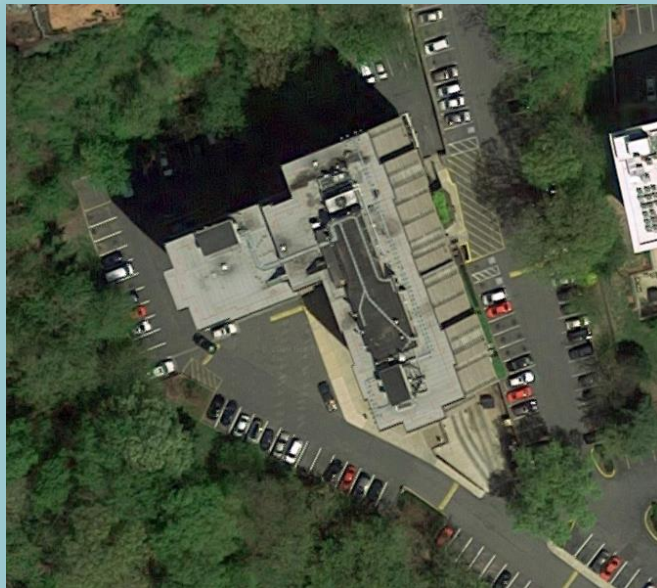


Radio Frequency - Electromagnetic Energy (RF-EME) Jurisdictional Report

Site No. 114383
Takoma Park
7600 Maple Avenue
Silver Spring, Maryland 20910
Montgomery County
38° 59' 3.00" N, -77° 0' 28.00" W NAD83

EBI Project No. 6219005076
June 2, 2020



Prepared for:
Verizon Wireless
10170 Junction Drive, 3rd Floor
Annapolis Junction, Maryland 20701

Prepared by:
 **EBI Consulting**
environmental | engineering | due diligence

TABLE OF CONTENTS

EXECUTIVE SUMMARY	1
1.0 INTRODUCTION.....	2
2.0 SITE DESCRIPTION	2
3.0 WORST-CASE PREDICTIVE MODELING.....	5
4.0 MITIGATION/SITE CONTROL OPTIONS	6
5.0 SUMMARY AND CONCLUSIONS	6
6.0 LIMITATIONS	7

APPENDICES

- APPENDIX A CERTIFICATIONS**
- APPENDIX B RADIO FREQUENCY ELECTROMAGNETIC ENERGY SAFETY / SIGNAGE PLANS**
- APPENDIX C FEDERAL COMMUNICATIONS COMMISSION (FCC) REQUIREMENTS**

EXECUTIVE SUMMARY

Purpose of Report

EnviroBusiness Inc. (dba EBI Consulting) has been contracted by Verizon Wireless ("Verizon") to conduct radio frequency electromagnetic (RF-EME) modeling for Verizon Site 114383 located at 7600 Maple Avenue in Silver Spring, Maryland to determine RF-EME exposure levels from proposed Verizon communications equipment at this site. As described in greater detail in Appendix C of this report, the Federal Communications Commission (FCC) has developed Maximum Permissible Exposure (MPE) Limits for the general public and for occupational activities. This report summarizes the results of RF-EME modeling in relation to relevant FCC RF-EME compliance standards for limiting human exposure to RF-EME fields.

Statement of Compliance

A site is considered out of compliance with FCC regulations if there are areas that exceed the FCC exposure limits and there are no RF hazard mitigation measures in place. Any carrier which has an installation that contributes more than 5% of the applicable MPE must participate in mitigating these RF hazards.

As presented in the sections below, based on worst-case predictive modeling, the worst-case emitted power density may exceed the FCC's general public limit within approximately 41 feet of Verizon's proposed antennas at the main roof level. Modeling also indicates that the worst-case emitted power density may exceed the FCC's occupational limit within approximately 21 feet of Verizon's proposed antennas at the main roof level. Additionally, there are areas where workers who may be elevated above the rooftop or ground may be exposed to power densities greater than the occupational limits. Therefore, workers should be informed about the presence and locations of antennas and their associated fields.

At the nearest walking/working surface to the Verizon antennas at the main roof level, the maximum power density generated by the Verizon antennas is approximately **2,598.45** percent of the FCC's general public limit (**519.69** percent of the FCC's occupational limit).

The composite exposure level from all carriers on this site is approximately **2,598.55** percent of the FCC's general public limit (**519.71** percent of the FCC's occupational limit) at the main roof level.

Composite worst-case emitted power densities for each elevation analyzed in this report can be found in Appendix B.

Recommended control measures are outlined in Section 4.0 and within the Site Safety Plan (attached); Verizon should also provide procedures to shut down and lockout/tagout this wireless equipment in accordance with Verizon's standard operating protocol. Non-telecom workers who will be working in areas of exceedance are required to contact Verizon since only Verizon has the ability to lockout/tagout the facility, or to authorize others to do so.

1.0 INTRODUCTION

Radio frequency waves are electromagnetic waves from the portion of the electromagnetic spectrum at frequencies lower than visible light and microwaves. The wavelengths of radio waves range from thousands of meters to around 30 centimeters. These wavelengths correspond to frequencies as low as 3 cycles per second (or hertz [Hz]) to as high as one gigahertz (one billion cycles per second).

Personal Communication (PCS) facilities used by Verizon in this area will potentially operate within a frequency range of 700 to 5000 MHz. Facilities typically consist of: 1) electronic transceivers (the radios or cabinets) connected to wired telephone lines; and 2) antennas that send the wireless signals created by the transceivers to be received by individual subscriber units (PCS telephones). Transceivers are typically connected to antennas by coaxial cables.

Because of the short wavelength of PCS services, the antennas require line-of-site paths for good propagation, and are typically installed a distance above ground level. Antennas are constructed to concentrate energy towards the horizon, with as little energy as possible scattered towards the ground or the sky. This design, combined with the low power of PCS facilities, generally results in no possibility for exposure to approach Maximum Permissible Exposure (MPE) levels, with the exception of in areas in the immediate vicinity of the antennas.

MPE limits do not represent levels where a health risk exists, since they are designed to provide a substantial margin of safety. These limits apply for continuous exposures and are intended to provide a prudent margin of safety for all persons, regardless of age, gender, size or health.

2.0 SITE DESCRIPTION

This project site includes the following proposed wireless telecommunication antennas on a rooftop located at 7600 Maple Avenue in Silver Spring, Maryland.

Ant #	Operator	Antenna Make	Antenna Model	Frequency (MHz)	Azimuth (deg.)	Mechanical Downtilt (deg.)	Horizontal Beamwidth (Degrees)	Aperture (feet)	Total Power Input (Watts)	Antenna Gain (dBd)	Total ERP (Watts)	Total EIRP (Watts)
1	Verizon	JMA	MX06FRO660-02 04DT 700	700	4	0	60	5.9	80	12.45	1117.09	1832.04
1	Verizon	JMA	MX06FRO660-02 05DT 850	850	4	0	53	5.9	80	12.45	1117.09	1832.04
1	Verizon	JMA	MX06FRO660-02 02DT 1900	1900	4	0	57	5.9	160	15.95	5001.73	8202.83
2	Verizon	JMA	MX06FRO660-02 04DT 700	700	4	0	60	5.9	80	12.45	1117.09	1832.04
2	Verizon	JMA	MX06FRO660-02 05DT 850	850	4	0	53	5.9	80	12.45	1117.09	1832.04
2	Verizon	JMA	MX06FRO660-02 02DT 2100	2100	4	0	52	5.9	240	15.55	6842.44	11221.61
3	Verizon	Amphenol	CWWX063X19x00-T06 850	850	4	2	65	6.2	160	13.1	2594.90	4255.63
4	Verizon	NOKIA	SON_AEUB_VZW	28000	4	0	13	1.5	1.26	26.85	610.06	1000.49
5	Verizon	JMA	MX06FRO660-02 10DT 700	700	124	0	58	5.9	80	12.35	1091.67	1790.33
5	Verizon	JMA	MX06FRO660-02 10DT 850	850	124	0	55	5.9	80	12.75	1196.99	1963.06
5	Verizon	JMA	MX06FRO660-02 03DT 1900	1900	124	0	55	5.9	160	15.95	5001.73	8202.83
6	Verizon	JMA	MX06FRO660-02 10DT 700	700	124	0	58	5.9	80	12.35	1091.67	1790.33
6	Verizon	JMA	MX06FRO660-02 10DT 850	850	124	0	55	5.9	80	12.75	1196.99	1963.06
6	Verizon	JMA	MX06FRO660-02 03DT 2100	2100	124	0	51	5.9	240	15.65	7001.82	11482.99
7	Verizon	AMPHENOL	CWWX063X19x00-T07 850	850	124	2	65	6.2	160	13.1	2594.90	4255.63
8	Verizon	NOKIA	SON_AEUB_VZW	28000	124	0	13	1.5	1.26	26.85	610.06	1000.49

Ant #	Operator	Antenna Make	Antenna Model	Frequency (MHz)	Azimuth (deg.)	Mechanical Downtilt (deg.)	Horizontal Beamwidth (Degrees)	Aperture (feet)	Total Power Input (Watts)	Antenna Gain (dBd)	Total ERP (Watts)	Total EIRP (Watts)
9	Verizon	JMA	MX06FRO660-02 02DT 700	700	244	0	60	5.9	80	12.45	1117.09	1832.04
9	Verizon	JMA	MX06FRO660-02 02DT 850	850	244	0	54	5.9	80	12.15	1042.53	1709.75
9	Verizon	JMA	MX06FRO660-02 02DT 1900	1900	244	0	57	5.9	160	15.95	5001.73	8202.83
10	Verizon	JMA	MX06FRO660-02 02DT 700	700	244	0	60	5.9	80	12.45	1117.09	1832.04
10	Verizon	JMA	MX06FRO660-02 02DT 850	850	244	0	54	5.9	80	12.15	1042.53	1709.75
10	Verizon	JMA	MX06FRO660-02 02DT 2100	2100	244	0	52	5.9	240	15.55	6842.44	11221.61
11	Verizon	AMPHENOL	CWWX063X19x00-T05 850	850	244	2	65	6.2	160	13.1	2594.90	4255.63
12	Verizon	NOKIA	SON_AEUB_VZW	28000	244	0	13	1.5	1.26	26.85	610.06	1000.49
13	AT&T	GENERIC	PANEL 6FT 00DT 850	850	0	0	66	6.0	120	12.62	1099.46	1803.12
14	AT&T	GENERIC	PANEL 6FT 00DT 1900	1900	0	0	66	6.0	120	15.84	2307.71	3784.64
15	AT&T	GENERIC	PANEL 6FT 00DT 2100	2100	0	0	63	6.0	80	16.39	1746.18	2863.74
15	AT&T	GENERIC	PANEL 6FT 00DT 700	700	0	0	68	6.0	60	12.33	514.22	843.33
16	AT&T	GENERIC	PANEL 6FT 00DT 850	850	120	0	66	6.0	120	12.62	1099.46	1803.12
17	AT&T	GENERIC	PANEL 6FT 00DT 1900	1900	120	0	66	6.0	120	15.84	2307.71	3784.64
18	AT&T	GENERIC	PANEL 6FT 00DT 2100	2100	120	0	63	6.0	80	16.39	1746.18	2863.74
18	AT&T	GENERIC	PANEL 6FT 00DT 700	700	120	0	68	6.0	60	12.33	514.22	843.33
19	AT&T	GENERIC	PANEL 6FT 00DT 850	850	240	0	66	6.0	120	12.62	1099.46	1803.12
20	AT&T	GENERIC	PANEL 6FT 00DT 1900	1900	240	0	66	6.0	120	15.84	2307.71	3784.64
21	AT&T	GENERIC	PANEL 6FT 00DT 2100	2100	240	0	63	6.0	80	16.39	1746.18	2863.74
21	AT&T	GENERIC	PANEL 6FT 00DT 700	700	240	0	68	6.0	60	12.33	514.22	843.33
22	Sprint	GENERIC	PANEL 6FT 00DT 850	850	20	0	66	6.0	20	12.62	183.24	300.52
23	Sprint	GENERIC	PANEL 6FT 00DT 1900	1900	20	0	66	6.0	120	15.84	2307.71	3784.64
24	Sprint	GENERIC	PANEL 6FT 00DT 850	850	150	0	66	6.0	20	12.62	183.24	300.52
25	Sprint	GENERIC	PANEL 6FT 00DT 1900	1900	150	0	66	6.0	120	15.84	2307.71	3784.64
26	Sprint	GENERIC	PANEL 6FT 00DT 850	850	260	0	66	6.0	20	12.62	183.24	300.52
27	Sprint	GENERIC	PANEL 6FT 00DT 1900	1900	260	0	66	6.0	120	15.84	2307.71	3784.64
28	T-Mobile	GENERIC	PANEL 6FT 00DT 1900	1900	350	0	66	6.0	120	15.84	2307.71	3784.64
29	T-Mobile	GENERIC	PANEL 6FT 00DT 2100	2100	350	0	63	6.0	120	16.39	4657.80	7638.80
30	T-Mobile	GENERIC	PANEL 6FT 00DT 1900	1900	150	0	66	6.0	120	15.84	2307.71	3784.64
31	T-Mobile	GENERIC	PANEL 6FT 00DT 2100	2100	150	0	63	6.0	120	16.39	4657.80	7638.80
32	T-Mobile	GENERIC	PANEL 6FT 00DT 1900	1900	220	0	66	6.0	120	15.84	2307.71	3784.64
33	T-Mobile	GENERIC	PANEL 6FT 00DT 2100	2100	220	0	63	6.0	120	16.39	4657.80	7638.80

• Note there are 4 Verizon antennas per sector at this site. For clarity, the different frequencies for each antenna are entered on separate lines.

Ant #	Carrier	X	Y	Antenna Radiation Centerline	Z-Height Penthouse	Z-Height Main Roof	Z-Height Top Floor (Below Main Roof)	Z-Height Lower Roof	Z-Height Top Floor (Below Lower Roof)	Z-Height Ground
1	Verizon	110.0	18.3	147.0	-21.6	-4.0	6.0	6.0	16.0	147.0
2	Verizon	113.1	16.6	147.0	-21.6	-4.0	6.0	6.0	16.0	147.0
3	Verizon	117.9	14.9	147.0	-21.6	-4.0	6.0	6.0	16.0	147.0
4	Verizon	120.5	13.5	147.0	-21.6	-4.0	6.0	6.0	16.0	147.0
5	Verizon	168.9	164.3	157.0	-11.6	6.0	16.0	16.0	26.0	157.0
6	Verizon	167.2	166.7	157.0	-11.6	6.0	16.0	16.0	26.0	157.0
7	Verizon	164.8	170.8	157.0	-11.6	6.0	16.0	16.0	26.0	157.0
8	Verizon	163.2	172.9	157.0	-11.6	6.0	16.0	16.0	26.0	157.0
9	Verizon	137.8	190.0	147.0	-21.6	-4.0	6.0	6.0	16.0	147.0
10	Verizon	136.6	186.9	147.0	-21.6	-4.0	6.0	6.0	16.0	147.0
11	Verizon	135.7	184.0	147.0	-21.6	-4.0	6.0	6.0	16.0	147.0
12	Verizon	134.5	181.4	147.0	-21.6	-4.0	6.0	6.0	16.0	147.0
13	AT&T	35.6	77.8	152.5	-16.1	1.5	11.5	11.5	21.5	152.5
14	AT&T	39.1	76.4	152.5	-16.1	1.5	11.5	11.5	21.5	152.5
15	AT&T	42.9	74.7	152.5	-16.1	1.5	11.5	11.5	21.5	152.5
16	AT&T	149.6	104.8	173.5	4.9	22.5	32.5	32.5	42.5	173.5
17	AT&T	151.3	108.6	173.5	4.9	22.5	32.5	32.5	42.5	173.5
18	AT&T	153.2	112.9	173.5	4.9	22.5	32.5	32.5	42.5	173.5
19	AT&T	111.7	83.0	173.5	4.9	22.5	32.5	32.5	42.5	173.5
20	AT&T	110.3	79.4	173.5	4.9	22.5	32.5	32.5	42.5	173.5
21	AT&T	108.9	76.1	173.5	4.9	22.5	32.5	32.5	42.5	173.5
22	Sprint	113.8	38.2	161.5	-7.1	10.5	20.5	20.5	30.5	161.5
23	Sprint	117.2	39.1	161.5	-7.1	10.5	20.5	20.5	30.5	161.5
24	Sprint	164.1	137.8	178.5	9.9	27.5	37.5	37.5	47.5	178.5
25	Sprint	159.1	147.3	178.5	9.9	27.5	37.5	37.5	47.5	178.5
26	Sprint	135.4	144.9	178.5	9.9	27.5	37.5	37.5	47.5	178.5
27	Sprint	131.4	136.1	178.5	9.9	27.5	37.5	37.5	47.5	178.5
28	T-Mobile	111.9	67.6	178.5	9.9	27.5	37.5	37.5	47.5	178.5
29	T-Mobile	120.7	63.8	178.5	9.9	27.5	37.5	37.5	47.5	178.5
30	T-Mobile	162.9	145.8	178.5	9.9	27.5	37.5	37.5	47.5	178.5
31	T-Mobile	155.8	148.9	178.5	9.9	27.5	37.5	37.5	47.5	178.5
32	T-Mobile	143.5	154.2	178.5	9.9	27.5	37.5	37.5	47.5	178.5
33	T-Mobile	138.7	152.7	178.5	9.9	27.5	37.5	37.5	47.5	178.5

• Note the Z-Height represents the distance from the antenna centerline.

The above tables contain an inventory of proposed Verizon Antennas and other carrier antennas if sufficient information was available to model them. Note that EBI uses an assumed set of antenna specifications and powers for unknown and other carrier antennas for modeling purposes. The FCC guidelines incorporate two separate tiers of exposure limits that are based upon occupational/controlled exposure limits (for workers) and general population/uncontrolled exposure limits for members of the general public that may be exposed to antenna fields. While access to this site is considered uncontrolled, the analysis has considered exposures with respect to both controlled and uncontrolled limits as an untrained worker may access adjacent rooftop locations. Additional information regarding controlled/uncontrolled exposure limits is provided in Appendix C. Appendix B presents a site safety plan that provides a plan view of the rooftop with antenna locations.

3.0 WORST-CASE PREDICTIVE MODELING

EBI has performed theoretical MPE modeling using RoofMaster™ software to estimate the worst-case power density at the site's nearby broadcast levels resulting from operation of the antennas. RoofMaster™ is a widely-used predictive modeling program that has been developed by Waterford Consultants to predict RF power density values for rooftop and tower telecommunications sites produced by vertical collinear antennas that are typically used in the cellular, PCS, paging and other communications services. Using the computational methods set forth in Federal Communications Commission (FCC) Office of Engineering & Technology (OET) Bulletin 65, "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields" (OET-65), RoofMaster™ calculates predicted power density in a scalable grid based on the contributions of all RF sources characterized in the study scenario. At each grid location, the cumulative power density is expressed as a percentage of the FCC limits. Manufacturer antenna pattern data is utilized in these calculations. RoofMaster™ models consist of the Far Field model as specified in OET-65 and an implementation of the OET-65 Cylindrical Model (Sula9). The models utilize several operational specifications for different types of antennas to produce a plot of spatially-averaged power densities that can be expressed as a percentage of the applicable exposure limit.

For this report, EBI utilized antenna and power data provided by Verizon and compared the resultant worst-case MPE levels to the FCC's occupational/controlled exposure limits outlined in OET Bulletin 65. The assumptions used in the modeling are based upon information provided by Verizon and information gathered from other sources. The parameters used for modeling are summarized in the Site Description antenna inventory table in Section 2.0.

Because actual building materials are unknown and to provide worst-case results, EBI did not include material attenuation for the building roof or exterior walls. It should be noted that building materials such as concrete, metal, wood, etc...reduce RF energy penetration; therefore, the theoretical MPE calculations found in this report for areas within the building at the top floor levels will be higher than real-world MPE levels encountered on site. The top floor levels were estimated to be 10 feet below each corresponding roof level.

T-Mobile, Sprint and AT&T also have antennas on the rooftop. Information about these antennas was included in the modeling analysis.

Based on worst-case predictive modeling, the worst-case emitted power density may exceed the FCC's general public limit within approximately 41 feet of Verizon's Sector B antennas at the main roof level. Modeling also indicates that the worst-case emitted power density may exceed the FCC's occupational limit within approximately 21 feet of Verizon's Sector B antennas at the main rooftop level. At the nearest walking/working surfaces to the Verizon antennas at the main roof, the maximum power density generated by the Verizon antennas is approximately 2,598.45 percent of the FCC's general public limit (519.69 percent of the FCC's occupational limit). The composite exposure level from all carriers on this site is approximately 2,598.55 percent of the FCC's general public limit (519.71 percent of the FCC's occupational limit) at the main roof level.

Composite worst-case emitted power densities for each elevation analyzed in this report can be found in Appendix B.

The Site Safety Plan also presents areas where Verizon Wireless antennas contribute greater than 5% of the applicable MPE limit for a site. A site is considered out of compliance with FCC regulations if there are areas that exceed the FCC exposure limits and there are no RF hazard mitigation measures in place.

Any carrier which has an installation that contributes more than 5% of the applicable MPE must participate in mitigating these RF hazards.

There were also worst-case predicted exposures above the general public MPE in front of the AT&T antennas. However, modeling indicates that the Verizon contribution to these areas is less than 5% of the general public MPE and as such, under FCC regulations, Verizon is not responsible for these predicted exceedances.

The inputs used in the modeling are summarized in the Site Description antenna inventory table in Section 2.0. A graphical representation of the RoofMaster™ modeling results is presented in Appendix B.

4.0 MITIGATION/SITE CONTROL OPTIONS

EBI's modeling indicates that there are areas in front of the Verizon antennas that exceed the FCC standards for general public and occupational exposure. In order to alert people accessing the rooftop, a Guidelines sign and an NOC Information sign are recommended for installation at each access point to the rooftop. Additionally, yellow Caution signs are recommended for installation on the proposed barrier at the Verizon Sector B antennas. These signs must be placed in a conspicuous manner so that they are visible to any person approaching the barrier from any direction.

Barriers are recommended for installation when possible to block access to the areas in front of the antennas that exceed the FCC general public and/or occupational limits. Barriers may consist of rope, chain, or fencing. Painted stripes should only be used as a last resort. Barriers are recommended 15 feet on either side of the Verizon Sector B antennas.

These protocols and recommended control measures have been summarized and included with a graphic representation of the antennas and associated signage and control areas in a RF-EME Site Safety Plan, which is included as Appendix B. Individuals and workers accessing the rooftop should be provided with a copy of the attached Site Safety Plan, made aware of the posted signage and barriers, and signify their understanding of the Site Safety Plan.

To reduce the risk of exposure, EBI recommends that access to areas associated with the active antenna installation be restricted and secured where possible.

Implementation of the signage and barriers recommended in the Site Safety Plan and in this report will bring this site into compliance with the FCC's rules and regulations.

5.0 SUMMARY AND CONCLUSIONS

EBI has prepared a Radiofrequency – Electromagnetic Energy (RF-EME) Compliance Report for telecommunications equipment installed by Verizon Site Number 114383 located at 7600 Maple Avenue in Silver Spring, Maryland to determine worst-case predicted RF-EME exposure levels from wireless communications equipment installed at this site. This report summarizes the results of RF-EME modeling in relation to relevant Federal Communications Commission (FCC) RF-EME compliance standards for limiting human exposure to RF-EME fields.

As presented in the sections above, based on the FCC criteria, the worst-case emitted power density may exceed the FCC's general public limit within approximately 41 feet of Verizon's proposed antennas at the main roof level. Modeling also indicates that the worst-case emitted power density may exceed the FCC's occupational limit within approximately 21 feet of Verizon's proposed antennas at the main roof level.

Workers should be informed about the presence and locations of antennas and their associated fields. Recommended control measures are outlined in Section 4.0 and within the Site Safety Plan (attached); Verizon should also provide procedures to shut down and lockout/tagout this wireless equipment in accordance with Verizon's standard operating protocol. Non-telecom workers who will be working in areas of exceedance are required to contact Verizon since only Verizon has the ability to lockout/tagout the facility, or to authorize others to do so.

6.0 LIMITATIONS

This report was prepared for the use of Verizon Wireless. It was performed in accordance with generally accepted practices of other consultants undertaking similar studies at the same time and in the same locale under like circumstances. The conclusions provided by EBI are based solely on the information provided by the client. The observations in this report are valid on the date of the investigation. Any additional information that becomes available concerning the site should be provided to EBI so that our conclusions may be revised and modified, if necessary. This report has been prepared in accordance with Standard Conditions for Engagement and authorized proposal, both of which are integral parts of this report. No other warranty, expressed or implied, is made.


Appendix A

Certifications

Preparer Certification

I, Jonathan Ilgenfritz, state that:

- I am an employee of EnviroBusiness Inc. (d/b/a EBI Consulting), which provides RF-EME safety and compliance services to the wireless communications industry.
- I have successfully completed RF-EME safety training, and I am aware of the potential hazards from RF-EME and would be classified “occupational” under the FCC regulations.
- I 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 have reviewed the data provided by the client and incorporated it into this Site Compliance Report such that the information contained in this report is true and accurate to the best of my knowledge.



Reviewed and Approved by:



sealed 3jun2020 mike@h2dc.com
H2DC PLLC Md CoA#: 09-50517

Michael A McGuire PE
Electrical Engineer
mike@h2dc.com

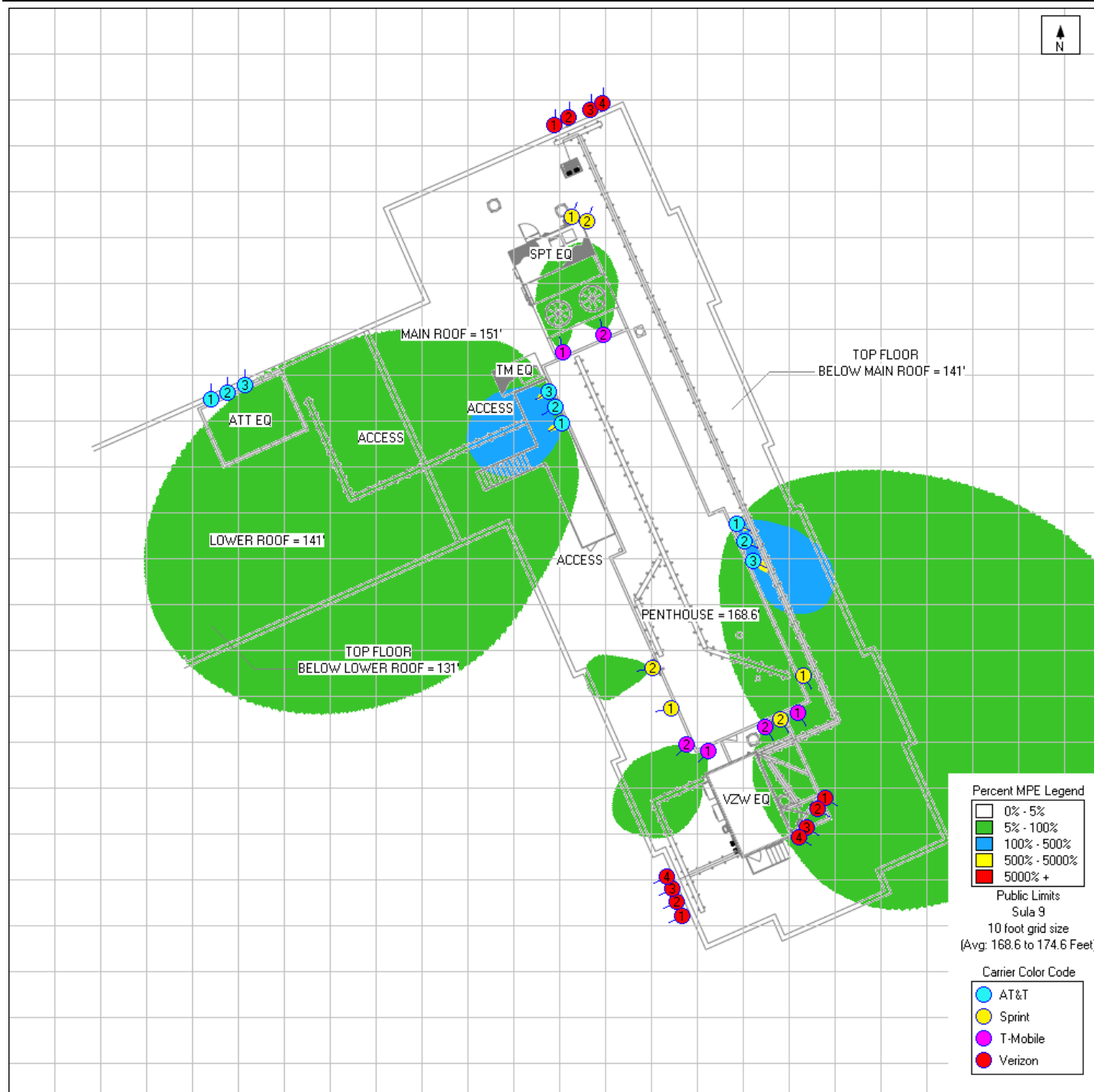
Note that EBI's scope of work is limited to an evaluation of the Radio Frequency – Electromagnetic Energy (RF-EME) field generated by the antennas and broadcast equipment noted in this report. The engineering and design of the structure, as well as the impact of the antennas and broadcast equipment on the structural integrity of the structure, are specifically excluded from EBI's scope of work.

Appendix B

Radio Frequency Electromagnetic Energy

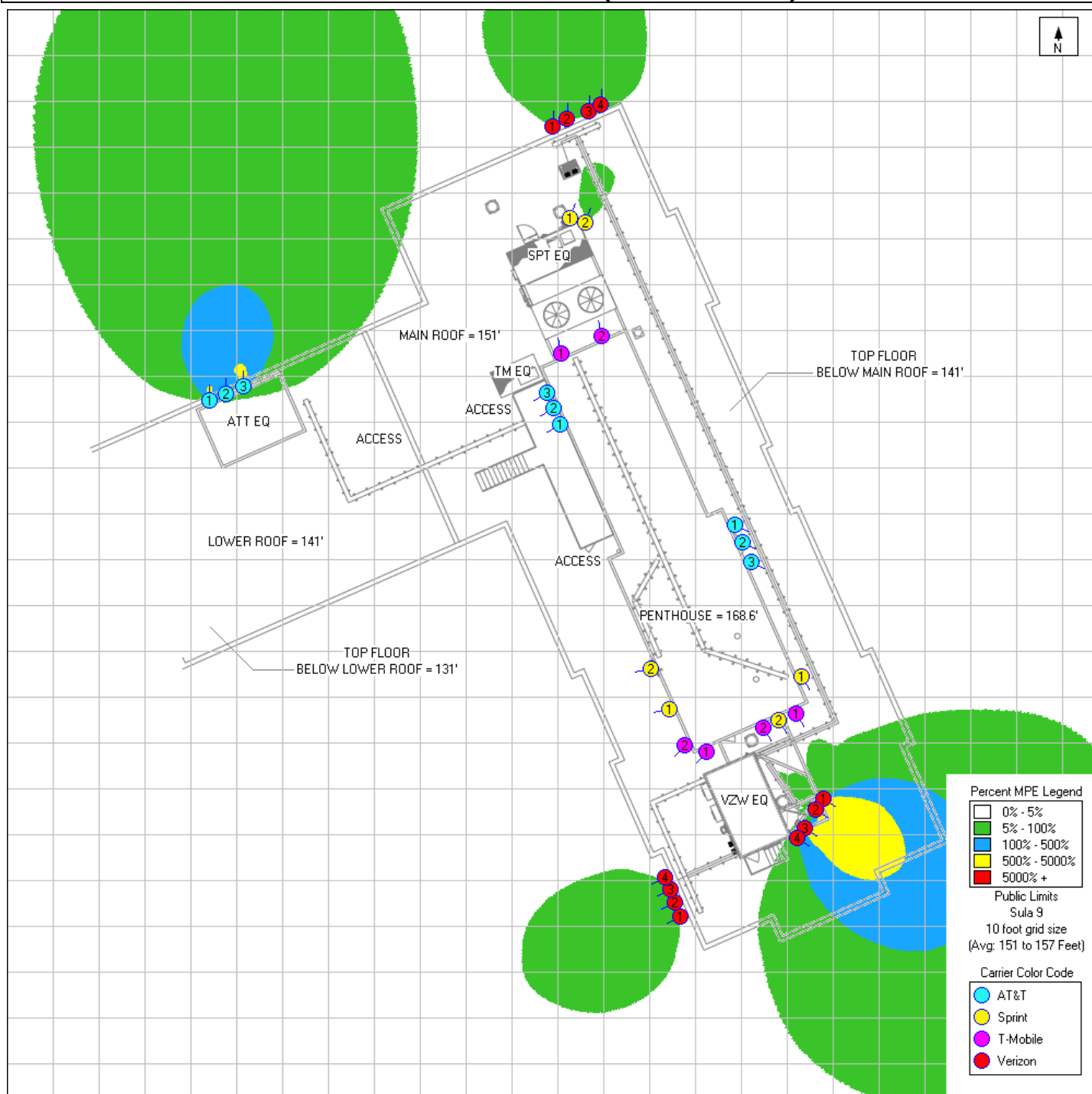
Safety Information and Signage Plans

Penthouse Roof Simulation (168.6 feet AGL)



Max Composite MPE:
771.6% FCC General
Public Limit

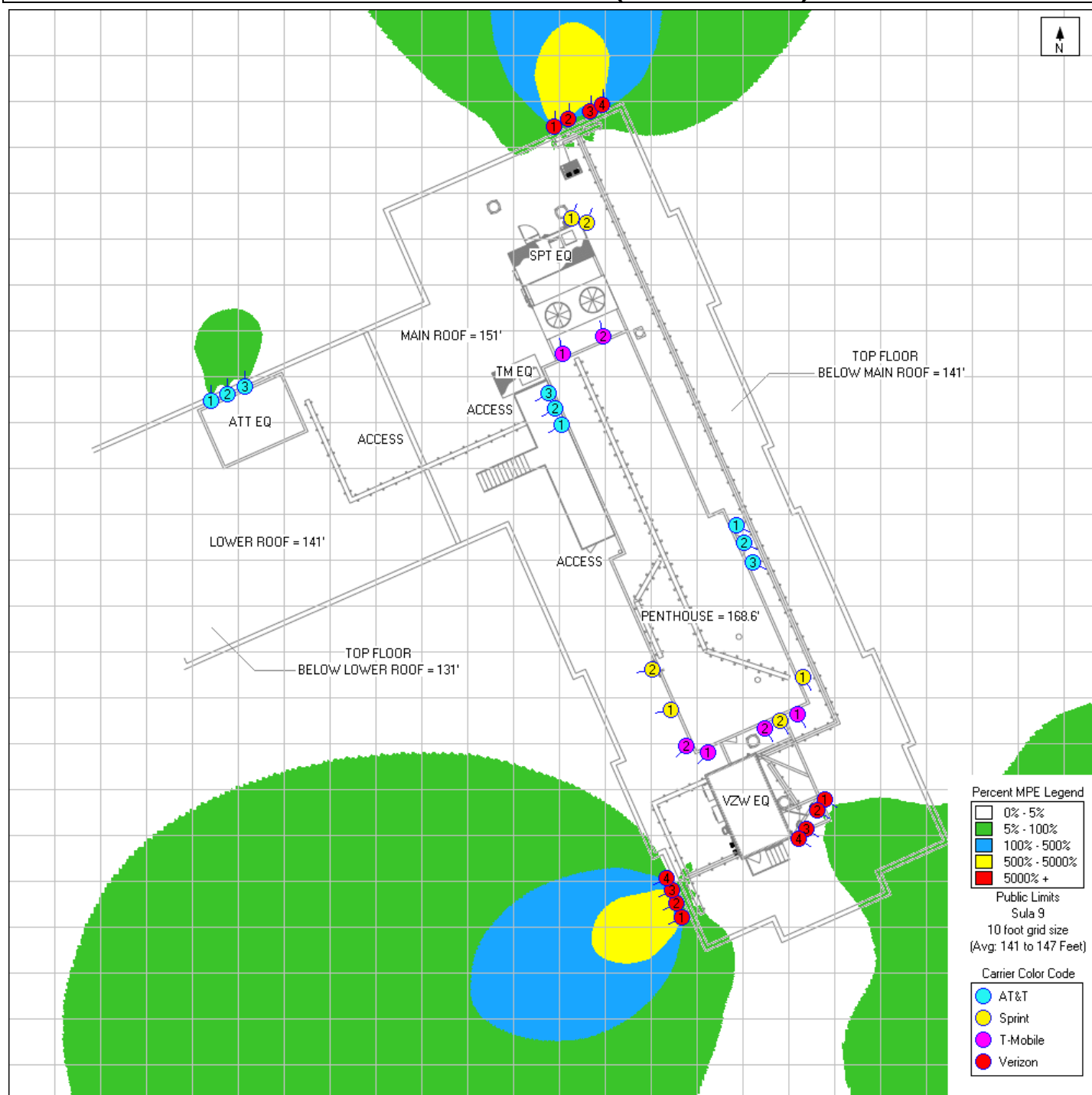
Main Roof Simulation (151 feet AGL)



Max Composite MPE:
2598.6% FCC General
Public Limit

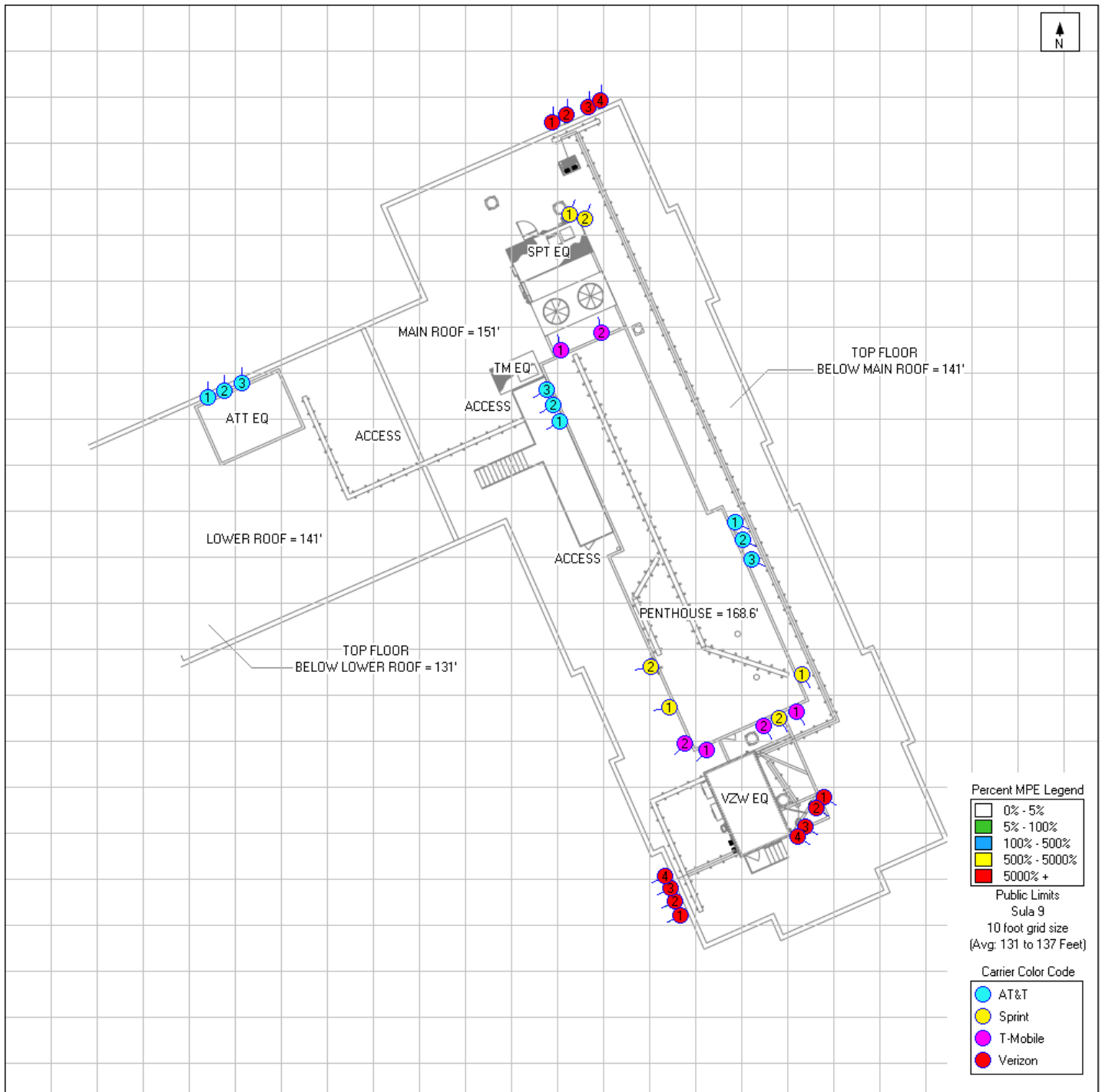
EBI Consulting ♦ 21 B Street ♦ Burlington, MA 01803 ♦ 1.800.786.2346

Lower Roof Simulation (141 feet AGL)



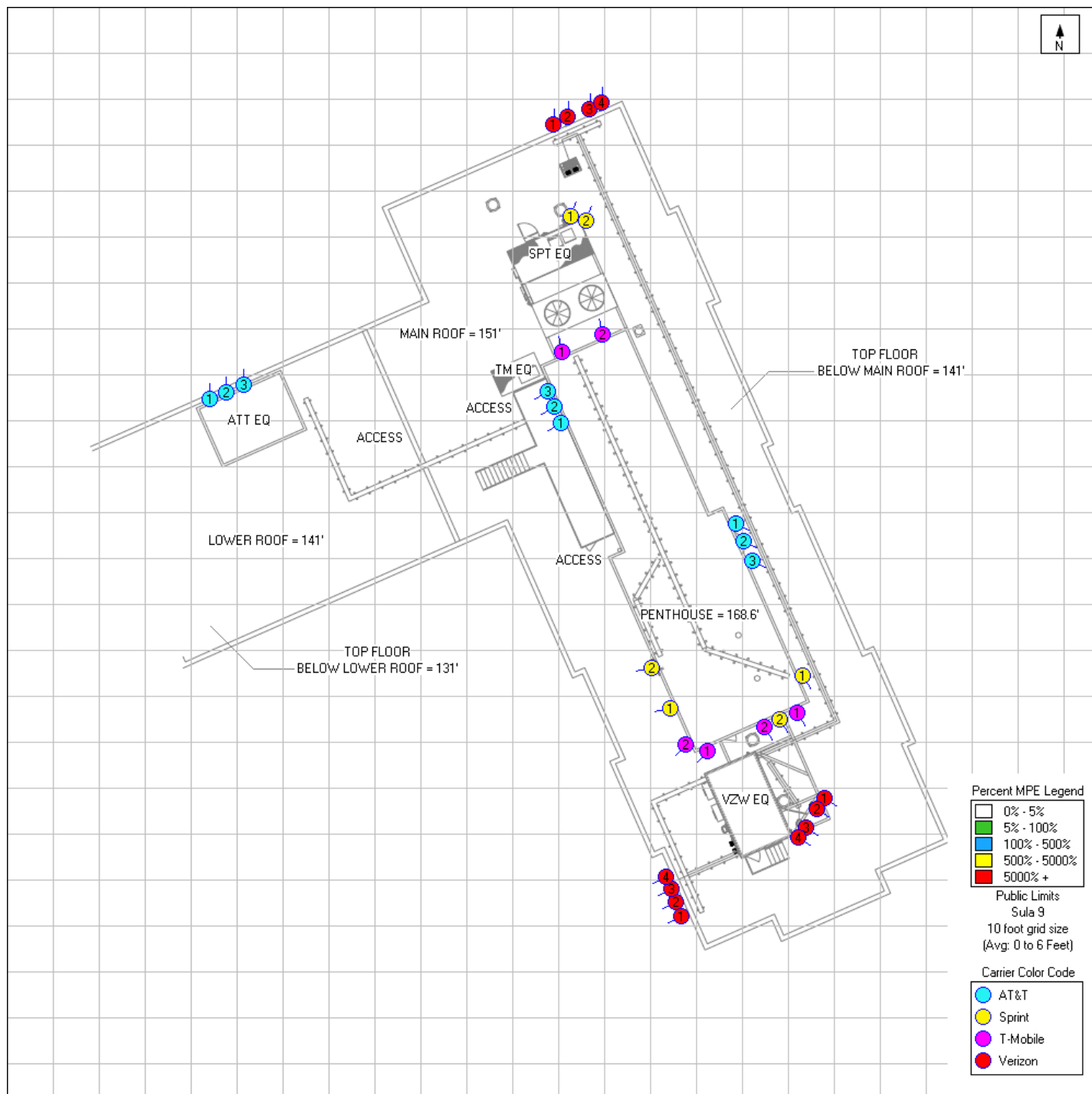
Max Composite MPE:
2526.8% FCC General
Public Limit

Top Floor (Interior Below Lower Roof) Simulation (131 feet AGL)

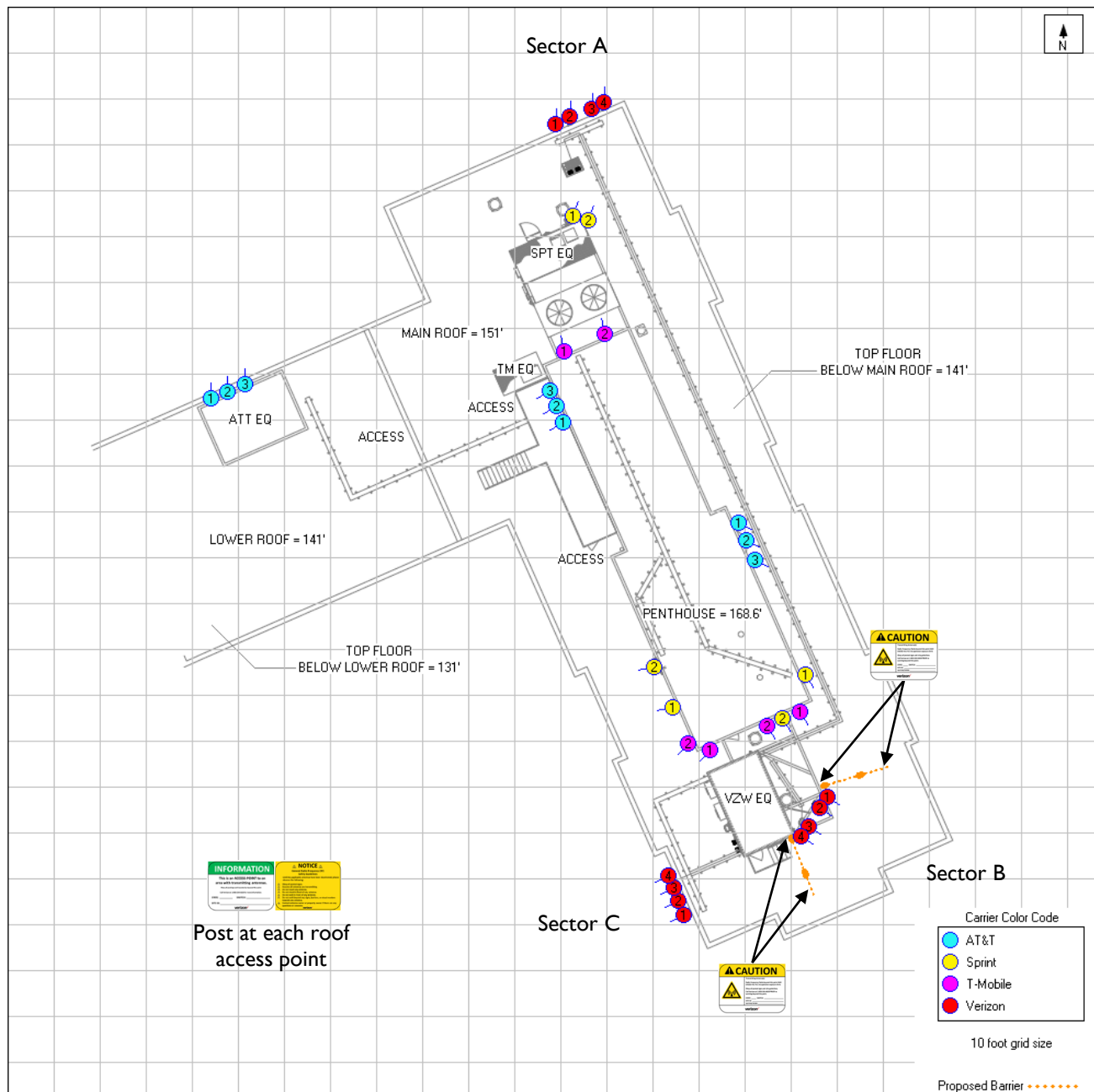





Max Composite MPE:
0.835% FCC General
Public Limit

Ground Level Simulation (0 feet AGL)



Verizon Signage Plan

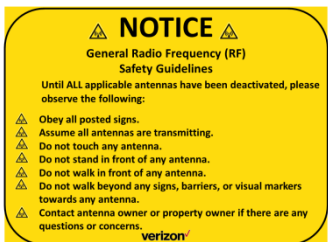






Sign	Posting Instructions	Required Signage / Mitigation
	Securely post at every point of access to the site and on the proposed barrier in a manner conspicuous to all individuals entering thereon as indicated in the signage plan.	3 – on each access point
	Securely post at every point of access to the site.	3 – on each access point
	Securely post on the proposed barrier in a manner conspicuous to all individuals entering thereon as indicated in the signage plan.	4 – on approaching sides of the proposed barrier at Sector B

RF Signage and Safety Information

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	NOTICE	CAUTION	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.	This sign indicates that RF emissions may exceed the FCC Occupational MPE limit.	This sign indicates that RF emissions may exceed at least 10x the FCC Occupational MPE limit.
			

NOC INFORMATION	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.	

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

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

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
<ul style="list-style-type: none"> Utilization of good equipment Enact control of hazard areas Limit exposures Employ medical surveillance and accident response 	<ul style="list-style-type: none"> Employ Lockout/Tag out Utilize personal alarms & protective clothing Prevent access to hazardous locations Develop or operate an administrative control program

Appendix C

Federal Communications Commission (FCC) Requirements

The FCC has established Maximum Permissible Exposure (MPE) limits for human exposure to Radiofrequency Electromagnetic (RF-EME) energy fields, based on exposure limits recommended by the National Council on Radiation Protection and Measurements (NCRP) and, over a wide range of frequencies, the exposure limits developed by the Institute of Electrical and Electronics Engineers, Inc. (IEEE) and adopted by the American National Standards Institute (ANSI) to replace the 1982 ANSI guidelines. Limits for localized absorption are based on recommendations of both ANSI/IEEE and NCRP.

The FCC guidelines incorporate two separate tiers of exposure limits that are based upon occupational/controlled exposure limits (for workers) and general public/uncontrolled exposure limits for members of the general public.

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure 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 public/uncontrolled limits (see below), 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.

General public/uncontrolled exposure limits apply to situations in which the general public may be exposed or in which persons who 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. Therefore, members of the general public would always be considered under this category when exposure is not employment-related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Table I and Figure I (below), which are included within the FCC's OET Bulletin 65, summarize the MPE limits for RF emissions. These limits are designed to provide a substantial margin of safety. They vary by frequency to take into account the different types of equipment that may be in operation at a particular facility and are "time-averaged" limits to reflect different durations resulting from controlled and uncontrolled exposures.

The FCC's MPEs are measured in terms of power (mW) over a unit surface area (cm²). Known as the power density, the FCC has established an occupational MPE of 5 milliwatts per square centimeter (mW/cm²) and an uncontrolled MPE of 1 mW/cm² for equipment operating in the 1900 MHz frequency range. For the Verizon equipment operating at 700 MHz or 850 MHz, the FCC's occupational MPE is 2.83 mW/cm² and an uncontrolled MPE of 0.57 mW/cm². For the Verizon equipment operating at 1900 MHz, the FCC's occupational MPE is 5.0 mW/cm² and an uncontrolled MPE limit of 1.0 mW/cm². These limits are considered protective of these populations.

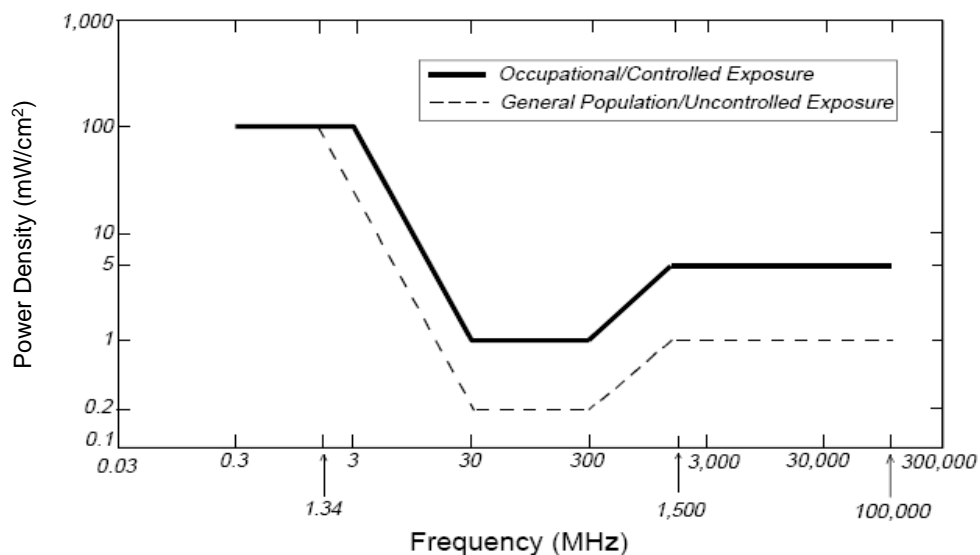
Table 1: Limits for Maximum Permissible Exposure (MPE)				
(A) Limits for Occupational/Controlled Exposure				
Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Time [E] ² , [H] ² , or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f ²)*	6
30-300	61.4	0.163	1.0	6
300-1,500	--	--	f/300	6
1,500-100,000	--	--	5	6
(B) Limits for General Public/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)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f ²)*	30
30-300	27.5	0.073	0.2	30
300-1,500	--	--	f/1,500	30
1,500-100,000	--	--	1.0	30

f = Frequency in (MHz)

* Plane-wave equivalent power density

Figure 1. FCC Limits for Maximum Permissible Exposure (MPE)

Plane-wave Equivalent Power Density



Based on the above, the most restrictive thresholds for exposures of unlimited duration to RF energy for several personal wireless services are summarized below:

Personal Wireless Service	Approximate Frequency	Occupational MPE	Public MPE
Microwave (Point-to-Point)	5,000 - 80,000 MHz	5.00 mW/cm ²	1.00 mW/cm ²
Broadband Radio (BRS)	2,600 MHz	5.00 mW/cm ²	1.00 mW/cm ²
Wireless Communication (WCS)	2,300 MHz	5.00 mW/cm ²	1.00 mW/cm ²
Advanced Wireless (AWS)	2,100 MHz	5.00 mW/cm ²	1.00 mW/cm ²
Personal Communication (PCS)	1,950 MHz	5.00 mW/cm ²	1.00 mW/cm ²
Cellular Telephone	870 MHz	2.90 mW/cm ²	0.58 mW/cm ²
Specialized Mobile Radio (SMR)	855 MHz	2.85 mW/cm ²	0.57 mW/cm ²
Long Term Evolution (LTE)	700 MHz	2.33 mW/cm ²	0.47 mW/cm ²
Most Restrictive Frequency Range	30-300 MHz	1.00 mW/cm ²	0.20 mW/cm ²

MPE limits are designed to provide a substantial margin of safety. These limits apply for continuous exposures and are intended to provide a prudent margin of safety for all persons, regardless of age, gender, size, or health.

Personal Communication (PCS) facilities used by Verizon in this area will potentially operate within a frequency range of 700 to 2100 MHz. Facilities typically consist of: 1) electronic transceivers (the radios or cabinets) connected to wired telephone lines; and 2) antennas that send the wireless signals created by the transceivers to be received by individual subscriber units (PCS telephones). Transceivers are typically connected to antennas by coaxial cables.

Because of the short wavelength of PCS services, the antennas require line-of-site paths for good propagation, and are typically installed above ground level. Antennas are constructed to concentrate energy towards the horizon, with as little energy as possible scattered towards the ground or the sky. This design, combined with the low power of PCS facilities, generally results in no possibility for exposure to approach Maximum Permissible Exposure (MPE) levels, with the exception of areas directly in front of the antennas.

FCC Compliance Requirement

A site is considered out of compliance with FCC regulations if there are areas that exceed the FCC exposure limits and there are no RF hazard mitigation measures in place. Any carrier which has an installation that contributes more than 5% of the applicable MPE must participate in mitigating these RF hazards.