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**RF FIELD MEASUREMENTS AND EXPOSURE STUDY  
TO DETERMINE COMPLIANCE WITH  
FCC RF EXPOSURE GUIDELINES**

Prepared on Behalf of

**Alpha Broadcasting, LLC**  
Licensee of  
**KUFO-FM**

AND

**Citicasters Licenses, Inc.**  
Licensee of  
**KLTH (FM)**

**APRIL 2010**

## **INTRODUCTION**

Hatfield & Dawson Consulting Engineers has been retained by Alpha Broadcasting, LLC ("Alpha") to make proper radiofrequency electromagnetic (RF) field strength measurements throughout the Sylvan Tower transmitter site area to determine if there are any areas that exceed the Federal Communications Commission (FCC) guidelines for human exposure to RF fields. These measurements are a requirement of the KUFO-FM Construction Permit, File number BPH-20090127AAX, and the KLTH(FM) Construction Permit, File number BPH-20090127AAZ.

## **BACKGROUND**

The KUFO and KLTH transmitters are located at the Sylvan Tower site, 5516 SW Barnes Rd, near Portland, in Multnomah County, Oregon. This site, including all transmission equipment, towers and guy wire anchor points, is entirely surrounded by a chain link fence. A locking gate topped with barbed wire restricts pedestrian and vehicle access to the site. The fence and gate preclude casual or inadvertent access to the Sylvan Tower site.

Stations KUFO, 101.1 MHz channel 266C, and KLTH, 106.7 MHz channel 294C, share a six-bay antenna centered at approximately the 271 m level on a 302 m tower. The Antenna Structure Registration Number (ASRN) is 1207367 for this tower. Its base is surrounded by a chain link fence, topped with barbed wire, and a padlocked gate. A yellow RF "Caution" sign, and a sign displaying the tower ASRN, are attached to the tower base.

All of the tower-mounted antennas are well above head height for persons standing at ground level anywhere on or near the Sylvan Tower site. Thus it is unlikely that anyone other than authorized RF personnel could approach near enough to any of the broadcast antennas on the Sylvan towers to cause that person's RF exposure levels to exceed FCC guidelines.

## DESCRIPTION OF RF FIELD STRENGTH MEASUREMENTS AND EXPOSURE SURVEY

I performed a ground-level RF exposure survey on 7 April 2010. The survey took place between approximately 2:00 p.m. and 3:30 p.m. Weather conditions were light showers, with temperatures in the lower 50s.

The equipment, measurement procedures and analysis used during the survey conform to the most recent FCC guidelines as set forth in FCC/OET Bulletin No. 65, ***Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields, OET Bulletin 65***, Edition 97-01, released in August 1997. Measurements were taken with a Narda model 8718B RF Survey Meter (S/N 00001), and a Narda 8742D Isotropic Shaped-response Electric Field probe (S/N 05003).

This meter and probe combination is a broadband instrument which measures power densities over a wide spectrum as required by IEEE Standard C95.3-2002, ***IEEE Recommended Practice for Measurements and Computations of Radio Frequency Electromagnetic Fields With Respect to Human Exposure to Such Fields, 100 kHz – 300 GHz***.

The meter/probe combination provides readings of RF exposure conditions in percentage of the General Public / Uncontrolled Environment (i.e., "Public") Maximum Permissible Exposure (MPE) limits allowed by the FCC guidelines, as specified in ***CFR 47 §1.1310, Radiofrequency radiation exposure limits***. Compliance is determined by comparing the corrected percent readings with the general population / uncontrolled environment (i.e., "Public") Maximum Permissible Exposure (MPE) limits allowed by the FCC guidelines.

During the measurement period accessible outdoor ground-level locations were scanned with the Narda probe. At the locations of the highest peak RF exposure readings the probe was moved from close to the ground up to a height of approximately two meters (6' 7"). During this procedure, the "Max Hold" feature of the survey meter was activated to capture the peak RF exposure level between the ground and head height.

The survey established the maximum exposure conditions during normal operations with all main broadcast facilities operating at normal power levels.

## **RESULTS OF RF EXPOSURE SURVEY**

The recent RF field measurements and exposure survey established the magnitudes and locations of the highest outdoor exposure conditions near ground level. The RF exposure survey verified that the KUFO and KLTH facilities, in combination with the existing RF facilities at the Sylvan Tower site, will be in compliance with FCC exposure guidelines once additional mitigations are in place. Those mitigations are explained in the Conclusions section of this report.

### **Northeast Guy Anchors**

The location of the highest RF exposure condition found during the survey was near the group of five guy anchors to the northeast of the Sylvan towers. This location is well within the fenced boundary of the site.

The highest measured exposure condition at the NE guy anchor location was approximately 141% of the Public MPE limit within approximately one meter of the massive outer guy anchor farthest to the northeast. Exposure conditions drop to less than 50% at a distance of two meters from this anchor. All other guy anchors within the NE group had exposure conditions less than 50% at a distance of one meter from the anchors.

### **Southwest Guy Anchors**

The location of the second-highest RF exposure condition found during the survey was near the group of six guy anchors approximately 150 meters southwest of the Sylvan towers. This location is on a down slope that is well within the fenced boundary of the site.

The highest measured exposure condition at this SW location was approximately 65.8% of the Public MPE limit within approximately one meter of the massive western-most outer guy anchor.

**Northwest Guy Anchors**

The northwest guy anchors for the Sylvan towers are near the intersection of SW 57<sup>th</sup> Ave and SW Barnes Road. This location is well within the fenced boundary of the site.

The highest measured exposure condition at this location was approximately 56.7% of the Public MPE limit within approximately one meter of the massive northwestern-most outer guy anchor.

All other accessible outdoor locations that were surveyed had maximum exposure conditions less than 50% of the Public MPE limit allowed by the FCC guidelines.

**ANALYSIS OF MEASURED RF EXPOSURE LEVELS**

The recent RF field measurements and exposure survey indicates that the maximum outdoor exposure conditions are associated with the outer guy anchors of the Sylvan towers. These are the anchors for the highest levels of guy wires.

The higher guy wires are closest to the FM antenna shared by KUFO, KLTH and other stations. Therefore it is the combined FM signals which are conducted along the higher guy wires down to the outer guy anchors that give rise to the high measured exposure conditions found near the anchors.

Analysis of the outdoor ground-level RF exposure conditions show that outside certain specific areas near the guy anchors, personnel who access the grounds of the Sylvan Tower site will encounter RF exposure conditions that are in compliance with current FCC rules and guidelines regarding human exposure to RF electromagnetic fields (EMFs). The localized areas near certain guy anchors where exposure conditions may approach or exceed FCC guideline limits for Public exposure can be mitigated through additional signage described in the following section.

### **CONCLUSIONS BASED ON EXPOSURE SURVEY AND FEDERAL REGULATIONS**

The Construction Permits for FM stations KUFO and KLTH require that "Any areas within the [perimeter] fence found to exceed the recommended [FCC] guidelines [for human exposure to RRF fields] must be clearly marked with appropriate additional signage."

Therefore an appropriate mitigation is for additional yellow RF "Caution" signs to be installed on all three of the massive outer guy anchors for the Sylvan towers. Those signs should specify the access rules and procedures for persons who may approach to within two meters of the anchors. A phone number for a responsible party should be included on the signs, for example "Call (503) XXX-XXXX before approaching within six feet or less from this guy anchor."

Once the above mitigation is complete, then stations KUFO and KLTH will be in compliance with current FCC rules and guidelines regarding Public RF exposure. This determination is based on my recent RF field measurements and exposure survey, and information obtained from representatives of Alpha Broadcasting, LLC, Citicasters Licenses, Inc. and Sylvan Tower, LLC.

The analysis presented in this report is based solely on the comparison of measured and estimated RF exposure conditions in specific areas with the corresponding safe exposure limits set forth in the FCC guidelines. The FCC exposure limits are based on recommendations by federal and private entities with the appropriate expertise in human safety issues.

On-tower exposure conditions were not considered in this study. However it should be noted that all instances of antenna-related work on any of the broadcast or non-broadcast antennas at the Sylvan Tower site require that the subject antenna be completely de-energized.

***The KUFO and KLTH transmitters, and the transmitters of all other stations that share the 6-bay antenna, must be shut down whenever personnel are in the vicinity of that antenna aperture.***

**QUALIFICATIONS**

I am an experienced radio engineer whose qualifications are a matter of record with the Federal Communications Commission. I am a partner in the firm of Hatfield & Dawson Consulting Engineers, I am registered as a Professional Engineer in the States of Oregon, Washington, California and Hawaii, and I hold an FCC General Radiotelephone Operator License PG-12-21740.

All representations contained herein are true to the best of my knowledge.

8 April 2010



David J. Pinion, P.E.

EXPIRATION DATE: 12/31/2010

Hatfield & Dawson Consulting Engineers







