Illinois Soil Classifiers Association

Fall 2017 Meeting

Saturday October 7th

Pyramid State Recreation Area

Near Pinckneyville, Illinois

Sam Indorante, USDA-NRCS (ACES)

Kristine Ryan (USDA-NRCS, MLRA Project Leader)

Ron Collman (USDA-NRCS, State Soil Scientist)

Dr. Kevin McSweeney (University of Illinois)

Dean Spindler (Illinois Department of Mines and Minerals)

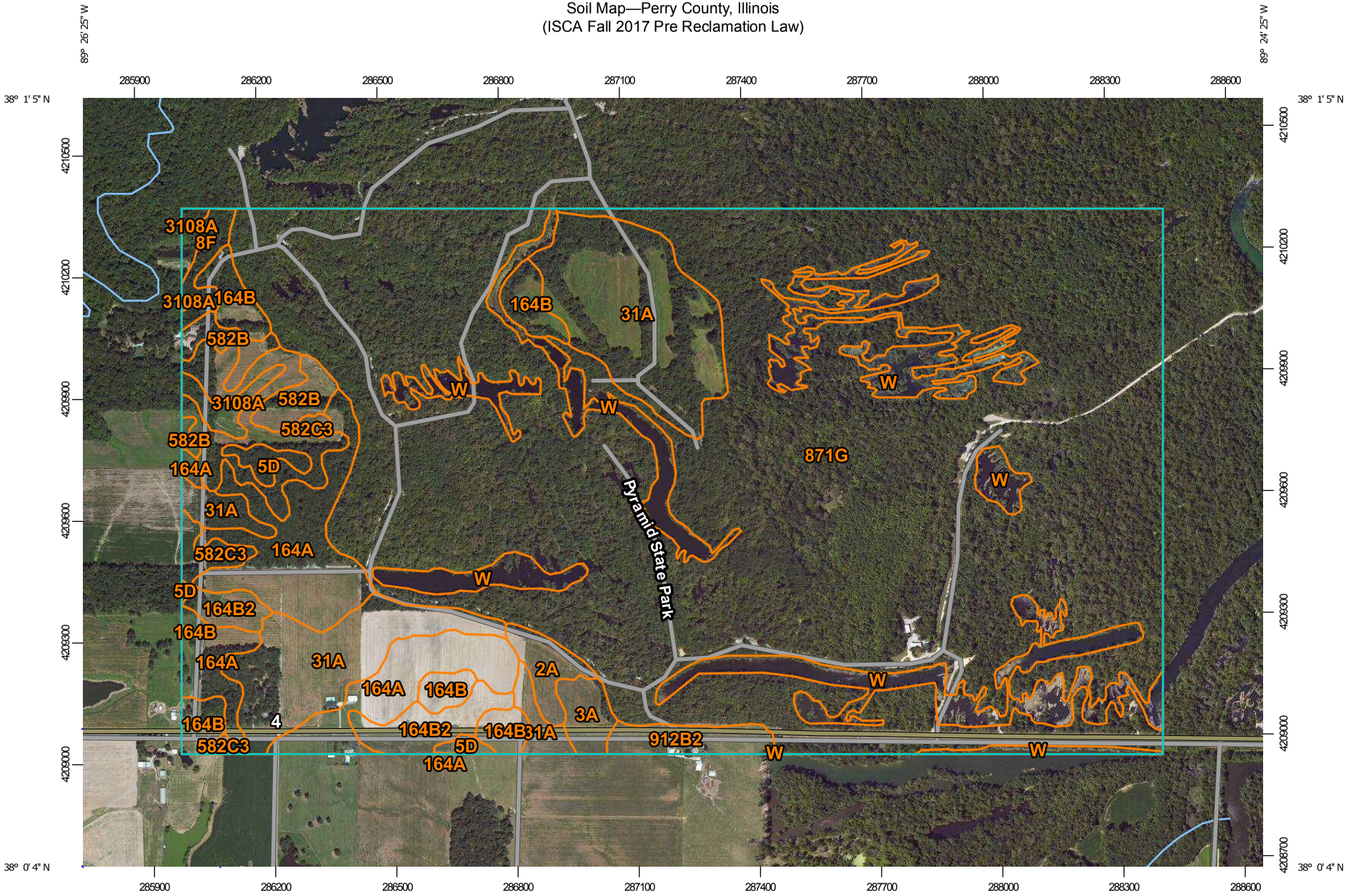
Cha Hill (Site Supervisor Pyramid State Recreation Area, Illinois Department of Natural Resources)

Erik Gerhard and Dwayne Williams (USDA-NRCS, Marion MLRA)

Google Maps Pyramid State Recreation Area near Pinckneyville, IL

Map data ©2017 Google United States 2 mi


ISCA Fall 2017
Legend
Pit 1
U of I Mix Plots
U of I Wedge Plots
Boulder Lake Picnic Area
Park Headquarters
Park Entrance
4
Pyatt Cutler Rd
Denmark
Google earth
N
1 mi



Map Scale: 1:13,400 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 150 300 600 900

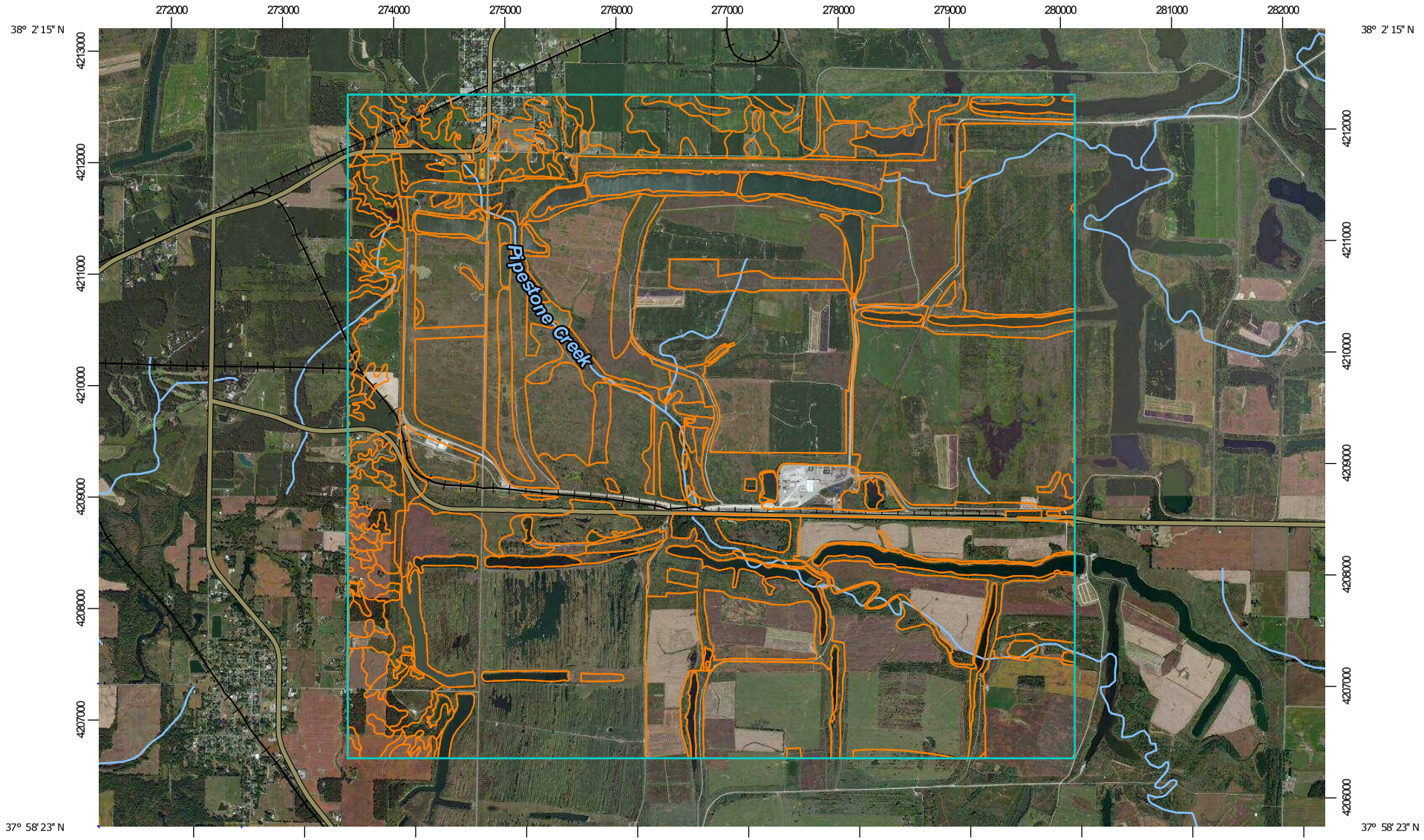
Feet: 0 500 1000 2000 3000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

Map Unit Legend

Perry County, Illinois (IL145)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
2A	Cisne silt loam, 0 to 2 percent slopes	5.8	0.7%
3A	Hoyleton silt loam, 0 to 2 percent slopes	5.1	0.6%
5D	Blair silt loam, 10 to 18 percent slopes	4.0	0.5%
8F	Hickory silt loam, 18 to 35 percent slopes	4.2	0.5%
31A	Pierron silt loam, 0 to 2 percent slopes	73.5	9.1%
164A	Stoy silt loam, 0 to 2 percent slopes	50.9	6.3%
164B	Stoy silt loam, 2 to 5 percent slopes	19.2	2.4%
164B2	Stoy silt loam, 2 to 5 percent slopes, eroded	12.1	1.5%
582B	Homen silt loam, 2 to 5 percent slopes	9.6	1.2%
582C3	Homen silty clay loam, 5 to 10 percent slopes, severely eroded	20.8	2.6%
871G	Lenzburg gravelly silty clay loam, 20 to 60 percent slopes, stony	519.1	64.1%
912B2	Hoyleton-Darmstadt silt loams, 2 to 5 percent slopes, eroded	7.1	0.9%
3108A	Bonnie silt loam, 0 to 2 percent slopes, frequently flooded	5.7	0.7%
W	Water	73.2	9.0%
Totals for Area of Interest		**810.1**	**100.0%**

Soil Map—Perry County, Illinois
(ISCA Fall 2017)



Map Scale: 1:50,500 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 500 1000 2000 3000

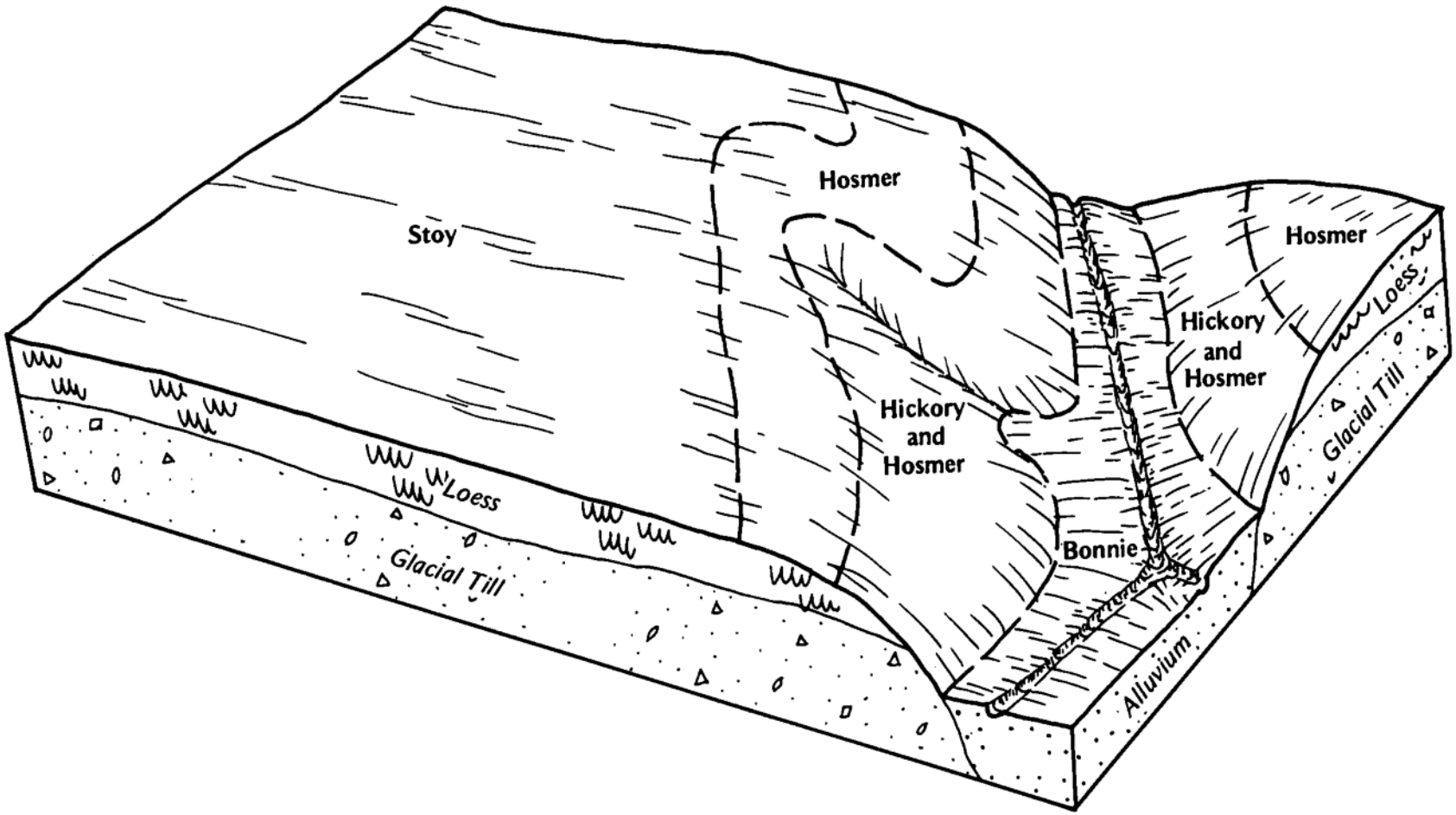
Feet
0 2000 4000 8000 12000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

Map Unit Legend

Perry County, Illinois (IL145)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
2A	Cisne silt loam, 0 to 2 percent slopes	88.9	0.9%
3B	Hoyleton silt loam, 2 to 5 percent slopes	3.2	0.0%
5C3	Blair silty clay loam, 5 to 10 percent slopes, severely eroded	58.0	0.6%
5D3	Blair silty clay loam, 10 to 18 percent slopes, severely eroded	6.8	0.1%
31A	Pierron silt loam, 0 to 2 percent slopes	105.9	1.1%
113A	Oconee silt loam, 0 to 2 percent slopes	7.3	0.1%
164A	Stoy silt loam, 0 to 2 percent slopes	306.5	3.2%
164B	Stoy silt loam, 2 to 5 percent slopes	251.2	2.6%
164B2	Stoy silt loam, 2 to 5 percent slopes, eroded	153.5	1.6%
581B2	Tamalco silt loam, 2 to 5 percent slopes, eroded	18.8	0.2%
582B	Homen silt loam, 2 to 5 percent slopes	14.8	0.2%
802B	Orthents, loamy, undulating	140.8	1.5%
821G	Morristown very stony silty clay loam, 20 to 60 percent slopes, very stony	964.9	10.0%
823B	Schuline silt loam, 1 to 5 percent slopes	1,451.9	15.0%
823C	Schuline silt loam, 5 to 10 percent slopes	12.6	0.1%
824B	Swanwick silt loam, 1 to 5 percent slopes	2,826.9	29.2%
825C	Lenzburg silty clay loam, acid substratum, 2 to 12 percent slopes	186.5	1.9%
866	Dumps, slurry	73.2	0.8%
871B	Lenzburg gravelly silty clay loam, 2 to 7 percent slopes, stony	517.8	5.4%
871D	Lenzburg gravelly silty clay loam, 7 to 20 percent slopes, stony	1,055.3	10.9%

Perry County, Illinois (IL145)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
871G	Lenzburg gravelly silty clay loam, 20 to 60 percent slopes, stony	498.3	5.2%
882A	Oconee-Darmstadt-Coulterville silt loams, 0 to 2 percent slopes	108.0	1.1%
912B2	Hoyleton-Darmstadt silt loams, 2 to 5 percent slopes, eroded	61.7	0.6%
991A	Cisne-Huey silt loams, 0 to 2 percent slopes	103.6	1.1%
W	Water	652.9	6.8%
Totals for Area of Interest		**9,669.2**	**100.0%**


Hosmer
Stoy
Hosmer
Loess
Hickory
and
Hosmer
Glacial Till
Hickory
and
Hosmer
Loess
Glacial Till
Bonnie
Alluvium

LOCATION STOY IL+IN

Established Series
Rev. GOW-JBF-TJE
08/2011

STOY SERIES

The Stoy series consists of very deep, somewhat poorly drained soils that formed in loess on uplands. Slope ranges from 0 to 10 percent. Mean annual precipitation is about 1067 mm (42 inches), and mean annual air temperature is about 13 degrees C (56 degrees F).

TAXONOMIC CLASS: Fine-silty, mixed, superactive, mesic Fragiaquic Hapludalfs

TYPICAL PEDON: Stoy silt loam, on a 3 percent slope in a cultivated field at an elevation of about 119 meters (389 feet) above mean sea level. (Colors are for moist soil unless otherwise stated.)

Ap--0 to 15 cm (0 to 6 inches); brown (10YR 4/3) silt loam; weak fine granular structure; friable; many roots; few fine iron-manganese concretions throughout; very strongly acid; abrupt smooth boundary. [15 to 25 cm (6 to 10 inches) thick]

El--15 to 23 cm (6 to 9 inches); mixed light yellowish brown (10YR 6/4) and yellowish brown (10YR 5/4) silt loam; weak thin platy structure parting to weak fine granular; friable; common roots; common very dark grayish brown (10YR 3/2) organic stains; few medium distinct light brownish gray (10YR 6/2) iron depletions in the matrix; many fine iron-manganese concretions throughout; very strongly acid; clear smooth boundary.

E2--23 to 33 cm (9 to 13 inches); yellowish brown (10YR 5/4) silt loam; weak fine and medium granular structure; friable; common roots; common medium distinct light brownish gray (10YR 6/2) iron depletions and yellowish brown (10YR 5/6) masses of oxidized iron in the matrix; many fine iron-manganese concretions throughout; very strongly acid; clear smooth boundary. [Combined thickness of the E horizon is 0 to 25 cm (10 inches).]

BE--33 to 41 cm (13 to 16 inches); yellowish brown (10YR 5/6) silty clay loam; weak fine and medium subangular blocky structure; friable; common roots; few medium prominent light brownish gray (10YR 6/2) iron depletions in the matrix; many fine iron-manganese concretions throughout; very strongly acid; clear smooth boundary. [0 to 15 cm (6 inches) thick]

Btl--41 to 53 cm (16 to 24 inches); yellowish brown (10YR 5/8) silty clay loam; moderate fine subangular blocky structure; firm; common roots; common prominent brown (10YR 4/3) clay films on faces of peds; common prominent light brownish gray (10YR 6/2) clay depletions on faces of peds, light gray (10YR 7/1) dry; few fine prominent light brownish gray (10YR 6/2) and brown (10YR 5/3) iron depletions in the matrix; many fine iron-manganese concretions

throughout; very strongly acid; clear smooth boundary.

Bt2--53 to 69 cm (24 to 27 inches); yellowish brown (10YR 5/8 and 10YR 5/4) silty clay loam; moderate coarse subangular blocky structure parting to moderate fine and very fine angular blocky; firm; common roots; many prominent light brownish gray (10YR 6/2) clay depletions on faces of larger peds and many distant brown (10YR 4/3) clay films on faces of smaller angular peds; few fine prominent light gray (10YR 7/1) iron depletions in the matrix; many medium iron-manganese concretions throughout; many black (10YR 2/1) threadlike manganese coatings and spherical manganese masses; very strongly acid; clear smooth boundary

Bt3--69 to 81 cm (27 to 32 inches); yellowish brown (10YR 5/8 and 10YR 5/4) silty clay loam; moderate medium subangular blocky structure; very firm; common roots; many distinct brown (10YR 4/3) clay films on faces of peds; few fine prominent light gray (10YR 7/1) and light brownish gray (10YR 6/2) iron depletions in the matrix; many fine iron-manganese concretions throughout; common black (10YR 2/1) threadlike manganese coatings and spherical manganese masses; very strongly acid; gradual smooth boundary. [Combined thickness of the Bt horizon is 25 to 76 cm (10 to 30 inches).]

Btxl--81 to 91 cm (32 to 36 inches); mottled grayish brown (10YR 5/2), brown (10YR 5/3), and yellowish brown (10YR 5/8) silty clay loam; weak coarse subangular blocky structure; firm; common roots; common distinct brown (10YR 4/3) clay films on faces of peds; few fine distinct light gray (10YR 7/1) iron depletions in the matrix; many iron-manganese concretions throughout; brittle; very strongly acid; gradual smooth boundary.

Btx2--91 to 114 cm (36 to 45 inches); mottled grayish brown (10YR 5/2) brown (10YR 5/3) and yellowish brown (10YR 5/8) silty clay loam; weak coarse prismatic structure; extremely firm; few roots; few distinct brown (10YR 4/3) clay films on faces of peds; common fine and medium distinct light gray (10YR 7/1) iron depletions in the matrix; many fine iron-manganese concretions throughout; brittle; very strongly acid; gradual smooth boundary. [Combined thickness of the Btx horizon is 20 to 76 cm (8 to 30 inches).]

Bx--114 to 203 cm (45 to 80 inches); mottled grayish brown (10YR 5/2), pale brown (10YR 6/3), yellowish brown (10YR 5/8), and light gray (10YR 7/1) silt loam; weak medium prismatic structure; extremely firm; few very dark grayish brown (10YR 3/2) threadlike manganese coatings and spherical manganese masses; many fine iron-manganese concretions throughout; brittle; very strongly acid.

TYPE LOCATION: Gallatin County, Illinois, about 2 miles southwest of Omaha; 1,320 feet east of southwest corner of sec. 28, T. 7 S., R. 8 E.; USGS Norris City topographic quadrangle; lat. 37 degrees 52 minutes 43 seconds N. and long. 88 degrees 19 minutes 58 seconds W.; UTM Zone 16, 382795 easting and 4193237 northing, NAD 83.

RANGE IN CHARACTERISTICS:
Depth to fragic soil properties: 64 to 114 cm (25 to 45 inches)
Depth to the base of the argillic horizon: 89 to 165 cm (35 to 65 inches)
Particle-size control section: averages 27 and 35 percent clay

Series control section: less than 10 percent fine sand or coarser material throughout the profile

Ap horizon:
Hue: 10YR
Value: 4 or 5
Chroma: 2 or 3
Texture: silt loam, but includes silty clay loam in some eroded pedons
Reaction: very strongly acid to neutral

A horizon (in undisturbed areas):
Hue: 10YR
Value: 2 to 3
Chroma: 1 or 2
Texture: commonly silt loam; less commonly silty clay loam
Reaction: very strongly acid to neutral

E, BE, or B/E horizon, where present:
Hue: 10YR
Value: 5 or 6
Chroma: 3 or 4
Reaction: very strongly acid to slightly acid
Texture: silt loam; silty clay loam in some BE horizons
Reaction: very strongly acid to neutral

Bt horizon:
Hue: 10YR or 2.5Y
Value: 4 to 6
Chroma: 2 to 8
Texture: silty clay loam or silt loam
Reaction: very strongly acid or strongly acid

Btx or Bx horizon
Hue: 10YR
Value: 5 to 7
Chroma: 2 to 8
Texture: silty clay loam or silt loam
Clay content: 24 to 35 percent
Reaction: very strongly acid to moderately acid

C horizon, where present
Hue: 10YR
Value: 5 to 7
Chroma: 1 to 8
Texture: silt loam
Clay content: 20 to 27 percent
Reaction: very strongly acid to neutral

COMPETING SERIES: There are no other series in this family.

GEOGRAPHIC SETTING: The Stoy soils are on ridgetops on loess covered Illinoian till plains and bedrock plateaus. Slope ranges from 0 to 10 percent. The soils are formed in loess. Mean annual precipitation ranges from 889 to 1143 mm (35 to 45 inches). Mean annual air temperature ranges from 12 to 14 degrees C (54 to 57 degrees F). Frost-free period is 180 to 200 days. Elevation is 104 to 311 meters (340 to 1,020 feet) above mean sea level.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Hosmer and Weir soils. Hosmer soils are moderately well drained, have fragipan horizons, and are on nearby landscapes generally with steeper slope gradients. Weir soils are poorly drained and are dominated by chroma of 1 and 2 in the solum.

DRAINAGE AND SATURATED HYDRAULIC CONDUCTIVITY: Somewhat poorly drained. Depth to the top of a perched seasonal high water table ranges from 31 to 61 cm (1 to 2 feet) in drained areas between January and May in normal years. Potential for surface runoff is low to high. Saturated hydraulic conductivity is moderately low. Permeability is slow.

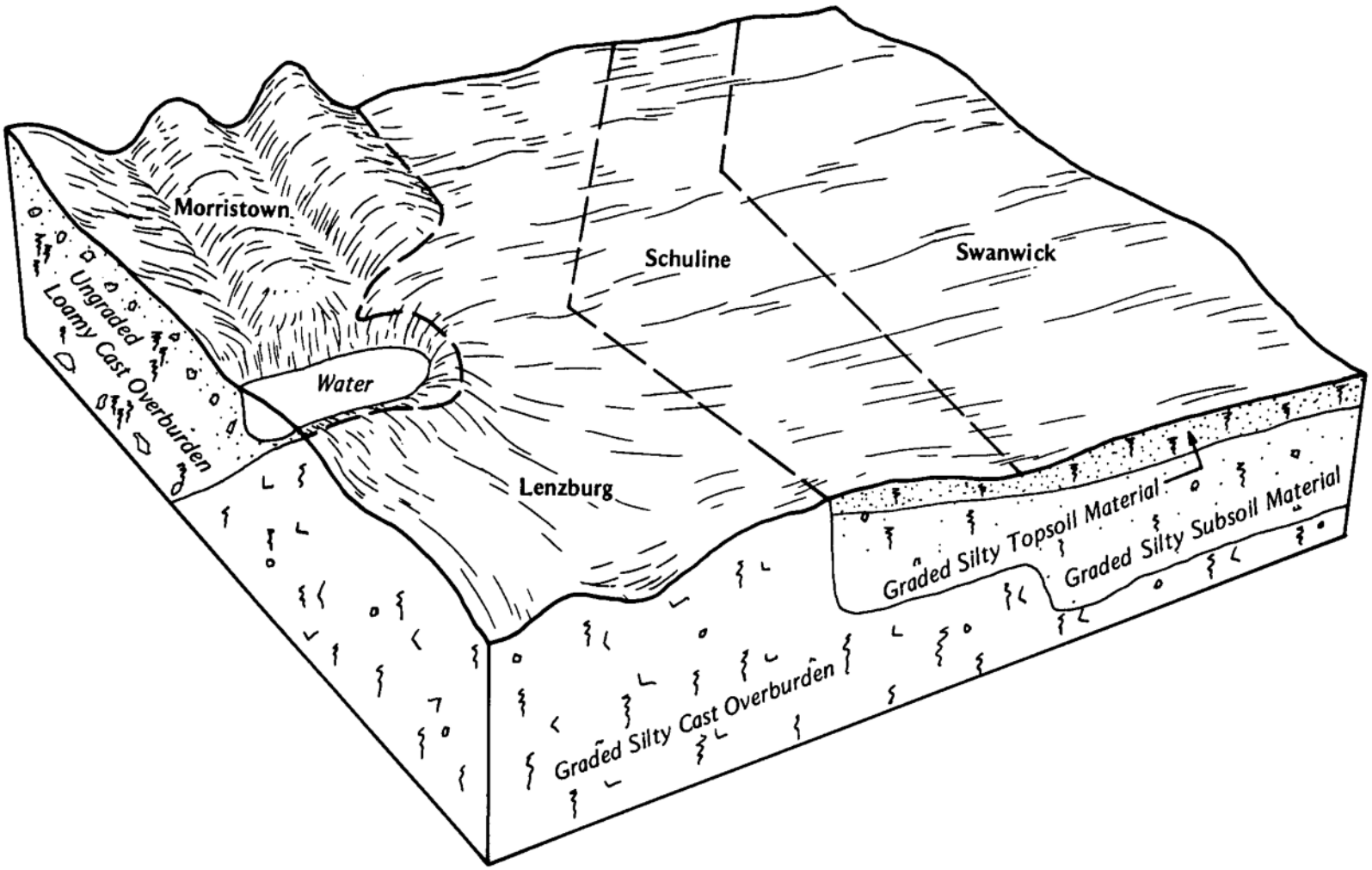
USE AND VEGETATION: Most areas are cropland but some still remains in forest. Native vegetation is mixed hardwood forest.

DISTRIBUTION AND EXTENT: MLRAs 113, 114B, 115A, 115B, 120A, 120C and 122 in southern Illinois and southern Indiana. The series is of moderate extent.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Indianapolis, Indiana

SERIES ESTABLISHED: Lawrence County, Illinois, 1952.

REMARKS:
Diagnostic horizons and features recognized in this pedon are:
Ochric epipedon: from the surface to a depth of 41 cm (16 inches) (Ap, E1, E2, BE horizons).
Argillic horizon: from a depth of 41 to 114cm (16 to 45 inches) (Bt1, Bt2, Bt3, Btx1, Btx2 horizons).
Aquic conditions: redoximorphic features present in all horizons beneath the Ap horizon.


Morristown
Schuline
Swanwick
Water
Ungraded Loamy Cast Overburden
Lenzburg
Graded Silty Topsoil Material
Graded Silty Subsoil Material
Graded Silty Cast Overburden

LOCATION LENZBURG IL+MO
Established Series
Rev. RDW-JWC-RAL
02/2006

LENZBURG SERIES

The Lenzburg series consists of very deep, well drained soils on surface-mined areas. These soils formed in materials that have been excavated during surface mining operations. Some areas have been graded. The regolith dominantly is fine earth material that contains till pebbles or fragments of bedrock that are shale, siltstone, sandstone, or limestone. Slope ranges from 0 to 70 percent. Mean annual precipitation is about 38 inches, and mean annual temperature is about 53 degrees F.

TAXONOMIC CLASS: Fine-loamy, mixed, active, calcareous, mesic Haplic Udarents

TYPICAL PEDON: Lenzburg silt loam - on a graded area with a 4 percent convex slope in a field of fescue and alfalfa. (Colors are for moist soils unless otherwise stated.)

Ap--0 to 3 inches (0 to 8 cm); mixed brown (10YR 4/3), light brownish gray (10YR 6/2), yellowish brown 10YR 5/6), and yellowish red (5YR 5/6) silt loam; pale brown (10YR 6/3) dry; weak fine granular structure; friable, slightly hard; about 7 percent rock fragments of till pebbles and channers and flags of limestone and siltstone; slightly effervescent; slightly alkaline; abrupt wavy boundary. (Thickness ranges from 0 to 10 inches.)

AC--3 to 6 inches (8 to 15 cm); mixed yellowish brown (10YR 5/4), light brownish gray (10YR 6/2), and strong brown (7.5YR 5/6) silt loam; moderate medium platy structure; friable, hard and slightly hard; about 9 percent rock fragments of till pebbles and channers and flags of limestone and siltstone; strongly effervescent; slightly alkaline; abrupt wavy boundary. (Thickness ranges from 0 to 10 inches.)

C1--6 to 10 inches (15 to 25 cm); brown (10YR 4/3) silt loam; strong thick horizontal layers; massive; firm, hard; few light brownish gray (10YR 6/2) silty clay loam soil fragments; few distinct very dark gray (10YR 3/1) coatings on faces of soil fragments; about 11 percent rock fragments of till pebbles and channers and flags of limestone and siltstone; strongly effervescent; slightly alkaline; abrupt wavy boundary.

C2--10 to 33 inches (15 to 84 cm); mixed brown (7.5YR 4/4) and pale brown (10YR 6/3) clay loam; massive; firm, hard; few vertical cleavage planes; few gray (10YR 5/1) soil fragments throughout, and few yellowish red (5YR 5/6) soil fragments in the lower part; about 9 percent rock fragments of till pebbles and channers and flags of limestone and siltstone; strongly effervescent; slightly alkaline; clear smooth boundary.

C3--33 to 45 inches (84 to 114 cm); mixed dark yellowish brown (10YR 4/4) and pale brown (10YR 6/3) clay loam; massive; firm, hard; few gray (10YR 6/1) and grayish brown (10YR 5/2) soil fragments; about 10 percent rock fragments of till pebbles and channers and flags of limestone and siltstone; strongly effervescent; slightly alkaline; clear smooth boundary.

C4--45 to 60 inches (114 to 152 cm); mixed brown (7.5YR 4/4) and gray (10YR 5/1) channery clay loam; very firm, very hard; few yellowish red (5YR 5/8) soil fragments; about 17 percent rock fragments of limestone; strongly effervescent; slightly alkaline.

TYPE LOCATION: Lenzburg silt loam, 1 to 7 percent slopes, at an elevation of 525 feet; Randolph County, Illinois; approximately 12 feet south and 580 feet east of the center of sec. 22, T. 5 S., R. 6 W.; USGS Steeleville, IL. topographic quadrangle; lat. 38 degrees 4 minutes 55 seconds N. and long. 89 degrees 44 minutes 54 seconds W. or UTM zone16 258966E 4218479N, NAD 83.

RANGE IN CHARACTERISTICS: The individual subhorizons within the C horizon are variable in thickness. Content of rock fragments in the particle-size control section averages from 5 to 35 percent by volume. Rock fragments are disordered relative to any plane in the profile and commonly are gravel and cobbles, but include stones and small boulders. Between 5 and 15 percent of the rock fragments are 3 inches in diameter or larger. In a few pedons, bridging of rock fragments by fine earth material forms small voids. Soil fragments and isolated peds of relict genetic horizons of pre-mined soils are randomly distributed throughout and also are disordered relative to any plane in the profile. Soil fragments have identifiable properties such as redoximorphic features, clay films, or coatings that are characteristic of their previous formation. The series control section is neutral to moderately alkaline and contains carbonates. The organic carbon content decreases irregularly with depth because of mixing and the presence of coal and other carbonaceous material. Depth to bedrock is more than 6 feet.

The A horizon has hue of 5YR, 10YR, 2.5Y, or 5Y; value of 2 to 6 (4 to 7 dry); and chroma typically of 2 to 4 but ranging from 1 to 6. Dark coatings are on the faces of peds in some pedons. The A horizon is silt loam, silty clay loam, clay loam, or loam; or the gravelly, stony, or channery analogs. Typically it has weak or moderate, fine or medium structure.

The C horizon has a wide range of colors. Dominant colors are in hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 1 to 6. Some pedons have color value of 2 or 3 (see remarks). Some included peds or soil fragments are grayer and some are browner than these colors. Redoximorphic iron depletions with chroma of 2 or less are relict and not indicative of soil drainage. They occur at random depth, spacing, and orientation in the soil. The C horizon is silty clay loam, silt loam, loam, silty clay, or clay loam; or the channery, gravelly, or cobbly analogs. Thin strata or small pockets of coarser or finer textured material are in some pedons. In some pedons there is evidence of weakly expressed post-mining genetic soil structure in the upper part of the C horizon or in an AC horizon. Some of the included peds or soil fragments of previous genetic horizons do not contain carbonates. Stony phases are recognized. An acid substratum phase has been

recognized, where, below a depth of 48 inches, it contains refuse material from the coal washing operation.

COMPETING SERIES: There are no other series in the same family. The Lenzwheel and Schuline series are in a closely related family. Lenzwheel and Schuline soils average less than 10 percent rock fragments in the particle-size control section, of which none or few are larger than 3 inches.

GEOGRAPHIC SETTING: Lenzburg soils are on crests and slopes of cast overburden material from surface mining. Slope gradients commonly are 3 to 30 percent and range from 0 to 70 percent. The soils formed in regolith that consists of a mixture that is dominated by calcareous loamy till and contains components of loess and residuum of weathered interbedded siltstone, sandstone, shale, or limestone. Some areas contain refuse material from coal processing, locally known as gob or slurry, in the substratum at a depth of 48 inches or more. Mean annual precipitation is 34 to 42 inches, and mean annual temperature is 48 to 57 degrees F., frost-free period is 160 to 200 days, and elevation is 350 to 1,000 feet above mean sea level.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Morristown and Rapatee soils on surface-mined areas, and the Darmstadt, Elco, Hickory, Ipava, Marseilles, Sable, and Stoy soils on adjacent or nearby undisturbed areas. Morristown soils contain more rock fragments throughout and are on similar nearby areas. Rapatee soils are on nearby areas that have had the darkened surface layers of pre-mined soils replaced at the surface. Darmstadt, Ipava, Sable, and Stoy soils are on nearby level or gently sloping summits and interstream divides. Elco soils are on side slopes of drainageways and on some ridgetops. Hickory and Marseilles soils are on side slopes of valleys and incised drainageways.

DRAINAGE AND SATURATED HYDRAULIC CONDUCTIVITY: Well drained. The potential for surface water runoff is low to very high. Saturated hydraulic conductivity is moderately high (1.41 to 4.23 micrometers/second). Permeability is moderately slow.

USE AND VEGETATION: Many areas that have a stony surface or steep slopes are seeded to grass-legume mixtures or fescue and are used for pasture. Other areas have a mixture of deciduous trees, or are in pine plantations and are used for recreation or wildlife habitat. Some areas have been graded and used for meadow, small grain, or row crops.

DISTRIBUTION AND EXTENT: Illinois and Missouri and possibly in Indiana, Kentucky, and Ohio; extent is moderate, and mainly in MLRA(s) 108A, 108B, 113, 114B, 115B and 115C.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Indianapolis, Indiana

SERIES ESTABLISHED: Henry County, Illinois, 1981.

REMARKS: These soils were formerly mapped as mine spoils, strip mines, Orthents, or other miscellaneous categories. Soil colors with value of 2 or 3 result from finely divided coal or black shale and are not result of current genetic soil development.

Diagnostic horizons and features in this pedon include:
Ochric epipedon - 0 to 6 inches (Ap and AC horizons).

ADDITIONAL DATA: Data for several pedons in Illinois have been collected and are on file at the NRCS state office in Champaign, Illinois.

National Cooperative Soil Survey
U.S.A.

LOCATION MORRISTOWN OH+IL KY

Established Series
SLH-DJB Rev. MDJ
12/2012

MORRISTOWN SERIES

MLRAs: 113 (Central Claypan Areas), 114B (Southern Illinois and Indiana Thin Loess and Till Plain, Western Part), 115B (Central Mississippi Valley Wooded Slopes, Western Part), 120A (Kentucky and Indiana Sandstone and Shale Hills and Valleys, Southern Part), 124 (Western Allegheny Plateau), 126 (Central Allegheny Plateau) and 139 (Lake Erie Glaciated Plateau)

TAXONOMIC CLASS: Loamy-skeletal, mixed, active, calcareous, mesic Typic Udorthents

TYPICAL PEDON: Morristown gravelly clay loam, stony, on a 3 percent convex slope, seeded to grass-legume pasture. (Colors are for moist soil unless otherwise indicated.)

Ap--0 to 13 cm (0 to 5 inches); dark gray (10YR 4/1) gravelly clay loam, gray (10YR 6/1) dry; moderate medium granular structure; slightly hard; common roots; common pores; 20 percent by volume gravel; strongly effervescent; moderately alkaline; abrupt wavy boundary. (0 to 18 cm thick)

C1--13 to 46 cm (5 to 18 inches); variegated dark gray (5Y 4/1) and yellowish brown (10YR 5/4 and 5/6) very gravelly clay loam: massive; slightly hard; common roots; 40 percent by volume gravel and cobbles; strongly effervescent; mildly alkaline; clear wavy boundary.

C2--46 to 94 cm (18 to 37 inches); variegated dark gray (5Y 4/1), light yellowish brown (10YR 6/4) and black (N 2/0) very gravelly clay loam; massive; firm; 40 percent by volume gravel and cobbles; strongly effervescent; mildly alkaline; clear wavy boundary.

C3--94 to 152 cm (37 to 60 inches); yellowish brown (10YR 5/4) very gravelly loam; massive; friable; 40 percent by volume gravel and cobbles; slightly effervescent; mildly alkaline. (Combined thickness of the C horizon is 152 cm or more.)

TYPE LOCATION:
State: Ohio
County: Belmont
USGS Quadrangle: Fairview
Latitude: 40.086583 N NAD 83

Longitude: 81.187278 W NAD 83
Direction: Kirkwood Township, about 3,800 feet south and 1,600 feet east of the northwest corner of sec. 22, T. 9 N., R. 6 W.

RANGE IN CHARACTERISTICS:
Depth to Bedrock: Greater than 152 cm (60 inches)
Depth Class: Very Deep
Rock Fragment Content: The A or Ap horizon ranges from 15 to 50 percent, by volume, where unreclaimed and up to 15 percent where reclaimed. The C horizon ranges from 35 to 80 percent, by volume, averaging 40 percent.
Rock Fragment Size: 2 mm to 25 cm, but can include stones and boulders
Rock Fragment Type: Limestone and shale with some medium-grained sandstone, siltstone and coal
Fine-Earth Fraction: Averages 18 to 35 percent clay in the control section
Soil Reaction: Slightly alkaline or moderately alkaline

Range of Individual Horizons:
A horizon (if it occurs):
Color--hue of 5YR through 2.5Y, value of 4 through 6, and chroma of 1 through 8
Texture (fine-earth fraction)--clay loam, silty clay loam, silt loam or loam

C horizon:
Color--hue of 5YR through 5Y, value of 2 through 6, and chroma of 0 through 8
Texture (fine-earth fraction)--loam, silt loam, sandy clay loam, clay loam or silty clay loam

COMPETING SERIES:
Janelew soils--Janelew soils form from calcareous regolith of greater than 65 percent mudstone with small amounts of sandstone, limestone, siltstone and shale. The particle-size control section ranges from 23 to 35 percent clay and 7 to 23 percent fine and coarser sand. The percent of fine and coarser sand is commonly less than 15 percent.

GEOGRAPHIC SETTING:
Landscape: Hills
Landform: Hillslope
Anthropogenic Features: Surface mine, spoil bank, spoil pile and reclaimed land
Hillslope Profile Position: Summit, shoulder, backslope, footslope and toeslope
Geomorphic Component: Interfluve, side slope, head slope, nose slope, free face and base slope
Parent Material: Coal extraction mine spoil derived from calcareous regolith, dominantly limestone and shale with some medium-grained sandstone and siltstone
Slope: 0 to 90 percent
Mean Annual Air Temperature: 9 to 13 degrees C. (48 to 56 degrees F.)
Mean Annual Precipitation: 889 to 1143 mm (35 to 45 inches)

GEOGRAPHICALLY ASSOCIATED SOILS:

Fairpoint soils--occur on similar landscape positions derived from nonacid surface mine overburden
Bethesda soils--occur on similar landscape positions derived from acid surface mine overburden
Culleoka soils--formed in residuum from shale, siltstone, limestone and sandstone on undisturbed uplands
Elba soils--formed in residuum from limestone, shale and siltstone on undisturbed uplands
Guernsey soils--formed in residuum from siltstone, shale and limestone on undisturbed uplands
Lowell soils--formed in residuum from limestone and shale on undisturbed uplands
Westmoreland soils--formed in residuum from siltstone, sandstone and limestone on undisturbed uplands
Gilpin soils--formed in residuum from shale, siltstone and sandstone on undisturbed uplands
Upshur soils--formed in residuum from shale and siltstone on undisturbed uplands
Brookside soils--formed in colluvium from siltstone, shale, sandstone and limestone on undisturbed uplands
Vandalia soils--formed in colluvium from shale, siltstone and sandstone on undisturbed uplands

DRAINAGE AND SATURATED HYDRAULIC CONDUCTIVITY:
Drainage Class (Agricultural): Well drained
Internal Free Water Occurrence: None
Flooding Frequency and Duration: None
Ponding Frequency and Duration: None
Index Surface Runoff: Very high
Saturated Hydraulic Conductivity: Low through moderately high in the upper part, and very low through moderately high in the lower part
Shrink-Swell Potential: Low

USE AND VEGETATION:
Major Uses: Wildlife habitat and recreational areas. The rough topography and coarse fragment content of unreclaimed areas make it impractical for agriculture and difficult for standard forest harvesting practices. Some reclaimed areas are used for hay or pasture, and increasingly, are also used for homesites. Reclaimed areas typically exhibit higher bulk densities, much lower saturated hydraulic conductivities and low organic matter in the surface horizon, making establishment of vegetation difficult.
Dominant Vegetation: Unreclaimed areas are naturally seeded deciduous forests with a few barren areas. Reclaimed areas are usually open grassland, including some legumes. A few reclaimed areas have been planted to trees, but mortality is high because of soil compaction.

DISTRIBUTION AND EXTENT:
Distribution: Ohio, Illinois and Kentucky
Extent: Large, about 158,000 acres identified at the time of this revision

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Morgantown, West Virginia

SERIES ESTABLISHED: Belmont County, Ohio, 1978

REMARKS: Morristown soils were previously mapped as a variety of strip mine spoil and udorthents units.

Diagnostic horizons and soil characteristics recognized in this pedon are:
Ochric epipedon--the zone from 0 to 13 cm (Ap horizon)
Series control section--the zone from 0 to 200 cm

Previous revisions: 6/01-DRM,TNR,KKH

ADDITIONAL DATA: Characterization data and engineering test data is available for pedons BT-21 (typical pedon), BT-22 and BT-23; analyzed by The Ohio State University Soil Characterization Laboratory, Columbus, Ohio.

Additional characterization data is available for pedons MS-16, MS-18, MS-19 and MS-20.

LOCATION SCHULINE IL+MO
Established Series
Rev. CCM-DRG-TJE
06/2001

SCHULINE SERIES

The Schuline series consists of very deep, well drained soils on surface mined areas. Permeability is moderate in the surface layer and moderatley slow and slow in the stratified substratum. These soils formed in materials that have been excavated and reclaimed during surface mining operations. Most areas have been covered with the surface layer of pre-mined soils. Slopes range from 0 to 15 percent. Mean annual temperature is abut 55 degrees F, and mean annual precipitation is about 40 inches.

TAXONOMIC CLASS: Fine-loamy, mixed, superactive, calcareous, mesic Alfic Udarents

TYPICAL PEDON: Schuline silt loam - with a 2 percent convex slope in a cultivated field. (Colors are for moist soil unless otherwise stated.)

Ap--0 to 6 inches; mixed brown (10YR 5/3) and yellowish brown (10YR 5/6) silt loam, very pale brown (10YR 7/3) dry; moderate fine and medium granular structure; friable; common very fine and fine roots; about 9 percent sand; moderately acid; abrupt smooth boundary. (3 to 10 inches thick)

AC--6 to 10 inches; mixed brown (10YR 5/3), yellowish brown (10YR 5/6), and gray (10YR 5/1) silt loam, very pale brown (10YR 7/3) dry; weak fine subangular blocky structure; firm; few very fine and fine roots; moderate thick platy clods about 9 percent sand; slightly acid; abrupt smooth boundary. (0 to 6 inches thick)

C1--10 to 21 inches; mixed light yellowish brown (10YR 6/4) and yellowish brown (10YR 5/6) loam; massive; firm; few very fine roots; few weak medium subangular blocky clods; few thin dark grayish brown (10YR 4/2) silt coats on faces of clods; few dark concretions (iron and manganese oxides); about 30 percent sand; about 5 percent gravel; slightly effervescent; slightly alkaline; clear smooth boundary. (0 to 15 inches thick)

C2--21 to 36 inches; mixed yellowish brown (10YR 5/4), brownish yellow (10YR 6/6), gray (10YR 5/1), and light brownish gray (10YR 6/2) loam; massive; firm; few dark concretions (iron and manganese oxides); about 30 percent sand; about 5 percent gravel; slightly effervescent; slightly alkaline; gradual smooth boundary. (0 to 24 inches thick)

C3--36 to 54 inches; mixed yellowish brown (10YR 5/4), grayish brown (10YR 5/2), and brownish yellow (10YR 6/8) loam; massive; firm; weathered shale fragments in the lower

part of the layer; about 30 percent sand; about 7 percent gravel; strongly effervescent; slightly alkaline; clear smooth boundary. (0 to 24 inches thick)

C4--54 to 60 inches; mixed yellowish brown (10YR 5/4 and 5/6), gray (10YR 5/1), and grayish brown (10YR 4/2) loam; massive; friable; few dark concretions (iron and manganese oxides); about 40 percent sand; about 15 percent gravel; violently effervescent; slightly alkaline.

TYPE LOCATION: Perry County, Illinois; about 4 miles east of Pinckneyville; 1,600 feet north and 300 feet east of the center of sec. 22, T. 5 S., R. 2 W.

RANGE IN CHARACTERISTICS: The 10- to 40-inch control section averages about 7 percent coarse fragments and ranges from 0 to 15 percent. The clay content in the control section ranges from 18 to 35 percent and sand content ranges from 15 to 30 percent. The coarse fragments are dominantly gravel, but a few cobbles are present in most pedons. In some pedons soil fragments and isolated peds of relict genetic horizons of pre-mined soils are randomly distributed throughout, and are disordered relative to any plane in the profile. Some of the soil fragments have identifiable properties such as mottles, clay films, or coatings that are characteristic of their previous formation. The organic carbon content decreases irregularly with depth in most pedons because of mixing (and because of the presence of flakes and fragments of coal or other carbonaceous material). Some pedons contain one or more layers that were compressed during placement and grading of the soil material. These layers have high bulk density and low available water capacity, and impede movement of roots and water. Depth to bedrock is more than 5 feet.

The upper part of the series control section (A horizon) has hue of 10YR or 7.5YR, value of 4 or 5, and chroma dominantly of 3 or 4 but ranging from 1 through 6. It is silt loam, silty clay loam, clay loam, or loam.

Some pedons do not have the AC horizon.

The individual layers within the lower part of the series control section (C horizons) are variable in number and thickness. To a depth of 48 inches or more, the C horizon typically has hue of 10YR, or 7.5YR, value of 4 through 7, and chroma of 1 to 6. It is loam, clay loam, silt loam, or silty clay loam. Below a depth of 48 inches the C horizon has a wide range of colors, and colors are mixed. It is clay loam, loam, silty clay loam, silt loam, or silty clay, or the gravelly or channery analogs. Some pedons contain stones below a depth of 48 inches and they occur at random depth, spacing, and orientation. Some pedons contain strata, pockets, or soil fragments below a depth of 48 inches that do not contain free carbonates.

COMPETING SERIES: These are the Lenzburg, and Steinauer series. Lenzburg soils contain 5 percent or more rock fragments larger than 3 inches in diameter and average more rock fragments in the control section. Steinauer soils have a regular decrease in organic carbon with increasing depth, having formed in calcareous glacial till in areas that receive less than 32 inches of precipitation.

GEOGRAPHIC SETTING: Schuline soils are on nearly level to strongly sloping summits and back slopes of reconstructed landscapes. Slope gradients commonly are 1 to 10 percent, but range from 0 to 15 percent. The soils formed in materials that were excavated and reclaimed during surface mining operations. The upper 48 inches of the regolith is dominantly fine-earth material, with a few coarse fragments. Most areas have been covered with the surface layer of pre-mined soils. At depths greater than 48 inches the regolith is fine-earth material or a mixture of unconsolidated fine-earth material and rock fragments. The fine-earth material is dominated by calcareous loamy material that was glacial till before it was mined and contains components that, before mining, were loess or residuum weathered from interbedded siltstone, sandstone, shale, or limestone. Mean annual temperature varies from 53 to 57 degrees F, and mean annual precipitation varies from 36 to 44 inches.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the competing Lenzburg and Swanwick soils on surface mined areas, and the Ava, Darmstadt, Hosmer, Hoyleton, and Wakeland soils on adjacent unmined landscapes. Lenzburg soils are nearby; graded areas are on similar parts of the landscape, and ungraded areas are on steeper side slopes or parallel ridges. Swanwick soils are nearby on similar parts of the landscape. Ava, Darmstadt, Hosmer, and Hoyleton soils all have argillic horizons. In addition, Ava and Hosmer soils have Bx horizons, Darmstadt soils have natric horizons, and Hoyleton soils have color value of 3 or darker in the surface layer. The somewhat poorly drained Wakeland soils are coarse-silty and formed in alluvium on bottomlands.

DRAINAGE AND PERMEABILITY: Well drained. Runoff is slow or medium. Permeability is moderate in the surface layer and moderately slow and slow in the stratified substratum.

USE AND VEGETATION: Shuline soils are used mainly for row crops or grass-legume mixtures for meadow or pasture.

DISTRIBUTION AND EXTENT: Southern Illinois and south western Indiana. Schuline soils have small extent.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Indianapolis, Indiana

SERIES ESTABLISHED: Perry County, Illinois, 1983.

REMARKS: These soils were formerly mapped as mine spoils, surface mines, loamy Orthents, or other miscellaneous categories. They mostly result from mining technology and reclamation procedures adopted since about 1975.

Diagnostic horizons and features recognized in this pedon are: ochric epipedon - the zone from the surface of the soil to a depth of approximately 10 inches (Ap and AC horizons).

ADDITIONAL DATA: Data for several pedons in Illinois are on file at the SCS Illinois state office.

National Cooperative Soil Survey
U.S.A.

LOCATION SWANWICK IL
Established Series
Rev. JWS-DRG-CCM-RAL-GRS
01/2000

SWANWICK SERIES

The Swanwick series consists of very deep, moderately well drained soils on surface-mined areas. Permeability is moderately slow in the surface layer, is moderately slow and very slow in the stratified materials to a depth of about 48 inches, and is very slow in the lower part of the substratum. These soils formed in materials that have been excavated and reclaimed during surface mining operations. Most areas have been covered with the surface layer of pre-mined soils. Slope ranges from 0 to 10 percent. Mean annual precipitation is about 38 inches, and mean annual temperature is about 55 degrees F.

TAXONOMIC CLASS: Fine-silty, mixed, active, nonacid, mesic Alfic Udarents

TYPICAL PEDON: Swanwick silt loam - with a 3 percent convex slope in a cultivated field at an elevation of about 470 feet above mean sea level. (Colors are for moist soils unless otherwise stated.)

Ap--0 to 9 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; moderate medium granular and moderate medium platy structure; friable, slightly hard; many fine roots; about 10 percent sand and 3 percent coarse fragments; neutral; clear smooth boundary. (3 to 15 inches thick)

AC--9 to 12 inches; mixed yellowish brown (10YR 5/4), light brownish gray (10YR 6/2), and reddish yellow (7.5YR 6/8) silty clay loam; massive; firm, hard; common fine roots; thick platy clods with horizontal cleavage planes; few dark iron-manganese stains on faces of clods; few iron-manganese concretions; about 6 percent sand and 6 percent coarse fragments; slightly alkaline; clear smooth boundary. (0 to 15 inches thick)

C1--12 to 27 inches; mixed dark grayish brown (10YR 4/2), brown (10YR 5/3), grayish brown (10YR 5/2), light brownish gray (10YR 6/2), and reddish yellow (7.5YR 6/8) silty clay loam; massive; firm, hard; common fine roots; layers of compact soil with horizontal cleavage planes; about 5 percent sand and 6 percent coarse fragments; slightly alkaline; gradual smooth boundary.

C2--27 to 40 inches; mixed yellowish brown (10YR 5/4) and reddish yellow (7.5YR 6/8) silty clay loam; massive; firm, very hard; few fine roots; layers of compact soil with horizontal cleavage planes; about 4 percent sand and 8 percent coarse fragments; strongly acid; abrupt smooth boundary.

C3--40 to 49 inches; mixed yellowish brown (10YR 5/4) and reddish yellow (7.5YR 6/8) silty clay loam; massive; friable and firm, slightly hard; few fine roots; few relict dark

iron-manganese stains and concretions; about 11 percent sand and 4 percent coarse fragments; neutral; clear smooth boundary.

C4--49 to 60 inches; mixed brown (10YR 4/3) and dark gray (10YR 4/1) silty clay loam; massive; very firm; very few fine roots; about 20 percent sand and 6 percent coarse fragments; slightly effervescent; slightly alkaline.

TYPE LOCATION: Randolph County, Illinois; about 5 miles northwest of Sparta (map sheet Baldwin SE, IL.); approximately 1,200 feet west and 1,000 feet north of the southeast corner of sec. 16, T. 4 S., R. 6 W.; USGS Baldwin, IL. topographic quadrangle; lat. 38 degrees 10 minutes 45 seconds N. and long. 89 degrees 45 minutes 46 seconds W.

RANGE IN CHARACTERISTICS: The particle-size control section ranges from 0 to about 10 percent coarse fragments. In soil pedons soil fragments and isolated peds of relict genetic horizons of pre-mined soils are randomly distributed throughout, and are disordered relative to any plane in the profile. Some of the soils fragments have identifiable properties such as redox features, clay films, or coatings that are characteristic of their previous formation. The organic carbon content decreases irregularly with depth in most pedons because of mixing or layering, and because of the presence of coal or other carbonaceous material. These soils have a succession of compressed layers of traffic pans in the C horizon that formed during placement and grading of the soil material. Some of the individual layers have high bulk density and low available water capacity. Abrupt boundaries between soil layers are common and the compact layers or contrasting materials contribute to the restricted movement of roots and water. The depth to bedrock is more than 5 feet.

The Ap or A horizon typically has hue of 10YR, value of 4 or 5 (6 or 7 dry), and chroma of 2 to 4. Less commonly it has hue of 7.5YR, 2.5Y, or 5Y; value of 4 to 6; and chroma of 1 to 8. The Ap or A horizon is silt loam or silty clay loam. Reaction ranges from strongly acid to slightly alkaline.

Some pedons do not have an AC horizon.

The individual layers within the C horizon are variable in number and thickness. In some pedons, the upper layer of the C horizon is part of the replaced surface layer of pre-mined soils. To a depth of 48 inches or more the C horizon typically has hue of 7.5YR, 10YR, 2.5Y, or 5Y; value of 4 to 6; and chroma of 1 to 8. Texture typically is silty clay loam, but individual layers are silt loam, loam, or clay loam. Below a depth of 48 inches the C horizon has a wide range of colors, and colors are mixed. Texture is clay loam, loam, silty clay loam, silt loam, or silty clay, or the gravelly or channery analogs. Some pedons contain stones below a depth of 48 inches and they occur at random depth, spacing and orientation. Individual layers in the C horizon range from very strongly acid to moderate alkaline. Some pedons contain strata, pockets, and soil fragments that contain carbonates.

COMPETING SERIES: There are no competing series.

GEOGRAPHIC SETTING: Swanwick soils are on crests and slopes of reconstructed landscapes. Slope ranges from 0 to 10 percent. The soils formed in materials that were

excavated and reclaimed during surface mining operations. The upper 48 inches of the regolith dominantly is fine-earth material that consists of a mixture of the subsoil and substratum layers of pre-mined soils. Most areas have been covered with the surface layer of pre-mined soils. At depths greater than 48 inches the regolith typically consists of unconsolidated fine-earth material and fragments of bedrock. It is dominated by calcareous loamy material that was till before it was mined, and contains components that, before mining, were loess or residuum weathered from interbedded siltstone, sandstone, shale, or limestone. Mean annual precipitation is 36 to 40 inches, and mean annual temperature is 54 to 57 degrees F., frost-free period is 180 to 200 days, and elevation is 400 to 800 feet above mean sea level.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Lenzburg, Morristown, and Schuline soils on surface-mined areas, and the Ava, Blair, Bluford, Darmstadt, Hosmer, Hoyleton, Stoy, and Wynoose soils on adjacent or nearby undisturbed areas. Lenzburg and Morristown soils contain more rock fragments throughout and typically are on steeper slopes in unreclaimed areas nearby. Schuline soils on similar areas nearby that have had the surface layers of pre-mined soils replaced at the surface. The moderately well drained Ava and Hosmer soils have argillic horizons and Bx horizons and are on convex summits and side slopes. The somewhat poorly drained Blair, Bluford, Darmstadt, Hoyleton, and Stoy soils have argillic horizons and are nearly level to sloping summits and side slopes. In addition Darmstadt soils have natric horizons. The poorly drained Wynoose soils have an albic horizon that is abruptly underlain by a fine-textured argillic horizon. They are on broad interfluves.

DRAINAGE AND PERMEABILITY: Moderately well drained. The potential for surface water runoff is low or medium. Permeability is moderately slow in the surface layer, is moderately slow and very slow in the stratified materials to a depth of about 48 inches, and is very slow in the lower part of the substratum. Some areas of these soils, especially with nearly level slope gradients, develop wet spots as a result of differential settlement of the disturbed material. Water perches at various levels within the soil on the compressed layers, but primarily on the discontinuity at a depth of about 48 inches.

USE AND VEGETATION: Swanwick soils are used mainly for cultivated crops or grass-legume mixtures for meadow or pasture. Some areas are used for specialty crops such as apples, peaches, or grapes.

DISTRIBUTION AND EXTENT: Southern Illinois. Extent is small, and mainly in MLRA(s) 113, 114, and 115.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Indianapolis, Indiana

SERIES ESTABLISHED: Randolph County, Illinois, 1983.

REMARKS: These soils were formerly mapped as mine spoils, strip mines, Orthents, or other miscellaneous categories. They mostly result from reclamation procedures adopted since about 1975.

Diagnostic horizons and features in this pedon include:
Ochric epipedon - from the surface of the soils to a depth of approximately 9 inches (Ap horizon).

ADDITIONAL DATA: Data for several pedons in Illinois have been collected and are on file at the NRCS/USDA state office in Champaign, Illinois.

National Cooperative Soil Survey
U.S.A.

'Keys to Soil Taxonomy', 12th Ed. (2014)

Updates include Taxa for Anthropogenic Soils

Human Altered/Human Transported (HA/HT) Material

Prepared by: Kristine Ryan

I. Major addition to the keys that define, provide criteria, and classify soils with human altered/human-modified materials

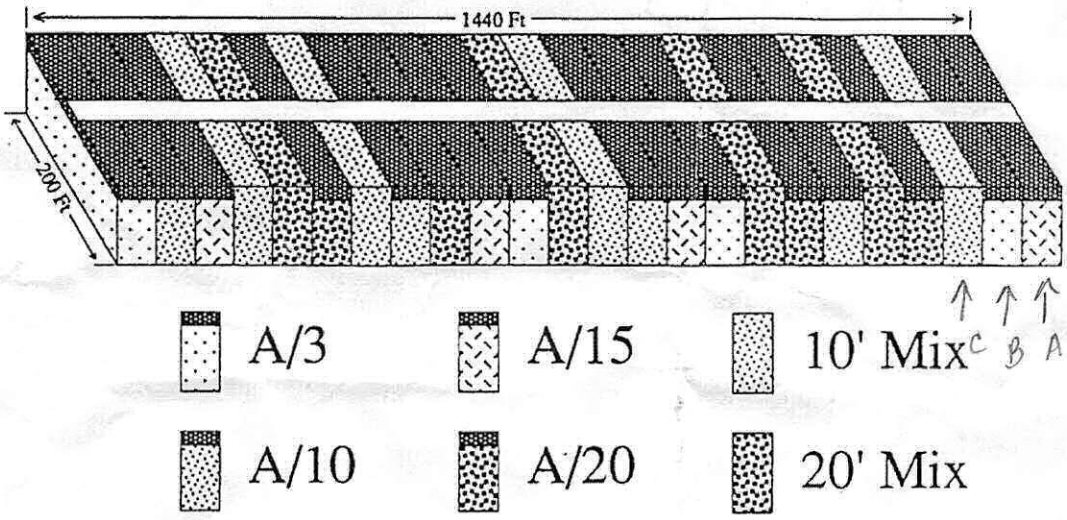
a. Updates to anthropic epipedon definition and criteria
b. Human-altered materials and human-transported materials definition criteria (HAHT)
    i. Anthropogenic landforms, artifacts, manufactured layers
c. HAHT material added to the family level
d. Impact of HAHT on control section depths
e. When describing these soils a caret (^) symbol is used before the horizon designations (i.e. ^Ap, ^C)

II. Human-altered materials – local modification

a. Occurs in soils with deep tilling (>50 cm), ponding for agricultural purposes or occurs on a destructional landform … think rice paddys and cemeteries.
b. Organic or mineral
c. May contain artifacts (shells or bones) used as agricultural amendments
d. BUT…majority of the material has no evidence that is was transported from outside the pedon
e. Hard to qualify for – reserved for deep ripping to break up duripans, petrocalcics, anthraquic conditions, etc.
f. Best professional judgement along with published or historical evidence and onsite observations that allows the most consistent identification of excavated HA material

III. Human-transported materials – brought in from outside sources

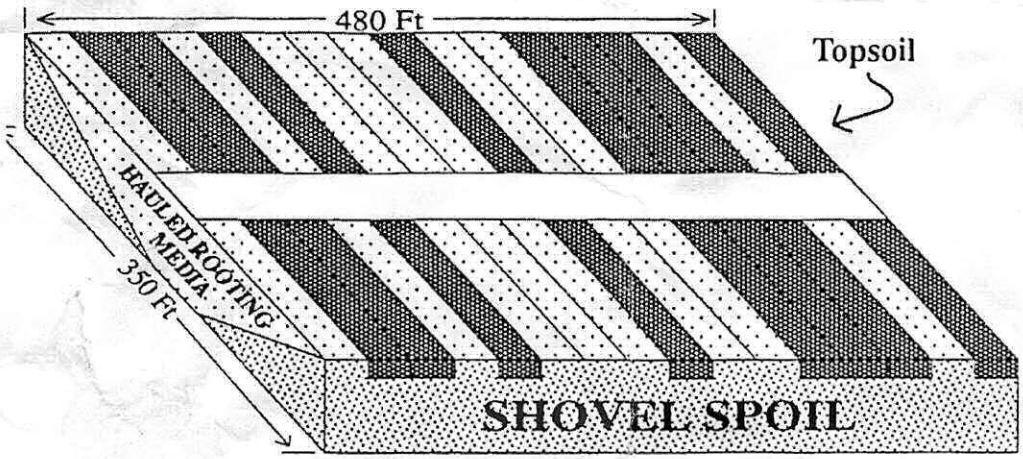
a. Purposeful transportation of soil from outside areas of the pedon
b. Moved with aid of machinery and hand tools
c. Organic or mineral
d. Occurs on a constructional anthropogenic landform or micro-feature or within an excavated destructional landform
e. May contain remnants of natural soils
f. May contain non-agricultural artifacts (asphalt) or discarded litter (aluminum cans)



S2016IL145001 A
S2016Ic145001 B
S2016Ic145001 C

Captain Mix Plots

FIGURE 1



Captain Wedge Plots

FIGURE 2

USDA - NATURAL RESOURCES CONSERVATION SERVICE
PEDON DESCRIPTION

Print Date: 10/24/2016
Description Date: 10/13/2016
Describer: Sam Indorante, Dr. Kevin McSweeney

User Site ID: S2016IL145001a
Site Note:
User Pedon ID: S2016IL145001a
Pedon Note:

Soil Name as Described/Sampled: Schuline
Taxon Kind as Sampled: series
Sampled as Classification:

Soil Name as Correlated:
Taxon Kind as Correlated:
Correlated Classification:

Pedon Type: taxadjunct to the series
Pedon Purpose: research site
Associated Soils: Schuline
Lab Source ID: Lab Pedon #:

Location Information:
Country:
State: Illinois
County: Perry
MLRA: 114B -- Southern Illinois and Indiana Thin Loess and Till Plain, Western Part
Soil Survey Area:
Map Unit:
Quad Name:

Location Description:
Legal Description: 675 feet west and 107 feet south of NE corner of Section 16, T6S, R4W, 3rd PM of Section 16, Township 6S , Range 4W

Latitude: 38 degrees 0 minutes 46.81 seconds north
Longitude: 89 degrees 32 minutes 27.50 seconds west
Datum: WGS84
UTM Zone: 16
UTM Easting: 4210099.378
UTM Northing: 276925.415

Enter lat-lon in decimal degrees

Lat	38.0130027778
Lon	-89.5409722222

or degrees-minutes-seconds

Lat	N	38-00-46.81000
Lon	W	089-32-27.50000

or drag map marker to a location of interest

Ellipsoid Height(m): 0.000

LLH		SPC		UTM(m)		XYZ(m)		USNG
Lat	38.0130027778 N380046.81000	Zone	N/A	Zone	UTM Zone 16	X	40310.996	16SBH7692510099
Siglat (arcsec)	±0.000000	Northing (m)	0.0	Northing	4210099.378	Y	-5031504.954	
Lon	-89.5409722222 W0893227.50000	Northing (usft)	0.0	Easting	276925.415	Z	3906386.714	
Siglon (arcsec)	±0.000000	Northing (ift)	0.0	Conv (dms)	-01 33 55.72156			
eht	0.000	Easting (m)	0.0	SF	1.00021292			
sigeht (m)	±0.000	Easting (usft)	0.0	CF	1.00021292			
		Easting (ift)	0.0					
		Conv (dms)	00 00 00.00000					
		SF	0.0					
		CF	0.0					

Physiographic Division:
Physiographic Province:
Physiographic Section:
State Physiographic Area:
Local Physiographic Area:

Geomorphic Setting: on backslope of side slope of None Assigned
Upslope Shape: linear Cross Slope Shape: convex

Primary Earth Cover:
Secondary Earth Cover:
Plant Association Name:
Existing Vegetation:

Parent Material: Mixed Peoria and Roxanna Loess with Drift (Anthropogenic) over mine spoil

Bedrock Data:

Vertical Order	Depth to Top (cm.)	Kind	Hardness	Fracture Interval	Geologic Formation

Surface Fragments:

Particle Size Control Section:

Diagnostic Features:

anthropic epipedon	0 to 17 cm.
manufactured layer	0 to 17 cm.
manufactured layer	17 to 150 cm.

Top Depth (cm)	Bottom Depth (cm)	Restriction Kind	Restriction Hardness

Slope (%)	Elevation (meters)	Aspect (deg)	MAAT (C)	MSAT (C)	MWAT (C)	MAP (mm)	Frost-Free Days	Drainage Class	Slope Length (meters)	Upslope Length (meters)
4.0	482.0	135						somewhat poorly		

Ap1--0 to 5 centimeters; very dark grayish brown (10YR 3/2) crushed; 8 percent sand; 68 percent silt; 24 percent clay; -- Error in Exists On --; friable, slightly sticky, slightly plastic; deformable; many fine roots throughout and common medium roots throughout and common coarse roots

throughout and many very fine roots throughout; noneffervescent, by HCl, 1 normal; ; clear smooth boundary.

Ap2--5 to 17 centimeters; very dark grayish brown (10YR 3/2) crushed; moderate medium granular structure; friable, slightly sticky, slightly plastic; deformable; common fine roots throughout and few medium roots throughout and few medium roots throughout and common very fine roots throughout; noneffervescent, by HCl, 1 normal; ; clear wavy boundary.

C1--17 to 117 centimeters; 30 percent yellowish brown (10YR 5/4) broken face and 25 percent grayish brown (10YR 5/2) broken face and 20 percent yellowish brown (10YR 5/6) broken face and 15 percent light brownish gray (10YR 6/2) broken face and 5 percent light gray (10YR 7/2) and ; moderate very coarse prismatic structure, and strong fine cloddy structure, and strong medium, and strong coarse cloddy structure, and strong very coarse cloddy structure; firm, moderately sticky, moderately plastic; deformable; common very fine roots between peds; 2 percent medium distinct irregular dark yellowish brown (10YR 3/4), moist, iron-manganese masses with diffuse boundaries in matrix and 2 percent medium prominent irregular yellowish brown (10YR 5/6), moist, masses of oxidized iron with diffuse boundaries in matrix; noneffervescent, by HCl, 1 normal; ; "cloddy" structure is identified as 'fritted'. "Structure created by reclamation method"; abrupt wavy boundary.

C2--117 to 150 centimeters; 30 percent yellowish brown (10YR 5/4) broken face and 25 percent grayish brown (10YR 5/2) broken face and 20 percent yellowish brown (10YR 5/6) broken face and 15 percent light brownish gray (10YR 6/2) broken face and 5 percent light gray (10YR 7/2); structureless massive structure; very firm, moderately sticky, moderately plastic; deformable; few very fine roots between peds; 3 percent medium distinct irregular brown (7.5YR 4/4), moist, iron-manganese masses with diffuse boundaries in matrix; noneffervescent, by HCl, 1 normal; .

USDA - NATURAL RESOURCES CONSERVATION SERVICE
PEDON DESCRIPTION

Print Date: 10/24/2016
Description Date: 10/13/2016
Describer: Sam Indorante, Dr. Kevin McSweeney

User Site ID: S2016IL145001b
Site Note:
User Pedon ID: S2016IL145001b
Pedon Note:

Soil Name as Described/Sampled: Schuline
Taxon Kind as Sampled: series
Sampled as Classification:

Soil Name as Correlated:
Taxon Kind as Correlated:
Correlated Classification:

Pedon Type:
Pedon Purpose:
Associated Soils: Schuline
Lab Source ID: Lab Pedon #:

Location Information:
Country:
State: Illinois
County: Perry
MLRA: 114B -- Southern Illinois and Indiana Thin Loess and Till Plain, Western Part
Soil Survey Area:
Map Unit:
Quad Name:

Location Description:
Legal Description: 671 feet west and 38 feet south of NE corner of Section 16, T6S, R4W, 3rd
Section 16, Township 6S , Range 4W

Latitude: 38 degrees 0 minutes 46.47 seconds north
Longitude: 89 degrees 32 minutes 27.64 seconds west
Datum: WGS84
UTM Zone: 16
UTM Easting: 4210088.99
UTM Northing: 276921.714

BETA
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Coordinate Conversion Tool

National Geodetic Survey

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Single Point Conversion | Multipoint Conversion | Web services | Downloads | About Conversion Tool

Convert from: (•) LLH ( ) SPC ( ) UTM ( ) XYZ ( ) USNG

Enter lat-lon in decimal degrees

Lat 38.0129083333 Enter a latitude as shown

Lon -89.5410111111 Enter a longitude as shown-West longitudes are negative

or degrees-minutes-seconds

Lat N 38-00-46.47000

Lon W 089-32-27.64000

or drag map marker to a location of interest

Ellipsoid Height(m) 0.000

Converted coordinates will be in output datum

Input datum USSD

Output datum USSD

LLH		SPC		UTM(m)		XYZ(m)		USNG
Lat	38.0129083333 N380046.47000	Zone	N/A	Zone	UTM Zone 16	X	40307.633	16SBH7692110088
Siglat (arcsec)	±0.000000	Northing (m)	0.0	Northing	4210088.99	Y	-5031511.437	
Lon	-89.5410111111 W0893227.64000	Northing (usft)	0.0	Easting	276921.714	Z	3906378.455	
Siglon (arcsec)	±0.000000	Northing (ift)	0.0	Conv (dms)	-01 33 55.79600			
eht	0.000	Easting (m)	0.0	SF	1.00021294			
sigeht (m)	±0.000	Easting (usft)	0.0	CF	1.00021294			
		Easting (ift)	0.0					
		Conv (dms)	00 00 00.00000					
		SF	0.0					
		CF	0.0					

Physiographic Division:
Physiographic Province:
Physiographic Section:
State Physiographic Area:
Local Physiographic Area:

Geomorphic Setting: on backslope of side slope of None Assigned
Upslope Shape: linear Cross Slope Shape: convex

Primary Earth Cover:
Secondary Earth Cover:
Plant Association Name:
Existing Vegetation:

Parent Material: Mixed Peoria and Roxanna Loess with Drift (Anthropogenic) over mine spoil

Bedrock Data:

Vertical Order	Depth to Top (cm.)	Kind	Hardness	Fracture Interval	Geologic Formation

Surface Fragments:

Particle Size Control Section:

Diagnostic Features:	anthropic epipedon	0 to 21 cm.
	manufactured layer	0 to 21 cm.
	cambic horizon	21 to 31 cm.
	manufactured layer	21 to 160 cm.
	manufactured layer	160 to 180 cm.

Top Depth (cm)	Bottom Depth (cm)	Restriction Kind	Restriction Hardness
160	180	manufactured layer	noncemented

Slope (%)	Elevation (meters)	Aspect (deg)	MAAT (C)	MSAT (C)	MWAT (C)	MAP (mm)	Frost-Free Days	Drainage Class	Slope Length (meters)	Upslope Length (meters)
5.0	492.0	135						moderately well		

Ap1--0 to 4 centimeters; very dark grayish brown (10YR 3/2) crushed; 8 percent sand; 68 percent silt; 24 percent clay; moderate medium granular structure; friable; common fine roots throughout and common medium roots throughout and common coarse roots throughout; noneffervescent, by HCl, 1 normal; ; clear smooth boundary.

Ap2--4 to 21 centimeters; very dark grayish brown (10YR 3/2) crushed; moderate medium granular structure; friable; common fine roots throughout and common medium roots throughout and common coarse roots throughout; noneffervescent, by HCl, 1 normal; ; clear wavy boundary.

Bw--21 to 31 centimeters; dark yellowish brown (10YR 4/4) broken face; weak medium subangular blocky structure; friable; common fine roots throughout and common medium roots throughout and few coarse roots throughout; 2 percent fine faint irregular iron depletions in matrix and 3 percent fine faint irregular masses of oxidized iron with diffuse boundaries in matrix; noneffervescent, by HCl, 1 normal; ; clear wavy boundary.

C1--31 to 80 centimeters; brown (10YR 4/3) broken face; structureless massive structure; very firm; 2 percent fine faint irregular iron depletions in matrix and 3 percent fine faint irregular masses of oxidized iron with diffuse boundaries in matrix; noneffervescent, by HCl, 1 normal; ; clear wavy

boundary.

C2--80 to 160 centimeters; dark yellowish brown (10YR 4/4) broken face; weak fine cloddy structure, and weak medium cloddy structure; friable; 2 percent fine faint irregular iron depletions in matrix and 3 percent fine faint irregular masses of oxidized iron with diffuse boundaries in matrix; noneffervescent, by HCl, 1 normal; ; "cloddy" structure is identified as 'fritted'. "Structure created by reclamation method"; clear smooth boundary.

C3--160 to 180 centimeters; structureless massive structure; firm; 2 percent fine faint irregular iron depletions in matrix and 3 percent fine faint irregular masses of oxidized iron with diffuse boundaries in matrix; noneffervescent, by HCl, 1 normal; ; clear boundary.

USDA - NATURAL RESOURCES CONSERVATION SERVICE
PEDON DESCRIPTION

Print Date: 10/24/2016
Description Date: 10/13/2016
Describer: Sam Indorante, Dr. Kevin McSweeney

User Site ID: S2016IL145001c
Site Note:
User Pedon ID: S2016IL145001c
Pedon Note:

Soil Name as Described/Sampled: Schuline
Taxon Kind as Sampled: series
Sampled as Classification:

Soil Name as Correlated:
Taxon Kind as Correlated:
Correlated Classification:

Pedon Type:
Pedon Purpose:
Associated Soils: Schuline
Lab Source ID: Lab Pedon #:

Location Information:
Country:
State: Illinois
County: Perry
MLRA: 114B -- Southern Illinois and Indiana Thin Loess and Till Plain, Western Part
Soil Survey Area:
Map Unit:
Quad Name:

Location Description:
Legal Description: 660 feet west and 4 feet north of SE corner of Section 9, T6S, R4W, 3rd PM of Section 9, Township 6S , Range 4W

Latitude: 38 degrees 0 minutes 46.93 seconds north
Longitude: 89 degrees 32 minutes 27.49 seconds west
Datum: WGS84
UTM Zone: 16
UTM Easting: 276925.76
UTM Northing: 4210103.07

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Coordinate Conversion Tool

National Geodetic Survey

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Single Point Conversion | Multipoint Conversion | Web services | Downloads | About Conversion Tool

Convert from: ● LLH ○ SPC ○ UTM ○ XYZ ○ USNG

Enter lat-lon in decimal degrees

Lat 38.0130361111

Lon -89.5409694444

or degrees-minutes-seconds

Lat N 38-00-46.93000

Lon W 089-32-27.49000

Enter a longitude as shown in DDDMMSS.ssssss format

or drag map marker to a location of interest

Ellipsoid Height(m) 0.000

Converted coordinates will be in output datum

Input datum USSD

Output datum USSD

LLH		SPC		UTM(m)		XYZ(m)		USNG
Lat	38.0130361111 N380046.93000	Zone	N/A	Zone	UTM Zone 16	X	40311.222	16SBH7692510103
Siglat (arcsec)	±0.000000	Northing (m)	0.0	Northing	4210103.07	Y	-5031502.674	
Lon	-89.5409694444 W0893227.49000	Northing (usft)	0.0	Easting	276925.76	Z	3906389.629	
Siglon (arcsec)	±0.000000	Northing (ift)	0.0	Conv (dms)	-01 33 55.71958			
eht	0.000	Easting (m)	0.0	SF	1.00021292			
sigeht (m)	±0.000	Easting (usft)	0.0	CF	1.00021292			
		Easting (ift)	0.0					
		Conv (dms)	00 00 00.00000					
		SF	0.0					
		CF	0.0					

Physiographic Division:
Physiographic Province:
Physiographic Section:
State Physiographic Area:
Local Physiographic Area:

Geomorphic Setting: on backslope of side slope of None Assigned
Upslope Shape: linear Cross Slope Shape: linear

Primary Earth Cover:
Secondary Earth Cover:
Plant Association Name:
Existing Vegetation:

Parent Material: Mixed Peoria and Roxanna Loess with Drift (Anthropogenic) over mine spoil

Bedrock Data:

Vertical Order	Depth to Top (cm.)	Kind	Hardness	Fracture Interval	Geologic Formation

Surface Fragments:

Particle Size Control Section:

Diagnostic Features:

ochric epipedon	0 to 4 cm.
manufactured layer	0 to 160 cm.
cambic horizon	4 to 31 cm.

Top Depth (cm)	Bottom Depth (cm)	Restriction Kind	Restriction Hardness

Slope (%)	Elevation (meters)	Aspect (deg)	MAAT (C)	MSAT (C)	MWAT (C)	MAP (mm)	Frost-Free Days	Drainage Class	Slope Length (meters)	Upslope Length (meters)
3.0	495.0	135						somewhat poorly		

A--0 to 4 centimeters; dark brown (10YR 3/3) crushed; 8 percent sand; 64 percent silt; 29 percent clay; moderate fine granular structure, and moderate medium granular structure; friable; many fine roots throughout and common medium roots throughout and many very fine roots throughout; noneffervescent, by HCl, 1 normal; ; clear smooth boundary.

Bw--4 to 31 centimeters; brown (10YR 4/3) broken face; moderate fine angular blocky structure, and moderate medium angular blocky structure; friable; many fine roots throughout and few medium roots throughout and many very fine roots throughout; 2 percent fine faint irregular pale brown (10YR 6/3), moist, iron depletions in matrix and 3 percent fine faint irregular yellowish brown (10YR 5/6), moist, masses of oxidized iron with diffuse boundaries in matrix; noneffervescent, by HCl, 1 normal; ; clear smooth boundary.

C--31 to 45 centimeters; brown (10YR 4/3) broken face; weak medium angular blocky structure, and strong medium cloddy structure; friable; common fine roots throughout and common very fine roots throughout; 2 percent fine faint irregular pale brown (10YR 6/3), moist, iron depletions in matrix and 3 percent fine faint irregular yellowish brown (10YR 5/6), moist, masses of oxidized iron with diffuse boundaries in matrix; noneffervescent, by HCl, 1 normal; ; "cloddy" structure is identified as 'fritted'. "Structure created by reclamation method"; gradual smooth boundary.

C--45 to 140 centimeters; dark yellowish brown (10YR 4/4) broken face; moderate medium cloddy

structure, and moderate fine cloddy structure; friable; very few fine roots throughout and few very fine roots throughout; 2 percent fine faint irregular pale brown (10YR 6/3), moist, iron depletions in matrix and 3 percent fine faint irregular yellowish brown (10YR 5/6), moist, masses of oxidized iron with diffuse boundaries in matrix; noneffervescent, by HCl, 1 normal; ; "cloddy" structure is identified as 'fritted'. "Structure created by reclamation method"; clear smooth boundary.

C--140 to 160 centimeters; brown (10YR 4/3) broken face; structureless massive structure; firm; very few fine roots throughout and very few very fine roots throughout; 2 percent fine faint irregular pale brown (10YR 6/3), moist, iron depletions in matrix and 3 percent fine faint irregular yellowish brown (10YR 5/6), moist, masses of oxidized iron with diffuse boundaries in matrix; noneffervescent, by HCl, 1 normal; .
