

# **VISIBILITY ANALYSIS**

**CROMWELL NORTH 2  
667 MAIN STREET  
CROMWELL, CT**



**Prepared for:**

**Verizon Wireless  
99 East River Drive  
East Hartford CT 06108**

**Prepared by:**

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# Project Introduction

Cellco Partnership d/b/a Verizon Wireless is considering the development of a new wireless communications facility (“Facility”) at 667 Main Street in Cromwell, Connecticut (the “Property”). At the request of Verizon Wireless, All-Points Technology Corporation, P.C. (“APT”) prepared this Visibility Analysis to evaluate the potential visual impacts associated with the proposed Facility from within a two-mile radius (the “Study Area”). A small part of the neighboring Town of Glastonbury is located in the eastern portion of the Study Area.

## Site Description and Setting

The 7.78-acre Property is comprised of four (4) separate, adjacent parcels of land located on the west side of Main Street. The Property is improved with buildings, infrastructure, and storage areas that support the daily operations of Cromwell Concrete Products, Inc., manufactures of pre-cast concrete products (drainage structures, light pole bases, etc.) and pavers and landscaping material (mulch and stone).

The area proposed for the Facility (the “Site”) is located in the northwest corner of the Property at an approximate ground elevation of 147 feet Above Mean Sea Level (“AMSL”). The proposed Facility would include a 120-foot tall steel monopole surrounded by a 50-foot by 50-foot, gravel base equipment compound.

Land use within the immediate vicinity of the Property is a mix of industrial and residential, with open space and the TPC golf complex nearby to the east. The topography within the Study Area is characterized generally by steep hills and river valleys; ground elevations range from approximately 10 feet AMSL to 290 feet AMSL. The tree cover within the Study Area (consisting of mixed deciduous hardwoods with interspersed stands of conifers) occupies approximately 3,240 acres of the 8,042-acre study area ( $\pm 40\%$ ). The average tree canopy is estimated to be approximately 60 feet.

## Methodology

APT used the combination of a predictive computer model and in-field analysis to evaluate the visibility associated with the proposed Facility on both a quantitative and qualitative basis. The predictive model provides a measurable assessment of potential visibility throughout the entire Study Area including private properties and other areas inaccessible for direct observations. The in-field analyses included a balloon float and reconnaissance of the Study Area to record existing conditions, verify results of the model, inventory visible and nonvisible locations, and provide photographic documentation from publicly accessible areas. A description of the procedures used in the analysis is provided below.

## **Preliminary Computer Modeling**

To conduct this assessment, a predictive computer model was developed specifically for this project using TerrSet, an image analysis program developed by Clark Labs at Clark University, to provide an estimation of potential visibility throughout the Study Area. The predictive model incorporates Project- and Study Area-specific data, including the site location, its ground elevation and the proposed Facility height, as well as the surrounding topography, existing vegetation, and structures (which are the primary features that can block direct lines of sight).

Information used in the model included LiDAR<sup>1</sup>-based digital elevation and land use data. The LiDAR-based Digital Elevation Model (“DEM”) represents topographic information for the state of Connecticut that was derived through the spatial interpolation of airborne LiDAR-based data collected in the year 2000 and has a horizontal resolution of ten (10) feet. In addition, multiple land use data layers were created from National Agricultural Imagery Program (USDA) aerial photography (1-foot resolution, flown in 2012) using IDRISI image processing tools. The TerrSet tools develop light reflective classes defined by statistical analysis of individual pixels, which are then grouped based on common reflective values such that distinctions can be made automatically between deciduous and coniferous tree species, as well as grassland, impervious surface areas, water and other distinct land use features. This information is manually cross-checked with the recent USGS topographic land characteristics to quality assure the imaging analysis.

Once the data layers were entered, an assumed, conservative average tree height of 50 feet was added, and image processing tools were applied and overlaid onto USGS topographic base maps and aerial photographs to achieve an estimate of locations where the Facility might be visible. Additional data was reviewed and incorporated into the visibility analysis, including protected private and public open space, parks, recreational facilities, hiking trails, schools, and historic districts. Two trail systems are located within the Study Area. Based on a review of publicly-available information, no designated state scenic roads exist within the Study Area.

## **Field Reconnaissance**

To supplement and fine tune the results of the computer modeling efforts, APT completed in-field verification activities consisting of a balloon float, vehicular and pedestrian reconnaissance, and photo-documentation.

### **Balloon Float and Field Reconnaissance**

A balloon float and field reconnaissance were conducted March 16, 2015 to evaluate the visibility associated with the proposed Facility and to obtain photographs for use in this report. The balloon float consisted of raising an approximately four-foot diameter, red helium-filled balloon tethered to a string height of 120 feet above ground level (“AGL”) at the proposed Facility location. Weather conditions were favorable for the in-field activities, with calm winds (less than 3 miles per hour) and mostly overcast skies. Once the balloon was secured, APT conducted a Study Area reconnaissance by driving along the local and State roads and other

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<sup>1</sup> LiDAR is an acronym for Light Detection and Ranging. It is a technology that utilized lasers to determine the distance to an object or surface. LiDAR is similar to radar, but incorporates laser pulses rather than sound waves. It measures the time delay between transmission and reflection of the laser pulse.

publicly accessible locations to document and inventory where the balloon could be seen above/through the tree canopy. Visual observations from the reconnaissance were also used to evaluate the results of the preliminary visibility mapping and identify any discrepancies in the initial modeling.

During the balloon float and in-field activities, several trees were randomly surveyed using a hand-held infrared laser range finder and a Suunto Tandem clinometer to ascertain their heights. The heights of trees adjacent to the site were field measured to document the surrounding canopy elevation. Numerous off-site locations were also selected to obtain tree canopy heights, including along roadways, wooded lots, and high- and low-lying areas to provide for the irregularities associated with different land characteristics and uses found within the Study Area. The average canopy height was developed based on measurements and comparative observations, in this case approximately 60 feet AGL. Throughout Connecticut, the tree canopy height varies from about 55 feet to in excess of 80 feet (where eastern white pine becomes a dominant component of the forest type, average tree heights may be even slightly higher). This general uniformity is most likely the result of historic state-wide clear cutting of forests for charcoal production in the late 1800s and early 1900s. Approximately 69% of Connecticut's forests are characterized as mature<sup>2</sup>.

## Photographic Documentation and Simulations

During the balloon float and field reconnaissance, APT drove the public roads within the Study Area and recorded observations, including photo-documentation, of those areas where the balloon was and was not visible. Photographs were obtained from several vantage points to document the views of a proposed Facility. The geographic coordinates of the camera's position at each photo location were logged using global positioning system ("GPS") technology. Photographs were taken with a Canon EOS 6D digital camera body and Canon EF 24 to 105 millimeter ("mm") zoom lens, with the lens 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."<sup>3</sup>*

## Final Visibility Mapping

Information obtained during the field reconnaissance was incorporated into the mapping data layers, including observations of the balloon float, the photo locations, areas that experienced recent land use changes and those places where the initial model was found to over-predict visibility. The revised average tree canopy height data (60 feet AGL) was merged with the DEM and added to the base ground elevations of the forested areas data layer. Once the additional data was integrated into the model, APT re-calculated the visibility of the proposed Facility from within the Study Area to assist in producing the final viewshed map.

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<sup>2</sup> USDA Resource Bulletin NE-160, 2004.

<sup>3</sup> Warren, Bruce. Photography, West Publishing Company, Eagan, MN, c. 1993, (page 70).

## Photographic Simulations

Photographic simulations were generated to portray scaled renderings of the proposed Facility from representative locations where the proposed Facility would be visible on a year-round basis. Using field data, site plan information and 3-dimension (3D) modeling software, spatially referenced models of the site area and Facility were generated and merged. The geographic coordinates obtained in the field for the photograph locations were incorporated into the model to produce virtual camera positions within the spatial 3D model. Photo simulations were then created using a combination of renderings generated in the 3D model and photo-rendering software programs<sup>4</sup>.

For presentation purposes in this report, the photographs were taken with a 50 mm focal length and produced in an approximate 7-inch by 10.5-inch format. When viewing in this format size, we believe it is important to provide the largest representational image while maintaining an accurate relation of sizes between objects within the frame of the photograph.

Photo-documentation of the balloon float and photo-simulations of the proposed Facility are presented in the attachment at the end of this report. The balloon float photos provide visual reference points for the approximate height and location of the proposed Facility relative to the scene. The photo-simulations are intended to provide the reader with a general understanding of the different views that might be achieved of the Facility. It is important to consider that the publicly-accessible locations selected are typically representative of a “worst case” scenario. They were chosen to present unobstructed view lines (wherever possible), are static in nature and do not necessarily fairly characterize the prevailing views from all locations within a given area. From several locations, moving a few feet in any direction will result in a far different perspective of the Facility than what is presented in the photographs. In several cases, a view of the Facility may be limited to the immediate area of the specific photo location.

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<sup>4</sup> As a final step, the accuracy and scale of select simulations are tested against photographs of similar existing facilities with recorded camera position, focal length, photo location, and tower location.

## Photograph Locations

The table below summarizes characteristics of the photographs and simulations presented in the attachment to this report including a description of each location, view orientation, the distance from where the photo was taken relative to the proposed Facility and the general characteristics of that view. The photo locations are depicted on the visibility analysis maps provided as attachments to this report.

View	Location	Orientation	Distance to Site	View Characteristics
1	Woodside Road	Northeast	±0.73 Mile	Not Visible
2	Geer Street	Northeast	±0.70 Mile	Not Visible
3	Cromwell Middle School	Northeast	±0.40 Mile	Seasonal
4	Botelle Manor	Northeast	±0.26 Mile	Seasonal
5	West Tract Road	Northeast	±0.39 Mile	Year-round
6	Raymond Road	Northeast	±0.27 Mile	Year-round
7	Raymond Road	Northeast	±0.21 Mile	Year-round
8	Goodrich Avenue	Northeast	±0.19 Mile	Year-round
9	Goodrich Avenue	Northwest	±0.23 Mile	Year-round
10	Grove Road	Northeast	±0.14 Mile	Year-round
11	Grove Road	Northeast	±0.18 Mile	Year-round
12	Watrous Park	Northeast	±0.25 Mile	Year-round
13	Sunset Drive	Northeast	±0.08 Mile	Year-round
14	Sunset Drive	Northwest	±0.16 Mile	Year-round
15	Main Street	Northwest	±0.17 Mile	Year-round
16	Main Street	Southwest	±0.19 Mile	Seasonal
17	Ronald Drive	Southwest	±0.37 Mile	Not Visible
18	Main Street	Southwest	±0.42 Mile	Seasonal
19	Farms Village Road	Southwest	±0.52 Mile	Not Visible
20	Highview Drive	Southwest	±0.77 Mile	Not Visible
21	Springbrook Drive	Southeast	±0.84 Mile	Not Visible
22	Brook Street	Southeast	±0.86 Mile	Year-round
23	Capital Boulevard	Southeast	±1.10 Miles	Not Visible
24	Golf Club Road	Southwest	±0.42 Mile	Year-round
25	Golf Club Road	West	±0.57 Mile	Year-round
26	Golf Club Road	Northwest	±0.49 Mile	Year-round
27	Field Road	Northwest	±0.55 Mile	Year-round
28	Field Road	Northwest	±0.69 Mile	Year-round
29	Laurel Drive	Northwest	±0.71 Mile	Not Visible
30	Reiman Drive	Southwest	±1.18 Miles	Not Visible

## **Visibility Analysis Results**

Results of this analysis are graphically displayed on the viewshed maps provided in the attachment at the end of this report. Areas from where the proposed Facility would be visible above the tree canopy year-round comprise a total of approximately 108 acres. When the leaves are off the trees, seasonal views through intervening tree trunks and branches are anticipated to occur over some locations within an area of 224± additional acres.

In general, year-round views of portions of the Facility appear to be primarily limited to locations within less than 0.75 mile of the Property. The generally level terrain results in large portions of the Facility being visible above the tree canopy from several locations. Areas to the east are fairly open with little vegetation. Residential neighborhoods to the west of the site have a combination of mature trees and landscaping so that fleeting year-round views are attained with the majority of lines of sight to the Facility being more seasonal in nature. A large portion of visibility (both year-round and seasonal) occurs over open undeveloped land to the east and west.

No views of the Facility will be achieved from the trail systems in the Study Area.

### **Proximity to Schools And Commercial Child Day Care Centers**

No schools or commercial child day care centers are located within 250 feet of the Property. The nearest school, Cromwell Middle School is located approximately 0.4 mile to the southwest. The nearest commercial child day care center, Kids Korner at Woodside Intermediate School , is located at 30 Woodside Avenue, approximately 0.75 mile to the south/southwest. No views of the Facility are anticipated from either of these locations.

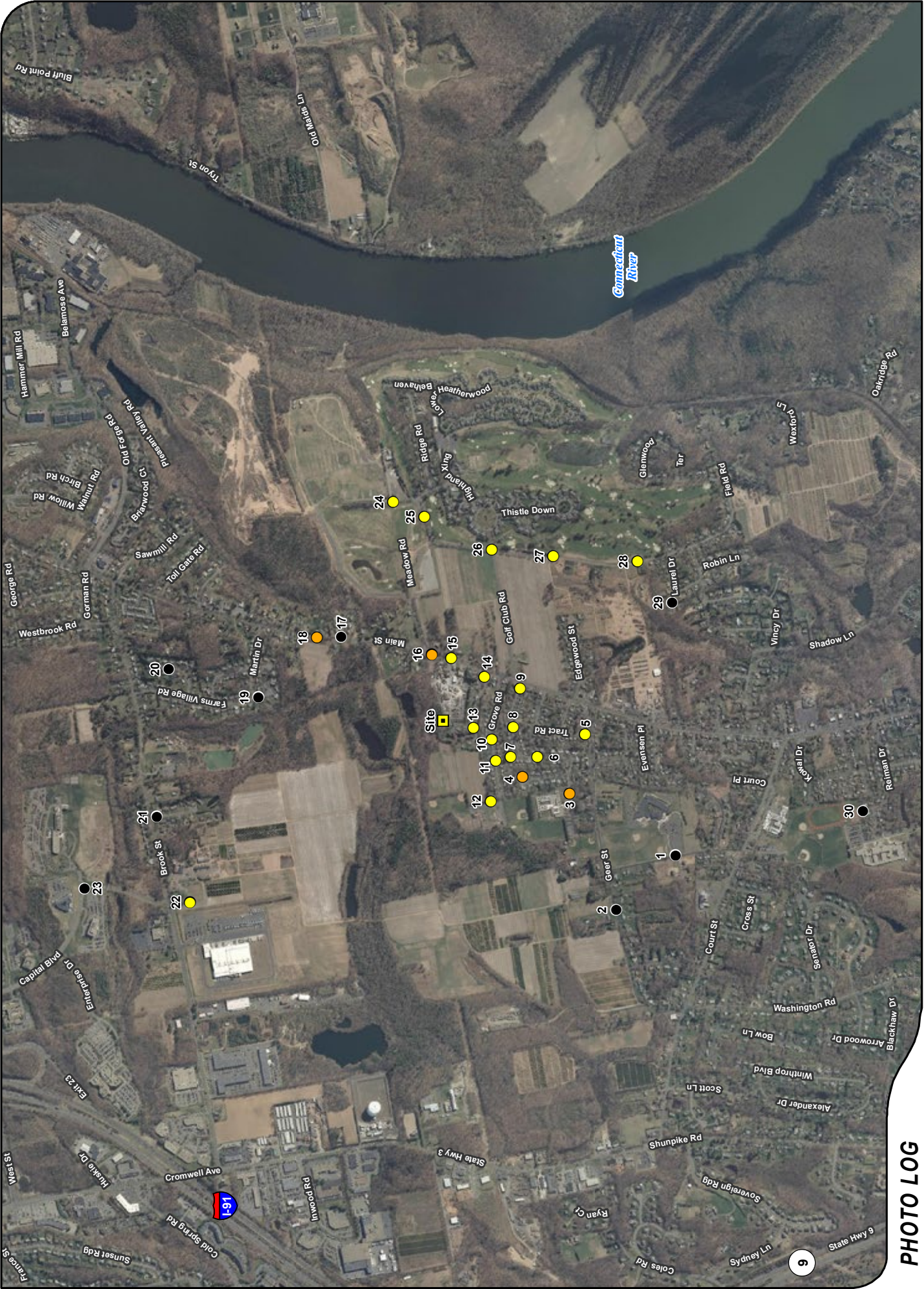
## **Limitations**

The viewshed maps presented in the attachment to this report depict areas where the proposed Facility may potentially be visible to the human eye without the aid of magnification based on a viewer eye-height of 5 feet above the ground and intervening topography and an assumed tree canopy height of 60 feet. This analysis may not necessarily account for all visible locations, as it is based on the combination of computer modeling, incorporating 2012 aerial photographs, and in-field observations from publicly-accessible locations. No access to private properties was provided to APT personnel. This analysis does not claim to depict the only areas, or all locations, where visibility may occur; it is intended to provide a representation of those areas where the Facility is likely to be seen.

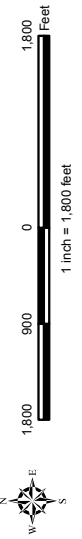
The simulations provide a representation of the Facility under similar settings as those encountered during the balloon floats and reconnaissance. Views of the Facility can change throughout the seasons and the time of day, and are dependent on weather and other atmospheric conditions (e.g., haze, fog, clouds); the location, angle and intensity of the sun; and the specific viewer location. Weather conditions on the day of the balloon float included partly cloudy skies and the photo-simulations presented in this report provide an accurate portrayal of the Facility during comparable conditions.

## **ATTACHMENTS**





Base Map Source: 2012 Aerial Photograph (CTECO)



- Legend**
- Site
  - Year-Round Visibility
  - Seasonal Visibility
  - Not Visible

# PHOTO LOG



**DOCUMENTATION**

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
1	WOODSIDE ROAD	NORTHEAST	+/- 0.73 MILE	NOT VISIBLE



**DOCUMENTATION**

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
2	GEER STREET	NORTHEAST	+/- 0.70 MILE	NOT VISIBLE



**DOCUMENTATION**

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
3	CROMWELL MIDDLE SCHOOL	NORTHEAST	+/- 0.40 MILE	SEASONAL



**SIMULATION**

PHOTO

3

LOCATION

**CROMWELL MIDDLE SCHOOL**

ORIENTATION

**NORTHEAST**

DISTANCE TO SITE

**+/- 0.40 MILE**

VISIBILITY

**SEASONAL**



**DOCUMENTATION**

PHOTO

4

LOCATION

**BOTELLE MANOR**

ORIENTATION

**NORTHEAST**

DISTANCE TO SITE

**+/- 0.26 MILE**

VISIBILITY

**SEASONAL**



**SIMULATION**

PHOTO

4

LOCATION

**BOTELLE MANOR**

ORIENTATION

**NORTHEAST**

DISTANCE TO SITE

**+/- 0.26 MILE**

VISIBILITY

**SEASONAL**



**DOCUMENTATION**

PHOTO

5

LOCATION

WEST TRACT ROAD

ORIENTATION

NORTHEAST

DISTANCE TO SITE

+/- 0.39 MILE

VISIBILITY

YEAR ROUND





**SIMULATION**

PHOTO

5

LOCATION

WEST TRACT ROAD

ORIENTATION

NORTHEAST

DISTANCE TO SITE

+/- 0.39 MILE

VISIBILITY

YEAR ROUND



**DOCUMENTATION**

PHOTO

6

LOCATION

RAYMOND ROAD

ORIENTATION

NORTHEAST

DISTANCE TO SITE

+/- 0.27 MILE

VISIBILITY

YEAR ROUND



**SIMULATION**

PHOTO

6

LOCATION

RAYMOND ROAD

ORIENTATION

NORTHEAST

DISTANCE TO SITE

+/- 0.27 MILE

VISIBILITY

YEAR ROUND



**DOCUMENTATION**

PHOTO

7

LOCATION

**RAYMOND ROAD**

ORIENTATION

**NORTHEAST**

DISTANCE TO SITE

**+/- 0.21 MILE**

VISIBILITY

**YEAR ROUND**



## **SIMULATION**

PHOTO

7

LOCATION

**RAYMOND ROAD**

ORIENTATION

**NORTHEAST**

DISTANCE TO SITE

**+/- 0.21 MILE**

VISIBILITY

**YEAR ROUND**



**DOCUMENTATION**

PHOTO

8

LOCATION

**GOODRICH AVENUE**

ORIENTATION

**NORTHEAST**

DISTANCE TO SITE

**+/- 0.19 MILE**

VISIBILITY

**YEAR ROUND**



**SIMULATION**

PHOTO

8

LOCATION

**GOODRICH AVENUE**

ORIENTATION

**NORTHEAST**

DISTANCE TO SITE

**+/- 0.19 MILE**

VISIBILITY

**YEAR ROUND**



**DOCUMENTATION**

PHOTO  
**9**

LOCATION  
**GOODRICH AVENUE**

ORIENTATION  
**NORTHWEST**

DISTANCE TO SITE  
**+/- 0.23 MILE**

VISIBILITY  
**YEAR ROUND**





**SIMULATION**

PHOTO

9

LOCATION

**GOODRICH AVENUE**

ORIENTATION

**NORTHWEST**

DISTANCE TO SITE

**+/- 0.23 MILE**

VISIBILITY

**YEAR ROUND**



**DOCUMENTATION**

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
10	GROVE ROAD	NORTHEAST	+/- 0.14 MILE	YEAR ROUND



**SIMULATION**

PHOTO

10

LOCATION

GROVE ROAD

ORIENTATION

NORTHEAST

DISTANCE TO SITE

+/- 0.14 MILE

VISIBILITY

YEAR ROUND



**DOCUMENTATION**

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
11	GROVE ROAD	NORTHEAST	+/- 0.18 MILE	YEAR ROUND



**SIMULATION**

PHOTO

11

LOCATION

GROVE ROAD

ORIENTATION

NORTHEAST

DISTANCE TO SITE

+/- 0.18 MILE

VISIBILITY

YEAR ROUND



**DOCUMENTATION**

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
12	WATROUS PARK	NORTHEAST	+/- 0.25 MILE	YEAR ROUND



**SIMULATION**

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
12	WATROUS PARK	NORTHEAST	+/- 0.25 MILE	YEAR ROUND



**DOCUMENTATION**

PHOTO

13

LOCATION

SUNSET DRIVE

ORIENTATION

NORTHEAST

DISTANCE TO SITE

+/- 0.08 MILE

VISIBILITY

YEAR ROUND





**SIMULATION**

PHOTO

13

LOCATION

SUNSET DRIVE

ORIENTATION

NORTHEAST

DISTANCE TO SITE

+/- 0.08 MILE

VISIBILITY

YEAR ROUND



**DOCUMENTATION**

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
14	SUNSET DRIVE	NORTHWEST	+/- 0.16 MILE	YEAR ROUND



## **SIMULATION**

PHOTO

14

LOCATION

**SUNSET DRIVE**

ORIENTATION

**NORTHWEST**

DISTANCE TO SITE

**+/- 0.16 MILE**

VISIBILITY

**YEAR ROUND**



**DOCUMENTATION**

PHOTO

15

LOCATION

MAIN STREET

ORIENTATION

NORTHWEST

DISTANCE TO SITE

+/- 0.17 MILE

VISIBILITY

YEAR ROUND



**SIMULATION**

PHOTO

15

LOCATION

MAIN STREET

ORIENTATION

NORTHWEST

DISTANCE TO SITE

+/- 0.17 MILE

VISIBILITY

YEAR ROUND



**DOCUMENTATION**

PHOTO

16

LOCATION

MAIN STREET

ORIENTATION

SOUTHWEST

DISTANCE TO SITE

+/- 0.19 MILE

VISIBILITY

SEASONAL



**SIMULATION**

PHOTO

16

LOCATION

MAIN STREET

ORIENTATION

SOUTHWEST

DISTANCE TO SITE

+/- 0.19 MILE

VISIBILITY

SEASONAL



**DOCUMENTATION**

PHOTO

17

LOCATION

RONALD DRIVE

ORIENTATION

SOUTHWEST

DISTANCE TO SITE

+/- 0.37 MILE

VISIBILITY

NOT VISIBLE





**DOCUMENTATION**

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
18	MAIN STREET	SEASONAL	+/- 0.42 MILE	SEASONAL



**DOCUMENTATION**

PHOTO

19

LOCATION

FARMS VILLAGE ROAD

ORIENTATION

SOUTHWEST

DISTANCE TO SITE

+/- 0.52 MILE

VISIBILITY

NOT VISIBLE



**DOCUMENTATION**

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
20	HIGHVIEW DRIVE	SOUTHWEST	+/- 0.77 MILE	NOT VISIBLE



**DOCUMENTATION**

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
21	SPRINGBROOK DRIVE	SOUTHEAST	+/- 0.84 MILE	NOT VISIBLE



**DOCUMENTATION**

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
22	BROOK STREET	SOUTHEAST	+/- 0.86 MILE	YEAR ROUND



**SIMULATION**

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
22	BROOK STREET	SOUTHEAST	+/- 0.86 MILE	YEAR ROUND



**DOCUMENTATION**

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
23	CAPITAL BOULEVARD	SOUTHEAST	+/- 1.10 MILES	NOT VISIBLE



**DOCUMENTATION**

PHOTO  
24

LOCATION  
GOLF CLUB ROAD

ORIENTATION  
SOUTHWEST

DISTANCE TO SITE  
+/- 0.62 MILE

VISIBILITY  
YEAR ROUND





**SIMULATION**

PHOTO

24

LOCATION

GOLF CLUB ROAD

ORIENTATION

SOUTHWEST

DISTANCE TO SITE

+/- 0.62 MILE

VISIBILITY

YEAR ROUND



**DOCUMENTATION**

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
25	GOLF CLUB ROAD	WEST	+/- 0.57 MILE	YEAR ROUND



**SIMULATION**

PHOTO  
**25**

LOCATION  
**GOLF CLUB ROAD**

ORIENTATION  
**WEST**

DISTANCE TO SITE  
**+/- 0.57 MILE**

VISIBILITY  
**YEAR ROUND**



**DOCUMENTATION**

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
26	GOLF CLUB ROAD	NORTHWEST	+/- 0.49 MILE	YEAR ROUND



**SIMULATION**

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
26	GOLF CLUB ROAD	NORTHWEST	+/- 0.49 MILE	YEAR ROUND



**DOCUMENTATION**

PHOTO  
**27**

LOCATION  
**FIELD ROAD**

ORIENTATION  
**NORTHWEST**

DISTANCE TO SITE  
**+/- 0.54 MILE**

VISIBILITY  
**YEAR ROUND**



**SIMULATION**

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
27	FIELD ROAD	NORTHWEST	+/- 0.54 MILE	YEAR ROUND



**DOCUMENTATION**

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
28	FIELD ROAD	NORTHWEST	+/- 0.69 MILE	YEAR ROUND





**SIMULATION**

PHOTO  
**28**

LOCATION  
**FIELD ROAD**

ORIENTATION  
**NORTHWEST**

DISTANCE TO SITE  
**+/- 0.69 MILE**

VISIBILITY  
**YEAR ROUND**



**DOCUMENTATION**

PHOTO

29

LOCATION

LAUREL DRIVE

ORIENTATION

NORTHWEST

DISTANCE TO SITE

+/- 0.71 MILE

VISIBILITY

NOT VISIBLE



**DOCUMENTATION**

PHOTO

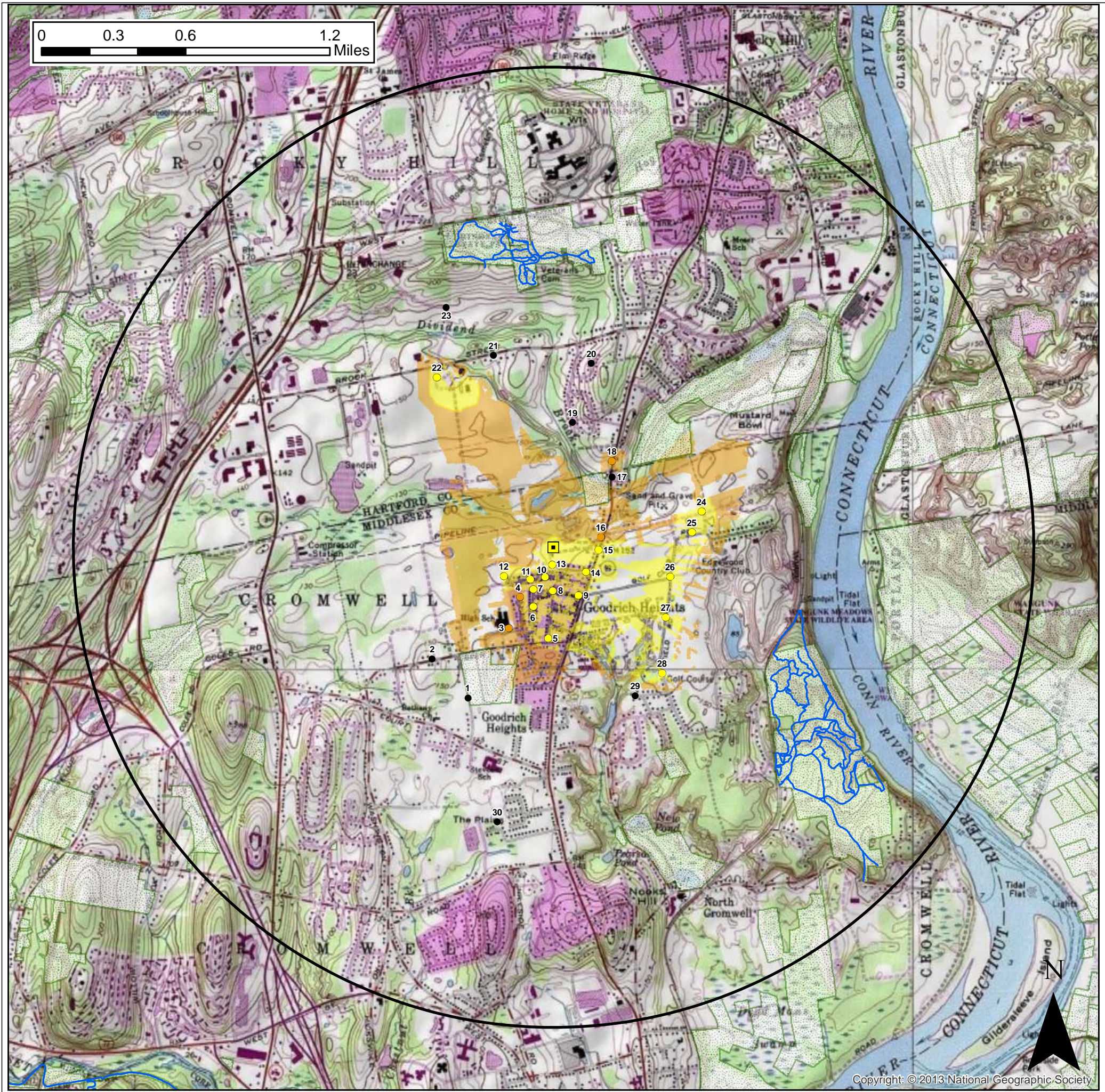
30

LOCATION  
**REIMAN DRIVE**

ORIENTATION  
**SOUTHWEST**

DISTANCE TO SITE  
**+/- 1.18 MILES**

VISIBILITY  
**NOT VISIBLE**



0 0.3 0.6 1.2 Miles



**Viewshed Map – Topo Base**  
 Proposed Wireless Telecommunications Facility  
 Cromwell North 2  
 667 Main Street, Cromwell, CT

Proposed facility height is 120 feet AGL.  
 Existing tree canopy height estimated as 60 feet.  
 Study area encompasses a two-mile radius and  
 includes 8,042 acres of land.

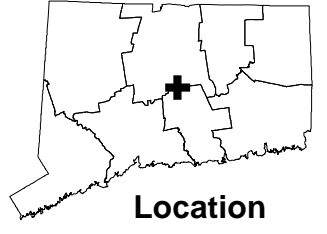
Map compiled 7/21/2015

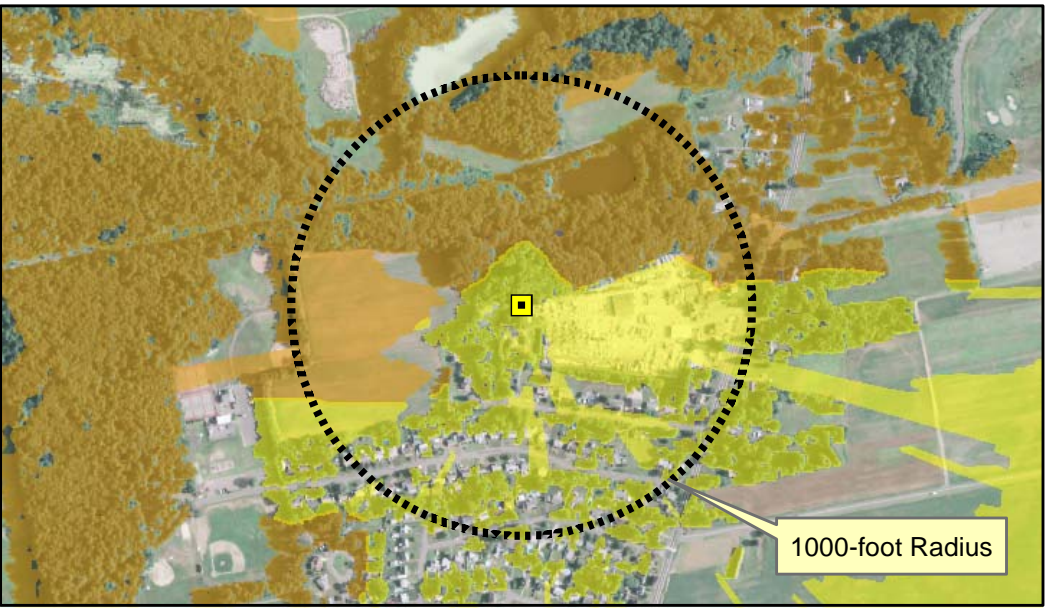
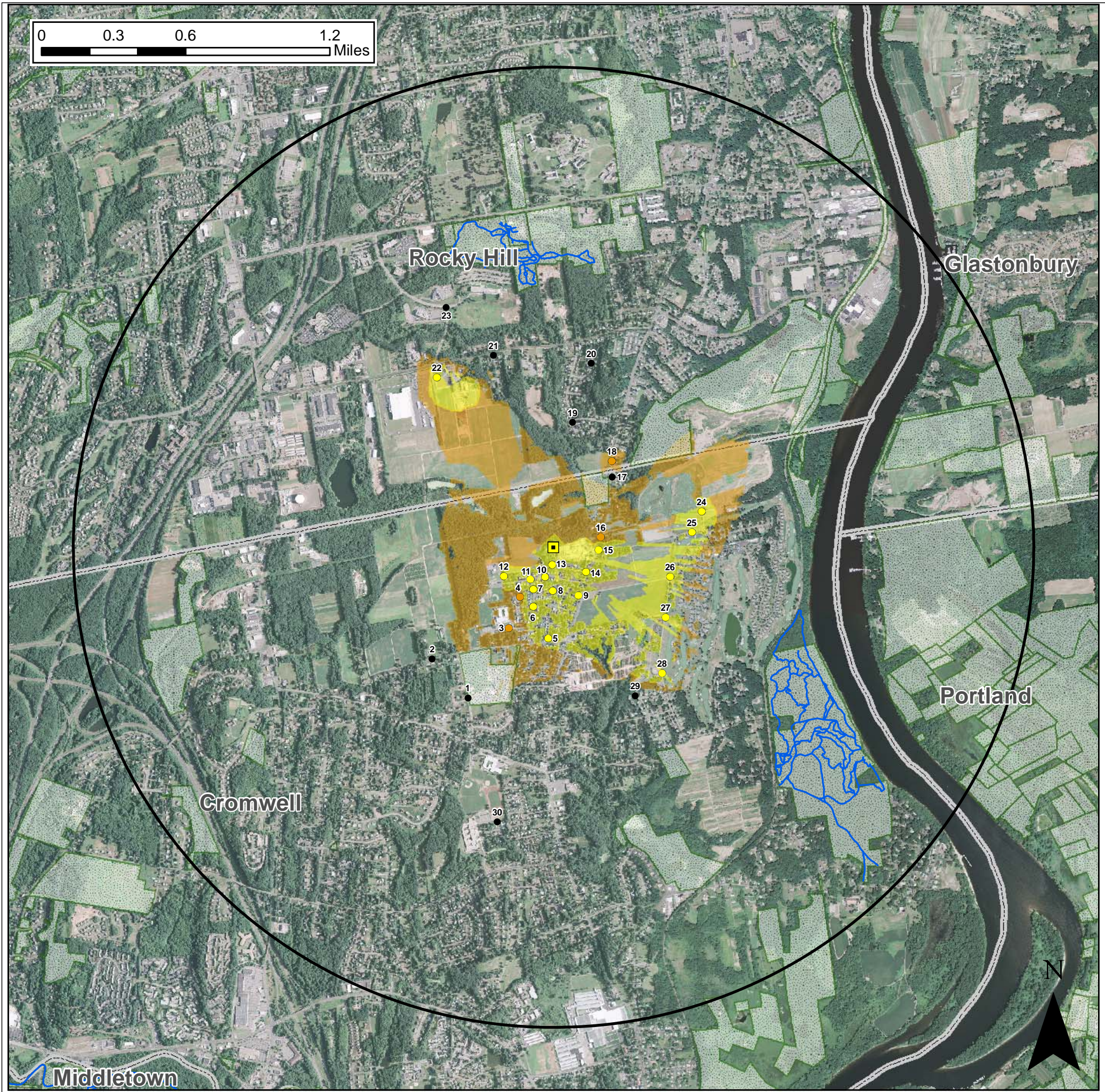
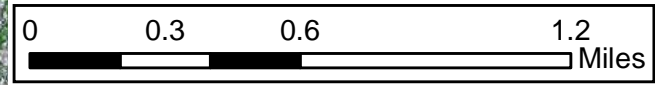
Map information field verified by APT on 3/16/2015.

Only those resources located within the extent of the map are depicted. For a complete list of data sources consulted for this analysis, please refer to the Documentation Page.

**Legend**

- Proposed Tower
- Photo Locations**
- Not Visible
- Seasonal Views
- Year-round Views
- Trails
- Predicted Seasonal Visibility (224 Acres)
- Predicted Year-Round Visibility (108 Acres)
- Towns
- 2-Mile Study Area
- Open Space





**Viewshed Map – Aerial Base**  
 Proposed Wireless Telecommunications Facility  
 Cromwell North 2  
 667 Main Street, Cromwell, CT

Proposed facility height is 120 feet AGL.  
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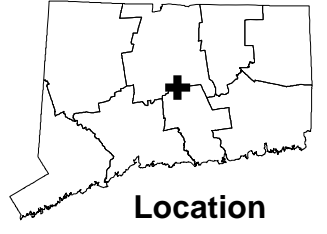
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- Towns
- 2-Mile Study Area
- Open Space



# DOCUMENTATION

## SOURCES CONSULTED FOR VIEWSHED MAPS

667 Main Street  
Cromwell, Connecticut

### *Physical Geography / Background Data*

Center for Land Use Education and Research, University of Connecticut (<http://clear.uconn.edu>)

- \*Land Use / Land Cover (2006)
- \*Coniferous and Deciduous Forest (2006)
- \*LiDAR data – topography (2000)

United States Geological Survey

- \*USGS topographic quadrangle maps – Hartford South, Middletown, Glastonbury, Middle Haddam (1984)

National Resource Conservation Service

- \*NAIP aerial photography (2012)

Department of Transportation data

- ^State Scenic Highways (updated monthly)

Heritage Consultants

- ^Municipal Scenic Roads

### *Cultural Resources*

Heritage Consultants

- ^National Register
- ^ Local Survey Data

### *Dedicated Open Space & Recreation Areas*

Connecticut Department of Energy and Environmental Protection (DEEP)

- \*DEEP Property (May 2007)
- \*Federal Open Space (1997)
- \*Municipal and Private Open Space (1997)
- \*DEEP Boat Launches (1994)

Connecticut Forest & Parks Association

- ^Connecticut Walk Books East –  
*The Guide to the Blue-Blazed Hiking Trails of Eastern Connecticut, 19th Edition, 2006.*

### *Other*

- ^ConnDOT Scenic Strips (based on Department of Transportation data)

\*Available to the public in GIS-compatible format (some require fees).

^ Data not available to general public in GIS format. Reviewed independently and, where applicable, GIS data later prepared specifically for this Study Area.

**NOTE** Not all the sources listed above appear on the Viewshed Maps. Only those features within the scale of the graphic are shown.

### **LIMITATIONS**

The visibility analysis map(s) presented in this report depict areas where the proposed Facility may potentially be visible to the human eye without the aid of magnification based on a viewer eye-height of 5 feet above the ground and intervening topography and an assumed tree canopy height of 60 feet. This analysis may not necessarily account for all visible locations, as it is based on the combination of computer modeling, incorporating 2012 aerial photographs, and in-field observations from publicly-accessible locations. No access to private properties beyond the host Property was provided to APT personnel. This analysis does not claim to depict the only areas, or all locations, where visibility may occur; it is intended to provide a representation of those areas where the Facility is likely to be seen.

The photo-simulations in this report are provided for visual representation only. Actual visibility depends on various environmental conditions, including (but not necessarily limited to) weather, season, time of day, and viewer location.