

Sutro Tower, Inc. • San Francisco, California

Statement of Hammett & Edison, Inc., Consulting Engineers

The firm of Hammett & Edison, Inc., Consulting Engineers, has been retained by Sutro Tower, Inc. to evaluate RF exposure levels near the Sutro Tower broadcast site, 1 La Avanzada Street, San Francisco, California, for compliance with appropriate guidelines limiting human exposure to radio frequency electromagnetic fields.

Background Information

Sutro Tower is located near Mt. Sutro in San Francisco, California, and currently supports the transmitting facilities for eleven DTV stations and four FM stations. As part of the final DTV antenna installation project, Sutro Tower agreed to provide measurement data of existing RF exposure levels at 200 locations within a 1,000-foot radius of the tower within two weeks of the activation of any new DTV antenna and every three years thereafter. The main antenna facilities for all eleven stations are now operational and measurements have been made on these antennas, which will be final DTV facilities for the Sutro Tower stations.

Prevailing Exposure Standards

The U.S. Congress requires that the Federal Communications Commission (“FCC”) evaluate its actions for possible significant impact on the environment. In Docket 93-62, effective October 15, 1997, the FCC adopted the human exposure limits for field strength and power density recommended in 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 and approved as American National Standard ANSI/IEEE C95.1-2006, “Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz,” includes similar exposure limits. 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.

Measurement Procedure

The site was visited by the undersigned engineer and by Rajat Mathur, P.E., a qualified engineer employed by Hammett & Edison, Inc., on November 24, 2009. Measurements were made at 208 locations within a 1,000-foot radius of Sutro Tower, as shown in Figure 2, including all residential streets. Measurements were taken at a typical spacing of about 60–75 feet along the streets, although



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variations occurred due to topography and street layout. Measurements were made using a Wandel & Goltermann Type EMR-300 Radiation Meter (Serial No. P-0008) with Type 18 and 25 Isotropic Electric Field Probes (Serial Nos. F-0034 and E-0001, respectively), last calibrated by the manufacturer on July 7, 2009, July 3, 2009, and June 5, 2008, respectively. The Type 25 probe is frequency-shaped and provides results as a percentage of the applicable FCC limit; that probe is calibrated only for exposure levels greater than 2.5% of the FCC public exposure limit. The Type 18 probe provides results in volts/meter and is calibrated for exposure of levels down to 0.2 V/m (0.005% of the most restrictive public limit); measurement results using that instrument are expressed as a percentage of the most restrictive FCC limit (0.2 mW/cm²). Both probes are broadband devices, which means that they measure all radio frequency sources, not just the broadcast operations at Sutro Tower.

The final specifications of the main DTV and FM antennas, as operating during the November 24, 2009, measurements, are as follows:

Station	Channel	Effective Radiated Power	Antenna Make & Model	Center Height Above Sea Level
KGO-DT	D07	24 kW	Dielectric TCL-6A7-S	544.2 m
KOFY-DT	D19	568	Dielectric TFU-30DSC/VP-R 4C190	519.0
KPIX-DT	D29	1,000	Dielectric TUM-C5SP-14/60H-2-T-R	542.6
KQED-DT	D30	355 (710)*	Dielectric TUM20-C5SP-14/60H-2-R-T	542.6
KMTP-DT	D33	500	Dielectric TUM20-C5SP-14/60H-2-R-T	542.6
KFSF-DT	D34	128 (370)*	Dielectric TFU-26DSC/VP-R P190	524.8
KRON-DT	D38	1,000	Dielectric TUM-C5SP-14/60H-2-T-R	542.6
KCNS-DT	D39	500 (1,000)*	Dielectric TUM20-C5SP-14/60H-2-R-T	542.6
KCSM-DT	D43	500	Dielectric TUM20-C5SP-14/60H-2-R-T	542.6
KTVU-DT	D44	1,000	Dielectric TUM-C5SP-14/60H-2-T-R	542.6
KBCW-DT	D45	330 (1,000)*	Dielectric TFU-19JSC/VP-R CT150 SP	521.4
KOIT-FM	243	24	Antenna Concepts ATI6M	511
KSOL(FM)	255	6.1	ERI LPX-3E-SP	440
KKSF(FM)	279	7.2	Harris FMH-4AE-HW	492
KFOG(FM)	283	7.1	Harris FMH-2AE-HW	490

Measurement Results

A tabulation of measurement results is provided in Figure 3. The maximum ambient RF level measured at any of the 208 points surrounding Sutro Tower was 4.5% of the most restrictive FCC public exposure limit. This compares to a maximum of 13.3% of the most restrictive limit during the last set of measurements made in 2006 for operation of the analog and interim digital television antennas. Overall, the measurement results were lower by an average of about 60%.

* Operating at reduced power during measurements. Power given in parenthesis is expected final authorized power.



Conclusion

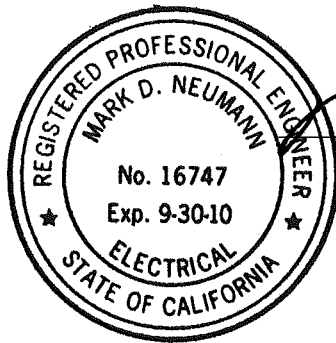
It is my professional opinion that the measurements reported above comply with the requirements of the Sutro Tower neighborhood agreement. Further, it is my professional opinion that the TV and FM broadcast stations at Sutro Tower continue to comply with prevailing standards for limiting public exposure to radio frequency energy.

Figures

In carrying out these engineering studies, the following attached figures were prepared under my direct supervision:

1. Summary of FCC RF exposure guidelines.
2. Map showing measurement locations.
3. Table showing measurement results.

December 11, 2009



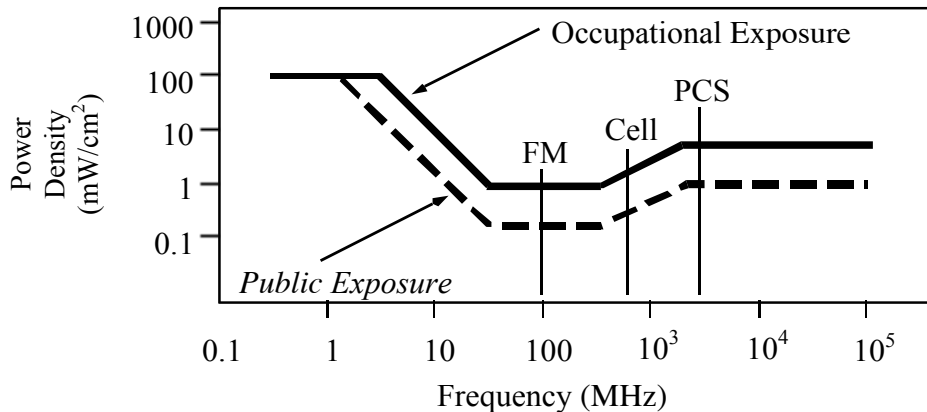
Mark D. Neumann
Mark D. Neumann, P.E.

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 and approved as American National Standard ANSI/IEEE C95.1-2006, “Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz 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:

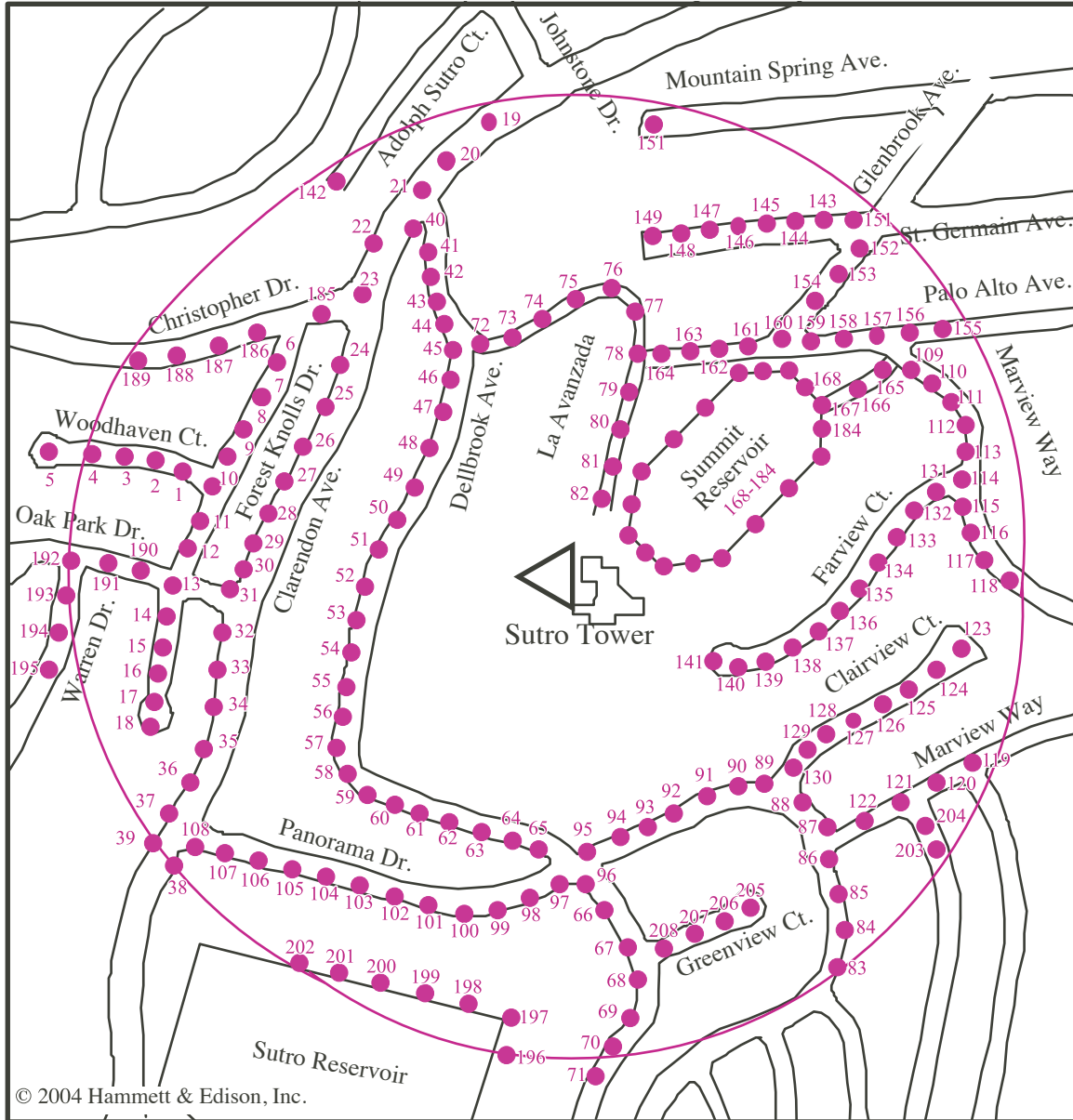
Frequency Applicable Range (MHz)	Electromagnetic Fields (f is frequency of emission in MHz)					
	Electric Field Strength (V/m)		Magnetic Field Strength (A/m)		Equivalent Far-Field Power Density (mW/cm ²)	
0.3 – 1.34	614	<i>614</i>	1.63	<i>1.63</i>	100	<i>100</i>
1.34 – 3.0	614	<i>823.8/f</i>	1.63	<i>2.19/f</i>	100	<i>180/f²</i>
3.0 – 30	1842/f	<i>823.8/f</i>	4.89/f	<i>2.19/f</i>	900/f ²	<i>180/f²</i>
30 – 300	61.4	<i>27.5</i>	0.163	<i>0.0729</i>	1.0	<i>0.2</i>
300 – 1,500	3.54√f	<i>1.59√f</i>	√f/106	<i>√f/238</i>	f/300	<i>f/1500</i>
1,500 – 100,000	137	<i>61.4</i>	0.364	<i>0.163</i>	5.0	<i>1.0</i>



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. However, neither of these allowances is incorporated in the conservative calculation formulas in the FCC Office of Engineering and Technology Bulletin No. 65 (August 1997) for projecting field levels. Hammett & Edison has built those formulas into a proprietary program that calculates, at each location on an arbitrary rectangular grid, the total expected power density from any number of individual radio sources. The program allows for the description of buildings and uneven terrain, if required to obtain more accurate projections.



Measurement Locations



Purple circle represents 1000-foot radius from Sutro Tower.
Purple dots denote locations for measurement results in Figure 3.

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Measured Power Density Levels
November 24, 2009

Point	Measurement*	Point	Measurement*	Point	Measurement*
1	1.4%	43	1.8%	85	0.53%
2	0.64%	44	1.8%	86	0.83%
3	0.53%	45	2.6%	87	1.0%
4	0.43%	46	2.1%	88	3.6%
5	0.43%	47	1.5%	89	2.3%
6	1.2%	48	1.4%	90	2.8%
7	1.7%	49	0.83%	91	3.7%
8	2.1%	50	0.83%	92	3.8%
9	2.3%	51	1.5%	93	3.2%
10	1.1%	52	2.1%	94	3.7%
11	1.4%	53	2.1%	95	2.3%
12	0.76%	54	1.3%	96	3.7%
13	0.64%	55	0.76%	97	2.1%
14	0.58%	56	0.97%	98	1.6%
15	0.64%	57	2.0%	99	1.5%
16	0.53%	58	2.1%	100	1.7%
17	0.58%	59	1.6%	101	1.7%
18	0.48%	60	1.0%	102	2.0%
19	0.19%	61	0.90%	103	1.4%
20	0.19%	62	1.0%	104	1.5%
21	0.34%	63	0.83%	105	1.4%
22	0.34%	64	0.83%	106	3.3%
23	2.1%	65	2.8%	107	3.1%
24	2.6%	66	1.9%	108	2.7%
25	1.3%	67	2.7%	109	0.90%
26	1.2%	68	1.5%	110	0.97%
27	0.9%	69	0.64%	111	0.76%
28	0.97%	70	0.53%	112	0.58%
29	0.83%	71	0.34%	113	0.76%
30	0.83%	72	3.9%	114	1.0%
31	1.2%	73	2.9%	115	0.90%
32	1.6%	74	1.9%	116	0.97%
33	1.3%	75	3.2%	117	1.1%
34	0.83%	76	1.4%	118	1.2%
35	0.58%	77	1.3%	119	0.48%
36	0.70%	78	1.0%	120	0.53%
37	0.76%	79	4.5%	121	0.64%
38	0.58%	80	2.3%	122	0.53%
39	0.48%	81	4.2%	123	1.0%
40	0.34%	82	2.5%	124	0.70%
41	1.4%	83	0.43%	125	0.76%
42	1.2%	84	0.58%	126	0.70%

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Measured Power Density Levels
November 24, 2009

Point	Measurement*	Point	Measurement*	Point	Measurement*
127	1.3%	155	1.2%	183	3.7%
128	1.0%	156	0.76%	184	2.0%
129	1.1%	157	0.97%	185	0.90%
130	1.6%	158	0.83%	186	0.53%
131	1.0%	159	0.83%	187	1.0%
132	1.4%	160	0.83%	188	0.83%
133	2.2%	161	1.4%	189	0.38%
134	1.2%	162	2.3%	190	0.90%
135	3.7%	163	2.1%	191	0.43%
136	3.7%	164	1.0%	192	0.38%
137	2.3%	165	0.83%	193	0.48%
138	2.5%	166	0.90%	194	0.34%
139	1.9%	167	1.3%	195	0.30%
140	1.7%	168	0.83%	196	0.38%
141	0.53%	169	0.97%	197	0.26%
142	0.22%	170	1.3%	198	0.26%
143	0.64%	171	1.1%	199	0.43%
144	0.53%	172	2.6%	200	0.22%
145	0.53%	173	1.4%	201	0.13%
146	0.43%	174	2.0%	202	0.11%
147	0.43%	175	0.83%	203	0.64%
148	0.90%	176	0.83%	204	0.53%
149	0.48%	177	0.90%	205	1.2%
150	0.58%	178	2.3%	206	1.7%
151	0.58%	179	2.6%	207	2.5%
152	0.83%	180	1.5%	208	1.4%
153	0.70%	181	3.8%†		
154	0.70%	182	4.0%		

* Expressed as percent of most restrictive FCC limit of 0.2 mW/cm², except as noted.

† Expressed as percent of applicable public limit for frequencies involved; Type 25 frequency-shaped probe used.