



WETLAND INVESTIGATION

May 2, 2014

**Verizon Wireless
99 East River Drive
East Hartford, CT 06108**

APT Project No.: CT1411690

Attn: Alexandria Carter

**Re: Proposed Orange North Facility
831 Derby Milford Road
Orange, Connecticut**

Dear Ms. Carter,

All-Points Technology Corporation, P.C. ("APT") understands that a wireless telecommunications facility ("Facility") is proposed by Verizon Wireless at 831 Derby Milford Road in Orange, Connecticut ("Subject Property"). At your request, Matthew Gustafson, a Connecticut registered Soil Scientist with APT conducted an inspection of the Subject Property on April 24, 2014 to determine the presence or absence of wetlands and watercourses within approximately 200 feet of proposed development activities ("Study Area"). The delineation methodology followed was consistent with both the Connecticut Inland Wetlands and Watercourses Act (IWWA) and the *Corps of Engineers Wetland Delineation Manual* (1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region*, Version 2.0 (January 2012). The results of this wetland investigation are provided below.

Site and Project Description:

The Subject Property, also known as Buttermilk Lane Farm, consists of an approximately 34.6-acre developed parcel. The area proposed for the wireless communications Facility is located in a mostly cleared upland area dominated by old field habitat and scatter mature red cedar (*Juniperus virginiana*). Access to the Facility is proposed to be gained via Derby Milford Road and travel northerly through a maintained upland hay field. The Study Area is dominated by a complex of upland warm-season and cool-season grass hay fields, old field successional habitats, and even-aged young wetland and upland forested blocks. The surrounding land use generally consists of residential development and undeveloped forested areas.

Three wetland areas were delineated within the Study Area consisting of the banks to a perennial stream system, a complex of bordering wetlands to a perennial stream system, associated hillside seeps, and an open water feature, as well as a wet meadow area located in the middle of a maintained hayfield. Please refer to the enclosed Wetland Delineation Map for the approximate locations of the identified wetland resource areas. Wetlands were marked with pink and blue plastic flagging tape numbered with the following sequence: WF 1-01 to 1-06, WF 2-01 to 2-21, and WF 3-01 to 3-08. General weather conditions encountered during the April inspection included low 50° F temperatures with sunny skies.

ALL-POINTS TECHNOLOGY CORPORATION, P.C.

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Regulation of Wetlands:

Wetlands and watercourses are regulated by local, state and federal regulations, with each regulatory agency differing slightly in their definition and regulatory authority of resource areas, as discussed below. The proposed Facility is under the exclusive jurisdiction of the State of Connecticut Siting Council and therefore exempt from local regulation, although local wetland regulations are considered by the Siting Council. If wetlands are identified on the Subject Property and direct impact is proposed, those wetlands may be considered Waters of the United States and therefore the activity may also be subject to jurisdiction by the U.S. Army Corps of Engineers (“ACOE”) New England District.

Town of Orange: The Town of Orange regulates activities within wetlands and watercourses and within 100 feet of wetlands and watercourses through administration of the Connecticut Inland Wetlands and Watercourses Act (IWWA).

State of Connecticut: **Freshwater Wetlands:** The IWWA requires the regulation of activities affecting or having the potential to affect wetlands under Sec. 22a-36 through 22a-45 of the Connecticut General Statutes. The IWWA is administered through local municipalities. The IWWA defines wetlands as areas of poorly drained, very poorly drained, floodplain, and alluvial soils, as delineated by a soil scientist. Watercourses are defined as bogs, swamps, or marshes, as well as lakes, ponds, rivers, streams, etc., whether natural or man-made, permanent or intermittent. Intermittent watercourse determinations are based on the presence of a defined permanent channel and bank, and two of the following characteristics: (1) evidence of scour or deposits of recent alluvium or detritus; (2) the presence of standing or flowing water for a duration longer than a particular storm incident; and (3) the presence of hydrophytic vegetation.

ACOE: The U.S. Army Corps of Engineers regulates the discharge of dredged or fill material into waters of the United States under Section 404 of the Clean Water Act. Waters of the United States are navigable waters, tributaries to navigable waters, wetlands adjacent to those waters, and/or isolated wetlands that have a demonstrated interstate commerce connection. The ACOE Wetlands Delineation Manual defines wetlands as “[t]hose areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.”

Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403) prohibits the unauthorized obstruction or alteration of any navigable water of the United States. This section provides that the construction of any structure in or over any navigable water of the United States, or the accomplishment of any other work affecting the course, location, condition, or physical capacity of such waters is unlawful unless the work has been approved by the ACOE.

Soil Description:

Soil types encountered throughout the Study Area were generally consistent with digitally available soil survey information obtained from the Natural Resources Conservation Service (“NRCS”)¹. The exception is the lack of NRCS-mapped wetland soils on the Site, which were identified in the field as Ridgebury, Leicester, and Whitman soils. The non-wetland soils were examined along the wetland boundary and more distant upland areas during the delineation, including the proposed Facility location. They are dominated by Charlton-Chatfield Complex, Canton and Charlton soils, and Agawam fine sandy loam. Detailed descriptions of wetland and upland soil types are provided below.

Wetland Soils:

The **Leicester** series consists of very deep, poorly drained loamy soils formed in friable till. They are nearly level or gently sloping soils in drainageways and low-lying positions on hills. Depth to bedrock is commonly more than 6 feet. Rock fragments range from 5 to 35 percent by volume to a depth of 40 inches and up to 50 percent below 40 inches. Leicester soils have a water table at or near the surface much of the year.

The **Ridgebury** series consists of very deep, somewhat poorly and poorly drained soils formed in glacial till derived mainly from granite, gneiss and schist. They are nearly level to gently sloping soils in low areas in uplands. This series includes phases that are poorly drained and the wetter part of somewhat poorly drained. A perched, fluctuating water table above the dense till saturates the solum to or near the surface for 7 to 9 months of the year.

The **Whitman** series consists of very deep, very poorly drained soils formed in glacial till derived mainly from granite, gneiss, and schist. They are nearly level or gently sloping soils in depressions and drainageways on uplands. Depth to dense till is 12 to 30 inches. Some pedons have organic horizons overlying the A horizon. They are fibric hemic or sapric material, and are up to 5 inches thick. Whitman soils are found on nearly level and gently sloping soils in depressions and in drainage ways of glacial uplands. Slopes are typically 0 to 2 percent but range up to 8 percent where wetness is due to seepage water. This soil is very poorly drained. A perched water table, or excess seepage water, is at or near the surface for about 9 months of the year.

Upland Soils:

The **Agawam** series consists of very deep, well drained soils formed in a loamy mantle over sandy, water deposited materials. They are level to steep soils on outwash plains and high stream terraces. Most areas are on slopes that are less than 15 percent. Steeper slopes are on terrace escarpments and steep sides of gullies in dissected outwash plains.

The **Canton** series consists of very deep, well drained soils formed in a loamy mantle underlain by sandy glacial till. They are on nearly level to very steep glaciated plains, hills, and ridges. Slope ranges from 0 to 35 percent. Permeability is moderately rapid in the solum and rapid in the substratum. The soils developed in a fine sandy loam mantle over acid sandy glacial till of Wisconsin age derived mainly from granite and gneiss and some fine-grained sandstone.

The **Charlton** series is a very deep, well drained loamy soil formed in friable till. They are nearly level to very steep soils on till plains and hills. Depth to bedrock and the seasonal high water table is commonly more than 6 feet.

¹ NRCS Web Soil Survey, <http://websoilsurvey.nrcs.usda.gov/app/>, accessed on April 23, 2014.

The **Chatfield** series consists of moderately deep, well drained, and somewhat excessively drained soils formed in till. They are nearly level to very steep soils on glaciated plains, hills, and ridges. Slope ranges from 0 to 70 percent. Crystalline bedrock is at depths of 20 to 40 inches. The soils formed in a moderately thick mantle of glacial till overlying granite, gneiss, or schist bedrock. Rock outcrops are rare to common and are limited to the more resistant bedrock.

Wetlands Discussion:

Wetland 1 Classification Summary:

Wetland 1 ²	System	Subsystem	Class	Subclass	Water Regime	Special Modifier
(WF 1-01 to 1-06)	Palustrine		Forested	Broad-leaved Deciduous	Permanently Flooded	
Watercourse Type (unnamed)	Perennial <input checked="" type="checkbox"/>	Intermittent <input type="checkbox"/>	Tidal <input type="checkbox"/>	Special Aquatic Habitat (None)	Vernal Pool <input type="checkbox"/>	Other <input type="checkbox"/>

Wetland 1 Description:

Wetland 1 is a perennial stream system located on the west side of Derby Milford Road, opposite of the proposed start of the access drive to the Facility. This perennial stream system generally flows south to north eventually emptying into the Housatonic River, located ±1,200 feet west of the Subject Property. The delineated boundary consists of the eastern bank to this stream system and is characterized as having little to no bordering wetlands. The stream system is significantly incised with stone armoring and little vegetative buffer separating it from Derby Milford Road. An 18” reinforced concrete pipe culvert conveys water from storm drains on Derby Milford Road to this portion of the wetland system via a rip-rap armored drainage swale.

Wetland 1 Dominant Vegetation:

Dominant Wetland Species Common Name (Latin Name)	Dominant Adjacent Upland Species Common Name (Latin Name)
Trout Lily (Erythronium americanum)	Asiatic Bittersweet* (Celastrus orbiculatus)
Spicebush (Lindera benzoin)	Eastern Hemlock (Tsuga canadensis)
Eastern Hemlock (Tsuga canadensis)	Trout Lily (Erythronium americanum)
Skunk Cabbage (Symplocarpus foetidus)	Black Birch (Betula lenta)
Multiflora Rose* (Rosa multiflora)	Black Cherry (Prunus serotina)
Sycamore (Platanus occidentalis)	Northern Red Oak (Quercus rubra)
	Black Oak (Quercus velutina)

* denotes Connecticut Invasive Plants Council invasive species

² Cowardin, L. M., V. Carter, F. C. Golet, E. T. LaRoe. 1979. Classification of wetlands and deepwater habitats of the United States. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. Jamestown, ND: Northern Prairie Wildlife Research Center Online. <http://www.npwrc.usgs.gov/resource/wetlands/classwet/index.htm - contents>.

Wetland 2 Classification Summary:

Wetland 2	System	Subsystem	Class	Subclass	Water Regime	Special Modifier
(WF 2-01 to 2-21)	Palustrine		Forested	Broad-leaved Deciduous	Permanently Flooded	Farmed
Watercourse Type (unnamed)	Perennial <input checked="" type="checkbox"/>	Intermittent <input type="checkbox"/>	Tidal <input type="checkbox"/>	Special Aquatic Habitat (None)	Vernal Pool <input type="checkbox"/>	Other <input type="checkbox"/>

Wetland 2 Description:

Wetland 2 is a forested hillside seep wetland system with an interior perennial stream. The stream generally flows east to west eventually draining into a man-made farm pond contained by an earthen dam. This perennial stream system continues west via an 18-inch reinforced concrete pipe culvert that outlets from the farm pond, eventually draining into Wetland 1.

Wetland 2 Dominant Vegetation:

Dominant Wetland Species	Dominant Adjacent Upland Species
Common Name (Latin Name)	Common Name (Latin Name)
Trout Lily (<i>Erythronium americanum</i>)	Asiatic Bittersweet* (<i>Celastrus orbiculatus</i>)
Spicebush (<i>Lindera benzoin</i>)	Eastern Hemlock (<i>Tsuga canadensis</i>)
Eastern Hemlock (<i>Tsuga canadensis</i>)	Trout Lily (<i>Erythronium americanum</i>)
Skunk Cabbage (<i>Symplocarpus foetidus</i>)	Black Birch (<i>Betula lenta</i>)
Multiflora Rose* (<i>Rosa multiflora</i>)	Black Cherry (<i>Prunus serotina</i>)
Sycamore (<i>Platanus occidentalis</i>)	Northern Red Oak (<i>Quercus rubra</i>)
Japanese Barberry* (<i>Berberis thunbergii</i>)	Black Oak (<i>Quercus velutina</i>)
Sensitive Fern (<i>Onoclea sensibilis</i>)	Canada Mayflower (<i>Maianthemum canadense</i>)

* denotes Connecticut Invasive Plants Council invasive species

Wetland 3 Classification Summary:

Wetland 3	System	Subsystem	Class	Subclass	Water Regime	Special Modifier
(WF 3-01 to 3-08)	Palustrine		Emergent	Nonpersistent	Semipermanently Flooded	Farmed
Watercourse Type (None)	Perennial <input type="checkbox"/>	Intermittent <input type="checkbox"/>	Tidal <input type="checkbox"/>	Special Aquatic Habitat (None)	Vernal Pool <input checked="" type="checkbox"/>	Other <input type="checkbox"/>

Wetland 3 Description:

Wetland 3 is a small isolated depressional emergent wet meadow area located in the heart of a maintained hay field. Evidence of hydraulic alternation of this wetland was observed with a manhole and PVC pipe outlet located at the eastern end of the wetland area. Evidence of prior surface inundation was present during the time of inspection in the form of water staining and detritus accumulation.

Wetland 3 Dominant Vegetation:

Dominant Wetland Species Common Name (Latin Name)	Dominant Adjacent Upland Species Common Name (Latin Name)
Reed Canarygrass* (Phalaris arundinacea)	Common Unidentifiable Hay Field Grasses
Rough Bedstraw (Galium aspellum)	
Carex species (Carex spp.)	
Sphagnum Species (Sphagnum sp.)	
Tussock Sedge (Carex stricta)	

* denotes Connecticut Invasive Plants Council invasive species

Summary:

Based on APT's understanding of the proposed Verizon Wireless development, no direct impact to wetlands or watercourses will result from the proposed activity. However, the proposed Facility and access drive will be in proximity to Wetland 1 and Wetland 2. The proposed entrance of the access road is located approximately 40 feet east of Wetland 1 across Derby Milford Road, while the proposed Facility's compound area is located approximately 100 feet southeast of Wetland 2.

No temporary impacts to nearby wetland resources from construction activities are anticipated provided sedimentation and erosion controls are designed, installed and maintained during construction activities in accordance with the 2002 Connecticut Guidelines For Soil Erosion and Sediment Control. Long term secondary impacts to nearby wetland resources possibly associated with the operation of the proposed Facility are minimized by the fact the development is unmanned, it minimizes the creation of impervious surfaces with the use of a gravel access drive and gravel compound, and it creates minimal traffic. APT recommends that stormwater generated by the proposed development be properly handled and treated in accordance with the 2004 Connecticut Stormwater Quality Manual. Provided these recommendations are implemented, it is APT's opinion that the proposed Verizon Wireless development will not result in a likely adverse impact to wetland resources.

If you have any questions regarding the above-referenced information, please feel free to contact me by telephone at (860) 617-0613 or via email at mgustafson@allpointstech.com.

Sincerely,

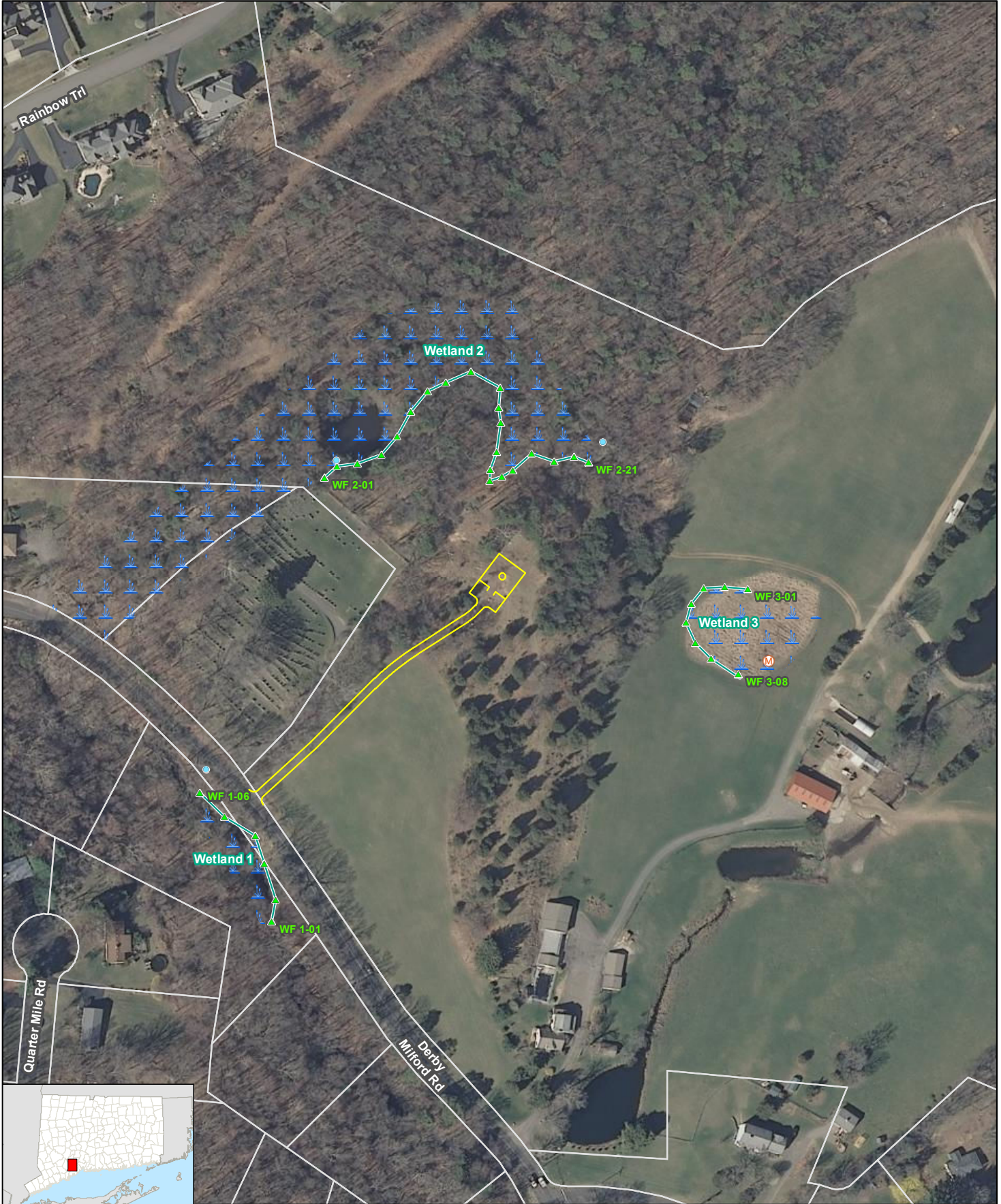
All-Points Technology Corporation, P.C.

Delineation Performed by:

Matthew Gustafson
Registered Soil Scientist

Enclosure

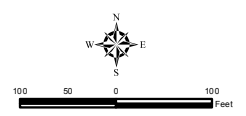
Wetland Delineation Map



Legend

- Culvert
- Proposed Facility Layout
- Approximate Parcel Boundary (CTDEEP)
- Manhole
- ▲ Wetland Flag
- Delineated Wetland Boundary
- ↘ Wetland Area

Base Map Source: 2012 Aerial Photograph (CTECO)
Map Date: May 2014



Wetland Delineation Map

verizonwireless

Proposed Wireless
Telecommunications Facility
Orange North
831 Derby Milford Road
Orange, Connecticut

