Radio Frequency Exposure
RF Safety and NIER Analysis Report

SITE-SPECIFIC-INFORMATION			
Site Name	**Santee**	**Multi-Licensee Facility** **☒ YES ☐ NO**	
Street Address	**Sycamore Canyon Road**		
City, State, Zip	**Santee, CA, 92071**		
Structure Type	**Monopine**		
Broadcast (AM/FM/TV) Co-Locators	**☐ YES ☒ NO**	**Assessment Purpose**	**NSB**
Total Access Points	**1**	**Total Report Revisions**	
Original Report Date	**03/30/2024**	**Report Revision Date**	
Compliance Status	**☐ COMPLIANT AS DESIGNED** **☐ COMPLIANT PER RF SAFETY PLAN SUBMISSION** **☒MITIGATION IS REQUIRED**		

Site Photo

Table of Contents

1 Certification

This report, prepared by Telecom Technology Services, Inc. for ATLAS Tower, 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, Telecom Technology Services, Inc. certifies that the assumptions are valid, and that the data used within Telecom Technology Services' control are accurate, including information collected as part of Telecom Technology Services' field surveys. Telecom Technology Services, Inc. does not, however, certify the accuracy or correctness of any data provided to Telecom Technology Services, Inc. for this analysis and report by ATLAS Tower or other third parties working on behalf of ATLAS Tower.

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:

SIGNED, 2 APR 2024

Tim Alexander, PE

Digitally signed by Tim Alexander, PE
DN: cn=Tim Alexander, PE, o=Proteus Power Engineering, ou, email=proteuspower@outlook.com, c=US
Date: 2024.04.02 09:35:13 -07'00'

Tim Alexander, P.E.

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

	Preparer	**Reviewer**
Name	Abdelsalam Masoud	Mike Arnold
Title	RF Engineer	Project Manager
Date	03/30/2024	03/30/2024

2 Executive Summary

This report provides the results of an RF power density analysis performed for **ATLAS Tower** at site **Santee** 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 defined by OET Bulletin 65: General Population/ Uncontrolled. Based on the analysis, this site will be **Compliant** with FCC rules and regulations and PTI's Signage and Barrier Policy if the mitigation details provided in Table 1 are implemented.

Final Compliant Configuration							
	GUIDELINES	**NOTICE**	**CAUTION**	**WARNING**	**NOC INFO**	**BARRIER/MARKER**	
Access Point(s)	☒ [1] *	☐ [ ]	☐ [ ]	☐ [ ]	☒ [1] *	☐	
Alpha	☐ [ ]	☐ [ ]	☐ [ ]	☐ [ ]	☐ [ ]	☐	
Beta	☐ [ ]	☐ [ ]	☐ [ ]	☐ [ ]	☐ [ ]	☐	
Gamma	☐ [ ]	☐ [ ]	☐ [ ]	☐ [ ]	☐ [ ]	☐	

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

** These RF signs should be posted on the Access Gate to the site. (See drawing in Section 5.2)*

Specialty Sign Detail

Location	**N/A**
Access Point	**N/A**
Alpha	**N/A**
Beta	**N/A**
Gamma	**N/A**

NOTE: The tables above represent EXISTING compliance items implemented at this location.

Notes/ Additional Compliance Requirements(s):
Mitigation is required per the Signage/ Barrier Diagram.

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 **Solar Panel level** will not exceed the FCC's MPE limit for General Population and Occupational.
- 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 General Population and Occupational.
- The max theoretical % MPE is **100.19%** (FCC General Public) directly in front of the antenna beams at the **Solar Panel** Level.
- NOC and Guidelines Signs need to be posted on the Access Gate to the Site. All access points to these areas need to remain locked at all times.
  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.

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 site and identify any areas of concern that require mitigation. This report also assesses the site'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 RoofMaster® 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:** Santee (ATLAS TOWER)
- **Street Address:** Sycamore Canyon Road
- Santee, CA 92071
- **Latitude:** 32.868385°
- **Longitude:** -117.007695°
- **Structure Type**: Monopine
- **Structure Height**: ± 89' AGL
- **BTS Equipment Location**: The Verizon, T-Mobile and AT&T equipment is located on the Ground Level.

3.2 Site Configuration Being Modeled

- This is a Monopine application where Verizon, T-Mobile, and AT&T antennas are mounted to mounting pipes on the Monopine.
- This is a Three-sector site supporting C-Band at 3700 MHz, CBRS at 3600 MHz, LTE at 700, 850, 1900, 2100 MHz for all Verizon sectors, N2500, L2500, U2100, N2100, L1900, N1900, G1900, N600, L600, L700, and L2100 Band for all T-Mobile sectors, and L700, L2100. FNET, L1900, and U850 Band for all AT&T sectors
- The values of the Verizon's antennas rad center (55') for all sectors, the T-Mobile's antennas rad center for all sectors (65'), and the AT&T's antennas rad center for all sectors (75'), and Solar Panel Height (18') are based on the CDs, RFDS and Google Earth. These values must be verified on the site audit for the post study.
- All LTE technologies were evaluated assuming the maximum number of channels and were running at maximum power 100% of the time.

.

.

4 Predictive Analysis Details

For purposes of this analysis, RoofMaster® 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 RoofMaster®, an MPE predictive analysis tool by Waterford Consultants, LLC.

4.1 Analysis Locations:

Number of Elevations Analyzed: 2

- Solar Panel level
- Ground Level

4.2 Antenna Inventory

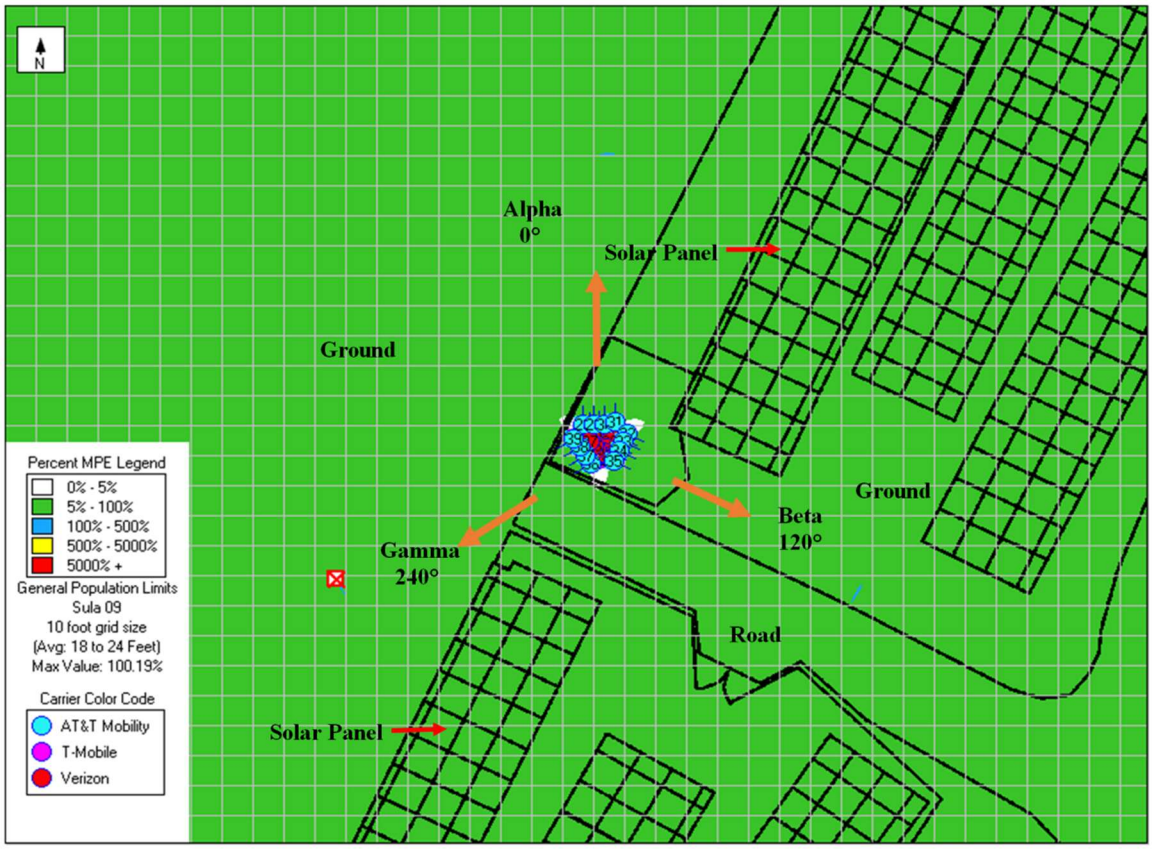
The following table contains the technical data used to simulate the power density that may be encountered with all antennas simultaneously operating at full rated power with the exception of any excluded antennas cited in this document. If co-locator's antennas exist and specific antenna details could not be secured, generic antennas, frequencies, and transmit 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	Total Input Power (Watts)	Total ERP (Watts)	Total EIRP (Watts)	Mfg	Model	Solar Panel Z (ft)	Ground Z (ft)	Type	(ft) Aper	dBd Gain	BWdth	Orientation
AT&T Alpha_Ant1	L700	700	40.0	4	0.5	142.6	2730	4479	JMA	NNH4-65C-R6H4	57	75	Panel	8.0	12.82	75	0
AT&T Alpha_Ant1	L850	850	40.0	4	0.5	142.6	3312	5434	JMA	NNH4-65C-R6H4	57	75	Panel	8.0	13.66	73	0
AT&T Alpha_Ant1	L1900	1900	40.0	4	0.5	142.6	4875	7998	JMA	NNH4-65C-R6H4	57	75	Panel	8.0	15.34	59	0
AT&T Alpha_Ant2	FNET	700	40.0	4	0.5	142.6	2730	4479	JMA	NNH4-65C-R6H4	57	75	Panel	8.0	12.82	75	0
AT&T Alpha_Ant2	L2100	2100	40.0	4	0.5	142.6	4731	7762	JMA	NNH4-65C-R6H4	57	75	Panel	8.0	15.21	61	0
AT&T Alpha_Ant3	DOD	3500	320.0	1	0.0	320.0	70793	116143	ERICSSON	AIR6419	57	75	Panel	2.5	23.45	13	0
AT&T Alpha_Ant4	C-Band	3700	320.0	1	0.0	320.0	70793	116143	ERICSSON	AIR6449	57	75	Panel	2.8	23.45	11.7	0
AT&T Beta_Ant1	L700	700	40.0	4	0.5	142.6	2730	4479	JMA	NNH4-65C-R6H4	57	75	Panel	8.0	12.82	75	120
AT&T Beta_Ant1	L850	850	40.0	4	0.5	142.6	3312	5434	JMA	NNH4-65C-R6H4	57	75	Panel	8.0	13.66	73	120
AT&T Beta_Ant1	L1900	1900	40.0	4	0.5	142.6	4875	7998	JMA	NNH4-65C-R6H4	57	75	Panel	8.0	15.34	59	120
AT&T Beta_Ant2	FNET	700	40.0	4	0.5	142.6	2730	4479	JMA	NNH4-65C-R6H4	57	75	Panel	8.0	12.82	75	120
AT&T Beta_Ant2	L2100	2100	40.0	4	0.5	142.6	4731	7762	JMA	NNH4-65C-R6H4	57	75	Panel	8.0	15.21	61	120
AT&T Beta_Ant3	DOD	3500	320.0	1	0.0	320.0	70793	116143	ERICSSON	AIR6419	57	75	Panel	2.5	23.45	13	120
AT&T Beta_Ant4	C-Band	3700	320.0	1	0.0	320.0	70793	116143	ERICSSON	AIR6449	57	75	Panel	2.8	23.45	11.7	120
AT&T Gamma_Ant1	L700	700	40.0	4	0.5	142.6	2730	4479	JMA	NNH4-65C-R6H4	57	75	Panel	8.0	12.82	75	240
AT&T Gamma_Ant1	L850	850	40.0	4	0.5	142.6	3312	5434	JMA	NNH4-65C-R6H4	57	75	Panel	8.0	13.66	73	240
AT&T Gamma_Ant1	L1900	1900	40.0	4	0.5	142.6	4875	7998	JMA	NNH4-65C-R6H4	57	75	Panel	8.0	15.34	59	240
AT&T Gamma_Ant2	FNET	700	40.0	4	0.5	142.6	2730	4479	JMA	NNH4-65C-R6H4	57	75	Panel	8.0	12.82	75	240
AT&T Gamma_Ant2	L2100	2100	40.0	4	0.5	142.6	4731	7762	JMA	NNH4-65C-R6H4	57	75	Panel	8.0	15.21	61	240
AT&T Gamma_Ant3	DOD	3500	320.0	1	0.0	320.0	70793	116143	ERICSSON	AIR6419	57	75	Panel	2.5	23.45	13	240
AT&T Gamma_Ant4	C-Band	3700	320.0	1	0.0	320.0	70793	116143	ERICSSON	AIR6449	57	75	Panel	2.8	23.45	11.7	240
T-Mobile Alpha_Ant1	L600	600	40.0	2	0.4	73.0	1067	1751	Commscope	FFVV-65B-R3-V1	47	65	Panel	6.0	11.65	64	0
T-Mobile Alpha_Ant1	N600	600	40.0	2	0.4	73.0	1067	1751	Commscope	FFVV-65B-R3-V1	47	65	Panel	6.0	11.65	64	0
T-Mobile Alpha_Ant1	L700	700	40.0	2	0.4	73.0	1104	1811	Commscope	FFVV-65B-R3-V1	47	65	Panel	6.0	11.8	58	0
T-Mobile Alpha_Ant2	L2100	2100	80.0	2	0.5	142.6	5929	9727	Commscope	FFVV-65B-R3-V1	47	65	Panel	6.0	16.19	53	0
T-Mobile Alpha_Ant2	L1900	1900	80.0	2	0.5	142.6	5420	8892	Commscope	FFVV-65B-R3-V1	47	65	Panel	6.0	15.8	62	0
T-Mobile Alpha_Ant2	G1900	1900	80.0	2	0.5	142.6	5420	8892	Commscope	FFVV-65B-R3-V1	47	65	Panel	6.0	15.8	62	0
T-Mobile Alpha_Ant3	U2100	2100	80.0	2	0.5	142.6	5929	9727	Commscope	FFVV-65B-R3-V1	47	65	Panel	6.0	16.19	53	0
T-Mobile Alpha_Ant3	N2100	2100	80.0	2	0.5	142.6	5929	9727	Commscope	FFVV-65B-R3-V1	47	65	Panel	6.0	16.19	53	0
T-Mobile Alpha_Ant3	N1900	1900	80.0	2	0.5	142.6	5420	8892	Commscope	FFVV-65B-R3-V1	47	65	Panel	6.0	15.8	62	0
T-Mobile Alpha_Ant4	L2500	2500	3.75	32	0.5	107.0	2979	4887	NOKIA	AEHC	47	65	Panel	2	14.45	65	0
T-Mobile Alpha_Ant4	N2500	2500	3.75	32	0.5	107.0	2979	4887	NOKIA	AEHC	47	65	Panel	2	14.45	65	0
T-Mobile Beta_Ant1	L600	600	40.0	2	0.4	73.0	1067	1751	Commscope	FFVV-65B-R3-V1	47	65	Panel	6.0	11.65	64	120
T-Mobile Beta_Ant1	N600	600	40.0	2	0.4	73.0	1067	1751	Commscope	FFVV-65B-R3-V1	47	65	Panel	6.0	11.65	64	120
T-Mobile Beta_Ant1	L700	700	40.0	2	0.4	73.0	1104	1811	Commscope	FFVV-65B-R3-V1	47	65	Panel	6.0	11.8	58	120
T-Mobile Beta_Ant2	L2100	2100	80.0	2	0.5	142.6	5929	9727	Commscope	FFVV-65B-R3-V1	47	65	Panel	6.0	16.19	53	120
T-Mobile Beta_Ant2	L1900	1900	80.0	2	0.5	142.6	5420	8892	Commscope	FFVV-65B-R3-V1	47	65	Panel	6.0	15.8	62	120
T-Mobile Beta_Ant2	G1900	1900	80.0	2	0.5	142.6	5420	8892	Commscope	FFVV-65B-R3-V1	47	65	Panel	6.0	15.8	62	120
T-Mobile Beta_Ant3	U2100	2100	80.0	2	0.5	142.6	5929	9727	Commscope	FFVV-65B-R3-V1	47	65	Panel	6.0	16.19	53	120
T-Mobile Beta_Ant3	N2100	2100	80.0	2	0.5	142.6	5929	9727	Commscope	FFVV-65B-R3-V1	47	65	Panel	6.0	16.19	53	120
T-Mobile Beta_Ant3	N1900	1900	80.0	2	0.5	142.6	5420	8892	Commscope	FFVV-65B-R3-V1	47	65	Panel	6.0	15.8	62	120
T-Mobile Beta_Ant4	L2500	2500	3.75	32	0.5	107.0	2979	4887	NOKIA	AEHC	47	65	Panel	2	14.45	65	120
T-Mobile Beta_Ant4	N2500	2500	3.75	32	0.5	107.0	2979	4887	NOKIA	AEHC	47	65	Panel	2	14.45	65	120
T-Mobile Gamma_Ant1	L600	600	40.0	2	0.4	73.0	1067	1751	Commscope	FFVV-65B-R3-V1	47	65	Panel	6.0	11.65	64	240
T-Mobile Gamma_Ant1	N600	600	40.0	2	0.4	73.0	1067	1751	Commscope	FFVV-65B-R3-V1	47	65	Panel	6.0	11.65	64	240
T-Mobile Gamma_Ant1	L700	700	40.0	2	0.4	73.0	1104	1811	Commscope	FFVV-65B-R3-V1	47	65	Panel	6.0	11.8	58	240
T-Mobile Gamma_Ant2	L2100	2100	80.0	2	0.5	142.6	5929	9727	Commscope	FFVV-65B-R3-V1	47	65	Panel	6.0	16.19	53	240
T-Mobile Gamma_Ant2	L1900	1900	80.0	2	0.5	142.6	5420	8892	Commscope	FFVV-65B-R3-V1	47	65	Panel	6.0	15.8	62	240
T-Mobile Gamma_Ant2	G1900	1900	80.0	2	0.5	142.6	5420	8892	Commscope	FFVV-65B-R3-V1	47	65	Panel	6.0	15.8	62	240
T-Mobile Gamma_Ant3	U2100	2100	80.0	2	0.5	142.6	5929	9727	Commscope	FFVV-65B-R3-V1	47	65	Panel	6.0	16.19	53	240
T-Mobile Gamma_Ant3	N2100	2100	80.0	2	0.5	142.6	5929	9727	Commscope	FFVV-65B-R3-V1	47	65	Panel	6.0	16.19	53	240
T-Mobile Gamma_Ant3	N1900	1900	80.0	2	0.5	142.6	5420	8892	Commscope	FFVV-65B-R3-V1	47	65	Panel	6.0	15.8	62	240
T-Mobile Gamma_Ant4	L2500	2500	3.75	32	0.5	107.0	2979	4887	NOKIA	AEHC	47	65	Panel	2	14.45	65	240
T-Mobile Gamma_Ant4	N2500	2500	3.75	32	0.5	107.0	2979	4887	NOKIA	AEHC	47	65	Panel	2	14.45	65	240
VZW Alpha_Ant 1	L700	700	60.0	4	0.5	213.9	3178.0	5213.8	Commscope	SON NNH4SS-65B-R3BT8	37	55	Panel	6	11.72	73	0
VZW Alpha_Ant 1	L850	850	60.0	4	0.5	213.9	4066	6670.6	Commscope	SON NNH4SS-65B-R3BT8	37	55	Panel	6	12.79	62	0
VZW Alpha_Ant 1	L1900	1900	80.0	4	0.5	285.2	8453.05	13868.0	Commscope	SON NNH4SS-65B-R3BT8	37	55	Panel	6	14.72	65	0
VZW Alpha_Ant 1	L2100	2100	40.0	4	0.5	142.6	4897.01	8034.0	Commscope	SON NNH4SS-65B-R3BT8	37	55	Panel	6	15.36	62	0
VZW Alpha_Ant 1	L2100_3	2100	40.0	4	0.5	142.6	4897.01	8034.0	Commscope	SON NNH4SS-65B-R3BT8	37	55	Panel	6	15.36	62	0
VZW Alpha_Ant 2	Spare	Spare	0.0	0	0.0	0.0	0	0.00	Commscope	SON SBNH-1D6565B	37	55	Panel	6	13.07	67	0
VZW Alpha_Ant 3	C-Band	3700	5.0	64	0.0	320.0	70793.44	116143.00	ERICSSON	SON AIR6419	37	55	Panel	2.4	23.45	11	0
VZW Alpha_Ant 4	CBRS	3600	5.0	4	0.0	20.0	2870.91	4710.0	ERICSSON	SON KRE105281	37	55	Switched Beam	0.7	9.53	64	0
VZW Beta_Ant 1	L700	700	60.0	4	0.5	213.9	3178	5213.79	Commscope	SON NNH4SS-65B-R3BT8	37	55	Panel	6	11.72	73	120
VZW Beta_Ant 1	L850	850	60.0	4	0.5	213.9	4066	6670.63	Commscope	SON NNH4SS-65B-R3BT8	37	55	Panel	6	12.79	62	120
VZW Beta_Ant 1	L1900	1900	80.0	4	0.5	285.2	8453.05	13868	Commscope	SON NNH4SS-65B-R3BT8	37	55	Panel	6	14.72	65	120
VZW Beta_Ant 1	L2100	2100	40.0	4	0.5	142.6	4897.01	8034	Commscope	SON NNH4SS-65B-R3BT8	37	55	Panel	6	15.36	62	120
VZW Beta_Ant 1	L2100_3	2100	40.0	4	0.5	142.6	4897.01	8034	Commscope	SON NNH4SS-65B-R3BT8	37	55	Panel	6	15.36	62	120
VZW Beta_Ant 2	Spare	Spare	0.0	0	0.0	0.0	0	0	Commscope	SON SBNH-1D6565B	37	55	Panel	6	13.07	67	120
VZW Beta_Ant 3	C-Band	3700	5.0	64	0.0	320.0	70793.44	116143	ERICSSON	SON AIR6419	37	55	Panel	2.4	23.45	11	120
VZW Beta_Ant 4	CBRS	3600	5.0	4	0.0	20.0	2870.91	4710	ERICSSON	SON KRE105281	37	55	Switched Beam	0.7	9.53	64	120
VZW Gamma_Ant 1	L700	700	60.0	4	0.5	213.9	3178	5213.79	Commscope	SON NNH4SS-65B-R3BT8	37	55	Panel	6	11.72	73	240
VZW Gamma_Ant 1	L850	850	60.0	4	0.5	213.9	4066	6670.63	Commscope	SON NNH4SS-65B-R3BT8	37	55	Panel	6	12.79	62	240
VZW Gamma_Ant 1	L1900	1900	80.0	4	0.5	285.2	8453.05	13868	Commscope	SON NNH4SS-65B-R3BT8	37	55	Panel	6	14.72	65	240
VZW Gamma_Ant 1	L2100	2100	40.0	4	0.5	142.6	4897.01	8034	Commscope	SON NNH4SS-65B-R3BT8	37	55	Panel	6	15.36	62	240
VZW Gamma_Ant 1	L2100_3	2100	40.0	4	0.5	142.6	4897.01	8034	Commscope	SON NNH4SS-65B-R3BT8	37	55	Panel	6	15.36	62	240
VZW Gamma_Ant 2	Spare	Spare	0.0	0	0.0	0.0	0	0	Commscope	SON SBNH-1D6565B	37	55	Panel	6	13.07	67	240
VZW Gamma_Ant 3	C-Band	3700	5.0	64	0.0	320.0	70793.44	116143	ERICSSON	SON AIR6419	37	55	Panel	2.4	23.45	11	240
VZW Gamma_Ant 4	CBRS	3600	5.0	4	0.0	20.0	2870.91	4710	ERICSSON	SON KRE105281	37	55	Switched Beam	0.7	9.53	64	240

The antenna Z-heights listed above are referenced to Top of the Solar Panel and Ground levels.

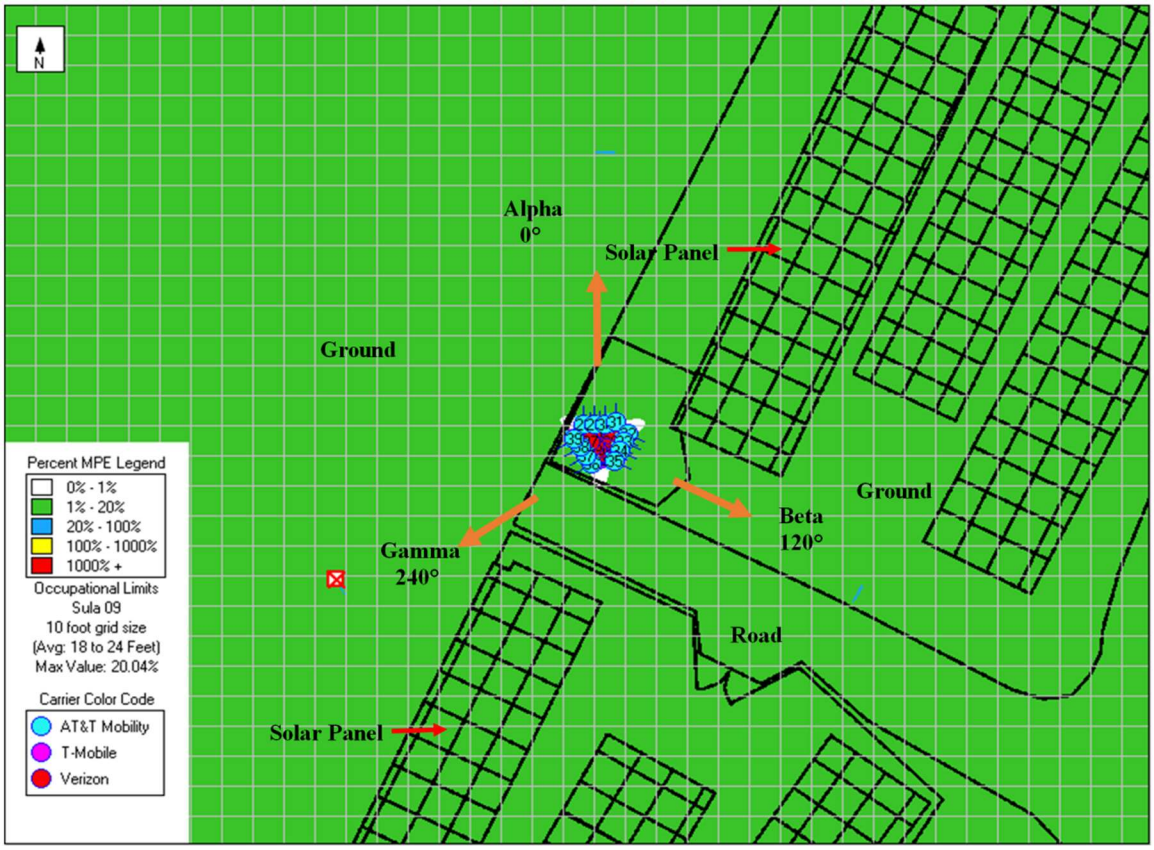
4.3 RF Emissions Diagram(s) - All Transmitters

Reference Plane: Solar Panel level



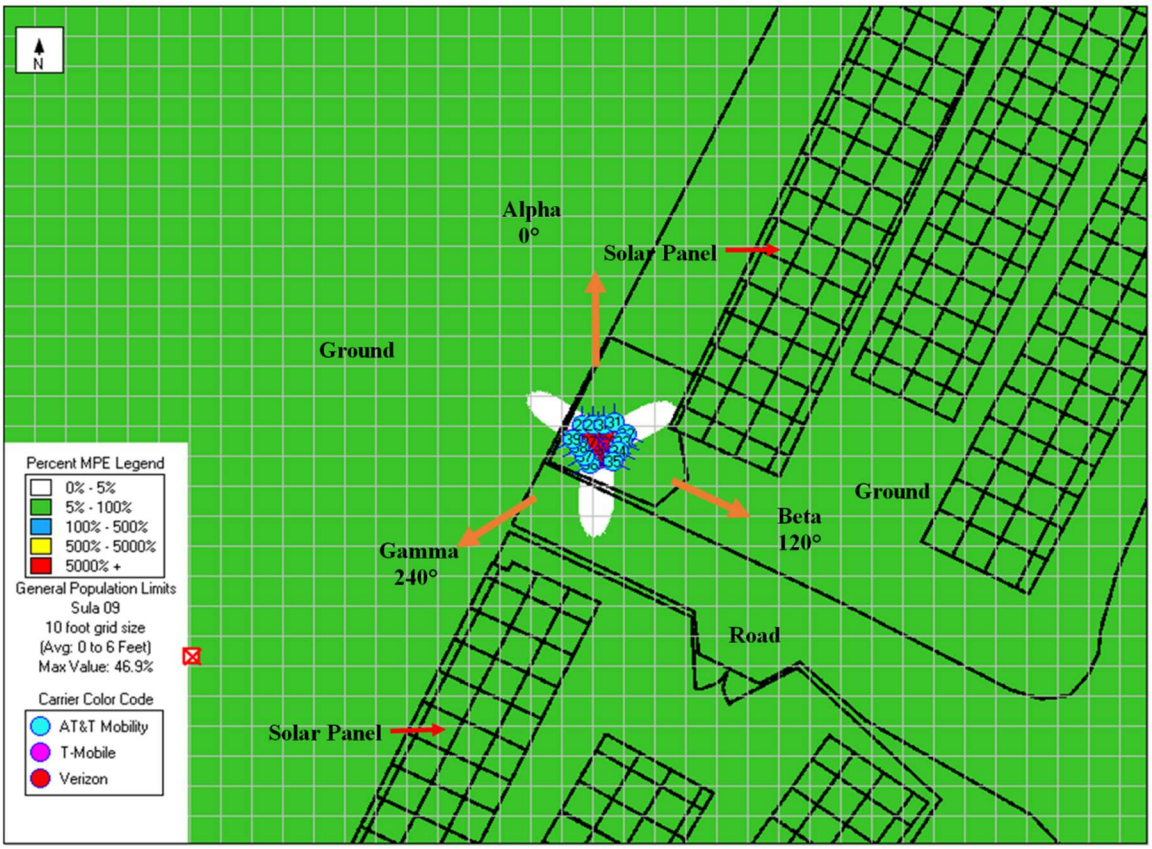
The maximum theoretical % MPE of the General Population limits =100.19%

Reference Plane: Solar Panel level



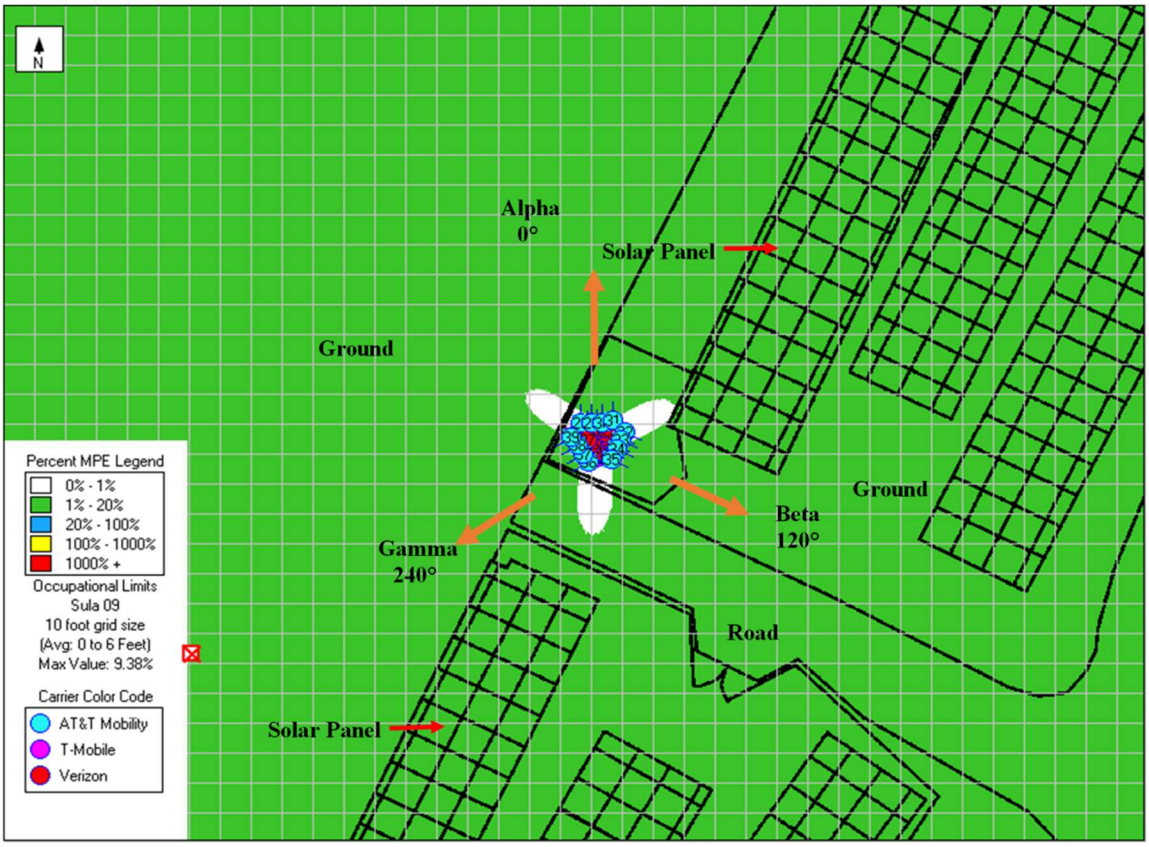
The maximum theoretical % MPE of the Occupational limits =20.04%

Reference Plane: Ground level



The maximum theoretical % MPE of the General Population limits =46.9%

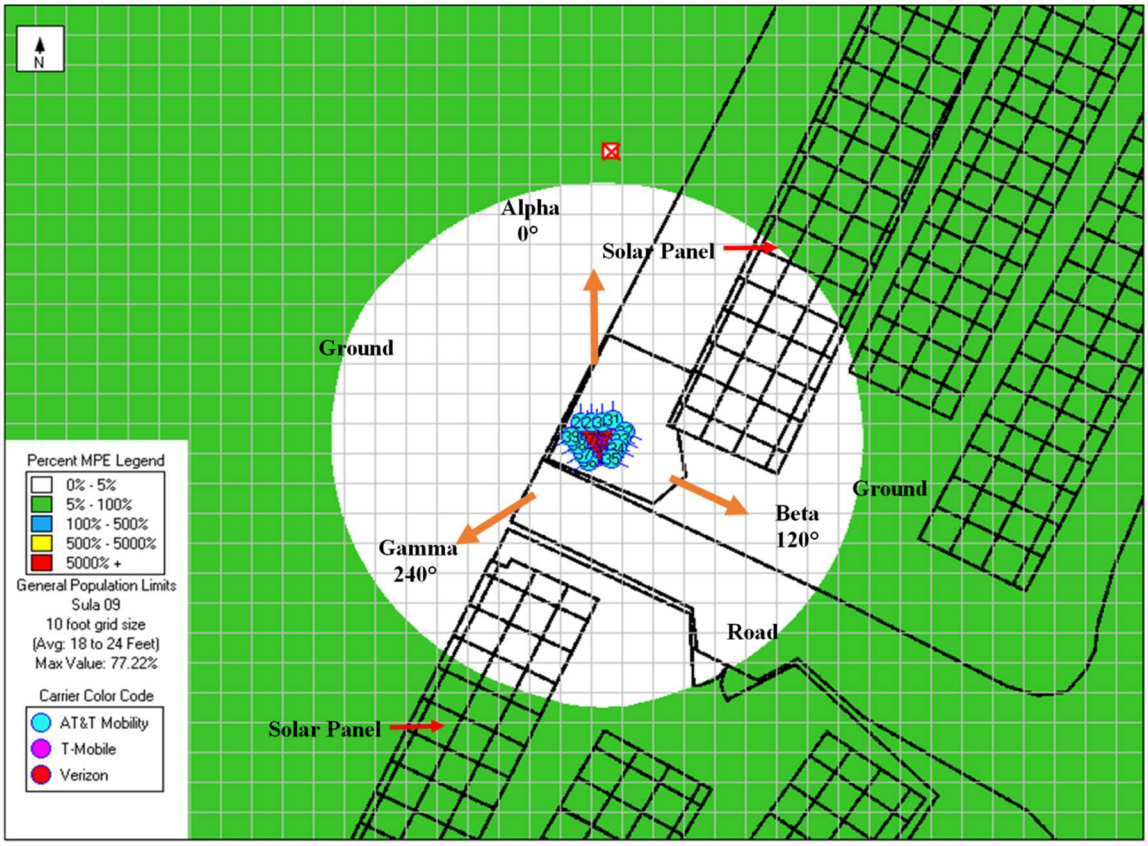
Reference Plane: Ground level



The maximum theoretical % MPE of the Occupational limits =9.38%

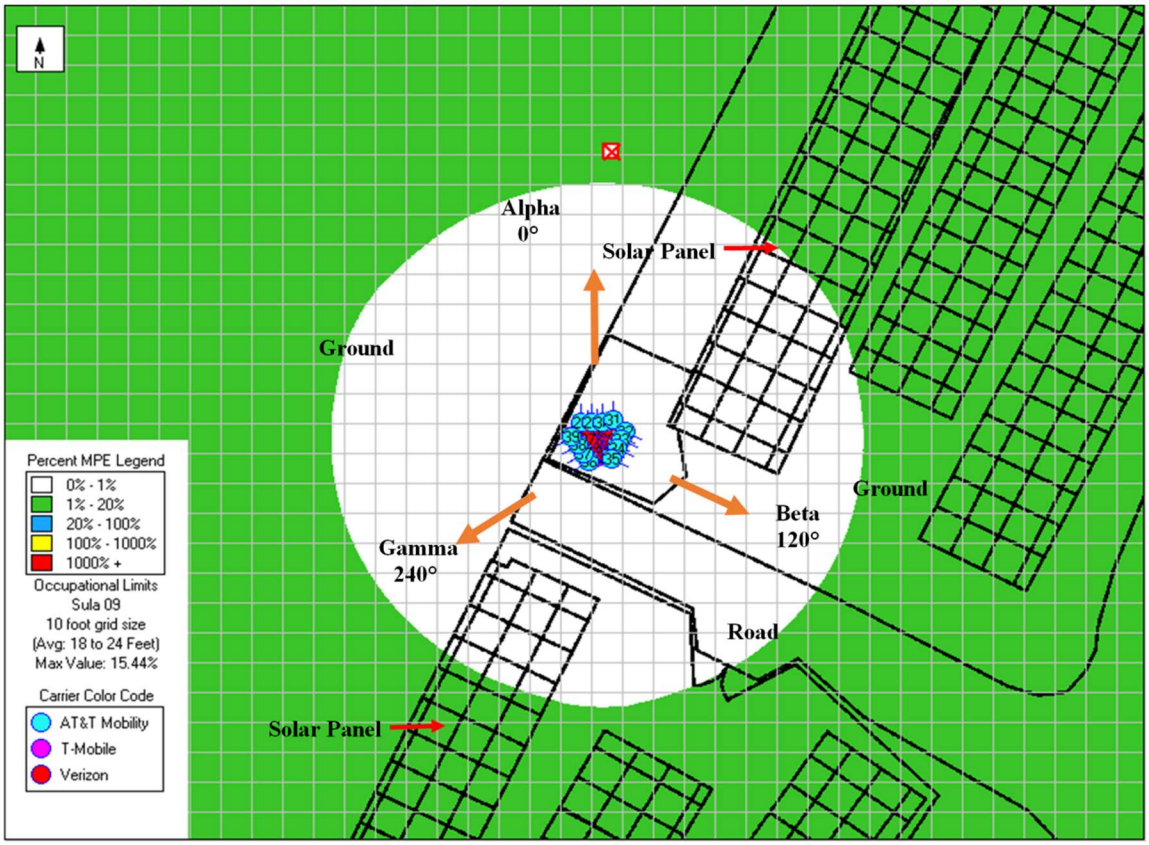
4.4 RF Emissions Diagram(s) - VZW Transmitters *Only*

Reference Plane: Solar Panel level



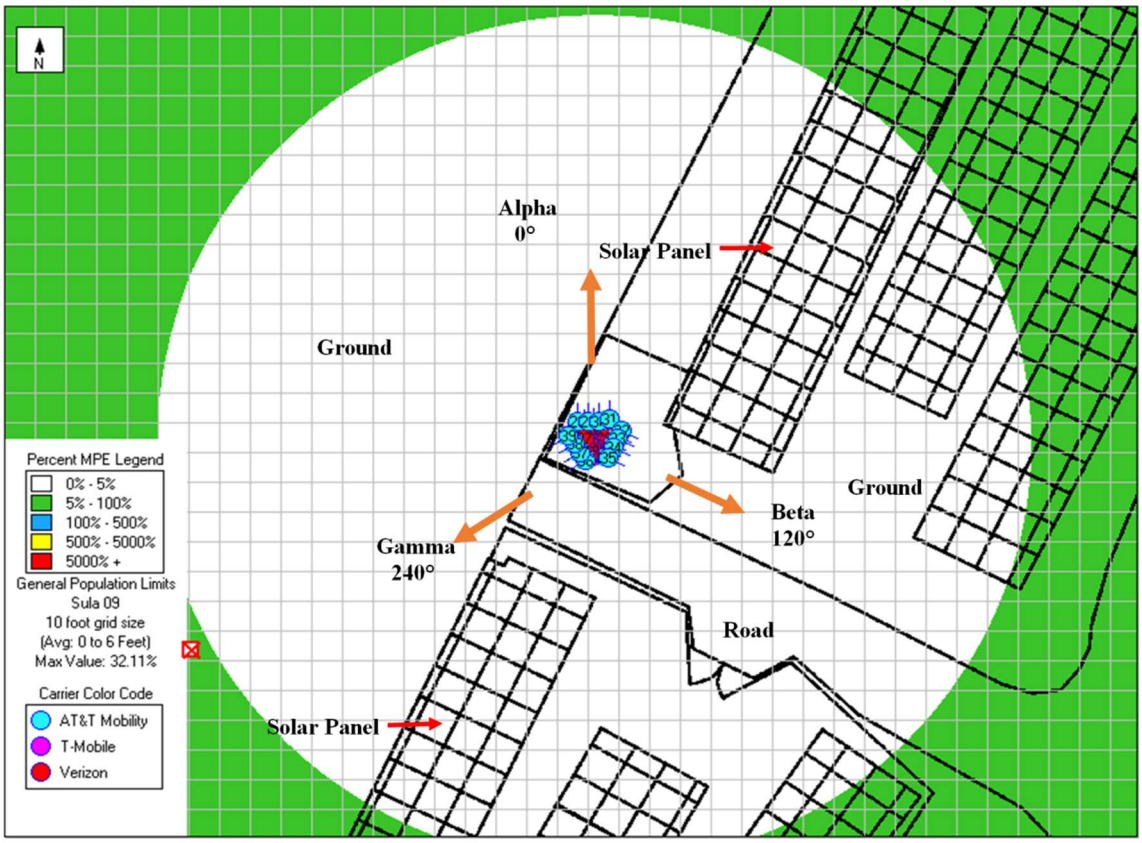
The maximum theoretical % MPE of the General Population limits =77.22%

Reference Plane: Solar Panel level



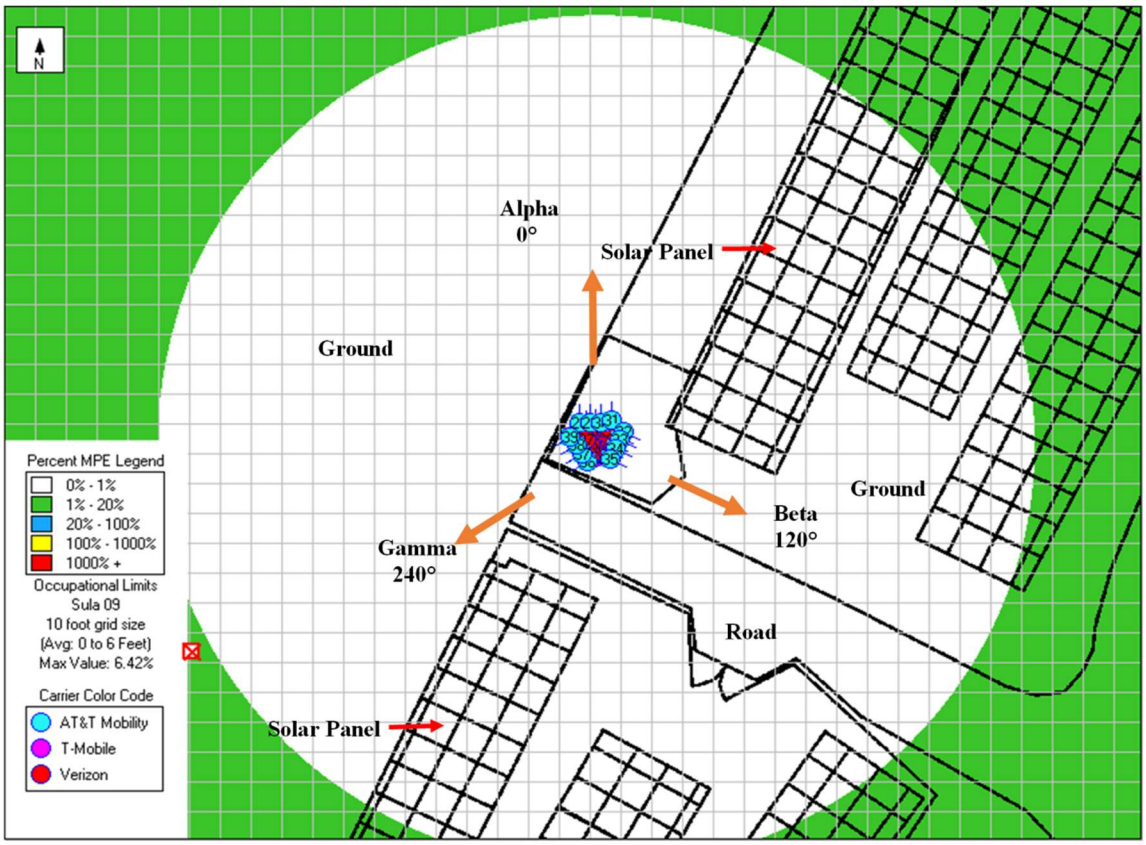
The maximum theoretical % MPE of the Occupational limits =15.44%

Reference Plane: Ground level



The maximum theoretical % MPE of the General Population limits =32.11%

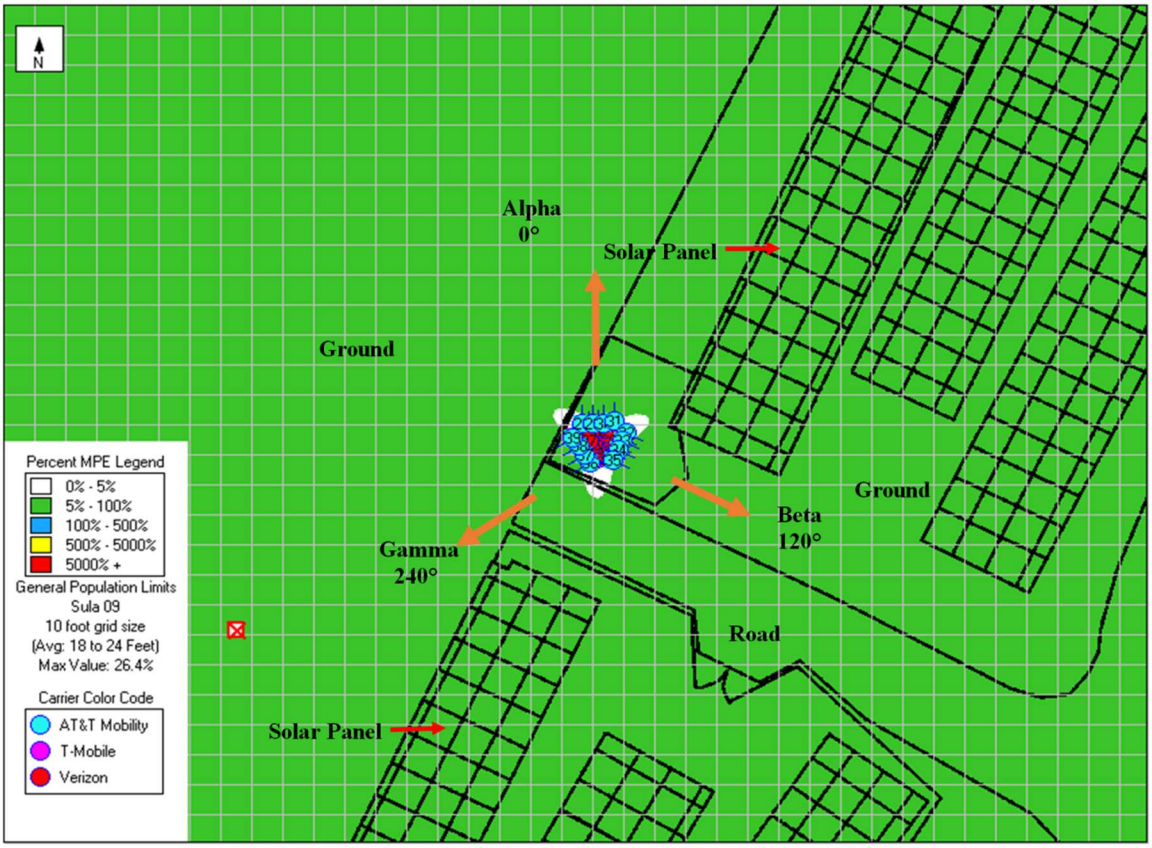
Reference Plane: Ground level



The maximum theoretical % MPE of the Occupational limits =6.42%

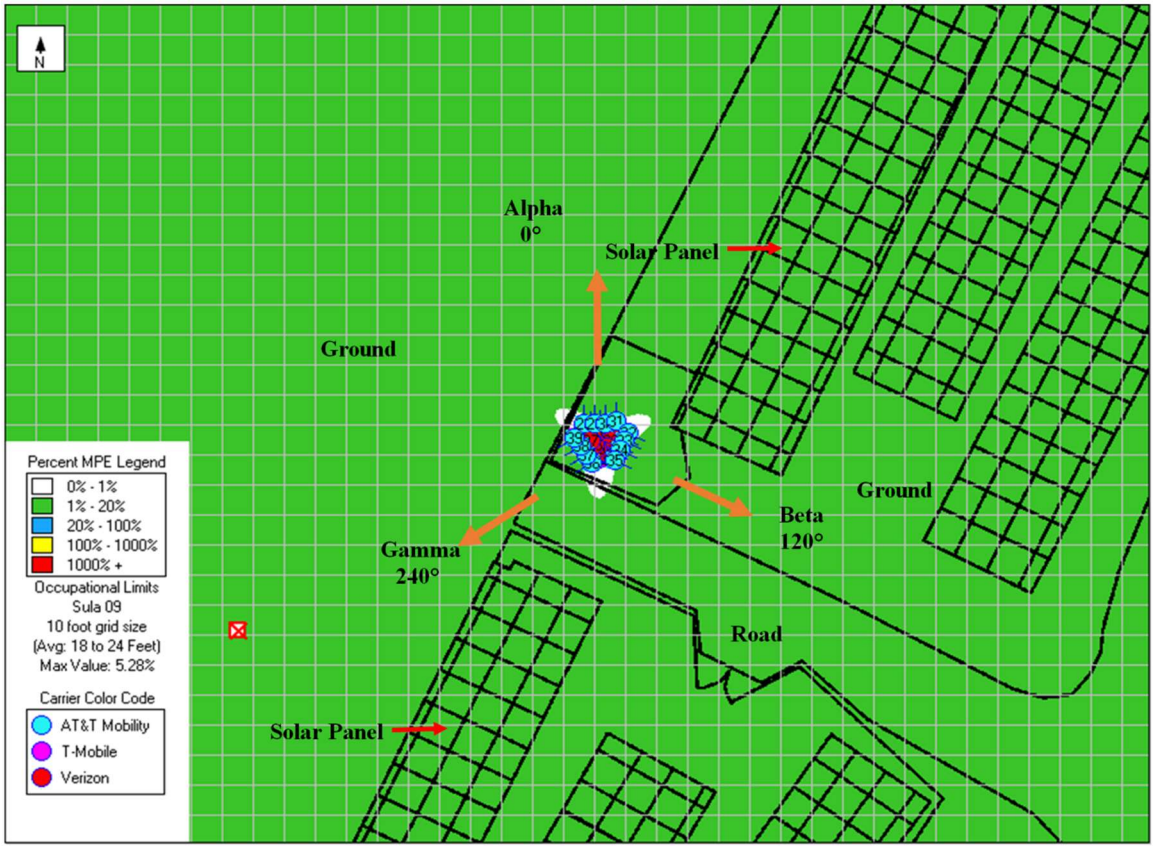
4.5 RF Emissions Diagram(s) – AT&T Transmitters *Only*

Reference Plane: Solar Panel level



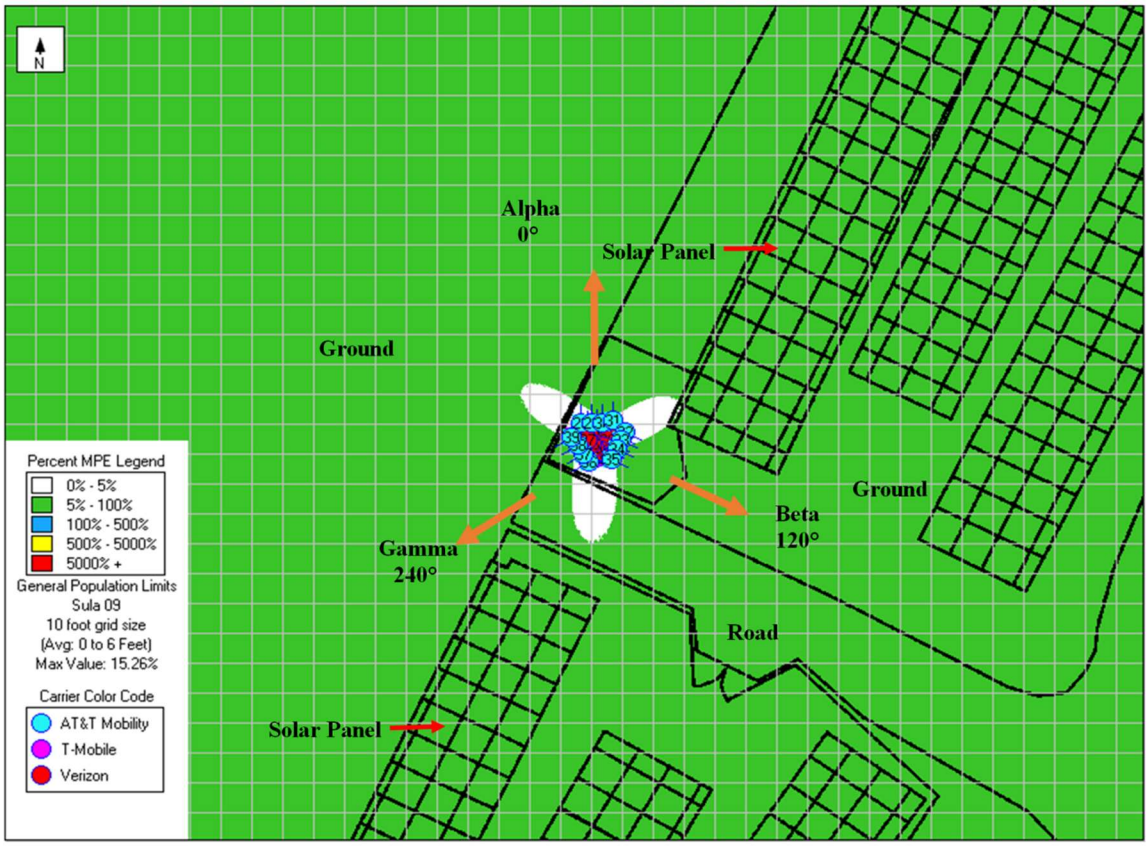
The maximum theoretical % MPE of the General Population limits =26.4%

Reference Plane: Solar Panel level



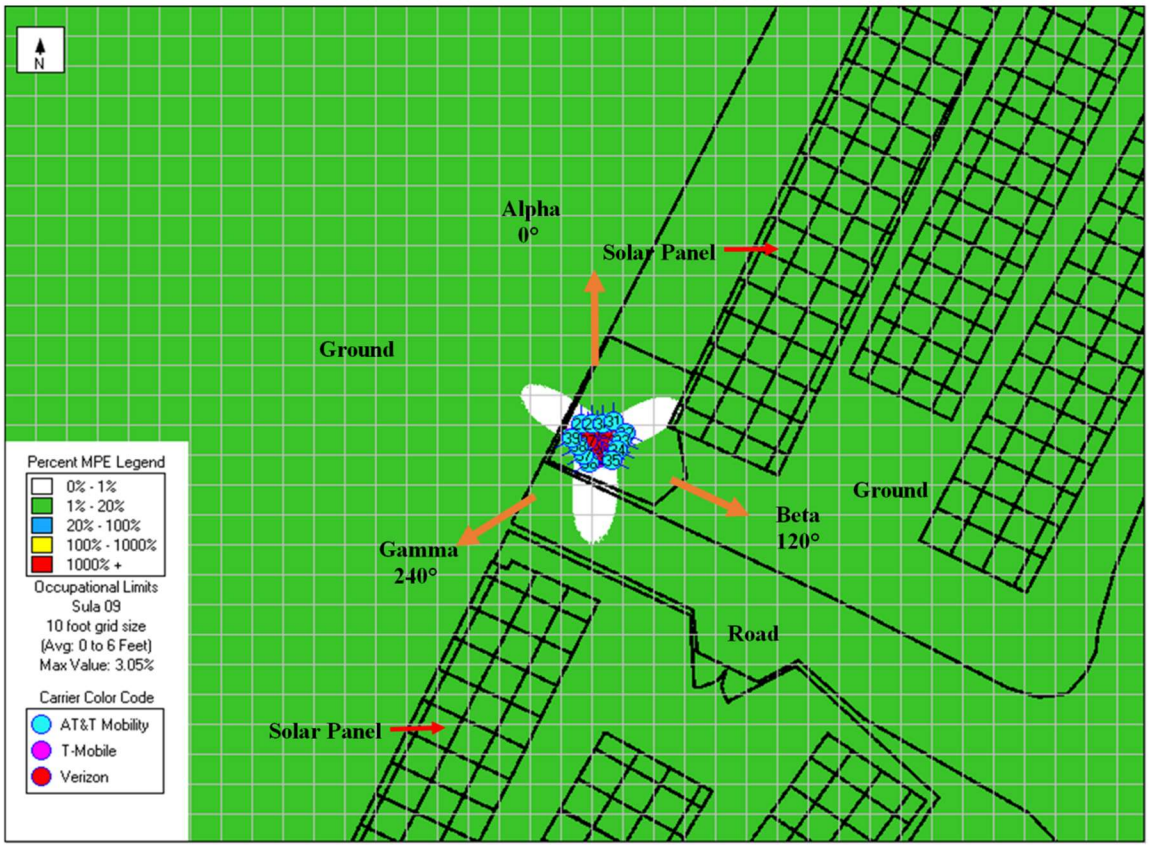
The maximum theoretical % MPE of the Occupational limits =5.28%

Reference Plane: Ground level



The maximum theoretical % MPE of the General Population limits =15.26%

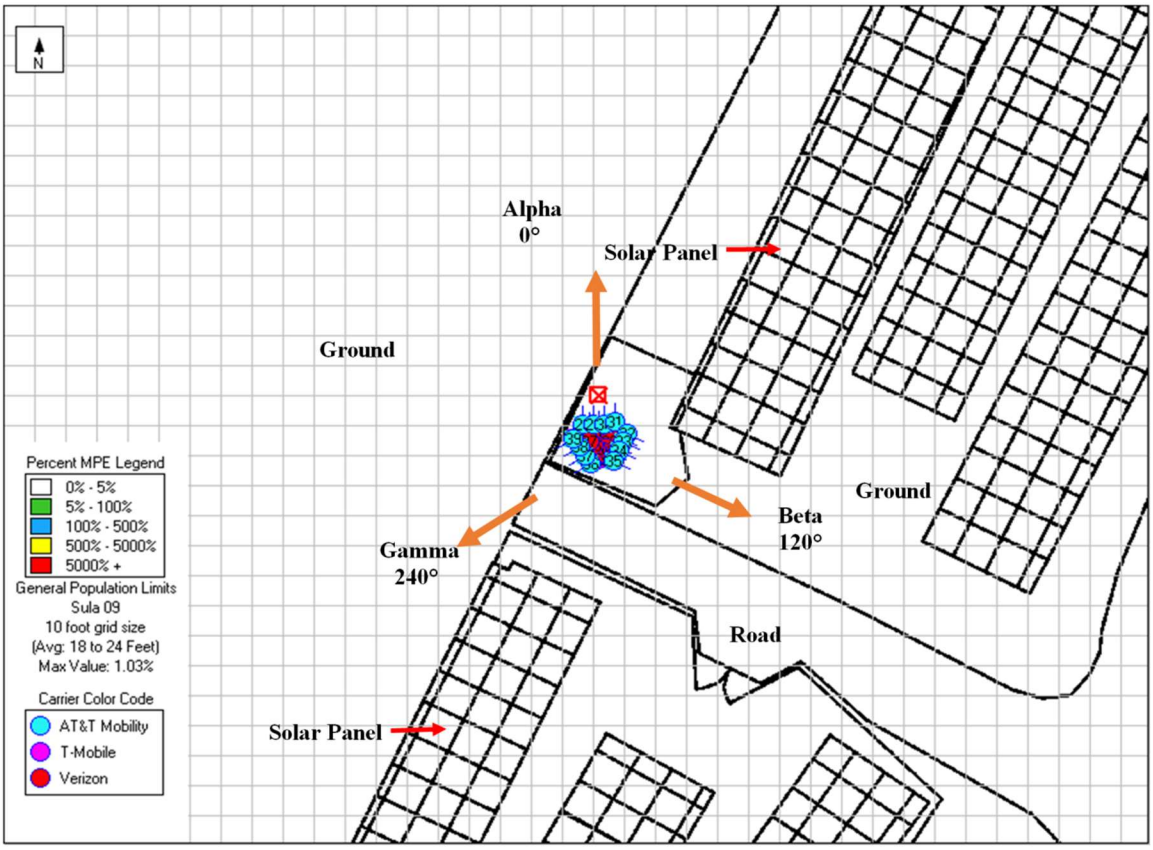
Reference Plane: Ground level



The maximum theoretical % MPE of the Occupational limits =3.05%

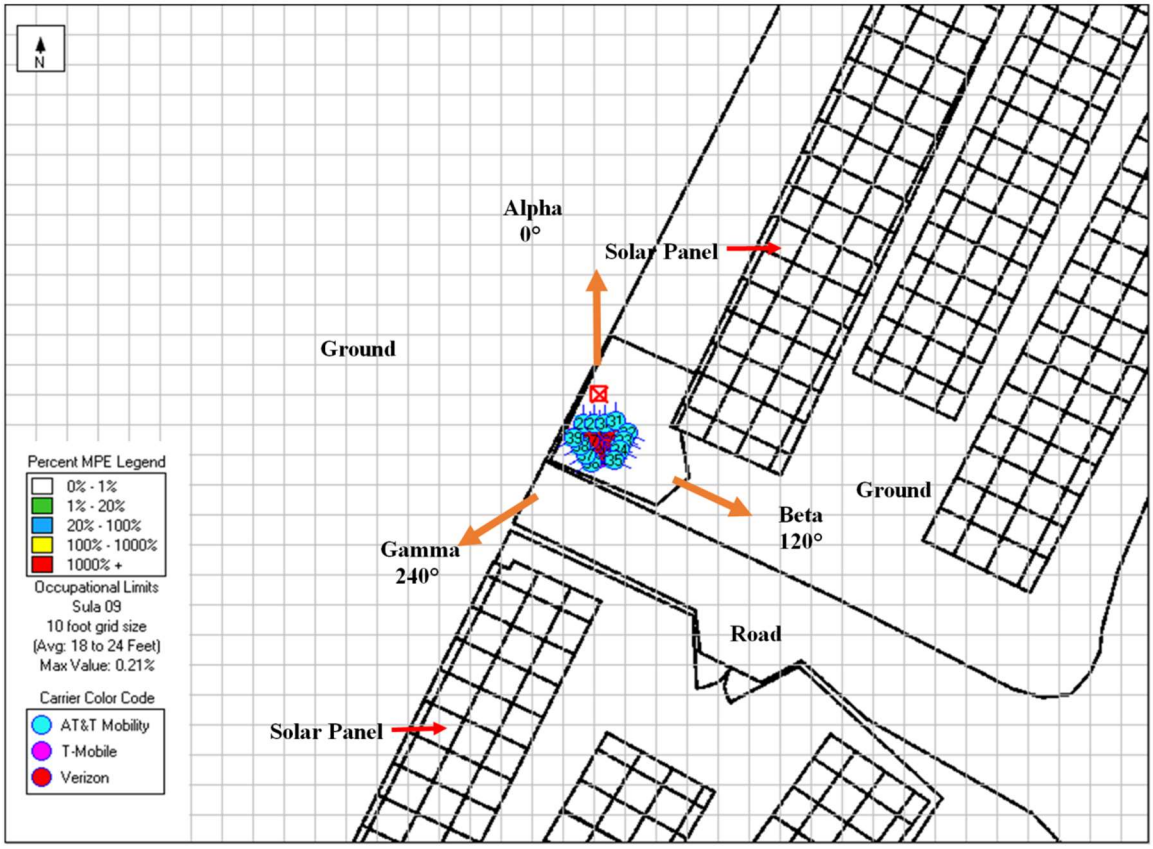
4.6 RF Emissions Diagram(s) – T-Mobile Transmitters *Only*

Reference Plane: Solar Panel level



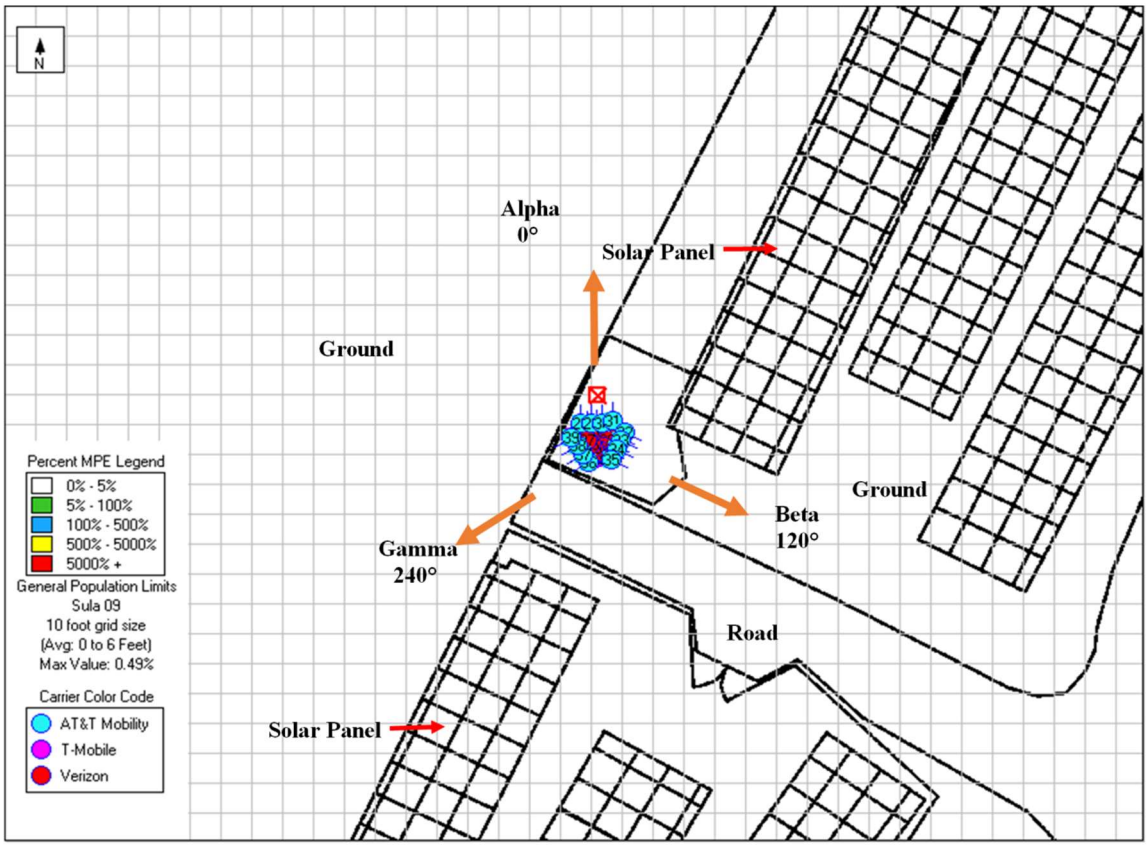
The maximum theoretical % MPE of the General Population limits =1.03%

Reference Plane: Solar Panel level



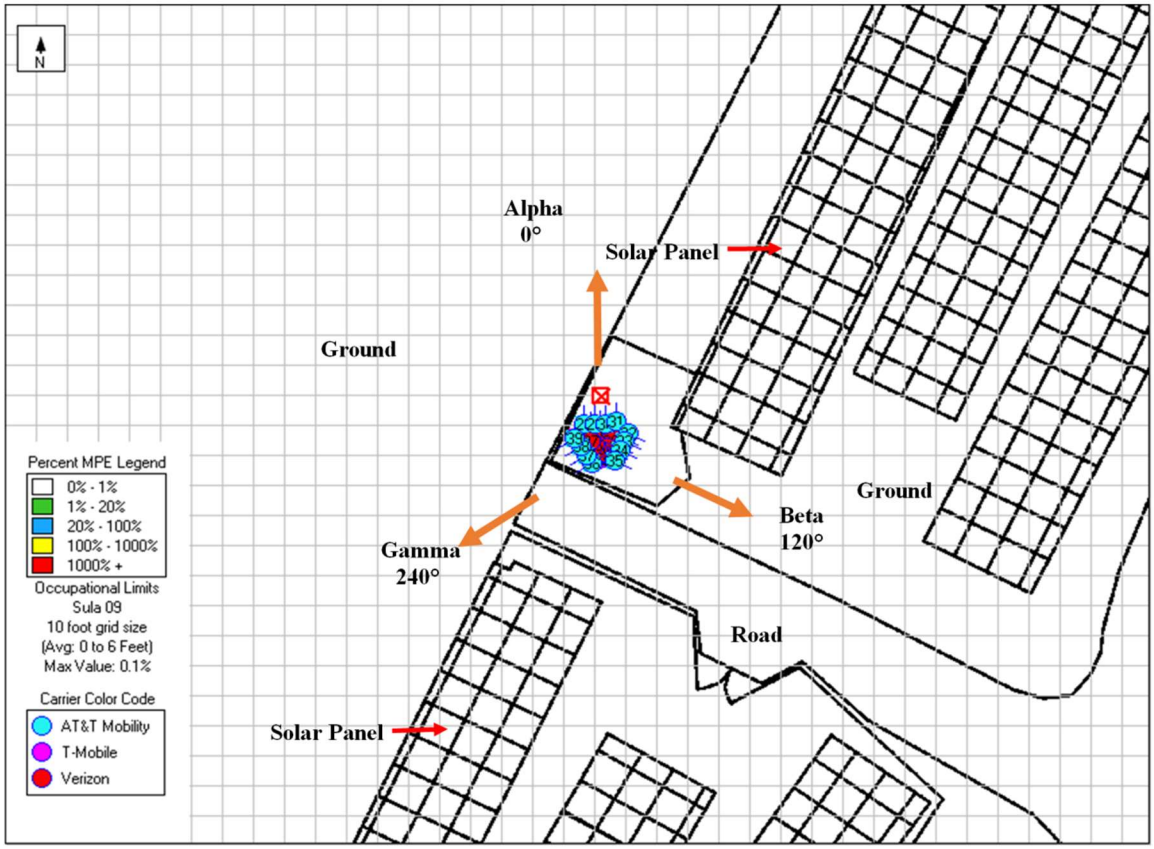
The maximum theoretical % MPE of the Occupational limits =0.21%

Reference Plane: Ground level



The maximum theoretical % MPE of the General Population limits =49%

Reference Plane: Ground level



The maximum theoretical % MPE of the Occupational limits =0.1%

5 Signage/ Mitigation

5.1 Signage/ Barrier Detail

Final Compliant Configuration						
	GUIDELINES	NOTICE	CAUTION	WARNING	NOC INFO	BARRIER/MARKER
Access Point(s)	☒ [1] *	☐ [ ]	☐ [ ]	☐ [ ]	☒ [1] *	☐
Alpha	☐ [ ]	☐ [ ]	☐ [ ]	☐ [ ]	☐ [ ]	☐
Beta	☐ [ ]	☐ [ ]	☐ [ ]	☐ [ ]	☐ [ ]	☐
Gamma	☐ [ ]	☐ [ ]	☐ [ ]	☐ [ ]	☐ [ ]	☐

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

** These RF signs should be posted on the Access Gate to the Site. (See drawing in Section 5.2)*

Specialty Sign Detail

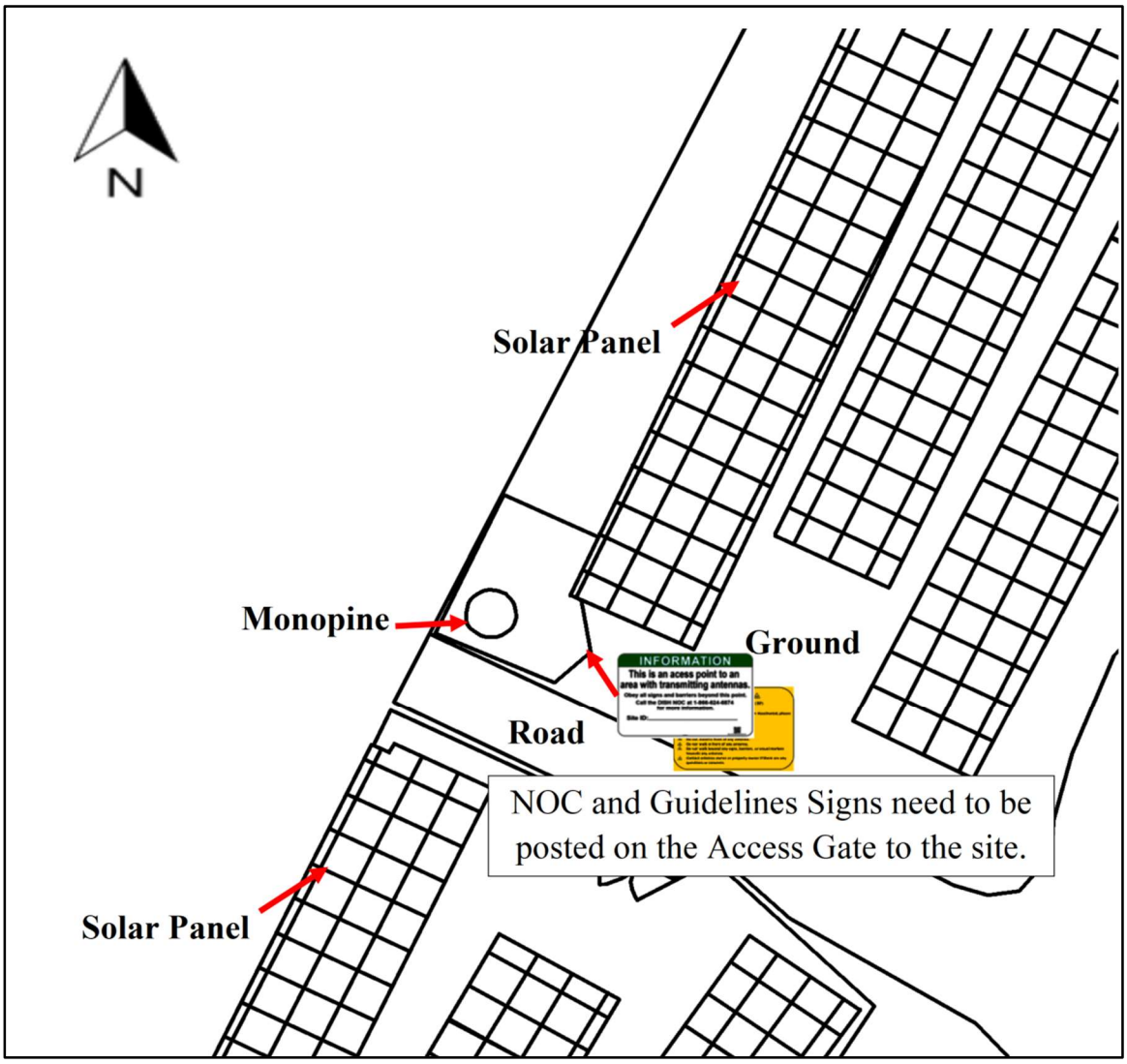
Location	**N/A**
Access Point	**N/A**
Alpha	**N/A**
Beta	**N/A**
Gamma	**N/A**

NOTE: The tables above represent EXISTING compliance items implemented at this location.

Notes/ Additional Compliance Requirements(s):
Mitigation is required per the Signage/ Barrier Diagram.

Table 2: Mitigation Requirements for Compliance

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 **Solar Panel level** will not exceed the FCC's MPE limit for General Population and Occupational.
- 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 General Population and Occupational.
- The max theoretical % MPE is **100.19%** (FCC General Public) directly in front of the antenna beams at the **Solar Panel** Level.
- NOC and Guidelines Signs need to be posted on the Access Gate to the Site. All access points to these areas need to remain locked at all times.
  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 ensure 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 ensuring the environment (such as a Monopole) 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:

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 signs are used as a means to provide contact information for any questions or concerns. They will include specific cell site identification information	

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 RoofMaster® Functions and Assumptions

RoofMaster® is a RF Compliance software package designed to enable the analysis, assessment and mitigation of communications sites with respect to human exposure to radiofrequency electromagnetic fields.

RoofMaster® was developed in 2008 by Waterford Consultants to support compliance assessments performed at single and multi-operator wireless locations throughout North America and has been in service since 2008. Real-world experience in evaluating thousands of base station installations is reflected in the RoofMaster® design approach. This document provides a guide for creating simulations of RF hazard conditions through the characterization of antenna systems and site features and through FCC-specified computational analysis.

On any structure, one may encounter antennas installed by wireless service providers, public safety and other FCC-licensed and unlicensed operators. Siting constraints have resulted in diverse and complex environments accessible to people performing a variety of activities around these antennas. RoofMaster® supports the characterization of these locations to convey important information regarding RF sources and accessible areas necessary to evaluate the potential for human exposure to hazardous levels of RF energy.

RoofMaster® supports the depiction of communications sites through the display of construction drawing or aerial photography image files as well as providing line drawing tools. These representations are scalable to enable the modeling of any location.

RoofMaster® utilizes a three-dimensional spatial framework consisting of a 1000 x 1000 grid with unlimited vertical dimensions necessary for the positioning of antennas and modeling of RF conditions at each grid point throughout the space. Predictive analysis is performed on a study plane at a specified elevation. The subsequent sections of this guide provide the steps necessary to create a site representation and conduct these studies.

RoofMaster® employs several power density prediction models based on the computational approaches set forth in the Federal Communications Commission's Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields, OET Bulletin 65. This guideline utilizes several antenna and operational parameters in calculating the power density contributions from each emitter at specified points throughout the study space. RoofMaster® enables antennas to be fully defined in site specific aspects as well as through the use of a library of manufacturer data. The parameters include:

§ Antenna model
§ Radiation patterns
§ Aperture length
§ Gain
§ Beamwidth
§ Antenna radiation center
§ Azimuth
§ Mechanical downtilt
§ Location
§ Frequency
§ Power into antenna

In OET-65, the Cylindrical Model is presented as an approach to determine the spatially averaged power density in the near field directly in front of an antenna. In order to implement this model in all directions, RoofMaster® utilizes the antenna manufacturer horizontal pattern data. Additionally, RoofMaster® incorporates factors that reduce the power density by the inverse square of horizontal and vertical distance beyond the near field region.

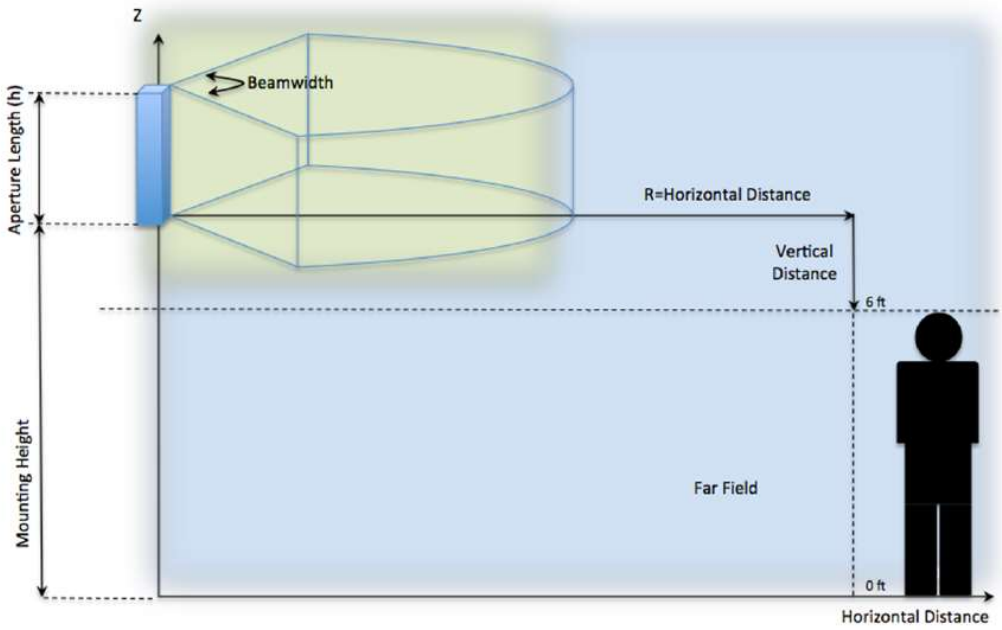
Power density is calculated as follows:

$$S = \left(\left(\frac{360}{Beamwidth} \right) \frac{P_{in} G_H H_r V_r}{2\pi Rh} \right) \frac{\mu W}{cm^2}$$

- S is the spatially averaged power density value
- R is the horizontal distance meters to the study point
- h is the aperture length in meters
- P_{in} is power into the antenna input port in Watts

RoofMaster® Implementation:

- G_H is gain offset to study point as specified in manufacturer horizontal pattern
- P_{in} is adjusted by the portion of the antenna aperture in the 0-6 ft. vertical study zone
- H_r accounts for $1/R^2$ Far Field roll off which starts at 2*h
- V_r accounts for 1/ (vertical distance)^2 roll off from antenna bottom to the top of the 0-6 ft. study zone (or antenna top to bottom of 0-6 ft. study zone)


Z
Beamwidth
Aperture Length (h)
R=Horizontal Distance
Vertical Distance
6 ft
Mounting Height
Far Field
0 ft
Horizontal Distance

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.

Waterford Consultants, LLC (2008). RoofMaster® User Guide, Waterford Consultants, LLC.

10 Limited Warranty

Telecom Technology Services, Inc. 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 Telecom Technology Services, Inc. employees or representatives via site surveys or research of ATLAS Tower's 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.

Telecom Technology Services, Inc. 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 Telecom Technology Services hereunder. In no event shall Telecom Technology Services be held liable to ATLAS Tower, 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 Telecom Technology Services be liable to ATLAS Tower 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.