



YOUR RF SAFETY PARTNER

RADIO FREQUENCY ELECTROMAGNETIC FIELDS EXPOSURE REPORT

PRE-Activation

Prepared for Verizon

Site Name: AG Valley Rd
Site ID: 5000918278
Site Type: Faux Water Tower

Located at:

789 Valley Rd
Arroyo Grande, CA 93420
Latitude: 35.106425 / Longitude: -120.580783

Report Date: 9/11/2023
Report By: Christopher Stollar, P.E.

Based on FCC Rules and Regulations, Verizon will be compliant provided recommendation(s) are implemented.

TABLE OF CONTENTS

1.0	EXECUTIVE SUMMARY.....	3
2.0	SITE DESCRIPTION.....	4
2.1	Site Map.....	4
2.2	Antenna Inventory.....	5
3.0	ANALYSIS.....	6
3.1	Emission Predictions.....	6
4.0	CONCLUSION.....	9
4.1	Results.....	9
4.2	Recommendation(s).....	9
4.3	Statement of Compliance.....	11
4.4	Engineer Certification.....	11
	Appendix A: Background.....	12
	Appendix B: Measurement and/or Computer Simulation Methods.....	13
	Appendix C: Limitations.....	13
	Appendix D: Sample Verizon RF Advisory Signs.....	14

1.0 EXECUTIVE SUMMARY

Dtech Communications, LLC (“Dtech”) has been retained by Sequoia Deployment Services, Inc., contractors to Verizon, to determine whether its wireless communications facility complies with the Federal Communications Commission (“FCC”) Radio Frequency (“RF”) Safety. This report contains a computer-simulated analysis of the Electromagnetic Fields (“EMF”) exposure resulting from the facility. The analysis also includes assessment of existing wireless carriers on site, where information is provided. The table below summarizes the results at a glance:

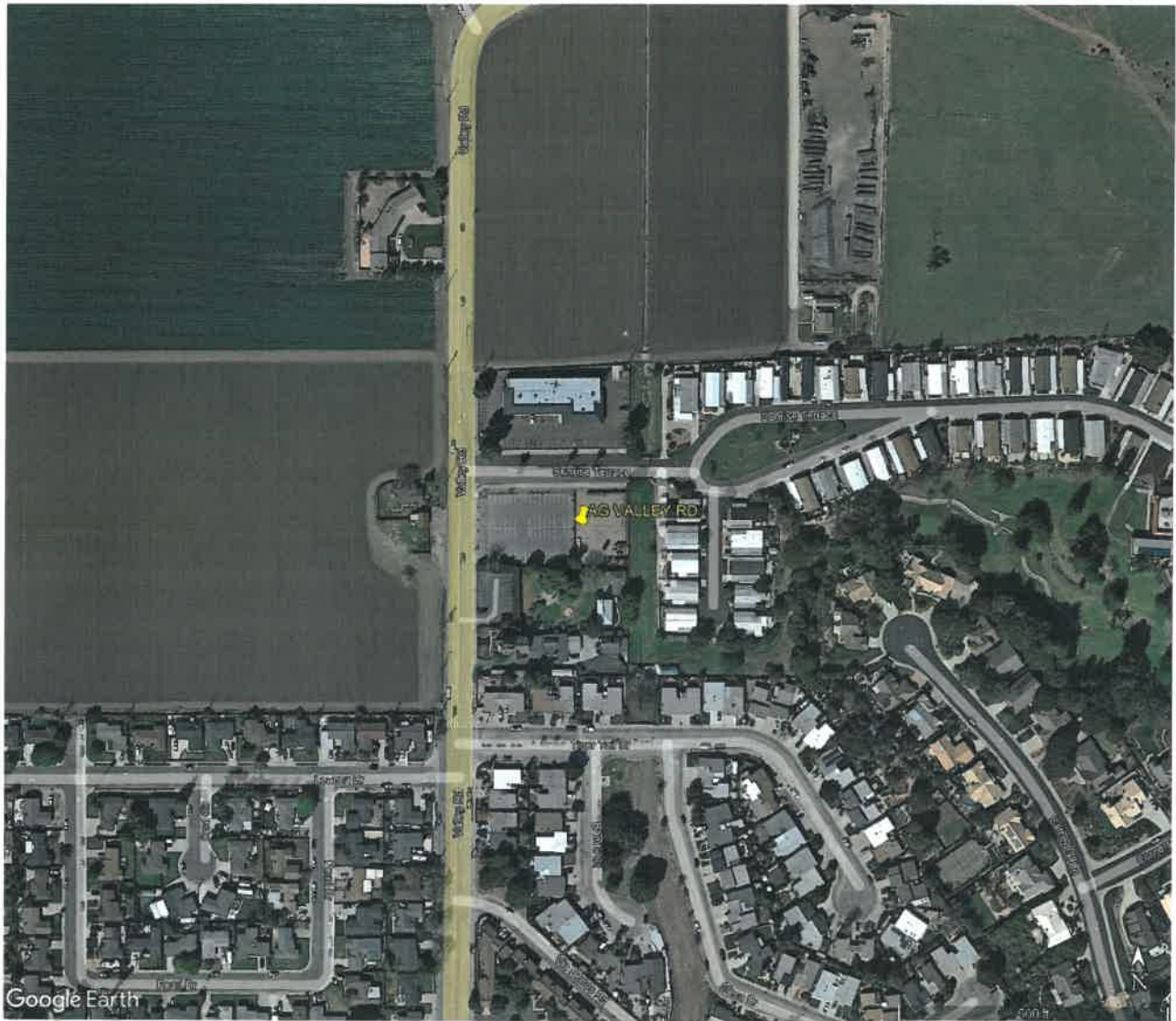
Table 1: EMF Summary

Verizon	Summary
Access Type	Gate
Access to antennas locked	Yes
RF Sign(s) @ access point(s)	NOC, GUIDELINE, WARNING (Recommended)
RF Sign(s) @ antennas	NA
Barrier(s) @ sectors	NA
Max EMF simulated level for Verizon on Ground	39.5% General Population
Max EMF simulated level for Verizon on Adj. Bldg Roof/Light Poles	82.0% General Population
Min Clearance Distance from Face of Verizon’s Antennas	90 Feet

2.0 SITE DESCRIPTION

The wireless telecommunication facility is located on the ground. The facility consists of 1 wireless carrier(s) or operator(s): Verizon. The antennas are typically grouped into sectors pointing in different directions to achieve the desired areas of coverage. Verizon's antennas are mounted inside a faux water tower.

2.1 Site Map



2.2 Antenna Inventory

The table below reflects the technical specifications provided by our clients and/or gathered from physical field surveys where applicable. This final configuration, including power settings and antenna orientations must be maintained to remain in compliance with FCC guidelines. For co-locators or nearby transmitters, conservative estimates are used for purposes of a cumulative study where information is not provided or available.

Table 2: Site Technical Specifications

Antenna ID	Antenna Num	Operator	Antenna Mfg	Antenna Model	Type	Frequency (MHz)	Orientation (°T)	Horizontal BWidth (°)	Antenna Aperture (ft)	Antenna Gain (dBd)	Total Input Power (Watts)	Total ERP (Watts)	Bottom Tip Height Above Ground (Z) (ft)	Bottom Tip Height Above Adj Roof (Z) (ft)	Bottom Tip Height Antenna Level (Z) (ft)
A1	1	Verizon	Ericsson	AIR6419	Panel	3700	60	11	2.4	23.5	320	70837	48.8	34.8	0.0
A2	2	Verizon	Commscope	NNH4-65B-R6	Panel	746	60	71	6.0	12.1	120	1924	47.0	33.0	0.0
A2	2	Verizon	Commscope	NNH4-65B-R6	Panel	880	60	62	6.0	12.7	120	2209	47.0	33.0	0.0
A2	2	Verizon	Commscope	NNH4-65B-R6	Panel	1965	60	59	6.0	14.2	240	6243	47.0	33.0	0.0
A3	3	Verizon	Commscope	NNH4-65B-R6	Panel	746	60	71	6.0	12.1	120	1924	47.0	33.0	0.0
A3	3	Verizon	Commscope	NNH4-65B-R6	Panel	880	60	62	6.0	12.7	120	2209	47.0	33.0	0.0
A3	3	Verizon	Commscope	NNH4-65B-R6	Panel	2120	60	58	6.0	14.4	240	6537	47.0	33.0	0.0
B1	4	Verizon	Ericsson	AIR6419	Panel	3700	190	11	2.4	23.5	320	70837	48.8	34.8	0.0
B2	5	Verizon	Commscope	NNH4-65B-R6	Panel	746	190	71	6.0	12.1	120	1924	47.0	33.0	0.0
B2	5	Verizon	Commscope	NNH4-65B-R6	Panel	880	190	62	6.0	12.7	120	2209	47.0	33.0	0.0
B2	5	Verizon	Commscope	NNH4-65B-R6	Panel	1965	190	59	6.0	14.2	240	6243	47.0	33.0	0.0
B3	6	Verizon	Commscope	NNH4-65B-R6	Panel	746	190	71	6.0	12.1	120	1924	47.0	33.0	0.0
B3	6	Verizon	Commscope	NNH4-65B-R6	Panel	880	190	62	6.0	12.7	120	2209	47.0	33.0	0.0
B3	6	Verizon	Commscope	NNH4-65B-R6	Panel	2120	190	58	6.0	14.4	240	6537	47.0	33.0	0.0
C1	7	Verizon	Ericsson	AIR6419	Panel	3700	300	11	2.4	23.5	320	70837	48.8	34.8	0.0
C2	8	Verizon	Commscope	NNH4-65B-R6	Panel	746	300	71	6.0	12.1	120	1924	47.0	33.0	0.0
C2	8	Verizon	Commscope	NNH4-65B-R6	Panel	880	300	62	6.0	12.7	120	2209	47.0	33.0	0.0
C2	8	Verizon	Commscope	NNH4-65B-R6	Panel	1965	300	59	6.0	14.2	240	6243	47.0	33.0	0.0
C3	9	Verizon	Commscope	NNH4-65B-R6	Panel	746	300	71	6.0	12.1	120	1924	47.0	33.0	0.0
C3	9	Verizon	Commscope	NNH4-65B-R6	Panel	880	300	62	6.0	12.7	120	2209	47.0	33.0	0.0
C3	9	Verizon	Commscope	NNH4-65B-R6	Panel	2120	300	58	6.0	14.4	240	6537	47.0	33.0	0.0

3.0 ANALYSIS

3.1 Emission Predictions

Figure 1: Plan (bird's eye) view map of results compared to FCC's General Population MPE (Maximum Permissible Exposure) Limits for a typical 6-foot person. White represents areas where exposure levels are calculated to be at or below 5%; Green- between 5% & 100% (below MPE limits); blue, yellow & red – greater than 100% (exceeds MPE limits). Individuals can safely occupy areas in white and green for indefinite amount of time; whereas areas in blue, yellow & red must be restricted to RF trained personnel who has been made fully aware of potential for exposure, has control and knows how to reduce their exposure with the use of personal protection equipment or has the ability to power down the transmitters.

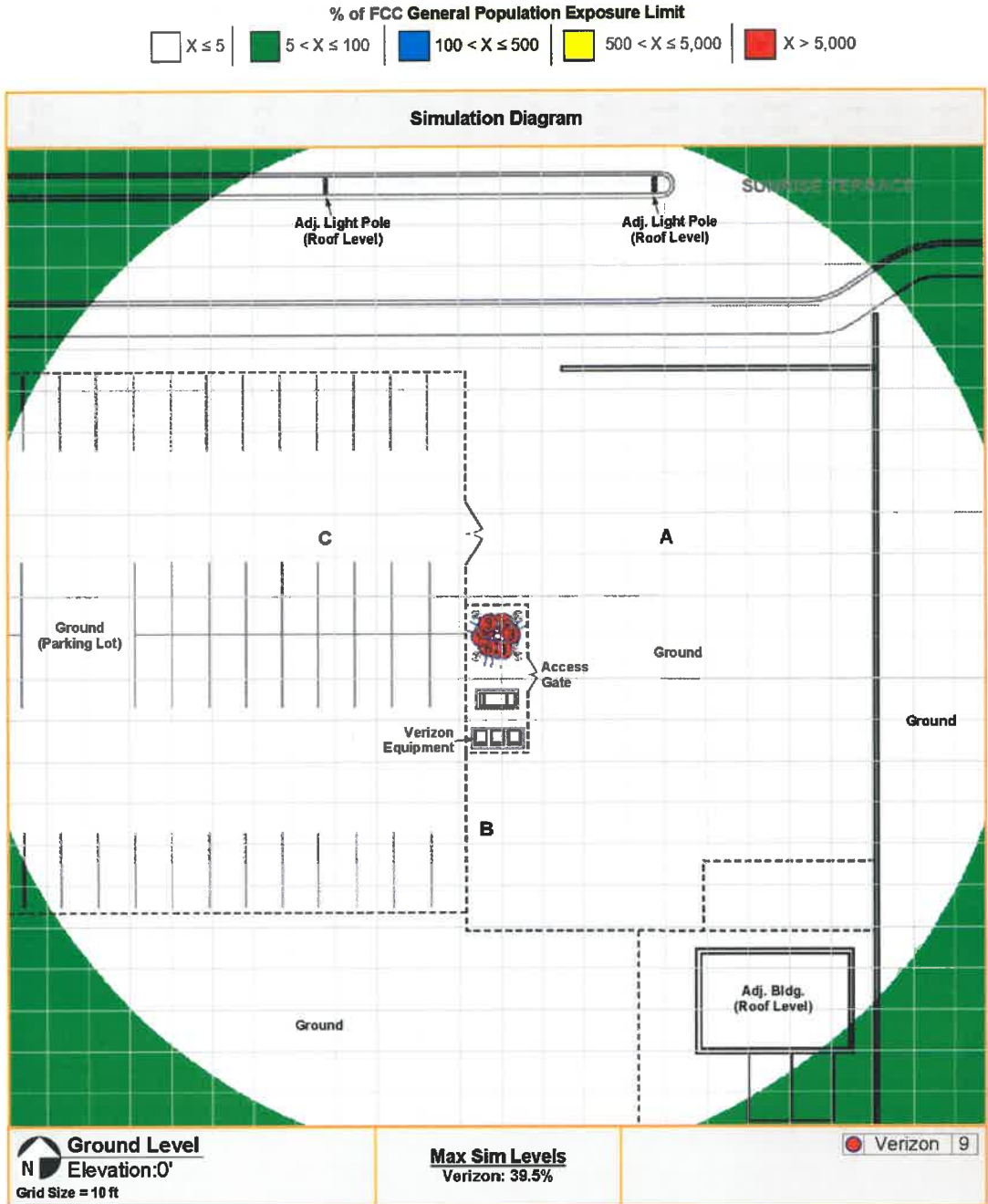


Figure 2: Plan (bird's eye) view map of results compared to FCC's General Population MPE (Maximum Permissible Exposure) Limits for a typical 6-foot person. White represents areas where exposure levels are calculated to be at or below 5%; Green- between 5% & 100% (below MPE limits); blue, yellow & red – greater than 100% (exceeds MPE limits). Individuals can safely occupy areas in white and green for indefinite amount of time; whereas areas in blue, yellow & red must be restricted to RF trained personnel who has been made fully aware of potential for exposure, has control and knows how to reduce their exposure with the use of personal protection equipment or has the ability to power down the transmitters.

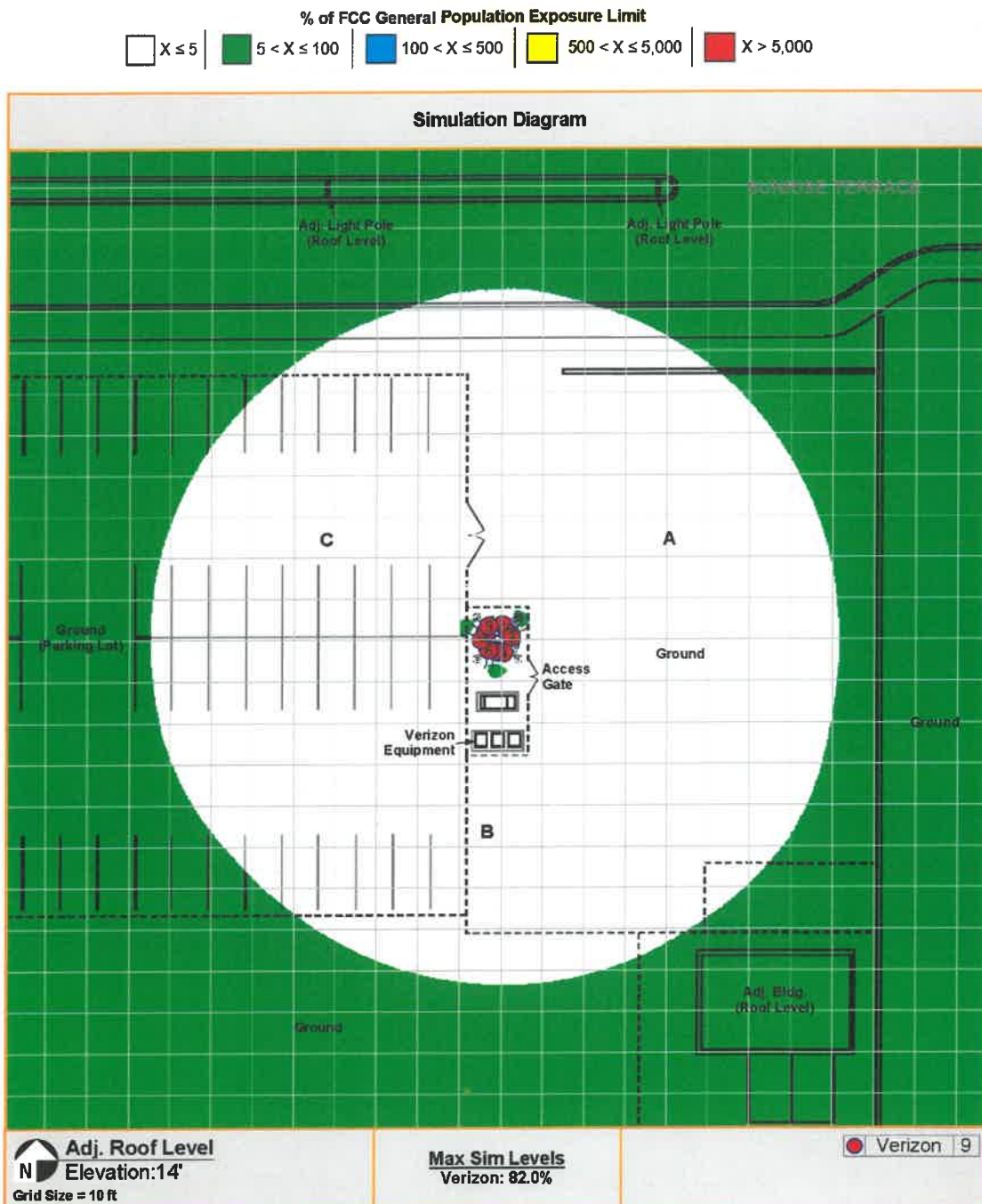
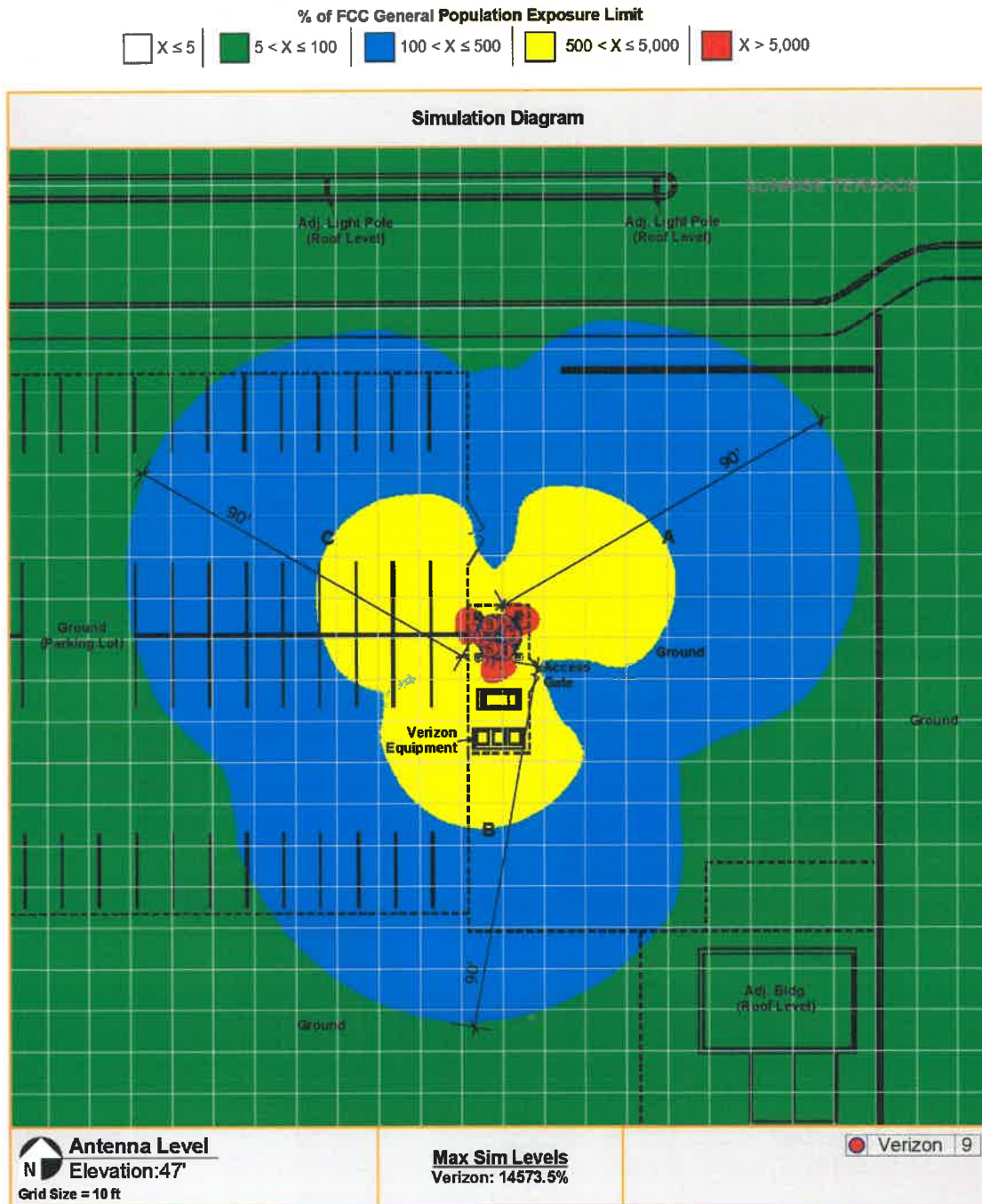


Figure 3: Plan (bird's eye) view map of results compared to FCC's General Population MPE (Maximum Permissible Exposure) Limits for a typical 6-foot person. White represents areas where exposure levels are calculated to be at or below 5%; Green- between 5% & 100% (below MPE limits); blue, yellow & red – greater than 100% (exceeds MPE limits). Individuals can safely occupy areas in white and green for indefinite amount of time; whereas areas in blue, yellow & red must be restricted to RF trained personnel who has been made fully aware of potential for exposure, has control and knows how to reduce their exposure with the use of personal protection equipment or has the ability to power down the transmitters.



4.0 CONCLUSION

4.1 Results

For a typical 6-foot person standing on the ground and adjacent building roof/light poles, calculations for Verizon's site resulted in exposure levels below the FCC's most stringent General Population MPE Limits (see figure 1 - 2).

At antenna elevation, the highest calculated exposure level is above the FCC's General Population MPE Limits near the Verizon antenna(s) (see figure 3). The overexposed (red, yellow and blue) areas extend 90-feet from the front face of the Verizon antenna(s). From the provided drawings, there are no other buildings or surrounding structures within 90-feet of the Verizon antenna(s). Beyond 90-feet, exposure levels are predicted to be below the FCC's most stringent General Population MPE Limits.

The antennas are mounted inside a tall tower and therefore not accessible by the general public. It is presumed that Verizon employees and contractors are aware of the transmitting antennas and will take appropriate precautions when working near them. However, there may be situations where workers i.e. painters, maintenance personnel, etc. may find themselves directly in front of the antennas. Individuals working near/in front of antennas must receive appropriate RF safety training and be made aware of the HotZones (areas where RF exposure may potentially exceed FCC safety limits). In addition, contact information should be made available in the event work is required within the HotZones. Alternatively, if the need occurs for any maintenance personnel to work directly in front of the antennas, Verizon should be contacted to arrange for the power to be shut down during the work period.

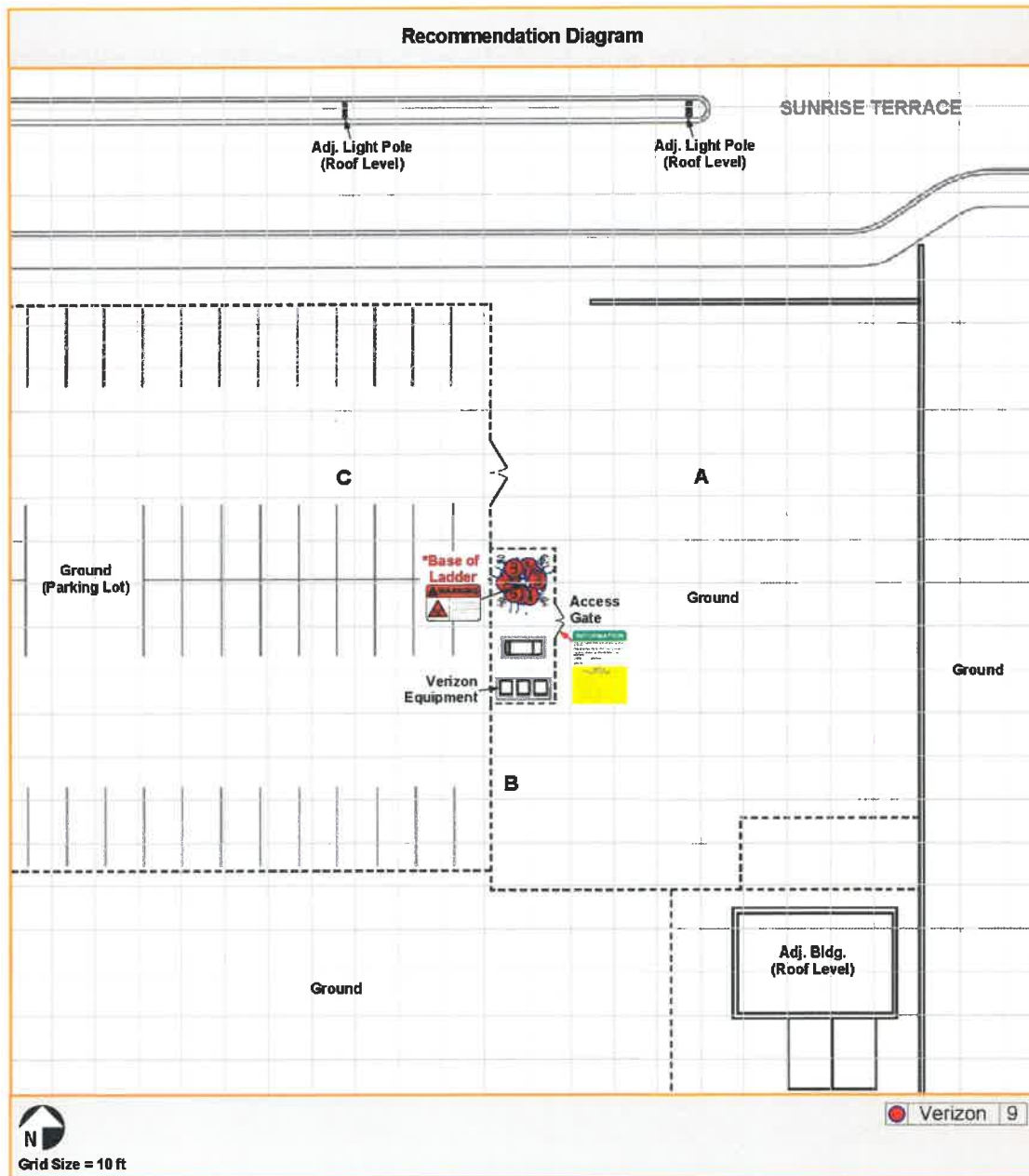
4.2 Recommendation(s)

The following compliance action(s) would be sufficient to meet the FCC's and Verizon's RF Safety Guidelines¹ (see figure 4):

- 1) Access to the facility should be controlled to prevent unauthorized routine access by the general public and restricted to personnel who has been made fully aware of the potential for RF exposure.
- 2) Install RF advisory signs according to the Recommendation diagram.
- 3) Apply RF safety program. Proper notification including identification of restricted areas or RF exposure maps, antenna power-down procedures and contact information must be provided to the facilities landlord or property owner. This will help ensure that a regional point of contact or the NOC will be contacted when someone in the public needs to perform maintenance in areas of potential concern.

¹ REGCOM-RCG-NP-15-0003 - RF Compliance Signage and Demarcation Policy

Figure 4: Recommendation(s)



4.3 Statement of Compliance

Based on the above results, analysis and recommendation(s), it is the undersigned's professional opinion that Verizon's site will be compliant with the FCC's RF Safety Guidelines provided recommendation(s) are implemented.

4.4 Engineer Certification

This report has been prepared by or under the direction of the following Registered Professional Engineer: Darang Tech, holding California registration number 16000. I have reviewed this report and believe it to be both true and accurate to the best of my knowledge.



Appendix A: Background

Dtech uses the FCC’s guidelines described in detail in Office of Engineering & Technology, Bulletin No. 65 (“OET-65”) “Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields”. The table below summarizes the current Maximum Permissible Exposure (“MPE”) safety limits classified into two groups: General population and Occupational.

Table 3: FCC MPE Limits (from OET-65)

Frequency (Mhz)	General Population/ Uncontrolled MPE (mW/cm ²)	Averaging Time (minutes)	Occupational/ Controlled MPE (mW/cm ²)	Averaging Time (minutes)
30 - 300	0.2	30	1.0	6
300 - 1500	Frequency (Mhz)/1500 (0.2 – 1.0)	30	Frequency (Mhz)/300 (1.0 – 5.0)	6
1500 - 100,000	1.0	30	5.0	6

General population/uncontrolled limits apply in situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment, and may not be fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general public always fall under this category when exposure is not employment-related.

Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment, and those persons have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits, as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

It is important to understand that the FCC guidelines specify *exposure* limits not *emission* limits. For a transmitting facility to be out of compliance with the FCC’s RF safety guidelines an area or areas where levels exceed the MPE limits must, first of all, be in some way *accessible* to the public or to workers. When accessibility to an area where excessive levels is appropriately restricted, the facility or operation can certify that it complies with the FCC requirements.

Appendix B: Measurement and/or Computer Simulation Methods

Spatial averaging measurement technique is used. An area between 2 and 6 feet, approximately the size of an average human, is scanned in single passes from top to bottom in multiple planes. When possible, measurements were made at very close proximity to the antennas and inside the main beam where most of the energy is emitted. The spatial averaged values were recorded. A result higher than 100% exceeds the FCC's General Population MPE Limits.

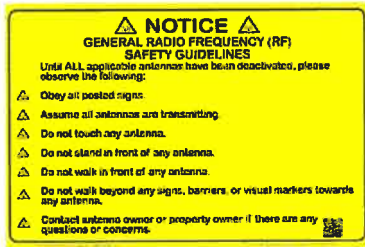
Dtech uses an industry standard power density prediction computer Model² to assess the worse-case, cumulative EMF impact of the surrounding areas of the subject site. In addition, the analysis is performed at 100% duty cycle-all transmitters are active at all times and transmitting at maximum power. In addition, lower interiors (if applicable), were analyzed 10-feet below roof level with a 10dB deck attenuation. For purposes of a cumulative study, nearby transmitters are included where possible. The result is a surrounding area map color-coded to percentages of the applicable FCC's MPE Limits.

Appendix C: Limitations

The conclusions in this document rendered by Dtech are based solely upon the information collected during the site survey and/or furnished by our Client which Dtech believes is accurate and correct. Dtech, however, has no responsibility should such Client provided information prove to be inaccurate or incorrect. Third party specification estimates used for cumulative computer simulation purposes, where applicable, are based on common industry practices and our best interpretation of available information. Data, results and conclusions in this document are valid as of its date. However, as mobile technologies continuously change, these data, results and conclusions may also be at variance with such future changes. Dtech has no responsibility to update its survey or report to account for such future technology changes. This document was prepared for the use of our Client only and cannot be utilized by any third party for any purpose without Dtech's written consent. Dtech shall have no liability for any unauthorized use of this document and any such unauthorized user shall defend, indemnify and hold Dtech and its owners, directors, officers and employees harmless from and against any liability, claim, demand, loss or expense (including reasonable attorney's fees) arising from such unauthorized use.

² Roofmaster(tm)

Appendix D: Sample Verizon³ RF Advisory Signs



GUIDELINES Sign



NOC INFORMATION Sign



NOTICE Sign



CAUTION Sign



CAUTION Stay-Back Sign



WARNING Sign

³ The above signage is for reference only. Actual signs may be updated in accordance to Verizon RF policy