



Planning Department <planning@amadorgov.org>

RE: [EXTERNAL] Re: Presentation - Shake Ridge

Steve Proo <SProo@completewireless.net>

Mon, Jun 10, 2024 at 3:37 PM

To: Ruslan Bratan <rbratan@amadorgov.org>, Amador County Planning Department <planning@amadorgov.org>

Hi Ruslan,

See attached my presentation on PowerPoint.

I'd like to bring to your attention, that there has been a revision made to the radio frequency report. The original report that was included in with my package had an error on it. See attached the revised rendition. The error that occurred were the number of ports to the antennas. The 700/800 MHz antennas have two ports, and the 1900/2100 MHz antennas have four ports, the previous report did not state that. As a result, the EME emissions has changed slightly from 22.95% to 23.30% , about ¼ of one percent.

Thank you,

Steve Proo

Planning Specialist – Land Use Development

Complete Wireless Consulting

sproo@completewireless.net

2009 V Street

Sacramento, CA 95818

Cell – 916-838-6713

From: Ruslan Bratan <rbratan@amadorgov.org>

Sent: Monday, June 10, 2024 11:59 AM

To: Steve Proo <SProo@completewireless.net>

Subject: [EXTERNAL] Re: Presentation - Shake Ridge

Hi Steve,

Sorry I missed your call. Attached are the comments we have received to date after the initial upload. We can certainly put up the presentation, but please send it via email to planning@amadorgov.org so we have it on file.

Best,

Ruslan Bratan

Planner | Amador County Planning Department

810 Court Street, Jackson, CA 95642

rbratan@amadorgov.org | (209) 223-6332

On Mon, Jun 10, 2024 at 9:29 AM Steve Proo <SProo@completewireless.net> wrote:

Hello Ruslan,

Checking in to see if any additional correspondence has been received since uploading the packet last week? I do have a power point to present for the commissioners and public. What would be the preferred method of providing this over to you? Would email be ok? I am just about finished and can email this to you towards the end of the day.

Thank you,

Steve Proo

Planning Specialist – Land Use Development

Complete Wireless Consulting

sproo@completewireless.net

2009 V Street

Sacramento, CA 95818

Cell – 916-838-6713

2 attachments



16994468_Shake Ridge_RF-EME Zoning Report_sealed_SHAKE RIDGE - MKT 37 - MCR.pdf
684K

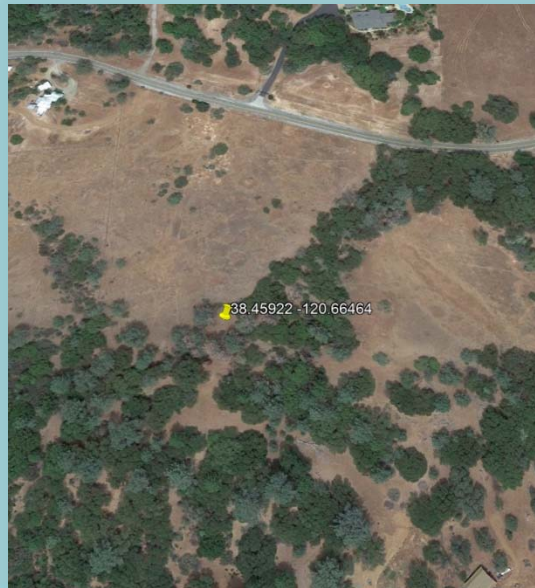


Presentation 6.11.24 - SHAKE RIDGE.pptx
11653K

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

Site No. 781398
Shake Ridge
19585 Shake Ridge Road
Volcano, California 95689
Amador County
38° 27' 33.19" N, -120° 39' 52.70" W NAD83

EBI Project No. 6223003686
February 12, 2024



Prepared for:
Verizon Wireless
c/o Complete Wireless Consulting, Inc.
2009 V Street, Sacramento, CA 95818

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

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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 781398 located at 19585 Shake Ridge Road in Volcano, California 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, there are no modeled areas on any accessible ground-level walking/working surface related to the proposed antennas that exceed the FCC’s occupational or general public exposure limits at this site.

At the nearest walking/working surfaces to the Verizon antennas, the maximum power density generated by the Verizon antennas is approximately **23.30** percent of the FCC’s general public limit (**4.66** percent of the FCC’s occupational limit).

The composite exposure level from all carriers on this site is approximately **23.30** percent of the FCC’s general public limit (**4.66** percent of the FCC’s occupational limit) at the nearest walking/working surface to each antenna.

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 monotree located at 19585 Shake Ridge Road in Volcano, California.

Ant #	Sector	Operator	Antenna Make	Antenna Model	Technology and Frequency (MHz)	Azimuth (Degrees)	Mechanical Downtilt (Degrees)	Horizontal Beamwidth (Degrees)	Aperture (feet)	Total Power Input (Watts)	Transmitter Count	Antenna Gain (dBd)	Total ERP (Watts)	Total EIRP (Watts)
1	Alpha	Verizon	ERICSSON	SON_AIR6419 TB 03.21.2023 3700 VZW	Cband 3700	0	0	11	2.4	320	1	23.45	70819.03	116143.21
2	Alpha	Verizon	COMMSCOPE	SON_NHH-85C-R2B 00DT-10DT 700	LTE 700	0	0	82	8.4	120	2	13.31	2571.47	4217.21
2	Alpha	Verizon	COMMSCOPE	SON_NHH-85C-R2B 00DT-10DT 850	LTE 850	0	0	83	8.4	120	2	13.39	2619.28	4295.61
2	Alpha	Verizon	COMMSCOPE	SON_NHH-85C-R2B 00DT-08DT 2100	LTE 2100	0	0	78	8.4	240	4	15.64	8794.50	14422.98
3	Alpha	Verizon	COMMSCOPE	SON_NHH-85C-R2B 00DT-10DT 700	LTE 700	0	0	82	8.4	120	2	13.31	2571.47	4217.21
3	Alpha	Verizon	COMMSCOPE	SON_NHH-85C-R2B 00DT-10DT 850	LTE 850	0	0	83	8.4	120	2	13.39	2619.28	4295.61
3	Alpha	Verizon	COMMSCOPE	SON_NHH-85C-R2B 00DT-08DT 1900	LTE 1900	0	0	78	8.4	240	4	15.23	8002.23	13123.66
4	Beta	Verizon	ERICSSON	SON_AIR6419 TB 03.21.2023 3700 VZW	Cband 3700	120	0	11	2.4	320	1	23.45	70819.03	116143.21
5	Beta	Verizon	COMMSCOPE	SON_NHH-85C-R2B 00DT-10DT 700	LTE 700	120	0	82	8.4	120	2	13.31	2571.47	4217.21
5	Beta	Verizon	COMMSCOPE	SON_NHH-85C-R2B 00DT-10DT 850	LTE 850	120	0	83	8.4	120	2	13.39	2619.28	4295.61
5	Beta	Verizon	COMMSCOPE	SON_NHH-85C-R2B 00DT-08DT 2100	LTE 2100	120	0	78	8.4	240	4	15.64	8794.50	14422.98
6	Beta	Verizon	COMMSCOPE	SON_NHH-85C-R2B 00DT-10DT 700	LTE 700	120	0	82	8.4	120	2	13.31	2571.47	4217.21
6	Beta	Verizon	COMMSCOPE	SON_NHH-85C-R2B 00DT-10DT 850	LTE 850	120	0	83	8.4	120	2	13.39	2619.28	4295.61
6	Beta	Verizon	COMMSCOPE	SON_NHH-85C-R2B 00DT-08DT 1900	LTE 1900	120	0	78	8.4	240	4	15.23	8002.23	13123.66
7	Gamma	Verizon	ERICSSON	SON_AIR6419 TB 03.21.2023 3700 VZW	Cband 3700	240	0	11	2.4	320	1	23.45	70819.03	116143.21

Ant #	Sector	Operator	Antenna Make	Antenna Model	Technology and Frequency (MHz)	Azimuth (Degrees)	Mechanical Downtilt (Degrees)	Horizontal Beamwidth (Degrees)	Aperture (feet)	Total Power Input (Watts)	Transmitter Count	Antenna Gain (dBd)	Total ERP (Watts)	Total EIRP (Watts)
8	Gamma	Verizon	COMMSCOPE	SON_NHH-85C-R2B 00DT-10DT 700	LTE 700	240	0	82	8.4	120	2	13.31	2571.47	4217.21
8	Gamma	Verizon	COMMSCOPE	SON_NHH-85C-R2B 00DT-10DT 850	LTE 850	240	0	83	8.4	120	2	13.39	2619.28	4295.61
8	Gamma	Verizon	COMMSCOPE	SON_NHH-85C-R2B 00DT-08DT 2100	LTE 2100	240	0	78	8.4	240	4	15.64	8794.50	14422.98
9	Gamma	Verizon	COMMSCOPE	SON_NHH-85C-R2B 00DT-10DT 700	LTE 700	240	0	82	8.4	120	2	13.31	2571.47	4217.21
9	Gamma	Verizon	COMMSCOPE	SON_NHH-85C-R2B 00DT-10DT 850	LTE 850	240	0	83	8.4	120	2	13.39	2619.28	4295.61
9	Gamma	Verizon	COMMSCOPE	SON_NHH-85C-R2B 00DT-08DT 1900	LTE 1900	240	0	78	8.4	240	4	15.23	8002.23	13123.66

• Note there are 3 Verizon antennas per sector at this site. For clarity, the different frequencies for each antenna are entered on separate lines.

Ant #	NAME	X	Y	Antenna Radiation Centerline	Z-Height Ground
1	Verizon	2.7	81.1	78.0	78.0
2	Verizon	5.3	81.1	68.0	68.0
3	Verizon	2.7	81.1	68.0	68.0
4	Verizon	9.5	86.0	78.0	78.0
5	Verizon	8.7	88.6	68.0	68.0
6	Verizon	9.5	86.0	68.0	68.0
7	Verizon	2.3	88.6	78.0	78.0
8	Verizon	0.4	86.4	68.0	68.0
9	Verizon	2.3	88.6	68.0	68.0

• 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 monotree 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.

There are no other wireless carriers with equipment installed at this site.

Based on worst-case predictive modeling, there are no modeled areas on any accessible ground-level walking/working surface related to the proposed Verizon antennas that exceed the FCC's occupational or general public exposure limits at this site. At the nearest walking/working surfaces to the Verizon antennas, the maximum power density generated by the Verizon antennas is approximately 23.30 percent of the FCC's general public limit (4.66 percent of the FCC's occupational limit). The composite exposure level from all carriers on this site is approximately 23.30 percent of the FCC's general public limit (4.66 percent of the FCC's occupational limit) at the nearest walking/working surface to each antenna.

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.

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. Microwave dish antennas are designed for point-to-point operations at the elevations of the installed equipment rather than ground level coverage. The maximum power density generated by all carrier antennas, including microwaves and panel antennas, is included in the modeling results presented within this report.

4.0 MITIGATION/SITE CONTROL OPTIONS

EBI's modeling indicates that there are no areas in front of the Verizon antennas that exceed the FCC standards for occupational or general public exposure. All exposures above the FCC's safe limits require that individuals be elevated above the ground. In accordance with the official Verizon Wireless Signage and Demarcation Policy for tower structures, no signage is recommended at this site.

There are no barriers recommended on this site.

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 monotree should be provided with a copy of the attached Site Safety Plan, made aware of the posted signage, 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. All workers and individuals, including arborists and landscapers, accessing the monotree along with nearby elevated structures or trees within areas exceeding the general public MPE must be made aware of the presence and locations of antennas and their associated fields, where applicable.

5.0 SUMMARY AND CONCLUSIONS

EBI has prepared a Radiofrequency – Electromagnetic Energy (RF-EME) Compliance Report for telecommunications equipment installed by Verizon Site Number 781398 located at 19585 Shake Ridge Road in Volcano, California 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, there are no modeled areas on any accessible ground-level walking/working surface related to the proposed antennas that exceed the FCC's occupational or general public exposure limits at this site.

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, Andrew Simpson, 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.



Andrew Simpson

Reviewed and Approved by:



sealed 13feb2024

Michael McGuire
Electrical Engineer
mike@h2dc.com

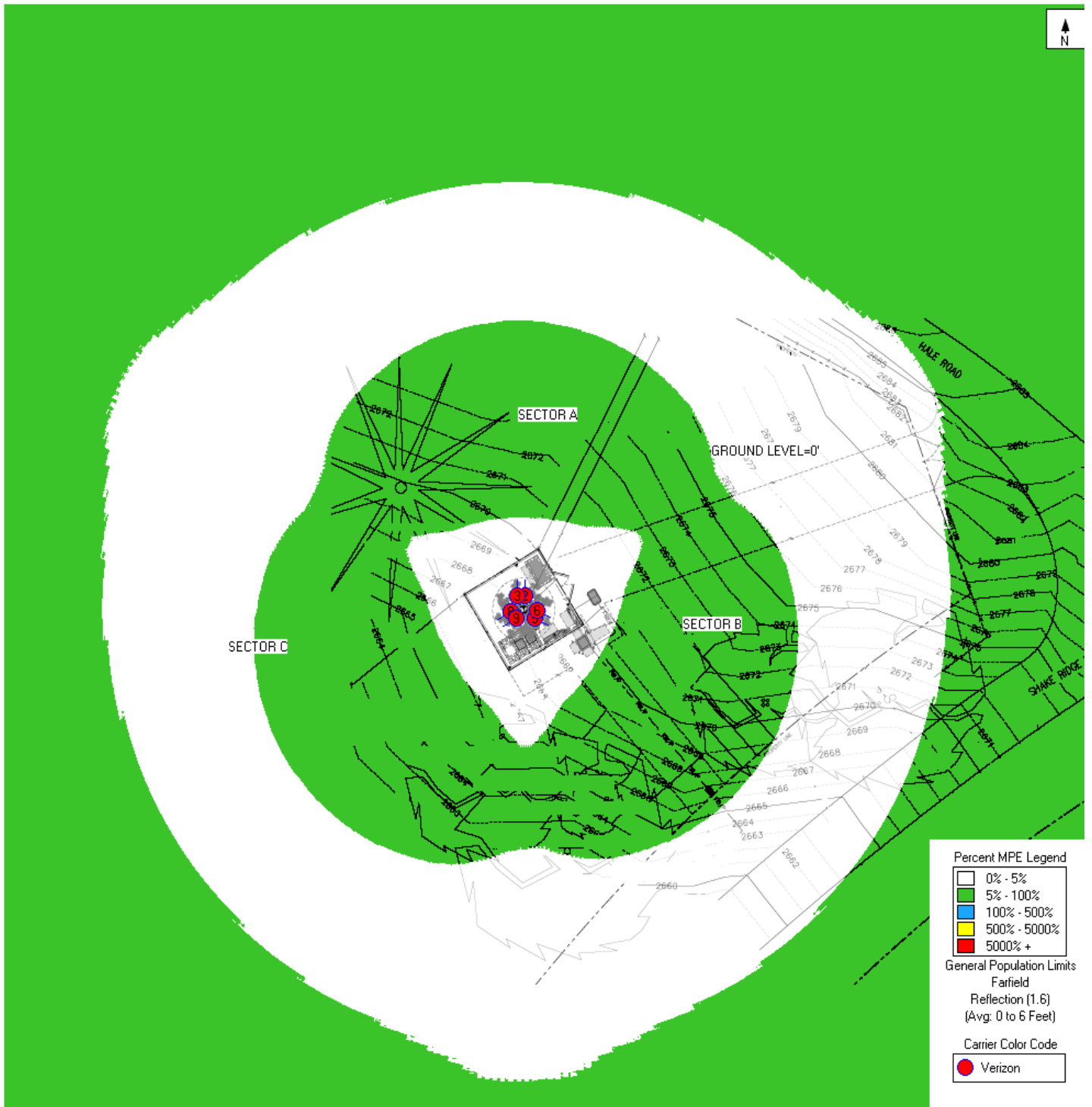
Note that EBI's scope of work is limited to an evaluation of the Radio Frequency – Electromagnetic Energy (RF-EME) field generated by the antennas and broadcast equipment noted in this report. The engineering and design of the building and related structures, as well as the impact of the antennas and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

Appendix B

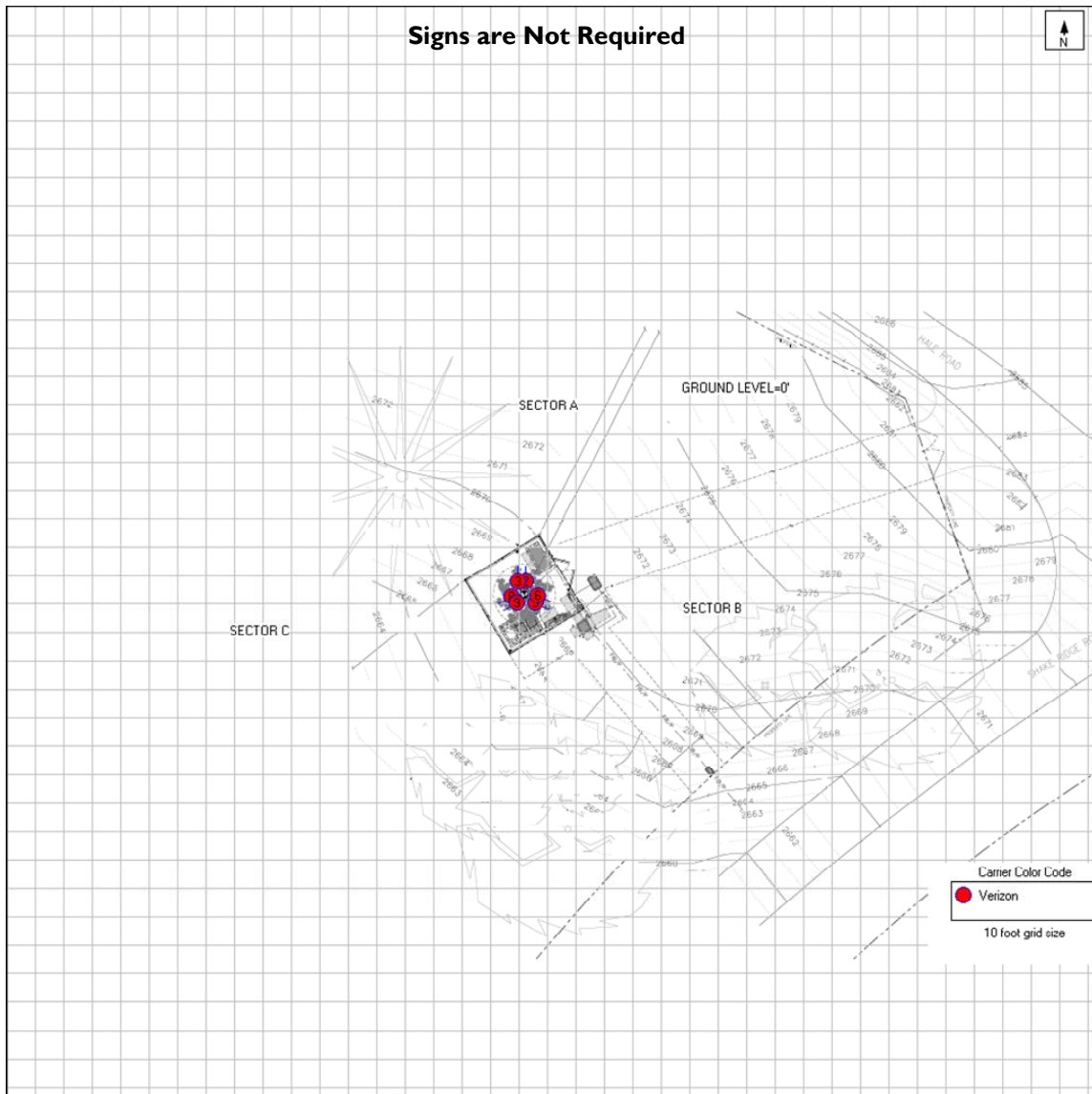
Radio Frequency Electromagnetic Energy






Safety Information and Signage Plans

Nearest Walking Surface - Ground Level



Verizon Signage Plan


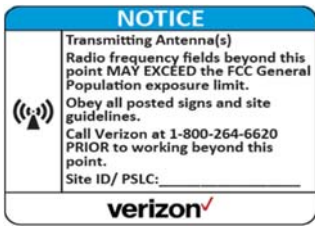





Sign	Posting Instructions	Required Signage / Mitigation
	Securely post at every point of access to the site in a manner conspicuous to all individuals entering thereon as indicated in the signage plan.	Signage not required.
	Securely post at every point of access to the site in a manner conspicuous to all individuals entering thereon as indicated in the signage plan.	Signage not required.
	Securely post in a manner conspicuous to all individuals entering thereon as indicated in the signage plan.	Signage not required.
	Securely post in a manner conspicuous to all individuals entering thereon as indicated in the signage plan.	Signage not required.
	Securely post in a manner conspicuous to all individuals entering thereon as indicated in the signage plan.	Signage not required.

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	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"


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.

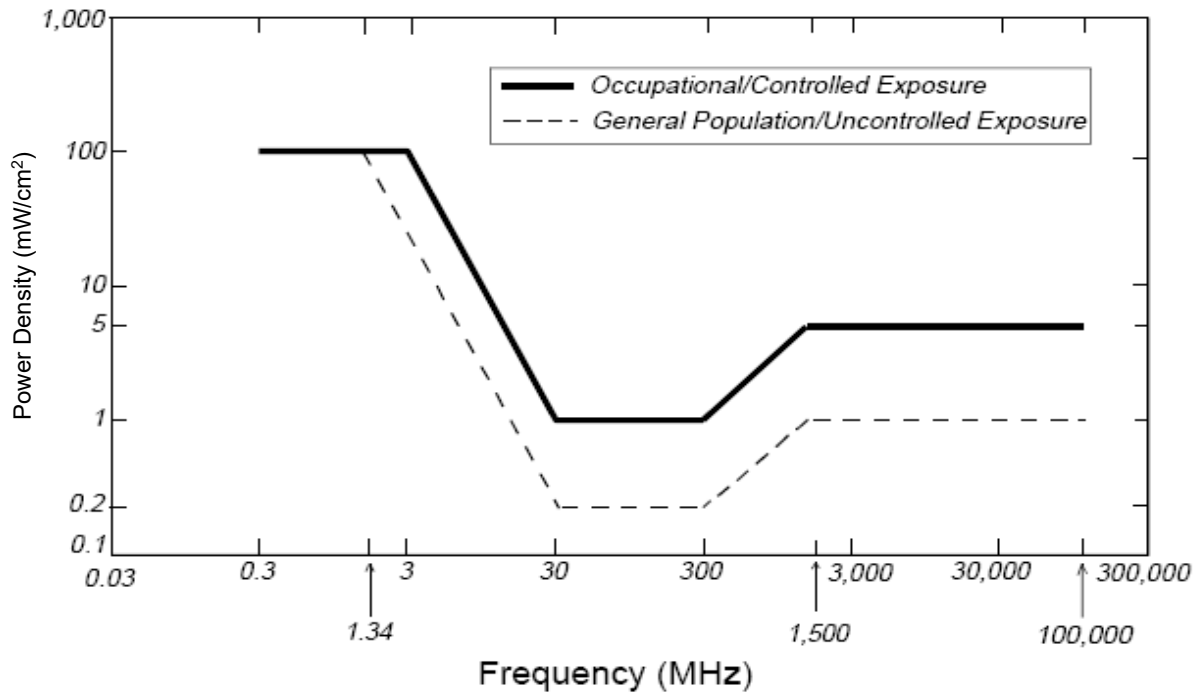
The FCC's MPEs are measured in terms of power (mW) over a unit surface area (cm²). Known as the power density, the FCC has established for equipment operating at frequencies range from 300 Mhz to 1,500 Mhz the Occupational/Controlled limit of $(f/300)$ mW/cm² where f is the Frequency in (MHz) and the General Population / Uncontrolled limit of $(f/1500)$ mW/cm² where f is the Frequency in (MHz). For equipment operating at frequency ranges from 1900 MHz to 100,000 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 I: 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



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.

Shake Ridge

June 11, 2024

Steve Proo, Complete Wireless Consulting

Yvonne Pinto, Municipal Engagement, Verizon Wireless

David Witkowski , Electromagnetic Safety Expert , Oku Solutions



Facility Design

- 90' tower camouflaged as pine tree
- Equipment enclosed within a 900' sq ft lease area with an 8' wood fence
- Emergency Stand-by generator

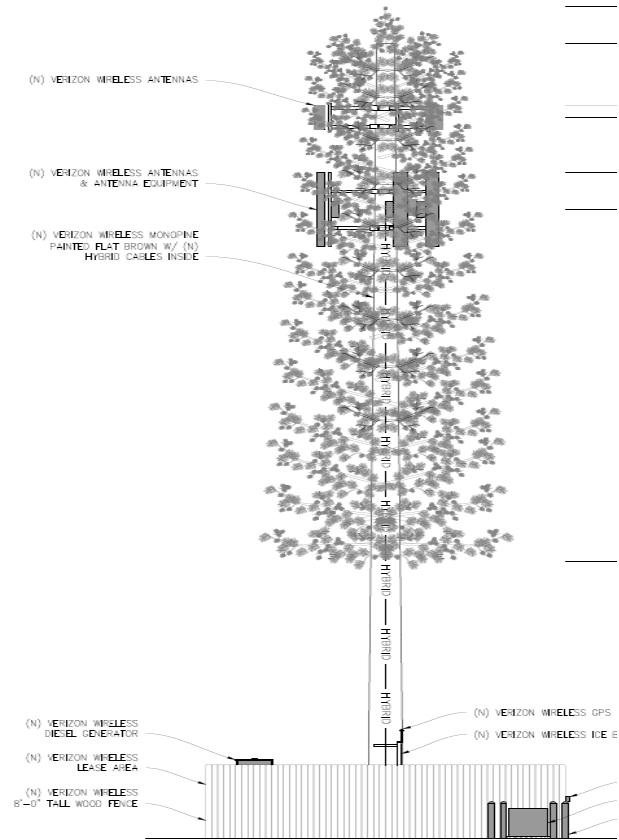


Photo Simulations



Photo Simulation - View 1

- View from Shake Ridge Rd. Looking West
- 200 ' from site
- Digger Pine 84' tree
- Proposed Mono-Pine – 90'



Photo Simulation - View 2

- View from Shake Ridge Rd. Looking Southeast
- 400 ' from site



Photo Simulation - View 3

- View from Hale Rd.
Looking Southeast
- 270 ' from site



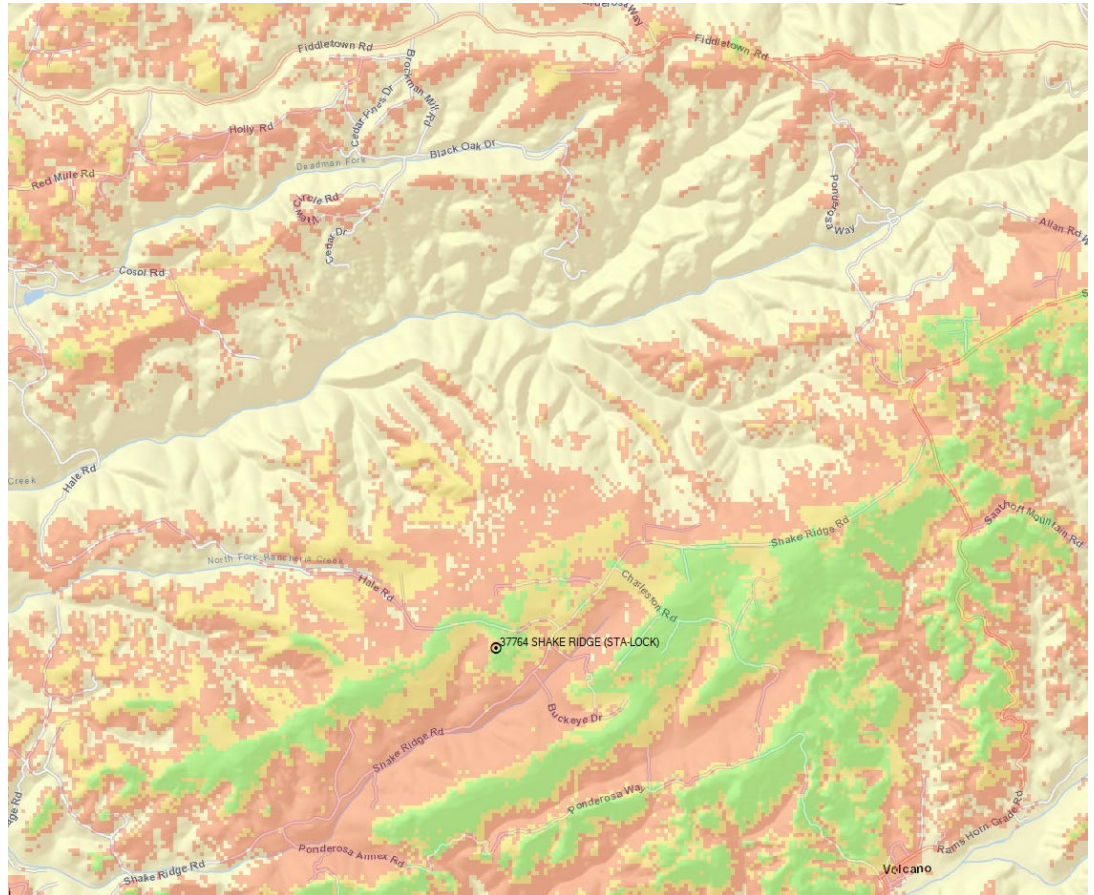
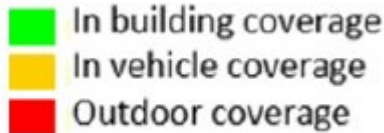
Photo Simulation - View 4

- View from Shake Ridge Road, Looking north
- 460 ' from site



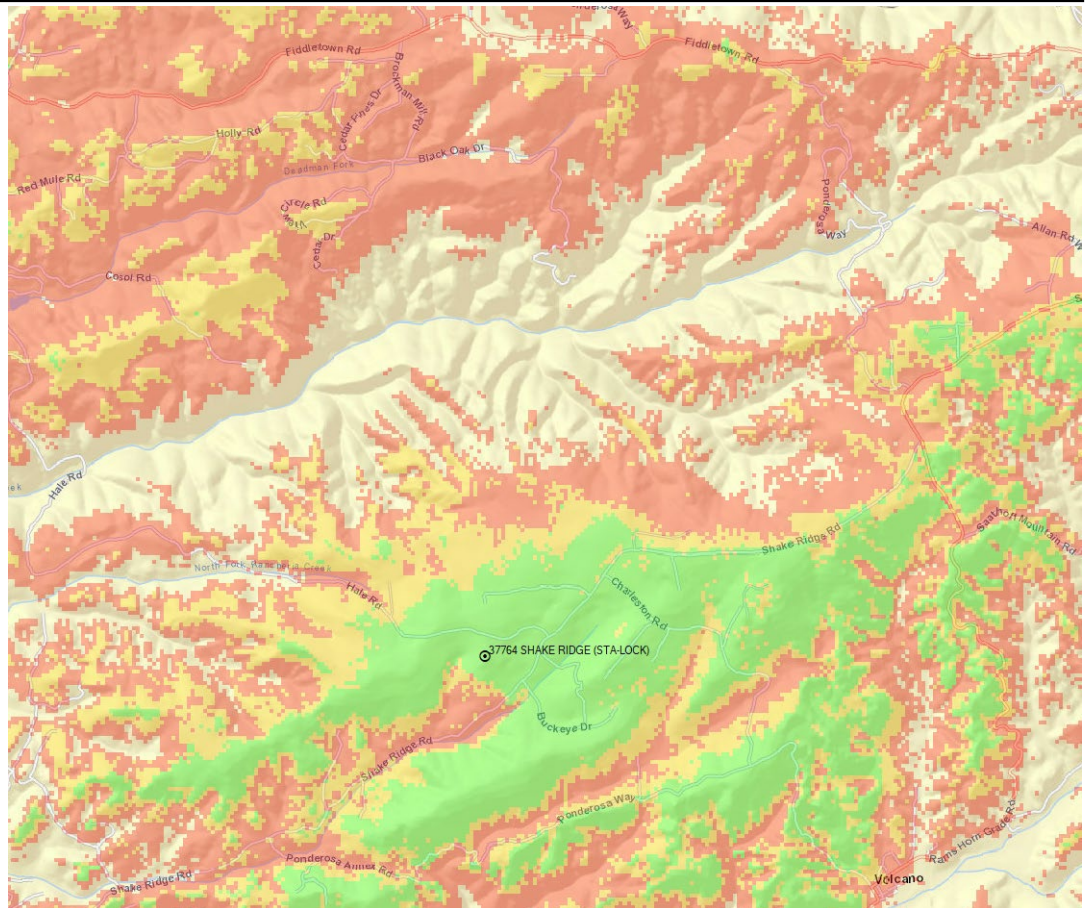
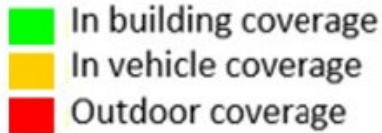
Coverage Gap

- Gap in coverage and capacity issues in this part of Amador County
- Shake Ridge site will offload Fiddletown and Pine Grove
- This area lacks reliable in-building and in-vehicle coverage



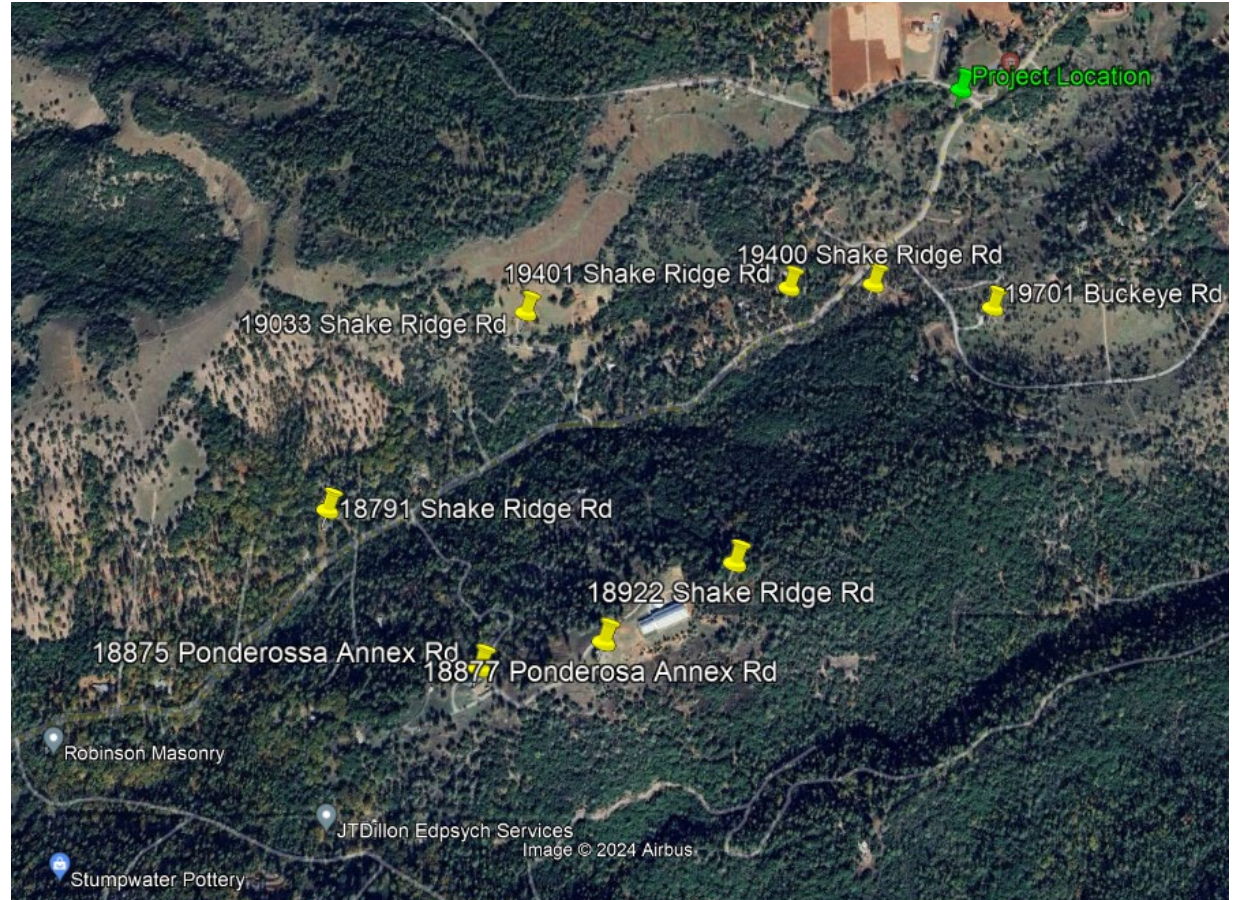
Improved Service

- This will improve coverage Shake Ridge Road, and community of Volcano
- This will improve coverage to existing residential, commercial, and industrial areas.
- This will improve coverage along Fiddletown Road



Alternative Sites

- Extensive tree removal & trenching
- Lack of landlord interest
- Unable to meet coverage objectives due to terrain and vegetation
- Did not meet setbacks



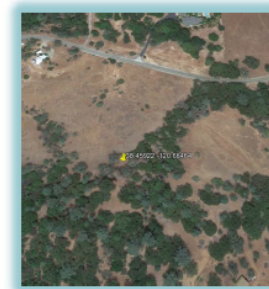
Complies with FCC Guidelines

- Engineer at EBI Consulting confirmed that radio frequency exposure will be less than FCC public limit at ground level. 23.30%
- Denial based on RF exposure preempted by federal law

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

Site No. 781398
Shake Ridge
19585 Shake Ridge Road
Volcano, California 95689
Amador County
38° 27' 33.19" N, -120° 39' 52.70" W NAD83

EBI Project No. 6223003686
February 12, 2024



Prepared for:
Verizon Wireless
c/o Complete Wireless Consulting, Inc.
2009 V Street, Sacramento, CA 95818



Complies With County Noise Limits

- Bollard Acoustical has confirmed that the all-noise levels are below county requirements.
- Noise level ranges from 46db to 51db
- Generator runs 2x per month for maintenance during daytime hours

Environmental Noise Assessment

Shake Ridge Verizon Cellular Facility

Amador County, California

BAC Job # 2023-119

Prepared For:

Complete Wireless Consulting

Attn: Jerry Agloro
2009 V Street
Sacramento, CA 95818

Prepared By:

Bollard Acoustical Consultants, Inc.



Dario Gotchet, Principal Consultant

September 28, 2023



Bollard Acoustical Consultants, Inc. • P.O. Box 7068, Auburn, CA, 95604 • Phone: (530) 537-2328 • bacnoise.com



Complies with County Development Standards per section 19.48.150

- Screened as a Pine tree to minimize visual impact.
- Designed at minimum functioning height to fill significant coverage gap
- Proposed facility located on parcel larger than 20 acres.
- Helipad – Lockwood Fire Department confirmed location. Zero concerns

Experts available for questions

- Steve Proo, Complete Wireless Consulting
- David Witkowski, Oku Solutions
- Yvonne Pinto, Verizon Wireless Municipal Engagement

