

# Technical Report 2019 License Renewal Radio Frequency (RF) Protection Study

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**WVAX(AM) - Charlottesville, VA**  
*BL-20060404AHF (Analog)*  
*Facility ID: 161156*

**WQMZ(FM) - Charlottesville, VA**  
*BLH-20000120AAT (Analog & Digital)*  
*Facility ID: 10653*

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**CERTIFICATION OF TECHNICAL CONSULTANT:** *I declare, under penalty of perjury, that the contents of this report are true and accurate to the best of my knowledge and belief. I further certify I have over twenty years of experience as a broadcast technical consultant before the Federal Communications Commission ("the FCC"); and am familiar with the Code of Federal Regulations Title 47 ("the Rules") as pertaining to this report and its contents herein. The underlying data utilized in this report was taken directly from FCC databases or indirectly through third party software vendors securing data directly from FCC databases. This firm cannot be held liable for errors or omissions resulting from the underlying data. The information contained herein is believed accurate to the date reported below.*



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Justin W. Asher, Technical Consultant

May 10, 2019

May, 2019

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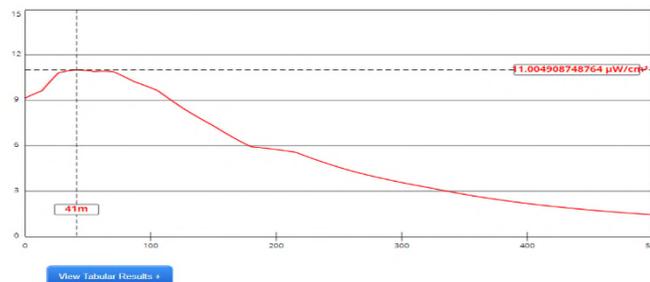
# Compliance with Radiofrequency Radiation Guidelines 1

**Explanation of Study** The studied facilities comply with the maximum permissible radiofrequency electromagnetic exposure limits for controlled and uncontrolled environments as set forth under §1.1310 of the Commission's rules and the guidelines for RF radiation protection guidelines as set forth in OET Bulletin No. 65 (Edition 97-01), and the accompanying Supplement A, (Edition 97-01). The site is intended to house multiple transmitters of mixed aural origin.

Concerning FM contributions, the potential for human exposure to non-ionizing radiofrequency radiation has been evaluated with regard to §1.1310 utilizing the Commission's own *FM Model* web-based software application. The use and implementation of this FCC sanctioned software is a matter of record before the Commission. To ensure complete protection, each maximum FM contribution has been assumed without regard to any restricted access fencing distance. The maximum permissible uncontrolled limit for FM stations is  $200 \mu\text{W}/\text{cm}^2$ . The maximum permissible controlled limit is  $1000 \mu\text{W}/\text{cm}^2$ . Therefore, single contributions of  $\leq 200 \mu\text{W}/\text{cm}^2$  remain within the tolerances as allowed by §1.1310 and its governing OET Bulletin No. 65 (Edition 97-01) for the more restrictive of either two environments.

Concerning AM contributions, FCC supplied MININEC interpolated graphs were used to determine the individual contribution of each AM station. MININEC AM Model Figure(s) 1-4 have been taken directly from, and employ the standards of, OET Bulletin No. 65 (Edition 97-01). The relevant MININEC AM Model Figure has been shown in graphical form at the end of this report with the predicted electrical field (V/m) and magnetic field (A/m) noted. For each AM contribution, the maximum contribution has been assumed using the maximum power regardless of mode of operation or directional tower power distribution. The AM contribution(s) have been interpolated at the measured fencing distance.

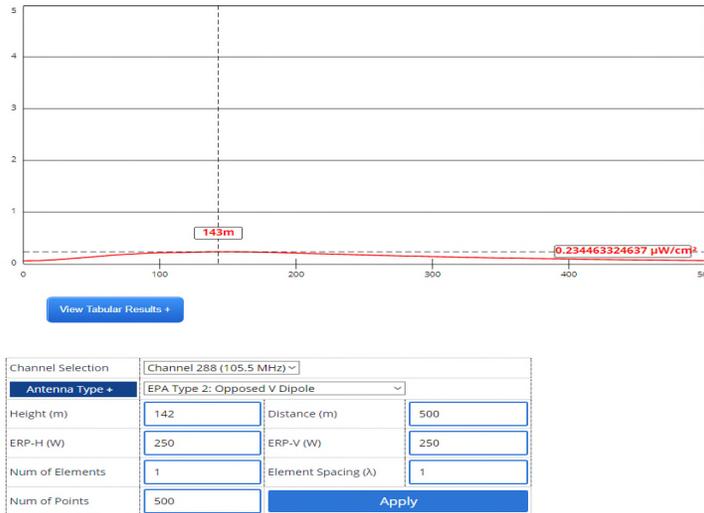
**Summary of Stations** The licensed WQMZ(FM).L - Charlottesville, VA, Analog FM Station operates on CH236A (95.1 MHz) with 6.0 kW ERP circular polarization (H&V). The facility broadcasts from an antenna COR mounted 153 meters above ground level (AGL). The facility operates with a four (4) bay, Celwave model CPM-LP-4 antenna. However, for purposes of this RF Compliance Study, a worst-case one bay, EPA Type 1 element as defined by the Commission's own FM Model - Appendix B (issued March 31, 2016) has been assumed. WQMZ(FM) operates with HD/IBOC facilities (BDNH-20120203ABT) of -14 dBc power (0.240 kW ERP) circular polarization (H&V) (or  $\text{Log}[0.04]*10 = -14 \text{ dBc}$ ) from the main antenna mounted at 153 meters AGL. Therefore, a sum power of 6.240 kW ERP (H&V) has been assumed for this common analog and digital contribution.



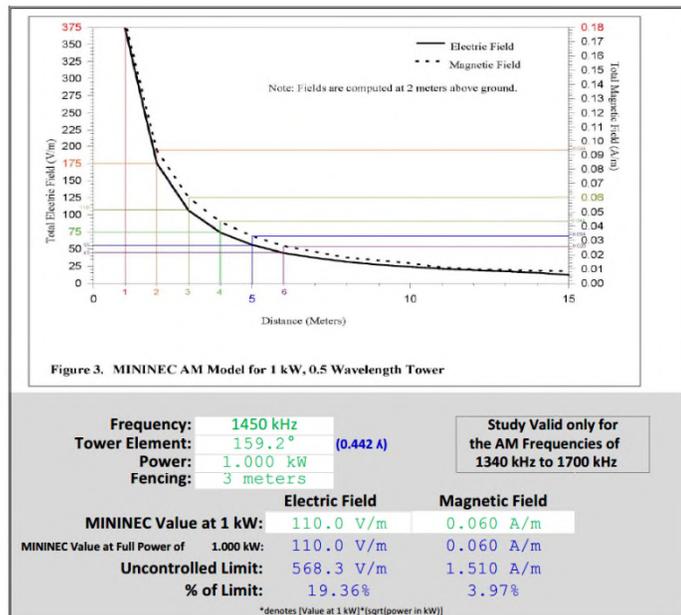
Channel Selection	Channel 236 (95.1 MHz)		
Antenna Type+	EPA Type 1: Ring-and-Stub or "Other"		
Height (m)	153	Distance (m)	500
ERP-H (W)	6240	ERP-V (W)	6240
Num of Elements	1	Element Spacing (λ)	1
Num of Points	500	Apply	

# Compliance with Radiofrequency Radiation Guidelines 2

**Summary of Stations** The non-co-owned, but collocated Construction Permit W288ED.C - Charlottesville, VA, Analog FM Translator (BNPFT-20130821ABF; Facility ID 148345) will operate on CH288D (105.5 MHz) with 0.250 kW ERP circular polarization (H&V). The facility will broadcast from an antenna COR mounted 142 meters above ground level (AGL). The facility will operate with a one (1) bay, Systems With Reliability, LP (SWR) model FMEC-1DA, "Opposed V Dipole" antenna employing an EPA Type 2 element as defined by the Commission's own FM Model - Appendix B (issued March 31, 2016). The element is spaced 1.0 wavelength ( $\lambda$ ) apart. This facility does not operate with HD/IBOC facilities at this time.



**Summary of Stations** The licensed WAVX(AM).L - Charlottesville, VA, Analog AM facility operates on a frequency of 1450 kHz into a common daytime/nighttime non-directional tower. The daytime power is 1.0 kW. The nighttime power is 1.0 kW. The common daytime/nighttime tower employs a vertical radiator of 159.2° or 0.442  $\lambda$  (wavelengths) for operation on the AM frequency. Existing fencing is no less than 3.0 meters from the tower in any direction.



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# *Compliance with Radiofrequency Radiation Guidelines* **3**

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**Results of Study** The sum of each individual contribution as a percentage of its each maximum permissible uncontrolled limit has been provided below. As the resulting contribution(s) as a whole is less than 100%, the combined exposure has been calculated to be within the guidelines of OET Bulletin No. 65 (Edition 97-01) for the more restrictive uncontrolled environment as defined by locations accessible by the general public. As stated before, protection of the uncontrolled environment implies protection of the controlled environment. There are no other broadcast sources of radiofrequency non-ionizing radiation present at this site.

<b>Contributing Station</b>	<b>Individual Contribution</b>	<b>Individual Uncontrolled Limit</b>	<b>Percent of Uncontrolled Limit</b>
WQMZ (FM) .I (analog & HD/IBOC)	11.005 $\mu\text{W}/\text{cm}^2$	200 $\mu\text{W}/\text{cm}^2$	5.50%
W288ED.C (analog)	0.234 $\mu\text{W}/\text{cm}^2$	200 $\mu\text{W}/\text{cm}^2$	0.12%
WVAX (AM) (analog)	110.0 V/m	568.3 V/m	19.36%
<b>Total of Uncontrolled Limit:</b>			<b>24.98%</b>

The facility is, or will be, properly marked with signs. Entry is, or will be, restricted by means of fencing with locked doors or gates. Furthermore, coordination with other users of the site will be secured to reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency electromagnetic fields in excess of FCC guidelines.