SITE 1

WETLAND DELINEATION REPORT

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WETLANDS DELINEATION REPORT

Vanasse Hangen Brustlin, Inc.

Date: September 1, 2010

Project No.: 41479.56

Prepared For: Ms. Alexandria Carter
Verizon Wireless
99 East River Drive
East Hartford, Connecticut 06108

Site Location: Sportsman's Club, 146 Old Colchester Road, Waterford, Connecticut

Site Map: Alternate Site Location Map (depicts delineated wetland areas)

Inspection Date: August 10, 2010

Field Conditions: Weather: sunny, mid 70's
Snow Depth: 0 inches
General Soil Moisture: moist
Frost Depth: 0 inches

Type of Wetlands Identified and Delineated:

Connecticut Inland Wetlands and Watercourses ☒
Tidal Wetlands ☐
U.S. Army Corps of Engineers ☐

Local Regulated Upland Review Areas: Wetlands: 100 feet Watercourses: 100 feet

Field Numbering Sequence of Wetlands Boundary: WF 1-01 to 1-24, WF 1-25 to 32, WF 2-01 to 2-10
[as depicted on attached wetland sketch map]

The classification systems of the National Cooperative Soil Survey, the U.S. Department of Agriculture, Natural Resources Conservation Service, County Soil Survey Identification Legend, Connecticut Department of Environmental Protection and United States Army Corps of Engineers New England District were used in this investigation.

All established wetlands boundary lines are subject to change until officially adopted by local, state, or federal regulatory agencies.

The wetlands delineation was conducted and reviewed by:

Dean Gustafson
Professional Soil Scientist

Enclosures

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Attachments

- Wetland Delineation Field Forms
- Soil Map
- Soil Report
- Alternate Site Location Map

Wetland Delineation Field Form

Project Address:	146 Old Colchester Road Waterford, Connecticut	Project Number:	41479.56
Inspection Date:	August 10, 2010	Inspector:	Dean Gustafson, PSS
Wetland I.D.:	Wetland 1		

Field Conditions:	Weather: sunny, mid 70's	Snow Depth: 0 inches
	General Soil Moisture: moist	Frost Depth: 0 inches
Type of Wetland Delineation:	Connecticut ☒	
	ACOE ☐	
	Tidal ☐	
Field Numbering Sequence: WF 1-01 to 1-24, WF 1-25 to 1-32		

WETLAND HYDROLOGY:

NONTIDAL

Intermittently Flooded ☐	Artificially Flooded ☐	Permanently Flooded ☐
Semipermanently Flooded ☐	Seasonally Flooded ☒	Temporarily Flooded ☐
Permanently Saturated ☐	Seasonally Saturated – seepage ☒	Seasonally Saturated - perched ☐
Comments:		

TIDAL

Subtidal ☐	Regularly Flooded ☐	Irregularly Flooded ☐
Irregularly Flooded ☐		
Comments: N/A		

WETLAND TYPE:

SYSTEM:

Estuarine ☐	Riverine ☐	Palustrine ☒
Lacustrine ☐	Marine ☐	
Comments:		

CLASS:

Emergent ☐	Scrub-shrub ☐	Forested ☒
Open Water ☐	Disturbed ☐	Wet Meadow ☐
Comments:		

WATERCOURSE TYPE:

Perennial ☐	Intermittent ☒	Tidal ☐
Comments: channel forms on downstream side of existing gravel road culvert crossing		

SPECIAL AQUATIC HABITAT:

Vernal Pool ☒	Other ☐	
Comments: potential vernal pool identified within interior of WF 1-01 to 1-24 system; defined by physical characteristics (dry at time of inspection).		

Wetland Delineation Field Form (Cont.)

MAPPED SOILS:

SOIL SERIES (Map Unit Symbol)	WET	UP	NRCS MAPPED	FIELD IDD/ CONFIRMED
Ridgebury, Leicester, and Whitman soils, extremely stony (3)	☒	☐	☒	☒
Charlton-Chatfield complex (73)	☐	☒	☒	☒
Hollis-Chatfield-Rock outcrop complex (75)	☐	☒	☒	☒
	☐	☐	☐	☐

DOMINANT PLANTS:

red maple (*Acer rubrum*)	winterberry (*Ilex verticillata*)
pepperbush (*Clethra alnifolia*)	sphagnum moss (*Sphagnum spp.)*
black gum (*Nyssa nigra*)	cinnamon fern (*Osmunda cinnamomea)*
highbush blueberry (*Vaccinium corymbosum*)	New York fern *(Thelypteris noveboracensis)*
sensitive fern (*Onoclea sensibilis*)	mountain laurel (*Kalmia latifolia)*

WETLAND NARRATIVE:

Wetland 1 is a forested palustrine wetland located in the interior of the town-owned Sportsman's Club property in proximity to two alternate proposed wireless telecommunications facility locations. An existing gravel road provides access to the proposed facility's locations from Old Colchester Road, bisecting this wetland feature. The existing road crossing utilizes a 15-inch corrugated metal pipe to convey flows from the main wetland area (WF 1-01 to 1-24) under the road to the narrow portion of the wetland (WF 1-25 to 1-32). A possible vernal pool was identified within the interior of the main portion of the identified wetland system. The possible vernal pool was identified based on physical characteristics (e.g., confined basin, no permanent outlet, etc.) since it was dry at the time of the site inspection. This wetland system generally drains northwest to southeast as a hillside seep converging with a larger forested wetland system to the southeast.

Wetland Delineation Field Form

Project Address:	146 Old Colchester Road Waterford, Connecticut	Project Number:	41479.56
Inspection Date:	August 10, 2010	Inspector:	Dean Gustafson, PSS
Wetland I.D.:	Wetland 2		

Field Conditions:	Weather: sunny, mid 70's	Snow Depth: 0 inches
	General Soil Moisture: moist	Frost Depth: 0 inches
Type of Wetland Delineation:	Connecticut ☒	
	ACOE ☐	
	Tidal ☐	
Field Numbering Sequence: WF 2-01 to 2-10		

WETLAND HYDROLOGY:

NONTIDAL

Intermittently Flooded ☐	Artificially Flooded ☐	Permanently Flooded ☐
Semipermanently Flooded ☐	Seasonally Flooded ☐	Temporarily Flooded ☐
Permanently Saturated ☐	Seasonally Saturated – seepage ☒	Seasonally Saturated - perched ☐
Comments:		

TIDAL

Subtidal ☐	Regularly Flooded ☐	Irregularly Flooded ☐
Irregularly Flooded ☐		
Comments: N/A		

WETLAND TYPE:

SYSTEM:

Estuarine ☐	Riverine ☐	Palustrine ☒
Lacustrine ☐	Marine ☐	
Comments:		

CLASS:

Emergent ☐	Scrub-shrub ☒	Forested ☒
Open Water ☐	Disturbed ☐	Wet Meadow ☐
Comments:		

WATERCOURSE TYPE:

Perennial ☐	Intermittent ☒	Tidal ☐
Comments:		

SPECIAL AQUATIC HABITAT:

Vernal Pool ☐	Other ☐	
Comments: N/A		

Wetland Delineation Field Form (Cont.)

MAPPED SOILS:

SOIL SERIES (Map Unit Symbol)	WET	UP	NRCS MAPPED	FIELD IDD/ CONFIRMED
Ridgebury, Leicester, and Whitman soils, extremely stony (3)	☒	☐	☒	☒
Charlton-Chatfield complex (73)	☐	☒	☒	☒
Hollis-Chatfield-Rock outcrop complex (75)	☐	☒	☒	☒
	☐	☐	☐	☐

DOMINANT PLANTS:

red maple (*Acer rubrum*)	cinnamon fern (*Osmunda cinnamomea)*
sensitive fern (*Onoclea sensibilis*)	New York fern *(Thelypteris noveboracensis)*
witchhazel (*Hamamelis*)	mountain laurel (*Kalmia latifolia)*

WETLAND NARRATIVE:

Wetland 2 is a headwater seep and narrow wetland system located near Old Colchester Road that flows to the south into a larger forested wetland system that Wetland 1 also feeds into. This wetland feature is a narrow wetland corridor dominated by a relatively small intermittent watercourse with a well defined and sometimes braided stony channel. No standing or flowing water was observed during site inspection.

Soil Map—State of Connecticut
(Sportman's Club - 146 Old Colchester Road, Waterford, CT)

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Units

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other

Special Line Features
- Gully
- Short Steep Slope
- Other

Political Features
- Cities

Water Features
- Oceans
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

MAP INFORMATION

Map Scale: 1:9,000 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:12,000.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 18N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: State of Connecticut
Survey Area Data: Version 7, Dec 3, 2009

Date(s) aerial images were photographed: 7/17/2006

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

State of Connecticut (CT600)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
3	Ridgebury, Leicester, and Whitman soils, extremely stony	30.7	9.0%
18	Catden and Freetown soils	4.9	1.5%
29B	Agawam fine sandy loam, 3 to 8 percent slopes	0.0	0.0%
32A	Haven and Enfield soils, 0 to 3 percent slopes	4.4	1.3%
38C	Hinckley gravelly sandy loam, 3 to 15 percent slopes	11.8	3.5%
51B	Sutton fine sandy loam, 2 to 8 percent slopes, very stony	1.8	0.5%
60B	Canton and Charlton soils, 3 to 8 percent slopes	5.4	1.6%
60D	Canton and Charlton soils, 15 to 25 percent slopes	1.5	0.4%
61B	Canton and Charlton soils, 3 to 8 percent slopes, very stony	32.2	9.5%
61C	Canton and Charlton soils, 8 to 15 percent slopes, very stony	5.2	1.5%
62C	Canton and Charlton soils, 3 to 15 percent slopes, extremely stony	45.1	13.3%
62D	Canton and Charlton soils, 15 to 35 percent slopes, extremely stony	3.5	1.0%
73C	Charlton-Chatfield complex, 3 to 15 percent slopes, very rocky	44.8	13.2%
73E	Charlton-Chatfield complex, 15 to 45 percent slopes, very rocky	57.2	16.8%
75C	Hollis-Chatfield-Rock outcrop complex, 3 to 15 percent slopes	3.1	0.9%
75E	Hollis-Chatfield-Rock outcrop complex, 15 to 45 percent slopes	1.0	0.3%
76E	Rock outcrop-Hollis complex, 3 to 45 percent slopes	8.2	2.4%
85B	Paxton and Montauk fine sandy loams, 3 to 8 percent slopes, very stony	3.2	1.0%
103	Rippowam fine sandy loam	4.4	1.3%
306	Udorthents-Urban land complex	8.6	2.5%
W	Water	63.0	18.5%
Totals for Area of Interest		**340.1**	**100.0%**

Map Unit Description (Brief)

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the selected area. The map unit descriptions in this report, along with the maps, can be used to determine the composition and properties of a unit. A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

The "Map Unit Description (Brief)" report gives a brief, general description of the major soils that occur in a map unit. Descriptions of nonsoil (miscellaneous areas) and minor map unit components may or may not be included. This description is written by the local soil scientists responsible for the respective soil survey area data. A more detailed description can be generated by the "Map Unit Description" report.

Additional information about the map units described in this report is available in other Soil Data Mart reports, which give properties of the soils and the limitations, capabilities, and potentials for many uses. Also, the narratives that accompany the Soil Data Mart reports define some of the properties included in the map unit descriptions.

Report—Map Unit Description (Brief)

State of Connecticut

Description Category: SOI

Map Unit: 3—Ridgebury, Leicester, and Whitman soils, extremely stony

Ridgebury, Leicester And Whitman Soils, Extremely Stony This map unit is in the New England and Eastern New York Upland, Southern Part Major Land Resource Area. The mean annual precipitation is 37 to 50 inches (940 to 1270 millimeters) and the average annual air temperature is 45 to 52 degrees F. (7 to 11 degrees C.) This map unit is 40 percent Ridgebury soils, 35 percent Leicester soils, 15 percent Whitman soils. 10 percent minor components. Ridgebury soils This component occurs on upland drainageway and depression landforms. The parent material consists of lodgement till derived from granite, schist, and gneiss. The slope ranges from 0 to 5 percent and the runoff class is very low. The depth to a restrictive feature is 20 to 30 inches to densic material. The drainage class is poorly drained. The slowest permeability within 60 inches is about 0.00 in/hr (very slow), with about 2.5 inches (low) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is about 3 inches. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 7s Typical Profile: 0 to 1 inches; slightly decomposed plant material 1 to 5 inches; fine sandy loam 5 to 14 inches; fine sandy loam 14 to 21 inches; fine sandy loam 21 to 60 inches; sandy loam Leicester soils This component occurs on upland drainageway and depression landforms. The parent material consists of melt-out till derived from granite, schist, and gneiss. The slope ranges from 0 to 5 percent and the runoff class is very low. The depth to a restrictive feature is greater than 60 inches. The drainage class is poorly drained. The slowest permeability within 60 inches is about 0.57 in/hr (moderate), with about 7.4 inches (high) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is about 9 inches. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 7s Typical Profile: 0 to 1 inches; moderately decomposed plant material 1 to 7 inches; fine sandy loam 7 to 10 inches; fine sandy loam 10 to 18 inches; fine sandy loam 18 to 24 inches; fine sandy loam 24 to 43 inches; gravelly fine sandy loam 43 to 65 inches; gravelly fine sandy loam Whitman soils This component occurs on upland drainageway and depression landforms. The parent material consists of lodgement till derived from gneiss, schist, and granite. The slope ranges from 0 to 2 percent and the runoff class is very low. The depth to a restrictive feature is 12 to 20 inches to densic material. The drainage class is very poorly drained. The slowest permeability within 60 inches is about 0.00 in/hr (very slow), with about 1.9 inches (very low) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is occasional. The minimum depth to a seasonal water table, when present, is about 0 inches. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 7s Typical Profile: 0 to 1 inches; slightly decomposed plant material 1 to 9 inches; fine sandy loam 9 to 16 inches; fine sandy loam 16 to 22 inches; fine sandy loam 22 to 60 inches; fine sandy loam

Map Unit: 18—Catden and Freetown soils

Catden And Freetown Soils This map unit is in the New England and Eastern New York Upland, Southern Part Major Land Resource Area. The mean annual precipitation is 32 to 47 inches (813 to 1194 millimeters) and the average annual air temperature is 45 to 52 degrees F. (7 to 11 degrees C.) This map unit is 40 percent Catden soils, 40 percent Freetown soils. 20 percent minor components. Catden soils This component occurs on depression landforms. The parent material consists of woody and herbaceous organic material. The slope ranges from 0 to 2 percent and the runoff class is negligible. The depth to a restrictive feature is greater than 60 inches. The drainage class is very poorly drained. The available water capacity is about 24.4 inches (very high). The weighted average shrink-swell potential in 10 to 60 inches is about 10.0 LEP (very high). The flooding frequency for this component is rare. The ponding hazard is frequent. The minimum depth to a seasonal water table, when present, is about 0 inches. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 5w Typical Profile: 0 to 2 inches; muck 2 to 18 inches; muck 18 to 47 inches; muck 47 to 49 inches; muck 49 to 61 inches; muck Freetown soils This component occurs on depression landforms. The parent material consists of woody and herbaceous organic material. The slope ranges from 0 to 2 percent and the runoff class is negligible. The depth to a restrictive feature is greater than 60 inches. The drainage class is very poorly drained. The available water capacity is about 33.1 inches (very high). The weighted average shrink-swell potential in 10 to 60 inches is about 10.0 LEP (very high). The flooding frequency for this component is rare. The ponding hazard is frequent. The minimum depth to a seasonal water table, when present, is about 0 inches. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 5w Typical Profile: 0 to 4 inches; peat 4 to 10 inches; peat 10 to 22 inches; muck 22 to 35 inches; muck 35 to 41 inches; muck 41 to 55 inches; muck 55 to 71 inches; muck 71 to 91 inches; muck

Map Unit: 29B—Agawam fine sandy loam, 3 to 8 percent slopes

Agawam Fine Sandy Loam, 3 To 8 Percent Slopes This map unit is in the Connecticut Valley New England and Eastern New York Upland, Southern Part Major Land Resource Area. The mean annual precipitation Is 32 to 50 inches (813 to 1270 millimeters) and the average annual air temperature is 45 to 50 degrees F. (7 to 10 degrees C.) This map unit is 80 percent Agawam soils. 20 percent minor components. Agawam soils This component occurs on valley and outwash plain terrace landforms. The parent material consists of eolian deposits over glaciofluvial deposits derived from schist, granite, and gneiss. The slope ranges from 3 to 8 percent and the runoff class is low. The depth to a restrictive feature is greater than 60 inches. The drainage lass is well drained. The slowest permeability within 60 inches is about 1.98 in/hr (moderately rapid), with about 4.8 inches (moderate) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is greater than 6 feet. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 2e Typical Profile: 0 to 8 inches; fine sandy loam 8 to 14 inches; fine sandy loam 14 to 24 inches; fine sandy loam 24 to 60 inches; stratified very gravelly coarse sand to fine sand

Map Unit: 32A—Haven and Enfield soils, 0 to 3 percent slopes

Haven And Enfield Soils, 0 To 3 Percent Slopes This map unit is in the Connecticut Valley New England and Eastern New York Upland, Southern Part Major Land Resource Area. The mean annual precipitation Is 40 to 50 inches (1016 to 1270 millimeters) and the average annual air temperature is 45 to 55 degrees F. (7 to 13 degrees C.) This map unit is 60 percent Haven soils, 25 percent Enfield soils. 15 percent minor components. Haven soils This component occurs on valley outwash plain and terrace landforms. The parent material consists of eolian deposits over glaciofluvial deposits derived from schist, granite, and gneiss. The slope ranges from 0 to 3 percent and the runoff class is low. The depth to a restrictive feature is greater than 60 inches. The drainage class is well drained. The slowest permeability within 60 inches is about 0.57 in/hr (moderate), with about 5.1 inches (moderate) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is greater than 6 feet. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 1 Typical Profile: 0 to 7 inches; silt loam 7 to 14 inches; silt loam 14 to 20 inches; silt loam 20 to 24 inches; fine sandy loam 24 to 60 inches; stratified very gravelly sand to gravelly fine sand Enfield soils This component occurs on valley outwash plain and terrace landforms. The parent material consists of eolian deposits over glaciofluvial deposits derived from schist, granite, and gneiss. The slope ranges from 0 to 3 percent and the runoff class is low. The depth to a restrictive feature is greater than 60 inches. The drainage class is well drained. The slowest permeability within 60 inches is about 0.57 in/hr (moderate), with about 6.8 inches (high) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is greater than 6 feet. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 1 Typical Profile: 0 to 3 inches; slightly decomposed plant material 3 to 4 inches; moderately decomposed plant material 4 to 12 inches; silt loam 12 to 20 inches; silt loam 20 to 26 inches; silt loam 26 to 30 inches; silt loam 30 to 37 inches; stratified coarse sand to very gravelly loamy sand 37 to 65 inches; stratified very gravelly loamy sand to coarse sand

Map Unit: 38C—Hinckley gravelly sandy loam, 3 to 15 percent slopes

Hinckley Gravelly Sandy Loam, 3 To 15 Percent Slopes This map unit is in the New England and Eastern New York Upland, Southern Part Major Land Resource Area. The mean annual precipitation is 40 to 50 inches (1016 to 1270 millimeters) and the average annual air temperature is 45 to 55 degrees F. (7 to 13 degrees C.) This map unit is 80 percent Hinckley soils. 20 percent minor components. Hinckley soils This component occurs on valley outwash plain, terrace, kame, and esker landforms. The parent material consists of sandy and gravelly glaciofluvial deposits derived from schist, granite, and gneiss. The slope ranges from 3 to 15 percent and the runoff class is low. The depth to a restrictive feature is greater than 60 inches. The drainage class is excessively drained. The slowest permeability within 60 inches is about 5.95 in/hr (rapid), with about 2.3 inches (very low) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is greater than 6 feet. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 4e Typical Profile: 0 to 8 inches; gravelly sandy loam 8 to 20 inches; very gravelly loamy sand 20 to 27 inches; very gravelly sand 27 to 42 inches; stratified cobbly coarse sand to extremely gravelly sand 42 to 60 inches; stratified cobbly coarse sand to extremely gravelly sand

Map Unit: 51B—Sutton fine sandy loam, 2 to 8 percent slopes, very stony

Sutton Fine Sandy Loam, 2 To 8 Percent Slopes, Very Stony This map unit is in the New England and Eastern New York Upland, Southern Part Major Land Resource Area. The mean annual precipitation is 37 to 49 inches (940 to 1244 millimeters) and the average annual air temperature is 45 to 52 degrees F. (7 to 11 degrees C.) This map unit is 80 percent Sutton soils. 20 percent minor components. Sutton soils This component occurs on upland hill landforms. The parent material consists of melt-out till derived from granite, gneiss, and schist. The slope ranges from 2 to 8 percent and the runoff class is very low. The depth to a restrictive feature is greater than 60 inches. The drainage class is moderately well drained. The slowest permeability within 60 inches is about 0.57 in/hr (moderate), with about 7.3 inches (high) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is about 24 inches. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 6s Typical Profile: 0 to 1 inches; moderately decomposed plant material 1 to 6 inches; fine sandy loam 6 to 12 inches; fine sandy loam 12 to 24 inches; fine sandy loam 24 to 28 inches; fine sandy loam 28 to 36 inches; gravelly fine sandy loam 36 to 65 inches; gravelly sandy loam

Map Unit: 60B—Canton and Charlton soils, 3 to 8 percent slopes

Canton And Charlton Soils, 3 To 8 Percent Slopes This map unit is in the New England and Eastern New York Upland, Southern Part Major Land Resource Area. The mean annual precipitation is 37 to 49 inches (940 to 1244 millimeters) and the average annual air temperature is 45 to 52 degrees F. (7 to 11 degrees C.) This map unit is 45 percent Canton soils, 35 percent Charlton soils. 20 percent minor components. Canton soils This component occurs on upland hill landforms. The parent material consists of melt-out till derived from schist, granite, and gneiss. The slope ranges from 3 to 8 percent and the runoff class is low. The depth to a restrictive feature is greater than 60 inches. The drainage class is well drained. The slowest permeability within 60 inches is about 1.98 in/hr (moderately rapid), with about 5.6 inches (high) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is greater than 6 feet. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 2e Typical Profile: 0 to 1 inches; moderately decomposed plant material 1 to 3 inches; gravelly fine sandy loam 3 to 15 inches; gravelly loam 15 to 24 inches; gravelly loam 24 to 30 inches; gravelly loam 30 to 60 inches; very gravelly loamy sand Charlton soils This component occurs on upland hill landforms. The parent material consists of melt-out till derived from granite, schist, and gneiss. The slope ranges from 3 to 8 percent and the runoff class is low. The depth to a restrictive feature is greater than 60 inches. The drainage class is well drained. The slowest permeability within 60 inches is about 0.57 in/hr (moderate), with about 6.4 inches (high) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is greater than 6 feet. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 2e Typical Profile: 0 to 4 inches; fine sandy loam 4 to 7 inches; fine sandy loam 7 to 19 inches; fine sandy loam 19 to 27 inches; gravelly fine sandy loam 27 to 65 inches; gravelly fine sandy loam

Map Unit: 60D—Canton and Charlton soils, 15 to 25 percent slopes

Canton And Charlton Soils, 15 To 25 Percent Slopes This map unit is in the New England and Eastern New York Upland, Southern Part Major Land Resource Area. The mean annual precipitation is 37 to 49 inches (940 to 1244 millimeters) and the average annual air temperature is 45 to 52 degrees F. (7 to 11 degrees C.) This map unit is 45 percent Canton soils 35, percent Charlton soils. 20 percent minor components Canton soils This component occurs on upland hill landforms. The parent material consists of melt-out till derived from schist, granite, and gneiss. The slope ranges from 15 to 25 percent and the runoff class is low. The depth to a restrictive feature is greater than 60 inches. The drainage class is well drained. The slowest permeability within 60 inches is about 1.98 in/hr (moderately rapid), with about 5.6 inches (high) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is greater than 6 feet. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 4e Typical Profile: 0 to 1 inches; moderately decomposed plant material 1 to 3 inches; gravelly fine sandy loam 3 to 15 inches; gravelly loam 15 to 24 inches; gravelly loam 24 to 30 inches; gravelly loam 30 to 60 inches; very gravelly loamy sand Charlton soils This component occurs on upland hill landforms. The parent material consists of melt-out till derived from granite, schist, and gneiss. The slope ranges from 15 to 25 percent and the runoff class is low. The depth to a restrictive feature is greater than 60 inches. The drainage class is well drained. The slowest permeability within 60 inches is about 0.57 in/hr (moderate), with about 6.4 inches (high) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is greater than 6 feet. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 4e Typical Profile: 0 to 4 inches; fine sandy loam 4 to 7 inches; fine sandy loam 7 to 19 inches; fine sandy loam 19 to 27 inches; gravelly fine sandy loam 27 to 65 inches; gravelly fine sandy loam

Map Unit: 61B—Canton and Charlton soils, 3 to 8 percent slopes, very stony

Canton And Charlton Soils, 3 To 8 Percent Slopes, Very Stony This map unit is in the New England and Eastern New York Upland, Southern Part Major Land Resource Area. The mean annual precipitation is 37 to 49 inches (940 to 1244 millimeters) and the average annual air temperature is 45 to 52 degrees F. (7 to 11 degrees C.) This map unit is 45 percent Canton soils, 35 percent Charlton soils. 20 percent minor components Canton soils This component occurs on upland hill landforms. The parent material consists of melt-out till derived from schist, granite, and gneiss. The slope ranges from 3 to 8 percent and the runoff class is low. The depth to a restrictive feature is greater than 60 inches. The drainage class is well drained. The slowest permeability within 60 inches is about 1.98 in/hr (moderately rapid), with about 5.6 inches (high) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is greater than 6 feet. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 6s Typical Profile: 0 to 1 inches; moderately decomposed plant material 1 to 3 inches; gravelly fine sandy loam 3 to 15 inches; gravelly loam 15 to 24 inches; gravelly loam 24 to 30 inches; gravelly loam 30 to 60 inches; very gravelly loamy sand Charlton soils This component occurs on upland hill landforms. The parent material consists of melt-out till derived from granite, schist, and gneiss. The slope ranges from 3 to 8 percent and the runoff class is low. The depth to a restrictive feature is greater than 60 inches. The drainage class is well drained. The slowest permeability within 60 inches is about 0.57 in/hr (moderate), with about 6.4 inches (high) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is greater than 6 feet. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 6s Typical Profile: 0 to 4 inches; fine sandy loam 4 to 7 inches; fine sandy loam 7 to 19 inches; fine sandy loam 19 to 27 inches; gravelly fine sandy loam 27 to 65 inches; gravelly fine sandy loam

Map Unit: 61C—Canton and Charlton soils, 8 to 15 percent slopes, very stony

Canton And Charlton Soils, 8 To 15 Percent Slopes, Very Stony This map unit is in the New England and Eastern New York Upland, Southern Part Major Land Resource Area. The mean annual precipitation is 37 to 49 inches (940 to 1244 millimeters) and the average annual air temperature is 45 to 52 degrees F. (7 to 11 degrees C.) This map unit is 45 percent Canton soils, 35 percent Charlton soils. 20 percent minor components Canton soils This component occurs on upland hill landforms. The parent material consists of melt-out till derived from schist, granite, and gneiss. The slope ranges from 8 to 15 percent and the runoff class is low. The depth to a restrictive feature is greater than 60 inches. The drainage class is well drained. The slowest permeability within 60 inches is about 1.98 in/hr (moderately rapid), with about 5.6 inches (high) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is greater than 6 feet. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 6s Typical Profile: 0 to 1 inches; moderately decomposed plant material 1 to 3 inches; gravelly fine sandy loam 3 to 15 inches; gravelly loam 15 to 24 inches; gravelly loam 24 to 30 inches; gravelly loam 30 to 60 inches; very gravelly loamy sand Charlton soils This component occurs on upland hill landforms. The parent material consists of melt-out till derived from granite, schist, and gneiss. The slope ranges from 8 to 15 percent and the runoff class is low. The depth to a restrictive feature is greater than 60 inches. The drainage class is well drained. The slowest permeability within 60 inches is about 0.57 in/hr (moderate), with about 6.4 inches (high) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is greater than 6 feet. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 6s Typical Profile: 0 to 4 inches; fine sandy loam 4 to 7 inches; fine sandy loam 7 to 19 inches; fine sandy loam 19 to 27 inches; gravelly fine sandy loam 27 to 65 inches; gravelly fine sandy loam

Map Unit: 62C—Canton and Charlton soils, 3 to 15 percent slopes, extremely stony

Canton And Charlton Soils, 3 To 15 Percent Slopes, Extremely Stony This map unit is in the New England and Eastern New York Upland, Southern Part Major Land Resource Area. The mean annual precipitation is 37 to 49 inches (940 to 1244 millimeters) and the average annual air temperature is 45 to 52 degrees F. (7 to 11 degrees C.) This map unit is 45 percent Canton soils, 35 percent Charlton soils. 20 percent minor components. Canton soils This component occurs on upland hill landforms. The parent material consists of melt-out till derived from schist, granite, and gneiss. The slope ranges from 3 to 15 percent and the runoff class is low. The depth to a restrictive feature is greater than 60 inches. The drainage class is well drained. The slowest permeability within 60 inches is about 1.98 in/hr (moderately rapid), with about 5.6 inches (high) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is greater than 6 feet. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 7s Typical Profile: 0 to 1 inches; moderately decomposed plant material 1 to 3 inches; gravelly fine sandy loam 3 to 15 inches; gravelly loam 15 to 24 inches; gravelly loam 24 to 30 inches; gravelly loam 30 to 60 inches; very gravelly loamy sand Charlton soils This component occurs on upland hill landforms. The parent material consists of melt-out till derived from granite, schist, and gneiss. The slope ranges from 3 to 15 percent and the runoff class is low. The depth to a restrictive feature is greater than 60 inches. The drainage class is well drained. The slowest permeability within 60 inches is about 0.57 in/hr (moderate), with about 6.4 inches (high) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is greater than 6 feet. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 7s Typical Profile: 0 to 4 inches; fine sandy loam 4 to 7 inches; fine sandy loam 7 to 19 inches; fine sandy loam 19 to 27 inches; gravelly fine sandy loam 27 to 65 inches; gravelly fine sandy loam

Map Unit: 62D—Canton and Charlton soils, 15 to 35 percent slopes, extremely stony

Canton And Charlton Soils, 15 To 35 Percent Slopes, Extremely Stony This map unit is in the New England and Eastern New York Upland, Southern Part Major Land Resource Area. The mean annual precipitation is 37 to 49 inches (940 to 1244 millimeters) and the average annual air temperature is 45 to 52 degrees F. (7 to 11 degrees C.) This map unit is 45 percent Canton soils, 35 percent Charlton soils. 20 percent minor components Canton soils This component occurs on upland hill landforms. The parent material consists of melt-out till derived from schist, granite, and gneiss. The slope ranges from 15 to 35 percent and the runoff class is medium. The depth to a restrictive feature is greater than 60 inches. The drainage class is well drained. The slowest permeability within 60 inches is about 1.98 in/hr (moderately rapid), with about 5.6 inches (high) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is greater than 6 feet. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 7s Typical Profile: 0 to 1 inches; moderately decomposed plant material 1 to 3 inches; gravelly fine sandy loam 3 to 15 inches; gravelly loam 15 to 24 inches; gravelly loam 24 to 30 inches; gravelly loam 30 to 60 inches; very gravelly loamy sand Charlton soils This component occurs on upland hill landforms. The parent material consists of melt-out till derived from granite, schist, and gneiss. The slope ranges from 15 to 35 percent and the runoff class is medium. The depth to a restrictive feature is greater than 60 inches. The drainage class is well drained. The slowest permeability within 60 inches is about 0.57 in/hr (moderate), with about 6.4 inches (high) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is greater than 6 feet. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 7s Typical Profile: 0 to 4 inches; fine sandy loam 4 to 7 inches; fine sandy loam 7 to 19 inches; fine sandy loam 19 to 27 inches; gravelly fine sandy loam 27 to 65 inches; gravelly fine sandy loam

Map Unit: 73C—Charlton-Chatfield complex, 3 to 15 percent slopes, very rocky

Charlton-Chatfield Complex, 3 To 15 Percent Slopes, Very Rocky This map unit is in the New England and Eastern New York Upland, Southern Part Major Land Resource Area. The mean annual precipitation is 37 to 49 inches (940 to 1244 millimeters) and the average annual air temperature is 45 to 52 degrees F. (7 to 11 degrees C.) This map unit is 45 percent Charlton soils, 30 percent Chatfield soils. 25 percent minor components. Charlton soils This component occurs on upland hill landforms. The parent material consists of melt-out till derived from granite, schist and gneiss. The slope ranges from 3 to 15 percent and the runoff class is low. The depth to a restrictive feature is greater than 60 inches. The drainage class is well drained. The slowest permeability within 60 inches is about 0.57 in/hr (moderate), with about 6.4 inches (high) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is greater than 6 feet. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 6s Typical Profile: 0 to 4 inches; fine sandy loam 4 to 7 inches; fine sandy loam 7 to 19 inches; fine sandy loam 19 to 27 inches; gravelly fine sandy loam 27 to 65 inches; gravelly fine sandy loam Chatfield soils This component occurs on upland hill and ridge landforms. The parent material consists of melt-out till derived from gneiss, granite, and schist. The slope ranges from 3 to 15 percent and the runoff class is low. The depth to a restrictive feature is 20 to 40 inches to bedrock (lithic). The drainage class is well drained. The slowest permeability within 60 inches is about 0.57 in/hr (moderate), with about 3.3 inches (moderate) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is greater than 6 feet. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 6s Typical Profile: 0 to 1 inches; highly decomposed plant material 1 to 6 inches; gravelly fine sandy loam 6 to 15 inches; gravelly fine sandy loam 15 to 29 inches; gravelly fine sandy loam 29 to 36 inches; unweathered bedrock

Map Unit: 73E—Charlton-Chatfield complex, 15 to 45 percent slopes, very rocky

Charlton-Chatfield Complex, 15 To 45 Percent Slopes, Very Rocky This map unit is in the New England and Eastern New York Upland, Southern Part Major Land Resource Area. The mean annual precipitation is 37 to 49 inches (940 to 1244 millimeters) and the average annual air temperature is 45 to 52 degrees F. (7 to 11 degrees C.) This map unit is 45 percent Charlton soils, 30 percent Chatfield soils. 25 percent minor components. Charlton soils This component occurs on upland hill landforms. The parent material consists of melt-out till derived from granite, schist, and gneiss. The slope ranges from 15 to 45 percent and the runoff class is high. The depth to a restrictive feature is greater than 60 inches. The drainage class is well drained. The slowest permeability within 60 inches is about 0.57 in/hr (moderate), with about 6.4 inches (high) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is greater than 6 feet. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 7s Typical Profile: 0 to 4 inches; fine sandy loam 4 to 7 inches; fine sandy loam 7 to 19 inches; fine sandy loam 19 to 27 inches; gravelly fine sandy loam 27 to 65 inches; gravelly fine sandy loam Chatfield soils This component occurs on upland hill and ridge landforms. The parent material consists of melt-out till derived from gneiss, granite, and schist. The slope ranges from 15 to 45 percent and the runoff class is high. The depth to a restrictive feature is 20 to 40 inches to bedrock (lithic). The drainage class is well drained. The slowest permeability within 60 inches is about 0.57 in/hr (moderate), with about 3.3 inches (moderate) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is greater than 6 feet. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 7s Typical Profile: 0 to 1 inches; highly decomposed plant material 1 to 6 inches; gravelly fine sandy loam 6 to 15 inches; gravelly fine sandy loam 15 to 29 inches; gravelly fine sandy loam 29 to 36 inches; unweathered bedrock

Map Unit: 75C—Hollis-Chatfield-Rock outcrop complex, 3 to 15 percent slopes

Hollis-Chatfield-Rock Outcrop Complex, 3 To 15 Percent Slopes This map unit is in the New England and Eastern New York Upland, Southern Part Major Land Resource Area. The mean annual precipitation is 37 to 49 inches (940 to 1244 millimeters) and the average annual air temperature is 45 to 54 degrees F. (7 to 12 degrees C.) This map unit is 35 percent Hollis soils, 30 percent Chatfield soils, 15 percent Rock Outcrop. 20 percent minor components. Hollis soils This component occurs on upland hill and ridge landforms. The parent material consists of melt-out till derived from granite, gneiss, and schist. The slope ranges from 3 to 15 percent and the runoff class is low. The depth to a restrictive feature is 10 to 20 inches to bedrock (lithic). The drainage class is somewhat excessively drained. The slowest permeability within 60 inches is about 0.57 in/hr (moderate), with about 1.8 inches (very low) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is greater than 6 feet. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 6s Typical Profile: 0 to 1 inches; highly decomposed plant material 1 to 6 inches; gravelly fine sandy loam 6 to 9 inches; channery fine sandy loam 9 to 15 inches; gravelly fine sandy loam 15 to 25 inches; unweathered bedrock Chatfield soils This component occurs on upland hill and ridge landforms. The parent material consists of melt-out till derived from gneiss, granite, and schist. The slope ranges from 3 to 15 percent and the runoff class is low. The depth to a restrictive feature is 20 to 40 inches to bedrock (lithic). The drainage class is well drained. The slowest permeability within 60 inches is about 0.57 in/hr (moderate), with about 3.3 inches (moderate) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is greater than 6 feet. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 6s Typical Profile: 0 to 1 inches; highly decomposed plant material 1 to 6 inches; gravelly fine sandy loam 6 to 15 inches; gravelly fine sandy loam 15 to 29 inches; gravelly fine sandy loam 29 to 36 inches; unweathered bedrock Rock Outcrop This component occurs on bedrock controlled landforms. The slope ranges from 3 to 15 percent and the runoff class is very high. The Nonirrigated Land Capability Class is 8

Map Unit: 75E—Hollis-Chatfield-Rock outcrop complex, 15 to 45 percent slopes

Hollis-Chatfield-Rock Outcrop Complex, 15 To 45 Percent Slopes This map unit is in the New England and Eastern New York Upland, Southern Part Major Land Resource Area. The mean annual precipitation is 37 to 49 inches (940 to 1244 millimeters) and the average annual air temperature is 45 to 54 degrees F. (7 to 12 degrees C.) This map unit is 35 percent Hollis soils, 30 percent Chatfield soils, 15 percent Rock Outcrop. 20 percent minor components. Hollis soils This component occurs on upland hill and ridge landforms. The parent material consists of melt-out till derived from granite, gneiss, and schist. The slope ranges from 15 to 45 percent and the runoff class is high. The depth to a restrictive feature is 10 to 20 inches to bedrock (lithic). The drainage class is somewhat excessively drained. The slowest permeability within 60 inches is about 0.57 in/hr (moderate), with about 1.8 inches (very low) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is greater than 6 feet. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 7s Typical Profile: 0 to 1 inches; highly decomposed plant material 1 to 6 inches; gravelly fine sandy loam 6 to 9 inches; channery fine sandy loam 9 to 15 inches; gravelly fine sandy loam 15 to 25 inches; unweathered bedrock Chatfield soils This component occurs on upland hill and ridge landforms. The parent material consists of melt-out till derived from gneiss, granite, and schist. The slope ranges from 15 to 45 percent and the runoff class is high. The depth to a restrictive feature is 20 to 40 inches to bedrock (lithic). The drainage class is well drained. The slowest permeability within 60 inches is about 0.57 in/hr (moderate), with about 3.3 inches (moderate) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is greater than 6 feet. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 7s Typical Profile: 0 to 1 inches; highly decomposed plant material 1 to 6 inches; gravelly fine sandy loam 6 to 15 inches; gravelly fine sandy loam 15 to 29 inches; gravelly fine sandy loam 29 to 36 inches; unweathered bedrock Rock Outcrop This component occurs on bedrock controlled landforms. The slope ranges from 15 to 45 percent and the runoff class is very high. The Nonirrigated Land Capability Class is 8

Map Unit: 76E—Rock outcrop-Hollis complex, 3 to 45 percent slopes

Rock Outcrop-Hollis Complex, 3 To 45 Percent Slopes This map unit is in the New England and Eastern New York Upland, Southern Part Major Land Resource Area. The mean annual precipitation is 37 to 49 inches (940 to 1244 millimeters) and the average annual air temperature is 45 to 54 degrees F. (7 to 12 degrees C.) This map unit is 55 percent Rock Outcrop, 25 percent Hollis soils. 20 percent minor components. Rock Outcrop This component occurs on bedrock controlled landforms. The slope ranges from 3 to 45 percent and the runoff class is very high. The Nonirrigated Land Capability Class is 8 Hollis soils This component occurs on upland hill and ridge landforms. The parent material consists of melt-out till derived from granite, gneiss, and schist. The slope ranges from 3 to 45 percent and the runoff class is medium. The depth to a restrictive feature is 10 to 20 inches to bedrock (lithic). The drainage class is somewhat excessively drained. The slowest permeability within 60 inches is about 0.57 in/hr (moderate), with about 1.8 inches (very low) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is greater than 6 feet. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 7s Typical Profile: 0 to 1 inches; highly decomposed plant material 1 to 6 inches; gravelly fine sandy loam 6 to 9 inches; channery fine sandy loam 9 to 15 inches; gravelly fine sandy loam 15 to 25 inches; unweathered bedrock

Map Unit: 85B—Paxton and Montauk fine sandy loams, 3 to 8 percent slopes, very stony

Paxton And Montauk Fine Sandy Loams, 3 To 8 Percent Slopes, Very Stony This map unit is in the New England and Eastern New York Upland, Southern Part Major Land Resource Area. The mean annual precipitation is 35 to 56 inches(889 to 1422 millimeters) and the average annual air temperature is 45 to 52 degrees F. (7 to 11 degrees C.) This map unit is 55 percent Paxton soils, 30 percent Montauk soils. 15 percent minor components. Paxton soils This component occurs on upland hill and drumlin landforms. The parent material consists of lodgement till derived from granite, gneiss, and schist. The slope ranges from 3 to 8 percent and the runoff class is medium. The depth to a restrictive feature is 20 to 40 inches to densic material. The drainage class is well drained. The slowest permeability within 60 inches is about 0.00 in/hr (very slow), with about 3.4 inches (moderate) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is about 24 inches. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 6s Typical Profile: 0 to 8 inches; fine sandy loam 8 to 15 inches; fine sandy loam 15 to 26 inches; fine sandy loam 26 to 65 inches; gravelly fine sandy loam Montauk soils This component occurs on upland hill and drumlin landforms. The parent material consists of sandy lodgement till derived from granite and gneiss. The slope ranges from 3 to 8 percent and the runoff class is low. The depth to a restrictive feature is 20 to 38 inches to densic material. The drainage class is well drained. The slowest permeability within 60 inches is about 0.00 in/hr (very slow), with about 3.3 inches (moderate) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is about 27 inches. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 6s Typical Profile: 0 to 4 inches; fine sandy loam 4 to 14 inches; fine sandy loam 14 to 25 inches; sandy loam 25 to 39 inches; gravelly loamy coarse sand 39 to 60 inches; gravelly sandy loam

Map Unit: 103—Rippowam fine sandy loam

Rippowam Fine Sandy Loam This map unit is in the New England and Eastern New York Upland, Southern Part Connecticut Valley Major Land Resource Area. The mean annual precipitation is 35 to 50 inches (889 to 1270 millimeters) and the average annual air temperature is 45 to 54 degrees F. (7 to 12 degrees C.) This map unit is 80 percent Rippowam soils. 20 percent minor components. Rippowam soils This component occurs on depression and flood plain landforms. The parent material consists of alluvium. The slope ranges from 0 to 3 percent and the runoff class is very low. The depth to a restrictive feature is greater than 60 inches. The drainage class is poorly drained. The slowest permeability within 60 inches is about 0.57 in/hr (moderate), with about 6.2 inches (high) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is frequent. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is about 9 inches. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 4w Typical Profile: 0 to 5 inches; fine sandy loam 5 to 12 inches; fine sandy loam 12 to 19 inches; fine sandy loam 19 to 24 inches; sandy loam 24 to 27 inches; sandy loam 27 to 31 inches; loamy sand 31 to 65 inches; stratified very gravelly coarse sand to loamy fine sand

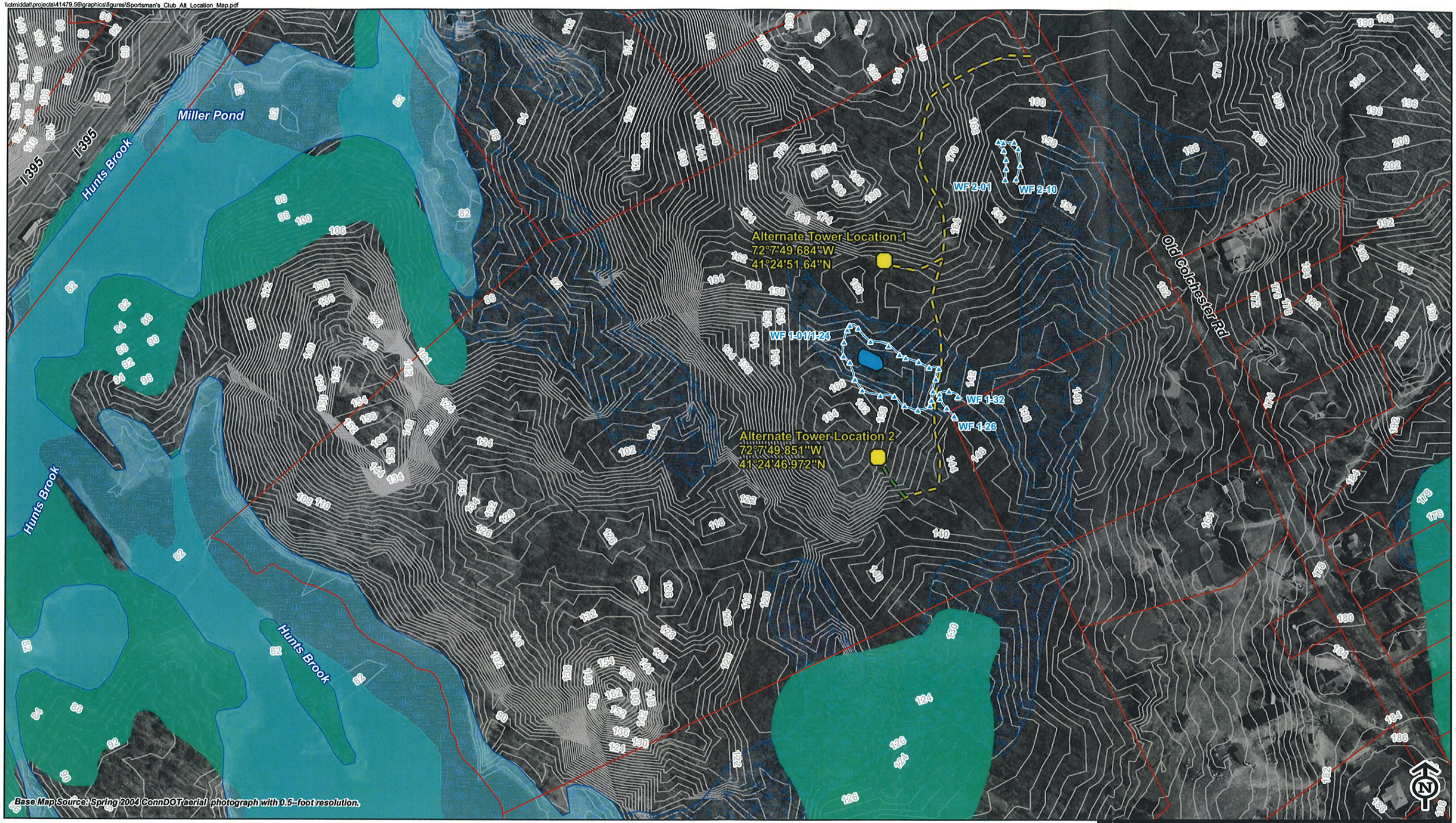
Map Unit: 306—Udorthents-Urban land complex

Udorthents-Urban Land Complex This map unit is in the New England and Eastern New York Upland, Southern Part Connecticut Valley Major Land Resource Area. The mean annual precipitation is 32 to 50 inches (813 to 1270 millimeters) and the average annual air temperature is 45 to 55 degrees F. (7 to 13 degrees C.) This map unit is 50 percent Udorthents soils, 35 percent Urban Land. 15 percent minor components. Udorthents soils This component occurs on cut (road, railroad, etc.), railroad bed, road bed, spoil pile, urban land, fill, and spoil pile landforms. The slope ranges from 0 to 25 percent and the runoff class is medium. The depth to a restrictive feature varies, but is commonly greater than 60 inches. The drainage class is typically well drained. The slowest permeability within 60 inches is about 0.00 in/hr (very slow), with about 9.0 inches (high) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.4 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table is greater than 60 inches. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 3e Typical Profile: 0 to 5 inches; loam 5 to 21 inches; gravelly loam 21 to 80 inches; very gravelly sandy loam Urban Land Urban land is land mostly covered by streets, parking lots, buildings, and other structures of urban areas. The slope ranges from 0 to 35 percent and the runoff class is very high. The Nonirrigated Land Capability Class is 8

Data Source Information

Soil Survey Area: State of Connecticut
Survey Area Data: Version 7, Dec 3, 2009

\\ctmiddat\projects\41479.56\graphics\figures\Sportsman's_Club_Alt_Location_Map.pdf



Legend

- Alternate Tower Location
- Existing Gravel Access
- Proposed Access
- VHB Delineated Wetland
- Wetland Flag
- Vernal Pool
- Parcel Boundary
- HYDROZ
- Open Water
- DEP Wetlands
- 100 Year Flood Zone
- 500 Year Flood Zone
- Floodway in Zone AE
- Other Flood Areas

100 50 0 100 200 300 400 Feet

Vanasse Hangen Brustlin, Inc.

Alternate Site Location Map
Proposed Verizon Wireless Facility
Waterford NE - Sportman's Club
146 Old Colchester Road
Waterford, Connecticut

verizonwireless

SITE 2

WETLAND DELINEATION REPORT

Vanasse Hangen Brustlin, Inc.

WETLANDS DELINEATION REPORT

Date: December 22, 2009

Project No.: 41479.56

Prepared For: Ms. Alexandria Carter
Verizon Wireless
99 East River Drive
East Hartford, Connecticut 06108

Site Location: 164 Old Colchester Road
Waterford, CT

Site Map: VHB Wetlands Sketch/Survey Map, Dated December 9, 2009

Inspection Date: December 8, 2009

Field Conditions: Weather: overcast, 40's
Snow Depth: 0 inches
General Soil Moisture: moist
Frost Depth: 0 inches

Type of Wetlands Identified and Delineated:

Connecticut Inland Wetlands and Watercourses	☒
Tidal Wetlands	☐
U.S. Army Corps of Engineers	☐

Local Regulated Upland Review Areas: Wetlands: 100 feet Watercourses: 100 feet

Field Numbering Sequence of Wetlands Boundary: Connecticut - WF 1-01 to 1-10, 1-20 to 1-30, 1-40 to 1-49, 1-59 to 1-64, 2-01/09

[as depicted on attached wetland sketch map]

The classification systems of the National Cooperative Soil Survey, the U.S. Department of Agriculture, Natural Resources Conservation Service, County Soil Survey Identification Legend, Connecticut Department of Environmental Protection and United States Army Corps of Engineers New England District were used in this investigation.

All established wetlands boundary lines are subject to change until officially adopted by local, state, or federal regulatory agencies.

The wetlands delineation was conducted by:

for Matthew Davison
Registered Soil Scientist

The wetlands delineation was reviewed by:

Dean Gustafson
Professional Soil Scientist

Enclosures

54 Tuttle Place
Middletown, Connecticut 06457-1847
860.632.1500 ▪ FAX 860.632.7879
email: info@vhb.com
www.vhb.com

Attachments

- Wetland Delineation Field Forms
- Soil Map
- Soil Report
- VHB Wetlands Sketch/Survey Map

Wetland Delineation Field Form

Project Address:	164 Old Colchester Road Waterford, Connecticut	Project Number:	41479.56
Inspection Date:	December 8, 2009	Inspector:	Matthew Davison
Wetland I.D.:	Wetland 1		

Field Conditions:	Weather: overcast	Snow Depth: 0 inches
	General Soil Moisture: moist	Frost Depth: 0 inches
Type of Wetland Delineation:	Connecticut ☒	
	ACOE ☐	
	Tidal ☐	
Field Numbering Sequence: 1-01 to 1-10, 1-20 to 1-30, 1-40 to 1-49, 1-59 to 1-64		

WETLAND HYDROLOGY:

NONTIDAL

Regularly Flooded ☐	Irregularly Flooded ☐	Permanently Flooded ☐
Semipermanently Flooded ☒	Seasonally Flooded ☒	Temporarily Flooded ☐
Permanently Saturated ☒	Seasonally Saturated – seepage ☒	Seasonally Saturated - perched ☐
Comments: Wetland complex includes various water regimes, some of which are artificially created.		

TIDAL

Subtidal ☐	Regularly Flooded ☐	Irregularly Flooded ☐
Seasonally Flooded ☐	Temporarily Flooded ☐	
Comments: N/A		

WETLAND TYPE:

SYSTEM:

Estuarine ☐	Riverine ☐	Palustrine ☒
Lacustrine ☐	Marine ☐	
Comments: System includes Palustrine Forested and Emergent Classes.		

CLASS:

Emergent ☒	Scrub-shrub ☐	Forested ☒
Open Water ☐	Disturbed ☒	Wet Meadow ☐
Comments: See above.		

WATERCOURSE TYPE:

Perennial ☐	Intermittent ☒	Tidal ☐
Comments: Wetland flags 1-40 to 1-49 delineate an intermittent watercourse.		

SPECIAL AQUATIC HABITAT:

Vernal Pool ☒	Other ☐	
Comments: Wetland flags 1-20 to 1-30 delineate a likely vernal pool. Spring survey required to confirm.		

Wetland Delineation Field Form (Cont.)

MAPPED SOILS:

SOIL SERIES (Map Unit Symbol)	WET	UP	NRCS MAPPED	FIELD IDD/ CONFIRMED
Canton and Charlton (60B, 60D)	☐	☒	☒	☒
Ridgebury, Leicester, and Whitman soils (3)	☒	☐	☒	☒
	☐	☐	☐	☐
	☐	☐	☐	☐

DOMINANT PLANTS:

red maple	tussock sedge
green ash	wool grass
silky dogwood	Juncus spp.
winterberry	spagnum
highbush blueberry	
spicebush	

WETLAND NARRATIVE:

Wetland 1 is a wetland complex which includes several components which were once contiguous but have been fragmented as a result of land development activities on the subject property. This wetland system, originating in bedrock controlled uplands located east of Miller Pond and southeast of the existing paved driveway, flows westerly terminating at a forested swamp bordering Miller Pond to the northeast. Wetland flags 1-20 to 1-30 delineate a seasonally or semipermanently flooded wetland which appears to have artificially impounded by an existing gravel access road and culvert. This area is likely to provide amphibian breeding habitat and may qualify as a vernal pool. A spring survey would be required to confirm this suspicion. This pool area outlets beneath a gravel drive via a 15" corrugated metal pipe (CMP) into a narrow conveyance channel (characterized and regulated as an intermittent watercourse) before being culverted beneath a paved drive and daylighting in a forested swamp which borders Miller Pond to the northeast. An unnamed perennial watercourse flows within the interior of this forested swamp to Miller Pond. Wetland flags 1-40 to 49 delineate an emergent marsh bordering Miller Pond to the east.

Wetland Delineation Field Form

Project Address:	164 Old Colchester Road Waterford, Connecticut	Project Number:	41479.56
Inspection Date:	December 8, 2009	Inspector:	Matthew Davison
Wetland I.D.:	Wetland 2		

Field Conditions:	Weather: overcast	Snow Depth: 0 inches
	General Soil Moisture: moist	Frost Depth: 0 inches
Type of Wetland Delineation:	Connecticut ☒	
	ACOE ☐	
	Tidal ☐	
Field Numbering Sequence: 2-01/09 (closed)		

WETLAND HYDROLOGY:

NONTIDAL

Regularly Flooded ☐	Irregularly Flooded ☐	Permanently Flooded ☐
Semipermanently Flooded ☐	Seasonally Flooded ☐	Temporarily Flooded ☐
Permanently Saturated ☐	Seasonally Saturated – seepage ☒	Seasonally Saturated - perched ☐
Comments: Depressional feature located within irregular topography.		

TIDAL

Subtidal ☐	Regularly Flooded ☐	Irregularly Flooded ☐
Seasonally Flooded ☐	Temporarily Flooded ☐	
Comments: N/A		

WETLAND TYPE:

SYSTEM:

Estuarine ☐	Riverine ☐	Palustrine ☒
Lacustrine ☐	Marine ☐	
Comments:		

CLASS:

Emergent ☐	Scrub-shrub ☐	Forested ☐
Open Water ☐	Disturbed ☒	Wet Meadow ☒
Comments: Disturbed wet meadow located within a small valley.		

WATERCOURSE TYPE:

Perennial ☐	Intermittent ☐	Tidal ☐
Comments: N/A		

SPECIAL AQUATIC HABITAT:

Vernal Pool ☐	Other ☐	
Comments: N/A		

Wetland Delineation Field Form (Cont.)

MAPPED SOILS:

SOIL SERIES (Map Unit Symbol)	WET	UP	NRCS MAPPED	FIELD IDD/ CONFIRMED
Canton and Charlton (60B, 60D)	☐	☒	☒	☒
Ridgebury, Leicester, and Whitman soils (3)	☒	☐	☒	☒
	☐	☐	☐	☐
	☐	☐	☐	☐

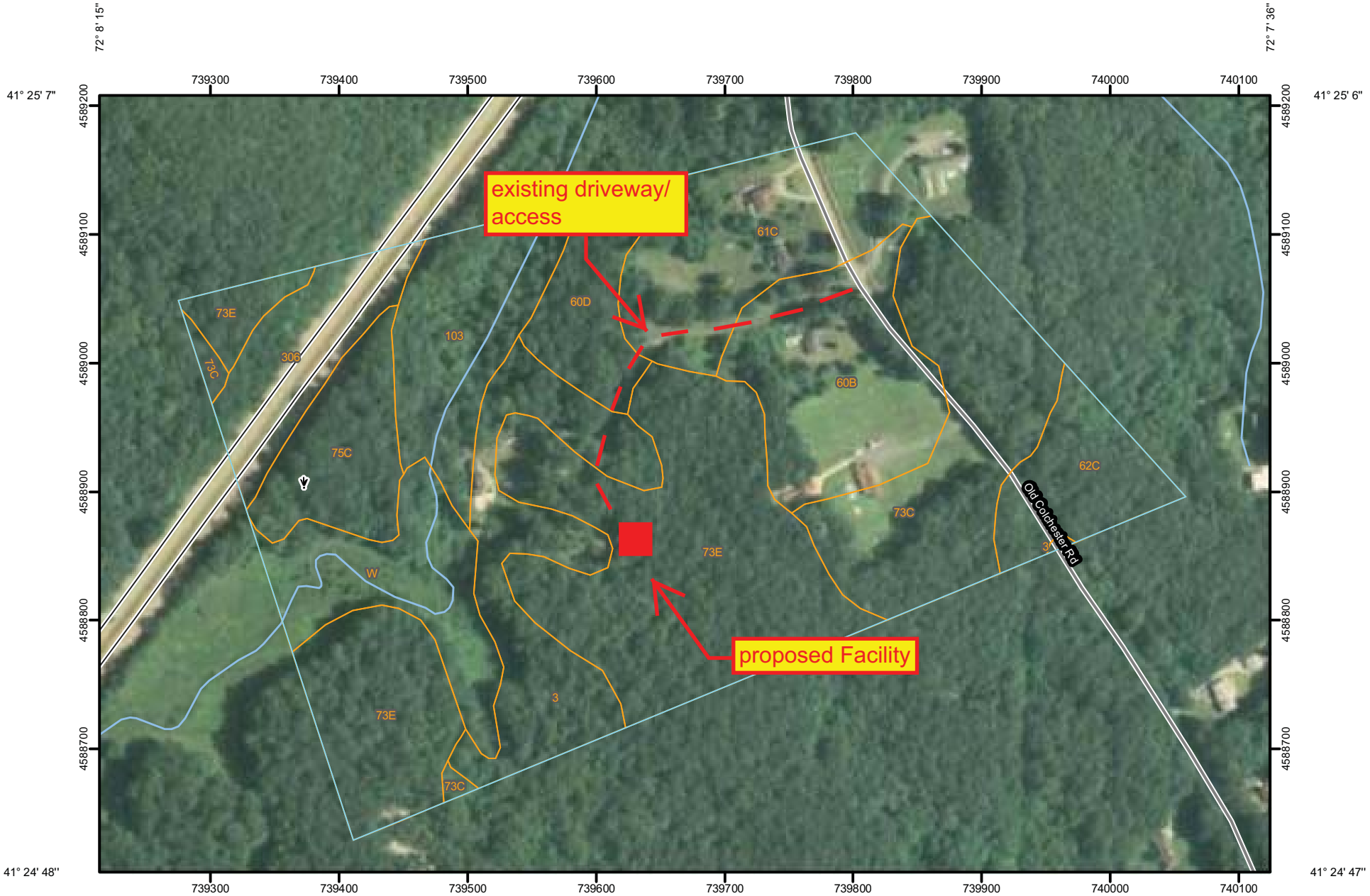
DOMINANT PLANTS:

wool grass	
swamp dewberry	
Juncus spp.	

WETLAND NARRATIVE:

Wetland 2 is a small, disturbed, isolated wet meadow located within a small valley. This area has been cleared and portions have been subject to grading. Disturbance within the delineated wetland was confirmed as a generally unaltered or minimally altered soil profile was observed beneath varying depths of shallow fill. This wetland drains westerly towards Miller Pond but no wetland connection to the Miller Pond wetland system was found or delineated.

Soil Map—State of Connecticut
(Verizon Wireless Waterford NE Facility - 164 Old Colchester Road, Waterford, CT)



Map Scale: 1:4,320 if printed on A size (8.5" x 11") sheet.

N

Meters
0 50 100 200 300

Feet
0 200 400 800 1,200

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Units

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other

Special Line Features
- Gully
- Short Steep Slope
- Other

Political Features
- Cities

Water Features
- Oceans
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

MAP INFORMATION

Map Scale: 1:4,320 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:12,000.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 18N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: State of Connecticut
Survey Area Data: Version 7, Dec 3, 2009

Date(s) aerial images were photographed: 7/17/2006

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

State of Connecticut (CT600)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
3	Ridgebury, Leicester, and Whitman soils, extremely stony	5.6	9.3%
60B	Canton and Charlton soils, 3 to 8 percent slopes	5.8	9.7%
60D	Canton and Charlton soils, 15 to 25 percent slopes	2.6	4.2%
61C	Canton and Charlton soils, 8 to 15 percent slopes, very stony	5.9	9.7%
62C	Canton and Charlton soils, 3 to 15 percent slopes, extremely stony	2.8	4.6%
73C	Charlton-Chatfield complex, 3 to 15 percent slopes, very rocky	7.3	12.1%
73E	Charlton-Chatfield complex, 15 to 45 percent slopes, very rocky	15.6	25.9%
75C	Hollis-Chatfield-Rock outcrop complex, 3 to 15 percent slopes	3.1	5.1%
103	Rippowam fine sandy loam	4.4	7.3%
306	Udorthents-Urban land complex	3.1	5.2%
W	Water	4.1	6.8%
Totals for Area of Interest		**60.5**	**100.0%**

Map Unit Description (Brief)

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the selected area. The map unit descriptions in this report, along with the maps, can be used to determine the composition and properties of a unit. A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

The "Map Unit Description (Brief)" report gives a brief, general description of the major soils that occur in a map unit. Descriptions of nonsoil (miscellaneous areas) and minor map unit components may or may not be included. This description is written by the local soil scientists responsible for the respective soil survey area data. A more detailed description can be generated by the "Map Unit Description" report.

Additional information about the map units described in this report is available in other Soil Data Mart reports, which give properties of the soils and the limitations, capabilities, and potentials for many uses. Also, the narratives that accompany the Soil Data Mart reports define some of the properties included in the map unit descriptions.

Report—Map Unit Description (Brief)

State of Connecticut

Description Category: SOI

Map Unit: 3—Ridgebury, Leicester, and Whitman soils, extremely stony

Ridgebury, Leicester And Whitman Soils, Extremely Stony This map unit is in the New England and Eastern New York Upland, Southern Part Major Land Resource Area. The mean annual precipitation is 37 to 50 inches (940 to 1270 millimeters) and the average annual air temperature is 45 to 52 degrees F. (7 to 11 degrees C.) This map unit is 40 percent Ridgebury soils, 35 percent Leicester soils, 15 percent Whitman soils. 10 percent minor components. Ridgebury soils This component occurs on upland drainageway and depression landforms. The parent material consists of lodgement till derived from granite, schist, and gneiss. The slope ranges from 0 to 5 percent and the runoff class is very low. The depth to a restrictive feature is 20 to 30 inches to densic material. The drainage class is poorly drained. The slowest permeability within 60 inches is about 0.00 in/hr (very slow), with about 2.5 inches (low) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is about 3 inches. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 7s Typical Profile: 0 to 1 inches; slightly decomposed plant material 1 to 5 inches; fine sandy loam 5 to 14 inches; fine sandy loam 14 to 21 inches; fine sandy loam 21 to 60 inches; sandy loam Leicester soils This component occurs on upland drainageway and depression landforms. The parent material consists of melt-out till derived from granite, schist, and gneiss. The slope ranges from 0 to 5 percent and the runoff class is very low. The depth to a restrictive feature is greater than 60 inches. The drainage class is poorly drained. The slowest permeability within 60 inches is about 0.57 in/hr (moderate), with about 7.4 inches (high) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is about 9 inches. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 7s Typical Profile: 0 to 1 inches; moderately decomposed plant material 1 to 7 inches; fine sandy loam 7 to 10 inches; fine sandy loam 10 to 18 inches; fine sandy loam 18 to 24 inches; fine sandy loam 24 to 43 inches; gravelly fine sandy loam 43 to 65 inches; gravelly fine sandy loam Whitman soils This component occurs on upland drainageway and depression landforms. The parent material consists of lodgement till derived from gneiss, schist, and granite. The slope ranges from 0 to 2 percent and the runoff class is very low. The depth to a restrictive feature is 12 to 20 inches to densic material. The drainage class is very poorly drained. The slowest permeability within 60 inches is about 0.00 in/hr (very slow), with about 1.9 inches (very low) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is occasional. The minimum depth to a seasonal water table, when present, is about 0 inches. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 7s Typical Profile: 0 to 1 inches; slightly decomposed plant material 1 to 9 inches; fine sandy loam 9 to 16 inches; fine sandy loam 16 to 22 inches; fine sandy loam 22 to 60 inches; fine sandy loam

Map Unit: 60B—Canton and Charlton soils, 3 to 8 percent slopes

Canton And Charlton Soils, 3 To 8 Percent Slopes This map unit is in the New England and Eastern New York Upland, Southern Part Major Land Resource Area. The mean annual precipitation is 37 to 49 inches (940 to 1244 millimeters) and the average annual air temperature is 45 to 52 degrees F. (7 to 11 degrees C.) This map unit is 45 percent Canton soils, 35 percent Charlton soils. 20 percent minor components. Canton soils This component occurs on upland hill landforms. The parent material consists of melt-out till derived from schist, granite, and gneiss. The slope ranges from 3 to 8 percent and the runoff class is low. The depth to a restrictive feature is greater than 60 inches. The drainage class is well drained. The slowest permeability within 60 inches is about 1.98 in/hr (moderately rapid), with about 5.6 inches (high) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is greater than 6 feet. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 2e Typical Profile: 0 to 1 inches; moderately decomposed plant material 1 to 3 inches; gravelly fine sandy loam 3 to 15 inches; gravelly loam 15 to 24 inches; gravelly loam 24 to 30 inches; gravelly loam 30 to 60 inches; very gravelly loamy sand Charlton soils This component occurs on upland hill landforms. The parent material consists of melt-out till derived from granite, schist, and gneiss. The slope ranges from 3 to 8 percent and the runoff class is low. The depth to a restrictive feature is greater than 60 inches. The drainage class is well drained. The slowest permeability within 60 inches is about 0.57 in/hr (moderate), with about 6.4 inches (high) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is greater than 6 feet. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 2e Typical Profile: 0 to 4 inches; fine sandy loam 4 to 7 inches; fine sandy loam 7 to 19 inches; fine sandy loam 19 to 27 inches; gravelly fine sandy loam 27 to 65 inches; gravelly fine sandy loam

Map Unit: 60D—Canton and Charlton soils, 15 to 25 percent slopes

Canton And Charlton Soils, 15 To 25 Percent Slopes This map unit is in the New England and Eastern New York Upland, Southern Part Major Land Resource Area. The mean annual precipitation is 37 to 49 inches (940 to 1244 millimeters) and the average annual air temperature is 45 to 52 degrees F. (7 to 11 degrees C.) This map unit is 45 percent Canton soils 35, percent Charlton soils. 20 percent minor components Canton soils This component occurs on upland hill landforms. The parent material consists of melt-out till derived from schist, granite, and gneiss. The slope ranges from 15 to 25 percent and the runoff class is low. The depth to a restrictive feature is greater than 60 inches. The drainage class is well drained. The slowest permeability within 60 inches is about 1.98 in/hr (moderately rapid), with about 5.6 inches (high) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is greater than 6 feet. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 4e Typical Profile: 0 to 1 inches; moderately decomposed plant material 1 to 3 inches; gravelly fine sandy loam 3 to 15 inches; gravelly loam 15 to 24 inches; gravelly loam 24 to 30 inches; gravelly loam 30 to 60 inches; very gravelly loamy sand Charlton soils This component occurs on upland hill landforms. The parent material consists of melt-out till derived from granite, schist, and gneiss. The slope ranges from 15 to 25 percent and the runoff class is low. The depth to a restrictive feature is greater than 60 inches. The drainage class is well drained. The slowest permeability within 60 inches is about 0.57 in/hr (moderate), with about 6.4 inches (high) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is greater than 6 feet. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 4e Typical Profile: 0 to 4 inches; fine sandy loam 4 to 7 inches; fine sandy loam 7 to 19 inches; fine sandy loam 19 to 27 inches; gravelly fine sandy loam 27 to 65 inches; gravelly fine sandy loam

Map Unit: 61C—Canton and Charlton soils, 8 to 15 percent slopes, very stony

Canton And Charlton Soils, 8 To 15 Percent Slopes, Very Stony This map unit is in the New England and Eastern New York Upland, Southern Part Major Land Resource Area. The mean annual precipitation is 37 to 49 inches (940 to 1244 millimeters) and the average annual air temperature is 45 to 52 degrees F. (7 to 11 degrees C.) This map unit is 45 percent Canton soils, 35 percent Charlton soils. 20 percent minor components Canton soils This component occurs on upland hill landforms. The parent material consists of melt-out till derived from schist, granite, and gneiss. The slope ranges from 8 to 15 percent and the runoff class is low. The depth to a restrictive feature is greater than 60 inches. The drainage class is well drained. The slowest permeability within 60 inches is about 1.98 in/hr (moderately rapid), with about 5.6 inches (high) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is greater than 6 feet. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 6s Typical Profile: 0 to 1 inches; moderately decomposed plant material 1 to 3 inches; gravelly fine sandy loam 3 to 15 inches; gravelly loam 15 to 24 inches; gravelly loam 24 to 30 inches; gravelly loam 30 to 60 inches; very gravelly loamy sand Charlton soils This component occurs on upland hill landforms. The parent material consists of melt-out till derived from granite, schist, and gneiss. The slope ranges from 8 to 15 percent and the runoff class is low. The depth to a restrictive feature is greater than 60 inches. The drainage class is well drained. The slowest permeability within 60 inches is about 0.57 in/hr (moderate), with about 6.4 inches (high) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is greater than 6 feet. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 6s Typical Profile: 0 to 4 inches; fine sandy loam 4 to 7 inches; fine sandy loam 7 to 19 inches; fine sandy loam 19 to 27 inches; gravelly fine sandy loam 27 to 65 inches; gravelly fine sandy loam

Map Unit: 62C—Canton and Charlton soils, 3 to 15 percent slopes, extremely stony

Canton And Charlton Soils, 3 To 15 Percent Slopes, Extremely Stony This map unit is in the New England and Eastern New York Upland, Southern Part Major Land Resource Area. The mean annual precipitation is 37 to 49 inches (940 to 1244 millimeters) and the average annual air temperature is 45 to 52 degrees F. (7 to 11 degrees C.) This map unit is 45 percent Canton soils, 35 percent Charlton soils. 20 percent minor components. Canton soils This component occurs on upland hill landforms. The parent material consists of melt-out till derived from schist, granite, and gneiss. The slope ranges from 3 to 15 percent and the runoff class is low. The depth to a restrictive feature is greater than 60 inches. The drainage class is well drained. The slowest permeability within 60 inches is about 1.98 in/hr (moderately rapid), with about 5.6 inches (high) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is greater than 6 feet. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 7s Typical Profile: 0 to 1 inches; moderately decomposed plant material 1 to 3 inches; gravelly fine sandy loam 3 to 15 inches; gravelly loam 15 to 24 inches; gravelly loam 24 to 30 inches; gravelly loam 30 to 60 inches; very gravelly loamy sand Charlton soils This component occurs on upland hill landforms. The parent material consists of melt-out till derived from granite, schist, and gneiss. The slope ranges from 3 to 15 percent and the runoff class is low. The depth to a restrictive feature is greater than 60 inches. The drainage class is well drained. The slowest permeability within 60 inches is about 0.57 in/hr (moderate), with about 6.4 inches (high) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is greater than 6 feet. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 7s Typical Profile: 0 to 4 inches; fine sandy loam 4 to 7 inches; fine sandy loam 7 to 19 inches; fine sandy loam 19 to 27 inches; gravelly fine sandy loam 27 to 65 inches; gravelly fine sandy loam

Map Unit: 73C—Charlton-Chatfield complex, 3 to 15 percent slopes, very rocky

Charlton-Chatfield Complex, 3 To 15 Percent Slopes, Very Rocky This map unit is in the New England and Eastern New York Upland, Southern Part Major Land Resource Area. The mean annual precipitation is 37 to 49 inches (940 to 1244 millimeters) and the average annual air temperature is 45 to 52 degrees F. (7 to 11 degrees C.) This map unit is 45 percent Charlton soils, 30 percent Chatfield soils. 25 percent minor components. Charlton soils This component occurs on upland hill landforms. The parent material consists of melt-out till derived from granite, schist and gneiss. The slope ranges from 3 to 15 percent and the runoff class is low. The depth to a restrictive feature is greater than 60 inches. The drainage class is well drained. The slowest permeability within 60 inches is about 0.57 in/hr (moderate), with about 6.4 inches (high) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is greater than 6 feet. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 6s Typical Profile: 0 to 4 inches; fine sandy loam 4 to 7 inches; fine sandy loam 7 to 19 inches; fine sandy loam 19 to 27 inches; gravelly fine sandy loam 27 to 65 inches; gravelly fine sandy loam Chatfield soils This component occurs on upland hill and ridge landforms. The parent material consists of melt-out till derived from gneiss, granite, and schist. The slope ranges from 3 to 15 percent and the runoff class is low. The depth to a restrictive feature is 20 to 40 inches to bedrock (lithic). The drainage class is well drained. The slowest permeability within 60 inches is about 0.57 in/hr (moderate), with about 3.3 inches (moderate) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is greater than 6 feet. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 6s Typical Profile: 0 to 1 inches; highly decomposed plant material 1 to 6 inches; gravelly fine sandy loam 6 to 15 inches; gravelly fine sandy loam 15 to 29 inches; gravelly fine sandy loam 29 to 36 inches; unweathered bedrock

Map Unit: 73E—Charlton-Chatfield complex, 15 to 45 percent slopes, very rocky

Charlton-Chatfield Complex, 15 To 45 Percent Slopes, Very Rocky This map unit is in the New England and Eastern New York Upland, Southern Part Major Land Resource Area. The mean annual precipitation is 37 to 49 inches (940 to 1244 millimeters) and the average annual air temperature is 45 to 52 degrees F. (7 to 11 degrees C.) This map unit is 45 percent Charlton soils, 30 percent Chatfield soils. 25 percent minor components. Charlton soils This component occurs on upland hill landforms. The parent material consists of melt-out till derived from granite, schist, and gneiss. The slope ranges from 15 to 45 percent and the runoff class is high. The depth to a restrictive feature is greater than 60 inches. The drainage class is well drained. The slowest permeability within 60 inches is about 0.57 in/hr (moderate), with about 6.4 inches (high) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is greater than 6 feet. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 7s Typical Profile: 0 to 4 inches; fine sandy loam 4 to 7 inches; fine sandy loam 7 to 19 inches; fine sandy loam 19 to 27 inches; gravelly fine sandy loam 27 to 65 inches; gravelly fine sandy loam Chatfield soils This component occurs on upland hill and ridge landforms. The parent material consists of melt-out till derived from gneiss, granite, and schist. The slope ranges from 15 to 45 percent and the runoff class is high. The depth to a restrictive feature is 20 to 40 inches to bedrock (lithic). The drainage class is well drained. The slowest permeability within 60 inches is about 0.57 in/hr (moderate), with about 3.3 inches (moderate) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is greater than 6 feet. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 7s Typical Profile: 0 to 1 inches; highly decomposed plant material 1 to 6 inches; gravelly fine sandy loam 6 to 15 inches; gravelly fine sandy loam 15 to 29 inches; gravelly fine sandy loam 29 to 36 inches; unweathered bedrock

Map Unit: 75C—Hollis-Chatfield-Rock outcrop complex, 3 to 15 percent slopes

Hollis-Chatfield-Rock Outcrop Complex, 3 To 15 Percent Slopes This map unit is in the New England and Eastern New York Upland, Southern Part Major Land Resource Area. The mean annual precipitation is 37 to 49 inches (940 to 1244 millimeters) and the average annual air temperature is 45 to 54 degrees F. (7 to 12 degrees C.) This map unit is 35 percent Hollis soils, 30 percent Chatfield soils, 15 percent Rock Outcrop. 20 percent minor components. Hollis soils This component occurs on upland hill and ridge landforms. The parent material consists of melt-out till derived from granite, gneiss, and schist. The slope ranges from 3 to 15 percent and the runoff class is low. The depth to a restrictive feature is 10 to 20 inches to bedrock (lithic). The drainage class is somewhat excessively drained. The slowest permeability within 60 inches is about 0.57 in/hr (moderate), with about 1.8 inches (very low) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is greater than 6 feet. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 6s Typical Profile: 0 to 1 inches; highly decomposed plant material 1 to 6 inches; gravelly fine sandy loam 6 to 9 inches; channery fine sandy loam 9 to 15 inches; gravelly fine sandy loam 15 to 25 inches; unweathered bedrock Chatfield soils This component occurs on upland hill and ridge landforms. The parent material consists of melt-out till derived from gneiss, granite, and schist. The slope ranges from 3 to 15 percent and the runoff class is low. The depth to a restrictive feature is 20 to 40 inches to bedrock (lithic). The drainage class is well drained. The slowest permeability within 60 inches is about 0.57 in/hr (moderate), with about 3.3 inches (moderate) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is greater than 6 feet. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 6s Typical Profile: 0 to 1 inches; highly decomposed plant material 1 to 6 inches; gravelly fine sandy loam 6 to 15 inches; gravelly fine sandy loam 15 to 29 inches; gravelly fine sandy loam 29 to 36 inches; unweathered bedrock Rock Outcrop This component occurs on bedrock controlled landforms. The slope ranges from 3 to 15 percent and the runoff class is very high. The Nonirrigated Land Capability Class is 8

Map Unit: 103—Rippowam fine sandy loam

Rippowam Fine Sandy Loam This map unit is in the New England and Eastern New York Upland, Southern Part Connecticut Valley Major Land Resource Area. The mean annual precipitation is 35 to 50 inches (889 to 1270 millimeters) and the average annual air temperature is 45 to 54 degrees F. (7 to 12 degrees C.) This map unit is 80 percent Rippowam soils. 20 percent minor components. Rippowam soils This component occurs on depression and flood plain landforms. The parent material consists of alluvium. The slope ranges from 0 to 3 percent and the runoff class is very low. The depth to a restrictive feature is greater than 60 inches. The drainage class is poorly drained. The slowest permeability within 60 inches is about 0.57 in/hr (moderate), with about 6.2 inches (high) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is frequent. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is about 9 inches. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 4w Typical Profile: 0 to 5 inches; fine sandy loam 5 to 12 inches; fine sandy loam 12 to 19 inches; fine sandy loam 19 to 24 inches; sandy loam 24 to 27 inches; sandy loam 27 to 31 inches; loamy sand 31 to 65 inches; stratified very gravelly coarse sand to loamy fine sand

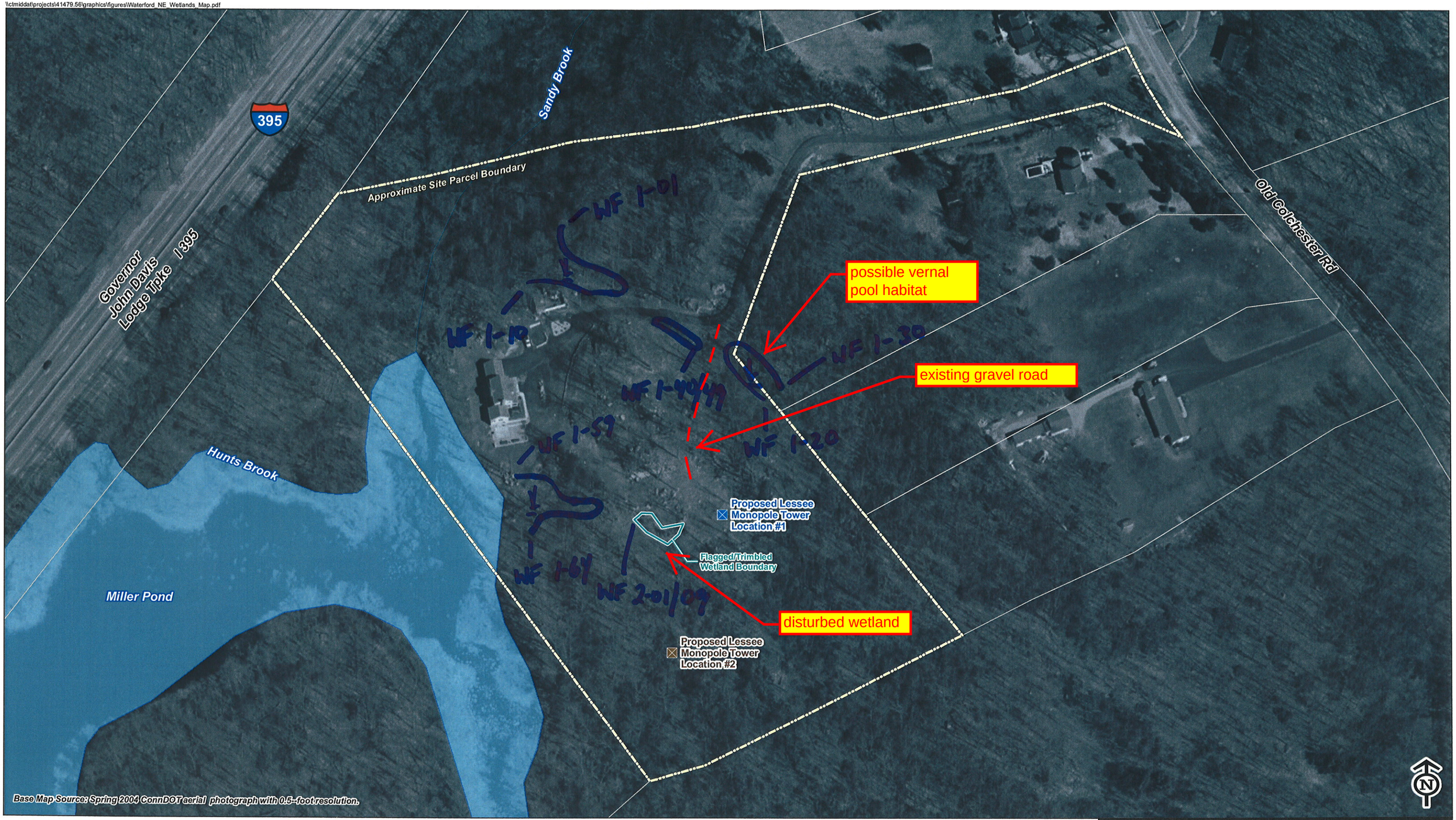
Map Unit: 306—Udorthents-Urban land complex

Udorthents-Urban Land Complex This map unit is in the New England and Eastern New York Upland, Southern Part Connecticut Valley Major Land Resource Area. The mean annual precipitation is 32 to 50 inches (813 to 1270 millimeters) and the average annual air temperature is 45 to 55 degrees F. (7 to 13 degrees C.) This map unit is 50 percent Udorthents soils, 35 percent Urban Land. 15 percent minor components. Udorthents soils This component occurs on cut (road, railroad, etc.), railroad bed, road bed, spoil pile, urban land, fill, and spoil pile landforms. The slope ranges from 0 to 25 percent and the runoff class is medium. The depth to a restrictive feature varies, but is commonly greater than 60 inches. The drainage class is typically well drained. The slowest permeability within 60 inches is about 0.00 in/hr (very slow), with about 9.0 inches (high) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.4 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table is greater than 60 inches. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 3e Typical Profile: 0 to 5 inches; loam 5 to 21 inches; gravelly loam 21 to 80 inches; very gravelly sandy loam Urban Land Urban land is land mostly covered by streets, parking lots, buildings, and other structures of urban areas. The slope ranges from 0 to 35 percent and the runoff class is very high. The Nonirrigated Land Capability Class is 8

Data Source Information

Soil Survey Area: State of Connecticut
Survey Area Data: Version 7, Dec 3, 2009

\\ctmiddat\projects\41479.56\graphics\figures\Waterford_NE_Wetlands_Map.pdf



Legend

Proposed Lessee Monopole Tower
- Location #1
- Location #2
- Site Parcel Boundary
- Parcel Boundary
- Flagged/Trimbled Wetland Boundary
- Open Water

Feet
100 50 0 100 200

denotes flagged/sketched wetland boundary

Vanasse Hangen Brustlin, Inc.

Proposed Verizon Wireless Facility
Waterford NE
164 Old Colchester Road
Waterford, Connecticut

verizon wireless

WETLAND AND VERNAL POOL SUMMARY REPORT

May 18, 2011

Vanasse Hangen Brustlin, Inc.

Ref: 41479.56

Ms. Alexandria Carter
Verizon Wireless
99 East River Drive
East Hartford, Connecticut 06108

Re: Wetlands and Vernal Pools Assessment
Proposed Verizon Wireless Waterford NE Facility
Site 1 – 146 Old Colchester Road
Site 2 – 164 Old Colchester Road
Waterford, Connecticut

Dear Ms. Carter:

Vanasse Hangen Brustlin, Inc. (VHB) is pleased to provide the following assessment of impacts to wetlands and vernal pools located on two properties under consideration for the proposed development of a single wireless telecommunications facility. The findings of this assessment are presented below.

Introduction

SITE 1
This candidate is located on municipally-owned property at 146 Old Colchester Road (identified herein as the "Site 1") in Waterford, Connecticut. Site 1 consists of approximately 45.9 acres of wooded, undeveloped land. The proposed Facility would be located in the eastern portion of the host property, roughly 675 feet to the west of Old Colchester Road, with access provided by an existing dirt road. Land use within the immediate vicinity of the proposed Facility consists of undeveloped forest and a few residential properties. Land use in the general vicinity of the proposed Facility is comprised of undeveloped woodlands, the Interstate 395 traffic corridor, medium-density residential development and several overhead electrical utility rights of way and their associated infrastructure.

SITE 2
This candidate is located on property at 164 Old Colchester Road (identified herein as the "Site 2") in Waterford, Connecticut. Site 2 consists of approximately 12.84 acres of land and is currently occupied by a single-family dwelling consisting of cleared and disturbed areas and undeveloped forest. The proposed Facility would be located at the eastern edge of a cleared area with access provided by an existing paved driveway then gravel drive with the last 200 feet following a generally cleared path. Land use within the immediate vicinity of the proposed Facility consists of cleared and disturbed areas associated with the Site residence, undeveloped forest, Miller Pond and a few nearby residential properties. Land

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use within the general vicinity of the proposed Facility is comprised of undeveloped woodlands, the Interstate 395 traffic corridor, medium-density residential development and several overhead electrical utility rights of way and their associated infrastructure.

Wetland Impact Assessment

For descriptive purposes, each identified and delineated wetland area was assigned a number. Refer to site plans prepared by Centek Engineering, latest revision 05/16/11, provided under separate cover for further details on both Sites 1 and 2 and the locations of the wetland areas in relationship to the two proposed alternate Sites. Details of the delineated wetlands are contained in VHB's Wetlands Delineation Reports provided under separate cover.

SITE 1

Wetland 1 This wetland (identified by wetland flags WF 1-01 to 1-24 and WF 1-25 to 1-32) is a palustrine forested wetland located in the interior of the town-owned Sportsman's Club property in proximity to two alternate proposed wireless telecommunications facility locations. An existing gravel road provides access to the proposed facility location from Old Colchester Road. A possible vernal pool was identified within the interior of the main portion of the identified wetland system (WF 1-01 to 1-24). The possible vernal pool was identified based on physical characteristics (e.g., confined basin, no permanent outlet, etc.) since it was dry at the time of the wetland inspection. This wetland system generally drains northwest to southeast as a hillside seep converging with a larger forested wetland system to the southeast.

Subsequent inspections on April 7 and 8, 2011 of this wetland confirmed that obligate vernal pool species are utilizing this pool for breeding. Numerous spotted salamander (*Ambystoma maculatum*) egg masses and wood frog (*Rana sylvatica*) egg masses were observed throughout the pool. Therefore, this wetland is considered to contain both the physical and biological characteristics of a vernal pool habitat. Other amphibians observed nearby this wetland during a cover search included redback salamander (*Plethodon cinereus*). Additional discussion of vernal pool habitat is provided in a subsequent section of this report.

No direct or indirect impacts to Wetland 1 will result from the proposed development. The nearest construction activity associated with the proposed Facility (level spreader along the south side of the proposed compound) is located approximately 120 feet north of the wetland boundary at Wetland 1. The vernal pool limits are located interior to the delineated wetland edge approximately 160 feet south of the limits off disturbance. A detailed discussion of potential impact to vernal pool habitat is provided in a subsequent section.

Wetland 2 This wetland (WF 2-01 to 2-10) is a headwater seep and narrow wetland system located near Old Colchester Road that flows to the south into a larger forested wetland system that Wetland 1 also feeds into. This wetland feature is a narrow wetland corridor dominated by a relatively small intermittent watercourse with a well defined and sometimes braided stony channel. No standing or flowing water was observed during site inspection and this wetland does not have the physical or biological characteristics to be classified as a vernal pool habitat.

No direct or indirect impacts to Wetland 2 will result from the proposed development. The nearest construction activities to Wetland 2 are associated with improvements to the existing dirt road, located approximately 160 feet west of wetland flag WF 2-01.

SITE 2

Wetland 1 This wetland complex (WF 1-01 to 1-10, 1-20 to 1-30, 1-40 to 1-49 and 1-59 to 1-64) includes several components which were once contiguous but have been fragmented as a result of residential development activities on the subject property. This wetland system, originating in bedrock controlled uplands located east of Miller Pond and southeast of the existing paved driveway, flows westerly terminating at a forested swamp bordering Miller Pond to the northeast. Wetland flags WF 1-20 to 1-30 delineate a seasonally or semipermanently flooded wetland which is artificially impounded by an existing gravel access road and culvert. This area was identified as having the potential to provide vernal pool habitat during the initial wetland delineation. As such, a seasonally appropriate inspection to confirm the presence of obligate vernal pool species was recommended, and is described below. This pool area outlets beneath a gravel drive via a 15" corrugated metal pipe (CMP) into a narrow conveyance channel (WF 1-40 to 1-49; characterized and regulated as an intermittent watercourse) before being culverted beneath a paved drive and day lighting in a forested swamp which borders Miller Pond to the northeast (WF 1-01 to 1-10). An unnamed perennial watercourse flows within the interior of this forested swamp to Miller Pond. Wetland flags 1-59 to 1-64 delineate an emergent marsh bordering Miller Pond to the east.

Subsequent inspections on April 7 and 8, 2011 of this wetland confirmed that obligate vernal pool species are utilizing the pool generally delineated by wetland flags WF 1-20 to 1-30 for breeding. Numerous spotted salamander (*Ambystoma maculatum*) egg masses and wood frog (*Rana sylvatica*) egg masses were observed throughout the pool. Therefore, this wetland is considered to contain both the physical and biological characteristics of a vernal pool habitat. Additional discussion of vernal pool habitat is provided in a subsequent section of this report.

No direct or indirect impacts to Wetland 1 will result from the proposed development. The proposed Facility (northeast corner) is located approximately 135 feet southwest of the vernal pool (WF 1-20) at its nearest location. The nearest construction activities associated with improvements to the proposed gravel access drive to wetlands is approximately 10 feet northwest of wetland flag WF 1-25, which forms the northern edge of the vernal pool contained within this wetland area. A detailed discussion of potential impact to vernal pool habitat is provided in a subsequent section.

Wetland 2 This wetland (WF 2-01 to 2-08) is a small, isolated wet meadow located within a small valley that has been disturbed by clearing and grading activities on the subject property. Disturbance within the delineated wetland was confirmed as a generally unaltered or minimally altered soil profile beneath varying depths of shallow fill. This wetland drains westerly towards Miller Pond but no wetland connection to the Miller Pond wetland system was found or delineated. No standing or flowing water was observed during site inspection and this wetland does not have the physical or biological characteristics to be classified as a vernal pool habitat.

No direct or indirect impacts to Wetland 2 will result from the proposed development. The nearest construction activities associated with the proposed Facility (level spreader along the west side of the proposed compound) are located approximately 10 feet east of wetland flag WF 2-5.

Vernal Pool Assessment

The following narrative describes the vernal pool inspection methodology, the characteristics of the identified vernal pools, the amphibian species observed and an analysis of potential impacts to these special aquatic habitats resulting from the proposed development.

Vernal pools provide an important wildlife habitat type. They are generally small, seasonally-inundated wetlands that lack fish populations and provide breeding habitat for obligate vernal pool species such as wood frogs (*Rana sylvatica*) and spotted salamander (*Ambystoma maculatum*). Numerous other wildlife species use vernal pools and the areas immediately adjacent for feeding, cover, and/or overwintering habitat.

The methods employed on the subject property to conclusively identify vernal pool habitat include a variety of recognized scientific field exploration techniques. Vernal pools are conclusively identified based on both physical characteristics (i.e., occurs within a confined depression or basin that lacks a permanent outlet stream, standing water for approximately two months during the growing season, lacks any fish population, and dries out most years) and the occurrence of one or more obligate wildlife species (i.e., spotted salamander, marbled salamander [*Ambystoma opacum*], wood frog, and fairy shrimp [*Eubranchipus vernalis*]) identified during seasonally appropriate surveys. The vernal pool physical and biological identification methodology utilized in this study generally follows the guidelines noted in *A Guide to the Identification and Protection of Vernal Pool Wetlands of Connecticut*[1] and *Guidelines for Certification of Vernal Pool Habitat*[2] along with various amphibian and vernal pool species field guides[3].

Vernal Pool Study Results

A vernal pool was identified on each of the alternate properties proposed by Verizon Wireless to construct a single Facility. These vernal pools, as described in the previous section (identified herein as "Site 1 Vernal Pool" and "Site 2 Vernal Pool"), were inspected in the field on April 7 and 8, 2011 by Dean Gustafson, a VHB Senior Wetland Scientist experienced in vernal pool identification. The location of the two identified vernal pools are illustrated on the enclosed Vernal Pool Evaluation maps. Photographs of the vernal pools and identified obligate species are provided in the attached photolog documentation.

VHB surveyed the potential vernal pools for direct evidence of obligate and facultative species breeding (e.g., congressing, presence of egg masses, and/or larvae and adult amphibians and

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[1] Donahue, D.F. 1997. A Guide to the Identification and Protection of Vernal Pool Wetlands of Connecticut. State University of Connecticut Cooperative Extension System.

[2] Massachusetts Natural Heritage and Endangered Species Program. 2001. Guidelines for the Certification of Vernal Pool Habitat.

[3] DeGraaf, R.M. and D.D. Rudis. 1983. Amphibians and Reptiles of New England. The University of Massachusetts Press. 83 pp.
Kenney, L.P. and M.R Burne. 2000. A Field Guide to the Animals of Vernal Pools. Mass Div Fish. & Wildlife. NHESP. 77 pp.
Klemens, M.W. 1993. Amphibians and Reptiles of Connecticut and Adjacent Regions. State Geological and Natural History Survey of Connecticut Bulletin 112. 318 pp.
Maine Audubon, The University of Maine and Maine Department of Inland Fisheries and Wildlife. 2003. Maine Citizen's Guide to Locating and Documenting Vernal Pools. 97 pp.
State Geological and Natural History Survey of Connecticut Bulletin 112. 318 pp.

invertebrates such as fairy shrimp and fingernail clam shells) and indirect evidence (e.g., chorusing) during the April 7 and 8, 2011 inspections to determine if vernal pool habitat is actually provided by these wetland areas. The potential vernal pool's interior was inspected with the aid of hip waders to visually survey the water column (using polarized sunglasses) and survey the pool and bottom with an aquatic dip net. Water depths typically encountered in Site 1 Vernal Pool measured at 20 to 24 inches deep while Site 2 Vernal Pool were shallower at generally 8 to 12 inches. In addition, a cover search was performed (i.e., downed tree limbs, logs, large rocks) in the vicinity of the vernal pool's edge for adult salamanders and frogs.

Both Site 1 Vernal Pool and Site 2 Vernal Pool were found to contain the necessary physical and biological characteristics to provide vernal pool habitat. The pools consist of confined basins that provide seasonal inundation that is expected to endure during most years to support successful amphibian breeding and development of tadpoles and larvae to juvenile stage.

Numerous spotted salamander and wood frog egg masses were observed within both pools. In the Site 1 Vernal Pool, over 30 spotted salamander egg masses and over 100 wood frog egg masses were observed. In the Site 2 Vernal Pool, over 20 spotted salamander egg masses and approximately 5 wood frog egg masses were observed. No state-listed species were identified during the vernal pool inspections. As a result of these observations, both vernal pools were found to contain the required biological characteristics and therefore are conclusively identified as a vernal pool habitat.

Impact Analysis

The following section details a recognized scientific method for analyzing the potential impact a project may have on a particular vernal pool and its surrounding upland habitat. In addition, an analysis of potential hydraulic impacts to the vernal pools resulting from the proposed development is provided.

Physical Impact to Pool and Surrounding Terrestrial Habitat

The proposed Facility development at either Site 1 or Site 2 will not result in direct physical impact to either of these vernal pools. It is widely documented that vernal pool dependent amphibians are not only solely dependent upon the actual vernal pool habitat for breeding and egg and juvenile development but require surrounding upland habitat for most of their adult lives. Recent studies recommend protection of adjacent habitat up to 750 feet from the vernal pool edge for obligate pool-breeding amphibians[4] through various protective measures employed during construction and minimizing certain development types and disturbance thresholds.

In order to evaluate potential impacts to this surrounding upland habitat as well as the vernal pool, the two vernal pools were assessed using methodology developed by Calhoun and Klemens (2002). This methodology assesses vernal pool ecological significance based on two parameters: 1) biological value of the vernal pool, and 2) conditions of the critical terrestrial habitat. The biological rating is based on the presence of federal or state-listed species and abundance and diversity of vernal pool indicator species. The terrestrial habitat is assessed based on the integrity of the vernal pool envelope (within

[4] Oscarson, D.B. and A.J.K. Calhoun. 2007. Developing Vernal Pool Conservation Plans at the Local Level Using Citizen-Scientists. Wetlands. Vol. 27, No. 1. 80-95. & Calhoun, A.J.K. and M.W. Klemens. 2002. Best Development Practices (BDPs): Conserving Pool-Breeding Amphibians in Residential and Commercial Developments in the Northeastern United States. WCS/MCA Technical Paper No. 5.

100 feet of the pool's edge) and the critical terrestrial habitat (within 100-750 feet of the pool's edge). Pools with 25% or less developed areas in the critical terrestrial habitat are identified as having high priority for maintaining less that 25% development, including site clearing, grading and construction, within this terrestrial habitat (Calhoun and Klemens, 2002). Based on the data collected, the conservation priority rating of Tier I, Tier II or Tier III was assigned to each vernal pool, with Tier I considered to have relatively high breeding activity and intact terrestrial habitat and Tier III pools representing lower amphibian productivity and fragmented terrestrial habitat.

Site 1 Vernal Pool and Site 2 Vernal Pool were rated based on this criterion for both the existing condition and the proposed condition to determine if the proposed wireless telecommunications project disturbances at either Site would result in a reduction in the tier rating system or reduce the terrestrial habitat integrity below the 75% non-development threshold. The results of the rating system reveal that both vernal pools currently have the highest conservation priority rating of Tier I. The post-development analysis, as detailed below, reveals that the proposed development at either Site 1 or Site 2 will not result in further degradation of the existing tier rating or terrestrial habitat integrity of either vernal pool due to the small area of disturbance proposed within the Critical Terrestrial Habitat (100 to 750 feet from the pool's edge) by the proposed project and avoidance in the case of Site 1 of any impact to the 100 foot Vernal Pool Envelope. In the case of Site 2, a small area of disturbance (0.05± acre) is proposed in the 100 foot Vernal Pool Envelope. However, this disturbance will occur within an existing disturbed dirt access drive that is currently located along the north side of the vernal pool (refer to photo 8).

The total area of the Critical Terrestrial Habitat associated with the Site 1 Vernal Pool is 43.8± acres with 1.08± acres of existing development, which represents 2.5% development of the Critical Terrestrial Habitat. The proposed wireless telecommunications Facility compound and access road will develop 0.53± acre, which represents and additional 1.2% development of the total Critical Terrestrial Habitat. The total area of the Critical Terrestrial Habitat associated with the Site 2 Vernal Pool is 43.82± acres with 8.42± acres of existing development associated with the on-site residence, representing 19.2% of the Critical Terrestrial Habitat. The proposed wireless telecommunications facility compound and access road will develop 0.29± acre, which represents an additional 0.7% development of the total Critical Terrestrial Habitat. The proposed developments at either Site 1 or Site 2 are below the recommended 25% development threshold within the Critical Terrestrial Habitat. Details of the rating system and calculations used to evaluate the existing and proposed conditions of the terrestrial habitat are provided in the attached Vernal Pool Assessment Sheets.

Therefore, based on this analysis the proposed Facility development at either Site 1 or Site 2 will not result in a likely adverse impact to existing amphibian productivity for either vernal pool and will not adversely impact the terrestrial habitat due to the limited amount of disturbance proposed. Impact to the vernal pool terrestrial habitat is further minimized by the unmanned nature of the facility and the limited traffic it generates (e.g., approximately one trip per month per carrier).

Hydraulic Alterations

Another consideration when evaluating a project's potential impact to vernal pool habitat includes evaluating land-use changes (i.e., clearing, increase in impervious surface) that could alter the watershed of a vernal pool. Direct inputs of stormwater flows into a pool may produce sudden water level increases in a short period of time and may lengthen the duration of flooding (hydroperiod).

Diversion of stormwater flows past a pool may have the opposite effect of decreasing water levels and shortening the pool's hydroperiod. In addition, stormwater features that create temporary pools of water (decoy pools) can result in a biological "sink" as breeding amphibians deposit eggs into a water body without the necessary hydraulic period to allow for successful development of the eggs into juveniles.

Site clearing and grading activities will not de-water the nearby vernal pools or alter surface water drainage patterns associated with either pool. Any runoff generated by the proposed compound at either Facility and along the respective access drives will be properly controlled with drainage swale features that will discharge through level spreaders to avoid concentrating flows that could potentially lead to erosion and siltation of sensitive wetland areas.

Impervious surfaces associated with the proposed Facility at either Site have been minimized with the use of a relatively narrow 12-foot wide gravel access road and gravel surface within the wireless telecommuncations Facility compound that promotes infiltration. In addition, the proposed development's drainage features are designed to avoid ponding water beyond a particular precipitation event so as not to create decoy pools that could adversely affect breeding amphibians. Therefore, the proposed development at either Site will not result in a likely adverse impact to the hydrology of these nearby vernal pools.

Conclusions and Protective Measures Recommendations

No direct impact to Site 1 Vernal Pool or Site 2 Vernal Pool will result from the proposed development. The vernal pools were evaluated for their ability to provide vernal pool habitat, for the presence of obligate (or indicator) vernal pool species and how the proposed development may affect the habitat. No state listed species were identified as occurring in any of the vernal pools. This study revealed that the proposed Verizon Wireless development at either Site 1 or Site 2 would not result in a significant impact to the terrestrial habitat used by adult amphibians that breed in these vernal pools and that the project will not influence the vernal pool's hydroperiod or hydrology. Based on these results, the proposed wireless telecommunications Facility project at either Site 1 or Site 2 will not result in a likely adverse impact to vernal pool habitat.

However, since the proposed development is in relative close proximity to both vernal pools, particularly in the case of Site 2, and there is a possibility that adult amphibians may be encountered during construction activities, certain protective measures are recommended.

Due to the proximity of proposed development activities at either Site 1 or Site 2 to sensitive wetland resource areas that provide vernal pool habitat, VHB recommends the following protective measures to avoid unintentional impact to these habitats.

- An extensive erosion and sedimentation control plan be developed in accordance with the *2002 Connecticut Guidelines for Soil Erosion and Sediment Control* to properly protect these special aquatic resources. This plan will be developed during the Development and Management process should a Facility at either one of these Sites is approved by the Connecticut Siting Council. In addition to providing proper control of siltation, silt fencing will act as an exclusion to amphibians from migrating into active construction areas and avoid amphibian mortality associated with construction equipment traffic.

- A thorough cover search of the construction area will be performed by a properly qualified professional for amphibians prior to and following installation of silt fencing to remove any amphibians from the work zone prior to the initiation of construction activities.

- A properly qualified professional independent of the site contractor will monitor the installation and maintenance of erosion and sedimentation controls throughout the construction project and perform periodic sweep for amphibians to ensure that nearby wetlands are protected and amphibians are not trapped within the construction zone of the project.

- Construction of the wireless telecommunications Facility will be seasonally restricted from occurring between March 1 to May 15 to avoid construction activities and potential disturbance during the peak amphibian migration and breeding period.

- Any ruts or artificial depressions that could hold water created unintentionally by site clearing/construction activities will be properly filled in and permanently stabilized with vegetation to avoid the creation of decoy pools that could intercept amphibians moving toward the vernal pools.

- Erosion control measures will be removed no later than 30 days following final site stabilization so as not to impede migration of amphibians or other wildlife.

- Restrict the usage of herbicides and pesticides at the proposed wireless telecommunications facility and along the proposed access drive.

Very truly yours,

VANASSE HANGEN BRUSTLIN, INC.

Dean Gustafson
Senior Wetland Scientist

cc: Kenneth C. Baldwin, Robinson & Cole LLP

Figures

- **Vernal Pool Evaluation Maps**

\\ctmiddat\projects\41479.56\graphics\figures\Waterford_NE_Site1_Vernal_Pool_CTH_Map.pdf

Old Colchester Rd

Critical Terrestrial Habitat
(100-750 feet from pool's edge)

DA

WF 2-01

WF 2-10

Vernal Pool Envelope
(100 feet from pool's edge)

Vernal
Pool

WF 1-23

WF 1-01

WF 1-32

WF 1-26

DA

Miller
Pond

Base Map Source: Spring 2004 ConnDOT aerial photograph with 0.5--foot resolution.

N

Legend

- Proposed Monopole Tower
- Proposed Facility Layout
- Wetland Boundary Line
- Approximate Property Boundary Line
- Open Water
- Wetland Flag
- Wetland
- Vernal Pool
- Existing Developed Area (DA)
- Proposed Clearing Limits

150 75 0 150
Feet

Vanasse Hangen Brustlin, Inc.

Vernal Pool and Critical Terrestrial Habitat Evaluation
Proposed Verizon Wireless Facility
Waterford NE - Site 1
146 Old Colchester Road
Waterford, Connecticut

verizonwireless

\\ctmiddat\projects\41479.56\graphics\figures\Waterford_NE_Site2_Vernal_Pool_CTH_Map.pdf

395

Governor John Davis Lodge Tpke

Critical Terrestrial Habitat
(100-750 feet from pool's edge)

Old Colchester Rd

Sandy Brook

DA

Existing Access Road

Vernal Pool Envelope
(100 feet from pool's edge)

WF 1-1

WF 1-10

WF 1-49

WF 1-40

WF 1-30

WF 1-20

Vernal Pool

DA

DA

DA

WF 1-59

WF 1-64

WF 2-1

WF 2-8

Hunts Brook

Miller Pond

Base Map Source: Spring 2004 ConnDOT aerial photograph with 0.5--foot resolution.

N

150 75 0 150 Feet

Legend

- Proposed Monopole Tower
- Proposed Facility Layout
- Intermittent Watercourse
- Property Boundary Line
- Wetland Boundary Line
- Open Water
- Wetland Flag
- Wetland
- Vernal Pool
- Existing Developed Area (DA)
- Proposed Clearing Limits

Vanasse Hangen Brustlin, Inc.

Vernal Pool and Critical Terrestrial Habitat Evaluation
Proposed Verizon Wireless Facility
Waterford NE - Site 2
164 Old Colchester Road
Waterford, Connecticut

verizonwireless

Vernal Pool Assessment Sheets

VERNAL POOL ASSESSMENT SHEET[1]
Waterford NE Site 1 Vernal Pool

A. Biological Value of the Vernal Pool

(1) Are there any state-listed species (Endangered, Threatened, or Special Concern) present or breeding in the pool?
Yes_____ No___X___

(2) Are there two or more vernal pool indicator species breeding (i.e., evidence of egg masses, spermatophores [sperm packets], mating, larvae) in the pool?
Yes___ X ____ No_____

(3) Are there 25 or more egg masses (regardless of species) present in the pool by the conclusion of the breeding season?
Yes___X___ No_____

B. Existing Condition of the Critical Terrestrial Habitat

(1) Is at least 75% of the land 100 feet from the pool undeveloped?
Yes___ X ____ No_____

(2) Is at least 50% of the habitat from 100-750 feet of the pool undeveloped?
Yes___ X ____ No_____

C. Proposed Condition of the Critical Terrestrial Habitat[2]

(1) Is at least 75% of the land 100 feet from the pool undeveloped?
Yes___ X ___ No_____

(2) Is at least 50% of the habitat from 100-750 feet of the pool undeveloped?
Yes___ X ___ No_____

NOTE: For these purposes, "undeveloped" means open land largely free of roads, structures, and other infrastructure. It can be forested, partially forested, or open agricultural land.

D. Cumulative Assessment

Number of questions answered YES in Category A	Number of questions answered YES in Category B/C	Rating (I = highest priority)
1-3	2	Tier I
1-3	1	Tier II
0	1-2	Tier III
1-3	0	Tier III

E. Vernal Pool Impact Assessment Summary

	Category A	Category B/C	Tier Rating
Existing Condition	2	2	I
Proposed Condition[3]	2	2	I

[1] Vernal Pool Assessment Sheet (source: Calhoun and Klemens 2002)

[2] Existing % Total VPE (100 feet) Disturbance = 0%; Existing % Total CTH (100-750 feet) Disturbance = 2.5%. Proposed % Total VPE (100 feet) Disturbance = 0%; Proposed % Total CTH (100-750 feet) Disturbance = 3.7%.

[3] It is assumed that the biological data collected for the existing condition will be equal to the proposed condition for the purposes of this evaluation.

VERNAL POOL ASSESSMENT SHEET[1]
Waterford NE Site 2 Vernal Pool

A. Biological Value of the Vernal Pool

(1) Are there any state-listed species (Endangered, Threatened, or Special Concern) present or breeding in the pool?
Yes_____ No___X___

(2) Are there two or more vernal pool indicator species breeding (i.e., evidence of egg masses, spermatophores [sperm packets], mating, larvae) in the pool?
Yes___ X ____ No_____

(3) Are there 25 or more egg masses (regardless of species) present in the pool by the conclusion of the breeding season?
Yes___X___ No_____

B. Existing Condition of the Critical Terrestrial Habitat

(1) Is at least 75% of the land 100 feet from the pool undeveloped?
Yes___ X ____ No_____

(2) Is at least 50% of the habitat from 100-750 feet of the pool undeveloped?
Yes___ X ____ No_____

C. Proposed Condition of the Critical Terrestrial Habitat[2]

(1) Is at least 75% of the land 100 feet from the pool undeveloped?
Yes___ X ___ No_____

(2) Is at least 50% of the habitat from 100-750 feet of the pool undeveloped?
Yes___ X ___ No_____

NOTE: For these purposes, "undeveloped" means open land largely free of roads, structures, and other infrastructure. It can be forested, partially forested, or open agricultural land.

D. Cumulative Assessment

Number of questions answered YES in Category A	Number of questions answered YES in Category B/C	Rating (I = highest priority)
1-3	2	Tier I
1-3	1	Tier II
0	1-2	Tier III
1-3	0	Tier III

E. Vernal Pool Impact Assessment Summary

	Category A	Category B/C	Tier Rating
Existing Condition	2	2	I
Proposed Condition[3]	2	2	I

[1] Vernal Pool Assessment Sheet (source: Calhoun and Klemens 2002)

[2] Existing % Total VPE (100 feet) Disturbance = 3.5%; Existing % Total CTH (100-750 feet) Disturbance = 19.2%. Proposed % Total VPE (100 feet) Disturbance = 8.71%; Proposed % Total CTH (100-750 feet) Disturbance = 19.9%.

[3] It is assumed that the biological data collected for the existing condition will be equal to the proposed condition for the purposes of this evaluation.

Photograph Documentation

Vanasse Hangen Brustlin, Inc.
PHOTOLOG DOCUMENTATION
Proposed Verizon Wireless Waterford NE Facility
Vernal Pool Inspection – May 7 &8, 2011

Photo 1: Overview of Site 1 Vernal Pool, looking west.

Photo 2: View of spotted salamander (left side) and wood frog (right side) egg masses in Site 1 Vernal Pool.

Vanasse Hangen Brustlin, Inc.
PHOTOLOG DOCUMENTATION
Proposed Verizon Wireless Waterford NE Facility
Vernal Pool Inspection – May 7 &8, 2011

Photo 3: View of spotted salamander from Site 1 Vernal Pool.

Photo 4: View of wood frog from Site 1 Vernal Pool.

Vanasse Hangen Brustlin, Inc.
PHOTOLOG DOCUMENTATION
Proposed Verizon Wireless Waterford NE Facility
Vernal Pool Inspection – May 7 &8, 2011

Photo 5: Overview of Site 2 Vernal Pool, looking northwest.

Photo 6: View of spotted salamander egg mass from Site 2 Vernal Pool.

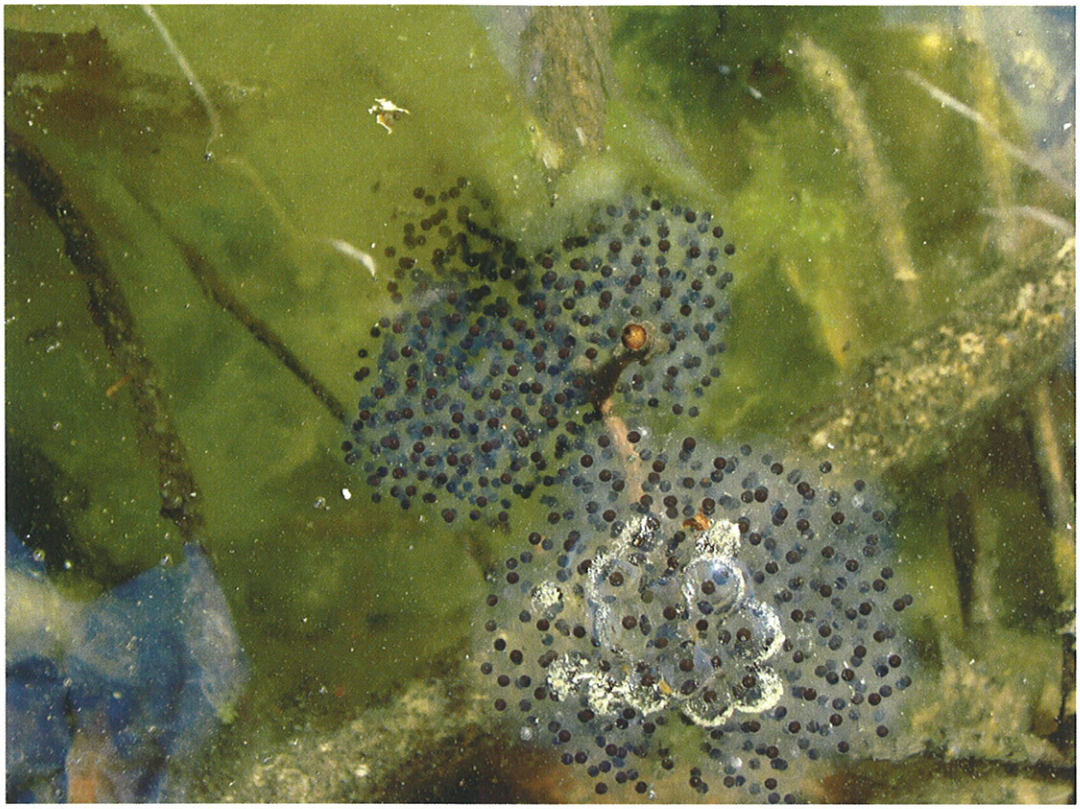

Photo 7: View of wood frog egg masses from Site 2 Vernal Pool.

Photo 8: View of Site 2 existing dirt access drive along north side of vernal pool (in right side of photo), looking north.