46 to 65 inches; silt loam

Minor Components**Knox**

Phase: Eroded

Composition: About 10 percent

Slope: 7 to 12 percent

Drainage class: Well drained

Mn—Martin silty clay loam, 4 to 7 percent slopes**Map Unit Composition**

Martin: 90 percent

Minor components: 10 percent

Component Descriptions**Martin**

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills

Landform: Hillslope on upland

Parent material: Silty and clayey colluvium

derived from limestone and shale over silty and

clayey residuum weathered from limestone and shale

Slope: 4 to 7 percent

Drainage class: Moderately well drained

Slowest permeability: Slow (About 0.06 in/hr)

Available water capacity: High (About 9.4 inches)

Shrink-swell potential: High (About 7.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Very high

Ecological site: Loamy Upland (pe30-37)

Land capability (nonirrigated): 3e

Typical Profile:

H1—0 to 8 inches; silty clay loam

H2—8 to 75 inches; silty clay

Minor Components

Elmont

Composition: About 5 percent

Slope: 3 to 7 percent

Depth to restrictive feature: More than 60 inches to bedrock

Drainage class: Well drained

Ecological site: Loamy Upland (pe30-37)

Grundy

Composition: About 5 percent

Slope: 3 to 7 percent

Drainage class: Somewhat poorly drained

Ecological site: Clay Upland (pe30-37)

Mr—Martin silty clay loam, 7 to 12 percent slopes

Map Unit Composition

Martin: 85 percent

Minor components: 15 percent

Component Descriptions

Martin

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills

Landform: Hillslope on upland

Parent material: Silty and clayey colluvium derived from limestone and shale over silty and

clayey residuum weathered from limestone and shale

Slope: 7 to 12 percent

Drainage class: Moderately well drained

Slowest permeability: Slow (About 0.06 in/hr)

Available water capacity: High (About 9.4 inches)

Shrink-swell potential: High (About 7.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Very high

Ecological site: Loamy Upland (pe30-37)

Land capability (nonirrigated): 4e

Typical Profile:

H1—0 to 8 inches; silty clay loam

H2—8 to 75 inches; silty clay

Minor Components

Elmont

Composition: About 10 percent

Slope: 7 to 12 percent

Depth to restrictive feature: More than 60 inches to bedrock

Drainage class: Well drained

Ecological site: Loamy Upland (pe30-37)

Martin

Phase: Eroded

Composition: About 5 percent

Slope: 6 to 12 percent

Drainage class: Moderately well drained

Ecological site: Loamy Upland (pe30-37)

Ms—Martin Soils, 6 to 12 percent slopes, eroded

Map Unit Composition

Martin: 85 percent

Minor components: 15 percent

Component Descriptions

Martin

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills

Landform: Hillslope on upland

Parent material: Silty and clayey colluvium derived from limestone and shale over silty and

clayey residuum weathered from limestone and shale

Slope: 6 to 12 percent

Drainage class: Moderately well drained

Slowest permeability: Slow (About 0.06 in/hr)

Available water capacity: Moderate (About 8.9 inches)

Shrink-swell potential: High (About 7.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Very high

Ecological site: Loamy Upland (pe30-37)

Land capability (nonirrigated): 6e

Typical Profile:

H1—0 to 7 inches; silty clay

H2—7 to 60 inches; silty clay

Minor Components

Grundy

Composition: About 5 percent

Slope: 3 to 7 percent

Drainage class: Somewhat poorly drained
Ecological site: Clay Upland (pe30-37)

Vinland

Composition: About 5 percent
Slope: 5 to 12 percent
Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)
Drainage class: Somewhat excessively drained
Ecological site: Loamy Upland (pe30-37)

Elmont

Composition: About 5 percent
Slope: 7 to 12 percent
Depth to restrictive feature: More than 60 inches to bedrock
Drainage class: Well drained
Ecological site: Loamy Upland (pe30-37)

On—Onawa silty clay loam, 0 to 1 percent slopes, occasionally flooded

Map Unit Composition

Onawa: 95 percent
Minor components: 5 percent

Component Descriptions

Onawa

MLRA: 107 - Iowa and Missouri Deep Loess Hills
Landform: Flood plain on river valley
Parent material: Clayey alluvium over loamy alluvium
Slope: 0 to 1 percent
Drainage class: Somewhat poorly drained
Slowest permeability: Slow (About 0.06 in/hr)
Available water capacity: High (About 10.4 inches)
Shrink-swell potential: High (About 7.5 LEP)
Flooding hazard: Occasional
Depth to seasonal water saturation: About 24 to 48 inches
Runoff class: Medium
Ecological site: Clay Lowland (pe35-37)
Land capability (irrigated): 2w
Land capability (nonirrigated): 2w

Typical Profile:

H1—0 to 6 inches; silty clay loam
H2—6 to 25 inches; silty clay
H3—25 to 60 inches; silt loam

Minor Components**Haynie**

Composition: About 5 percent
Slope: 0 to 1 percent
Drainage class: Well drained
Ecological site: Loamy Lowland (pe35-37)

Oo—Onawa Soils, 0 to 1 percent slopes, occasionally flooded, Overwash

Map Unit Composition

Onawa: 90 percent
Minor components: 10 percent

Component Descriptions

Onawa

MLRA: 107 - Iowa and Missouri Deep Loess Hills
Landform: Flood plain on river valley
Parent material: Clayey alluvium over loamy alluvium
Slope: 0 to 1 percent
Drainage class: Somewhat poorly drained
Slowest permeability: Slow (About 0.06 in/hr)
Available water capacity: High (About 11.1 inches)
Shrink-swell potential: High (About 7.5 LEP)
Flooding hazard: Occasional
Depth to seasonal water saturation: About 24 to 48 inches
Runoff class: Medium
Ecological site: Clay Lowland (pe35-37)
Land capability (nonirrigated): 2w

Typical Profile:

H1—0 to 7 inches; loam
H2—7 to 25 inches; silty clay
H3—25 to 60 inches; silt loam

Minor Components**Haynie**

Composition: About 5 percent
Slope: 0 to 1 percent
Drainage class: Well drained
Ecological site: Loamy Lowland (pe35-37)

Onawa

Composition: About 5 percent
Slope: 0 to 1 percent
Drainage class: Somewhat poorly drained
Ecological site: Clay Lowland (pe35-37)

Os—Oska silty clay loam, 3 to 8 percent slopes

Map Unit Composition

Oska: 80 percent
Minor components: 20 percent

Component Descriptions

Oska

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills

Landform: Hillslope on upland

Parent material: Silty and clayey residuum weathered from limestone and shale

Slope: 3 to 8 percent

Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)

Drainage class: Well drained

Slowest permeability: Slow (About 0.06 in/hr)

Available water capacity: Moderate (About 6.4 inches)

Shrink-swell potential: High (About 7.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: High

Ecological site: Loamy Upland (pe30-37)

Land capability (nonirrigated): 3e

Typical Profile:

H1—0 to 9 inches; silty clay loam

H2—9 to 38 inches; silty clay loam

R—38 to 38 inches; unweathered bedrock

Minor Components

Grundy

Composition: About 5 percent

Slope: 3 to 7 percent

Drainage class: Somewhat poorly drained

Ecological site: Clay Upland (pe30-37)

Martin

Composition: About 5 percent

Slope: 4 to 7 percent

Drainage class: Moderately well drained

Ecological site: Loamy Upland (pe30-37)

Pawnee

Composition: About 5 percent

Slope: 4 to 8 percent

Drainage class: Moderately well drained

Ecological site: Clay Upland (pe30-37)

Sharpsburg

Composition: About 5 percent

Slope: 4 to 8 percent

Drainage class: Moderately well drained

Ecological site: Loamy Upland (pe35-37)

Pb—Pawnee clay loam, 1 to 4 percent slopes

Map Unit Composition

Pawnee: 90 percent
Minor components: 10 percent

Component Descriptions

Pawnee

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills

Landform: Hillslope on upland

Parent material: Clayey drift

Slope: 1 to 4 percent

Drainage class: Moderately well drained

Slowest permeability: Slow (About 0.06 in/hr)

Available water capacity: Moderate (About 8.2 inches)

Shrink-swell potential: High (About 7.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: About 10 to 14 inches

Runoff class: High

Ecological site: Clay Upland (pe30-37)

Land capability (nonirrigated): 2e

Typical Profile:

H1—0 to 17 inches; clay loam

H2—17 to 41 inches; clay

H3—41 to 60 inches; clay loam

Minor Components

Grundy

Composition: About 5 percent

Slope: 1 to 3 percent

Drainage class: Somewhat poorly drained

Ecological site: Clay Upland (pe30-37)

Shelby

Composition: About 5 percent

Slope: 1 to 4 percent

Drainage class: Moderately well drained

Ecological site: Loamy Upland (pe30-37)

Pc—Pawnee clay loam, 4 to 8 percent slopes**Map Unit Composition**

Pawnee: 85 percent
 Minor components: 15 percent

Component Descriptions**Pawnee**

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills

Landform: Hillslope on upland

Parent material: Clayey drift

Slope: 4 to 8 percent

Drainage class: Moderately well drained

Slowest permeability: Slow (About 0.06 in/hr)

Available water capacity: Moderate (About 8.0 inches)

Shrink-swell potential: High (About 7.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: About 10 to 14 inches

Runoff class: Very high

Ecological site: Clay Upland (pe30-37)

Land capability (nonirrigated): 3e

Typical Profile:

H1—0 to 12 inches; clay loam

H2—12 to 36 inches; clay

H3—36 to 60 inches; clay loam

Minor Components**Grundy**

Composition: About 5 percent

Slope: 3 to 7 percent

Drainage class: Somewhat poorly drained

Ecological site: Clay Upland (pe30-37)

Oska

Composition: About 5 percent

Slope: 3 to 8 percent

Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)

Drainage class: Well drained

Ecological site: Loamy Upland (pe30-37)

Shelby

Composition: About 5 percent

Slope: 4 to 8 percent

Drainage class: Moderately well drained

Ecological site: Loamy Upland (pe30-37)

Pe—Pawnee clay loam, 4 to 8 percent slopes, eroded**Map Unit Composition**

Pawnee: 85 percent
 Minor components: 15 percent

Component Descriptions**Pawnee**

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills

Landform: Hillslope on upland

Parent material: Clayey drift

Slope: 4 to 8 percent

Drainage class: Moderately well drained

Slowest permeability: Slow (About 0.06 in/hr)

Available water capacity: Moderate (About 7.6 inches)

Shrink-swell potential: High (About 7.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: About 10 to 14 inches

Runoff class: Very high

Ecological site: Clay Upland (pe30-37)

Land capability (nonirrigated): 3e

Typical Profile:

H1—0 to 7 inches; clay loam

H2—7 to 36 inches; clay

H3—36 to 60 inches; clay loam

Minor Components**Grundy**

Composition: About 5 percent

Slope: 3 to 7 percent

Drainage class: Somewhat poorly drained

Ecological site: Clay Upland (pe30-37)

Shelby

Composition: About 5 percent

Slope: 4 to 8 percent

Drainage class: Moderately well drained

Ecological site: Loamy Upland (pe30-37)

Oska

Composition: About 5 percent

Slope: 3 to 8 percent

Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)

Drainage class: Well drained

Ecological site: Loamy Upland (pe30-37)

Qu—Quarries

H2—9 to 60 inches; fine sand

Rs—River sand**Map Unit Composition**

River Wash: 100 percent

Component Descriptions**River Wash***MLRA:* 106 - Nebraska and Kansas Loess-Drift Hills*Slope:* 0 to 1 percent*Flooding hazard:* None*Depth to seasonal water saturation:* More than 6 feet*Land capability (nonirrigated):* 8s**Haynie***MLRA:* 107 - Iowa and Missouri Deep Loess Hills*Landform:* Flood plain on river valley*Parent material:* Coarse-silty alluvium*Slope:* 0 to 3 percent*Drainage class:* Well drained*Slowest permeability:* Moderate (About 0.60 in/hr)*Available water capacity:* High (About 10.9 inches)*Shrink-swell potential:* Low (About 1.5 LEP)*Flooding hazard:* Occasional*Depth to seasonal water saturation:* More than 6 feet*Runoff class:* Very low*Ecological site:* Loamy Lowland (pe35-37)*Land capability (nonirrigated):* 2w*Typical Profile:*

H1—0 to 8 inches; very fine sandy loam

H2—8 to 60 inches; very fine sandy loam

Sa—Sarpy-Haynie complex, 0 to 3 percent slopes, occasionally flooded**Map Unit Composition**

Sarpy: 55 percent

Haynie: 35 percent

Minor components: 10 percent

Component Descriptions**Sarpy***MLRA:* 107 - Iowa and Missouri Deep Loess Hills*Landform:* Flood plain on river valley*Parent material:* Sandy alluvium*Slope:* 0 to 3 percent*Drainage class:* Somewhat excessively drained*Slowest permeability:* Rapid (About 5.95 in/hr)*Available water capacity:* Low (About 4.1 inches)*Shrink-swell potential:* Low (About 1.5 LEP)*Flooding hazard:* Occasional*Depth to seasonal water saturation:* More than 6 feet*Runoff class:* Negligible*Ecological site:* Sandy Lowland (pe35-37)*Land capability (nonirrigated):* 3w*Typical Profile:*

H1—0 to 9 inches; loamy fine sand

Minor Components**Unnamed Soil***Composition:* About 10 percent*Slope:* 0 to 2 percent*Drainage class:* Somewhat excessively drained*Ecological site:* Clay Lowland (pe30-37)**Sb—Sharpsburg silty clay loam, 1 to 4 percent slopes****Map Unit Composition**

Sharpsburg: 80 percent

Minor components: 20 percent

Component Descriptions**Sharpsburg***MLRA:* 106 - Nebraska and Kansas Loess-Drift Hills*Landform:* Hillslope on upland*Parent material:* Silty and clayey loess*Slope:* 1 to 4 percent*Drainage class:* Moderately well drained*Slowest permeability:* Moderately slow (About 0.20 in/hr)*Available water capacity:* High (About 11.7 inches)

Shrink-swell potential: Moderate (About 4.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Medium
Ecological site: Loamy Upland (pe30-37)
Land capability (nonirrigated): 2e

Typical Profile:

H1—0 to 15 inches; silty clay loam
 H2—15 to 30 inches; silty clay loam
 H3—30 to 42 inches; silty clay loam
 H4—42 to 60 inches; silty clay loam

Minor Components

Grundy

Composition: About 5 percent
Slope: 1 to 3 percent
Drainage class: Somewhat poorly drained
Ecological site: Clay Upland (pe30-37)

Gymer

Composition: About 5 percent
Slope: 3 to 7 percent
Drainage class: Well drained
Ecological site: Loamy Upland (pe30-37)

Pawnee

Composition: About 5 percent
Slope: 1 to 4 percent
Drainage class: Moderately well drained
Ecological site: Clay Upland (pe30-37)

Shelby

Composition: About 5 percent
Slope: 1 to 4 percent
Drainage class: Moderately well drained
Ecological site: Loamy Upland (pe30-37)

Sc—Sharpsburg silty clay loam, 4 to 8 percent slopes

Map Unit Composition

Sharpsburg: 80 percent
 Minor components: 20 percent

Component Descriptions

Sharpsburg

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills
Landform: Hillslope on upland
Parent material: Silty and clayey loess
Slope: 4 to 8 percent

Drainage class: Moderately well drained
Slowest permeability: Moderately slow (About 0.20 in/hr)
Available water capacity: High (About 11.5 inches)
Shrink-swell potential: Moderate (About 4.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Medium
Ecological site: Loamy Upland (pe35-37)
Land capability (nonirrigated): 3e

Typical Profile:

H1—0 to 10 inches; silty clay loam
 H2—10 to 30 inches; silty clay loam
 H3—30 to 42 inches; silty clay loam
 H4—42 to 60 inches; silty clay loam

Minor Components

Grundy

Composition: About 5 percent
Slope: 3 to 7 percent
Drainage class: Somewhat poorly drained
Ecological site: Clay Upland (pe30-37)

Shelby

Composition: About 5 percent
Slope: 4 to 8 percent
Drainage class: Moderately well drained
Ecological site: Loamy Upland (pe30-37)

Pawnee

Composition: About 5 percent
Slope: 4 to 8 percent
Drainage class: Moderately well drained
Ecological site: Clay Upland (pe30-37)

Oska

Composition: About 5 percent
Slope: 3 to 8 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Ecological site: Loamy Upland (pe30-37)

Se—Shelby loam, 1 to 4 percent slopes

Map Unit Composition

Shelby: 90 percent
 Minor components: 10 percent

Component Descriptions

Shelby

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills

Landform: Hillslope on upland

Parent material: Fine-loamy drift

Slope: 1 to 4 percent

Drainage class: Moderately well drained

Slowest permeability: Moderately slow (About 0.20 in/hr)

Available water capacity: High (About 10.3 inches)

Shrink-swell potential: Moderate (About 4.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Medium

Ecological site: Loamy Upland (pe30-37)

Land capability (nonirrigated): 2e

Typical Profile:

H1—0 to 7 inches; loam

H2—7 to 40 inches; clay loam

H3—40 to 75 inches; clay loam

Minor Components

Sharpsburg

Composition: About 5 percent

Slope: 1 to 4 percent

Drainage class: Moderately well drained

Ecological site: Loamy Upland (pe30-37)

Pawnee

Composition: About 5 percent

Slope: 1 to 4 percent

Drainage class: Moderately well drained

Ecological site: Clay Upland (pe30-37)

Sh—Shelby loam, 4 to 8 percent slopes

Map Unit Composition

Shelby: 80 percent

Minor components: 20 percent

Component Descriptions

Shelby

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills

Landform: Hillslope on upland

Parent material: Fine-loamy till

Slope: 4 to 8 percent

Drainage class: Moderately well drained

Slowest permeability: Moderately slow (About 0.20 in/hr)

Available water capacity: High (About 10.3 inches)

Shrink-swell potential: Moderate (About 4.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: High

Ecological site: Loamy Upland (pe30-37)

Land capability (nonirrigated): 3e

Typical Profile:

H1—0 to 7 inches; loam

H2—7 to 40 inches; clay loam

H3—40 to 75 inches; clay loam

Minor Components

Oska

Composition: About 5 percent

Slope: 3 to 8 percent

Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)

Drainage class: Well drained

Ecological site: Loamy Upland (pe30-37)

Sharpsburg

Composition: About 5 percent

Slope: 4 to 8 percent

Drainage class: Moderately well drained

Ecological site: Loamy Upland (pe35-37)

Elmont

Composition: About 5 percent

Slope: 7 to 12 percent

Depth to restrictive feature: More than 60 inches to bedrock

Drainage class: Well drained

Ecological site: Loamy Upland (pe30-37)

Pawnee

Phase: Eroded

Composition: About 5 percent

Slope: 4 to 8 percent

Drainage class: Moderately well drained

Ecological site: Clay Upland (pe30-37)

Sm—Shelby loam, 8 to 12 percent slopes**Map Unit Composition**

Shelby: 90 percent
 Minor components: 10 percent

Component Descriptions**Shelby**

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills

Landform: Hillslope on upland

Parent material: Fine-loamy till

Slope: 8 to 12 percent

Drainage class: Moderately well drained

Slowest permeability: Moderately slow (About 0.20 in/hr)

Available water capacity: High (About 10.2 inches)

Shrink-swell potential: Moderate (About 4.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: High

Ecological site: Loamy Upland (pe30-37)

Land capability (nonirrigated): 4e

Typical Profile:

H1—0 to 5 inches; loam

H2—5 to 40 inches; clay loam

H3—40 to 75 inches; clay loam

Minor Components**Pawnee**

Composition: About 5 percent

Slope: 4 to 8 percent

Drainage class: Moderately well drained

Ecological site: Clay Upland (pe30-37)

Elmont

Composition: About 5 percent

Slope: 7 to 12 percent

Depth to restrictive feature: More than 60 inches to bedrock

Drainage class: Well drained

Ecological site: Loamy Upland (pe30-37)

Sp—Shelby-Pawnee complex, 4 to 8 percent slopes**Map Unit Composition**

Shelby: 50 percent
 Pawnee: 35 percent
 Minor components: 15 percent

Component Descriptions**Shelby**

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills

Landform: Hillslope on upland

Parent material: Fine-loamy drift

Slope: 4 to 8 percent

Drainage class: Moderately well drained

Slowest permeability: Moderately slow (About 0.20 in/hr)

Available water capacity: High (About 10.3 inches)

Shrink-swell potential: Moderate (About 4.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: High

Ecological site: Loamy Upland (pe30-37)

Land capability (nonirrigated): 3e

Typical Profile:

H1—0 to 7 inches; loam

H2—7 to 40 inches; clay loam

H3—40 to 75 inches; clay loam

Pawnee

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills

Landform: Hillslope on upland

Parent material: Clayey drift

Slope: 4 to 8 percent

Drainage class: Moderately well drained

Slowest permeability: Slow (About 0.06 in/hr)

Available water capacity: Moderate (About 8.0 inches)

Shrink-swell potential: High (About 7.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: About 10 to 14 inches

Runoff class: Very high

Ecological site: Clay Upland (pe30-37)

Land capability (nonirrigated): 3e

Typical Profile:

H1—0 to 12 inches; clay loam

H2—12 to 36 inches; clay
H3—36 to 60 inches; clay loam

Minor Components

Elmont

Composition: About 5 percent
Slope: 3 to 7 percent
Depth to restrictive feature: More than 60 inches to bedrock
Drainage class: Well drained
Ecological site: Loamy Upland (pe30-37)

Grundy

Composition: About 5 percent
Slope: 3 to 7 percent
Drainage class: Somewhat poorly drained
Ecological site: Clay Upland (pe30-37)

Sharpsburg

Composition: About 5 percent
Slope: 4 to 8 percent
Drainage class: Moderately well drained
Ecological site: Loamy Upland (pe35-37)

Ss—Shelby-Pawnee complex, 4 to 8 percent slopes, eroded

Map Unit Composition

Shelby: 55 percent
Pawnee: 35 percent
Minor components: 10 percent

Component Descriptions

Shelby

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills
Landform: Hillslope on upland
Parent material: Fine-loamy drift
Slope: 4 to 8 percent
Drainage class: Moderately well drained
Slowest permeability: Moderately slow (About 0.20 in/hr)
Available water capacity: High (About 10.0 inches)
Shrink-swell potential: Moderate (About 4.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: High
Ecological site: Loamy Upland (pe30-37)
Land capability (nonirrigated): 3e

Typical Profile:

H1—0 to 7 inches; clay loam
H2—7 to 40 inches; clay loam
H3—40 to 75 inches; clay loam

Pawnee

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills
Landform: Hillslope on upland
Parent material: Clayey drift
Slope: 4 to 8 percent
Drainage class: Moderately well drained
Slowest permeability: Slow (About 0.06 in/hr)
Available water capacity: Moderate (About 7.6 inches)
Shrink-swell potential: High (About 7.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: About 10 to 14 inches
Runoff class: Very high
Ecological site: Clay Upland (pe30-37)
Land capability (nonirrigated): 3e

Typical Profile:

H1—0 to 7 inches; clay loam
H2—7 to 36 inches; clay
H3—36 to 60 inches; clay loam

Minor Components

Grundy

Composition: About 5 percent
Slope: 3 to 7 percent
Drainage class: Somewhat poorly drained
Ecological site: Clay Upland (pe30-37)

Elmont

Composition: About 5 percent
Slope: 3 to 7 percent
Depth to restrictive feature: More than 60 inches to bedrock
Drainage class: Well drained
Ecological site: Loamy Upland (pe30-37)

Sy—Sibleyville loam, 4 to 8 percent slopes

Map Unit Composition

Sibleyville: 85 percent
Minor components: 15 percent

Component Descriptions

Sibleyville

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills

Landform: Hillslope on upland

Parent material: Sandy and silty residuum weathered from sandstone and shale

Slope: 4 to 8 percent

Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)

Drainage class: Well drained

Slowest permeability: Moderate (About 0.60 in/hr)

Available water capacity: Moderate (About 6.0 inches)

Shrink-swell potential: Low (About 1.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Medium

Ecological site: Loamy Upland (pe30-37)

Land capability (nonirrigated): 3e

Typical Profile:

H1—0 to 13 inches; loam

H2—13 to 32 inches; clay loam

Cr—32 to 32 inches; weathered bedrock

Minor Components

Elmont

Composition: About 5 percent

Slope: 3 to 7 percent

Depth to restrictive feature: More than 60 inches to bedrock

Drainage class: Well drained

Ecological site: Loamy Upland (pe30-37)

Shelby

Composition: About 5 percent

Slope: 4 to 8 percent

Drainage class: Moderately well drained

Ecological site: Loamy Upland (pe30-37)

Vinland

Composition: About 5 percent

Slope: 5 to 12 percent

Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)

Drainage class: Somewhat excessively drained

Ecological site: Loamy Upland (pe30-37)

SZ—Sogn-Vinland complex, 5 to 20 percent slopes

Map Unit Composition

Sogn: 55 percent

Vinland: 30 percent

Minor components: 15 percent

Component Descriptions

Sogn

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills

Landform: Hillslope on upland

Parent material: Loamy residuum weathered from limestone

Slope: 5 to 20 percent

Depth to restrictive feature: 4 to 20 inches to bedrock (lithic)

Drainage class: Somewhat excessively drained

Slowest permeability: Moderate (About 0.60 in/hr)

Available water capacity: Very low (About 2.6 inches)

Shrink-swell potential: Moderate (About 4.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Medium

Ecological site: Shallow Limy (pe30-37)

Land capability (nonirrigated): 7s

Typical Profile:

H1—0 to 13 inches; silty clay loam

R—13 to 17 inches;

Vinland

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills

Landform: Hillslope on upland

Parent material: Sandy and silty residuum weathered from shale

Slope: 5 to 20 percent

Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)

Drainage class: Somewhat excessively drained

Slowest permeability: Moderate (About 0.60 in/hr)

Available water capacity: Low (About 3.5 inches)

Shrink-swell potential: Moderate (About 4.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Medium

Ecological site: Loamy Upland (pe30-37)

Land capability (nonirrigated): 6s

Typical Profile:

H1—0 to 12 inches; silty clay loam

H2—12 to 16 inches; silty clay loam

Cr—16 to 20 inches; weathered bedrock

Minor Components

Martin

Composition: About 5 percent

Slope: 3 to 8 percent

Drainage class: Moderately well drained

Ecological site: Loamy Upland (pe30-37)

Oska

Composition: About 5 percent

Slope: 2 to 6 percent

Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)

Drainage class: Well drained

Ecological site: Loamy Upland (pe30-37)

Sibleyville

Composition: About 5 percent

Slope: 7 to 12 percent

Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)

Drainage class: Well drained

Ecological site: Loamy Upland (pe30-37)

VR—Vinland-Rock outcrop complex, 20 to 40 percent slopes

Map Unit Composition

Rock outcrop: 60 percent

Vinland: 26 percent

Minor components: 14 percent

Component Descriptions

Rock outcrop

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills

Landform: Hillslope on upland

Slope: 20 to 40 percent

Depth to restrictive feature: 0 inches to bedrock (lithic)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Very high

Land capability (nonirrigated): 8

Vinland

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills

Landform: Hillslope on upland

Parent material: Sandy and silty residuum weathered from shale

Slope: 20 to 30 percent

Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)

Drainage class: Somewhat excessively drained

Slowest permeability: Moderate (About 0.60 in/hr)

Available water capacity: Low (About 3.5 inches)

Shrink-swell potential: Moderate (About 4.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: High

Ecological site: Loamy Upland (pe35-42)

Land capability (nonirrigated): 6e

Typical Profile:

H1—0 to 7 inches; silty clay loam

H2—7 to 17 inches; silty clay loam

Cr—17 to 21 inches; weathered bedrock

Minor Components

Sogn

Composition: About 10 percent

Slope: 15 to 20 percent

Depth to restrictive feature: 4 to 20 inches to bedrock (lithic)

Drainage class: Somewhat excessively drained

Ecological site: Shallow Limy (pe30-37)

Martin

Composition: About 2 percent

Slope: 7 to 11 percent

Drainage class: Moderately well drained

Ecological site: Loamy Upland (pe35-42)

Oska

Composition: About 2 percent

Slope: 3 to 6 percent

Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)

Drainage class: Well drained

Ecological site: Loamy Upland (pe35-42)

Vs—Vinland-Sibleyville complex, 5 to 12 percent slopes

Map Unit Composition

Vinland: 55 percent
Sibleyville: 45 percent

Component Descriptions

Vinland

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills

Landform: Hillslope on upland

Parent material: Sandy and silty residuum weathered from shale

Slope: 5 to 12 percent

Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)

Drainage class: Somewhat excessively drained

Slowest permeability: Moderate (About 0.60 in/hr)

Available water capacity: Low (About 4.2 inches)

Shrink-swell potential: Low (About 1.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Medium

Ecological site: Loamy Upland (pe30-37)

Land capability (nonirrigated): 6e

Typical Profile:

H1—0 to 18 inches; loam
Cr—18 to 18 inches; weathered bedrock

Sibleyville

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills

Landform: Hillslope on upland

Parent material: Sandy and silty residuum weathered from sandstone and shale

Slope: 4 to 12 percent

Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)

Drainage class: Well drained

Slowest permeability: Moderate (About 0.60 in/hr)

Available water capacity: Moderate (About 6.0 inches)

Shrink-swell potential: Low (About 1.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Medium

Ecological site: Loamy Upland (pe30-37)

Land capability (nonirrigated): 4e

Typical Profile:

H1—0 to 13 inches; loam
H2—13 to 32 inches; clay loam
Cr—32 to 32 inches; weathered bedrock

W—Water

Wa—Wabash silty clay, 0 to 1 percent slopes, occasionally flooded

Map Unit Composition

Wabash: 90 percent
Minor components: 10 percent

Component Descriptions

Wabash

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills

Landform: Flood plain on valley

Parent material: Clayey alluvium

Slope: 0 to 1 percent

Drainage class: Poorly drained

Slowest permeability: Very slow (About 0.00 in/hr)

Available water capacity: Moderate (About 6.1 inches)

Shrink-swell potential: Very high (About 17.0 LEP)

Flooding hazard: Occasional

Depth to seasonal water saturation: About 0 to 12 inches

Runoff class: Very high

Ecological site: Clay Lowland (pe30-37)

Land capability (nonirrigated): 3w

Typical Profile:

H1—0 to 6 inches; silty clay
H2—6 to 60 inches; silty clay

Minor Components

Kennebec

Composition: About 5 percent

Slope: 0 to 1 percent

Drainage class: Moderately well drained

Ecological site: Loamy Lowland (pe30-37)

Zook

Composition: About 5 percent
Slope: 0 to 1 percent
Drainage class: Poorly drained
Ecological site: Clay Lowland (pe30-37)

Slope: 4 to 7 percent
Drainage class: Moderately well drained

Wc—Welda silt loam, 4 to 9 percent slopes

Map Unit Composition

Welda: 85 percent
 Minor components: 15 percent

Component Descriptions

Welda

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills

Landform: Terrace on valley

Parent material: Silty and clayey loess

Slope: 4 to 9 percent

Drainage class: Well drained

Slowest permeability: Moderately slow (About 0.20 in/hr)

Available water capacity: High (About 11.4 inches)

Shrink-swell potential: Moderate (About 4.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: High

Ecological site: Savannah (pe30-37)

Land capability (nonirrigated): 3e

Typical Profile:

H1—0 to 12 inches; silt loam

H2—12 to 37 inches; silty clay loam

H3—37 to 70 inches; silty clay loam

Minor Components

Konawa

Composition: About 5 percent

Slope: 3 to 8 percent

Drainage class: Well drained

Ecological site: Savannah (pe30-37)

Gymer

Composition: About 5 percent

Slope: 3 to 7 percent

Drainage class: Well drained

Ecological site: Loamy Upland (pe30-37)

Ladoga

Composition: About 5 percent

Wd—Welda silt loam, 9 to 15 percent slopes

Map Unit Composition

Welda: 90 percent
 Minor components: 10 percent

Component Descriptions

Welda

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills

Landform: Terrace on valley

Parent material: Silty and clayey loess

Slope: 9 to 15 percent

Drainage class: Well drained

Slowest permeability: Moderately slow (About 0.20 in/hr)

Available water capacity: High (About 11.4 inches)

Shrink-swell potential: Moderate (About 4.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: High

Ecological site: Savannah (pe30-37)

Land capability (nonirrigated): 4e

Typical Profile:

H1—0 to 12 inches; silt loam

H2—12 to 37 inches; silty clay loam

H3—37 to 70 inches; silty clay loam

Minor Components

Armster

Composition: About 5 percent

Slope: 8 to 12 percent

Drainage class: Moderately well drained

Ecological site: Clay Upland (pe30-37)

Konawa

Composition: About 5 percent

Slope: 8 to 20 percent

Drainage class: Well drained

Ecological site: Savannah (pe30-37)

Zo—Zook silty clay loam, 0 to 1 percent slopes, occasionally flooded

Map Unit Composition

Zook: 90 percent
Minor components: 10 percent

Component Descriptions

Zook

MLRA: 106 - Nebraska and Kansas Loess-Drift Hills

Landform: Flood plain on valley

Parent material: Silty and clayey alluvium

Slope: 0 to 1 percent

Drainage class: Poorly drained

Slowest permeability: Slow (About 0.06 in/hr)

Available water capacity: High (About 9.3 inches)

Shrink-swell potential: High (About 7.5 LEP)

Flooding hazard: Occasional

Depth to seasonal water saturation: About 0 to 36 inches

Runoff class: Medium

Ecological site: Clay Lowland (pe30-37)

Land capability (nonirrigated): 2w

Typical Profile:

H1—0 to 22 inches; silty clay loam

H2—22 to 76 inches; silty clay loam

Minor Components

Kennebec

Composition: About 5 percent

Slope: 0 to 1 percent

Drainage class: Moderately well drained

Ecological site: Loamy Lowland (pe30-37)

Wabash

Composition: About 5 percent

Slope: 0 to 1 percent

Drainage class: Poorly drained

Ecological site: Clay Lowland (pe30-37)

PRIME FARMLAND
Leavenworth and Wyandotte Counties, Kansas

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting the Nation's short- and long-range needs for food and fiber. 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 qualities, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. It is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. Slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

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

The map units in the survey area that are considered prime farmland are listed in the following table. This list does not constitute a recommendation for a particular land use. On some soils included in the list, measures that overcome a hazard or limitation, such as flooding, wetness, and droughtiness, are needed. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures. The extent of each listed map unit is shown in the "Acres and Proportionate Extent of Soils" table. The location is shown on the detailed soil maps. The soil qualities that affect use and management are described in other tables in this document."

Map symbol	Mapunit name	Farmland Classification
005HN	Haynie silt loam, 0 to 2 percent slopes, occasionally flooded	All areas are prime farmland
045ET	Eudora silt loam, rarely flooded	All areas are prime farmland
045EV	Eudora-kimo complex, rarely flooded	All areas are prime farmland
045KM	Kimo silty clay loam, rarely flooded	All areas are prime farmland
045MR	Morrill clay loam, 3 to 7 percent slopes	All areas are prime farmland
087RE	Reading silt loam, 0 to 2 percent slopes, very rarely flooded, moderately wet	All areas are prime farmland
091ED	Eudora-kimo complex, overwash, rarely flooded	All areas are prime farmland
091RA	Reading silt loam, 0 to 2 percent slopes, rarely flooded	All areas are prime farmland
Ec	Elmont silt loam, 3 to 7 percent slopes	All areas are prime farmland
Eu	Eudora complex, 0 to 1 percent slopes, rarely flooded, overwash	All areas are prime farmland
Gt	Grundy silty clay loam, 1 to 3 percent slopes	All areas are prime farmland
Gu	Grundy silty clay loam, 3 to 7 percent slopes	All areas are prime farmland
Gy	Gymer silt loam, 3 to 7 percent slopes	All areas are prime farmland
Hy	Haynie silt loam, 0 to 1 percent slopes, occasionally flooded	All areas are prime farmland
Ju	Judson silt loam, 0 to 1 percent slopes	All areas are prime farmland
Ke	Kennebec silt loam, 0 to 1 percent slopes, occasionally flooded	All areas are prime farmland
La	Ladoga silt loam, 4 to 7 percent slopes	All areas are prime farmland
Mb	Marshall silt loam, 1 to 4 percent slopes	All areas are prime farmland
Mc	Marshall silt loam, 4 to 9 percent slopes	All areas are prime farmland
Pb	Pawnee clay loam, 1 to 4 percent slopes	All areas are prime farmland
Sb	Sharpsburg silty clay loam, 1 to 4 percent slopes	All areas are prime farmland
Se	Shelby loam, 1 to 4 percent slopes	All areas are prime farmland
Sh	Shelby loam, 4 to 8 percent slopes	All areas are prime farmland
005HO	Haynie-onawa complex, 0 to 2 percent slopes, occasionally flooded	Prime farmland if drained
005KG	Kennebec-colo silt loams, 0 to 2 percent slopes, occasionally flooded	Prime farmland if drained
005OD	Onawa loam, 0 to 2 percent slopes, occasionally flooded, overwash	Prime farmland if drained
005WA	Wabash silty clay loam, 0 to 2 percent slopes, occasionally flooded	Prime farmland if drained
045WC	Wabash silty clay loam, occasionally flooded	Prime farmland if drained
087WC	Wabash silty clay loam, 0 to 1 percent slopes, very rarely flooded	Prime farmland if drained
Br	Bremer silty clay loam, 0 to 2 percent slopes, rarely flooded	Prime farmland if drained
Hg	Haig silty clay loam, 0 to 1 percent slopes	Prime farmland if drained
On	Onawa silty clay loam, 0 to 1 percent slopes, occasionally flooded	Prime farmland if drained
Oo	Onawa soils, 0 to 1 percent slopes, occasionally flooded, overwash	Prime farmland if drained
Wa	Wabash silty clay, 0 to 1 percent slopes, occasionally flooded	Prime farmland if drained
Zo	Zook silty clay loam, 0 to 1 percent slopes, occasionally flooded	Prime farmland if drained

SOIL RATING FOR PLANT GROWTH, modified 1998
Leavenworth and Wyandotte Counties, Kansas

The "Soil Rating for Plant Growth, modified 1998" (SRPG) is a relative rating of the capacity of a soil to produce a specific plant under a defined management system. The index is determined from yield data on a few benchmark soils and is used to calculate yields, the net returns from crops, land assessment values, and taxes and to perform risk analysis when land management decisions are made. Specific information on plants and yields can be obtained from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

Map symbol	Soil name	Crop Index
005AQ	Fluvaquents, Ponded-----	1
005AR	Armster Clay Loam, 6 To 12 Percent Slopes-----	64
005GO	Gosport Silty Clay Loam, 25 To 45 Percent Slopes-----	13
005HN	Haynie Silt Loam, 0 To 2 Percent Slopes, Occasionally Flooded-----	52
005HO	Haynie-Onawa Complex, 0 To 2 Percent Slopes, Occasionally Flooded-----	46
005KG	Kennebec-Colo Silt Loams, 0 To 2 Percent Slopes, Occasionally Flooded-----	76
005KY	Knox-Gosport Complex, 10 To 30 Percent Slopes-----	43
005OD	Onawa Loam, 0 To 2 Percent Slopes, Occasionally Flooded, Overwash-----	32
005OW	Onawet Silty Clay Loam, Depressionnal, 0 To 1 Percent Slopes, Frequently Flooded-----	39
005PA	Palermo-Knox Complex, 10 To 18 Percent Slopes-----	65
005PB	Palermo Silty Clay Loam, 18 To 30 Percent Slopes-----	40
005SH	Shelby Clay Loam, 5 To 10 Percent Slopes-----	73
005WA	Wabash Silty Clay Loam, 0 To 2 Percent Slopes, Occasionally Flooded-----	57
005WH	Wathena-Haynie Complex, 0 To 2 Percent Slopes, Occasionally Flooded-----	37
045ET	Eudora Silt Loam, Rarely Flooded-----	75
045EV	Eudora-Kimo Complex, Rarely Flooded-----	73
045KM	Kimo Silty Clay Loam, Rarely Flooded-----	74
045MR	Morrill Clay Loam, 3 To 7 Percent Slopes-----	80
045RO	Riverwash-----	44
045SB	Sarpy-Eudora Complex, Overwash, Occasionally Flooded-----	43
045VM	Vinland-Martin Complex, 7 To 15 Percent Slopes-----	30
045WC	Wabash Silty Clay Loam, Occasionally Flooded-----	64
087RE	Reading Silt Loam, 0 To 2 Percent Slopes, Very Rarely Flooded, Moderately Wet-----	84
087SS	Sibleyville Complex, 3 To 7 Percent Slopes-----	43
087SV	Sibleyville Complex, 7 To 12 Percent Slopes-----	41
087VO	Vinland Complex, 7 To 15 Percent Slopes-----	27
087WC	Wabash Silty Clay Loam, 0 To 1 Percent Slopes, Very Rarely Flooded-----	73
091ED	Eudora-Kimo Complex, Overwash, Rarely Flooded-----	77
091LB	Ladoga Silt Loam, 8 To 15 Percent Slopes-----	69
091RA	Reading Silt Loam, 0 To 2 Percent Slopes, Rarely Flooded-----	86
091SB	Sharpsburg-Urban Land Complex, 3 To 8 Percent Slopes-----	42
AED	Arents, Earthen Dam-----	0
Aa	Kennebec Silt Loam, Channeled-----	64
Ac	Armster Loam, 3 To 8 Percent Slopes-----	72
Ad	Armster Loam, 8 To 12 Percent Slopes-----	65
Ae	Armster Clay Loam, 8 To 12 Percent Slopes, Eroded-----	65
Ba	Basehor Complex, 5 To 30 Percent Slopes-----	12
Br	Bremer Silty Clay Loam, 0 To 2 Percent Slopes, Rarely Flooded-----	85
Cf	Cut And Fill-----	0
Ec	Elmont Silt Loam, 3 To 7 Percent Slopes-----	81
Ed	Elmont Silt Loam, 7 To 12 Percent Slopes-----	75
Eu	Eudora Complex, 0 To 1 Percent Slopes, Rarely Flooded, Overwash-----	69
Gc	Gosport Complex, 10 To 30 Percent Slopes-----	27
Gp	Gravel Pits-----	0
Gs	Gosport-Sogn Complex, 7 To 35 Percent Slopes-----	23
Gt	Grundy Silty Clay Loam, 1 To 3 Percent Slopes-----	75
Gu	Grundy Silty Clay Loam, 3 To 7 Percent Slopes-----	70
Gy	Gymer Silt Loam, 3 To 7 Percent Slopes-----	81
Hg	Haig Silty Clay Loam, 0 To 1 Percent Slopes-----	69
Hy	Haynie Silt Loam, 0 To 1 Percent Slopes, Occasionally Flooded-----	53
Ju	Judson Silt Loam, 0 To 1 Percent Slopes-----	91
Ke	Kennebec Silt Loam, 0 To 1 Percent Slopes, Occasionally Flooded-----	81
Kh	Knox Silt Loam, 7 To 12 Percent Slopes-----	76
Kk	Knox Silt Loam, 12 To 18 Percent Slopes-----	69
Km	Knox Silty Clay Loam, 7 To 12 Percent Slopes, Eroded-----	75
Kn	Knox Complex, 18 To 30 Percent Slopes-----	24
Ko	Konawa Fine Sandy Loam, 3 To 8 Percent Slopes-----	66
Kw	Konawa Fine Sandy Loam, 8 To 20 Percent Slopes-----	57
La	Ladoga Silt Loam, 4 To 7 Percent Slopes-----	77
M-W	Miscellaneous Water-----	0
Mb	Marshall Silt Loam, 1 To 4 Percent Slopes-----	87
Mc	Marshall Silt Loam, 4 To 9 Percent Slopes-----	82
Md	Marshall Silt Loam, 9 To 15 Percent Slopes-----	75
Mn	Martin Silty Clay Loam, 4 To 7 Percent Slopes-----	77
Mr	Martin Silty Clay Loam, 7 To 12 Percent Slopes-----	72
Ms	Martin Soils, 6 To 12 Percent Slopes, Eroded-----	65
On	Onawa Silty Clay Loam, 0 To 1 Percent Slopes, Occasionally Flooded-----	56
Oo	Onawa Soils, 0 To 1 Percent Slopes, Occasionally Flooded, Overwash-----	62
Os	Oska Silty Clay Loam, 3 To 8 Percent Slopes-----	69
Pb	Pawnee Clay Loam, 1 To 4 Percent Slopes-----	70
Pc	Pawnee Clay Loam, 4 To 8 Percent Slopes-----	66
Pe	Pawnee Clay Loam, 4 To 8 Percent Slopes, Eroded-----	64
Qu	Quarries-----	0
Rs	River Sand-----	44
SZ	Sogn-Vinland Complex, 5 To 20 Percent Slopes-----	17
Sa	Sarpy-Haynie Complex, 0 To 3 Percent Slopes, Occasionally Flooded-----	37
Sb	Sharpsburg Silty Clay Loam, 1 To 4 Percent Slopes-----	80
Sc	Sharpsburg Silty Clay Loam, 4 To 8 Percent Slopes-----	76
Se	Shelby Loam, 1 To 4 Percent Slopes-----	83

SOIL RATING FOR PLANT GROWTH, modified 1998
Leavenworth and Wyandotte Counties, Kansas

The "Soil Rating for Plant Growth, modified 1998" (SRPG) is a relative rating of the capacity of a soil to produce a specific plant under a defined management system. The index is determined from yield data on a few benchmark soils and is used to calculate yields, the net returns from crops, land assessment values, and taxes and to perform risk analysis when land management decisions are made. Specific information on plants and yields can be obtained from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

Map symbol	Soil name	Crop Index
Sh	Shelby Loam, 4 To 8 Percent Slopes-----	79
Sm	Shelby Loam, 8 To 12 Percent Slopes-----	74
Sp	Shelby-Pawnee Complex, 4 To 8 Percent Slopes-----	75
Ss	Shelby-Pawnee Complex, 4 To 8 Percent Slopes, Eroded-----	73
Sy	Sibleyville Loam, 4 To 8 Percent Slopes-----	59
VR	Vinland-Rock Outcrop Complex, 20 To 40 Percent Slopes-----	3
Vs	Vinland-Sibleyville Complex, 5 To 12 Percent Slopes-----	35
W	Water-----	0
Wa	Wabash Silty Clay, 0 To 1 Percent Slopes, Occasionally Flooded-----	45
Wc	Welda Silt Loam, 4 To 9 Percent Slopes-----	77
Wd	Welda Silt Loam, 9 To 15 Percent Slopes-----	69
Zo	Zook Silty Clay Loam, 0 To 1 Percent Slopes, Occasionally Flooded-----	65

Leavenworth and Wyandotte Counties, Kansas: Published
 Field Office Thunderbook: Soils Properties for Conservation Planning

(Entries under "Erosion factors--T" apply to the entire profile. Entries under "K", "Kf", "Wind Erodibility Group" and "Wind Erodibility Index" apply only to the surface layer)

Map symbol and soil name	Percent	Irr Cap Class	Nonirr Cap Class	Prime Farmland	Hydro-logic Group	Range site name	Windbreak suitability group	Erosion factors			Wind erodibility group	Wind erodibility index
								K	Kf	T		
005AQ:FLUVAQUENT S-----	95	N/A	8w	Not prime farmland		Unspecified	5	---	---	5	4L	86
005AR:ARMSTER---	85	N/A	4e	Not prime farmland	C	Clay Upland (pe30-37)	7	.37	.37	5	6	48
005GO:GOSPORT---	85	N/A	7e	Not prime farmland	C	Unspecified	8	.43	.43	3	7	38
005HN:HAYNIE----	96	2w-	2w	All areas are prime farmland	B	Loamy Lowland (pe35-37)	5	.37	.37	5	4L	86
005HO:HAYNIE----	60	2w-	2w	Prime farmland if drained	B	Loamy Lowland (pe35-37)	5	.37	.37	5	4L	86
005HO:ONAWA-----	30	2w-	2w	Prime farmland if drained	D	Clay Lowland (pe35-37)	4	.32	.32	5	4	86
005KG:KENNEBEC--	60	N/A	2w	Prime farmland if drained	B	Loamy Lowland (pe30-37)	7	.28	.28	5	6	48
005KG:COLO-----	30	N/A	N/A	Prime farmland if drained	B/D	Unspecified	7	.28	.28	5	6	48
005KY:KNOX-----	60	N/A	6e	Not prime farmland	B	Unspecified	7	.32	.32	5	6	48
005KY:GOSPORT---	30	N/A	N/A	Not prime farmland	C	Unspecified	8	.43	.43	3	7	38
005OD:ONAWA-----	95	2w-	2w	Prime farmland if drained	D	Clay Lowland (pe35-37)	4	.32	.32	5	4	86
005OW:ONAWET----	95	N/A	5w	Not prime farmland	D	Unspecified	4	.32	.32	5	4	86
005PA:KNOX-----	50	N/A	3e	Not prime farmland	B	Unspecified	7	.32	.32	5	6	48
005PA:PALERMO---	50	N/A	4e	Not prime farmland	B	Unspecified	7	.37	.37	5	6	48
005PB:PALERMO---	95	N/A	4e	Not prime farmland	B	Unspecified	7	.37	.37	5	6	48
005SH:SHELBY----	85	N/A	3e	Not prime farmland	B	Loamy Upland (pe30-37)	7	.28	.28	5	6	48
005WA:WABASH----	85	N/A	3w	Prime farmland if drained	D	Clay Lowland (pe30-37)	8	.37	.37	5	7	38
005WH:WATHENA---	55	N/A	4w	Not prime farmland	B	Sandy Lowland (pe35-37)	2	.17	.17	5	2	134

Leavenworth and Wyandotte Counties, Kansas: Published
 Field Office Thunderbook: Soils Properties for Conservation Planning--Continued

Map symbol and soil name	Percent	Irr Cap Class	Nonirr Cap Class	Prime Farmland	Hydro-logic Group	Range site name	Windbreak suitability group	Erosion factors			Wind erodi-bility group	Wind erodi-bility index
								K	Kf	T		
005WH:HAYNIE----	40	2w-	2w	Not prime farmland	B	Loamy Lowland (pe35-37)	5	.37	.37	5	4L	86
045ET:EUDORA----	90	N/A	1	All areas are prime farmland	B	Loamy Lowland (pe30-37)	6	.32	.32	5	5	56
045EV:EUDORA----	60	N/A	2w	All areas are prime farmland	B	Loamy Lowland (pe30-37)	6	.32	.32	5	5	56
045EV:KIMO-----	30	N/A	2w	All areas are prime farmland	C	Clay Lowland (pe30-37)	4	.37	.37	5	4	86
045KM:KIMO-----	90	N/A	2w	All areas are prime farmland	C	Clay Lowland (pe30-37)	4	.37	.37	5	4	86
045MR:MORRILL---	90	N/A	3e	All areas are prime farmland	B	Loamy Upland (pe30-37)	7	.28	.28	5	6	48
045RO:RIVER WASH	100	N/A	8s	Not prime farmland		Unspecified		---	---	-	---	0
045SB:SARPY-----	55	N/A	3w	Not prime farmland	A	Sandy Lowland (pe30-37)	2	.17	.17	5	2	134
045SB:EUDORA----	45	N/A	3w	Not prime farmland	B	Loamy Lowland (pe30-37)	3	.20	.20	5	3	86
045VM:VINLAND---	40	N/A	6e	Not prime farmland	D	Loamy Upland (pe35-42)	8	.32	.32	2	7	38
045VM:MARTIN----	25	N/A	4e	Not prime farmland	C	Loamy Upland (pe35-42)	8	.37	.37	5	7	38
045WC:WABASH----	88	N/A	3w	Prime farmland if drained	D	Clay Lowland (pe30-37)	8	.28	.28	5	7	38
087RE:READING---	85	N/A	2w	All areas are prime farmland	B	Unspecified	7	.32	.32	5	6	48
087SS:SIBLEYVILL E-----	60	N/A	4e	Not prime farmland	B	Loamy Upland (pe35-42)	7	.28	.28	3	6	48
087SV:SIBLEYVILL E-----	50	N/A	6e	Not prime farmland	B	Loamy Upland (pe30-37)	7	.32	.32	3	6	48
087VO:VINLAND---	55	N/A	6e	Not prime farmland	D	Loamy Upland (pe30-37)	8	.32	.32	2	7	38
087WC:WABASH----	94	N/A	3w	Prime farmland if drained	D	Clay Lowland (pe30-37)	8	.37	.37	5	7	38
091ED:EUDORA----	75	N/A	1	All areas are prime farmland	B	Loamy Lowland (pe30-37)	6	.32	.32	5	5	56
091ED:KIMO-----	25	N/A	2w	All areas are prime farmland	C	Clay Lowland (pe30-37)	4	.37	.37	5	4	86

Leavenworth and Wyandotte Counties, Kansas: Published
 Field Office Thunderbook: Soils Properties for Conservation Planning--Continued

Map symbol and soil name	Percent	Irr Cap Class	Nonirr Cap Class	Prime Farmland	Hydro-logic Group	Range site name	Windbreak suitability group	Erosion factors			Wind erodi-bility group	Wind erodi-bility index
								K	Kf	T		
091LB:LADOGA----	85	N/A	4e	Not prime farmland	B	Unspecified	7	.32	.32	5	6	48
091RA:READING---	90	N/A	1	All areas are prime farmland	B	Loamy Lowland (pe35-42)	7	.32	.32	5	6	48
091SB:SHARPSBURG	55	N/A	3e	Not prime farmland	B	Loamy Upland (pe30-37)	7	.32	.32	5	6	48
091SB:URBAN LAND	45	N/A	N/A	Not prime farmland		Unspecified		---	---	-	---	---
AED:ARENTS, EARTHEN DAM----	100	N/A	8	Not prime farmland		Unspecified		---	---	-	---	---
Aa:KENNEBEC-----	85	N/A	5w	Not prime farmland	B	Loamy Lowland (pe30-37)	7	.28	.28	5	6	48
Ac:ARMSTER-----	90	N/A	3e	Not prime farmland	C	Clay Upland (pe30-37)	7	.37	.37	5	6	48
Ad:ARMSTER-----	90	N/A	4e	Not prime farmland	C	Clay Upland (pe30-37)	7	.37	.37	5	6	48
Ae:ARMSTER-----	75	N/A	4e	Not prime farmland	C	Clay Upland (pe30-37)	7	.37	.37	5	6	48
Ba:BASEHOR-----	55	N/A	6s	Not prime farmland	D	Shallow Savannah (pe30-37)	6	.32	.32	1	5	56
Br:BREMER-----	95	N/A	2w	Prime farmland if drained	C	Unspecified	8	.28	.28	5	7	38
Cf:BORROW PITS--	100	N/A	N/A	Not prime farmland		Unspecified		---	---	-	---	---
Ec:ELMONT-----	85	N/A	3e	All areas are prime farmland	B	Loamy Upland (pe30-37)	7	.32	.32	5	6	48
Ed:ELMONT-----	85	N/A	4e	Not prime farmland	B	Loamy Upland (pe30-37)	7	.32	.32	5	6	48
Eu:EUDORA-----	70	N/A	1	All areas are prime farmland	B	Loamy Lowland (pe30-37)	3	.20	.20	5	3	86
Eu:HAYNIE-----	20	2w-	2w	All areas are prime farmland	B	Loamy Lowland (pe35-37)	5	.37	.37	5	4L	86
Gc:GOSPORT-----	50	N/A	7e	Not prime farmland	C	Unspecified	7	.43	.43	3	6	48
Gp:GRAVEL PITS--	100	N/A	N/A	Not prime farmland		Unspecified		---	---	-	---	0
Gs:GOSPORT-----	50	N/A	7e	Not prime farmland	C	Unspecified	7	.43	.43	3	6	48
Gs:SOGN-----	35	N/A	N/A	Not prime farmland	D	Shallow Limy (pe30-37)	5	.32	.32	1	4L	86

Leavenworth and Wyandotte Counties, Kansas: Published
 Field Office Thunderbook: Soils Properties for Conservation Planning--Continued

Map symbol and soil name	Percent	Irr Cap Class	Nonirr Cap Class	Prime Farmland	Hydro-logic Group	Range site name	Windbreak suitability group	Erosion factors			Wind erodi-bility group	Wind erodi-bility index
								K	Kf	T		
Gt:GRUNDY-----	90	N/A	2e	All areas are prime farmland	C	Clay Upland (pe30-37)	8	.37	.37	5	7	38
Gu:GRUNDY-----	90	N/A	3e	All areas are prime farmland	C	Clay Upland (pe30-37)	8	.37	.37	5	7	38
Gy:GYMER-----	85	N/A	3e	All areas are prime farmland	C	Loamy Upland (pe30-37)	7	.32	.32	5	6	48
Hg:HAIG-----	90	N/A	2w	Prime farmland if drained	C/D	Clay Upland (pe30-37)	8	.37	.37	5	7	38
Hy:HAYNIE-----	90	2w-	2w	All areas are prime farmland	B	Loamy Lowland (pe35-37)	5	.37	.37	5	4L	86
Ju:JUDSON-----	90	N/A	1	All areas are prime farmland	B	Loamy Lowland (pe35-37)	7	.28	.28	5	6	48
Ke:KENNEBEC-----	90	N/A	2w	All areas are prime farmland	B	Loamy Lowland (pe30-37)	7	.28	.28	5	6	48
Kh:KNOX-----	80	N/A	3e	Not prime farmland	B	Unspecified	7	.32	.32	5	6	48
Kk:KNOX-----	90	N/A	4e	Not prime farmland	B	Unspecified	7	.32	.32	5	6	48
Km:KNOX-----	85	N/A	4e	Not prime farmland	B	Unspecified	8	.32	.32	5	7	38
Kn:KNOX-----	65	N/A	6e	Not prime farmland	B	Unspecified	7	.32	.32	5	6	48
Kn:SOGN-----	35	N/A	N/A	Not prime farmland	D	Shallow Limy (pe35-37)	5	.32	.32	1	4L	86
Ko:KONAWA-----	85	N/A	3e	Not prime farmland	B	Savannah (pe30-37)	3	.24	.24	5	3	86
Kw:KONAWA-----	90	N/A	6e	Not prime farmland	B	Savannah (pe30-37)	3	.24	.24	5	3	86
La:LADOGA-----	80	N/A	3e	All areas are prime farmland	B	Unspecified	7	.32	.32	5	6	48
M- W:MISCELLANEOUS WATER-----	100	N/A	N/A	Not prime farmland		Unspecified		---	---	-	---	---
Mb:MARSHALL-----	90	N/A	2e	All areas are prime farmland	B	Loamy Upland (pe35-37)	7	.32	.32	5	6	48
Mc:MARSHALL-----	90	N/A	3e	All areas are prime farmland	B	Loamy Upland (pe35-37)	7	.28	.28	5	6	48

Leavenworth and Wyandotte Counties, Kansas: Published
 Field Office Thunderbook: Soils Properties for Conservation Planning--Continued

Map symbol and soil name	Percent	Irr Cap Class	Nonirr Cap Class	Prime Farmland	Hydro-logic Group	Range site name	Windbreak suitability group	Erosion factors			Wind erodi-bility group	Wind erodi-bility index
								K	Kf	T		
Md:MARSHALL-----	90	N/A	4e	Not prime farmland	B	Loamy Upland (pe35-37)	7	.32	.32	5	6	48
Mn:MARTIN-----	90	N/A	3e	Not prime farmland	C	Loamy Upland (pe30-37)	8	.37	.37	5	7	38
Mr:MARTIN-----	85	N/A	4e	Not prime farmland	C	Loamy Upland (pe30-37)	8	.37	.37	5	7	38
Ms:MARTIN-----	85	N/A	6e	Not prime farmland	C	Loamy Upland (pe30-37)	4	.28	.28	5	4	86
On:ONAWA-----	95	2w-	2w	Prime farmland if drained	D	Clay Lowland (pe35-37)	4	.32	.32	5	4	86
Oo:ONAWA-----	90	N/A	2w	Prime farmland if drained	D	Clay Lowland (pe35-37)	5	.32	.32	5	4L	86
Os:OSKA-----	80	N/A	3e	Not prime farmland	C	Loamy Upland (pe30-37)	8	.37	.37	2	7	38
Pb:PAWNEE-----	90	N/A	2e	All areas are prime farmland	D	Clay Upland (pe30-37)	7	.37	.37	5	6	48
Pc:PAWNEE-----	85	N/A	3e	Not prime farmland	D	Clay Upland (pe30-37)	7	.37	.37	5	6	48
Pe:PAWNEE-----	85	N/A	3e	Not prime farmland	D	Clay Upland (pe30-37)	7	.37	.37	5	6	48
Qu:QUARRIES-----	100	N/A	N/A	Not prime farmland		Unspecified		---	---	-	---	0
Rs:RIVER WASH---	100	N/A	8s	Not prime farmland		Unspecified		---	---	-	---	0
SZ:SOGN-----	55	N/A	7s		D	Shallow Limy (pe30-37)	5	.32	.32	1	4L	86
SZ:VINLAND-----	30	N/A	6s		D	Loamy Upland (pe30-37)	8	.32	.32	2	7	38
Sa:SARPY-----	55	N/A	3w	Not prime farmland	A	Sandy Lowland (pe35-37)	2	.17	.17	5	2	134
Sa:HAYNIE-----	35	N/A	2w	Not prime farmland	B	Loamy Lowland (pe35-37)	3	.37	.37	5	3	86
Sb:SHARPSBURG---	80	N/A	2e	All areas are prime farmland	B	Loamy Upland (pe30-37)	8	.32	.32	5	7	38
Sc:SHARPSBURG---	80	N/A	3e	Not prime farmland	B	Loamy Upland (pe35-37)	8	.32	.32	5	7	38
Se:SHELBY-----	90	N/A	2e	All areas are prime farmland	B	Loamy Upland (pe30-37)	7	.28	.28	5	6	48
Sh:SHELBY-----	80	N/A	3e	All areas are prime farmland	B	Loamy Upland (pe30-37)	7	.28	.28	5	6	48

Leavenworth and Wyandotte Counties, Kansas: Published
 Field Office Thunderbook: Soils Properties for Conservation Planning--Continued

Map symbol and soil name	Percent	Irr Cap Class	Nonirr Cap Class	Prime Farmland	Hydro-logic Group	Range site name	Windbreak suitability group	Erosion factors			Wind erodi-bility group	Wind erodi-bility index
								K	Kf	T		
Sm:SHELBY-----	90	N/A	4e	Not prime farmland	B	Loamy Upland (pe30-37)	7	.28	.28	5	6	48
Sp:SHELBY-----	50	N/A	3e	Not prime farmland	B	Loamy Upland (pe30-37)	7	.28	.28	5	6	48
Sp:PAWNEE-----	35	N/A	3e	Not prime farmland	D	Clay Upland (pe30-37)	7	.37	.37	5	6	48
Ss:SHELBY-----	55	N/A	3e	Not prime farmland	B	Loamy Upland (pe30-37)	7	.28	.28	5	6	48
Ss:PAWNEE-----	35	N/A	3e	Not prime farmland	D	Clay Upland (pe30-37)	7	.37	.37	5	6	48
Sy:SIBLEYVILLE--	85	N/A	3e	Not prime farmland	B	Loamy Upland (pe30-37)	7	.32	.32	3	6	48
Uc:----- Un:-----		N/A	N/A			Unspecified		---	---	-	---	---
VR:ROCK OUTCROP--	60	N/A	8	Not prime farmland		Unspecified		---	---	-	---	0
VR:VINLAND-----	26	N/A	6e	Not prime farmland	D	Loamy Upland (pe35-42)	8	.32	.32	2	7	38
Vs:VINLAND-----	55	N/A	6e	Not prime farmland	D	Loamy Upland (pe30-37)	7	.28	.28	2	6	48
Vs:SIBLEYVILLE--	45	N/A	4e	Not prime farmland	B	Loamy Upland (pe30-37)	7	.32	.32	3	6	48
W:WATER-----	100	N/A	N/A			Unspecified		---	---	-	---	---
Wa:WABASH-----	90	N/A	3w	Prime farmland if drained	D	Clay Lowland (pe30-37)	4	.28	.28	5	4	86
Wc:WELDA-----	85	N/A	3e	Not prime farmland	C	Savannah (pe30-37)	7	.37	.37	5	6	48
Wd:WELDA-----	90	N/A	4e	Not prime farmland	C	Savannah (pe30-37)	7	.37	.37	5	6	48
Zo:ZOOK-----	90	N/A	2w	Prime farmland if drained	C/D	Clay Lowland (pe30-37)	8	.37	.37	5	7	38

RANGELAND PRODUCTIVITY
Leavenworth and Wyandotte
Counties, Kansas

Use and Explanation of Rangeland, Grazed Forest Land, Native Pastureland Interpretations

Information in this subsection can be used to plan the use and management of soils for rangeland, grazed forest land, and native pasture. Different kinds of soils vary in their capacity to produce native grasses and other plants suitable for grazing. Information in this subsection provides groupings of similar soils and estimates of potential forage production, which can be used to determine livestock stocking rates.

Rangeland. Range is land on which the native vegetation (climax or natural potential plant community) is predominantly grasses, grasslike plants, forbs, and shrubs suitable for grazing and browsing. Range includes natural grasslands, savannas, many wetlands, some deserts, tundra, and certain shrub and forb communities. Rangeland receives no regular or frequent cultural treatment. The composition and production of the plant community are determined by soil, climate, topography, overstory canopy, and grazing management.

Grazed Forest Land. Includes land on which the understory includes, as an integral part of the forest plant community, plants that can be grazed without significantly impairing other forest values.

Native Pasture. Includes land on which the native vegetation (climax or natural potential plant community) is forest but which is used and managed primarily for production of native plants for forage. Native pasture includes cut-over forest land and forest land cleared and now managed for native or naturalized forage plants.

Rangeland

In areas that have similar climate and topography, differences in the kind and amount of vegetation produced on rangeland are closely related to the kind of soil. Effective management based on the relationship between the soils and vegetation and water.

The Rangeland, Grazed Forest land, Native Pastureland Interpretations shows, for each soil that supports rangeland vegetation, the ecological site and the potential annual production of vegetation in favorable, normal, unfavorable years. An explanation of the column headings in this table follows.

An ecological site is the product of all the environmental factors responsible for its development. It has characteristic soils that have developed over time throughout the soil development process; a characteristic hydrology, particularly infiltration and runoff, that has developed over time; and a characteristic plant community (kind and amount of vegetation). The hydrology of a site is influenced by development of the soil and plant community. The vegetation, soils, and hydrology are all interrelated. Each is influenced by the others and influences the development of the others. The plant community on an ecological site is typified by an association of species that differs from that of other ecological sites in the kind and/or proportion of species or in total production. Descriptions of ecological sites are provided in the Field Office Technical Guide, which is available in local offices of the Natural Resources Conservation Service.

Total dry-weight production is the amount of vegetation that can be expected to grow annually on well managed rangeland that is supporting the potential natural plant community. It includes all vegetation, whether or not it is palatable to grazing animals. It includes the current year's growth of leaves, twigs, and fruits of woody plants. It does not include the increase in stem diameter of trees and shrubs. It is expressed in pounds per acre of air-dry vegetation for favorable, average, and unfavorable years. In a favorable year, the amount and distribution of precipitation and the temperatures make growing conditions substantially better than average. In a normal year, growing conditions are about average. In an unfavorable year, growing conditions are well below average, generally because of low available soil moisture. Yields are adjusted to a common percent of air-dry moisture content.

Range management requires a knowledge of the kinds of soil and of the potential natural plant community. It also requires an evaluation of the present range similarity index and rangeland trend. Range similarity index is determined by comparing the present plant community with the potential natural plant community on a particular rangeland ecological site. The more closely the existing community resembles the potential community, the higher the range similarity index. Rangeland trend is defined as the direction of change in an existing plant community relative to the potential natural plant community. Further information about the range similarity index and rangeland trend is available in chapter 4 of the National Range and Pasture Handbook, which is available in local offices of the Natural Resources Conservation Service. The objective in range management is to control grazing so that the plants growing on a site are about the same in kind and amount as the potential natural plant community for that site. Such management generally results in the optimum production of vegetation, control of undesirable brush species, conservation of water, and control of erosion. Sometimes, however, an area with a range similarity index somewhat below the potential meets grazing needs, provides wildlife habitat, and protects soil and water resources.

RANGELAND PRODUCTIVITY--Continued
Leavenworth and Wyandotte
Counties, Kansas

(Only the soils that support rangeland vegetation suitable for grazing are rated.) Refer to range site description to determine the percentage allowable of grasses, forbs, and shrubs for the range ecological site.

Map symbol and soil name	Ecological site	Total dry-weight production		
		Favorable year	Average year	Unfavorable year
		Lb/acre	Lb/acre	Lb/acre
005AQ: Fluvaquents-----	---	---	---	---
005AR: Armster-----	Clay Upland (pe30-37)	---	---	---
005GO: Gosport-----	---	---	---	---
005HN: Haynie-----	Loamy Lowland (pe35-37)	5,300	4,900	4,500
005HO: Haynie-----	Loamy Lowland (pe35-37)	5,300	4,900	4,500
Onawa-----	Clay Lowland (pe35-37)	4,000	3,600	3,200
005KG: Kennebec-----	Loamy Lowland (pe30-37)	10,000	8,000	6,000
Colo-----	---	---	---	---
005KY: Knox-----	---	---	---	---
Gosport-----	---	---	---	---
005OD: Onawa-----	Clay Lowland (pe35-37)	4,000	3,600	3,200
005OW: Onawet-----	---	6,500	6,000	5,500
005PA: Knox-----	---	---	---	---
Palermo-----	---	---	---	---
005PB: Palermo-----	---	---	---	---
005SH: Shelby-----	Loamy Upland (pe30-37)	4,400	3,900	3,500
005WA: Wabash-----	Clay Lowland (pe30-37)	10,000	9,000	7,000
005WH: Wathena-----	Sandy Lowland (pe35-37)	3,800	3,500	3,000
Haynie-----	Loamy Lowland (pe35-37)	5,300	4,900	4,500
045ET: Eudora-----	Loamy Lowland (pe30-37)	10,000	8,000	6,000
045EV: Eudora-----	Loamy Lowland (pe30-37)	10,000	8,000	6,000
Kimo-----	Clay Lowland (pe30-37)	9,000	7,000	5,000
045KM: Kimo-----	Clay Lowland (pe30-37)	9,000	7,000	5,000
045MR: Morrill-----	Loamy Upland (pe30-37)	6,000	5,000	4,000
045RO: River Wash-----	---	---	---	---
045SB: Sarpy-----	Sandy Lowland (pe30-37)	3,800	3,500	3,000
Eudora-----	Loamy Lowland (pe30-37)	10,000	8,000	6,000
045VM: Vinland-----	Loamy Upland (pe35-42)	5,500	4,500	3,500
Martin-----	Loamy Upland (pe35-42)	7,000	5,500	4,000
045WC: Wabash-----	Clay Lowland (pe30-37)	10,000	9,000	7,000
087RE: Reading-----	---	10,000	8,000	6,000
087SS: Sibleyville-----	Loamy Upland (pe35-42)	6,000	5,000	3,500
087SV: Sibleyville-----	Loamy Upland (pe30-37)	6,000	5,000	3,500
087VO: Vinland-----	Loamy Upland (pe30-37)	5,500	4,500	3,500
087WC: Wabash-----	Clay Lowland (pe30-37)	10,000	9,000	7,000
091ED: Eudora-----	Loamy Lowland (pe30-37)	10,000	8,000	6,000
Kimo-----	Clay Lowland (pe30-37)	9,000	7,000	5,000
091LB: Ladoga-----	---	---	---	---
091RA: Reading-----	Loamy Lowland (pe35-42)	10,000	8,000	6,000
091SB: Sharpsburg-----	Loamy Upland (pe30-37)	4,800	4,400	4,000
Urban Land-----	---	---	---	---
Aa: Kennebec, CHANNELED-----	Loamy Lowland (pe30-37)	8,500	6,700	5,700
Ac: Armster-----	Clay Upland (pe30-37)	---	---	---
Ad: Armster-----	Clay Upland (pe30-37)	---	---	---
Ae: Armster, eroded-----	Clay Upland (pe30-37)	---	---	---
AED: Arents, Earthen Dam-----	---	---	---	---
Ba: Basehor-----	Shallow Savannah (pe30-37)	3,500	2,500	2,000

RANGELAND PRODUCTIVITY--Continued
Leavenworth and Wyandotte
Counties, Kansas

(Only the soils that support rangeland vegetation suitable for grazing are rated.) Refer to range site description to determine the percentage allowable of grasses, forbs, and shrubs for the range ecological site.

Map symbol and soil name	Ecological site	Total dry-weight production		
		Favorable year	Average year	Unfavorable year
		Lb/acre	Lb/acre	Lb/acre
Br:				
Bremer-----	---	---	---	---
Cf:				
Borrow Pits-----	---	---	---	---
Ec:				
Elmont-----	Loamy Upland (pe30-37)	7,000	5,500	4,000
Ed:				
Elmont-----	Loamy Upland (pe30-37)	7,000	5,500	4,000
Eu:				
Eudora-----	Loamy Lowland (pe30-37)	10,000	8,000	6,000
Haynie-----	Loamy Lowland (pe35-37)	5,300	4,900	4,500
Gc:				
Gosport-----	---	---	---	---
Gp:				
Gravel Pits-----	---	---	---	---
Gs:				
Gosport-----	---	---	---	---
Sogn-----	Shallow Limy (pe30-37)	3,500	2,500	1,500
Gt:				
Grundy-----	Clay Upland (pe30-37)	---	---	---
Gu:				
Grundy-----	Clay Upland (pe30-37)	---	---	---
Gy:				
Gymer-----	Loamy Upland (pe30-37)	7,000	5,500	4,000
Hg:				
Haig-----	Clay Upland (pe30-37)	6,000	4,000	3,000
Hy:				
Haynie-----	Loamy Lowland (pe35-37)	5,300	4,900	4,500
Ju:				
Judson-----	Loamy Lowland (pe35-37)	5,300	4,900	4,500
Ke:				
Kennebec-----	Loamy Lowland (pe30-37)	10,000	8,000	6,000
Kh:				
Knox-----	---	---	---	---
Kk:				
Knox-----	---	---	---	---
Km:				
Knox, eroded-----	---	---	---	---
Kn:				
Knox-----	---	---	---	---
Sogn-----	Shallow Limy (pe35-37)	3,500	2,500	1,500
Ko:				
Konawa-----	Savannah (pe30-37)	4,500	3,300	2,500
Kw:				
Konawa-----	Savannah (pe30-37)	4,500	3,300	2,500
La:				
Ladoga-----	---	---	---	---
M-W:				
Miscellaneous Water-----	---	---	---	---
Mb:				
Marshall-----	Loamy Upland (pe35-37)	4,800	4,400	4,000
Mc:				
Marshall-----	Loamy Upland (pe35-37)	4,800	4,400	4,000
Md:				
Marshall-----	Loamy Upland (pe35-37)	4,800	4,400	4,000
Mn:				
Martin-----	Loamy Upland (pe30-37)	7,000	5,500	4,000
Mr:				
Martin-----	Loamy Upland (pe30-37)	7,000	5,500	4,000
Ms:				
Martin-----	Loamy Upland (pe30-37)	7,000	5,500	4,000
On:				
Onawa-----	Clay Lowland (pe35-37)	4,000	3,600	3,200
Oo:				
Onawa-----	Clay Lowland (pe35-37)	4,000	3,600	3,200
Os:				
Oska-----	Loamy Upland (pe30-37)	6,000	5,000	3,500
Pb:				
Pawnee-----	Clay Upland (pe30-37)	3,700	3,200	2,700
Pc:				
Pawnee-----	Clay Upland (pe30-37)	3,700	3,200	2,700
Pe:				
Pawnee, eroded-----	Clay Upland (pe30-37)	3,700	3,200	2,700
Qu:				
Quarries-----	---	---	---	---
Rs:				
River Wash-----	---	---	---	---
Sa:				
Sarpy-----	Sandy Lowland (pe35-37)	3,800	3,500	3,000
Haynie-----	Loamy Lowland (pe35-37)	5,300	4,900	4,500
Sb:				
Sharpsburg-----	Loamy Upland (pe30-37)	4,800	4,400	4,000
Sc:				
Sharpsburg-----	Loamy Upland (pe35-37)	4,800	4,400	4,000

RANGELAND PRODUCTIVITY--Continued
Leavenworth and Wyandotte
Counties, Kansas

(Only the soils that support rangeland vegetation suitable for grazing are rated.) Refer to range site description to determine the percentage allowable of grasses, forbs, and shrubs for the range ecological site.

Map symbol and soil name	Ecological site	Total dry-weight production		
		Favorable year	Average year	Unfavorable year
		Lb/acre	Lb/acre	Lb/acre
Se: Shelby-----	Loamy Upland (pe30-37)	7,000	5,500	4,000
Sh: Shelby-----	Loamy Upland (pe30-37)	7,000	5,500	4,000
Sm: Shelby-----	Loamy Upland (pe30-37)	7,000	5,500	4,000
Sp: Shelby-----	Loamy Upland (pe30-37)	7,000	5,500	4,000
Pawnee-----	Clay Upland (pe30-37)	3,700	3,200	2,700
Ss: Shelby, eroded-----	Loamy Upland (pe30-37)	7,000	5,500	4,000
Pawnee, eroded-----	Clay Upland (pe30-37)	3,700	3,200	2,700
Sy: Sibleyville-----	Loamy Upland (pe30-37)	6,000	5,000	3,500
SZ: Sogn-----	Shallow Limy (pe30-37)	3,500	2,500	1,500
Vinland-----	Loamy Upland (pe30-37)	5,500	4,500	3,500
Uc: -----	---	---	---	---
Un: -----	---	---	---	---
VR: Rock Outcrop-----	---	---	---	---
Vinland-----	Loamy Upland (pe35-42)	5,500	4,500	3,500
Vs: Vinland-----	Loamy Upland (pe30-37)	5,500	4,500	3,500
Sibleyville-----	Loamy Upland (pe30-37)	6,000	5,000	3,500
W: Water-----	---	---	---	---
Wa: Wabash-----	Clay Lowland (pe30-37)	10,000	9,000	7,000
Wc: Welda-----	Savannah (pe30-37)	5,500	4,500	3,500
Wd: Welda-----	Savannah (pe30-37)	5,500	4,500	3,500
Zo: Zook-----	Clay Lowland (pe30-37)	9,000	8,000	7,000

BUILDING SITE DEVELOPMENT
Leavenworth and Wyandotte Counties, Kansas

Building Site Development

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 following tables 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. Slightly limited indicates that the soil has features that are favorable for the specified use. The limitations are minor and can be easily overcome. Good performance and 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 0.00 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.

BUILDING SITE DEVELOPMENT--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
005AQ: Fluvaquents-----	95	Very limited Ponding Flooding Depth to saturated zone	1.00 1.00 1.00	Very limited Ponding Flooding Depth to saturated zone	1.00 1.00 1.00	Very limited Ponding Flooding Depth to saturated zone	1.00 1.00 1.00
005AR: Armster-----	85	Very limited Shrink-swell Depth to saturated zone Slope	1.00 1.00 0.04	Very limited Depth to saturated zone Shrink-swell Slope	1.00 1.00 0.04	Very limited Shrink-swell Depth to saturated zone Slope	1.00 1.00 1.00
005GO: Gosport-----	85	Very limited Slope Shrink-swell	1.00 1.00	Very limited Slope Shrink-swell Depth to soft bedrock	1.00 1.00 0.10	Very limited Slope Shrink-swell	1.00 1.00
005HN: Haynie-----	96	Very limited Flooding Depth to saturated zone	1.00 0.39	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 0.39
005HO: Haynie-----	60	Very limited Flooding Depth to saturated zone	1.00 0.39	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 0.39
Onawa-----	30	Very limited Ponding Flooding Depth to saturated zone	1.00 1.00 0.39	Very limited Ponding Flooding Depth to saturated zone	1.00 1.00 1.00	Very limited Ponding Flooding Depth to saturated zone	1.00 1.00 0.39
005KG: Kennebec-----	60	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
Colo-----	30	Very limited Flooding Shrink-swell Depth to saturated zone	1.00 0.50 0.39	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 0.50	Very limited Flooding Shrink-swell Depth to saturated zone	1.00 0.50 0.39
005KY: Knox-----	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
Gosport-----	30	Very limited Shrink-swell Slope	1.00 1.00	Very limited Shrink-swell Slope Depth to soft bedrock	1.00 1.00 0.42	Very limited Slope Shrink-swell	1.00 1.00
005OD: Onawa-----	95	Very limited Ponding Flooding Shrink-swell	1.00 1.00 1.00	Very limited Ponding Flooding Depth to saturated zone	1.00 1.00 0.95	Very limited Ponding Flooding Shrink-swell	1.00 1.00 1.00
005OW: Onawet-----	95	Very limited Ponding Flooding	1.00 1.00	Very limited Ponding Flooding Depth to saturated zone	1.00 1.00 1.00	Very limited Ponding Flooding	1.00 1.00
005PA: Knox-----	50	Somewhat limited Slope	0.96	Somewhat limited Slope	0.96	Very limited Slope	1.00
Palermo-----	50	Somewhat limited Slope	0.96	Somewhat limited Slope	0.96	Very limited Slope	1.00
005PB: Palermo-----	95	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00

BUILDING SITE DEVELOPMENT--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
005SH: Shelby-----	85	Somewhat limited Shrink-swell Slope	0.50 0.00	Somewhat limited Shrink-swell Slope	0.50 0.00	Very limited Slope Shrink-swell	1.00 0.50
005WA: Wabash-----	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
005WH: Wathena-----	55	Very limited Ponding Flooding	1.00 1.00	Very limited Ponding Flooding Depth to saturated zone	1.00 1.00 1.00	Very limited Ponding Flooding	1.00 1.00
Haynie-----	40	Very limited Flooding Depth to saturated zone	1.00 0.39	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 0.39
045ET: Eudora-----	90	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
045EV: Eudora-----	60	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
Kimo-----	30	Very limited Flooding Shrink-swell Depth to saturated zone	1.00 1.00 0.39	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Shrink-swell Depth to saturated zone	1.00 1.00 0.39
045KM: Kimo-----	90	Very limited Flooding Shrink-swell Depth to saturated zone	1.00 1.00 0.39	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Shrink-swell Depth to saturated zone	1.00 1.00 0.39
045MR: Morrill-----	90	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Slope	0.50 0.12
045RO: River Wash-----	100	Not rated		Not rated		Not rated	
045SB: Sarpy-----	55	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
Eudora-----	45	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
045VM: Vinland-----	40	Somewhat limited Depth to soft bedrock Shrink-swell Slope	1.00 0.50 0.37	Very limited Depth to soft bedrock Shrink-swell Slope	1.00 0.50 0.37	Very limited Depth to soft bedrock Slope Shrink-swell	1.00 1.00 0.50
Martin-----	25	Very limited Shrink-swell Depth to saturated zone Slope	1.00 0.39 0.04	Very limited Depth to saturated zone Shrink-swell Slope	1.00 1.00 0.04	Very limited Shrink-swell Slope Depth to saturated zone	1.00 1.00 0.39
045WC: Wabash-----	88	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
087RE: Reading-----	85	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Shrink-swell Depth to saturated zone	1.00 0.50 0.24	Very limited Flooding Shrink-swell	1.00 0.50

BUILDING SITE DEVELOPMENT--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
087SS: Sibleyville-----	60	Not limited		Somewhat limited Depth to soft bedrock	0.29	Somewhat limited Slope	0.12
087SV: Sibleyville-----	50	Somewhat limited Slope	0.16	Somewhat limited Depth to soft bedrock Slope	0.54 0.16	Very limited Slope	1.00
087VO: Vinland-----	55	Somewhat limited Depth to soft bedrock Shrink-swell Slope	1.00 0.50 0.37	Very limited Depth to soft bedrock Shrink-swell Slope	1.00 0.50 0.37	Very limited Depth to soft bedrock Slope Shrink-swell	1.00 1.00 1.00 0.50
087WC: Wabash-----	94	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
091ED: Eudora-----	75	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
Kimo-----	25	Very limited Flooding	1.00	Very limited Flooding Depth to saturated zone	1.00 0.61	Very limited Flooding	1.00
091LB: Ladoga-----	85	Somewhat limited Slope Shrink-swell	0.63 0.50	Somewhat limited Slope Shrink-swell	0.63 0.50	Very limited Slope Shrink-swell	1.00 0.50
091RA: Reading-----	90	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Shrink-swell	1.00 0.50
091SB: Sharpsburg-----	55	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Slope	0.50 0.48
Urban Land-----	45	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
Aa: Kennebec, CHANNELED-	85	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 0.82 0.50	Very limited Flooding Shrink-swell	1.00 0.50
Ac: Armster-----	90	Very limited Shrink-swell	1.00	Very limited Shrink-swell Depth to saturated zone	1.00 0.95	Very limited Shrink-swell Slope	1.00 0.48
Ad: Armster-----	90	Very limited Shrink-swell Slope	1.00 0.16	Very limited Shrink-swell Depth to saturated zone Slope	1.00 0.95 0.16	Very limited Shrink-swell Slope	1.00 1.00
Ae: Armster, eroded----	75	Very limited Shrink-swell Slope	1.00 0.16	Very limited Shrink-swell Depth to saturated zone Slope	1.00 0.95 0.16	Very limited Shrink-swell Slope	1.00 1.00
AED: Arents, Earthen Dam-	100	Not rated		Not rated		Not rated	
Ba: Basehor-----	55	Very limited Depth to hard bedrock Slope	1.00 1.00	Very limited Depth to hard bedrock Slope	1.00 1.00	Very limited Depth to hard bedrock Slope	1.00 1.00

BUILDING SITE DEVELOPMENT--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Br: Bremer-----	95	Very limited Flooding Shrink-swell Depth to saturated zone	1.00 1.00 0.98	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 1.00	Very limited Flooding Shrink-swell Depth to saturated zone	1.00 1.00 0.98
Cf: Borrow Pits-----	100	Not rated		Not rated		Not rated	
Ec: Elmont-----	85	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Slope	0.50 0.12
Ed: Elmont-----	85	Somewhat limited Shrink-swell Slope	0.50 0.16	Somewhat limited Shrink-swell Slope	0.50 0.16	Very limited Slope Shrink-swell	1.00 0.50
Eu: Eudora-----	70	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
Haynie-----	20	Very limited Flooding Depth to saturated zone	1.00 0.39	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 0.39
Gc: Gosport-----	50	Very limited Shrink-swell Slope	1.00 1.00	Very limited Shrink-swell Slope Depth to soft bedrock	1.00 1.00 0.20	Very limited Slope Shrink-swell	1.00 1.00
Gp: Gravel Pits-----	100	Not rated		Not rated		Not rated	
Gs: Gosport-----	50	Very limited Shrink-swell Slope	1.00 1.00	Very limited Shrink-swell Slope Depth to soft bedrock	1.00 1.00 0.20	Very limited Shrink-swell Slope	1.00 1.00
Sogn-----	35	Very limited Depth to hard bedrock Slope Shrink-swell	1.00 0.96 0.50	Very limited Depth to hard bedrock Slope Shrink-swell	1.00 0.96 0.50	Very limited Depth to hard bedrock Slope Shrink-swell	1.00 1.00 0.50
Gt: Grundy-----	90	Very limited Shrink-swell Depth to saturated zone	1.00 0.98	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Shrink-swell Depth to saturated zone	1.00 0.98
Gu: Grundy-----	90	Very limited Shrink-swell Depth to saturated zone	1.00 0.98	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Shrink-swell Depth to saturated zone Slope	1.00 0.98 0.12
Gy: Gymer-----	85	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Slope	0.50 0.12
Hg: Haig-----	90	Very limited Shrink-swell Depth to saturated zone	1.00 0.98	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Shrink-swell Depth to saturated zone	1.00 0.98
Hy: Haynie-----	90	Very limited Flooding Depth to saturated zone	1.00 0.39	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 0.39
Ju: Judson-----	90	Not limited		Somewhat limited Shrink-swell	0.50	Not limited	

BUILDING SITE DEVELOPMENT--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ke: Kennebec-----	90	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
Kh: Knox-----	80	Somewhat limited Shrink-swell Slope	0.50 0.16	Somewhat limited Shrink-swell Slope	0.50 0.16	Very limited Slope Shrink-swell	1.00 0.50
Kk: Knox-----	90	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
Km: Knox, eroded-----	85	Somewhat limited Shrink-swell Slope	0.50 0.16	Somewhat limited Shrink-swell Slope	0.50 0.16	Very limited Slope Shrink-swell	1.00 0.50
Kn: Knox-----	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
Sogn-----	35	Very limited Slope Depth to hard bedrock Shrink-swell	1.00 1.00 0.50	Very limited Slope Depth to hard bedrock Shrink-swell	1.00 1.00 0.50	Very limited Slope Depth to hard bedrock Shrink-swell	1.00 1.00 0.50
Ko: Konawa-----	85	Not limited		Not limited		Somewhat limited Slope	0.48
Kw: Konawa-----	90	Somewhat limited Slope Shrink-swell	0.96 0.50	Somewhat limited Slope Shrink-swell	0.96 0.50	Very limited Slope Shrink-swell	1.00 0.50
La: Ladoga-----	80	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Slope	0.50 0.48
M-W: Miscellaneous Water-	100	Not rated		Not rated		Not rated	
Mb: Marshall-----	90	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50
Mc: Marshall-----	90	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Slope Shrink-swell	0.86 0.50
Md: Marshall-----	90	Somewhat limited Slope Shrink-swell	0.63 0.50	Somewhat limited Slope Shrink-swell	0.63 0.50	Very limited Slope Shrink-swell	1.00 0.50
Mn: Martin-----	90	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00	Very limited Shrink-swell Slope	1.00 0.48
Mr: Martin-----	85	Very limited Shrink-swell Slope	1.00 0.16	Very limited Shrink-swell Slope	1.00 0.16	Very limited Shrink-swell Slope	1.00 1.00
Ms: Martin-----	85	Very limited Shrink-swell Slope	1.00 0.04	Very limited Shrink-swell Slope	1.00 0.04	Very limited Shrink-swell Slope	1.00 1.00
On: Onawa-----	95	Very limited Flooding Shrink-swell	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 0.95	Very limited Flooding Shrink-swell	1.00 1.00
Oo: Onawa-----	90	Very limited Flooding Shrink-swell	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 0.95	Very limited Flooding Shrink-swell	1.00 1.00

BUILDING SITE DEVELOPMENT--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Os: Oska-----	80	Very limited Shrink-swell Depth to hard bedrock	1.00 0.01	Very limited Shrink-swell Depth to hard bedrock	1.00 1.00	Very limited Shrink-swell Slope Depth to hard bedrock	1.00 0.48 0.01
Pb: Pawnee-----	90	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00
Pc: Pawnee-----	85	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 0.48
Pe: Pawnee, eroded-----	85	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 0.48
Qu: Quarries-----	100	Not rated		Not rated		Not rated	
Rs: River Wash-----	100	Not rated		Not rated		Not rated	
Sa: Sarpy-----	55	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
Haynie-----	35	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
Sb: Sharpsburg-----	80	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50
Sc: Sharpsburg-----	80	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Slope	0.50 0.48
Se: Shelby-----	90	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50
Sh: Shelby-----	80	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Slope	0.50 0.48
Sm: Shelby-----	90	Somewhat limited Shrink-swell Slope	0.50 0.16	Somewhat limited Shrink-swell Slope	0.50 0.16	Very limited Slope Shrink-swell	1.00 0.50
Sp: Shelby-----	50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Slope	0.50 0.48
Pawnee-----	35	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell Slope	1.00 1.00 0.48
Ss: Shelby, eroded-----	55	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Slope	0.50 0.48
Pawnee, eroded-----	35	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell Slope	1.00 1.00 0.48
Sy: Sibleyville-----	85	Not limited		Somewhat limited Depth to soft bedrock	0.29	Somewhat limited Slope	0.48

BUILDING SITE DEVELOPMENT--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
SZ:							
Sogn-----	55	Very limited Depth to hard bedrock Shrink-swell Slope	1.00 0.50 0.16	Very limited Depth to hard bedrock Shrink-swell Slope	1.00 0.50 0.16	Very limited Depth to hard bedrock Slope Shrink-swell	1.00 1.00 0.50
Vinland-----	30	Somewhat limited Depth to soft bedrock Slope Shrink-swell	1.00 0.84 0.50	Very limited Depth to soft bedrock Slope Shrink-swell	1.00 0.84 0.50	Very limited Depth to soft bedrock Slope Shrink-swell	1.00 1.00 0.50
VR:							
Rock Outcrop-----	60	Not rated		Not rated		Not rated	
Vinland-----	26	Very limited Slope Depth to soft bedrock Shrink-swell	1.00 1.00 0.50	Very limited Slope Depth to soft bedrock Shrink-swell	1.00 1.00 0.50	Very limited Slope Depth to soft bedrock Shrink-swell	1.00 1.00 0.50
Vs:							
Vinland-----	55	Somewhat limited Depth to soft bedrock Slope	1.00 0.04	Very limited Depth to soft bedrock Slope	1.00 0.04	Very limited Depth to soft bedrock Slope	1.00 1.00
Sibleyville-----	45	Somewhat limited Slope	0.04	Somewhat limited Depth to soft bedrock Slope	0.29 0.04	Very limited Slope	1.00
W:							
Water-----	100	Not rated		Not rated		Not rated	
Wa:							
Wabash-----	90	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
Wc:							
Welda-----	85	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Slope Shrink-swell	0.86 0.50
Wd:							
Welda-----	90	Somewhat limited Slope Shrink-swell	0.63 0.50	Somewhat limited Slope Shrink-swell	0.63 0.50	Very limited Slope Shrink-swell	1.00 0.50
Zo:							
Zook-----	90	Very limited Flooding Shrink-swell Depth to saturated zone	1.00 1.00 1.00 0.98	Very limited Flooding Shrink-swell Depth to saturated zone	1.00 1.00 1.00 1.00	Very limited Flooding Shrink-swell Depth to saturated zone	1.00 1.00 1.00 0.98

BUILDING SITE DEVELOPMENT--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
005AQ: Fluvaquents-----	95	Very limited Ponding Depth to saturated zone Flooding	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Flooding Cutbanks cave	1.00 1.00 0.60 0.10	Very limited Ponding Depth to saturated zone Flooding	1.00 1.00 0.60
005AR: Armster-----	85	Very limited Low strength Shrink-swell Depth to saturated zone Frost action Slope	1.00 1.00 0.94 0.50 0.04	Very limited Depth to saturated zone Cutbanks cave Slope	1.00 0.10 0.04	Somewhat limited Depth to saturated zone Slope	0.94 0.04
005GO: Gosport-----	85	Very limited Slope Low strength Shrink-swell Frost action	1.00 1.00 1.00 0.50	Very limited Slope Too clayey Cutbanks cave Depth to soft bedrock	1.00 0.32 0.10 0.10	Very limited Slope Depth to bedrock	1.00 0.10
005HN: Haynie-----	96	Very limited Frost action Flooding Low strength Depth to saturated zone	1.00 1.00 0.22 0.19	Very limited Depth to saturated zone Flooding Cutbanks cave	1.00 0.60 0.10	Somewhat limited Flooding Depth to saturated zone	0.60 0.19
005HO: Haynie-----	60	Very limited Frost action Flooding Low strength Depth to saturated zone	1.00 1.00 0.22 0.19	Very limited Depth to saturated zone Flooding Cutbanks cave	1.00 0.60 0.10	Somewhat limited Flooding Depth to saturated zone	0.60 0.19
Onawa-----	30	Very limited Ponding Flooding Low strength Depth to saturated zone	1.00 1.00 1.00 0.19	Very limited Ponding Depth to saturated zone Flooding Cutbanks cave Too clayey	1.00 1.00 0.60 0.10 0.02	Very limited Ponding Flooding Depth to saturated zone	1.00 0.60 0.19
005KG: Kennebec-----	60	Very limited Frost action Flooding Low strength Shrink-swell	1.00 1.00 1.00 0.50	Somewhat limited Depth to saturated zone Flooding Cutbanks cave	0.61 0.60 0.10	Somewhat limited Flooding	0.60
Colo-----	30	Very limited Frost action Flooding Low strength Shrink-swell Depth to saturated zone	1.00 1.00 1.00 1.00 0.50 0.19	Very limited Depth to saturated zone Flooding Cutbanks cave	1.00 0.60 0.10	Somewhat limited Flooding Depth to saturated zone	0.60 0.19
005KY: Knox-----	60	Very limited Frost action Low strength Slope Shrink-swell	1.00 1.00 1.00 0.50	Very limited Slope Cutbanks cave	1.00 0.10	Very limited Slope	1.00
Gosport-----	30	Very limited Low strength Shrink-swell Slope Frost action	1.00 1.00 1.00 1.00 0.50	Very limited Slope Depth to soft bedrock Too clayey Cutbanks cave	1.00 0.42 0.32 0.10	Very limited Slope Depth to bedrock	1.00 0.42

BUILDING SITE DEVELOPMENT--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
0050D: Onawa-----	95	Very limited Ponding Flooding Low strength Shrink-swell	1.00 1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Flooding Cutbanks cave Too clayey	1.00 0.95 0.60 0.10 0.02	Very limited Ponding Flooding	1.00 0.60
0050W: Onawet-----	95	Very limited Ponding Frost action Flooding Low strength	1.00 1.00 1.00 1.00 0.78	Very limited Ponding Cutbanks cave Depth to saturated zone Flooding Too clayey	1.00 1.00 1.00 0.80 0.68	Very limited Ponding Flooding	1.00 1.00
005PA: Knox-----	50	Very limited Frost action Low strength Slope	1.00 1.00 0.96	Somewhat limited Slope Cutbanks cave	0.96 0.10	Somewhat limited Slope	0.96
Palermo-----	50	Very limited Frost action Slope	1.00 0.96	Somewhat limited Slope Cutbanks cave	0.96 0.10	Somewhat limited Slope	0.96
005PB: Palermo-----	95	Very limited Slope Frost action	1.00 1.00	Very limited Slope Cutbanks cave	1.00 0.10	Very limited Slope	1.00
005SH: Shelby-----	85	Very limited Low strength Shrink-swell Frost action Slope	1.00 0.50 0.50 0.00	Somewhat limited Cutbanks cave Slope	0.10 0.00	Somewhat limited Slope	0.00
005WA: Wabash-----	85	Very limited Shrink-swell Depth to saturated zone Frost action Flooding Low strength	1.00 1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Flooding Too clayey Cutbanks cave	1.00 0.60 0.50 0.10	Very limited Depth to saturated zone Flooding	1.00 0.60
005WH: Wathena-----	55	Very limited Ponding Flooding	1.00 1.00	Very limited Ponding Cutbanks cave Depth to saturated zone Flooding	1.00 1.00 1.00 0.60	Very limited Ponding Flooding Droughty	1.00 0.60 0.41
Haynie-----	40	Very limited Frost action Flooding Low strength Depth to saturated zone	1.00 1.00 0.22 0.19	Very limited Depth to saturated zone Flooding Cutbanks cave	1.00 0.60 0.10	Somewhat limited Flooding Depth to saturated zone	0.60 0.19
045ET: Eudora-----	90	Very limited Frost action Flooding	1.00 0.40	Somewhat limited Cutbanks cave	0.10	Not limited	
045EV: Eudora-----	60	Very limited Frost action Flooding	1.00 0.40	Somewhat limited Cutbanks cave	0.10	Not limited	
Kimo-----	30	Very limited Frost action Shrink-swell Flooding Depth to saturated zone	1.00 1.00 1.00 0.40 0.19	Very limited Depth to saturated zone Too clayey Cutbanks cave	1.00 0.12 0.10	Somewhat limited Depth to saturated zone	0.19

BUILDING SITE DEVELOPMENT--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
045KM: Kimo-----	90	Very limited Frost action	1.00	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.19
		Shrink-swell	1.00	Too clayey	0.12		
		Flooding	0.40	Cutbanks cave	0.10		
		Depth to saturated zone	0.19				
045MR: Morrill-----	90	Somewhat limited Shrink-swell Frost action	0.50 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
045RO: River Wash-----	100	Not rated		Not rated		Not rated	
045SB: Sarpy-----	55	Very limited Flooding	1.00	Very limited Cutbanks cave Flooding	1.00 0.60	Somewhat limited Droughty Flooding	0.69 0.60
Eudora-----	45	Very limited Frost action Flooding	1.00 1.00	Somewhat limited Flooding Cutbanks cave	0.60 0.10	Somewhat limited Flooding	0.60
045VM: Vinland-----	40	Somewhat limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock	1.00	Very limited Depth to bedrock	1.00
		Shrink-swell	0.50	Slope	0.37	Slope	0.37
		Frost action	0.50	Cutbanks cave	0.10	Droughty	0.11
		Slope	0.37				
Martin-----	25	Very limited Frost action	1.00	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.19
		Shrink-swell	1.00	Too clayey	0.32	Slope	0.04
		Depth to saturated zone	0.19	Cutbanks cave	0.10		
		Slope	0.04	Slope	0.04		
045WC: Wabash-----	88	Very limited Shrink-swell	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Flooding	0.60	Flooding	0.60
		Flooding	1.00	Too clayey	0.50		
		Frost action	0.50	Cutbanks cave	0.10		
087RE: Reading-----	85	Very limited Frost action	1.00	Somewhat limited Depth to saturated zone	0.24	Not limited	
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Flooding	0.20				
087SS: Sibleyville-----	60	Somewhat limited Frost action	0.50	Somewhat limited Depth to soft bedrock Cutbanks cave	0.29 0.10	Somewhat limited Depth to bedrock	0.29
087SV: Sibleyville-----	50	Somewhat limited Frost action	0.50	Somewhat limited Depth to soft bedrock	0.54	Somewhat limited Depth to bedrock	0.54
		Slope	0.16	Slope Cutbanks cave	0.16 0.10	Slope	0.16
087VO: Vinland-----	55	Somewhat limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock	1.00	Very limited Depth to bedrock	1.00
		Shrink-swell	0.50	Slope	0.37	Slope	0.37
		Frost action	0.50	Cutbanks cave	0.10	Droughty	0.09
		Slope	0.37				
087WC: Wabash-----	94	Very limited Shrink-swell	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Too clayey	0.50		
		Frost action	0.50	Cutbanks cave	0.10		
		Flooding	0.20				

BUILDING SITE DEVELOPMENT--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
091ED: Eudora-----	75	Very limited Frost action Flooding	1.00 0.40	Somewhat limited Cutbanks cave	0.10	Not limited	
Kimo-----	25	Very limited Frost action Flooding	1.00 0.40	Somewhat limited Depth to saturated zone Cutbanks cave Too clayey	0.61 0.10 0.03	Not limited	
091LB: Ladoga-----	85	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
091RA: Reading-----	90	Very limited Frost action Low strength Shrink-swell Flooding	1.00 1.00 0.50 0.40	Somewhat limited Cutbanks cave Too clayey	0.10 0.02	Not limited	
091SB: Sharpsburg-----	55	Very limited Frost action Shrink-swell	1.00 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
Urban Land-----	45	Very limited Slope Low strength	1.00 1.00	Very limited Slope Cutbanks cave	1.00 0.10	Very limited Slope	1.00
Aa: Kennebec, CHANNELED-	85	Very limited Frost action Flooding Low strength Shrink-swell	1.00 1.00 1.00 1.00 0.50	Somewhat limited Depth to saturated zone Flooding Cutbanks cave	0.82 0.80 0.10	Very limited Flooding	1.00
Ac: Armster-----	90	Very limited Low strength Shrink-swell Frost action	1.00 1.00 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.95 0.10	Not limited	
Ad: Armster-----	90	Very limited Low strength Shrink-swell Frost action Slope	1.00 1.00 0.50 0.16	Somewhat limited Depth to saturated zone Slope Cutbanks cave	0.95 0.16 0.10	Somewhat limited Slope	0.16
Ae: Armster, eroded----	75	Very limited Low strength Shrink-swell Frost action Slope	1.00 1.00 0.50 0.16	Somewhat limited Depth to saturated zone Slope Cutbanks cave	0.95 0.16 0.10	Somewhat limited Slope	0.16
AED: Arents, Earthen Dam-	100	Not rated		Not rated		Not rated	
Ba: Basehor-----	55	Very limited Depth to hard bedrock Slope Frost action	1.00 1.00 0.50	Very limited Depth to hard bedrock Slope Cutbanks cave	1.00 1.00 0.10	Very limited Depth to bedrock Droughty Slope Content of large stones	1.00 1.00 0.03
Br: Bremer-----	95	Very limited Frost action Low strength Shrink-swell Depth to saturated zone Flooding	1.00 1.00 1.00 0.75 0.40	Very limited Depth to saturated zone Cutbanks cave Too clayey	1.00 0.10 0.02	Somewhat limited Depth to saturated zone	0.75

BUILDING SITE DEVELOPMENT--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Cf: Borrow Pits-----	100	Not rated		Not rated		Not rated	
Ec: Elmont-----	85	Very limited Frost action Low strength Shrink-swell	1.00 1.00 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
Ed: Elmont-----	85	Very limited Frost action Low strength Shrink-swell Slope	1.00 1.00 0.50 0.16	Somewhat limited Slope Cutbanks cave	0.16 0.10	Somewhat limited Slope	0.16
Eu: Eudora-----	70	Very limited Frost action Flooding	1.00 0.40	Somewhat limited Cutbanks cave	0.10	Not limited	
Haynie-----	20	Very limited Frost action Flooding Low strength Depth to saturated zone	1.00 1.00 1.00 0.19	Very limited Depth to saturated zone Flooding Cutbanks cave	1.00 0.60 0.10	Somewhat limited Flooding Depth to saturated zone	0.60 0.19
Gc: Gosport-----	50	Very limited Low strength Shrink-swell Slope Frost action	1.00 1.00 1.00 0.50	Very limited Slope Too clayey Depth to soft bedrock Cutbanks cave	1.00 0.32 0.20 0.10	Very limited Slope Depth to bedrock	1.00 0.20
Gp: Gravel Pits-----	100	Not rated		Not rated		Not rated	
Gs: Gosport-----	50	Very limited Low strength Shrink-swell Slope Frost action	1.00 1.00 1.00 0.50	Very limited Slope Too clayey Depth to soft bedrock Cutbanks cave	1.00 0.32 0.20 0.10	Very limited Slope Depth to bedrock	1.00 0.20
Sogn-----	35	Very limited Depth to hard bedrock Slope Shrink-swell Frost action	1.00 0.96 0.50 0.50	Very limited Depth to hard bedrock Slope Cutbanks cave	1.00 0.96 0.10	Very limited Depth to bedrock Slope Droughty Content of large stones	1.00 0.96 0.89 0.00
Gt: Grundy-----	90	Very limited Frost action Low strength Shrink-swell Depth to saturated zone	1.00 1.00 1.00 0.75	Very limited Depth to saturated zone Too clayey Cutbanks cave	1.00 0.12 0.10	Somewhat limited Depth to saturated zone	0.75
Gu: Grundy-----	90	Very limited Frost action Shrink-swell Depth to saturated zone	1.00 1.00 0.75	Very limited Depth to saturated zone Too clayey Cutbanks cave	1.00 0.12 0.10	Somewhat limited Depth to saturated zone	0.75
Gy: Gymer-----	85	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	

BUILDING SITE DEVELOPMENT--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Hg: Haig-----	90	Very limited Low strength Shrink-swell Depth to saturated zone Frost action	1.00 1.00 0.75 0.50	Very limited Depth to saturated zone Too clayey Cutbanks cave	1.00 0.12 0.10	Somewhat limited Depth to saturated zone	0.75
Hy: Haynie-----	90	Very limited Frost action Flooding Low strength Depth to saturated zone	1.00 1.00 1.00 0.19	Very limited Depth to saturated zone Flooding Cutbanks cave	1.00 0.60 0.10	Somewhat limited Flooding Depth to saturated zone	0.60 0.19
Ju: Judson-----	90	Very limited Frost action Low strength	1.00 1.00	Somewhat limited Cutbanks cave	0.10	Not limited	
Ke: Kennebec-----	90	Very limited Frost action Flooding Low strength Shrink-swell	1.00 1.00 1.00 0.50	Somewhat limited Depth to saturated zone Flooding Cutbanks cave	0.61 0.60 0.10	Somewhat limited Flooding	0.60
Kh: Knox-----	80	Very limited Frost action Low strength Shrink-swell Slope	1.00 1.00 0.50 0.16	Somewhat limited Slope Cutbanks cave	0.16 0.10	Somewhat limited Slope	0.16
Kk: Knox-----	90	Very limited Frost action Low strength Slope Shrink-swell	1.00 1.00 1.00 0.50	Very limited Slope Cutbanks cave	1.00 0.10	Very limited Slope	1.00
Km: Knox, eroded-----	85	Very limited Frost action Low strength Shrink-swell Slope	1.00 1.00 0.50 0.16	Somewhat limited Slope Cutbanks cave	0.16 0.10	Somewhat limited Slope	0.16
Kn: Knox-----	65	Very limited Slope Frost action Low strength Shrink-swell	1.00 1.00 1.00 0.50	Very limited Slope Cutbanks cave	1.00 0.10	Very limited Slope	1.00
Sogn-----	35	Very limited Depth to hard bedrock Slope Shrink-swell Frost action	1.00 1.00 1.00 0.50 0.50	Very limited Depth to hard bedrock Slope Cutbanks cave	1.00 1.00 0.10	Very limited Depth to bedrock Slope Droughty Content of large stones	1.00 1.00 0.89 0.00
Ko: Konawa-----	85	Somewhat limited Frost action	0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
Kw: Konawa-----	90	Somewhat limited Slope Shrink-swell	0.96 0.50	Somewhat limited Slope Cutbanks cave	0.96 0.10	Somewhat limited Slope	0.96
La: Ladoga-----	80	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
M-W: Miscellaneous Water-	100	Not rated		Not rated		Not rated	

BUILDING SITE DEVELOPMENT--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Mb: Marshall-----	90	Very limited Frost action Low strength Shrink-swell	1.00 1.00 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
Mc: Marshall-----	90	Very limited Frost action Low strength Shrink-swell	1.00 1.00 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
Md: Marshall-----	90	Very limited Frost action Low strength Slope Shrink-swell	1.00 1.00 0.63 0.50	Somewhat limited Slope Cutbanks cave	0.63 0.10	Somewhat limited Slope	0.63
Mn: Martin-----	90	Very limited Frost action Low strength Shrink-swell	1.00 1.00 1.00	Somewhat limited Too clayey Cutbanks cave	0.28 0.10	Not limited	
Mr: Martin-----	85	Very limited Frost action Low strength Shrink-swell Slope	1.00 1.00 1.00 0.16	Somewhat limited Too clayey Slope Cutbanks cave	0.28 0.16 0.10	Somewhat limited Slope	0.16
Ms: Martin-----	85	Very limited Frost action Low strength Shrink-swell Slope	1.00 1.00 1.00 0.04	Somewhat limited Too clayey Cutbanks cave Slope	0.28 0.10 0.04	Very limited Too clayey Slope	1.00 0.04
On: Onawa-----	95	Very limited Frost action Flooding Low strength Shrink-swell	1.00 1.00 1.00 1.00	Somewhat limited Depth to saturated zone Flooding Too clayey Cutbanks cave	0.95 0.60 0.50 0.10	Somewhat limited Flooding	0.60
Oo: Onawa-----	90	Very limited Frost action Flooding Low strength Shrink-swell	1.00 1.00 1.00 1.00	Somewhat limited Depth to saturated zone Flooding Too clayey Cutbanks cave	0.95 0.60 0.12 0.10	Somewhat limited Flooding	0.60
Os: Oska-----	80	Very limited Low strength Shrink-swell Frost action Depth to hard bedrock	1.00 1.00 0.50 0.01	Very limited Depth to hard bedrock Too clayey Cutbanks cave	1.00 0.28 0.10	Somewhat limited Depth to bedrock	0.01
Pb: Pawnee-----	90	Very limited Low strength Shrink-swell Depth to saturated zone Frost action	1.00 1.00 1.00 0.50	Very limited Depth to saturated zone Too clayey Cutbanks cave	1.00 0.12 0.10	Very limited Depth to saturated zone	1.00
Pc: Pawnee-----	85	Very limited Low strength Shrink-swell Depth to saturated zone Frost action	1.00 1.00 1.00 0.50	Very limited Depth to saturated zone Too clayey Cutbanks cave	1.00 0.12 0.10	Very limited Depth to saturated zone	1.00

BUILDING SITE DEVELOPMENT--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Pe: Pawnee, eroded-----	85	Very limited Low strength Shrink-swell Depth to saturated zone Frost action	1.00 1.00 1.00 1.00 0.50	Very limited Depth to saturated zone Too clayey Cutbanks cave	1.00 0.12 0.10	Very limited Depth to saturated zone	1.00
Qu: Quarries-----	100	Not rated		Not rated		Not rated	
Rs: River Wash-----	100	Not rated		Not rated		Not rated	
Sa: Sarpy-----	55	Very limited Flooding	1.00	Very limited Cutbanks cave Flooding	1.00 0.60	Somewhat limited Droughty Flooding	0.69 0.60
Haynie-----	35	Very limited Frost action Flooding	1.00 1.00	Somewhat limited Flooding Cutbanks cave	0.60 0.10	Somewhat limited Flooding	0.60
Sb: Sharpsburg-----	80	Very limited Frost action Low strength Shrink-swell	1.00 1.00 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
Sc: Sharpsburg-----	80	Very limited Frost action Low strength Shrink-swell	1.00 1.00 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
Se: Shelby-----	90	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
Sh: Shelby-----	80	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
Sm: Shelby-----	90	Very limited Low strength Shrink-swell Frost action Slope	1.00 0.50 0.50 0.16	Somewhat limited Slope Cutbanks cave	0.16 0.10	Somewhat limited Slope	0.16
Sp: Shelby-----	50	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
Pawnee-----	35	Very limited Low strength Shrink-swell Depth to saturated zone Frost action	1.00 1.00 1.00 1.00 0.50	Very limited Depth to saturated zone Too clayey Cutbanks cave	1.00 0.12 0.10	Very limited Depth to saturated zone	1.00
Ss: Shelby, eroded-----	55	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
Pawnee, eroded-----	35	Very limited Low strength Shrink-swell Depth to saturated zone Frost action	1.00 1.00 1.00 1.00 0.50	Very limited Depth to saturated zone Too clayey Cutbanks cave	1.00 0.12 0.10	Very limited Depth to saturated zone	1.00
Sy: Sibleyville-----	85	Somewhat limited Frost action	0.50	Somewhat limited Depth to soft bedrock Cutbanks cave	0.29 0.10	Somewhat limited Depth to bedrock	0.29

BUILDING SITE DEVELOPMENT--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
SZ: Sogn-----	55	Very limited Depth to hard bedrock Shrink-swell Frost action Slope	1.00 0.50 0.50 0.16	Very limited Depth to hard bedrock Slope Cutbanks cave	1.00 0.16 0.10	Very limited Depth to bedrock Droughty Slope Content of large stones	1.00 0.80 0.16 0.00
Vinland-----	30	Somewhat limited Depth to soft bedrock Slope Shrink-swell Frost action	1.00 0.84 0.50 0.50	Very limited Depth to soft bedrock Slope Cutbanks cave	1.00 0.84 0.10	Very limited Depth to bedrock Slope Droughty	1.00 0.84 0.09
VR: Rock Outcrop-----	60	Not rated		Not rated		Not rated	
Vinland-----	26	Very limited Slope Depth to soft bedrock Shrink-swell Frost action	1.00 1.00 0.50 0.50	Very limited Depth to soft bedrock Slope Cutbanks cave	1.00 1.00 0.10	Very limited Depth to bedrock Slope Droughty	1.00 1.00 0.11
Vs: Vinland-----	55	Somewhat limited Depth to soft bedrock Frost action Slope	1.00 0.50 0.04	Very limited Depth to soft bedrock Cutbanks cave Slope	1.00 0.10 0.04	Very limited Depth to bedrock Slope	1.00 0.04
Sibleyville-----	45	Somewhat limited Frost action Slope	0.50 0.04	Somewhat limited Depth to soft bedrock Cutbanks cave Slope	0.29 0.10 0.04	Somewhat limited Depth to bedrock Slope	0.29 0.04
W: Water-----	100	Not rated		Not rated		Not rated	
Wa: Wabash-----	90	Very limited Shrink-swell Depth to saturated zone Flooding Low strength Frost action	1.00 1.00 1.00 1.00 0.50	Very limited Depth to saturated zone Flooding Too clayey Cutbanks cave	1.00 0.60 0.50 0.10	Very limited Depth to saturated zone Too clayey Flooding	1.00 1.00 0.60
Wc: Welda-----	85	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
Wd: Welda-----	90	Very limited Low strength Slope Shrink-swell Frost action	1.00 0.63 0.50 0.50	Somewhat limited Slope Cutbanks cave	0.63 0.10	Somewhat limited Slope	0.63
Zo: Zook-----	90	Very limited Flooding Low strength Shrink-swell Depth to saturated zone Frost action	1.00 1.00 1.00 0.75 0.50	Very limited Depth to saturated zone Flooding Cutbanks cave Too clayey	1.00 0.60 0.10 0.00	Somewhat limited Depth to saturated zone Flooding	0.75 0.60

CONSTRUCTION MATERIALS
Leavenworth and Wyandotte Counties, Kansas

Construction Materials

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

The soils are rated good, fair, or poor as potential sources of topsoil, reclamation material, and roadfill. 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 topsoil, reclamation material, or roadfill. The lower the number, the greater the limitation.

The soils are rated as a probable or improbable source of sand and gravel. A rating of probable means that the source material is likely to be in or below the soil. The numerical ratings in these columns indicate the degree of probability. The number 0.00 indicates that the soil is an improbable source. A number between 0.00 and 1.00 indicates the degree to which the soil is a probable source of sand or gravel.

Sand and gravel are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In these tables, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material. The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the Unified classification of the soil), the thickness of suitable material, and the content of rock fragments. If the lowest layer of the soil contains sand or gravel, the soil is rated as a probable source regardless of thickness. The assumption is that the sand or gravel layer below the depth of observation exceeds the minimum thickness.

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.

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).

CONSTRUCTION MATERIALS--Continued
Leavenworth and Wyandotte Counties, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The ratings given for the thickest layer are for the thickest layer above and excluding the bottom layer. The numbers in the value columns range from 0.00 to 0.99. The greater the value, the greater the likelihood that the bottom layer or thickest layer of the soil is a source of sand or gravel. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
005AQ: Fluvaquents-----	95	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
005AR: Armster-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
005GO: Gosport-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
005HN: Haynie-----	96	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
005HO: Haynie-----	60	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Onawa-----	30	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
005KG: Kennebec-----	60	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Colo-----	30	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
005KY: Knox-----	60	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Gosport-----	30	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
005OD: Onawa-----	95	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
005OW: Onawet-----	95	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.00 0.22
005PA: Knox-----	50	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Palermo-----	50	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
005PB: Palermo-----	95	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
005SH: Shelby-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00

CONSTRUCTION MATERIALS--Continued
Leavenworth and Wyandotte Counties, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The ratings given for the thickest layer are for the thickest layer above and excluding the bottom layer. The numbers in the value columns range from 0.00 to 0.99. The greater the value, the greater the likelihood that the bottom layer or thickest layer of the soil is a source of sand or gravel. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
005WA: Wabash-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
005WH: Wathena-----	55	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.17 0.95
Haynie-----	40	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
045ET: Eudora-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
045EV: Eudora-----	60	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Kimo-----	30	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
045KM: Kimo-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
045MR: Morrill-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
045RO: River Wash-----	100	Not rated		Not rated	
045SB: Sarpy-----	55	Poor Bottom layer Thickest layer	0.00 0.00	Fair Bottom layer Thickest layer	0.50 0.50
Eudora-----	45	Poor Bottom layer Thickest layer	0.00 0.00	Fair Bottom layer Thickest layer	0.00 0.08
045VM: Vinland-----	40	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Martin-----	25	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
045WC: Wabash-----	88	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
087RE: Reading-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
087SS: Sibleyville-----	60	Poor Bottom layer Thickest layer	0.00 0.00	Fair Bottom layer Thickest layer	0.00 0.01
087SV: Sibleyville-----	50	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00

CONSTRUCTION MATERIALS--Continued
Leavenworth and Wyandotte Counties, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The ratings given for the thickest layer are for the thickest layer above and excluding the bottom layer. The numbers in the value columns range from 0.00 to 0.99. The greater the value, the greater the likelihood that the bottom layer or thickest layer of the soil is a source of sand or gravel. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
087VO: Vinland-----	55	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
087WC: Wabash-----	94	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
091ED: Eudora-----	75	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Kimo-----	25	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
091LB: Ladoga-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
091RA: Reading-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
091SB: Sharpsburg-----	55	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Urban Land-----	45	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Aa: Kennebec, CHANNELED-	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Ac: Armster-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Ad: Armster-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Ae: Armster, eroded----	75	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
AED: Arents, Earthen Dam-	100	Not rated		Not rated	
Ba: Basehor-----	55	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Br: Bremer-----	95	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Cf: Borrow Pits-----	100	Not rated		Not rated	

CONSTRUCTION MATERIALS--Continued
Leavenworth and Wyandotte Counties, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The ratings given for the thickest layer are for the thickest layer above and excluding the bottom layer. The numbers in the value columns range from 0.00 to 0.99. The greater the value, the greater the likelihood that the bottom layer or thickest layer of the soil is a source of sand or gravel. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
Ec: Elmont-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Ed: Elmont-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Eu: Eudora-----	70	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Haynie-----	20	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Gc: Gosport-----	50	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Gp: Gravel Pits-----	100	Not rated		Not rated	
Gs: Gosport-----	50	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Sogn-----	35	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Gt: Grundy-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Gu: Grundy-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Gy: Gymer-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Hg: Haig-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Hy: Haynie-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Ju: Judson-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Ke: Kennebec-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Kh: Knox-----	80	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00

CONSTRUCTION MATERIALS--Continued
Leavenworth and Wyandotte Counties, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The ratings given for the thickest layer are for the thickest layer above and excluding the bottom layer. The numbers in the value columns range from 0.00 to 0.99. The greater the value, the greater the likelihood that the bottom layer or thickest layer of the soil is a source of sand or gravel. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
Kk: Knox-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Km: Knox, eroded-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Kn: Knox-----	65	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Sogn-----	35	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Ko: Konawa-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.00 0.08
Kw: Konawa-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
La: Ladoga-----	80	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
M-W: Miscellaneous Water-	100	Not rated		Not rated	
Mb: Marshall-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Mc: Marshall-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Md: Marshall-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Mn: Martin-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Mr: Martin-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Ms: Martin-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
On: Onawa-----	95	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Oo: Onawa-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00

CONSTRUCTION MATERIALS--Continued
Leavenworth and Wyandotte Counties, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The ratings given for the thickest layer are for the thickest layer above and excluding the bottom layer. The numbers in the value columns range from 0.00 to 0.99. The greater the value, the greater the likelihood that the bottom layer or thickest layer of the soil is a source of sand or gravel. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
Os: Oska-----	80	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Pb: Pawnee-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Pc: Pawnee-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Pe: Pawnee, eroded-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Qu: Quarries-----	100	Not rated		Not rated	
Rs: River Wash-----	100	Not rated		Not rated	
Sa: Sarpy-----	55	Poor Bottom layer Thickest layer	0.00 0.00	Fair Bottom layer Thickest layer	0.50 0.50
Haynie-----	35	Poor Bottom layer Thickest layer	0.00 0.00	Fair Bottom layer Thickest layer	0.00 0.01
Sb: Sharpsburg-----	80	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Sc: Sharpsburg-----	80	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Se: Shelby-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Sh: Shelby-----	80	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Sm: Shelby-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Sp: Shelby-----	50	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Pawnee-----	35	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Ss: Shelby, eroded-----	55	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Pawnee, eroded-----	35	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00

CONSTRUCTION MATERIALS--Continued
Leavenworth and Wyandotte Counties, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The ratings given for the thickest layer are for the thickest layer above and excluding the bottom layer. The numbers in the value columns range from 0.00 to 0.99. The greater the value, the greater the likelihood that the bottom layer or thickest layer of the soil is a source of sand or gravel. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
Sy: Sibleyville-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
SZ: Sogn-----	55	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Vinland-----	30	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
VR: Rock Outcrop-----	60	Not rated		Not rated	
Vinland-----	26	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Vs: Vinland-----	55	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Sibleyville-----	45	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
W: Water-----	100	Not rated		Not rated	
Wa: Wabash-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Wc: Welda-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Wd: Welda-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Zo: Zook-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00

CONSTRUCTION MATERIALS--Continued
Leavenworth and Wyandotte Counties, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 0.99. The smaller the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
005AQ: Fluvaquents-----	95	Poor Low content of organic matter	0.00	Poor Depth to saturated zone	0.00	Poor Depth to saturated zone	0.00
005AR: Armster-----	85	Fair Too clayey	0.08	Poor Low strength	0.00	Fair Depth to saturated zone	0.04
		Low content of organic matter	0.08	Depth to saturated zone	0.04	Too Clayey	0.05
		Too acid	0.88	Shrink-swell	0.12	Slope	0.96
		No water erosion limitation	0.99			Rock fragments	0.97
005GO: Gosport-----	85	Poor Too clayey	0.00	Poor Depth to bedrock	0.00	Poor Slope	0.00
		Low content of organic matter	0.08	Slope	0.00	Too Clayey	0.00
		Too acid	0.12	Low strength	0.00	Too acid	0.59
		Droughty	0.67	Shrink-swell	0.12	Depth to bedrock	0.90
		Water erosion	0.90				
		Depth to bedrock	0.90				
005HN: Haynie-----	96	Fair Carbonate content	0.97	Fair Depth to saturated zone	0.53	Fair Depth to saturated zone	0.53
		No water erosion limitation	0.99	Low strength	0.78	Carbonate content	0.97
005HO: Haynie-----	60	Fair Carbonate content	0.97	Fair Depth to saturated zone	0.53	Fair Depth to saturated zone	0.53
		No water erosion limitation	0.99	Low strength	0.78	Carbonate content	0.97
Onawa-----	30	Fair Water erosion	0.90	Poor Low strength	0.00	Fair Depth to saturated zone	0.53
				Depth to saturated zone	0.53		
005KG: Kennebec-----	60	Good		Poor Low strength	0.00	Good	
				Shrink-swell	0.87		
Colo-----	30	Fair Too clayey	0.92	Poor Low strength	0.00	Fair Depth to saturated zone	0.53
				Depth to saturated zone	0.53	Too Clayey	0.87
				Shrink-swell	0.87		
005KY: Knox-----	60	Fair Low content of organic matter	0.88	Poor Low strength	0.00	Poor Slope	0.00
		Water erosion	0.90	Slope	0.50		
				Shrink-swell	0.98		
Gosport-----	30	Poor Too clayey	0.00	Poor Depth to bedrock	0.00	Poor Too Clayey	0.00
		Too acid	0.12	Low strength	0.00	Slope	0.00
		Low content of organic matter	0.18	Shrink-swell	0.12	Depth to bedrock	0.58
		Droughty	0.30	Slope	0.50	Too acid	0.59
		Depth to bedrock	0.58				
		Water erosion	0.90				
005OD: Onawa-----	95	Poor Too clayey	0.00	Poor Low strength	0.00	Poor Too Clayey	0.00
		Water erosion	0.90	Shrink-swell	0.92		

CONSTRUCTION MATERIALS--Continued
Leavenworth and Wyandotte Counties, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 0.99. The smaller the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
005OW: Onawet-----	95	Poor Too clayey Low content of organic matter Water erosion Carbonate content	0.00 0.12 0.90 0.97	Fair Low strength Depth to saturated zone Shrink-swell	0.22 0.89 0.99	Poor Too Clayey Depth to saturated zone	0.00 0.89
005PA: Knox-----	50	Fair Low content of organic matter Water erosion Too acid	0.32 0.90 0.92	Poor Low strength	0.00	Fair Slope	0.04
Palermo-----	50	Fair Too acid Water erosion	0.80 0.90	Good		Fair Slope	0.04
005PB: Palermo-----	95	Fair Too acid Water erosion	0.80 0.90	Fair Slope	0.18	Poor Slope	0.00
005SH: Shelby-----	85	Fair Too clayey Low content of organic matter Too acid	0.82 0.88 0.97	Poor Low strength Shrink-swell	0.00 0.87	Fair Too Clayey	0.59
005WA: Wabash-----	85	Poor Too clayey No water erosion limitation	0.00 0.99	Poor Depth to saturated zone Shrink-swell Low strength	0.00 0.00 0.00	Poor Too Clayey Depth to saturated zone	0.00 0.00
005WH: Wathena-----	55	Poor Wind erosion Low content of organic matter Too sandy	0.00 0.00 0.44	Fair Depth to saturated zone	0.94	Fair Too sandy Depth to saturated zone	0.44 0.94
Haynie-----	40	Fair Carbonate content No water erosion limitation	0.97 0.99	Fair Depth to saturated zone Low strength	0.53 0.78	Fair Depth to saturated zone Carbonate content	0.53 0.97
045ET: Eudora-----	90	Fair Low content of organic matter Water erosion	0.08 0.90	Good		Good	
045EV: Eudora-----	60	Fair Water erosion	0.90	Good		Good	
Kimo-----	30	Poor Too clayey Low content of organic matter No water erosion limitation	0.00 0.50 0.99	Fair Depth to saturated zone Shrink-swell	0.53 0.97	Poor Too Clayey Depth to saturated zone	0.00 0.53
045KM: Kimo-----	90	Poor Too clayey Low content of organic matter No water erosion limitation	0.00 0.50 0.99	Fair Depth to saturated zone Shrink-swell	0.53 0.97	Poor Too Clayey Depth to saturated zone	0.00 0.53

CONSTRUCTION MATERIALS--Continued
Leavenworth and Wyandotte Counties, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 0.99. The smaller the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
045MR: Morrill-----	90	Fair Low content of organic matter Too clayey Too acid	0.88 0.92 0.97	Fair Shrink-swell	0.87	Fair Too Clayey Rock fragments	0.66 0.88
045RO: River Wash-----	100	Not rated		Not rated		Not rated	
045SB: Sarpy-----	55	Poor Too sandy Wind erosion Low content of organic matter Droughty	0.00 0.00 0.12 0.35	Good		Poor Too sandy	0.00
Eudora-----	45	Fair Water erosion	0.90	Good		Good	
045VM: Vinland-----	40	Poor Depth to bedrock Droughty Low content of organic matter Water erosion Too clayey	0.00 0.07 0.88 0.90 0.92	Poor Depth to bedrock Shrink-swell	0.00 0.87	Poor Depth to bedrock Slope Too Clayey Rock fragments	0.00 0.63 0.66 0.97
Martin-----	25	Poor Too clayey Too acid No water erosion limitation	0.00 0.95 0.99	Fair Shrink-swell Depth to saturated zone	0.17 0.53	Poor Too Clayey Depth to saturated zone Slope	0.00 0.53 0.96
045WC: Wabash-----	88	Poor Too clayey	0.00	Poor Depth to saturated zone Shrink-swell	0.00 0.00	Poor Too Clayey Depth to saturated zone	0.00 0.00
087RE: Reading-----	85	Fair Too clayey Water erosion Low content of organic matter Too acid	0.82 0.90 0.92 0.95	Fair Shrink-swell	0.87	Fair Too Clayey	0.72
087SS: Sibleyville-----	60	Fair Droughty Depth to bedrock Low content of organic matter Too acid	0.57 0.71 0.88 0.97	Poor Depth to bedrock	0.00	Fair Rock fragments Depth to bedrock	0.50 0.71
087SV: Sibleyville-----	50	Fair Depth to bedrock Droughty Low content of organic matter Too acid	0.46 0.81 0.88 0.97	Poor Depth to bedrock	0.00	Fair Depth to bedrock Rock fragments Slope	0.46 0.50 0.84
087VO: Vinland-----	55	Poor Depth to bedrock Droughty Water erosion Too clayey	0.00 0.08 0.90 0.98	Poor Depth to bedrock Shrink-swell	0.00 0.87	Poor Depth to bedrock Slope Rock fragments Too Clayey	0.00 0.63 0.97 0.98

CONSTRUCTION MATERIALS--Continued
Leavenworth and Wyandotte Counties, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 0.99. The smaller the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
087WC: Wabash-----	94	Poor Too clayey No water erosion limitation	0.00 0.99	Poor Depth to saturated zone Shrink-swell	0.00 0.00	Poor Too Clayey Depth to saturated zone	0.00 0.00
091ED: Eudora-----	75	Fair Water erosion	0.90	Good		Good	
Kimo-----	25	Poor Low content of organic matter Too clayey No water erosion limitation	0.00 0.00 0.99	Fair Shrink-swell	0.99	Poor Too Clayey	0.00
091LB: Ladoga-----	85	Fair Too clayey Low content of organic matter Too acid Water erosion	0.02 0.50 0.74 0.90	Fair Shrink-swell	0.90	Fair Too Clayey Slope	0.01 0.37
091RA: Reading-----	90	Fair Water erosion Too acid Too clayey	0.90 0.95 0.98	Poor Low strength Shrink-swell	0.00 0.90	Fair Too Clayey	0.89
091SB: Sharpsburg-----	55	Fair Too clayey Too acid Water erosion	0.02 0.74 0.90	Fair Shrink-swell	0.87	Fair Too Clayey	0.02
Urban Land-----	45	Poor Low content of organic matter	0.00	Poor Slope Low strength	0.00 0.00	Poor Slope	0.00
Aa: Kennebec, CHANNELED-	85	Good		Poor Low strength Shrink-swell	0.00 0.87	Good	
Ac: Armster-----	90	Fair Too clayey Low content of organic matter Too acid No water erosion limitation	0.08 0.08 0.88 0.99	Poor Low strength Shrink-swell	0.00 0.12	Fair Too Clayey Rock fragments	0.05 0.97
Ad: Armster-----	90	Fair Low content of organic matter Too clayey Too acid No water erosion limitation	0.08 0.50 0.88 0.99	Poor Low strength Shrink-swell	0.00 0.12	Fair Too Clayey Slope Rock fragments	0.28 0.84 0.97
Ae: Armster, eroded----	75	Fair Too clayey Low content of organic matter Too acid No water erosion limitation	0.08 0.08 0.88 0.99	Poor Low strength Shrink-swell	0.00 0.12	Fair Too Clayey Slope Rock fragments	0.05 0.84 0.97
AED: Arents, Earthen Dam-	100	Not rated		Not rated		Not rated	

CONSTRUCTION MATERIALS--Continued
Leavenworth and Wyandotte Counties, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 0.99. The smaller the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ba: Basehor-----	55	Poor Droughty Depth to bedrock Too acid	0.00 0.00 0.00 0.84	Poor Depth to bedrock Slope	0.00 0.82	Poor Depth to bedrock Slope Rock fragments	0.00 0.00 0.95
Br: Bremer-----	95	Poor Too clayey Too acid	0.00 0.95	Poor Low strength Depth to saturated zone Shrink-swell	0.00 0.14 0.16	Poor Too Clayey Depth to saturated zone	0.00 0.14
Cf: Borrow Pits-----	100	Not rated		Not rated		Not rated	
Ec: Elmont-----	85	Fair Water erosion Too acid Too clayey	0.90 0.97 0.98	Poor Low strength Shrink-swell	0.00 0.92	Fair Too Clayey	0.76
Ed: Elmont-----	85	Fair Water erosion Too acid Too clayey	0.90 0.97 0.98	Poor Low strength Shrink-swell	0.00 0.92	Fair Too Clayey Slope	0.76 0.84
Eu: Eudora-----	70	Fair Low content of organic matter Water erosion	0.08 0.90	Good		Good	
Haynie-----	20	Fair Low content of organic matter Carbonate content No water erosion limitation	0.50 0.97 0.99	Poor Low strength Depth to saturated zone	0.00 0.53	Fair Depth to saturated zone Carbonate content	0.53 0.97
Gc: Gosport-----	50	Poor Too clayey Too acid Low content of organic matter Droughty Depth to bedrock Water erosion	0.00 0.12 0.18 0.64 0.79 0.90	Poor Depth to bedrock Low strength Shrink-swell Slope	0.00 0.00 0.12 0.32	Poor Too Clayey Slope Too acid Depth to bedrock	0.00 0.00 0.59 0.79
Gp: Gravel Pits-----	100	Not rated		Not rated		Not rated	
Gs: Gosport-----	50	Poor Too clayey Too acid Low content of organic matter Droughty Depth to bedrock Water erosion	0.00 0.12 0.18 0.64 0.79 0.90	Poor Depth to bedrock Low strength Shrink-swell Slope	0.00 0.00 0.12 0.32	Poor Too Clayey Slope Too acid Depth to bedrock	0.00 0.00 0.59 0.79
Sogn-----	35	Poor Droughty Depth to bedrock Too clayey	0.00 0.00 0.00 0.98	Poor Depth to bedrock Shrink-swell	0.00 0.87	Poor Depth to bedrock Slope Too Clayey	0.00 0.04 0.93

CONSTRUCTION MATERIALS--Continued
Leavenworth and Wyandotte Counties, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 0.99. The smaller the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Gt: Grundy-----	90	Poor Too clayey Low content of organic matter Too acid No water erosion limitation	0.00 0.92 0.95 0.99	Poor Low strength Shrink-swell Depth to saturated zone	0.00 0.14 0.14	Poor Too Clayey Depth to saturated zone	0.00 0.14
Gu: Grundy-----	90	Poor Too clayey Low content of organic matter Too acid No water erosion limitation	0.00 0.92 0.95 0.99	Fair Shrink-swell Depth to saturated zone	0.12 0.14	Poor Too Clayey Depth to saturated zone	0.00 0.14
Gy: Gymer-----	85	Fair Too clayey Too acid Water erosion Low content of organic matter	0.05 0.84 0.90 0.92	Poor Low strength Shrink-swell	0.00 0.87	Fair Too Clayey	0.03
Hg: Haig-----	90	Poor Too clayey Low content of organic matter Too acid No water erosion limitation	0.00 0.50 0.74 0.99	Poor Low strength Shrink-swell Depth to saturated zone	0.00 0.12 0.14	Poor Too Clayey Depth to saturated zone	0.00 0.14
Hy: Haynie-----	90	Fair Low content of organic matter Carbonate content No water erosion limitation	0.32 0.97 0.99	Poor Low strength Depth to saturated zone	0.00 0.53	Fair Depth to saturated zone Carbonate content	0.53 0.97
Ju: Judson-----	90	Fair Water erosion	0.90	Poor Low strength Shrink-swell	0.00 0.99	Good	
Ke: Kennebec-----	90	Good		Poor Low strength Shrink-swell	0.00 0.87	Good	
Kh: Knox-----	80	Fair Low content of organic matter Water erosion	0.68 0.90	Poor Low strength Shrink-swell	0.00 0.87	Fair Slope	0.84
Kk: Knox-----	90	Fair Low content of organic matter Water erosion	0.68 0.90	Poor Low strength Shrink-swell	0.00 0.87	Poor Slope	0.00
Km: Knox, eroded-----	85	Fair Low content of organic matter Water erosion	0.32 0.90	Poor Low strength Shrink-swell	0.00 0.87	Fair Slope	0.84
Kn: Knox-----	65	Fair Low content of organic matter Water erosion	0.32 0.90	Poor Low strength Slope Shrink-swell	0.00 0.02 0.87	Poor Slope	0.00

CONSTRUCTION MATERIALS--Continued
Leavenworth and Wyandotte Counties, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 0.99. The smaller the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Sogn-----	35	Poor Droughty Depth to bedrock Too clayey	0.00 0.00 0.98	Poor Depth to bedrock Slope Shrink-swell	0.00 0.68 0.87	Poor Slope Depth to bedrock Too Clayey	0.00 0.00 0.93
Ko: Konawa-----	85	Fair Low content of organic matter Too acid	0.32 0.54	Good		Fair Too acid	0.98
Kw: Konawa-----	90	Fair Low content of organic matter Too acid Too clayey	0.32 0.54 0.92	Fair Shrink-swell	0.95	Fair Slope Too Clayey Too acid	0.04 0.57 0.98
La: Ladoga-----	80	Fair Too clayey Too acid Low content of organic matter Water erosion	0.02 0.74 0.88 0.90	Poor Low strength Shrink-swell	0.00 0.87	Fair Too Clayey	0.01
M-W: Miscellaneous Water-	100	Not rated		Not rated		Not rated	
Mb: Marshall-----	90	Fair Water erosion Too clayey	0.90 0.99	Poor Low strength Shrink-swell	0.00 0.87	Fair Too Clayey	0.87
Mc: Marshall-----	90	Fair Water erosion Too clayey	0.90 0.99	Poor Low strength Shrink-swell	0.00 0.87	Fair Too Clayey	0.87
Md: Marshall-----	90	Fair Water erosion Too clayey	0.90 0.99	Poor Low strength Shrink-swell	0.00 0.87	Fair Slope Too Clayey	0.37 0.87
Mn: Martin-----	90	Poor Too clayey Low content of organic matter Too acid No water erosion limitation	0.00 0.32 0.95 0.99	Poor Low strength Shrink-swell	0.00 0.12	Poor Too Clayey	0.00
Mr: Martin-----	85	Poor Too clayey Low content of organic matter Too acid No water erosion limitation	0.00 0.32 0.95 0.99	Poor Low strength Shrink-swell	0.00 0.12	Poor Too Clayey Slope	0.00 0.84
Ms: Martin-----	85	Poor Too clayey Low content of organic matter Too acid No water erosion limitation	0.00 0.32 0.95 0.99	Poor Low strength Shrink-swell	0.00 0.12	Poor Too Clayey Slope	0.00 0.96
On: Onawa-----	95	Poor Too clayey Low content of organic matter Water erosion	0.00 0.18 0.90	Poor Low strength Shrink-swell	0.00 0.99	Poor Too Clayey	0.00

CONSTRUCTION MATERIALS--Continued
Leavenworth and Wyandotte Counties, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 0.99. The smaller the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Oo: Onawa-----	90	Poor Too clayey Low content of organic matter Water erosion	0.00 0.18 0.90	Poor Low strength Shrink-swell	0.00 0.99	Poor Too Clayey	0.00
Os: Oska-----	80	Poor Too clayey Low content of organic matter Too acid Depth to bedrock No water erosion limitation	0.00 0.50 0.95 0.99 0.99	Poor Depth to bedrock Low strength Shrink-swell	0.00 0.00 0.12	Poor Too Clayey Depth to bedrock	0.00 0.99
Pb: Pawnee-----	90	Poor Too clayey No water erosion limitation	0.00 0.99	Poor Low strength Depth to saturated zone Shrink-swell	0.00 0.00 0.21	Poor Too Clayey Depth to saturated zone	0.00 0.00
Pc: Pawnee-----	85	Poor Too clayey No water erosion limitation	0.00 0.99	Poor Low strength Depth to saturated zone Shrink-swell	0.00 0.00 0.15	Poor Too Clayey Depth to saturated zone	0.00 0.00
Pe: Pawnee, eroded-----	85	Poor Too clayey No water erosion limitation	0.00 0.99	Poor Low strength Depth to saturated zone Shrink-swell	0.00 0.00 0.12	Poor Too Clayey Depth to saturated zone	0.00 0.00
Qu: Quarries-----	100	Not rated		Not rated		Not rated	
Rs: River Wash-----	100	Not rated		Not rated		Not rated	
Sa: Sarpy-----	55	Poor Too sandy Wind erosion Low content of organic matter Droughty	0.00 0.00 0.18 0.35	Good		Poor Too sandy	0.00
Haynie-----	35	Fair Low content of organic matter Carbonate content No water erosion limitation	0.18 0.97 0.99	Good		Fair Carbonate content	0.97
Sb: Sharpsburg-----	80	Fair Too clayey Low content of organic matter Too acid Water erosion	0.02 0.50 0.74 0.90	Poor Low strength Shrink-swell	0.00 0.87	Fair Too Clayey	0.02
Sc: Sharpsburg-----	80	Fair Too clayey Too acid Water erosion	0.02 0.74 0.90	Poor Low strength Shrink-swell	0.00 0.87	Fair Too Clayey	0.02

CONSTRUCTION MATERIALS--Continued
Leavenworth and Wyandotte Counties, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 0.99. The smaller the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Se: Shelby-----	90	Fair Low content of organic matter Too clayey Too acid	0.50 0.88 0.97	Poor Low strength Shrink-swell	0.00 0.87	Fair Too Clayey	0.57
Sh: Shelby-----	80	Fair Low content of organic matter Too clayey Too acid	0.50 0.88 0.97	Poor Low strength Shrink-swell	0.00 0.87	Fair Too Clayey	0.57
Sm: Shelby-----	90	Fair Low content of organic matter Too acid	0.50 0.97	Poor Low strength Shrink-swell	0.00 0.87	Fair Slope	0.84
Sp: Shelby-----	50	Fair Low content of organic matter Too clayey Too acid	0.50 0.88 0.97	Poor Low strength Shrink-swell	0.00 0.87	Fair Too Clayey	0.57
Pawnee-----	35	Poor Too clayey No water erosion limitation	0.00 0.99	Poor Low strength Depth to saturated zone Shrink-swell	0.00 0.00 0.15	Poor Too Clayey Depth to saturated zone	0.00 0.00
Ss: Shelby, eroded-----	55	Fair Low content of organic matter Too clayey Too acid	0.50 0.88 0.97	Poor Low strength Shrink-swell	0.00 0.87	Fair Too Clayey	0.57
Pawnee, eroded-----	35	Poor Too clayey No water erosion limitation	0.00 0.99	Poor Low strength Depth to saturated zone Shrink-swell	0.00 0.00 0.12	Poor Too Clayey Depth to saturated zone	0.00 0.00
Sy: Sibleyville-----	85	Fair Depth to bedrock Too acid	0.71 0.97	Poor Depth to bedrock	0.00	Fair Depth to bedrock	0.71
SZ: Sogn-----	55	Poor Droughty Depth to bedrock Too clayey	0.00 0.00 0.98	Poor Depth to bedrock Shrink-swell	0.00 0.87	Poor Depth to bedrock Slope Too Clayey	0.00 0.84 0.93
Vinland-----	30	Poor Depth to bedrock Droughty Water erosion Too clayey	0.00 0.08 0.90 0.98	Poor Depth to bedrock Shrink-swell	0.00 0.87	Poor Depth to bedrock Slope Rock fragments Too Clayey	0.00 0.16 0.97 0.98
VR: Rock Outcrop-----	60	Not rated		Not rated		Not rated	
Vinland-----	26	Poor Depth to bedrock Droughty Low content of organic matter Water erosion Too clayey	0.00 0.07 0.88 0.90 0.92	Poor Depth to bedrock Slope Shrink-swell	0.00 0.00 0.87	Poor Slope Depth to bedrock Too Clayey Rock fragments	0.00 0.00 0.66 0.97
Vs: Vinland-----	55	Poor Depth to bedrock Droughty	0.00 0.34	Poor Depth to bedrock	0.00	Poor Depth to bedrock Slope Rock fragments	0.00 0.96 0.97

CONSTRUCTION MATERIALS--Continued
Leavenworth and Wyandotte Counties, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 0.99. The smaller the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Sibleyville-----	45	Fair Depth to bedrock Too acid	0.71 0.97	Poor Depth to bedrock	0.00	Fair Depth to bedrock Slope	0.71 0.96
W: Water-----	100	Not rated		Not rated		Not rated	
Wa: Wabash-----	90	Poor Too clayey Low content of organic matter	0.00 0.08	Poor Depth to saturated zone Shrink-swell Low strength	0.00 0.00 0.00	Poor Too Clayey Depth to saturated zone	0.00 0.00
Wc: Welda-----	85	Fair Low content of organic matter Too clayey Too acid No water erosion limitation	0.18 0.32 0.84 0.99	Poor Low strength Shrink-swell	0.00 0.89	Fair Too Clayey	0.21
Wd: Welda-----	90	Fair Low content of organic matter Too clayey Too acid No water erosion limitation	0.18 0.32 0.84 0.99	Poor Low strength Shrink-swell	0.00 0.88	Fair Too Clayey Slope	0.21 0.37
Zo: Zook-----	90	Fair Too clayey No water erosion limitation	0.12 0.99	Poor Low strength Shrink-swell Depth to saturated zone	0.00 0.12 0.14	Fair Too Clayey Depth to saturated zone	0.12 0.14

RECREATIONAL INTERPRETATIONS
Leavenworth and Wyandotte Counties, Kansas

Recreation

The soils of the survey area are rated in the following tables according to limitations that affect their suitability for recreation. 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. Slightly limited indicates that the soil has features that are favorable for the specified use. The limitations are minor and can be easily overcome. Good performance and 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 0.00 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 this table can be supplemented by other information in this survey, for example, interpretations for building site development, construction materials, sanitary facilities, and water management.

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.

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.

RECREATIONAL INTERPRETATIONS--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
005AQ: Fluvaquents-----	95	Very limited Depth to saturated zone Flooding Ponding Restricted permeability	1.00 1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Restricted permeability	1.00 1.00 1.00	Very limited Restricted permeability Depth to saturated zone Ponding Flooding	1.00 1.00 1.00 0.60
005AR: Armster-----	85	Very limited Depth to saturated zone Restricted permeability Slope	1.00 0.15 0.04	Somewhat limited Depth to saturated zone Restricted permeability Slope	0.94 0.15 0.04	Very limited Slope Depth to saturated zone Restricted permeability Gravel content	1.00 1.00 0.15 0.06
005GO: Gosport-----	85	Very limited Slope Restricted permeability	1.00 1.00	Very limited Slope Restricted permeability	1.00 1.00	Very limited Slope Restricted permeability Depth to bedrock	1.00 1.00 0.10
005HN: Haynie-----	96	Very limited Flooding Depth to saturated zone	1.00 0.39	Somewhat limited Depth to saturated zone	0.19	Somewhat limited Flooding Depth to saturated zone	0.60 0.39
005HO: Haynie-----	60	Very limited Flooding Depth to saturated zone	1.00 0.39	Somewhat limited Depth to saturated zone	0.19	Somewhat limited Flooding Depth to saturated zone	0.60 0.39
Onawa-----	30	Very limited Flooding Ponding Restricted permeability Depth to saturated zone	1.00 1.00 0.94 0.39	Very limited Ponding Restricted permeability Depth to saturated zone	1.00 0.94 0.19	Very limited Ponding Restricted permeability Flooding Depth to saturated zone	1.00 0.94 0.60 0.39
005KG: Kennebec-----	60	Very limited Flooding	1.00	Not limited		Somewhat limited Flooding	0.60
Colo-----	30	Very limited Flooding Depth to saturated zone	1.00 0.39	Somewhat limited Depth to saturated zone	0.19	Somewhat limited Flooding Depth to saturated zone	0.60 0.39
005KY: Knox-----	60	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
Gosport-----	30	Very limited Restricted permeability Slope	1.00 1.00	Very limited Restricted permeability Slope	1.00 1.00	Very limited Slope Restricted permeability Depth to bedrock	1.00 1.00 0.42
005OD: Onawa-----	95	Very limited Flooding Ponding Restricted permeability	1.00 1.00 0.94	Very limited Ponding Restricted permeability	1.00 0.94	Very limited Ponding Restricted permeability Flooding	1.00 0.94 0.60
005OW: Onawet-----	95	Very limited Flooding Ponding Restricted permeability	1.00 1.00 0.94	Very limited Ponding Restricted permeability Flooding	1.00 0.94 0.40	Very limited Flooding Ponding Restricted permeability	1.00 1.00 0.94
005PA: Knox-----	50	Somewhat limited Slope	0.96	Somewhat limited Slope	0.96	Very limited Slope	1.00
Palermo-----	50	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00

RECREATIONAL INTERPRETATIONS--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
005PB: Palermo-----	95	Slope	0.96	Slope	0.96	Slope	1.00
		Very limited Slope	1.00	Very limited Slope	1.00	Very limited Restricted permeability Slope	1.00
		Restricted permeability	1.00	Restricted permeability	1.00		
005SH: Shelby-----	85	Somewhat limited Restricted permeability Slope	0.15	Somewhat limited Restricted permeability Slope	0.15	Very limited Slope	1.00
			0.00		0.00	Restricted permeability	0.15
005WA: Wabash-----	85	Very limited Depth to saturated zone Flooding	1.00	Very limited Depth to saturated zone Restricted permeability	1.00	Very limited Depth to saturated zone Restricted permeability Flooding	1.00
			1.00		1.00		
		Restricted permeability	1.00				0.60
005WH: Wathena-----	55	Very limited Flooding Ponding Too sandy	1.00	Very limited Ponding Too sandy	1.00	Very limited Ponding Flooding Too sandy	1.00
			0.50		0.50		0.50
		Very limited Flooding	1.00	Somewhat limited Depth to saturated zone	0.19	Somewhat limited Flooding	0.60
Haynie-----	40	Depth to saturated zone	0.39			Depth to saturated zone	0.39
045ET: Eudora-----	90	Very limited Flooding	1.00	Not limited		Not limited	
045EV: Eudora-----	60	Very limited Flooding	1.00	Not limited		Not limited	
Kimo-----	30	Very limited Flooding	1.00	Somewhat limited Restricted permeability Depth to saturated zone	0.94	Somewhat limited Restricted permeability Depth to saturated zone	0.94
			0.94		0.19		0.39
		Restricted permeability Depth to saturated zone	0.39				
045KM: Kimo-----	90	Very limited Flooding	1.00	Somewhat limited Restricted permeability Depth to saturated zone	0.94	Somewhat limited Restricted permeability Depth to saturated zone	0.94
			0.94		0.19		0.39
		Restricted permeability Depth to saturated zone	0.39				
045MR: Morrill-----	90	Somewhat limited Restricted permeability	0.15	Somewhat limited Restricted permeability	0.15	Somewhat limited Slope Restricted permeability Gravel content	0.87
							0.15
							0.06
045RO: River Wash-----	100	Not rated		Not rated		Not rated	
045SB: Sarpy-----	55	Very limited Flooding Too sandy	1.00	Somewhat limited Too sandy	0.88	Somewhat limited Too sandy Flooding	0.88
			0.88				0.60
		Very limited Flooding	1.00	Not limited		Somewhat limited Flooding	0.60
045VM: Vinland-----	40	Very limited Depth to bedrock Slope	1.00	Very limited Depth to bedrock Slope	1.00	Very limited Slope Depth to bedrock Gravel content	1.00
			0.37		0.37		1.00
							0.04
Martin-----	25	Somewhat limited Restricted permeability Depth to saturated zone Slope	0.94	Somewhat limited Restricted permeability Depth to saturated zone Slope	0.94	Very limited Slope	1.00
			0.39		0.19	Restricted permeability Depth to saturated zone	0.94
			0.04		0.04		0.39
045WC: Wabash-----	88	Very limited		Very limited		Very limited	

RECREATIONAL INTERPRETATIONS--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
		Depth to saturated zone Flooding	1.00	Depth to saturated zone Restricted permeability	1.00	Depth to saturated zone Restricted permeability Flooding	1.00
087RE: Reading-----	85	Very limited Flooding	1.00	Not limited		Not limited	
087SS: Sibleyville-----	60	Not limited		Not limited		Somewhat limited Slope Depth to bedrock	0.87 0.29
087SV: Sibleyville-----	50	Somewhat limited Slope	0.16	Somewhat limited Slope	0.16	Very limited Slope Depth to bedrock	1.00 0.54
087VO: Vinland-----	55	Very limited Depth to bedrock Slope	1.00 0.37	Very limited Depth to bedrock Slope	1.00 0.37	Very limited Slope Depth to bedrock Gravel content	1.00 1.00 0.04
087WC: Wabash-----	94	Very limited Depth to saturated zone Flooding	1.00	Very limited Depth to saturated zone Restricted permeability	1.00	Very limited Depth to saturated zone Restricted permeability	1.00
091ED: Eudora-----	75	Very limited Flooding	1.00	Not limited		Not limited	
Kimo-----	25	Very limited Flooding	1.00	Somewhat limited Restricted permeability	0.94	Somewhat limited Restricted permeability	0.94
091LB: Ladoga-----	85	Somewhat limited Slope Restricted permeability	0.63 0.15	Somewhat limited Slope Restricted permeability	0.63 0.15	Very limited Slope Restricted permeability	1.00 0.15
091RA: Reading-----	90	Very limited Flooding	1.00	Not limited		Not limited	
091SB: Sharpsburg-----	55	Somewhat limited Restricted permeability	0.15	Somewhat limited Restricted permeability	0.15	Very limited Slope Restricted permeability	1.00 0.15
Urban Land-----	45	Very limited Slope Restricted permeability	1.00 1.00	Very limited Slope Restricted permeability	1.00 1.00	Very limited Slope Restricted permeability	1.00 1.00
Aa: Kennebec, CHanneled-	85	Very limited Flooding	1.00	Somewhat limited Flooding	0.40	Very limited Flooding	1.00
Ac: Armster-----	90	Somewhat limited Restricted permeability	0.15	Somewhat limited Restricted permeability	0.15	Very limited Slope Restricted permeability Gravel content	1.00 0.15 0.06
Ad: Armster-----	90	Somewhat limited Slope Restricted permeability	0.16 0.15	Somewhat limited Slope Restricted permeability	0.16 0.15	Very limited Slope Restricted permeability Gravel content	1.00 0.15 0.06
Ae: Armster, eroded-----	75	Somewhat limited Slope Restricted permeability	0.16 0.15	Somewhat limited Slope Restricted permeability	0.16 0.15	Very limited Slope Restricted permeability Gravel content	1.00 0.15 0.06
AED: Arents, Earthen Dam-	100	Not rated		Not rated		Not rated	

RECREATIONAL INTERPRETATIONS--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ba: Basehor-----	55	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Depth to bedrock Slope Content of large stones	1.00 1.00 0.03
Br: Bremer-----	95	Very limited Flooding Depth to saturated zone Restricted permeability	1.00 0.98 0.15	Somewhat limited Depth to saturated zone Restricted permeability	0.75 0.15	Somewhat limited Depth to saturated zone Restricted permeability	0.98 0.15
Cf: Borrow Pits-----	100	Not rated		Not rated		Not rated	
Ec: Elmont-----	85	Somewhat limited Restricted permeability	0.15	Somewhat limited Restricted permeability	0.15	Somewhat limited Slope Restricted permeability	0.87 0.15
Ed: Elmont-----	85	Somewhat limited Slope Restricted permeability	0.16 0.15	Somewhat limited Slope Restricted permeability	0.16 0.15	Very limited Slope Restricted permeability	1.00 0.15
Eu: Eudora-----	70	Very limited Flooding	1.00	Not limited		Not limited	
Haynie-----	20	Very limited Flooding Depth to saturated zone	1.00 0.39	Somewhat limited Depth to saturated zone	0.19	Somewhat limited Flooding Depth to saturated zone	0.60 0.39
Gc: Gosport-----	50	Very limited Restricted permeability Slope	1.00 1.00	Very limited Restricted permeability Slope	1.00 1.00	Very limited Slope Restricted permeability Depth to bedrock	1.00 1.00 0.20
Gp: Gravel Pits-----	100	Not rated		Not rated		Not rated	
Gs: Gosport-----	50	Very limited Restricted permeability Slope	1.00 1.00	Very limited Restricted permeability Slope	1.00 1.00	Very limited Slope Restricted permeability Depth to bedrock	1.00 1.00 0.20
Sogn-----	35	Very limited Depth to bedrock Slope	1.00 0.96	Very limited Depth to bedrock Slope	1.00 0.96	Very limited Slope Depth to bedrock Content of large stones	1.00 1.00 0.00
Gt: Grundy-----	90	Somewhat limited Depth to saturated zone Restricted permeability	0.98 0.94	Somewhat limited Restricted permeability Depth to saturated zone	0.94 0.75	Somewhat limited Depth to saturated zone Restricted permeability Slope	0.98 0.94 0.00
Gu: Grundy-----	90	Somewhat limited Depth to saturated zone Restricted permeability	0.98 0.94	Somewhat limited Restricted permeability Depth to saturated zone	0.94 0.75	Somewhat limited Depth to saturated zone Restricted permeability Slope	0.98 0.94 0.87
Gy: Gymer-----	85	Somewhat limited Restricted permeability	0.15	Somewhat limited Restricted permeability	0.15	Somewhat limited Slope Restricted permeability	0.87 0.15
Hg: Haig-----	90	Somewhat limited		Somewhat limited		Somewhat limited	

RECREATIONAL INTERPRETATIONS--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Hy: Haynie-----	90	Depth to saturated zone	0.98	Restricted permeability	0.94	Depth to saturated zone	0.98
		Restricted permeability	0.94	Depth to saturated zone	0.75	Restricted permeability	0.94
		Very limited Flooding	1.00	Somewhat limited Depth to saturated zone	0.19	Somewhat limited Flooding	0.60
		Depth to saturated zone	0.39			Depth to saturated zone	0.39
Ju: Judson-----	90	Not limited		Not limited		Not limited	
Ke: Kennebec-----	90	Very limited Flooding	1.00	Not limited		Somewhat limited Flooding	0.60
Kh: Knox-----	80	Somewhat limited Slope	0.16	Somewhat limited Slope	0.16	Very limited Slope	1.00
Kk: Knox-----	90	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
Km: Knox, eroded-----	85	Somewhat limited Slope	0.16	Somewhat limited Slope	0.16	Very limited Slope	1.00
Kn: Knox-----	65	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
		Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
Sogn-----	35					Content of large stones	0.00
Ko: Konawa-----	85	Not limited		Not limited		Very limited Slope	1.00
Kw: Konawa-----	90	Somewhat limited Slope	0.96	Somewhat limited Slope	0.96	Very limited Slope	1.00
La: Ladoga-----	80	Somewhat limited Restricted permeability	0.15	Somewhat limited Restricted permeability	0.15	Very limited Slope	1.00
						Restricted permeability	0.15
M-W: Miscellaneous Water-	100	Not rated		Not rated		Not rated	
Mb: Marshall-----	90	Not limited		Not limited		Somewhat limited Slope	0.13
Mc: Marshall-----	90	Not limited		Not limited		Very limited Slope	1.00
Md: Marshall-----	90	Somewhat limited Slope	0.63	Somewhat limited Slope	0.63	Very limited Slope	1.00
Mn: Martin-----	90	Somewhat limited Restricted permeability	0.94	Somewhat limited Restricted permeability	0.94	Very limited Slope	1.00
						Restricted permeability	0.94
Mr: Martin-----	85	Somewhat limited Restricted permeability	0.94	Somewhat limited Restricted permeability	0.94	Very limited Slope	1.00
		Slope	0.16	Slope	0.16	Restricted permeability	0.94
Ms: Martin-----	85	Very limited Too clayey	1.00	Very limited Too clayey	1.00	Very limited Slope	1.00
		Restricted permeability	0.94	Restricted permeability	0.94	Too clayey	1.00
		Slope	0.04	Slope	0.04	Restricted permeability	0.94
On: Onawa-----	95	Very limited Flooding	1.00	Somewhat limited Restricted permeability	0.94	Somewhat limited Restricted permeability	0.94
		Restricted permeability	0.94			Flooding	0.60

RECREATIONAL INTERPRETATIONS--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Oo: Onawa-----	90	Very limited Flooding Restricted permeability	1.00 0.94	Somewhat limited Restricted permeability	0.94	Somewhat limited Restricted permeability Flooding	0.94 0.60
Os: Oska-----	80	Somewhat limited Restricted permeability	0.94	Somewhat limited Restricted permeability	0.94	Very limited Slope Restricted permeability Depth to bedrock	1.00 0.94 0.01
Pb: Pawnee-----	90	Very limited Depth to saturated zone Restricted permeability	1.00 0.94	Very limited Depth to saturated zone Restricted permeability	1.00 0.94	Very limited Depth to saturated zone Restricted permeability Slope	1.00 0.94 0.13
Pc: Pawnee-----	85	Very limited Depth to saturated zone Restricted permeability	1.00 0.94	Very limited Depth to saturated zone Restricted permeability	1.00 0.94	Very limited Depth to saturated zone Slope Restricted permeability	1.00 1.00 0.94
Pe: Pawnee, eroded-----	85	Very limited Depth to saturated zone Restricted permeability	1.00 0.94	Very limited Depth to saturated zone Restricted permeability	1.00 0.94	Very limited Depth to saturated zone Slope Restricted permeability	1.00 1.00 0.94
Qu: Quarries-----	100	Not rated		Not rated		Not rated	
Rs: River Wash-----	100	Not rated		Not rated		Not rated	
Sa: Sarpy-----	55	Very limited Flooding Too sandy	1.00 0.88	Somewhat limited Too sandy	0.88	Somewhat limited Too sandy Flooding Slope	0.88 0.60 0.00
Haynie-----	35	Very limited Flooding	1.00	Not limited		Somewhat limited Flooding Slope	0.60 0.00
Sb: Sharpsburg-----	80	Somewhat limited Restricted permeability	0.15	Somewhat limited Restricted permeability	0.15	Somewhat limited Restricted permeability Slope	0.15 0.13
Sc: Sharpsburg-----	80	Somewhat limited Restricted permeability	0.15	Somewhat limited Restricted permeability	0.15	Very limited Slope Restricted permeability	1.00 0.15
Se: Shelby-----	90	Somewhat limited Restricted permeability	0.15	Somewhat limited Restricted permeability	0.15	Somewhat limited Restricted permeability Slope	0.15 0.13
Sh: Shelby-----	80	Somewhat limited Restricted permeability	0.15	Somewhat limited Restricted permeability	0.15	Very limited Slope Restricted permeability	1.00 0.15
Sm: Shelby-----	90	Somewhat limited Slope Restricted permeability	0.16 0.15	Somewhat limited Slope Restricted permeability	0.16 0.15	Very limited Slope Restricted permeability	1.00 0.15
Sp: Shelby-----	50	Somewhat limited Restricted permeability	0.15	Somewhat limited Restricted permeability	0.15	Very limited Slope	1.00

RECREATIONAL INTERPRETATIONS--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Pawnee-----	35	Very limited Depth to saturated zone Restricted permeability	1.00 0.94	Very limited Depth to saturated zone Restricted permeability	1.00 0.94	Restricted permeability Very limited Depth to saturated zone Slope	0.15 1.00 1.00 0.94
Ss: Shelby, eroded-----	55	Somewhat limited Restricted permeability	0.15	Somewhat limited Restricted permeability	0.15	Very limited Slope	1.00 0.15
Pawnee, eroded-----	35	Very limited Depth to saturated zone Restricted permeability	1.00 0.94	Very limited Depth to saturated zone Restricted permeability	1.00 0.94	Restricted permeability Very limited Depth to saturated zone Slope	1.00 1.00 1.00 0.94
Sy: Sibleyville-----	85	Not limited		Not limited		Very limited Slope Depth to bedrock	1.00 0.29
SZ: Sogn-----	55	Very limited Depth to bedrock Slope	1.00 0.16	Very limited Depth to bedrock Slope	1.00 0.16	Very limited Depth to bedrock Slope Content of large stones	1.00 1.00 0.00
Vinland-----	30	Very limited Depth to bedrock Slope	1.00 0.84	Very limited Depth to bedrock Slope	1.00 0.84	Very limited Depth to bedrock Slope Gravel content	1.00 1.00 0.04
VR: Rock Outcrop-----	60	Not rated		Not rated		Not rated	
Vinland-----	26	Very limited Slope Depth to bedrock	1.00 1.00	Very limited Slope Depth to bedrock	1.00 1.00	Very limited Slope Depth to bedrock Gravel content	1.00 1.00 0.04
Vs: Vinland-----	55	Very limited Depth to bedrock Slope	1.00 0.04	Very limited Depth to bedrock Slope	1.00 0.04	Very limited Depth to bedrock Slope Gravel content	1.00 1.00 0.04
Sibleyville-----	45	Somewhat limited Slope	0.04	Somewhat limited Slope	0.04	Very limited Slope Depth to bedrock	1.00 0.29
W: Water-----	100	Not rated		Not rated		Not rated	
Wa: Wabash-----	90	Very limited Depth to saturated zone Flooding Restricted permeability Too clayey	1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Restricted permeability Too clayey	1.00 1.00 1.00	Very limited Depth to saturated zone Restricted permeability Too clayey Flooding	1.00 1.00 1.00 0.60
Wc: Welda-----	85	Somewhat limited Restricted permeability	0.15	Somewhat limited Restricted permeability	0.15	Very limited Slope Restricted permeability	1.00 0.15
Wd: Welda-----	90	Somewhat limited Slope Restricted permeability	0.63 0.15	Somewhat limited Slope Restricted permeability	0.63 0.15	Very limited Slope Restricted permeability	1.00 0.15
Zo: Zook-----	90	Very limited Flooding	1.00	Somewhat limited Restricted permeability	0.94	Somewhat limited Depth to saturated zone	0.98

RECREATIONAL INTERPRETATIONS--Continued
 Leavenworth and Wyandotte Counties, Kansas

(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 potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
		Depth to saturated zone	0.98	Depth to saturated zone	0.75	Restricted permeability	0.94
		Restricted permeability	0.94			Flooding	0.60

RECREATIONAL INTERPRETATIONS--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Paths and trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value
005AQ: Fluvaquents-----	95	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Ponding Depth to saturated zone Flooding	1.00 1.00 0.60
005AR: Armster-----	85	Somewhat limited Depth to saturated zone	0.86	Somewhat limited Depth to saturated zone Slope	0.94 0.04
005GO: Gosport-----	85	Very limited Slope	1.00	Very limited Slope Depth to bedrock	1.00 0.10
005HN: Haynie-----	96	Not limited		Somewhat limited Flooding Depth to saturated zone	0.60 0.19
005HO: Haynie-----	60	Not limited		Somewhat limited Flooding Depth to saturated zone	0.60 0.19
Onawa-----	30	Very limited Ponding	1.00	Very limited Ponding Flooding Depth to saturated zone	1.00 0.60 0.19
005KG: Kennebec-----	60	Not limited		Somewhat limited Flooding	0.60
Colo-----	30	Not limited		Somewhat limited Flooding Depth to saturated zone	0.60 0.19
005KY: Knox-----	60	Somewhat limited Slope	0.50	Very limited Slope	1.00
Gosport-----	30	Somewhat limited Slope	0.50	Very limited Slope Depth to bedrock	1.00 0.42
005OD: Onawa-----	95	Very limited Ponding	1.00	Very limited Ponding Flooding	1.00 0.60
005OW: Onawet-----	95	Very limited Ponding Flooding	1.00 0.40	Very limited Ponding Flooding	1.00 1.00
005PA: Knox-----	50	Not limited		Somewhat limited Slope	0.96
Palermo-----	50	Not limited		Somewhat limited Slope	0.96
005PB: Palermo-----	95	Somewhat limited Slope	0.82	Very limited Slope	1.00
005SH: Shelby-----	85	Not limited		Somewhat limited Slope	0.00
005WA: Wabash-----	85	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Flooding	1.00 0.60
005WH: Wathena-----	55	Very limited Ponding Too sandy	1.00 0.50	Very limited Ponding Flooding Droughty	1.00 0.60 0.41
Haynie-----	40	Not limited		Somewhat limited Flooding Depth to saturated zone	0.60 0.19
045ET: Eudora-----	90	Not limited		Not limited	
045EV: Eudora-----	60	Not limited		Not limited	

RECREATIONAL INTERPRETATIONS--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Paths and trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Kimo-----	30	Not limited		Somewhat limited Depth to saturated zone	0.19
045KM: Kimo-----	90	Not limited		Somewhat limited Depth to saturated zone	0.19
045MR: Morrill-----	90	Not limited		Not limited	
045RO: River Wash-----	100	Not rated		Not rated	
045SB: Sarpy-----	55	Somewhat limited Too sandy	0.88	Somewhat limited Droughty Flooding	0.69 0.60
Eudora-----	45	Not limited		Somewhat limited Flooding	0.60
045VM: Vinland-----	40	Not limited		Very limited Depth to bedrock Slope Droughty	1.00 0.37 0.11
Martin-----	25	Not limited		Somewhat limited Depth to saturated zone Slope	0.19 0.04
045WC: Wabash-----	88	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Flooding	1.00 0.60
087RE: Reading-----	85	Not limited		Not limited	
087SS: Sibleyville-----	60	Not limited		Somewhat limited Depth to bedrock	0.29
087SV: Sibleyville-----	50	Not limited		Somewhat limited Depth to bedrock Slope	0.54 0.16
087VO: Vinland-----	55	Not limited		Very limited Depth to bedrock Slope Droughty	1.00 0.37 0.09
087WC: Wabash-----	94	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
091ED: Eudora-----	75	Not limited		Not limited	
Kimo-----	25	Not limited		Not limited	
091LB: Ladoga-----	85	Not limited		Somewhat limited Slope	0.63
091RA: Reading-----	90	Not limited		Not limited	
091SB: Sharpsburg-----	55	Not limited		Not limited	
Urban Land-----	45	Very limited Slope Water erosion	1.00 1.00	Very limited Slope	1.00
Aa: Kennebec, CHANNELED-	85	Somewhat limited Flooding	0.40	Very limited Flooding	1.00
Ac: Armster-----	90	Not limited		Not limited	
Ad: Armster-----	90	Not limited		Somewhat limited Slope	0.16
Ae: Armster, eroded----	75	Not limited		Somewhat limited Slope	0.16
AED: Arents, Earthen Dam-	100	Not rated		Not rated	
Ba: Basehor-----	55	Somewhat limited Slope	0.18	Very limited Depth to bedrock Droughty	1.00 1.00

RECREATIONAL INTERPRETATIONS--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Paths and trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Br: Bremer-----	95	Somewhat limited Depth to saturated zone	0.44	Slope Content of large stones	1.00 0.03
Cf: Borrow Pits-----	100	Not rated		Not rated	
EC: Elmont-----	85	Not limited		Not limited	
Ed: Elmont-----	85	Not limited		Somewhat limited Slope	0.16
Eu: Eudora-----	70	Not limited		Not limited	
Haynie-----	20	Not limited		Somewhat limited Flooding Depth to saturated zone	0.60 0.19
Gc: Gosport-----	50	Somewhat limited Slope	0.68	Very limited Slope Depth to bedrock	1.00 0.20
Gp: Gravel Pits-----	100	Not rated		Not rated	
Gs: Gosport-----	50	Somewhat limited Slope	0.68	Very limited Slope Depth to bedrock	1.00 0.20
Sogn-----	35	Not limited		Very limited Depth to bedrock Slope Droughty Content of large stones	1.00 0.96 0.89 0.00
Gt: Grundy-----	90	Somewhat limited Depth to saturated zone	0.44	Somewhat limited Depth to saturated zone	0.75
Gu: Grundy-----	90	Somewhat limited Depth to saturated zone	0.44	Somewhat limited Depth to saturated zone	0.75
Gy: Gymer-----	85	Not limited		Not limited	
Hg: Haig-----	90	Somewhat limited Depth to saturated zone	0.44	Somewhat limited Depth to saturated zone	0.75
Hy: Haynie-----	90	Not limited		Somewhat limited Flooding Depth to saturated zone	0.60 0.19
Ju: Judson-----	90	Not limited		Not limited	
Ke: Kennebec-----	90	Not limited		Somewhat limited Flooding	0.60
Kh: Knox-----	80	Not limited		Somewhat limited Slope	0.16
Kk: Knox-----	90	Somewhat limited Slope	0.00	Very limited Slope	1.00
Km: Knox, eroded-----	85	Not limited		Somewhat limited Slope	0.16
Kn: Knox-----	65	Somewhat limited Slope	0.98	Very limited Slope	1.00
Sogn-----	35	Somewhat limited Slope	0.32	Very limited Depth to bedrock Slope Droughty	1.00 1.00 0.89

RECREATIONAL INTERPRETATIONS--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Paths and trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value
				Content of large stones	0.00
Ko: Konawa-----	85	Not limited		Not limited	
Kw: Konawa-----	90	Not limited		Somewhat limited Slope	0.96
La: Ladoga-----	80	Not limited		Not limited	
M-W: Miscellaneous Water-	100	Not rated		Not rated	
Mb: Marshall-----	90	Not limited		Not limited	
Mc: Marshall-----	90	Not limited		Not limited	
Md: Marshall-----	90	Not limited		Somewhat limited Slope	0.63
Mn: Martin-----	90	Not limited		Not limited	
Mr: Martin-----	85	Not limited		Somewhat limited Slope	0.16
Ms: Martin-----	85	Very limited Too clayey	1.00	Very limited Too clayey Slope	1.00 0.04
On: Onawa-----	95	Not limited		Somewhat limited Flooding	0.60
Oo: Onawa-----	90	Not limited		Somewhat limited Flooding	0.60
Os: Oska-----	80	Not limited		Somewhat limited Depth to bedrock	0.01
Pb: Pawnee-----	90	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
Pc: Pawnee-----	85	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
Pe: Pawnee, eroded-----	85	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
Qu: Quarries-----	100	Not rated		Not rated	
Rs: River Wash-----	100	Not rated		Not rated	
Sa: Sarpy-----	55	Somewhat limited Too sandy	0.88	Somewhat limited Droughty Flooding	0.69 0.60
Haynie-----	35	Not limited		Somewhat limited Flooding	0.60
Sb: Sharpsburg-----	80	Not limited		Not limited	
Sc: Sharpsburg-----	80	Not limited		Not limited	
Se: Shelby-----	90	Not limited		Not limited	
Sh: Shelby-----	80	Not limited		Not limited	
Sm: Shelby-----	90	Not limited		Somewhat limited Slope	0.16
Sp: Shelby-----	50	Not limited		Not limited	
Pawnee-----	35	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
Ss: Shelby, eroded-----	55	Not limited		Not limited	
Pawnee, eroded-----	35	Very limited		Very limited	

RECREATIONAL INTERPRETATIONS--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Paths and trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
Sy: Sibleyville-----	85	Not limited		Somewhat limited Depth to bedrock	0.29
SZ: Sogn-----	55	Not limited		Very limited Depth to bedrock	1.00
				Droughty	0.80
				Slope	0.16
				Content of large stones	0.00
Vinland-----	30	Not limited		Very limited Depth to bedrock	1.00
				Slope	0.84
				Droughty	0.09
VR: Rock Outcrop-----	60	Not rated		Not rated	
Vinland-----	26	Very limited Slope	1.00	Very limited Depth to bedrock	1.00
				Slope	1.00
				Droughty	0.11
Vs: Vinland-----	55	Not limited		Very limited Depth to bedrock	1.00
				Slope	0.04
Sibleyville-----	45	Not limited		Somewhat limited Depth to bedrock	0.29
				Slope	0.04
W: Water-----	100	Not rated		Not rated	
Wa: Wabash-----	90	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Too clayey	1.00	Too clayey	1.00
				Flooding	0.60
Wc: Welda-----	85	Not limited		Not limited	
Wd: Welda-----	90	Not limited		Somewhat limited Slope	0.63
Zo: Zook-----	90	Somewhat limited Depth to saturated zone	0.44	Somewhat limited Depth to saturated zone	0.75
				Flooding	0.60

WILDLIFE INTERPRETATIONS
Leavenworth and Wyandotte Counties, Kansas

Use and Explanation of Wildlife Interpretations

Soils directly affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the development of water impoundments. The kind and abundance of wildlife that populate an area depend largely on the amount and distribution of food, cover, water, and living space. If any one of these elements is missing, inadequate, or inaccessible, wildlife will be scarce or will not inhabit the area. If the soils have the potential, wildlife habitat can be created or improved by planting appropriate vegetation, properly managing the existing plant cover, and fostering the natural establishment of desirable plants.

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

Suitability Ratings

The potential of the soil is rated good, fair, poor, or very poor.

Good - means that the element of wildlife habitat or the kind of habitat is easily created, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected if the soil is used for the designated purpose.

Fair - means that the element of wildlife habitat or kind of habitat can be created, improved, or maintained in most places. Moderately intensive management is required for satisfactory results.

Poor - means that limitations are severe for the designated element or kind of wildlife habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and requires intensive effort.

Very Poor - means that limitations are very severe for the designated element or kind of wildlife habitat. Habitat is difficult to create, improve, or maintain in most places, and management is difficult and requires intensive effort.

Description of Wildlife Habitat Elements

Openland habitat consists of croplands, pastures, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. The kind of wildlife attracted to these areas include bobwhite quail, pheasant, meadowlark, field sparrow, killdeer, cottontail rabbit, red fox, and coyote.

Woodland habitat consists of hardwood or conifers, or a mixture of these and associated grasses, legumes and wild herbaceous plants. Examples of wildlife attracted to this habitat are wild turkey, thrushes, woodpeckers, owl, tree squirrels, raccoon, and deer.

Wetland habitat consists of water-tolerant plants in open, marshy or swampy, shallow water areas. Examples of wildlife attracted to this habitat are ducks, geese, herons, bitterns, rails, kingfishers, shorebirds, muskrat, mink, and beaver.

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

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

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

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

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

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

Shrubs are bushy woody plants that produce fruit, buds, twigs, bark, and foliage. Soil properties and features that affect the growth of shrubs are depth of the root zone, available water capacity, salinity, and soil moisture. Examples of shrubs are fragrant sumac, chokecherry, American plum, sand plum, and garden currant.

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

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

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

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

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

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

Habitat for rangeland wildlife consists of areas of shrubs and wild herbaceous plants. Wildlife attracted to rangeland include antelope, deer, cottontail rabbit, prairie chicken, meadowlark, quail, and pheasant.

WILDLIFE INTERPRETATIONS
Leavenworth and Wyandotte Counties, Kansas

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hard- wood trees	Conif- erous plants	Shrubs	Wetland plants	Shallow water areas	Open- land wild- life	Wood- land wild- life	Wetland wild- life	Range- land wild- life
005AQ: FLUVAQUENTS-----	---	---	---	---	---	---	Good	---	---	---	Good	---
005AR: ARMSTER-----	Fair	Good	Good	Good	Good	---	Very poor	Very poor	Good	Good	Very poor	---
005GO: GOSPORT-----	Very poor	Poor	Fair	Fair	Fair	---	Very poor	Very poor	Poor	Fair	Very poor	---
005HN: HAYNIE-----	Good	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
005HO: HAYNIE-----	Good	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
ONAWA-----	Fair	Fair	Fair	Fair	Very poor	---	Good	Good	Fair	Good	Good	---
005KG: KENNEBEC-----	Good	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
COLO-----	Good	Fair	Good	Fair	Poor	---	Good	Good	Fair	Fair	Good	---
005KY: KNOX-----	Poor	Fair	Good	Good	Good	---	Very poor	Very poor	Fair	Good	Very poor	---
GOSPORT-----	Very poor	Poor	Fair	Fair	Fair	---	Very poor	Very poor	Poor	Fair	Very poor	---
005OD: ONAWA-----	Fair	Fair	Fair	Fair	Very poor	---	Good	Good	Fair	Good	Good	---
005OW: ONAWET-----	Very poor	Poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good	Poor
005PA: KNOX-----	Fair	Good	Good	Good	Good	---	Very poor	Very poor	Good	Good	Very poor	---
PALERMO-----	Fair	Good	Good	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor	Fair
005PB: PALERMO-----	Fair	Good	Good	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor	Fair
005SH: SHELBY-----	Fair	Good	Fair	Good	Good	---	Very poor	Very poor	Fair	Good	Very poor	---
005WA: WABASH-----	Poor	Poor	Poor	Poor	Poor	---	Good	Good	Poor	Poor	Good	---
005WH: WATHENA-----	Poor	Poor	Fair	Poor	Poor	---	Very poor	Very poor	Poor	Poor	Very poor	---
HAYNIE-----	Good	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
045ET: EUDORA-----	Good	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor	---
045EV: EUDORA-----	Good	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor	---
KIMO-----	Good	Good	Good	Fair	Fair	Fair	Good	Good	Good	Fair	Good	---
045KM: KIMO-----	Good	Good	Good	Fair	Fair	Fair	Good	Good	Good	Fair	Good	---
045MR: MORRILL-----	Fair	Good	Good	Fair	Fair	Good	Very poor	Very poor	Good	Fair	Very poor	Good
045RO: RIVER WASH-----	---	---	---	---	---	---	---	---	---	---	---	---

WILDLIFE INTERPRETATIONS--Continued
Leavenworth and Wyandotte Counties, Kansas

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hard- wood trees	Conif- erous plants	Shrubs	Wetland plants	Shallow water areas	Open- land wild- life	Wood- land wild- life	Wetland wild- life	Range- land wild- life
045SB: SARPY-----	Poor	Poor	Fair	Poor	Poor	---	Very poor	Very poor	Poor	Poor	Very poor	---
EUDORA-----	Good	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor	Good
045VM: VINLAND-----	Poor	Poor	Fair	Fair	Fair	Fair	Very poor	Very poor	Poor	Fair	Very poor	Fair
MARTIN-----	Fair	Good	Good	Fair	Fair	Good	Poor	Very poor	Good	Fair	Very poor	Good
045WC: WABASH-----	Poor	Poor	Poor	Poor	Poor	---	Good	Good	Poor	Poor	Good	---
087RE: READING-----	Good	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor	---
087SS: SIBLEYVILLE----	Fair	Good	Good	Fair	Fair	Good	Poor	Very poor	Good	Fair	Very poor	Good
087SV: SIBLEYVILLE----	Fair	Good	Good	Fair	Fair	Good	Very poor	Very poor	Good	Fair	Very poor	Good
087VO: VINLAND-----	Poor	Poor	Fair	Fair	Fair	Fair	Very poor	Very poor	Poor	Fair	Very poor	Fair
087WC: WABASH-----	Poor	Poor	Poor	Poor	Poor	---	Good	Good	Poor	Poor	Good	---
091ED: EUDORA-----	Good	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor	---
KIMO-----	Good	Good	Good	Fair	Fair	Fair	Good	Good	Good	Fair	Good	---
091LB: LADOGA-----	Fair	Good	Fair	Good	Good	---	Very poor	Poor	Fair	Good	Very poor	---
091RA: READING-----	Good	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor	---
091SB: SHARPSBURG-----	Fair	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
URBAN LAND-----	---	---	---	---	---	---	---	---	---	---	---	---
Aa: KENNEBEC-----	Poor	Poor	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor	Good
Ac: ARMSTER-----	Fair	Good	Good	Good	Good	Fair	Very poor	Very poor	Good	Good	Very poor	---
Ad: ARMSTER-----	Fair	Good	Good	Good	Good	---	Very poor	Very poor	Good	Good	Very poor	---
Ae: ARMSTER-----	Fair	Good	Good	Good	Good	---	Very poor	Very poor	Good	Good	Very poor	---
AED: ARENTS, EARTHEN DAM-----	---	---	---	---	---	---	---	---	---	---	---	---
Ba: BASEHOR-----	Poor	Poor	Fair	Good	Good	Fair	Very poor	Very poor	Poor	Good	Very poor	Poor
Br: BREMER-----	Good	Good	Good	Fair	Poor	---	Good	Good	Good	Fair	Good	---
Cf: BORROW PITS-----	---	---	---	---	---	---	---	---	---	---	---	---
Ec: ELMONT-----	Fair	Good	Good	Fair	Fair	Good	Poor	Very poor	Good	Fair	Very poor	Good

WILDLIFE INTERPRETATIONS--Continued
Leavenworth and Wyandotte Counties, Kansas

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hard- wood trees	Conif- erous plants	Shrubs	Wetland plants	Shallow water areas	Open- land wild- life	Wood- land wild- life	Wetland wild- life	Range- land wild- life
Ed: ELMONT-----	Fair	Good	Good	Fair	Fair	Good	Poor	Very poor	Good	Fair	Very poor	Good
Eu: EUDORA-----	Good	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor	---
HAYNIE-----	Good	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
Gc: GOSPORT-----	Very poor	Poor	Fair	Fair	Fair	---	Very poor	Very poor	Poor	Fair	Very poor	---
Gp: GRAVEL PITS----	---	---	---	---	---	---	---	---	---	---	---	---
Gs: GOSPORT-----	Very poor	Poor	Fair	Fair	Fair	---	Very poor	Very poor	Poor	Fair	Very poor	---
SOGN-----	Very poor	Very poor	Poor	---	---	Poor	Very poor	Very poor	Very poor	---	Very poor	Poor
Gt: GRUNDY-----	Fair	Good	Fair	Good	Good	---	Fair	Fair	Fair	Good	Fair	---
Gu: GRUNDY-----	Fair	Good	Fair	Good	Good	---	Poor	Very poor	Fair	Good	Very poor	---
Gy: GYMER-----	Fair	Good	Fair	Good	Good	Good	Poor	Very poor	Fair	---	Very poor	Fair
Hg: HAIG-----	Good	Fair	Fair	Fair	Poor	Fair	Good	Good	Fair	Fair	Good	---
Hy: HAYNIE-----	Good	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
Ju: JUDSON-----	Good	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor	---
Ke: KENNEBEC-----	Good	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
Kh: KNOX-----	Fair	Good	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor	Fair
Kk: KNOX-----	Poor	Fair	Good	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor	Fair
Km: KNOX-----	Fair	Good	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor	Fair
Kn: KNOX-----	Poor	Fair	Good	Good	Good	Fair	Very poor	Very poor	Fair	Good	Very poor	Poor
SOGN-----	Very poor	Very poor	Poor	---	---	Poor	Very poor	Very poor	Very poor	---	Very poor	Poor
Ko: KONAWA-----	Fair	Good	Good	Good	Good	---	Very poor	Very poor	Good	Good	Very poor	---
Kw: KONAWA-----	Fair	Good	Good	Good	Good	---	Very poor	Very poor	Good	Good	Very poor	---
La: LADOGA-----	Fair	Good	Fair	Good	Good	---	Very poor	Poor	Fair	Good	Very poor	---
M-W: MISCELLANEOUS WATER-----	---	---	---	---	---	---	---	---	---	---	---	---
Mb: MARSHALL-----	Good	Good	Good	Good	Good	---	Very poor	Very poor	Good	Good	Very poor	---

WILDLIFE INTERPRETATIONS--Continued
Leavenworth and Wyandotte Counties, Kansas

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hard- wood trees	Conif- erous plants	Shrubs	Wetland plants	Shallow water areas	Open- land wild- life	Wood- land wild- life	Wetland wild- life	Range- land wild- life
Mc: MARSHALL-----	Fair	Good	Good	Good	Good	---	Very poor	Very poor	Good	Good	Very poor	---
Md: MARSHALL-----	Fair	Good	Good	Good	Good	---	Very poor	Very poor	Good	Good	Very poor	---
Mn: MARTIN-----	Fair	Good	Good	Fair	Fair	Good	Poor	Very poor	Good	Fair	Very poor	Good
Mr: MARTIN-----	Fair	Good	Good	Fair	Fair	Good	Poor	Very poor	Good	Fair	Very poor	Good
Ms: MARTIN-----	Fair	Good	Good	Fair	Fair	Good	Poor	Very poor	Good	Fair	Very poor	Good
On: ONAWA-----	Fair	Fair	Fair	Poor	Very poor	---	Good	Good	Fair	Poor	Good	---
Oo: ONAWA-----	Fair	Fair	Fair	Poor	Very poor	---	Good	Good	Fair	Poor	Good	---
Os: OSKA-----	Fair	Good	Good	---	---	Good	Poor	Poor	Fair	---	Poor	Good
Pb: PAWNEE-----	Fair	Good	Good	---	Fair	Fair	Very poor	Poor	Good	---	Poor	Fair
Pc: PAWNEE-----	Fair	Good	Good	---	Fair	Fair	Very poor	Poor	Good	---	Poor	Fair
Pe: PAWNEE-----	Fair	Good	Good	---	Fair	Fair	Very poor	Poor	Good	---	Poor	Fair
Qu: QUARRIES-----	---	---	---	---	---	---	---	---	---	---	---	---
Rs: RIVER WASH-----	---	---	---	---	---	---	---	---	---	---	---	---
Sa: SARPY-----	Poor	Poor	Fair	Poor	Poor	---	Very poor	Very poor	Poor	Poor	Very poor	---
HAYNIE-----	Good	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
Sb: SHARPSBURG-----	Good	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
Sc: SHARPSBURG-----	Fair	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
Se: SHELBY-----	Good	Good	Fair	Good	Good	Good	Poor	Poor	Good	Good	Poor	---
Sh: SHELBY-----	Fair	Good	Fair	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor	---
Sm: SHELBY-----	Fair	Good	Fair	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor	---
Sp: SHELBY-----	Fair	Good	Fair	Good	Good	---	Very poor	Very poor	Fair	Good	Very poor	---
PAWNEE-----	Fair	Good	Good	---	Fair	Fair	Very poor	Poor	Good	---	Poor	Fair
Ss: SHELBY-----	Fair	Good	Fair	Good	Good	---	Very poor	Very poor	Fair	Good	Very poor	---

WILDLIFE INTERPRETATIONS--Continued
Leavenworth and Wyandotte Counties, Kansas

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hard- wood trees	Conif- erous plants	Shrubs	Wetland plants	Shallow water areas	Open- land wild- life	Wood- land wild- life	Wetland wild- life	Range- land wild- life
PAWNEE-----	Fair	Good	Good	---	Fair	Fair	Very poor	Poor	Good	---	Poor	Fair
Sy: SIBLEYVILLE----	Fair	Good	Good	Fair	Fair	Good	Poor	Very poor	Good	Fair	Very poor	Good
SZ: SOGN-----	Very poor	Very poor	Poor	---	---	Poor	Very poor	Very poor	Very poor	---	Very poor	Poor
VINLAND-----	Poor	Poor	Fair	Fair	Fair	Fair	Very poor	Very poor	Poor	Fair	Very poor	Fair
Uc: -----	---	---	---	---	---	---	---	---	---	---	---	---
Un: -----	---	---	---	---	---	---	---	---	---	---	---	---
VR: ROCK OUTCROP----	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor
VINLAND-----	Poor	Poor	Fair	Fair	Fair	Fair	Very poor	Very poor	Poor	Fair	Very poor	Fair
Vs: VINLAND-----	Poor	Poor	Fair	Fair	Fair	Fair	Very poor	Very poor	Poor	Fair	Very poor	Fair
SIBLEYVILLE----	Fair	Good	Good	Fair	Fair	Good	Poor	Very poor	Good	Fair	Very poor	Good
W: WATER-----	---	---	---	---	---	---	---	---	---	---	---	---
Wa: WABASH-----	Poor	Poor	Poor	Poor	Poor	Fair	Poor	Good	Poor	Poor	Fair	---
Wc: WELDA-----	Fair	Good	Good	Good	Good	Good	Very poor	Poor	Good	Good	Very poor	Good
Wd: WELDA-----	Fair	Good	Good	Good	Good	Good	Very poor	Poor	Good	Good	Very poor	Good
Zo: ZOOK-----	Good	Fair	Good	Fair	Poor	Fair	Good	Good	Fair	Fair	Good	---

YIELDS PER ACRE OF PASTURE AND HAYLAND
Leavenworth and Wyandotte Counties, Kansas

Use and Explanation of Pastureland and Hayland Interpretations

This subsection provides information concerning the suitability of soils for the production of pasture and hayland. This subsection may contain pasture and hayland suitability groupings, land capability and yield estimates, yield estimates for individual grasses or legumes, or other information pertaining to the production of forage.

Pasture and Hayland Suitability Groupings

Soils are placed in pasture and hayland groups according to their suitability for the production of forage. The soils in each group are enough alike to be suited to the same grasses or legumes, to have similar limitations and hazards, to require similar management, and to have similar productivity and other responses to management. Thus, the pasture and hayland suitability group is a convenient way of grouping the soils for their management. If used, these groupings are identified and described in other reports in the subsection.

Yield Estimates

The average yields per acre that can be expected of the principal pasture or hayland crops, under a high level of management, are presented in this subsection. In any given year, yields may be higher or lower than those indicated in the tables because of variations in rainfall or other climatic factors. The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations are also considered.

Under good management, proper grazing is essential for the production of high quality forage, stand survival, and erosion control. Proper grazing helps plants maintain sufficient and generally vigorous top growth during the growing season. Brush control is essential in many areas, and weed control generally is needed. Rotation grazing and renovation are also important management practices.

The Pasture and Hayland table show yield estimates in tons per acre and animal unit months for pasture and hayland groups. An animal unit month is the amount of forage required by one animal unit (AU) for 30 days. One animal unit (AU) is one (1000 pound) mature cow and a calf up to weaning age (usually six months of age) or their equivalent. The Natural Resources Conservation Service uses 900 pounds of air dry forage as the amount needed to meet this requirement. To maintain a healthy and vigorous plant community, the degree of use should never be greater than 50 percent. Therefore only 25 percent of the total biomass grown is considered consumed by the grazing animal. Animal Unit Months can be converted to air dry pounds per acre production by multiplying the AUM by 30 days, then by 30 pounds per day, and then by four. This figure is the amount of total forage production.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil in the Nontechnical Description section. Specific information on plants and yields can be obtained from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

(Yields in the "N" columns are for nonirrigated soils; those in the "I" columns are for irrigated soils. Yields are those that can be expected under a high level of nonirrigated and irrigated management by component. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil)
Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

Map symbol and soil name	Land capability		Alfalfa hay	
	N	I	N	I
			Tons	Tons
005AQ: Fluvaquents-----	8w	---	---	---
005AR: Armster-----	4e	---	3.00	---
005GO: Gosport-----	7e	---	2.00	---
005HN: Haynie-----	2w	2w	---	---
005HO: Haynie-----	2w	2w	---	---
Onawa-----	2w	2w	---	---
005KG: Kennebec-----	2w	---	4.50	---
Colo-----	w	---	3.00	---
005KY: Knox-----	6e	---	1.50	---
Gosport-----	e	---	1.00	---
005OD: Onawa-----	2w	2w	---	---
005OW: Onawet-----	5w	---	---	---
005PA: Knox-----	3e	---	---	---
Palermo-----	4e	---	---	---
005PB: Palermo-----	4e	---	---	---
005SH: Shelby-----	3e	---	3.40	---
005WA: Wabash-----	3w	---	---	---
005WH: Wathena-----	4w	---	---	---
Haynie-----	2w	2w	---	---
045ET: Eudora-----	1	---	5.00	---
045EV: Eudora-----	2w	---	5.00	---
Kimo-----	2w	---	4.50	---
045KM: Kimo-----	2w	---	4.50	---
045MR: Morrill-----	3e	---	3.60	---
045RO: River Wash-----	8s	---	---	---
045SB: Sarpy-----	3w	---	4.50	---
Eudora-----	3w	---	5.00	---
045VM: Vinland-----	6e	---	---	---
Martin-----	4e	---	2.80	---

(Yields in the "N" columns are for nonirrigated soils; those in the "I" columns are for irrigated soils. Yields are those that can be expected under a high level of nonirrigated and irrigated management by component. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil)
Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

Map symbol and soil name	Land capability		Alfalfa hay	
	N	I	N	I
			Tons	Tons
045WC: Wabash-----	3w	---	---	---
087RE: Reading-----	2w	---	5.00	---
087SS: Sibleyville-----	4e	---	3.20	---
087SV: Sibleyville-----	6e	---	---	---
087VO: Vinland-----	6e	---	---	---
087WC: Wabash-----	3w	---	---	---
091ED: Eudora-----	1	---	5.00	---
Kimo-----	2w	---	4.50	---
091LB: Ladoga-----	4e	---	---	---
091RA: Reading-----	1	---	5.60	---
091SB: Sharpsburg-----	3e	---	---	---
Urban Land-----	---	---	---	---
Aa: Kennebec, CHANNELED-----	5w	---	---	---
Ac: Armster-----	3e	---	---	---
Ad: Armster-----	4e	---	---	---
Ae: Armster, eroded-----	4e	---	---	---
AED: Arents, Earthen Dam-----	8	---	---	---
Ba: Basehor-----	6s	---	---	---
Br: Bremer-----	2w	---	---	---
Cf: Borrow Pits-----	---	---	---	---
Ec: Elmont-----	3e	---	3.60	---
Ed: Elmont-----	4e	---	3.20	---
Eu: Eudora-----	1	---	5.00	---
Haynie-----	2w	2w	---	---
Gc: Gosport-----	7e	---	---	---
Gp: Gravel Pits-----	---	---	---	---
Gs: Gosport-----	7e	---	---	---
Sogn-----	e	---	---	---

(Yields in the "N" columns are for nonirrigated soils; those in the "I" columns are for irrigated soils. Yields are those that can be expected under a high level of nonirrigated and irrigated management by component. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil)
Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

Map symbol and soil name	Land capability		Alfalfa hay	
	N	I	N	I
			Tons	Tons
Gt: Grundy-----	2e	---	---	---
Gu: Grundy-----	3e	---	---	---
Gy: Gymer-----	3e	---	3.60	---
Hg: Haig-----	2w	---	---	---
Hy: Haynie-----	2w	2w	---	---
Ju: Judson-----	1	---	---	---
Ke: Kennebec-----	2w	---	---	---
Kh: Knox-----	3e	---	---	---
Kk: Knox-----	4e	---	---	---
Km: Knox, eroded-----	4e	---	---	---
Kn: Knox-----	6e	---	---	---
Sogn-----	---	---	---	---
Ko: Konawa-----	3e	---	---	---
Kw: Konawa-----	6e	---	---	---
La: Ladoga-----	3e	---	---	---
M-W: Miscellaneous Water-----	---	---	---	---
Mb: Marshall-----	2e	---	---	---
Mc: Marshall-----	3e	---	---	---
Md: Marshall-----	4e	---	---	---
Mn: Martin-----	3e	---	3.20	---
Mr: Martin-----	4e	---	2.80	---
Ms: Martin-----	6e	---	2.80	---
On: Onawa-----	2w	2w	---	---
Oo: Onawa-----	2w	---	---	---
Os: Oska-----	3e	---	3.00	---
Pb: Pawnee-----	2e	---	3.50	4.80
Pc: Pawnee-----	3e	---	2.10	---

(Yields in the "N" columns are for nonirrigated soils; those in the "I" columns are for irrigated soils. Yields are those that can be expected under a high level of nonirrigated and irrigated management by component. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil)
Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

Map symbol and soil name	Land capability		Alfalfa hay	
	N	I	N	I
			Tons	Tons
Pe: Pawnee, eroded-----	3e	---	1.80	---
Qu: Quarries-----	---	---	---	---
Rs: River Wash-----	8s	---	---	---
Sa: Sarpy-----	3w	---	---	---
Haynie-----	2w	---	---	---
Sb: Sharpsburg-----	2e	---	---	---
Sc: Sharpsburg-----	3e	---	---	---
Se: Shelby-----	2e	---	---	---
Sh: Shelby-----	3e	---	---	---
Sm: Shelby-----	4e	---	---	---
Sp: Shelby-----	3e	---	---	---
Pawnee-----	3e	---	2.10	---
Ss: Shelby, eroded-----	3e	---	---	---
Pawnee, eroded-----	3e	---	1.80	---
Sy: Sibleyville-----	3e	---	3.20	---
SZ: Sogn-----	7s	---	---	---
Vinland-----	6s	---	---	---
Uc:	---	---	---	---
Un:	---	---	---	---
VR: Rock Outcrop-----	8	---	---	---
Vinland-----	6e	---	---	---
Vs: Vinland-----	6e	---	---	---
Sibleyville-----	4e	---	3.20	---
W: Water-----	---	---	---	---
Wa: Wabash-----	3w	---	---	---
Wc: Welda-----	3e	---	3.50	---
Wd: Welda-----	4e	---	3.00	---
Zo: Zook-----	2w	---	3.80	---

CONSERVATION TREE AND SHRUB MANAGEMENT
Leavenworth and Wyandotte
Counties, Kansas

A Conservation Tree/Shrub Suitability Group (CTSG), formerly Windbreak Suitability Group, is a physiographic unit or area having similar climatic and edaphic characteristics that control the selection and height growth of trees and shrubs.

In this table, the Conservation Tree and Shrub Grouping is expressed as a group index number. The group index for Conservation Tree and Shrub groups (CTSG) are a guide for species best suited for different kinds of soil and for prediction height, growth, and effectiveness. The groupings can be used when selection woody plants for windbreaks, wildlife plantings riparian buffers, reforestation, other environmental plantings, recreation, landscaping, wetland restoration or enhancement and critical area plantings. CTSG's are developed to assure satisfactory species selection and adaptation to specific conditions of soil, climate and physiography. CTSG's are a guide for selection species best suited for different kinds of soil and prediction height growth and effectiveness.

All soil series mapped in the state have been placed in 10 groups of similar soil characteristics. Groups 1, 2, 3, 4, 6, and 9 are further divided into subgroups. In addition, all groups provide information by Major Land Resource Areas.

Each tree or shrub species has certain climatic and physiographic limits. Within these parameters a tree or shrub may be well or poorly suited because of soil characteristics. Each tree or shrub also has definable potentials of height growth depending on the factors just mentioned. Accurate definitions of potential heights are necessary for proper windbreak planning and design.

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

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

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

Windbreaks are often planted on land that did not grow trees originally. Knowledge of how trees perform on such land can be gained only by observing and recording their performance where trees have been planted and survived. The problem is compounded by the fact that many favorite windbreak species are not indigenous to the areas in which they are planted.

The Kansas Field Office Technical Guide Notice KS-230, Conservation Tree and Shrub Plantings Suitability Groups shows the adapted species listing for each group index number. Showing the height that locally grown trees and shrubs are expected to reach in 20 years on various soils. The estimates are based on measurements and observation of established plantings that have been given adequate care. This information should be used to determine the placement of a windbreak, the area protected and the arrangement of species.

A number of attributes are included in the CTSG species tables for each group number found in this section of the Field Office Technical Guide. These attributes were rated subjectively and assigned a relative value to further assist those unfamiliar with individual species characteristics or desirability for the intended use. Definitions and explanations can be found. Additional information on planning windbreaks and screens and planting and caring for trees and shrubs can be obtained from the local office of the Natural Resources Conservation Service or of the Cooperative Extension Service or from a commercial nursery. See part 537 of the National Forestry Manual for additional information.

In the Tree and Shrub Management table interpretive ratings are given for various aspects of forest and conservation tree and shrub management. Some rating class terms indicate the degree to which the soils are suited to a specified forest management practice. Well suited indicates that the soil has features that are favorable for the specified practice and has no limitations. Good performance can be expected, and little or no maintenance is needed. Moderately well suited indicates that the soil has features that are moderately favorable for the specified practice. One or more soil properties are less than desirable and fair performance can be expected. Some maintenance is needed. Poorly suited indicates that the soil has one or more properties that are unfavorable for the specified practice. Overcoming the unfavorable properties requires special design, extra maintenance, and costly alteration. Unsuitable indicates that the expected performance of the soil is unacceptable for the specified practice or that extreme measures are needed to overcome the undesirable soil properties.

The paragraphs that follow indicate the soil properties considered in rating the soils for forest and conservation tree and shrub management practices. More detailed information about the criteria used in the ratings is available in the "National Forestry Manual," which is available in local offices of the Natural Resources Conservation Service or on the Internet. Also, in the Kansas Field Office Technical Guide Notice KS-230, Conservation Tree and Shrub Plantings Suitability Groups.

Ratings in the columns suitability for hand planting and suitability for mechanical planting are based on slope, depth to a restrictive layer, content of sand, plasticity index, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, moderately well suited, poorly suited, or unsuited to these methods of planting. It is assumed that necessary site preparation is completed before seedlings are planted.

Ratings in the column suitability for mechanical site preparation (surface) are based on slope, depth to a restrictive layer, plasticity index, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, poorly suited, or unsuited to this management activity. The part of the soil from the surface to a depth of about 1-foot is considered in the ratings.

Ratings in the column suitability for mechanical site preparation (deep) are based on slope, depth to a restrictive layer, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, poorly suited, or unsuited to this management activity. The part of the soil from the surface to a depth of about 3 feet is considered in the ratings.

Ratings in the column potential for seedling mortality are based on flooding, ponding, depth to a water table, content of lime, reaction, salinity, available water capacity, soil moisture regime, soil temperature regime, aspect, and slope. The soils are described as having a low, moderate, or high potential for seedling mortality. See the National Forestry Manual, Subpart B for criteria used in rating management concerns. Specific information on plants and yields can be obtained from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

CONSERVATION TREE AND SHRUB MANAGEMENT
Leavenworth and
Wyandotte Counties,
Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. Pines and spruces are prone to disease problems. See text for further explanation of ratings in this table.)

Map symbol and soil name	Wind break Group	Suitability for hand planting	Suitability for mechanical planting	Suitability for mechanical site preparation (surface)	Suitability for mechanical site preparation (deep)	Potential for seedling mortality
		Rating class and limiting features	Rating class and limiting features	Rating class and limiting features	Rating class and limiting features	Rating class and limiting features
005AQ: Fluvaquents-----		Moderately suited Rock fragments	Poorly suited Rock fragments	Poorly suited Rock fragments	Well suited	High Wetness Soil reaction
005AR: Armster-----	4C	Moderately suited Stickiness	Moderately suited Stickiness Slope	Poorly suited Stickiness	Well suited	High Wetness
005GO: Gosport-----	4C	Poorly suited Stickiness Slope	Unsuited Slope Stickiness	Poorly suited Slope Stickiness	Poorly suited Slope	Low
005HN: Haynie-----	1K	Well suited	Well suited	Well suited	Well suited	Moderate Lime
005HO: Haynie-----	1K	Well suited	Well suited	Well suited	Well suited	Moderate Lime
Onawa-----	1	Poorly suited Stickiness	Poorly suited Stickiness	Poorly suited Stickiness	Well suited	Moderate Soil reaction
005KG: Kennebec-----	1	Well suited	Well suited	Well suited	Well suited	Low
Colo-----	1	Moderately suited Stickiness	Moderately suited Stickiness	Well suited	Well suited	Moderate Wetness
005KY: Knox-----	3	Moderately suited Stickiness	Poorly suited Slope Stickiness	Poorly suited Slope	Poorly suited Slope	Low
Gosport-----	4C	Poorly suited Stickiness	Poorly suited Slope Stickiness	Poorly suited Stickiness Slope	Poorly suited Slope	Low
005OD: Onawa-----	1	Moderately suited Stickiness	Moderately suited Stickiness	Well suited	Well suited	Moderate Soil reaction
005OW: Onawet-----	10	Poorly suited Stickiness	Poorly suited Stickiness	Poorly suited Stickiness	Well suited	High Wetness
005PA: Knox-----	3	Moderately suited Stickiness	Moderately suited Slope Stickiness	Well suited	Well suited	Low
Palermo-----	3	Well suited	Moderately suited Slope	Well suited	Well suited	Low
005PB: Palermo-----	3	Well suited	Poorly suited Slope	Poorly suited Slope	Poorly suited Slope	Low
005SH: Shelby-----	3	Moderately suited Stickiness	Moderately suited Slope Stickiness	Well suited	Well suited	Low
005WA: Wabash-----	2	Poorly suited Stickiness	Poorly suited Stickiness	Poorly suited Stickiness	Well suited	High Wetness
005WH: Wathena-----	1K	Well suited	Well suited	Well suited	Well suited	Moderate Wetness
Haynie-----	1K	Well suited	Well suited	Well suited	Well suited	Moderate Lime
045ET: Eudora-----	1	Well suited	Well suited	Well suited	Well suited	Low
045EV: Eudora-----	1	Well suited	Well suited	Well suited	Well suited	Low
Kimo-----	1	Moderately suited Stickiness	Moderately suited Stickiness	Poorly suited Stickiness	Well suited	Low
045KM: Kimo-----	1	Moderately suited Stickiness	Moderately suited Stickiness	Poorly suited Stickiness	Well suited	Low

CONSERVATION TREE AND SHRUB MANAGEMENT
Leavenworth and
Wyandotte Counties,
Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. Pines and spruces are prone to disease problems. See text for further explanation of ratings in this table.)

Map symbol and soil name	Wind break Group	Suitability for hand planting	Suitability for mechanical planting	Suitability for mechanical site preparation (surface)	Suitability for mechanical site preparation (deep)	Potential for seedling mortality
		Rating class and limiting features	Rating class and limiting features	Rating class and limiting features	Rating class and limiting features	Rating class and limiting features
045MR: Morrill-----	3	Well suited	Moderately suited Slope	Well suited	Well suited	Low
045RO: River Wash-----		Not rated	Not rated	Not rated	Not rated	Not rated
045SB: Sarpy-----	1K	Well suited	Well suited	Well suited	Well suited	Low
Eudora-----	1	Well suited	Well suited	Well suited	Well suited	Low
045VM: Vinland-----	10	Well suited	Moderately suited Slope	Well suited	Well suited	Low
Martin-----	4C	Moderately suited Stickiness	Moderately suited Slope Stickiness	Well suited	Well suited	Low
045WC: Wabash-----	2	Moderately suited Stickiness	Moderately suited Stickiness	Well suited	Well suited	High Wetness
087RE: Reading-----	1	Well suited	Well suited	Well suited	Well suited	Low
087SS: Sibleyville-----	6D	Well suited	Moderately suited Slope	Well suited	Well suited	Low
087SV: Sibleyville-----	6D	Well suited	Moderately suited Slope	Well suited	Well suited	Low
087VO: Vinland-----	10	Well suited	Moderately suited Slope	Well suited	Well suited	Low
087WC: Wabash-----	2	Moderately suited Stickiness	Moderately suited Stickiness	Well suited	Well suited	High Wetness
091ED: Eudora-----	1	Well suited	Well suited	Well suited	Well suited	Low
Kimo-----	1	Moderately suited Stickiness	Moderately suited Stickiness	Poorly suited Stickiness	Well suited	Low
091LB: Ladoga-----	3	Well suited	Moderately suited Slope	Well suited	Well suited	Low
091RA: Reading-----	1	Well suited	Well suited	Well suited	Well suited	Low
091SB: Sharpsburg-----	3	Moderately suited Stickiness	Moderately suited Stickiness Slope	Well suited	Well suited	Low
Urban Land-----		Unsuited Horizon table contains no data	Unsuited Horizon table contains no data	Unsuited Horizon table contains no data	Unsuited Horizon table contains no data	High Horizon table contains no data
Aa: Kennebec, CHANNELED-	1	Well suited	Well suited	Well suited	Well suited	Low
Ac: Armster-----	4C	Moderately suited Stickiness	Moderately suited Stickiness Slope	Poorly suited Stickiness	Well suited	High Wetness
Ad: Armster-----	4C	Moderately suited Stickiness	Moderately suited Stickiness Slope	Poorly suited Stickiness	Well suited	High Wetness
Ae: Armster, eroded----	4C	Moderately suited Stickiness	Moderately suited Stickiness Slope	Poorly suited Stickiness	Well suited	High Wetness
AED: Arents, Earthen Dam-		Not rated	Not rated	Not rated	Not rated	Not rated

CONSERVATION TREE AND SHRUB MANAGEMENT
Leavenworth and
Wyandotte Counties,
Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. Pines and spruces are prone to disease problems. See text for further explanation of ratings in this table.)

Map symbol and soil name	Wind break Group	Suitability for hand planting	Suitability for mechanical planting	Suitability for mechanical site preparation (surface)	Suitability for mechanical site preparation (deep)	Potential for seedling mortality
		Rating class and limiting features	Rating class and limiting features	Rating class and limiting features	Rating class and limiting features	Rating class and limiting features
Ba: Basehor-----	10	Moderately suited Rock fragments	Poorly suited Slope Rock fragments	Poorly suited Rock fragments Slope	Poorly suited Slope	Low
Br: Bremer-----	2	Poorly suited Stickiness	Poorly suited Stickiness	Poorly suited Stickiness	Well suited	Low
Cf: Borrow Pits-----		Not rated	Not rated	Not rated	Not rated	Not rated
Ec: Elmont-----	3	Well suited	Moderately suited Slope	Well suited	Well suited	Low
Ed: Elmont-----	3	Well suited	Moderately suited Slope	Well suited	Well suited	Low
Eu: Eudora----- Haynie-----	1 1K	Well suited Well suited	Well suited Well suited	Well suited Well suited	Well suited Well suited	Low Moderate Lime
Gc: Gosport-----	4C	Poorly suited Stickiness	Poorly suited Slope Stickiness	Poorly suited Stickiness Slope	Poorly suited Slope	Low
Gp: Gravel Pits-----		Not rated	Not rated	Not rated	Not rated	Not rated
Gs: Gosport-----	4C	Poorly suited Stickiness	Poorly suited Slope Stickiness	Poorly suited Stickiness Slope	Poorly suited Slope	Low
Sogn-----	10	Well suited	Moderately suited Slope	Well suited	Unsuited Restrictive layer	Low
Gt: Grundy-----	4C	Moderately suited Stickiness	Moderately suited Stickiness	Poorly suited Stickiness	Well suited	Low
Gu: Grundy-----	4C	Moderately suited Stickiness	Moderately suited Stickiness Slope	Poorly suited Stickiness	Well suited	Low
Gy: Gymer-----	4C	Moderately suited Stickiness	Moderately suited Slope Stickiness	Well suited	Well suited	Low
Hg: Haig-----	4C	Poorly suited Stickiness	Poorly suited Stickiness	Poorly suited Stickiness	Well suited	Low
Hy: Haynie-----	1K	Well suited	Well suited	Well suited	Well suited	Moderate Lime
Ju: Judson-----	1	Well suited	Well suited	Well suited	Well suited	Low
Ke: Kennebec-----	1	Well suited	Well suited	Well suited	Well suited	Low
Kh: Knox-----	3	Well suited	Moderately suited Slope	Well suited	Well suited	Low
Kk: Knox-----	3	Well suited	Moderately suited Slope	Poorly suited Slope	Poorly suited Slope	Low
Km: Knox, eroded-----	3	Well suited	Moderately suited Slope	Well suited	Well suited	Low
Kn: Knox-----	3	Well suited	Poorly suited	Poorly suited	Poorly suited	Low

CONSERVATION TREE AND SHRUB MANAGEMENT
Leavenworth and
Wyandotte Counties,
Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. Pines and spruces are prone to disease problems. See text for further explanation of ratings in this table.)

Map symbol and soil name	Wind break Group	Suitability for hand planting	Suitability for mechanical planting	Suitability for mechanical site preparation (surface)	Suitability for mechanical site preparation (deep)	Potential for seedling mortality
		Rating class and limiting features	Rating class and limiting features	Rating class and limiting features	Rating class and limiting features	Rating class and limiting features
Sogn----- Ko: Konawa-----	10 5	Well suited	Slope Poorly suited Slope	Slope Poorly suited Slope	Slope Poorly suited Slope	Low
Kw: Konawa-----	5	Well suited	Moderately suited Slope	Well suited	Well suited	Low
La: Ladoga-----	5 3	Well suited	Moderately suited Slope	Well suited	Well suited	Low
M-W: Miscellaneous Water-		Not rated	Not rated	Not rated	Not rated	Not rated
Mb: Marshall-----	3	Well suited	Well suited	Well suited	Well suited	Low
Mc: Marshall-----	3	Well suited	Moderately suited Slope	Well suited	Well suited	Low
MG: Marshall-----	3	Well suited	Moderately suited Slope	Well suited	Well suited	Low
Mn: Martin-----	4C	Poorly suited Stickiness	Poorly suited Stickiness Slope	Poorly suited Stickiness	Well suited	Low
Mr: Martin-----	4C	Poorly suited Stickiness	Poorly suited Stickiness Slope	Poorly suited Stickiness	Well suited	Low
Ms: Martin-----	4C	Poorly suited Stickiness	Poorly suited Stickiness Slope	Poorly suited Stickiness	Well suited	Low
On: Onawa-----	1	Poorly suited Stickiness	Poorly suited Stickiness	Poorly suited Stickiness	Well suited	Moderate Soil reaction
Oo: Onawa-----	1	Poorly suited Stickiness	Poorly suited Stickiness	Poorly suited Stickiness	Well suited	Moderate Soil reaction
Os: Oska-----	6D	Moderately suited Stickiness	Moderately suited Stickiness Slope	Well suited	Well suited	Low
Pb: Pawnee-----	4C	Moderately suited Stickiness	Moderately suited Stickiness	Well suited	Well suited	High Wetness
Pc: Pawnee-----	4C	Poorly suited Stickiness	Poorly suited Stickiness Slope	Poorly suited Stickiness	Well suited	High Wetness
Pe: Pawnee, eroded-----	4C	Poorly suited Stickiness	Poorly suited Stickiness Slope	Poorly suited Stickiness	Well suited	High Wetness
Qu: Quarries-----		Not rated	Not rated	Not rated	Not rated	Not rated
Rs: River Wash-----		Not rated	Not rated	Not rated	Not rated	Not rated
Sa: Sarpy-----	1K	Well suited	Well suited	Well suited	Well suited	Moderate Wetness
Haynie-----	1K	Well suited	Well suited	Well suited	Well suited	Moderate Lime
Sb: Sharpsburg-----	3	Moderately suited Stickiness	Moderately suited Stickiness	Well suited	Well suited	Low

CONSERVATION TREE AND SHRUB MANAGEMENT
Leavenworth and
Wyandotte Counties,
Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. Pines and spruces are prone to disease problems. See text for further explanation of ratings in this table.)

Map symbol and soil name	Wind break Group	Suitability for hand planting	Suitability for mechanical planting	Suitability for mechanical site preparation (surface)	Suitability for mechanical site preparation (deep)	Potential for seedling mortality
		Rating class and limiting features	Rating class and limiting features	Rating class and limiting features	Rating class and limiting features	Rating class and limiting features
Sc: Sharpsburg-----	3	Moderately suited Stickiness	Moderately suited Stickiness Slope	Well suited	Well suited	Low
Se: Shelby-----	3	Moderately suited Stickiness	Moderately suited Stickiness	Well suited	Well suited	Low
Sh: Shelby-----	3	Moderately suited Stickiness	Moderately suited Slope Stickiness	Well suited	Well suited	Low
Sm: Shelby-----	3	Well suited	Moderately suited Slope	Well suited	Well suited	Low
Sp: Shelby-----	3	Moderately suited Stickiness	Moderately suited Slope Stickiness	Well suited	Well suited	Low
Pawnee-----	4C	Poorly suited Stickiness	Poorly suited Stickiness Slope	Poorly suited Stickiness	Well suited	High Wetness
Ss: Shelby, eroded-----	3	Moderately suited Stickiness	Moderately suited Slope Stickiness	Well suited	Well suited	Low
Pawnee, eroded-----	4C	Poorly suited Stickiness	Poorly suited Stickiness Slope	Poorly suited Stickiness	Well suited	High Wetness
Sy: Sibleyville-----	6D	Well suited	Moderately suited Slope	Well suited	Well suited	Low
SZ: Sogn-----	10	Well suited	Moderately suited Slope	Well suited	Unsuited Restrictive layer	Low
Vinland-----	10	Well suited	Moderately suited Slope	Well suited	Well suited	Low
VR: Rock Outcrop-----		Not rated	Not rated	Not rated	Not rated	Not rated
Vinland-----	10	Well suited	Poorly suited Slope	Poorly suited Slope	Poorly suited Slope	Low
Vs: Vinland-----	10	Well suited	Moderately suited Slope	Well suited	Well suited	Low
Sibleyville-----	6D	Well suited	Moderately suited Slope	Well suited	Well suited	Low
W: Water-----		Not rated	Not rated	Not rated	Not rated	Not rated
Wa: Wabash-----	2	Poorly suited Stickiness	Poorly suited Stickiness	Poorly suited Stickiness	Well suited	High Wetness
Wc: Welda-----	3	Moderately suited Stickiness	Moderately suited Stickiness Slope	Well suited	Well suited	Low
Wd: Welda-----	3	Moderately suited Stickiness	Moderately suited Slope Stickiness	Well suited	Well suited	Low
Zo: Zook-----	2	Moderately suited Stickiness	Moderately suited Stickiness	Well suited	Well suited	Moderate Wetness

ENGINEERING INDEX PROPERTIES
Leavenworth and Wyandotte
Counties, Kansas

Engineering Index Properties table gives the engineering classifications and the range of index 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.

Classification of the soils is determined according to the Unified soil classification system (ASTM, 1998) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 1998). 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. The AASHTO classification for soils tested, with group index numbers in parentheses, is given in Engineering Index Properties table.

Rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage. Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an oven-dry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and plasticity index (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination. The estimates of particle-size distribution, liquid limit, and plasticity index are generally rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is generally omitted in the table.

ENGINEERING INDEX PROPERTIES--Continued
Leavenworth and Wyandotte
Counties, Kansas

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

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
					Pct	Pct						
005AQ: Fluvaquents----	0-80	Stratified variable			---	---	---	---	---	---	---	---
005AR: Armster-----	0-7 7-60	Clay loam Clay loam	CL CH, CL	A-7 A-7	0 0	0 0	95-100 95-100	80-95 80-95	70-90 70-90	55-80 55-80	40-50 45-60	25-35 25-35
005GO: Gosport-----	0-8 8-35 35-39	Silty clay loam Silty clay Weathered bedrock	MH, ML CH	A-7 A-7	0 0	0 0	100 100	90-100 90-100	90-100 90-100	85-100 85-100	41-55 50-65	11-20 35-50
005HN: Haynie-----	0-7 7-60	Silt loam Stratified silt loam	CL, CL-ML CL, CL-ML	A-4, A-6 A-4, A-6	0 0	0 0	100 100	100 100	85-100 85-100	70-100 85-100	25-40 25-35	5-15 5-15
005HO: Haynie-----	0-7 7-60	Silt loam Stratified silt loam	CL, CL-ML CL, CL-ML	A-4, A-6 A-6, A-4	0 0	0 0	100 100	100 100	85-100 85-100	70-100 85-100	25-40 25-35	5-15 5-15
Onawa-----	0-7 7-22 22-60	Silty clay loam Silty clay Silt loam	CH, MH CH CL, CL-ML	A-7 A-7 A-4, A-6	0 0 0	0 0 0	100 100 100	100 100 100	95-100 95-100 95-100	95-100 95-100 85-100	48-56 58-72 32-38	27-33 35-46 14-19
005KG: Kennebec-----	0-47 47-60	Silt loam Silt loam	CL CL, CL-ML	A-6, A-7 A-4, A-6	0 0	0 0	100 100	100 100	95-100 95-100	90-100 90-100	25-45 25-40	10-20 5-15
Colo-----	0-8 8-60 60-64	Silt loam Silty clay loam Silty clay loam	CL, CL-ML CL, CL-ML CH, CL	A-6, A-7 A-4, A-6 A-7 A-7	0 0 0	0 0 0	100 100 100	100 100 100	95-100 95-100 90-100	90-100 90-100 80-100	25-40 40-55 40-55	5-15 20-30 15-30
005KY: Knox-----	0-8 8-45 45-60	Silt loam Silty clay loam Silt loam	CL, CL-ML, ML CL CL	A-4, A-6 A-7 A-6, A-7	---	0 0	100 100 100	100 100 100	95-100 95-100 95-100	90-100 95-100 90-100	20-35 40-50 30-45	2-15 20-30 10-25
Gosport-----	0-8 8-35 35-39	Silty clay loam Silty clay Weathered bedrock	MH, ML CH	A-7 A-7	---	0 0	100 100	90-100 90-100	90-100 90-100	85-100 85-100	41-55 50-65	11-20 35-50
005OD: Onawa-----	0-10 10-17 17-32 32-70	Loam Silty clay loam Silty clay Silt loam			0 0 0 0	0 0 0 0	100 100 100 100	100 100 100 100	92-100 95-100 95-100 95-100	75-85 95-100 95-100 85-100	31-44 48-56 58-72 32-38	14-23 27-33 35-46 14-19
005OW: Onawet-----	0-7 7-24 24-56 56-80	Silty clay loam Silty clay Silt loam Loamy fine sand			0 0 0 0	0 0 0 0	100 100 100 100	100 100 100 100	95-100 95-100 85-100 70-85	85-95 90-100 60-90 40-55	40-55 55-75 25-35 0-20	15-30 35-60 5-20 NP-5
005PA: Knox-----	0-7 7-12	Silt loam Silty clay loam, silt loam	CL	A-7	---	0 0	100 100	100 100	95-100 95-100	90-100 95-100	27-37 29-39	8-18 9-19
Palermo-----	12-23 23-35 35-61 61-70 0-5 5-11 11-23 23-41 41-80	Silty clay loam Silty clay loam Silty clay loam Silt loam Silty clay loam Silty clay loam Silt loam Silt loam	CL	A-6, A-7	---	0 0 0 0 0 0 0 0	100 100 100 100 100 100 100 100	100 100 100 100 100 100 100 100	95-100 95-100 95-100 95-100 ---	90-100 90-100 90-100 90-100 ---	36-46 32-42 30-40 27-37 30-35 ---	15-25 10-21 10-20 1-18 10-15 ---
005PB: Palermo-----	0-5 5-11 11-23 23-41 41-80	Silty clay loam Silty clay loam Silty clay loam Silt loam Silt loam			0 0 0 0 0	0 0 0 0 0	100 100 100 100 100	100 100 100 100 100	---	---	30-35 ---	10-15 ---
005SH: Shelby-----	0-12 12-47 47-60	Clay loam Clay loam Clay loam	CL CL CL	A-6, A-7 A-6, A-7 A-6, A-7	0 0 0	0 0-5 0-5	90-95 90-95 90-95	85-95 85-95 85-95	75-90 75-90 75-90	55-70 55-70 55-70	35-45 30-45 30-45	15-25 15-25 15-25
005WA: Wabash-----	0-8 8-60	Silty clay loam Silty clay	CH, CL CH	A-6, A-7 A-7	0 0	0 0	100 100	100 100	100 100	95-100 95-100	35-55 52-78	15-35 30-55
005WH: Wathena-----	0-9 9-37	Loamy fine sand Stratified loamy fine sand	SM SM	A-2-4 A-2-4	0 0	0 0	100 100	100 100	90-100 60-80	15-35 15-35	0-0 0-0	NP NP
Haynie-----	37-52 52-64 64-80 0-7 7-60	Stratified silt loam Stratified silt loam Fine sand Silt loam Stratified silt loam			---	---	100 100 100 100	100 100 100 100	90-100 90-100 65-80 85-100	70-90 70-90 20-35 85-100	28-35 28-35 0-0 25-40	9-15 9-15 NP 5-15

ENGINEERING INDEX PROPERTIES--Continued
Leavenworth and Wyandotte
Counties, Kansas

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

Map symbol and soil name	Depth In	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit Pct	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
					Pct	Pct						
045ET: Eudora-----	0-12 12-72	Silt loam Silt loam	CL, CL-ML, ML CL, CL-ML, ML	A-4, A-6 A-4	0 0	0 0	100 100	100 100	85-100 95-100	60-100 65-100	20-30 15-25	2-11 NP-10
045EV: Eudora-----	0-12 12-72	Silt loam Silt loam	CL, CL-ML, ML CL, CL-ML, ML	A-4, A-6 A-4	0 0	0 0	100 100	100 100	85-100 95-100	60-100 65-100	20-30 15-25	2-11 NP-10
Kimo-----	0-6 6-28 28-60	Silty clay loam Silty clay Silt loam	CH, CL CH, CL CL-ML, ML	A-7-6 A-7-6 A-4	0 0 0	0 0 0	100 100 100	100 100 100	95-100 95-100 95-100	90-100 90-100 50-100	45-65 45-65 15-15	20-40 20-40 NP-4
045KM: Kimo-----	0-6 6-28 28-60	Silty clay loam Silty clay Silt loam	CH, CL CL, CH CL-ML, ML	A-7-6 A-7-6 A-4	0 0 0	0 0 0	100 100 100	100 100 100	95-100 95-100 95-100	90-100 90-100 50-100	45-65 45-65 15-15	20-40 20-40 NP-4
045MR: Morrill-----	0-10 10-56 56-66	Clay loam Clay loam Clay loam	CL CL, SC CL, ML, SC, SM	A-4, A-6 A-6, A-7-6 A-2, A-4, A-6	0 0 0	0 0 0	95-100 85-100 90-100	75-100 70-100 70-100	65-100 55-100 45-100	50-80 25-80 20-80	25-40 30-45 20-35	7-20 11-25 8-20
045RO: River Wash-----	---	---	---	---	---	---	---	---	---	---	---	---
045SB: Sarpy-----	0-12 12-60 60-8	Loamy fine sand Fine sand Fine sandy loam	SM SM, SP, SP-SM CL-ML, ML, SC-SM, SM	A-2-4 A-2-4, A-3 A-4	0 0 0	0 0 0	100 100 100	100 100 100	60-80 60-80 70-85	15-35 2-35 40-55	---	NP NP NP-10
Eudora-----	8-60	Silt loam	CL, CL-ML, ML	A-4	0	0	100	100	95-100	65-100	15-25	NP-10
045VM: Vinland-----	0-7 7-17 17-21	Silty clay loam Silty clay loam Weathered bedrock	CL CL, SC ---	A-6, A-7 A-6, A-7 ---	0 0 ---	0-5 0 ---	80-100 90-100 ---	75-100 75-100 ---	70-100 50-100 ---	65-95 35-95 ---	35-45 25-45 ---	15-20 10-20 ---
Martin-----	0-9 9-14 14-60	Silty clay loam Silty clay loam Silty clay	CL CL CH, CL	A-6, A-7 A-6, A-7 A-7	0 0 0	0 0 0	100 100 100	100 100 100	95-100 95-100 95-100	80-100 80-100 80-100	35-45 35-45 40-70	15-25 15-25 25-40
045WC: Wabash-----	0-16 16-70	Silty clay loam Silty clay	CH, CL CH	A-6, A-7 A-7	0 0	0 0	100 100	100 100	100 100	95-100 95-100	35-55 52-78	15-35 30-55
087RE: Reading-----	0-8 8-14 14-21 21-29 29-42 42-60 60-72	Silt loam Silt loam Silty clay loam Silty clay loam Silty clay loam Silty clay loam Silty clay loam	CL CL CL CL CL CL CL	A-6 A-6 A-6, A-7 A-7 A-7 A-7 A-7	0 0 0 0 0 0 0	0 0 0 0 0 0 0	100 100 100 100 100 100 100	100 100 100 100 100 100 100	90-100 95-100 95-100 95-100 95-100 95-100 95-100	80-90 85-95 85-95 85-95 85-95 85-95 80-90	30-35 35-45 40-50 40-50 40-50 40-50 40-50	10-15 15-20 20-30 20-30 20-30 20-30 20-30
087SS: Sibleyville----	0-7 7-15 15-27 27-31	Loam Loam Channery loam Weathered bedrock	CL, CL-ML CL, SC CL, CL-ML, SC, SC-SM ---	A-4, A-6 A-6 A-2, A-4, A-6 ---	0 0 0 ---	0 0 0-20 ---	100 100 70-90 ---	85-100 85-100 70-90 ---	70-95 70-90 50-90 ---	50-75 30-55 25-70 ---	25-35 30-40 25-40 ---	5-15 11-20 5-20 ---
087SV: Sibleyville----	0-10 10-18 18-29 29-33	Loam Loam Channery loam Weathered bedrock	CL, CL-ML CL, SC CL, CL-ML, SC, SC-SM ---	A-4, A-6 A-6 A-2, A-4, A-6 ---	0 0 0 ---	0 0 0-20 ---	100 100 70-90 ---	85-100 85-100 70-90 ---	70-95 70-90 50-90 ---	50-75 30-55 25-70 ---	25-35 30-40 25-40 ---	5-15 11-20 5-20 ---
087VO: Vinland-----	0-12 12-16 16-20	Silty clay loam Silty clay loam Weathered bedrock	CL CL, SC, ML ---	A-6, A-7 A-6, A-7 ---	0 0 ---	0-5 0 ---	80-100 90-100 ---	75-100 75-100 ---	70-100 50-100 ---	65-95 35-95 ---	35-45 25-45 ---	15-20 10-20 ---
087WC: Wabash-----	0-19 19-60	Silty clay loam Silty clay	CH, CL CH	A-6, A-7 A-7	0 0	0 0	100 100	100 100	100 100	95-100 95-100	35-55 52-78	15-35 30-55
091ED: Eudora-----	0-13 13-60	Silt loam Very fine sandy loam	CL, CL-ML, ML CL, CL-ML, ML	A-6, A-4 A-4	0 0	0 0	100 100	100 100	85-100 95-100	60-100 65-100	20-30 15-25	2-11 NP-10
Kimo-----	0-6 6-24 24-60	Silty clay loam Silty clay loam Silt loam	CH, CL CH, CL CL-ML, ML	A-7-6 A-7-6 A-4	0 0 0	0 0 0	100 100 100	100 100 100	95-100 95-100 95-100	90-100 90-100 50-100	45-65 45-65 15-15	20-40 20-40 NP-4
091LB: Ladoga-----	0-13 13-31 31-60	Silt loam Silty clay loam Silty clay loam	CL, CL-ML CH, CL CL	A-4, A-6 A-7 A-6	0 0 0	0 0 0	100 100 100	100 100 100	100 95-100 95-100	95-100 95-100 95-100	25-40 40-55 30-40	5-15 25-35 15-20
091RA: Reading-----	0-15 15-41 41-60	Silt loam Silty clay loam Silty clay	CL CL CL	A-6 A-6, A-7 A-6, A-7	0 0 0	0 0 0	100 100 100	100 100 100	90-100 95-100 95-100	80-90 85-95 80-95	30-35 35-45 40-50	10-15 15-20 20-30
091SB: Sharpsburg-----	0-9 9-35 35-60	Silt loam Silty clay loam Silty clay loam	CL CH, CL CL	A-6 A-7 A-6, A-7	0 0 0	0 0 0	100 100 100	100 100 100	100 95-100 95-100	95-100 95-100 95-100	25-40 40-60 35-50	10-20 20-35 20-30
Urban Land-----	---	---	---	---	---	---	---	---	---	---	---	---

ENGINEERING INDEX PROPERTIES--Continued
Leavenworth and Wyandotte
Counties, Kansas

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

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
Aa: Kennebec, CHANNELED-----	0-8	Silt loam	CL	A-6, A-7	0	0	100	100	95-100	90-100	25-45	10-20
	8-18	Silt loam	CL	A-6, A-7	0	0	100	100	95-100	90-100	25-45	10-20
	18-32	Silt loam	CL	A-6, A-7	0	0	100	100	95-100	90-100	25-45	10-20
	32-41	Silt loam	CL	A-6, A-7	0	0	100	100	95-100	90-100	25-45	10-20
	41-54	Silt loam	CL, CL-ML	A-6, A-4	0	0	100	100	95-100	90-100	25-40	5-15
	54-60	Silt loam	CL, CL-ML	A-6, A-4	0	0	100	100	95-100	90-100	25-40	5-15
Ac: Armster-----	0-10	Loam	CL	A-6	0	0	95-100	80-95	75-90	55-80	25-40	11-20
	10-60	Clay loam	CH, CL	A-7	0	0	95-100	80-95	70-90	55-80	45-60	25-35
Ad: Armster-----	0-10	Loam	CL	A-6	0	0	95-100	80-95	75-90	55-80	25-40	11-20
	10-60	Clay loam	CH, CL	A-7	0	0	95-100	80-95	70-90	55-80	45-60	25-35
Ae: Armster, eroded	0-7	Clay loam	CL	A-7	0	0	95-100	80-95	70-90	55-80	40-50	25-35
	7-60	Clay loam	CH, CL	A-7	0	0	95-100	80-95	70-90	55-80	45-60	25-35
AED: Arents, Earthen Dam-----	---	---	---	---	---	---	---	---	---	---	---	---
Ba: Basehor-----	0-10	Loam	CL, ML	A-4	---	0-15	80-100	80-100	70-95	50-75	15-30	NP-10
	10-13	Weathered bedrock			---	---	---	---	---	---	---	---
	13-17	Unweathered bedrock			---	---	---	---	---	---	---	---
Br: Bremer-----	0-13	Silty clay loam	CH, CL	A-7	0	0	100	100	100	95-100	45-60	25-40
	13-50	Silty clay	CH, MH	A-7	0	0	100	100	100	95-100	50-65	20-35
	50-60	Silty clay loam	CH, CL	A-7	0	0	100	100	95-100	95-100	40-60	25-40
Cf: Borrow Pits----	---	---	---	---	---	---	---	---	---	---	---	---
Ec: Elmont-----	0-15	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	75-100	25-40	6-15
	15-65	Silty clay loam	CL	A-6, A-7-6	0	0	100	100	95-100	85-100	35-45	15-25
	65-69				---	---	---	---	---	---	---	---
Ed: Elmont-----	0-15	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	75-100	25-40	6-15
	15-65	Silty clay loam	CL	A-6, A-7-6	0	0	100	100	95-100	85-100	35-45	15-25
	65-69				---	---	---	---	---	---	---	---
Eu: Eudora-----	0-12	Very fine sandy loam	CL-ML, ML	A-4	0	0	100	100	85-95	50-65	15-25	NP-10
	12-70	Very fine sandy loam	CL, CL-ML, ML	A-4	0	0	100	100	95-100	65-100	15-25	NP-10
Haynie-----	0-8	Silt loam	CL, CL-ML	A-4, A-6	---	0	100	100	85-100	70-100	25-40	5-15
	8-60	Very fine sandy loam	CL, CL-ML	A-4, A-6	---	0	100	100	85-100	85-100	25-35	5-15
Gc: Gosport-----	0-6	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	90-100	90-100	70-100	25-40	5-15
	6-33	Silty clay	CH	A-7	0	0	100	90-100	90-100	85-100	50-65	35-50
	>33	Weathered bedrock			---	---	---	---	---	---	---	---
Gp: Gravel Pits----	---	---	---	---	---	---	---	---	---	---	---	---
Gs: Gosport-----	0-6	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	90-100	90-100	70-100	25-40	5-15
	6-33	Silty clay	CH	A-7	0	0	100	90-100	90-100	85-100	50-65	35-50
	>33	Weathered bedrock			---	---	---	---	---	---	---	---
Sogn-----	0-16	Silty clay loam	CH, CL, MH, ML	A-6, A-7	0	0-10	85-100	85-100	85-100	70-100	25-55	10-25
	>16	Unweathered bedrock			---	---	---	---	---	---	---	---
Gt: Grundy-----	0-11	Silty clay loam	CH, CL	A-7	0	0	100	100	95-100	90-100	40-55	20-35
	11-15	Silty clay loam	CH, CL	A-7	0	0	100	100	95-100	90-100	45-55	25-35
	15-43	Silty clay	CH	A-7	0	0	100	100	95-100	90-100	50-70	30-45
	43-65	Silty clay loam	CH, CL	A-7	0	0	100	100	90-100	90-100	40-55	25-35
Gu: Grundy-----	0-11	Silty clay loam	CH, CL	A-7	0	0	100	100	95-100	90-100	40-55	20-35
	11-15	Silty clay loam	CH, CL	A-7	0	0	100	100	95-100	90-100	45-55	25-35
	15-43	Silty clay	CH	A-7	0	0	100	100	95-100	90-100	50-70	30-45
	43-65	Silty clay loam	CH, CL	A-7	0	0	100	100	90-100	90-100	40-55	25-35
Gy: Gymer-----	0-10	Silt loam	CL	A-4, A-6	0	0	100	100	95-100	75-100	25-40	8-20
	10-39	Silty clay loam	CH, CL	A-6, A-7	0	0	100	100	95-100	85-100	35-55	15-30
	39-60	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	85-100	30-45	11-25
Hg: Haig-----	0-9	Silty clay loam	CH, CL, MH, ML	A-7	0	0	100	100	100	95-100	40-55	15-25
	9-45	Silty clay	CH	A-7	0	0	100	100	100	95-100	50-65	30-40
	45-60	Silty clay loam	CH, CL	A-6, A-7	0	0	100	100	100	95-100	35-55	20-30
Hy: Haynie-----	0-8	Silt loam	CL, CL-ML	A-4, A-6	---	0	100	100	85-100	70-100	25-40	5-15
	8-60	Very fine sandy loam	CL, CL-ML	A-4, A-6	---	0	100	100	85-100	85-100	25-35	5-15

ENGINEERING INDEX PROPERTIES--Continued
Leavenworth and Wyandotte
Counties, Kansas

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

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
					Pct	Pct						
Ju:	In											
Judson-----	0-30	Silt loam	CL, CL-ML	A-4, A-6	---	0	100	100	100	95-100	25-35	5-15
	30-50	Silty clay loam	CL	A-6, A-7	---	0	100	100	100	95-100	30-50	15-25
	50-70	Silt loam	CL, CL-ML	A-4, A-6, A-7	---	0	100	100	100	95-100	25-50	5-25
Ke:												
Kennebec-----	0-45	Silt loam	CL	A-6, A-7	0	0	100	100	95-100	90-100	25-45	10-20
	45-72	Silty clay loam	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	90-100	25-40	5-15
Kh:												
Knox-----	0-6	Silt loam	CL	A-4, A-6	---	0	100	100	95-100	90-100	28-35	9-15
	6-60	Silty clay loam	CL	A-7	---	0	100	100	95-100	95-100	34-44	14-22
Kk:												
Knox-----	0-6	Silt loam	CL	A-4, A-6	---	0	100	100	95-100	90-100	28-35	9-15
	6-60	Silty clay loam	CL	A-7	---	0	100	100	95-100	95-100	34-44	14-22
Km:												
Knox, eroded---	0-6	Silty clay loam	CL	A-6	---	0	100	100	95-100	95-100	35-39	15-18
	6-60	Silty clay loam	CL	A-7	---	0	100	100	95-100	95-100	34-43	14-21
Kn:												
Knox-----	0-6	Silt loam	CL	A-4, A-6	---	0	100	100	95-100	90-100	28-35	9-15
	6-60	Silty clay loam	CL	A-7	---	0	100	100	95-100	95-100	34-44	14-22
Sogn-----	0-16	Silt loam	CL	A-6	---	0-10	85-100	85-100	85-100	70-95	25-40	11-23
	16-20	Unweathered bedrock			---	---	---	---	---	---	---	---
Ko:												
Konawa-----	0-19	Fine sandy loam	CL, ML, SC, SM	A-4	0	0	100	98-100	94-100	36-60	15-30	NP-10
	19-47	Clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	100	100	90-100	36-90	25-40	7-18
	47-60	Sandy clay loam	CL, ML, SC, SM	A-4, A-6	0	0	100	98-100	90-100	36-65	15-37	NP-16
Kw:												
Konawa-----	0-19	Fine sandy loam	CL, ML, SC, SM	A-4	0	0	100	98-100	94-100	36-60	15-30	NP-10
	19-47	Clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	100	100	90-100	36-90	25-40	7-18
	47-60	Clay loam	CL, ML, SC, SM	A-4, A-6	0	0	100	98-100	90-100	36-65	15-37	NP-16
La:												
Ladoga-----	0-7	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	100	95-100	25-40	5-15
	7-49	Silty clay loam	CH, CL	A-7	0	0	100	100	100	95-100	40-55	25-35
	49-60	Silty clay loam	CL	A-6	0	0	100	100	100	95-100	30-40	15-20
M-W:												
Miscellaneous Water-----	---	---	---	---	---	---	---	---	---	---	---	---
Mb:												
Marshall-----	0-13	Silt loam	CL	A-6	---	0	100	100	100	95-100	32-40	13-18
	13-46	Silty clay loam	CL	A-6, A-7	---	0	100	100	100	95-100	36-43	14-22
	46-65	Silt loam	CL	A-6	---	0	100	100	100	95-100	32-40	13-18
Mc:												
Marshall-----	0-13	Silt loam	CL	A-6	---	0	100	100	100	95-100	32-40	13-18
	13-46	Silty clay loam	CL	A-6, A-7	---	0	100	100	100	95-100	36-43	14-22
	46-65	Silt loam	CL	A-6	---	0	100	100	100	95-100	32-40	13-18
Md:												
Marshall-----	0-13	Silt loam	CL	A-6	---	0	100	100	100	95-100	32-40	13-18
	13-46	Silty clay loam	CL	A-6, A-7	---	0	100	100	100	95-100	36-43	14-22
	46-65	Silt loam	CL	A-6	---	0	100	100	100	95-100	32-40	13-18
Mn:												
Martin-----	0-8	Silty clay loam	CL	A-7	0	0	100	100	95-100	80-100	42-66	22-41
	8-75	Silty clay	CH	A-7	0	0	100	100	95-100	80-100	56-72	33-46
Mr:												
Martin-----	0-8	Silty clay loam	CL	A-7	0	0	100	100	95-100	80-100	42-66	22-41
	8-75	Silty clay	CH	A-7	0	0	100	100	95-100	80-100	56-72	33-46
Ms:												
Martin-----	0-7	Silty clay	CH	A-7	0	0	100	100	95-100	80-100	54-66	31-41
	7-60	Silty clay	CH	A-7	0	0	100	100	95-100	80-100	56-72	33-46
On:												
Onawa-----	0-6	Silty clay loam	CH, MH	A-7	---	0	100	100	95-100	95-100	50-60	20-30
	6-25	Silty clay	CH	A-7	---	0	100	100	95-100	95-100	60-85	40-60
	25-60	Silt loam	CL, CL-ML	A-4, A-6	---	0	100	100	95-100	85-100	25-40	5-20
Oo:												
Onawa-----	0-7	Loam	CL, CL-ML	A-4, A-6	---	0	100	100	95-100	80-100	25-40	5-20
	7-25	Silty clay	CH	A-7	---	0	100	100	95-100	95-100	60-85	40-60
	25-60	Silt loam	CL, CL-ML	A-4, A-6	---	0	100	100	95-100	85-100	25-40	5-20
Os:												
Oska-----	0-9	Silty clay loam	CL, ML	A-6, A-7	0	0	100	100	95-100	90-100	35-50	10-25
	9-38	Silty clay loam	CH, CL	A-7	0	0	100	100	95-100	95-100	45-60	20-35
	>38	Unweathered bedrock			---	---	---	---	---	---	---	---
Pb:												
Pawnee-----	0-17	Clay loam	CL	A-7	0	0	95-100	95-100	85-100	70-90	46-54	25-31
	17-41	Clay	CH	A-7	0	0	95-100	95-100	85-100	70-85	56-66	33-41
	41-60	Clay loam	CH, CL	A-7	0	0	95-100	95-100	80-100	70-90	42-52	22-30
Pc:												
Pawnee-----	0-12	Clay loam	CL	A-7	0	0	95-100	95-100	85-100	70-90	46-54	25-33
	12-36	Clay	CH	A-7	0	0	95-100	95-100	85-100	70-85	56-66	33-41
	36-60	Clay loam	CH, CL	A-7	0	0	95-100	95-100	80-100	70-90	42-52	22-30

ENGINEERING INDEX PROPERTIES--Continued
Leavenworth and Wyandotte
Counties, Kansas

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

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
Pe: Pawnee, eroded-	0-7 7-36 36-60	Clay loam Clay Clay loam	CL CH CH, CL	A-7 A-7 A-7	0 0 0	0 0 0	95-100 95-100 95-100	95-100 95-100 95-100	85-100 85-100 80-100	70-90 70-85 70-90	46-54 56-66 42-52	25-31 33-41 22-30
Qu: Quarries-----	---	---	---	---	---	---	---	---	---	---	---	---
Rs: River Wash-----	---	---	---	---	---	---	---	---	---	---	---	---
Sa: Sarpy-----	0-9 9-60	Loamy fine sand Fine sand	SM SM, SP, SP-SM	A-2-4 A-2-4, A-3	---	0 0	100 100	100 100	60-80 60-80	15-35 2-35	---	NP NP
Haynie-----	0-8 8-60	Very fine sandy loam Very fine sandy loam	CL-ML, ML CL, CL-ML	A-4 A-4, A-6	---	0 0	100 100	100 100	85-100 85-100	70-100 85-100	15-25 25-35	NP-5 5-15
Sb: Sharpsburg-----	0-15 15-30 30-42 42-60	Silty clay loam Silty clay loam Silty clay loam Silty clay loam	CH, CL CH, CL CL CL	A-6, A-7 A-7 A-6, A-7 A-6, A-7	0 0 0 0	0 0 0 0	100 100 100 100	100 100 100 100	100 100 100 100	95-100 95-100 95-100 95-100	35-55 40-60 35-50 35-50	18-32 20-35 20-30 20-30
Sc: Sharpsburg-----	0-10 10-30 30-42 42-60	Silty clay loam Silty clay loam Silty clay loam Silty clay loam	CH, CL CH, CL CL CL	A-6, A-7 A-7 A-6, A-7 A-6, A-7	0 0 0 0	0 0 0 0	100 100 100 100	100 100 100 100	100 100 100 100	95-100 95-100 95-100 95-100	35-55 40-60 35-50 35-50	18-32 20-35 20-30 20-30
Se: Shelby-----	0-7 7-40 40-75	Loam Clay loam Clay loam	CL CL CL	A-6 A-6, A-7 A-6, A-7	0 0 0	0 0-5 0-5	95-100 90-95 90-95	85-95 85-95 85-95	75-90 75-90 75-90	55-70 55-70 55-70	32-43 37-44 37-44	13-21 16-22 16-22
Sh: Shelby-----	0-7 7-40 40-75	Loam Clay loam Clay loam	CL CL CL	A-6 A-6, A-7 A-6, A-7	0 0 0	0 0-5 0-5	95-100 90-95 90-95	85-95 85-95 85-95	75-90 75-90 75-90	55-70 55-70 55-70	32-43 37-44 37-44	13-21 16-22 16-22
Sm: Shelby-----	0-5 5-40 40-75	Loam Clay loam Clay loam	CL CL CL	A-6 A-6, A-7 A-6, A-7	0 0 0	0 0-5 0-5	95-100 90-95 90-95	85-95 85-95 85-95	75-90 75-90 75-90	55-70 55-70 55-70	32-43 37-44 37-44	13-21 16-22 16-22
Sp: Shelby-----	0-7 7-40 40-75	Loam Clay loam Clay loam	CL CL CL	A-6 A-6, A-7 A-6, A-7	0 0 0	0 0-5 0-5	95-100 90-95 90-95	85-95 85-95 85-95	75-90 75-90 75-90	55-70 55-70 55-70	32-43 37-44 37-46	13-21 16-22 16-23
Pawnee-----	0-12 12-36 36-60	Clay loam Clay Clay loam	CL CH CH, CL	A-7 A-7 A-7	0 0 0	0 0 0	95-100 95-100 95-100	95-100 95-100 95-100	85-100 85-100 80-100	70-90 70-85 70-90	46-54 56-66 42-52	25-31 33-41 22-30
Ss: Shelby, eroded-	0-7 7-40 40-75	Clay loam Clay loam Clay loam	CL CL CL	A-6, A-7 A-6, A-7 A-6, A-7	0 0 0	0 0-5 0-5	90-95 90-95 90-95	85-95 85-95 85-95	75-90 75-90 75-90	55-70 55-70 55-70	37-44 37-55 37-46	16-22 16-22 16-23
Pawnee, eroded-	0-7 7-36 36-60	Clay loam Clay Clay loam	CL CH CH, CL	A-7 A-7 A-7	0 0 0	0 0 0	95-100 95-100 95-100	95-100 95-100 95-100	85-100 85-100 80-100	70-90 70-85 70-90	46-54 56-66 42-52	25-31 33-41 22-30
Sy: Sibleyville----	0-13 13-32 >32	Loam Clay loam Weathered bedrock	CL, CL-ML CL, SC ---	A-4, A-6 A-6 ---	0 0 ---	0 0 ---	100 100 ---	85-100 85-100 ---	70-95 70-90 ---	50-75 30-55 ---	25-35 30-40 ---	5-15 11-20 ---
SZ: Sogn-----	0-13 13-17	Silty clay loam Silty clay loam	CH, CL, MH, ML CL	A-6, A-7 A-6, A-7	0 0	0-10 0-5	85-100 80-100	85-100 75-100	85-100 70-100	70-100 65-95	25-55 35-45	10-25 15-20
Vinland-----	0-12 12-16 16-20	Silty clay loam Silty clay loam Weathered bedrock	CL CL, SC, ML ---	A-6, A-7 A-6, A-7 ---	0 0 ---	0 0 ---	80-100 90-100 ---	75-100 75-100 ---	70-100 50-100 ---	65-95 35-95 ---	35-45 25-45 ---	15-20 10-20 ---
Uc: Un: VR: Rock Outcrop---	0-5	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
Vinland-----	0-7 7-17 17-21	Silty clay loam Silty clay loam Weathered bedrock	CL CL, SC ---	A-6, A-7 A-6, A-7 ---	0 0 ---	0-5 0 ---	80-100 90-100 ---	75-100 75-100 ---	70-100 50-100 ---	65-95 35-95 ---	35-45 25-45 ---	15-20 10-20 ---
Vs: Vinland-----	0-18 >18	Loam Weathered bedrock	CL, SC ---	A-6 ---	0 ---	0-5 ---	80-100 ---	75-100 ---	65-95 ---	45-75 ---	25-35 ---	10-15 ---
Sibleyville----	0-13 13-32 >32	Loam Clay loam Weathered bedrock	CL, CL-ML CL, SC ---	A-4, A-6 A-6 ---	0 0 ---	0 0 ---	100 100 ---	85-100 85-100 ---	70-95 70-90 ---	50-75 30-55 ---	25-35 30-40 ---	5-15 11-20 ---
W: Water-----	---	---	---	---	---	---	---	---	---	---	---	---

ENGINEERING INDEX PROPERTIES--Continued
Leavenworth and Wyandotte
Counties, Kansas

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

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
					Pct	Pct						
	In											
Wa: Wabash-----	0-6 6-60	Silty clay Silty clay	CH CH	A-7 A-7	0 0	0 0	100 100	100 100	100 100	95-100 95-100	50-75 52-78	30-50 30-55
Wc: Welda-----	0-12 12-37 37-70	Silt loam Silty clay loam Silty clay loam	CL, CL-ML CL CL, ML	A-4, A-6 A-6, A-7-6 A-4, A-6, A-7-6	0 0 0	0 0 0	100 100 100	100 100 100	90-100 95-100 95-100	75-100 85-100 75-100	25-35 38-50 30-45	5-15 20-30 7-20
Wd: Welda-----	0-12 12-37 37-70	Silt loam Silty clay loam Silty clay loam	CL, CL-ML CL CL, ML	A-4, A-6 A-6, A-7-6 A-4, A-6, A-7-6	0 0 0	0 0 0	100 100 100	100 100 100	90-100 95-100 90-100	75-100 85-100 75-100	25-35 38-50 30-45	5-15 20-30 7-20
Zo: Zook-----	0-22 22-76	Silty clay loam Silty clay loam	CH, CL CH	A-7 A-7	0 0	0 0	100 100	100 100	95-100 95-100	95-100 95-100	45-65 60-85	20-35 35-55

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

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

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

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

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

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

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

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

Moist bulk density is the weight of soil (oven-dry) 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 shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. Depending on soil texture, a bulk density of more than 1.4 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability (K_{sat}) refers to the ability of a soil to transmit water or air. The term "permeability," as used in soil surveys, indicates saturated hydraulic conductivity (K_{sat}). The estimates in the table indicate the rate of water movement, in inches per hour, 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 Physical Properties 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 Physical Properties table as the K factor (K_w and K_f) 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 K_w indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Erosion factor K_f 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 as follows:

1. Coarse sands, sands, fine sands, and very fine sands.
2. Loamy coarse sands, loamy sands, loamy fine sands, loamy very fine sands, ash material, and sapric soil material.
3. Coarse sandy loams, sandy loams, fine sandy loams, and very fine sandy loams.
- 4L. Calcareous loams, silt loams, clay loams, and silty clay loams.
4. Clays, silty clays, noncalcareous clay loams, and silty clay loams that are more than 35 percent clay.
5. Noncalcareous loams and silt loams that are less than 20 percent clay and sandy clay loams, sandy clays, and hemic soil material.
6. Noncalcareous loams and silt loams that are more than 20 percent clay and noncalcareous clay loams that are less than 35 percent clay.
7. Silts, noncalcareous silty clay loams that are less than 35 percent clay, and fibric soil material.
8. Soils that are not subject to wind erosion because of coarse fragments on the surface or because of surface wetness.

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.

Explanation of Wind Erodibility Groups

Soil erodibility by wind is directly related to the percentage of dry non-erodible surface soil aggregates larger than 0.84 mm in diameter. From this percentage, the wind erodibility index (I-factor) is determined. The I-factor is an expression of the stability of these soil aggregates against breakdown by tillage and abrasion from wind erosion. Soils are placed in Wind Erodibility Groups (WEG) having similar percentages of dry soil aggregates larger than 0.84 mm as shown in the following table.

WEG	Properties of Soil Surface Layer	Dry Soil Aggregates >0.84mm Percent	Wind Erodibility Index T/Ac/Yr (I)
1	Very fine sand, fine sand, sand, or coarse sand	1	310 1/
		2	250
		3	220
		5	180
		7	160
		10	134
		25	86
2	Loamy very fine sand, loamy fine sand, loamy sand, loamy coarse sand, organic soil materials.	10	134
3	Very fine sandy loam, fine sandy loam, sandy loam, or coarse sandy loam.	25	86
4	Clay, silty clay, non-calcareous clay loam, or silty clay loam with >35 percent clay content.	25	86
4L	Calcareous 2/ loam, silt loam, clay loam, or silty clay loam.	25	86
5	Non-calcareous loam and silt loam with <20 percent clay content, or sandy clay loam, sandy clay, and hemic 3/ organic soil materials.	40	56
6	Non-calcareous loam and silt loam with >20 percent clay content, or non-calcareous clay loam with <35 percent clay content.	45	48
7	Silt, non-calcareous silty clay loam with >35 percent clay content and fibric 3/ organic soil material.	50	38
8	Soils not suitable for cultivation due to coarse fragments or wetness; wind erosion is not a problem.	--	0

1/ The "I" values for WEG 1 vary from 160 for coarse sands to 310 for very fine sands. Use an "I" of 220 as an average figure. For coarser sand that has gravel, use a lower figure. For a soil that has no gravel and very fine sand, use a higher figure. (Modification for coarse fragments is preparation.)

2/ Calcareous is a strongly or violently effervescent reaction to cold dilute (1N) HCL.

3/ See Soil Taxonomy for definition.

PHYSICAL PROPERTIES OF THE SOILS--Continued
Leavenworth and Wyandotte Counties, Kansas: Published

(Single entries under "Sand and Silt" are a representative percentage are calculated using an algorithm. 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)

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
										K	Kf	T		
	In	Pct	Pct	Pct	g/cc	in/hr	In/in	Pct	Pct					
005AQ: Fluvaquents--	0-80			---	---	---	---	---	---	---	---	5	4L	86
005AR: Armster-----	0-7 7-60	20-45 5-45	15-50 10-40	27-40 35-48	1.35-1.45 1.35-1.45	0.20-0.60 0.20-0.60	0.10-0.18 0.10-0.18	3.0-5.9 6.0-8.9	0.5-1.0 0.1-0.3	.37 .37	.37 .37	5	6	48
005GO: Gosport-----	0-8 8-35 35-39	1-20 1-20	50-70 30-60	27-34 36-60	1.30-1.40 1.50-1.60	0.20-0.60 0.00-0.06	0.14-0.16 0.12-0.14	3.0-5.9 6.0-8.9	1.0-2.0 0.1-0.3	.43 .32	.43 .32	3	7	38
005HN: Haynie-----	0-7 7-60	5-40 5-55	50-75 40-75	15-25 15-19	1.20-1.35 1.20-1.35	0.60-2.00 0.60-2.00	0.18-0.23 0.18-0.23	0.0-2.9 0.0-2.9	1.0-3.0 0.1-1.0	.37 .37	.37 .37	5	4L	86
005HO: Haynie-----	0-7 7-60	5-40 5-55	50-75 40-75	15-25 15-19	1.20-1.35 1.20-1.35	0.60-2.00 0.60-2.00	0.18-0.23 0.18-0.23	0.0-2.9 0.0-2.9	1.0-3.0 0.0-1.0	.37 .37	.37 .37	5	4L	86
Onawa-----	0-7 7-22 22-60	16 42 20	50 42 60	33-40 42-55 15-22	1.30-1.40 1.15-1.30 1.30-1.35	0.20-0.60 0.06-0.20 0.57-1.98	0.21-0.23 0.11-0.14 0.20-0.22	6.0-8.9 6.0-8.9 1.0-2.9	2.0-3.0 1.5-2.0 0.0-1.0	.32 .32 .43	.32 .32 .43	5	4	86
005KG: Kennebec-----	0-47 47-60	4 4	72 70	22-27 24-28	1.25-1.35 1.35-1.40	0.60-2.00 0.60-2.00	0.22-0.24 0.20-0.22	3.0-5.9 3.0-5.9	2.0-5.0 1.0-2.0	.28 .43	.28 .43	5	6	48
Colo-----	0-8 8-60 60-64	1-20 1-20 11-20	50-75 50-70 40-65	20-26 30-35 25-35	1.25-1.30 1.25-1.35 1.35-1.45	0.60-2.00 0.60-2.00 0.60-2.00	0.22-0.24 0.18-0.20 0.18-0.20	3.0-5.9 3.0-5.9 3.0-5.9	2.0-4.0 1.0-3.0 0.5-1.5	.28 .28 .28	.28 .28 .28	5	6	48
005KY: Knox-----	0-8 8-45 45-60	3 3 3	74 67 74	18-27 25-35 18-27	1.20-1.30 1.30-1.40 1.20-1.40	0.60-2.00 0.60-2.00 0.60-2.00	0.22-0.24 0.18-0.20 0.20-0.22	0.0-2.9 3.0-5.9 0.5-0.5	1.0-3.0 0.5-1.0 0.5-0.5	.32 .43 .43	.32 .43 .43	5	6	48
Gosport-----	0-8 8-35 35-39	11 15	58 37	27-34 36-60	1.30-1.40 1.50-1.60	0.20-0.60 0.00-0.06	0.14-0.16 0.12-0.14	3.0-5.9 6.0-8.9	1.0-2.0 0.1-0.5	.43 .32	.43 .32	3	7	38
005OD: Onawa-----	0-10 10-17 17-32 32-70	40-52 10-20 10-25 10-55	30-40 30-55 30-55 40-65	15-27 33-40 42-55 15-22	1.15-1.25 1.30-1.40 1.15-1.30 1.30-1.35	0.57-1.98 0.20-0.60 0.06-0.20 0.57-1.98	0.09-0.16 0.21-0.23 0.11-0.14 0.20-0.22	3.0-6.0 6.0-8.9 6.0-8.9 1.0-2.9	1.0-2.5 2.0-3.0 1.5-2.0 0.1-1.2	.32 .32 .32 .43	.32 .32 .32 .43	5	4	86
005OW: Onawet-----	0-7 7-24 24-56 56-80	5-15 5-15 10-30 75-85	45-60 30-45 60-75 5-15	25-42 40-65 7-27 0-15	1.20-1.30 1.30-1.40 1.40-1.50 1.45-1.55	0.20-0.60 0.06-0.20 0.57-1.98 5.95-19.98	0.19-0.22 0.10-0.14 0.18-0.20 0.06-0.10	3.0-5.9 6.0-8.9 0.0-2.9 0.0-2.9	2.0-3.0 0.0-1.0 0.0-0.5 0.0-0.5	.32 .32 .43 .17	.32 .32 .43 .17	5	4	86
005PA: Knox-----	0-7 7-12 12-23 23-35 35-61 61-70	3 3 3 3 3	74 72 65 68 70 74	18-27 22-30 28-35 27-35 22-35 18-27	1.20-1.50 1.30-1.50 1.30-1.50 1.30-1.50 1.30-1.50 1.20-1.50	0.60-2.00 0.60-2.00 0.60-2.00 0.60-2.00 0.60-2.00 0.60-2.00	0.22-0.24 0.18-0.20 0.19-0.22 0.19-0.22 0.19-0.22 0.20-0.22	---	1.0-3.0 0.5-1.0 0.4-0.8 0.3-0.6 0.3-0.6 0.1-0.5	.32 .43 .43 .43 .43 .43	.32 .43 .43 .43 .43 .43	5	6	48
Palermo-----	0-5 5-11 11-23 23-41 41-80	2 2 2 2	65 63 69 69 76	---	1.25-1.40 1.30-1.40 1.30-1.40 1.30-1.40 1.20-1.35	---	0.19-0.22 0.18-0.20 0.18-0.21 0.18-0.21 0.18-0.21	0.0-2.9 ---	---	.37 .43 .43 .43 .43	.37 .43 .43 .43 .43	5	6	48
005PB: Palermo-----	0-5 5-11 11-23 23-41 41-80	2 2 2 2	65 63 69 69 76	---	1.25-1.40 1.30-1.40 1.30-1.40 1.30-1.40 1.20-1.35	---	0.19-0.22 0.18-0.20 0.18-0.21 0.18-0.21 0.18-0.21	0.0-2.9 ---	---	.37 .43 .43 .43 .43	.37 .43 .43 .43 .43	5	6	48
005SH: Shelby-----	0-12 12-47 47-60	25-45 25-50 25-45	25-45 20-35 15-30	27-35 30-35 30-35	1.50-1.55 1.55-1.65 1.55-1.65	0.20-0.60 0.20-0.60 0.20-0.60	0.16-0.18 0.16-0.18 0.16-0.18	3.0-5.9 3.0-5.9 3.0-5.9	2.0-4.0 0.5-1.0 0.1-0.5	.28 .28 .37	.28 .28 .37	5	6	48
005WA: Wabash-----	0-8 8-60	1-5 1-5	50-70 30-60	27-35 40-60	1.35-1.50 1.20-1.45	0.06-0.20 0.00-0.06	0.21-0.24 0.08-0.12	6.0-8.9 9.0-25.0	2.0-4.0 0.5-2.0	.37 .28	.37 .28	5	7	38
005WH: Wathena-----	0-9 9-37 37-52 52-64 64-80	72-90 70-90 20-35 20-35 86-95	10-20 10-22 50-65 50-65 4-9	2-5 2-5 15-22 15-22 0-3	1.40-1.50 1.40-1.50 1.30-1.35 1.30-1.35 1.50-1.60	5.95-19.98 5.95-19.98 ---	0.05-0.09 0.05-0.09 0.20-0.22 0.20-0.22 0.05-0.07	0.0-2.9 0.0-2.9 3.0-6.0 3.0-6.0 0.0-2.9	0.0-1.0 0.0-0.0 0.0-0.0 0.0-0.0 0.0-0.0	.17 .17 .32 .32 .15	.17 .17 .32 .32 .15	5	2	134
Haynie-----	0-7 7-60	5-40 5-60	55-75 30-75	15-25 15-19	1.20-1.35 1.20-1.35	0.60-2.00 0.60-2.00	0.18-0.23 0.18-0.23	0.0-2.9 0.0-2.9	1.0-3.0 0.0-1.0	.37 .37	.37 .37	5	4L	86
045ET: Eudora-----	0-12 12-72	10-50 10-75	50-80 40-75	5-18 5-18	1.30-1.50 1.35-1.50	0.60-2.00 0.60-2.00	0.20-0.24 0.17-0.22	0.0-2.9 0.0-2.9	1.0-2.0 0.1-0.3	.32 .43	.32 .43	5	5	56
045EV: Eudora-----	0-12 12-72	1-20 1-55	50-80 40-75	5-18 5-18	1.30-1.50 1.35-1.50	0.60-2.00 0.60-2.00	0.20-0.24 0.17-0.22	0.0-2.9 0.0-2.9	1.0-4.0 0.1-2.0	.32 .43	.32 .43	5	5	56
Kimo-----	0-6 6-28 28-60	1-10 1-10 10-70	40-60 40-60 25-85	35-40 35-50 7-18	1.20-1.30 1.20-1.30 1.30-1.40	0.06-0.20 0.06-0.20 0.60-2.00	0.13-0.22 0.13-0.22 0.17-0.22	6.0-8.9 6.0-8.9 0.0-2.9	2.0-4.0 0.5-1.5 0.2-0.8	.37 .37 .37	.37 .37 .37	5	4	86

PHYSICAL PROPERTIES OF THE SOILS--Continued
 Leavenworth and Wyandotte Counties, Kansas: Published

(Single entries under "Sand and Silt" are a representative percentage are calculated using an algorithm. 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)

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
										K	Kf	T		
	In	Pct	Pct	Pct	g/cc	in/hr	In/in	Pct	Pct					
045KM:														
Kimo-----	0-6	1-20	50-70	35-40	1.20-1.30	0.06-0.20	0.13-0.22	6.0-8.9	2.0-4.0	.37	.37	5	4	86
	6-28	1-20	40-60	35-50	1.20-1.30	0.06-0.20	0.13-0.22	6.0-8.9	0.5-1.5	.37	.37			
	28-60	20-75	25-75	7-18	1.30-1.40	0.60-2.00	0.17-0.22	0.0-2.9	0.2-0.8	.37	.37			
045MR:														
Morrill-----	0-10	20-45	15-52	15-30	1.30-1.40	0.60-2.00	0.14-0.21	0.0-2.9	2.0-4.0	.28	.28	5	6	48
	10-56	20-50	15-52	25-35	1.35-1.45	0.20-0.60	0.15-0.19	3.0-5.9	0.5-1.0	.28	.28			
	56-66	20-50	15-50	10-29	1.40-1.55	0.20-2.00	0.15-0.18	3.0-5.9	0.2-0.8	.37	.37			
045RO:														
River Wash---	---													0
045SB:														
Sarpy-----	0-12	70-95	1-10	2-5	1.20-1.50	5.95-19.98	0.05-0.09	0.0-2.9	0.2-1.0	.17	.17	5	2	134
	12-60	70-95	1-10	2-5	1.20-1.50	5.95-19.98	0.05-0.09	0.0-2.9	0.1-0.5	.15	.15			
Eudora-----	0-8	55-75	10-40	5-15	1.35-1.50	2.00-6.00	0.16-0.18	0.0-2.9	0.5-1.0	.20	.20	5	3	86
	8-60	10-75	40-75	5-18	1.35-1.50	0.60-2.00	0.17-0.22	0.0-2.9	0.1-2.0	.43	.43			
045VM:														
Vinland-----	0-7	1-20	50-75	27-35	1.20-1.40	0.60-2.00	0.21-0.24	3.0-5.9	2.0-4.0	.32	.32	2	7	38
	7-17	1-55	20-70	18-35	1.30-1.60	0.60-2.00	0.15-0.22	3.0-5.9	0.5-1.0	.43	.43			
	17-21													
Martin-----	0-9	1-10	50-70	27-40	1.35-1.40	0.20-0.60	0.21-0.23	3.0-5.9	2.0-4.0	.37	.37	5	7	38
	9-14	1-10	50-70	27-40	1.35-1.40	0.20-0.60	0.18-0.20	3.0-5.9	1.0-3.0	.37	.37			
	14-60	1-10	30-60	40-55	1.40-1.50	0.06-0.20	0.12-0.18	6.0-8.9	0.5-1.5	.37	.37			
045WC:														
Wabash-----	0-16	1-10	50-70	27-35	1.35-1.50	0.06-0.20	0.21-0.24	6.0-8.9	2.5-4.0	.28	.28	5	7	38
	16-70	1-10	30-60	40-60	1.20-1.45	0.00-0.06	0.08-0.12	9.0-25.0	0.5-2.0	.28	.28			
087RE:														
Reading-----	0-8	2-20	50-75	18-27	1.35-1.40	0.60-2.00	0.22-0.24	1.5-4.5	2.5-4.0	.32	.32	5	6	48
	8-14	2-20	50-75	18-30	1.40-1.50	0.20-2.00	0.18-0.20	3.0-5.9	2.5-3.5	.43	.43			
	14-21	2-20	50-75	18-35	1.40-1.50	0.20-2.00	0.13-0.20	3.0-5.9	2.5-3.5	.43	.43			
	21-29	2-20	50-75	18-35	1.40-1.50	0.20-2.00	0.13-0.20	3.0-5.9	2.0-2.5	.43	.43			
	29-42	2-20	50-75	18-35	1.40-1.50	0.20-2.00	0.13-0.20	3.0-5.9	1.0-2.0	.43	.43			
	42-60	2-20	50-75	18-35	1.40-1.50	0.20-2.00	0.13-0.20	3.0-5.9	0.7-1.0	.43	.43			
	60-72	2-20	50-75	22-30	1.40-1.50	0.20-2.00	0.13-0.20	3.0-5.9	0.5-0.8	.43	.43			
087SS:														
Sibleyville--	0-7	30-55	20-50	14-27	1.30-1.40	0.60-2.00	0.18-0.21	0.0-2.9	1.0-4.0	.28	.28	3	6	48
	7-15	20-50	20-50	20-35	1.35-1.45	0.60-2.00	0.16-0.19	0.0-2.9	1.0-2.0	.28	.28			
	15-27	25-60	15-50	14-29	1.35-1.50	0.60-2.00	0.12-0.15	0.0-2.9	0.5-1.0	.20	.20			
	27-31													
087SV:														
Sibleyville--	0-10	30-55	20-50	14-27	1.30-1.40	0.60-2.00	0.18-0.21	0.0-2.9	1.0-4.0	.32	.32	3	6	48
	10-18	25-52	20-50	20-35	1.35-1.45	0.60-2.00	0.16-0.19	0.0-2.9	1.0-2.0	.28	.32			
	18-29	25-60	15-50	14-29	1.35-1.50	0.60-2.00	0.12-0.15	0.0-2.9	0.5-1.0	.20	.32			
	29-33													
087VO:														
Vinland-----	0-12	1-20	50-75	27-35	1.20-1.40	0.60-2.00	0.21-0.24	3.0-5.9	2.0-4.0	.32	.32	2	7	38
	12-16	1-55	20-70	18-35	1.30-1.60	0.60-2.00	0.15-0.22	3.0-5.9	0.5-1.0	.43	.49			
	16-20													
087WC:														
Wabash-----	0-19	1-10	50-70	27-35	1.35-1.50	0.06-0.20	0.21-0.24	6.0-8.9	2.5-4.0	.37	.37	5	7	38
	19-60	1-10	30-60	40-60	1.20-1.45	0.00-0.06	0.08-0.12	9.0-25.0	0.5-2.0	.28	.28			
091ED:														
Eudora-----	0-13			5-18	1.30-1.50	0.60-2.00	0.20-0.24	0.0-2.9	1.0-4.0	.32	.32	5	5	56
	13-60			5-18	1.35-1.50	0.60-2.00	0.17-0.22	0.0-2.9	0.0-2.0	.43	.43			
Kimo-----	0-6			35-40	1.20-1.30	0.06-0.20	0.13-0.22	6.0-8.9	2.0-4.0	.37	.37	5	4	86
	6-24			35-50	1.20-1.30	0.06-0.20	0.13-0.22	6.0-8.9	---	.37	.37			
	24-60			7-18	1.30-1.40	0.60-2.00	0.17-0.22	0.0-2.9	---	.37	.37			
091LB:														
Ladoga-----	0-13			18-27	1.30-1.35	0.60-2.00	0.22-0.24	0.0-2.9	2.0-3.0	.32	.32	5	6	48
	13-31			36-42	1.30-1.40	0.20-0.60	0.18-0.20	3.0-5.9	0.5-1.0	.43	.43			
	31-60			24-32	1.35-1.45	0.60-2.00	0.18-0.20	3.0-5.9	0.5-0.5	.43	.43			
091RA:														
Reading-----	0-15	1-10	50-75	18-27	1.35-1.40	0.60-2.00	0.22-0.24	1.5-4.5	2.0-4.0	.32	.32	5	6	48
	15-41	1-10	45-70	27-35	1.40-1.50	0.20-2.00	0.18-0.20	3.0-5.9	0.5-3.0	.43	.43			
	41-60	1-30	40-60	30-45	1.40-1.50	0.20-2.00	0.13-0.20	3.0-5.9	0.5-1.0	.43	.43			
091SB:														
Sharpsburg---	0-9	1-5	67-74	23-27	1.30-1.35	0.60-2.00	0.21-0.23	3.0-5.9	3.0-4.0	.32	.32	5	6	48
	9-35	1-5	54-63	36-42	1.35-1.40	0.20-0.60	0.18-0.20	3.0-5.9	1.0-2.0	.43	.43			
	35-60	1-5	60-72	25-32	1.40-1.45	0.60-2.00	0.18-0.20	3.0-5.9	0.0-1.0	.43	.43			
Urban Land---	---													
Aa:														
Kennebec,	0-8	2-8	65-75	22-27	1.25-1.35	0.60-2.00	0.22-0.24	3.0-6.0	2.3-6.0	.28	.28	5	6	48
CHANNELED---														
	8-18	2-8	65-75	22-27	1.25-1.35	0.60-2.00	0.22-0.24	3.0-6.0	2.1-6.0	.28	.28			
	18-32	2-8	65-75	22-27	1.25-1.35	0.60-2.00	0.22-0.24	3.0-6.0	2.1-5.0	.28	.28			
	32-41	2-8	65-75	22-27	1.25-1.35	0.60-2.00	0.22-0.24	3.0-6.0	2.1-5.0	.28	.28			
	41-54	2-12	60-75	24-28	1.35-1.40	0.60-2.00	0.20-0.22	3.0-6.0	1.0-3.0	.43	.43			
	54-60	2-12	60-75	24-28	1.35-1.40	0.60-2.00	0.20-0.22	3.0-6.0	1.0-2.5	.43	.43			
Ac:														
Armster-----	0-10	15-52	15-50	15-27	1.35-1.50	0.60-2.00	0.17-0.20	3.0-5.9	1.0-2.0	.37	.37	5	6	48
	10-60	15-45	10-40	35-48	1.35-1.45	0.20-0.60	0.10-0.18	6.0-8.9	0.1-0.3	.37	.37			
Ad:														
Armster-----	0-10	15-52	15-50	15-27	1.35-1.50	0.60-2.00	0.17-0.20	3.0-5.9	1.0-2.0	.37	.37	5	6	48
	10-60	15-40	10-40	33-48	1.35-1.45	0.20-0.60	0.10-0.18	6.0-8.9	0.1-0.3	.37	.37			

PHYSICAL PROPERTIES OF THE SOILS--Continued
Leavenworth and Wyandotte Counties, Kansas: Published

(Single entries under "Sand and Silt" are a representative percentage are calculated using an algorithm. 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)

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index	
										K	Kf	T			
	In	Pct	Pct	Pct	g/cc	in/hr	In/in	Pct	Pct						
Ae: Armster, eroded-----	0-7	20-45	15-50	27-40	1.35-1.45	0.20-0.60	0.10-0.18	3.0-5.9	0.5-1.0	.37	.37	5	6	48	
	7-60	15-40	10-40	35-48	1.35-1.45	0.20-0.60	0.10-0.18	6.0-8.9	0.1-0.3	.37	.37				
AED: Arents, Earthen Dam-	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
Ba: Basehor-----	0-10	30-50	28-52	8-22	1.30-1.45	2.00-6.00	0.17-0.21	0.0-2.9	1.0-2.0	.32	.32	1	5	56	
	10-13	---	---	---	---	---	---	---	---	---	---	---	---	---	
	13-17	---	---	---	---	---	---	---	---	---	---	---	---	---	
Br: Bremer-----	0-13	1-10	50-70	27-32	1.25-1.30	0.60-2.00	0.21-0.23	3.0-5.9	3.0-6.5	.28	.28	5	7	38	
	13-50	1-10	40-60	35-45	1.30-1.40	0.20-0.60	0.15-0.17	6.0-8.9	1.0-3.0	.28	.28				
	50-60	1-10	50-70	32-38	1.40-1.45	0.20-0.60	0.18-0.20	6.0-8.9	0.1-0.3	.28	.28				
Cf: Borrow Pits--	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
Ec: Elmont-----	0-15	1-15	50-75	15-27	1.30-1.40	0.60-2.00	0.22-0.24	0.0-2.9	2.0-4.0	.32	.32	5	6	48	
	15-65	1-10	45-70	27-35	1.30-1.45	0.20-0.60	0.18-0.20	3.0-5.9	0.5-1.5	.43	.43				
	65-69	---	---	---	---	---	---	---	---	---	---	---	---	---	
Ed: Elmont-----	0-15	1-15	50-75	15-27	1.30-1.40	0.60-2.00	0.22-0.24	0.0-2.9	2.0-4.0	.32	.32	5	6	48	
	15-65	1-25	45-70	27-35	1.30-1.45	0.20-0.60	0.18-0.20	3.0-5.9	0.5-1.5	.43	.43				
	65-69	---	---	---	---	---	---	---	---	---	---	---	---	---	
Eu: Eudora-----	0-12	10-50	40-80	5-18	1.30-1.50	0.60-2.00	0.20-0.24	0.0-2.9	1.0-2.0	.20	.20	5	3	86	
	12-70	10-75	40-75	5-18	1.35-1.50	0.60-2.00	0.17-0.22	0.0-2.9	0.1-0.3	.43	.43				
	Haynie-----	0-8	5-40	50-75	15-25	1.20-1.35	0.60-2.00	0.18-0.23	1.0-3.0	.37	.37	5	4L	86	
	8-60	5-55	40-75	15-18	1.20-1.35	0.60-2.00	0.18-0.23	0.0-2.9	0.2-2.0	.37	.37				
Gc: Gosport-----	0-6	4-20	40-70	18-27	1.30-1.40	0.20-0.60	0.18-0.20	0.0-2.9	1.0-2.0	.43	.43	3	6	48	
	6-33	5-30	30-50	36-60	1.50-1.60	0.00-0.06	0.12-0.14	6.0-8.9	0.1-0.5	.32	.32				
	>33	---	---	---	---	---	---	---	---	---	---	---	---	---	
Gp: Gravel Pits--	---	---	---	---	---	---	---	---	---	---	---	---	---	0	
Gs: Gosport-----	0-6	4-20	40-70	18-27	1.30-1.40	0.20-0.60	0.18-0.20	0.0-2.9	1.0-2.0	.43	.43	3	6	48	
	6-33	5-30	30-50	36-60	1.50-1.60	0.00-0.06	0.12-0.14	6.0-8.9	0.1-0.5	.32	.32				
	>33	---	---	---	---	---	---	---	---	---	---	---	---	---	
	Sogn-----	0-16	1-20	50-70	27-35	1.15-1.20	0.60-2.00	0.17-0.22	3.0-5.9	.32	.32	1	4L	86	
	>16	---	---	---	---	---	---	---	---	---	---	---	---	---	
Gt: Grundy-----	0-11	1-8	60-70	28-35	1.35-1.45	0.20-0.60	0.18-0.20	3.0-5.9	2.0-4.0	.37	.37	5	7	38	
	11-15	1-8	50-68	32-45	1.35-1.45	0.20-0.60	0.18-0.20	6.0-8.9	1.0-3.0	.37	.37				
	15-43	1-8	40-60	40-50	1.30-1.40	0.06-0.20	0.11-0.13	6.0-8.9	0.4-1.1	.37	.37				
	43-65	1-8	60-70	28-35	1.35-1.40	0.06-0.20	0.18-0.20	6.0-8.9	0.1-0.5	.37	.37				
Gu: Grundy-----	0-11	1-8	60-70	28-35	1.35-1.45	0.20-0.60	0.18-0.20	6.0-8.9	2.0-4.0	.37	.37	5	7	38	
	11-15	1-8	50-70	32-45	1.35-1.45	0.20-0.60	0.18-0.20	6.0-8.9	1.0-3.0	.37	.37				
	15-43	1-8	40-60	40-50	1.30-1.40	0.06-0.20	0.11-0.13	6.0-8.9	0.4-1.1	.37	.37				
	43-65	1-8	60-70	28-35	1.35-1.40	0.06-0.20	0.18-0.20	6.0-8.9	0.1-0.5	.37	.37				
Gy: Gymer-----	0-10	7-20	45-65	20-27	1.30-1.40	0.60-2.00	0.22-0.24	0.0-2.9	2.0-4.0	.32	.32	5	6	48	
	10-39	7-20	40-65	35-42	1.40-1.50	0.20-0.60	0.12-0.20	3.0-5.9	0.3-1.0	.43	.43				
	39-60	7-20	45-65	27-35	1.30-1.40	0.60-2.00	0.18-0.20	3.0-5.9	0.1-0.4	.43	.43				
Hg: Haig-----	0-9	1-5	50-70	32-40	1.35-1.40	0.60-2.00	0.21-0.23	6.0-8.9	3.0-4.0	.37	.37	5	7	38	
	9-45	1-5	50-65	40-50	1.30-1.45	0.06-0.20	0.12-0.14	6.0-8.9	0.3-1.0	.37	.37				
	45-60	1-5	50-70	28-40	1.40-1.50	0.20-0.60	0.18-0.20	6.0-8.9	0.1-0.2	.37	.37				
Hy: Haynie-----	0-8	5-40	50-75	15-25	1.20-1.35	0.60-2.00	0.18-0.23	0.0-2.9	1.0-3.0	.37	.37	5	4L	86	
	8-60	5-55	40-75	15-18	1.20-1.35	0.60-2.00	0.18-0.23	0.0-2.9	0.2-1.0	.37	.37				
Ju: Judson-----	0-30	1-9	60-75	24-27	1.30-1.35	0.60-2.00	0.21-0.23	0.0-2.9	3.0-5.0	.28	.28	5	6	48	
	30-50	1-9	55-70	30-35	1.35-1.45	0.60-2.00	0.21-0.23	3.0-5.9	1.0-3.0	.43	.43				
	50-70	1-9	55-70	25-32	1.35-1.45	0.60-2.00	0.21-0.23	3.0-5.9	0.2-0.6	.43	.43				
Ke: Kennebec-----	0-45	1-10	60-79	22-27	1.25-1.35	0.60-2.00	0.22-0.24	3.0-5.9	4.0-6.0	.28	.28	5	6	48	
	45-72	1-8	60-75	24-28	1.35-1.40	0.60-2.00	0.20-0.22	3.0-5.9	1.0-2.0	.43	.43				
Kh: Knox-----	0-6	1-5	70-78	18-27	1.20-1.30	0.60-2.00	0.22-0.24	0.2-2.9	1.0-3.0	.32	.32	5	6	48	
	6-60	1-5	62-72	25-35	1.30-1.40	0.60-2.00	0.18-0.20	3.0-5.9	0.2-1.0	.43	.43				
Kk: Knox-----	0-6	1-5	70-78	18-27	1.20-1.30	0.60-2.00	0.22-0.24	0.2-2.9	1.0-3.0	.32	.32	5	6	48	
	6-60	1-5	62-72	25-35	1.30-1.40	0.60-2.00	0.18-0.20	3.0-5.9	0.2-1.0	.43	.43				
Km: Knox, eroded-	0-6	1-5	67-70	27-30	1.20-1.30	0.60-2.00	0.18-0.20	3.0-5.9	0.8-3.0	.32	.32	5	7	38	
	6-60	1-5	62-72	25-35	1.30-1.40	0.60-2.00	0.18-0.20	3.0-5.9	0.2-1.0	.43	.43				
Kn: Knox-----	0-6	1-5	70-78	18-27	1.20-1.30	0.60-2.00	0.22-0.24	0.2-2.9	0.8-3.0	.32	.32	5	6	48	
	6-60	1-5	62-72	25-35	1.30-1.40	0.60-2.00	0.18-0.20	3.0-5.9	0.2-1.0	.43	.43				
	Sogn-----	0-16	1-20	50-70	18-35	1.15-1.20	0.60-2.00	0.17-0.22	3.0-5.9	1.0-3.0	.32	.32	1	4L	86
	16-20	---	---	---	---	---	---	---	---	---	---	---	---	---	

PHYSICAL PROPERTIES OF THE SOILS--Continued
 Leavenworth and Wyandotte Counties, Kansas: Published

(Single entries under "Sand and Silt" are a representative percentage are calculated using an algorithm. 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)

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
										K	Kf	T		
	In	Pct	Pct	Pct	g/cc	in/hr	In/in	Pct	Pct					
Ko:														
Konawa-----	0-19	55-75	21	10-18	1.30-1.60	2.00-6.00	0.11-0.15	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	19-47	30-45	32	20-35	1.35-1.65	0.60-2.00	0.12-0.20	0.0-2.9	0.2-0.8	.32	.32			
	47-60	55-75	10	18-32	1.35-1.65	0.60-2.00	0.11-0.17	0.0-2.9	0.1-0.2	.32	.32			
Kw:														
Konawa-----	0-19	52-75	10-40	10-18	1.30-1.60	2.00-6.00	0.11-0.15	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	19-47	20-45	20-50	20-35	1.35-1.65	0.60-2.00	0.12-0.20	3.0-5.9	0.2-0.8	.32	.32			
	47-60	20-45	20-50	18-32	1.35-1.65	0.60-2.00	0.11-0.17	3.0-5.9	0.1-0.2	.32	.32			
La:														
Ladoga-----	0-7	1-4	68-80	18-27	1.30-1.35	0.60-2.00	0.22-0.24	0.0-2.9	2.0-3.0	.42	.32	5	6	48
	7-49	1-4	54-64	36-42	1.30-1.40	0.20-0.60	0.18-0.20	3.0-5.9	0.5-1.0	.43	.43			
	49-60	1-4	60-78	24-32	1.35-1.45	0.60-2.00	0.18-0.20	3.0-5.9	0.5-0.5	.43	.43			
M-W:														
Miscellaneous Water-----	---			---	---	---	---	---	---	---	---	-	---	---
Mb:														
Marshall-----	0-13	1-5	50-75	24-27	1.25-1.30	0.60-2.00	0.21-0.23	3.0-5.9	2.0-4.0	.32	.32	5	6	48
	13-46	1-5	50-70	27-34	1.30-1.35	0.60-2.00	0.18-0.20	3.0-5.9	1.0-2.0	.43	.43			
	46-65	1-5	50-75	22-30	1.30-1.40	0.60-2.00	0.20-0.22	3.0-5.9	0.2-1.0	.43	.43			
Mc:														
Marshall-----	0-13	1-5	50-75	24-27	1.25-1.30	0.60-2.00	0.21-0.23	3.0-5.9	2.0-4.0	.28	.28	5	6	48
	13-46	1-5	50-70	27-34	1.30-1.35	0.60-2.00	0.18-0.20	3.0-5.9	1.0-2.0	.43	.43			
	46-65	1-5	50-75	22-30	1.30-1.40	0.60-2.00	0.20-0.22	3.0-5.9	0.2-1.0	.43	.43			
Md:														
Marshall-----	0-13	1-5	50-75	24-27	1.25-1.30	0.60-2.00	0.21-0.23	3.0-5.9	2.0-4.0	.32	.32	5	6	48
	13-46	1-5	50-70	27-34	1.30-1.35	0.60-2.00	0.18-0.20	3.0-5.9	1.0-2.0	.43	.43			
	46-65	1-5	50-75	22-30	1.30-1.40	0.60-2.00	0.20-0.22	3.0-5.9	0.2-1.0	.43	.43			
Mn:														
Martin-----	0-8	2-12	50-64	27-50	1.35-1.40	0.20-0.60	0.21-0.23	3.0-5.9	2.0-4.0	.37	.37	5	7	38
	8-75	2-12	35-55	40-55	1.40-1.50	0.06-0.20	0.12-0.18	6.0-8.9	0.2-0.7	.37	.37			
Mr:														
Martin-----	0-8	2-12	50-64	27-50	1.35-1.40	0.20-0.60	0.21-0.23	3.0-5.9	2.0-4.0	.37	.37	5	7	38
	8-75	2-12	35-55	40-55	1.40-1.50	0.06-0.20	0.12-0.18	6.0-8.9	0.2-0.7	.37	.37			
Ms:														
Martin-----	0-7	2-12	45-57	38-50	1.35-1.45	0.06-0.20	0.12-0.18	6.0-8.9	0.8-2.0	.28	.28	5	4	86
	7-60	2-12	35-55	40-55	1.40-1.50	0.06-0.20	0.12-0.18	6.0-8.9	0.2-0.7	.37	.37			
On:														
Onawa-----	0-6	10-20	35-55	38-40	1.30-1.35	0.20-0.60	0.12-0.14	6.0-8.9	2.0-3.0	.32	.32	5	4	86
	6-25	10-25	25-45	45-60	1.30-1.40	0.06-0.20	0.12-0.14	6.0-8.9	1.0-2.0	.32	.32			
	25-60	10-55	25-70	12-18	1.40-1.50	0.57-5.95	0.20-0.22	0.0-2.9	0.1-0.7	.43	.43			
Oo:														
Onawa-----	0-7	40-52	30-40	15-22	1.20-1.25	0.60-2.00	0.22-0.24	0.0-2.9	1.0-3.0	.32	.32	5	4L	86
	7-25	10-25	25-55	40-60	1.30-1.40	0.06-0.20	0.12-0.14	6.0-8.9	1.0-2.0	.32	.32			
	25-60	10-55	40-65	12-18	1.40-1.50	0.57-5.95	0.20-0.22	0.0-2.9	0.1-0.7	.43	.43			
Os:														
Oska-----	0-9	2-12	55-65	27-40	1.30-1.40	0.20-0.60	0.18-0.20	3.0-5.9	1.0-4.0	.37	.37	2	7	38
	9-38	2-12	45-60	35-60	1.35-1.45	0.06-0.20	0.14-0.18	6.0-8.9	0.2-2.0	.37	.37			
	>38													
Pb:														
Pawnee-----	0-17	20-45	20-38	30-38	1.40-1.50	0.20-0.60	0.17-0.19	3.0-5.9	2.0-4.0	.37	.37	5	6	48
	17-41	15-40	15-35	40-50	1.50-1.70	0.06-0.20	0.09-0.11	6.0-8.9	0.5-1.5	.37	.37			
	41-60	20-48	20-38	25-35	1.40-1.50	0.06-0.20	0.14-0.16	6.0-8.9	0.1-0.5	.37	.37			
Pc:														
Pawnee-----	0-12	20-45	20-38	30-38	1.40-1.50	0.20-0.60	0.17-0.19	3.0-5.9	2.0-4.0	.37	.37	5	6	48
	12-36	15-40	15-35	40-50	1.50-1.70	0.06-0.20	0.09-0.11	6.0-8.9	0.5-1.5	.37	.37			
	36-60	20-48	20-38	25-35	1.40-1.50	0.06-0.20	0.14-0.16	6.0-8.9	0.1-0.5	.37	.37			
Pe:														
Pawnee, eroded-----	0-7	20-45	20-38	30-38	1.40-1.50	0.20-0.60	0.17-0.19	3.0-5.9	2.0-3.0	.37	.37	5	6	48
	7-36	15-40	15-35	40-50	1.50-1.70	0.06-0.20	0.09-0.11	6.0-8.9	0.5-1.5	.37	.37			
	36-60	20-48	20-38	25-35	1.40-1.50	0.06-0.20	0.14-0.16	6.0-8.9	0.1-0.5	.37	.37			
Qu:														
Quarries-----	---			---	---	---	---	---	---	---	---	-	---	0
Rs:														
River Wash---	---			---	---	---	---	---	---	---	---	-	---	0
Sa:														
Sarpy-----	0-9	75-95	1-20	2-5	1.20-1.50	5.95-19.98	0.05-0.09	0.0-2.9	0.1-1.0	.17	.17	5	2	134
	9-60	75-95	1-20	2-5	1.20-1.50	5.95-19.98	0.05-0.09	0.0-2.9	0.1-0.5	.15	.15			
Haynie-----	0-8	30-70	20-40	15-20	1.20-1.35	0.60-2.00	0.18-0.23	0.0-2.9	1.0-2.0	.37	.37	5	3	86
	8-60	30-70	20-55	15-18	1.20-1.35	0.60-2.00	0.15-0.20	0.0-2.9	0.1-0.5	.37	.37			
Sb:														
Sharpsburg---	0-15	1-10	60-70	27-36	1.30-1.35	0.60-2.00	0.21-0.23	3.0-5.9	3.0-4.0	.32	.32	5	7	38
	15-30	1-10	55-65	36-42	1.35-1.40	0.20-0.60	0.18-0.20	3.0-5.9	1.0-2.0	.43	.43			
	30-42	1-10	55-70	30-38	1.40-1.45	0.60-2.00	0.18-0.20	3.0-5.9	0.5-1.0	.43	.43			
	42-60	1-10	55-70	25-32	1.40-1.45	0.60-2.00	0.18-0.20	3.0-5.9	0.1-1.0	.43	.43			
Sc:														
Sharpsburg---	0-10	1-10	60-70	27-36	1.30-1.35	0.60-2.00	0.21-0.23	3.0-5.9	3.0-4.0	.32	.32	5	7	38
	10-30	1-10	55-65	36-42	1.35-1.40	0.20-0.60	0.18-0.20	3.0-5.9	1.0-2.0	.43	.43			
	30-42	1-10	55-70	30-38	1.40-1.45	0.60-2.00	0.18-0.20	3.0-5.9	0.5-1.0	.43	.43			
	42-60	1-10	60-75	25-32	1.40-1.45	0.60-2.00	0.18-0.20	3.0-5.9	0.1-1.0	.43	.43			
Se:														
Shelby-----	0-7	25-50	28-50	22-33	1.50-1.55	0.60-2.00	0.20-0.22	3.0-5.9	2.5-4.0	.28	.28	5	6	48
	7-40	20-46	25-45	27-35	1.55-1.65	0.20-0.60	0.16-0.18	3.0-5.9	0.2-1.0	.28	.28			
	40-75	20-46	25-45	27-35	1.55-1.65	0.20-0.60	0.16-0.18	3.0-5.9	0.1-1.0	.37	.37			

PHYSICAL PROPERTIES OF THE SOILS--Continued
Leavenworth and Wyandotte Counties, Kansas: Published

(Single entries under "Sand and Silt" are a representative percentage are calculated using an algorithm. 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)

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
										K	Kf	T		
	In	Pct	Pct	Pct	g/cc	in/hr	In/in	Pct	Pct					
Sh:														
Shelby-----	0-7	25-50	28-50	22-33	1.50-1.55	0.60-2.00	0.20-0.22	3.0-5.9	2.5-4.0	.28	.28	5	6	48
	7-40	20-46	25-45	27-35	1.55-1.65	0.20-0.60	0.16-0.18	3.0-5.9	0.2-1.0	.28	.28			
	40-75	20-46	25-45	27-35	1.55-1.65	0.20-0.60	0.16-0.18	3.0-5.9	0.1-1.0	.37	.37			
Sm:														
Shelby-----	0-5	25-50	28-50	22-33	1.35-1.48	0.60-2.00	0.20-0.22	3.0-5.9	2.2-4.0	.28	.28	5	6	48
	5-40	20-46	25-45	27-35	1.40-1.65	0.20-0.60	0.16-0.18	3.0-5.9	0.2-1.0	.28	.28			
	40-75	20-46	25-45	27-35	1.50-1.70	0.20-0.60	0.16-0.18	3.0-5.9	0.1-0.5	.37	.37			
Sp:														
Shelby-----	0-7	25-50	28-50	22-33	1.50-1.55	0.60-2.00	0.20-0.22	3.0-5.9	2.5-4.0	.28	.28	5	6	48
	7-40	20-46	25-45	27-35	1.55-1.65	0.20-0.60	0.16-0.18	3.0-5.9	0.2-1.0	.28	.28			
	40-75	20-46	25-45	27-38	1.55-1.65	0.20-0.60	0.16-0.18	3.0-5.9	0.1-1.0	.37	.37			
Pawnee-----	0-12	20-45	20-38	30-38	1.40-1.50	0.20-0.60	0.17-0.19	3.0-5.9	2.0-4.0	.37	.37	5	6	48
	12-36	15-40	15-35	40-50	1.50-1.70	0.06-0.20	0.09-0.11	6.0-8.9	0.5-1.5	.37	.37			
	36-60	20-48	20-38	25-35	1.40-1.50	0.06-0.20	0.14-0.16	6.0-8.9	0.1-0.5	.37	.37			
Ss:														
Shelby, eroded-----	0-7	25-50	28-40	27-35	1.50-1.55	0.20-0.60	0.16-0.18	3.0-5.9	2.0-3.0	.28	.28	5	6	48
	7-40	20-46	25-45	27-35	1.55-1.65	0.20-0.60	0.16-0.18	3.0-5.9	0.2-1.0	.28	.28			
	40-75	20-46	25-45	27-38	1.55-1.65	0.20-0.60	0.16-0.18	3.0-5.9	0.1-1.0	.37	.37			
Pawnee, eroded-----	0-7	20-45	20-38	30-38	1.40-1.50	0.20-0.60	0.17-0.19	3.0-5.9	2.0-3.0	.37	.37	5	6	48
	7-36	15-40	15-35	40-50	1.50-1.70	0.06-0.20	0.09-0.11	6.0-8.9	0.5-1.5	.37	.37			
	36-60	20-48	20-38	25-35	1.40-1.50	0.06-0.20	0.14-0.16	6.0-8.9	0.1-0.5	.37	.37			
Sy:														
Sibleyville--	0-13	35-50	30-40	14-27	1.30-1.40	0.60-2.00	0.18-0.21	0.0-2.9	1.0-4.0	.32	.32	3	6	48
	13-32	30-45	25-40	20-35	1.35-1.45	0.60-2.00	0.16-0.19	0.0-2.9	1.0-2.0	.28	.32			
	>32	---	---	---	---	---	---	---	---	---	---			
SZ:														
Sogn-----	0-13	1-20	50-70	27-35	1.15-1.20	0.60-2.00	0.17-0.22	3.0-5.9	1.0-3.0	.32	.32	1	4L	86
	13-17	---	---	---	---	---	---	---	---	---	---			
Vinland-----	0-12	1-20	50-75	27-35	1.20-1.40	0.60-2.00	0.21-0.24	3.0-5.9	2.0-4.0	.32	.32	2	7	38
	12-16	1-55	20-70	18-35	1.30-1.60	0.60-2.00	0.15-0.22	3.0-5.9	0.5-1.0	.43	.49			
	16-20	---	---	---	---	---	---	---	---	---	---			
Uc:														
Un:														
VR:														
Rock Outcrop-	0-5					0.00-0.00								0
Vinland-----	0-7	1-20	50-75	27-35	1.20-1.40	0.60-2.00	0.21-0.24	3.0-5.9	2.0-4.0	.32	.32	2	7	38
	7-17	1-55	20-70	18-35	1.30-1.60	0.60-2.00	0.15-0.22	3.0-5.9	0.5-1.0	.43	.43			
	17-21	---	---	---	---	---	---	---	---	---	---			
Vs:														
Vinland-----	0-18	25-50	23-60	10-27	1.20-1.40	0.60-2.00	0.21-0.24	0.0-2.9	2.0-4.0	.28	.28	2	6	48
	>18	---	---	---	---	---	---	---	---	---	---			
Sibleyville--	0-13	35-50	30-40	14-27	1.30-1.40	0.60-2.00	0.18-0.21	0.0-2.9	1.0-4.0	.32	.32	3	6	48
	13-32	30-45	25-40	20-35	1.35-1.45	0.60-2.00	0.16-0.19	0.0-2.9	1.0-2.0	.28	.32			
	>32	---	---	---	---	---	---	---	---	---	---			
W:														
Water-----	---													
Wa:														
Wabash-----	0-6	1-5	48-60	40-46	1.25-1.45	0.00-0.06	0.12-0.14	9.0-25.0	2.0-4.0	.28	.28	5	4	86
	6-60	1-5	38-55	40-60	1.20-1.45	0.00-0.06	0.08-0.12	9.0-25.0	0.1-0.4	.28	.28			
Wc:														
Welda-----	0-12	1-10	50-75	12-27	1.25-1.35	0.60-2.00	0.22-0.24	0.0-2.9	0.5-1.0	.37	.37	5	6	48
	12-37	1-10	40-65	35-42	1.35-1.40	0.20-0.60	0.14-0.20	3.0-5.9	0.3-0.7	.32	.32			
	37-70	1-10	50-70	18-35	1.40-1.45	0.60-2.00	0.18-0.22	3.0-5.9	0.1-0.5	.32	.32			
Wd:														
Welda-----	0-12	1-10	50-75	12-27	1.25-1.35	0.60-2.00	0.22-0.24	1.5-4.5	0.5-1.0	.37	.37	5	6	48
	12-37	1-10	40-65	35-42	1.35-1.40	0.20-0.60	0.14-0.20	3.0-5.9	0.3-0.7	.32	.32			
	37-70	1-10	50-70	18-35	1.40-1.45	0.60-2.00	0.18-0.22	3.0-5.9	0.1-0.5	.32	.32			
Zo:														
Zook-----	0-22	1-5	50-65	35-40	1.30-1.35	0.20-0.60	0.21-0.23	6.0-8.9	2.0-5.0	.37	.37	5	7	38
	22-76	1-8	50-65	36-45	1.30-1.45	0.06-0.20	0.11-0.13	6.0-8.9	0.5-2.0	.28	.28			

CHEMICAL PROPERTIES OF THE SOILS
Leavenworth and Wyandotte Counties, Kansas

The Chemical Properties table shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils. Depth to the upper and lower boundaries of each layer is indicated.

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

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

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

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.

Gypsum is expressed as a percent, by weight, of hydrated calcium sulfates in the fraction of the soil less than 20 millimeters in size. Gypsum is partially soluble in water and can be dissolved and removed by water. Soils that have a high content of gypsum may collapse if the gypsum is removed by percolating water.

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

Sodium adsorption ratio (SAR) is a measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration divided by the square root of one-half of the Ca + Mg concentration. Soils that have SAR values of 13 or more may be characterized by an increased dispersion of organic matter and clay particles, reduced permeability and aeration, and a general degradation of soil structure.

CHEMICAL PROPERTIES OF THE SOILS--Continued
Leavenworth and Wyandotte Counties, Kansas

Map symbol and soil name	Depth	Cation-exchange capacity	Effective Cation Exchange Capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100g	pH	Pct	Pct	mmhos/cm		
005AQ: Fluvaquents-----	0-80	---	---	---	---	---	---	---
005AR: Armster-----	0-7 7-60	11-25 14-29	---	4.5-7.3 4.5-7.3	0 0	0 0	0 0	0 0
005GO: Gosport-----	0-8 8-35 35-39	11-22 ---	---	5.1-7.3 3.6-5.5	0 0	0 0	0 0	0 0
005HN: Haynie-----	0-7 7-60	6.0-17 6.0-11	---	6.6-8.4 7.4-8.4	0-25 5-30	---	---	---
005HO: Haynie-----	0-7 7-60	6.0-17 6.0-11	---	6.6-8.4 7.4-8.4	0-25 5-30	---	---	---
Onawa-----	0-7 7-22 22-60	23-30 26-37 7.0-15	---	7.4-8.4 7.4-8.4 7.4-8.4	---	---	---	---
005KG: Kennebec-----	0-47 47-60	10-20 10-18	---	5.6-7.3 6.1-7.3	0 0	0 0	0 0	0 0
Colo-----	0-8 8-60 60-64	9.0-19 12-21 10-21	---	5.6-7.3 5.6-7.3 6.1-7.3	0 0 0	0 0 0	0 0 0	0 0 0
005KY: Knox-----	0-8 8-45 45-60	7.0-18 10-22 7.0-17	---	5.6-7.3 5.6-7.3 6.1-7.3	0 0 0	0 0 0	0 0 0	0 0 0
Gosport-----	0-8 8-35 35-39	11-22 ---	14-36 0.0-0.0	5.1-7.3 3.6-5.5	0 0	0 0	0 0	0 0
005OD: Onawa-----	0-10 10-17 17-32 32-70	15-25 23-30 26-37 7.0-15	---	7.4-8.4 7.4-8.4 7.4-8.4 7.4-8.4	0-2 1-4 3-10 3-10	---	---	---
005OW: Onawet-----	0-7 7-24 24-56 56-80	20-35 35-50 10-20 5.0-15	---	6.6-7.8 7.4-8.4 7.4-8.4 7.4-8.4	5-25 5-25 5-30 0-25	0 0 0 0	0 0 0 0	0 0 0 0
005PA: Knox-----	0-7 7-12 12-23 23-35 35-61 61-70	20-29 20-29 20-29 20-29 16-27 16-27	---	5.6-7.3 5.6-7.3 5.6-7.3 5.6-7.3 5.6-7.3 6.1-7.3	---	---	---	---
Palermo-----	0-5 5-11 11-23 23-41 41-80	---	---	---	---	---	---	---
005PB: Palermo-----	0-5 5-11 11-23 23-41 41-80	---	---	---	---	---	---	---
005SH: Shelby-----	0-12 12-47 47-60	11-23 12-22 12-22	---	5.1-7.3 5.1-7.3 6.6-8.4	0 0 0-30	0 0 0	0 0 0	0 0 0
005WA: Wabash-----	0-8 8-60	11-24 16-36	---	5.6-7.3 5.6-7.8	0 0	0 0	0 0	0 0
005WH: Wathena-----	0-9 9-37 37-52 52-64 64-80	0.0-4.0 0.0-3.0 ---	---	6.6-8.4 6.6-8.4	---	---	---	---
Haynie-----	0-7 7-60	6.0-17 6.0-11	---	6.6-8.4 7.4-8.4	0-25 5-30	---	---	---
045ET: Eudora-----	0-12 12-72	2.0-13 2.0-12	---	6.1-7.8 6.6-8.4	0 0	0 0	0 0	0 0
045EV: Eudora-----	0-12 12-72	2.0-13 2.0-12	---	6.1-7.8 6.6-8.4	0 ---	0 0	0 0	0 0
Kimo-----	0-6 6-28 28-60	14-27 14-30 2.0-11	---	6.1-8.4 6.1-8.4 6.1-8.4	0 0 0	0 0 0	0 0 0	0 0 0

CHEMICAL PROPERTIES OF THE SOILS--Continued
Leavenworth and Wyandotte Counties, Kansas

Map symbol and soil name	Depth	Cation- exchange capacity	Effective Cation Exchange Capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100g	pH	Pct	Pct	mmhos/cm		
045KM: Kimo-----	0-6	14-27	---	6.1-8.4	---	---	---	---
	6-28	14-30	---	6.1-8.4	---	---	---	---
	28-60	2.0-11	---	6.1-8.4	---	---	---	---
045MR: Morrill-----	0-10	6.0-20	---	5.1-7.3	0	0	0	0
	10-56	10-21	---	5.1-7.3	0	0	0	0
	56-66	4.0-18	---	5.1-7.3	0	0	0	0
045RO: River Wash-----	---	---	---	---	---	---	---	---
045SB: Sarpy-----	0-12	0.0-4.0	---	6.6-8.4	0	0	0	0
	12-60	0.0-3.0	---	6.6-8.4	0	0	0	0
Eudora-----	0-8	2.0-12	---	6.1-7.8	0	0	0	0
	8-60	2.0-11	---	6.6-8.4	0	0	0	0
045VM: Vinland-----	0-7	11-24	---	5.6-7.8	0	0	0	0
	7-17	6.0-22	---	5.6-7.8	0	0	0	0
	17-21	---	---	---	---	---	---	---
Martin-----	0-9	11-27	---	5.6-6.5	0	0	0	0
	9-14	10-24	---	5.6-7.3	0	0	0	0
	14-60	16-33	---	5.6-7.8	0-1	0	0	0
045WC: Wabash-----	0-16	11-24	---	5.6-7.3	0	0	0	0
	16-70	16-36	---	5.6-7.8	0	0	0	0
087RE: Reading-----	0-8	10-25	---	5.6-6.5	0	0	0	0
	8-14	10-25	---	5.6-6.5	0	0	0	0
	14-21	15-25	---	6.1-7.8	0	0	0	0
	21-29	15-25	---	6.1-7.8	0	0	0	0
	29-42	15-25	---	6.1-7.8	0	0	0	0
	42-60	15-25	---	6.1-8.4	0	0	0	0
	60-72	10-20	---	6.1-8.4	0	0	0	0
087SS: Sibleyville-----	0-7	6.0-19	---	5.6-7.3	0	0	0	0
	7-15	8.0-22	---	5.1-7.3	0	0	0	0
	15-27	5.0-18	---	5.1-7.3	0	0	0	0
	27-31	---	---	---	---	---	---	---
087SV: Sibleyville-----	0-10	6.0-19	---	5.6-7.3	0	0	0	0
	10-18	8.0-22	---	5.1-7.3	0	0	0	0
	18-29	5.0-18	---	5.1-7.3	0	0	0	0
	29-33	---	---	---	---	---	---	---
087VO: Vinland-----	0-12	11-24	---	5.6-7.8	0	0	0	0
	12-16	6.0-22	---	5.6-7.8	0	0	0	0
	16-20	---	---	---	---	---	---	---
087WC: Wabash-----	0-19	11-24	---	5.6-7.3	0	0	0	0
	19-60	16-36	---	5.6-7.8	0	0	0	0
091ED: Eudora-----	0-13	2.0-13	---	6.1-7.8	0	0	0	0
	13-60	2.0-12	---	6.6-8.4	0	0	0	0
Kimo-----	0-6	14-27	---	6.1-8.4	---	---	---	---
	6-24	14-30	---	6.1-8.4	---	---	---	---
	24-60	2.0-11	---	6.1-8.4	---	---	---	---
091LB: Ladoga-----	0-13	8.0-18	---	6.1-7.3	0	0	0	0
	13-31	14-26	---	5.1-6.0	0	0	0	0
	31-60	9.0-20	---	5.1-6.5	0	0	0	0
091RA: Reading-----	0-15	8.0-19	---	5.6-6.5	0	0	0	0
	15-41	11-23	---	5.6-6.5	0	0	0	0
	41-60	12-26	---	6.1-8.4	0	0	0	0
091SB: Sharpsburg-----	0-9	11-19	---	5.1-7.3	---	---	---	---
	9-35	14-27	---	5.1-6.0	---	---	---	---
	35-60	10-20	---	6.1-6.5	---	---	---	---
Urban Land-----	---	---	---	---	---	---	---	---
Aa: Kennebec, CHANNELED-----	0-8	30-36	---	5.6-7.3	0	0	0	0
	8-18	30-36	---	5.6-7.3	0	0	0	0
	18-32	30-36	---	5.6-7.3	0	0	0	0
	32-41	30-36	---	5.6-7.3	0	0	0	0
	41-54	30-36	---	6.1-7.3	0	0	0	0
	54-60	30-36	---	6.1-7.3	0	0	0	0
Ac: Armster-----	0-10	6.0-18	---	4.5-7.3	0	0	0	0
	10-60	14-29	---	4.5-7.3	0	0	0	0
Ad: Armster-----	0-10	6.0-18	---	4.5-7.3	0	0	0	0
	10-60	14-29	---	4.5-7.3	0	0	0	0

CHEMICAL PROPERTIES OF THE SOILS--Continued
Leavenworth and Wyandotte Counties, Kansas

Map symbol and soil name	Depth	Cation- exchange capacity	Effective Cation Exchange Capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
Ae:								
Armster, eroded-	0-7	11-25	---	4.5-7.3	0	0	0	0
	7-60	14-29	---	4.5-7.3	0	0	0	0
AED:								
Arents, Earthen Dam-----	---	---	---	---	---	---	---	---
Ba:								
Basehor-----	0-10	3.0-13	---	5.1-6.5	0	0	0	0
	10-13	---	---	---	---	---	---	---
	13-17	---	---	---	---	---	---	---
Br:								
Bremer-----	0-13	12-24	---	5.6-7.3	0	0	0	0
	13-50	14-25	---	5.6-6.5	0	0	0	0
	50-60	12-23	---	5.6-6.5	0	0	0	0
Cf:								
Borrow Pits-----	---	---	---	---	---	---	---	---
Ec:								
Elmont-----	0-15	6.0-19	---	5.1-7.3	0	0	0	0
	15-65	10-21	---	5.1-7.3	0	0	0	0
	65-69	---	---	---	---	---	---	---
Ed:								
Elmont-----	0-15	6.0-19	---	5.1-7.3	0	0	0	0
	15-65	10-21	---	5.1-7.3	0	0	0	0
	65-69	---	---	---	---	---	---	---
Eu:								
Eudora-----	0-12	2.0-13	---	6.1-7.8	0	0	0	0
	12-70	2.0-12	---	6.6-8.4	0	0	0	0
Haynie-----	0-8	6.0-17	---	6.6-8.4	0-25	0	0	0
	8-60	6.0-11	---	7.4-8.4	5-30	0	0	0
Gc:								
Gosport-----	0-6	7.0-18	---	5.1-6.5	---	---	---	---
	6-33	---	14-36	3.6-5.5	---	---	---	---
	>33	---	0.0-0.0	---	---	---	---	---
Gp:								
Gravel Pits-----	---	---	---	---	---	---	---	---
Gs:								
Gosport-----	0-6	7.0-18	---	5.1-6.5	---	---	---	---
	6-33	---	14-36	3.6-5.5	---	---	---	---
	>33	---	0.0-0.0	---	---	---	---	---
Sogn-----	0-16	11-23	---	6.1-8.4	---	0	0	0
	>16	---	0.0-0.0	---	---	---	---	---
Gt:								
Grundy-----	0-11	12-24	---	5.6-7.3	0	0	0	0
	11-15	12-27	---	5.6-6.5	0	0	0	0
	15-43	16-30	---	5.1-7.3	0	0	0	0
	43-65	11-21	---	5.6-7.3	0	0	0	0
Gu:								
Grundy-----	0-11	12-24	---	5.6-7.3	---	---	---	---
	11-15	12-27	---	5.6-6.5	---	---	---	---
	15-43	16-30	---	5.1-7.3	---	---	---	---
	43-65	11-21	---	5.6-7.3	---	---	---	---
Gy:								
Gymer-----	0-10	8.0-19	---	5.1-6.5	0	0	0	0
	10-39	14-25	---	5.6-6.5	0	0	0	0
	39-60	10-21	---	5.6-6.5	0	0	0	0
Hg:								
Haig-----	0-9	14-27	---	5.6-7.3	0	0	0	0
	9-45	16-30	---	5.1-6.0	0	0	0	0
	45-60	11-24	---	6.1-7.3	0	0	0	0
Hy:								
Haynie-----	0-8	6.0-17	---	6.6-8.4	0-25	0	0	0
	8-60	6.0-11	---	7.4-8.4	5-30	0	0	0
Ju:								
Judson-----	0-30	11-19	---	5.6-7.3	0	0	---	0
	30-50	12-21	---	5.6-7.3	0	0	---	0
	50-70	10-19	---	6.1-7.8	0	0	---	0
Ke:								
Kennebec-----	0-45	10-20	---	5.6-7.3	---	---	---	---
	45-72	10-18	---	6.1-7.3	---	---	---	---
Kh:								
Knox-----	0-6	7.0-18	---	5.6-7.3	0	0	0	0
	6-60	10-22	---	5.6-7.3	0	0	0	0
Kk:								
Knox-----	0-6	7.0-18	---	5.6-7.3	0	0	0	0
	6-60	10-22	---	5.6-7.3	0	0	0	0
Km:								
Knox, eroded----	0-6	11-20	---	5.6-7.3	---	---	---	---
	6-60	10-22	---	5.6-7.3	---	---	---	---
Kn:								
Knox-----	0-6	7.0-18	---	5.6-7.3	0	0	0	0
	6-60	10-22	---	5.6-7.3	0	0	0	0
Sogn-----	0-16	7.0-17	---	6.1-8.4	0	0	0	0
	16-20	---	---	---	---	---	---	---

CHEMICAL PROPERTIES OF THE SOILS--Continued
Leavenworth and Wyandotte Counties, Kansas

Map symbol and soil name	Depth	Cation- exchange capacity	Effective Cation Exchange Capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100g	pH	Pct	Pct	mmhos/cm		
Ko:								
Konawa-----	0-19	4.0-11	---	5.6-7.3	---	---	---	---
	19-47	---	8.0-21	4.5-6.0	---	---	---	---
	47-60	---	7.0-19	4.5-6.0	---	---	---	---
Kw:								
Konawa-----	0-19	4.0-11	---	5.6-7.3	0	0	0	0
	19-47	---	8.0-21	4.5-6.0	0	0	0	0
	47-60	---	7.0-19	4.5-6.0	0	0	0	0
La:								
Ladoga-----	0-7	8.0-18	---	6.1-7.3	0	0	0	0
	7-49	---	---	5.1-6.0	0	0	0	0
	49-60	9.0-20	---	5.1-6.5	0	0	0	0
M-W:								
Miscellaneous	---	---	---	---	---	---	---	---
Water-----								
Mb:								
Marshall-----	0-13	11-19	---	5.6-7.3	0	0	0	0
	13-46	11-22	---	5.6-7.3	0	0	0	0
	46-65	8.0-19	---	6.6-7.3	0	0	0	0
Mc:								
Marshall-----	0-13	11-19	---	5.6-7.3	0	0	0	0
	13-46	11-22	---	5.6-7.3	0	0	0	0
	46-65	8.0-19	---	6.6-7.3	0	0	0	0
Md:								
Marshall-----	0-13	11-19	---	5.6-7.3	0	0	0	0
	13-46	11-22	---	5.6-7.3	0	0	0	0
	46-65	8.0-19	---	6.6-7.3	0	0	0	0
Mn:								
Martin-----	0-8	11-27	---	5.6-6.5	0	0	0	0
	8-75	16-33	---	5.6-7.8	0	0	0	0
Mr:								
Martin-----	0-8	11-27	---	5.6-6.5	0	0	0	0
	8-75	16-33	---	5.6-7.8	0	0	0	0
Ms:								
Martin-----	0-7	16-31	---	5.6-6.5	0	0	0	0
	7-60	16-33	---	5.6-7.8	0	0	0	0
On:								
Onawa-----	0-6	16-26	---	7.4-8.4	0-2	0	0	0
	6-25	20-36	---	7.4-8.4	1-6	0	0	0
	25-60	4.0-11	---	7.4-8.4	3-10	0	0	0
Oo:								
Onawa-----	0-7	6.0-14	---	7.4-8.4	0-3	0	0	0
	7-25	20-36	---	7.4-8.4	1-5	0	0	0
	25-60	4.0-11	---	7.4-8.4	3-10	0	0	0
Os:								
Oska-----	0-9	11-26	---	5.6-6.5	0	0	0	0
	9-38	14-36	---	5.6-7.8	0	0	0	0
	>38	---	---	---	---	---	---	---
Pb:								
Pawnee-----	0-17	13-25	---	5.6-7.3	0	0	0	0
	17-41	16-30	---	6.1-8.4	0	0	0	0
	41-60	10-21	---	7.4-8.4	0	0	0	0
Pc:								
Pawnee-----	0-12	13-25	---	5.6-7.3	0	0	0	0
	12-36	16-30	---	6.1-8.4	0	0	0	0
	36-60	10-21	---	7.4-8.4	0	0	0	0
Pe:								
Pawnee, eroded--	0-7	13-25	---	5.6-7.3	0	0	0	0
	7-36	16-30	---	6.1-8.4	0	0	0	0
	36-60	10-21	---	7.4-8.4	0	0	0	0
Qu:								
Quarries-----	---	---	---	---	---	---	---	---
Rs:								
River Wash-----	---	---	---	---	---	---	---	---
Sa:								
Sarpy-----	0-9	0.0-4.0	---	6.6-8.4	0	0	0	0
	9-60	0.0-3.0	---	6.6-8.4	0	0	0	0
	0-8	6.0-14	---	6.6-8.4	0-25	0	0	0
	8-60	6.0-11	---	7.4-8.4	5-30	0	0	0
Sb:								
Sharpsburg-----	0-15	12-24	---	5.1-7.3	---	---	---	---
	15-30	14-27	---	5.1-6.0	---	---	---	---
	30-42	12-24	---	5.1-6.5	---	---	---	---
	42-60	10-20	---	6.1-6.5	---	---	---	---
Sc:								
Sharpsburg-----	0-10	12-24	---	5.1-7.3	---	---	---	---
	10-30	14-27	---	5.1-6.0	---	---	---	---
	30-42	12-24	---	5.1-6.5	---	---	---	---
	42-60	10-20	---	6.1-6.5	---	---	---	---
Se:								
Shelby-----	0-7	10-19	---	5.1-7.3	0	0	0	0
	7-40	12-22	---	5.1-7.3	0	0	0	0
	40-75	12-22	---	6.6-8.4	0-30	0	0	0

CHEMICAL PROPERTIES OF THE SOILS--Continued
Leavenworth and Wyandotte Counties, Kansas

Map symbol and soil name	Depth	Cation-exchange capacity	Effective Cation Exchange Capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100g	pH	Pct	Pct	mmhos/cm		
Sh:								
Shelby-----	0-7	10-19	---	5.1-7.3	0	0	0	0
	7-40	12-22	---	5.1-7.3	0	0	0	0
	40-75	12-22	---	6.6-8.4	0-30	0	0	0
Sm:								
Shelby-----	0-5	10-19	---	5.1-7.3	0	0	0	0
	5-40	12-22	---	5.1-7.3	0	0	0	0
	40-75	12-22	---	6.6-8.4	0-30	0	0	0
Sp:								
Shelby-----	0-7	10-19	---	5.1-7.3	0	0	0	0
	7-40	12-22	---	5.1-7.3	0	0	0	0
	40-75	12-22	---	6.6-8.4	0-30	0	0	0
Pawnee-----	0-12	13-25	---	5.6-7.3	0	0	0	0
	12-36	16-30	---	6.1-8.4	0	0	0	0
	36-60	10-21	---	7.4-8.4	0	0	0	0
Ss:								
Shelby, eroded--	0-7	11-23	---	5.1-7.3	0	0	0	0
	7-40	12-22	---	5.1-7.3	0	0	0	0
	40-75	12-22	---	6.6-8.4	0-30	0	0	0
Pawnee, eroded--	0-7	13-25	---	5.6-7.3	0	0	0	0
	7-36	16-30	---	6.1-8.4	0	0	0	0
	36-60	10-21	---	7.4-8.4	0	0	0	0
Sy:								
Sibleyville-----	0-13	6.0-19	---	5.6-7.3	0	0	0	0
	13-32	8.0-22	---	5.1-7.3	0	0	0	0
	>32	---	0.0-0.0	---	---	---	---	---
SZ:								
Sogn-----	0-13	11-23	---	6.1-8.4	0	0	0	0
	13-17	---	---	---	---	---	---	---
Vinland-----	0-12	11-24	---	5.6-7.8	0	0	0	0
	12-16	6.0-22	---	5.6-7.8	0	0	0	0
	16-20	---	---	---	---	---	---	---
Uc:								
Un:								
VR:								
Rock Outcrop----	0-5	---	0.0-0.0	---	---	---	---	---
Vinland-----	0-7	11-24	---	5.6-7.8	0	0	0	0
	7-17	6.0-22	---	5.6-7.8	0	0	0	0
	17-21	---	---	---	---	---	---	---
Vs:								
Vinland-----	0-18	4.0-19	---	5.6-7.8	0	0	0	0
	>18	---	---	---	---	---	---	---
Sibleyville-----	0-13	6.0-19	---	5.6-7.3	0	0	0	0
	13-32	8.0-22	---	5.1-7.3	0	0	0	0
	>32	---	0.0-0.0	---	---	---	---	---
W:								
Water-----	---	---	---	---	---	---	---	---
Wa:								
Wabash-----	0-6	16-30	---	5.6-7.3	0	0	0	0
	6-60	16-36	---	5.6-7.8	0	0	0	0
Wc:								
Welda-----	0-12	5.0-17	---	5.1-7.3	0	0	0	0
	12-37	14-25	---	5.1-6.5	0	0	0	0
	37-70	7.0-21	---	5.1-6.5	0	0	0	0
Wd:								
Welda-----	0-12	5.0-17	---	5.1-7.3	0	0	0	0
	12-37	14-25	---	5.1-6.5	0	0	0	0
	37-70	7.0-21	---	5.1-6.5	0	0	0	0
Zo:								
Zook-----	0-22	16-28	---	5.6-7.3	0	0	0	0
	22-76	15-36	---	5.6-7.8	0	0	0	0

WATER FEATURES
Leavenworth and Wyandotte Counties, Kansas

The Water Features table 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.

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 Water Features 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 Water Features 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, the temporary inundation of an area, is caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, 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--Continued
Leavenworth and Wyandotte Counties, Kansas

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

Map symbol and soil name	Hydro-logic group	Month	Soil Saturation		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
005AQ: Fluvaquents-----	---	January	---	---	0.0-0.1	Very brief	Rare	---	---
		February	0.0	>6.0	0.0-0.1	Very brief	Rare	---	---
		March	0.0	>6.0	0.0-0.1	Long	Frequent	Brief	Occasional
		April	0.0	>6.0	0.0-0.1	Long	Frequent	Brief	Occasional
		May	0.0	>6.0	0.0-0.1	Very long	Frequent	Brief	Occasional
		June	0.0	>6.0	0.0-0.1	Long	Frequent	Brief	Occasional
		July	0.0	>6.0	0.0-0.1	Long	Occasional	Very brief	Occasional
		August	0.0	>6.0	0.0-0.1	Brief	Occasional	Very brief	Rare
		September	0.0	>6.0	0.0-0.1	Brief	Occasional	Very brief	Occasional
		October	0.0	>6.0	0.0-0.1	Long	Occasional	Very brief	Occasional
		November	0.0	>6.0	0.0-0.1	Brief	Occasional	---	---
		December	---	---	0.0-0.1	Brief	Occasional	---	---
005AR: Armster-----	C	January	1.0-1.5	1.5-2.0	---	---	---	---	None
		February	1.0-1.5	1.5-2.0	---	---	---	---	None
		March	1.0-1.5	1.5-2.0	---	---	---	---	None
		November	1.0-1.5	1.5-2.0	---	---	---	---	None
		December	1.0-1.5	1.5-2.0	---	---	---	---	None
005GO: Gosport-----	C		---	---	---	---	---	---	---
005HN: Haynie-----	B	February	---	---	---	---	None	Very brief	Rare
		March	---	---	---	---	None	Very brief	Occasional
		April	---	---	---	---	None	Very brief	Occasional
		May	---	---	---	---	None	Very brief	Occasional
		June	1.0-3.0	>6.0	---	---	None	Very brief	Occasional
		July	---	---	---	---	None	Very brief	Occasional
		August	---	---	---	---	None	Very brief	Occasional
		September	---	---	---	---	None	Very brief	Occasional
		October	---	---	---	---	None	Very brief	Occasional
		November	---	---	---	---	None	Very brief	Rare
		005HO: Haynie-----	B	February	---	---	---	---	None
March	---			---	---	---	None	Very brief	Occasional
April	---			---	---	---	None	Very brief	Occasional
May	---			---	---	---	None	Very brief	Occasional
June	1.0-3.0			>6.0	---	---	None	Very brief	Occasional
July	---			---	---	---	None	Very brief	Occasional
August	---			---	---	---	None	Very brief	Occasional
September	---			---	---	---	None	Very brief	Occasional
October	---			---	---	---	None	Very brief	Occasional
November	---			---	---	---	None	Very brief	Rare
Onawa-----	D			January	3.0-5.0	>6.0	---	---	---
		February	3.0-5.0	>6.0	---	---	---	---	---
		March	3.0-5.0	>6.0	---	---	---	Brief	Occasional
		April	3.0-5.0	>6.0	---	---	---	Brief	Occasional
		May	2.0-3.0	>6.0	0.0-0.8	Very brief	Occasional	Brief	Occasional
		June	1.0-3.0	>6.0	0.0-0.8	Very brief	Occasional	Brief	Occasional
		July	3.0-5.0	>6.0	---	---	---	Brief	Occasional
		August	3.0-5.0	>6.0	---	---	---	Brief	Occasional
		September	3.0-5.0	>6.0	---	---	---	Brief	Occasional
		October	3.0-5.0	>6.0	---	---	---	Brief	Occasional
		November	3.0-5.0	>6.0	---	---	---	---	---
		December	3.0-5.0	>6.0	---	---	---	---	---
		005KG: Kennebec-----	B	January	3.0-5.0	>6.0	---	---	---
February	3.0-5.0			>6.0	---	---	---	Brief	Occasional
March	3.0-5.0			>6.0	---	---	---	Brief	Occasional
April	3.0-5.0			>6.0	---	---	---	Brief	Occasional
May	3.0-5.0			>6.0	---	---	---	Brief	Occasional
June	3.0-5.0			>6.0	---	---	---	Brief	Occasional
July	3.0-5.0			>6.0	---	---	---	Brief	Occasional
August	---			---	---	---	---	Brief	Occasional
September	---			---	---	---	---	Brief	Occasional
October	---			---	---	---	---	Brief	Occasional
November	3.0-5.0			>6.0	---	---	---	Brief	Occasional
December	3.0-5.0			>6.0	---	---	---	---	None

WATER FEATURES--Continued
Leavenworth and Wyandotte Counties, Kansas

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

Map symbol and soil name	Hydro-logic group	Month	Soil Saturation		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Colo-----	B/D	January	1.0-3.0	>6.0	---	---	---	---	None
		February	1.0-3.0	>6.0	---	---	---	Long	Occasional
		March	1.0-3.0	>6.0	---	---	---	Long	Occasional
		April	1.0-3.0	>6.0	---	---	---	Long	Occasional
		May	1.0-3.0	>6.0	---	---	---	Long	Occasional
		June	1.0-3.0	>6.0	---	---	---	Long	Occasional
		July	1.0-3.0	>6.0	---	---	---	Long	Occasional
		August	---	---	---	---	---	Long	Occasional
		September	---	---	---	---	---	Long	Occasional
		October	---	---	---	---	---	Long	Occasional
		November	1.0-3.0	>6.0	---	---	---	Long	Occasional
		December	1.0-3.0	>6.0	---	---	---	---	None
005KY: Knox-----	B		---	---	---	---	---	---	---
Gosport-----	C		---	---	---	---	---	---	---
005OD: Onawa-----	D	February	2.0-4.0	>6.0	---	---	---	---	---
		March	2.0-4.0	>6.0	---	---	---	Brief	Occasional
		April	2.0-4.0	>6.0	---	---	---	Brief	Occasional
		May	2.0-4.0	>6.0	0.0-0.8	Very brief	Occasional	Brief	Occasional
		June	2.0-4.0	>6.0	0.0-0.8	Very brief	Occasional	Brief	Occasional
		July	2.0-4.0	>6.0	---	---	---	Brief	Occasional
		August	---	---	---	---	---	Brief	Occasional
		September	---	---	---	---	---	Brief	Occasional
		October	---	---	---	---	---	Brief	Occasional
005OW: Onawet-----	D	January	3.0-5.0	>6.0	0.0-0.3	Very brief	Rare	Brief	Occasional
		February	3.0-5.0	>6.0	0.0-0.3	Very brief	Rare	Brief	Frequent
		March	3.0-5.0	>6.0	0.0-0.3	Brief	Occasional	Brief	Frequent
		April	2.0-3.0	>6.0	0.0-0.3	Brief	Frequent	Brief	Frequent
		May	2.0-3.0	>6.0	0.0-0.3	Brief	Frequent	Brief	Frequent
		June	2.0-3.0	>6.0	0.0-0.3	Long	Frequent	Brief	Frequent
		July	2.0-3.0	>6.0	0.0-0.3	Long	Occasional	Brief	Frequent
		August	2.0-3.0	>6.0	0.0-0.3	Brief	Rare	Brief	Frequent
		September	2.0-4.0	>6.0	0.0-0.3	Very brief	Occasional	Brief	Frequent
		October	2.0-4.0	>6.0	0.0-0.3	Very brief	Occasional	Brief	Frequent
		November	2.0-4.0	>6.0	0.0-0.3	Very brief	Rare	Brief	Frequent
		December	2.0-4.0	>6.0	0.0-0.3	Very brief	Rare	Brief	Occasional
005PA: Knox-----	B		---	---	---	---	---	---	---
Palermo-----	B		---	---	---	---	---	---	---
005PB: Palermo-----	B		---	---	---	---	---	---	---
005SH: Shelby-----	B		---	---	---	---	---	---	---
005WA: Wabash-----	D	January	0.2-0.8	>6.0	---	---	---	---	Rare
		February	0.2-0.8	>6.0	---	---	---	---	Rare
		March	0.2-0.8	>6.0	---	---	---	Brief	Occasional
		April	0.2-0.8	>6.0	---	---	---	Brief	Occasional
		May	0.2-0.8	>6.0	---	---	---	Brief	Occasional
		June	0.8-1.2	>6.0	---	---	---	Brief	Occasional
		July	---	---	---	---	---	Brief	Occasional
		August	---	---	---	---	---	Brief	Occasional
		September	---	---	---	---	---	Brief	Occasional
		October	---	---	---	---	---	Brief	Occasional
		November	0.8-1.2	>6.0	---	---	---	Brief	Occasional
		December	0.8-1.2	>6.0	---	---	---	---	Rare
005WH: Wathena-----	B	January	3.0-5.0	>6.0	---	---	---	---	---
		February	3.0-5.0	>6.0	---	---	---	---	None
		March	3.0-5.0	>6.0	---	---	---	Long	Occasional
		April	---	---	---	---	---	Long	Occasional
		May	2.1-3.3	>6.0	0.0-0.3	Very brief	Occasional	Long	Occasional
		June	2.1-3.3	>6.0	0.0-0.3	Very brief	Occasional	Long	Occasional
		July	2.1-3.3	>6.0	---	---	---	Brief	Occasional
		August	---	---	---	---	---	Brief	Occasional
		September	3.0-5.0	>6.0	---	---	---	Brief	Occasional
		October	3.0-5.0	>6.0	---	---	---	Brief	Occasional
		November	3.0-5.0	>6.0	---	---	---	Brief	Occasional
		December	3.0-5.0	>6.0	---	---	---	---	---

WATER FEATURES--Continued
Leavenworth and Wyandotte Counties, Kansas

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

Map symbol and soil name	Hydro-logic group	Month	Soil Saturation		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Haynie-----	B	February	---	---	---	---	None	Very brief	Rare
		March	---	---	---	---	None	Very brief	Occasional
		April	---	---	---	---	None	Very brief	Occasional
		May	---	---	---	---	None	Very brief	Occasional
		June	1.0-3.0	>6.0	---	---	None	Very brief	Occasional
		July	---	---	---	---	None	Very brief	Occasional
		August	---	---	---	---	None	Very brief	Occasional
		September	---	---	---	---	None	Very brief	Occasional
		October	---	---	---	---	None	Very brief	Occasional
		November	---	---	---	---	None	Very brief	Occasional
		045ET: Eudora-----	B	January	---	---	---	---	---
February	---	---		---	---	---	---	---	Rare
March	---	---		---	---	---	---	---	Rare
April	---	---		---	---	---	---	---	Rare
May	---	---		---	---	---	---	---	Rare
June	---	---		---	---	---	---	---	Rare
July	---	---		---	---	---	---	---	Rare
August	---	---		---	---	---	---	---	Rare
September	---	---		---	---	---	---	---	Rare
October	---	---		---	---	---	---	---	Rare
November	---	---		---	---	---	---	---	Rare
December	---	---		---	---	---	---	---	Rare
045EV: Eudora-----	B	January		---	---	---	---	---	---
February		---	---	---	---	---	---	---	Rare
March		---	---	---	---	---	---	---	Rare
April		---	---	---	---	---	---	---	Rare
May		---	---	---	---	---	---	---	Rare
June		---	---	---	---	---	---	---	Rare
July		---	---	---	---	---	---	---	Rare
August		---	---	---	---	---	---	---	Rare
September		---	---	---	---	---	---	---	Rare
October		---	---	---	---	---	---	---	Rare
November		---	---	---	---	---	---	---	Rare
December		---	---	---	---	---	---	---	Rare
Kimo-----		C	January	1.8-2.2	>6.0	---	---	---	---
	February		1.8-2.2	>6.0	---	---	---	---	Rare
	March		1.8-2.2	>6.0	---	---	---	---	Rare
	April		1.8-2.2	>6.0	---	---	---	---	Rare
	May		2.8-3.2	>6.0	---	---	---	---	Rare
	June		---	---	---	---	---	---	Rare
	July		---	---	---	---	---	---	Rare
	August		---	---	---	---	---	---	Rare
	September		---	---	---	---	---	---	Rare
	October		---	---	---	---	---	---	Rare
	November		---	---	---	---	---	---	Rare
	December		2.8-3.2	>6.0	---	---	---	---	Rare
	045KM: Kimo-----		C	January	1.8-2.2	>6.0	---	---	---
February	1.8-2.2	>6.0		---	---	---	---	Rare	
March	1.8-2.2	>6.0		---	---	---	---	Rare	
April	1.8-2.2	>6.0		---	---	---	---	Rare	
May	2.8-3.2	>6.0		---	---	---	---	Rare	
June	---	---		---	---	---	---	Rare	
July	---	---		---	---	---	---	Rare	
August	---	---		---	---	---	---	Rare	
September	---	---		---	---	---	---	Rare	
October	---	---		---	---	---	---	Rare	
November	---	---		---	---	---	---	Rare	
December	2.8-3.2	>6.0		---	---	---	---	Rare	
045MR: Morrill-----	B			---	---	---	---	---	---
045RO: River Wash-----	---		---	---	---	---	---	---	---
045SB:			---	---	---	---	---	---	---

WATER FEATURES--Continued
Leavenworth and Wyandotte Counties, Kansas

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

Map symbol and soil name	Hydro-logic group	Month	Soil Saturation		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Sarpy-----	A	January	---	---	---	---	---	---	Rare
		February	---	---	---	---	---	---	Rare
		March	---	---	---	---	---	Brief	Occasional
		April	---	---	---	---	---	Brief	Occasional
		May	---	---	---	---	---	Brief	Occasional
		June	---	---	---	---	---	---	Rare
		July	---	---	---	---	---	---	Rare
		August	---	---	---	---	---	---	Rare
		September	---	---	---	---	---	---	Rare
		October	---	---	---	---	---	---	Rare
		November	---	---	---	---	---	---	Rare
		December	---	---	---	---	---	---	Rare
Eudora-----	B	January	---	---	---	---	---	---	Rare
		February	---	---	---	---	---	---	Rare
		March	---	---	---	---	---	Brief	Occasional
		April	---	---	---	---	---	Brief	Occasional
		May	---	---	---	---	---	Brief	Occasional
		June	---	---	---	---	---	---	Rare
		July	---	---	---	---	---	---	Rare
		August	---	---	---	---	---	---	Rare
		September	---	---	---	---	---	---	Rare
		October	---	---	---	---	---	---	Rare
		November	---	---	---	---	---	---	Rare
		December	---	---	---	---	---	---	Rare
045VM: Vinland-----	D	---	---	---	---	---	---	---	
Martin-----		C	February	1.8-2.2	2.8-3.2	---	---	---	None
---	March		1.8-2.2	2.8-3.2	---	---	---	None	
---	April		1.8-2.2	2.8-3.2	---	---	---	None	
045WC: Wabash-----	D	January	0.2-0.8	>6.0	---	---	---	---	Rare
---		February	0.2-0.8	>6.0	---	---	---	---	Rare
---		March	0.2-0.8	>6.0	---	---	---	Brief	Occasional
---		April	0.2-0.8	>6.0	---	---	---	Brief	Occasional
---		May	0.2-0.8	>6.0	---	---	---	Brief	Occasional
---		June	0.8-1.2	>6.0	---	---	---	Brief	Occasional
---		July	---	---	---	---	---	Brief	Occasional
---		August	---	---	---	---	---	Brief	Occasional
---		September	---	---	---	---	---	Brief	Occasional
---		October	---	---	---	---	---	Brief	Occasional
---		November	0.8-1.2	>6.0	---	---	---	---	Rare
---		December	0.8-1.2	>6.0	---	---	---	---	Rare
087RE: Reading-----	B	January	3.5-6.0	>6.0	---	---	---	---	Very rare
---		February	3.5-6.0	>6.0	---	---	---	---	Very rare
---		March	3.5-6.0	>6.0	---	---	---	---	Very rare
---		April	3.5-6.0	>6.0	---	---	---	---	Very rare
---		May	---	---	---	---	---	---	Very rare
---		June	---	---	---	---	---	---	Very rare
---		July	---	---	---	---	---	---	Very rare
---		August	---	---	---	---	---	---	Very rare
---		September	---	---	---	---	---	---	Very rare
---		October	---	---	---	---	---	---	Very rare
---		November	---	---	---	---	---	---	Very rare
---		December	3.5-6.0	>6.0	---	---	---	---	Very rare
087SS: Sibleyville-----	B	---	---	---	---	---	---	---	
---		---	---	---	---	---	---	---	
087SV: Sibleyville-----	B	---	---	---	---	---	---	---	
---		---	---	---	---	---	---	---	
087VO: Vinland-----	D	---	---	---	---	---	---	---	
---		---	---	---	---	---	---	---	
087WC: Wabash-----	D	January	0.2-0.8	>6.0	---	---	---	---	Very rare
---		February	0.2-0.8	>6.0	---	---	---	---	Very rare
---		March	0.2-0.8	>6.0	---	---	---	---	Very rare
---		April	0.2-0.8	>6.0	---	---	---	---	Very rare
---		May	0.2-0.8	>6.0	---	---	---	---	Very rare
---		June	0.8-1.2	>6.0	---	---	---	---	Very rare
---		July	---	---	---	---	---	---	Very rare
---		August	---	---	---	---	---	---	Very rare
---		September	---	---	---	---	---	---	Very rare
---		October	---	---	---	---	---	---	Very rare
---		November	0.8-1.2	>6.0	---	---	---	---	Very rare
---		December	0.8-1.2	>6.0	---	---	---	---	Very rare

WATER FEATURES--Continued
Leavenworth and Wyandotte Counties, Kansas

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

Map symbol and soil name	Hydro-logic group	Month	Soil Saturation		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
091ED: Eudora-----	B	January	---	---	---	---	---	---	Rare
		February	---	---	---	---	---	---	Rare
		March	---	---	---	---	---	---	Rare
		April	---	---	---	---	---	---	Rare
		May	---	---	---	---	---	---	Rare
		June	---	---	---	---	---	---	Rare
		July	---	---	---	---	---	---	Rare
		August	---	---	---	---	---	---	Rare
		September	---	---	---	---	---	---	Rare
		October	---	---	---	---	---	---	Rare
		November	---	---	---	---	---	---	Rare
		December	---	---	---	---	---	---	Rare
Kimo-----	C	January	---	---	---	---	---	---	Rare
		February	---	---	---	---	---	---	Rare
		March	2.0-6.0	>6.0	---	---	---	---	Rare
		April	2.0-6.0	>6.0	---	---	---	---	Rare
		May	2.0-6.0	>6.0	---	---	---	---	Rare
		June	2.0-6.0	>6.0	---	---	---	---	Rare
		July	---	---	---	---	---	---	Rare
		August	---	---	---	---	---	---	Rare
		September	---	---	---	---	---	---	Rare
		October	---	---	---	---	---	---	Rare
		November	---	---	---	---	---	---	Rare
		December	---	---	---	---	---	---	Rare
091LB: Ladoga-----	B		---	---	---	---	---	---	---
091RA: Reading-----	B	January	---	---	---	---	---	---	Rare
		February	---	---	---	---	---	---	Rare
		March	---	---	---	---	---	---	Rare
		April	---	---	---	---	---	---	Rare
		May	---	---	---	---	---	---	Rare
		June	---	---	---	---	---	---	Rare
		July	---	---	---	---	---	---	Rare
		August	---	---	---	---	---	---	Rare
		September	---	---	---	---	---	---	Rare
		October	---	---	---	---	---	---	Rare
		November	---	---	---	---	---	---	Rare
		December	---	---	---	---	---	---	Rare
091SB: Sharpsburg-----	B		---	---	---	---	---	---	---
Urban Land-----	---		---	---	---	---	---	---	---
Aa: Kennebec, CHANNELED-----	B	January	---	---	---	---	None	---	Rare
		February	---	---	---	---	None	---	Rare
		March	3.3-4.6	>6.0	---	---	None	Brief	Frequent
		April	3.3-4.6	>6.0	---	---	None	Brief	Frequent
		May	3.3-4.6	>6.0	---	---	None	Brief	Frequent
		June	---	---	---	---	None	Brief	Frequent
		July	---	---	---	---	None	Brief	Frequent
		August	---	---	---	---	None	Brief	Frequent
		September	---	---	---	---	None	Brief	Frequent
		October	---	---	---	---	None	Brief	Frequent
		November	3.3-4.6	>6.0	---	---	None	Brief	Frequent
		December	---	---	---	---	None	---	Rare
Ac: Armster-----	C	March	---	---	---	---	---	---	None
		April	---	---	---	---	---	---	None
		May	---	---	---	---	---	---	None
Ad: Armster-----	C	March	---	---	---	---	---	---	None
		April	---	---	---	---	---	---	None
		May	---	---	---	---	---	---	None
Ae: Armster, eroded-----	C	March	---	---	---	---	---	---	None
		April	---	---	---	---	---	---	None
		May	---	---	---	---	---	---	None
Ba:			---	---	---	---	---	---	---

WATER FEATURES--Continued
Leavenworth and Wyandotte Counties, Kansas

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

Map symbol and soil name	Hydro-logic group	Month	Soil Saturation		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Basehor-----	D		Ft	Ft	Ft				
Br:			---	---	---	---	---	---	---
Bremer-----	C	January	1.0-2.0	>6.0	---	---	---	---	Rare
		February	1.0-2.0	>6.0	---	---	---	---	Rare
		March	1.0-2.0	>6.0	---	---	---	---	Rare
		April	1.0-2.0	>6.0	---	---	---	---	Rare
		May	1.0-2.0	>6.0	---	---	---	---	Rare
		June	1.0-2.0	>6.0	---	---	---	---	Rare
		July	1.0-2.0	>6.0	---	---	---	---	Rare
		August	---	---	---	---	---	---	Rare
		September	---	---	---	---	---	---	Rare
		October	---	---	---	---	---	---	Rare
		November	1.0-2.0	>6.0	---	---	---	---	Rare
		December	1.0-2.0	>6.0	---	---	---	---	Rare
Cf:			---	---	---	---	---	---	---
Borrow Pits-----	---		---	---	---	---	---	---	---
Ec:			---	---	---	---	---	---	---
Elmont-----	B		---	---	---	---	---	---	---
Ed:			---	---	---	---	---	---	---
Elmont-----	B		---	---	---	---	---	---	---
Eu:			---	---	---	---	---	---	---
Eudora-----	B	January	---	---	---	---	---	---	Rare
		February	---	---	---	---	---	---	Rare
		March	---	---	---	---	---	---	Rare
		April	---	---	---	---	---	---	Rare
		May	---	---	---	---	---	---	Rare
		June	---	---	---	---	---	---	Rare
		July	---	---	---	---	---	---	Rare
		August	---	---	---	---	---	---	Rare
		September	---	---	---	---	---	---	Rare
		October	---	---	---	---	---	---	Rare
		November	---	---	---	---	---	---	Rare
		December	---	---	---	---	---	---	Rare
Haynie-----	B	February	---	---	---	---	---	---	Rare
		March	---	---	---	---	None	Very brief	Occasional
		April	---	---	---	---	None	Very brief	Occasional
		May	---	---	---	---	None	Very brief	Occasional
		June	1.0-3.0	>6.0	---	---	None	Very brief	Occasional
		July	---	---	---	---	None	Very brief	Occasional
		August	---	---	---	---	None	Very brief	Occasional
		September	---	---	---	---	None	Very brief	Occasional
		October	---	---	---	---	None	Very brief	Occasional
		November	---	---	---	---	None	Very brief	Rare
Gc:			---	---	---	---	---	---	---
Gosport-----	C		---	---	---	---	---	---	---
Gp:			---	---	---	---	---	---	---
Gravel Pits-----	---		---	---	---	---	---	---	---
Gs:			---	---	---	---	---	---	---
Gosport-----	C		---	---	---	---	---	---	---
Sogn-----	D		---	---	---	---	---	---	---
Gt:			---	---	---	---	---	---	---
Grundy-----	C	March	0.8-1.6	2.8-3.2	---	---	---	---	None
		April	0.8-1.6	2.8-3.2	---	---	---	---	None
		May	0.8-1.6	2.8-3.2	---	---	---	---	None
Gu:			---	---	---	---	---	---	---
Grundy-----	C	March	0.8-1.6	2.8-3.2	---	---	---	---	None
		April	0.8-1.6	2.8-3.2	---	---	---	---	None
		May	0.8-1.6	2.8-3.2	---	---	---	---	None
Gy:			---	---	---	---	---	---	---
Gymer-----	C		---	---	---	---	---	---	---
Hg:			---	---	---	---	---	---	---

WATER FEATURES--Continued
Leavenworth and Wyandotte Counties, Kansas

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

Map symbol and soil name	Hydro-logic group	Month	Soil Saturation		Ponding			Flooding			
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency		
Haig-----	C/D	January	1.0-2.0	>6.0	---	---	---	---	None		
		February	1.0-2.0	>6.0	---	---	---	---	None		
		March	1.0-2.0	>6.0	---	---	---	---	None		
		April	1.0-2.0	>6.0	---	---	---	---	None		
		May	1.0-2.0	>6.0	---	---	---	---	None		
		June	1.0-2.0	>6.0	---	---	---	---	None		
		July	1.0-2.0	>6.0	---	---	---	---	None		
		November	1.0-2.0	>6.0	---	---	---	---	None		
		December	1.0-2.0	>6.0	---	---	---	---	None		
		Hy: Haynie-----	B	February	---	---	---	---	None	Very brief	Rare
				March	---	---	---	---	None	Very brief	Occasional
				April	---	---	---	---	None	Very brief	Occasional
May	---			---	---	---	None	Very brief	Occasional		
June	1.0-3.0			>6.0	---	---	None	Very brief	Occasional		
July	---			---	---	---	None	Very brief	Occasional		
August	---			---	---	---	None	Very brief	Occasional		
September	---			---	---	---	None	Very brief	Occasional		
October	---			---	---	---	None	Very brief	Occasional		
November	---			---	---	---	None	Very brief	Rare		
Ju: Judson-----	B										
Ke: Kennebec-----	B	January	3.0-5.0	>6.0	---	---	---	---	None		
		February	3.0-5.0	>6.0	---	---	---	Brief	Occasional		
		March	3.0-5.0	>6.0	---	---	---	Brief	Occasional		
		April	3.0-5.0	>6.0	---	---	---	Brief	Occasional		
		May	3.0-5.0	>6.0	---	---	---	Brief	Occasional		
		June	3.0-5.0	>6.0	---	---	---	Brief	Occasional		
		July	3.0-5.0	>6.0	---	---	---	Brief	Occasional		
		August	---	---	---	---	---	Brief	Occasional		
		September	---	---	---	---	---	Brief	Occasional		
		October	---	---	---	---	---	Brief	Occasional		
		November	3.0-5.0	>6.0	---	---	---	Brief	Occasional		
		December	3.0-5.0	>6.0	---	---	---	---	None		
Kh: Knox-----	B										
Kk: Knox-----	B										
Km: Knox, eroded-----	B										
Kn: Knox-----	B										
Sogn-----	D										
Ko: Konawa-----	B										
Kw: Konawa-----	B										
La: Ladoga-----	B										
Mb: Marshall-----	B										
Mc: Marshall-----	B										
Md: Marshall-----	B										
Mn: Martin-----	C										
Mr: Martin-----	C										
Ms: Martin-----	C										
On:											

WATER FEATURES--Continued
Leavenworth and Wyandotte Counties, Kansas

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

Map symbol and soil name	Hydro-logic group	Month	Soil Saturation		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Onawa-----	D	February	2.0-4.0	>6.0	---	---	---	Brief	Occasional
		March	2.0-4.0	>6.0	---	---	---	Brief	Occasional
		April	2.0-4.0	>6.0	---	---	---	Brief	Occasional
		May	2.0-4.0	>6.0	---	---	---	Brief	Occasional
		June	2.0-4.0	>6.0	---	---	---	Brief	Occasional
		July	2.0-4.0	>6.0	---	---	---	Brief	Occasional
		August	---	---	---	---	---	Brief	Occasional
		September	---	---	---	---	---	Brief	Occasional
		October	---	---	---	---	---	Brief	Occasional
		November	---	---	---	---	---	Brief	Occasional
Oo: Onawa-----	D	February	2.0-4.0	>6.0	---	---	---	Brief	Occasional
March		2.0-4.0	>6.0	---	---	---	Brief	Occasional	
April		2.0-4.0	>6.0	---	---	---	Brief	Occasional	
May		2.0-4.0	>6.0	---	---	---	Brief	Occasional	
June		2.0-4.0	>6.0	---	---	---	Brief	Occasional	
July		2.0-4.0	>6.0	---	---	---	Brief	Occasional	
August		---	---	---	---	---	Brief	Occasional	
September		---	---	---	---	---	Brief	Occasional	
October		---	---	---	---	---	Brief	Occasional	
November		---	---	---	---	---	Brief	Occasional	
Os: Oska-----	C		---	---	---	---	---	---	
Pb: Pawnee-----	D	March	0.8-1.1	2.6-3.6	---	---	---	---	None
April		0.8-1.1	2.6-3.6	---	---	---	---	None	
May		0.8-1.1	2.6-3.6	---	---	---	---	None	
Pc: Pawnee-----	D	March	0.8-1.1	2.6-3.6	---	---	---	---	None
April		0.8-1.1	2.6-3.6	---	---	---	---	None	
May		0.8-1.1	2.6-3.6	---	---	---	---	None	
Pe: Pawnee, eroded-----	D	March	0.8-1.1	2.6-3.6	---	---	---	---	None
April		0.8-1.1	2.6-3.6	---	---	---	---	None	
May		0.8-1.1	2.6-3.6	---	---	---	---	None	
Qu: Quarries-----	---		---	---	---	---	---	---	
Rs: River Wash-----	---		---	---	---	---	---	---	
Sa: Sarpy-----	A	January	---	---	---	---	---	Long	Occasional
February		---	---	---	---	---	Long	Occasional	
March		---	---	---	---	---	Long	Occasional	
April		---	---	---	---	---	Long	Occasional	
May		---	---	---	---	---	Long	Occasional	
June		---	---	---	---	---	Long	Occasional	
November		---	---	---	---	---	Long	Occasional	
December		---	---	---	---	---	Long	Occasional	
Haynie-----	B	February	---	---	---	---	---	Very brief	Occasional
March		---	---	---	---	---	Very brief	Occasional	
April		---	---	---	---	---	Very brief	Occasional	
May		---	---	---	---	---	Very brief	Occasional	
June		---	---	---	---	---	Very brief	Occasional	
July		---	---	---	---	---	Very brief	Occasional	
August		---	---	---	---	---	Very brief	Occasional	
September		---	---	---	---	---	Very brief	Occasional	
October		---	---	---	---	---	Very brief	Occasional	
November		---	---	---	---	---	Very brief	Occasional	
Sb: Sharpsburg-----		B		---	---	---	---	---	---
Sc: Sharpsburg-----	B		---	---	---	---	---	---	
Se: Shelby-----	B		---	---	---	---	---	---	
Sh: Shelby-----	B		---	---	---	---	---	---	
Sm: Shelby-----	B		---	---	---	---	---	---	
Sp:			---	---	---	---	---	---	

WATER FEATURES--Continued
Leavenworth and Wyandotte Counties, Kansas

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

Map symbol and soil name	Hydro-logic group	Month	Soil Saturation		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Shelby-----	B		Ft	Ft	Ft				
Pawnee-----	D		---	---	---	---	---	---	---
Ss: Shelby, eroded-----	B	March	0.8-1.1	2.6-3.6	---	---	---	---	None
		April	0.8-1.1	2.6-3.6	---	---	---	---	None
		May	0.8-1.1	2.6-3.6	---	---	---	---	None
Pawnee, eroded-----	D								
Sy: Sibleyville-----	B	March	0.8-1.1	2.6-3.6	---	---	---	---	None
		April	0.8-1.1	2.6-3.6	---	---	---	---	None
		May	0.8-1.1	2.6-3.6	---	---	---	---	None
SZ: Sogn-----	D								
Vinland-----	D								
VR: Rock Outcrop-----	---								
Vinland-----	D								
Vs: Vinland-----	D								
Sibleyville-----	B								
W: Water-----	---								
Wa: Wabash-----	D	January	0.0-1.0	>6.0	---	---	---	Long	Occasional
		February	0.0-1.0	>6.0	---	---	---	Long	Occasional
		March	0.0-1.0	>6.0	---	---	---	Long	Occasional
		April	0.0-1.0	>6.0	---	---	---	Long	Occasional
		May	0.0-1.0	>6.0	---	---	---	Long	Occasional
		November	0.0-1.0	>6.0	---	---	---	Long	Occasional
		December	0.0-1.0	>6.0	---	---	---	Long	Occasional
Wc: Welda-----	C								
Wd: Welda-----	C								
Zo: Zook-----	C/D	January	0.0-3.0	>6.0	---	---	---	---	None
		February	0.0-3.0	>6.0	---	---	---	Long	Occasional
		March	0.0-3.0	>6.0	---	---	---	Long	Occasional
		April	0.0-3.0	>6.0	---	---	---	Long	Occasional
		May	0.0-3.0	>6.0	---	---	---	Long	Occasional
		June	---	---	---	---	---	Long	Occasional
		July	---	---	---	---	---	Long	Occasional
		August	---	---	---	---	---	Long	Occasional
		September	---	---	---	---	---	Long	Occasional
		October	---	---	---	---	---	Long	Occasional
		November	0.0-3.0	>6.0	---	---	---	Long	Occasional
		December	0.0-3.0	>6.0	---	---	---	---	None

SOIL FEATURES
Leavenworth and Wyandotte Counties, Kansas

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

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

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

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

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

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

Map symbol and soil name	Restrictive layer				Potential for Frost action	Risk of corrosion	
	Kind	Depth to top In	Thickness In	Hardness		Uncoated Steel	Concrete
005AQ: Fluvaquents-----	---	---	---	---	---	---	---
005AR: Armster-----	---	---	---	---	Moderate	High	Moderate
005GO: Gosport-----	20-40	Bedrock (paralithic)	---	Weakly cemented	Moderate	High	High
005HN: Haynie-----	---	---	---	---	High	Low	Low
005HO: Haynie-----	---	---	---	---	High	Low	Low
Onawa-----	---	---	---	---	None	High	Low
005KG: Kennebec-----	---	---	---	---	High	Moderate	Low
Colo-----	---	---	---	---	High	High	Moderate
005KY: Knox-----	---	---	---	---	High	Low	Low
Gosport-----	20-40	Bedrock (paralithic)	---	---	Moderate	High	High
005OD: Onawa-----	---	---	---	---	None	High	Low
005OW: Onawet-----	---	---	---	---	High	Moderate	Low
005PA: Knox-----	---	---	---	---	High	Low	Low
Palermo-----	---	---	---	---	High	Low	Low
005PB: Palermo-----	---	---	---	---	High	Low	Low
005SH: Shelby-----	---	---	---	---	Moderate	Moderate	Moderate
005WA: Wabash-----	---	---	---	---	High	High	Moderate
005WH: Wathena-----	---	---	---	---	Low	Low	Low
Haynie-----	---	---	---	---	High	Low	Low
045ET: Eudora-----	---	---	---	---	High	Low	Low
045EV: Eudora-----	---	---	---	---	High	Low	Low
Kimo-----	---	---	---	---	High	High	Low
045KM: Kimo-----	---	---	---	---	High	High	Low
045MR: Morrill-----	---	---	---	---	Moderate	Moderate	Moderate
045RO: River Wash-----	---	---	---	---	---	---	---
045SB: Sarpy-----	---	---	---	---	Low	Low	Low
Eudora-----	---	---	---	---	High	Low	Low
045VM: Vinland-----	10-20	Bedrock (paralithic)	---	Weakly cemented	Moderate	Low	Moderate
Martin-----	---	---	---	---	High	High	Low
045WC: Wabash-----	---	---	---	---	Moderate	High	Moderate
087RE: Reading-----	---	---	---	---	High	Moderate	Low
087SS: Sibleyville-----	20-40	Bedrock (paralithic)	---	Moderately cemented	Moderate	Low	Moderate
087SV: Sibleyville-----	20-40	Bedrock (paralithic)	---	Moderately cemented	Moderate	Low	Moderate
087VO: Vinland-----	10-20	Bedrock (paralithic)	---	Weakly cemented	Moderate	Low	Moderate
087WC: Wabash-----	---	---	---	---	Moderate	High	Moderate
091ED: Eudora-----	---	---	---	---	High	Low	Low
Kimo-----	---	---	---	---	High	High	Low
091LB: Ladoga-----	---	---	---	---	Moderate	Moderate	Moderate
091RA: Reading-----	---	---	---	---	High	Moderate	Low
091SB: Sharpsburg-----	---	---	---	---	High	Moderate	Moderate
Urban Land-----	---	---	---	---	---	---	---
Aa: Kennebec, CHANNELED-----	---	---	---	---	High	Moderate	Low
Ac: Armster-----	---	---	---	---	Moderate	High	Moderate
Ad: Armster-----	---	---	---	---	Moderate	High	Moderate
Ae: Armster, eroded-----	---	---	---	---	Moderate	High	Moderate

SOIL FEATURES--Continued
Leavenworth and Wyandotte Counties, Kansas

Map symbol and soil name	Restrictive layer				Potential for Frost action	Risk of corrosion	
	Kind	Depth to top In	Thickness In	Hardness		Uncoated Steel	Concrete
AED: Arents, Earthen Dam-----	---	---	---	---	---	---	---
Ba: Basehor-----	10-20	Bedrock (lithic)	---	Moderately cemented	Moderate	Low	Moderate
Br: Bremer-----	---	---	---	---	High	Moderate	Moderate
Cf: Borrow Pits----	---	---	---	---	---	---	---
Ec: Elmont-----	40-80	Bedrock (paralithic)	---	Weakly cemented	High	Moderate	Low
Ed: Elmont-----	40-80	Bedrock (paralithic)	---	Weakly cemented	High	Moderate	Low
Eu: Eudora-----	---	---	---	---	High	Low	Low
Haynie-----	---	---	---	---	High	Low	Low
Gc: Gosport-----	20-40	Bedrock (paralithic)	---	Weakly cemented	Moderate	High	High
Gp: Gravel Pits----	---	---	---	---	---	---	---
Gs: Gosport-----	20-40	Bedrock (paralithic)	---	Weakly cemented	Moderate	High	High
Sogn-----	4-20	Bedrock (lithic)	---	Indurated	Moderate	Low	Low
Gt: Grundy-----	---	---	---	---	High	High	Moderate
Gu: Grundy-----	---	---	---	---	High	High	Moderate
Gy: Gymer-----	---	---	---	---	Moderate	Moderate	Moderate
Hg: Haig-----	---	---	---	---	Moderate	High	Moderate
Hy: Haynie-----	---	---	---	---	High	Low	Low
Ju: Judson-----	---	---	---	---	High	Moderate	Low
Ke: Kennebec-----	---	---	---	---	High	Moderate	Low
Kh: Knox-----	---	---	---	---	High	Low	Low
Kk: Knox-----	---	---	---	---	High	Low	Low
Km: Knox, eroded----	---	---	---	---	High	Low	Low
Kn: Knox-----	---	---	---	---	High	Low	Low
Sogn-----	4-20	Bedrock (lithic)	---	---	High Moderate	Low Low	Low Low
Ko: Konawa-----	---	---	---	---	Moderate	Moderate	Moderate
Kw: Konawa-----	---	---	---	---	---	Moderate	Moderate
La: Ladoga-----	---	---	---	---	Moderate	Moderate	Moderate
M-W: Miscellaneous Water-----	---	---	---	---	---	---	---
Mb: Marshall-----	---	---	---	---	High	Moderate	Moderate
Mc: Marshall-----	---	---	---	---	High	Moderate	Moderate
Md: Marshall-----	---	---	---	---	High	Moderate	Moderate
Mn: Martin-----	---	---	---	---	High	High	Low
Mr: Martin-----	---	---	---	---	High	High	Low
Ms: Martin-----	---	---	---	---	High	High	Low
On: Onawa-----	---	---	---	---	High	High	Low
Oo: Onawa-----	---	---	---	---	High	High	Low
Os: Oska-----	20-40	Bedrock (lithic)	---	---	Moderate	Moderate	Moderate
Pb: Pawnee-----	---	---	---	---	Moderate	High	Low
Pc: Pawnee-----	---	---	---	---	Moderate	High	Low
Pe: Pawnee, eroded----	---	---	---	---	Moderate	High	Low
Qu: Quarries-----	---	---	---	---	---	---	---

Map symbol and soil name	Restrictive layer				Potential for Frost action	Risk of corrosion	
	Kind	Depth to top In	Thickness In	Hardness		Uncoated Steel	Concrete
Rs: River Wash-----	---	---	---	---	---	---	---
Sa: Sarpy----- Haynie-----	---	---	---	---	Low High	Low Low	Low Low
Sb: Sharpsburg-----	---	---	---	---	High	Moderate	Moderate
Sc: Sharpsburg-----	---	---	---	---	High	Moderate	Moderate
Se: Shelby-----	---	---	---	---	Moderate	Moderate	Moderate
Sh: Shelby-----	---	---	---	---	Moderate	Moderate	Moderate
Sm: Shelby-----	---	---	---	---	Moderate	Moderate	Moderate
Sp: Shelby----- Pawnee-----	---	---	---	---	Moderate Moderate	Moderate High	Moderate Low
Ss: Shelby, eroded-- Pawnee, eroded--	---	---	---	---	Moderate Moderate	Moderate High	Moderate Low
Sy: Sibleyville-----	20-40	Bedrock (paralithic)	---	Weakly cemented	Moderate	Low	Moderate
SZ: Sogn----- Vinland-----	4-20 10-20	Bedrock (lithic) Bedrock (paralithic)	---	Indurated Weakly cemented	Moderate Moderate	Low Low	Low Moderate
Uc: Un:	---	---	---	---	---	---	---
VR: Rock Outcrop---- Vinland-----	0-0 10-20	Bedrock (lithic) Bedrock (paralithic)	---	---	---	---	---
Vs: Vinland----- Sibleyville-----	10-20 20-40	Bedrock (paralithic) Bedrock (paralithic)	---	Weakly cemented Weakly cemented	Moderate Moderate	Low Low	Moderate Moderate
W: Water----- Wa: Wabash----- Wc: Welda----- Wd: Welda----- Zo: Zook-----	---	---	---	---	Low Moderate Moderate Moderate Moderate	---	---

WATER MANAGEMENT
Leavenworth and Wyandotte Counties, Kansas

The soils of the survey area are rated in the Water Management table according to limitations that affect their suitability for water management. Soils are rated for pond reservoir areas, drainage, irrigation, terraces and diversions, and grassed waterways. Restrictive features that affect each soil for the specified use is also provided in the table.

The ratings in the table 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 specified use. 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. Slightly limited indicates that the soil has features that are favorable for the specified use. The limitations are minor and can be easily overcome. Good performance and low maintenance can be expected. Moderately 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. Limited indicates that the soil has one or more features that are significant limitations for the specified use. The limitations can be overcome, but generally require special design, soil reclamation, or installation procedures that may result in additional expense. Fair performance and moderate to high 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.

Limitation class terms, such as very limited or limited, etc., limitation ratings, and numerical ratings are shown for each soil feature listed. As many as three soil features may be listed for each soil component if applicable. The overall limitation rating for the soil component is based on the most severe limitation.

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

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

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

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

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.

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

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

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

Grassed waterways are natural or constructed channels, generally broad and shallow, which conduct surface water to outlets at a non-erosive velocity. Large stones, wetness, slope, and depth to bedrock or to a cemented pan affect the construction of grassed waterways. A hazard of wind erosion, low available water capacity, restricted rooting depth, toxic substances such as salts and sodium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

WATER MANAGEMENT--Continued
Leavenworth and Wyandotte Counties, Kansas

(The information in this report indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Map symbol and soil name	Features affecting--			
	Drainage	Irrigation	Terraces and diversions	Grassed waterways
005AQ: Fluvaquents-----	---	---	---	---
005AR: Armster-----	Limitation: slope	Limitation: erodes easily slope wetness	Limitation: erodes easily slope wetness	Limitation: erodes easily slope wetness
005GO: Gosport-----	Limitation: deep to water	Limitation: percs slowly slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope depth to rock
005HN: Haynie-----	Limitation: deep to water	Limitation: erodes easily flooding	Limitation: erodes easily	Limitation: erodes easily
005HO: Haynie-----	Limitation: deep to water	Limitation: erodes easily flooding	Limitation: erodes easily	Limitation: erodes easily
Onawa-----	Limitation: flooding frost action percs slowly	Limitation: flooding percs slowly wetness	Limitation: erodes easily wetness	Limitation: erodes easily percs slowly
005KG: Kennebec-----	Limitation: deep to water	Limitation: flooding	Favorable	Favorable
Colo-----	Limitation: flooding frost action	Limitation: flooding wetness	Limitation: wetness	Limitation: wetness
005KY: Knox-----	Limitation: deep to water	Limitation: slope	Limitation: erodes easily slope	Limitation: erodes easily slope
Gosport-----	Limitation: deep to water	Limitation: percs slowly slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope depth to rock
005OD: Onawa-----	Limitation: flooding frost action percs slowly	Limitation: flooding percs slowly wetness	Limitation: erodes easily wetness	Limitation: erodes easily percs slowly
005OW: Onawet-----	---	---	---	---
005PA: Knox-----	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily
Palermo-----	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily
005PB: Palermo-----	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily
005SH: Shelby-----	Limitation: deep to water	Limitation: slope	Favorable	Favorable
005WA: Wabash-----	Limitation: flooding percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
005WH: Wathena-----	Limitation: deep to water	Limitation: fast intake soil blowing droughty	Limitation: too sandy soil blowing	Limitation: droughty
Haynie-----	Limitation: deep to water	Limitation: erodes easily flooding	Limitation: erodes easily	Limitation: erodes easily
045ET: Eudora-----	Limitation: deep to water	Favorable	Limitation: erodes easily	Limitation: erodes easily
045EV: Eudora-----	Limitation: deep to water	Favorable	Limitation: erodes easily	Limitation: erodes easily
Kimo-----	Limitation: frost action percs slowly cutbanks cave	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily wetness	Limitation: erodes easily percs slowly
045KM: Kimo-----	Limitation: frost action percs slowly cutbanks cave	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily wetness	Limitation: erodes easily percs slowly

WATER MANAGEMENT--Continued
Leavenworth and Wyandotte Counties, Kansas

(The information in this report indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Map symbol and soil name	Features affecting--			
	Drainage	Irrigation	Terraces and diversions	Grassed waterways
045MR: Morrill-----	Limitation: deep to water	Limitation: slope	Favorable	Favorable
045RO: River Wash-----	---	---	---	---
045SB: Sarpy-----	Limitation: deep to water	Limitation: fast intake soil blowing droughty	Limitation: too sandy soil blowing	Limitation: droughty
Eudora-----	Limitation: deep to water	Limitation: flooding soil blowing	Limitation: erodes easily soil blowing	Limitation: erodes easily
045VM: Vinland-----	Limitation: deep to water	Limitation: slope depth to rock	Limitation: slope depth to rock	Limitation: slope depth to rock
Martin-----	Limitation: frost action percs slowly slope	Limitation: percs slowly slope wetness	Limitation: erodes easily slope wetness	Limitation: erodes easily slope wetness
045WC: Wabash-----	Limitation: flooding percs slowly	Limitation: flooding percs slowly wetness	Limitation: percs slowly wetness	Limitation: percs slowly wetness
087RE: Reading-----	Limitation: deep to water	Favorable	Limitation: erodes easily	Limitation: erodes easily
087SS: Sibleyville-----	Limitation: deep to water	Limitation: slope depth to rock	Limitation: depth to rock	Limitation: depth to rock
087SV: Sibleyville-----	Limitation: deep to water	Limitation: slope depth to rock	Limitation: slope depth to rock	Limitation: slope depth to rock
087VO: Vinland-----	Limitation: deep to water	Limitation: slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope depth to rock
087WC: Wabash-----	Limitation: flooding percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
091ED: Eudora-----	Limitation: deep to water	Favorable	Limitation: erodes easily	Limitation: erodes easily
Kim-----	Limitation: frost action percs slowly cutbanks cave	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily wetness	Limitation: erodes easily percs slowly
091LB: Ladoga-----	Limitation: deep to water	Limitation: slope	Limitation: erodes easily slope	Limitation: erodes easily slope
091RA: Reading-----	Limitation: deep to water	Favorable	Limitation: erodes easily	Limitation: erodes easily
091SB: Sharpsburg-----	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily
Urban Land-----	---	---	---	---
Aa: Kennebec, CHANNELED-----	Limitation: deep to water	Limitation: flooding	Favorable	Favorable
Ac: Armster-----	Limitation: slope	Limitation: erodes easily slope wetness	Limitation: erodes easily wetness	Limitation: erodes easily wetness
Ad: Armster-----	Limitation: slope	Limitation: erodes easily slope wetness	Limitation: erodes easily slope wetness	Limitation: erodes easily slope wetness
Ae: Armster, eroded-----	Limitation: slope	Limitation: erodes easily slope wetness	Limitation: erodes easily slope wetness	Limitation: erodes easily slope wetness

WATER MANAGEMENT--Continued
Leavenworth and Wyandotte Counties, Kansas

(The information in this report indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Map symbol and soil name	Features affecting--			
	Drainage	Irrigation	Terraces and diversions	Grassed waterways
AED: Arents, Earthen Dam-----	---	---	---	---
Ba: Basehor-----	Limitation: deep to water	Limitation: slope depth to rock	Limitation: slope depth to rock	Limitation: slope depth to rock
Br: Bremer-----	Limitation: frost action	Limitation: wetness	Limitation: wetness	Limitation: wetness
Cf: Borrow Pits-----	---	---	---	---
Ec: Elmont-----	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily
Ed: Elmont-----	Limitation: deep to water	Limitation: slope	Limitation: erodes easily slope	Limitation: erodes easily slope
Eu: Eudora-----	Limitation: deep to water	Limitation: soil blowing	Limitation: erodes easily soil blowing	Limitation: erodes easily
Haynie-----	Limitation: deep to water	Limitation: erodes easily	Limitation: erodes easily	Limitation: erodes easily
Gc: Gosport-----	Limitation: deep to water	Limitation: percs slowly slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope depth to rock
Gp: Gravel Pits-----	---	---	---	---
Gs: Gosport-----	Limitation: deep to water	Limitation: percs slowly slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope depth to rock
Sogn-----	Limitation: deep to water	Limitation: slope depth to rock	Limitation: slope depth to rock	Limitation: slope depth to rock
Gt: Grundy-----	Limitation: frost action percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
Gu: Grundy-----	Limitation: frost action percs slowly slope	Limitation: percs slowly slope wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
Gy: Gymer-----	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily
Hg: Haig-----	Limitation: frost action percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
Hy: Haynie-----	Limitation: deep to water	Limitation: erodes easily	Limitation: erodes easily	Limitation: erodes easily
Ju: Judson-----	Limitation: deep to water	Favorable	Limitation: erodes easily	Limitation: erodes easily
Ke: Kennebec-----	Limitation: deep to water	Limitation: flooding	Favorable	Favorable
Kh: Knox-----	Limitation: deep to water	Limitation: slope	Limitation: erodes easily slope	Limitation: erodes easily slope
Kk: Knox-----	Limitation: deep to water	Limitation: slope	Limitation: erodes easily slope	Limitation: erodes easily slope
Km: Knox, eroded---	Limitation: deep to water	Limitation: slope	Limitation: erodes easily slope	Limitation: erodes easily slope
Kn: Knox-----	Limitation: deep to water	Limitation: slope	Limitation: erodes easily slope	Limitation: erodes easily slope
Sogn-----	Limitation: deep to water	Limitation: slope depth to rock	Limitation: slope depth to rock	Limitation: slope depth to rock

WATER MANAGEMENT--Continued
Leavenworth and Wyandotte Counties, Kansas

(The information in this report indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Map symbol and soil name	Features affecting--			
	Drainage	Irrigation	Terraces and diversions	Grassed waterways
Ko: Konawa-----	Limitation: deep to water	Limitation: slope soil blowing	Limitation: soil blowing	Favorable
Kw: Konawa-----	Limitation: deep to water	Limitation: slope soil blowing	Limitation: slope soil blowing	Limitation: slope
La: Ladoga-----	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily
M-W: Miscellaneous Water-----	---	---	---	---
Mb: Marshall-----	Limitation: deep to water	Favorable	Limitation: erodes easily	Limitation: erodes easily
Mc: Marshall-----	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily
Md: Marshall-----	Limitation: deep to water	Limitation: slope	Limitation: erodes easily slope	Limitation: erodes easily slope
Mn: Martin-----	Limitation: frost action percs slowly slope	Limitation: percs slowly slope wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
Mr: Martin-----	Limitation: frost action percs slowly slope	Limitation: percs slowly slope wetness	Limitation: erodes easily slope wetness	Limitation: erodes easily slope wetness
Ms: Martin-----	Limitation: frost action percs slowly slope	Limitation: slope slow intake wetness	Limitation: erodes easily slope wetness	Limitation: erodes easily slope wetness
On: Onawa-----	Limitation: flooding frost action percs slowly	Limitation: flooding percs slowly wetness	Limitation: erodes easily wetness	Limitation: erodes easily percs slowly
Oo: Onawa-----	Limitation: flooding frost action percs slowly	Limitation: flooding percs slowly wetness	Limitation: erodes easily wetness	Limitation: erodes easily percs slowly
Os: Oska-----	Limitation: deep to water	Limitation: percs slowly slope depth to rock	Limitation: erodes easily percs slowly depth to rock	Limitation: erodes easily percs slowly depth to rock
Pb: Pawnee-----	Limitation: frost action percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
Pc: Pawnee-----	Limitation: frost action percs slowly slope	Limitation: percs slowly slope wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
Pe: Pawnee, eroded--	Limitation: frost action percs slowly slope	Limitation: percs slowly slope wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
Qu: Quarries-----	---	---	---	---
Rs: River Wash-----	---	---	---	---
Sa: Sarpy-----	Limitation: deep to water	Limitation: fast intake soil blowing droughty	Limitation: too sandy soil blowing	Limitation: droughty
Haynie-----	Limitation: deep to water	Limitation: erodes easily flooding soil blowing	Limitation: erodes easily soil blowing	Limitation: erodes easily
Sb: Sharpsburg-----	Limitation: deep to water	Favorable	Limitation: erodes easily	Limitation: erodes easily

WATER MANAGEMENT--Continued
Leavenworth and Wyandotte Counties, Kansas

(The information in this report indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Map symbol and soil name	Features affecting--			
	Drainage	Irrigation	Terraces and diversions	Grassed waterways
Sc: Sharpsburg-----	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily
Se: Shelby-----	Limitation: deep to water	Favorable	Favorable	Favorable
Sh: Shelby-----	Limitation: deep to water	Limitation: slope	Favorable	Favorable
Sm: Shelby-----	Limitation: deep to water	Limitation: slope	Limitation: slope	Limitation: slope
Sp: Shelby-----	Limitation: deep to water	Limitation: slope	Favorable	Favorable
Pawnee-----	Limitation: frost action percs slowly slope	Limitation: percs slowly slope wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
Ss: Shelby, eroded--	Limitation: deep to water	Limitation: slope	Favorable	Favorable
Pawnee, eroded--	Limitation: frost action percs slowly slope	Limitation: percs slowly slope wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
Sy: Sibleyville----	Limitation: deep to water	Limitation: slope depth to rock	Limitation: depth to rock	Limitation: depth to rock
SZ: Sogn-----	Limitation: slope deep to water	Limitation: slope depth to rock	Limitation: slope depth to rock	Limitation: slope depth to rock
Vinland-----	Limitation: deep to water	Limitation: slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope depth to rock
Uc:	---	---	---	---
Un:	---	---	---	---
VR: Rock Outcrop---	Limitation: deep to water	Limitation: slope depth to rock	Limitation: slope depth to rock	Limitation: slope depth to rock
Vinland-----	Limitation: deep to water	Limitation: slope depth to rock	Limitation: slope depth to rock	Limitation: slope depth to rock
Vs: Vinland-----	Limitation: slope deep to water	Limitation: slope depth to rock	Limitation: slope depth to rock	Limitation: slope depth to rock
Sibleyville----	Limitation: deep to water	Limitation: slope depth to rock	Limitation: depth to rock	Limitation: depth to rock
W: Water-----	---	---	---	---
Wa: Wabash-----	Limitation: flooding percs slowly	Limitation: slow intake wetness droughty	Limitation: percs slowly wetness	Limitation: percs slowly wetness droughty
Wc: Welda-----	Limitation: deep to water	Limitation: erodes easily slope	Limitation: erodes easily	Limitation: erodes easily
Wd: Welda-----	Limitation: deep to water	Limitation: erodes easily slope	Limitation: erodes easily slope	Limitation: erodes easily slope
Zo: Zook-----	Limitation: flooding frost action percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness

WATER MANAGEMENT--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Pond Reservoir Area		Embankments, Dikes, and Levees		Excavated Ponds (Aquifer-fed)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
005AQ: Fluvaquents-----	95	Very limited Seepage	1.00	Very limited Ponding Depth to saturated zone	1.00 1.00	Somewhat limited Cutbanks cave	0.10
005AR: Armster-----	85	Somewhat limited Seepage	0.05	Very limited Depth to saturated zone Hard to pack	1.00 0.50	Very limited Deep to water	1.00
005GO: Gospport-----	85	Somewhat limited Slope Depth to bedrock	0.72 0.04	Very limited Hard to pack Thin layer	1.00 0.70	Very limited Deep to water	1.00
005HN: Haynie-----	96	Somewhat limited Seepage	0.30	Very limited Piping Depth to saturated zone	1.00 1.00	Somewhat limited Slow refill Cutbanks cave Deep to water	0.70 0.10 0.00
005HO: Haynie-----	60	Somewhat limited Seepage	0.30	Very limited Piping Depth to saturated zone	1.00 1.00	Somewhat limited Slow refill Cutbanks cave Deep to water	0.70 0.10 0.00
Onawa-----	30	Somewhat limited Seepage	0.81	Very limited Ponding Depth to saturated zone	1.00 1.00	Somewhat limited Slow refill Cutbanks cave Deep to water	0.19 0.10 0.00
005KG: Kennebec-----	60	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.73	Somewhat limited Deep to water Slow refill Cutbanks cave	0.81 0.30 0.10
Colo-----	30	Somewhat limited Seepage	0.70	Very limited Depth to saturated zone	1.00	Somewhat limited Slow refill Cutbanks cave Deep to water	0.30 0.10 0.00
005KY: Knox-----	60	Somewhat limited Seepage Slope	0.70 0.12	Not limited		Very limited Deep to water	1.00
Gospport-----	30	Somewhat limited Slope Depth to bedrock	0.12 0.11	Very limited Hard to pack Thin layer	1.00 0.85	Very limited Deep to water	1.00
005OD: Onawa-----	95	Somewhat limited Seepage	0.81	Very limited Ponding Depth to saturated zone	1.00 0.46	Somewhat limited Deep to water Slow refill Cutbanks cave	0.24 0.19 0.10
005OW: Onawet-----	95	Very limited Seepage	1.00	Very limited Ponding Depth to saturated zone Piping Seepage	1.00 0.86 0.30 0.22	Very limited Cutbanks cave Deep to water	1.00 0.06
005PA: Knox-----	50	Somewhat limited Seepage Slope	0.70 0.02	Somewhat limited Piping	0.36	Very limited Deep to water	1.00
Palermo-----	50	Very limited Seepage	1.00	Not limited		Very limited Deep to water	1.00

WATER MANAGEMENT--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Pond Reservoir Area		Embankments, Dikes, and Levees		Excavated Ponds (Aquifer-fed)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
005PB: Palermo-----	95	Slope	0.02	Not limited		Very limited Deep to water	1.00
		Very limited Seepage	1.00				
		Slope	0.18				
005SH: Shelby-----	85	Somewhat limited Seepage	0.05	Not limited		Very limited Deep to water	1.00
005WA: Wabash-----	85	Not limited		Very limited Depth to saturated zone Hard to pack	1.00	Very limited Slow refill Cutbanks cave	1.00
					1.00		0.10
005WH: Wathena-----	55	Very limited Seepage	1.00	Very limited Ponding Seepage Depth to saturated zone	1.00	Very limited Cutbanks cave Deep to water	1.00
					0.95		0.10
Haynie-----	40	Somewhat limited Seepage	0.30	Very limited Piping Depth to saturated zone	1.00	Somewhat limited Slow refill Cutbanks cave Deep to water	0.70
					1.00		0.10
045ET: Eudora-----	90	Somewhat limited Seepage	0.70	Very limited Piping	1.00	Very limited Deep to water	1.00
045EV: Eudora-----	60	Somewhat limited Seepage	0.70	Very limited Piping	1.00	Very limited Deep to water	1.00
					1.00		0.30
Kimo-----	30	Somewhat limited Seepage	0.70	Very limited Depth to saturated zone Piping	1.00	Somewhat limited Slow refill Cutbanks cave Deep to water	0.30
					0.91		0.10
045KM: Kimo-----	90	Somewhat limited Seepage	0.70	Very limited Depth to saturated zone Piping	1.00	Somewhat limited Slow refill Cutbanks cave Deep to water	0.30
					0.91		0.10
045MR: Morrill-----	90	Somewhat limited Seepage	0.57	Somewhat limited Piping	0.13	Very limited Deep to water	1.00
045RO: River Wash-----	100	Not rated		Not rated		Not rated	
045SB: Sarpy-----	55	Very limited Seepage	1.00	Somewhat limited Seepage	0.50	Very limited Deep to water	1.00
					1.00		1.00
Eudora-----	45	Somewhat limited Seepage	0.70	Very limited Piping Seepage	1.00	Very limited Deep to water	1.00
					0.08		
045VM: Vinland-----	40	Very limited Seepage Depth to bedrock Slope	1.00	Very limited Thin layer Piping	1.00	Very limited Deep to water	1.00
			0.58		0.50		
			0.00				
Martin-----	25	Not limited		Very limited Depth to saturated zone Hard to pack	1.00	Very limited Slow refill Cutbanks cave Deep to water	1.00
					0.63		0.10
							0.00

WATER MANAGEMENT--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Pond Reservoir Area		Embankments, Dikes, and Levees		Excavated Ponds (Aquifer-fed)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
045WC: Wabash-----	88	Not limited		Very limited Depth to saturated zone Hard to pack	1.00 1.00	Very limited Slow refill Cutbanks cave	1.00 0.10
087RE: Reading-----	85	Somewhat limited Seepage	0.57	Not limited		Very limited Deep to water	1.00
087SS: Sibleyville-----	60	Somewhat limited Seepage Depth to bedrock	0.70 0.08	Somewhat limited Thin layer Seepage	0.81 0.04	Very limited Deep to water	1.00
087SV: Sibleyville-----	50	Somewhat limited Seepage Depth to bedrock	0.70 0.13	Somewhat limited Thin layer Seepage	0.88 0.04	Very limited Deep to water	1.00
087VO: Vinland-----	55	Very limited Seepage Depth to bedrock Slope	1.00 0.61 0.00	Very limited Thin layer Piping	1.00 0.36	Very limited Deep to water	1.00
087WC: Wabash-----	94	Not limited		Very limited Depth to saturated zone Hard to pack	1.00 1.00	Very limited Slow refill Cutbanks cave	1.00 0.10
091ED: Eudora-----	75	Somewhat limited Seepage	0.70	Very limited Piping	1.00	Very limited Deep to water	1.00
Kimo-----	25	Somewhat limited Seepage	0.70	Very limited Piping	1.00	Somewhat limited Deep to water Slow refill Cutbanks cave	0.81 0.30 0.10
091LB: Ladoga-----	85	Somewhat limited Seepage Slope	0.70 0.00	Not limited		Very limited Deep to water	1.00
091RA: Reading-----	90	Somewhat limited Seepage	0.57	Somewhat limited Piping	0.00	Very limited Deep to water	1.00
091SB: Sharpsburg-----	55	Somewhat limited Seepage	0.70	Not limited		Very limited Deep to water	1.00
Urban Land-----	45	Very limited Seepage Slope	1.00 0.50	Very limited Hard to pack	1.00	Very limited Deep to water	1.00
Aa: Kennebec, CHANNELED-	85	Somewhat limited Seepage	0.70	Somewhat limited Piping Depth to saturated zone	0.81 0.09	Somewhat limited Deep to water Slow refill Cutbanks cave	0.54 0.30 0.10
Ac: Armster-----	90	Somewhat limited Seepage	0.05	Somewhat limited Hard to pack Depth to saturated zone	0.50 0.46	Very limited Deep to water	1.00
Ad: Armster-----	90	Somewhat limited Seepage	0.05	Somewhat limited Hard to pack Depth to saturated zone	0.50 0.46	Very limited Deep to water	1.00
Ae: Armster, eroded----	75	Somewhat limited Seepage	0.05	Somewhat limited Hard to pack	0.50	Very limited Deep to water	1.00

WATER MANAGEMENT--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Pond Reservoir Area		Embankments, Dikes, and Levees		Excavated Ponds (Aquifer-fed)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AED: Arents, Earthen Dam-	100	Not rated		Depth to saturated zone Not rated	0.46	Not rated	
Ba: Basehor-----	55	Very limited Seepage Depth to bedrock Slope	1.00 1.00 0.08	Very limited Thin layer	1.00	Very limited Deep to water	1.00
Br: Bremer-----	95	Somewhat limited Seepage	0.05	Very limited Depth to saturated zone Hard to pack	1.00 0.39	Somewhat limited Slow refill Cutbanks cave	0.95 0.10
Cf: Borrow Pits-----	100	Not rated		Not rated		Not rated	
Ec: Elmont-----	85	Somewhat limited Seepage	0.05	Somewhat limited Piping	0.02	Very limited Deep to water	1.00
Ed: Elmont-----	85	Somewhat limited Seepage	0.05	Somewhat limited Piping	0.02	Very limited Deep to water	1.00
Eu: Eudora-----	70	Somewhat limited Seepage	0.70	Very limited Piping	1.00	Very limited Deep to water	1.00
Haynie-----	20	Somewhat limited Seepage	0.70	Very limited Piping Depth to saturated zone	1.00 1.00	Somewhat limited Slow refill Cutbanks cave Deep to water	0.30 0.10 0.00
Gc: Gosport-----	50	Somewhat limited Slope Depth to bedrock	0.15 0.06	Very limited Hard to pack Thin layer	1.00 0.77	Very limited Deep to water	1.00
Gp: Gravel Pits-----	100	Not rated		Not rated		Not rated	
Gs: Gosport-----	50	Somewhat limited Slope Depth to bedrock	0.15 0.06	Very limited Hard to pack Thin layer	1.00 0.77	Very limited Deep to water	1.00
Sogn-----	35	Very limited Seepage Depth to bedrock Slope	1.00 1.00 0.02	Very limited Thin layer Piping	1.00 0.12	Very limited Deep to water	1.00
Gt: Grundy-----	90	Not limited		Very limited Depth to saturated zone Hard to pack	1.00 0.80	Very limited Deep to water	1.00
Gu: Grundy-----	90	Not limited		Very limited Depth to saturated zone Hard to pack	1.00 0.80	Very limited Deep to water	1.00
Gy: Gymer-----	85	Somewhat limited Seepage	0.70	Not limited		Very limited Deep to water	1.00

WATER MANAGEMENT--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Pond Reservoir Area		Embankments, Dikes, and Levees		Excavated Ponds (Aquifer-fed)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Hg: Haig-----	90	Somewhat limited Seepage	0.05	Very limited Depth to saturated zone Hard to pack	1.00 0.68	Somewhat limited Slow refill Cutbanks cave	0.95 0.10
Hy: Haynie-----	90	Somewhat limited Seepage	0.70	Very limited Piping Depth to saturated zone	1.00 1.00	Somewhat limited Slow refill Cutbanks cave Deep to water	0.30 0.10 0.00
Ju: Judson-----	90	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.50	Very limited Deep to water	1.00
Ke: Kennebec-----	90	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.84	Somewhat limited Deep to water Slow refill Cutbanks cave	0.81 0.30 0.10
Kh: Knox-----	80	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.08	Very limited Deep to water	1.00
Kk: Knox-----	90	Somewhat limited Seepage Slope	0.70 0.03	Somewhat limited Piping	0.08	Very limited Deep to water	1.00
Km: Knox, eroded-----	85	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.08	Very limited Deep to water	1.00
Kn: Knox-----	65	Somewhat limited Seepage Slope	0.70 0.24	Somewhat limited Piping	0.08	Very limited Deep to water	1.00
Sogn-----	35	Very limited Seepage Depth to bedrock Slope	1.00 1.00 0.10	Very limited Thin layer Piping	1.00 0.18	Very limited Deep to water	1.00
Ko: Konawa-----	85	Somewhat limited Seepage	0.70	Very limited Piping Seepage	1.00 0.08	Very limited Deep to water	1.00
Kw: Konawa-----	90	Somewhat limited Seepage Slope	0.70 0.02	Very limited Piping	1.00	Very limited Deep to water	1.00
La: Ladoga-----	80	Somewhat limited Seepage	0.70	Not limited		Very limited Deep to water	1.00
M-W: Miscellaneous Water-	100	Not rated		Not rated		Not rated	
Mb: Marshall-----	90	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.39	Very limited Deep to water	1.00
Mc: Marshall-----	90	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.38	Very limited Deep to water	1.00
Md: Marshall-----	90	Somewhat limited Seepage Slope	0.70 0.00	Somewhat limited Piping	0.39	Very limited Deep to water	1.00
Mn: Martin-----	90	Not limited		Somewhat limited		Very limited	

WATER MANAGEMENT--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Pond Reservoir Area		Embankments, Dikes, and Levees		Excavated Ponds (Aquifer-fed)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Mr: Martin-----	85	Not limited		Hard to pack	0.99	Deep to water	1.00
Ms: Martin-----	85	Not limited		Somewhat limited Hard to pack	0.99	Very limited Deep to water	1.00
On: Onawa-----	95	Very limited Seepage	1.00	Somewhat limited Depth to saturated zone	0.43	Somewhat limited Deep to water Cutbanks cave	0.25 0.10
Oo: Onawa-----	90	Very limited Seepage	1.00	Somewhat limited Depth to saturated zone	0.43	Somewhat limited Deep to water Cutbanks cave	0.25 0.10
Os: Oska-----	80	Somewhat limited Depth to bedrock	0.56	Somewhat limited Thin layer Hard to pack	0.56 0.28	Very limited Deep to water	1.00
Pb: Pawnee-----	90	Not limited		Very limited Depth to saturated zone Hard to pack	1.00 0.65	Very limited Deep to water	1.00
Pc: Pawnee-----	85	Not limited		Very limited Depth to saturated zone Hard to pack	1.00 0.63	Very limited Deep to water	1.00
Pe: Pawnee, eroded-----	85	Not limited		Very limited Depth to saturated zone Hard to pack	1.00 0.66	Very limited Deep to water	1.00
Qu: Quarries-----	100	Not rated		Not rated		Not rated	
Rs: River Wash-----	100	Not rated		Not rated		Not rated	
Sa: Sarpy-----	55	Very limited Seepage	1.00	Somewhat limited Seepage	0.50	Very limited Deep to water	1.00
Haynie-----	35	Somewhat limited Seepage	0.70	Very limited Piping Seepage	1.00 0.01	Very limited Deep to water	1.00
Sb: Sharpsburg-----	80	Somewhat limited Seepage	0.70	Not limited		Very limited Deep to water	1.00
Sc: Sharpsburg-----	80	Somewhat limited Seepage	0.70	Not limited		Very limited Deep to water	1.00
Se: Shelby-----	90	Somewhat limited Seepage	0.05	Not limited		Very limited Deep to water	1.00
Sh: Shelby-----	80	Somewhat limited Seepage	0.05	Not limited		Very limited Deep to water	1.00
Sm: Shelby-----	90	Somewhat limited		Somewhat limited		Very limited	

WATER MANAGEMENT--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Pond Reservoir Area		Embankments, Dikes, and Levees		Excavated Ponds (Aquifer-fed)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Sp: Shelby-----	50	Seepage	0.05	Piping	0.08	Deep to water	1.00
		Somewhat limited Seepage	0.05	Not limited		Very limited Deep to water	1.00
Pawnee-----	35	Not limited		Very limited Depth to saturated zone Hard to pack	1.00 0.63	Very limited Deep to water	1.00
		Somewhat limited Seepage	0.05	Not limited		Very limited Deep to water	1.00
Ss: Shelby, eroded-----	55	Somewhat limited Seepage	0.05	Not limited		Very limited Deep to water	1.00
		Not limited		Very limited Depth to saturated zone Hard to pack	1.00 0.66	Very limited Deep to water	1.00
Pawnee, eroded-----	35	Not limited		Very limited Depth to saturated zone Hard to pack	1.00 0.66	Very limited Deep to water	1.00
		Somewhat limited Seepage	0.05	Not limited		Very limited Deep to water	1.00
Sy: Sibleyville-----	85	Somewhat limited Seepage	0.70	Somewhat limited Thin layer	0.81	Very limited Deep to water	1.00
		Depth to bedrock	0.08	Not rated		Not rated	
SZ: Sogn-----	55	Very limited Seepage	1.00	Very limited Thin layer	1.00	Very limited Deep to water	1.00
		Depth to bedrock	1.00	Piping	0.12	Very limited Deep to water	1.00
Vinland-----	30	Very limited Seepage	1.00	Very limited Thin layer	1.00	Very limited Deep to water	1.00
		Depth to bedrock	0.61	Piping	0.36	Very limited Deep to water	1.00
Slope	0.01	Not rated		Not rated		Not rated	
		Not rated		Very limited Thin layer	1.00	Very limited Deep to water	1.00
VR: Rock Outcrop-----	60	Not rated		Very limited Piping	0.50	Very limited Deep to water	1.00
		Very limited Seepage	1.00	Very limited Thin layer	1.00	Very limited Deep to water	1.00
Depth to bedrock	0.58	Very limited Slope	0.28	Very limited Piping	0.88	Very limited Deep to water	1.00
		Very limited Seepage	1.00	Very limited Thin layer	1.00	Very limited Deep to water	1.00
Depth to bedrock	0.53	Very limited Slope	0.53	Very limited Piping	0.88	Very limited Deep to water	1.00
		Somewhat limited Seepage	0.70	Somewhat limited Thin layer	0.81	Very limited Deep to water	1.00
Depth to bedrock	0.08	Not rated		Not rated		Not rated	
		Not rated		Not rated		Not rated	
W: Water-----	100	Not rated		Not rated		Not rated	
		Not limited		Very limited Depth to saturated zone Hard to pack	1.00 1.00	Very limited Slow refill Cutbanks cave	1.00 0.10
Wa: Wabash-----	90	Not limited		Somewhat limited Piping	0.07	Very limited Deep to water	1.00
		Somewhat limited Seepage	0.70	Somewhat limited Piping	0.07	Very limited Deep to water	1.00
Wc: Welda-----	85	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.07	Very limited Deep to water	1.00
		Somewhat limited Seepage	0.70	Somewhat limited Piping	0.07	Very limited Deep to water	1.00
Slope	0.00	Not rated		Very limited Hard to pack	1.00	Somewhat limited Slow refill	0.95
		Somewhat limited Slope	0.00	Very limited Hard to pack	1.00	Somewhat limited Slow refill	0.95
Zo: Zook-----	90	Somewhat limited Seepage	0.05	Very limited Hard to pack	1.00	Somewhat limited Slow refill	0.95

WATER MANAGEMENT--Continued
 Leavenworth and Wyandotte Counties, Kansas

(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 potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit						
				Depth to saturated zone	1.00	Cutbanks cave	0.10

SANITARY FACILITIES
Leavenworth and Wyandotte Counties, Kansas

Sanitary Facilities

The following 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. Slightly limited indicates that the soil has features that are favorable for the specified use. The limitations are minor and can be easily overcome. Good performance and 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 0.00 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.

SANITARY FACILITIES
Leavenworth and Wyandotte Counties, Kansas

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.

SANITARY FACILITIES--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
005AQ: Fluvaquents-----	95	Very limited Flooding Ponding Depth to saturated zone	1.00 1.00 1.00	Very limited Ponding Flooding Depth to saturated zone	1.00 1.00 1.00
005AR: Armster-----	85	Very limited Depth to saturated zone Restricted permeability Slope	1.00 1.00 0.04	Very limited Slope	1.00
005GO: Gosport-----	85	Very limited Restricted permeability Depth to bedrock Slope	1.00 1.00 1.00	Very limited Depth to soft bedrock Slope	1.00 1.00
005HN: Haynie-----	96	Very limited Flooding Depth to saturated zone Restricted permeability	1.00 1.00 0.92	Very limited Flooding Depth to saturated zone Seepage	1.00 1.00 0.08
005HO: Haynie-----	60	Very limited Flooding Depth to saturated zone Restricted permeability	1.00 1.00 0.92	Very limited Flooding Depth to saturated zone Seepage	1.00 1.00 0.08
Onawa-----	30	Very limited Flooding Ponding Depth to saturated zone Restricted permeability	1.00 1.00 1.00 0.32	Very limited Ponding Flooding Depth to saturated zone Seepage	1.00 1.00 1.00 0.68
005KG: Kennebec-----	60	Very limited Flooding Depth to saturated zone Restricted permeability	1.00 1.00 0.50	Very limited Flooding Depth to saturated zone Seepage	1.00 0.71 0.50
Colo-----	30	Very limited Flooding Depth to saturated zone Restricted permeability	1.00 1.00 0.50	Very limited Flooding Depth to saturated zone Seepage	1.00 1.00 0.50
005KY: Knox-----	60	Very limited Slope Restricted permeability	1.00 0.50	Very limited Slope Seepage	1.00 0.50
Gosport-----	30	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Depth to soft bedrock Slope	1.00 1.00
005OD: Onawa-----	95	Very limited Flooding Restricted permeability Ponding Depth to saturated zone	1.00 1.00 1.00 1.00	Very limited Ponding Flooding Depth to saturated zone Seepage	1.00 1.00 1.00 0.68
005OW: Onawet-----	95	Very limited Flooding Restricted permeability Ponding Depth to saturated zone	1.00 1.00 1.00 1.00	Very limited Ponding Flooding Seepage Depth to saturated zone	1.00 1.00 1.00 1.00

SANITARY FACILITIES--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
005PA: Knox-----	50	Filtering capacity	1.00		
Palermo-----	50	Somewhat limited Slope	0.96	Very limited Slope	1.00
005PB: Palermo-----	95	Restricted permeability	0.50	Seepage	0.50
005SH: Shelby-----	85	Somewhat limited Slope	0.96	Very limited Slope	1.00
005WA: Wabash-----	85	Very limited Slope	1.00	Very limited Slope	1.00
005WH: Wathena-----	55	Very limited Flooding	1.00	Very limited Flooding	1.00
Haynie-----	40	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Flooding	1.00
045ET: Eudora-----	90	Filtering capacity	1.00	Seepage	0.08
		Depth to saturated zone	1.00	Flooding	0.40
045EV: Eudora-----	60	Very limited Flooding	1.00	Somewhat limited Seepage	0.50
Kimo-----	30	Restricted permeability	0.50	Flooding	0.40
		Flooding	0.40	Very limited Flooding	1.00
045KM: Kimo-----	90	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	0.40	Seepage	0.50
045MR: Morrill-----	90	Depth to saturated zone	1.00	Flooding	0.40
		Flooding	0.40	Very limited Depth to saturated zone	1.00
045RO: River Wash-----	100	Seepage	0.32	Seepage	0.32
		Not rated		Not rated	
045SB: Sarpy-----	55	Very limited Flooding	1.00	Very limited Flooding	1.00
		Filtering capacity	1.00	Seepage	1.00
Eudora-----	45	Very limited Flooding	1.00	Very limited Flooding	1.00
		Restricted permeability	0.50	Seepage	0.50
045VM: Vinland-----	40	Very limited		Very limited	

SANITARY FACILITIES--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Martin-----	25	Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	0.37	Slope	1.00
		Seepage		Seepage	0.50
		Very limited Restricted permeability	1.00	Very limited Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Slope	1.00
045WC: Wabash-----	88	Slope	0.04		
087RE: Reading-----	85	Very limited Flooding	1.00	Very limited Flooding	1.00
		Restricted permeability	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00		
087SS: Sibleyville-----	60	Somewhat limited Restricted permeability	0.68	Somewhat limited Seepage	0.32
		Depth to saturated zone	0.65	Flooding	0.20
		Flooding	0.20	Depth to saturated zone	0.02
		Very limited Depth to bedrock	1.00	Very limited Depth to soft bedrock	1.00
087SV: Sibleyville-----	50	Restricted permeability	0.50	Slope	0.67
				Seepage	0.50
		Very limited Depth to bedrock	1.00	Very limited Depth to soft bedrock	1.00
087VO: Vinland-----	55	Restricted permeability	0.50	Slope	1.00
		Slope	0.16	Seepage	0.50
		Very limited Depth to bedrock	1.00	Very limited Depth to soft bedrock	1.00
087WC: Wabash-----	94	Slope	0.37	Slope	1.00
		Very limited Restricted permeability	1.00	Seepage	0.50
		Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
091ED: Eudora-----	75	Flooding	0.20	Flooding	0.20
		Somewhat limited Restricted permeability	0.50	Somewhat limited Seepage	0.50
Kimo-----	25	Flooding	0.40	Flooding	0.40
		Very limited Restricted permeability	1.00	Somewhat limited Depth to saturated zone	0.71
		Depth to saturated zone	1.00	Seepage	0.50
091LB: Ladoga-----	85	Flooding	0.40	Flooding	0.40
		Very limited Restricted permeability	1.00	Very limited Slope	1.00
091RA: Reading-----	90	Slope	0.63	Seepage	0.50
		Somewhat limited Restricted permeability	0.68	Somewhat limited Flooding	0.40
091SB: Sharpsburg-----	55	Flooding	0.40	Seepage	0.32
		Very limited Restricted permeability	1.00	Somewhat limited Slope	0.91
Urban Land-----	45	Very limited Slope	1.00	Seepage	0.50
				Very limited Slope	1.00

SANITARY FACILITIES--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Aa: Kennebec, CHANNELED-	85	Very limited Flooding Depth to saturated zone Restricted permeability	1.00 1.00 0.50	Very limited Flooding Depth to saturated zone Seepage	1.00 1.00 0.50
Ac: Armster-----	90	Very limited Restricted permeability Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone Slope	1.00 0.91
Ad: Armster-----	90	Very limited Restricted permeability Depth to saturated zone Slope	1.00 1.00 0.16	Very limited Slope Depth to saturated zone	1.00 1.00
Ae: Armster, eroded----	75	Very limited Restricted permeability Depth to saturated zone Slope	1.00 1.00 0.16	Very limited Slope Depth to saturated zone	1.00 1.00
AED: Arents, Earthen Dam-	100	Not rated		Not rated	
Ba: Basehor-----	55	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Depth to hard bedrock Slope	1.00 1.00
Br: Bremer-----	95	Very limited Depth to saturated zone Restricted permeability Flooding	1.00 1.00 0.40	Very limited Depth to saturated zone Flooding	1.00 0.40
Cf: Borrow Pits-----	100	Not rated		Not rated	
Ec: Elmont-----	85	Very limited Restricted permeability Depth to bedrock	1.00 0.09	Somewhat limited Slope	0.67
Ed: Elmont-----	85	Very limited Restricted permeability Slope Depth to bedrock	1.00 0.16 0.09	Very limited Slope	1.00
Eu: Eudora-----	70	Somewhat limited Restricted permeability Flooding	0.50 0.40	Somewhat limited Seepage Flooding	0.50 0.40
Haynie-----	20	Very limited Flooding Depth to saturated zone Restricted permeability	1.00 1.00 0.50	Very limited Flooding Depth to saturated zone Seepage	1.00 1.00 0.50
Gc: Gospport-----	50	Very limited Restricted permeability Depth to bedrock Slope	1.00 1.00 1.00	Very limited Depth to soft bedrock Slope	1.00 1.00
Gp: Gravel Pits-----	100	Not rated		Not rated	
Gs: Gospport-----	50	Very limited Restricted permeability	1.00	Very limited Depth to soft bedrock	1.00

SANITARY FACILITIES--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Sogn-----	35	Depth to bedrock	1.00	Slope	1.00
		Slope	1.00	Very limited Depth to hard bedrock	1.00
		Very limited	1.00		
Gt: Grundy-----	90	Depth to bedrock	1.00	Slope	1.00
		Slope	0.96	Somewhat limited Depth to saturated zone	0.00
		Very limited	1.00		
Gu: Grundy-----	90	Restricted permeability	1.00	Slope	0.67
		Depth to saturated zone	1.00	Depth to saturated zone	0.00
		Very limited	1.00		
Gy: Gymer-----	85	Restricted permeability	1.00	Slope	0.67
		Depth to saturated zone	1.00	Seepage	0.50
		Very limited	1.00	Very limited Depth to saturated zone	1.00
Hg: Haig-----	90	Restricted permeability	1.00		
Depth to saturated zone		1.00			
Very limited		1.00			
Hy: Haynie-----	90	Flooding	1.00	Very limited Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	0.50	Seepage	0.50
Ju: Judson-----	90	Somewhat limited Restricted permeability	0.50	Somewhat limited Seepage	0.50
Ke: Kennebec-----	90	Very limited Flooding	1.00	Very limited Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	0.71
		Restricted permeability	0.50	Seepage	0.50
Kh: Knox-----	80	Somewhat limited Restricted permeability	0.50	Very limited Slope	1.00
		Slope	0.16	Seepage	0.50
		Very limited Slope	1.00	Very limited Slope	1.00
Restricted permeability	0.50				
Kk: Knox-----	90	Very limited Slope	1.00	Seepage	0.50
		Restricted permeability	0.50	Very limited Slope	1.00
		Somewhat limited Restricted permeability	0.50		
Km: Knox, eroded-----	85	Slope	0.16	Seepage	0.50
		Very limited Slope	1.00	Very limited Slope	1.00
		Restricted permeability	0.50		
Kn: Knox-----	65	Very limited Slope	1.00	Very limited Slope	1.00
		Restricted permeability	0.50	Seepage	0.50
		Very limited Depth to bedrock	1.00	Very limited Depth to hard bedrock	1.00
Slope	1.00				
Ko: Konawa-----	85	Somewhat limited Restricted permeability	0.50	Somewhat limited Slope	0.91
		Very limited Slope	1.00	Seepage	0.50
		Somewhat limited Slope	0.96	Very limited Slope	1.00
Very limited Slope	0.96				

SANITARY FACILITIES--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
La: Ladoga-----	80	Restricted permeability	0.50	Seepage	0.50
		Very limited Restricted permeability	1.00	Somewhat limited Slope	0.91
M-W: Miscellaneous Water-	100	Not rated		Seepage	0.50
Mb: Marshall-----	90	Not rated		Not rated	
		Somewhat limited Restricted permeability	0.50	Somewhat limited Seepage	0.50
Mc: Marshall-----	90	Somewhat limited Restricted permeability	0.50	Slope	0.09
		Somewhat limited Restricted permeability	0.50	Very limited Slope	1.00
Md: Marshall-----	90	Somewhat limited Slope	0.63	Seepage	0.50
		Very limited Restricted permeability	0.50	Very limited Slope	1.00
Mn: Martin-----	90	Very limited Restricted permeability	1.00	Seepage	0.50
		Very limited Restricted permeability	1.00	Somewhat limited Slope	0.91
Mr: Martin-----	85	Very limited Restricted permeability	1.00	Slope	1.00
		Very limited Slope	0.16	Very limited Slope	1.00
Ms: Martin-----	85	Very limited Restricted permeability	1.00	Very limited Slope	1.00
		Very limited Slope	0.04		
On: Onawa-----	95	Very limited Flooding	1.00	Very limited Flooding	1.00
		Restricted permeability	1.00	Depth to saturated zone	1.00
Oo: Onawa-----	90	Depth to saturated zone	1.00	Seepage	1.00
		Very limited Flooding	1.00	Very limited Flooding	1.00
Os: Oska-----	80	Restricted permeability	1.00	Depth to hard bedrock	1.00
		Depth to bedrock	1.00	Slope	0.91
Pb: Pawnee-----	90	Very limited Restricted permeability	1.00	Somewhat limited Slope	0.09
		Depth to saturated zone	1.00		
Pc: Pawnee-----	85	Very limited Restricted permeability	1.00	Somewhat limited Slope	0.91
		Depth to saturated zone	1.00		
Pe: Pawnee, eroded-----	85	Very limited Restricted permeability	1.00	Somewhat limited Slope	0.91
		Depth to saturated zone	1.00		
Qu: Quarries-----	100	Not rated		Not rated	

SANITARY FACILITIES--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Rs: River Wash-----	100	Not rated		Not rated	
Sa: Sarpy-----	55	Very limited Flooding Filtering capacity	1.00 1.00	Very limited Flooding Seepage	1.00 1.00
Haynie-----	35	Very limited Flooding Restricted permeability	1.00 0.50	Slope Very limited Flooding Seepage	0.00 1.00 0.50
Sb: Sharpsburg-----	80	Very limited Restricted permeability	1.00	Slope Somewhat limited Seepage	0.00 0.50 0.09
Sc: Sharpsburg-----	80	Very limited Restricted permeability	1.00	Slope Somewhat limited Seepage	0.91 0.50
Se: Shelby-----	90	Very limited Restricted permeability	1.00	Slope Somewhat limited Slope	0.09
Sh: Shelby-----	80	Very limited Restricted permeability	1.00	Slope Somewhat limited Slope	0.91
Sm: Shelby-----	90	Very limited Restricted permeability Slope	1.00 0.16	Very limited Slope	1.00
Sp: Shelby-----	50	Very limited Restricted permeability	1.00	Slope Somewhat limited Slope	0.91
Pawnee-----	35	Very limited Restricted permeability Depth to saturated zone	1.00 1.00	Slope Somewhat limited Slope	0.91
Ss: Shelby, eroded-----	55	Very limited Restricted permeability	1.00	Slope Somewhat limited Slope	0.91
Pawnee, eroded-----	35	Very limited Restricted permeability Depth to saturated zone	1.00 1.00	Slope Somewhat limited Slope	0.91
Sy: Sibleyville-----	85	Very limited Depth to bedrock Restricted permeability	1.00 0.50	Very limited Depth to soft bedrock Slope Seepage	1.00 0.91 0.50
SZ: Sogn-----	55	Very limited Depth to bedrock Slope	1.00 0.16	Very limited Depth to hard bedrock Slope	1.00 1.00
Vinland-----	30	Very limited Depth to bedrock Slope	1.00 0.84	Very limited Depth to soft bedrock Slope Seepage	1.00 1.00 0.50
VR: Rock Outcrop-----	60	Not rated		Not rated	
Vinland-----	26	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Depth to soft bedrock Slope Seepage	1.00 1.00 0.50

SANITARY FACILITIES--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Vs: Vinland-----	55	Very limited Depth to bedrock	1.00	Very limited Depth to soft bedrock	1.00
Sibleyville-----	45	Slope Very limited Depth to bedrock	0.04 1.00	Slope Very limited Depth to soft bedrock	1.00 1.00
		Restricted permeability Slope	0.50 0.04	Slope Seepage	1.00 0.50
W: Water-----	100	Not rated		Not rated	
Wa: Wabash-----	90	Very limited Flooding Restricted permeability Depth to saturated zone	1.00 1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00
Wc: Welda-----	85	Very limited Restricted permeability	1.00	Very limited Slope Seepage	1.00 0.50
Wd: Welda-----	90	Very limited Restricted permeability Slope	1.00 0.63	Very limited Slope Seepage	1.00 0.50
Zo: Zook-----	90	Very limited Flooding Restricted permeability Depth to saturated zone	1.00 1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00

SANITARY FACILITIES--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
005AQ: Fluvaquents-----	95	Very limited Flooding Depth to saturated zone Ponding Seepage	1.00 1.00 1.00 1.00	Very limited Flooding Ponding Depth to saturated zone	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00
005AR: Armster-----	85	Very limited Depth to saturated zone Too clayey Slope	1.00 0.50 0.04	Very limited Depth to saturated zone Slope	1.00 0.04	Very limited Depth to saturated zone Hard to compact Too clayey Slope	1.00 1.00 0.50 0.04
005GO: Gosport-----	85	Very limited Slope Depth to bedrock Too clayey Seepage	1.00 1.00 1.00 1.00	Very limited Slope Depth to bedrock	1.00 1.00	Very limited Depth to bedrock Slope Too clayey Hard to compact	1.00 1.00 1.00 1.00
005HN: Haynie-----	96	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00	Somewhat limited Depth to saturated zone	0.86
005HO: Haynie-----	60	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00	Somewhat limited Depth to saturated zone	0.86
Onawa-----	30	Very limited Flooding Depth to saturated zone Ponding	1.00 1.00 1.00	Very limited Flooding Ponding Depth to saturated zone	1.00 1.00 1.00	Very limited Ponding Carbonate content Depth to saturated zone	1.00 1.00 0.86
005KG: Kennebec-----	60	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00	Not limited	
Colo-----	30	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	Very limited Hard to compact Depth to saturated zone Too clayey	1.00 0.86 0.50
005KY: Knox-----	60	Very limited Slope Too clayey	1.00 0.50	Very limited Slope	1.00	Very limited Slope Too clayey	1.00 0.50
Gosport-----	30	Very limited Depth to bedrock Too clayey Slope Seepage	1.00 1.00 1.00 1.00	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Depth to bedrock Too clayey Hard to compact Slope	1.00 1.00 1.00 1.00
005OD: Onawa-----	95	Very limited Flooding Depth to saturated zone Ponding	1.00 1.00 1.00	Very limited Flooding Ponding Depth to saturated zone	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 0.11
005OW: Onawet-----	95	Very limited Flooding Depth to saturated zone Ponding Seepage	1.00 1.00 1.00 1.00	Very limited Flooding Ponding Depth to saturated zone	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 0.47
005PA: Knox-----	50	Somewhat limited Slope Too clayey	0.96 0.50	Somewhat limited Slope	0.96	Somewhat limited Slope Too clayey	0.96 0.50
Palermo-----	50	Very limited Seepage Slope	1.00 0.96	Somewhat limited Slope	0.96	Somewhat limited Slope	0.96
005PB: Palermo-----	95	Very limited		Very limited		Very limited	

SANITARY FACILITIES--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
005SH: Shelby-----	85	Slope	1.00	Slope	1.00	Slope	1.00
		Seepage	1.00				
005WA: Wabash-----	85	Somewhat limited	0.50	Somewhat limited	0.00	Somewhat limited	0.50
		Too clayey	0.00	Slope		Too clayey	0.00
005WH: Wathena-----	55	Very limited	1.00	Very limited	1.00	Very limited	1.00
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
Haynie-----	40	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	1.00
		Too clayey	1.00			Hard to compact	1.00
045ET: Eudora-----	90	Very limited	1.00	Very limited	1.00	Very limited	1.00
		Flooding	1.00	Flooding	1.00	Ponding	1.00
045EV: Eudora-----	60	Depth to saturated zone	1.00	Ponding	1.00	Seepage	1.00
		Flooding	1.00	Depth to saturated zone	1.00	Carbonate content	1.00
045KM: Kimo-----	30	Too Sandy	1.00	Seepage	1.00	Too Sandy	0.50
		Seepage	1.00			Depth to saturated zone	0.35
045MR: Morrill-----	90	Very limited	1.00	Very limited	1.00	Somewhat limited	0.86
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	
045RO: River Wash-----	100	Depth to saturated zone	1.00	Depth to saturated zone	1.00		
		Flooding	0.40			Not limited	
045SB: Sarpy-----	55	Somewhat limited	0.40	Somewhat limited	0.40	Not limited	
		Flooding	0.40	Flooding	0.40	Not limited	
045VM: Vinland-----	45	Very limited	1.00	Very limited	1.00	Somewhat limited	0.86
		Depth to saturated zone	0.40	Depth to saturated zone	0.40	Depth to saturated zone	
045WC: Wabash-----	88	Flooding	1.00	Flooding	1.00	Somewhat limited	0.50
		Too clayey	0.50	Not limited		Too clayey	
087RE: Reading-----	85	Not rated		Not rated		Not rated	
		Very limited	1.00	Very limited	1.00	Very limited	1.00
087SS: Sibleyville-----	60	Flooding	1.00	Flooding	1.00	Too Sandy	1.00
		Seepage	1.00	Seepage	1.00	Seepage	1.00
087SS: Sibleyville-----	60	Too Sandy	1.00	Very limited	1.00	Not limited	
		Seepage	1.00	Flooding	1.00	Very limited	1.00
087RE: Reading-----	85	Very limited	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Flooding	1.00	Seepage	0.37	Too clayey	0.50
087RE: Reading-----	85	Too clayey	0.50	Slope	0.37	Slope	0.37
		Flooding	0.20				
087RE: Reading-----	85	Very limited	1.00	Very limited	1.00	Very limited	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	1.00
087RE: Reading-----	85	Too clayey	1.00	Slope	0.04	Hard to compact	1.00
		Flooding	0.50			Depth to saturated zone	0.86
087RE: Reading-----	85	Somewhat limited	0.50	Somewhat limited	0.20	Slope	0.04
		Flooding	0.20	Flooding	0.20	Very limited	1.00
087RE: Reading-----	85	Too clayey	0.50	Somewhat limited	0.20	Depth to saturated zone	1.00
		Flooding	0.20	Flooding	0.20	Too clayey	0.50
087RE: Reading-----	85	Very limited	1.00	Very limited	1.00	Very limited	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00

SANITARY FACILITIES--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
087SV: Sibleyville-----	50	Seepage	1.00				
		Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage	1.00	Slope	0.16	Slope	0.16
		Slope	0.16				
087VO: Vinland-----	55	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage	1.00	Slope	0.37	Too clayey	0.50
		Too clayey	0.50			Slope	0.37
		Slope	0.37				
087WC: Wabash-----	94	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too clayey	1.00	Flooding	0.20	Too clayey	1.00
		Flooding	0.20			Hard to compact	1.00
091ED: Eudora-----	75	Somewhat limited		Somewhat limited		Not limited	
		Flooding	0.40	Flooding	0.40		
Kimo-----	25	Very limited		Very limited		Not limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00		
		Flooding	0.40	Flooding	0.40		
091LB: Ladoga-----	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63
		Too clayey	0.50			Too clayey	0.50
091RA: Reading-----	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.50	Flooding	0.40	Too clayey	0.50
		Flooding	0.40				
091SB: Sharpsburg-----	55	Somewhat limited		Not limited		Very limited	
		Too clayey	0.50			Hard to compact	1.00
						Too clayey	0.50
Urban Land-----	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Aa: Kennebec, CHANNELED-	85	Very limited		Very limited		Not limited	
		Flooding	1.00	Flooding	1.00		
		Depth to saturated zone	1.00	Depth to saturated zone	1.00		
Ac: Armster-----	90	Somewhat limited		Not limited		Very limited	
		Too clayey	0.50			Hard to compact	1.00
		Depth to saturated zone	0.47			Too clayey	0.50
						Depth to saturated zone	0.11
Ad: Armster-----	90	Somewhat limited		Somewhat limited		Very limited	
		Too clayey	0.50	Slope	0.16	Hard to compact	1.00
		Depth to saturated zone	0.47			Too clayey	0.50
		Slope	0.16			Slope	0.16
						Depth to saturated zone	0.11
Ae: Armster, eroded----	75	Somewhat limited		Somewhat limited		Very limited	
		Too clayey	0.50	Slope	0.16	Hard to compact	1.00
		Depth to saturated zone	0.47			Too clayey	0.50
		Slope	0.16			Slope	0.16
						Depth to saturated zone	0.11
AED: Arents, Earthen Dam-	100	Not rated		Not rated		Not rated	
Ba: Basehor-----	55	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Seepage	1.00				
Br: Bremer-----	95	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	1.00
		Too clayey	1.00	Flooding	0.40	Hard to compact	1.00
		Flooding	0.40			Depth to saturated zone	1.00

SANITARY FACILITIES--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Cf: Borrow Pits-----	100	Not rated		Not rated		Not rated	
Ec: Elmont-----	85	Very limited Depth to bedrock 1.00 Seepage 1.00 Too clayey 0.50		Not limited		Somewhat limited Too clayey	0.50
Ed: Elmont-----	85	Very limited Depth to bedrock 1.00 Seepage 1.00 Too clayey 0.50 Slope 0.16		Somewhat limited Slope	0.16	Somewhat limited Too clayey Slope	0.50 0.16
Eu: Eudora-----	70	Somewhat limited Flooding	0.40	Somewhat limited Flooding	0.40	Not limited	
Haynie-----	20	Very limited Flooding	1.00	Very limited Flooding	1.00	Somewhat limited Depth to saturated zone	0.86
		Depth to saturated zone	1.00	Depth to saturated zone	1.00		
Gc: Gosport-----	50	Very limited Depth to bedrock 1.00 Too clayey 1.00 Slope 1.00 Seepage 1.00		Very limited Depth to bedrock 1.00 Slope 1.00	1.00 1.00	Very limited Depth to bedrock 1.00 Too clayey 1.00 Hard to compact 1.00 Slope 1.00	1.00 1.00 1.00 1.00
Gp: Gravel Pits-----	100	Not rated		Not rated		Not rated	
Gs: Gosport-----	50	Very limited Depth to bedrock 1.00 Too clayey 1.00 Slope 1.00 Seepage 1.00		Very limited Depth to bedrock 1.00 Slope 1.00	1.00 1.00	Very limited Depth to bedrock 1.00 Too clayey 1.00 Hard to compact 1.00 Slope 1.00	1.00 1.00 1.00 1.00
Sogn-----	35	Very limited Depth to bedrock 1.00 Seepage 1.00 Slope 0.96 Too clayey 0.50		Very limited Depth to bedrock 1.00 Slope 0.96	1.00 0.96	Very limited Depth to bedrock 1.00 Hard to compact 1.00 Slope 0.96 Too clayey 0.50	1.00 1.00 0.96 0.50
Gt: Grundy-----	90	Very limited Depth to saturated zone 1.00 Too clayey 1.00		Very limited Depth to saturated zone	1.00	Very limited Too clayey	1.00
						Hard to compact Depth to saturated zone	1.00 1.00
Gu: Grundy-----	90	Very limited Depth to saturated zone 1.00 Too clayey 1.00		Very limited Depth to saturated zone	1.00	Very limited Too clayey	1.00
						Hard to compact Depth to saturated zone	1.00 1.00
Gy: Gymer-----	85	Somewhat limited Too clayey	0.50	Not limited		Very limited Hard to compact Too clayey	1.00 0.50
Hg: Haig-----	90	Very limited Depth to saturated zone 1.00 Too clayey 1.00		Very limited Depth to saturated zone	1.00	Very limited Too clayey	1.00
						Hard to compact Depth to saturated zone	1.00 1.00
Hy: Haynie-----	90	Very limited Flooding	1.00	Very limited Flooding	1.00	Somewhat limited Depth to saturated zone	0.86
		Depth to saturated zone	1.00	Depth to saturated zone	1.00		
Ju: Judson-----	90	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
Ke: Kennebec-----	90	Very limited Flooding 1.00 Depth to saturated zone 1.00		Very limited Flooding 1.00 Depth to saturated zone 1.00	1.00 1.00	Not limited	

SANITARY FACILITIES--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Kh: Knox-----	80	Somewhat limited Too clayey Slope	0.50 0.16	Somewhat limited Slope	0.16	Somewhat limited Too clayey Slope	0.50 0.16
Kk: Knox-----	90	Very limited Slope Too clayey	1.00 0.50	Very limited Slope	1.00	Very limited Slope Too clayey	1.00 0.50
Km: Knox, eroded-----	85	Somewhat limited Too clayey Slope	0.50 0.16	Somewhat limited Slope	0.16	Somewhat limited Too clayey Slope	0.50 0.16
Kn: Knox-----	65	Very limited Slope Too clayey	1.00 0.50	Very limited Slope	1.00	Very limited Slope Too clayey	1.00 0.50
Sogn-----	35	Very limited Slope Depth to bedrock Seepage	1.00 1.00 1.00	Very limited Slope Depth to bedrock	1.00 1.00	Very limited Depth to bedrock Slope	1.00 1.00
Ko: Konawa-----	85	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
Kw: Konawa-----	90	Somewhat limited Slope Too clayey	0.96 0.50	Somewhat limited Slope	0.96	Somewhat limited Slope Too clayey	0.96 0.50
La: Ladoga-----	80	Somewhat limited Too clayey	0.50	Not limited		Very limited Hard to compact Too clayey	1.00 0.50
M-W: Miscellaneous Water-	100	Not rated		Not rated		Not rated	
Mb: Marshall-----	90	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
Mc: Marshall-----	90	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
Md: Marshall-----	90	Somewhat limited Slope Too clayey	0.63 0.50	Somewhat limited Slope	0.63	Somewhat limited Slope Too clayey	0.63 0.50
Mn: Martin-----	90	Very limited Too clayey	1.00	Not limited		Very limited Too clayey Hard to compact	1.00 1.00
Mr: Martin-----	85	Very limited Too clayey Slope	1.00 0.16	Somewhat limited Slope	0.16	Very limited Too clayey Hard to compact Slope	1.00 1.00 0.16
Ms: Martin-----	85	Very limited Too clayey Slope	1.00 0.04	Somewhat limited Slope	0.04	Very limited Too clayey Hard to compact Slope	1.00 1.00 0.04
On: Onawa-----	95	Very limited Flooding Depth to saturated zone Seepage	1.00 1.00 1.00	Very limited Flooding Depth to saturated zone Seepage	1.00 1.00 1.00	Somewhat limited Seepage Depth to saturated zone	0.21 0.09
Oo: Onawa-----	90	Very limited Flooding Depth to saturated zone Seepage	1.00 1.00 1.00	Very limited Flooding Depth to saturated zone Seepage	1.00 1.00 1.00	Somewhat limited Seepage Depth to saturated zone	0.21 0.09
Os: Oska-----	80	Very limited Depth to bedrock Seepage Too clayey	1.00 1.00 0.50	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock Hard to compact Too clayey	1.00 1.00 0.50
Pb: Pawnee-----	90	Very limited Depth to saturated zone Too clayey	1.00 1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Too clayey Hard to compact	1.00 1.00 1.00

SANITARY FACILITIES--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Pc: Pawnee-----	85	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
Pe: Pawnee, eroded-----	85	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
Qu: Quarries-----	100	Not rated		Not rated		Not rated	
Rs: River Wash-----	100	Not rated		Not rated		Not rated	
Sa: Sarpy-----	55	Very limited Flooding Seepage Too Sandy	1.00 1.00 1.00	Very limited Flooding Seepage	1.00 1.00	Very limited Too Sandy Seepage	1.00 1.00
Haynie-----	35	Very limited Flooding	1.00	Very limited Flooding	1.00	Not limited	
Sb: Sharpsburg-----	80	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
Sc: Sharpsburg-----	80	Somewhat limited Too clayey	0.50	Not limited		Very limited Hard to compact Too clayey	1.00 0.50
Se: Shelby-----	90	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
Sh: Shelby-----	80	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
Sm: Shelby-----	90	Somewhat limited Too clayey Slope	0.50 0.16	Somewhat limited Slope	0.16	Somewhat limited Too clayey Slope	0.50 0.16
Sp: Shelby-----	50	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
Pawnee-----	35	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
Ss: Shelby, eroded-----	55	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
Pawnee, eroded-----	35	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
Sy: Sibleyville-----	85	Very limited Depth to bedrock Seepage Too clayey	1.00 1.00 0.50	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock Too clayey	1.00 0.50
SZ: Sogn-----	55	Very limited Depth to bedrock Seepage Too clayey Slope	1.00 1.00 0.50 0.16	Very limited Depth to bedrock Slope	1.00 0.16	Very limited Depth to bedrock Hard to compact Too clayey Slope	1.00 1.00 0.50 0.16
Vinland-----	30	Very limited Depth to bedrock Seepage Slope Too clayey	1.00 1.00 0.84 0.50	Very limited Depth to bedrock Slope	1.00 0.84	Very limited Depth to bedrock Slope Too clayey	1.00 0.84 0.50
VR: Rock Outcrop-----	60	Not rated		Not rated		Not rated	
Vinland-----	26	Very limited Slope Depth to bedrock Seepage Too clayey	1.00 1.00 1.00 0.50	Very limited Slope Depth to bedrock	1.00 1.00	Very limited Depth to bedrock Slope Too clayey	1.00 1.00 0.50

SANITARY FACILITIES--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Vs: Vinland-----	55	Very limited Depth to bedrock Seepage Slope	1.00 1.00 0.04	Very limited Depth to bedrock Slope	1.00 0.04	Very limited Depth to bedrock Slope	1.00 0.04
Sibleyville-----	45	Very limited Depth to bedrock Seepage Too clayey Slope	1.00 1.00 0.50 0.04	Very limited Depth to bedrock Slope	1.00 0.04	Very limited Depth to bedrock Too clayey Slope	1.00 0.50 0.04
W: Water-----	100	Not rated		Not rated		Not rated	
Wa: Wabash-----	90	Very limited Flooding Depth to saturated zone Too clayey	1.00 1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone Too clayey Hard to compact	1.00 1.00 1.00
Wc: Welda-----	85	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
Wd: Welda-----	90	Somewhat limited Slope Too clayey	0.63 0.50	Somewhat limited Slope	0.63	Somewhat limited Slope Too clayey	0.63 0.50
Zo: Zook-----	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	Very limited Hard to compact Depth to saturated zone Too clayey	1.00 1.00 0.50

AGRICULTURAL WASTE MANAGEMENT
Leavenworth and Wyandotte Counties, Kansas

The nature of the soil is also important in the application of organic wastes and wastewater to land as fertilizers and irrigation; it is also important when the soil is used as a medium for treatment and disposal of these wastes. Favorable soil properties are required to prevent environmental damage.

The use of organic wastes and wastewater as production resources will result in energy conservation, prevent the waste of these important resources, and prevent problems associated with their disposal. Where disposal is the goal, and a maximum amount is disposed in a minimum area to hold costs to a minimum, risk of environmental damage is the principal constraint. Where the reuse goal is pursued, and a minimum amount is applied to a maximum area to obtain the greatest benefit, environmental damage is unlikely.

Interpretations developed for waste management may include ratings for (1) manure and food processing wastes; (2) municipal sewage sludge; (3) irrigation use of wastewater; or (4) treatment of wastewater by the slow rate process, overland flow process, or rapid infiltration process. If available, these should be located in this subsection.

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.

The Ag-Waste tables show the degree and kind of soil limitations affecting the treatment of agricultural waste, including municipal and food-processing wastewater and effluent from lagoons or storage ponds. Municipal wastewater is the waste stream from a municipality. It contains domestic waste and may contain industrial waste. It may have received primary or secondary treatment. It is rarely untreated sewage. Food-processing wastewater results from the preparation of fruits, vegetables, milk, cheese, and meats for public consumption. In places it is high in content of sodium and chloride. In the context of these tables, 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, phosphorus, heavy metals, and salts are not added in excessive amounts.

The ratings in the tables are for waste management systems that not only dispose of and treat organic waste or wastewater but also are beneficial to crops (application of manure and food-processing waste, application of sewage sludge, and disposal of wastewater by irrigation) and for waste management systems that are designed only for the purpose of wastewater disposal and treatment (overland flow of wastewater, rapid infiltration of wastewater, and slow rate treatment of wastewater).

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. Slightly limited indicates that the soil has features that are generally favorable for the specified use. The limitations are minor and can be easily overcome. Good performance and 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 0.00 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 either 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 erodibility 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.

AGRICULTURAL WASTE MANAGEMENT
Leavenworth and Wyandotte Counties, Kansas

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 erodibility 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.

See the National Soil Handbook, September 1992, Part 620, for criteria used in rating soils for sanitary facilities and waste management.

AGRICULTURAL WASTE MANAGEMENT--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
005AQ: Fluvaquents-----	95	Very limited Ponding Depth to saturated zone Low adsorption Flooding	1.00 1.00 1.00 0.60	Very limited Ponding Depth to saturated zone Flooding Low adsorption	1.00 1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Low adsorption Flooding	1.00 1.00 1.00 0.60
005AR: Armster-----	85	Very limited Depth to saturated zone Restricted permeability Too acid Slope	1.00 0.30 0.08 0.04	Very limited Depth to saturated zone Too acid Restricted permeability Slope	1.00 0.31 0.22 0.04	Very limited Depth to saturated zone Too steep for surface application Too acid Restricted permeability Too steep for sprinkler application	1.00 1.00 0.31 0.22 0.22
005GO: Gosport-----	85	Very limited Slope Restricted permeability Droughty Depth to bedrock Too acid	1.00 1.00 0.33 0.10 0.02	Very limited Restricted permeability Slope Droughty Depth to bedrock Too acid	1.00 1.00 0.33 0.10 0.07	Very limited Restricted permeability Too steep for surface application Too steep for sprinkler application Droughty Depth to bedrock	1.00 1.00 1.00 0.33 0.10
005HN: Haynie-----	96	Very limited Depth to saturated zone Flooding	1.00 0.60	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone Flooding	1.00 0.60
005HO: Haynie-----	60	Very limited Depth to saturated zone Flooding	1.00 0.60	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone Flooding	1.00 0.60
Onawa-----	30	Very limited Ponding Restricted permeability Depth to saturated zone Flooding Runoff limitation	1.00 1.00 1.00 0.60 0.40	Very limited Ponding Flooding Restricted permeability Depth to saturated zone	1.00 1.00 1.00 1.00	Very limited Ponding Restricted permeability Depth to saturated zone Flooding	1.00 1.00 1.00 0.60
005KG: Kennebec-----	60	Somewhat limited Flooding	0.60	Very limited Flooding	1.00	Somewhat limited Flooding	0.60
Colo-----	30	Very limited Depth to saturated zone Leaching limitation Flooding	1.00 0.70 0.60	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone Flooding	1.00 0.60
005KY: Knox-----	60	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Too steep for surface application Too steep for sprinkler application	1.00 1.00
Gosport-----	30	Very limited Slope Droughty	1.00 0.70	Very limited Slope Droughty	1.00 0.70	Very limited Too steep for surface application Too steep for sprinkler application	1.00 1.00

AGRICULTURAL WASTE MANAGEMENT--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
0050D: Onawa-----	95	Depth to bedrock	0.42	Depth to bedrock	0.42	Droughty	0.70
		Restricted permeability	0.30	Restricted permeability	0.22	Depth to bedrock	0.42
		Too acid	0.02	Too acid	0.07	Restricted permeability	0.22
		Very limited Ponding	1.00	Very limited Ponding	1.00	Very limited Ponding	1.00
0050W: Onawet-----	95	Restricted permeability	1.00	Flooding	1.00	Restricted permeability	1.00
		Ponding	1.00	Restricted permeability	1.00	Flooding	1.00
		Flooding	0.60	Depth to saturated zone	0.46	Depth to saturated zone	0.46
		Depth to saturated zone	0.46	Runoff limitation	0.40	Runoff limitation	0.40
005PA: Knox-----	50	Very limited Ponding	1.00	Very limited Ponding	1.00	Very limited Ponding	1.00
		Restricted permeability	1.00	Flooding	1.00	Flooding	1.00
		Flooding	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
005PB: Palermo-----	50	Depth to saturated zone	0.86	Depth to saturated zone	0.86	Depth to saturated zone	0.86
		Somewhat limited Slope	0.96	Somewhat limited Slope	0.96	Very limited Too steep for surface application	1.00
		Too acid	0.05	Too acid	0.21	Too steep for sprinkler application	0.97
		Too acid	0.05	Too acid	0.21	Too acid	0.21
005PB: Palermo-----	95	Very limited Low adsorption	1.00	Very limited Low adsorption	1.00	Very limited Low adsorption	1.00
		Slope	0.96	Slope	0.96	Too steep for surface application	1.00
		Too acid	0.14	Too acid	0.55	Too steep for sprinkler application	0.97
		Too acid	0.14	Too acid	0.55	Too acid	0.55
005SH: Shelby-----	85	Very limited Slope	1.00	Very limited Low adsorption	1.00	Very limited Low adsorption	1.00
		Low adsorption	1.00	Slope	1.00	Too steep for surface application	1.00
		Too acid	0.14	Too acid	0.55	Too steep for sprinkler application	1.00
		Too acid	0.14	Too acid	0.55	Too acid	0.55
005WA: Wabash-----	85	Somewhat limited Restricted permeability	0.30	Somewhat limited Restricted permeability	0.22	Very limited Too steep for surface application	1.00
		Too acid	0.02	Too acid	0.07	Restricted permeability	0.22
		Slope	0.00	Slope	0.00	Too steep for sprinkler application	0.10
		Slope	0.00	Slope	0.00	Too acid	0.07
005WH: Wathena-----	55	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	0.60	Flooding	1.00	Flooding	0.60
		Runoff limitation	0.40	Runoff limitation	0.40	Runoff limitation	0.40
005WH: Wathena-----	55	Very limited Ponding	1.00	Very limited Ponding	1.00	Very limited Ponding	1.00
		Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00

AGRICULTURAL WASTE MANAGEMENT--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Haynie-----	40	Depth to saturated zone	0.78	Filtering capacity	1.00	Depth to saturated zone	0.78
		Flooding	0.60	Depth to saturated zone	0.78	Flooding	0.60
		Very limited	1.00	Flooding	1.00	Very limited	1.00
		Depth to saturated zone	0.60	Depth to saturated zone	1.00	Depth to saturated zone	0.60
045ET: Eudora-----	90	Not limited		Somewhat limited	0.40	Not limited	
045EV: Eudora-----	60	Not limited		Somewhat limited	0.40	Not limited	
Kimo-----	30	Very limited	1.00	Very limited	1.00	Very limited	1.00
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
045KM: Kimo-----	90	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	0.40	Flooding	0.40	Flooding	0.40
045MR: Morrill-----	90	Very limited	1.00	Very limited	1.00	Very limited	1.00
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
045MR: Morrill-----	90	Depth to saturated zone	0.30	Depth to saturated zone	0.22	Depth to saturated zone	0.31
		Somewhat limited	0.02	Somewhat limited	0.07	Somewhat limited	0.07
045RO: River Wash-----	100	Too acid	0.02	Too acid	0.07	Too steep for surface application	0.22
045RO: River Wash-----	100	Not rated		Not rated		Restricted permeability	0.07
045SB: Sarpy-----	55	Not rated		Not rated		Too acid	0.07
		Very limited	1.00	Very limited	1.00	Very limited	1.00
045SB: Sarpy-----	55	Filtering capacity	0.65	Flooding	1.00	Filtering capacity	0.65
		Droughty	0.60	Droughty	0.65	Droughty	0.60
045SB: Sarpy-----	55	Flooding	0.45	Flooding	0.65	Flooding	0.60
		Leaching limitation	0.60	Droughty	0.65	Droughty	0.60
Eudora-----	45	Somewhat limited	0.60	Very limited	1.00	Somewhat limited	0.60
		Flooding	0.00	Flooding	0.00	Flooding	0.00
045VM: Vinland-----	40	Filtering capacity	0.00	Filtering capacity	0.00	Filtering capacity	0.00
		Very limited	1.00	Very limited	1.00	Very limited	1.00
045VM: Vinland-----	40	Depth to bedrock	0.93	Depth to bedrock	0.93	Depth to bedrock	1.00
		Droughty	0.40	Droughty	0.37	Too steep for surface application	0.93
045VM: Vinland-----	40	Runoff limitation	0.37	Slope	0.37	Droughty	0.93
		Slope	0.04	Slope	0.04	Too steep for sprinkler application	0.59
Martin-----	25	Very limited	1.00	Very limited	1.00	Very limited	1.00
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
Martin-----	25	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slope	0.04	Too acid	0.14	Too steep for surface application	1.00
045WC: Wabash-----	88	Too acid	0.03	Slope	0.04	Depth to saturated zone	0.22
		Very limited	1.00	Very limited	1.00	Too steep for sprinkler application	0.14
045WC: Wabash-----	88	Restricted permeability	1.00	Restricted permeability	1.00	Too acid	0.14

AGRICULTURAL WASTE MANAGEMENT--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
087RE: Reading-----	85	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	0.60	Flooding	1.00	Flooding	0.60
		Runoff limitation	0.40				
087SS: Sibleyville-----	60	Somewhat limited	0.03	Somewhat limited	0.20	Somewhat limited	0.14
		Too acid		Flooding	0.14	Too acid	
				Too acid			
087SV: Sibleyville-----	50	Somewhat limited	0.43	Somewhat limited	0.43	Somewhat limited	0.43
		Droughty	0.29	Droughty	0.29	Droughty	0.31
		Depth to bedrock		Depth to bedrock		Too steep for surface application	0.29
087VO: Vinland-----	55	Somewhat limited	0.54	Somewhat limited	0.54	Very limited	1.00
		Depth to bedrock		Depth to bedrock		Too steep for surface application	
		Droughty	0.19	Droughty	0.19	Depth to bedrock	0.54
087WC: Wabash-----	94	Slope	0.16	Slope	0.16	Too steep for sprinkler application	0.39
						Droughty	0.19
091ED: Eudora-----	75	Very limited	1.00	Very limited	1.00	Very limited	1.00
		Depth to bedrock	0.92	Depth to bedrock	0.92	Depth to bedrock	1.00
		Droughty		Droughty		Too steep for surface application	
091LB: Ladoga-----	85	Runoff limitation	0.40	Slope	0.37	Droughty	0.92
		Slope	0.37			Too steep for sprinkler application	0.59
091RA: Reading-----	90	Very limited	1.00	Very limited	1.00	Very limited	1.00
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
091SB: Sharpsburg-----	55	Runoff limitation	0.40	Flooding	0.20		
		Slope	0.63				
Urban Land-----	45	Somewhat limited	0.03	Somewhat limited	0.40	Somewhat limited	0.14
		Too acid		Flooding	0.14	Too acid	
				Too acid			
Urban Land-----	45	Somewhat limited	0.30	Somewhat limited	0.22	Somewhat limited	0.66
		Restricted permeability	0.02	Restricted permeability	0.07	Too steep for surface application	0.22
		Too acid		Too acid		Restricted permeability	0.07
Urban Land-----	45	Very limited	1.00	Very limited	1.00	Too steep for sprinkler application	0.00
		Slope		Low adsorption			
						Very limited	1.00

AGRICULTURAL WASTE MANAGEMENT--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Aa: Kennebec, CHANNELED-	85	Low adsorption	1.00	Slope	1.00	Too steep for surface application	1.00
						Too steep for sprinkler application	1.00
Ac: Armster-----	90	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
		Depth to saturated zone	0.09	Depth to saturated zone	0.09	Depth to saturated zone	0.09
		Somewhat limited Depth to saturated zone	0.46	Somewhat limited Depth to saturated zone	0.46	Somewhat limited Too steep for surface application	0.66
		Restricted permeability	0.30	Too acid	0.31	Depth to saturated zone	0.46
Ad: Armster-----	90	Too acid	0.08	Restricted permeability	0.22	Too acid	0.31
						Restricted permeability	0.22
						Too steep for sprinkler application	0.00
		Somewhat limited Depth to saturated zone	0.46	Somewhat limited Depth to saturated zone	0.46	Very limited Too steep for surface application	1.00
Ae: Armster, eroded----	75	Restricted permeability	0.30	Too acid	0.31	Depth to saturated zone	0.46
		Slope	0.16	Restricted permeability	0.22	Too steep for sprinkler application	0.39
		Too acid	0.08	Slope	0.16	Too acid	0.31
						Restricted permeability	0.22
AED: Arents, Earthen Dam-	100	Somewhat limited Depth to saturated zone	0.46	Somewhat limited Depth to saturated zone	0.46	Very limited Too steep for surface application	1.00
		Restricted permeability	0.30	Too acid	0.31	Depth to saturated zone	0.46
		Slope	0.16	Restricted permeability	0.22	Too steep for sprinkler application	0.39
		Too acid	0.08	Slope	0.16	Too acid	0.31
Ba: Basehor-----	55	Not rated		Not rated		Restricted permeability	0.22
						Very limited	
						Droughty	1.00
		Very limited Depth to bedrock	1.00	Droughty	1.00	Depth to bedrock	1.00
Br: Bremer-----	95	Droughty	1.00	Depth to bedrock	1.00	Too steep for surface application	1.00
		Slope	1.00	Slope	1.00	Too steep for sprinkler application	1.00
		Runoff limitation	0.40	Too acid	0.42	Too steep for sprinkler application	1.00
		Too acid	0.11	Filtering capacity	0.00	Too acid	0.42
Cf: Borrow Pits-----	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
		Restricted permeability	0.30	Flooding	0.40	Restricted permeability	0.22
				Restricted permeability	0.22		
		Not rated		Not rated		Not rated	

AGRICULTURAL WASTE MANAGEMENT--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ec: Elmont-----	85	Somewhat limited Restricted permeability	0.30	Somewhat limited Restricted permeability	0.22	Somewhat limited Too steep for surface application	0.31
		Too acid	0.02	Too acid	0.07	Restricted permeability Too acid	0.22
							0.07
Ed: Elmont-----	85	Somewhat limited Restricted permeability	0.30	Somewhat limited Restricted permeability	0.22	Very limited Too steep for surface application	1.00
		Slope	0.16	Slope	0.16	Too steep for sprinkler application	0.39
		Too acid	0.02	Too acid	0.07	Restricted permeability Too acid	0.22
Eu: Eudora-----	70	Not limited		Somewhat limited Flooding	0.40	Not limited	
		Haynie-----	20	Very limited Depth to saturated zone Flooding	1.00	Very limited Depth to saturated zone Flooding	1.00
Gc: Gosport-----	50	Very limited Restricted permeability Slope	1.00	Very limited Restricted permeability Slope	1.00	Very limited Restricted permeability Too steep for surface application	1.00
		Droughty	0.36	Too acid	0.42	Too steep for sprinkler application	1.00
		Depth to bedrock Too acid	0.20	Droughty Depth to bedrock	0.36	Too acid Droughty	0.42
Gp: Gravel Pits-----	100	Not rated		Not rated		Not rated	
Gs: Gosport-----	50	Very limited Restricted permeability Slope	1.00	Very limited Restricted permeability Slope	1.00	Very limited Restricted permeability Too steep for surface application	1.00
		Droughty	0.36	Too acid	0.42	Too steep for sprinkler application	1.00
		Depth to bedrock Too acid	0.20	Droughty Depth to bedrock	0.36	Too acid Droughty	0.42
Sogn-----	35	Very limited Depth to bedrock Droughty Slope	1.00	Very limited Droughty Depth to bedrock Slope	1.00	Very limited Droughty Depth to bedrock Too steep for surface application	1.00
		Runoff limitation	0.40			Too steep for sprinkler application	0.97
Gt: Grundy-----	90	Very limited Depth to saturated zone Restricted permeability	1.00	Very limited Depth to saturated zone Restricted permeability	1.00	Very limited Depth to saturated zone Restricted permeability	1.00
Gu: Grundy-----	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

AGRICULTURAL WASTE MANAGEMENT--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Gy: Gymer-----	85	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability Too steep for surface application	1.00 0.31
		Somewhat limited Restricted permeability Too acid	0.30	Somewhat limited Too acid	0.42	Somewhat limited Too acid	0.42
			0.11	Restricted permeability	0.22	Too steep for surface application Restricted permeability	0.31 0.22
Hg: Haig-----	90	Very limited Restricted permeability	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Depth to saturated zone Leaching limitation	1.00	Restricted permeability	1.00	Restricted permeability	1.00
			0.50	Very limited Flooding	1.00	Very limited Depth to saturated zone	1.00
Hy: Haynie-----	90	Very limited Depth to saturated zone	1.00	Depth to saturated zone	1.00	Flooding	0.60
		Flooding	0.60	Not limited		Not limited	
Ju: Judson-----	90	Not limited		Not limited		Not limited	
Ke: Kennebec-----	90	Somewhat limited Flooding	0.60	Very limited Flooding	1.00	Somewhat limited Flooding	0.60
Kh: Knox-----	80	Somewhat limited Slope	0.16	Somewhat limited Slope	0.16	Very limited Too steep for surface application Too steep for sprinkler application	1.00 0.39
		Very limited Slope	1.00	Very limited Slope	1.00	Very limited Too steep for surface application Too steep for sprinkler application	1.00 1.00
Km: Knox, eroded-----	85	Somewhat limited Slope	0.16	Somewhat limited Slope	0.16	Very limited Too steep for surface application Too steep for sprinkler application	1.00 0.39
		Very limited Slope	1.00	Very limited Slope	1.00	Very limited Too steep for surface application Too steep for sprinkler application	1.00 1.00
Sogn-----	35	Very limited Slope	1.00	Very limited Droughty	1.00	Very limited Droughty	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Droughty	1.00	Slope	1.00	Too steep for surface application	1.00
		Runoff limitation	0.40			Too steep for sprinkler application	1.00
Ko: Konawa-----	85	Somewhat limited		Somewhat limited		Somewhat limited	

AGRICULTURAL WASTE MANAGEMENT--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Kw: Konawa-----	90	Filtering capacity	0.00	Filtering capacity	0.00	Too steep for surface application	0.66
						Filtering capacity	0.00
						Too steep for sprinkler application	0.00
La: Ladoga-----	80	Somewhat limited Slope	0.96	Somewhat limited Slope	0.96	Very limited Too steep for surface application	1.00
		Filtering capacity	0.00	Filtering capacity	0.00	Too steep for sprinkler application	0.97
						Filtering capacity	0.00
M-W: Miscellaneous Water-	100	Not rated		Not rated		Not rated	
Mb: Marshall-----	90	Not limited		Not limited		Somewhat limited Too steep for surface application	0.00
Mc: Marshall-----	90	Not limited		Not limited		Somewhat limited Too steep for surface application	0.91
						Too steep for sprinkler application	0.02
Md: Marshall-----	90	Somewhat limited Slope	0.63	Somewhat limited Slope	0.63	Very limited Too steep for surface application	1.00
						Too steep for sprinkler application	0.77
Mn: Martin-----	90	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00
		Too acid	0.03	Too acid	0.14	Too steep for surface application	0.66
						Too acid	0.14
Mr: Martin-----	85	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00
		Slope	0.16	Slope	0.16	Too steep for surface application	1.00
		Too acid	0.03	Too acid	0.14	Too steep for sprinkler application	0.39
Ms: Martin-----	85	Very limited		Very limited		Too acid	0.14
						Very limited	

AGRICULTURAL WASTE MANAGEMENT--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Rs: River Wash-----	100	Not rated		Not rated		Not rated	
Sa: Sarpy-----	55	Very limited Filtering capacity Droughty	1.00 0.65	Very limited Flooding Filtering capacity Droughty	1.00 1.00 0.65	Very limited Filtering capacity Droughty Flooding	1.00 0.65 0.60
Haynie-----	35	Flooding Leaching limitation Somewhat limited Flooding	0.60 0.45 0.60	Very limited Flooding	1.00	Somewhat limited Flooding	0.60
Sb: Sharpsburg-----	80	Somewhat limited Restricted permeability Too acid	0.30 0.02	Somewhat limited Restricted permeability Too acid	0.22 0.07	Somewhat limited Restricted permeability Too acid Too steep for surface application	0.22 0.07 0.00
Sc: Sharpsburg-----	80	Somewhat limited Restricted permeability Too acid	0.30 0.02	Somewhat limited Restricted permeability Too acid	0.22 0.07	Somewhat limited Too steep for surface application Restricted permeability Too acid Too steep for sprinkler application	0.66 0.22 0.07 0.00
Se: Shelby-----	90	Somewhat limited Restricted permeability Too acid	0.30 0.02	Somewhat limited Restricted permeability Too acid	0.22 0.07	Somewhat limited Restricted permeability Too acid Too steep for surface application	0.22 0.07 0.00
Sh: Shelby-----	80	Somewhat limited Restricted permeability Too acid	0.30 0.02	Somewhat limited Restricted permeability Too acid	0.22 0.07	Somewhat limited Too steep for surface application Restricted permeability Too acid Too steep for sprinkler application	0.66 0.22 0.07 0.00
Sm: Shelby-----	90	Somewhat limited Restricted permeability Slope Too acid	0.30 0.16 0.02	Somewhat limited Restricted permeability Slope Too acid	0.22 0.16 0.07	Very limited Too steep for surface application Too steep for sprinkler application Restricted permeability Too acid	1.00 0.39 0.22 0.07
Sp: Shelby-----	50	Somewhat limited Restricted permeability Too acid	0.30 0.02	Somewhat limited Restricted permeability Too acid	0.22 0.07	Somewhat limited Too steep for surface application Restricted permeability Too acid Too steep for sprinkler application	0.66 0.22 0.07 0.00
Pawnee-----	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

AGRICULTURAL WASTE MANAGEMENT--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ss: Shelby, eroded-----	55	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Runoff limitation	0.40			Too steep for surface application	0.66
						Too steep for sprinkler application	0.00
		Somewhat limited Restricted permeability	0.30	Somewhat limited Restricted permeability	0.22	Somewhat limited Too steep for surface application	0.66
		Too acid	0.02	Too acid	0.07	Restricted permeability	0.22
						Too acid	0.07
						Too steep for sprinkler application	0.00
Pawnee, 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
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Runoff limitation	0.40			Too steep for surface application	0.66
						Too steep for sprinkler application	0.00
Sy: Sibleyville-----	85	Somewhat limited Depth to bedrock	0.29	Somewhat limited Depth to bedrock	0.29	Somewhat limited Too steep for surface application	0.66
						Depth to bedrock	0.29
						Too steep for sprinkler application	0.00
SZ: Sogn-----	55	Very limited Depth to bedrock	1.00	Very limited Droughty	1.00	Very limited Droughty	1.00
		Droughty	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Runoff limitation	0.40	Slope	0.16	Too steep for surface application	1.00
		Slope	0.16			Too steep for sprinkler application	0.39
Vinland-----	30	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00
		Droughty	0.92	Droughty	0.92	Too steep for surface application	1.00
		Slope	0.84	Slope	0.84	Droughty	0.92
		Runoff limitation	0.40			Too steep for sprinkler application	0.89
VR: Rock Outcrop-----	60	Not rated		Not rated		Not rated	
Vinland-----	26	Very limited Slope	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00
		Depth to bedrock	1.00	Slope	1.00	Too steep for surface application	1.00
		Droughty	0.93	Droughty	0.93	Too steep for sprinkler application	1.00
		Runoff limitation	0.40			Droughty	0.93
Vs: Vinland-----	55	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00

AGRICULTURAL WASTE MANAGEMENT--Continued
Leavenworth and Wyandotte Counties, Kansas

(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 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Sibleyville-----	45	Droughty	0.66	Droughty	0.66	Too steep for surface application	1.00
		Runoff limitation	0.40	Slope	0.04	Droughty	0.66
		Slope	0.04			Too steep for sprinkler application	0.22
		Somewhat limited Depth to bedrock	0.29	Somewhat limited Depth to bedrock	0.29	Very limited	1.00
W: Water-----	100	Slope	0.04	Slope	0.04	Too steep for surface application	0.29
						Depth to bedrock	0.22
						Too steep for sprinkler application	
		Not rated		Not rated		Not rated	
Wa: Wabash-----	90	Very limited		Very limited		Very limited	
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	0.60	Flooding	1.00	Flooding	0.60
Wc: Welda-----	85	Runoff limitation	0.40				
		Somewhat limited Restricted permeability	0.30	Somewhat limited Restricted permeability	0.22	Somewhat limited	0.91
		Too acid	0.02	Too acid	0.07	Too steep for surface application	0.22
						Restricted permeability	0.07
Wd: Welda-----	90					Too acid	0.02
		Somewhat limited Slope	0.63	Somewhat limited Slope	0.63	Too steep for sprinkler application	
						Very limited	1.00
		Restricted permeability	0.30	Restricted permeability	0.22	Too steep for surface application	0.77
Zo: Zook-----	90	Too acid	0.02	Too acid	0.07	Too steep for sprinkler application	0.22
						Restricted permeability	0.07
		Very limited Restricted permeability	1.00	Very limited Flooding	1.00	Too acid	0.07
		Depth to saturated zone	1.00	Restricted permeability	1.00	Too steep for surface application	1.00
				Depth to saturated zone	1.00		
				Flooding	0.60		
				Leaching limitation	0.50		

WIN-PST SPISP II
SOIL SENSITIVITY TO PESTICIDE LOSS RATING REPORT

Soils Data Table: SOIL_KS Sort Order: MUSYM

Leavenworth and Wyandotte Counties, Kansas: KS601

MUSYM/SEQ#	COMPONENT/TEXTURE/MU%	HYD	KFACT	SURFACE DEPTH	% OM	SPISP II Ratings		
						Leaching (SLP)	Solution Runoff (SSRP)	Adsorbed Runoff (SARP)
005AR 1	ARMSTER CL 100%	C	0.37	7"	0.8%	H (w)	H	H
005GO 1	GOSPORT SICL 100%	C	0.43	8"	1.5%	L	H	H (s)
005KG 1	KENNEBEC SIL 55%	B	0.28	47"	5.5%	L	I	I
005KG 2	COLO SIL 45%	B	0.28	8"	4.0%	H (w)	I	I
005KG 2	COLO SIL 45%	D	0.28	8"	4.0%	H (w)	H	H
005KY 1	KNOX SIL 65%	B	0.32	8"	2.0%	I	I	H (s)
005KY 2	GOSPORT SICL 35%	C	0.43	8"	1.5%	L	H	H (s)
005PA 1	KNOX SIL 50%	B	0.32	7"	2.0%	I	I	H (s)
005PA 2	PALERMO SICL 50%	B	0.37	5"	0.0%	H	I	H (s)
005PB 1	PALERMO SICL 95%	B	0.37	5"	0.0%	H	I	H (s)
005SH 1	SHELBY CL 100%	B	0.28	12"	3.0%	I	I	I
005WA 1	WABASH SICL 85%	D	0.37	8"	3.3%	H (w)	H	H
045ET 1	EUDORA SIL 90%	B	0.32	12"	1.5%	I	I	I
045EV 1	EUDORA SIL 60%	B	0.32	12"	2.5%	I	I	I
045EV 2	KIMO SICL 30%	C	0.37	6"	3.0%	H (w)	H	H
045KM 1	KIMO SICL 90%	C	0.37	6"	3.0%	H (w)	H	H
045MR 1	MORRILL CL 90%	B	0.28	10"	3.0%	I	I	I
045RO 1	RIVER WASH 100%		0.00	0"	0.0%	?	?	?
045SB 1	SARPY LFS 55%	A	0.17	12"	0.7%	H	L	L
045SB 2	EUDORA FSL 45%	B	0.20	8"	0.8%	H	I	I
045VM 1	VINLAND SICL 40%	D	0.32	7"	3.0%	V	H	H
045VM 2	MARTIN SICL 25%	C	0.37	9"	3.0%	H (w)	H	H
045WC 1	WABASH SICL 88%	D	0.28	16"	3.3%	H (w)	H	H
087RE 1	READING SIL 85%	B	0.32	8"	3.0%	I	I	I
087SS 1	SIBLEYVILLE L 60%	B	0.28	7"	2.5%	I	I	I
087SS 2	Unnamed series 1 - shallow L 25%	B	0.28	7"	2.5%	I	I	I
087SV 1	SIBLEYVILLE L 50%	B	0.32	10"	2.5%	I	I	I

WIN-PST SPISP II
SOIL SENSITIVITY TO PESTICIDE LOSS RATING REPORT

Soils Data Table: SOIL_KS Sort Order: MUSYM

Leavenworth and Wyandotte Counties, Kansas: KS601

087VO 1	VINLAND SICL 55%	D	0.32	12"	3.0% V	H	H
087VO 2	VINLAND-like SICL 30%	C	0.32	9"	3.0% L	H	H
087WC 1	WABASH SICL 94%	D	0.37	19"	3.3% H (w)	H	H
091ED 1	EUDORA SIL 75%	B	0.32	13"	2.5% I	I	I
091ED 2	KIMO SICL 25%	C	0.37	6"	3.0% H (w)	H	H
091LB 1	LADOGA SIL 100%	B	0.32	13"	2.5% I	I	I
091RA 1	READING SIL 90%	B	0.32	15"	3.0% L	I	I
091SB 1	SHARPSBURG SIL 55%	B	0.32	9"	3.5% I	I	I
091SB 2	URBAN LAND 45%		0.00	0"	0.0% ?	?	?
Aa 1	KENNEBEC SIL 85%	B	0.28	8"	5.5% I	I	I
Ac 1	ARMSTER L 100%	C	0.37	10"	1.5% H (w)	H	H
Ad 1	ARMSTER L 100%	C	0.37	10"	1.5% H (w)	H	H
Ae 1	ARMSTER CL 100%	C	0.37	7"	0.8% H (w)	H	H
AED 1	ARENTS, EARTHEN DAM 100%		0.00	0"	0.0% ?	?	?
Aq 1	FLUVAQUENTS VAR 95%		0.00	80"	0.0% ?	?	?
Ba 1	BASEHOR L 100%	D	0.32	10"	0.0% V	H	H (s)
Br 1	BREMER SICL 100%	C	0.28	13"	6.0% H (w)	H	H
Cf 1	BORROW PITS 100%		0.00	0"	0.0% ?	?	?
Ec 1	ELMONT SIL 85%	B	0.32	15"	3.0% L	I	I
Ed 1	ELMONT SIL 85%	B	0.32	15"	3.0% L	I	I
Eu 1	EUDORA VFSL 100%	B	0.20	12"	1.5% I	I	I
Gc 1	GOSPORT SIL 100%	C	0.43	6"	1.5% L	H	H (s)
Gp 1	GRAVEL PITS 100%		0.00	0"	0.0% ?	?	?
Gs 1	GOSPORT SIL 65%	C	0.43	6"	1.5% L	H	H (s)
Gs 2	SOGN SICL 35%	D	0.32	16"	2.0% V	H	H (s)
Gt 1	GRUNDY SICL 85%	C	0.37	11"	3.0% H (w)	H	H
Gu 1	GRUNDY SICL 85%	C	0.37	11"	3.0% H (w)	H	H
Gy 1	GYMER SIL 100%	C	0.32	10"	3.0% L	H	H
Hg 1	HAIG SICL 100%	C	0.37	9"	3.5% H (w)	H	H
Hg 1	HAIG SICL 100%	D	0.37	9"	3.5% H (w)	H	H

WIN-PST SPISP II
SOIL SENSITIVITY TO PESTICIDE LOSS RATING REPORT

Soils Data Table: SOIL_KS Sort Order: MUSYM

Leavenworth and Wyandotte Counties, Kansas: KS601

Hn 1	HAYNIE SIL 96%	B	0.37	7"	2.0%	H (w)	I	I
Ho 1	HAYNIE SIL 60%	B	0.37	7"	2.0%	H (w)	I	I
Ho 2	ONAWA SICL 30%	D	0.32	7"	2.5%	H (w)	H	H
Hy 1	HAYNIE SIL 100%	B	0.37	8"	2.0%	I	I	I
Ju 1	JUDSON SIL 100%	B	0.28	30"	4.5%	L	I	I
Ke 1	KENNEBEC SIL 100%	B	0.28	45"	5.5%	L	I	I
Kh 1	KNOX SIL 100%	B	0.32	6"	2.0%	I	I	I
Kk 1	KNOX SIL 100%	B	0.32	6"	2.0%	I	I	H (s)
Km 1	KNOX SICL 100%	B	0.32	6"	2.0%	I	I	I
Kn 1	KNOX SIL 65%	B	0.32	6"	2.0%	I	I	H (s)
Kn 2	SOGN SIL 35%	D	0.32	16"	2.0%	V	H	H (s)
Ko 1	KONAWA FSL 100%	B	0.24	19"	0.8%	I	I	I
Kw 1	KONAWA FSL 90%	B	0.24	19"	1.5%	I	I	H (s)
La 1	LADOGA SIL 100%	B	0.32	7"	2.5%	I	I	I
M-W 1	MISCELLANEOUS WATER 100%		0.00	0"	0.0%	?	?	?
Mb 1	MARSHALL SIL 100%	B	0.32	13"	3.5%	L	I	I
Mc 1	MARSHALL SIL 100%	B	0.28	13"	3.5%	L	I	I
Md 1	MARSHALL SIL 100%	B	0.32	13"	3.5%	L	I	I
Mn 1	MARTIN SICL 100%	C	0.37	8"	3.0%	L	H	H
Mr 1	MARTIN SICL 100%	C	0.37	8"	3.0%	L	H	H
Ms 1	MARTIN SIC 100%	C	0.28	7"	1.5%	L	H	H
Od 1	ONAWA L 95%	D	0.32	10"	1.8%	H (w)	H	H
On 1	ONAWA SICL 100%	D	0.32	6"	2.5%	H (w)	H	H
Oo 1	ONAWA L 100%	D	0.32	7"	1.5%	H (w)	H	H
Os 1	OSKA SICL 85%	C	0.37	9"	2.0%	L	H	H
Ow 1	ONAWET SICL 95%	D	0.32	7"	2.5%	H (w)	H	H
Pb 1	PAWNEE CL 85%	D	0.37	17"	3.0%	H (w)	H	H
Pc 1	PAWNEE CL 85%	D	0.37	12"	3.0%	H (w)	H	H
Pe 1	PAWNEE CL 85%	D	0.37	7"	2.5%	H (w)	H	H
Qu 1	QUARRIES 100%		0.00	0"	0.0%	?	?	?

WIN-PST SPISP II
SOIL SENSITIVITY TO PESTICIDE LOSS RATING REPORT

Soils Data Table: SOIL_KS Sort Order: MUSYM

Leavenworth and Wyandotte Counties, Kansas: KS601

Rs 1	RIVER WASH 100%		0.00	0"	0.0% ?	?	?
Sa 1	SARPY LFS 55%	A	0.17	9"	0.6% H	L	L
Sa 2	HAYNIE VFSL 35%	B	0.37	8"	1.5% I	I	I
Sb 1	SHARPSBURG SICL 100%	B	0.32	15"	3.5% L	I	I
Sc 1	SHARPSBURG SICL 100%	B	0.32	10"	3.5% I	I	I
Se 1	SHELBY L 100%	B	0.28	7"	3.5% I	I	I
Sh 1	SHELBY L 85%	B	0.28	7"	3.0% I	I	I
Sm 1	SHELBY L 85%	B	0.28	7"	3.0% I	I	I
Sp 1	SHELBY L 60%	B	0.28	7"	3.5% I	I	I
Sp 2	PAWNEE CL 40%	D	0.37	12"	3.0% H (w)	H	H
Ss 1	SHELBY CL 60%	B	0.28	7"	2.5% I	I	I
Ss 2	PAWNEE CL 40%	D	0.37	7"	3.0% H (w)	H	H
Sy 1	SIBLEYVILLE L 100%	B	0.32	13"	2.5% I	I	I
SZ 1	SOGN SICL 55%	D	0.32	13"	2.0% V	H	H (s)
SZ 2	VINLAND SICL 30%	D	0.32	12"	3.0% V	H	H (s)
VR 1	ROCK OUTCROP UWB 60%		0.00	5"	0.0% ?	?	?
VR 2	VINLAND SICL 26%	D	0.32	7"	3.0% V	H	H (s)
Vs 1	VINLAND L 55%	D	0.28	18"	3.0% V	H	H
Vs 2	SIBLEYVILLE L 45%	B	0.32	13"	2.5% I	I	I
W 1	WATER 100%		0.00	0"	0.0% ?	?	?
Wa 1	WABASH SIC 100%	D	0.28	6"	3.0% H (w)	H	H
Wc 1	WELDA SIL 85%	C	0.37	12"	0.8% L	H	H
Wd 1	WELDA SIL 90%	C	0.37	12"	0.8% L	H	H
Wh 1	WATHENA LFS 55%	B	0.17	9"	0.5% H	I	I
Wh 2	HAYNIE SIL 40%	B	0.37	7"	2.0% H (w)	I	I
Zo 1	ZOOK SICL 100%	C	0.37	22"	6.0% H (w)	H	H
Zo 1	ZOOK SICL 100%	D	0.37	22"	6.0% H (w)	H	H

(.\REPORTS\SOILS.TXT generated on 12/12/01 at 12:11:15)

H -- High
I -- Intermediate
L -- Low
V -- Very Low

Conditions that affect ratings:

- m -- There are macropores in the surface horizon deeper than 24"
- w -- The high water table comes within 24" of the surface during the growing season
- s -- The field slope is greater than 15%

SPISP II S-Ratings:

- SLP -- Soil Leaching Potential
- SSRP -- Soil Solution Runoff Potential
- SARP -- Soil Adsorbed Runoff Potential

HYDRIC SOIL INTERPRETATIONS
HYDRIC SOILS LIST
Leavenworth and Wyandotte
Counties, Kansas

PAGE 1 of 9

In this section, hydric soils are defined and described and the hydric soils in the survey area are listed. The three essential characteristics of wetlands are hydrophytic vegetation, hydric soils, and wetland hydrology (Cowardin and others, 1979; U.S. Army Corps of Engineers, 1987; National Research Council, 1995; Tiner, 1985). Criteria for each of the characteristics must be met for areas to be identified as wetlands. Undrained hydric soils that have natural vegetation should support a dominant population of ecological wetland plant species. Hydric soils that have been converted to other uses should be capable of being restored to wetlands.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). These soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 1995). These criteria are used to identify a phase of a soil series that normally is associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (USDA, 1999) and "Keys to Soil Taxonomy" (USDA, 1998) and in the "Soil Survey Manual" (USDA, 1993).

If soils are wet enough for a long enough period to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils in this survey area are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and others, 1996).

Hydric soils are identified by examining and describing the soil to a depth of about 20 inches. This depth may be greater if determination of an appropriate indicator so requires. It is always recommended that soils be excavated and described to the depth necessary for an understanding of the redoximorphic processes. Then, using the completed soil descriptions, soil scientists can compare the soil features required by each indicator and specify which indicators have been matched with the conditions observed in the soil. The soil can be identified as a hydric soil if at least one of the approved indicators is present.

Map units in the Hydric Soil Interpretations table meet the definition of hydric soils and, in addition, have at least one of the hydric soil indicators. This list can help in planning land uses; however, onsite investigation is recommended to determine the hydric soils on a specific site (National Research Council, 1995; Hurt and others, 1996).

Map units that are made up of hydric soils may have small areas, or inclusions, of nonhydric soils in the higher positions on the landform, and map units made up of nonhydric soils may have inclusions of hydric soils in the lower positions on the landform.

These map units, in general, do not meet the definition of hydric soils because they do not have one of the hydric soil indicators. A portion of these map units, however, may include hydric soils. Onsite investigation is recommended to determine whether hydric soils occur and the location of the included hydric soils.

HYDRIC SOIL INTERPRETATIONS
 HYDRIC SOILS LIST
 Leavenworth and Wyandotte
 Counties, Kansas

All mapunits are displayed regardless of hydric status and are listed in alpha-numeric order by mapunit symbol. The "Hydric Soils Criteria" columns indicate the conditions that caused the mapunit component to be classified as "Hydric" or "Non-Hydric". These criteria are defined in "Hydric Soils of the United States" (USDA Miscellaneous Publication No. 1491, June, 1991). See the "Criteria for Hydric Soils" endnote to determine the meaning of these columns. Spot symbols are footnoted at the end of the table.

Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
005AQ: FLUVAQUENTS, PONDED	FLUVAQUENTS	Yes	depression, flood plain	2B2	YES	NO	NO
	ONAWA	No	flood plain	---	---	---	---
005AR: ARMSTER CLAY LOAM, 6 TO 12 PERCENT SLOPES	ARMSTER	No	hillslope	---	---	---	---
	KNOX	No	hillslope	---	---	---	---
	MARTIN	No	hillslope	---	---	---	---
	SHARPSBURG	No	hillslope	---	---	---	---
005GO: GOSPORT SILTY CLAY LOAM, 25 TO 45 PERCENT SLOPES	GOSPORT	No	hillslope	---	---	---	---
	ARMSTER	No	hillslope	---	---	---	---
	KNOX	No	hillslope	---	---	---	---
005HN: HAYNIE SILT LOAM, 0 TO 2 PERCENT SLOPES, OCCASIONALLY FLOODED	MARTIN	No	hillslope	---	---	---	---
	HAYNIE	No	alluvial flat	---	---	---	---
	ONAWA	No	flood plain	---	---	---	---
005HO: HAYNIE-ONAWA COMPLEX, 0 TO 2 PERCENT SLOPES, OCCASIONALLY FLOODED	WATHENA	No	flood plain, natural levee	---	---	---	---
	HAYNIE	No	alluvial flat	---	---	---	---
005KG: KENNEBEC-COLO SILT LOAMS, 0 TO 2 PERCENT SLOPES, OCCASIONALLY FLOODED	ONAWA	No	flood plain	---	---	---	---
	WALDRON	No	flood plain	---	---	---	---
005KY: KNOX-GOSPORT COMPLEX, 10 TO 30 PERCENT SLOPES	KENNEBEC	No	flood plain	---	---	---	---
	COLO	Yes	flood plain	2B3	YES	NO	NO
005PA: PALERMO-KNOX COMPLEX, 10 TO 18 PERCENT SLOPES	CHASE	No	flood plain	---	---	---	---
	KNOX	No	hillslope	---	---	---	---
	GOSPORT	No	hillslope	---	---	---	---
	ARMSTER	No	hillslope	---	---	---	---
	JUDSON	No	terrace	---	---	---	---
005OD: ONAWA LOAM, 0 TO 2 PERCENT SLOPES, OCCASIONALLY FLOODED, OVERWASH	KENNEBEC	No	flood plain	---	---	---	---
	ONAWA	No	flood plain	---	---	---	---
005OW: ONAWET SILTY CLAY LOAM, DEPRESSIONAL, 0 TO 1 PERCENT SLOPES, FREQUENTLY FLOODED	HAYNIE	No	alluvial flat	---	---	---	---
	ONAWET	---	flood plain	---	---	---	---
005PB: PALERMO SILTY CLAY LOAM, 18 TO 30 PERCENT SLOPES	ALBATON	Yes	depression, flood plain	2B3	YES	NO	NO
	KNOX	No	hillslope	---	---	---	---
	PALERMO	No	hillslope	---	---	---	---
005SH: SHELBY CLAY LOAM, 5 TO 10 PERCENT SLOPES	PALERMO	No	hillslope	---	---	---	---
	KNOX	No	hillslope	---	---	---	---
	SHELBY	No	hillslope	---	---	---	---
	KENNEBEC	No	flood plain	---	---	---	---
005WA: WABASH SILTY CLAY LOAM, 0 TO 2 PERCENT SLOPES, OCCASIONALLY FLOODED	PAWNEE	No	hillslope	---	---	---	---
	SHARPSBURG	No	hillslope	---	---	---	---
	WABASH	Yes	flood plain	2B3	YES	NO	NO
	CHASE	No	flood-plain step	---	---	---	---
	KENNEBEC	No	flood plain	---	---	---	---

HYDRIC SOIL INTERPRETATIONS
 HYDRIC SOILS LIST
 Leavenworth and Wyandotte
 Counties, Kansas

All mapunits are displayed regardless of hydric status and are listed in alpha-numeric order by mapunit symbol. The "Hydric Soils Criteria" columns indicate the conditions that caused the mapunit component to be classified as "Hydric" or "Non-Hydric". These criteria are defined in "Hydric Soils of the United States" (USDA Miscellaneous Publication No. 1491, June, 1991). See the "Criteria for Hydric Soils" endnote to determine the meaning of these columns. Spot symbols are footnoted at the end of the table.

Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
005WH: WATHENA-HAYNIE COMPLEX, 0 TO 2 PERCENT SLOPES, OCCASIONALLY FLOODED	WATHENA	No	flood plain, natural levee	---	---	---	---
	HAYNIE SARPY	No No	alluvial flat flood-plain splay	---	---	---	---
045ET: EUDORA SILT LOAM, RARELY FLOODED	EUDORA	No	flood plain	---	---	---	---
	KIMO SARPY	No No	flood plain flood plain	---	---	---	---
	UNNAMED HYDRIC SOIL	Yes	depression, flood plain	2B3	YES	NO	NO
045EV: EUDORA-KIMO COMPLEX, RARELY FLOODED	EUDORA	No	flood plain	---	---	---	---
	KIMO SARPY	No No	flood plain flood plain	---	---	---	---
	WABASH	Yes	flood plain	2B3	YES	NO	NO
045KM: KIMO SILTY CLAY LOAM, RARELY FLOODED	KIMO	No	flood plain	---	---	---	---
	EUDORA WABASH	No Yes	flood plain flood plain	---	---	---	---
045MR: MORRILL CLAY LOAM, 3 TO 7 PERCENT SLOPES	MORRILL	No	hillslope	---	---	---	---
	OSKA PAWNEE	No No	hillslope hillslope	---	---	---	---
045RO: RIVERWASH	RIVER WASH	Unranked	---	---	---	---	
045SB: SARPY-EUDORA COMPLEX, OVERWASH, OCCASIONALLY FLOODED	SARPY	No	flood plain	---	---	---	---
	EUDORA	No	flood plain	---	---	---	---
045VM: VINLAND-MARTIN COMPLEX, 7 TO 15 PERCENT SLOPES	VINLAND	No	hillslope	---	---	---	---
	MARTIN	No	hillslope	---	---	---	---
	Unnamed soil	No	hillslope	---	---	---	---
	SIBLEYVILLE SOGN	No No	hillslope hillslope	---	---	---	---
045WC: WABASH SILTY CLAY LOAM, OCCASIONALLY FLOODED	WABASH	Yes	terrace	3	NO	NO	YES
	KENNEBEC	No	flood plain	---	---	---	---
	LEANNA	Unranked	flood plain	---	---	---	---
	READING WABASH	No Yes	terrace flood plain	---	---	---	---
087RE: READING SILT LOAM, 0 TO 2 PERCENT SLOPES, VERY RARELY FLOODED, MODERATELY WET	READING	No	terrace	2B3	YES	NO	NO
	MUSCOTAH ROSSVILLE	No No	terrace terrace	---	---	---	---
	SIBLEYVILLE	No	hillslope	---	---	---	---
087SS: SIBLEYVILLE COMPLEX, 3 TO 7 PERCENT SLOPES	Unnamed series 1 - shallow	No	hillslope	---	---	---	---
	Unnamed series 2 - deep	No	hillslope	---	---	---	---
	BASEHOR	No	hillslope	---	---	---	---
	MARTIN	No	hillslope	---	---	---	---
	VINLAND	No	hillslope	---	---	---	---
	WOODSON	No	hillslope divide	---	---	---	---
	087SV: SIBLEYVILLE COMPLEX, 7 TO 12 PERCENT SLOPES	SIBLEYVILLE	No	hillslope	---	---	---
SIBLEYVILLE SIBLEYVILLE GYMER MARTIN PAWNEE VINLAND	No No No No No No	hillslope hillslope hillslope hillslope hillslope hillslope	---	---	---	---	

HYDRIC SOIL INTERPRETATIONS
 HYDRIC SOILS LIST
 Leavenworth and Wyandotte
 Counties, Kansas

All mapunits are displayed regardless of hydric status and are listed in alpha-numeric order by mapunit symbol. The "Hydric Soils Criteria" columns indicate the conditions that caused the mapunit component to be classified as "Hydric" or "Non-Hydric". These criteria are defined in "Hydric Soils of the United States" (USDA Miscellaneous Publication No. 1491, June, 1991). See the "Criteria for Hydric Soils" endnote to determine the meaning of these columns. Spot symbols are footnoted at the end of the table.

Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
087VO: VINLAND COMPLEX, 7 TO 15 PERCENT SLOPES	VINLAND	No	hillslope	---	---	---	---
	VINLAND	No	hillslope	---	---	---	---
	SOGN	No	hillslope	---	---	---	---
	GYMER	No	hillslope	---	---	---	---
	MARTIN	No	hillslope	---	---	---	---
	PAWNEE	No	hillslope	---	---	---	---
	SHELBY	No	---	---	---	---	---
	SIBLEYVILLE	No	hillslope	---	---	---	---
087WC: WABASH SILTY CLAY LOAM, 0 TO 1 PERCENT SLOPES, VERY RARELY FLOODED	WABASH	Yes	terrace	2B3	YES	NO	NO
	KENNEBEC READING	No	flood plain terrace	---	---	---	---
091ED: EUDORA-KIMO COMPLEX, OVERWASH, RARELY FLOODED	EUDORA	No	flood-plain step	---	---	---	---
	KIMO	No	flood-plain step	---	---	---	---
091LB: LADOGA SILT LOAM, 8 TO 15 PERCENT SLOPES	LADOGA	No	hillslope	---	---	---	---
091RA: READING SILT LOAM, 0 TO 2 PERCENT SLOPES, RARELY FLOODED	READING	No	terrace	---	---	---	---
	CHASE WABASH	No Yes	terrace terrace	---	---	---	---
091SB: SHARPSBURG-URBAN LAND COMPLEX, 3 TO 8 PERCENT SLOPES	SHARPSBURG	No	hillslope	---	---	---	---
	URBAN LAND	Unranked	hillslope	---	---	---	---
Aa: KENNEBEC SILT LOAM, CHANNELED	KENNEBEC	No	flood plain	---	---	---	---
	NODAWAY	No	flood plain	---	---	---	---
	KENRIDGE	No	flood plain	---	---	---	---
	MUSCOTAH ZOOK	No Yes	flood plain flood plain	---	---	---	---
Ac: ARMSTER LOAM, 3 TO 8 PERCENT SLOPES	ARMSTER	No	hillslope	---	---	---	---
	LADOGA WELDA	No No	hillslope terrace	---	---	---	---
Ad: ARMSTER LOAM, 8 TO 12 PERCENT SLOPES	ARMSTER	No	hillslope	---	---	---	---
	UNNAMED SOIL	---	hillslope	---	---	---	---
Ae: ARMSTER CLAY LOAM, 8 TO 12 PERCENT SLOPES, ERODED	ARMSTER	No	hillslope	---	---	---	---
	LADOGA UNNAMED SOIL	No ---	hillslope hillslope	---	---	---	---
	WELDA	No	terrace	---	---	---	---
AED: ARENTS, EARTHEN DAM	ARENTS, EARTHEN DAM	Unranked	---	---	---	---	
Ba: BASEHOR COMPLEX, 5 TO 30 PERCENT SLOPES	BASEHOR	No	hillslope	---	---	---	---
	UNNAMED SOIL VINLAND	---	hillslope hillslope	---	---	---	---
Br: BREMER SILTY CLAY LOAM, 0 TO 2 PERCENT SLOPES, RARELY FLOODED	BREMER	Yes	flood-plain step	2B3	YES	NO	NO
	JUDSON	No	terrace	---	---	---	---
Cf: CUT AND FILL	BORROW PITS	Unranked	---	---	---	---	
Ec: ELMONT SILT LOAM, 3 TO 7 PERCENT SLOPES	ELMONT	No	hillslope	---	---	---	---
	MARTIN	No	hillslope	---	---	---	---
	SIBLEYVILLE VINLAND	No No	hillslope hillslope	---	---	---	---

HYDRIC SOIL INTERPRETATIONS
 HYDRIC SOILS LIST
 Leavenworth and Wyandotte
 Counties, Kansas

All mapunits are displayed regardless of hydric status and are listed in alpha-numeric order by mapunit symbol. The "Hydric Soils Criteria" columns indicate the conditions that caused the mapunit component to be classified as "Hydric" or "Non-Hydric". These criteria are defined in "Hydric Soils of the United States" (USDA Miscellaneous Publication No. 1491, June, 1991). See the "Criteria for Hydric Soils" endnote to determine the meaning of these columns. Spot symbols are footnoted at the end of the table.

Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
Ed: ELMONT SILT LOAM, 7 TO 12 PERCENT SLOPES	ELMONT	No	hillslope	---	---	---	---
	MARTIN	No	hillslope	---	---	---	---
	SIBLEYVILLE	No	hillslope	---	---	---	---
	VINLAND	No	hillslope	---	---	---	---
Eu: EUDORA COMPLEX, 0 TO 1 PERCENT SLOPES, RARELY FLOODED, OVERWASH	EUDORA	No	flood-plain step	---	---	---	---
	HAYNIE	No	alluvial flat	---	---	---	---
	ONAWA	No	flood plain	---	---	---	---
	SARPY	No	flood plain	---	---	---	---
Gc: GOSPORT COMPLEX, 10 TO 30 PERCENT SLOPES	GOSPORT	No	hillslope	---	---	---	---
	UNNAMED SOIL	---	hillslope	---	---	---	---
	ELMONT	No	hillslope	---	---	---	---
	MARTIN	No	hillslope	---	---	---	---
Gp: GRAVEL PITS	GRAVEL PITS	Unranked	---	---	---	---	---
Gs: GOSPORT-SOGN COMPLEX, 7 TO 35 PERCENT SLOPES	GOSPORT	No	hillslope	---	---	---	---
	SOGN	No	hillslope	---	---	---	---
	ELMONT	No	hillslope	---	---	---	---
	MARTIN	No	hillslope	---	---	---	---
	OSKA	No	hillslope	---	---	---	---
Gt: GRUNDY SILTY CLAY LOAM, 1 TO 3 PERCENT SLOPES	GRUNDY	No	hillslope	---	---	---	---
	SHARPSBURG	No	hillslope	---	---	---	---
Gu: GRUNDY SILTY CLAY LOAM, 3 TO 7 PERCENT SLOPES	GRUNDY	No	hillslope	---	---	---	---
	PAWNEE	No	hillslope	---	---	---	---
	SHELBY	No	hillslope	---	---	---	---
Gy: GYMER SILT LOAM, 3 TO 7 PERCENT SLOPES	GYMER	No	hillslope	---	---	---	---
	KONAWA	No	hillslope	---	---	---	---
	SHARPSBURG	No	hillslope	---	---	---	---
	WELDA	No	terrace	---	---	---	---
Hg: HAIG SILTY CLAY LOAM, 0 TO 1 PERCENT SLOPES	HAIG	Yes	depression, hillslope	2B3	YES	NO	NO
	GRUNDY	No	hillslope	---	---	---	---
	MARTIN	No	hillslope	---	---	---	---
Hy: HAYNIE SILT LOAM, 0 TO 1 PERCENT SLOPES, OCCASIONALLY FLOODED	HAYNIE	No	alluvial flat	---	---	---	---
	EUDORA	No	flood-plain step	---	---	---	---
	SARPY	No	flood plain	---	---	---	---
Ju: JUDSON SILT LOAM, 0 TO 1 PERCENT SLOPES	JUDSON	No	terrace	---	---	---	---
	BREMER	Yes	flood-plain step	2B3	YES	NO	NO
	KENNEBEC	No	flood plain	---	---	---	---
Ke: KENNEBEC SILT LOAM, 0 TO 1 PERCENT SLOPES, OCCASIONALLY FLOODED	KENNEBEC	No	flood plain	---	---	---	---
	BREMER	Yes	flood-plain step	2B3	YES	NO	NO
	WABASH	Yes	flood plain	2B3	YES	NO	NO
Kh: KNOX SILT LOAM, 7 TO 12 PERCENT SLOPES	KNOX	No	hillslope	---	---	---	---
	ARMSTER	No	hillslope	---	---	---	---
	LADOGA	No	hillslope	---	---	---	---
	SIMILAR SOIL	No	hillslope	---	---	---	---
	WELDA	No	terrace	---	---	---	---
Kk: KNOX SILT LOAM, 12 TO 18 PERCENT SLOPES	KNOX	No	hillslope	---	---	---	---
	SIMILAR SOIL	No	hillslope	---	---	---	---

HYDRIC SOIL INTERPRETATIONS
 HYDRIC SOILS LIST
 Leavenworth and Wyandotte
 Counties, Kansas

All mapunits are displayed regardless of hydric status and are listed in alpha-numeric order by mapunit symbol. The "Hydric Soils Criteria" columns indicate the conditions that caused the mapunit component to be classified as "Hydric" or "Non-Hydric". These criteria are defined in "Hydric Soils of the United States" (USDA Miscellaneous Publication No. 1491, June, 1991). See the "Criteria for Hydric Soils" endnote to determine the meaning of these columns. Spot symbols are footnoted at the end of the table.

Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
Km: KNOX SILTY CLAY LOAM, 7 TO 12 PERCENT SLOPES, ERODED	KNOX	No	hillslope	---	---	---	---
	ARMSTER	No	hillslope	---	---	---	---
	LADOGA WELDA	No No	hillslope terrace	---	---	---	---
Kn: KNOX COMPLEX, 18 TO 30 PERCENT SLOPES	KNOX	No	hillslope	---	---	---	---
	SOGN	No	hillslope	---	---	---	---
Ko: KONAWA FINE SANDY LOAM, 3 TO 8 PERCENT SLOPES	KONAWA	No	hillslope	---	---	---	---
	GYMER LADOGA WELDA	No No No	hillslope hillslope terrace	---	---	---	---
	KONAWA	No	hillslope	---	---	---	---
Kw: KONAWA FINE SANDY LOAM, 8 TO 20 PERCENT SLOPES	KONAWA	No	hillslope	---	---	---	---
	GYMER WELDA	No No	hillslope terrace	---	---	---	---
La: LADOGA SILT LOAM, 4 TO 7 PERCENT SLOPES	LADOGA	No	hillslope	---	---	---	---
	KNOX SHARPSBURG	No No	hillslope hillslope	---	---	---	---
	MISCELLANEOUS WATER	---	---	---	---	---	---
Mb: MARSHALL SILT LOAM, 1 TO 4 PERCENT SLOPES	MARSHALL	No	interfluve	---	---	---	---
	SHARPSBURG	No	hillslope	---	---	---	---
Mc: MARSHALL SILT LOAM, 4 TO 9 PERCENT SLOPES	MARSHALL	No	hillslope	---	---	---	---
	SHARPSBURG	No	hillslope	---	---	---	---
Md: MARSHALL SILT LOAM, 9 TO 15 PERCENT SLOPES	MARSHALL	No	hillslope	---	---	---	---
	KNOX	No	hillslope	---	---	---	---
Mn: MARTIN SILTY CLAY LOAM, 4 TO 7 PERCENT SLOPES	MARTIN	No	hillslope	---	---	---	---
	ELMONT GRUNDY	No No	hillslope hillslope	---	---	---	---
Mr: MARTIN SILTY CLAY LOAM, 7 TO 12 PERCENT SLOPES	MARTIN	No	hillslope	---	---	---	---
	ELMONT MARTIN	No No	hillslope hillslope	---	---	---	---
Ms: MARTIN SOILS, 6 TO 12 PERCENT SLOPES, ERODED	MARTIN	No	hillslope	---	---	---	---
	ELMONT GRUNDY VINLAND	No No No	hillslope hillslope hillslope	---	---	---	---
	ONAWA	No	flood plain	---	---	---	---
On: ONAWA SILTY CLAY LOAM, 0 TO 1 PERCENT SLOPES, OCCASIONALLY FLOODED	ONAWA	No	flood plain	---	---	---	---
	HAYNIE	No	alluvial flat	---	---	---	---
Oo: ONAWA SOILS, 0 TO 1 PERCENT SLOPES, OCCASIONALLY FLOODED, OVERWASH	ONAWA	No	flood plain	---	---	---	---
	HAYNIE ONAWA	No No	alluvial flat flood plain	---	---	---	---
	OSKA	No	hillslope	---	---	---	---
Os: OSKA SILTY CLAY LOAM, 3 TO 8 PERCENT SLOPES	OSKA	No	hillslope	---	---	---	---
	GRUNDY MARTIN PAWNEE SHARPSBURG	No No No No	hillslope hillslope hillslope hillslope	---	---	---	---

HYDRIC SOIL INTERPRETATIONS
 HYDRIC SOILS LIST
 Leavenworth and Wyandotte
 Counties, Kansas

All mapunits are displayed regardless of hydric status and are listed in alpha-numeric order by mapunit symbol. The "Hydric Soils Criteria" columns indicate the conditions that caused the mapunit component to be classified as "Hydric" or "Non-Hydric". These criteria are defined in "Hydric Soils of the United States" (USDA Miscellaneous Publication No. 1491, June, 1991). See the "Criteria for Hydric Soils" endnote to determine the meaning of these columns. Spot symbols are footnoted at the end of the table.

Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
Pb: PAWNEE CLAY LOAM, 1 TO 4 PERCENT SLOPES	PAWNEE	No	hillslope	---	---	---	---
	GRUNDY SHELBY	No No	hillslope hillslope	---	---	---	---
Pc: PAWNEE CLAY LOAM, 4 TO 8 PERCENT SLOPES	PAWNEE	No	hillslope	---	---	---	---
	GRUNDY	No	hillslope	---	---	---	---
	OSKA SHELBY	No No	hillslope hillslope	---	---	---	---
Pe: PAWNEE CLAY LOAM, 4 TO 8 PERCENT SLOPES, ERODED	PAWNEE	No	hillslope	---	---	---	---
	GRUNDY	No	hillslope	---	---	---	---
	OSKA SHELBY	No No	hillslope hillslope	---	---	---	---
Qu: QUARRIES	QUARRIES	Unranked	hillslope	---	---	---	---
Rs: RIVER SAND	RIVER WASH	Unranked	---	---	---	---	---
Sa: SARPY-HAYNIE COMPLEX, 0 TO 3 PERCENT SLOPES, OCCASIONALLY FLOODED	SARPY	No	flood plain	---	---	---	---
	HAYNIE unnamed soil	No No	flood plain flood-plain step	---	---	---	---
Sb: SHARPSBURG SILTY CLAY LOAM, 1 TO 4 PERCENT SLOPES	SHARPSBURG	No	hillslope	---	---	---	---
	GRUNDY	No	hillslope	---	---	---	---
	GYMER	No	hillslope	---	---	---	---
	PAWNEE SHELBY	No No	hillslope hillslope	---	---	---	---
Sc: SHARPSBURG SILTY CLAY LOAM, 4 TO 8 PERCENT SLOPES	SHARPSBURG	No	hillslope	---	---	---	---
	GRUNDY	No	hillslope	---	---	---	---
	OSKA	No	hillslope	---	---	---	---
	PAWNEE SHELBY	No No	hillslope hillslope	---	---	---	---
Se: SHELBY LOAM, 1 TO 4 PERCENT SLOPES	SHELBY	No	hillslope	---	---	---	---
	PAWNEE SHARPSBURG	No No	hillslope hillslope	---	---	---	---
Sh: SHELBY LOAM, 4 TO 8 PERCENT SLOPES	SHELBY	No	hillslope	---	---	---	---
	ELMONT	No	hillslope	---	---	---	---
	OSKA	No	hillslope	---	---	---	---
	PAWNEE SHARPSBURG	No No	hillslope hillslope	---	---	---	---
Sm: SHELBY LOAM, 8 TO 12 PERCENT SLOPES	SHELBY	No	hillslope	---	---	---	---
	ELMONT	No	hillslope	---	---	---	---
	PAWNEE	No	hillslope	---	---	---	---
Sp: SHELBY-PAWNEE COMPLEX, 4 TO 8 PERCENT SLOPES	SHELBY	No	hillslope	---	---	---	---
	PAWNEE	No	hillslope	---	---	---	---
	ELMONT	No	hillslope	---	---	---	---
	GRUNDY SHARPSBURG	No No	hillslope hillslope	---	---	---	---
Ss: SHELBY-PAWNEE COMPLEX, 4 TO 8 PERCENT SLOPES, ERODED	SHELBY	No	hillslope	---	---	---	---
	PAWNEE	No	hillslope	---	---	---	---
	ELMONT GRUNDY	No No	hillslope hillslope	---	---	---	---
Sy: SIBLEYVILLE LOAM, 4 TO 8 PERCENT SLOPES	SIBLEYVILLE	No	hillslope	---	---	---	---
	ELMONT	No	hillslope	---	---	---	---
	SHELBY VINLAND	No No	hillslope hillslope	---	---	---	---

HYDRIC SOIL INTERPRETATIONS
 HYDRIC SOILS LIST
 Leavenworth and Wyandotte
 Counties, Kansas

All mapunits are displayed regardless of hydric status and are listed in alpha-numeric order by mapunit symbol. The "Hydric Soils Criteria" columns indicate the conditions that caused the mapunit component to be classified as "Hydric" or "Non-Hydric". These criteria are defined in "Hydric Soils of the United States" (USDA Miscellaneous Publication No. 1491, June, 1991). See the "Criteria for Hydric Soils" endnote to determine the meaning of these columns. Spot symbols are footnoted at the end of the table.

Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
SZ: SOGN-VINLAND COMPLEX, 5 TO 20 PERCENT SLOPES	SOGN	No	hillslope	---	---	---	---
	VINLAND	No	hillslope	---	---	---	---
	MARTIN	No	hillslope	---	---	---	---
	OSKA	No	hillslope	---	---	---	---
Uc: UNCLASSIFIED	SIBLEYVILLE	No	hillslope	---	---	---	---
	---	---	---	---	---	---	---
	Un: UNKNOWN	---	---	---	---	---	---
	VR: VINLAND-ROCK OUTCROP COMPLEX, 20 TO 40 PERCENT SLOPES	ROCK OUTCROP	No	hillslope	---	---	---
Vs: VINLAND-SIBLEYVILLE COMPLEX, 5 TO 12 PERCENT SLOPES	VINLAND	No	hillslope	---	---	---	---
	VINLAND	No	hillslope	---	---	---	---
	SOGN	No	hillslope	---	---	---	---
	MARTIN	No	hillslope	---	---	---	---
W: WATER	OSKA	No	hillslope	---	---	---	---
	SIBLEYVILLE	No	hillslope	---	---	---	---
	WATER	Yes	---	4,3	NO	YES	YES
	Wa: WABASH SILTY CLAY, 0 TO 1 PERCENT SLOPES, OCCASIONALLY FLOODED	WABASH	Yes	flood plain	2B3	YES	NO
Wc: WELDA SILT LOAM, 4 TO 9 PERCENT SLOPES	KENNEBEC	No	flood plain	---	---	---	---
	ZOOK	Yes	flood plain	2B3	YES	NO	NO
	WELDA	No	terrace	---	---	---	---
	GYMER	No	hillslope	---	---	---	---
Wd: WELDA SILT LOAM, 9 TO 15 PERCENT SLOPES	KONAWA	No	hillslope	---	---	---	---
	LADOGA	No	hillslope	---	---	---	---
	WELDA	No	terrace	---	---	---	---
	ARMSTER	No	hillslope	---	---	---	---
Zo: ZOOK SILTY CLAY LOAM, 0 TO 1 PERCENT SLOPES, OCCASIONALLY FLOODED	KONAWA	No	hillslope	---	---	---	---
	ZOOK	Yes	flood plain	2B3	YES	NO	NO
	KENNEBEC	No	flood plain	---	---	---	---
	WABASH	Yes	flood plain	2B3	YES	NO	NO

HYDRIC SOIL INTERPRETATIONS
 HYDRIC SOILS LIST
 Leavenworth and Wyandotte
 Counties, Kansas

All mapunits are displayed regardless of hydric status and are listed in alpha-numeric order by mapunit symbol. The "Hydric Soils Criteria" columns indicate the conditions that caused the mapunit component to be classified as "Hydric" or "Non-Hydric". These criteria are defined in "Hydric Soils of the United States" (USDA Miscellaneous Publication No. 1491, June, 1991). See the "Criteria for Hydric Soils" endnote to determine the meaning of these columns. Spot symbols are footnoted at the end of the table.

Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria

FOOTNOTE: There may be small areas of included soils or miscellaneous areas that are significant to use and management of the soil; yet are too small to delineate on the soil map at the map's original scale. These may be designated as spot symbols and are defined in the published Soil Survey Report or the USDA-NRCS Technical Guide, Part II.

Areas mapped as water or any map unit that contains one of the following conventional symbols is considered a hydric soil map unit: marshes or swamps; wet spots; depressions; streams, lakes and ponds.

1. All Histosols except Folists, or
2. Soils in Aquic suborders, great groups, or subgroups, Albolls suborder, Aquisalids, Pachic subgroups, or Cumulic subgroups that are:
 - a. Somewhat poorly drained with a water table equal to 0.0 foot (ft) from the surface during the growing season, or
 - b. poorly drained or very poorly drained and have either:
 - (1) water table equal to 0.0 ft during the growing season if textures are coarse sand, sand, or fine sand in all layers within 20 inches (in),
or for other soils
 - (2) water table at less than or equal to 0.5 ft from the surface during the growing season if permeability is equal to or greater than 6.0 in/hour (h) in all layers within 20 in, or
 - (3) water table at less than or equal to 1.0 ft from the surface during the growing season if permeability is less than 6.0 in/h in any layer within 20 in, or
3. Soils that are frequently ponded for long duration or very long duration during the growing season, or
4. Soils that are frequently flooded for long duration or very long duration during the growing season.