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Radio Frequency Emissions Compliance Report For AT&T Mobility

Site Name:	**Alta Vista Tank #2**	**Site Structure Type:**	**Monopole**
Address:	**North Of 775 Alta Vista Road**	**Latitude:**	**37.548925**
	Montara, CA 94037	**Longitude:**	**-122.497764**
Report Date:	**February 25, 2021**	**Project:**	**New Build**

Compliance Statement

Based on information provided by AT&T Mobility and predictive modeling, the Alta Vista Tank #2 installation proposed by AT&T Mobility will be compliant with Radiofrequency Radiation Exposure Limits of 47 C.F.R. §§ 1.1307(b)(3) and 1.1310. RF alerting signage at the base of the Monopole and restricting access to authorized climbers that have completed RF safety training is required for Occupational environment compliance. The proposed operation will not expose members of the General Public to hazardous levels of RF energy and will not contribute to existing cumulative MPE levels on walkable surfaces at ground or in adjacent buildings by 5% of the General Population limits.

Certification

I, David H. Kiser, am the reviewer and approver of this report and 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, specifically in accordance with FCC's OET Bulletin 65. I have reviewed this Radio Frequency Exposure Assessment report and believe it to be both true and accurate to the best of my knowledge.

David H. Kiser, P.E.
Registered Professional Engineer (Electrical)
State of California, 21542, Expires 6/30/2022
Date: 2021-February-26

General Summary

The compliance framework is derived from the Federal Communications Commission (FCC) Rules and Regulations for preventing human exposure in excess of the applicable Maximum Permissible Exposure ("MPE") limits. At any location at this site, the power density resulting from each transmitter may be expressed as a percentage of the frequency-specific limits and added to determine if 100% of the exposure limit has been exceeded. The FCC Rules define two tiers of permissible exposure differentiated by the situation in which the exposure takes place and/or the status of the individuals who are subject to exposure. General Population / Uncontrolled exposure limits apply to those situations in which persons may not be aware of the presence of electromagnetic energy, where exposure is not employment-related, or where persons cannot exercise control over their exposure. Occupational / Controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment, have been made fully aware of the potential for exposure, and can exercise control over their exposure. Based on the criteria for these classifications, the FCC General Population limit is considered to be a level that is safe for continuous exposure time. The FCC General Population limit is 5 times more restrictive than the Occupational limits.

Table 1: FCC Limits

Frequency (MHz)	*Limits for General Population/ Uncontrolled Exposure*		*Limits for Occupational/ Controlled Exposure*	
	Power Density (mW/cm^2)	**Averaging Time (minutes)**	**Power Density (mW/cm^2)**	**Averaging Time (minutes)**
30-300	0.2	30	1	6
300-1500	f/1500	30	f/300	6
1500-100,000	1.0	30	5.0	6

f=Frequency (MHz)

In situations where the predicted MPE exceeds the General Population threshold in an accessible area as a result of emissions from multiple transmitters, FCC licensees that contribute greater than 5% of the aggregate MPE share responsibility for mitigation.

Based on the computational guidelines set forth in FCC OET Bulletin 65, Waterford Consultants, LLC has developed software to predict the overall Maximum Permissible Exposure possible at any location given the spatial orientation and operating parameters of multiple RF sources. The power density in the Far Field of an RF source is specified by OET-65 Equation 5 as follows:

$$S = \frac{EIRP}{4 \cdot \pi \cdot R^2} \ (\mathrm{mW/cm^2})$$

where EIRP is the Effective Radiated Power relative to an isotropic antenna and R is the distance between the antenna and point of study. Additionally, consideration is given to the manufacturers' horizontal and vertical antenna patterns as well as radiation reflection. At any location, the predicted power density in the Far Field is the spatial average of points within a 0 to 6-foot vertical profile that a person would occupy. Near field power density is based on OET-65 Equation 20 stated as

$$S = \left(\frac{180}{\theta_{BW}}\right) \cdot \frac{100 \cdot P_{in}}{\pi \cdot R \cdot h} \ (\mathrm{mW/cm^2})$$

where P_{in} is the power input to the antenna, θ_{BW} is the horizontal pattern beamwidth and h is the aperture length.

These theoretical results represent maximum-case predictions as all RF emitters are assumed to be operating at 100% duty cycle.

For any area in excess of 100% General Population MPE, access controls with appropriate RF alerting signage must be put in place and maintained to restrict access to authorized personnel. Signage must be posted to be visible upon approach from any direction to provide notification of potential conditions within these areas. Subject to other site security requirements, occupational personnel should be trained in RF safety and equipped with personal protective equipment (e.g. RF personal monitor) designed for safe work in the vicinity of RF emitters. Controls such as physical barriers to entry imposed by locked doors, hatches and ladders or other access control mechanisms may be supplemented by alarms that alert the individual and notify site management of a breach in access control. Waterford Consultants, LLC recommends that any work activity in these designated areas or in front of any transmitting antennas be coordinated with all wireless tenants.

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Analysis

AT&T Mobility proposes the following installation at this location:

- INSTALLATION OF (9) AT&T PANEL ANTENNAS
- INSTALLATION OF (15) AT&T REMOTE RADIO HEADS (RRH'S)

The antennas will be mounted on a 75-foot Monopole with centerlines 72 feet above ground level. Proposed antenna operating parameters are listed in Appendix A. Other appurtenances such as GPS antennas, RRUs and hybrid cable below the antennas are not sources of RF emissions. No other antennas are known to be operating in the vicinity of this site.

Figure 1: Antenna Locations

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Power density decreases significantly with distance from any antenna. The panel-type antennas to be employed at this site are highly directional by design and the orientation in azimuth and mounting elevation, as documented, serves to reduce the potential to exceed MPE limits at any location other than directly in front of the antennas. For accessible areas at ground level, the maximum predicted power density level resulting from all AT&T Mobility operations is 2.71% of the FCC General Population limits. Incident at adjacent buildings depicted in Figure 1, the maximum predicted power density level resulting from all AT&T Mobility operations is 2.8963% of the FCC General Population limits. The proposed operation will not expose members of the General Public to hazardous levels of RF energy and will not contribute to existing cumulative MPE levels on walkable surfaces at ground or in adjacent buildings by 5% of the General Population limits.

Waterford Consultants, LLC recommends posting RF alerting signage with contact information (Caution 2B) at the base of the Monopole to inform authorized climbers of potential conditions near the antennas. These recommendations are depicted in Figure 2.

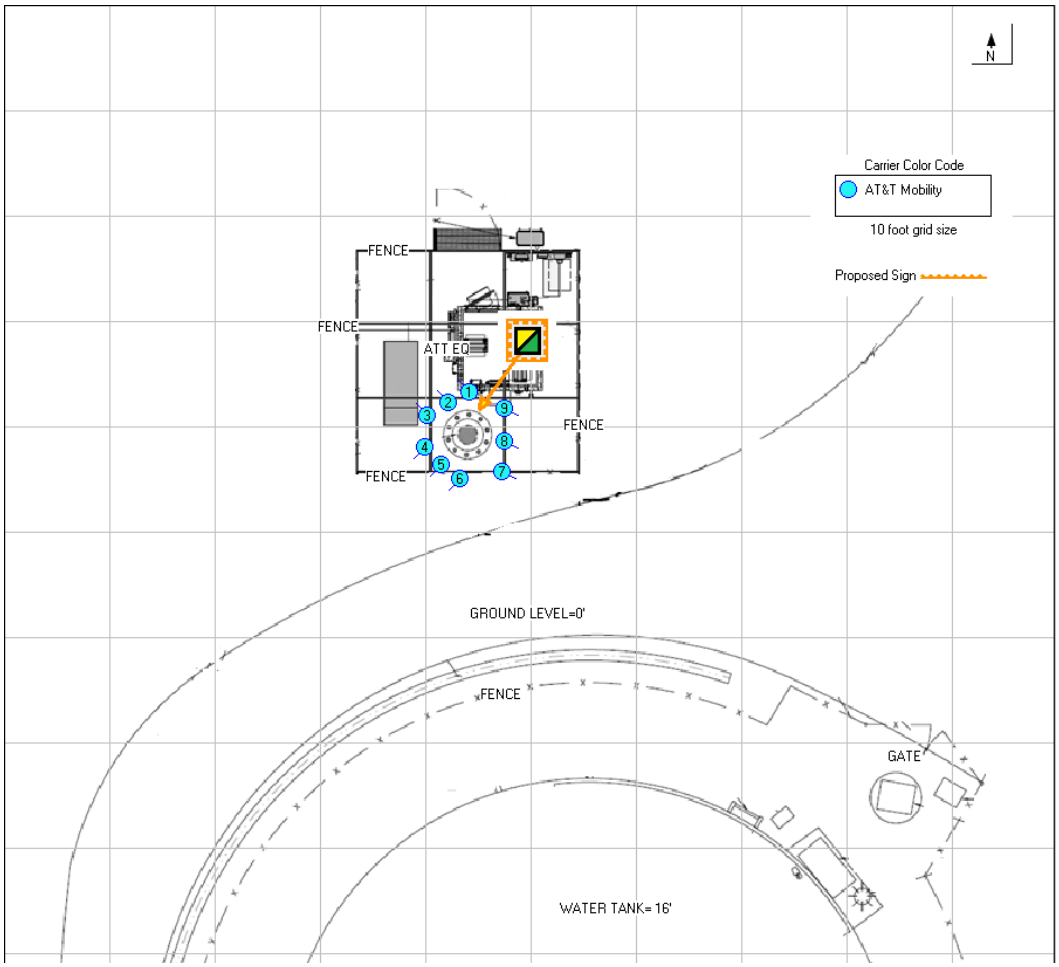

Figure 2: Mitigation Recommendations

Caution 2B

1 Caution 2B sign required at the base of the Monopole

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Appendix A: Operating Parameters Considered in this Analysis

Antenna #:	Carrier:	Manufacturer	Pattern:	Band (MHz):	Mech Az (deg):	Mech DT (deg):	H BW (deg):	Length (ft):	TPO (W):	Channels:	Loss (dB):	Gain (dBd):	ERP (W):	EIRP (W):	Rad Center (ft):
1	AT&T	COMMSCOPE	NNH4-65B-R6H4 02DT	700	320	0	71	6	40	2	0	11.45	1117	1833	72
1	AT&T	COMMSCOPE	NNH4-65B-R6H4 02DT	2300	320	0	58	6	25	4	0	15.71	3724	6109	72
2	AT&T	COMMSCOPE	NNH4-65B-R6H4 02DT	700	320	0	71	6	40	4	0	11.45	2234	3665	72
3	AT&T	COMMSCOPE	NNH4-65B-R6H4 02DT	700	320	0	71	6	40	4	0	11.45	2234	3665	72
3	AT&T	COMMSCOPE	NNH4-65B-R6H4 02DT	850	320	0	65	6	40	4	0	12.35	2749	4509	72
3	AT&T	COMMSCOPE	NNH4-65B-R6H4 02DT	1900	320	0	75	6	40	4	0	13.95	3973	6518	72
3	AT&T	COMMSCOPE	NNH4-65B-R6H4 02DT	2100	320	0	65	6	40	4	0	14.98	5036	8263	72
4	AT&T	COMMSCOPE	NNH4-65B-R6H4 02DT	700	220	0	71	6	40	2	0	11.45	1117	1833	72
4	AT&T	COMMSCOPE	NNH4-65B-R6H4 02DT	2300	220	0	58	6	25	4	0	15.71	3724	6109	72
5	AT&T	COMMSCOPE	NNH4-65B-R6H4 02DT	700	220	0	71	6	40	4	0	11.45	2234	3665	72
6	AT&T	COMMSCOPE	NNH4-65B-R6H4 02DT	700	220	0	71	6	40	4	0	11.45	2234	3665	72
6	AT&T	COMMSCOPE	NNH4-65B-R6H4 02DT	850	220	0	65	6	40	4	0	12.35	2749	4509	72
6	AT&T	COMMSCOPE	NNH4-65B-R6H4 02DT	1900	220	0	75	6	40	4	0	13.95	3973	6518	72
6	AT&T	COMMSCOPE	NNH4-65B-R6H4 02DT	2100	220	0	65	6	40	4	0	14.98	5036	8263	72
7	AT&T	COMMSCOPE	NNH4-65B-R6H4 02DT	700	120	0	71	6	40	2	0	11.45	1117	1833	72
7	AT&T	COMMSCOPE	NNH4-65B-R6H4 02DT	2300	120	0	58	6	25	4	0	15.71	3724	6109	72
8	AT&T	COMMSCOPE	NNH4-65B-R6H4 02DT	700	120	0	71	6	40	4	0	11.45	2234	3665	72
9	AT&T	COMMSCOPE	NNH4-65B-R6H4 02DT	700	120	0	71	6	40	4	0	11.45	2234	3665	72
9	AT&T	COMMSCOPE	NNH4-65B-R6H4 02DT	850	120	0	65	6	40	4	0	12.35	2749	4509	72
9	AT&T	COMMSCOPE	NNH4-65B-R6H4 02DT	1900	120	0	75	6	40	4	0	13.95	3973	6518	72
9	AT&T	COMMSCOPE	NNH4-65B-R6H4 02DT	2100	120	0	65	6	40	4	0	14.98	5036	8263	72

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