Visual Resource Evaluation Report

Proposed Wireless Telecommunications Facility

CTNH801B
123 Pine Orchard Road
Branford, Connecticut

Prepared for T-Mobile

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Visual Resource Evaluation

Omni Point Communications, Inc., dba T-Mobile, seeks approval from the Connecticut Siting Council for a Certificate of Environmental Compatibility and Public Need for the construction of a wireless telecommunications facility ("Facility") to be located on property at 123 Pine Orchard Road, in the Town of Branford, Connecticut (identified herein as the "host property"). This Visual Resource Evaluation was conducted to assess the visibility of the proposed Facility within a two-mile radius ("Study Area"). Attachment A contains a photograph of the proposed project area. Attachment A also contains a map that depicts the location of the proposed Facility and the limits of the Study Area.

Project Introduction

The proposed Facility includes the installation of a 125-foot tall monopole with associated ground equipment to be located at its base. Both the proposed monopole and ground equipment would be situated within a 50-foot by 50-foot fence-enclosed compound. The proposed Facility is located at approximately 30 feet Above Mean Sea Level ("AMSL"). Access to the Facility would be provided via an existing gravel driveway currently located on the host property.

Site Description and Setting

Identified in the Town of Branford land records as Map 08/Block 06/ Lot 49, the host property consists of approximately 3.76 acres of land and is currently occupied by a trucking operation. The proposed Facility would be located in an open, undeveloped area immediately north of an existing Amtrak railroad corridor and associated overhead electrical infrastructure. Land use in the immediate vicinity of the host property consists of medium density residential development and the railroad corridor. Segments of US Route 1, Route 146 and Interstate 95 are contained within the Study Area. In total, the Study Area features approximately 122 linear miles of roadways and rail line.

The topography within the Study Area is characterized by gently rolling hills with ground elevations that range from sea level to approximately 150 feet AMSL. The Study Area contains approximately 1,948 acres of surface water, including portions of Long Island Sound, which occupies the southern third of the Study Area, Branford Harbor and the Branford River which flows north to south through the western half of the Study Area. The tree cover within the Study Area consists mainly of mixed deciduous hardwood species. The tree canopy occupies approximately 2,847 acres of the 8,042-acre study area (36%). During the in-field activities associated with this analysis, an infrared laser range finder was used to determine the average tree canopy height throughout the Study Area. Numerous trees were selected for measurement and the average tree canopy was determined to be 60 feet.

METHODOLOGY

In order to better represent the visibility associated with the Facility, 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.

Visibility Analysis

Using ESRI's ArcView® Spatial Analyst, a computer modeling tool, the areas from where 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. The average height of the tree canopy was determined in the field using a laser range finder. The average tree canopy height is incorporated into the final viewshed map; in this case, 60 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 60 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. Lastly, based on a review of information published by both the State of Connecticut Department of Transportation and the Town of Branford, it was determined that the portion of Route 146 that traverses the Study Area is a state-designated scenic roadway.

A preliminary viewshed map (using topography only) 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 was then incorporated into the final visibility map.

Balloon Float and Study Area Reconnaissance

On July 14, 2009 Vanasse Hangen Brustlin Inc., (VHB) conducted a balloon float at the proposed Facility location to further evaluate the potential viewshed within the Study Area. The balloon float consisted of raising and maintaining an approximate four-foot diameter, helium-filled weather balloon at the proposed site location at a height of 125 feet. Once the balloon was 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 document where the balloon was, and was not, visible above and/or through the tree canopy. During the balloon float, the temperature was approximately 75 degrees Fahrenheit with calm wind conditions and sunny skies.

Photographic Documentation

During the balloon float, VHB personnel drove the public road system within the Study Area to inventory those areas where the balloon was visible. The balloon was photographed from several different vantage points to document the actual view towards the proposed Facility. Several photographs where the balloon was not visible are also included. The locations of the photos are described below:

1. View from Route 146 north of Field Place.
2. View from Tabor Street at Tabor Cemetery.
3. View from Route 146 south of Tabor Street.
4. View from Knollwood Drive north of Pine Orchard Road.
5. View from Pine Orchard Road at Knollwood Drive.
6. View from Indian Neck Avenue over Branford River.
7. View from Pawson Road at Sunset Manor Road.
8. View from Linden Avenue north of Montgomery Parkway.
9. View from Route 146 at Lenny's Restaurant.

10. View from Route 146 at Wilford Road.
11. View from Route 146 at Young's Park.
12. View from Damascus Road at Francis Walsh Junior High School.
13. View from end of Collins Drive.
14. View from Pine Orchard Road adjacent to house #134.

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 50 mm. "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 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.

Photographic Simulation

Photographic simulations were generated for five representative locations where the balloon was visible during the in-field activities. The photographic simulations represent a scaled depiction of the proposed Facility (a 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.

CONCLUSIONS

Based on this analysis, areas from where the proposed 125-foot tall monopole may be visible comprise approximately 683 acres within the 8,042-acre Study Area. As depicted on the attached viewshed map, the majority of the potential visibility occurs over open water on Long Island Sound and Branford Harbor located to the south/southwest. Year-round visibility on Long Island Sound and Branford Harbor accounts for approximately 633 acres of the 683-acre total (93%). The map also depicts areas of year-round visibility along select portions of Route 146 located approximately 0.60-mile to the southwest of the proposed site; Knollwood Drive located roughly 0.17-mile to the north/northeast; and a short segment of Pine Orchard Road located within the immediate vicinity of the proposed Facility. Other areas of anticipated visibility are located on private and/or otherwise inaccessible properties within the Study Area and therefore could not be evaluated by VHB staff during the balloon float. This includes potential year-round visibility along the existing Amtrak railroad corridor. Overall, potential year-round visibility associated with the proposed Facility is limited to the areas described above by a combination of the mature vegetation, including well-established street trees and landscaping found within the nearby residential

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

neighborhoods, and the intervening topography contained within the Study Area. VHB estimates that at least partial year-round views of the proposed Facility may be achieved from approximately 16 residential properties located within the Study Area. This includes four residences located along Pine Orchard Road within the immediate vicinity of the host property; three properties located along Knollwood Drive; eight properties located along Route 146; and one property located along Hotchkiss Grove Road.

The viewshed map also depicts several additional areas where seasonal (i.e. during "leaf off" conditions) views are anticipated. These areas comprise approximately 33 additional acres and are located within the general vicinity of the host property (typically within 0.25-mile) and along select portions of Route 146, Knollwood Drive, Collins Drive and Ark Road. VHB estimates that seasonal views of the proposed monopole may be achieved from portions of approximately 26 additional residential properties. This includes four properties located along Route 146; four properties located along Knollwood Drive; up to 12 properties located along Collins Drive which abuts the host property to the northwest; and two properties along Ark Road located between 0.50-mile and 0.60-mile to the southwest of the proposed Facility.

Attachment A

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

PHOTOGRAPHIC DOCUMENTATION

PROJECT AREA

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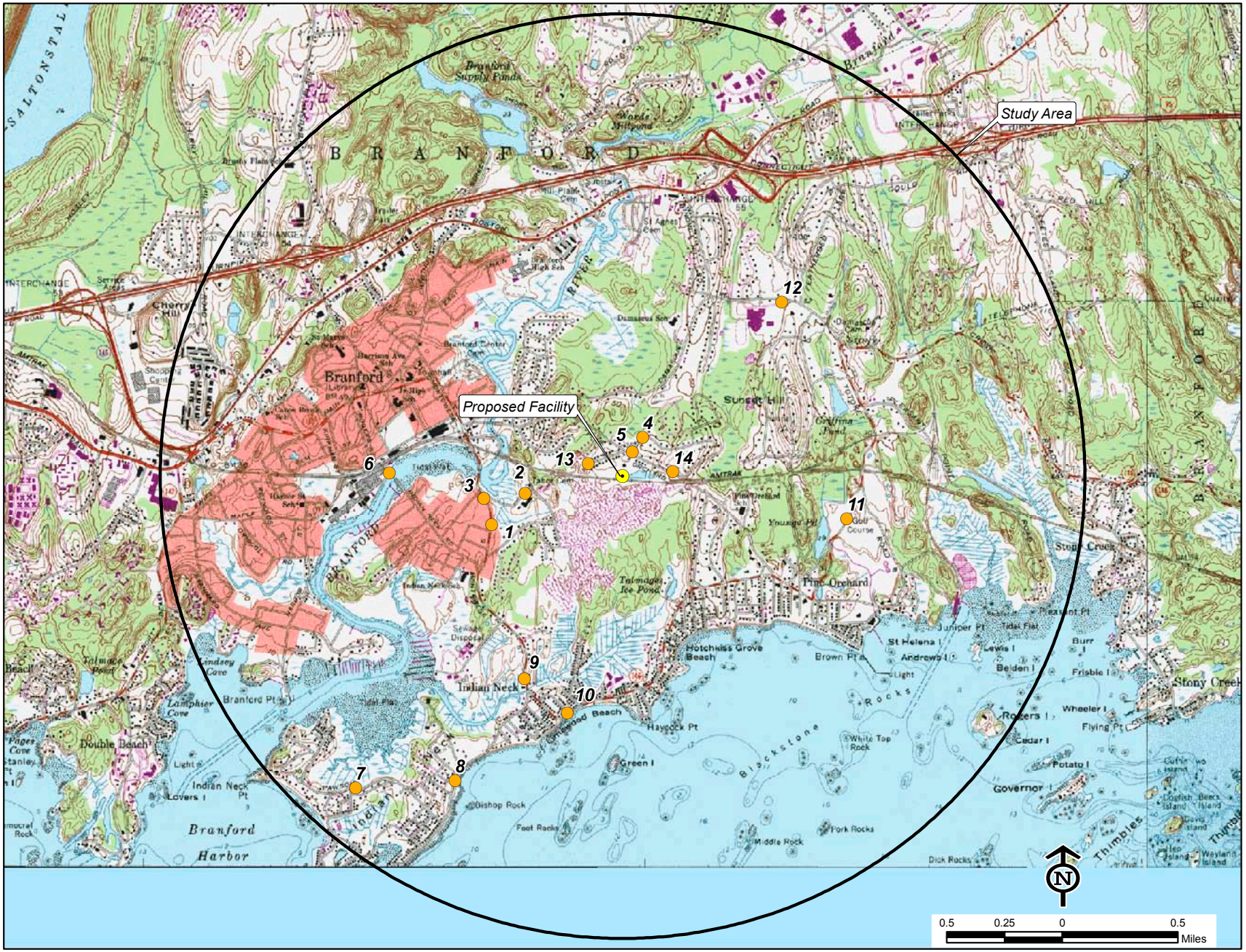
PHOTOLOG MAP



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VIEW 1

PHOTO TAKEN FROM ROUTE 146 NORTH OF FIELD PLACE, LOOKING NORTHEAST

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.60 MILE +/-

PHOTOGRAPHIC SIMULATION

VIEW 1

PHOTO TAKEN FROM ROUTE 146 NORTH OF FIELD PLACE, LOOKING NORTHEAST

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.60 MILE +/-

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PHOTOGRAPHIC DOCUMENTATION

VIEW 2

PHOTO TAKEN FROM TABOR STREET AT TABOR CEMETERY, LOOKING NORTHEAST

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.42 MILE +/-

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PHOTOGRAPHIC SIMULATION

VIEW 2

PHOTO TAKEN FROM TABOR STREET AT TABOR CEMETERY, LOOKING NORTHEAST

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.42 MILE +/-

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VIEW 3

PHOTO TAKEN FROM ROUTE 146 SOUTH OF TABOR STREET, LOOKING NORTHEAST

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.61 MILE +/-

PHOTOGRAPHIC SIMULATION

VIEW 3

PHOTO TAKEN FROM ROUTE 146 SOUTH OF TABOR STREET, LOOKING NORTHEAST

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.61 MILE +/-

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VIEW 4

PHOTO TAKEN FROM KNOLLWOOD DRIVE NORTH OF PINE ORCHARD ROAD, LOOKING SOUTHWEST

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.19 MILE +/-

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PHOTOGRAPHIC SIMULATION

VIEW 4

PHOTO TAKEN FROM KNOLLWOOD DRIVE NORTH OF PINE ORCHARD ROAD, LOOKING SOUTHWEST

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.19 MILE +/-

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VIEW 5

PHOTO TAKEN FROM PINE ORCHARD ROAD AT KNOLLWOOD DRIVE, LOOKING SOUTHWEST

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.12 MILE +/-

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PHOTOGRAPHIC SIMULATION

VIEW 5

PHOTO TAKEN FROM PINE ORCHARD ROAD AT KNOLLWOOD DRIVE, LOOKING SOUTHWEST

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.12 MILE +/-

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VIEW 6

PHOTO TAKEN FROM INDIAN NECK AVENUE OVER BRANFORD RIVER, LOOKING EAST - BALLOON IS NOT VISIBLE

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

VIEW 7

PHOTO TAKEN FROM PAWSON ROAD AT SUNSET MANOR ROAD, LOOKING NORTHEAST - BALLOON IS NOT VISIBLE

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 1.77 MILES +/-

VIEW 8

PHOTO TAKEN FROM LINDEN AVENUE NORTH OF MONTGOMERY PARKWAY, LOOKING NORTHEAST - BALLOON IS NOT VISIBLE

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 1.50 MILES +/-

VIEW 9

PHOTO TAKEN FROM ROUTE 146 AT LENNY'S RESTAURANT, LOOKING NORTHEAST - BALLOON IS NOT VISIBLE

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.98 MILE +/-

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VIEW 10

PHOTO TAKEN FROM ROUTE 146 AT WILFORD ROAD, LOOKING NORTHEAST - BALLOON IS NOT VISIBLE

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 1.05 MILES +/-

VIEW 11

PHOTO TAKEN FROM ROUTE 146 AT YOUNG'S PARK, LOOKING NORTHWEST - BALLOON IS NOT VISIBLE

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

VIEW 12

PHOTO TAKEN FROM DAMASCUS ROAD AT FRANCIS WALSH JUNIOR HIGH SCHOOL, LOOKING SOUTHWEST - BALLOON IS NOT VISIBLE

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 1.03 MILES +/-

VIEW 13

PHOTO TAKEN FROM END OF COLLINS DRIVE, LOOKING SOUTHEAST - BALLOON IS NOT VISIBLE

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.17 MILE +/-

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VIEW 14

PHOTO TAKEN FROM PINE ORCHARD ROAD ADJACENT TO HOUSE# 134, LOOKING SOUTHWEST - BALLOON IS NOT VISIBLE

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

Attachment B

Viewshed Map