

Pedon characteristics

B. PEDON CHARACTERISTICS

Saturated Hydraulic Conductivity

Surface (10)

Most Limiting (10)

_____ High

_____ High

_____ Moderate

_____ Moderate

_____ Low

_____ Low

Saturated Hydraulic Conductivity

- **HIGH** > 3.6 cm/hr
 - O horizons (> 2.5 cm)
 - s, ls textures
 - sl, l textures that are loose because of high OM content
 - fragmental soils: large volume of coarse fragments with insufficient fines.
- **MODERATE** $0.036 - 3.6$ cm/hr
 - materials excluded from high and low
- **LOW** < 0.036 cm/hr
 - c, sc, sic textures with moderate (2) or weaker structure
 - s1c1 textures with weak (1) structure
 - fragipans
 - dense glacial till (Cd)
 - hard bedrock (R)
 - horizontally bedded soft bedrock with few vertical fractures (Cr)

Saturated hydraulic conductivity

- Surface: based on first described horizon
- Most Limiting: least conductive layer in the soil profile.

B. PEDON CHARACTERISTICS

Saturated Hydraulic Conductivity

Surface (10)

_____ High

_____ Moderate

_____ Low

Most Limiting (10)

_____ High

_____ Moderate

_____ Low

Soil Wetness Class (10)

- _____ Class 1, ≥ 150 cm
- _____ Class 2, 100 to 150 cm
- _____ Class 3, 50 to 100 cm
- _____ Class 4, 25 to 50 cm
- _____ Class 5, < 25 cm

Effective Rooting Depth (10)

_____ ≥ 150 cm

_____ 100 to 150 cm

_____ 50 to 100 cm

_____ 25 to 50 cm

_____ < 25 cm

Effective rooting depth

Soil depth classes are defined as the depth from the soil surface to the upper boundary of a root restricting layer, including:

- hard or soft bedrock (Cr or R horizons)
- fragipans (Bx, Bxg, Btx, Btxg horizons)
- cemented and densic materials
- c, sc, sic with massive structure

Effective rooting depth

- If the lower depth of judging is less than 150 cm, and there is no restricting layer within or at the judging depth, the horizon encountered at the bottom of the judged profile may be assumed to continue to at least 150 cm and “very deep” should be selected.

Available Water Holding Capacity (10)

_____ High, ≥ 22.5 cm

_____ Medium, 15.0 to 22.5 cm

_____ Low, 7.5 to 15.0 cm

_____ Very low, < 7.5 cm

PA

SC

_____ cm H₂O/cm soil

Available water holding capacity

- Amount of water held between field capacity and wilting point = available water.
- Computed for the top 100 cm (1 m) of soil or to bedrock, whichever is shallower.

Available water holding capacity (AWHC)

texture	cm water / cm soil
s	0.04
organic material	0.05
ls	0.08
sl, scl, cl, sc, sic, c	0.14
sicl, l	0.17
sil, si	0.20

AWHC= (horizon thickness, cm) x (texture water content value) x (1 - % rock fragments)

*If a fragipan or dense glacial till is present, reduce water holding capacity by ½ for all horizons from the top of the fragipan or dense till to 100 cm or bedrock.

example 1

texture	cm water / cm soil
s	0.04
organic material	0.05
ls	0.08
sl, scl, cl, sc, sic, c	0.14
sicl, l	0.17
sil, si	0.20

horizon	depth, cm	texture	% CoF
A	0 - 20	ls	0
Bw1	20 - 50	sl	0
Bw2	50 - 75	l	0
BC	75 - 100	sl	0

AWHC= (horizon thickness, cm) x (texture water content value) x (1 - % rock fragments)

example 2

texture	cm water / cm soil
s	0.04
organic material	0.05
ls	0.08
sl, scl, cl, sc, sic, c	0.14
sicl, l	0.17
sil, si	0.20

horizon	depth, cm	texture	% CoF
A	0 - 25	l	10
E	25 - 50	sl	15
Bt	50 - 70	c	25
BC	70 - 100	cl	40

AWHC= (horizon thickness, cm) x (texture water content value) x (1 - % rock fragments)

Runoff class

Slope (10)

_____ <3 %

_____ 3-7 %

_____ 7-12 %

_____ 12-20%

_____ ≥20%

_____ %

Surface Runoff (10)

_____ Ponded

_____ Very Slow

_____ Slow

_____ Medium

_____ Rapid

_____ Very Rapid

Runoff class

- Runoff is the water that flows away from the soil over the surface without infiltrating.
- Soil characteristics, management practices, climatic factors (e.g., rainfall intensity), vegetative cover, and topography determine the rate and amount of runoff.

Runoff class

% slope	Limiting hydraulic conductivity of the surface horizon		
	HIGH	MODERATE	LOW
closed depression	ponded	ponded	ponded
0 - <1	very slow	very slow	slow
1 - <2	very slow	slow	medium
2 - <6	slow	medium	rapid
6 - <12	medium	rapid	very rapid
≥ 12	rapid	very rapid	very rapid

Table assumes cultivated soil - If a site is in perennial vegetation (natural area, pasture, or woodland) determine the runoff rate as though the area was cultivated; then consider the effect of vegetation by assigning the next slower runoff class to a minimum of very slow.

Runoff class

% slope	Limiting hydraulic conductivity of the surface horizon		
	HIGH	MODERATE	LOW
closed depression	ponded	ponded	ponded
0 - <1	very slow	very slow	slow
1 - <2	very slow	slow	medium
2 - <6	slow	medium	rapid
6 - <12	medium	rapid	very rapid
≥ 12	rapid	very rapid	very rapid

A soil with 3% slope, moderate saturated hydraulic conductivity in the surface, and perennial vegetation has runoff class of...

MEDIUM → SLOW

complete pedon characteristics for Goldston and
Dellwood

mollic, umbric, ochric, histic, melanic

Thick, organic-rich layer common in grasslands and is diagnostic for Mollisols. High base saturation.

Dark, organic surface layer (not mineral soil). Typically formed in wet areas with low bulk density.

Low organic matter, light-colored, diagnostic for Aridisols.

Organic-rich, volcanic surface layer.

Acidic, similar to Mollic except less fertile with low base saturation.