

**Attachment E-4. Soil Profile Description for the SP1 Locality on the Memorial Park Surface**

Horizon <sup>1</sup>	Boundary <sup>2</sup> (lower)	Depth (cm)	~Thickness (cm)	Color <sup>3</sup>		Texture <sup>4</sup>	Structure <sup>5</sup>			Consistence <sup>6</sup>			Clay Films <sup>7</sup>	Sand	Silt	Clay <sup>8</sup>	Parent sediment and notes for horizons: (roots, pores, redox features, <sup>9</sup> coarse lithics, bioturbation, etc.)
				dry	moist		grade	size	shape	dry	moist	wet		% <2 mm	fraction		
A	C B	0-20	20	7.5 YR 4/2	7.5 YR 5/2	CL	2	m	abk	h	fi	ss ps	no	36	41	23	<b>Fine-sandy silt</b> ; broken lower boundary; v. few, med. roots; fine-v. fine pores
E	CB	20-26	6	10 YR 7/3	10 YR4/3	L	2	f-m	pr	so-sh	fr	s p	v1f po	41	37	22	<b>Pale, fine silty sand</b> ; discontinuous E ~5 cm thick; common slightly reddened irregular masses;
Bt <sub>1</sub>	CS	26-38	12	10 YR 4/4	10 YR 4/6	CL	3	m-c	abk-cpr	h-vh	vfi	vs vp	2-3d pf & br, 1f po	na	na	na	<b>Fine sandy mud</b> ; common v. fine-med roots, common burrows/ bioturbation; common, thin light greyish brown coatings on grains
Bt <sub>2</sub>	(u)	38-62	72	10 YR 4/4	10 YR 3/4	CL	3	m-c	abk	eh	efi	vs vp	2-3p pf & po	24	40	36	<b>Medium-coarse, sandy and pebbly mud</b> ; few dark reddish-brown irregular masses; common, fine roots; common reddened irregular masses/mottles common reddened irregular mottles; few,
	(m)	62-86		10 YR 4/4	10 YR 3/4	CL	3	c	sbk	eh	efi	vs vp	3p pf & po & br	24	38	38	
	(l)	86-110		10 YR 4/4	10 YR 3/4	CL	3	c	sbk	vh	vfi	vs vp	2d pf & po & br	28	41	31	
2Bt <sub>3</sub>	(u)	110-129	38	2.5 Y 6/4	2.5 Y 5/3	SCL	2	c	abk	h-vh	fi-vf	s p	1d po, v1f pf	51	31	18	<b>Coarse-sandy, fine pebble gravel</b> ; many reddened irregular-blocky masses; common, v. fine-root filaments common, v. fine-root filaments; many reddened irregular-blocky masses; few, small, dark red nodules
	(l)	129-148		2.5 Y 6/6	2.5 Y 5/6	SCL	2	c	abk	h-vh	fi	s p	1d po & br, v1 pf	50	30	20	
3Bt <sub>4</sub>	G I	148-170	22	2.5 Y 7/4	2.5 Y 5/3	SCL	2	m-c	sbk	h	fi	s p	2d co & br	45	34	21	<b>Moderately sorted, medium sand</b> ; common black (Mn) dendritic-irregular nodules; common reddened, irregular, masses-nodules
4Bt <sub>5</sub>	D	170-190	20	2.5 Y 6/3	2.5 Y 5/4	SCL	2	m-c	sbk	vh	vfi	s p	1-2d po, 1f-br	44	34	22	<b>Fine-pebble gravel</b> ; common, v. fine-root filaments; many, distinct, reticulate, reddened masses
5Bt <sub>6</sub>	(u)	190-200	21+	10 YR 5/6	10 YR 4/6	SL	1	f	gr-sbk	so	fr	ns po	v1f cobr	75	15	10	<b>Upper medium sand and a lower sandy and pebbly mud</b> ; fine gravel, fine-med sand; few, faint, reddened, reticulate nodules common, prominent dark red & black irregular nodules
	(l)	200-211+		10 YR 5/6	10 YR 4/4	SL	1	f	abk	so	fr-fi	ss po	v1f cobr	67	20	13	

<sup>1</sup> Horizon: A, surface soil horizon characterized by accumulation of organic matter, and eluviation of clay; E, mineral horizon with a loss of silicate clay, iron, and/or aluminum, leaving a concentration of sand and silt; B, horizon characterized by reddening, stronger development, and/or accumulation of secondary illuvial materials; C, horizon that has little or no pedogenic alteration. Arabic numbers used as prefixes indicate a change in parent material. Master-horizon modifiers: t= clay accumulation. Horizons Bt<sub>2</sub>, 2Bt<sub>3</sub>, and 5Bt<sub>6</sub> were subdivided into either two (2Bt<sub>3</sub> & 5Bt<sub>6</sub>) or three (Bt<sub>2</sub>) arbitrary, but roughly equally thick subhorizons, upper (u) and lower (l), or (upper, middle and lower (u, m, and l) in order to determine variations in clay with depth in more detail.

<sup>2</sup> Boundary: the first letter refers to the distinctness and the second letter refers to the nature of the surface (aka topography). Distinctness: A= abrupt, transition < 2 cm thick; C=clear, transition is 2-5 cm thick; G=gradual, transition < 5-15 cm thick; D=diffuse, transition >15 cm thick. Topography: S=smooth, planar; W=wavy, width of undulation is >than depth; I=irregular, depth of undulation is >than width; B=broken, discontinuous horizons

<sup>3</sup> Munsell Soil Color Charts (Munsell Color Co., Inc.)

<sup>4</sup> CL=clay; L=loam; SCL=sandy clay loam.

<sup>5</sup> Structure: Grade: m: massive; sg: single grain; 1: weak; 2: moderate; 3: strong; Size: vf: very fine; f: fine; m: medium; c: coarse; vc: very coarse; gr: granule; pl: platy; sbk: subangular blocky; pr: prismatic

<sup>6</sup> Consistence: Dry: so=soft; sh=slightly hard; h=hard; vh=very hard; eh= extremely hard; Moist: vfr=very friable; fr= friable; fi=firm; vfi=very firm; efi=extremely firm; Wet: so=nonsticky; ss=slightly sticky; s=sticky; vs=very sticky

<sup>7</sup> Clay films: Amount: v1: very few; 1: few; 2: common; 3: many; Distinctness: f: faint; d: distinct; p: prominent; Location of clay films: pf: pedfaces; po: pores; br: bridges; co: colloidal stains; cobr: coats and bridges

<sup>8</sup> Clay percentages determined through laser diffraction particle size distribution analyses (Coulter) G. Schneider, USGS, written communication, 08/20/2014.

<sup>9</sup> Characterization of redox features modified from *Field Book for Describing and Sampling Soils, Version 3.0*, Natural Soil Survey Center, NRCS, U.S. Department of Agriculture, September 2012.