

Proposed Wireless Telecommunications Facility

Peck Road
Danbury, Connecticut

Prepared for



Prepared by

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Visual Resource Evaluation

Wireless Edge seeks approval from the Connecticut Siting Council for a Certificate of Environmental Compatibility and Public Need to construct a wireless telecommunications facility ("Facility") to be located on municipally-owned property off Peck Road ("host property") in the City of Danbury, Connecticut. This "Visual Resource Evaluation" was conducted to approximate the visibility of the proposed Facility within a two-mile radius of the Site ("Study Area").

Project Introduction

The proposed Facility includes the construction of a 150-foot tall monopole with associated ground equipment to be located within a fenced enclosure at the base of the tower. The monopole would be designed to accommodate up to six antenna arrays and two top-mounted whip antennae. Based on information provided by the Site engineers, Tectonic Engineering and Surveying Consultants, P.C., the proposed project area is located at ± 646 feet above mean sea level (AMSL). Access to the Facility would follow a proposed 20-foot wide access and utility easement originating from the north side of Peck Road.

Site Description and Setting

The host property includes 71.14-acres of undeveloped land and is currently identified by the City of Danbury Tax Assessor's Department as Map F05\Lot 27. The proposed Facility is situated within a wooded area approximately 262 feet north of Peck Road, and ± 600 feet east of the Margerie Reservoir. The Margerie Lake Reservoir is located immediately adjacent to the west\northwest of the host property and The City of Danbury Water Treatment facility is located to the southwest. Land use within the immediate vicinity of the proposed Facility is mainly comprised of commercial, industrial, and institutional (Danbury Federal Prison) parcels along Route 37 with medium and high-density residential parcels located at distances of .05-mile or more to the north, south, east and west. State numbered routes that traverse portions of the Study Area include segments of Route 37 and 39. In total, the Study Area contains roughly 98 linear miles of roadways.

The topography in the Study Area is generally characterized by rolling hills that range in ground elevation from approximately 600 to 1025 feet AMSL. The tree cover within the Study Area consists mainly of mixed deciduous hardwood species. The tree canopy occupies approximately 4,404 acres of the 8,042-acre study area (55%). During the in-field activities associated with this analysis, an infrared laser range finder was used to accurately determine the average tree canopy height throughout the Study Area. Numerous trees were selected for measurement and the average tree canopy established, in this case 65 feet. Lastly, the Study Area features approximately 1,094 acres of surface water, dominated in large measure by the portions of Candlewood Lake and the Margerie Reservoir. The northern portion of the Study Area extends into the neighboring town of New Fairfield.



METHODOLOGY

To estimate the visibility associated with the proposed Facility, VHB incorporates a two-fold approach utilizing 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 photographic 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.

Visibility Analysis

Using ESRI’s ArcView® Spatial Analyst, a computer modeling tool, the areas from where the proposed 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, existing vegetation and any significant structures/objects that may act to obstruct potential views. Data incorporated in the model includes 7.5 minute digital elevation models (DEMs) and a digital forest layer for the Study Area. The DEMs were produced by the United States Geological Survey (USGS) in 1982 at a 30 meter resolution. The forest layer was derived through on-screen digitizing in ArcView® GIS from 2000 and 2005 digital orthophotos with 1-meter and 2-meter pixel resolutions, respectively.

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 is 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 this layers provides a reference for comparison once the tree canopy is established and also assists in the evaluation of potential seasonal visibility of the proposed Facility. An estimated tree canopy height of 50 feet is then used to prepare a preliminary viewshed map for use during the Study Area reconnaissance. A preliminary viewshed map is generated for use during the in-field activity in order to confirm that no significant land use changes have occurred since the aerial photographs used in this analysis were produced and to verify the results of the model in comparison to the balloon float. Information obtained during the reconnaissance is then incorporated into the final visibility map.

The average height of the tree canopy, in this case 65 feet, is determined in the field using a hand-held infra-red laser range finder. The forested areas within the Study Area are then overlaid on the DEM with a height of 65 feet added and the visibility calculated. The forested

areas are then 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.

Lastly, in order to calculate the approximate amount of the monopole structure that may be visible above the tree canopy, this process was repeated in 38-foot increments and the results combined into a single thematic data layer.

Also included on the map is a data layer, obtained from the Connecticut State Department of Environmental Protection (CTDEP), which depicts various land and water resources such as state parks and forests, recreational facilities, dedicated open space and CTDEP boat launches and other categories. This layer is useful in identifying potential visual impacts to any sensitive receptors that may be located within the Study Area. Lastly, based on a review of available data published by the Connecticut Department of Transportation and discussions with staff in Danbury and New Fairfield, it was determined that the Study Area does not contain any state- or locally-designated scenic roadways.

Balloon Float and Study Area Reconnaissance

On March 21, 2007 Vanasse Hangen Brustlin Inc., (VHB) conducted a balloon float at the proposed Facility in order to further evaluate the potential viewshed within the Study Area. The balloon float consisted of tethering an approximate four-foot diameter, helium-filled weather balloon at the proposed Site location at a height of 150 feet. Once the balloon was aloft, VHB personnel drove the public road system in the Study Area to inventory those areas where the balloon was visible. During the balloon float, weather conditions were sunny with calm winds of less than 10 miles per hour. Temperatures during the float ranged between 30 and 35 degrees Fahrenheit.

Photographic Documentation

During the balloon float, 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 and refine the results of the preliminary viewshed map and to verify where the balloon was, and was not, visible above and/or through the tree canopy. The balloon was photographed from a number of different vantage points to document the actual view towards the proposed Facility. The locations of the photos are depicted on the photolog documentation map contained in Attachment A and are described below:

1. View from end of Peck Road.

2. View from Peck Road approaching proposed project area.
3. View from the end of Kevin Drive.
4. View from Peck Road west of Route 37.
5. View from Route 37 north of Peck Road.
6. View from Hollandale Road adjacent to house #13.
7. View from Bear Mountain Road adjacent to house #8.
8. View from Bear Mountain Road near Pembroke Road.
9. View from Margerie View Drive adjacent to house #10.
10. View from Hamilton Drive adjacent to house #9.
11. View from New Fairfield Shopping Center.
12. View from Route 37 north of Bear Mountain Road.
13. View from Marbil Road adjacent to house #9.
14. View from Huntington Drive adjacent to house #9.
15. View from Huntington Drive adjacent to house #16.
16. View from Barnum Road adjacent to house #36.
17. View from Bridle Ridge Road adjacent to house #3.
18. View from Barnum Road adjacent to house #47.
19. View from Bullet Hill Road adjacent to house #10.
20. View from Pembroke Road adjacent to FCI Prison entrance.

Photographs of the balloon from the view points listed above were taken with a Panasonic Digital Camera DMC-FZ5, which has a lens focal length equivalent to a 35 mm camera with a 38 to 115 mm zoom. "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."¹ The optical zoom lens for the Panasonic DMC-FZ5 was set at a range of 50 mm to 70 mm for the purposes of this Visual Resource Evaluation.

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.



CONCLUSIONS

Based on this analysis, areas from where the proposed 150-foot tall Facility would be visible above the tree canopy comprise approximately 262 acres, or roughly 3.3 percent of the 8,042-acre Study Area. Of the 262-acre total, approximately 201 acres of year-round visibility occurs over open water on the Margerie Reservoir which is not accessible to the public. The map also depicts an approximate 20-acre area of year-round visibility over a cleared field within the Danbury Federal Corrections Institution which is off limits to the public. Other areas of potential year-round visibility include select portions of the Route 37 traffic corridor

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

where a total of 18 residential properties would potentially have at least partial views of the proposed Facility (including 10 units within an adjacent condominium complex); Huntington Drive where an elevated and exposed aspect towards the proposed Facility would yield views from approximately 10 residential properties; Bridle Ridge Road where year-round views may be achieved from portions of approximately five residential properties; Kevin Road where approximately three residential properties may have at least partial year-round views of the proposed Facility; and Margerie View Drive where year-round views may be achieved from southwest-facing portions of approximately four properties. Limited or passing views may also be achieved from select portions of Hamilton Road, Marbil Road and Bullet Hill Road. VHB estimates that roughly two properties along each of these roadways may have such views. The viewshed map also depicts additional areas where seasonal (i.e. during "leaf off" conditions) views through the trees are anticipated. These areas comprise approximately 45 additional acres and are mostly limited to the general vicinity of the proposed Facility, mostly within less than 0.50 mile. In total, VHB anticipates that approximately 12 additional residences will achieve seasonal views of the proposed Facility from select portions of their respective properties. These properties are located along Hollandale Road, Bear Mountain Road and Barnum Road.

Attachment A

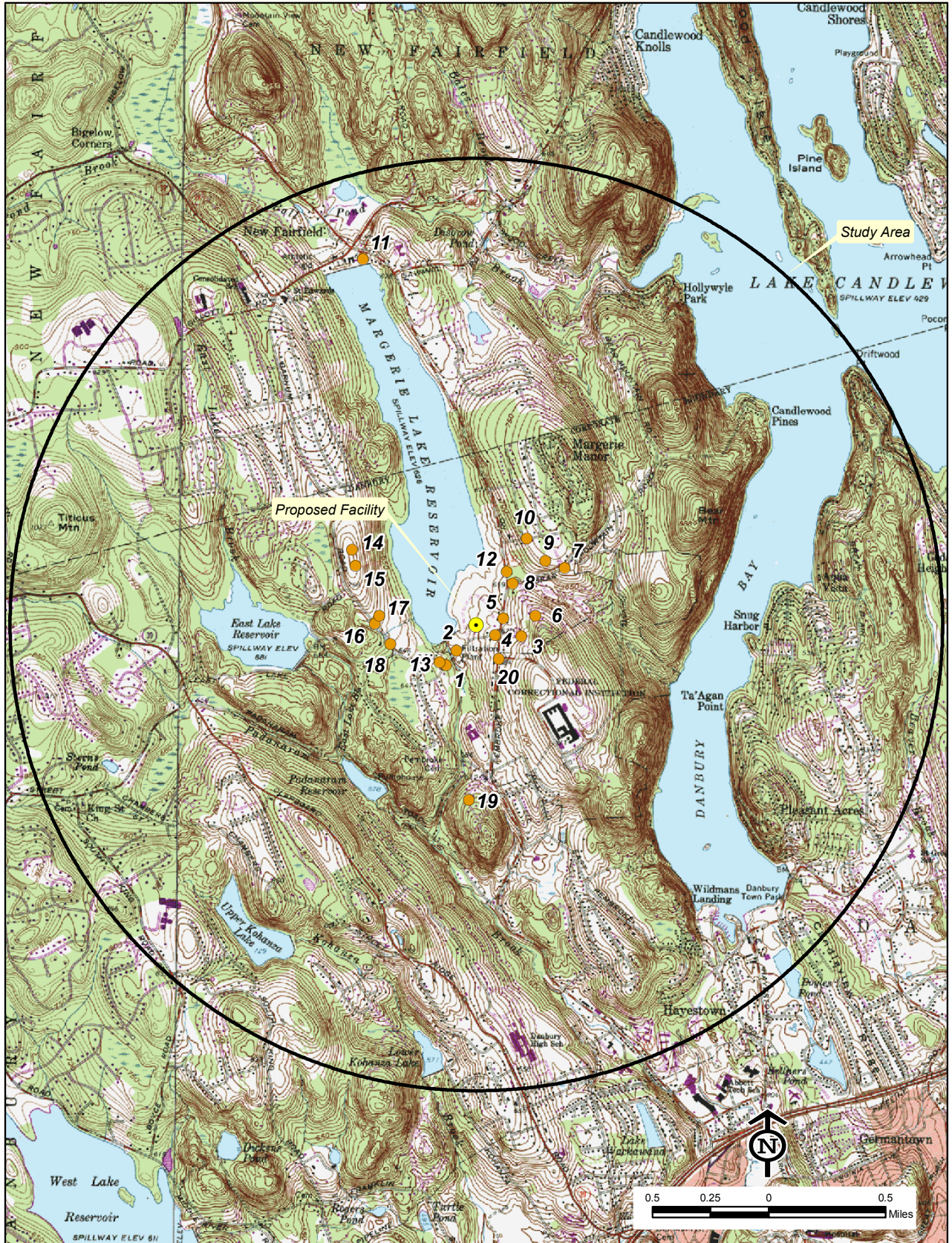
Photolog Documentation Map and Balloon Float Photographs

Attachment B

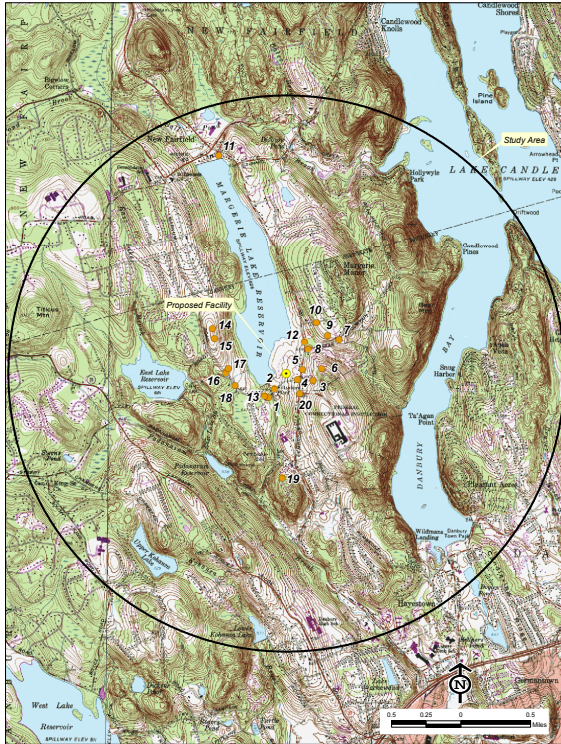
Viewshed Map

Photolog Documentation

City of
Danbury
Connecticut



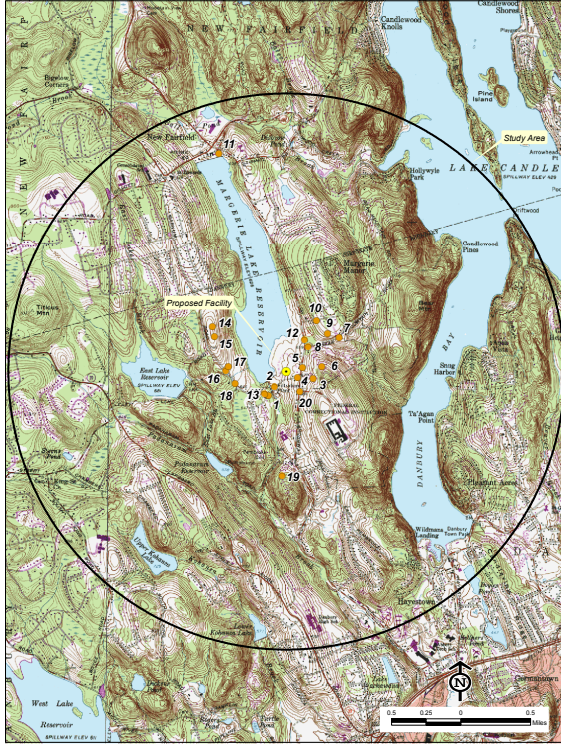
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Peck Road
Danbury, Connecticut

PHOTO TAKEN FROM END OF PECK ROAD, LOOKING NORTHEAST
DISTANCE FROM THE PHOTOGRAPH LOCATION TO THE PROPOSED SITE IS 0.22 MILE +/-

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Peck Road
Danbury, Connecticut

PHOTO TAKEN FROM PECK ROAD APPROACHING PROPOSED PROJECT AREA, LOOKING NORTHEAST
DISTANCE FROM THE PHOTOGRAPH LOCATION TO THE PROPOSED SITE IS 0.14 MILE +/-

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Peck Road
Danbury, Connecticut

PHOTO TAKEN FROM THE END OF KEVIN DRIVE, LOOKING NORTHWEST
DISTANCE FROM THE PHOTOGRAPH LOCATION TO THE PROPOSED SITE IS 0.22 MILE +/-

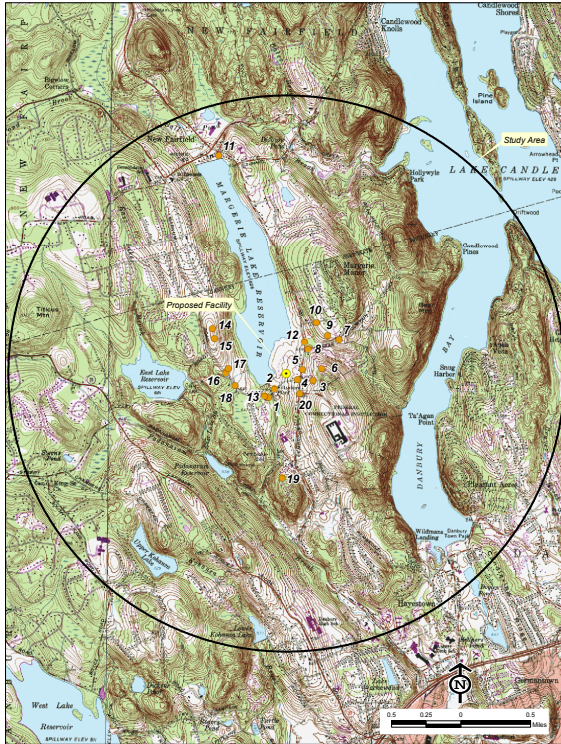
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Peck Road
Danbury, Connecticut

PHOTO TAKEN FROM PECK ROAD WEST OF ROUTE 37, LOOKING NORTHWEST
DISTANCE FROM THE PHOTOGRAPH LOCATION TO THE PROPOSED SITE IS 0.11 MILE +/-

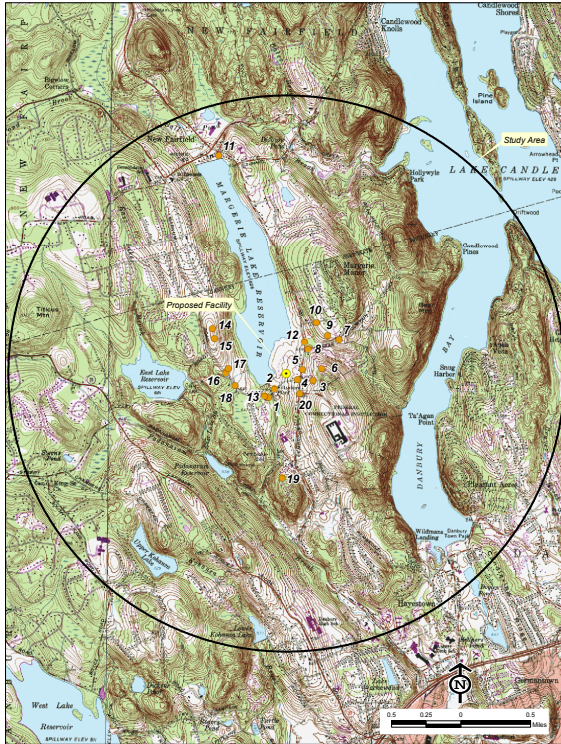
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Peck Road
Danbury, Connecticut

PHOTO TAKEN FROM ROUTE 37 NORTH OF PECK ROAD, LOOKING SOUTHWEST
DISTANCE FROM THE PHOTOGRAPH LOCATION TO THE PROPOSED SITE IS 0.13 MILE +/-

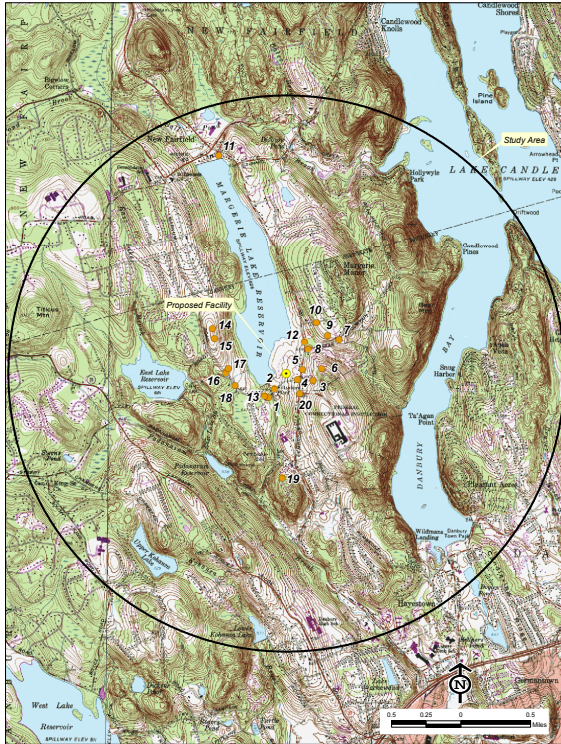
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Peck Road
Danbury, Connecticut

PHOTO TAKEN FROM HOLLANDALE ROAD, ADJACENT TO HOUSE #13, LOOKING SOUTHWEST - BALLOON IS VISIBLE THROUGH TREES

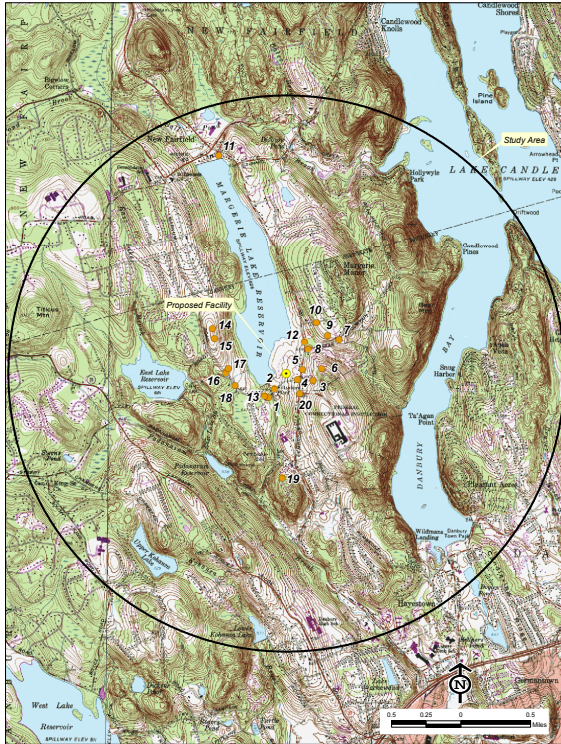
DISTANCE FROM THE PHOTOGRAPH LOCATION TO THE PROPOSED SITE IS 0.27 MILE +/-



Peck Road
Danbury, Connecticut

PHOTO TAKEN FROM BEAR MOUNTAIN ROAD, ADJACENT TO HOUSE #8, LOOKING SOUTHWEST - BALLOON IS VISIBLE THROUGH TREES
DISTANCE FROM THE PHOTOGRAPH LOCATION TO THE PROPOSED SITE IS 0.45 MILE +/-

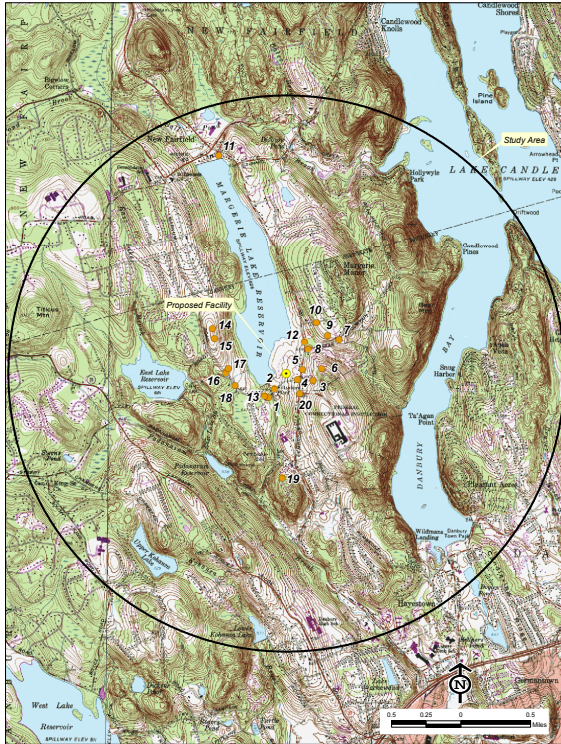
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Peck Road
Danbury, Connecticut

PHOTO TAKEN FROM BEAR MOUNTAIN ROAD NEAR PEMBROKE ROAD, LOOKING SOUTHWEST
DISTANCE FROM THE PHOTOGRAPH LOCATION TO THE PROPOSED SITE IS 0.23 MILE +/-

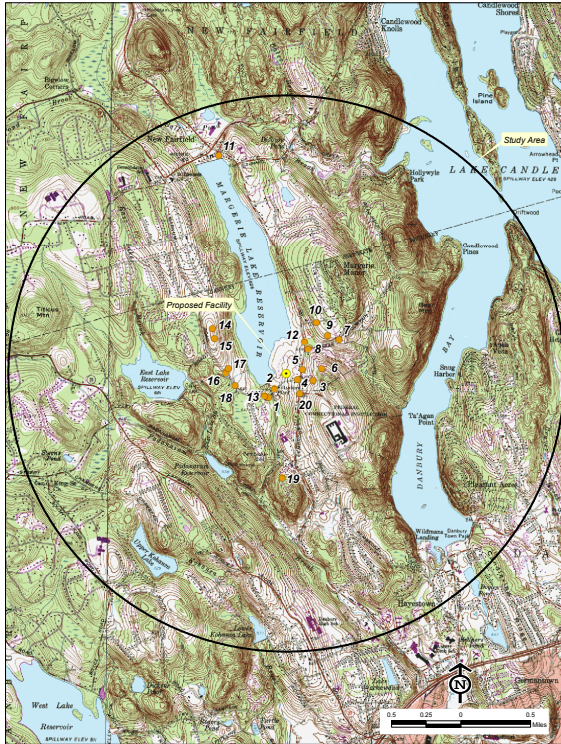
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Peck Road
Danbury, Connecticut

PHOTO TAKEN FROM MARGERIE VIEW DRIVE, ADJACENT TO HOUSE #10, LOOKING SOUTHWEST
DISTANCE FROM THE PHOTOGRAPH LOCATION TO THE PROPOSED SITE IS 0.40 MILE +/-

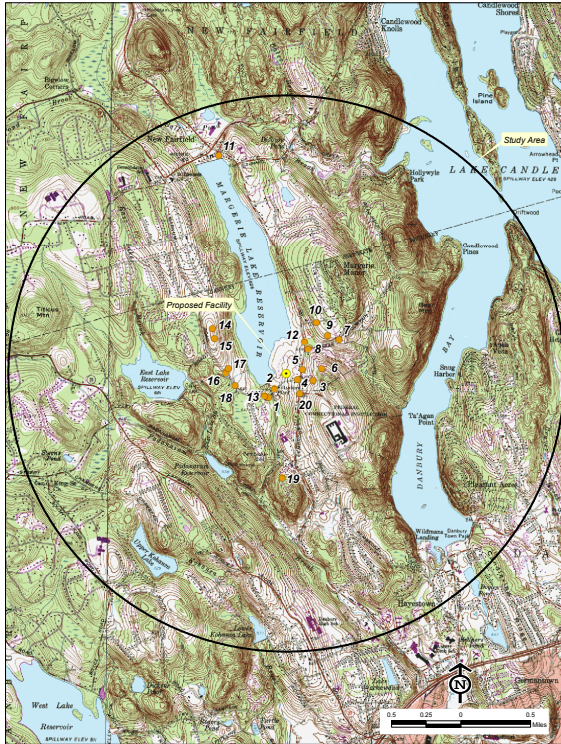
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Peck Road
Danbury, Connecticut

PHOTO TAKEN FROM HAMILTON DRIVE, ADJACENT TO HOUSE #9, LOOKING SOUTHWEST
DISTANCE FROM THE PHOTOGRAPH LOCATION TO THE PROPOSED SITE IS 0.42 MILE +/-

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Peck Road
Danbury, Connecticut

**PHOTO TAKEN FROM NEW FAIRFIELD SHOPPING CENTER, LOOKING SOUTHEAST OVER MARGERIE LAKE RESERVOIR
DISTANCE FROM THE PHOTOGRAPH LOCATION TO THE PROPOSED SITE IS 1.62 MILES +/-**

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Peck Road
Danbury, Connecticut

PHOTO TAKEN FROM ROUTE 37 NORTH OF BEAR MOUNTAIN ROAD, LOOKING SOUTHWEST
DISTANCE FROM THE PHOTOGRAPH LOCATION TO THE PROPOSED SITE IS 0.26 MILE +/-

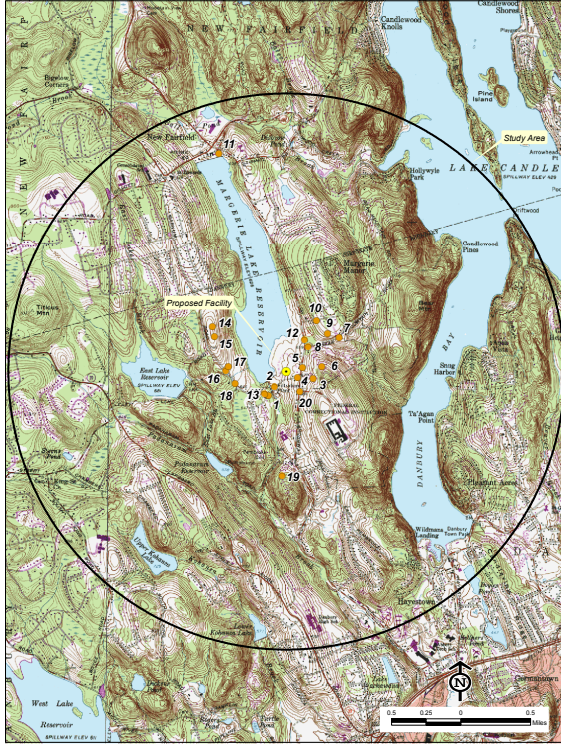
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Peck Road
Danbury, Connecticut

PHOTO TAKEN FROM MARBIL ROAD, ADJACENT TO HOUSE #9, LOOKING NORTHEAST
DISTANCE FROM THE PHOTOGRAPH LOCATION TO THE PROPOSED SITE IS 0.23 MILE +/-

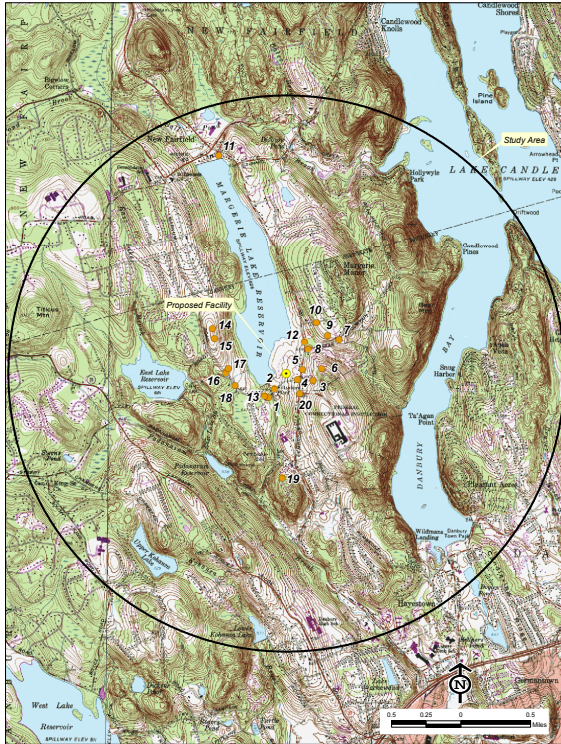
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Peck Road
Danbury, Connecticut

PHOTO TAKEN FROM HUNTINGTON DRIVE, ADJACENT TO HOUSE #9, LOOKING SOUTHEAST
DISTANCE FROM THE PHOTOGRAPH LOCATION TO THE PROPOSED SITE IS 0.60 MILE +/-

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Peck Road
Danbury, Connecticut

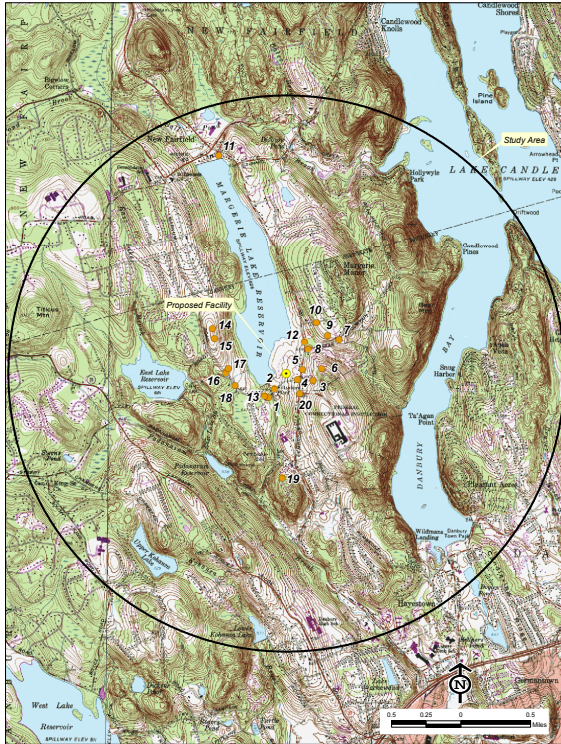
PHOTO TAKEN FROM HUNTINGTON DRIVE, ADJACENT TO HOUSE #16, LOOKING SOUTHEAST
DISTANCE FROM THE PHOTOGRAPH LOCATION TO THE PROPOSED SITE IS 0.56 MILE +/-

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Peck Road
Danbury, Connecticut

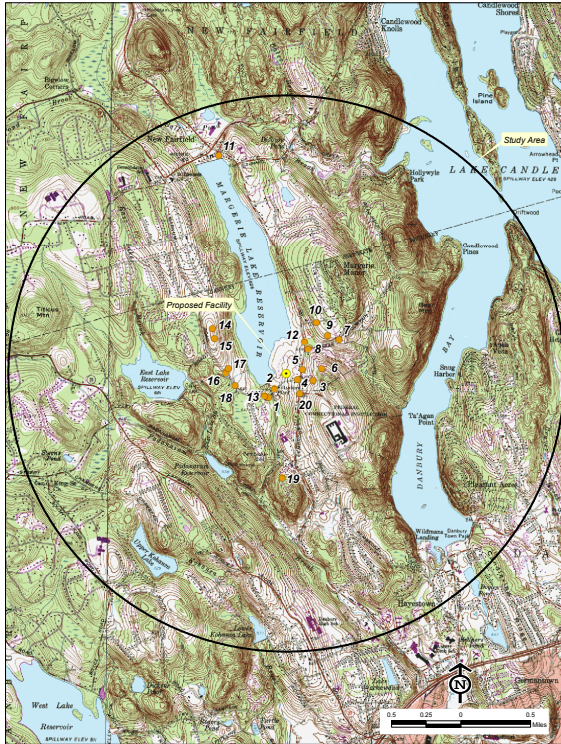
PHOTO TAKEN FROM BARNUM ROAD, ADJACENT TO HOUSE #36, LOOKING EAST
DISTANCE FROM THE PHOTOGRAPH LOCATION TO THE PROPOSED SITE IS 0.42 MILE +/-



Peck Road
Danbury, Connecticut



PHOTO TAKEN FROM BRIDLE RIDGE ROAD, ADJACENT TO HOUSE #3, LOOKING SOUTHEAST
DISTANCE FROM THE PHOTOGRAPH LOCATION TO THE PROPOSED SITE IS 0.40 MILE +/-



Peck Road
Danbury, Connecticut



PHOTO TAKEN FROM BARNUM ROAD ADJACENT TO HOUSE #47, LOOKING NORTHEAST - BALLOON IS VISIBLE THROUGH TREES

DISTANCE FROM THE PHOTOGRAPH LOCATION TO THE PROPOSED SITE IS 0.37 MILE +/-

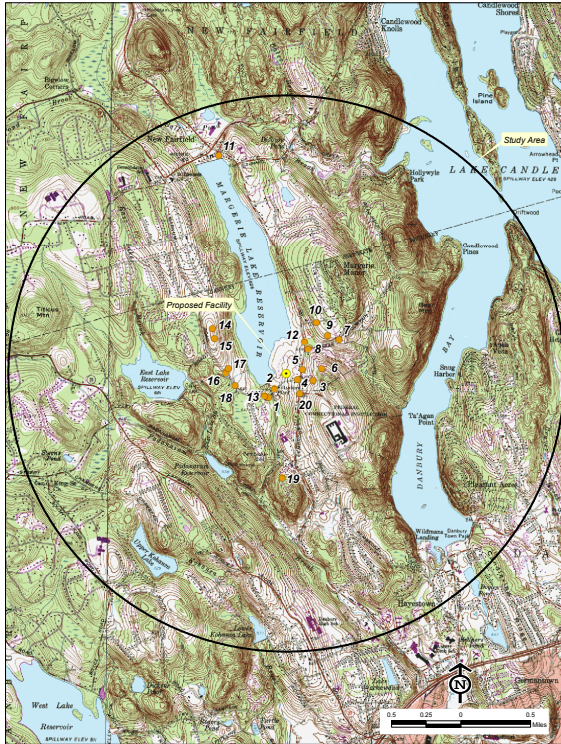


Peck Road
Danbury, Connecticut

PHOTO TAKEN FROM BULLET HILL ROAD ADJACENT TO HOUSE #10, LOOKING NORTH
DISTANCE FROM THE PHOTOGRAPH LOCATION TO THE PROPOSED SITE IS 0.78 MILE +/-

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Peck Road
Danbury, Connecticut

PHOTO TAKEN FROM PEMBROKE ROAD ADJACENT TO FCI PRISON ENTRANCE, LOOKING NORTHWEST
DISTANCE FROM THE PHOTOGRAPH LOCATION TO THE PROPOSED SITE IS 0.18 MILE +/-

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