

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

for

WMQR(FM) - Broadway, VA
BLH-19900531KA (Analog & Digital)
Facility ID: 40648

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.*



Justin W. Asher, Technical Consultant

May 30, 2019

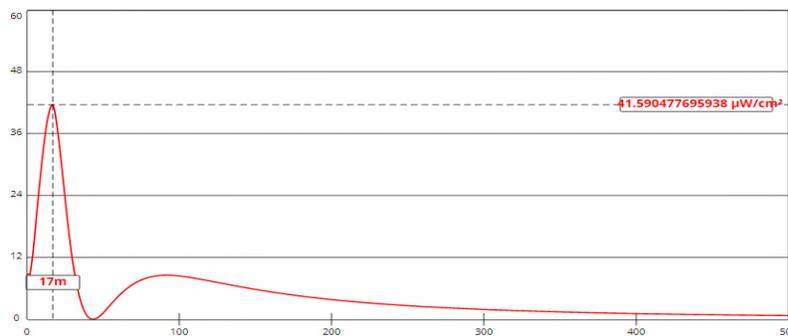
May, 2019

Compliance with Radiofrequency Radiation Guidelines 1

Explanation of Study The studied facility complies 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.

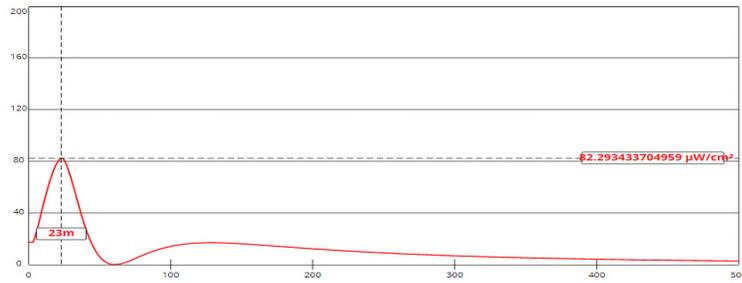
Summary of Stations The licensed WMQR(FM).L - Broadway, VA, Analog FM Station operates on CH241B1 (96.1 MHz) with 2.6 kW ERP circular polarization (H&V). The facility broadcasts from an antenna COR mounted 27 meters above ground level (AGL). The facility operates with a two (2) bay, Continental (CON) G5CPM-2E (or an ERI MPX-2E or LPX-2E series antenna branded under the Continental label) "Opposed U Dipole" antenna employing EPA Type 3 elements as defined by the Commission's own FM Model - Appendix B (issued March 31, 2016). The elements are spaced 1.0 wavelength (λ) apart. WMQR(FM) operates with HD/IBOC facilities (BDNH-20150910ABU) of -14 dBc power (0.104 kW ERP) circular polarization (H&V) (or $\text{Log}[0.04]*10 = -14 \text{ dBc}$) from the main antenna mounted at 27 meters AGL. Therefore, a sum power of 2.704 kW ERP (H&V) has been assumed for this common analog and digital contribution.



Channel Selection	Channel 241 (96.1 MHz)		
Antenna Type +	EPA Type 3: Opposed U Dipole		
Height (m)	27	Distance (m)	500
ERP-H (W)	2704	ERP-V (W)	2704
Num of Elements	2	Element Spacing (λ)	1
Num of Points	500	Apply	

Compliance with Radiofrequency Radiation Guidelines 2

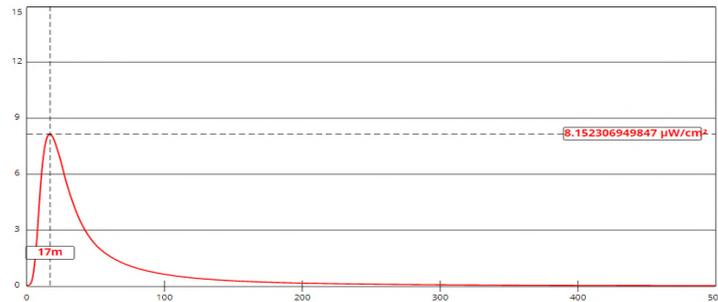
Summary of Stations The non-co-owned, but collocated licensed WMRA(FM).L - Harrisonburg, VA analog FM Station (BMLED-19970520KA; Facility ID 65447) operates on CH214B (90.7 MHz) with 10.5 kW ERP circular polarization (H&V). This facility operates with an antenna COR mounted 37 meters above ground level (AGL). The facility is believed to operate with a two (2) bay, ERI model LPX-2E "Opposed U Dipole" antenna employing EPA Type 3 elements as defined by the Commission's own FM Model - Appendix B (issued March 31, 2016). The elements are believed spaced 1.0 wavelength (λ) apart. This facility does not operate with HD/IBOC facilities at this time.



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Channel Selection	Channel 214 (90.7 MHz)		
Antenna Type +	EPA Type 3: Opposed U Dipole		
Height (m)	37	Distance (m)	500
ERP-H (W)	10500	ERP-V (W)	10500
Num of Elements	2	Element Spacing (λ)	1
Num of Points	500	Apply	

Summary of Stations The non-co-owned, but collocated licensed W271CC.L - Broadway, VA Analog FM Translator (BLFT-20171205ABZ; Facility ID 150808) operates on CH271D (102.1 MHz) with 0.094 kW ERP circular polarization (H&V). This facility operates with an antenna COR mounted 11 meters above ground level (AGL). The facility operates with a two (2) bay, Nicom model BKG77/2(1/2wave) "Opposed V Dipole" antenna employing EPA Type 2 elements as defined by the Commission's own FM Model - Appendix B (issued March 31, 2016). The elements are spaced 0.5 wavelength (λ) apart. This facility does not operate with HD/IBOC facilities at this time.



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Channel Selection	Channel 271 (102.1 MHz)		
Antenna Type +	EPA Type 2: Opposed V Dipole		
Height (m)	11	Distance (m)	500
ERP-H (W)	94	ERP-V (W)	94
Num of Elements	2	Element Spacing (λ)	0.5
Num of Points	500	Apply	

Compliance with Radiofrequency Radiation Guidelines **3**

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.

Contributing Station	Individual Contribution	Individual Uncontrolled Limit	Percent of Uncontrolled Limit
WMQR (FM) .L (analog & HD/IBOC)	41.590 $\mu\text{W}/\text{cm}^2$	200 $\mu\text{W}/\text{cm}^2$	20.80%
WMRA (FM) .L (analog)	82.293 $\mu\text{W}/\text{cm}^2$	200 $\mu\text{W}/\text{cm}^2$	41.15%
W271CC.L (analog)	8.152 $\mu\text{W}/\text{cm}^2$	200 $\mu\text{W}/\text{cm}^2$	4.08%
Total of Uncontrolled Limit:			66.02%

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.