NRCS Soils Program - Massachusetts

- **Program Highlights, Overview**

- **Soils information changes that may affect you**

Massachusetts Soil Survey

19 SOIL SURVEY AREAS

182 SOIL SERIES

2294 MAP UNITS

9017 COMPONENTS

24998 HORIZONS

129 DATA ELEMENTS PER HORIZON = 3, 224,742


Massachusetts Soil Survey Milestone!
Franklin
Middlesex
Plymouth
N
0
220,000
440,000
880,000
Feet

National Soil Survey Program Organization/Functions

Inventory/production

-MLRA Soil Survey Offices

-Soil Survey

Delivery

-State Soil Scientist

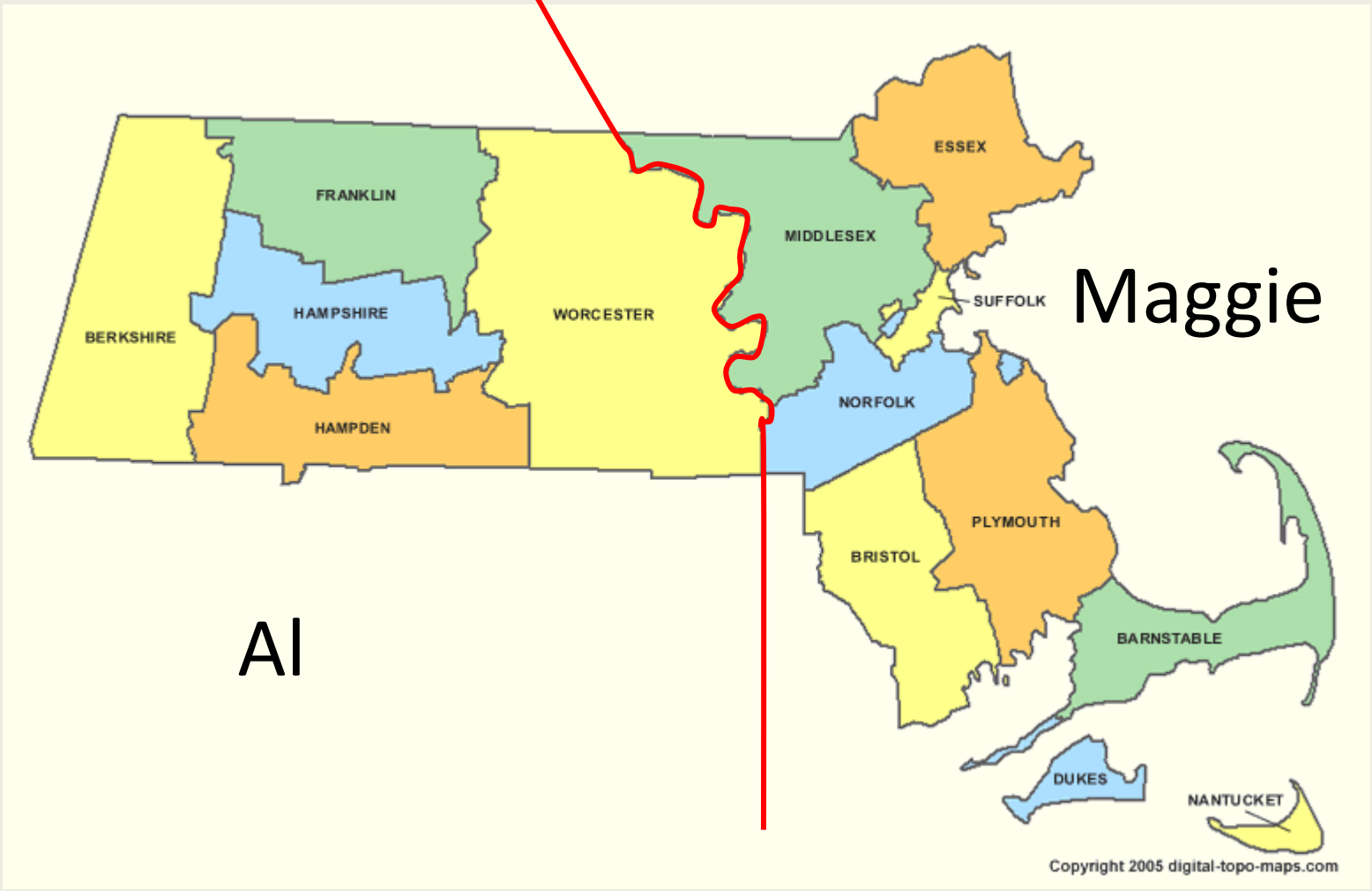
-Technical Soil Services

Technical Soil Services

The Presentation and Application of Soil Survey Information

- Site investigations: design and program support
- Training: use and understanding of soils information
- Liaison to NCSS partners, promote involvement, solicit input
- Regional and state soil survey planning conferences
- ID information needs and deficiencies

Service Areas



Use of Soil Survey Information

What's the most sought after soil interpretation in MA?

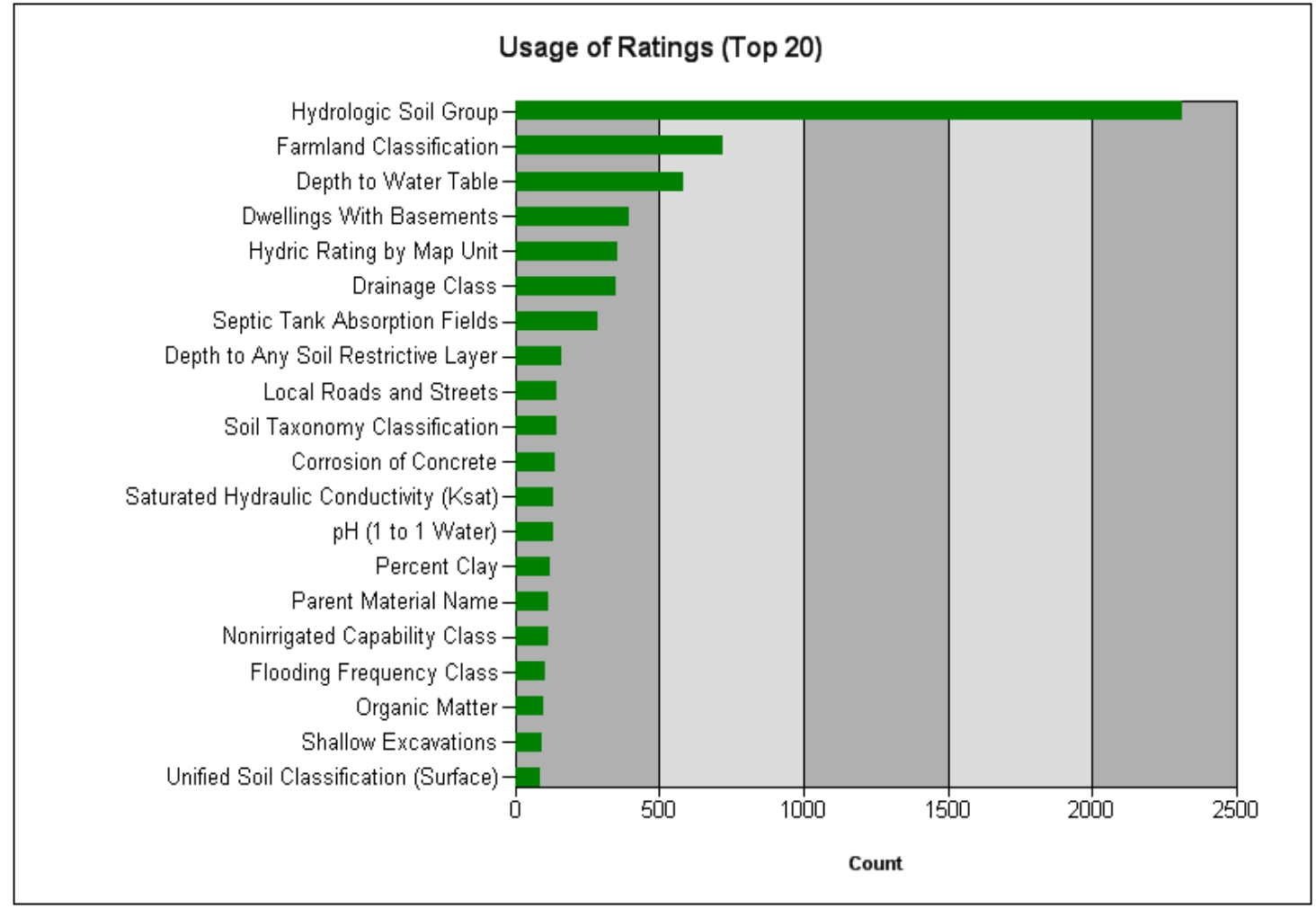
A. **Septic tank absorption fields**

B. **Farmland classification**

C. **Depth to seasonal high water table**

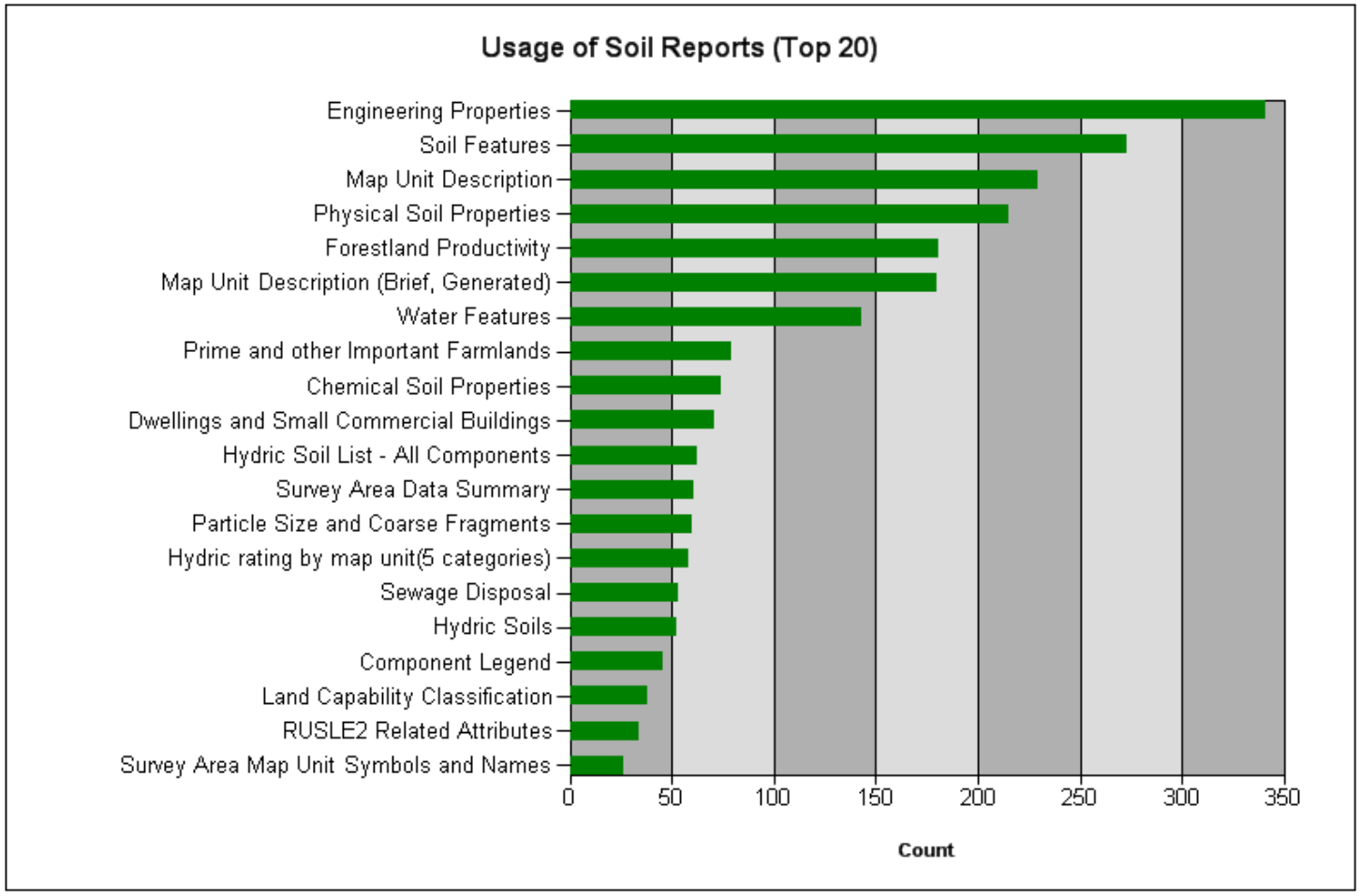
D. **Hydrologic soil group**

Usage of Ratings, MA Soil Surveys – Last 12 months

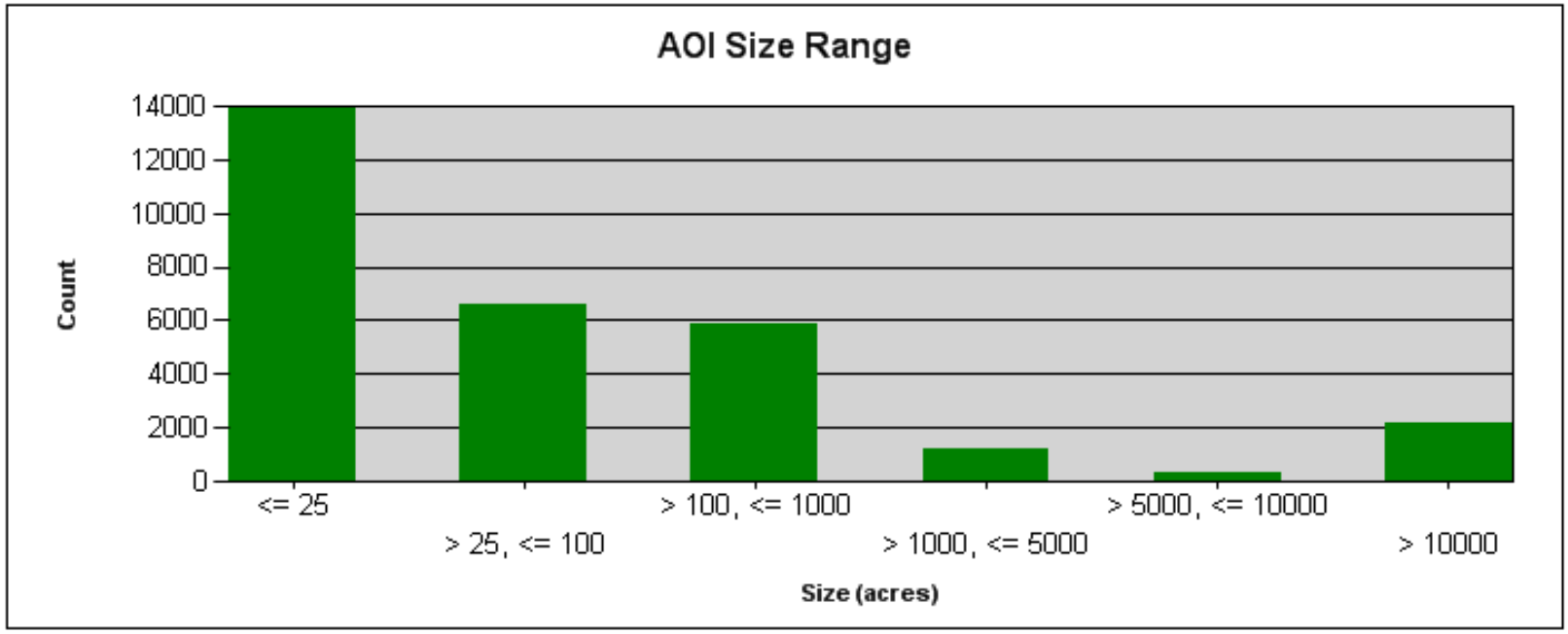


HSG: 2311 of 9415 instances – 25%

Usage of Reports, MA Soil Surveys – Last 12 months



2570 instances



Size Range (acres)	Count
<= 25	13925
> 25, <= 100	6617
> 100, <= 1000	5840
> 1000, <= 5000	1192
> 5000, <= 10000	337
> 10000	2143
Total:	**30054**

Changes in Interpretive Values

Historical values – specific parameters, interpolation, comparison with soils having similar properties

NH0001

SOIL INTERPRETATIONS RECORD

MLRA(S): 142, 143, 144B
REV. GLR,HRM, 9-84
TYPIC HAPLORTHODS, COARSE-LOAMY, MIXED, FRIGID

BECKET SERIES

THE BECKET SERIES CONSISTS OF VERY DEEP, WELL DRAINED SOILS ON DRUMLINS AND GLACIATED UPLANDS. THEY FORMED IN GLACIAL TILL. TYPICALLY THESE SOILS HAVE A DARK BROWN FINE SANDY LOAM SURFACE LAYER 8 INCHES THICK. THE SUBSOIL FROM 8 TO 12 INCHES IS STRONG BROWN FINE SANDY LOAM, FROM 12 TO 22 INCHES IS YELLOWISH BROWN GRAVELLY SANDY LOAM, FROM 22 TO 31 INCHE IS LIGHT OLIVE BROWN GRAVELLY SANDY LOAM. THE SUBSTATUM FROM 31 TO 60 INCHES IS FIRM OLIVE GRAVELLY LOAMY SAND. SLOPES RANGE FROM 3 TO 60 PERCENT.

ESTIMATED SOIL PROPERTIES (A)

DEPTH (IN.)	USDA TEXTURE	UNIFIED	AASHTO	FRACT >3 IN (PCT)	PERCENT OF MATERIAL LESS THAN 3" PASSING SIEVE NO. 4	10	40	200	LIQUID LIMIT	PLASTICITY INDEX
0-8	FSL, L, SL	SM	A-2, A-4	0-10	85-95	75-90	60-85	20-50	<18	NP
0-8	GR-FSL, GR-SL, GR-L	SM	A-2, A-4, A-1-B	0-15	70-90	60-75	30-65	20-40	<15	NP
8-31	FSL, SL, GR-SL	SM	A-2, A-4	5-15	75-95	60-95	50-75	20-45	<12	NP
31-60	SL, LS, GR-SL	SM, SP-SM, GM, GP-GM	A-1, A-2	5-25	60-85	45-75	30-70	10-35	-	NP

DEPTH (IN.)	CLAY (PCT)	MOIST BULK DENSITY (G/CM3)	PERMEABILITY (IN/HR)	AVAILABLE WATER CAPACITY (IN/IN)	SOIL REACTION (PH)	SALINITY (MMHOS/CM)	SHRINK-SWELL POTENTIAL	EROSION FACTORS K	T	WIND EROD. GROUP	ORGANIC MATTER (PCT)	CORROSIVITY STEEL	CONCRETE
0-8	2-6	0.60-1.20	0.6-2.0	0.10-0.23	3.6-6.0	-	LOW	.20	3	-	2-6	LOW	MODERATE
0-8	2-6	0.60-1.30	0.6-2.0	0.06-0.20	3.6-6.0	-	LOW	.17	3	-	2-6		
8-31	2-7	1.30-1.60	0.6-2.0	0.06-0.16	3.6-6.0	-	LOW	.28					
31-60	1-5	1.60-1.75	0.06-0.6	0.03-0.09	5.1-6.5	-	LOW	.17					

FLOODING FREQUENCY	FLOODING DURATION	FLOODING MONTHS	HIGH WATER TABLE DEPTH (FT)	HIGH WATER TABLE KIND	HIGH WATER TABLE MONTHS	CEMENTED PAN DEPTH (IN)	CEMENTED PAN HARDNESS	BEDROCK DEPTH (IN)	BEDROCK HARDNESS	SUBSIDENCE INIT. (IN)	SUBSIDENCE TOTAL (IN)	HYD GRP	POTENTIAL FROST ACTION
NONE			2.0-3.5	PERCHED	MAR-APR	-		>60		-		C	MODERATE

As of 10/1/14 – Interpretive values calculated factoring data elements populated for each soil and layer

Component | Horizon

Lineage		Comp %						
DMU Rec ID	Seq	Low	RV	High	Component Name	Local Phase	Taxon Kind	Major Component	SIR phase - obsolete
639133	2		5		Bernardston	very stony	series		

Horizon | Component Canopy Cover | Component Crop Yield | Component Diagnostic Features | Component Ecological Site | Component Erosion Accelerated | Component Existing Plants | Component Forest Productivity | Component Geomorphic Description | Compon

	Top De...	Bottom...	Thickness			Total Fragment Volume			Rock >10			Rock 3-10			#4			#10		
	RV	RV	RV	Designation	Master	Low	RV	High	Low	RV	High	Low	RV	High	Low	RV	High	Low	RV	High
	0	15	15	Ap	A	5	5	10	0	0	16	5	5	26	80.0	94.0	94.0	70.0	94.0	94.0
	15	25	10	Bw1	B	10	10	25	0	0	22	9	9	39	70.0	90.0	90.0	61.0	90.0	90.0
	25	51	25	Bw2	B	10	15	25	0	0	21	9	13	38	71.0	85.0	90.0	62.0	85.0	90.0
	91	165	74	Cd2	C	10	30	30	0	0	17	6	19	34	73.0	77.0	93.0	66.0	77.0	93.0
	51	91	41	Cd1	C	10	25	30	0	0	17	7	16	34	73.0	81.0	93.0	65.0	81.0	93.0

Component | Horizon

Lineage		Comp %						
DMU Rec ID	Seq	Low	RV	High	Component Name	Local Phase	Taxon Kind	Majo
639133	2		5		Bernardston	very stony	series	

Component Restrictions | Component Surface Fragments | Component Taxonomic Family Mineralogy | Component Taxonomic Family Other Criteria | Component Taxonomic Moisture Class | Component Text | Com

	Top Depth			Bottom Depth			Thickness				
Seq	Low	RV	High	Low	RV	High	Low	RV	High	Kind	Hardness
	51	51	91	165	165	165	74	114	114	densic material	noncemented

Newly Calculated Interpretive Values

- **K-factor**
- **Steel and concrete corrosion**
- **Wind erodibility**
- **T-factor**
- **Hydrologic Soil Group**

Hydrologic Soil Group

- **Used to estimate direct runoff from rainfall.**
- **Relative measure of the amount of material comprising a given soil type that can absorb and transmit water.**

Hydrologic Soil Groups

Data elements factored in calculation

- **Depth to restrictive layer**
- **Saturated hydraulic conductivity**
- **Depth to seasonal high water table**

Group A.
Excessively to well drained, permeable throughout.

Group B.
Well and moderately well drained, relatively deep to water table and slowly permeable layer.

Group C.
Well and moderately well drained, relatively shallow to water table and slowly permeable layer.

Group D.
Well drained to very poorly drained, shallow depth to water table and/or slowly permeable layer.

Dual hydrologic group – A/D, B/D, C/D assigned to soils in class D that behave as A, B or C if drained. THE FIRST LETTER INDICATES THE DRAINED CONDITION.

Table 7–1 Criteria for assignment of hydrologic soil group (HSG)

Depth to water impermeable layer 1/	Depth to high water table 2/	K_{sat} of least transmissive layer in depth range	K_{sat} depth range	HSG 3/
<50 cm [<20 in]	—	—	—	D
50 to 100 cm [20 to 40 in]	<60 cm [<24 in]	>40.0 µm/s (>5.67 in/h)	0 to 60 cm [0 to 24 in]	A/D
		>10.0 to ≤40.0 µm/s (>1.42 to ≤5.67 in/h)	0 to 60 cm [0 to 24 in]	B/D
		>1.0 to ≤10.0 µm/s (>0.14 to ≤1.42 in/h)	0 to 60 cm [0 to 24 in]	C/D
		≤1.0 µm/s (≤0.14 in/h)	0 to 60 cm [0 to 24 in]	D
	≥60 cm [≥24 in]	>40.0 µm/s (>5.67 in/h)	0 to 50 cm [0 to 20 in]	A
		>10.0 to ≤40.0 µm/s (>1.42 to ≤5.67 in/h)	0 to 50 cm [0 to 20 in]	B
		>1.0 to ≤10.0 µm/s (>0.14 to ≤1.42 in/h)	0 to 50 cm [0 to 20 in]	C
		≤1.0 µm/s (≤0.14 in/h)	0 to 50 cm [0 to 20 in]	D
>100 cm [>40 in]	<60 cm [<24 in]	>10.0 µm/s (>1.42 in/h)	0 to 100 cm [0 to 40 in]	A/D
		>4.0 to ≤10.0 µm/s (>0.57 to ≤1.42 in/h)	0 to 100 cm [0 to 40 in]	B/D
		>0.40 to ≤4.0 µm/s (>0.06 to ≤0.57 in/h)	0 to 100 cm [0 to 40 in]	C/D
		≤0.40 µm/s (≤0.06 in/h)	0 to 100 cm [0 to 40 in]	D
	60 to 100 cm [24 to 40 in]	>40.0 µm/s (>5.67 in/h)	0 to 50 cm [0 to 20 in]	A
		>10.0 to ≤40.0 µm/s (>1.42 to ≤5.67 in/h)	0 to 50 cm [0 to 20 in]	B
		>1.0 to ≤10.0 µm/s (>0.14 to ≤1.42 in/h)	0 to 50 cm [0 to 20 in]	C
		≤1.0 µm/s (≤0.14 in/h)	0 to 50 cm [0 to 20 in]	D
	>100 cm [>40 in]	>10.0 µm/s (>1.42 in/h)	0 to 100 cm [0 to 40 in]	A
		>4.0 to ≤ 10.0 µm/s (>0.57 to ≤1.42 in/h)	0 to 100 cm [0 to 40 in]	B
		>0.40 to ≤4.0 µm/s (>0.06 to ≤0.57 in/h)	0 to 100 cm [0 to 40 in]	C
		≤0.40 µm/s (≤0.06 in/h)	0 to 100 cm [0 to 40 in]	D

1/ An impermeable layer has a K_{sat} less than 0.01 µm/s [0.0014 in/h] or a component restriction of fragipan; duripan; petrocalcic; orstein; petrogypsic; cemented horizon; densic material; placic; bedrock, paralithic; bedrock, lithic; bedrock, densic; or permafrost.

2/ High water table during any month during the year.

3/ Dual HSG classes are applied only for wet soils (water table less than 60 cm [24 in]). If these soils can be drained, a less restrictive HSG can be assigned, depending on the K_{sat}.

In/hr	Permeability Class
>5.67	moderately rapid to very rapid
>1.42-5.67	moderate to moderately rapid
>.57-1.42	moderately slow to moderate
>.06-.57	slow to moderately slow
<.06	very slow to impermeable

National Engineering Handbook, Part 630 Hydrology, Chapter 7.

MA Technical Soil Services Program

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