MAXIMUM PERMISSIBLE EXPOSURE STUDY

THEORETICAL REPORT

Site Number:	VW-MA-0057
Site Name:	Wellfleet 6
Latitude:	41.89696667
Longitude:	-69.984375
Address:	724 Route 6, Wellfleet, MA 02667

Conclusion: ***The proposed antenna installation is calculated to be within the FCC Standard for Uncontrolled/General Public and Controlled/Occupational Maximum Permissible Exposure (MPE).***

This is a preliminary MPE report based on a standard configuration for each carrier. A final report can be completed once specific carrier details are known. If questions arise regarding the calculations herein, SAI Communications recommends that a comprehensive field survey be performed after installation to resolve any disputes.

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Date of Report: January 30, 2015

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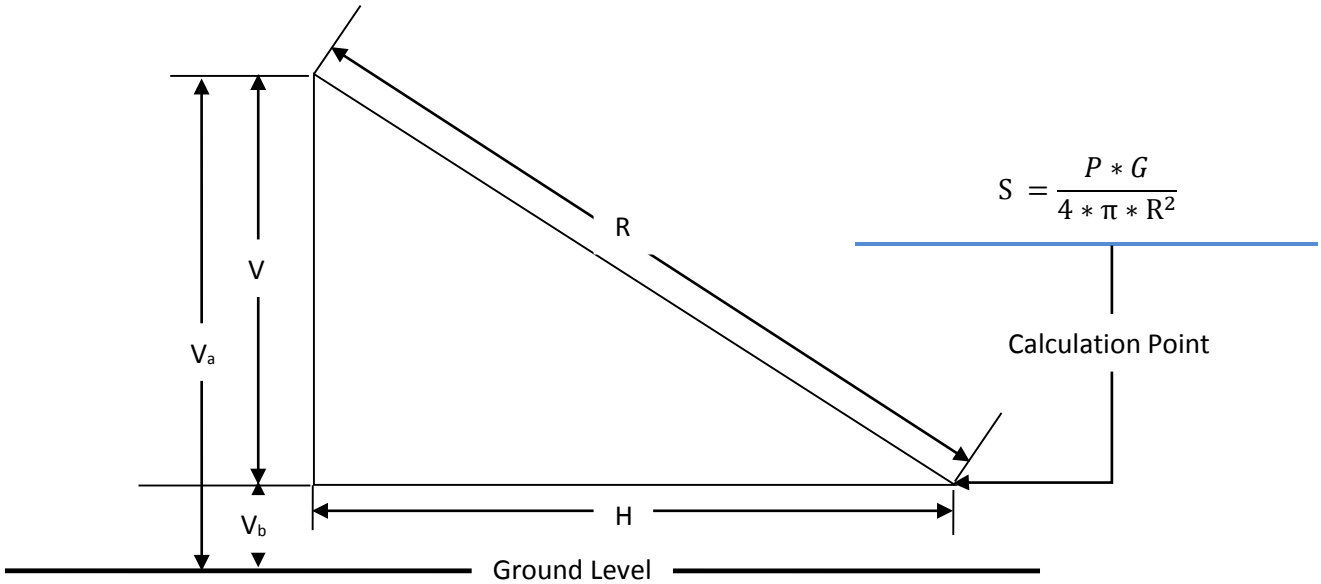
Introduction

SAI Communications has conducted this theoretical analysis for Varsity Wireless, to ensure that the proposed radio facility complies with Federal Communications Commission (FCC) regulations. This report will show that, through the use of FCC suggested prediction methods, the radio facility in question will be in compliance with all appropriate Federal regulations in regards to Radio Frequency (RF) Exposure.

This is a preliminary MPE report based on a standard configuration for each carrier. A final report can be completed once specific carrier details are known.

RF Exposure Prediction Method

Power Density is calculated in accordance with FCC OET Bulletin 65 formula (3):



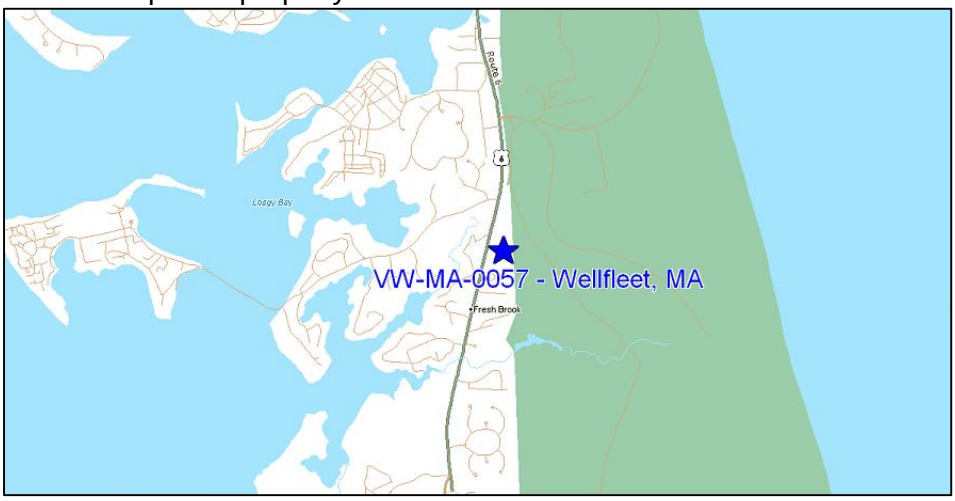
Where:
S = Power Density
P = Power input to the antenna
G = Gain of an antenna
R = Radial distance = $\sqrt{H^2 + V^2}$
H = Horizontal distance from antenna
V = Vertical distance from antenna = $Va - Vb$
V_a = Antenna height above ground
V_b = Calculation height above ground = 6ft

Case Summary

The proposed radio facility will have a radiation centers of 117ft, 127ft, 137ft, and 147ft. It will be located at the following geographic coordinates:

Latitude: 41.89696667
Longitude: -69.984375

See sketch below for specific property location.



RF Design Specifications

Varsity Wireless is planning to install panel antennas for 4 wireless carriers with UMTS, CDMA and LTE Technologies. Assumptions have been made for channel counts and antenna specifications on the four wireless carriers.

Carrier	Rad Center, AGL (ft)
Verizon	147
AT&T	137
Sprint	117
T-Mobile	127

FCC Guidelines

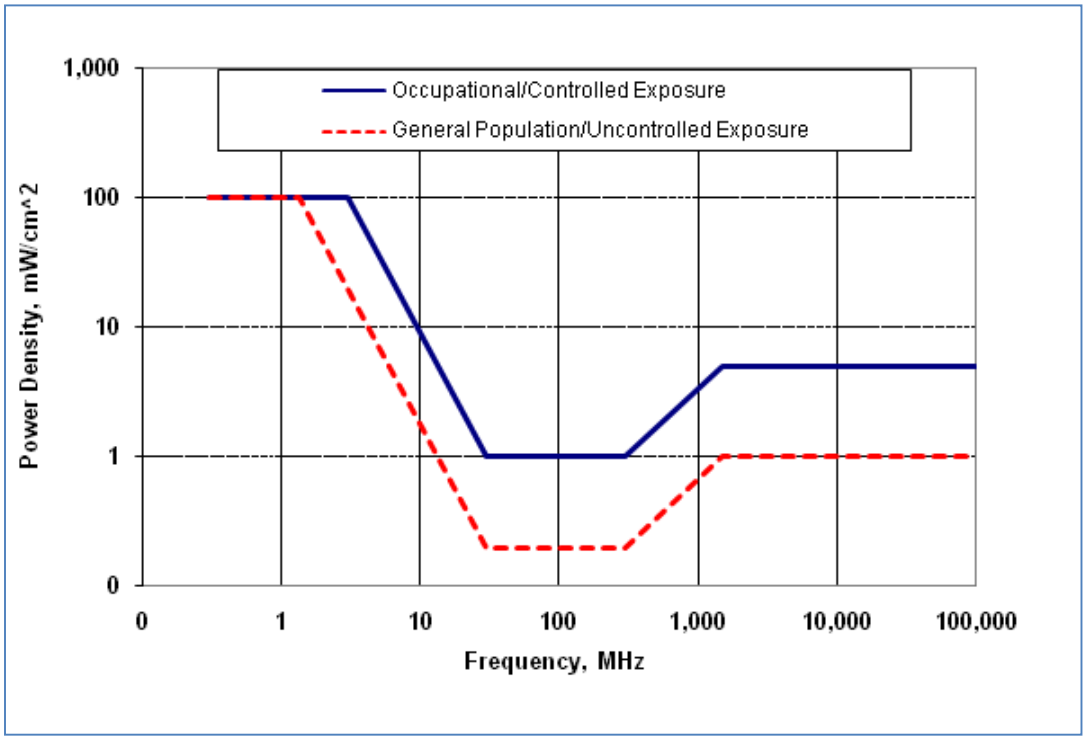
Table 1. MPE Limits for General Population/ Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Averaging Time for $\|E\|^2$, $\|H\|^2$, or S (Minutes)
0.3 – 1.34	614	1.63	(100)*	30
1.34 -30	824/f	2.19/f	$(180/f^2)$*	30
30 – 300	27.5	0.073	0.2	30
300 – 1500	--	--	f/1500	30
1500– 100,000	--	--	1.0	30
f = frequency in MHz		* = Plane wave equivalent power density		

General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can't exercise control over their exposure.

Table 2. MPE Limits for Occupational/Controlled Exposure				
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Averaging Time for $\|E\|^2$, $\|H\|^2$, 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 – 1500	--	--	f/300	6
1500– 100,000	--	--	5.0	6
f = frequency in MHz		* = Plane wave equivalent power density		

Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where such occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

FCC RF Exposure Limits

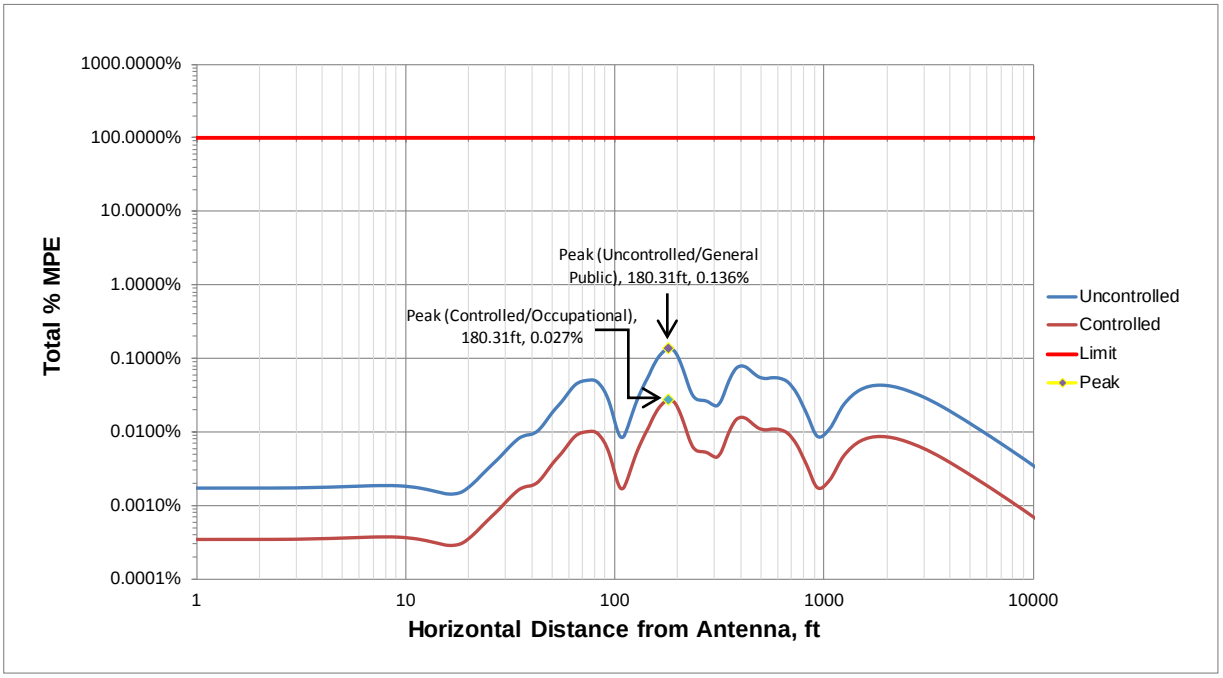


Maximum Permissible Exposures. Occupational/Controlled and General Population/Uncontrolled MPE's are functions of frequency.

Calculation Results (6ft AGL)

The following chart shows the graphical representation of the calculated cumulative contribution levels at 6ft above ground, as horizontal distance from antenna increases. %MPE was calculated with assumed power, channel counts, and antenna specifications for all carriers. The calculations take into account the vertical pattern of the antennas and represent the immediate direction of each sector azimuth within the antenna horizontal beamwidth. The calculations also assume line of site to the antennas and the result will be lower if measured indoor due to in-building penetration loss.

%MPE



Statement of Certification

I certify to the best of my knowledge that the statements contained in this report are true and accurate. The theoretical computations contained are based on FCC recommended methods, with industry standard assumptions & formulas, and complies with FCC mandated Maximum Permissible RF Exposure requirements.

A comprehensive field survey was not performed prior to the generation of this report. If questions arise regarding the calculations herein, SAI Communications recommends that a comprehensive field survey be performed to resolve any disputes.

Mike Lawton
RF Engineering Manager
SAI Communications

January 30, 2015
Date