

**J5 Infrastructure on behalf of T-Mobile
Site ID – BA00324A
Assessment Purpose – TMO Mod
(Anchor)
Site Name – SF324 MEADOW PARK
SCHOOL
Site Compliance Report**

**5400 Nave Drive
Novato, CA 94949**

Latitude: N38-3-02.09
Longitude: W122-31-49.97
Structure Type: Rooftop

Report generated date: May 2, 2024
Report by: Sophie Thein
Customer Contact: Jaclyn Bellicitti

**T-Mobile proposed modification will be
compliant upon completion of the remediation
identified in Section 1.3.**

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J5 Infrastructure on behalf of T-Mobile SF324 MEADOW PARK SCHOOL Radio Frequency (RF) Site Compliance Report



5400 Nave Drive, Novato, CA 94949



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1 Executive Summary

1.1 General

Upon evaluation of the cumulative RF exposure levels from all operators at this site, J5 Infrastructure on behalf of T-Mobile has contracted with Site Safe, LLC (Sitesafe), an independent Radio Frequency (RF) regulatory and engineering consulting firm, to determine whether the proposed communications site, BA00324A - SF324 MEADOW PARK SCHOOL, located at 5400 Nave Drive, Novato, CA, is in compliance with the Federal Communications Commission (FCC) Rules and Regulations for RF exposure.

This report contains a detailed summary of the RF environment at the site including:

- Site compliance determination
- Diagram of the site
- Inventory of the make / model of all antennas
- Theoretical MPE based on predictive modeling

1.2 Site Classification & FCC MPE Limits

This report addresses exposure to radio frequency electromagnetic fields in accordance with the FCC Rules and Regulations for all individuals, classified in two groups—Occupational (Controlled) and General Public (Uncontrolled). The FCC defines two sets of MPE limits for these groups. Occupational limits apply in situations in which persons are exposed as a consequence of their employment and where those persons have undergone proper RF awareness training, have been made fully aware of the potential for exposure, and can exercise control over their exposure. General Public limits, conversely, apply to accessible areas where workers or the general public may be exposed and have not undergone RF awareness training, may not be aware of the potential for exposure, and may not be able to exercise control over their exposure.

1.3 Site Compliance Statement

Upon evaluation of the cumulative RF exposure levels from all operators at this site, Sitesafe has determined that:

T-Mobile's proposed modification will be compliant with the FCC Rules and Regulations, as described in OET Bulletin 65, **upon implementation of the proposed remediation.**

Site Access Location

- (1) Notice sign(s) required.
 - (1) RF Guideline sign(s) required.
- Ensure that this access point is locked/restricted.

T-Mobile Proposed Alpha Sector Location

- (2) Caution sign(s) required.

T-Mobile Proposed Beta Sector Location

- (2) Caution sign(s) required.

Note: Barriers are not required at T-Mobile Alpha and Beta sector(s). The parapet wall is <39" and the areas exceeding the Occupational MPE limit are within 6' of the roof edge.

Note: Sitesafe recommends that persons accessing any adjacent trees in excess above ground level (i.e. landscape and arborist contractors or other maintenance workers) directly in front of the T-Mobile antennas are informed of areas where RF levels exceed the FCC General Public limit.

This document and the conclusions herein are based on the information provided by T-Mobile.

If you have any questions regarding RF safety and regulatory compliance, please do not hesitate to contact Sitesafe's Customer Support Department at (703) 276-1100.

2 Technical Framework

2.1 FCC Rules and Regulations

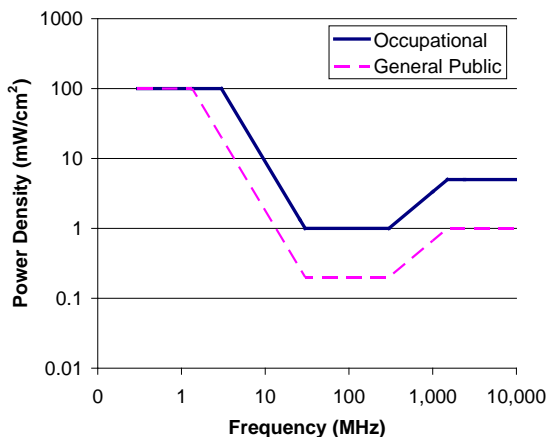
In 1996, the FCC adopted regulations for evaluating the effects of RF emissions in 47 CFR § 1.1307(b) and 1.1310. The guideline from the FCC Office of Engineering and Technology is Bulletin 65 (OET Bulletin 65), *Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields*, Edition 97-01, published August 1997. Since 1996, the FCC periodically reviews these rules and regulations as per its congressional mandate.

FCC regulations designate two separate tiers of exposure limits: Occupational (Controlled) and General Public (Uncontrolled). The FCC defines two sets of MPE limits for these groups. Occupational limits apply in situations in which persons are exposed as a consequence of their employment and where those persons have undergone proper RF awareness training, have been made fully aware of the potential for exposure, and can exercise control over their exposure. General Public limits, conversely, apply to accessible areas where workers or the general public may be exposed and have not undergone RF awareness training, may not be aware of the potential for exposure, and may not be able to exercise control over their exposure.

Areas are considered controlled when the environment is restricted or “controlled” in order to prevent access from members of the general public or untrained workers. Conversely, areas are considered uncontrolled when access is unrestricted or “uncontrolled” which allows access from members of the general public or untrained workers. A controlled environment can be evaluated with Occupational MPE limits whereas uncontrolled environments should always be evaluated with General Public MPE limits.

The MPE limits utilized in this analysis are outlined in the following diagram and table:

FCC Limits for Maximum Permissible Exposure (MPE)
Plane-wave Equivalent Power Density



Limits for Occupational/Controlled Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Time (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
300-1500	--	--	f/300	6
1500-100,000	--	--	5	6

Limits for General Population/Uncontrolled Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Time (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
300-1500	--	--	f/1500	30
1500-100,000	--	--	1.0	30

f = frequency in MHz *Plane-wave equivalent power density

3 General Safety Recommendations

The following are *general recommendations* appropriate for any site with accessible areas in excess of 100% General Public MPE. These recommendations are not specific to this site. These are safety recommendations appropriate for typical site management, building management, and other tenant operations.

- 1) All individuals needing access to the main site or the area(s) indicated to be in excess of General Public MPE should wear a Personal Protective Monitor (PPM), successfully complete proper RF Safety Awareness training, and have and be trained in the use of appropriate personal protective equipment. Awareness training increases a worker's understanding of potential RF exposure scenarios. Awareness can be achieved in a number of ways (e.g. videos, formal classroom lecture or internet-based courses). Sitesafe strongly recommends the use of a PPM. Wearing a PPM will properly forewarn the individual prior to entering an RF exposure area that may approach or exceed the exposure limits.
- 2) Any maintenance personnel required to work immediately in front of antennas and/or in areas indicated as above 100% of the Occupational MPE limits should coordinate with the wireless operators to disable transmitters during their work activities.
- 3) Access restrictions to transmitting antenna locations is the primary element in a site safety plan. Examples of access restrictions are as follows:
 - Locked door or gate
 - Alarmed door
 - Locked ladder access
 - Restrictive barrier at antenna(s) (e.g., chain-link with posted RF signage)
- 4) All individuals needing access to the main site should be instructed to obey all posted signs at all times. RF signage plays an important role in properly warning a worker prior to entering into a potential RF exposure area.
- 5) Individuals should always assume all antennas are active. Due to the nature of telecommunications transmissions, an antenna transmits intermittently. Always assume an antenna is transmitting and never stop in front of an antenna. If someone must pass by an antenna, they should move through in a transient manner as quickly and safely as possible, thereby reducing any exposure to a minimum.
- 6) The site should be routinely inspected and this or a similar report updated with any changes to the RF environment including:
 - addition of new antennas that have been located at the site
 - removal of existing antennas that are no longer present at the site
 - addition of new frequency bands on any antenna systems
 - changes in the radiating power and/or number of RF emitters



- 7) Post the appropriate **NOTICE, CAUTION, or WARNING** signage at the main site access point(s) and other locations as required. Note: please refer to the mitigation diagram(s) in Section 5 of this report for the locations of existing/proposed RF signage and barriers and inform everyone who has access to this site that beyond posted signs there may be levels in excess of the limits prescribed by the FCC.
- 8) It is the responsibility of all licensees comprising the site to maintain ongoing compliance with FCC rules and regulations. Individual licensees that contribute less than 5% MPE to any area(s) out of compliance are not responsible for corrective actions in those areas.
- 9) Keep a copy of this report available for all persons who must access the site. They should read this report and be aware of the potential hazards with regards to RF and MPE limits.

Additional RF information is available at the following sites:

<https://www.fcc.gov/general/radio-frequency-safety-0>

<https://www.fcc.gov/engineering-technology/electromagnetic-compatibility-division/radio-frequency-safety/faq/rf-safety>

OSHA has additional information available at:

<https://www.osha.gov/SLTC/radiofrequencyradiation/index.html>

4 T-Mobile Antenna Inventory

The Antenna Inventory below displays all transmitting antennas at the site. This inventory was provided by the customer and was utilized by Sitesafe to perform theoretical modeling of RF exposure. The inventory coincides with the site diagram(s) in this report, identifying each antenna's location. The antenna information collected includes the following information:

- Sector
- Technology
- Antenna manufacturers make & model
- Azimuth
- Antenna Height



The following antenna inventory was provided by the customer and was utilized to create the site model diagrams:

Sector	Antenna Number	Technology	Antenna Make and Model	Azimuth (Degrees)	Centerline Height Above Main/Reference Level (ft)
Alpha	1	5G	Ericsson AIR6419	15	30.6
Alpha	1	5G	Ericsson AIR6419	15	30.6
Alpha	2	5G	RFS APXVAALL18_43-U-NA20	15	29
Alpha	2	LTE	RFS APXVAALL18_43-U-NA20	15	29
Alpha	2	GSM	RFS APXVAALL18_43-U-NA20	15	29
Alpha	2	LTE	RFS APXVAALL18_43-U-NA20	15	29
Alpha	2	5G	RFS APXVAALL18_43-U-NA20	15	29
Alpha	2	LTE/AWS1	RFS APXVAALL18_43-U-NA20	15	29
Beta	3	5G	RFS APXVAALL18_43-U-NA20	220	29
Beta	3	LTE	RFS APXVAALL18_43-U-NA20	220	29
Beta	3	GSM	RFS APXVAALL18_43-U-NA20	220	29
Beta	3	LTE	RFS APXVAALL18_43-U-NA20	220	29
Beta	3	5G	RFS APXVAALL18_43-U-NA20	220	29
Beta	3	LTE/AWS1	RFS APXVAALL18_43-U-NA20	220	29
Beta	4	5G	Ericsson AIR6419	220	30.6
Beta	4	5G	Ericsson AIR6419	220	30.6

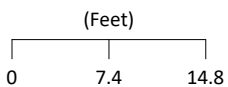
Note: The centerline height indicates antenna height above the **ground level** unless otherwise indicated.

Note: Each row with the same number in the Ant Number column references the same physical antenna as an antenna may operate in multiple frequency bands.

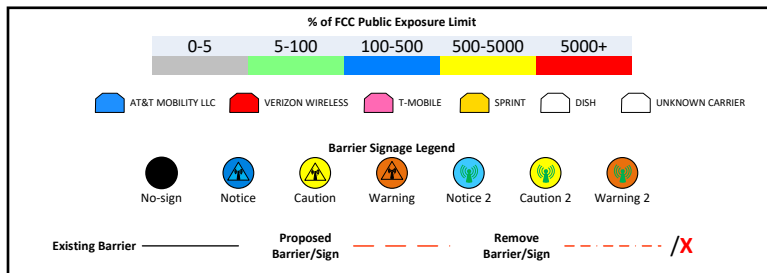
5 RF EXPOSURE & Mitigation Diagram(s)

The following diagrams display the predictive RF exposure at the facility as well as the existing and/or proposed mitigation required for site compliance. If applicable, measurement locations are also displayed. See Appendix C for further explanation of the colors shown on the RF exposure diagram.

RF Exposure Simulation For: SF324 MEADOW PARK SCHOOL Composite View



www.sitesafe.com
5/2/2024 8:12:31 AM



Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

6 Summary

The T-Mobile facility was evaluated for compliance with FCC rules and regulations using the data provided to Sitesafe. For areas that may exceed the MPE limits for which RF signage/barriers are required for site compliance, the recommended mitigation is detailed in Section 1.3 as well as in the diagram(s) in Section 5.

T-Mobile's proposed modification will be compliant with the FCC Rules and Regulations, as described in OET Bulletin 65, **upon implementation of the proposed remediation.**

To reduce the risk of exposure and/or injury, Sitesafe recommends that access to the rooftop or areas associated with the T-Mobile antenna installation be restricted to authorized personnel who have undergone proper RF awareness safety training. Additionally, all signs and barriers should be obeyed at all times and any work that must be performed in close proximity to the T-Mobile antennas should be coordinated in advance with T-Mobile to ensure safe working conditions. Workers can call the T-Mobile NOC Number at 1-888-662-4662 for guidance.

7 Engineer Certification

The professional engineer whose seal appears on the cover of this document hereby certifies and affirms:

That I am registered as a Professional Engineer in the jurisdiction indicated in the professional engineering stamp on the cover of this document; and

That I, Michael A. McGuire, P.E., am currently and actively licensed to provide (in this state/jurisdiction as indicated within the professional electrical engineering seal on the cover of this document) professional electrical engineering services, as an employee of Hurricane Hill Development Company, PLLC, a duly authorized/registered engineering firm (in this state, as applicable) on behalf of Site Safe, LLC; and

That I am thoroughly familiar with the Rules and Regulations of the Federal Communications Commission (FCC) as well as the regulations of the Occupational Safety and Health Administration (OSHA), both in general and specifically as they apply to the FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields; and

That I have thoroughly reviewed this Site Compliance Report and believe it to be true and accurate to the best of my knowledge as assembled by and attested to by Sophie Thein.

May 2, 2024

Appendix A – Definitions

5% Rule – The rules adopted by the FCC specify that, in general, at multiple transmitter sites actions necessary to bring the area into compliance with the guidelines are the shared responsibility of all licensees whose transmitters produce field strengths or power density levels at the area in question in excess of 5% of the exposure limits. In other words, any wireless operator that contributes 5% or greater of the MPE limits in an area that is identified to be greater than 100% of the MPE limits is responsible for taking corrective actions to bring the site into compliance.

Compliance – The determination of whether a site complies with FCC standards with regards to Human Exposure to Radio Frequency Electromagnetic Fields from transmitting antennas.

Decibel (dB) – A unit for measuring power or strength of a signal.

Duty Cycle – The percent of pulse duration to the pulse period of a periodic pulse train. Also, may be a measure of the temporal transmission characteristic of an intermittently transmitting RF source such as a paging antenna by dividing average transmission duration by the average period for transmission. A duty cycle of 100% corresponds to continuous operation.

Effective (or Equivalent) Isotropic Radiated Power (EIRP) – The product of the power supplied to the antenna and the antenna gain in a given direction relative to an isotropic antenna.

Effective Radiated Power (ERP) – The product of the power supplied to the antenna and the antenna gain in a given direction relative to a half-wave dipole antenna.

Gain (of an antenna) – The ratio, usually expressed in decibels, of the power required at the input of a loss-free reference antenna to the power supplied to the input of the given antenna to produce, in a given direction, the same field strength or the same power density at the same distance. When not specified otherwise, the gain refers to the direction of maximum radiation. Gain may be considered for a specified polarization. Gain may be referenced to an isotropic antenna (dBi) or a half-wave dipole (dBd) antenna.

General Public/Uncontrolled Environment – Defined by the FCC as an area where RF exposure may occur to persons who are **unaware** of the potential for exposure and who have no control over their exposure. General Public is also referenced as General Population.

Generic Antenna – For the purposes of this report, the use of “Generic” as an antenna model means the antenna information was not provided and could not be obtained while on site. In the event of unknown information, Sitesafe will use its industry specific knowledge of antenna models to select a worst-case scenario antenna to model the site.

Isotropic Antenna – An antenna that is completely non-directional. In other words, an antenna that radiates energy equally in all directions.

Maximum Permissible Exposure (MPE) – The rms and peak electric and magnetic field strength, their squares, or the plane-wave equivalent power densities associated with



these fields to which a person may be exposed without harmful effect and with acceptable safety factor.

Occupational/Controlled Environment – Defined by the FCC as an area where RF exposure may occur to persons who are **aware** of the potential for exposure as a condition of employment or specific activity and can exercise control over their exposure.

OET Bulletin 65 – Technical guideline developed by the FCC’s Office of Engineering and Technology to determine the impact of RF exposure on humans. The guideline was published in August 1997.

OSHA (Occupational Safety and Health Administration) – Under the Occupational Safety and Health Act of 1970, employers are responsible for providing a safe and healthy workplace for their employees. OSHA's role is to promote the safety and health of America's working men and women by setting and enforcing standards; providing training, outreach and education; establishing partnerships; and encouraging continual process improvement in workplace safety and health. For more information, visit www.osha.gov.

Radio Frequency Exposure or Electromagnetic Fields – Electromagnetic waves that are propagated from antennas through space.

Spatial Average Measurement – A technique used to average a minimum of ten (10) measurements taken in a ten (10) second interval from zero (0) to six (6) feet. This measurement is intended to model the average energy a 6-foot-tall human body will absorb while present in an electromagnetic field of energy.

Transmitter Power Output (TPO) – The RF output power of a transmitter’s final RF stage as measured at the output terminal while connected to a load.



Appendix B – Statement of Limiting Conditions

Sitesafe will not be responsible for matters of a legal nature that affect the site or property.

Due to the complexity of some wireless sites, Sitesafe performed an analysis and created this report utilizing best industry practices and due diligence. Sitesafe cannot be held accountable or responsible for anomalies or discrepancies due to actual site conditions (e.g., mislabeling of antennas or equipment, inaccessible cable runs, inaccessible antennas or equipment, etc.) or information or data supplied by T-Mobile, the site manager, or their affiliates, subcontractors or assigns.

Sitesafe may note in the Site Compliance Report any adverse physical conditions, such as needed repairs, observed during the survey of the subject property or that Sitesafe became aware of during the normal research involved in performing this survey. Sitesafe will not be responsible for any such conditions that do exist or for any engineering or testing that might be required to discover whether such conditions exist. Because Sitesafe does not provide expertise in the field of mechanical engineering or building maintenance, the Site Compliance Report must not be considered a structural or physical engineering report.

Sitesafe obtained information used in this Site Compliance Report from sources that Sitesafe considers reliable and believes them to be true and correct. Sitesafe does not assume any responsibility for the accuracy of such items that were furnished by other parties. When conflicts in information occur between data provided by a second party and physical data collected by Sitesafe, the physical data will be used.

Appendix C – RF Exposure Diagram Color Coding

The five color levels identified in this analysis can be interpreted in the following manner:

- **Gray** represents areas predicted to be at 5% or less of the General Public MPE limits. The general public and trained workers can access these areas with no restrictions.
- **Green** represents areas predicted to be between 5% and 100% of the General Public MPE limits. The general public and workers can access these areas with no restrictions.
- **Blue** represents areas predicted to be between 100% and 500% of the General Public MPE limits. The general public should be restricted from accessing these areas. Workers can access these areas assuming they have basic understanding of EME awareness and RF safety procedures and understand how to limit their exposure.
- **Yellow** represents areas predicted to be between 500% and 5000% of the General Public MPE limits. The General Public should be restricted from accessing these areas. Workers can access these areas assuming they have basic understanding of EME awareness and RF safety procedures and understand how to limit their exposure. Transmitter power reduction and/or time-averaging may be required.
- **Red** represents areas predicted to be greater than 5000% of the General Public MPE limits. The General Public should be restricted from accessing these areas. These areas are not safe for workers to be in for prolonged periods of time. Special procedures must be adhered to, such as lockout/tagout or transmitter power reduction, to minimize worker exposure to EME.

Keep a copy of this report available for all persons who must access the site. They should read this report and be aware of the potential hazards with regards to RF and MPE limits.