Verizon Wireless • Base Station (Site Name "Ozone")
2629 Manhattan Avenue • Hermosa Beach, California

Statement of Hammett & Edison, Inc., Consulting Engineers

The firm of Hammett & Edison, Inc., Consulting Engineers, has been retained by Verizon Wireless, a wireless telecommunications carrier, to evaluate its existing base station (Site Name "Ozone") located at 2629 Manhattan Avenue in Hermosa Beach, California, for compliance with appropriate guidelines limiting human exposure to radio frequency ("RF") electromagnetic fields.

Executive Summary

Verizon Wireless had installed directional panel antennas above the roof of the commercial building at 2629 Manhattan Avenue in Hermosa Beach, California. All exposure levels under the existing conditions for anyone in publicly accessible areas nearby were well below the federal standard.

Prevailing Exposure Standards

The U.S. Congress requires that the Federal Communications Commission ("FCC") evaluate its actions for possible significant impact on the environment. A summary of the FCC's exposure limits is shown in Figure 1. 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. The most restrictive FCC limit for exposures of unlimited duration to radio frequency energy for several wireless services are as follows:

Wireless Service Band	Transmit Frequency	"Uncontrolled" Public Limit	Occupational Limit (5 times Public)
Microwave (point-to-point)	1–80 GHz	1.0 mW/cm^2	5.0 mW/cm^2
Millimeter-wave	24–47	1.0	5.0
Part 15 (WiFi & other unlicensed)	2–6	1.0	5.0
C-Band	3,700 MHz	1.0	5.0
CBRS (Citizens Broadband Radio)	3,550	1.0	5.0
BRS (Broadband Radio)	2,490	1.0	5.0
WCS (Wireless Communication)	2,305	1.0	5.0
AWS (Advanced Wireless)	2,110	1.0	5.0
PCS (Personal Communication)	1,930	1.0	5.0
Cellular	869	0.58	2.9
SMR (Specialized Mobile Radio)	854	0.57	2.85
700 MHz	716	0.48	2.4
600 MHz	617	0.41	2.05
[most restrictive frequency range]	30–300	0.20	1.0

General Facility Requirements

Antennas for base station use are designed to concentrate their energy toward the horizon, with very little energy wasted toward the sky or the ground. Since the antennas need an unobstructed area in front of them, it is generally not possible for exposure conditions to approach the FCC limits without being physically very near the antennas.

Site Description

The site at 2629 Manhattan Avenue in Hermosa Beach was visited by the undersigned Professional Engineer during normal business hours on June 22, 2023, a non-holiday weekday. Verizon had installed six JMA Model directional panel antennas inside a view screen enclosure above the roof of the single-story commercial building located at that address. Access to the antennas was restricted by their mounting location; there is no installed access to the roof. There were observed no other wireless telecommunications base stations located at this site or nearby.

Measurement Results

The measurement equipment used was a Narda Type NBM-520 Broadband Field Meter with Type EA-5091 and EF-0692 Isotropic Electric Field Probe (Serial Nos. 01035 and C-0223, respectively). The meters and probes were under current calibration.

The maximum observed power density level for a person at ground near the site was 0.012 mW/cm^2, which is less than 2.4% of the applicable public limit. The maximum observed level at any upper-floor elevation of nearby buildings was 13% of the applicable public limit. The three-dimensional perimeter of RF levels equal to the public exposure limit did not reach any publicly accessible areas.

Recommended Training

Due to their mounting location, the Verizon antennas were not accessible to the general public, and so no mitigation measures are necessary to comply with the FCC public exposure guidelines. It is recommended that appropriate RF safety training, to include review of personal monitor use and lockout/tagout procedures, be provided to all authorized personnel who have access to the roof, including employees and contractors of Verizon and of the property owner.

Conclusion

Based on the information and analysis above, it is the undersigned's professional opinion that the Verizon Wireless base station located at 2629 Manhattan Avenue in Hermosa Beach, California, as installed and operating at the time of the visit, complies with the FCC guidelines limiting public

exposure to radio frequency energy and, therefore, does not for this reason cause a significant impact on the environment.

Authorship

The undersigned author of this statement is a qualified Professional Engineer, holding California Registration Nos. E-13026 and M-20676, which expire on June 30, 2025. This work has been carried out under his direction, and all statements are true and correct of his own knowledge except, where noted, when data has been supplied by others, which data he believes to be correct.

William F. Hammett, P.E.
707/996-5200

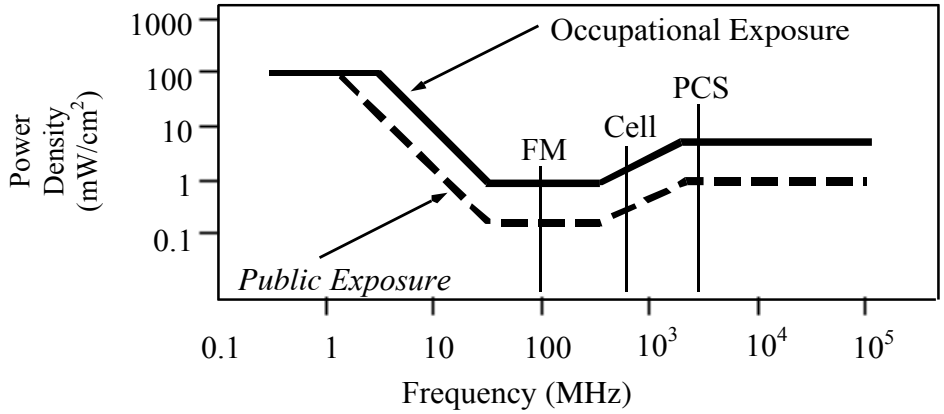
June 27, 2023

FCC Radio Frequency Protection Guide

The U.S. Congress required (1996 Telecom Act) the Federal Communications Commission ("FCC") to adopt a nationwide human exposure standard to ensure that its licensees do not, cumulatively, have a significant impact on the environment. The FCC adopted the limits from Report No. 86, "Biological Effects and Exposure Criteria for Radiofrequency Electromagnetic Fields," published in 1986 by the Congressionally chartered National Council on Radiation Protection and Measurements ("NCRP"). Separate limits apply for occupational and public exposure conditions, with the latter limits generally five times more restrictive. The more recent standard, developed by the Institute of Electrical and Electronics Engineers IEEE C95.1-2019, "Safety Levels with Respect to Human Exposure to Electric, Magnetic, and Electromagnetic Fields, 0 Hz to 300 GHz," includes similar limits. These limits apply for continuous exposures from all sources and are intended to provide a prudent margin of safety for all persons, regardless of age, gender, size, or health.

As shown in the table and chart below, separate limits apply for occupational and public exposure conditions, with the latter limits (in *italics* and/or dashed) up to five times more restrictive:

Frequency	Electromagnetic Fields (f is frequency of emission in MHz)					
Applicable Range (MHz)	Electric Field Strength (V/m)		Magnetic Field Strength (A/m)		Equivalent Far-Field Power Density (mW/cm^2)	
0.3 – 1.34	614	*614*	1.63	*1.63*	100	*100*
1.34 – 3.0	614	*823.8/ f*	1.63	*2.19/ f*	100	*180/ f^2*
3.0 – 30	1842/ f	*823.8/ f*	4.89/ f	*2.19/ f*	900/ f^2	*180/ f^2*
30 – 300	61.4	*27.5*	0.163	*0.0729*	1.0	*0.2*
300 – 1,500	$3.54\sqrt{f}$	*$1.59\sqrt{f}$*	$\sqrt{f}/106$	*$\sqrt{f}/238$*	f/300	*f/1500*
1,500 – 100,000	137	*61.4*	0.364	*0.163*	5.0	*1.0*



Higher levels are allowed for short periods of time, such that total exposure levels averaged over six or thirty minutes, for occupational or public settings, respectively, do not exceed the limits, and higher levels also are allowed for exposures to small areas, such that the spatially averaged levels do not exceed the limits. Hammett & Edison has incorporated conservative calculation formulas in the FCC Office of Engineering and Technology Bulletin No. 65 (August 1997) for projecting field levels in a computer program capable of calculating, at thousands of locations on an arbitrary grid, the total expected power density from any number of individual radio frequency sources. The program allows for the inclusion of uneven terrain in the vicinity, as well as any number of nearby buildings of varying heights, to obtain more accurate projections.