

MO-03 Technical Note

Date: November 27, 2006

Subject: Guidelines for Data Population and Horizon Description of Pedogenic Cemented layers in M0-03/MO-01

General: Cementation is defined for soil material as a state in which air-dry clods which are completely immersed in water for 1 hour do not slake. Rupture resistance of the wet, cemented material is used to define the cementation class. The possible classes of cementation range from extremely weakly cemented through indurated and represent a broad range of “hardness”. Where cementation is of a sufficient hardness, it dominates the behavior and management of the soil layer to a great degree. Where the cementation is less pronounced, it may be less important to managers and less influential to soil behavior than other properties of the layer. Classes of very strongly cemented or indurated are usually distinguished from less cemented layers in *Soil Taxonomy*. In general, description and data population of cemented layers have been limited to “in lieu of” terms such as CEM and IND. Nothing else is commonly populated in the horizon table except Ksat. However, when the layer is very susceptible to rupture, other features can and should be described. These other features are important to managers who may be willing to modify a rippable or workable layer that is cemented.

Focus: These guidelines are for use with layers having pedogenic cementation, not for bedrock layers.

Guide to data population and layer description: In the MO-03 and MO-01 regions, it is recommended that the following protocols be used to consistently and adequately describe cemented layers.

1 Where the layer has rupture resistance of *moderately cemented or stronger*

- Populate the Ksat column, horizon depths to top and bottom, horizon designation columns. Use the NASIS texture modifier “cemented” and the in-lieu of term “material”.

Horizon							
Seq	Desi	Sub	Top Depth	Bottom De	Ksat		
			RV	RV	Low	RV	High
	H3	3	64	89	0.0000	0.0050	0.0100

Horizon Texture Group				
Seq	Tex Mod & Class	Stratified?	RV?	Rec ID
1	CEM-MAT	C	no	yes 2666288

Horizon Texture			
Seq	Texture	In Lieu	Rec ID
		mat	2739256

Horizon Texture Modifier		
Seq	Modifier	Rec ID
	cem	1600716

- Populate the component restriction table.

Component Restrictions											
Seq	Kind	Hardness	Top Depth			Bottom Depth			Thickness		
			Low	RV	High	Low	RV	High	Low	RV	High
	petrocalcic	indurated	51	71	102	102	120	152	45	49	100

2 Where the layer has rupture resistance that is *less than moderately cemented*

- Use the NASIS texture modifier “cemented” and the appropriate texture term (ie: “sl”).
- Populate all the observed features and properties that are determined in the field – include texture, rock fragments, clay content, AWC, etc. Be sure to adjust for lowered Ksat, higher bulk density, and probably lower Atterburg limits and AWC due to cementation.

Horizon											
Desig	Top D	Bottom Depth	#4			#10			#40		
	RV	RV	Low	RV	High	Low	RV	High	Low	RV	High
Bqm	43	71	90.0	95.0	100.0	85.0	92.0	100.0	65.0	72.0	80.0

Horizon Texture Group				
Seq	Tex Mod & Class	Stratified?	RV?	Rec ID
	CEM-ASHY-SL	S	no	3811438

Horizon Texture			
Seq	Texture	In Lieu	Rec ID
	sl		3912541

Horizon Texture Modifier		
Seq	Modifier	Rec ID
1	cem	1601022
2	ashy	1132171

- Populate the component restriction table!

Component Restrictions											
Seq	Kind	Hardness	Top Depth			Bottom Depth			Thickness		
			Low	RV	High	Low	RV	High	Low	RV	High
	duripan	weakly	36	43	51	61	71	102	25	28	51

It is important that the restriction table is populated so that AWC calculations and other calculations that are looking at the root zone can be cut off at the top of the restriction. It is assumed that in virtually every case, a soil that does not slake after prolonged soaking will be somewhat root restrictive. If roots pass easily through the layer, investigate the possibility that the matrix is not cemented in more than 50 percent of its volume.

- Describe the horizon in a *TUD* or *OSD* using terms that clearly support the taxonomic classification and describe the strength of cementation. For example “Bqm—17 to 28 inches; light brownish gray (10YR 6/2) cemented ashy sandy loam ... hard, firm, nonsticky and nonplastic; very weakly cemented by silica ...”

Developed in discussion by teleconference - 9/6/2001. Chad McGrath, Thor Thorson, Russ Langridge, John Haagen, Tom McKay and Joe Chiaretti, participants.