

WEKH

Eastern Kentucky University

Hazard, Kentucky

Radiofrequency Electromagnetic Exposure Exhibit

September 2007

© 2007 Eastern Kentucky University

Timothy L. Warner, Inc.
Post Office Box 8045
Asheville, North Carolina 28814-8045
(828) 258-1238
twarner@tlwinc.net

WEKH
Eastern Kentucky University
Hazard, Kentucky

Table of Contents

Description	Page
Declaration	1
Narrative	2
WEKH Calculations	2
Television Calculations	3
Table 1: Summary of Calculated Power Density at 2 Meters Above Ground	4
Figure 1: FM Model Output Plot	5

Declaration

I declare, under penalty of perjury, that I am a technical consultant to broadcasting and other communications systems, that I have over twenty-five years of experience in the engineering of broadcast and other communications systems, that I am familiar with the Federal Communications Commission's Rules found in the Code of Federal Regulations Title 47, that I am a Professional Engineer registered in North Carolina, that I have prepared or supervised the preparation of the attached Radiofrequency Electromagnetic Exposure Exhibit for Eastern Kentucky University, and that all of the facts therein, except for facts of which the Federal Communications Commission may take official notice, are true to the best of my knowledge and belief.



Timothy L. Warner, P.E.
Post Office Box 8045
Asheville, North Carolina 28801
(828) 258-1238
twarner@tlwinc.net
6 September 2007

Narrative

The purpose of this Exhibit is to establish compliance with the Commission's limits on nonionizing radiofrequency electromagnetic exposure. WEKH operates at a site shared with television stations WKHA and WKHA-DT. The facility requires calculations which are beyond the scope of the worksheets for FCC Form 340.

It is noted that this exhibit only addresses the potential for radiofrequency electromagnetic field exposure. All other aspects of the environmental processing analysis will be or have already been provided to the FCC by the tower owner as part of the tower registration process. The tower proposed for this station was constructed prior to March 16, 2001.

WEKH Calculations

The WEKH facilities, when evaluated under worst case methods in OET-65¹, would create 0.257 mW/cm² at 2 meters above ground level, which exceeds the limit for uncontrolled/public exposure, although it is 26% of the occupational/controlled limit. When the vertical elevation pattern of the antenna, a Shively 6510-4-DA full wave spaced antenna, is considered, the power density at ground level will be significantly reduced. Using the manufacturer's elevation pattern and the equations in OET-65, the maximum electromagnetic power density is 0.0258 mW/cm² at a distance of 51 meters from the tower base, or 13% of the maximum uncontrolled/public exposure. The exposure was also calculated using the computer program FM Model² which calculates the maximum field at 2 meters above ground

¹ Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields, OET Bulletin 65, Edition 97-01, Robert F. Cleveland, Jr., David M. Sylvar, and Jerry L. Ulcek, and Supplement A, Additional Information for Radio and Television Broadcast Stations.

² FM Model for Windows, version 2.10 Beta, March 22, 1995, Office of Engineering and Technology, Spectrum Engineering, Telecommunications Analysis Branch, Michael R. Davis

to be 0.020 mW/cm^2 at 50 meters from the tower base, or 10% of the maximum public exposure. The power density calculated by FM Model is plotted in this Exhibit.

Television Calculations

There are two television facilities authorized on the tower proposed by WEKH, WKHA and WKHA-DT. The power density was calculated for each television facility using the methods in OET-65. Elevation pattern factors were used for the television stations. OET-65 lists 0.2 as typical for VHF stations and between 0.05 and 0.1 for UHF stations. For this study, 0.2 was used for the VHF facility and 0.2 for the UHF facilities.

Table 1: Summary of Calculated Power Density at 2 Meters Above Ground³

Television Stations						
Call Sign	Channel	Frequency (mHz)	ERP (Visual) (kW)	RCAGL (m)	% Controlled	% Public
WKHA	35	482	646	177	0.86%	4.3%
WKHA-DT	16	596	53.2	161	0.06%	0.28%
Total for Television Stations					0.92%	4.6%
FM Stations						
Call Sign	Frequency (mHz)	ERP (H) (kW)	ERP (V) (kW)	RCAGL (m)	% Controlled	% Public
WEKH	90.9	0	100	116	2.6%	13.0%
Total for Radio Station					2.6%	13.0%
Total of Television and Radio					3.5%	17.6%

³ OET-65, op.cit.

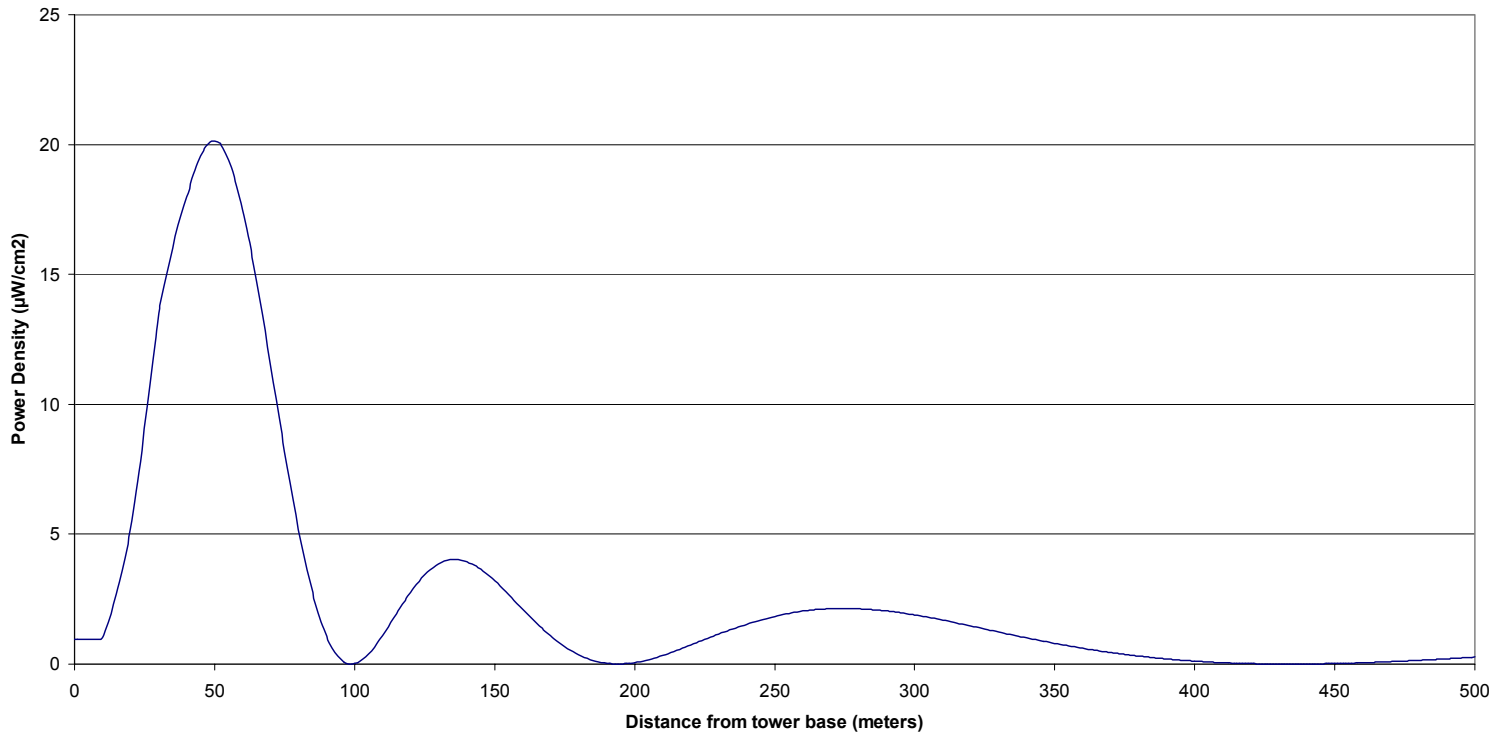


Figure 1: FM Model Output Plot

WEKH was evaluated using the computer program FM Model. The distance was set to 500 meters. Power density was calculated at one (1) meter increments along the horizontal axis. Each elevation was adjusted to compute power density at two (2) meters above ground level, or normal head height.