Visual Resource Evaluation Report

Proposed Wireless Telecommunications Facility

Bloomfield

Maple Hill Farms, Inc.
12 Burr Road
Bloomfield, CT

Prepared for SBA

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March 2009

Visual Resource Evaluation

SBA Network Services, Inc. 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 property at 12 Burr Road ("Host Property") in the town of Bloomfield, 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"). Attachment A 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 construction of a 130-foot tall monopole designed to support up to four antenna platforms with associated ground equipment to be located within a fenced enclosure at the base of the tower. Based on information provided by the project engineer, Clough Harbor Associates, LLP, the proposed Facility is located at approximately 200 feet above mean sea level (AMSL). Access to the project area would initially utilize an existing driveway located on the Host Property then a proposed gravel driveway would extend in a northwesterly direction to the project area.

Site Description and Setting

Identified in the Town of Bloomfield land records as Map 85-1\Block 126-2\Lot 13, the Host Property includes 29.54-acres of land and is currently occupied by Maple Hill Farms, Inc., a dairy products wholesaler. The proposed Facility would be located on an undeveloped portion of the Host Property, roughly 50 feet to the northwest of an existing single story building. Land use within the general vicinity of the Host Property is mainly comprised of medium-density residential parcels with several tracts of active agricultural land located to the southwest of the proposed project area and the Tumble Brook Country Club located to the southeast. Segments of Route 178, Route 185, Route 189 and Route 218 traverse various portions of the Study Area. In total, the Study Area contains roughly 88 linear miles of roadways.

The topography in the Study Area is generally characterized by rolling hills and a prominent ridgeline that runs north to south along the western limits of the two mile radius. Ground elevations within the Study Area range from approximately 90 feet AMSL to approximately 950 feet AMSL. The tree cover within the Study Area consists mainly of mixed deciduous hardwood species. The tree canopy occupies approximately 5,276 acres of the 8,042-acre study area (66%). During the in-field activities associated with this analysis, an infra-red 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 185 acres of surface water, including the Hartford Reservoir No. 6, Gale Pond and Hoe Pond.

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METHODOLOGY

In order to better represent the visibility associated with the Facility, VHB has developed 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 crane test and Study Area drive-through reconnaissance are also conducted to provide a height and locational representation, back checking of the computer model and photographic documentation from publicly accessible areas. Results of the crane test 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 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 United States Geological Survey (USGS) National Elevation Dataset (NED), a seamless, publicly available elevation dataset with an approximate 30-meter resolution. The forest layer was derived through on-screen digitizing in ArcView® GIS from 2001, 2005 and 2006 digital orthophotos with 1-meter, 2-meter and 1-foot 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 layer 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 initially utilized to prepare a preliminary viewshed map for use during the Study Area reconnaissance. 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 were 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.

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. It was also determined that portions of the Metacomet Trail, part of the Connecticut Blue Blaze trail system are contained within the western half of the Study Area. These segments of the trail traverse the Talcott Mountain Ridgeline and are depicted on the attached viewshed map. The Hueblein Tower, located just off the Metacomet Trail (approximately 1.85 miles northwest of the proposed Facility), is also contained within the Study Area. Lastly, based on a review of available data published by the Connecticut Department of Transportation and discussions with staff in Bloomfield, it was determined that there are currently no state- or locally-designated scenic roadways within the Study Area.

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 crane test. Information obtained during the reconnaissance is then incorporated into the final visibility map.

Crane Test and Study Area Reconnaissance

On June 9, 2008 Vanasse Hangen Brustlin Inc., (VHB) observed a crane test at the project Site and conducted Study Area reconnaissance in order to further evaluate the potential viewshed associated with the proposed Facility. The crane test consisted of locating a crane at the proposed Facility and raising its arm to 130 feet in order to simulate the height of the proposed monopole. 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 crane arm was, and was not, visible above and/or through the tree canopy. During the in-field activities, weather conditions were sunny. The temperature was approximately 75 degrees Fahrenheit.

Photographic Documentation

During the crane test, VHB personnel drove the public road system in the Study Area to inventory those areas where the crane arm was visible. The crane arm was photographed from a number of different vantage points to document the actual view towards the proposed Facility. The locations of the photographs are depicted on a photolog documentation map contained in Attachment A and are described below:

1. View from Auer Farm.
2. View from Auer Farm Access Road.
3. View from High Hill Road west of Route 185.
4. View from Milburn Drive adjacent to house #16.
5. View from Route 185 at Kenmore Road.
6. View from Route 185 at High Hill Road.
7. View from Burr Road adjacent to Host Property

Photographs of the crane arm 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.[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 locations identified above. 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 crane in the photographs and a proportional monopole image is simulated into the photographs. The simulations are contained in Attachment A.

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

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CONCLUSIONS

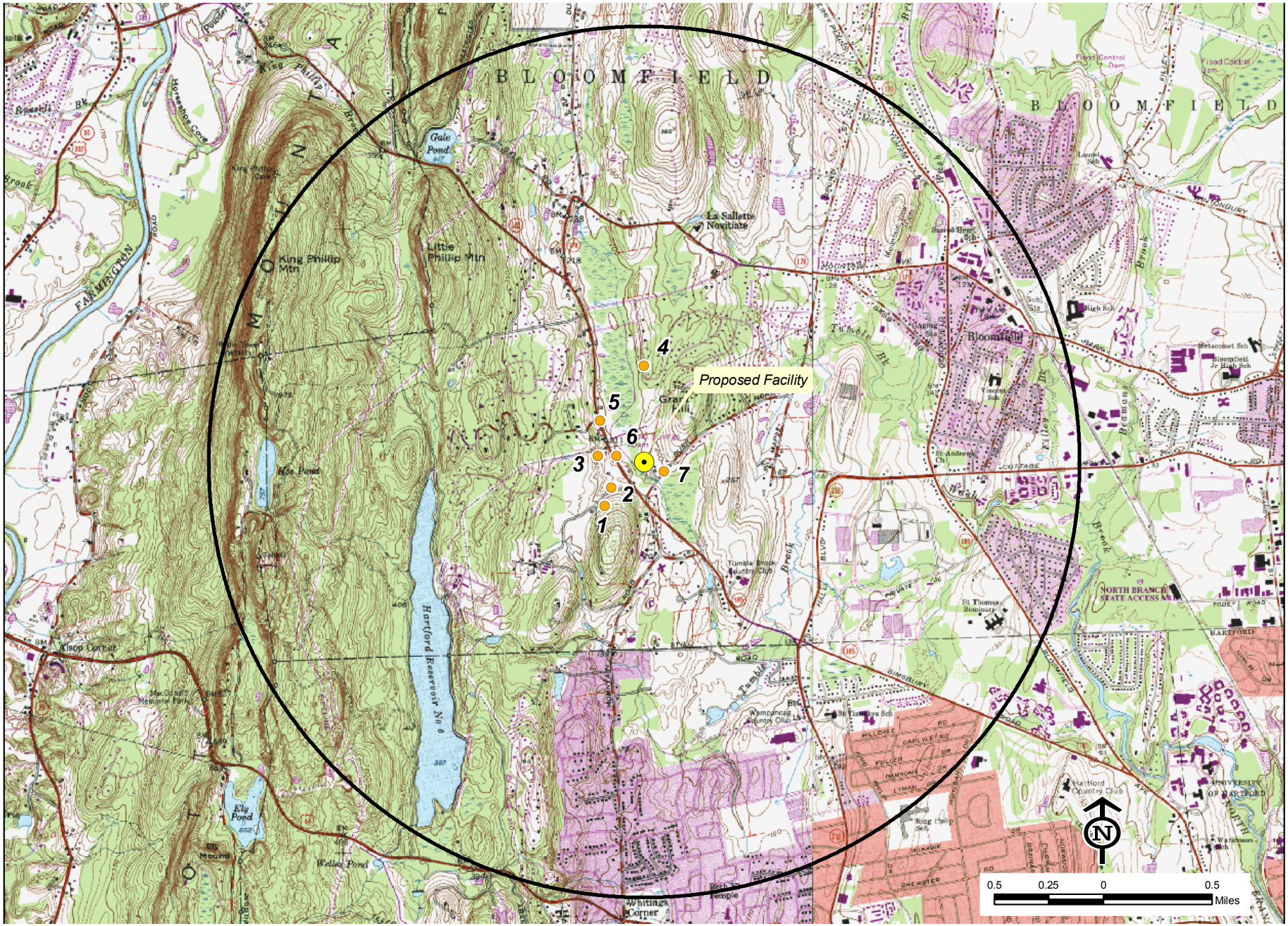
Based on this analysis, areas from where the proposed 130-foot monopole would be visible above the tree canopy comprise approximately 37 acres, or less than one percent of the 8,042-acre Study Area. As depicted on the attached viewshed map (included as Attachment B), most of the year-round visibility associated with the proposed Facility occurs on and/or within the immediate vicinity of the Host Property, including select portions of Route 185, Burr Road, High Hill Road and several open fields within the Auer Farm property to the southwest. The viewshed map also identifies smaller areas of anticipated year-round visibility located further from the proposed Facility that include a short segment of Milburn Road to the northeast and a small area within the Tumble Brook Country Club to the east/southeast. As evidenced by the results of the crane test and the photographic documentation and simulations presented in this report, potential year-round views of the proposed Facility would generally be passing or intermittent as one traverses the roadways listed above. In total, VHB estimates that at least partial views of the proposed Facility may be achieved from select portions of approximately nine residential properties within the Study Area. These include three properties located along Route 185; two properties located along High Hill Road; three properties located along Burr Road; and one property located along Milburn Road. No views are anticipated from the Metacomet Trail which is located between one and two miles to the west of the proposed Facility. Distant views of the proposed Facility may be achieved from east/southeast-facing upper story windows within the Heublein Tower which is located nearly two miles to the northwest of the project area. Overall, year-round visibility associated with the proposed Facility would be largely minimized by both the intervening topography contained within the Study Area as well as the existing vegetation, particularly among the residential areas adjacent to the Host Property where numerous mature trees and shrubs serve as a significant visual buffer.

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 14 additional acres and, similar to year-round visibility, are limited to the immediate vicinity of the proposed Facility. Potential seasonal views from the areas depicted on the map would be largely obstructed by existing vegetation, even during "leaf-off" conditions. In total, VHB anticipates that approximately eight additional residences could achieve seasonal views of the proposed Facility from select portions of their respective properties. These residences are located along High Hill Road, Burr Road and Kenmore Road.

Attachment A

Photolog Documentation Map, Crane Test Photographs and Photographic Simulations

PHOTOLOG MAP



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VIEW 1

PHOTO TAKEN FROM AUER FARM, LOOKING NORTHEAST

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

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PHOTOGRAPHIC SIMULATION

VIEW 1

PHOTO TAKEN FROM AUER FARM, LOOKING NORTHEAST

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

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VIEW 2

PHOTO TAKEN FROM AUER FARM ACCESS ROAD, LOOKING NORTHEAST

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

VIEW 2

PHOTO TAKEN FROM AUER FARM ACCESS ROAD, LOOKING NORTHEAST

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

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VIEW 3

PHOTO TAKEN FROM HIGH HILL ROAD WEST OF ROUTE 185, LOOKING SOUTHEAST

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.20 MILE +/-

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PHOTOGRAPHIC SIMULATION

VIEW 3

PHOTO TAKEN FROM HIGH HILL ROAD WEST OF ROUTE 185, LOOKING SOUTHEAST

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.20 MILE +/-

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VIEW 4

PHOTO TAKEN FROM MILBURN DRIVE ADJACENT TO HOUSE #16, LOOKING SOUTH

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.44 MILE +/-

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PHOTOGRAPHIC SIMULATION

VIEW 4

PHOTO TAKEN FROM MILBURN DRIVE ADJACENT TO HOUSE #16, LOOKING SOUTH

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.44 MILE +/-

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VIEW 5

PHOTO TAKEN FROM 185 AT KENMORE ROAD, LOOKING SOUTHEAST

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.28 MILE +/-

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VIEW 5

PHOTO TAKEN FROM 185 AT KENMORE ROAD, LOOKING SOUTHEAST

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.28 MILE +/-

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VIEW 6

PHOTO TAKEN FROM ROUTE 185 AT HIGH HILL ROAD, LOOKING SOUTHEAST

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.14 MILE +/-

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VIEW 6

PHOTO TAKEN FROM ROUTE 185 AT HIGH HILL ROAD, LOOKING SOUTHEAST

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.14 MILE +/-

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VIEW 7

PHOTO TAKEN FROM BURR ROAD ADJACENT TO HOST PROPERTY, LOOKING NORTHEAST

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.10 MILE +/-

VIEW 7

PHOTO TAKEN FROM BURR ROAD ADJACENT TO HOST PROPERTY, LOOKING NORTHEAST

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.10 MILE +/-

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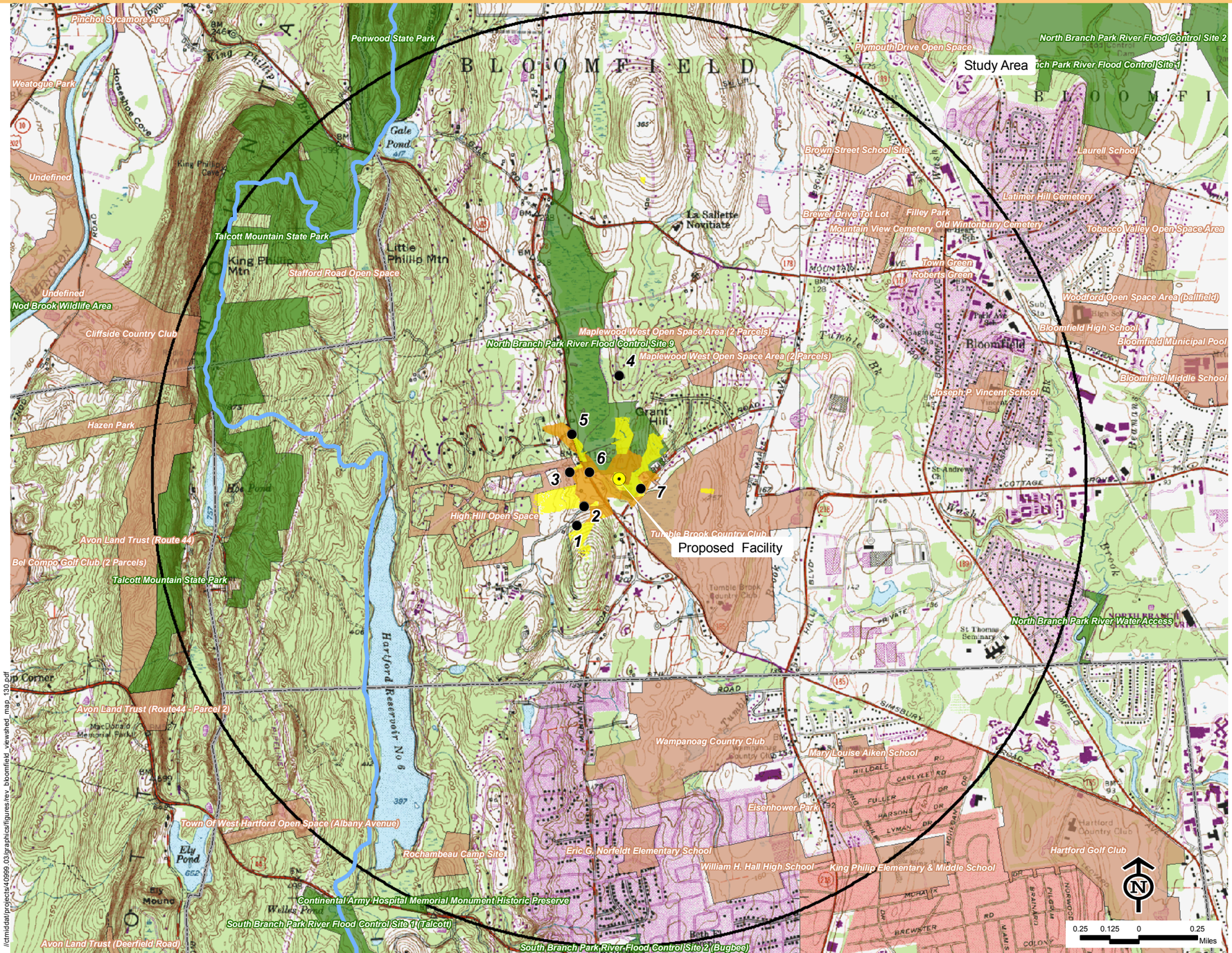
Attachment B

Viewshed Map

Viewshed Map

Topography and Forest Cover as Constraints

Town of Bloomfield Connecticut



Proposed Wireless Telecommunications Facility
Bloomfield
12 Burr Road
Bloomfield, Connecticut

NOTE:
- Viewshed analysis conducted using ESRI's Spatial Analyst.
- Proposed Facility height is 130 feet.
- Existing tree canopy height estimated at 65 feet.

DATA SOURCES:
- Digital elevation model (DEM) derived from USGS National Elevation Dataset (NED) with a resolution of one arc-second (approximately 30 meters) produced by the USGS, 1925 - 1999
- Forest areas derived from 2001, 2005 and 2006 digital orthophotos with 1-meter, 2-meter and 1-foot pixel resolution, respectively; digitized by VHB, 2008
- Base map comprised of the Avon (1984) and Hartford North (1992) USGS Quadrangle Maps
- Protected municipal and private open space properties and federal protected properties and data layers provided by CTDEP, 1997
- Protected CTDEP properties data layer provided by CTDEP, May 2007
- CTDEP boat launches data layer provided by CTDEP, 1994
- Scenic Roads layer derived from available State and Local listings.

Map Compiled September, 2008

Legend

- Proposed Monopole Location (Includes select areas of visibility approximately 500 feet around facility)

Photographs - June 9, 2008
- Crane Visible

- Seasonal Visibility (Approximately 14 Acres)
- Approximate Year-Round Visibility (Approximately 37 Acres)

- Protected Municipal and Private Open Space Properties (1997)
  - Cemetery
  - Preservation
  - Conservation
  - Existing Preserved Open Space
  - Recreation
  - General Recreation
  - School
  - Uncategorized

- CT DEP Protected Properties (2007)
  - State Forest
  - State Park
  - DEP Owned Waterbody
  - State Park Scenic Reserve
  - Historic Preserve
  - Natural Area Preserve
  - Fish Hatchery
  - Flood Control
  - Other
  - State Park Trail
  - Water Access
  - Wildlife Area
  - Wildlife Sanctuary
- Federal Protected Properties (1997)
- CT DEP Boat Launches (1994)
- Metacomet Trail (CT Blue Blaze)
- Scenic Road (State and Local)
- Town Line

//ctmiddat/projects/40999.03/graphics/figures/rev_bloomfield_viewshed_map_130.pdf

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