



## ***Engineering Statement***

Jerry Tibbetts  
WMBH (AM) - Joplin, Missouri

This consultant has been retained by Jerry Tibbetts (Tibbetts), licensee of WMBH in Joplin, MO for the purpose of preparing the technical portion of Form 301 in application for a minor modification to the licensed operation of WMBH (BL-19980817AD). WMBH is presently operating on a STA (BESTA-20140306AAO).

### **Proposed WMBH (AM) operation**

It is proposed that WMBH operate with a series fed tower that measures 160 feet (48.77 m). Such a tower at 1560 kHz has an electrical height of  $91.36^\circ$  and, when coupled with the proposed ground system consisting of 120, equally spaced, buried, copper wires which measure 48.04 meters ( $1/4 \lambda$ ) long the resultant efficiency, calculated via the Commission's Figure 8 radio tool, is 306.627mV/m/kW @ 1km. At 0.5 kW as proposed the theoretical tower efficiency is 216.818 mV/m @ 1km.

A copy of the Joplin West USGS 7.5' topographic quadrangle, identifying the proposed tower site as well as the 1000 mV/m contour of the proposed operation is included in this report as Exhibit 1.

A survey of the property and its legal description is included in this report as Exhibit 2.

An aerial photograph of the proposed tower site is included in this report as Exhibit 3.

Exhibit 4 is a tabular listing, on 5 degree increments, of the distances to all relevant contours.

A vertical sketch of the proposed tower, showing all relevant heights and elevations, is included in this report as Exhibit 5 and a graphical description of the ground system, along with the property boundaries, is included as Exhibit 6.

Exhibit 7 of this report is a digitally generated map which shows the 0.025, 0.25, and the 0.5 mV/m predicted contours of the proposed WMBH operation.

### **Principal Community Coverage**

Exhibit 8 of this report is a digitally generated map shows the 2 mV/m and 5 mV/m contours from the proposed WMBH operation as well as the corporate boundaries of Joplin, Missouri. As shown in Exhibit 8, the entire city of Joplin, Missouri is encompassed by the 5 mV/m city grade contour. This consultant used a K&E model 620000 polar planimeter and measured the city grade coverage of the City of Joplin and found that 95% of the corporate limits is indeed covered by the 5 mV/m contour.

### **Interference Considerations**

Exhibit 9 of this report is a radiation limits study, based on data from the Commission's April 1, 2014 AM database, which identifies two first adjacent channel stations, KLFJ in Springfield, Missouri and KZLI in Catoosa, Oklahoma as radio stations where there is prohibited overlap under the provisions of 47 CFR 73.37 of the Commission's Rules. This prohibited overlap is existing with the licensed WMBH operation and the area of interference is actually reduced by this proposed WMBH modification.

Exhibit 10 of this report is a digitally generated map which shows the 0.5 and 0.25 mV/m contours of the licensed and proposed WMBH operation and the licensed operation of KLFJ. As shown in Exhibit 10 there is only a reduction in interference caused to KLFJ and that area of reduced interference encompasses 54.2 km<sup>2</sup>. The interference received by WMBH has areas of decrease and areas of increase, largely due to a M3 conductivity shift that occurs near the proposed WMBH tower site. The area of increased interference is graphically shown in red while the area of decrease is graphically shown in green. The areas of interference were measured using a polar planimeter and the area of increased interference encompasses 28.8 km<sup>2</sup> while the area of decreased interference encompasses 72.2 km<sup>2</sup> for a net area reduction of interference received from KLFJ of 43.4 km<sup>2</sup>.

Exhibit 11 is a digitally generated map which shows the 0.25 and 0.5 mV/m contours of the licensed and proposed WMBH facilities and the 0.25 and 0.5 mV/m contours of KZLI in Catoosa, Oklahoma. As shown in Exhibit 11 there continues to be no prohibited overlap between the WMBH 0.25 mV/m contour and the KZLI 0.5 mV/m contour. There is an increase in the area of interference received by WMBH and that area of increase measures 24.0 km<sup>2</sup>.

The net result of the proposed WMBH modification is a decrease of 54.2 km<sup>2</sup> in interference caused by WMBH to KLFJ and a decrease of 19.4 km<sup>2</sup> in interference received from KLFJ and KZLI.

### **Nighttime Operation**

WMBH is presently licensed to operate with 9 watts during nighttime hours on the 228.4° radiator. Exhibit 12 of this report is a nighttime radiation limits study which indicates that WMBH can operate with nighttime field of 59.4 mV/m at departure angles between 23.5° and 36° above the horizon. For the purposes of this application the nighttime power limits were calculated at the horizon and the resultant WMBH nighttime power level is thus 35 Watts.

RSS calculations used in the nighttime power limitations are included in this report as Exhibit 13.

### **Environmental Considerations**

The proposed WMBH tower site is in an industrial and agricultural area that is adjoining an abandoned Drive In theater, automobile salvage yards, and farms. The property is not a designated wetland nor is it historically significant. The proposed tower passes the slope test and FAA notification is not required. The tower will not be marked, painted, or lighted.

The proposed tower will be encompassed by a locked fence that is not less than 1 meter distant from the face of the tower at any point. That 1 meter distance is a sufficient distance to prevent passive overexposure to harmful levels of non ionizing RF radiation as set forth in Bulletin 65, Appendix A. So as to prevent any occupational overexposure Jerry Tibbetts pledges that tower maintenance will only be performed while WMBH is turned off. Tribal notifications of the proposed new tower will be made in accordance with the Nationwide Programmatic Agreement.

### **Certification**

All information contained in this report is true and accurate to the best of my belief, Having had numerous matters before the Commission, my qualifications are a matter of record.

5/16/2014

*R. Lee Wheeler*