

ATTACHMENT 4



PRELIMINARY VISUAL ASSESSMENT

Date: April 30, 2020

To: Verizon Wireless
20 Alexander Drive
Wallingford, CT 06492

From: Brian Gaudet, Project Manager

Re: Woodbridge N2 CT
Proposed Telecommunications Facility
118 Newton Road
Woodbridge, Connecticut

Cellco Partnership d/b/a Verizon Wireless ("Verizon") has identified a proposed location for development of a wireless telecommunications facility at 118 Newton Road in Woodbridge, Connecticut (the "Host Property"). The proposed Facility would include a 140-foot tall steel monopole with antennas extending to 144 feet above ground level and associated ground equipment located in a 50-foot by 50-foot fenced compound in the south-central portion of the Host Property (the "Site").

The Host Property is a ±6.01-acre parcel developed with a residence and multiple outbuildings. A paved drive extends westward from Newton Road onto the eastern portion of the Host Property and provides access to the residence and outbuildings. A gravel drive extends southward onto the northwestern portion of the Host Property from the cul-de-sac of Sound View Drive. The Host Property is located west of Newton Road and south of Sound View Drive in the northern portion of Woodbridge. Land use in the immediate vicinity consists primarily of residentially developed properties. Alice Newton Street Memorial Park is located approximately 2,000 feet southwest of the Site and Amity High School is located approximately 3,500 feet south of the Site.

At the request of Verizon, All-Points Technology Corporation, P.C. ("APT") has prepared initial viewshed mapping to provide a preliminary evaluation of the visibility associated with the proposed Facility. To conduct this assessment, a predictive computer model was developed specifically for this project using ESRI's ArcMap Geographic Information System ("GIS")¹ software and available GIS data. The predictive model provides an initial estimate of potential visibility throughout a pre-defined Study Area, in this case a two-mile radius surrounding the proposed Facility location. The predictive model incorporates Project and Study Area-specific data, including the Facility location, its ground elevation and the proposed Facility height, as well as the surrounding topography, existing vegetation, and structures (the primary features that can block direct lines of sight). The Study Area primarily covers the Town of Woodbridge, but also includes small portions of the

¹ ArcMap is a Geographic Information System desktop application developed by the Environmental Systems Research Institute for creating maps, performing spatial analysis, and managing geographic data.

neighboring municipalities of Ansonia and Seymour (to the west), Bethany (to the north), and Hamden (to the east).

A digital surface model ("DSM"), capturing both the natural and built features on the Earth's surface, was generated for the extent of the Study Area utilizing State of Connecticut 2016 LiDAR² LAS³ data points. LiDAR is a remote-sensing technology that develops elevation data by measuring the time it takes for laser light to return from the surface to the instrument's sensors. The varying reflectivity of objects also means that the "returns" can be classified based on the characteristics of the reflected light, normally into categories such as "bare earth," "vegetation," "road," or "building". Derived from the 2016 LiDAR data, the LAS datasets contain the corresponding elevation point data and return classification values. The Study Area DSM incorporates the first return LAS dataset values that are associated with the highest feature in the landscape, typically a treetop, top of a building, and/or the highest point of other tall structures.

Once the DSM was generated, ESRI's Viewshed Tool was utilized to identify locations within the Study Area where the proposed Facility may be visible. ESRI's Viewshed Tool predicts visibility by identifying those cells⁴ within the DSM that can be seen from an observer location. Cells where visibility was indicated were extracted and converted from a raster dataset to a polygon feature which was then overlaid onto an aerial photograph and topographic base map. Since the DSM includes the highest relative feature in the landscape, isolated "visible" cells are often indicated within heavily forested areas (e.g., from the top of the highest tree) or on building rooftops during the initial processing. It is recognized that these areas do not represent typical viewer locations and overstate visibility. As such, the resulting polygon feature is further refined by extracting those areas. The viewshed results are also cross-checked against the most current aerial photographs to assess whether significant changes (a new housing development, for example) have occurred since the time the LiDAR-based LAS datasets were captured.

The results of the preliminary analysis are intended to provide a representation of those areas where portions of the Facility may potentially be visible to the human eye without the aid of magnification, based on a viewer eye-height of five (5) feet above the ground and the combination of intervening topography, trees and other vegetation, and structures. However, the Facility may not necessarily be visible from all locations within those areas identified by the predictive model, which has limitations. For instance, it is important to note that the computer model cannot account for mass density, tree diameters and branching variability of trees, or the degradation of views that occurs with distance. As a result, some areas depicted on the viewshed maps as theoretically offering potential visibility of the Facility may be over-predicted because the quality of those views is not sufficient for the human eye to recognize the Facility or discriminate it from other surrounding or intervening objects.

The preliminary viewshed mapping results indicate that predicted year-round visibility associated with the proposed Facility could include up to approximately 18 acres (<1% of the 8,042-acre Study Area). The majority of the predicted year-round visibility would be within approximately 800 feet to the west, north and east of the Facility. Additional year-round visibility may be experienced at distances of more than one mile away over open fields to the northeast and southeast.

² Light Detection and Ranging

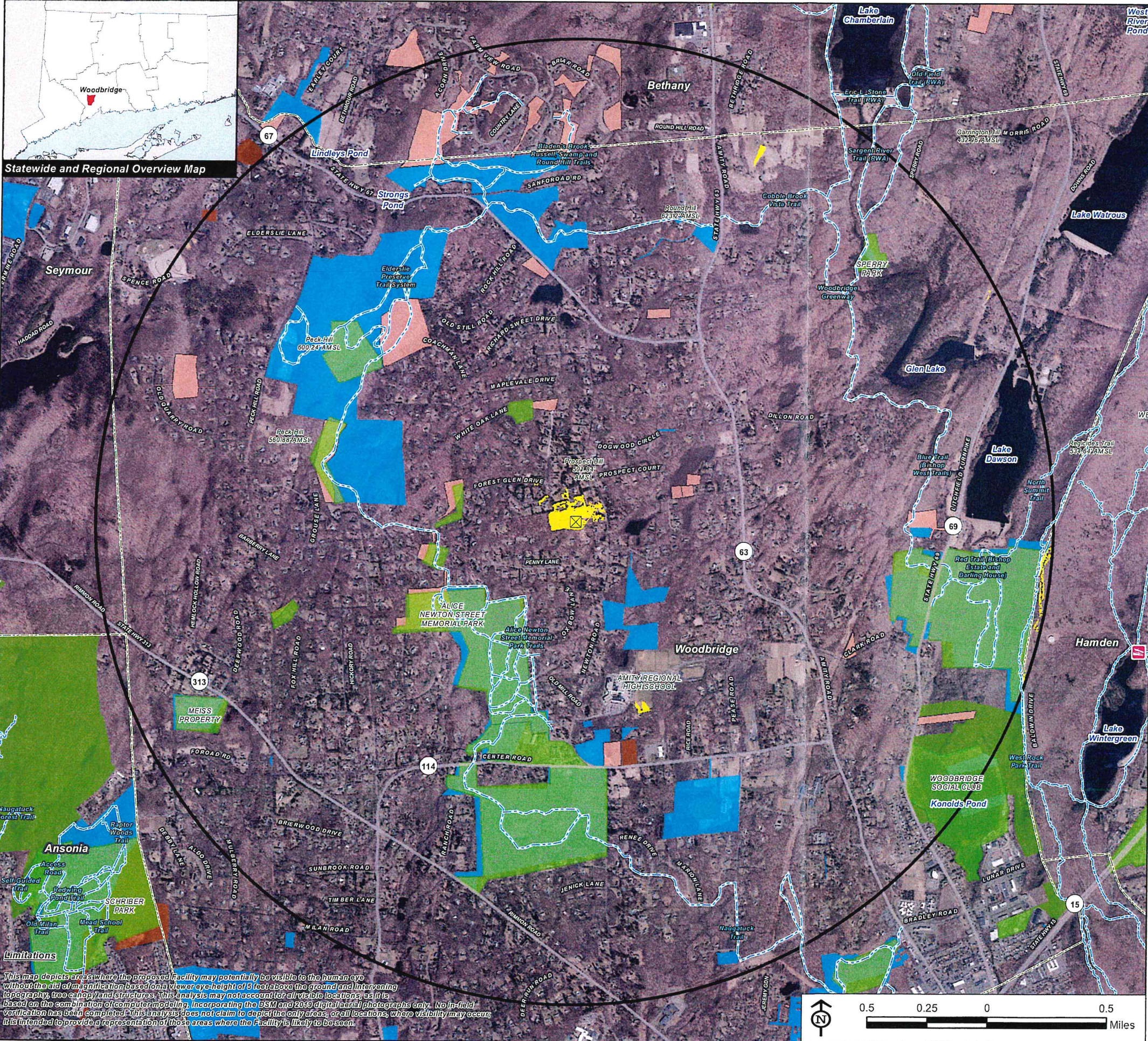
³ An LAS file is an industry-standard binary format for storing airborne LiDAR data.

⁴ Each DSM cell size is 1 square meter.

The maps provided as attachments offer a preliminary basis for understanding the extent of visibility that may occur throughout the Study Area, but they do not address the character of those potential views. Note that the results of the computer model have not been field verified. Our experience is that the computer model's sensitivity typically results in the initial mapping being over-predictive of the Facility's viewshed.

The initial results presented herein will be field-verified in the future via a balloon float or crane test and reconnaissance to supplement and fine tune the results of the preliminary computer modeling. The reconnaissance activities will consist of raising a brightly-colored, approximately four-foot diameter, helium-filled balloon or brightly-colored flag tethered at the proposed monopole height at the Site. Once the balloon/flag is raised into position, APT will perform a Study Area reconnaissance by driving publicly-accessible local and State roads and inventorying those locations where the balloon/flag is seen above/through the trees. Visual observations will be used to evaluate the results of the preliminary viewshed mapping and identify any discrepancies in the initial modeling. APT will also photo-document areas where the balloon/flag can be seen (as well as locations where it is not visible) and will prepare photographic simulations from several vantage points where the balloon/flag can be seen to depict scaled renderings of the proposed Facility. This information will be included in Verizon's application to the Connecticut Siting Council for a Certificate of Environmental Compatibility and Public Need.

ATTACHMENTS



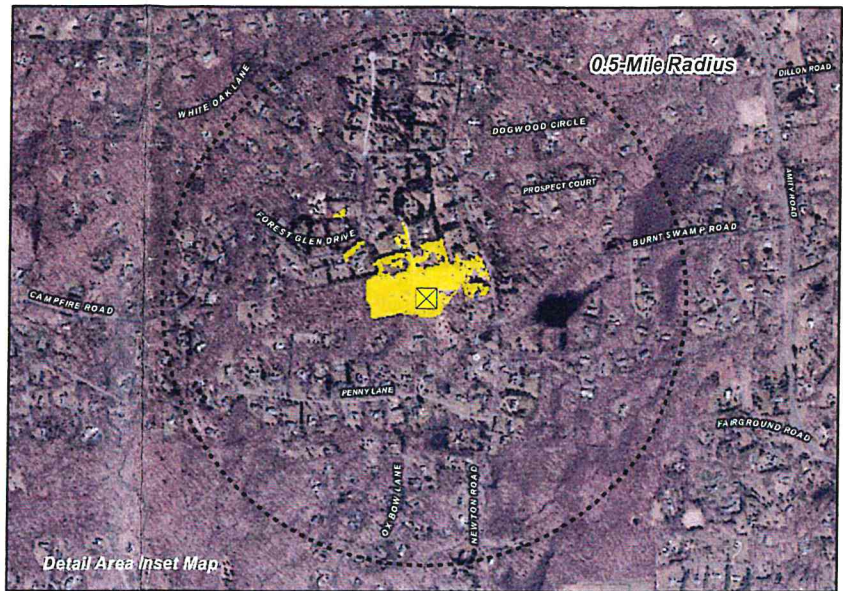
Statewide and Regional Overview Map

Woodbridge



Limitations

This map depicts areas where the proposed facility may potentially be visible to the human eye without the aid of magnification based on a viewer eye-height of 5 feet above the ground and intervening topography, tree canopy and structures. This analysis may not account for all visible locations, as it is based on the combination of computer modeling, incorporating the DSM and 2019 digital aerial photographs only. No in-field verification has been completed. This analysis does not claim to depict the only areas, or all locations, where visibility may occur. It is intended to provide a representation of those areas where the facility is likely to be seen.



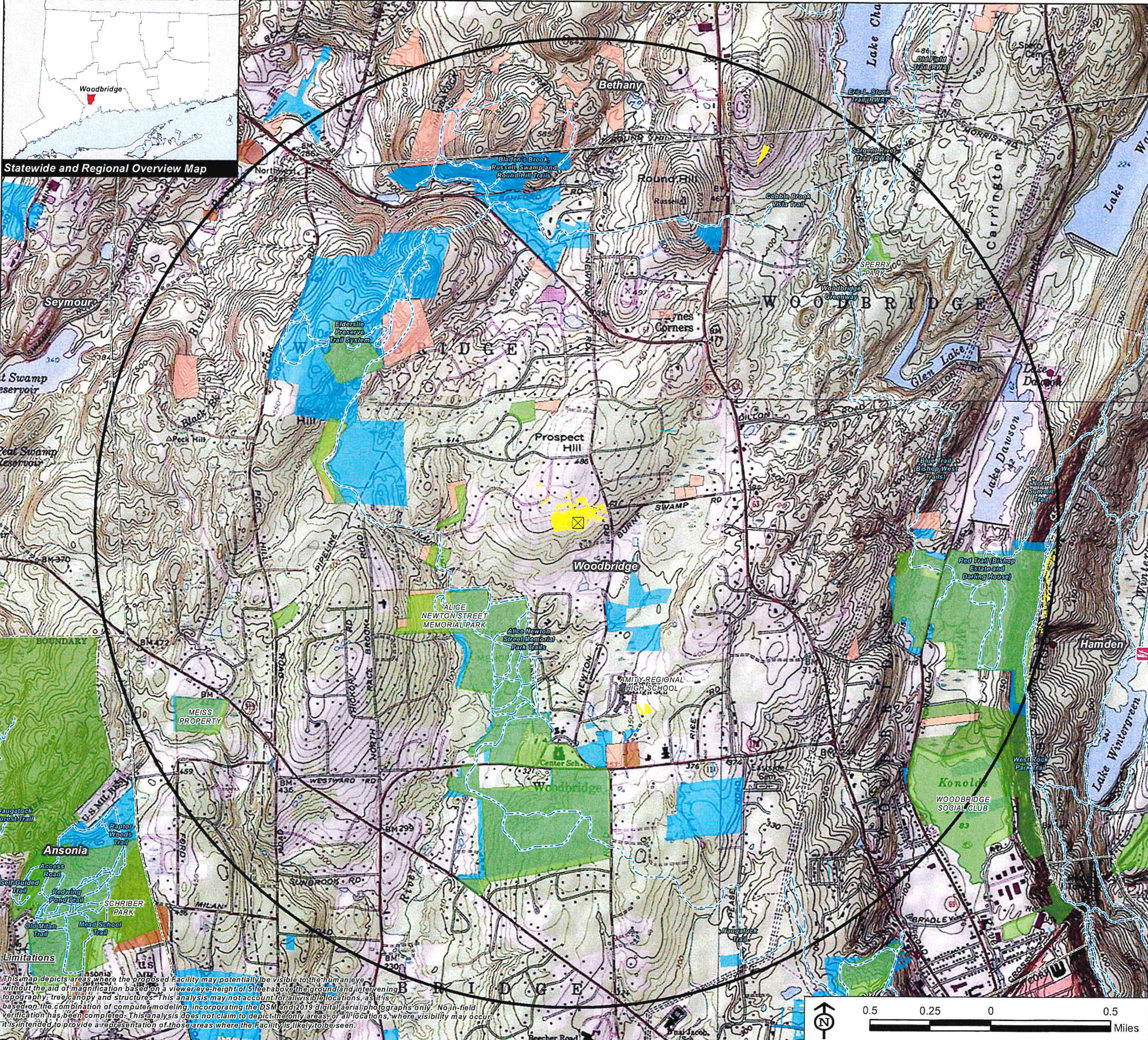
Preliminary Viewshed Analysis Map
 Proposed Wireless Telecommunications Facility
 Woodbridge N2 CT
 118 Newton Road
 Woodbridge, Connecticut

Proposed facility height is 144 feet AGL.
 Forest canopy height is derived from LIDAR data.
 Study area encompasses a two-mile radius and includes 8,042 acres.
 Information provided on this map has not been field verified
 Base Map Source: 2019 Aerial Photograph (CTECO)
 Map Date: April 2020

Legend

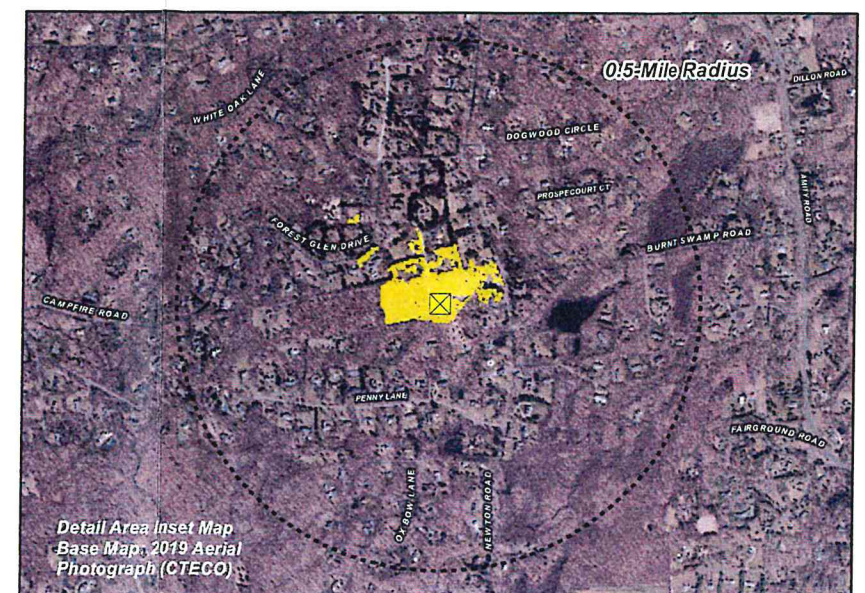
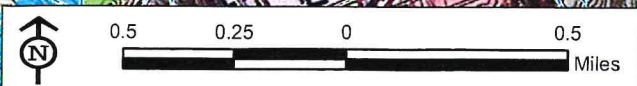
Proposed Site	Trail
Study Area (2-Mile Radius)	Scenic Highway
Predicted Year-Round Visibility (18 Acres)	DEEP Boat Launches
Municipal Boundary	Municipal and Private Open Space Property
	State Forest/Park
	Protected Open Space Property
	Federal
	Land Trust
	Municipal
	Private
	State

Data Sources:
Physical Geography / Background Data
 A digital surface model (DSM) was created from the State of Connecticut 2016 LIDAR LAS data points. The DSM captures the natural and built features on the Earth's surface.
 Municipal Open Space, State Recreation Areas, Trails, County Recreation Areas, and Town Boundary data obtained from CT DEEP.
 Scenic Roads: CTDOT State Scenic Highways (2015); Municipal Scenic Roads (compiled by APT)
Dedicated Open Space & Recreation Areas
 Connecticut Department of Energy and Environmental Protection (DEEP): DEEP Property (May 2007; Federal Open Space (1997); Municipal and Private Open Space (1997); DEEP Boat Launches (1994)
 Connecticut Forest & Parks Association, Connecticut Walk Books East & West
Other
 CTDOT Scenic Strips (based on Department of Transportation data)
Notes
 **Not all the sources listed above appear on the Viewshed Maps. Only those features within the scale of the graphic are shown.



Statewide and Regional Overview Map

Limitations
 This map depicts areas where the proposed facility may potentially be visible to the human eye without the aid of magnification based on a viewer eye-height of 5 feet above the ground and intervening topography, tree canopy and structures. This analysis may not account for all visible locations, as it is based on the combination of computer modeling, incorporating the DSM and 2019 digital aerial photographs only. No in-field verification has been completed. This analysis does not claim to depict the only areas, or all locations, where visibility may occur. It is intended to provide a representation of those areas where the facility is likely to be seen.



Detail Area Inset Map
 Base Map: 2019 Aerial Photograph (CTECO)

Preliminary Viewshed Analysis Map

Proposed Wireless Telecommunications Facility
 Woodbridge N2 CT
 118 Newton Road
 Woodbridge, Connecticut

Proposed facility height is 144 feet AGL.
 Forest canopy height is derived from LIDAR data.
 Study area encompasses a two-mile radius and includes 8,042 acres.
 Information provided on this map has not been field verified.
 Base Map Source: USGS 7.5 Minute Topographic Quadrangle Maps, Ansonia, CT (1984), Mount Carmel, CT (1984), Naugatuck, CT (1984) and New Haven, CT (1984)
 Map Date: April 2020

Legend

- Proposed Site
- Study Area (2-Mile Radius)
- Predicted Year-Round Visibility (18 Acres)
- Municipal Boundary
- Trail
- Scenic Highway
- DEEP Boat Launches
- Municipal and Private Open Space Property
- State Forest/Park
- Protected Open Space Property**
 - Federal
 - Land Trust
 - Municipal
 - Private
 - State

Data Sources:

- Physical Geography / Background Data**
 A digital surface model (DSM) was created from the State of Connecticut 2016 LIDAR LAS data points. The DSM captures the natural and built features on the Earth's surface.
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 CTDOT Scenic Strips (based on Department of Transportation data)

Notes

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ATTACHMENT 5

Site Name: Woodbridge North 2 CT

Cumulative Power Density

Operator	Operating Frequency	Number of Trans.	ERP Per Trans.	Total ERP	Distance to Target	Calculated Power Density	Maximum Permissible Exposure*	Fraction of MPE
	(MHz)		(watts)	(watts)	(feet)	(mW/cm ²)	(mW/cm ²)	(%)
VZW 700	746	4	807	3,227	140	0.0592	0.497333333	11.90%
VZW Cellular	880	4	449	1,795	140	0.0329	0.586666667	5.61%
VZW PCS	1970	4	1,681	6,724	140	0.1234	1.0	12.34%
VZW AWS	2145	4	1,700	6,799	140	0.1248	1.0	12.48%
VZW CBRS	3550	4	6	25	140	0.0005	1.0	0.05%

Total Percentage of Maximum Permissible Exposure

42.38%

*Guidelines adopted by the FCC on August 1, 1996, 47 CFR Section 1.13101 based on NCRP Report 86, 1986 and generally on ANSI/IEEE C95.1-1992

MHz = Megahertz

mW/cm² = milliwatts per square centimeter

ERP = Effective Radiated Power

Absolute worst case maximum values used, including the following assumptions:

1. closest accessible point is distance from antenna to base of pole;
2. continuous transmission from all available channels at full power for indefinite time period; and,
3. all RF energy is assumed to be directed solely to the base of the pole.

ATTACHMENT 6

**Cellco Partnership d/b/a Verizon Wireless
118 Newton Road
Woodbridge, Connecticut**

Woodbridge North 2 Facility

Site Search Summary

Section 16-50j-74(j) of the Regulations of Connecticut State Agencies requires the submission of a statement that describes “the narrowing process by which other possible sites were considered and eliminated.” In accordance with this requirement, descriptions of the general site search process, the identification of the applicable search area and the alternative locations considered for development of the proposed telecommunications facility in north-central Woodbridge are provided below.

Site Search Process

To initiate its site selection process in an area where wireless service problems have been identified, Cellco first establishes a “site search ring” or “site search area”. In any search ring or search area, Cellco seeks to avoid the unnecessary proliferation of towers and to reduce the potential adverse environmental effects of the cell site, while at the same time maximizing the quality of service provided from a facility. These objectives are achieved by initially locating existing towers and other sufficiently tall structures within and near the site search area. If any are found, they are evaluated to determine whether they can support Cellco’s telecommunications antennas and related equipment at a location and satisfies its technical requirements.

The list of available locations may be further reduced if, after preliminary negotiations, the property owners withdraw a site from further consideration. From among the remaining locations, the proposed sites are selected by eliminating those that have greater potential for adverse environmental effects and fewer benefits to the public (*i.e.*, those requiring taller towers; those with substantial adverse environmental impacts, or in densely populated residential areas; and those with limited ability to share space with other public or private telecommunications service providers). It should be noted that in any given site search, the weight afforded to factors considered in the selection process will vary depending upon the availability and nature of sites within the search area.

Need for the Woodbridge North 2 Facility

Within approximately four (4) miles of the proposed Woodbridge North 2 Facility, Cellco maintains eight (8) macro-cell and three (3) small cell telecommunications facilities. These facilities are identified as Cellco’s Ansonia East, Bethany, Hamden Relo, Westville, Westville West, Woodbridge East, Woodbridge North, Woodbridge South 2, Hamden SC9, Hamden SC10, Hamden SC12 cell sites.

Cellco's Ansonia East facility consists of antennas on a tower at 1 Deerfield Lane in Ansonia. Cellco's Bethany facility consists of antennas on a tower at 93 Old Amity Road in Bethany. Cellco's Hamden Relo facility consists of antennas on a tower at 796 Woodin Street in Hamden. Cellco's Westville facility consists of antennas on a rooftop at 1015 Whalley Avenue in New Haven. Cellco's Westville West facility consists of antennas on a tower at 50 Woodfield Road in Woodbridge. Cellco's Woodbridge East facility consists of antennas on a flagpole tower at 100 Pond Lily Avenue in New Haven. Cellco's Woodbridge North facility consists of antennas on a tower at 6 Progress Avenue in Seymour. Cellco's Woodbridge South 2 facility consists of antennas on a tower at 77 Pease Road in Woodbridge. Cellco's Hamden SC9 facility consists of antennas on a utility pole near 465 Pine Rock Avenue in Hamden. Cellco's Hamden SC10 facility consists of antennas on a utility pole near 667 Pine Rock Avenue in Hamden. Cellco's Hamden SC12 facility consists of antennas on a utility pole near 546 Circular Avenue in Hamden.

These existing facilities currently provide little or no reliable wireless service in the area around the proposed Woodbridge North 2 Facility location. These gaps in reliable wireless service and signal level deficiencies persist along portions of Route 63, 67 and 114 and more generally in the residential areas of north-central Woodbridge. Unfortunately, there are no other existing towers or other sufficiently tall structures available in this area that would help Cellco satisfy its need for service and reliability improvements. Construction of a new tower, therefore, is required to resolve Cellco's wireless service problems.

Identification of the Woodbridge North 2 Search Area

The purpose of the proposed Woodbridge North 2 Facility is to fill existing wireless service gaps in Cellco's 2100 MHz frequency range and provide more reliable wireless service in Cellco's 700 MHz frequency range in north-central Woodbridge. (See attached Search Area Map). The Woodbridge North 2 site search was initiated in 2014. The project was put on hold in 2015 but the site search was re-initiated in 2016 following a shift in the search area location by Cellco's RF Engineers.

Sites Investigated

Cellco identified and investigated a total of seven (7) sites in north-central Woodbridge. A listing of the sites investigated is provided below.

1. **118 Newton Road, Woodbridge, CT (MBL# 1304/1240/118)**: Cellco entered into a lease agreement with Michael Soufrine Trustee of the Soufrine Family Trust, for the development of a new tower site on this 6.01-acre parcel in the Town's A Residence zone district.
2. **19 Soundview Drive, Woodbridge, CT (MBL# 1304/1740/19)**: This is an 8.2-acre residential parcel owned by Jay Michael Soufrine located immediately west of the proposed tower site.
3. **30 Sperry Road, Woodbridge, CT (MBL# 0904/1760/30)**: This is an undeveloped 117-acre parcel, west off Sperry Road, owned by the South-Central Connecticut Regional Water Authority.

4. **615 Amity Road, Woodbridge, CT (MBL# 0403/30/615)**: This is an undeveloped 199-acre parcel east of Amity Road and west of Sperry Road and owned by the South-Central Connecticut Regional Water Authority.
5. **2060 Litchfield Turnpike, Woodbridge, CT (MBL# 1002/1000/2060)**: This is an undeveloped 435-acre parcel east of Litchfield Turnpike and east of Sperry Road and owned by the South-Central Connecticut Regional Water Authority.

In addition to the privately-owned parcels listed above, Cellco's real estate representatives identified two (2) additional parcels, both owned by the Town of Woodbridge as potentially viable alternative tower locations. Through this municipal consultation process, Cellco would like to explore whether the Town is interested in leasing space on either of these parcels for the development of a telecommunication facility. These municipal parcels include:

6. **46 Burnt Swamp Road, Woodbridge, CT (MBL# 1403/260/46)**: This is a 3.87-acre parcel owned by the Town of Woodbridge. The parcel contains significant wetland areas associated with the Wepawaug River in the southerly portion of this parcel.
7. **7 Meeting House Road, Woodbridge, CT (MBL# 1704/1115/7)**: This is a vacant 103.34-acre parcel owned by the Woodbridge Park Association, Inc.

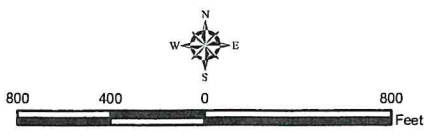


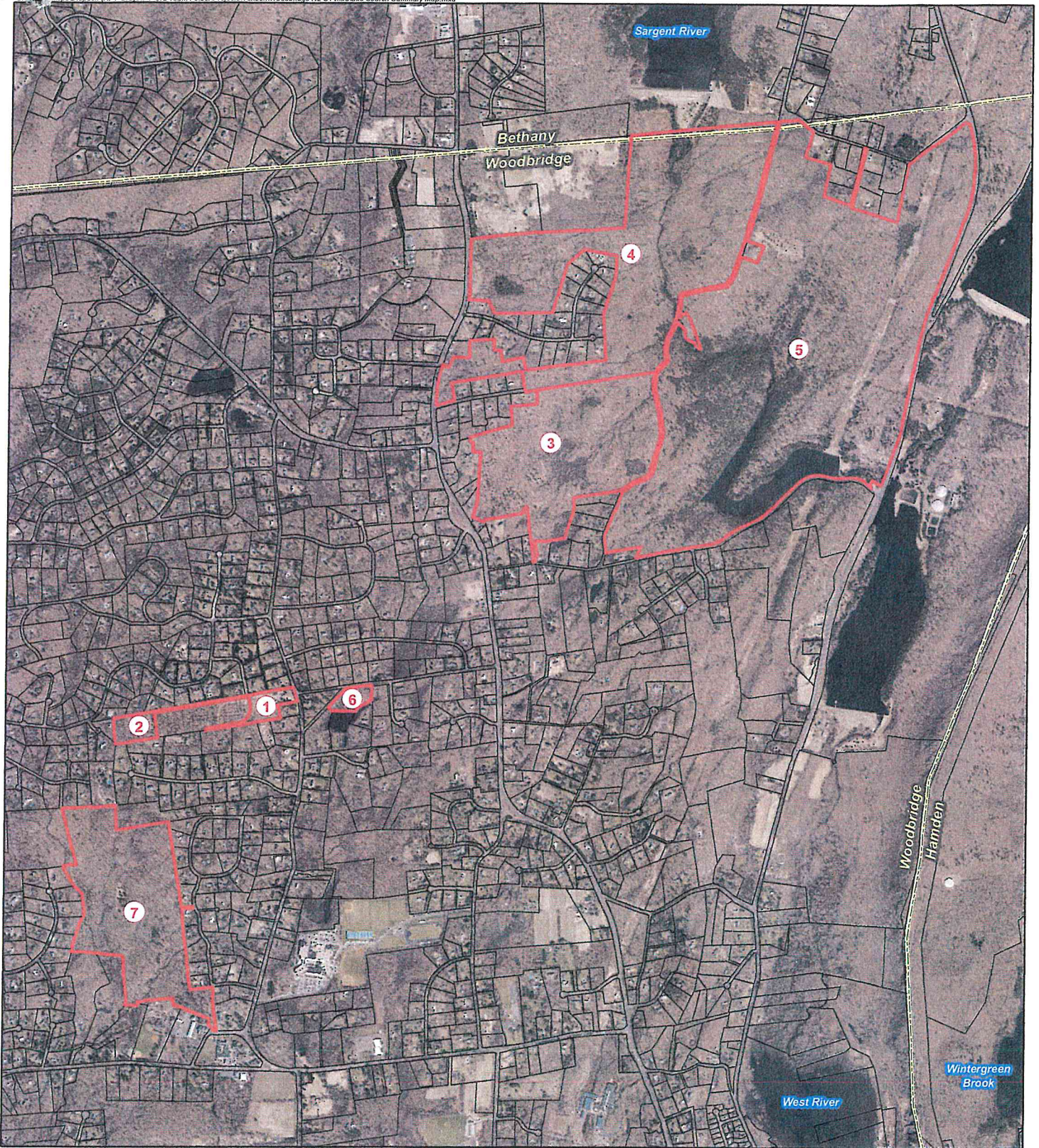
Legend
 Search Areas

Search Area Map
 Proposed Wireless
 Telecommunications Facility
 Woodbridge N2 CT
 118 Newton Road
 Woodbridge, Connecticut



Base Map Source: CT ECO 2019 Imagery
 Map Scale: 1 inch = 800 feet
 Map Date: June 2020





Legend

- Site Investigated
- Approximate Parcel Boundary
- Municipal Boundary

Sites Investigated:

- ① 118 Newton Road, Woodbridge, CT
- ② 19 Soundview Drive, Woodbridge, CT
- ③ 30 Sperry Road, Woodbridge, CT
- ④ 615 Amity Road, Woodbridge, CT
- ⑤ 2060 Litchfield Turnpike, Woodbridge, CT
- ⑥ 46 Burnt Swamp Road, Woodbridge, CT
- ⑦ 7 Meeting House Road, Woodbridge, CT

Site Search Summary Map

Proposed Wireless
Telecommunications Facility
Woodbridge N2 CT
118 Newton Road
Woodbridge, Connecticut

Map Notes:
Base Map Source: 2019 Aerial Photograph (CT ECO)
Map Scale: 1 inch = 2,000 feet
Map Date: June 2020

