

# *Proposed Wireless Telecommunications Facility*

## *Sterling/Oneco CT*

Alternate Candidate Site Locations:  
859 and 863 Plainfield Pike (Site A)  
875 Plainfield Pike (Site B)  
Sterling, Connecticut

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Prepared for



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## Visual Resource Evaluation

Cellco Partnership, dba Verizon Wireless ("Verizon Wireless") seeks approval from the Connecticut Siting Council for a Certificate of Environmental Compatibility and Public Need to construct a telecommunications Facility to be located within the Town of Sterling, Connecticut. As part of the approval process, Verizon Wireless has selected two alternative sites for further evaluation that are referred to herein as Candidate A and Candidate B. Candidate A is situated on two adjoining properties located at 859 and 863 Plainfield Pike (Route 14a) and Candidate B is located on property at 875 Plainfield Pike in Sterling, Connecticut ("host properties"). The Candidate project sites are located approximately 1,000 feet apart. This "Visual Resource Evaluation" was conducted to approximate the visibility of a Facility at the proposed locations within a two-mile radius surrounding each of the Candidate sites ("Study Area") and present the results of the analysis in a comparative format. The Town of Plainfield is included within the western portion of the Study Area. Attachment A contains a map that depicts the location of the Candidates and the limits of the Study Area.

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## Project Introduction

Development of either Candidate would include the construction of a 100-foot tall monopole with associated ground equipment located within a fence-enclosed compound area at the base of the tower structure. The Candidate A project area is located at approximately 543 feet Above Mean Sea Level (AMSL) and the Candidate B project area is located at approximately 504 feet AMSL. Access to the Candidate locations would be provided via a proposed gravel driveway that would partially utilize existing access/egress on each of the respective host properties.

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## Site Description and Setting

Identified in the Town of Sterling Tax Assessors records as Map 3646/Block 27/Lots 12 and 12B, the Candidate A host property consists of approximately 18.51 acres land (13.26 acres and 5.25 acres for lot 12 and lot 12B, respectively) and is currently occupied by two residential structures and several commercial greenhouses. The proposed Facility would be situated on the southerly portion of lot 12B which is wooded and undeveloped. The Candidate B project area is located on an 11.99-acre parcel identified in the Town of Sterling Tax Assessors records as Map 3646/Block 27/Lot 12A. A single-family residence and several outbuildings currently occupy the Candidate B host property. A Facility on the Candidate B host property would be located within a lightly wooded area in its southeasterly portion. Land use within the general vicinity of these Candidates is comprised of medium-density residential parcels, commercial uses, active agricultural parcels and tracts of undeveloped woodlands. Segments of Route 14a and Route 49 are contained within the Study Area. In total, the Study Area features approximately 47 linear miles of roadways.

The topography within the Study Area is characterized by rolling hills that range in ground elevation from approximately 280 feet AMSL to roughly 675 feet AMSL. Overall, the Study

Area contains approximately 69 acres of surface water, mainly associated with Oneco and Sterling Ponds and other portions of the Moosup River. The tree cover within the Study Area consists mainly of mixed deciduous hardwood species interspersed with stands of mature evergreen trees. The tree canopy occupies approximately 6,741 acres of the 8,525-acre study area (79%). The average tree canopy height throughout the Study Area is 65 feet.



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## METHODOLOGY

In order to better represent the visibility associated with the Facility, Vanasse Hangen Brustlin, Inc. (VHB) uses a two-fold approach incorporating both a predictive computer model and in-field analysis. The predictive model is employed to assess potential visibility throughout the entire Study Area, including private property and/or otherwise inaccessible areas for field verification. A "balloon float" and Study Area drive-through reconnaissance are also conducted to obtain locational and height representations, back-check the initial computer model results and provide documentation from publicly accessible areas. Results of both activities are analyzed and incorporated into the final viewshed map. A description of the methodologies used in the analysis is provided below.

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### Visibility Analysis

Using ESRI's ArcView® Spatial Analyst, a computer modeling tool, the areas from which the top of the Facility is expected to be visible are calculated. This is based on information entered into the computer model, including Facility height, its ground elevation, the surrounding topography and existing vegetation. Data incorporated into the predictive model includes a digital elevation model (DEM) and a digital forest layer for the Study Area. The DEM was derived from the Connecticut LiDAR-based digital elevation data. The LiDAR data was produced by the University of Connecticut Center for Land Use Education and Research (CLEAR) in 2007 and has a horizontal resolution of 10 feet. In order to create the forest layer, digital aerial photographs of the Study Area are incorporated into the computer model. The mature trees and woodland areas depicted on the aerial photos are manually traced in ArcView® GIS and then converted into a geographic data layer. The aerial photographs were produced in 2006 and have a pixel resolution of one foot.

Once the data are entered, a series of constraints are applied to the computer model to achieve an estimate of where the Facility will be visible. Initially, only topography was used as a visual constraint; the tree canopy is omitted to evaluate all areas of potential visibility without any vegetative screening. Although this is an overly conservative prediction, the initial omission of these layers assists in the evaluation of potential seasonal visibility of the proposed Facility. A conservative tree canopy height of 50 feet is then used to prepare a preliminary viewshed map for use during the Study Area reconnaissance. The average height of the tree canopy is determined in the field using a hand-held infrared laser range finder. The average tree canopy height is incorporated into the final viewshed map; in this case, 65 feet was identified as the average tree canopy height. The forested areas within the Study Area were then overlaid on the DEM with a height of 65 feet added and the visibility

calculated. As a final step, the forested areas are extracted from the areas of visibility, with the assumption that a person standing among the trees will not be able to view the Facility beyond a distance of approximately 500 feet. Depending on the density of the vegetation in these areas, it is assumed that some locations within this range will provide visibility of at least portions of the Facility based on where one is standing.

Also included on the map is a data layer, obtained from the State of Connecticut Department of Environmental Protection ("CTDEP"), which depicts various land and water resources such as parks and forests, recreational facilities, dedicated open space, CTDEP boat launches and other categories. This layer is useful in identifying potential visibility from any sensitive receptors that may be located within the Study Area. Lastly, based on both a review of published information and discussions with municipal officials in Sterling, it was determined that segments of Route 14a and Route 49 that traverse the Study Area are designated scenic roadways. The Moosup Valley State Park Trail (part of the Airline Trail) extends east to west, generally, through the northern portion of the Study Area. These resources are depicted on the Viewshed Map contained in Attachment B.

The preliminary viewshed map (using topography and a conservative tree canopy height of 50 feet) is used during the in-field activity to assist in determining if significant land use changes have occurred since the aerial photographs used in this analysis were produced and to compare the results of the computer model with observations of the balloon float. Information obtained during the reconnaissance is then incorporated into the final visibility map.

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### **Balloon Float and Study Area Reconnaissance**

On January 26, 2009 and February 9, 2009, VHB conducted a "balloon float" at the Candidate sites to further evaluate the potential viewshed within the Study Area. The events consisted of raising and maintaining an approximate four-foot diameter, helium-filled weather balloon at each of the proposed site locations at a height of 100 feet. During the January 26<sup>th</sup> balloon float, the temperature was approximately 25 degrees Fahrenheit with calm wind conditions and sunny skies. Weather conditions for the February 9<sup>th</sup> balloon float included calm winds, overcast skies with a temperature of approximately 40 degrees Fahrenheit.

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### **Photographic Documentation**

Once the balloons were secured, VHB staff conducted a drive-by reconnaissance along the roads located within the Study Area with an emphasis on nearby residential areas and other potential sensitive receptors in order to evaluate the results of the preliminary viewshed map and to verify where the balloons were, and were not, visible above and/or through the tree canopy. The balloons were photographed from several vantage points to document the actual view towards the Candidate Sites. Select locations where the balloons were not visible are also included. The locations and orientations of the photos are described below:

1. Views from Plainfield Pike (Route 14a) at Porter Pond Road/Porter Town Road.
2. Views from Porter Pond Road/Porter Town Road south of Plainfield Pike (Route 14a).
3. Views from Porter Pond Road/Porter Town Road.
4. Views from Sterling Hill Road.
5. Views from Plainfield Pike (Route 14a) adjacent to host property.
6. Views from Plainfield Pike (Route 14a) at Ledge Hill Road.
7. Views from Sterling Hill Road at First Baptists Church of Sterling.
8. Views from Route 49.
9. Views from Porter Pond Road/Porter Town Road.
10. Views from Pine Hill Road.

Photographs of the balloon from the view points listed above were taken with a Nikon D-80 digital camera body and Nikon 18 to 135 mm zoom lens. For the purposes of this report, the lens was set to 50mm. "The lens that most closely approximates the view of the unaided human eye is known as the normal focal-length lens. For the 35 mm camera format, which gives a 24x36 mm image, the normal focal length is about 50 mm."<sup>1</sup>

The locations of the photographic points are recorded in the field using a hand held GPS receiver and are subsequently plotted on the maps contained in the attachments to this document.

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## Photographic Simulation

A photographic simulation was generated for the six photo locations introduced above where at least one of the balloons was visible. The photographic simulations represent a scaled depiction of the proposed monopole from these locations. The height of the Facility is determined based on the location of the balloon in the photograph and a proportional monopole image is simulated into the photographs. The simulations are contained in Attachment A.



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## CONCLUSIONS

Based on this analysis, areas from where the proposed monopoles would be visible above the tree canopy comprise approximately 7 acres and 4 acres for Candidate A and Candidate B, respectively (or less than one half of one percent of the 8,525 acres of land contained within the Study Area). As depicted on the viewshed map, the majority of the visibility associated with the Candidates occurs on their respective host properties; this is entirely the case for Candidate B where no year-round views are anticipated beyond the host property.

For Candidate A, year-round visibility extends beyond the host property to include limited portions of Plainfield Pike (Route 14a), Porter Pond and select portions of private properties

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<sup>1</sup> Warren, Bruce. *Photography*, West Publishing Company, Eagan, MN, c. 1993, (page 70).

to the west of the proposed Facility. These areas are all within the immediate vicinity of the Candidate A site location (generally within 0.25-mile). VHB estimates that at least partial views of the Candidate A monopole would be achieved from portions of approximately six residential properties located within the Study Area. This includes three properties located along Plainfield Pike (Route 14a) and three located off Porter Pond Road/Porter Town Road.

The viewshed maps also depict several additional areas where seasonal (i.e. during "leaf off" conditions) views are anticipated. These comprise approximately 28 acres and 9 acres for Candidate A and Candidate B, respectively, and appear limited to immediately surrounding areas within 0.5-mile or less. For Candidate A, seasonal views extend to portions of Plainfield Pike (Route 14a), Porter Pond Road/Porter Town Road, Sterling Hill Road (see View 4) and Ledge Hill Road. VHB estimates that seasonal views of the proposed Candidate A location could be achieved from approximately three additional residential properties within the Study Area. Areas of potential seasonal visibility associated with Candidate B also include a short section of Porter Pond Road/Porter Town Road. In total, VHB estimates that seasonal views associated with Candidate B may be achieved from portions of approximately two additional residential properties within the Study Area.

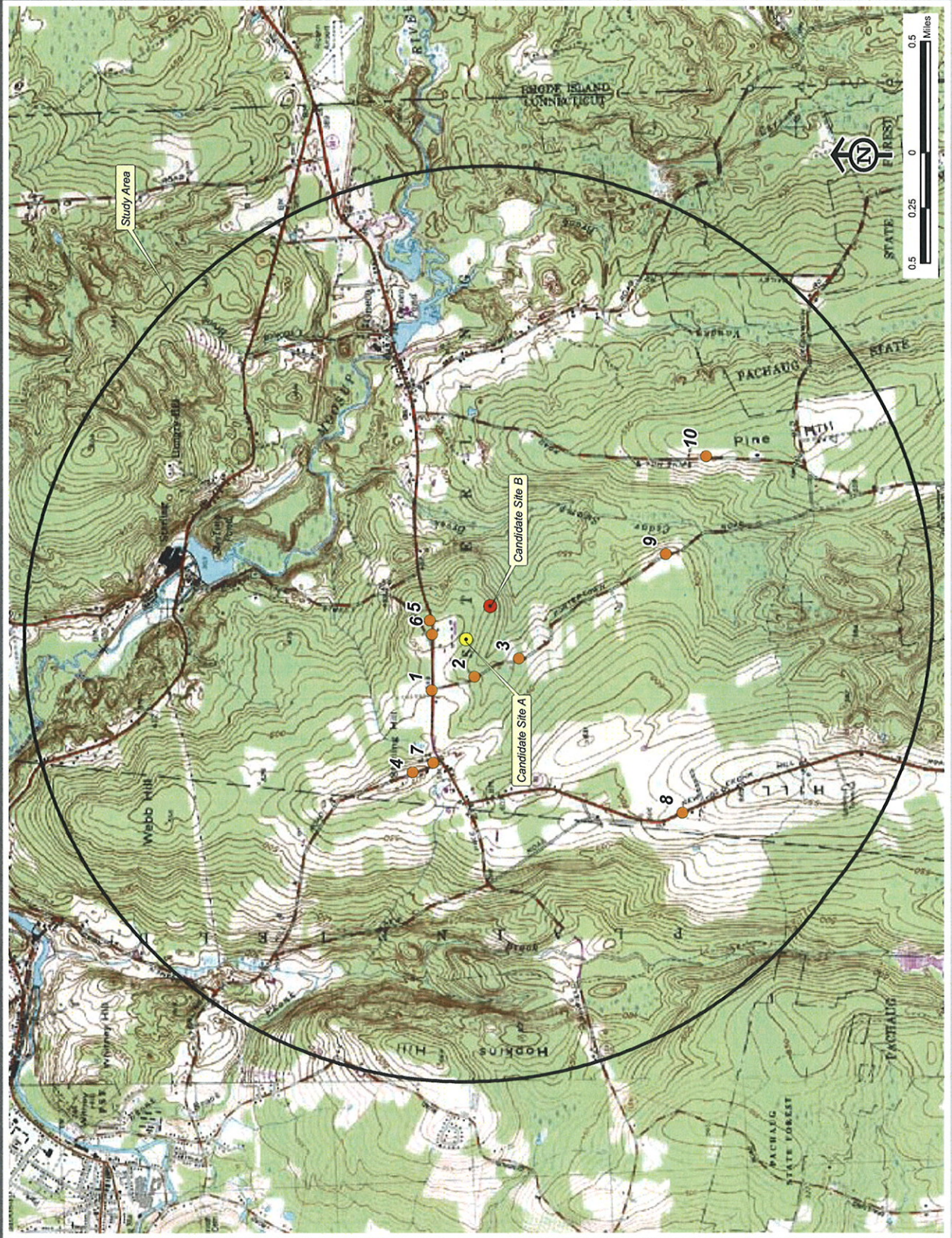
With the exception of the intersection of Route 14a and Porter Pond Road/Porter Town Road (see View 1), no views are anticipated from scenic roadways. No views would be achieved from the Moosup River, Sterling Pond, Oneco Pond, or the Moosup Valley State Park Trail.

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## Attachment A

# Photolog Documentation Map, Project Area Photographs, and Balloon Float/ Photographic Simulations

# Photolog Map



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PHOTO TAKEN FROM PLAINFIELD PIKE (ROUTE 14A) AT PORTER POND ROAD/PORTER TOWN ROAD, LOOKING SOUTHEAST

- SITE A BALLOON IS VISIBLE; SITE B BALLOON IS NOT VISIBLE FROM THIS LOCATION

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE A IS 0.27 MILE +/-

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE B IS 0.40 MILE +/-



PHOTO TAKEN FROM PLAINFIELD PIKE (ROUTE 14A) AT PORTER POND ROAD/PORTER TOWN ROAD, LOOKING SOUTHEAST

- SITE A BALLOON IS VISIBLE; SITE B BALLOON IS NOT VISIBLE FROM THIS LOCATION

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE A IS 0.27 MILE +/-

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE B IS 0.40 MILE +/-

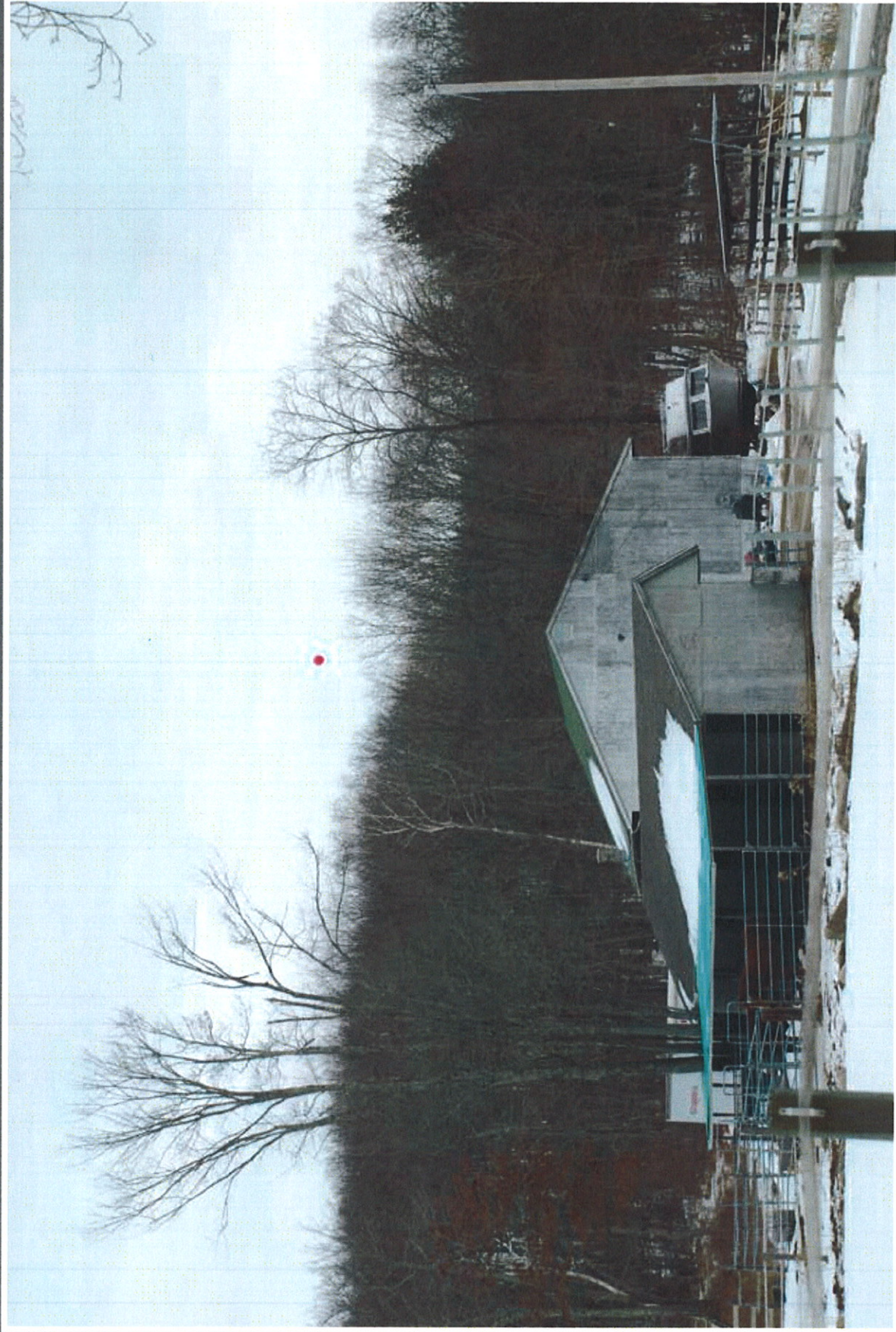


PHOTO TAKEN FROM PORTER POND ROAD/PORTER TOWN ROAD SOUTH OF PLAINFIELD PIKE (ROUTE 14A), LOOKING NORTHEAST

- SITE A BALLOON IS VISIBLE; SITE B BALLOON IS NOT VISIBLE FROM THIS LOCATION

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE A IS 0.21 MILE +/-

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE B IS 0.26 MILE +/-

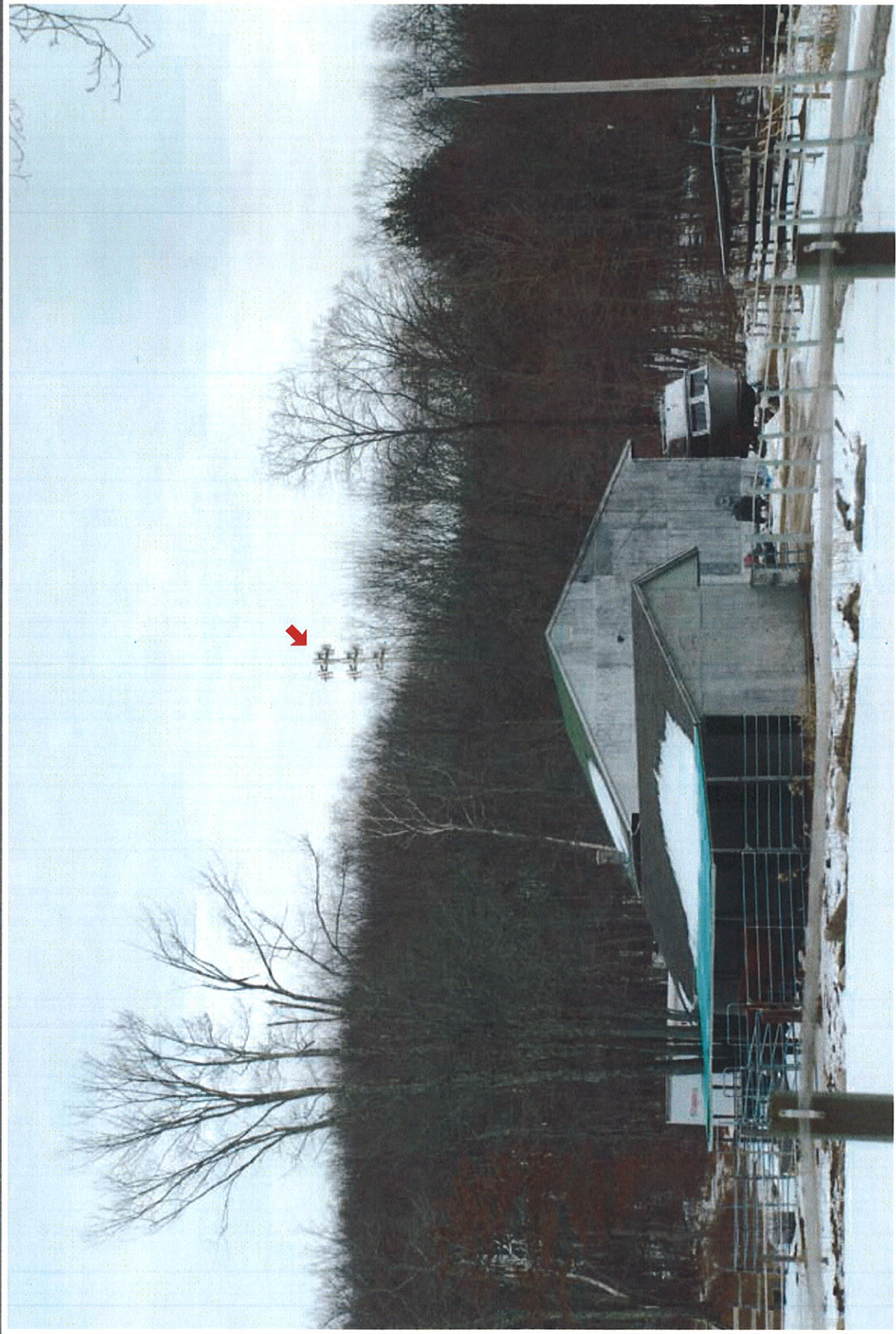


PHOTO TAKEN FROM PORTER POND ROAD/PORTER TOWN ROAD SOUTH OF PLAINFIELD PIKE (ROUTE 14A), LOOKING NORTHEAST

- SITE A BALLOON IS VISIBLE; SITE B BALLOON IS NOT VISIBLE FROM THIS LOCATION

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE A IS 0.21 MILE +/-

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE B IS 0.26 MILE +/-



PHOTO TAKEN FROM PORTER POND ROAD/PORTER TOWN ROAD, LOOKING NORTHEAST

- SITE B BALLOON IS VISIBLE; SITE A BALLOON IS NOT VISIBLE FROM THIS LOCATION

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE B IS 0.23 MILE +/-

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE A IS 0.29 MILE +/-

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PHOTO TAKEN FROM PORTER POND ROAD/PORTER TOWN ROAD, LOOKING NORTHEAST  
- SITE B BALLOON IS VISIBLE; SITE A BALLOON IS NOT VISIBLE FROM THIS LOCATION

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE B IS 0.23 MILE +/-

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE A IS 0.29 MILE +/-



PHOTO TAKEN FROM STERLING HILL ROAD, LOOKING SOUTHEAST

- SITE A BALLOON IS VISIBLE THROUGH TREES; SITE B BALLOON IS NOT VISIBLE FROM THIS LOCATION

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE A IS 0.67 MILE +/-

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE B IS 0.77 MILE +/-



PHOTO TAKEN FROM STERLING HILL ROAD, LOOKING SOUTHEAST

- SITE A BALLOON IS VISIBLE THROUGH TREES; SITE B BALLOON IS NOT VISIBLE FROM THIS LOCATION

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE A IS 0.67 MILE +/-

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE B IS 0.77 MILE +/-

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PHOTO TAKEN FROM PLAINFIELD PIKE (ROUTE 14A) ADJACENT TO HOST PROPERTY, LOOKING SOUTHWEST

- SITE A BALLOON IS VISIBLE; SITE B BALLOON IS NOT VISIBLE FROM THIS LOCATION

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE A IS 0.16 MILE +/-

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE B IS 0.27 MILE +/-

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PHOTO TAKEN FROM PLAINFIELD PIKE (ROUTE 14A) ADJACENT TO HOST PROPERTY, LOOKING SOUTHWEST

- SITE A BALLOON IS VISIBLE; SITE B BALLOON IS NOT VISIBLE FROM THIS LOCATION

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE A IS 0.16 MILE +/-

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE B IS 0.27 MILE +/-



PHOTO TAKEN FROM PLAINFIELD PIKE (ROUTE 14A) AT LEDGE HILL ROAD, LOOKING SOUTH  
- SITE A BALLOON IS VISIBLE; SITE B BALLOON IS NOT VISIBLE FROM THIS LOCATION

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE A IS 0.13 MILE +/-

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE B IS 0.26 MILE +/-

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PHOTO TAKEN FROM PLAINFIELD PIKE (ROUTE 14A) AT LEDGE HILL ROAD, LOOKING SOUTH  
- SITE A BALLOON IS VISIBLE; SITE B BALLOON IS NOT VISIBLE FROM THIS LOCATION

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE A IS 0.13 MILE +/-

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE B IS 0.26 MILE +/-



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**PHOTO TAKEN FROM STERLING HILL ROAD AT FIRST BAPTIST CHURCH OF STERLING, LOOKING SOUTHEAST  
BALLOONS ARE NOT VISIBLE FROM THIS LOCATION**

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE **A** IS **0.59** MILE +/-

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE **B** IS **0.68** MILE +/-



PHOTO TAKEN FROM ROUTE 49, LOOKING NORTHEAST  
BALLOONS ARE NOT VISIBLE FROM THIS LOCATION

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE A IS 1.29 MILES +/-

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE B IS 1.26 MILES +/-

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PHOTO TAKEN FROM PORTER POND ROAD/PORTER TOWN ROAD, LOOKING NORTHWEST  
BALLOONS ARE NOT VISIBLE FROM THIS LOCATION

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE A IS 1.00 MILE +/-

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE B IS 0.86 MILE +/-

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**PHOTO TAKEN FROM PINE HILL ROAD, LOOKING NORTHWEST  
BALLOONS ARE NOT VISIBLE FROM THIS LOCATION**

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE **A** IS **1.36** MILES +/-

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE **B** IS **1.24** MILES +/-



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# Attachment B

## Viewshed Map

Viewshed Analysis  
Proposed Cellco Partnership d/b/a  
Verizon Wireless  
Telecommunications Facilities  
Sterling/Oneco  
Two Candidate Site Locations  
Plainfield Pike  
Sterling, Connecticut

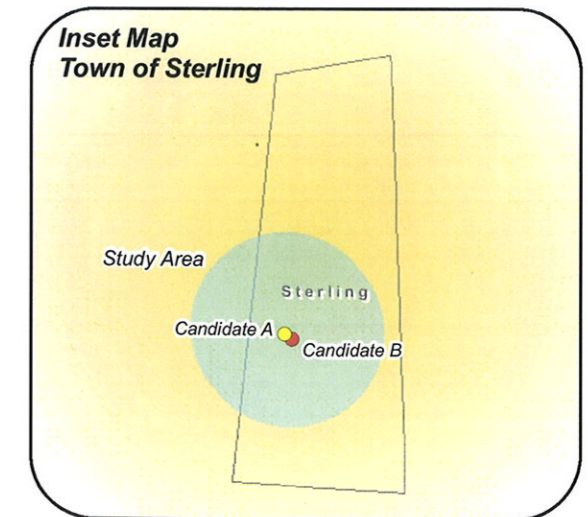
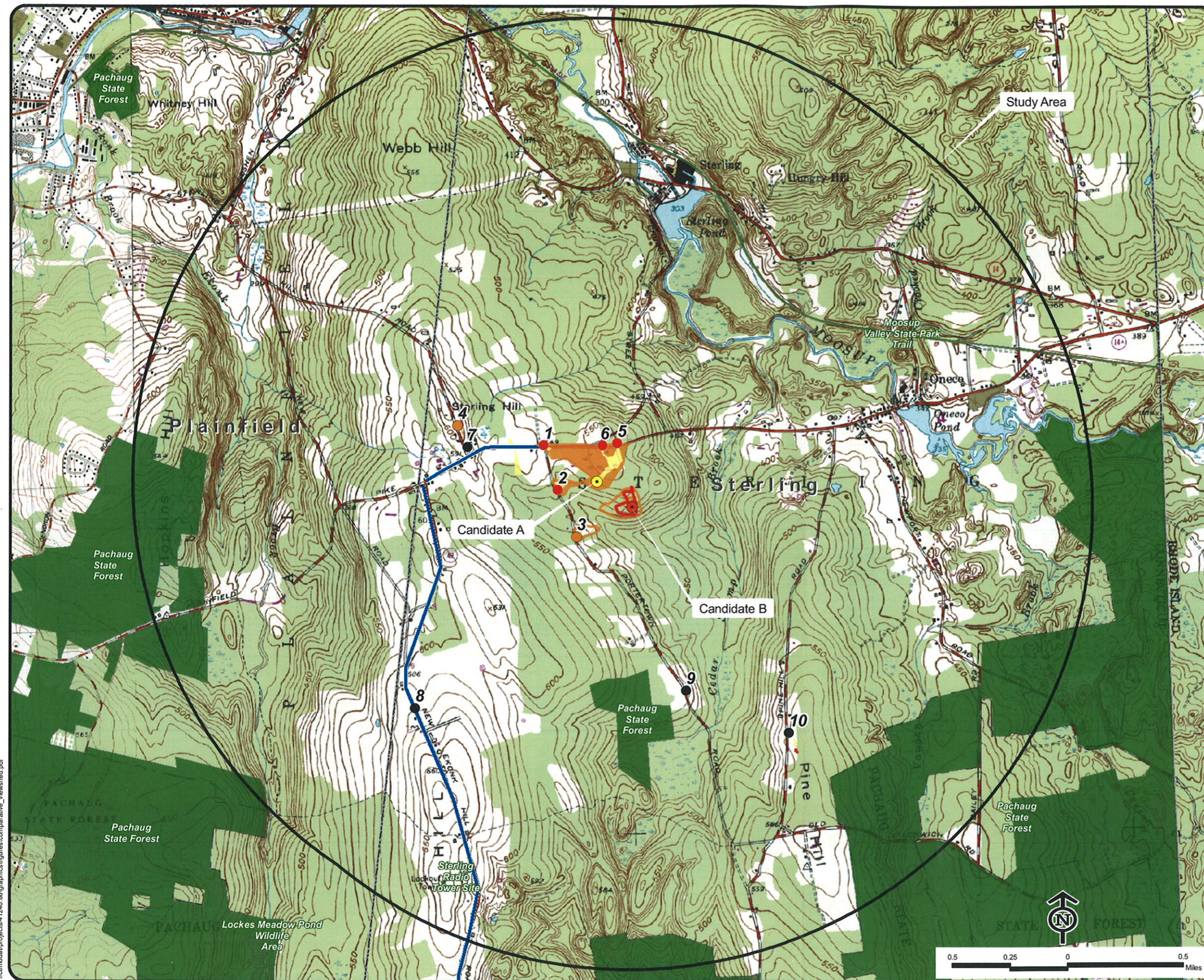
NOTE:  
 - Viewshed analysis conducted using ESRI's Spatial Analyst.  
 - Proposed Facility height is 100 feet.  
 - Existing tree canopy height estimated at 65 feet.  
 - The Study Area is comprised of a two-mile radius surrounding each site location and includes 8,525 acres of land.

DATA SOURCES:  
 - Digital elevation model (DEM) derived from Connecticut LIDAR-based Digital Elevation Data with a horizontal resolution of 10 feet produced by the University of Connecticut and the Center for Land Use Education and Research (CLEAR); 2007  
 - Forest areas derived from 2006 digital orthophotos with 1-foot pixel resolution; digitized by VHB, 2008  
 - Base map comprised of Oneco (1970) and Plainfield (1983) USGS Quadrangle Maps  
 - Protected municipal and private open space properties and federal protected properties and data layers provided by CT DEP, 1997  
 - Protected CT DEP properties data layer provided by CTDEP, May 2007  
 - CT DEP boat launches data layer provided by CT DEP, 1994  
 - Scenic Roads layer derived from available State and Local listings.

Map Compiled February, 2009

**Legend**

- |  |   |  |  |
|--|---|--|--|
|  | *Candidate A - 859 and 863 Plainfield Pike                  |  | CT DEP Protected Properties (2007)                           |
|  | *Candidate B - 875 Plainfield Pike                          |  | State Forest   |
| Photographs - January 26 and February 9, 2009  |   |  | State Park   |
|  | ● Balloon is not visible                                    |  | DEP Owned Waterbody  |
|  | ● Balloon is visible through trees                          |  | State Park Scenic Reserve                                    |
|  | ● Balloon visible above trees                               |  | Historic Preserve  |
|  | Year-Round Visibility - Candidate A (Approximately 7 acres) |  | Natural Area Preserve  |
|  | Year-Round Visibility - Candidate B (Approximately 4 acres) |  | Fish Hatchery  |
|  | Seasonal Visibility - Candidate A (Approximately 28 acres)  |  | Flood Control  |
|  | Seasonal Visibility - Candidate B (Approximately 9 acres)   |  | Other  |
|  | Federal Protected Properties (1997)                         |  | State Park Trail   |
|  | CT DEP Boat Launches (1994)                                 |  | Water Access   |
|  | Scenic Road (State and Local)                               |  | Wildlife Area  |
|  | Town Line   |  | Wildlife Sanctuary   |
| <i>*Note: Includes select areas of visibility approximately 500 feet around facility</i> |   |  | Protected Municipal and Private Open Space Properties (1997) |
|  |   |  | Cemetery   |
|  |   |  | Preservation   |
|  |   |  | Conservation   |
|  |   |  | Existing Preserved Open Space                                |
|  |   |  | Recreation   |
|  |   |  | General Recreation   |
|  |   |  | School   |
|  |   |  | Uncategorized  |



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