WATERFORD

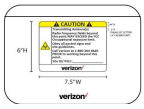
verizon

Radio Frequency Exposure
FCC Compliance Assessment

Pre

SITE-SPECIFIC-INFORMATION			
Site Name	**YOLANDA AVE**	**Multi-Licensee Facility**	**☐ YES ☒ NO**
Street Address	**244 Colgan Avenue**	**Is Verizon a Significant Contributor To Co-Locator Areas Requiring Mitigation?**	**☐ YES ☐ NO ☒ N/A**
City, State, Zip	**Santa Rosa, CA 95404**		
Verizon's Max % MPE (Measured – General Population)	**N/A**	**Verizon's Max % MPE (Predicted – General Population)**	**127.83% at 30ft Adjacent Building**
Structure Type	**Monopine**	**Assessment Date**	**May 24, 2023**
Broadcast (AM/FM/TV) Co-Locators	**No**	**Assessment Purpose**	**New Site Build**
Total Access Points	**N/A**	**Total Report Revisions**	**N/A**
Original Report Date	**N/A**	**Report Revision Date**	**N/A**
Compliance Status	**☐ COMPLIANT AS DESIGNED, no additional mitigation required** **☒ MITIGATION IS REQUIRED (Barriers, Signs, RF Safety Plan, etc, see below)**		

VERIZON'S WORST-CASE RF EMISSIONS IN ACCESSIBLE AREAS AT THIS FACILITY	
☐	BELOW the General Population MPE limit
☒	ABOVE the General Population MPE limit and BELOW the Occupational MPE limit
☐	ABOVE the Occupational MPE limit and BELOW 10x the Occupational MPE limit
☐	ABOVE 10x the Occupational MPE limit

Final Compliant Configuration							
	GUIDELINES	**NOTICE**	**CAUTION**	**WARNING**	**NOC INFO**	**BARRIER/MARKER**	
Access Point(s)	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐	N/A
Alpha	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐	N/A
Beta	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐	N/A
Gamma	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐	N/A
Delta	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐	N/A

NOTE: The table above represents EVERY compliance item that MUST be implemented at this location; Also in Sec. 4 (B)

☐ **RF Safety Plan required**

☒ **Engineering Controls required**

Description of all Compliance Requirements(s): See recommended mitigation in Section 4			
Items to be Installed	Access: No action required, other than restricting access to the tower Alpha: No action required Beta: No action required Gamma: No action required Delta: No action required		
Items to be Removed	N/A		
Items to be Repaired/Replaced	N/A		
Consultant Legal Name	Waterford Consultants, LLC	**Phone/Fax**	(703) 596-1022
Email Contact	support@waterfordconsultants.com		
Address	7430 New Technology Way Suite 150, Frederick, Maryland 21703		

SPECIAL OPERATING MITIGATION INSTRUCTIONS	
Alpha	3 dB power reduction below maximum for C-Band antenna to avoid impact at 30ft adjacent building
Beta	N/A
Gamma	3 dB power reduction below maximum for C-Band antenna to avoid impact at 30ft adjacent building
Delta	N/A

Contents

1. Introduction

Verizon Wireless has contracted with Waterford Consultants, LLC, an independent Radio Frequency consulting firm, to conduct a **Radio Frequency Exposure (RFE) FCC Compliance Assessment** of the **YOLANDA AVE** cell site. The following report contains a detailed summary of the Radio Frequency environment as it relates to Federal Communications Commission (FCC) and Occupational Safety & Health Administration (OSHA) Rules and Regulations for all individuals.

The **Verizon Wireless antenna data** was provided by:

Name	Peter Hilliard
Title	Project Manager
Date	May 9, 2023
Sub-Market	NorCal

This compliance assessment and report has been **prepared** and **reviewed** by:

	Preparer	**Reviewer**
Name	Jassmine Aldrich	David H. Kiser
Title	RF Technical Analyst	RF Engineer
Date	May 24, 2023	May 25, 2023

This report utilizes the following **for predictive modeling of the ambient RF environment**:
MPE Modeling Program: RoofMaster™ (See Section 7)
Required Modeling Assumptions: 100% Duty Cycle and Maximum Total Power Output.

Additional Modeling Assumptions:

Antenna radiation pattern files that characterize directivity and energy suppression values have been utilized to model each RF emitter at this location. If a manufacturer's antenna pattern is not available or the actual antenna model is unknown, Waterford Consultants, LLC has utilized a generic antenna pattern from a library of panel, omnidirectional, microwave and broadcast patterns that are representative of the actual antenna. Similarly, the effective radiated power values for each antenna, if not provided, has been assumed based on antenna type, carrier and region. Refer to the antenna inventory table for a listing of the emitter properties utilized in this report.

Documents utilized in this analysis:

Verizon-YolandaAve-5000169536-NSB-ZD100-05-01-23.pdf

RFDS_YOLANDAAVE_8079985_2842023115234.pdf

2. Existing Site Characteristics

a. Structure

Physical Description	The Verizon Wireless antennas are mounted to a 64ft monopine.
Single-Family Home	No
Latitude (NAD 83)	38.420864
Longitude (NAD 83)	-122.711361
Total Analyzed Elevations (Roof Levels)	5

b. Existing Verizon Observations - based on Site Visit or Information Received

Existing Observations							
	GUIDELINES	**NOTICE**	**CAUTION**	**WARNING**	**NOC INFO**	**BARRIER/MARKER**	
Access Point(s)	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐	N/A
Alpha	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐	N/A
Beta	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐	N/A
Gamma	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐	N/A
Delta	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐	N/A

NOTE: The table above represents EXISTING compliance items implemented at this location.

c. Antenna Inventory

Z-height represents the distance from the nearest walking surface to the _____ of the antenna.	☐ **Bottom** ☒ **Centerline** ☐ **Top**
NON-Verizon Co-locator Data	☐ **Estimates** ☐ **Actual Data** ☒ **N/A**

Roof Master™ Antenna Inventory with Client Provided Parameters

Ant #	Operator	Antenna Make	Antenna Model	Type	Frequency (MHz)	Az (Deg)	Downtilt (Deg)	Horizontal Beam Width (Deg)	Ant (ft)	TPO (W)	# of Ch	Loss (dB)	Ant Gain (dBd)	Total ERP (W)	Total EIRP (W)	Antenna Centerline Ground Level (0 ft)
1	Verizon	QUINTEL	QS6456-5 V3 02DT	Panel	700	0	0	49	6	60	2	0	13.05	2422	3974	65
1	Verizon	QUINTEL	QS6456-5 V3 02DT	Panel	850	0	0	46	6	60	2	0	13.05	2422	3974	65
1	Verizon	QUINTEL	QS6456-5 V3 00DT	Panel	1900	0	0	44	6	60	4	0	16.35	10356	16991	65
2	Verizon	QUINTEL	QS6456-5 V3 02DT	Panel	700	0	0	49	6	60	2	0	13.05	2422	3974	65
2	Verizon	QUINTEL	QS6456-5 V3 02DT	Panel	850	0	0	46	6	60	2	0	13.05	2422	3974	65
2	Verizon	QUINTEL	QS6456-5 V3 00DT	Panel	2100	0	0	43	6	30	4	0	16.35	5178	8495	65
2	Verizon	QUINTEL	QS6456-5 V3 00DT	Panel	2100	0	0	43	6	30	4	0	16.35	5178	8495	65
3	Verizon	ERICSSON	SON_AIR6449 NR TB 03.24.21 3700 VZW	Panel	3700	0	0	11	2.8	320	1	0	23.55	72469	118891	65
4	Verizon	QUINTEL	QS6456-5 V3 02DT	Panel	700	90	0	49	6	60	2	0	13.05	2422	3974	65
4	Verizon	QUINTEL	QS6456-5 V3 02DT	Panel	850	90	0	46	6	60	2	0	13.05	2422	3974	65
4	Verizon	QUINTEL	QS6456-5 V3 00DT	Panel	1900	90	0	44	6	60	4	0	16.35	10356	16991	65
5	Verizon	QUINTEL	QS6456-5 V3 02DT	Panel	700	90	0	49	6	60	2	0	13.05	2422	3974	65
5	Verizon	QUINTEL	QS6456-5 V3 02DT	Panel	850	90	0	46	6	60	2	0	13.05	2422	3974	65
5	Verizon	QUINTEL	QS6456-5 V3 00DT	Panel	2100	90	0	43	6	30	4	0	16.35	5178	8495	65
5	Verizon	QUINTEL	QS6456-5 V3 00DT	Panel	2100	90	0	43	6	30	4	0	16.35	5178	8495	65
6	Verizon	ERICSSON	SON_AIR6449 NR TB 03.24.21 3700 VZW	Panel	3700	90	0	11	2.8	320	1	0	23.55	72469	118891	65
7	Verizon	QUINTEL	QS6456-5 V3 02DT	Panel	700	180	0	49	6	60	2	0	13.05	2422	3974	65
7	Verizon	QUINTEL	QS6456-5 V3 02DT	Panel	850	180	0	46	6	60	2	0	13.05	2422	3974	65
7	Verizon	QUINTEL	QS6456-5 V3 00DT	Panel	1900	180	0	44	6	60	4	0	16.35	10356	16991	65
8	Verizon	QUINTEL	QS6456-5 V3 02DT	Panel	700	180	0	49	6	60	2	0	13.05	2422	3974	65
8	Verizon	QUINTEL	QS6456-5 V3 02DT	Panel	850	180	0	46	6	60	2	0	13.05	2422	3974	65
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11	Verizon	QUINTEL	QS6456-5 V3 00DT	Panel	2100	270	0	43	6	30	4	0	16.35	5178	8495	65
11	Verizon	QUINTEL	QS6456-5 V3 00DT	Panel	2100	270	0	43	6	30	4	0	16.35	5178	8495	65
12	Verizon	ERICSSON	SON_AIR6449 NR TB 03.24.21 3700 VZW	Panel	3700	270	0	11	2.8	320	1	0	23.55	72469	118891	65
13	Verizon	ANDREW	VHLP4-11	Microwave	11000	0	0	1.5	4	0.2	1	0	38.7	1483	2432	52.9

Note 1: Operating parameters depicted in above table have been provided by client.

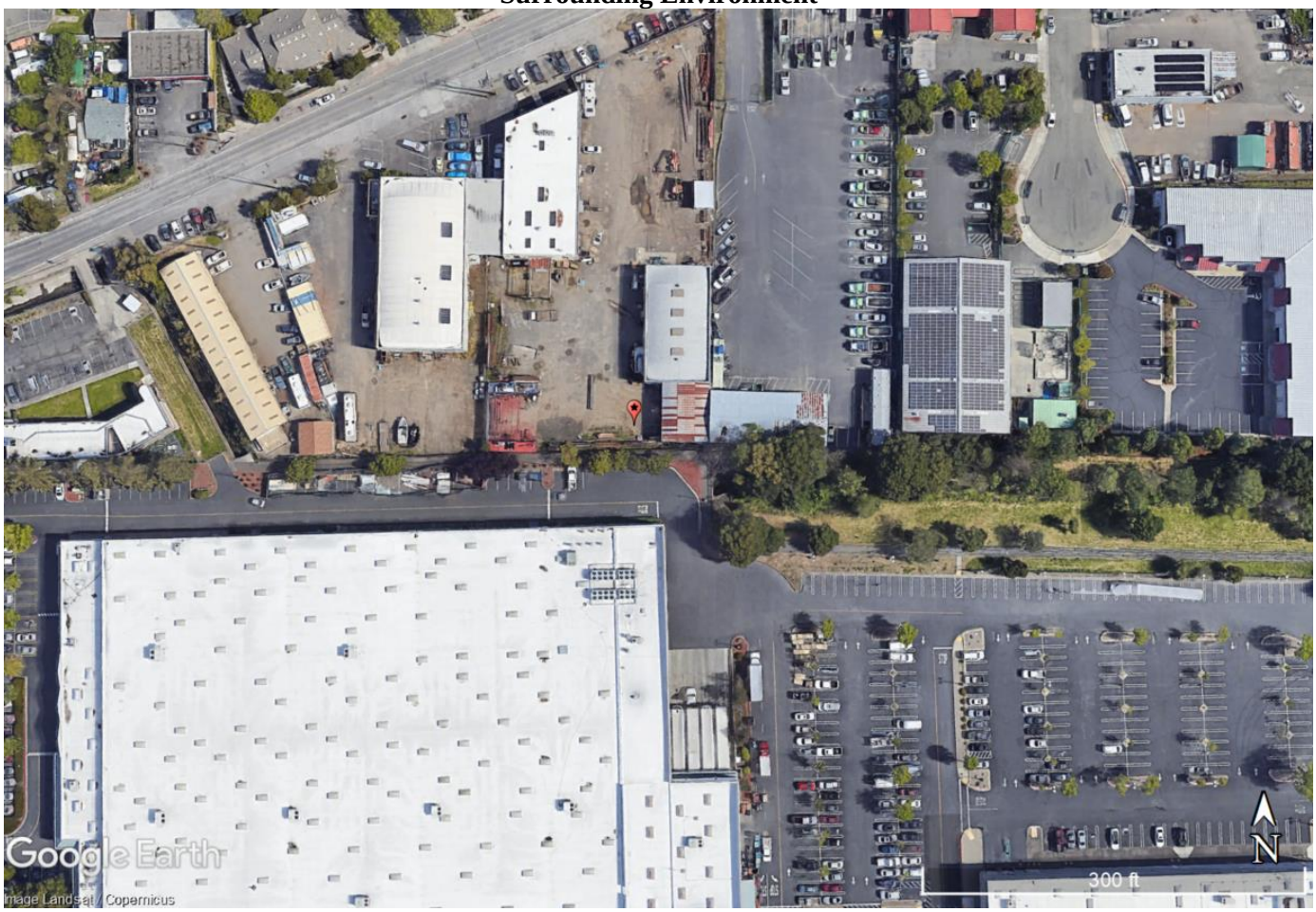
Note 2: Some antennas identified by the SON designation may employ beamsteering technology where RF energy allocated to each customer device is dynamically directed toward their location. In the analysis presented herein, predicted exposure levels are based on all beams at full utilization (i.e. full power) simultaneously focused in any direction. As this condition is unlikely to occur, the actual power density levels at ground and at adjacent structures will be less than the levels reported below.

Note 3: No other transmitting antennas are known to be operating in the vicinity of this site.

3. Analysis

Could field measurements be taken in areas with Verizon antennas?	**☐ YES ☐ NO ☒ N/A**
Describe why measurements could not be taken - if applicable.	**N/A**
Adjacent Structure(s)	**☐ Touching ☒ Potential Concern ☐ No Concern**
If the structure is a Single-Family Residential Home, were measurements taken inside the residence?	**☐ YES ☐ NO ☒ N/A**
Field Measurement Equipment	**☐ Broadband ☐ Narrowband ☒ N/A**
Field Measurement Start Time	**☒ N/A**
Field Measurement End Time	**☒ N/A**
Location Broadband Equipment Zeroed	**☒ N/A**

Surrounding Environment



a. Predictive Modeling

Predictive Modeling shall include models of the following:

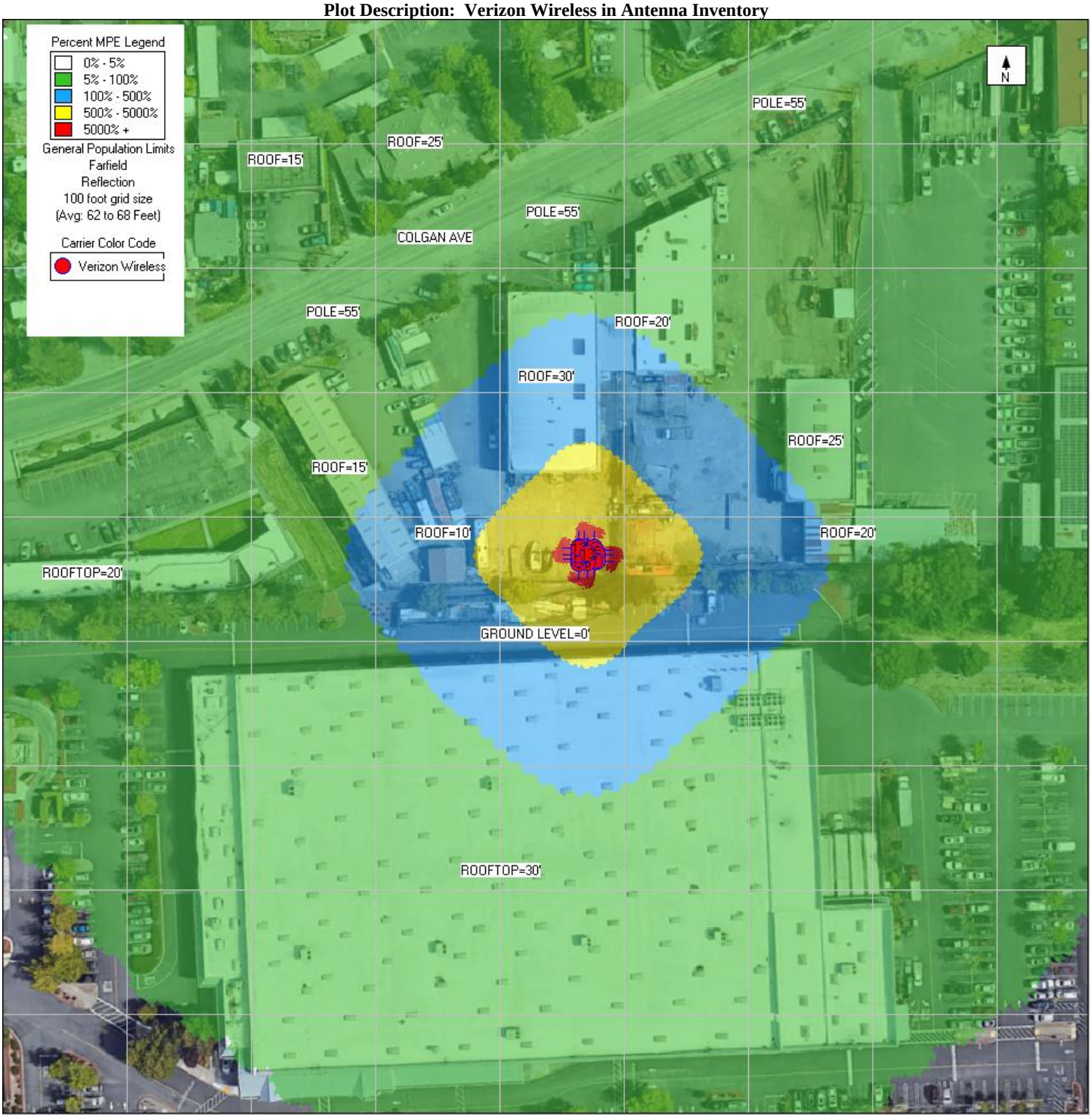
- All known transmitters model
- Verizon transmitters only model

All plots will need to show the extent of the exposure with appropriate scaling to make engineering decisions. Multiple plots at different scales may be required to reflect the total exposure and to make engineering decisions. All areas accessed by the general public in which the MPE is above the FCC General Population limits will need to be mitigated.

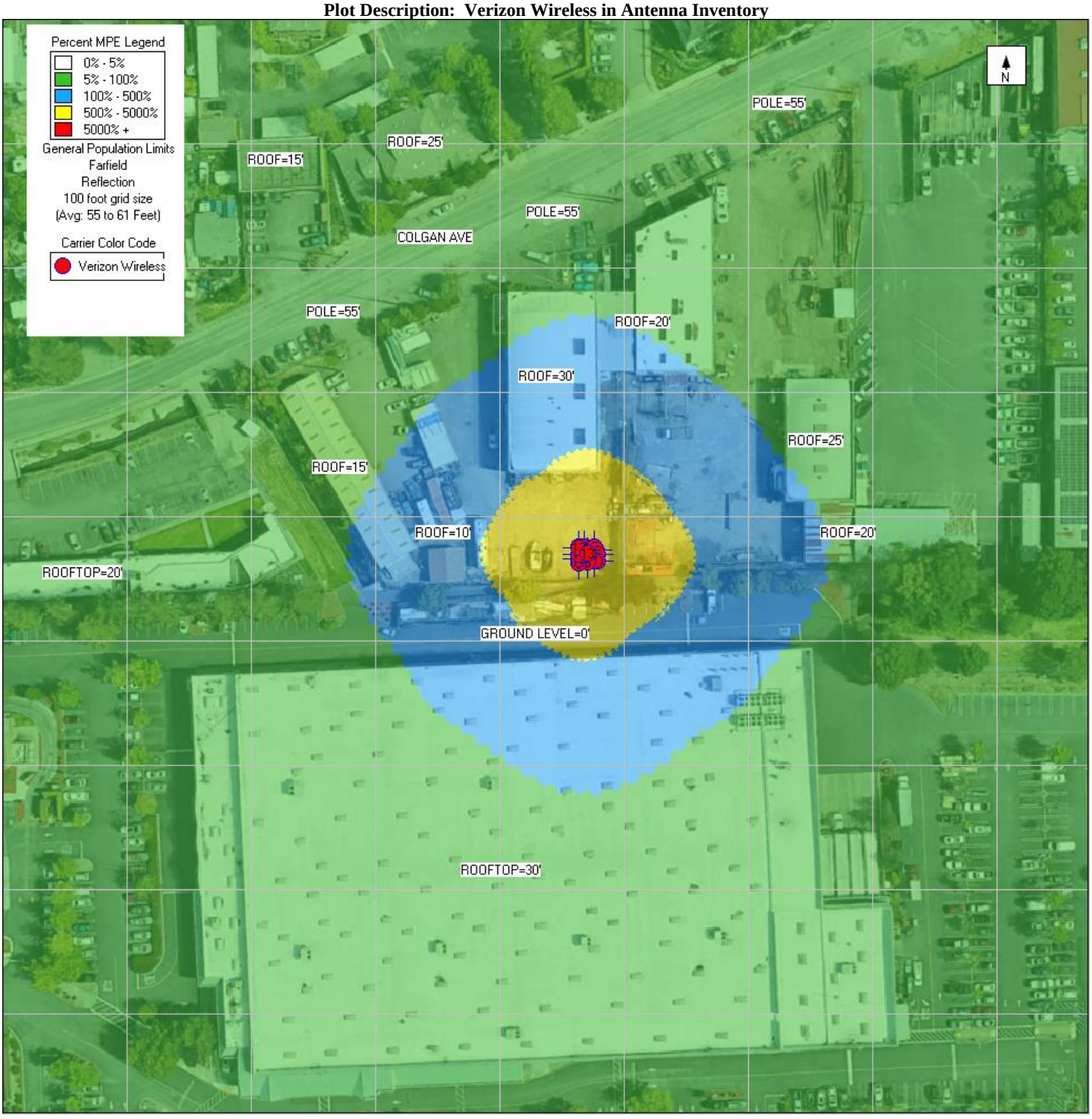
b. Predictive Model: Verizon Transmitters

Is the area being modeled completely INACCESSIBLE to members of the general population (including untrained maintenance workers)?	**☐ YES ☒ NO**

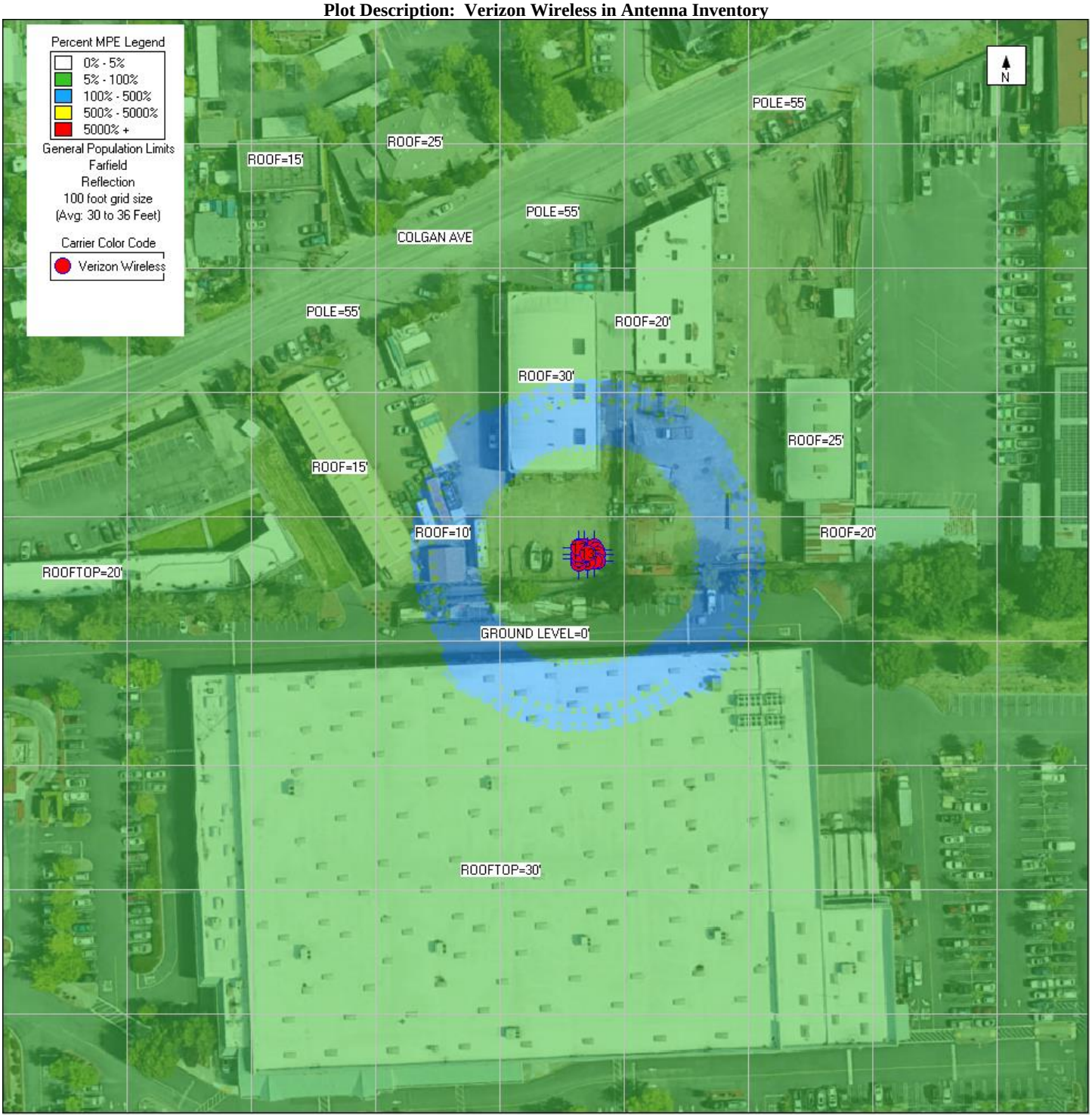
Reference Plane: 62 ft (Antenna Level)
Plot Description: Verizon Wireless in Antenna Inventory



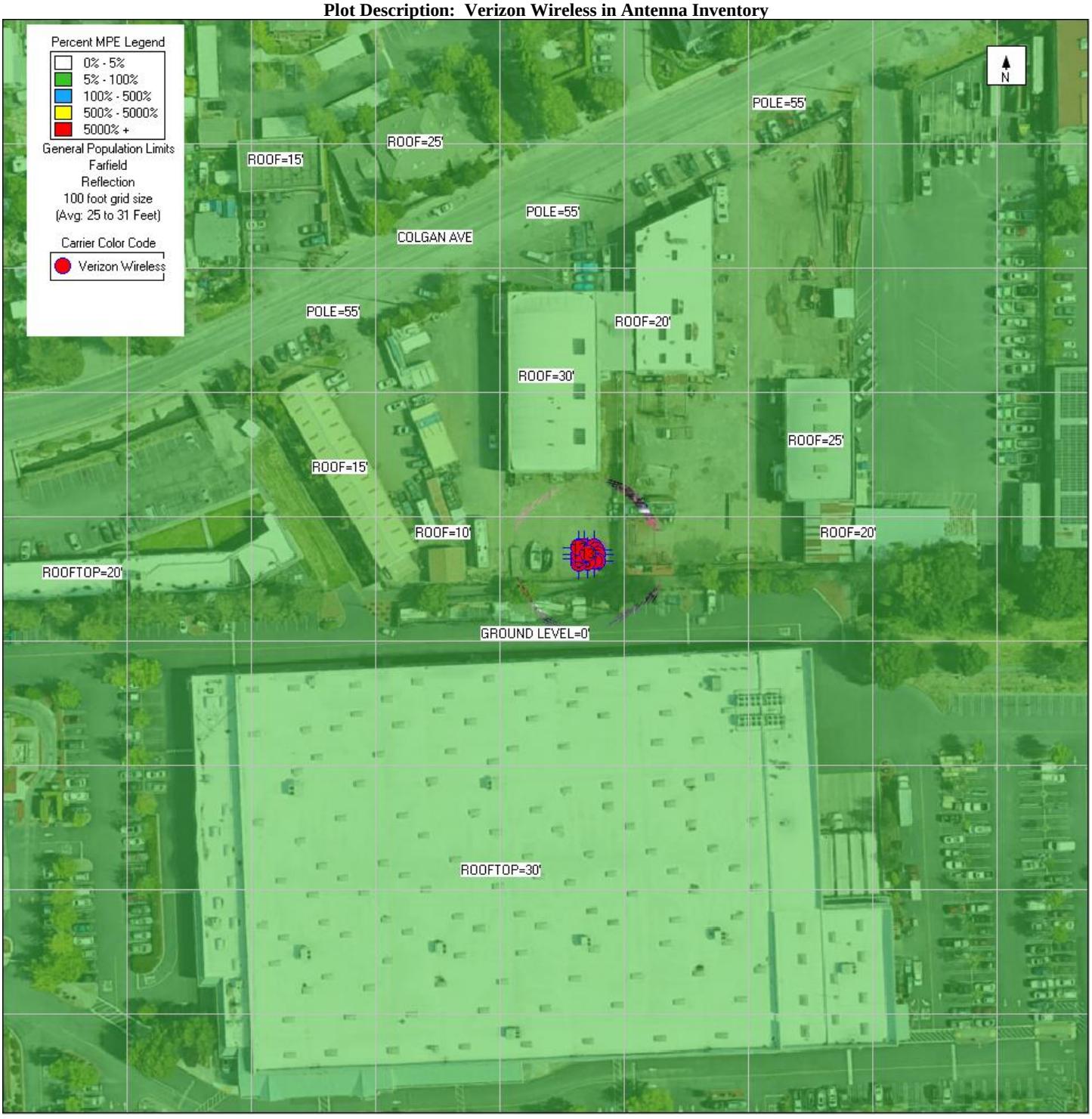
Reference Plane: 55 ft (Adjacent Electric Pole Level)
Plot Description: Verizon Wireless in Antenna Inventory



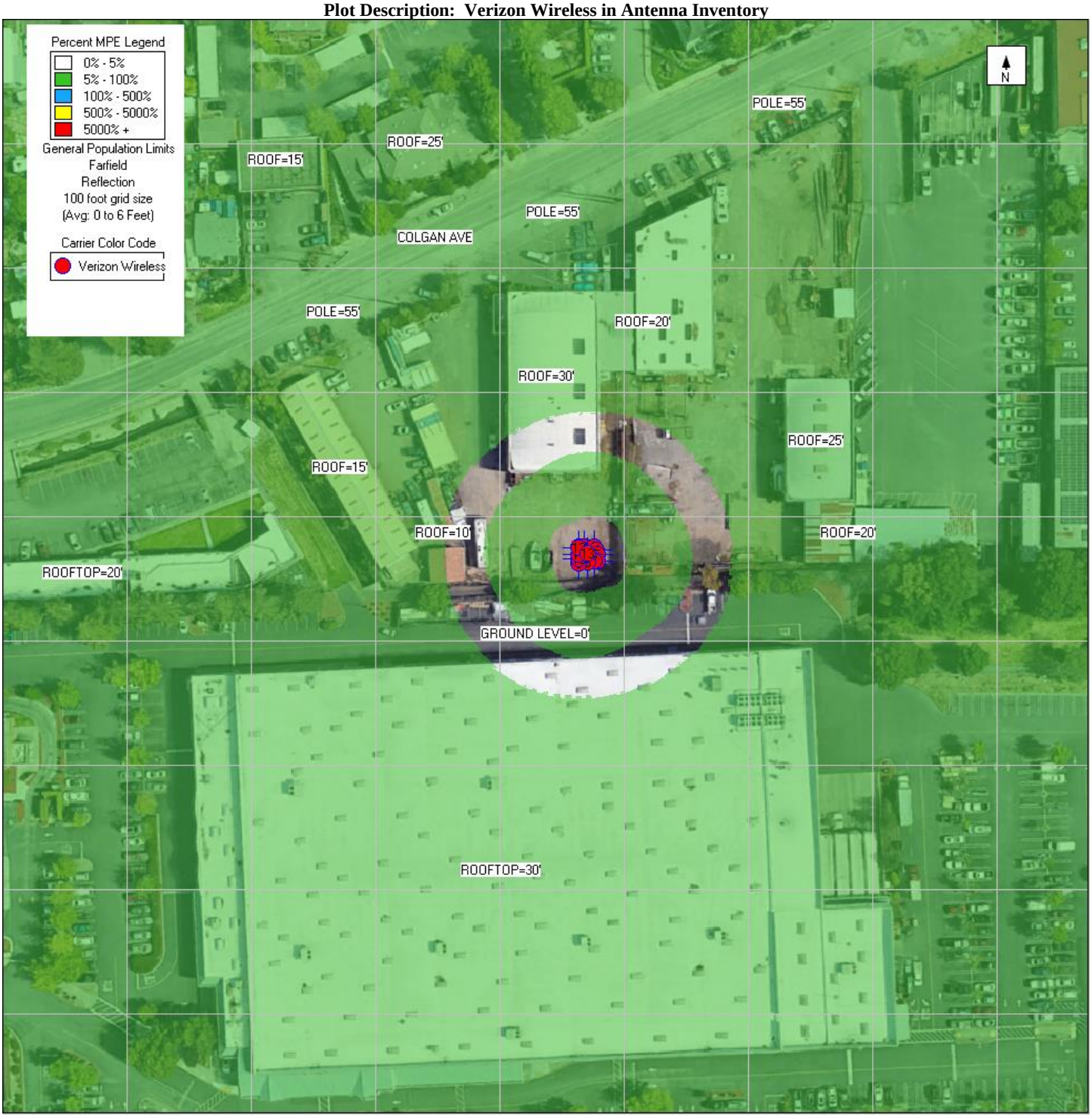
Reference Plane: 30 ft (Adjacent Building Level)
Plot Description: Verizon Wireless in Antenna Inventory



Reference Plane: 25 ft (Adjacent Building Level)
Plot Description: Verizon Wireless in Antenna Inventory



Reference Plane: 0 ft (Ground Level)
Plot Description: Verizon Wireless in Antenna Inventory



Roof Master™ Antenna Inventory with Recommended Operating Parameters

Ant #	Operator	Antenna Make	Antenna Model	Type	Frequency (MHz)	Az (Deg)	Downtilt (Deg)	Horizontal Beam Width (Deg)	Ant (ft)	TPO (W)	# of Ch	Loss (dB)	Ant Gain (dBd)	Total ERP (W)	Total EIRP (W)	Antenna Centerline Ground Level (0 ft)
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2	Verizon	QUINTEL	QS6456-5 V3 02DT	Panel	700	0	0	49	6	60	2	0	13.05	2422	3974	65
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4	Verizon	QUINTEL	QS6456-5 V3 02DT	Panel	700	90	0	49	6	60	2	0	13.05	2422	3974	65
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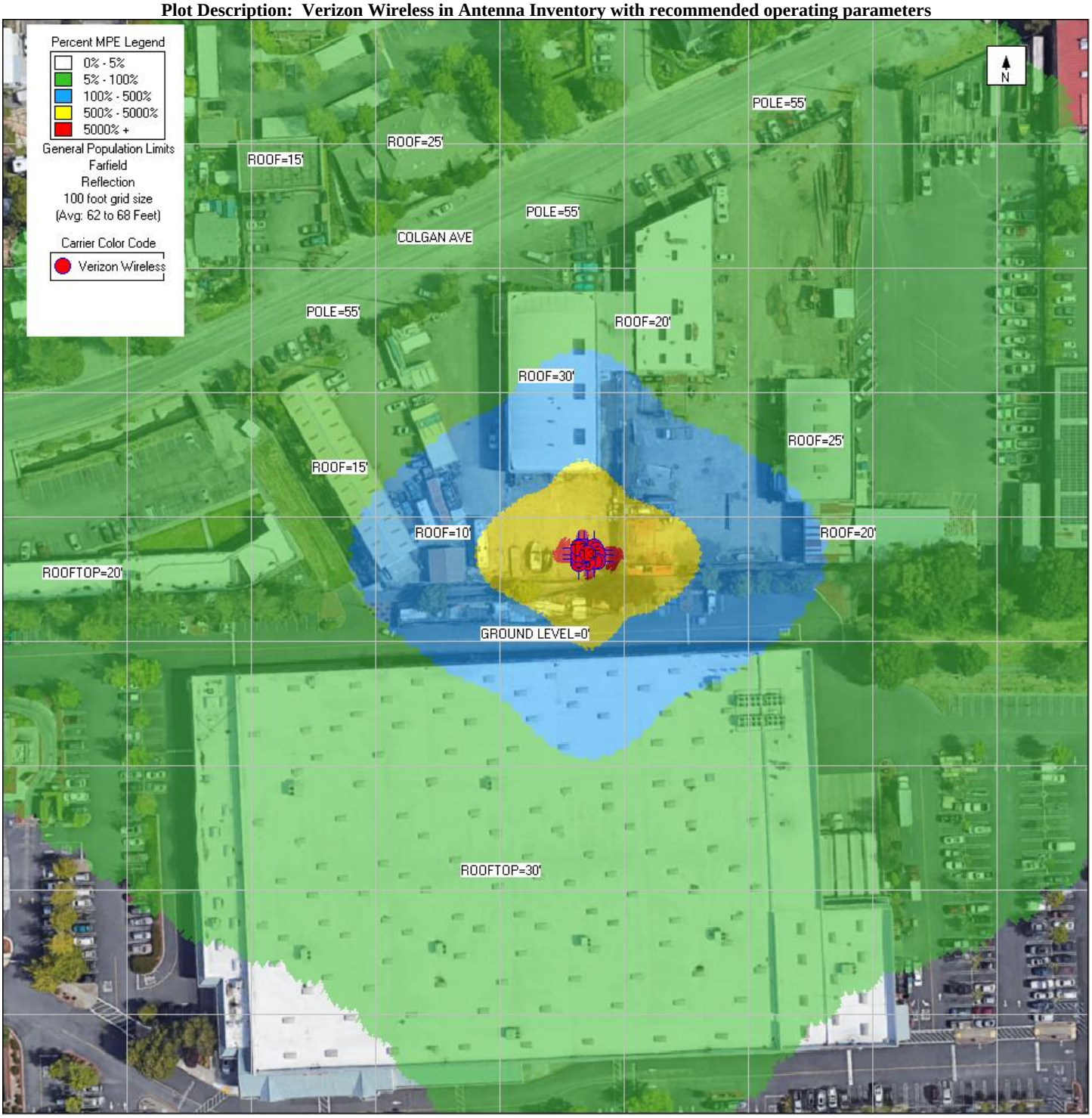
12	Verizon	ERICSSON	SON_AIR6449 NR TB 03.24.21 3700 VZW	Panel	3700	270	0	11	2.8	320	1	0	23.55	72469	118891	65
13	Verizon	ANDREW	VHLP4-11	Microwave	11000	0	0	1.5	4	0.2	1	0	38.7	1483	2432	52.9

SPECIAL OPERATING MITIGATION INSTRUCTIONS	
Alpha	3 dB power reduction below maximum for C-Band antenna to avoid impact at 30ft adjacent building
Beta	N/A
Gamma	3 dB power reduction below maximum for C-Band antenna to avoid impact at 30ft adjacent building
Delta	N/A

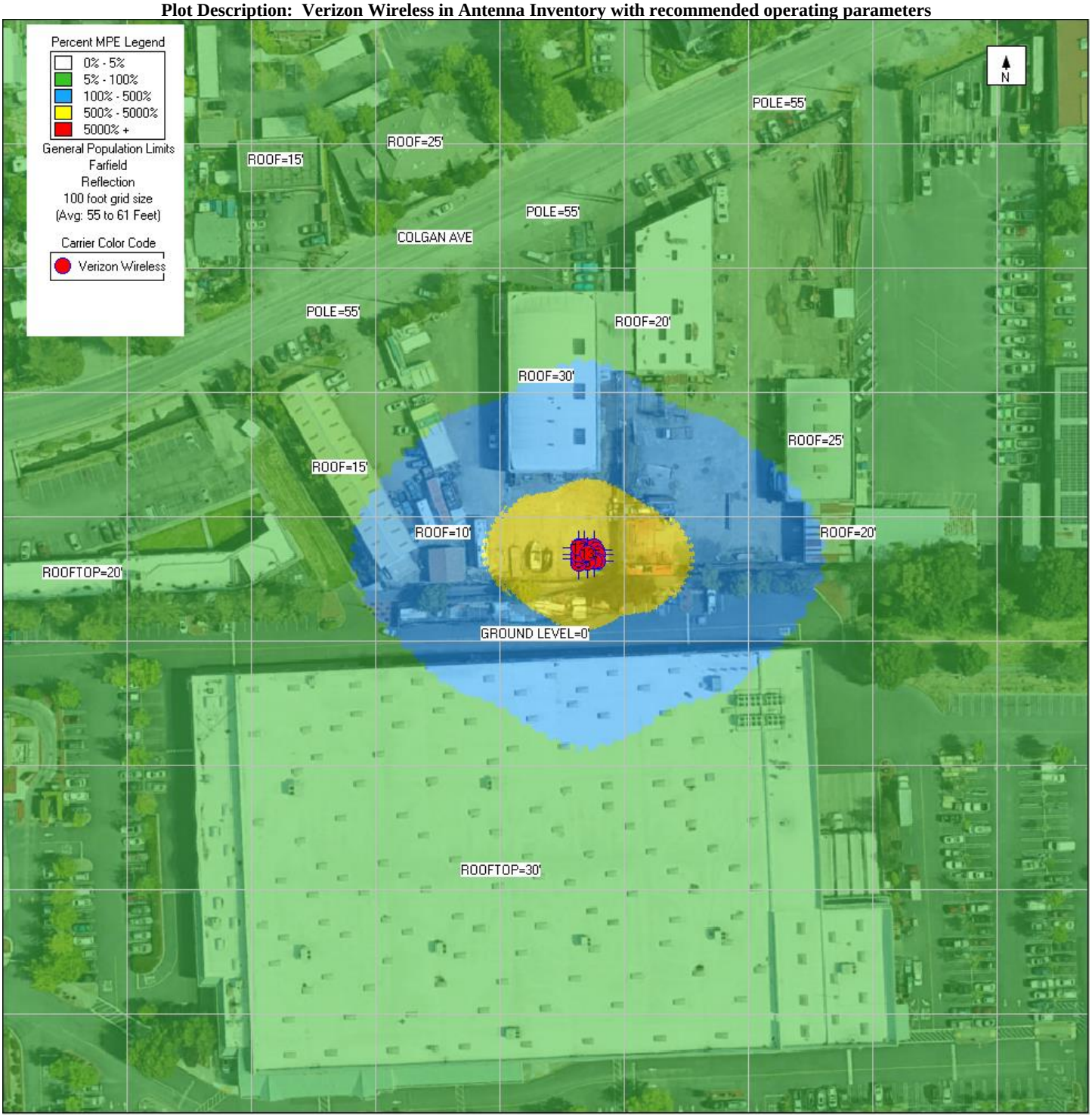
c. Predictive Model: Verizon Transmitters with Recommended Parameters

Is the area being modeled completely INACCESSIBLE to members of the general population (including untrained maintenance workers)?	**☐ YES ☒ NO**

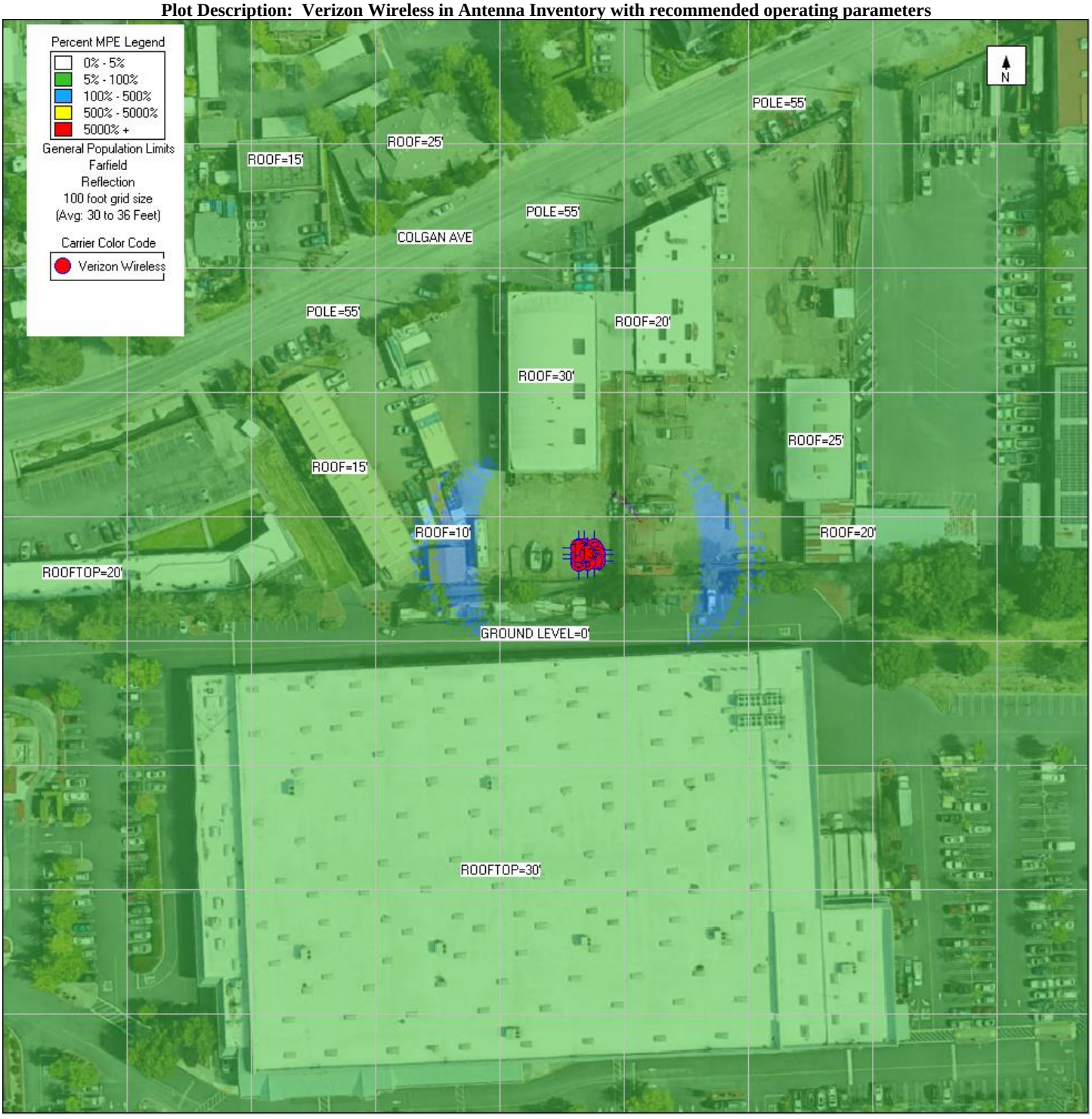
Reference Plane: 62 ft (Antenna Level)
Plot Description: Verizon Wireless in Antenna Inventory with recommended operating parameters



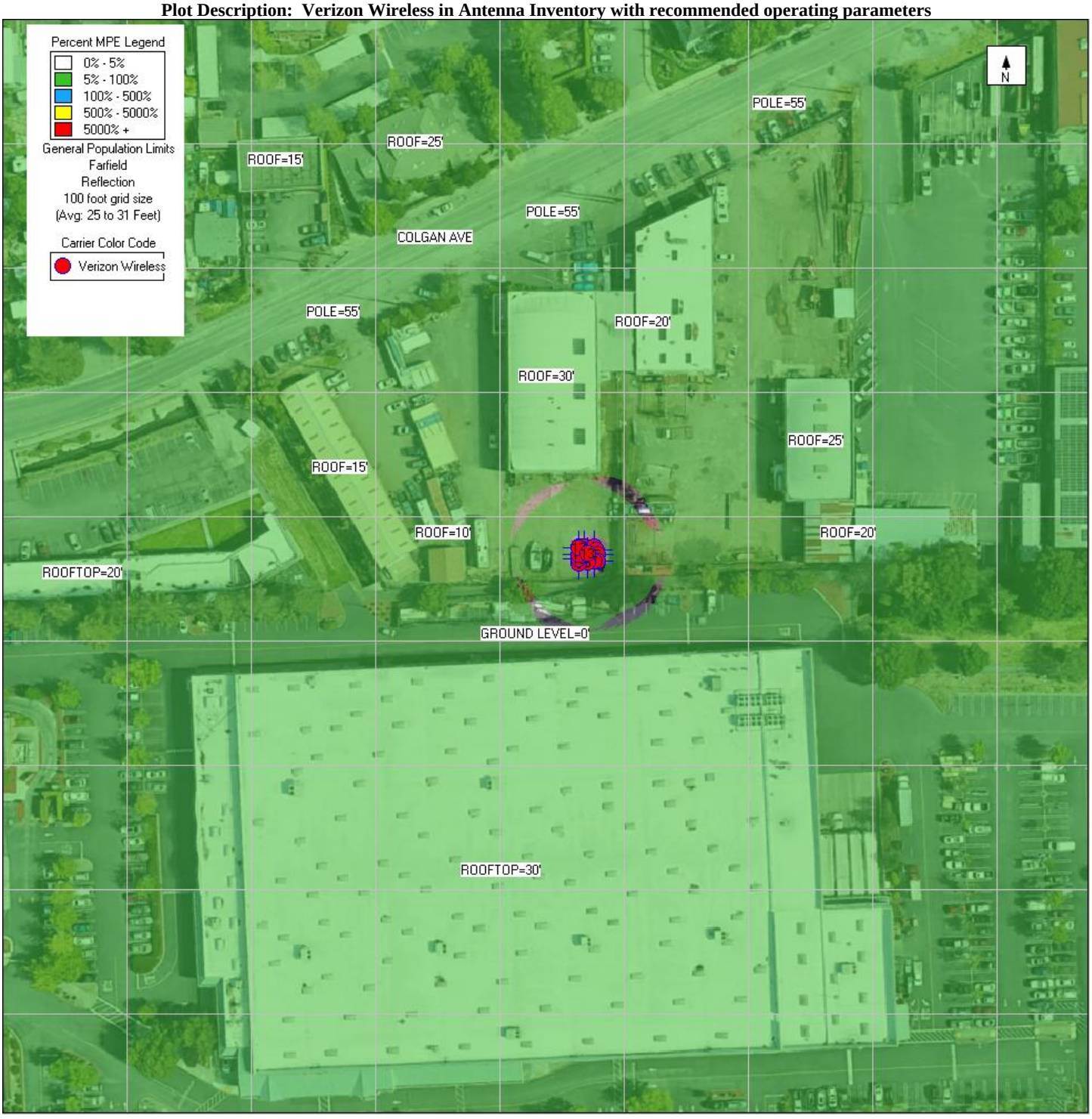
Reference Plane: 55 ft (Adjacent Electric Pole Level)
Plot Description: Verizon Wireless in Antenna Inventory with recommended operating parameters



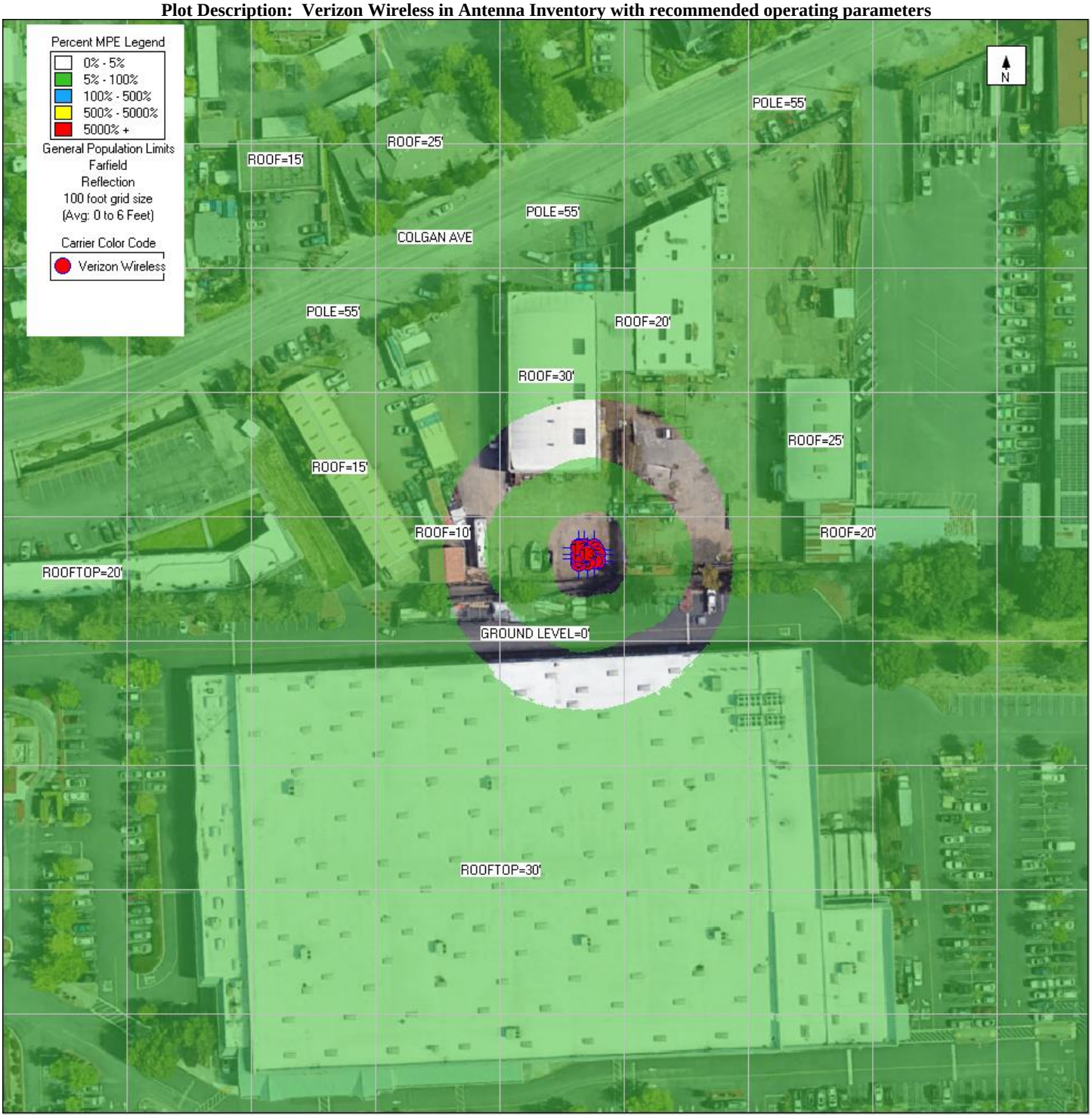
Reference Plane: 30 ft (Adjacent Building Level)
Plot Description: Verizon Wireless in Antenna Inventory with recommended operating parameters



Reference Plane: 25 ft (Adjacent Building Level)
Plot Description: Verizon Wireless in Antenna Inventory with recommended operating parameters



Reference Plane: 0 ft (Ground Level)
Plot Description: Verizon Wireless in Antenna Inventory with recommended operating parameters



4. Conclusion

a. Conclusion Narrative

Description of MPE-Limit Exceeding Areas:

Electric Pole Level 55 ft Assessment

- Antenna Inventory Configuration: Below General Population limits
- Recommended Configuration: Below General Population limits

Adjacent Building Level 30 ft Assessment

Verizon Wireless Antennas #1 through #3 and #7 through #9

- Antenna Inventory Configuration: Above General Population limits, Below Occupational limits
- Recommended Configuration: Below General Population limits

Adjacent Building Level 25 ft Assessment

- Antenna Inventory Configuration: Below General Population limits
- Recommended Configuration: Below General Population limits

Ground Level 0 ft Assessment

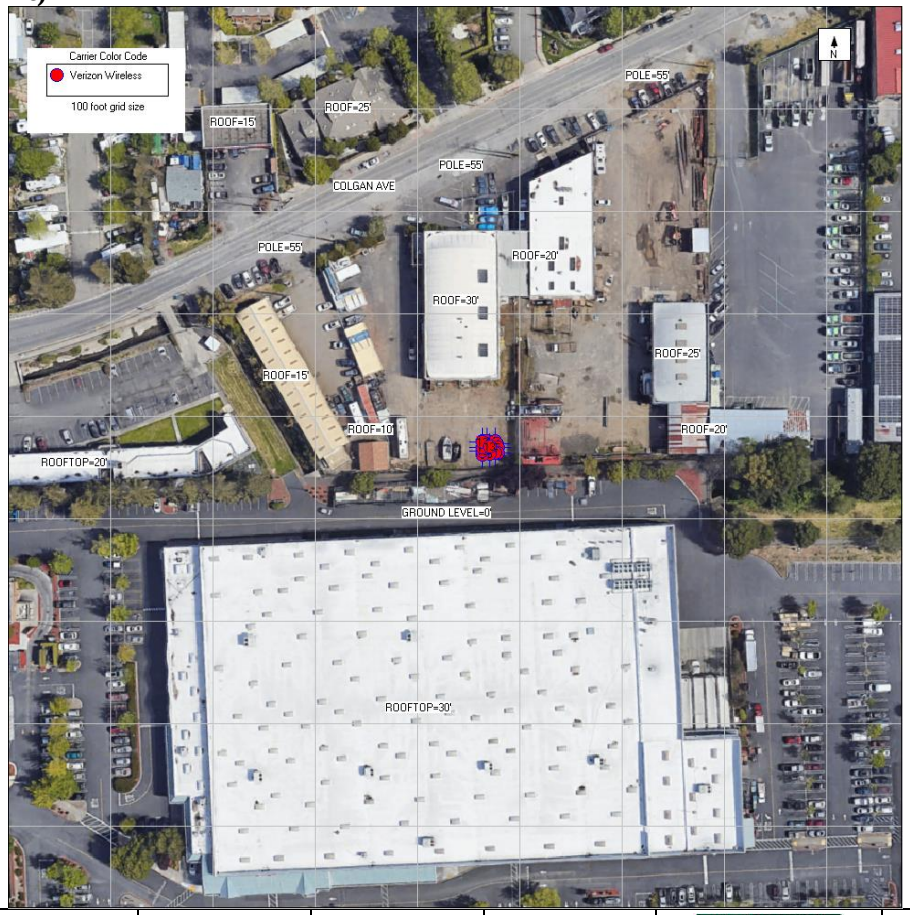
- Antenna Inventory Configuration: Below General Population limits
- Recommended Configuration: Below General Population limits

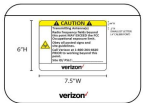
Potentially Non-Compliant Co-Locator Areas: Verizon Responsibility

The following table represents potentially non-compliant co-locators for which Verizon is a 5% General Population MPE (1% Occupational MPE) contributor.

AT&T	T-Mobile	Other (name)	Other (name)	Unknown	Other
☐	☐	☐	☐	☐	Insert Co-Locator
					Insert Co-Locator
					Insert Co-Locator
					Insert Co-Locator

b. Signage/Barrier Diagram (Access Point)

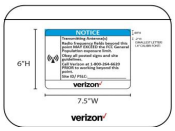
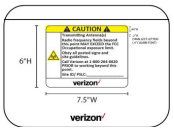
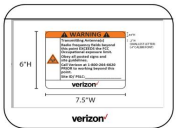


Final Compliant Configuration						
	GUIDELINES	NOTICE	CAUTION	WARNING	NOC INFO	BARRIER/MARKER
Access Point(s)	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ N/A

Proposed Signs/Barriers ●— — — — —● Existing Signs/Barriers ●— — — — —●

NOTE: The table above represents EVERY compliance item that MUST be implemented at this location.

c. Signage/Barrier Installation Detail

Mitigation Actions Required/Taken												
	GUIDELINES		**NOTICE**		**CAUTION**		**WARNING**		**NOC INFO**		**BARRIER/MARKER**	
Access Point(s)	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐	N/A
Alpha	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐	N/A
Beta	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐	N/A
Gamma	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐	N/A
Delta	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐ [#]	☐	N/A
	ADD	**REM**	**ADD**	**REM**	**ADD**	**REM**	**ADD**	**REM**	**ADD**	**REM**	**ADD ONLY**	

NOTE: The table represents either the signage/barriers installed / removed OR items required by the market (if mitigation is not installed by consultant/vendor).

SPECIAL MITIGATION INSTRUCTIONS	
Items to be Installed	Access: No action required, other than restricting access to the tower Alpha: No action required Beta: No action required Gamma: No action required Delta: No action required
Items to be Removed	N/A
Items to be Repaired/Replaced	N/A

5. Appendix C: RF Consultant Certifications

a. Preparer Certification

I, Jassmine Aldrich, the preparer of this report, am fully aware of and familiar with the Rules and Regulations of both the Federal Communications Commissions (FCC) and the Occupational Safety and Health Administration (OSHA) with regard to Human Exposure to Radio Frequency Radiation. I am also fully aware of and familiar with the Verizon Wireless Signage & Demarcation Policy. I have reviewed this Radio Frequency Exposure Assessment report and believe it to be both true and accurate to the best of my knowledge.

Jassmine Aldrich

b. Reviewer Certification

I, David H. Kiser, the reviewer and approved of this report, am fully aware of and familiar with the Rules and Regulations of both the Federal Communications Commissions (FCC) and the Occupational Safety and Health Administration (OSHA) with regard to Human Exposure to Radio Frequency Radiation. I am also fully aware of and familiar with the Verizon Wireless Signage & Demarcation Policy. I have reviewed this Radio Frequency Exposure Assessment report and believe it to be both true and accurate to the best of my knowledge.

David H Kiser 2023.05.25 14:34:06 -04'00'

6. Appendix D: Reference Information

a. FCC Rules & Regulations

The Federal Communications Commission (FCC) has established safety guidelines relating to RF exposure from cell sites. The FCC developed those standards, known as Maximum Permissible Exposure (MPE) limits, in consultation with numerous other federal agencies, including the Environmental Protection Agency, the Food and Drug Administration, and the Occupational Safety and Health Administration. The standards were developed by expert scientists and engineers after extensive reviews of the scientific literature related to RF biological effects. The FCC explains that its standards "incorporate prudent margins of safety." The following represents explanations of the most applicable information:

Two Classifications for Exposure Limits

Occupational – Applies to situations in which persons are "exposed as a consequence of their *employment*" and are "*fully aware* of the potential for exposure and can *exercise control* over their exposure".	General Population – Applies to situations in which persons are "exposed as a consequence of their employment *may not be made fully aware* of the potential for exposure or *cannot exercise control* over their exposure". Generally speaking, those without significant and documented RF Safety & Awareness training would be in the General Population classification.

Environment Classification

Controlled – Applies to environments that are restricted or "controlled" in order to prevent access from members of the General Population classification.	Uncontrolled – Applies to environments that are unrestricted or "uncontrolled" that allow access from members of the General Population classification.

Limits for Occupational/Controlled Exposure		
Frequency Range (MHz)	**Power Density (S) (mW/cm^2)**	**Averaging Time $\|E\|^2$, $\|H\|^2$, or S (minutes)**
300-1500	f/300	6
1500-100,000	5	6
Limits for General Population/Uncontrolled Exposure		
Frequency Range (MHz)	**Power Density (S) (mW/cm^2)**	**Averaging Time $\|E\|^2$, $\|H\|^2$, or S (minutes)**
300-1500	f/1500	30
1500-100,000	1	30
f = frequency in MHz		

Significant Contribution to the RF Environment

Any carrier contributing an aggregate MPE percentage of 5 or more (to the applicable RF Environment Classification) is defined as a significant contributor. This means that if any area is determined to be out of compliance with FCC rules, all significant contributors are jointly responsible for correcting any deficiencies.

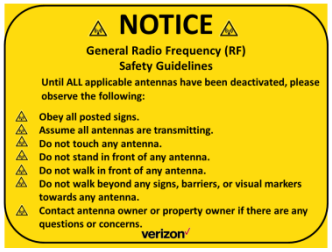
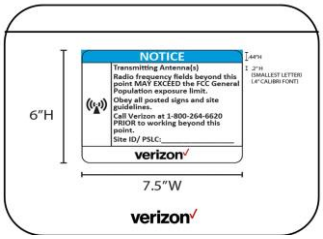
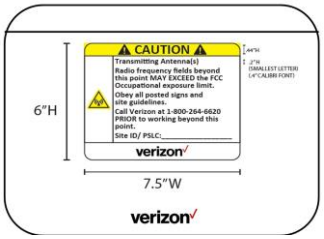
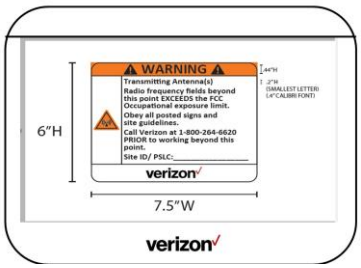
b. Occupational Safety and Health Administration (OSHA) Requirements

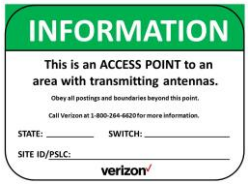
A formal adopter of FCC Standards, OSHA stipulates that those in the Occupational classification must complete training in the following: RF Safety, RF Awareness, and Utilization of Personal Protective Equipment. OSHA also provides options for Hazard Prevention and Control:

Hazard Prevention	Control
• Utilization of good equipment • Enact control of hazard areas • Limit exposures • Employ medical surveillance and accident response	• Employ Lockout/Tag out • Utilize personal alarms & protective clothing • Prevent access to hazardous locations • Develop or operate an administrative control program

c. RF Signage

Areas or portions of any transmitter site may be susceptible to high power densities that could cause personnel exposures in excess of the FCC guidelines. These areas must be demarcated by conspicuously posted signage that identifies the potential exposure. Signage MUST be viewable regardless of the viewer's position.

GUIDELINES	Category Two - Notice	Category Three - Caution	Category Four - Warning
This sign will inform anyone of the basic precautions to follow when entering an area with transmitting radiofrequency equipment.	This sign indicates that RF emissions may exceed the FCC General Population MPE limit. ● Sign Color Blue ● Sign Signal Word "Notice"	This sign indicates that RF emissions may exceed the FCC Occupational MPE limit. ● Sign Color Yellow ● Sign Signal Word "Caution"	This sign indicates that RF emissions may exceed at least 10x the FCC Occupational MPE limit. ● Sign Color Orange for Warning ● Sign Signal Word "Warning"
			

Category One - Information	
Information signs are used as a means to provide contact information for any questions or concerns. They will include specific cell site identification information and the Verizon Wireless Network Operations Center phone number. ● Sign Color Green ● Sign Signal Word "Information"	

Signs for Category Two through Four must have the following:

- Appropriate signal word, associated color {i.e., {DANGER" (red), "WARNING" (orange), "CAUTION," (yellow) "NOTICE" (blue)};
- RF energy advisory symbol;
- An explanation of the RF source;
- Behavior necessary to comply with the exposure limits; and
- Up-to-date contact information.

Signage Design features.

- All signs shall be furnished with rounded or blunt corners and shall be free from sharp edges, burrs, splinters, or other sharp projections. The ends or heads of bolts or other fastening devices shall be located in such a way that they do not constitute a hazard.

d. Physical Barriers

Physical barriers are control measures that require awareness and participation of personnel. Physical barriers are employed as an additional administration control to complement RF signage and physically demarcate an area in which RF exposure levels may exceed the FCC General Population limit. **Example**: chain-connected stanchions

e. Indicative Markers

Indicative markers are visible control measures that require awareness and participation of personnel, as they cannot physically prevent someone from entering an area of potential concern. Indicative markers are employed as an additional administration control to complement RF signage and visually demarcate an area in which RF exposure levels may exceed the FCC General Population limit. **Example**: paint stripes

7. Appendix E: Roofmaster™

RoofMaster™ is the software package that Waterford Consultants created to model RF environments associated with multiple emitters where the potential exists for human exposure. Based on the computational guidelines set forth in OET Bulletin 65 from the Federal Communications Commission (FCC), RoofMaster™ considers the operating parameters of specified RF sources to predict the overall Maximum Permissible Exposure possible at a given location. These theoretical results represent worst-case predictions as emitters are assumed to be operating at 100% duty cycle.

From the FCC document:

> *"The revised OET Bulletin 65 has been prepared to provide assistance in determining whether proposed or existing transmitting facilities, operations or devices comply with limits for human exposure to radiofrequency (RF) fields adopted by the Federal Communications Commission (FCC). The bulletin offers guidelines and suggestions for evaluating compliance."*

http://transition.fcc.gov/Bureaus/Engineering_Technology/Documents/bulletins/oet65/oet65.pdf

8. Appendix F: Qualifications of Waterford Consultants, LLC

Waterford Consultants, LLC [Waterford] provides technical consulting services to clients in the Radio Communications and antenna locating industry. Waterford retains professional engineers who are placed in responsible charge of the processes for analysis.

Waterford is familiar with 47 C.F.R. § § 1.1307(b)(3) and 1.1310 along with the general Rules, Regulations and policies of the FCC. Waterford work processes incorporate all specifications of FCC Office of Engineering and Technology, Bulletin 65 ("OET65"), from the website: www.fcc.gov/oet/rfsafety and follow criteria detailed in 47 CFR § 1.1310 "Radiofrequency radiation exposure Limits".

Within the technical and regulatory framework detailed above, Waterford developed tools according to recognized and generally accepted good engineering practices. Permissible exposure limits are band specific, and the Waterford computerized modeling tools correctly calculate permissible exposure based on the band(s) specified in the input data. Only clients and client representatives are authorized to provide input data through the Waterford web portal. In securing that authorization, clients and client representatives attest to the accuracy of all input data.

Waterford Consultants, LLC attests to the accuracy of the engineering calculations computed by those modeling tools. Furthermore, Waterford attests that the results of those engineering calculations are correctly summarized in this report

9. Appendix G: Statement of Limiting Conditions

Waterford Consultants, LLC field personnel have visited the site and collected only data with regard to the MPE environment. Waterford Consultants will not be responsible for matters of a legal nature that affect the site or property. The property has been analyzed under the premise that it is under responsible ownership and management and our client has the legal right to conduct business at this facility.

Due to the complexity of some wireless sites, Waterford Consultants has created this report utilizing best industry practices and due diligence. Waterford Consultants cannot be held accountable or responsible for anomalies or discrepancies due to actual site conditions (i.e., mislabeling of antennas or equipment, inaccessible cable runs, inaccessible antennas or equipment, etc.) or information or data supplied by Wireless Carrier, the site manager, or their affiliates, subcontractors or assigns.

Waterford Consultants has provided the results of a computer generated model in this MPE Site Compliance Report to show approximate dimensions of the site, and the model results is included to assist the reader of the compliance report to visualize the site area, and to provide supporting documentation for Waterford Consultants' recommendations.

Waterford Consultants will not be responsible for any existing conditions or for any engineering or testing that might be required to discover whether adverse safety conditions exist. Because Waterford Consultants is not an expert in the field of mechanical engineering or building maintenance, this MPE Site Compliance Report must not be considered a structural or physical engineering report.

Waterford Consultants obtained information used in this MPE Site Compliance Report from sources that Waterford Consultants considers reliable and believes them to be true and correct. Waterford Consultants does not assume any responsibility for the accuracy of such items that were furnished by other parties.