

*Proposed Wireless
Telecommunications Facility*

Suffield Southwest
174 South Grand Street
Suffield, Connecticut

Prepared for



Prepared by

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

July 2010

Visual Resource Evaluation

Cellco Partnership dba Verizon Wireless 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 174 South Grand Street (identified herein as the "host property"), in the Town of Suffield, Connecticut. This Visual Resource Evaluation was conducted to evaluate the visibility of the proposed Facility within a two-mile radius ("Study Area"). Attachment A contains a map that depicts the location of the proposed Facility and the limits of the Study Area. The Study Area also contains land located within the neighboring municipality of East Granby, Connecticut to the southwest.

Project Introduction

The proposed Facility includes the installation of a 120-foot tall monopole tower with associated ground equipment to be located at its base. Both the proposed monopole and ground equipment would be situated within a 60- by 60-foot fence-enclosed compound. The proposed Facility is located at a ground elevation of 192 feet Above Mean Sea Level (AMSL). Access to the Facility would follow an existing dirt road currently located on the host property (to be improved).

Site Description and Setting

Identified in the Town of Suffield land records as Map 16/Block 24/Lot 51A, the host property consists of approximately 17.57 acres of mostly wooded, undeveloped land. The host property is currently occupied by a single-family residence located approximately 485 feet to the southwest of the proposed Facility and small barn located approximately 520 feet to the northwest. Land use within the general vicinity of the proposed Facility is mainly comprised of active agricultural land, low-density residential development, and undeveloped woodlands. Segments of Route 168 and Route 187 are contained within the Study Area. In total, the Study Area features approximately 37 linear miles of roadways.

The topography within the Study Area is generally characterized by gently rolling hills and a steep, north-to-south ridgeline (West Suffield Mountain) that traverses the western third of the two-mile radius. Ground elevations within the Study Area range from approximately 120 feet AMSL among the low lying areas located roughly 1.50-miles to the southeast of the proposed Facility to approximately 696 feet AMSL on the summit of West Suffield Mountain located nearly two miles to the northwest. The Study Area contains approximately 43 acres of surface water, which includes Whites Pond located approximately 1.30-miles to the northwest of the proposed Facility within the Town-owned Sunrise Park. The tree cover within the Study Area consists mainly of mixed deciduous hardwood species that occupy approximately 4,495 acres of the 8,042-acre study area (56%). The average tree canopy height throughout the Study Area was determined to be approximately 65 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 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 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 by measuring the heights of numerous trees during the reconnaissance. 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. It was also determined that a segment of the Metacomet Trail, part of the Connecticut Blue Blaze Trail System, traverses West Suffield Mountain in the western portion of the Study Area. Lastly, based on both a review of published information and discussions with municipal officials in Suffield it was determined that there are no state or locally-designated scenic roadways located within the Study Area.

A preliminary viewshed map (using a conservative tree height of 50 feet) was 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 17, 2010 Vanasse Hangen Brustlin Inc., (VHB) conducted a balloon float at the proposed Facility 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 balloon at the proposed site location at a height of 120 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 a number of different vantage points to document the actual view towards the proposed Facility. Several locations where the balloon was not visible are also included in order to provide documentation from select areas. The locations of the photos are described below:

1. View from Route 168 approximately 400 feet east of Route 187.
2. View from Route 187 adjacent to house #84.
3. View from Route 187 adjacent to house #399.
4. View from Sheldon Street adjacent to house #1360.
5. View from Hill Street.

6. View from Route 187 north of Route 168.
7. View from Ratley Road.
8. View from Taintor Street adjacent to house #90.

Photographs of the balloon from the view points listed above were taken with a Nikon D-80 digital camera body and fixed Nikon 50 mm lens. "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 five representative locations where the balloon was visible during the in-field activities. The photographic simulations represent a scaled depiction of the proposed Facility 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. A photolog map and the simulations are contained in Attachment A.

CONCLUSIONS

Based on this analysis, areas from where the proposed 120-foot tall Facility would be visible above the tree canopy comprise approximately 46 acres, or roughly one half of one percent of the 8,042-acre Study Area. As depicted on the viewshed map (provided in Attachment B), most of the potential year-round visibility associated with the proposed monopole occurs along select portions of South Grand Street (Route 187) and the open fields located immediately adjacent to the roadway, approximately 0.50-mile to the southwest, and roughly 0.20-mile to the northwest of the proposed Facility. Year round visibility is also anticipated along Route 168 east of South Grand Street, approximately 0.30-mile to the north/northeast of the proposed Facility; select portions of Hill Street and Sheldon Street located approximately 1.70-miles to the northwest and 0.75-mile to the southeast of the proposed Facility, respectively; and several smaller areas of visibility located to the west and southwest. Similarly, most of these areas are also generally open and undeveloped. Lastly, VHB also anticipates potential year-round views of the proposed Facility from select portions of the Metacomet Trail located roughly 1.70-miles to the west/southwest. Potential views from the Trail would be distant and at an aspect where the proposed Facility would be viewed from a significantly higher ground elevation and therefore be set into existing vegetation and hillsides. Overall, potential year-round visibility would be confined to the areas identified above by the rolling topography and the extent of vegetative cover contained

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

within the Study Area. VHB estimates that portions of approximately 17 residential properties may have at least partial year-round views of the proposed Facility. This includes approximately 12 residences located along South Grand Street; three residences along Sheldon Street; and two residences located along Hill Street.

The viewshed map also depicts several additional areas where seasonal (i.e. during "leaf off" conditions) views are anticipated. These areas comprise approximately 98 acres and are located within the general vicinity of the proposed Facility, including the host property and areas to the east and west of South Grand Street. VHB estimates that limited seasonal views of the proposed Facility may be achieved from portions of approximately 20 additional residential properties including 16 residential properties located along South Grand Street and four residential properties located along Route 168.

Attachment A

Study Area Map, Balloon Float Photographs, and Photographic Simulations

Photolog Map



| Photographic Documentation



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VIEW	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
1	VIEW FROM ROUTE 168 APPROXIMATELY 400 FEET EAST OF ROUTE 187	SOUTHWEST	0.29 MILE +/-	YEAR-ROUND

Photographic Simulation



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VIEW	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
1	VIEW FROM ROUTE 168 APPROXIMATELY 400 FEET EAST OF ROUTE 187	SOUTHWEST	0.29 MILE +/-	YEAR-ROUND

| Photographic Documentation



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VIEW	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
2	VIEW FROM ROUTE 187 ADJACENT TO HOUSE #84	SOUTHEAST	0.20 MILE +/-	YEAR-ROUND

Photographic Simulation



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VIEW	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
2	VIEW FROM ROUTE 187 ADJACENT TO HOUSE #84	SOUTHEAST	0.20 MILE +/-	YEAR-ROUND

| Photographic Documentation



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VIEW	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
3	VIEW FROM ROUTE 187 ADJACENT TO HOUSE #399	NORTHEAST	0.50 MILE +/-	YEAR-ROUND

Photographic Simulation



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VIEW	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
3	VIEW FROM ROUTE 187 ADJACENT TO HOUSE #399	NORTHEAST	0.50 MILE +/-	YEAR-ROUND

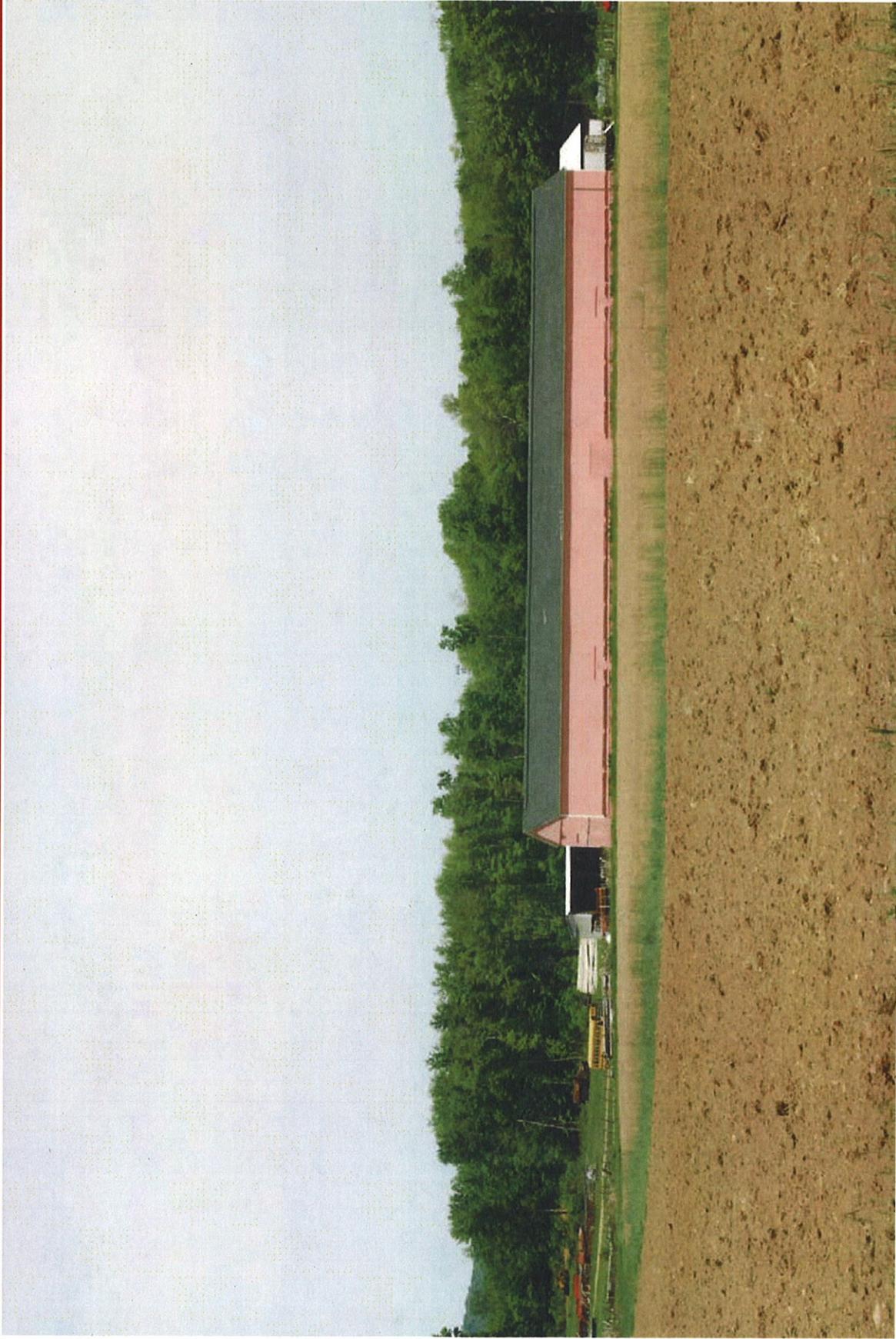
| Photographic Documentation



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VIEW	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
4	VIEW FROM SHELDON STREET ADJACENT TO HOUSE #1360	NORTHWEST	0.78 MILE +/-	YEAR-ROUND

Photographic Simulation



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VIEW	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
4	VIEW FROM SHELDON STREET ADJACENT TO HOUSE #1360	NORTHWEST	0.78 MILE +/-	YEAR-ROUND

Photographic Documentation



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VIEW	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
5	VIEW FROM HILL STREET	SOUTHWEST	1.69 MILES +/-	YEAR-ROUND

Photographic Simulation



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VIEW	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
5	VIEW FROM HILL STREET	SOUTHWEST	1.69 MILES +/-	YEAR-ROUND

| Photographic Documentation



J:\41469.00\graphics\FIGURES\41469_00_Photos.m

VIEW	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
6	VIEW FROM ROUTE 187 NORTH OF ROUTE 168	SOUTH	0.33 MILE +/-	NON-VISIBLE

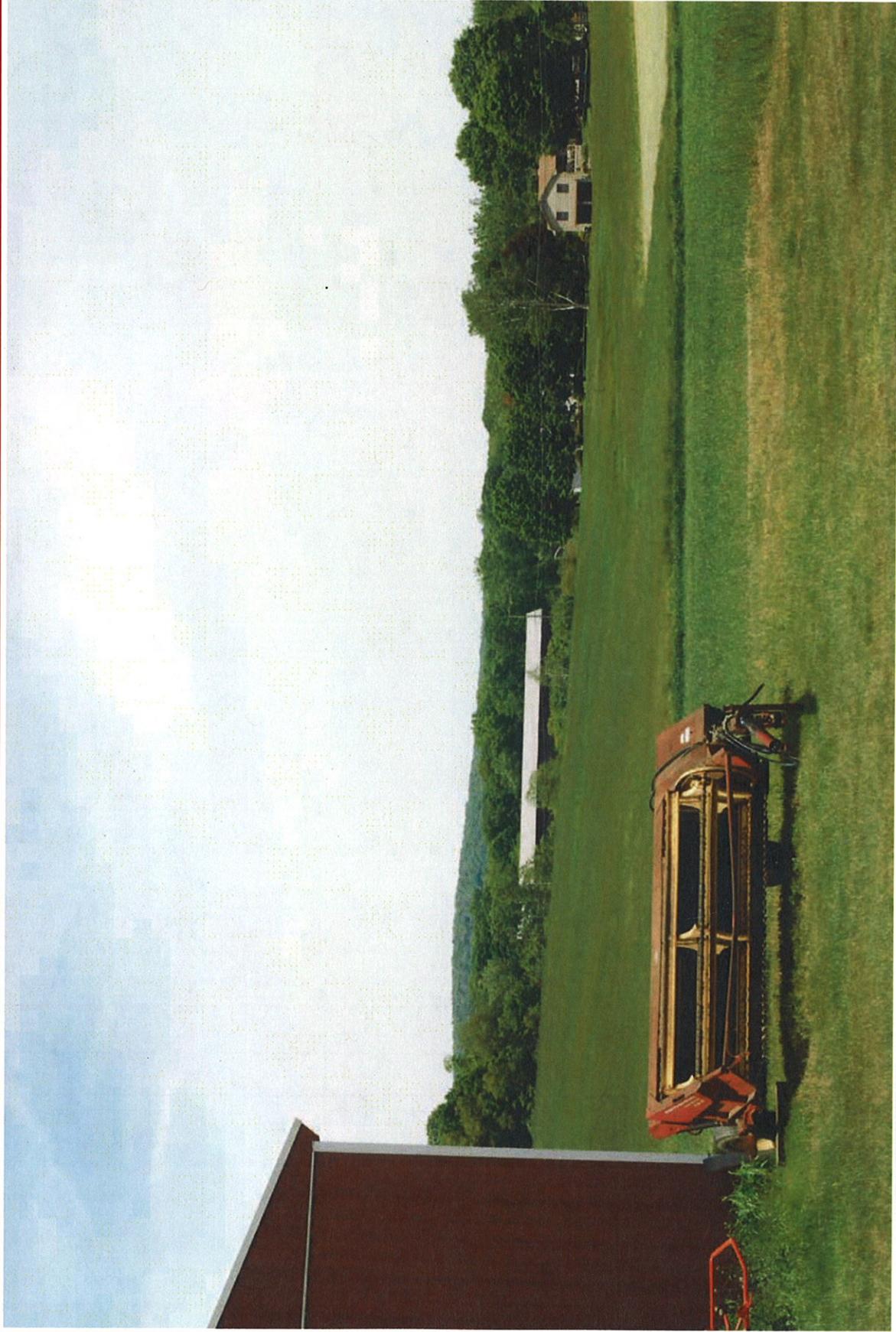
| Photographic Documentation



J:\41469.00\graphics\FIGURES\41469.00_Proxim

VIEW	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
7	VIEW FROM RATLEY ROAD	SOUTHEAST	1.54 MILES +/-	NON-VISIBLE

| Photographic Documentation



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VIEW	LOCATION		ORIENTATION	DISTANCE TO SITE	VISIBILITY
8	VIEW FROM TAINTOR STREET ADJACENT TO HOUSE #90		NORTHWEST	1.26 MILES +/-	NON-VISIBLE

Attachment B

Viewshed Map

Viewshed Analysis
Proposed Verizon Wireless
Telecommunications Facility
Suffield SW
174 South Grand Street
Suffield, Connecticut

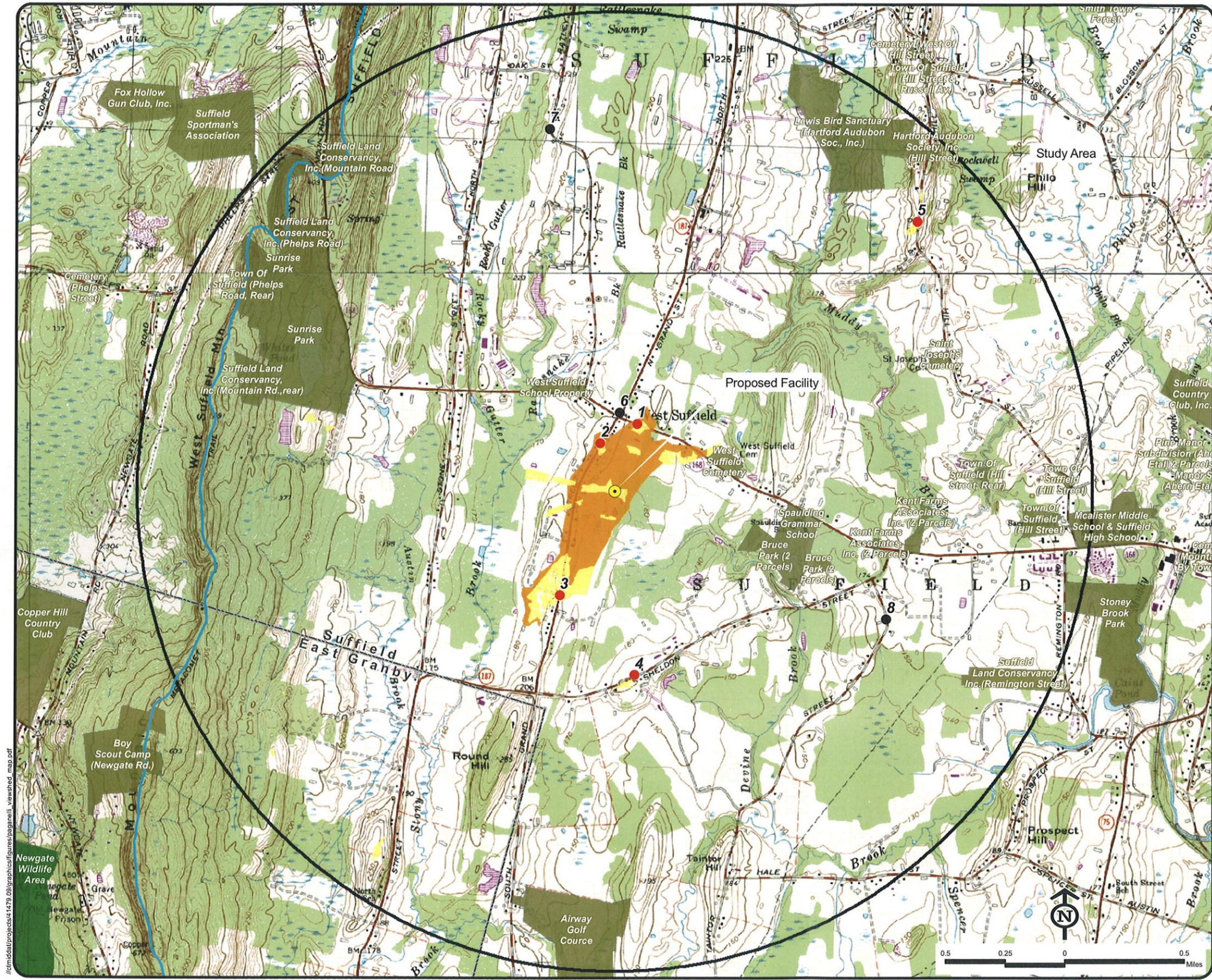
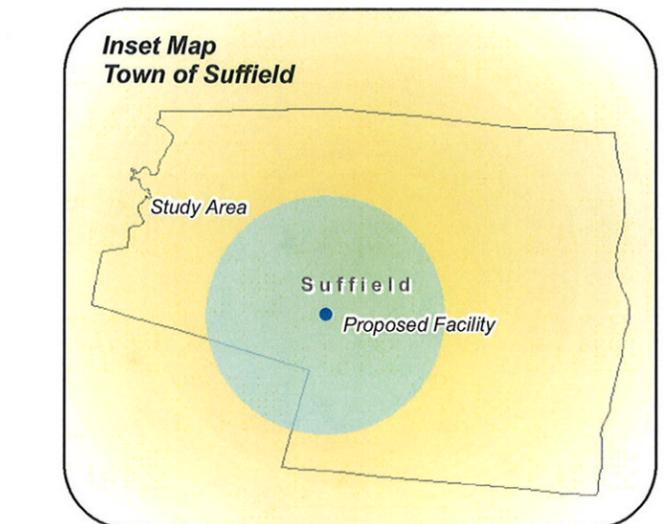
NOTE:
 - Viewshed analysis conducted using ESRI's Spatial Analyst.
 - Proposed Facility height is 120 feet.
 - Existing tree canopy height estimated at 65 feet.
 - Study Area is comprised of a two-mile radius surrounding the proposed facility and includes 8,042 acres of land.

DATA SOURCES:
 - Digital elevation model (DEM) derived from Connecticut LiDAR-based Digital Elevation Data (collected in 2000) with a 10-foot spatial resolution 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, 2010
 - Base map comprised of Southwick (1972), Terriville (1984), West Springfield (1979) and Windsor Locks (1984) USGS Quadrangle Maps
 - Municipal and Private Open Space data layer provided by CT DEP, 1997
 - Federal Open Space data layer provided by CT DEP, 2004
 - CT DEP Property data layer provided by CT DEP, Dec 2009
 - CT DEP boat launches data layer provided by CT DEP, Dec 2009
 - Scenic Roads layer derived from available State and Local listings

Map Compiled July 2010

Legend

- | | |
|---|------------------------------------|
| Proposed Tower Location | CT DEP Property (CT DEP, Dec 2009) |
| Balloon is not visible | State Forest |
| Balloon visible above trees | State Park |
| Anticipated Seasonal Visibility (Approximately 98 acres) | DEP Owned Waterbody |
| Year-Round Visibility (Approximately 46 acres) | State Park Scenic Reserve |
| Protected Municipal and Private Open Space (CT DEP, 1997) | Historic Preserve |
| Cemetery | Natural Area Preserve |
| Preservation | Fish Hatchery |
| Conservation | Flood Control |
| Existing Preserved Open Space | Other |
| Recreation | State Park Trail |
| General Recreation | Water Access |
| School | Wildlife Area |
| Uncategorized | Wildlife Sanctuary |
| | Federal Open Space (CT DEP, 2004) |
| | Boat Launches (CT DEP, Dec 2009) |
| | Scenic Road (State and Local) |
| | Metacomet Trail (CT Blue Blaze) |
| | Town Line |





Vanasse Hangen Brustlin, Inc.

54 Tuttle Place
Middletown, Connecticut 06457
860 632-1500
FAX 860 632-7879

Memorandum

To: Ms. Alexandria Carter
Verizon Wireless
99 East River Drive
East Hartford, CT 06108

Date: June 30, 2010

Project No.: 41479.09

From: Dean Gustafson
Professional Soil Scientist

Re: NEPA Wetland Compliance
Suffield SW Facility
174 South Grand Street
Suffield, Connecticut

Vanasse Hangen Brustlin, Inc. (VHB) previously completed on-site investigations to determine if wetlands and/or watercourses are located on the above-referenced Site.

The Site was inspected on November 7, 2008. The Site is occupied by a residence and associated structures; however, it is undeveloped in the vicinity of the proposed wireless telecommunications facility (Facility). Access to the Facility would utilize an existing access drive from South Grand Street serving a storage garage in the northwest portion of the Site. The proposed access road would then generally follow a historic farm road along the north and east Site boundaries to the proposed Facility. Vegetative characteristics in the vicinity of the proposed access drive are indicative of an abandoned Christmas tree farm and overgrown agricultural field. The area in the vicinity of the proposed telecommunications facility is characterized by a coniferous forest dominated by red pine (*Pinus resinosa*). Red pine is not native to Connecticut and was often planted in the 1930's during the Depression by the Civilian Conservation Corps on abandoned agricultural land as part of a national reforestation program. The nearest wetland/watercourse is a wetland system located off Site approximately 75 feet to the east of the proposed Facility. A watercourse feature was identified approximately 230 feet south of the proposed tower location on the subject property. No direct impact to wetlands is proposed for the Verizon Wireless development. Appropriate erosion control measures will be installed and maintained during construction of the proposed Facility. Therefore, the proposed Verizon Wireless development will not result in a likely adverse impact to nearby wetlands and watercourses.

In addition, as no direct impact to federal wetlands is associated with Verizon Wireless' construction activities, **NO significant change in surface features** (e.g., wetland fill, deforestation or water diversion) will result in accordance with the National Environmental Policy Act Categorical Exclusion checklist.

Transportation
Land Development
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Services



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January 21, 2009

Vanasse Hangen Brustlin, Inc.

Ref: 41479.09

Ms. Alexandria Carter
Verizon Wireless
99 East River Drive
East Hartford, Connecticut 06108

Re: Suffield SW CT - Wetland Inspection
174 South Grand Street (Paganelli)
West Suffield, CT

Dear Ms. Carter:

Vanasse Hangen Brustlin, Inc. (VHB) has completed on-site investigations to determine if wetlands and/or watercourses are located on the above-referenced Site. The approximate location of the proposed access road and telecommunications facility were determined during a preliminary site constraints visit on November 7, 2008, and are depicted on the attached Wetland Resources Map.

VHB understands that Verizon Wireless proposes to construct a wireless telecommunications facility in West Suffield at 174 South Grand Street, generally located south and east of the intersection of South Grand Street and Route 168 in the town of Suffield, Connecticut (the "Site"). The Site is occupied by a residence and associated structures; however, it is undeveloped in the vicinity of the proposed telecommunications facility. Access to the facility would utilize an existing access drive from South Grand Street serving a storage garage in the northwest portion of the Site. The proposed access road would then generally follow a historic farm road along the north and east Site boundaries to the proposed telecommunications facility. Vegetative characteristics in the vicinity of the proposed access drive are indicative of an abandoned Christmas tree farm and overgrown agricultural field. The area in the vicinity of the proposed telecommunications facility is characterized by a coniferous forest dominated by red pine (*Pinus resinosa*). Red pine is not native to Connecticut and was often planted in the 1930's during the Depression by the Civilian Conservation Corps on abandoned agricultural land as part of a national reforestation program.

A detailed inspection was conducted in areas to the west of the proposed telecommunications facility where published soil mapping and initial observations indicated the possible presence of poorly drained soil types (wetlands). Four shallow test pits were excavated by hand in this area to classify the soil type(s) and accurately determine the drainage class at each location (see attached Wetland Resources Map). Following the characterization of the soil type, these pits were left open for approximately 1 hour to equilibrate. Groundwater levels, which are anticipated to approach seasonal high levels at the time of observation, ranged in depth from 24 to 27+ inches below ground level. Based on these detailed observations, soils were field classified in the vicinity of the proposed development as Elmridge fine sandy loam (soil symbol - 28). Elmridge is a moderately well drained soil glaciofluvial (outwash) soil, which was not depicted on the published soil map in the vicinity of the proposed facility. The nearest wetland/watercourse is a wetland system located off site approximately 75 feet to the east of the proposed tower compound at the base of a hill. A

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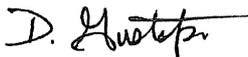
Project No.: 41479.09
January 21, 2009
Page 2

watercourse feature was identified approximately 230 feet south of the proposed tower location. This feature conveys flows from a 12-inch reinforced concrete pipe (RCP). Flow within this RCP originates from South Grand Street, a wetland area on the southern portion of the site and yard drains within maintained lawn areas associated with the onsite residence. Therefore, the proposed development will not directly or indirectly affect wetlands or watercourses.

If you have any questions concerning this matter do not hesitate to call us.

Very truly yours,

VANASSE HANGEN BRUSTLIN, INC.

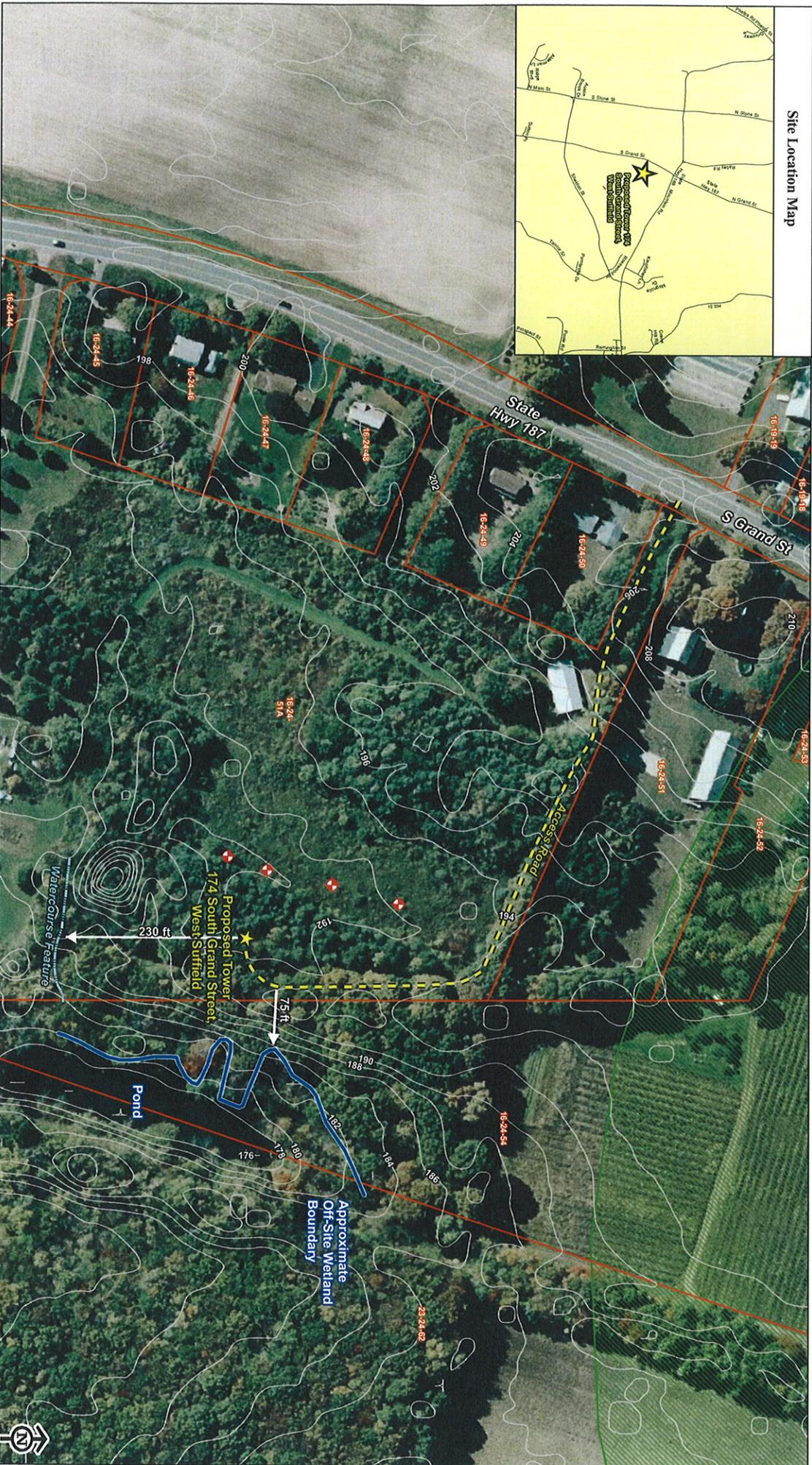
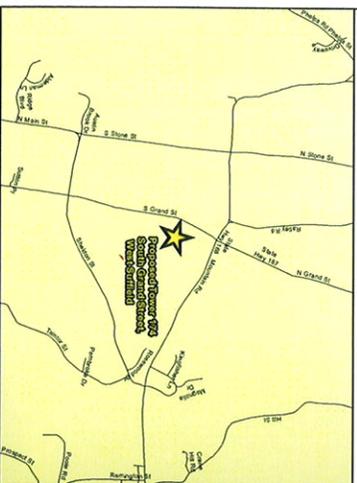

for Matthew Davison
Registered Soil Scientist


Dean Gustafson
Professional Soil Scientist

Enclosure



Site Location Map



- Legend**
- Proposed Tower
 - Groundwater Test Pits
 - Access Road
 - Wetland Boundary
 - Watercourse
 - Contours (2 foot)
 - Surficial Assessor, Parcels (2005)
 - Natural Diversity Database Areas (buffered, last updated 05/10)
 - FEMA Flood Zone
 - 100 Year Flood Zone
 - 500 Year Flood Zone
 - Floodway in Zone AE
 - Other Flood Areas

Source: 2006 color aerial photograph with 1-foot resolution, 2 foot contour interval, and 2005 Elevation Model collected in 2000 (<http://clear.uconn.edu>).



Vanasse Hangen Brustlin, Inc.
Proposed Verizon Wireless Facility
 Suffield SW CT
 Wetland Resources Map
 174 South Grand Street (Paganeli)
 West Suffield, Connecticut



lood insurance is available in this community, contact yo
 nial Flood Insurance Program at (800) 638-6620.



MAP SCALE 1" = 500'



NATIONAL FLOOD INSURANCE PROGRAM

Panel 2

PANEL 0202F

FIRM
FLOOD INSURANCE RATE MAP
 HARTFORD COUNTY,
 CONNECTICUT
 (ALL JURISDICTIONS)

PANEL 202 OF 675
 (SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
EAST GRANBY TOWN OF	06025	0202	F
SUFFIELD TOWN OF	06038	0202	F

Notice to User: The Map Number shown below should be used
 above should be used on insurance applications for the subject
 community.



MAP NUMBER
09003C0202F
EFFECTIVE DATE:
SEPTEMBER 26, 2008

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It
 was extracted using F-MIT On-Line. This map does not reflect changes
 or amendments which may have been made subsequent to the date on the
 title block. For the latest product information about National Flood Insurance
 Program flood maps check the FEMA Flood Map Store at www.fema.gov