

Daniel D. Klasnick
Licensed in Massachusetts and New Hampshire
dklasnick@dkp-law.com

February 21, 2020

Margaret Olson, Chair
Planning Board
Town Office
16 Lincoln Road
Lincoln, Massachusetts 01773

**Re: Rezoning Petition
Section 12.6 Wireless Communications Facilities Overlay District
Zoning Map of Lincoln, Massachusetts
Property at 6 Emerson Road, Lincoln, MA (Map 112, Lot 10)**

Chair Olson:

Further to the petition to request that the Town of Lincoln amend Section 12.6 WCF - Wireless Communications Facilities Overlay District of the Town of Lincoln Zoning By-Law and the existing zoning map of the Town of Lincoln to add the property located at 6 Emerson Road to the Zoning_Overlay_Districts, Wireless Communications Facilities (the "Petition"), I am providing this correspondence and enclosures. As noted in my submission to the Lincoln Board of Selectmen, the Petition is submitted on behalf of the Property Owner of 6 Emerson Road and Petitioners as follows:

Property Owner: Sandra Damirjian, Trustee
Sandra Damirjian Revocable Trust
6 Emerson Road
Lincoln, MA 01773-1815

Petitioners: Crown Castle 06-2 LLC and
Global Signal Acquisitions IV LLC
c/o Daniel D. Klasnick, Esquire
Duval & Klasnick LLC
210 Broadway, Suite 203
Lynnfield, MA 01940

By way of background, Crown Castle 06-2 LLC and Global Signal Acquisitions IV LLC as wholly owned subsidiaries of Crown Castle International Corp. engineers, deploys, owns and operates technologically advanced shared wireless infrastructure, including an extensive network of towers. Crown Castle works around the country to build and maintain the infrastructure behind the world's most revolutionary wireless technologies. Please visit our website at: www.crowncastle.com for further details.

The locus parcel located at 6 Emerson Road (Map 112, Lot 10) in Lincoln, Massachusetts consists of approximately 3.0 acres and currently includes a residential structure. The Petitioners, Crown Castle 06-2 LLC and Global Signal Acquisitions IV LLC, have leased from the property owner an approximate 70' x 70' area of ground space located on an undeveloped portion of the property. There will be a 30' wide access, utility and fiber easement leading from the existing access driveway to the fenced area containing the wireless communications facility.

PROPOSAL

The Petitioners currently operate two 85' tall monopole towers on the property located at 9 Mary's Way aka 37 Cambridge Turnpike in the Town of Lincoln – Map 111, Lot 9 (“Existing Towers”). The Existing Towers currently provide space for antennas and supporting ground radio equipment of leading wireless service providers. The list of the Petitioners' current tenants on the Existing Towers includes AT&T and Sprint. Because the leases for the Existing Towers are expiring and it will be possible to consolidate the two towers into one tower, the Petitioners are proposing to install a relocation tower to address the continuation of wireless service on the networks of some of the leading providers in the Town of Lincoln. The Petitioners have identified the property at 6 Emerson Road as a suitable location to install a relocated tower to address AT&T and Sprint's network service requirements. To accommodate the installation of the AT&T and Sprint wireless equipment at 6 Emerson Road, it will be possible to replace the two 85' existing towers with a single 60' monopole tower (“Relocation Tower”).

Upon the installation of the AT&T and Sprint antennas and other equipment on the Relocation Tower and supporting ground equipment, the Petitioners will promptly remove the Existing Towers. The installation of the Relocation Tower will allow the Petitioners to remove the two existing approximately 85' tall monopole towers at 9 Mary's Way.

DESIGN DETAILS

To replace the Existing Towers, the Petitioners propose to construct a single self-supporting sixty (60) foot Monopole Tower. The proposed ground space for the Wireless Communications Facility is an area of approximately four thousand two hundred twenty-five (4,225) square feet [65' wide x 65' long] that will be surrounded by a chain link fence that will have a locked entrance gate. For your ease of reference, I am including with this submission a set of drawings depicting the design and layout of the proposed wireless communications facility to be located on 6 Emerson Road.

Access will be over an extension of the existing driveway from Emerson Road with electric and telephone lines run from the Wireless Communications Facility connected to an existing service in consultation with the utility providers, as shown and described in the Plans.

After construction of the Wireless Communications Facility is complete, the only traffic to the facility will be for routine monthly service by the Petitioners and the wireless service providers of the facility to ensure that the telecommunications equipment remains in good working order.

The Wireless Communications Facility has been sited and designed in a manner that minimizes its visibility from neighboring residences and streets. To illustrate the limited visibility, I have included a Viewshed Analysis. A one-mile radius surrounding the site is defined as the study area for this Viewshed Analysis. The Viewshed Analysis was conducted within the predefined study area using computer modeling providing the best possible prediction of locations that will have views of proposed telecommunications facility. As illustrated in the Viewshed Analysis, the Relocation Tower will have very limited visibility and will likely not be noticed in the community.

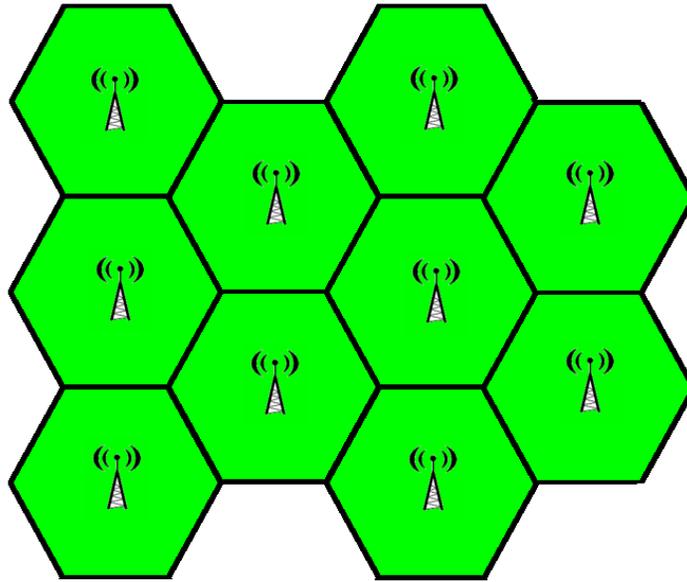
An airspace safety analysis & compliance study has been undertaken to confirm satisfaction of the requirements of the Federal Aviation Administration. The report certifies that the proposed tower will not be a hazard to air navigation. The night lighting of the monopole tower shall be limited as required by the Federal Aviation Administration.

The proposed wireless communications facility will not impact the health and safety of adjoining properties, the general neighborhood or the surrounding neighborhoods as outlined by the certifications and attestation of compliance with all rules and regulations. The proposed equipment meets the requirements of all applicable regulations regarding radio frequency emissions.¹ As part of this submission, the Petitioner has included a RF Safety and NIER Analysis Report dated February 13, 2020. This report confirms that the radio frequency emissions of the proposed installation will comply with FCC standards.

NETWORK DESIGN

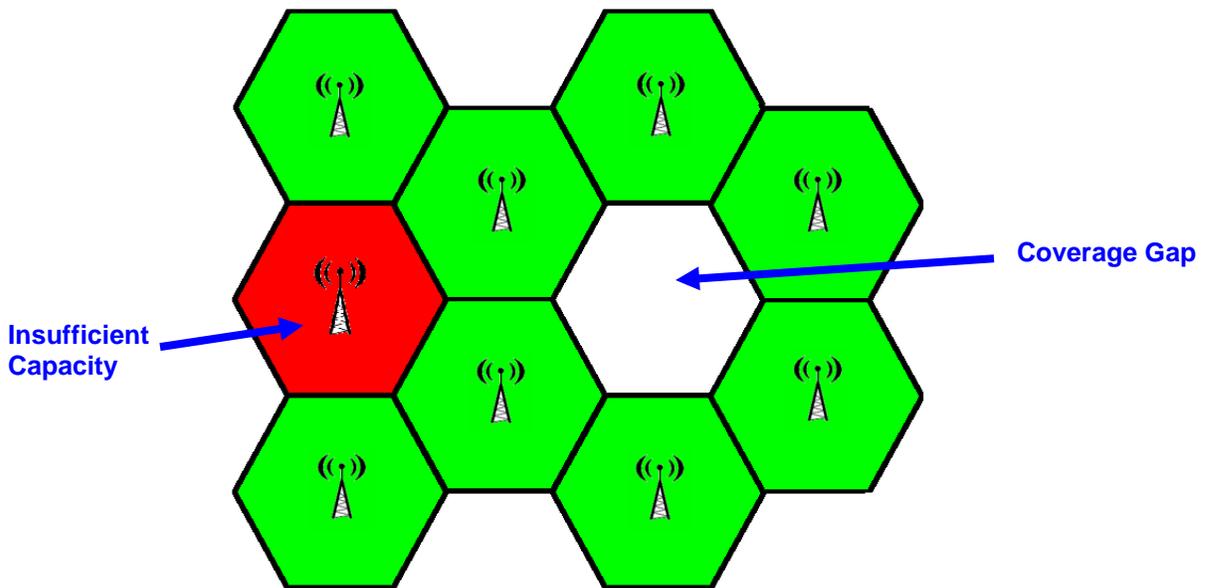
By way of further illustration, it is helpful to consider each wireless facility as an individual “cell” of a honeycomb that provides wireless coverage to a certain geographical area. As a customer travels outside of the range of the wireless facility, the network service is “handed off” to a wireless facility (or facilities) in the area to which the customer is traveling. Wireless facilities must be placed close enough together so that there is some overlap in coverage, which allows for a smooth handoff of network service from cell to cell.

¹ The Telecommunications Act prohibits local authorities from considering the effects of RF emissions for wireless facilities that comply with RF emission guidelines established by the FCC47 USC § 332(c)(7)(B)(iv).



Example of Network “Honeycomb”

The decommissioning of the Existing Towers will result in a significant coverage gap. Users located within areas without reliable wireless service may not receive any service at all, or they may receive substandard service such as dropped or poor-quality calls, failed text messages, interrupted internet connections, and other similar issues.



Network “Honeycomb” with Coverage and Capacity Problems

Coverage and capacity gaps affecting areas of heavy usage such as Route 2 (Cambridge Turnpike) present a particular challenge to RF engineers because a signal can be lost very easily if

coverage is not adequate. The best analogy is a train traveling on its tracks. Even the smallest gap in the train tracks can derail the entire train, just as a small gap can cause a signal to be lost.

DUE DILIGENCE

Using the criteria identified by the Petitioners' Radiofrequency Engineer, Site Acquisition Specialists analyzed numerous properties within the limited search area to find a site that would meet the necessary standards for the installation of the Relocation Tower. A property would need to satisfy a number of requirements to be considered a suitable location for the Relocation Tower including: (i) Sufficient ground space to permit construction of a wireless facility; (ii) Sufficient and unobstructed airspace to allow for the installation and maintenance of the tower, and effective propagation of wireless signals; (iii) Sufficient setback from lot lines, public ways, and residential structures; (iv) Adequate screening between the proposed facility and residential areas; (v) Topography that does not prevent the effective propagation of wireless signals; (vi) Lack of adverse title conditions in land records for the property; (vii) Lack of environmental contamination at the site and in the surrounding area; (viii) Ability to bring utilities (power and telephone) onto the property; (ix) Unobstructed vehicle access to the area of the proposed facility; and (x) Ability to secure a lease with the landowner on commercially reasonable terms.

The Town of Lincoln Zoning By-Law imposes a further limitation by only allowing upon grant of special permit the installation of wireless communications facilities on the limited parcels designated as within the Wireless Communications Facilities Overlay District. There are no properties within the current Wireless Communications Facilities Overlay District that will both satisfy AT&T and Sprint's network requirements for the area and also satisfy the criteria outline above. It therefore was necessary for Petitioners' Site Acquisition Specialists to evaluate properties outside of the current Wireless Communications Facilities Overlay District.

NETWORK ASSESSMENT

The Petitioners are committed to working with local communities in siting and construction of its wireless communications facilities and therefore the proposal is to amend the Town of Lincoln Zoning By-Law to add the property at 6 Emerson Road to the Wireless Communications Facilities Overlay District. The selection of the property for the Relocation Tower was determined utilizing sophisticated computer engineering models that simultaneously evaluate topography, population patterns, and land use concerns to identify specific geographic regions to be serviced by the communications facility in the wireless service providers' network.

The Petitioners' Radio Frequency Engineer ("RF Engineer") has reviewed the service requirements in the search area in which the subject parcel is located. This research has confirmed that the Relocation Tower will address a "significant gap" in wireless coverage that will result from the removal of the Existing Towers, which requires a wireless communications facility in this area of the Town of Lincoln. The Petitioners' RF Engineer has further determined that an installation on the Relocation Tower would enable the wireless service providers to close gaps in its wireless coverage that will occur upon removal of the Existing Towers. For your reference, I have enclosed a RF Design Analysis report prepared by Biwabkos Consultants LLC.

THE IMPORTANCE OF STAYING CONNECTED

It is a truism to state that, in today's competitive environment, it is absolutely essential that there is the necessary infrastructure to ensure access to reliable wireless services. The ability to utilize mobile devices has become so integral that the absence of reliable service certainly has a negative impact. The availability of reliable wireless service also provides greater access to 911 emergency services. Maintaining wireless service provides another tool for ensuring that emergencies can be reported as quickly as possible, which reduces the response times of public safety personnel.

The direct and indirect financial benefits of reliable wireless service to the area surrounding the proposed Relocation Tower are indicative of the very nature of the use by the public and private sector. Today, just over half – 57% - of American households only have a mobile voice connection and 90% of US households use wireless service. For Millennials (those born between 1982 and 2004), that increases to over two-thirds who live in mobile-only households. Wireless may also be the only connection available to access 911 and reverse 911. Surveys have found that cellular service is of major importance to homebuyers. It was more important than schools when looking for a home (cellular service ranked 76% versus 60% for schools). Cellular coverage trailed only crime rates (96%), local taxes (90%), and amenities (84%). Among Millennials, 83% said cell service was the most important fact in purchasing a home. In all, traffic totaled 13.72 trillion megabytes – the equivalent of 1.58 million years of streaming HD video – an increase of 4.07 trillion megabytes over 2015. Over the past two years, data use has increased 238 percent. (2017 CTIA Wireless Snapshot, May 2017). With this increase in demand from users in vehicles, at home and those who work from home, there is a need for facilities to meet the customer requirements. The availability of wireless communications service enhances community safety, and is increasingly relied upon by civil defense and other safety officers as well as the general public in times of crisis, natural disaster, bad storms or similar circumstances.

By providing an installation for the continued deployment of wireless equipment in this area of the Town of Lincoln, the Relocation Tower further aligns with the objectives of FirstNet's mission to create a nationwide broadband network for America's public safety-first responders. This initiative will strengthen and modernize the communications services by providing for quicker response by law enforcement, fire and emergency medical personnel. The FirstNet initiative requires a highly reliable network that offers priority to first responders with a trusted and resilient network. The Relocation Tower will allow for continuing access to a reliable and robust network in this area of the Town of Lincoln.

TELECOMMUNICATIONS ACT

Because the rezoning petition is for a zoning amendment for the installation of equipment that provides wireless services, the proposed zoning amendment and Relocation Tower is subject to §704 of the federal Telecommunications Act of 1996 ("TCA"), codified at 47 U.S.C. §332(c)(7)(B). By way of background, the TCA is a federal law enacted in 1996 whose purpose is "[t]o promote competition and reduce regulation in order to secure lower prices and higher quality

services for American telecommunications consumers and encourage the rapid deployment of new telecommunications technologies.” To further this purpose, the TCA established national standards that apply to permitting for wireless facilities. These standards preempt inconsistent state and local laws, so they must be considered in making decisions related to wireless facilities.

The Petitioners look forward to meeting with you and discussing this Petition for a zoning amendment. Should you require any additional information, please don't hesitate to contact me.

Thank you very much for your cooperation.

Very truly yours,
DUVAL & KLASNICK LLC

A handwritten signature in blue ink that reads "Daniel D. Klasnick". The signature is written in a cursive style and is positioned above a horizontal line.

By: Daniel D. Klasnick
Attorney at Law

Exhibit 1
‘Petition for Zoning Amendment’

TOWN OF LINCOLN MASSACHUSETTS

TO THE BOARD OF SELECTMEN

REZONING PETITION

SANDRA DAMIRJIAN, AS TRUSTEE OF THE SANDRA DAMIRJIAN REVOCABLE TRUST, CROWN CASTLE TOWERS 06-2 LLC AND GLOBAL SIGNAL ACQUISITIONS IV LLC HEREBY PETITIONS TO SEE IF THE TOWN OF LINCOLN MASSACHUSETTS WILL AMEND SECTION 12.6 WCF – WIRELESS COMMUNICATIONS FACILITIES OVERLAY DISTRICT OF THE TOWN OF LINCOLN ZONING BY-LAW AND THE EXISTING ZONING MAP OF LINCOLN, MASSACHUSETTS AS FOLLOWS:

SECTION 12.6.2 entitled “LOCATION,” there shall be added to the Wireless Communications Facilities Overlay District (“WCF District”) the following parcel:

Assessors’ Map Parcel No.	Location/Street Address	Approximate acreage
112-10	6 Emerson Road	3.0 acres

The Zoning Map of Lincoln, Massachusetts is hereby amended by adding to the Zoning_Overlay_Districts, Wireless Communications Facilities the following:

The land situated in the County of Middlesex, Town of Lincoln, State of Massachusetts and shown as Lot #7 on a plan entitled "Subdivision of Land in Lincoln, MASS. Belonging to Carleton W. Owen" dated January 1963, Rowland H. Barnes & Co., Civil Eng'rs., recorded with Middlesex South District Deeds as Plan No. 184 of 1963 commonly known as 6 Emerson Road - Parcel Id #112-0010-000 and further, bounded and described as follows:

Southwesterly by Concord Turnpike, as shown on said plan, 312.00 feet;

Westerly by Lot #8, as shown on said plan, 417.07 feet;

Northerly by Estate of E. H. Rogers, as shown on said plan, 244.61 feet; and

Easterly by Lot #6, as shown on said plan, 576.41 feet.

Containing 131,832 square feet of land, according to said plan.

Together with right of way 40' wide along the Southwesterly lot line of Lot #6 as shown on said plan for the benefit of Lot #7 for all purposes for which rights of way are commonly used in the Town of Lincoln.

Exhibit 2
“Letter of Authorization”

LETTER OF AUTHORIZATION

Sandra Demirjian, Trustee of the Sandra Demirjian Revocable Trust

December 16, 2019

Planning Board
Code Enforcement
Zoning Board of Appeals
Board of Selectmen
Town of Lincoln
16 Lincoln Road
Lincoln, MA 01773

Re: Authorization of Crown Castle Towers 06-2 LLC and Global Signal Acquisitions IV LLC ("Crown Castle")

Dear Ladies and Gentlemen:

The undersigned, as owner of premises in the Town of Lincoln, located at 6 Emerson Road, further described in the Middlesex County Registry of Deeds at Book 65537 Page 519 (the "Property"), hereby authorizes Crown Castle Towers 06-2 LLC and Global Signal Acquisitions IV LLC ("Crown Castle"), and McLane Middleton, PA and their employees, agents, attorneys and consultants, to seek approval from the Town of Lincoln (including, but not limited to, re-zoning a wireless communications facilities overlay district, building permit, special permit and site plan review from the planning board, zoning and planning relief and special permit) in connection with the construction and installation of a wireless telecommunications facility on the Property.

Sincerely,



Sandra Demirjian, Trustee

Exhibit 3
“Amended Zoning Map”

DRAFT 5/28/2013
REVISED 10/10/2019

Zoning Map of Lincoln, Massachusetts

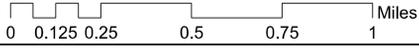


Zoning_Overlay_Districts

- Name
- North Lincoln
 - Solar Photovoltaic Facilities
 - South Lincoln
 - Wireless Communication Facilities

Zoning_Districts

- DistrictCode
- B-1
 - B-2
 - R-1
 - R-2
 - R-3
 - R-4



**PROPOSED WCF
OVERLAY DISTRICT
BOUNDARY EXPANSION**

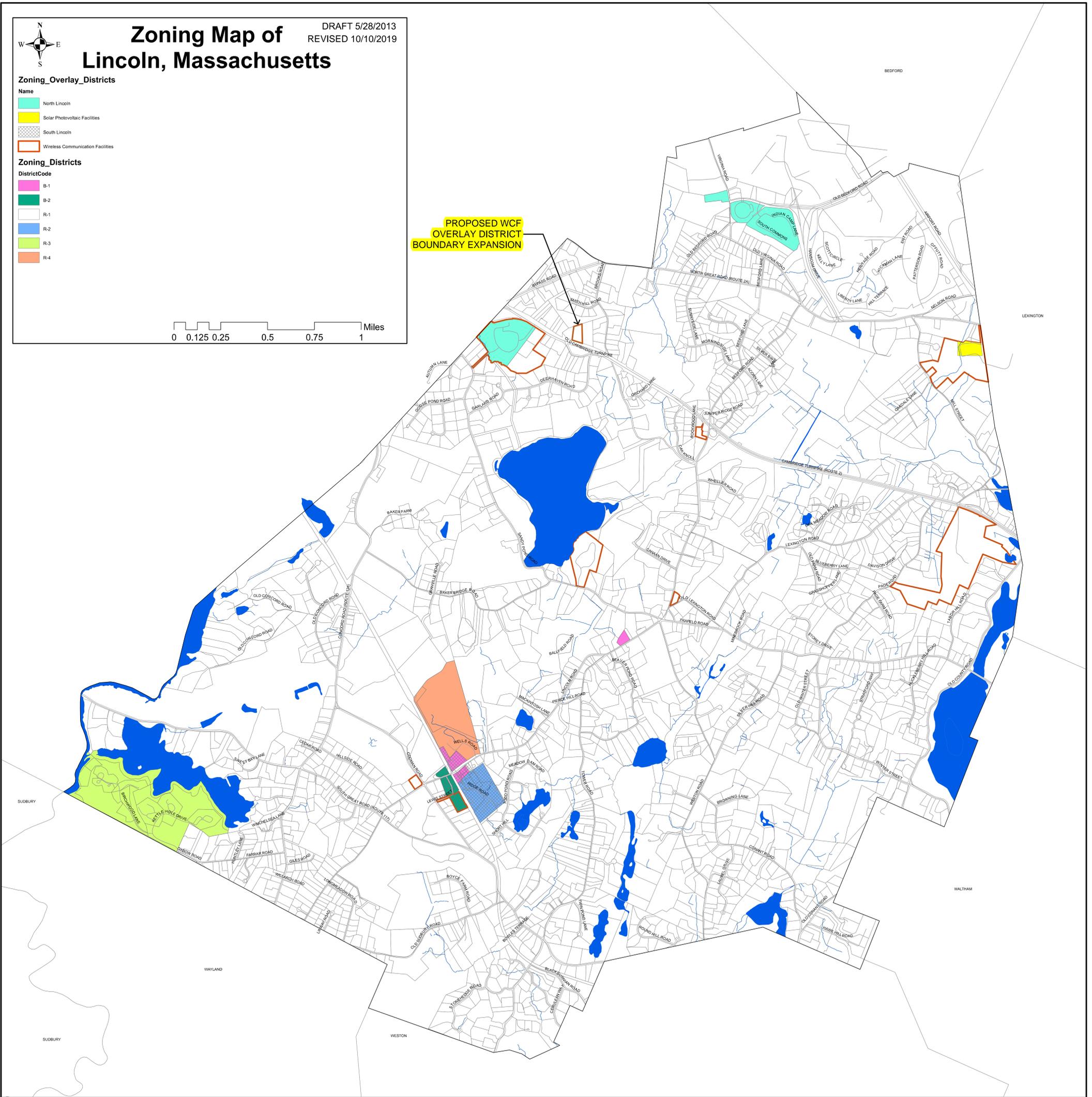


Exhibit 4
“Site and Design Plans”

Exhibit 5
“RF Design Analysis”

WIRELESS NETWORK CONSULTING



Crown Site# 831301 Lincoln Site

RF DESIGN ANALYSIS

Existing Sites

- † 875048 - Existing 85' Monopole Tower
 - 37 Cambridge Turnpike Lincoln, MA 01773
 - Latitude: 42.44589 (NAD83)
 - Longitude: -71.31897 (NAD83)
 - Sprint 82'

- † 841175 – Existing 84' Monopole Tower
 - 37 Cambridge Turnpike Lincoln, MA 01773
 - Latitude: 42.44602778 (NAD83)
 - Longitude: -71.3188056 (NAD83)
 - AT&T 83'

Proposed Site

- † 831301 – Proposed 60' Monopole Tower
 - 6 Emerson Road Lincoln, MA 01773
 - Latitude: 42.4480 (NAD83)
 - Longitude: -71.3126 (NAD83)
 - Sprint 60'
 - AT&T 55'

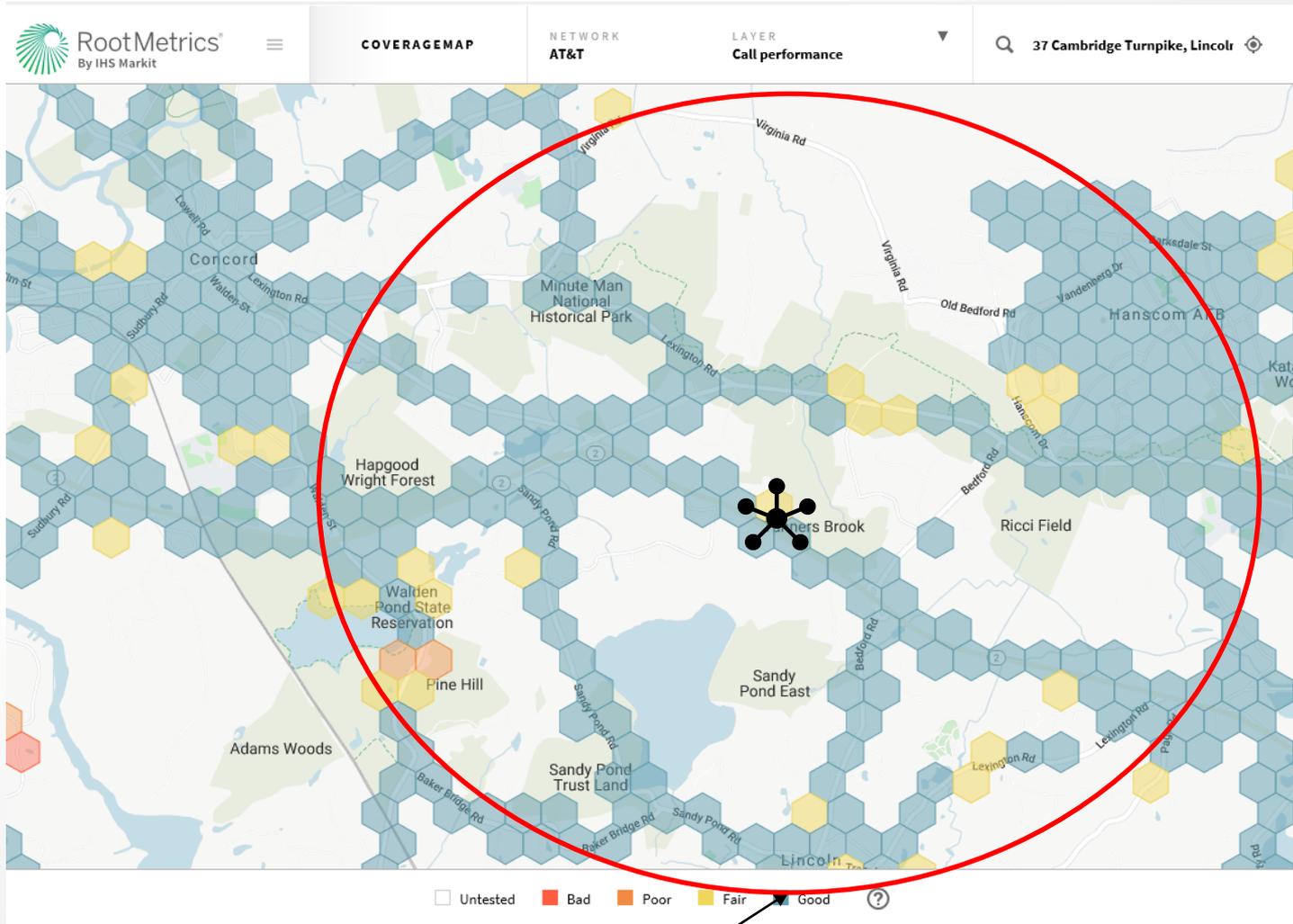
Sites



Objective of new site

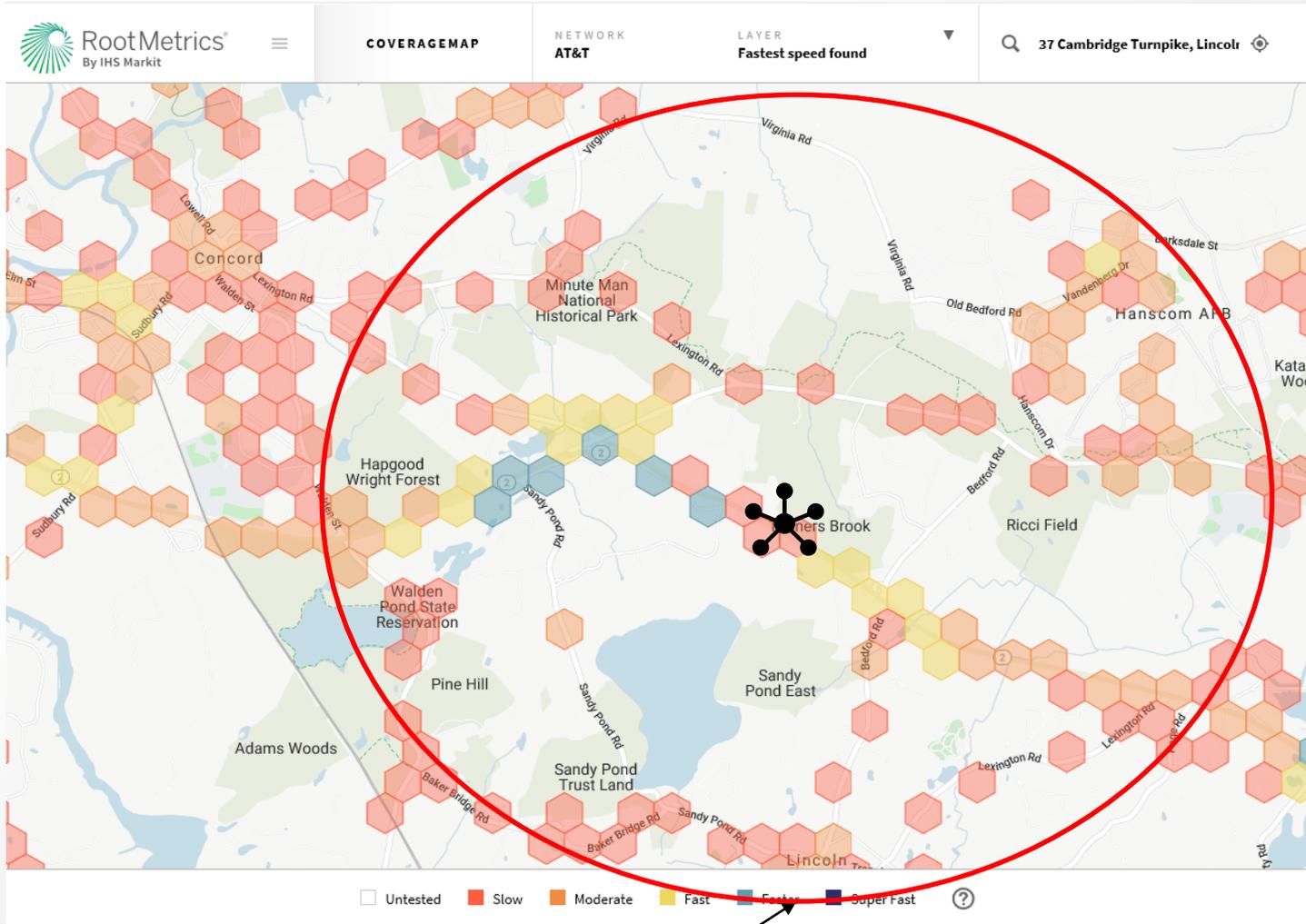
- † Replace existing coverage for (2) carriers that provide service to Hwy 2, East Concord and North Lincoln.
- † Site would also continue to provide services to users on Southern side of Hanscom Air Force Base
- † Since ground elevation at proposed site is higher site is able to be slightly shorter than the existing sites.

RootMetrics – AT&T Coverage Map



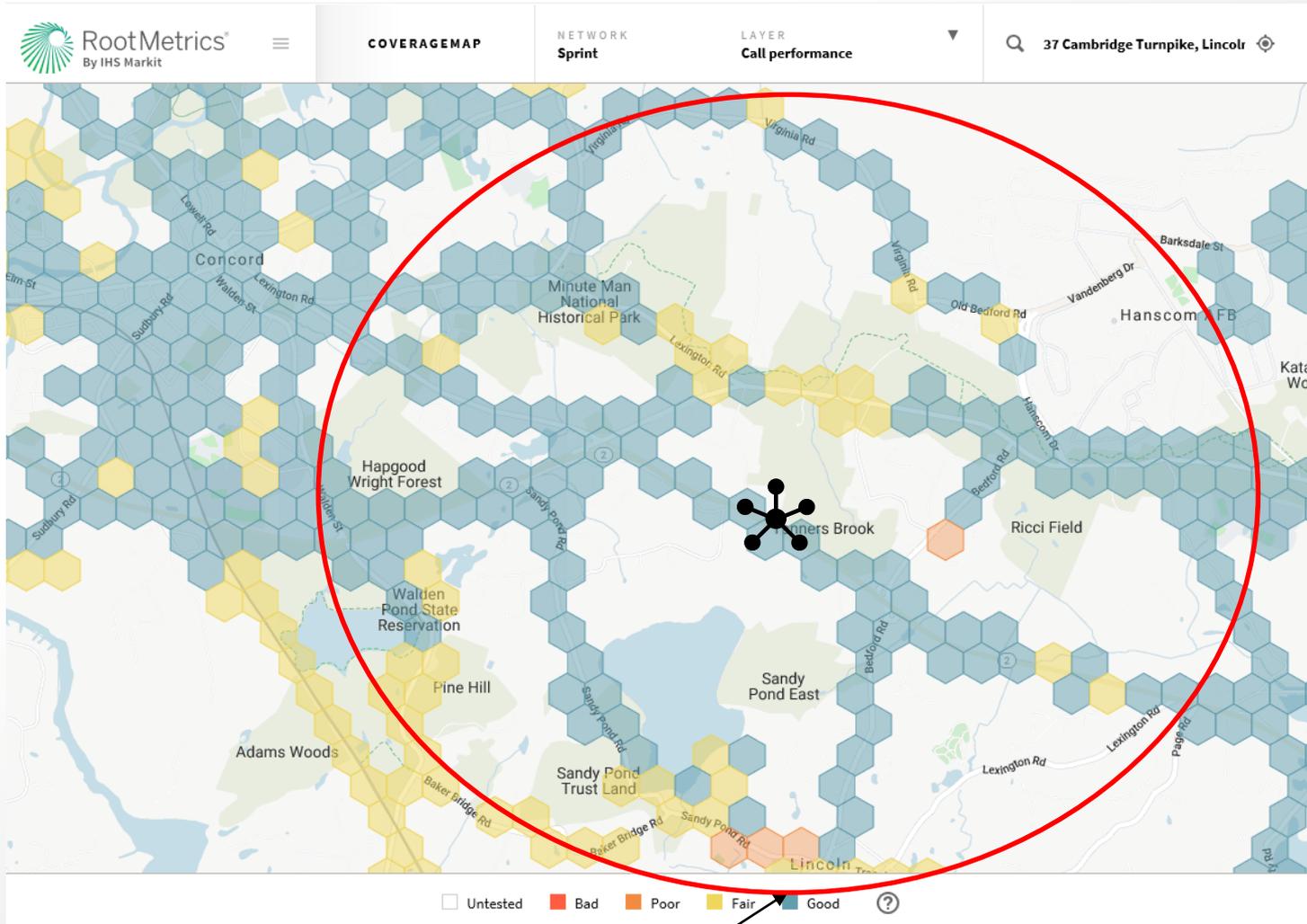
Area where existing site provides coverage and capacity

RootMetrics – AT&T Throughput Map



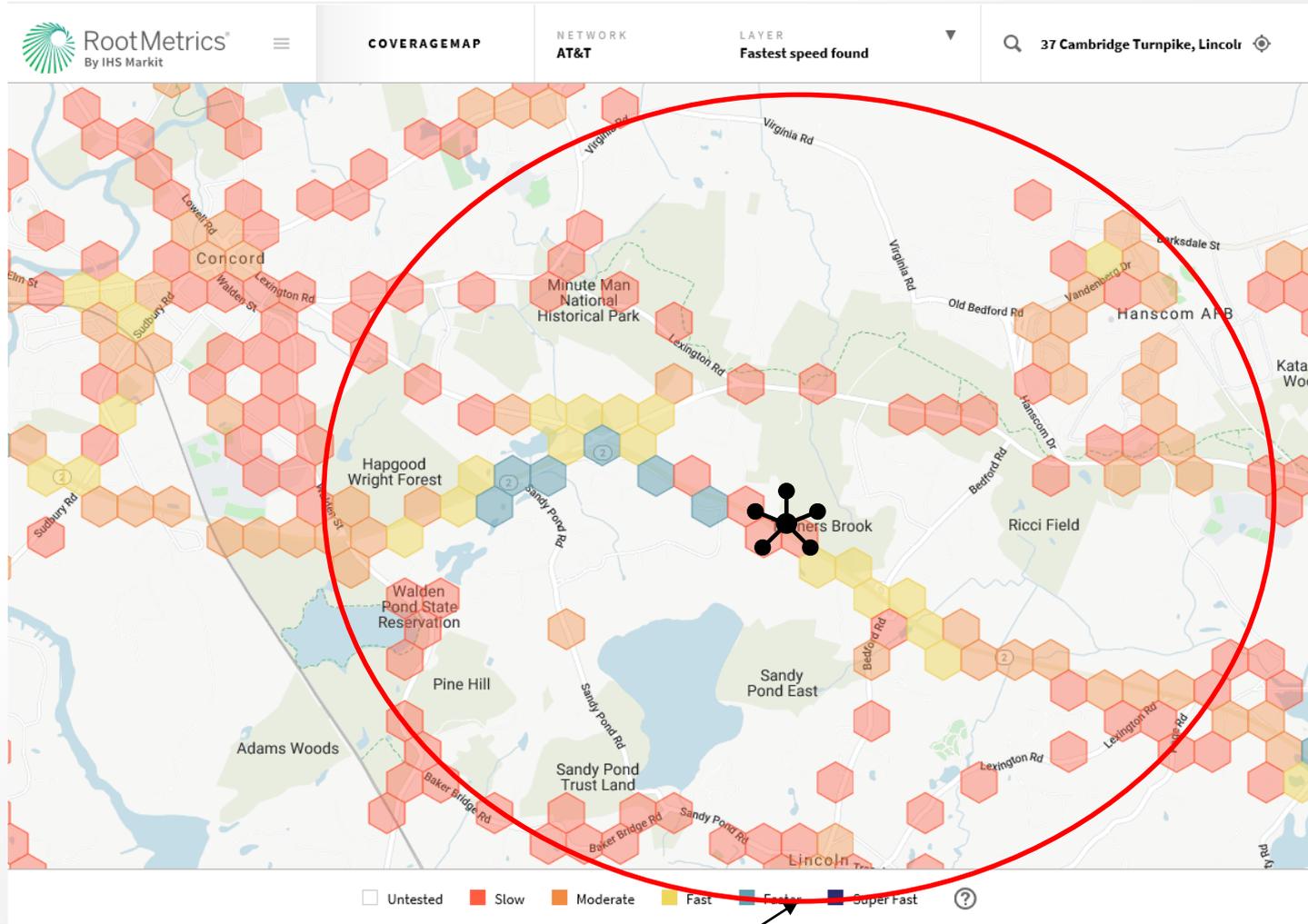
Area where existing site provides coverage and capacity

RootMetrics – Sprint Coverage Map



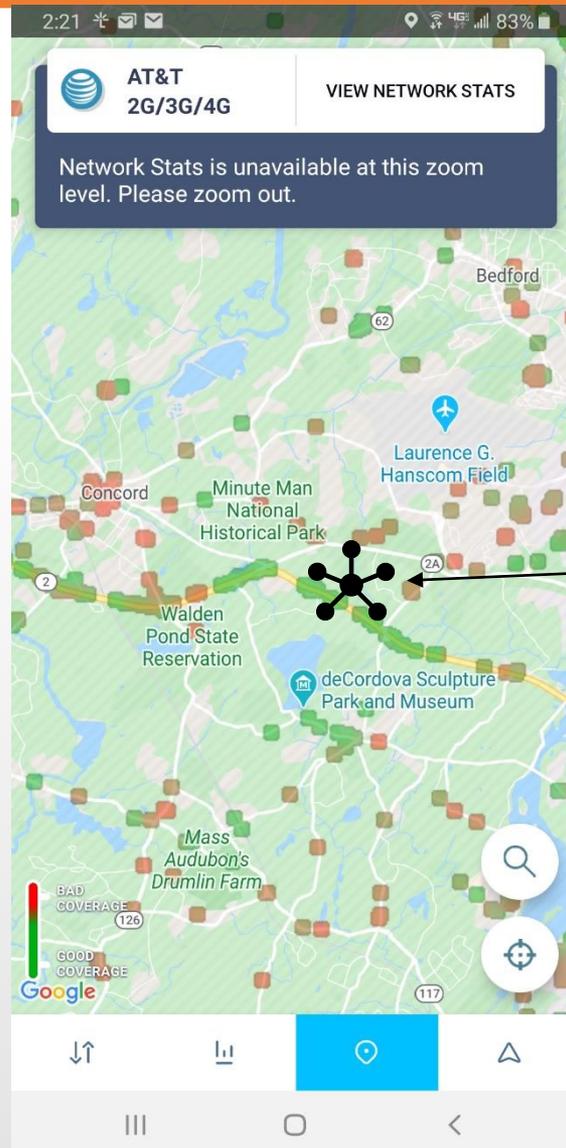
Area where existing site provides coverage and capacity

RootMetrics – Sprint Throughput Map



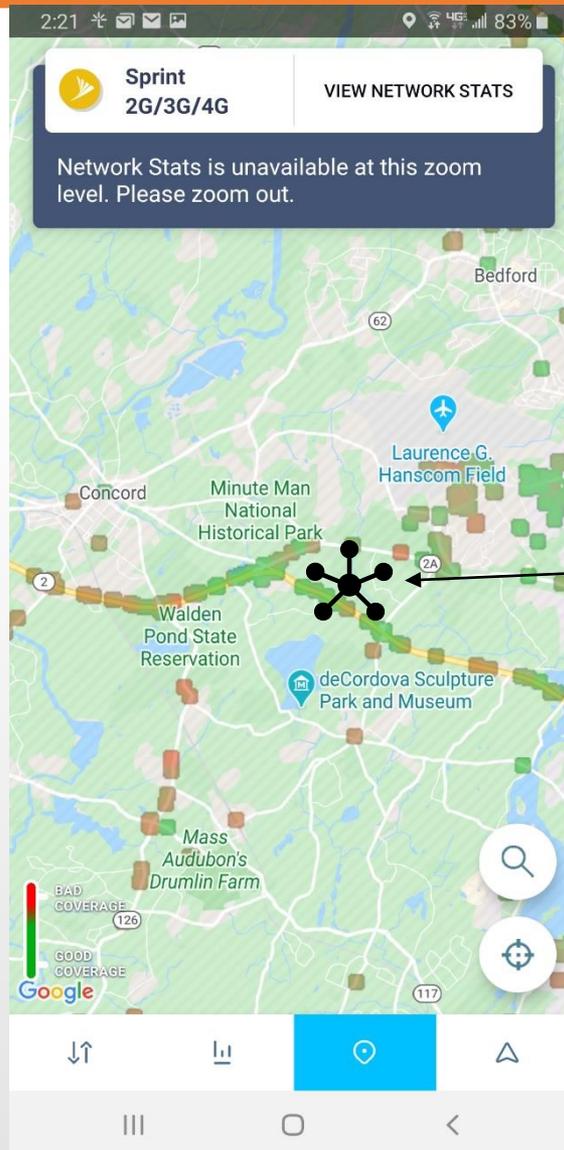
Area where existing site provides coverage and capacity

Open Signal – AT&T Quality Map



Area where existing site provides coverage and capacity

Open Signal – AT&T Quality Map



Area where existing site provides coverage and capacity

Exhibit 6

“RF Safety and NIER Analysis Report”



Biwabkos Consultants, LLC

RF Safety and NIER Analysis Report

February 13, 2020

Site: Lincoln Relo (831301)

LINCOLN, MA

Prepared for:

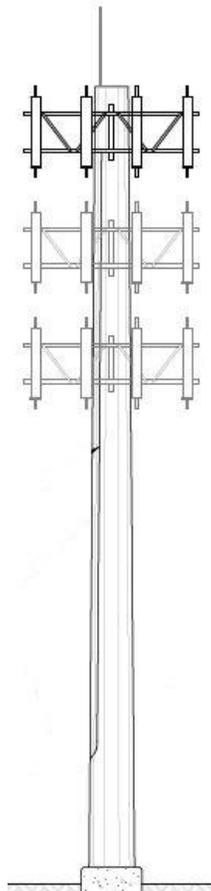


Table of Contents

1	Certification	3
2	Executive Summary	4
2.1	Conclusion and Recommendations:	4
3	Introduction.....	5
3.1	Site Description:.....	5
3.2	Site Configuration Being Modeled:	5
3.3	Assumptions:.....	5
4	Predictive Analysis Details:.....	6
4.1	Analysis Locations:	6
4.2	Antenna Inventory:.....	6
4.3	RF Emissions Diagram(s)- All Transmitters:	8
5	Signage/ Mitigation:.....	9
5.1	Signage/ Barrier Detail.....	9
5.2	Signage/ Barrier Diagram.....	10
6	Conclusions and Recommendations:	10
7	Appendix A: FCC Compliance and RF Safety Policies	11
8	Appendix B: Overview of RoofView® Functions and Assumptions.....	13
9	References.....	14
10	Limited Warranty.....	15

1 Certification

This report, prepared by Biwabkos Consultants LLC for **Crown Castle**, is intended to document compliance and evaluate power density levels as outlined in the report. The computations, analysis, and resulting report and conclusions were based on applicable FCC guidelines and regulations for maximum permissible exposure to humans consistent with FCC OET Bulletin 65, Edition 97-01.

Additionally, Biwabkos Consultants LLC certifies that the assumptions are valid and that the data used within Biwabkos Consultants' control are accurate, including information collected as part of Biwabkos Consultants' field surveys (if applicable). Biwabkos Consultants LLC does not however certify the accuracy or correctness of any data provided to Biwabkos Consultants LLC for this analysis and report by Crown Castle.

I certify that the attached RF exposure analysis and report is correct to the best of my knowledge, and all calculations, assumptions and conclusions are based on generally acceptable engineering practices:



Report Prepared By
David Dodson, RF Engineer
02/13/2020



Report Reviewed By
Steven Kennedy, Engineering Manager
2/13/2020

2 Executive Summary

This report provides the results of an RF power density analysis performed for **Crown Castle** at site **LINCOLN RELO (831301)** in accordance with the Federal Communications Commission (FCC) rules and regulations for RF emissions described in OET Bulletin 65, Edition 97-01.

This report addresses RF safety for two classified groups defined by OET Bulletin 65: Occupational/ Controlled and General Population/ Uncontrolled. Based on the analysis, this site will be **Compliant** with FCC rules and regulations and Crown Castle Signage and Barrier Policy since the mitigation details provided in Table 1 are implemented.

Minimum Required For Compliance							
Mitigation Information							
	Notice	Caution	Warning	Guidelines	Site Info	Barrier	Marker
Access Point							
Alpha							
Beta							
Gamma							
Delta							
Omni							

Notes/ Additional Compliance Requirements(s):
No Mitigation Required

Table 1: Mitigation Requirements for Compliance

2.1 Conclusion and Recommendations:

- The results of the analysis indicate that the power density levels in the generally accessible areas on the Ground level will not exceed the FCC’s MPE limit for both General Population and Occupational environment.
- The max theoretical % MPE (Occupational) is 3.8%.
- No mitigation is required.
- This site will operate in general compliance with FCC OET Bulletin 65 and Crown Castle’s Signage and Barrier policy.

3 Introduction

The purpose of this analysis and report is to evaluate the cumulative power density levels of all non-excluded antennas located on the Monopole and identify any areas of concern that require mitigation. This report also assesses the Monopole's compliance with FCC OET Bulletin 65; "Guidelines for Human Exposure to Radio-frequency Electromagnetic Fields".

The power density simulation performed for this site utilized RoofView® analysis software. All antennas were assigned an operating frequency and transmit power and were deemed to be operating at 100% of their rated output power.

3.1 Site Description:

- **Site Name:** LINCOLN RELO
- **Street Address:** 6 EMERSON ROAD
LINCOLN, MA 01773
- **Latitude:** 42° 26' 52.8" N
- **Longitude:** 71° 18' 45.36" W
- **Structure Type:** Monopole
- **Structure Height:** 60' AGL
- **BTS Equipment Location:** Within the shelters inside the fenced-in compound.
- **Co-Locators/ Other Antennas:** Total of (2) co-locators and (12) antennas
- **Access:** Access is through a locked gate on the east side of the fenced-in compound.
- **Other Notes:** There are no other adjacent structures where the General Population would get within an unsafe distance.

3.2 Site Configuration Being Modeled:

- This site has (2) carriers with (3) sectors each
- There is a total of (12) antennas
- Each sector supports various LTE carriers including, but not limited to 700 MHz, 850 MHz, 1900 MHz, 2100 MHz frequencies.
- All LTE supports MIMO.

3.3 Assumptions:

- The fenced-in compound will remain locked and is not accessible to the General Population.

4 Predictive Analysis Details:

For purposes of this analysis, RoofView® was configured to provide an output based on the appropriate MPE limit(s) published in the FCC's guidelines. The antenna information was loaded into RoofView®, an MPE predictive analysis tool by Richard Tell and Associates, Inc.

4.1 Analysis Locations:

Number of Elevations Analyzed: 1

- The Ground level is accessible to the General Population outside the fenced-in compound and is accessible to the Occupational population within the fenced-in compound.

4.2 Antenna Inventory:

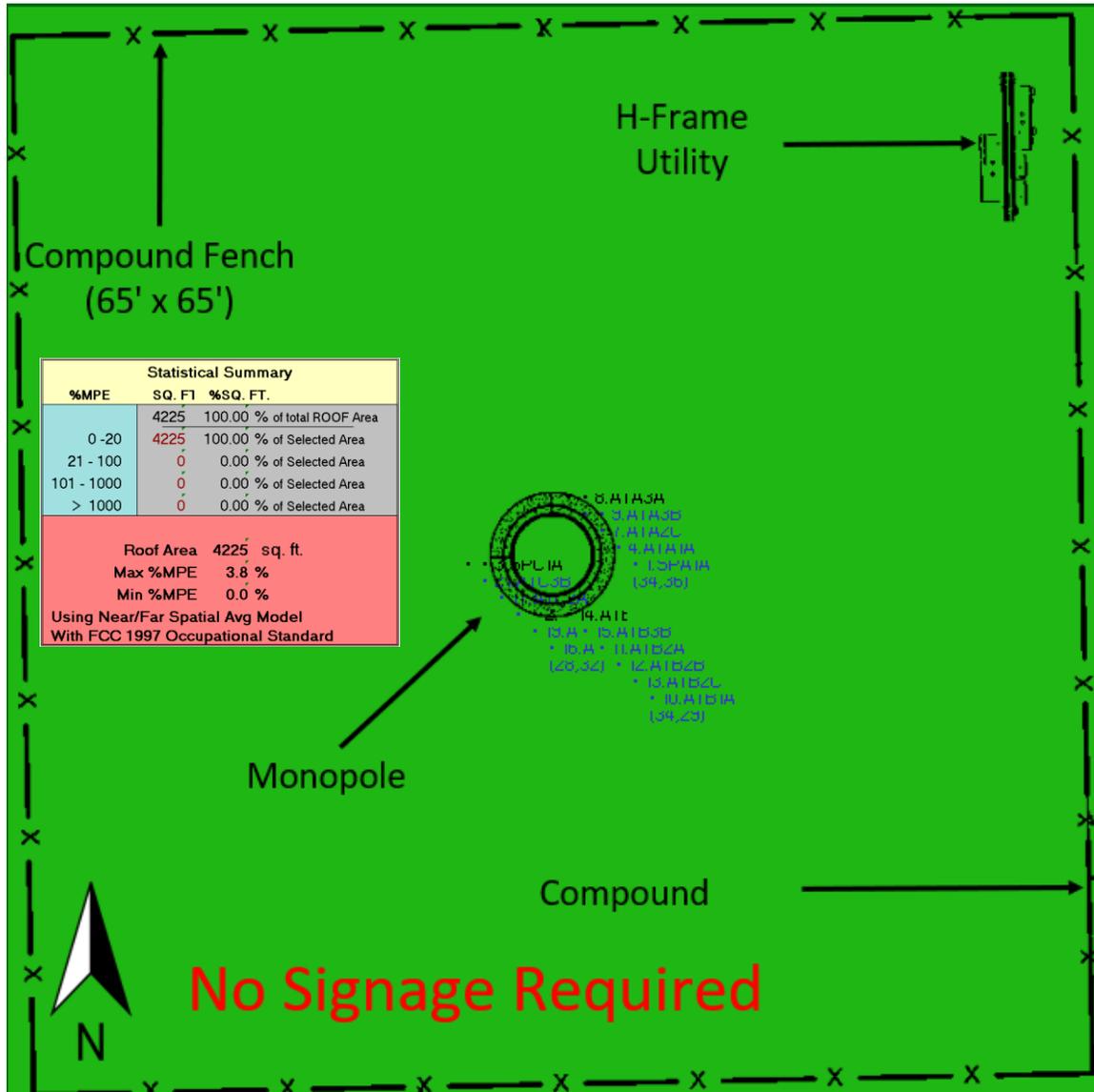
The following table contains the technical data used to simulate the power density that may be encountered with all antennas simultaneously operating at full rated power with the exception of any excluded antennas cited in this document. If Co-Locator antennas exist and specific antenna details could not be secured, generic antennas, frequencies, and Tx powers were used for modeling. The assumptions used are based on past experience with communications carriers.

ID	Name	(MHz) Freq	Trans Power	Trans Count	Other Loss	Calc Power	Mfg	Model	Height (ft) Ground	Type	(ft) Aper	dBd Gain	BWdth Pt Dir
SPA1A	C1900	1950	20	3	0.5	53.5	RFS	APXVSP18-C-A20	57	X-Pole	6.0	15.9	65;25
SPB1A	C1900	1950	20	3	0.5	53.5	RFS	APXVSP18-C-A20	57	X-Pole	6.0	15.9	65;185
SPC1A	C1900	1950	20	3	0.5	53.5	RFS	APXVSP18-C-A20	57	X-Pole	6.0	15.9	65;265
ATA1A	U850	850	60	2	0.5	107.0	Kathrein	800 10121	52.7	Quadport	4.5	11.5	86;30
ATA2A	L700	730	60	2	0.5	107.0	KMW	EPBQ-654L8H8-L2	51.2	12-Port	7.6	14.7	69;150
ATA2B	L2100	2100	60	2	0.5	107.0	KMW	EPBQ-654L8H8-L2	51.2	12-Port	7.6	15.4	59;150
ATA2C	L2300	2300	60	2	0.5	107.0	KMW	EPBQ-654L8H8-L2	51.2	12-Port	7.6	15.4	55;150
ATA3A	L700	730	60	2	0.5	107.0	CCI	OPA-65R-LCUU-H8	51.1	Octoport	7.7	12.6	65;270
ATA3B	L1900	1950	60	2	0.5	107.0	CCI	OPA-65R-LCUU-H8	51.1	Octoport	7.7	14.9	62;270
ATB1A	U850	850	60	2	0.5	107.0	Kathrein	800 10121	52.7	Quadport	4.5	11.5	86;30
ATB2A	L700	730	60	2	0.5	107.0	KMW	EPBQ-654L8H8-L2	51.2	12-Port	7.6	14.7	69;150
ATB2B	L2100	2100	60	2	0.5	107.0	KMW	EPBQ-654L8H8-L2	51.2	12-Port	7.6	15.4	59;150
ATB2C	L2300	2300	60	2	0.5	107.0	KMW	EPBQ-654L8H8-L2	51.2	12-Port	7.6	15.4	55;150
ATB3A	L700	730	60	2	0.5	107.0	CCI	OPA-65R-LCUU-H8	51.1	Octoport	7.7	12.6	65;270
ATB3B	L1900	1950	60	2	0.5	107.0	CCI	OPA-65R-LCUU-H8	51.1	Octoport	7.7	14.9	62;270
ATC1A	U850	850	60	2	0.5	107.0	Kathrein	800 10121	52.7	Quadport	4.5	11.5	86;30
ATC2A	L700	730	60	2	0.5	107.0	KMW	EPBQ-654L8H8-L2	51.2	12-Port	7.6	14.7	69;150
ATC2B	L2100	2100	60	2	0.5	107.0	KMW	EPBQ-654L8H8-L2	51.2	12-Port	7.6	15.4	59;150
ATC2C	L2300	2300	60	2	0.5	107.0	KMW	EPBQ-654L8H8-L2	51.2	12-Port	7.6	15.4	55;150
ATC3A	L700	730	60	2	0.5	107.0	CCI	OPA-65R-LCUU-H8	51.1	Octoport	7.7	12.6	65;270
ATC3B	L1900	1950	60	2	0.5	107.0	CCI	OPA-65R-LCUU-H8	51.1	Octoport	7.7	14.9	62;270

Table 2- Antenna Inventory

4.3 RF Emissions Diagram(s)- All Transmitters:

The following Diagram(s) represent the theoretical spatially averaged Maximum Permissible Exposure (MPE) percentages that are expected for each study's elevation from all Transmitters.



Green	≤ 20% Occupational Limit (≤ 100% General Population Limit)
Blue	> 20% through 100% Occupational Limit (> 100% General Population Limit)
Yellow	> 100% through 1000% Occupational Limit
Red	> 1000% Occupational Limit

Diagram 1- MPE% for Ground Level

5 Signage/ Mitigation:

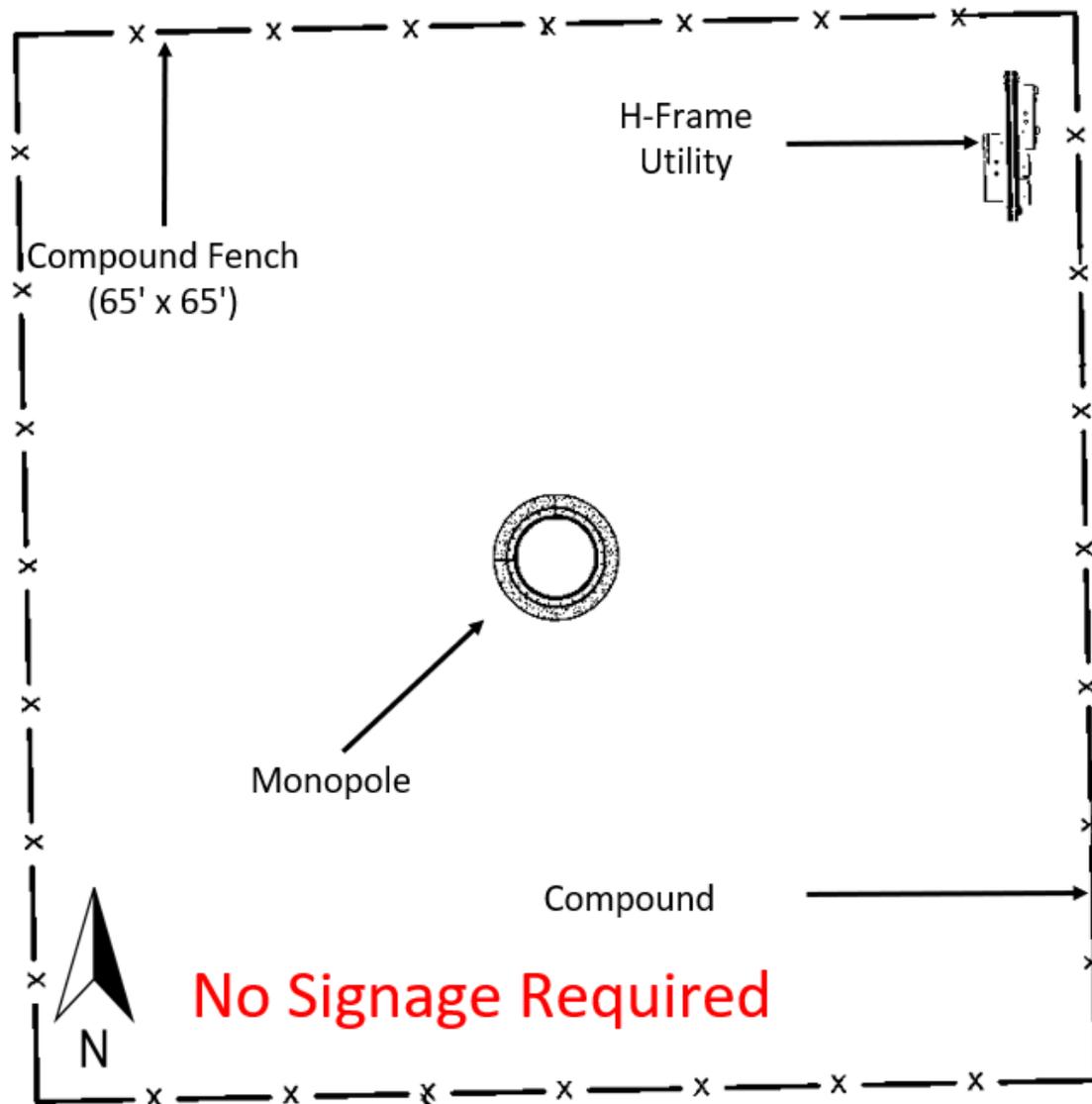
5.1 Signage/ Barrier Detail

Minimum Required For Compliance							
Mitigation Information							
	Notice	Caution	Warning	Guidelines	Site Info	Barrier	Marker
Access Point							
Alpha							
Beta							
Gamma							
Delta							
Omni							

Table 3-Mitigation Requirements for Compliance

Notes/ Additional Mitigation Details from Audit:
No Mitigation Required

5.2 Signage/ Barrier Diagram



6 Conclusions and Recommendations:

- The results of the analysis indicate that the power density levels in the generally accessible areas on the Ground level will not exceed the FCC's MPE limit for both General Population and Occupational environment.
- The max theoretical % MPE (Occupational) is 3.8%.
- No mitigation is required.
- This site will operate in general compliance with FCC OET Bulletin 65 and Crown Castle' Signage and Barrier policy.

Note: Modifications to the site; and/or increases in channel counts or power levels exceeding those listed in this report will require additional evaluation to determine compliance

7 Appendix A: FCC Compliance and RF Safety Policies

In August of 1997, the FCC published OET Bulletin 65 Edition 97-01 to regulate methods for evaluating compliance with FCC guidelines for human exposure to radiofrequency (RF) electromagnetic fields. The FCC guidelines for human exposure to RF electromagnetic fields incorporate two categories of limits; namely “Controlled” (a.k.a. Occupational) and “Uncontrolled” (a.k.a. General Public). The guidelines offer suggested methods for evaluating fixed RF transmitters to insure that the controlled and uncontrolled limits deemed safe by the FC for human exposure are not exceeded.

OET Bulletin 65 recommended guidelines are intended to allow an applicant to “make a reasonably quick determination as to whether a proposed facility is in compliance with the limits.” In addition, the guidelines offer alternate supplementary considerations and procedures such as field measurements and more detailed analysis that should be used for multiple emitter situations.

These guidelines define RF as emissions in the frequency range of 300 kHz to 100 GHz. The FCC define Maximum Permissible Exposure (MPE) limits within this frequency range based on limits recommended by the National Council on Radiation Protection and Measurement, the Institute of Electrical and Electronics Engineers (IEEE), and by the American National Standards Institute (ANSI).

The specific MPE limits defined by the FCC are as follows:

Limits for Occupational/Controlled Exposure				
Frequency Range [MHz]	Electric Field Strength (E) [V/m]	Magnetic Field Strength (H) [A/m]	Power Density (S) [mW/Cm ²]	Averaging Time E ^2, H ^2 or S [minutes]
0.3 - 3.0	614	1.63	100*	6
3.0 - 30	1842/f	4.89/f	900/f ² *	6
30 - 300	61.4	0.163	1	6
300 - 1,500	-	-	f/300	6
1,500 - 100,000	-	-	5	6

Limits for General Population/Uncontrolled Exposure				
Frequency Range [MHz]	Electric Field Strength (E) [V/m]	Magnetic Field Strength (H) [A/m]	Power Density (S) [mW/Cm ²]	Averaging Time E ^2, H ^2 or S [minutes]
0.3 - 3.0	614	1.63	100*	30
3.0 - 30	842/f	2.19/f	180/f ² *	30
30 - 300	27.5	0.073	0.2	30
300 - 1,500	-	-	f/1500	30
1,500 - 100,000	-	-	1	30

f = frequency

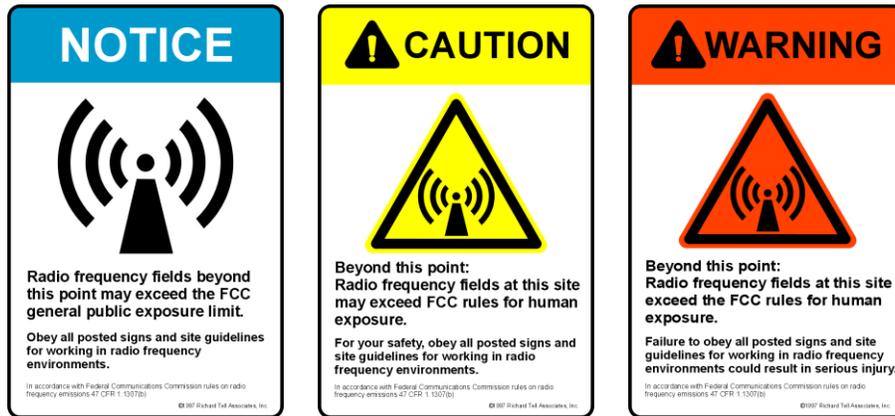
*Plane-wave equivalent power density

The FCC states that “Occupational/ Controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for Occupational/ Controlled exposure also apply in situations when an individual is transient through a location where Occupational/ Controlled limits apply provided he or she is made aware of the potential for exposure.”

For General Population/ Uncontrolled limits, the FCC states that “General Population/ Uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not fully be aware of the potential for exposure or cannot exercise control over their exposure.”

For purposes of this analysis, all limits are evaluated against the Power Density limits.

Typical guidelines for determining whether Occupational/ Controlled limits can be applied include insuring the environment (such as a rooftop) as limited/controlled access via locked doors or physical barrier that are preferably controlled by a landlord that is aware of the situation and can inform anyone going through the locked door of the existence of the RF emissions. Such notification/awareness is typically accomplished by means of signage on the door, or other access to the area of concern, as well as signage on or near the antennas. Examples of such signs include the following:



Standards for when to use each of the above signs for Occupational situations are as follows:

No sign required: <20% of Occupational MPE
Blue Sign, Notice: 20% to <100% of MPE
Yellow Sign, Caution: 100% to <1000% of MPE
Red Sign, Warning: >1000% of MPE

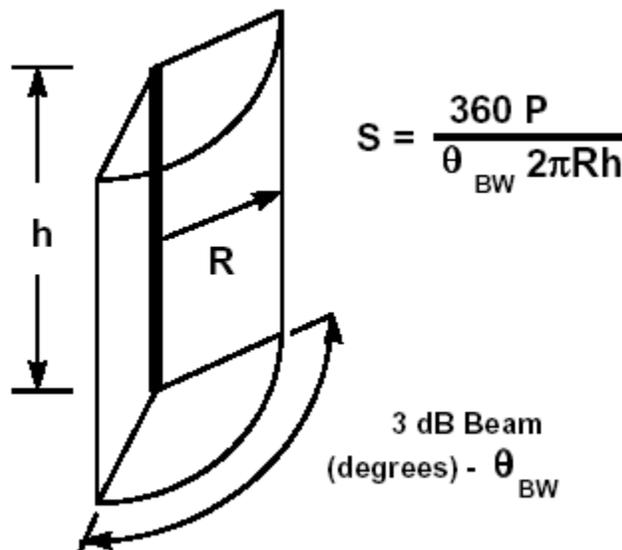
All MPE references are to the FCC Occupational limits.

8 Appendix B: Overview of RoofView® Functions and Assumptions

RoofView® is a tool developed and supported by Richard Tell Associates, Inc. to be used for analysis of RF field levels at telecommunications sites produced by antennas of the type commonly used in cellular, paging, SMR, PCS and two-way radio communications services. Although its name suggests that the tool is only for use in evaluating emissions for roof top applications, it can also be used to evaluate ground level effects of tower facilities.

RoofView® allows the user to apply near field, far field, or a combination of near and far field computational methods as desired by the user. For this analysis, near field computations are used for areas within the near field, and far field computations are used beyond the near field. Specific break points are dynamic based on the aperture of the antenna being analyzed.

The near field methodology is based on a cylindrical model that assumes the power into an antenna is distributed as a cylinder around the aperture of the antenna. Research by Richard Tell Associates, Inc. found that using such a model, along with corrections for height and antenna pattern, is very accurate, if not slightly conservative in estimating RF exposure. FCC Bulletin 65 recognizes the use of the cylindrical model for near field calculations. The following picture and corresponding equation summarizes the computations used by RoofView® on a bin-by-bin basis when the near field method is used:



Each bin's results are then also adjusted by spatially averaging the portion of a 6 foot tall human that intercepts the aperture over 6 feet. Once the antenna is completely above (or below) the height that corresponds to a 6 foot tall human, the cylindrical results are reduced

to 10% of their results and then dissipated inversely in proportion to the square of the distance.

Once bins being analyzed fall outside of the near field (as determined by a method and variable that is user-selectable; see below for method and variable used in this analysis), a far-field spatial average is calculated. Spatially averaged power density in the far-field is calculated by reducing the spatially averaged power density inversely, by the square of the distance from the antenna(s).

There are several input variables to RoofView® that can impact the results produced when evaluating specific cell sites. Those variables are summarized accordingly:

Standard

- FCC 1997 Occupational (default)
- FCC 1997 General Population (as applicable)

Model

- Near/Far Spatial Average

Uptime

- 100% (vary as applicable)

Near/Far Field Transition Method

- X ApHt

Near/Far Field Transition At Ht Factor

- 1.5

9 References

FCC (1997). “Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields”; Federal Communications Commission; Office of Engineering and Technology, OET Bulletin 65, Edition 97-01, August.

Richard Tell Associates, Inc. (2003). RoofView® User Guide Version 4.15, Richard Tell Associates, Inc., February 10, 2003.

10 Limited Warranty

Biwabkos Consultants LLC warrants that this analysis was performed in good faith using the methodologies and assumptions covered in this report and that data used for the analysis and report were obtained by Biwabkos Consultants LLC employees or representatives via site surveys or research of Crown Castle' available information. In the event that specific third party details were not available, best efforts were made to use assumptions that are based on industry experience of various carriers' standards without violating any confidential information obtained under non-disclosure terms.

Biwabkos Consultants LLC also warrants that this analysis was performed in accordance with industry acceptable standards and methods.

There are no other warranties, express or implied, including but not limited to, the implied warranties of merchantability and fitness for a particular purpose, relating to this agreement or to the services rendered by Biwabkos Consultants hereunder. In no event shall Biwabkos Consultants be held liable to Crown Castle, or to any third party, for any indirect, special, incidental, or consequential damages, including but not limited to loss of profits, loss of data, loss of good will, and increased expenses. In no event shall Biwabkos Consultants be liable to Crown Castle for damages, whether based in contract, tort, negligence, strict liability, or otherwise, exceeding the amount payable hereunder for the services giving rise to such liability.

Exhibit 7

“ASAC Site Specific Evaluation”

AIRPORT/HELIPORT INFORMATION

Nearest public use or Government Use (DOD) facility: Laurence G Hanson Field.

This structure will be located 1.6 NM or 10274 FT from the airport on a bearing of 38 degrees true to the airport.

Nearest private use landing facility is: Horizon Hill.

This structure will be located 1.6 NM from the helipad on a bearing of 175 degrees true to the helipad.

STUDY FINDINGS

FAA FAR Part 77 paragraph 9 (FAR 77.9): (Construction or Alteration requiring notice.) (These are the imaginary surfaces that the FAA has implemented to provide general criteria for notification purposes.)

This structure does require notification to the FAA.

FAA FAR Part 77 paragraph 17(FAR 77.17): (Standards for Determining Obstructions.)(These are the imaginary surfaces that the FAA has implemented to protect aircraft safety. If any of these surfaces are penetrated, the structure may pose a Hazard to Air Navigation.)

This structure does exceed these surfaces.

FCC Notice Requirements:
(FCC Rules, Part 17)

This structure does require notification to the FAA or FCC based on these rules.

FAA EMI:
(The FAA protects certain air navigational aids, radio transmitters, and RADAR facilities from possible interference. The distance and direction are dependent on the type of facility being evaluated. Some of these transmission and receiver facilities are listed in the National Flight Data Center (NFDC) database.)

This site would not affect any FAA air navigational aids or transmitters.

Military Airspace:

(This would include low level visual and instrument routes along with operations areas and special use airspace.)

This structure will not affect this airspace.

AM Facilities:

(The FCC protects AM radio stations from possible interference for a distance of 3.0 km for directional facilities, and 1.0 km for non-directional facilities. New changes to the FCC critical distances are calculated based on the AM transmission Movement Method Proof evaluation.)

This site was evaluated against the FCC's AM antenna database using the Movement Method proof calculations and no further action is required.

MARKING AND LIGHTING

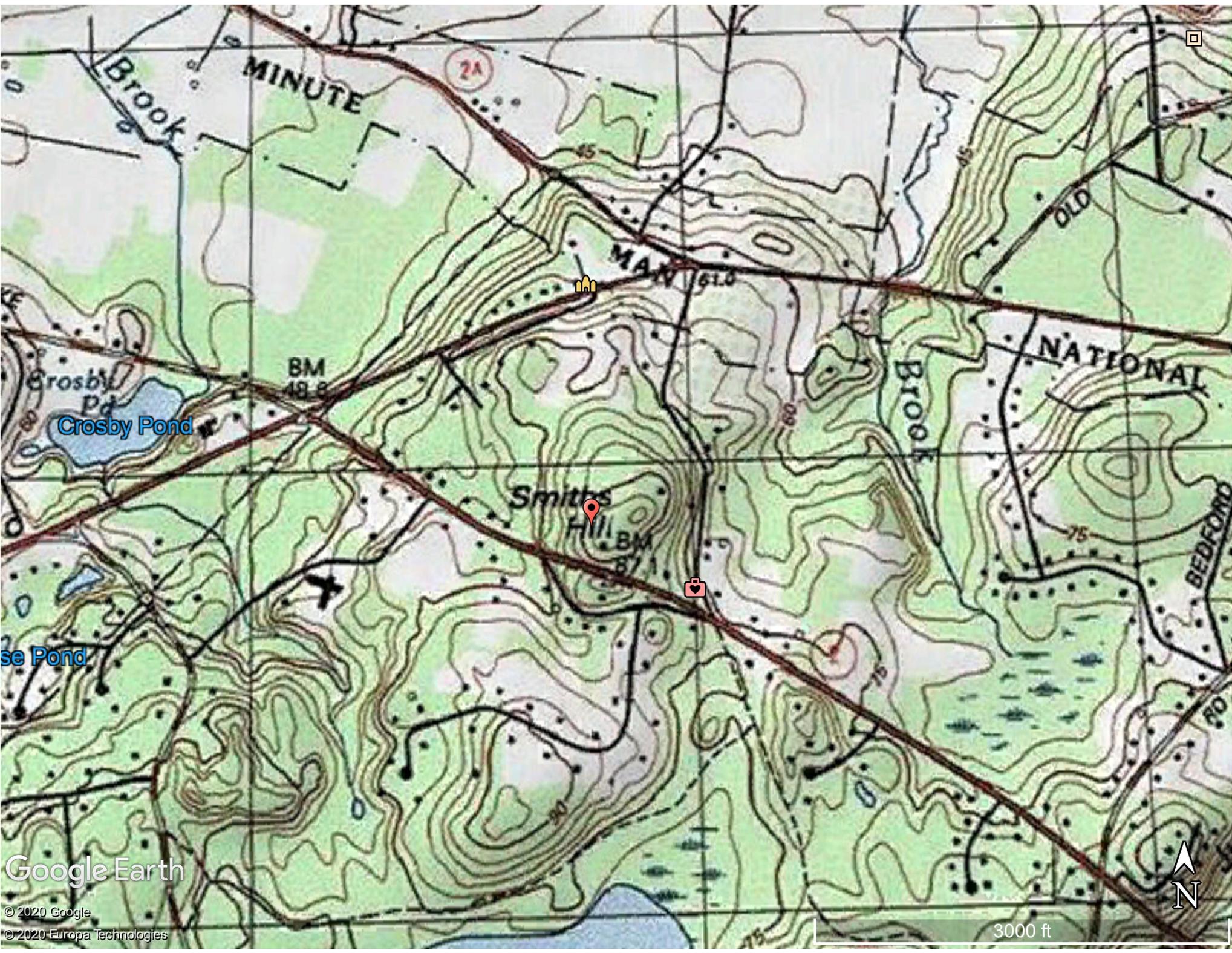
FAA Advisory Circular 70/7460-1:

Marking and lighting is required for this structure.

RECOMMENDATIONS

This site was evaluated in accordance with the requirements specified by the FAA under Federal Aviation Rules part 77, and found not to be a hazard to air navigation.

This site will trigger an extended study and marking and lighting by the FAA. If the tower will not be above the surrounding tree heights, then pass this information to the FAA and request omission from marking and lighting. You may have to submit a surveyed tree, near the site, that is closer and taller for the FAA to consider this request.



Google Earth

© 2020 Google
© 2020 Europa Technologies

Exhibit 8
“Viewshed Analysis”

Viewshed Mapping Package

Proposed Wireless Telecommunications Facility:

831301 Lincoln
6 Emerson Road
Lincoln, MA 01773

- Proposed new 60 ft AGL antenna structure
- Viewshed map completed 2/12/2020

Package prepared by:

Virtual Site Simulations, LLC
28 Caswell Street
Suite 100
Narragansett, Rhode Island 02882

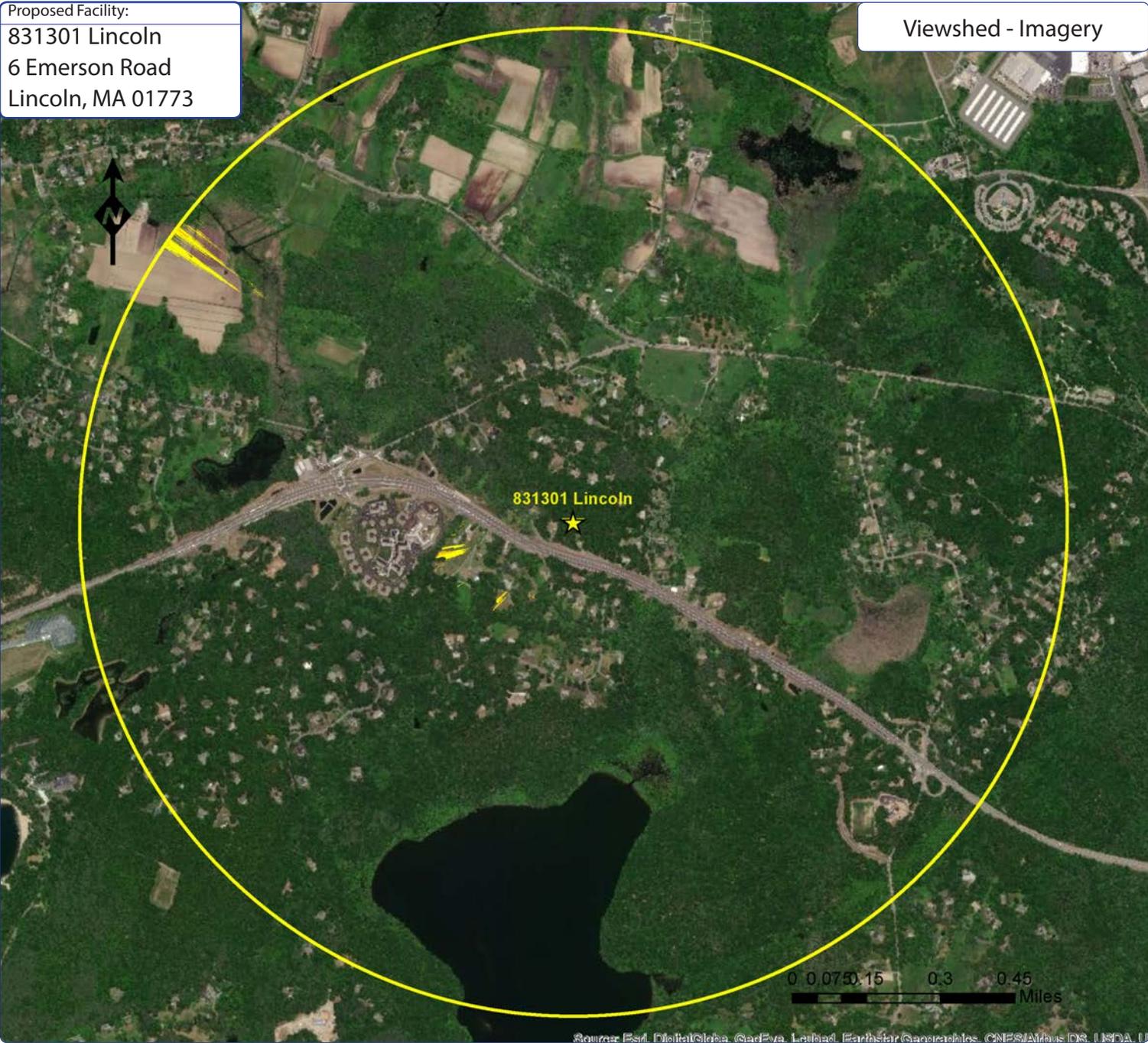
www.VirtualSiteSimulations.com
www.ThinkVSSFirst.com

Viewshed analysis maps and representations contained herein depict where proposed facility may potentially be visible based on the best data available and site conditions at the time data was collected. This study does not claim to depict all locations from where the facility may be potentially visible.

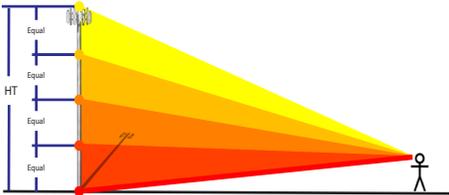


Proposed Facility:
 831301 Lincoln
 6 Emerson Road
 Lincoln, MA 01773

Viewshed - Imagery



IVSview® Color Legend



★ Facility Location ○ 1 Mile Radius

- ⊗ Photo location -Balloon visible
- Year Round Visibility
- ⊗ Photo location -Balloon visible
- Obstructed Visibility
- ⊗ Photo location -Balloon NOT visible

Tower Visibility			
Color	Location	% Vis	Acres
Yellow	Top 25%	0.13%	2.6
Orange	Top 50%	0.01%	0.2
Red-Orange	Top 75%	0.00%	0.0
Red	Top 100%	0.00%	0.0
Red	Base	0.00%	0.0
TOTAL		0.14%	2.9 Acres

Statistics:
 PROJ_DESC=Geographic (Lat/Long) / WGS84 / arc degrees
 PROJ_DATUM=WGS84 PROJ_UNITS=arc degrees
 PIXEL WIDTH=0.0000013 arc degrees (+/- .6 ft)
 PIXEL HEIGHT=0.0000014 arc degrees(+/- .6 ft)
 RADIUS (FT)= 1 Mile
 TRANSMITTER_HEIGHT (Ft-AGL)= 60
 RECEIVER_HEIGHT (Ft-AGL)= 5 Ft
 PERCENT_VISIBLE (%)= 0.14%

Notes:
 - map compiled by VSS, LLC on : 2/12/2020
 - Tower location(lat/long NAD 83): 42.44791 -71.31253
 - Data Sources noted on documentation page attached

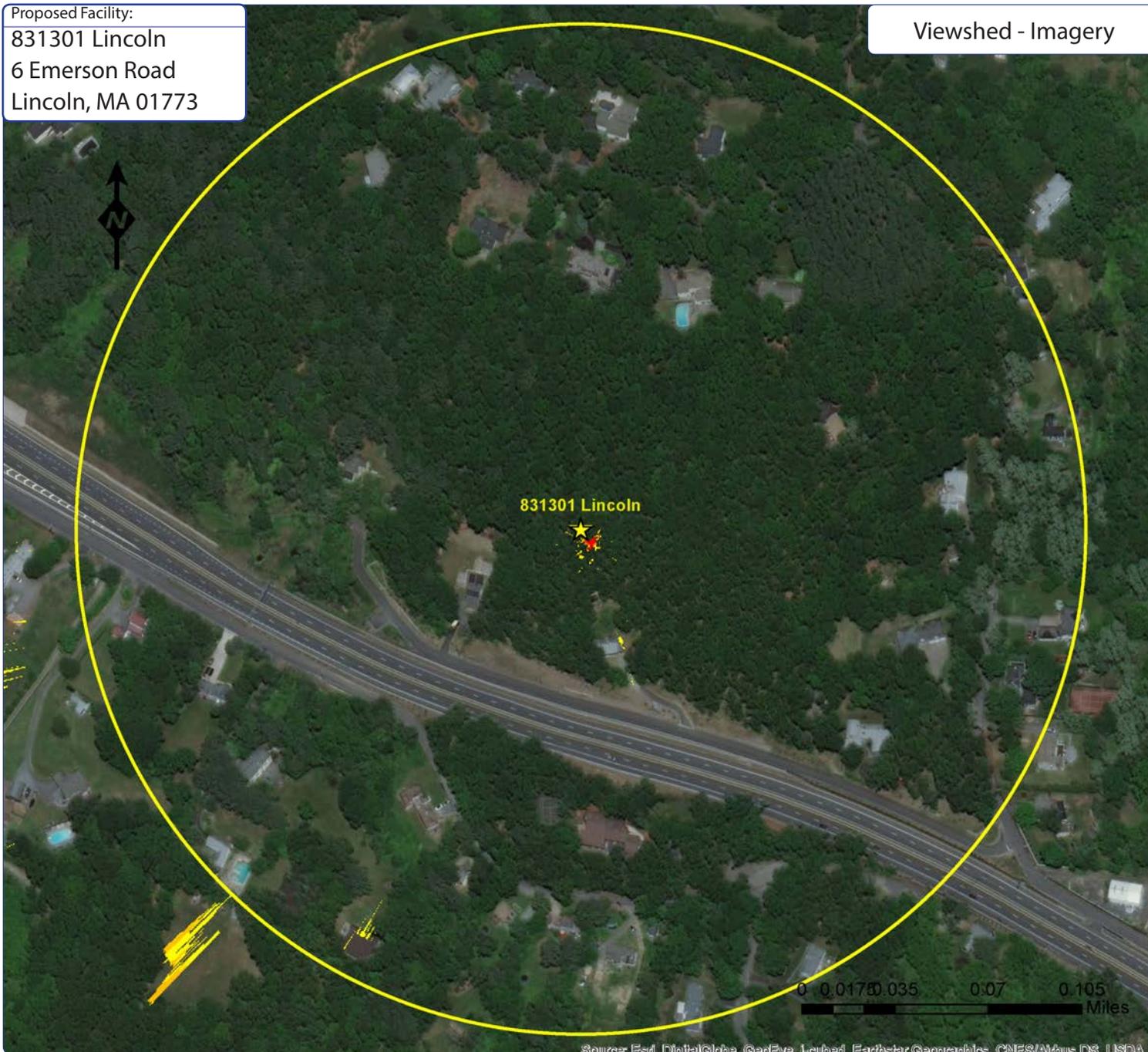


VSS-IVS- Interactive Viewshed Analysis output maps contained herein depict where proposed facility may potentially be visible based on the best and newest data publicly available at the time the data was collected. VSS does not claim to depict all locations from where the facility may potentially be visible and calculated output should be confirmed via site testing as needed.

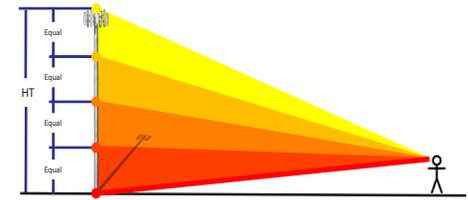


Proposed Facility:
 831301 Lincoln
 6 Emerson Road
 Lincoln, MA 01773

Viewshed - Imagery



IVSview® Color Legend



★ Facility Location ○ 1000 Ft Radius

- ⊗ Photo location -Balloon visible
- Year Round Visibility
- ⊗ Photo location -Balloon visible
- Obstructed Visibility
- ⊗ Photo location -Balloon NOT visible

Tower Visibility			
Color	Location	% Vis	Acres
Yellow	Top 25%	0.13%	2.6
Orange	Top 50%	0.01%	0.2
Red-Orange	Top 75%	0.00%	0.0
Red	Top 100%	0.00%	0.0
	Base	0.00%	0.0
	TOTAL	0.14%	2.9 Acres

Statistics:

PROJ_DESC=Geographic (Lat/Long) / WGS84 / arc degrees
 PROJ_DATUM=WGS84 PROJ_UNITS=arc degrees
 PIXEL WIDTH=0.0000013 arc degrees (+/- .6 ft)
 PIXEL HEIGHT=0.0000014 arc degrees(+/- .6 ft)
 RADIUS (FT)= 1000 Feet
 TRANSMITTER_HEIGHT (Ft-AGL)= 60
 RECEIVER_HEIGHT (Ft-AGL)= 5 Ft
 PERCENT_VISIBLE (%)= 0.14%

Notes:

- map compiled by VSS, LLC on : 2/12/2020
- Tower location(lat/long NAD 83): 42.44791 -71.31253
- Data Sources noted on documentation page attached

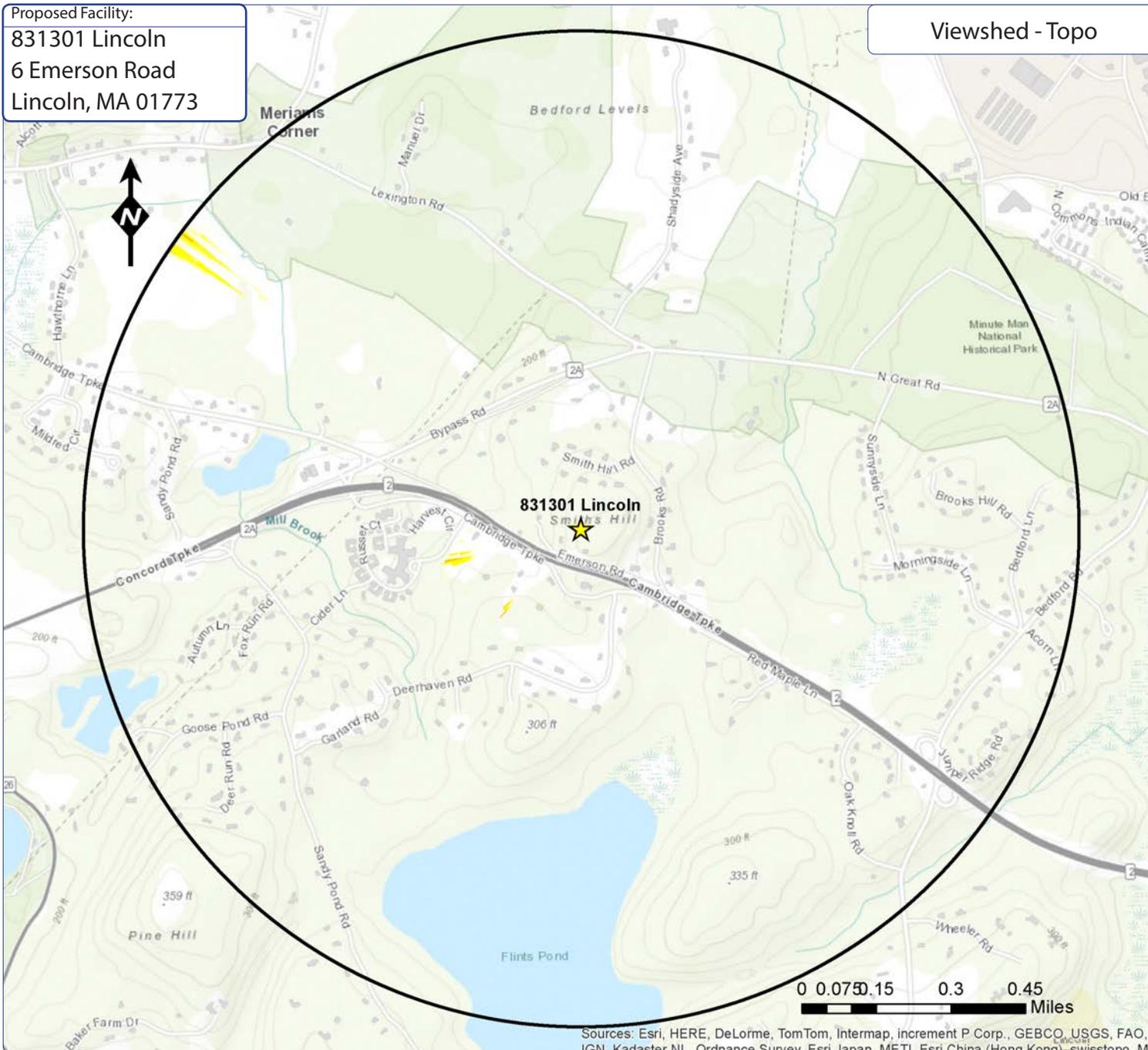


VSS-IVS- Interactive Viewshed Analysis output maps contained herein depict where proposed facility may potentially be visible based on the best and newest data publicly available at the time the data was collected. VSS does not claim to depict all locations from where the facility may potentially be visible and calculated output should be confirmed via site testing as needed.

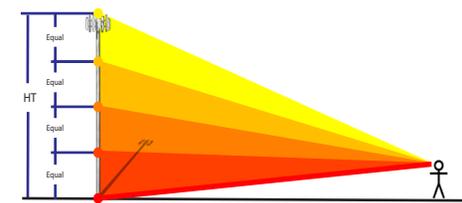


Proposed Facility:
 831301 Lincoln
 6 Emerson Road
 Lincoln, MA 01773

Viewshed - Topo



IVSview® Color Legend



- ★ Facility Location
- 1 Mile Radius
- ⊗ Photo location -Balloon visible
- Year Round Visibility
- ⊗ Photo location -Balloon visible
- Obstructed Visibility
- ⊗ Photo location -Balloon NOT visible

Tower Visibility			
Color	Location	% Vis	Acres
Yellow	Top 25%	0.13%	2.6
Orange	Top 50%	0.01%	0.2
Light Red	Top 75%	0.00%	0.0
Dark Red	Top 100%	0.00%	0.0
Dark Red	Base	0.00%	0.0
TOTAL		0.14%	2.9 Acres

Statistics:
 PROJ_DESC=Geographic (Lat/Long) / WGS84 / arc degrees
 PROJ_DATUM=WGS84 PROJ_UNITS=arc degrees
 PIXEL WIDTH=0.0000013 arc degrees (+/- .6 ft)
 PIXEL HEIGHT=0.0000014 arc degrees(+/- .6 ft)
 RADIUS (FT)= 1 Mile
 TRANSMITTER_HEIGHT (Ft-AGL)= 60
 RECEIVER_HEIGHT (Ft-AGL)= 5 Ft
 PERCENT_VISIBLE (%)= 0.14%

Notes:
 - map compiled by VSS, LLC on : 2/12/2020
 - Tower location(lat/long NAD 83): 42.44791 -71.31253
 - Data Sources noted on documentation page attached

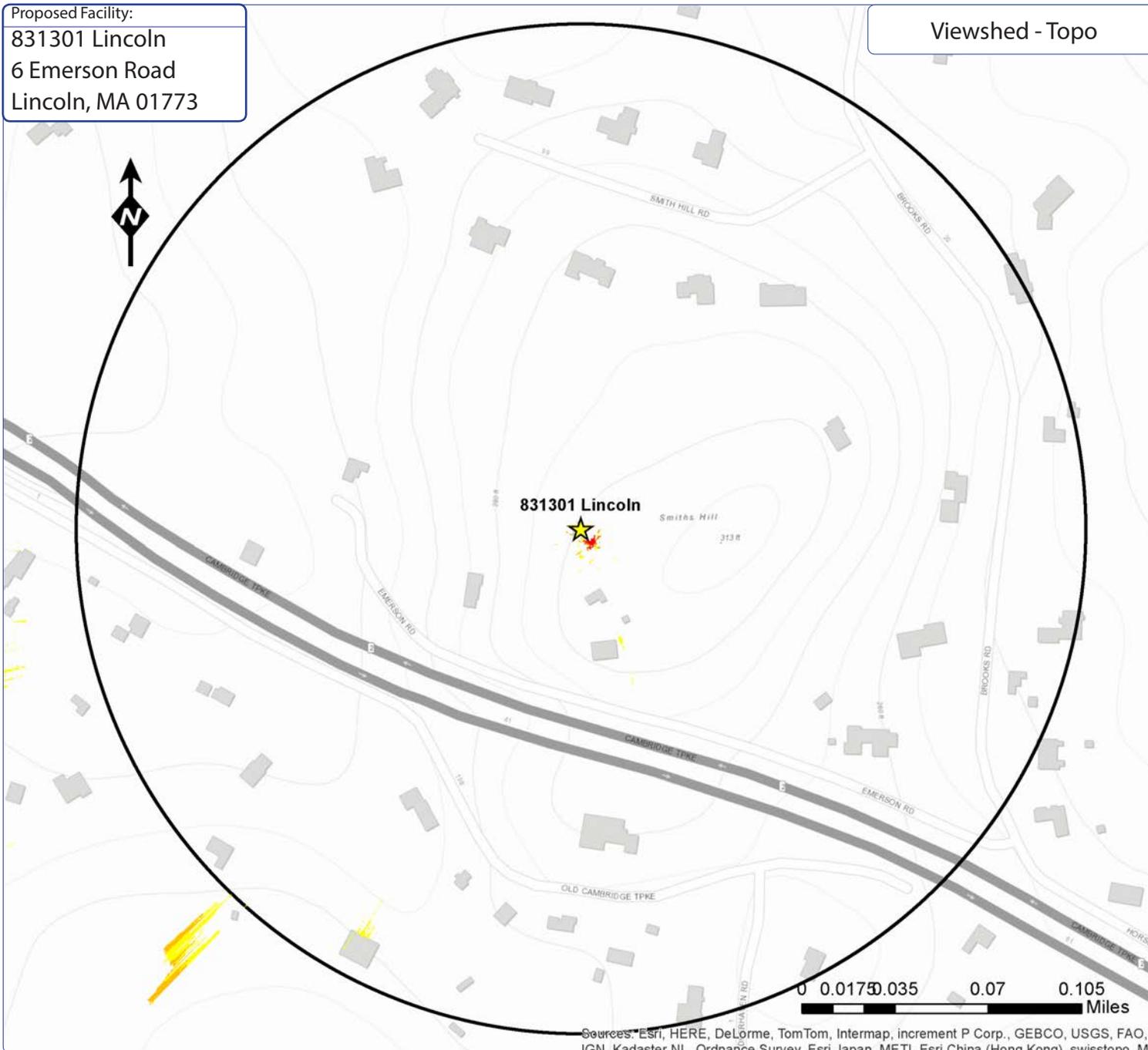


VSS-IVS- Interactive Viewshed Analysis output maps contained herein depict where proposed facility may potentially be visible based on the best and newest data publicly available at the time the data was collected. VSS does not claim to depict all locations from where the facility may potentially be visible and calculated output should be confirmed via site testing as needed.

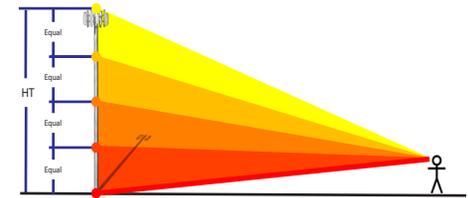


Proposed Facility:
 831301 Lincoln
 6 Emerson Road
 Lincoln, MA 01773

Viewshed - Topo



IVSview® Color Legend



★ Facility Location ○ 1000 Ft Radius

- ⊗ Photo location -Balloon visible
- Year Round Visibility
- ⊗ Photo location -Balloon visible
- Obstructed Visibility
- ⊗ Photo location -Balloon NOT visible

Tower Visibility			
Color	Location	% Vis	Acres
Yellow	Top 25%	0.13%	2.6
Orange	Top 50%	0.01%	0.2
Red-Orange	Top 75%	0.00%	0.0
Red	Top 100%	0.00%	0.0
Red	Base	0.00%	0.0
TOTAL		0.14%	2.9 Acres

Statistics:

PROJ_DESC=Geographic (Lat/Long) / WGS84 / arc degrees
 PROJ_DATUM=WGS84 PROJ_UNITS=arc degrees
 PIXEL_WIDTH=0.0000013 arc degrees (+/- .6 ft)
 PIXEL_HEIGHT=0.0000014 arc degrees (+/- .6 ft)
 RADIUS (FT)= 1000 Feet
 TRANSMITTER_HEIGHT (Ft-AGL)= 60
 RECEIVER_HEIGHT (Ft-AGL)= 5 Ft
 PERCENT_VISIBLE (%)= 0.14%

Notes:

- map compiled by VSS, LLC on : 2/12/2020
- Tower location(lat/long NAD 83): 42.44791 -71.31253
- Data Sources noted on documentation page attached



VSS-IVS- Interactive Viewshed Analysis output maps contained herein depict where proposed facility may potentially be visible based on the best and newest data publicly available at the time the data was collected. VSS does not claim to depict all locations from where the facility may potentially be visible and calculated output should be confirmed via site testing as needed.

