

**Sutro Tower, Inc • San Francisco, California  
Supplemental Report**

**Statement of Hammett & Edison, Inc., Consulting Engineers**

The firm of Hammett & Edison, Inc., Consulting Engineers, has been retained by Sutro Tower, Inc., to prepare this supplement to our September 22, 2014, evaluation of the proposed addition of several radio facilities on the Sutro Tower in San Francisco, California, for compliance with appropriate guidelines limiting human exposure to radio frequency (“RF”) electromagnetic fields.

**Executive Summary**

This supplement provides additional information on the revised Dielectric antenna patterns, the conservative nature of our calculations, the construction phase power densities, and the lack of interference to consumer electronic devices.

**As-Built Dielectric Antenna Patterns**

Our report dated April 3, 2008, was based on planned antenna patterns provided by Dielectric Communications, the antenna manufacturer, which were dated September 12, 2007, for eleven post-transition DTV stations. Dielectric issued new patterns on September 18, 2008, well after our report was prepared. As a result of these as-built patterns, the highest calculated ground-level radio frequency power density for normal operations decreased from 8.4% of the public limit reported in our April 2008 study to 6.2% of the public limit reported in our September 2014 study, even though the number of FM and TV stations was higher in 2014.

**Conservative Nature of Calculations**

The calculated RF exposure level of 6.2% is conservative due to several factors, that is, actual exposure levels are expected to be below the calculated levels. Among these factors are:

- The assumption that the proposed KQED-FM auxiliary antenna would be operating in addition to the main antennas of all stations which locate both their main and auxiliary antennas on Sutro Tower. The KQED-FM main antenna is located at San Bruno Mountain rather than Sutro Tower, so it typically operates from Sutro Tower only for short periods at irregular intervals.
- The assumption that all of the FM stations at Sutro Tower, both existing and proposed, would operate with 10% In Band On Channel (IBOC) power, even though at least one of the Sutro Tower FM stations has FCC allocation restraints that would preclude full 10% IBOC power.
- The assumption that FM Station KOSF is still conducting customary operations at Sutro Tower. While continuing as a tenant on Sutro Tower for its auxiliary antenna, that station has since relocated its main antenna operation to San Bruno Mountain. Although KOSF retains



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its right to use its former Level 6 main antenna and its Level 2 auxiliary antenna at Sutro Tower, doing so would require a new application to the FCC to re-establish Sutro Tower as that station's main antenna. In the event the previously studied KOSF Level 6 main antenna were to be re-licensed as a separate-site auxiliary antenna, the power would have to be substantially reduced to comply with FCC rules governing auxiliary antenna operation.

### **Construction Phase Power Densities**

During construction to install the additional radio and TV antennas, it will be necessary again for the Sutro Tower TV stations to operate temporarily with their Level 4 auxiliary antennas (for the UHF TV stations) and the one Level 2 auxiliary antenna (for KGO-TV, Channel D07). All of the existing FM stations would continue to operate into their main antennas except for KOIT, which would operate with its new Level 5 auxiliary antenna. The newcomer TV stations, KTNC-TV, D14, and KEMO-TV, D32, would not yet be operational. The proposed newcomer FM stations, KREV and KQED-FM auxiliary, would not yet be operational, nor would the proposed FM translator station. Under these conditions the ground-level power density in any publicly-accessible area is not predicted to exceed 15% of the public limit. The maximum would occur to the east of Sutro Tower, at the Sutro reservoir. As shown by the attached figure, the calculated power density levels in the neighborhoods surrounding Sutro Tower are substantially lower.

The calculated ground-level power densities for the construction phase are based on the DTV auxiliary antenna powers provided by Dielectric in 2007. Since that time, four stations, KGO-TV, D07; KMTP-TV, D33; KFSF-DT, D34; and KCNS, D39, have increased their auxiliary antenna power capability. For the construction-phase simultaneous operation of all UHF TV stations transmitting from the Level 4 auxiliary antennas, the auxiliary antenna effective radiated powers (ERPs) should be limited to the power levels shown in Figure 4 of our July 23, 2007, report in order for the maximum calculated ground-level power density to remain at 15% of the public limit. These operating powers are as follows:

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Station	Channel	Auxiliary Antenna Maximum Effective Radiated Power
KGO-TV	7	65 kW
KBWB	19	500
KPIX-TV	29	500
KQED	30	500
KMTP-TV	33	220
KFSF-DT	34	210
KRON-TV	38	500
KCNS	39	250
KCSM-TV	43	250
KTVU	44	500
KBCW	45	500

### No Greater Radio Interference To Consumer Electronic Devices

The addition to Sutro Tower of two TV stations, two FM stations (only one of which will involve normally always-on main antenna operation), and one FM translator station will not significantly increase the likelihood of interference to consumer electronic devices. The newcomer radio and TV stations must, like the existing stations, adhere to all FCC restrictions for power, frequency stability, modulation, and out-of-band emissions. The incremental increase to the radio frequency levels seen by consumer electronic devices will be small, and still substantially less than the levels during the earlier DTV transition period, when both analog and digital TV signals were present, in addition to the FM signals. The moving of the KOSF main antenna in May 2013 from Sutro Tower to San Bruno Mountain will actually mean less total FM signal strength in the vicinity of the tower, since the KOSF ERP was 7.2 kW, whereas the newcomer KREV ERP is just 0.27 kW. Any re-licensing of the KOSF former Level 6 main antenna on Sutro Tower as an updated auxiliary antenna will have to comply with FCC rules limiting a station's auxiliary antenna coverage to be entirely inside its main antenna coverage. Since the KOSF main antenna is now located at San Bruno Mountain, 8 km from Sutro Tower, this means substantially less power than is currently authorized for the KOSF Sutro Tower Level 2 auxiliary antenna.

### Conclusion

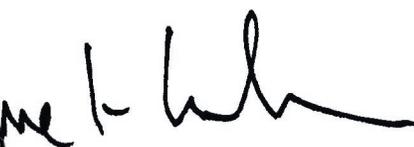
Even with the proposed addition of two TV stations, two FM stations, and an FM Translator station, the calculated ground-level power density for normal operation of all of the radio and TV stations proposed for Sutro Tower would be more than ten times below the public limit. Follow-up ground-level radio frequency power density measurements would be made to establish actual post-modification levels at Sutro Tower with 13 TV stations, 5 FM stations, and one FM translator station.

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**Authorship**

The undersigned author of this statement is a qualified Professional Engineer, holding California Registration No. E-11654, which expires on September 30, 2016. This work has been carried out under his direction, and all statements are true and correct of his own knowledge except, where noted, when data has been supplied by others, which data he believes to be correct.

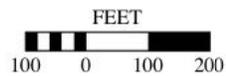
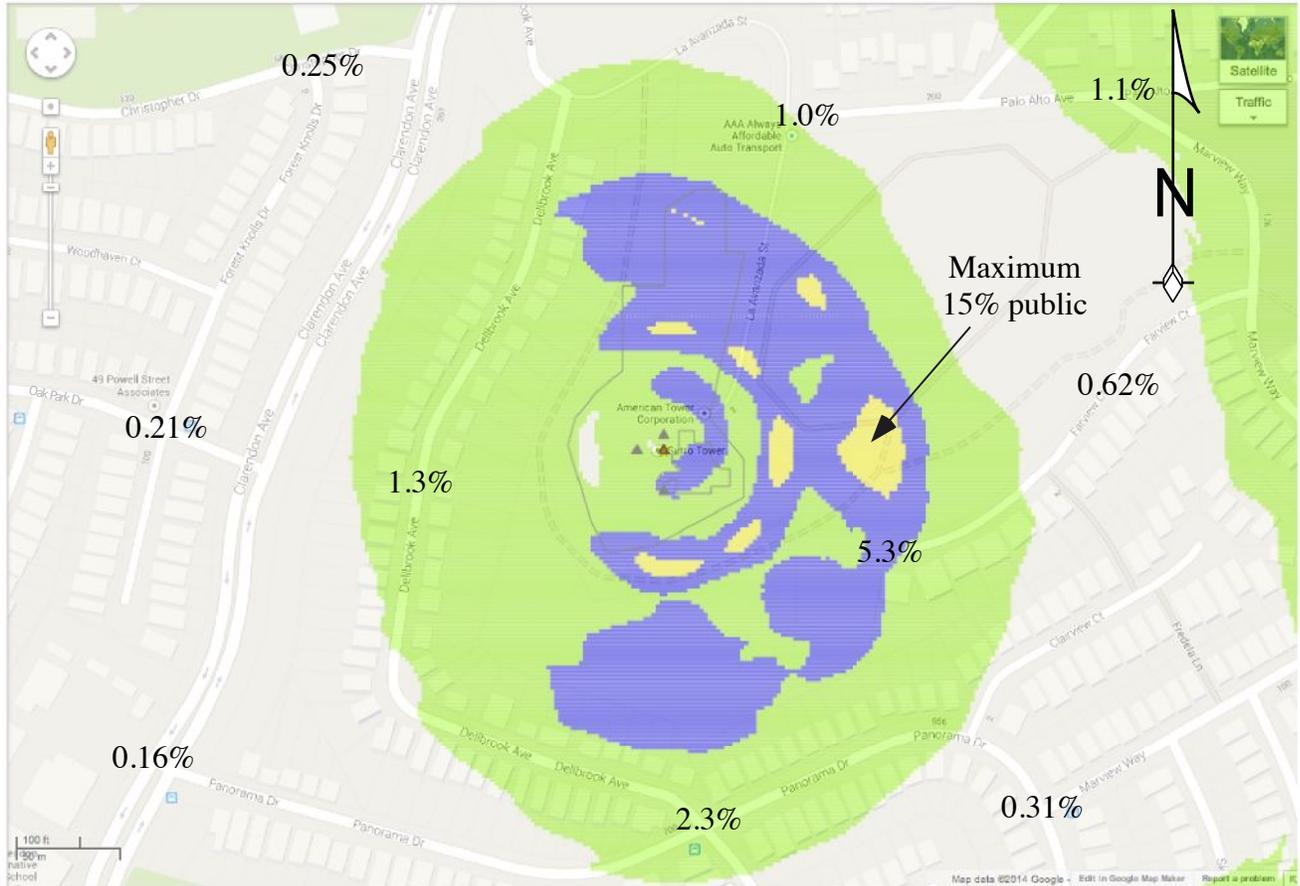


  
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**Calculated Ground-Level Radio Frequency Exposure Levels During Construction Phase**



**Calculations performed according to OET Bulletin No. 65, August 1997.  
Colors shown represent percent of applicable FCC public limit.**

[blank] <1%    >1%    >5%    >10%