



WETLAND INVESTIGATION

May 1, 2014

**North Atlantic Towers, LLC
1001 3rd Avenue West, Suite 420
Bradenton, FL 34205**

APT Project No.: CT407100

**Re: Proposed Bethel Facility – CT1155C
62 and 64 Codfish Hill Road
Bethel, Connecticut**

All-Points Technology Corporation, P.C. (“APT”) understands that a wireless telecommunications facility (“Facility”) is proposed by North Atlantic Towers, LLC at 62 and 64 Codfish Hill Road in Bethel, Connecticut (“Subject Property”). At your request, Dean Gustafson, a Connecticut registered Professional Soil Scientist with APT conducted an inspection of the Subject Property on April 4, 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, identified as 62 and 64 Codfish Hill Road in Bethel, Connecticut, consists of an approximately 49.85-acre residential lot with woodland, open fields and old field habitats. The area proposed for the wireless communications Facility is located in one of two locations: Site 1 is located in the far eastern end of the Subject Property in a relatively mature upland forest; Site 2 is centrally located on the property in a mature upland forest adjacent to bedrock outcrops. Access to both locations generally follows an existing dirt road with the longer access to Site 1 also traveling through some open field areas. The Study Area is dominated by bedrock controlled thin glacial till soil parent material with distinct topographic relief features in the central portion of the Subject Property and more moderate rolling topography in the eastern side of the property. Several hillside seep style wetland systems were identified scattered throughout the Study Area. The surrounding land-use is dominated by residential properties located on moderately sized parcels.

Five wetland areas were delineated within the Study Area consisting primarily of hillside seep forested wetland systems; Wetlands 1, 3 and 4 are associated with interior intermittent watercourses. 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- 32, WF 2-01 to 2- 10, WF 3-01 to 3-08, WF 4-01 to 4-18 and 5-01 to 5-08. General weather conditions encountered during the above-referenced inspection included low 40° F temperatures with cloudy 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 Bethel: The Town of Bethel 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. Wetland soils field identified consist of Ridgebury, Leicester, and Whitman soils, extremely stony. The non-wetland soils were examined along the wetland boundary and more distant upland areas during the delineation, including the proposed Facility locations. They are dominated by Charlton-Chatfield complex, Woodbridge fine sandy loam, Paxton and Montauk fine sandy loams, and Hollis-Chatfield-Rock outcrop complex. 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 **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.

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.

The **Hollis** series consists of shallow, well drained and somewhat excessively drained soils formed in a thin mantle of glacial till derived mainly from gneiss, schist, and granite. They are nearly level to very steep upland soils on bedrock controlled hills and ridges. Depth to hard bedrock ranges from 10 to 20 inches. Bedrock outcrops vary from few to many.

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

The **Montauk** series consists of very deep, well drained soils formed in glacial till derived primarily from granitic materials. These soils are on upland till plains and moraines. Slope ranges from 0 to 35 percent. The landscape in some areas has many closed depressions, some of which are filled by perennial ponds or wet spots. The soils formed in thick moderately coarse or medium textured glacial till mantles underlain by firm sandy till. Some areas have very stony or extremely stony surfaces. The potential for runoff is low to high. Permeability is moderate or moderately rapid in the solum and slow or moderately slow in the substratum.

The **Paxton** series consists of well drained loamy soils formed in subglacial till. The soils are very deep to bedrock and moderately deep to a densic contact (known locally as hardpan). They are nearly level to steep soils on till plains, hills, and drumlins. The depth to the densic contact and material is commonly 20 to 40 inches but the range includes 18 to 40 inches. Depth to bedrock is commonly more than 6 feet. Rock fragments range from 5 to 35 percent by volume.

The **Woodbridge** series consists of moderately well drained loamy soils formed in compact, subglacial till. They are very deep to bedrock. They are nearly level to moderately steep soils on till plains, hills, and drumlins. Depth to the compact layer (hardpan) is 18 to 40 inches. Depth to bedrock is commonly more than 6 feet. Woodbridge soils have a seasonal high water table on top of the compact layer (18-40") from fall through late spring.

Wetlands Discussion:

Wetland 1 Classification Summary:

Wetland 1 ² (WF 1-01 to 1-32)	System Palustrine	Subsystem	Class Forested	Subclass Broad-leaved Deciduous	Water Regime Saturated	Special Modifier
Watercourse Type	Perennial <input type="checkbox"/>	Intermittent <input checked="" 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 located approximately 240 feet east of Site 1, generally along the east property boundary. This forested hillside seep wetland system is formed in dense glacial till that is seasonally saturated. An intermittent watercourse that receives seasonal overland and subsurface flow from this wetland system is located in the southeast corner of the Subject Property. This small, north-flowing, sand-mud bottomed, 1- to 2-foot wide seasonal stream was observed with low, clear flows of less than 3 inches deep at the time of the inspection. The western leading edge of the wetland is characterized by seasonal springs, including an open concrete well in the north end of this wetland.

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 1 Dominant Vegetation:

Dominant Wetland Species Common Name (Latin Name)	Dominant Adjacent Upland Species Common Name (Latin Name)
Red Maple (<i>Acer rubrum</i>)	Sugar Maple (<i>Acer saccharum</i>)
Black Birch (<i>Betula lenta</i>)	White Oak (<i>Quercus alba</i>)
Yellow Birch (<i>Betula alleghaniensis</i>)	Northern Red Oak (<i>Quercus rubra</i>)
Japanese Barberry* (<i>Berberis thunbergii</i>)	Black Oak (<i>Quercus velutina</i>)
Winterberry (<i>Ilex verticillata</i>)	Red Maple (<i>Acer rubrum</i>)
Winged Euonymus* (<i>Euonymus alata</i>)	Black Cherry (<i>Prunus serotina</i>)
Skunk Cabbage (<i>Symplocarpus foetidus</i>)	Japanese Barberry* (<i>Berberis thunbergii</i>)
Multiflora Rose* (<i>Rosa multiflora</i>)	Multiflora Rose* (<i>Rosa multiflora</i>)
	Winged Euonymus* (<i>Euonymus alata</i>)
	Shagbark Hickory (<i>Carya ovata</i>)

* denotes Connecticut Invasive Plants Council invasive species

Wetland 2 Classification Summary:

Wetland 2³ (WF 2-01 to 2-10)	System Palustrine	Subsystem	Class Forested	Subclass Broad-leaved Deciduous	Water Regime Saturated	Special Modifier
Watercourse Type (None)	Perennial <input 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 located approximately 190 feet north of Site 1, generally along the north property boundary in the eastern portion of the Subject Property. This forested hillside seep wetland system is formed in a concave interruption of the east glacial till slope; no inundation was observed as the soils were found to be saturated at or near the surface. A surface hydrologic connection does not exist between Wetlands 2 and 1, although overland surface sheet flows through uplands appears to occur from the eastern and northern portions of Wetland 2 during its peak hydroperiod.

³ 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 Dominant Vegetation:

Dominant Wetland Species Common Name (Latin Name)	Dominant Adjacent Upland Species Common Name (Latin Name)
Red Maple (<i>Acer rubrum</i>)	Sugar Maple (<i>Acer saccharum</i>)
Black Birch (<i>Betula lenta</i>)	White Oak (<i>Quercus alba</i>)
Yellow Birch (<i>Betula alleghaniensis</i>)	Northern Red Oak (<i>Quercus rubra</i>)
Japanese Barberry* (<i>Berberis thunbergii</i>)	Black Oak (<i>Quercus velutina</i>)
Winterberry (<i>Ilex verticillata</i>)	Red Maple (<i>Acer rubrum</i>)
Winged Euonymus* (<i>Euonymus alata</i>)	Black Cherry (<i>Prunus serotina</i>)
Skunk Cabbage (<i>Symplocarpus foetidus</i>)	Japanese Barberry* (<i>Berberis thunbergii</i>)
Multiflora Rose* (<i>Rosa multiflora</i>)	Multiflora Rose* (<i>Rosa multiflora</i>)
Sensitive Fern (<i>Onclea sensibilis</i>)	Winged Euonymus* (<i>Euonymus alata</i>)
Soft Rush (<i>Juncus effuses</i>)	Shagbark Hickory (<i>Carya ovata</i>)
Sedges (<i>Carex</i> spp.)	

* denotes Connecticut Invasive Plants Council invasive species

Wetland 3 Classification Summary:

Wetland 3 ⁴ (WF 3-01 to 3-08)	System Palustrine	Subsystem	Class Forested	Subclass Broad-leaved Deciduous	Water Regime Saturated	Special Modifier Artificial
Watercourse Type	Perennial <input type="checkbox"/>	Intermittent <input checked="" type="checkbox"/>	Tidal <input type="checkbox"/>	Special Aquatic Habitat (None)	Vernal Pool <input type="checkbox"/>	Other <input type="checkbox"/>

Wetland 3 Description:

Wetland 3, located approximately 100 feet south of Site 2, is a man-made eroded channel that is functioning as a seep and incised intermittent watercourse. This feature appears to have formed due to erosion of an old farm road. The channel was observed to be saturated with no flows at the time of inspection.

Wetland 3 Dominant Vegetation:

Dominant Wetland Species Common Name (Latin Name)	Dominant Adjacent Upland Species Common Name (Latin Name)
Red Maple (<i>Acer rubrum</i>)	Sugar Maple (<i>Acer saccharum</i>)
Japanese Barberry* (<i>Berberis thunbergii</i>)	White Oak (<i>Quercus alba</i>)
	Northern Red Oak (<i>Quercus rubra</i>)
	Red Maple (<i>Acer rubrum</i>)
	Japanese Barberry* (<i>Berberis thunbergii</i>)
	Multiflora Rose* (<i>Rosa multiflora</i>)
	Winged Euonymus* (<i>Euonymus alata</i>)
	Shagbark Hickory (<i>Carya ovata</i>)

* denotes Connecticut Invasive Plants Council invasive species

⁴ 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 4 Classification Summary:

Wetland 4⁵ (WF 4-01 to 4-18)	System Palustrine	Subsystem	Class Forested	Subclass Broad-leaved Deciduous	Water Regime Saturated	Special Modifier
Watercourse Type	Perennial <input type="checkbox"/>	Intermittent <input checked="" type="checkbox"/>	Tidal <input type="checkbox"/>	Special Aquatic Habitat (None)	Vernal Pool <input type="checkbox"/>	Other <input type="checkbox"/>

Wetland 4 Description:

Wetland 4 is located approximately 120 feet north of Site 2, at the base of a steep slope that includes some bedrock outcrops. This forested hillside seep wetland system is formed in thin dense glacial till that is seasonally saturated; hydrology appears to be controlled by the shallow depth to bedrock, particularly in the headwater portions of this wetland. An intermittent watercourse that receives seasonal overland and subsurface flow from this wetland system is located in the interior of this wetland system. This small, sand-mud bottomed, 2- to 3-foot wide seasonal stream was observed with low, clear flows of less than 5 inches deep at the time of the inspection. The southern leading edge of the wetland is characterized by seasonal springs.

Wetland 4 Dominant Vegetation:

Dominant Wetland Species Common Name (Latin Name)	Dominant Adjacent Upland Species Common Name (Latin Name)
Red Maple (<i>Acer rubrum</i>)	Sugar Maple (<i>Acer saccharum</i>)
Black Birch (<i>Betula lenta</i>)	White Oak (<i>Quercus alba</i>)
Yellow Birch (<i>Betula alleghaniensis</i>)	Northern Red Oak (<i>Quercus rubra</i>)
Japanese Barberry* (<i>Berberis thunbergii</i>)	Black Oak (<i>Quercus velutina</i>)
Winterberry (<i>Ilex verticillata</i>)	Red Maple (<i>Acer rubrum</i>)
Skunk Cabbage (<i>Symplocarpus foetidus</i>)	Black Cherry (<i>Prunus serotina</i>)
Multiflora Rose* (<i>Rosa multiflora</i>)	Japanese Barberry* (<i>Berberis thunbergii</i>)
	Multiflora Rose* (<i>Rosa multiflora</i>)
	Winged Euonymus* (<i>Euonymus alata</i>)
	Shagbark Hickory (<i>Carya ovata</i>)

* denotes Connecticut Invasive Plants Council invasive species

⁵ 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 5 Classification Summary:

Wetland 5 ⁶ (WF 5-01 to 5-08)	System Palustrine	Subsystem	Class Emergent	Subclass Nonpersistent	Water Regime Saturated	Special Modifier
Watercourse Type (None)	Perennial <input type="checkbox"/>	Intermittent <input type="checkbox"/>	Tidal <input type="checkbox"/>	Special Aquatic Habitat (None)	Vernal Pool <input type="checkbox"/>	Other <input type="checkbox"/>

Wetland 5 Description:

Wetland 5 is located in the southwest corner of the Subject Property near the paved driveway that serves the residence and which will be used for access from Codfish Hill Road. This reed canary dominated grass area consists of a hillside seep wetland system formed in thin dense glacial till that is seasonally saturated. Overflow from this wetland area is discharged into a culvert that conveys flows to the south under Codfish Hill Road into a larger emergent marsh wetland system.

Wetland 5 Dominant Vegetation:

Dominant Wetland Species Common Name (Latin Name)	Dominant Adjacent Upland Species Common Name (Latin Name)
Reed Canarygrass* (Phalaris arundinacea)	Bush Honeysuckles* (Lonicera spp.)
Purple Loosestrife* (Lythrum salicaria)	Multiflora Rose* (Rosa multiflora)
Bebb Willow (Salix bebbiana)	Sugar Maple (Acer saccharum)
	Eastern Redcedar (Juniperus virginiana)

* denotes Connecticut Invasive Plants Council invasive species

⁶ 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>.

Summary:

Based on a review of the Site/Site Survey Plans for both Site 1 and Site 2 prepared by Centek Engineering (Sheet No. C-1A, latest revision date 04/17/14), no direct impacts to wetlands are associated with the proposed North Atlantic Towers development. A Facility as Site 1 would be located ± 180 feet from the nearest wetland (representing the edge of level spreader #1 to wetland flag 2-05); the northeast compound corner is ± 200 feet from wetland flag 2-05). Proposed Facility at Site 2 would be located ± 48 feet from edge of grading to wetland flag 3-05 and ± 50 feet from a level spreader to wetland flag 4-04. The proposed Site 2 Facility compound would be located ± 60 feet from wetland flag 3-05 and ± 148 from wetland flag 4-03. Portions of the existing access proposed for upgrading are located in close proximity to wetland resources, passing within ± 80 feet of wetland flags 5-04 and 4-03. Access to Site 1 would also extend through an area that lies within ± 85 feet of wetland flag 3-06.

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*. Short term and long term secondary impacts to nearby wetland areas are also mitigated by the fact the proposed access drive follows an existing farm road which minimizes grading and tree removal requirements. Long term secondary impacts to wetland resources possibly associated with the operation of either the Site 1 or Site 2 Facility are further 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 generates minimal traffic. APT recommends that stormwater generated by the proposed development at either Site 1 or Site 2 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 North Atlantic Towers development of either Site 1 or Site 2 will not result in a likely adverse impact to wetland resources. However, when comparing these two alternatives, Site 1 does result in an overall reduction of impact to upland areas that are located in proximity to wetland resources and therefore would be considered the preferred alternative from a wetlands resource perspective.

If you have any questions regarding the above-referenced information, please feel free to contact me by telephone at (860) 663-1697 ext. 201 or via email at dgustafson@allpointstech.com.

Sincerely,

All-Points Technology Corporation, P.C.

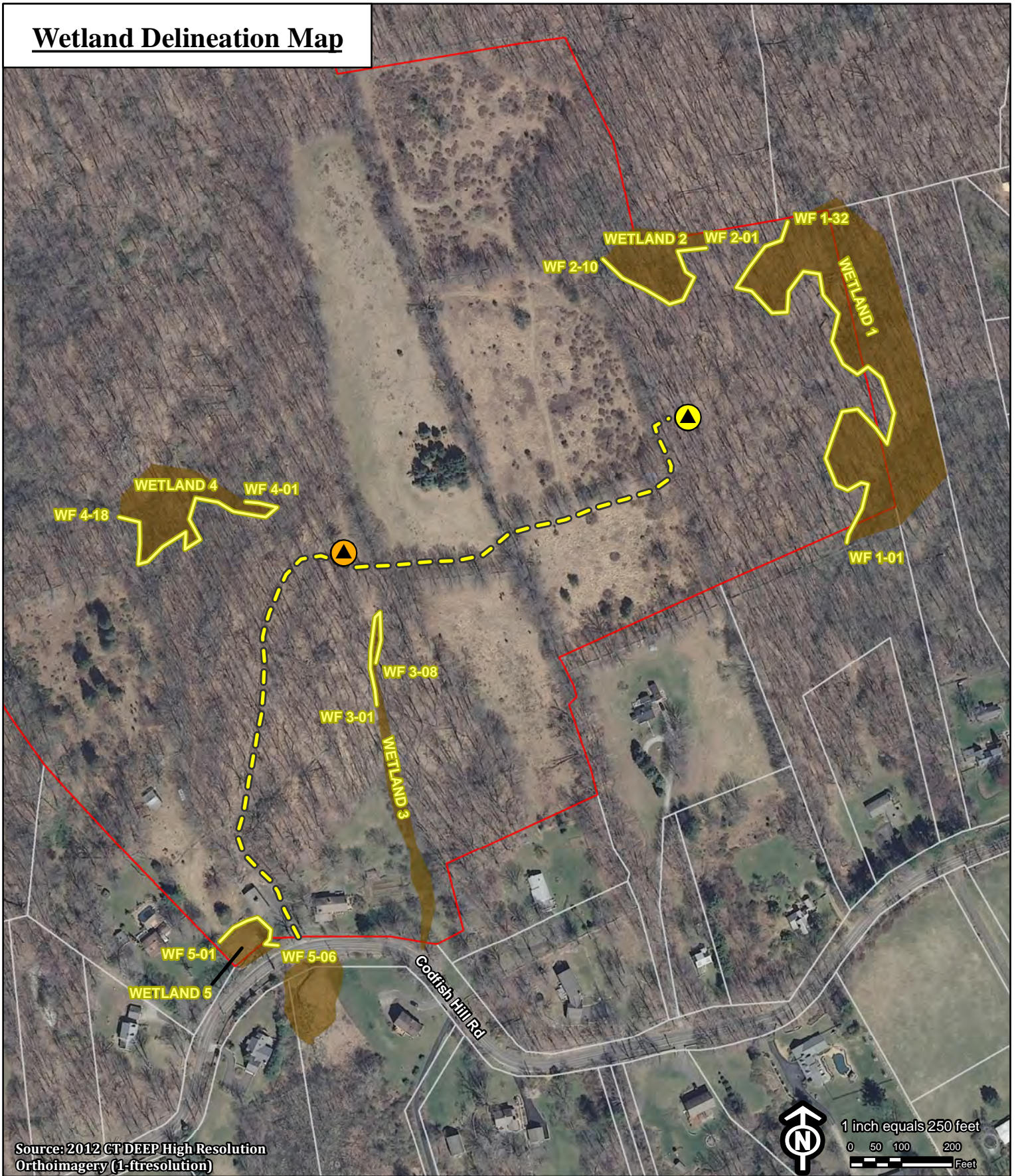
Dean Gustafson

Professional Soil Scientist

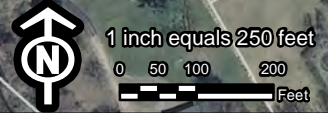
Enclosure

Wetland Delineation Map

Wetland Delineation Map



Source: 2012 CT DEEP High Resolution Orthoimagery (1-ft resolution)



Legend

- SITE 1
- Proposed Access Route
- APT Delineated Wetland Boundary
- Approximate Wetland Area
- Subject Parcel
- SITE 2

Proposed North Atlantic Towers Bethel Facility
62 & 64 Codfish Hill Road
Bethel, Connecticut

Monday, April 07, 2014

