Radio Frequency Emissions Compliance Report for AT&T Mobility

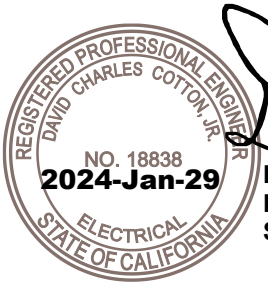
Site Name:	**Marione Drive**	**Site Structure Type:**	**Stealth Pole – Extrnl Array**
Address:	**5204 Marione Drive**	**Latitude:**	**38.596394**
	Carmichael, CA 95608	**Longitude:**	**-121.343839**
Report Date:	**January 30, 2024**	**Project:**	**New Build**

Compliance Statement

Based on information provided by AT&T Mobility and predictive modeling, the MARIONE DRIVE 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 Lattice 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 structures by 5% of the General Population limits.

Certification

I, David C. Cotton, Jr., 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.



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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.

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.

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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)

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.

Some antennas employ beamforming technology where RF energy allocated to each customer device is dynamically directed toward their location. This analysis includes a statistical factor reducing the actual power of the antenna system to 32% of maximum theoretical power to account for spatial distribution of users, network utilization, time division duplexing, and scheduling time. AT&T recommends the use of this factor based on a combination of guidance from its antenna system manufacturers, supporting international industry standards, industry publications, and its extensive experience.

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Analysis

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

- INSTALL (12) NEW PANEL ANTENNAS
- INSTALL (12) NEW RRUS

The antennas will be mounted on a 74-foot Monopine with centerlines 63.25, 68.83, & 70 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 have been installed at this site by other wireless operators. Operating parameters for these antennas considered in this analysis are also listed in Appendix A.

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 7.0325% of the FCC General Population limits. Incident at adjacent structures depicted in Figure 1, the maximum predicted power density level resulting from all AT&T Mobility operations is 29.0675% 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 structures 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 Monopine to inform authorized climbers of potential conditions near the antennas. These recommendations are depicted in Figure 2.

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Compliance Requirement Diagram (Access Location)

Recommendations

AT&T Mobility Access Location
Caution 2B sign posted at the base of the tower

Materials –
[1] Caution 2B sign

Figure 2: Mitigation Recommendation

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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	QUINTEL	QD8612-2 V1 02DT	700	20	0	69	8	60	4	0	13.0532	4848	7953	70
1	AT&T	QUINTEL	QD8612-2 V1 02DT	850	20	0	59	8	60	4	0	13.5229	5401	8861	70
1	AT&T	QUINTEL	QD8612-2 V1 00DT	1900	20	0	60	8	60	4	0	15.3015	8135	13346	70
1	AT&T	QUINTEL	QD8612-2 V1 00DT	2100	20	0	61	8	60	4	0	15.3581	8242	13521	70
2	AT&T	Ericsson	SON_AIR6419 TB 05.17.22 3700 AT&T	3700	20	0	13	2.4	108.4	1	0	23.45	23999	39372	63.25
3	AT&T	Ericsson	SON_AIR6419 TB 05.17.22 3500 AT&T	3500	20	0	13	2.4	54.2	1	0	23.45	11999	19686	68.83
4	AT&T	QUINTEL	QD8612-2 V1 02DT	700	20	0	69	8	40	4	0	13.0532	3232	5302	70
4	AT&T	QUINTEL	QD8612-2 V1 02DT	1900	20	0	61	8	40	4	0	15.3423	5475	8982	70
5	AT&T	QUINTEL	QD8612-2 V1 02DT	700	240	0	69	8	60	4	0	13.0532	4848	7953	70
5	AT&T	QUINTEL	QD8612-2 V1 02DT	850	240	0	59	8	60	4	0	13.5229	5401	8861	70
5	AT&T	QUINTEL	QD8612-2 V1 00DT	1900	240	0	60	8	60	4	0	15.3015	8135	13346	70
5	AT&T	QUINTEL	QD8612-2 V1 00DT	2100	240	0	61	8	60	4	0	15.3581	8242	13521	70
6	AT&T	Ericsson	SON_AIR6419 TB 05.17.22 3700 AT&T	3700	240	0	13	2.4	108.4	1	0	23.45	23999	39372	63.25
7	AT&T	Ericsson	SON_AIR6419 TB 05.17.22 3500 AT&T	3500	240	0	13	2.4	54.2	1	0	23.45	11999	19686	68.83
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8	AT&T	QUINTEL	QD8612-2 V1 02DT	1900	240	0	61	8	40	4	0	15.3423	5475	8982	70
9	AT&T	QUINTEL	QD8612-2 V1 02DT	700	130	0	69	8	60	4	0	13.0532	4848	7953	70
9	AT&T	QUINTEL	QD8612-2 V1 02DT	850	130	0	59	8	60	4	0	13.5229	5401	8861	70
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12	AT&T	QUINTEL	QD8612-2 V1 02DT	1900	130	0	61	8	40	4	0	15.3423	5475	8982	70

Notes: Table depicts recommended operating parameters for AT&T Mobility proposed operations.