

Proposed Wireless Telecommunications Facility

CTNL803
232 Shore Road (Route 156)
Old Lyme, Connecticut

Prepared for 

Prepared by **VHB/Vanasse Hangen Brustlin, Inc.**
54 Tuttle Place
Middletown, CT 06457

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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 232 Shore Road, in the Town of Old Lyme, 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 100-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 40-foot by 60-foot fence-enclosed compound. The proposed Facility is located at approximately 28 feet Above Mean Sea Level ("AMSL"). Access to the Facility would utilize the existing gravel access/egress currently located on the host property.

Site Description and Setting

Identified in the Town of Old Lyme land records as Map 8/Block 36/ Lot 2, the host property consists of approximately 5.00 acres of land and is currently occupied by a multi-unit self-storage facility. The proposed Facility would be located in a lightly wooded, undeveloped area on the northwest portion of the host property, immediately west of the two northern most storage units. Land use in the immediate vicinity of the host property consists of an existing Amtrak railroad corridor and associated overhead electrical infrastructure to the north/northwest; several commercial establishments located along Shore Road (Route 156) to the southeast and southwest; and medium-density residential development to the south. Segments of Interstate 95 and Route 156 are contained within the Study Area. In total, the Study Area features approximately 80 linear miles of roadways and rail lines.

The topography within the Study Area is characterized by gently rolling hills with ground elevations that range from approximately sea level to approximately 185 feet AMSL. The Study Area contains approximately 2,605 acres of surface water, dominated in large measure by portions of Long Island Sound which occupies the southern third of the Study Area. The tree cover within the Study Area consists mainly of mixed deciduous hardwood species. The tree canopy occupies approximately 3,804 acres of the 8,042-acre study area (47%). 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 both a review of published information and discussions with municipal officials in Old Lyme, it was determined that there are no designated scenic roadways located within the Study Area.

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 May 5, 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 100 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 60 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 a number of 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 Otter Rock Road adjacent to house #14.
2. View from Route 156 (Shore Road) at Dogwood Drive.
3. View from Route 156 (Shore Road) at Hawks Nest Road
4. View from Hawks Nest Road adjacent to house #10.
5. View from Center Beach Avenue adjacent to house #14.
6. View from Liberty Street at Corsino Avenue.
7. View from Pond Road adjacent to house #18A.
8. View from Washington Avenue adjacent to house #14.
9. View from Hawks Nest Road north of Avenue A.

10. View from West End Drive adjacent to house #82.
11. View from Center Beach Avenue adjacent to house #40.
12. View from Hartford Avenue north of Pond 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 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 the seven 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 100-foot tall monopole may be visible comprise approximately 1,817 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 located to the south. Year-round visibility on Long Island Sound accounts for approximately 97 percent the 1,817-acre total, or roughly 1,773 acres. The predictive model also depicts areas of potential visibility that are located within the general vicinity of the proposed site (typically within 0.25-mile) including select portions Shore Road, Otter Rock Road, Hawks Nest Road and Washington Avenue. Areas of limited visibility are also anticipated along select portions of Pond Road and Corsina Avenue which are located further to the southeast. VHB estimates that the proposed Facility may be at least partially visible from portions of 21 residential properties located within approximately 0.5-mile of the host property. This includes three residences located along Otter Rock Road; three residences located along Hawks Nest Road; six residences located along Washington Avenue; four residences located along Shore Road (Route 156); two residences located along Corsino Avenue; and three residences located along Pond Road.

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

The viewshed map also depicts several additional areas where seasonal (i.e. during “leaf off” conditions) views are anticipated. These areas comprise approximately 55 additional acres and are limited to the host property and general vicinity thereof. Seasonal visibility may also extend to the southeast of the proposed Facility along select portions of Center Beach Road, Hawks Nest Road, Washington Avenue and Columbus Avenue. VHB estimates that seasonal views of the proposed Facility may be achieved from portions of approximately 14 additional residential properties located within the above mentioned areas.

Attachment A

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

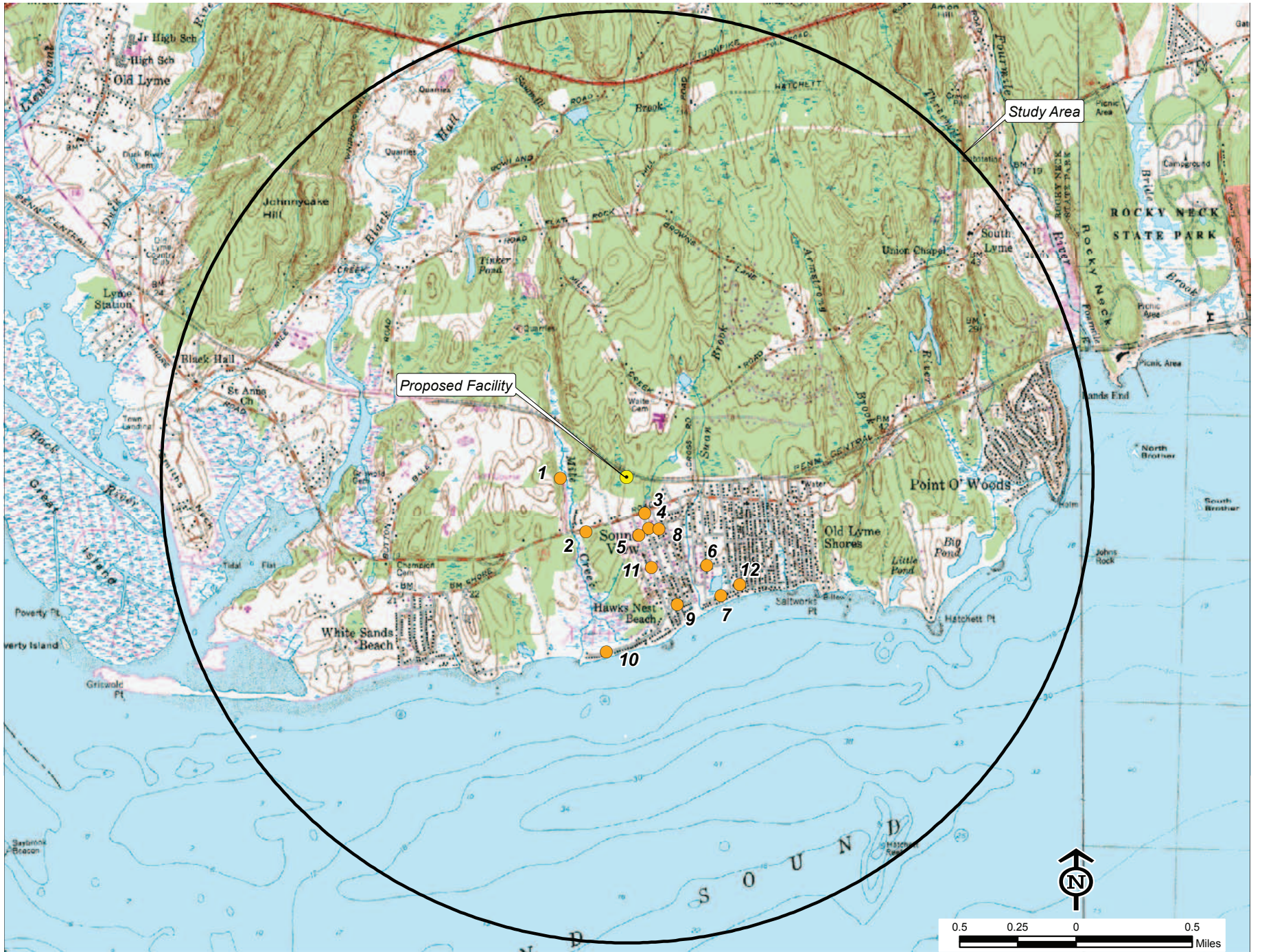
PHOTOGRAPHIC DOCUMENTATION



PROPOSED PROJECT AREA

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PHOTOLOG MAP



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VIEW 1



PHOTO TAKEN FROM OTTER ROCK ROAD ADJACENT TO HOUSE #14, LOOKING EAST
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.28 MILE +/-

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VIEW 1



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PHOTO TAKEN FROM OTTER ROCK ROAD ADJACENT TO HOUSE #14, LOOKING EAST
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.28 MILE +/-

VIEW 2



PHOTO TAKEN FROM ROUTE 156 (SHORE ROAD) AT DOGWOOD DRIVE, LOOKING NORTHEAST
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.29 MILE +/-

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VIEW 2



ct:\mddat\40505-08\graphics\FIGURES\40505-08_Photosim.indd

PHOTO TAKEN FROM ROUTE 156 (SHORE ROAD) AT DOGWOOD DRIVE, LOOKING NORTHEAST
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.29 MILE +/-

VIEW 3



ct:\mdata\40505.08\graphics\FIGURES\40505.08_Photosim.indd

PHOTO TAKEN FROM ROUTE 156 (SHORE ROAD) AT HAWKS NEST ROAD, LOOKING NORTHWEST
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.17 MILE +/-

VIEW 3



ct:\mdata\40505_08\graphics\FIGURES\40505_08_Photosim.indd

PHOTO TAKEN FROM ROUTE 156 (SHORE ROAD) AT HAWKS NEST ROAD, LOOKING NORTHWEST
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.17 MILE +/-

VIEW 4



PHOTO TAKEN FROM HAWKS NEST ROAD ADJACENT TO HOUSE #10, LOOKING NORTHWEST
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.17 MILE +/-

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VIEW 4



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PHOTO TAKEN FROM HAWKS NEST ROAD ADJACENT TO HOUSE #10, LOOKING NORTHWEST
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.17 MILE +/-

VIEW 5



PHOTO TAKEN FROM CENTER BEACH AVENUE ADJACENT TO HOUSE #14, LOOKING NORTH
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.26 MILE +/-

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VIEW 5



PHOTO TAKEN FROM CENTER BEACH AVENUE ADJACENT TO HOUSE #14, LOOKING NORTH
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.26 MILE +/-

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VIEW 6



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PHOTO TAKEN FROM LIBERTY STREET AT CORSINO AVENUE, LOOKING NORTHWEST
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.51 MILE +/-

VIEW 6



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PHOTO TAKEN FROM LIBERTY STREET AT CORSINO AVENUE, LOOKING NORTHWEST
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.51 MILE +/-

VIEW 7



ct:\mddat\40505.08\graphics\FIGURES\40505.08_Photosim.indd

PHOTO TAKEN FROM POND ROAD ADJACENT TO HOUSE #18A, LOOKING NORTHWEST

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.65 MILE +/-

VIEW 7



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PHOTO TAKEN FROM POND ROAD ADJACENT TO HOUSE #18A, LOOKING NORTHWEST
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.65 MILE +/-

VIEW 8



ct:\mddat\40505.08\graphics\FIGURES\40505.08_Photosim.indd

PHOTO TAKEN FROM WASHINGTON AVENUE ADJACENT TO HOUSE #14, LOOKING NORTHWEST - BALLOON IS NOT VISIBLE
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.27 MILE +/-

VIEW 9



PHOTO TAKEN FROM HAWKS NEST ROAD NORTH OF AVENUE A, LOOKING NORTHWEST - BALLOON IS NOT VISIBLE
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.59 MILE +/-

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VIEW 10



PHOTO TAKEN FROM WEST END DRIVE ADJACENT TO HOUSE #82, LOOKING NORTHEAST - BALLOON IS NOT VISIBLE
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.76 MILE +/-

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VIEW 11



PHOTO TAKEN FROM CENTER BEACH AVENUE ADJACENT TO HOUSE #40, LOOKING NORTHWEST - BALLOON IS NOT VISIBLE
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.40 MILE +/-

ct:\mddat\40505.08\graphics\FIGURES\40505.08_Photosim.indd

VIEW 12



c:\m\dat\40505.08\graphics\FIGURES\40505.08_Photosim.indd

PHOTO TAKEN FROM HARTFORD AVENUE NORTH OF POND ROAD, LOOKING NORTHWEST - BALLOON IS NOT VISIBLE
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.67 MILE +/-

Attachment B

Viewshed Map