

# **APPLICATION FOR A MINOR MODIFICATION OF A FM AUXILIARY CONSTRUCTION PERMIT**

**FCC FORM 301**

**File Number: BXPB-20061220AAH**

**(MAIN FACILITY - WYSF, Facility Number - 16901)**

**WYSF**

**Birmingham, Alabama**

**CHANNEL 233C0 – 94.5 MHz**

**ERP: 50.0 kW (H&V)**

**HAAT: 274.1 m**

**APPLICANT: Citadel Broadcasting Company**

**January, 2007**

**Prepared by:**



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**Engineering Statement**  
**In Support of an Application for a Minor**  
**Modification of a FM Auxiliary**  
**WYSF, Birmingham, Alabama, Channel 233C0**

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# **ENGINEERING STATEMENT**

**Of**

**Lee S. Reynolds**

**And**

**Virgle Leon Strickland**

**In Support of an Application**

**for a Minor Modification**

**of a FM Auxiliary**

**Construction Permit**

**WYSF**

**Birmingham, Alabama**

**Channel 233 – 94.5 MHz**

**ERP: 50.0 kW(H&V)**

**January, 2007**

## **General**

As broadcast technical consultants doing business as Reynolds Technical Associates (RTA), we have been authorized by Citadel Broadcasting Company (herein referred to as “The Applicant”), to conduct engineering studies and prepare the engineering portion of an application to modify a construction permit for an auxiliary facility of WYSF (File number BXPB-20061220AAH). The applicant is seeking to reduce the authorized effective radiated power from 100 kilowatts to 50 kilowatts. All other operating parameters will remain the same.

WYSF's licensee is the same entity filing the instant FM auxiliary application.

The following engineering studies and exhibits support the instant application study results.

**The Proposed Site**  
**(Exhibit E, Figure 1)**

Exhibit E, Figure 1 is a vertical sketch of the existing antenna supporting structure with pertinent proposed elevations. The antenna structure registration number for the existing tower is 1017640.

There are no proposed or authorized FM or TV transmitters that may produce receiver-induced interference within ten (10) kilometers of the proposed.

**Surrounding Terrain and Predicted Contours**  
**(Exhibit E, Figures 2 through 4)**

Exhibit E, Figure 2 is a terrain averaging and service contour study showing the FCC F(50/50) 60 dBu contour of the proposed FM auxiliary.

Exhibit E, Figure 3 is a terrain averaging and service contour study showing the FCC F(50/50) 60 dBu contour of the licensed main facilities. The resulting contours for the proposed auxiliary facility and the main facility are shown in map form as Exhibit E, Figure 4.

The distance to the blanketing contour is calculated to be 2.78 kilometer (1.73 mile).

**Human Exposure**  
**(Exhibit E, Figure 5)**

The proposed FM facility was evaluated in terms of potential radiofrequency radiation exposure at ground level in accordance with the RF Worksheet #1 [FCC 301 Worksheet 7 (Page 4 and 5)].

Exhibit E, Figure 5 is results of the evaluation considering all facilities (including the proposed facilities)

Should anyone be required to climb the tower, the policy is to either reduce power or cease operation, so as to prevent hazardous exposure to radiofrequency radiation.

**Environmental Impact**  
**(No Exhibits)**

A grant of the proposed construction would not constitute a major action as defined in the Commission's Rules and Regulations.

During operation, the facility will produce no chemical or significant thermal pollution, and no ionizing radiation will be generated. Areas of high intensity radiofrequency fields will be confined to the immediate area of the transmitting antenna, far above the ground and away from any human and wildlife population.

The area is not officially designated as a wilderness area or wildlife preserve and is not pending consideration. The area has no significant value in American history, architecture, archaeology, or culture, which is listed in the Register of Historic Places, and it is not eligible for listing. It is not recognized either nationally or locally for special scenic or recreational value.

## **Conclusion**

This statement/application has been prepared for The Applicant by utilizing the latest available information, cross-checked with the Federal Communications Commission and other sources. Therefore, it is submitted that the engineering data compiled and demonstrated herein for the proposed is in compliance with Commission's Rules and Regulations at the time of this application's filing date. We welcome the opportunity to discuss with the staff of the Federal Communications Commission the engineering data contained in this application. Should any questions arise concerning the information, please contact us.

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### **Statement of the Consultants**

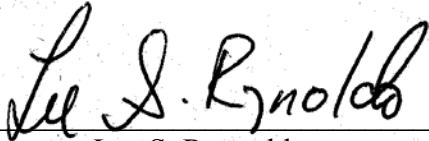
The instant engineering statement was prepared for The Applicant and supports an application for a minor modification of a construction permit for a FM Auxiliary for WYSF, Birmingham, Alabama. It was developed by RTA and may not be used for purposes other than submission to the Commission by the applicant.

It may not be reproduced in its entirety, or in part, by anyone (other than from the Commission) without the written consent of RTA.

It is prepared for The Applicant under contractual agreement, and its certification by RTA is used accordingly. If The Applicant fails in its contractual obligation, RTA reserves the right to withdraw its certification.

The information in this application is compiled from the most recent Commission and outside data. RTA is not responsible for errors resulting from incorrect data or unpublished rule and procedure changes.

For RTA:

  
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Lee S. Reynolds

January 26<sup>th</sup>, 2007

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Birmingham, Alabama 35242  
(205) 618-2020





## Engineering Statement

### In Support of an Application for a Construction Permit

#### WYSF Auxiliary, Birmingham, Alabama Channel 233

#### Terrain-Contour Study for Auxiliary Facility

##### Reference Coordinates:

North Latitude: 33-27-45

West Longitude: 86-50-59

ERP = 50.0 kW		FM - 2-6 Tables		F(50-50)
Azimuth	Ave. Elev.	Effective	ERP	Distance to
°T.	3 to 16 km	Antenna Height	(dBk)	60 dBu Contour
	Meters AMSL	Meters AAT		km
0	159.5	297.0	16.990	65.2
5	164.1	292.4	16.990	64.8
10	166.0	290.5	16.990	64.7
15	165.6	290.9	16.990	64.7
20	167.5	289.0	16.990	64.5
25	168.8	287.7	16.990	64.4
30	171.1	285.4	16.990	64.3
35	176.0	280.5	16.990	63.9
40	175.5	281.0	16.990	63.9
45	181.4	275.1	16.990	63.5
50	203.4	253.1	16.990	61.8
55	238.4	218.1	16.990	58.9
60	239.3	217.2	16.990	58.8
65	234.7	221.8	16.990	59.2
70	230.3	226.2	16.990	59.6
75	215.7	240.8	16.990	60.8
80	202.7	253.8	16.990	61.8
85	209.4	247.1	16.990	61.3
90	210.6	245.9	16.990	61.2
95	212.4	244.1	16.990	61.1
100	208.1	248.4	16.990	61.4
105	202.5	254.0	16.990	61.8
110	196.7	259.8	16.990	62.3
115	192.4	264.1	16.990	62.6
120	192.5	264.0	16.990	62.6
125	190.9	265.6	16.990	62.7
130	184.1	272.4	16.990	63.3
135	181.0	275.5	16.990	63.5
140	176.9	279.6	16.990	63.8
145	177.7	278.8	16.990	63.7
150	179.7	276.8	16.990	63.6
155	177.4	279.1	16.990	63.8

Continued on the next page

ERP =	50.0 kW	FM - 2-6 Tables		F(50-50)
Azimuth	Ave. Elev.	Effective	ERP	Distance to
°T.	3 to 16 km	Antenna Height	(dBk)	70 dBu Contour
	Meters AMSL	Meters AAT		km
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160	177.5	279.0	16.990	63.8
165	181.6	274.9	16.990	63.4
170	186.3	270.2	16.990	63.1
175	197.2	259.3	16.990	62.2
180	207.3	249.2	16.990	61.5
185	202.2	254.3	16.990	61.8
190	189.4	267.1	16.990	62.8
195	193.2	263.3	16.990	62.5
200	194.7	261.8	16.990	62.4
205	198.6	257.9	16.990	62.1
210	192.7	263.8	16.990	62.6
215	180.7	275.8	16.990	63.5
220	170.9	285.6	16.990	64.3
225	186.3	270.2	16.990	63.1
230	188.2	268.3	16.990	62.9
235	176.7	279.8	16.990	63.8
240	159.6	296.9	16.990	65.2
245	153.6	302.9	16.990	65.6
250	155.4	301.1	16.990	65.5
255	156.3	300.2	16.990	65.4
260	159.3	297.2	16.990	65.2
265	164.0	292.5	16.990	64.8
270	166.5	290.0	16.990	64.6
275	167.3	289.2	16.990	64.6
280	167.7	288.8	16.990	64.5
285	174.2	282.3	16.990	64.0
290	177.4	279.1	16.990	63.8
295	180.0	276.5	16.990	63.6
300	182.5	274.0	16.990	63.4
305	177.7	278.8	16.990	63.7
310	172.9	283.6	16.990	64.1
315	166.5	290.0	16.990	64.6
320	163.7	292.8	16.990	64.8
325	162.1	294.4	16.990	65.0
330	167.7	288.8	16.990	64.5
335	171.4	285.1	16.990	64.2
340	169.6	286.9	16.990	64.4
345	168.3	288.2	16.990	64.5
350	166.6	289.9	16.990	64.6
355	161.8	294.7	16.990	65.0
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## Engineering Statement

### In Support of an Application for a Construction Permit

#### WYSF Auxiliary, Birmingham, Alabama Channel 233

#### Terrain-Contour Study for Main Facility

##### Reference Coordinates:

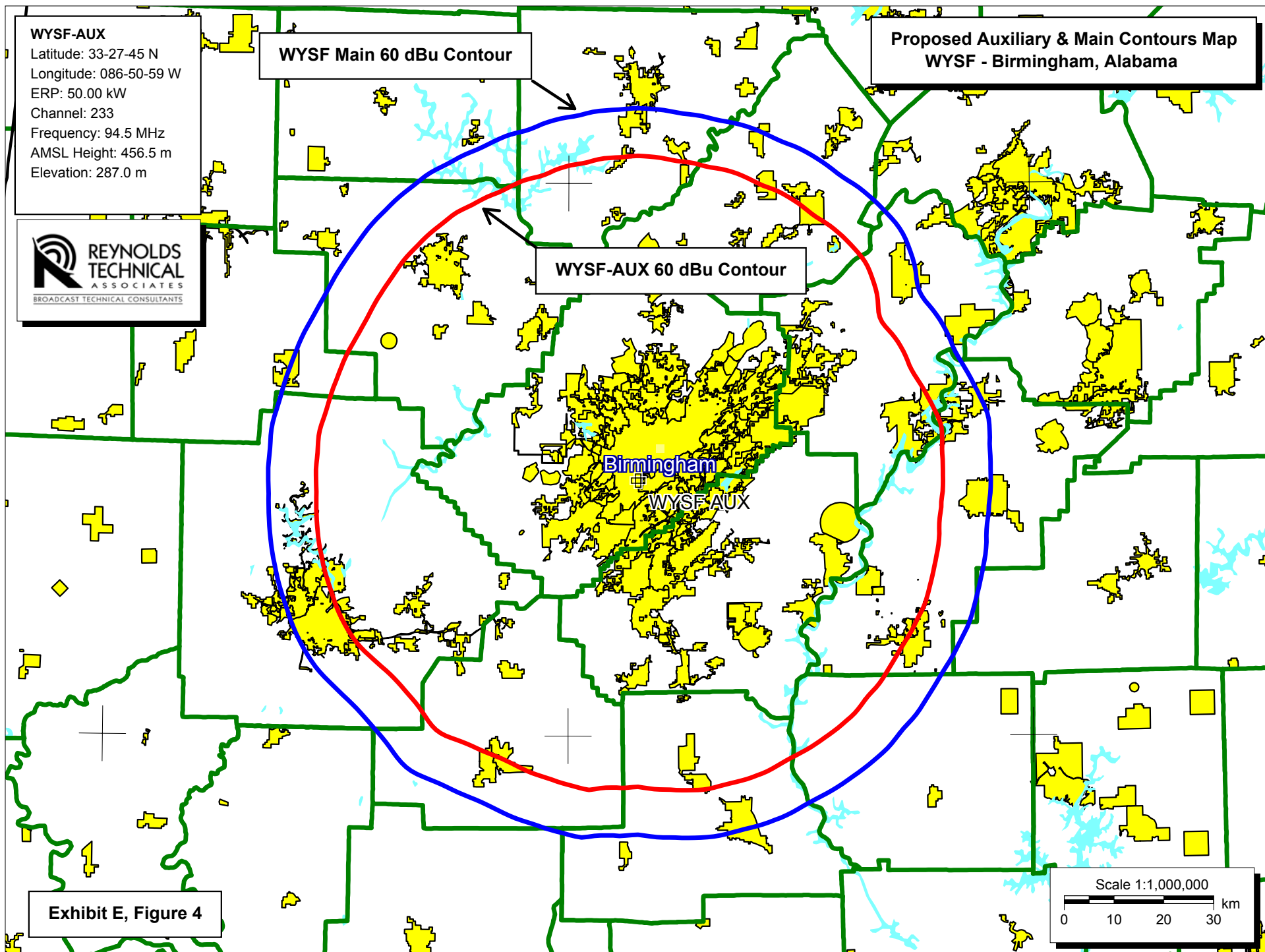
North Latitude: 33-27-45

West Longitude: 86-50-59

ERP = 100.0 kW		FM - 2-6 Tables		F(50-50)
Azimuth	Ave. Elev.	Effective	ERP	Distance to
°T.	3 to 16 km	Antenna Height	(dBk)	60 dBu Contour
	Meters AMSL	Meters AAT		km
0	159.5	331.5	20.000	74.7
5	164.1	326.9	20.000	74.4
10	166.0	325.0	20.000	74.2
15	165.6	325.4	20.000	74.3
20	167.5	323.5	20.000	74.1
25	168.8	322.2	20.000	74.0
30	171.1	319.9	20.000	73.9
35	176.0	315.0	20.000	73.5
40	175.5	315.5	20.000	73.5
45	181.4	309.6	20.000	73.1
50	203.4	287.6	20.000	71.4
55	238.4	252.6	20.000	68.5
60	239.3	251.7	20.000	68.4
65	234.7	256.3	20.000	68.8
70	230.3	260.7	20.000	69.1
75	215.7	275.3	20.000	70.4
80	202.7	288.3	20.000	71.5
85	209.4	281.6	20.000	70.9
90	210.6	280.4	20.000	70.8
95	212.4	278.6	20.000	70.6
100	208.1	282.9	20.000	71.0
105	202.5	288.5	20.000	71.5
110	196.7	294.3	20.000	71.9
115	192.4	298.6	20.000	72.3
120	192.5	298.5	20.000	72.3
125	190.9	300.1	20.000	72.4
130	184.1	306.9	20.000	72.9
135	181.0	310.0	20.000	73.1
140	176.9	314.1	20.000	73.4
145	177.7	313.3	20.000	73.4
150	179.7	311.3	20.000	73.2
155	177.4	313.6	20.000	73.4

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ERP =	100.0 kW	FM - 2-6 Tables		F(50-50)
Azimuth	Ave. Elev.	Effective	ERP	Distance to
°T.	3 to 16 km	Antenna Height	(dBk)	70 dBu Contour
	Meters AMSL	Meters AAT		km
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160	177.5	313.5	20.000	73.4
165	181.6	309.4	20.000	73.1
170	186.3	304.7	20.000	72.7
175	197.2	293.8	20.000	71.9
180	207.3	283.7	20.000	71.1
185	202.2	288.8	20.000	71.5
190	189.4	301.6	20.000	72.5
195	193.2	297.8	20.000	72.2
200	194.7	296.3	20.000	72.1
205	198.6	292.4	20.000	71.8
210	192.7	298.3	20.000	72.3
215	180.7	310.3	20.000	73.2
220	170.9	320.1	20.000	73.9
225	186.3	304.7	20.000	72.7
230	188.2	302.8	20.000	72.6
235	176.7	314.3	20.000	73.5
240	159.6	331.4	20.000	74.7
245	153.6	337.4	20.000	75.2
250	155.4	335.6	20.000	75.0
255	156.3	334.7	20.000	75.0
260	159.3	331.7	20.000	74.7
265	164.0	327.0	20.000	74.4
270	166.5	324.5	20.000	74.2
275	167.3	323.7	20.000	74.1
280	167.7	323.3	20.000	74.1
285	174.2	316.8	20.000	73.6
290	177.4	313.6	20.000	73.4
295	180.0	311.0	20.000	73.2
300	182.5	308.5	20.000	73.0
305	177.7	313.3	20.000	73.4
310	172.9	318.1	20.000	73.7
315	166.5	324.5	20.000	74.2
320	163.7	327.3	20.000	74.4
325	162.1	328.9	20.000	74.5
330	167.7	323.3	20.000	74.1
335	171.4	319.6	20.000	73.8
340	169.6	321.4	20.000	74.0
345	168.3	322.7	20.000	74.1
350	166.6	324.4	20.000	74.2
355	161.8	329.2	20.000	74.6
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**Engineering Statement  
In Support of an  
Application for a Construction Permit  
WYSF, Birmingham, Alabama**

**Human Exposure to Radiofrequency Radiation Study**

WYSF and WZRR main facilities use an ERI G5CPS-8BC (full wave spaced) 8 bay antenna as a common antenna mounted 204 meters above ground level. Each operates with 100 kilowatts (horizontally & vertically). WYSF is proposing to use a 4 bay ERI antenna (full wave spaced) to be mounted 170 meters above ground with 50 kilowatts (horizontally & vertically) as an auxiliary antenna. WZRR is proposing to use a 4 bay ERI antenna (full wave spaced) to be mounted 152 meters above ground with 50 kilowatts (horizontally & vertically) as an auxiliary antenna. The power densities of this evaluation for all of the WYSF & WZRR facilities were base on FM Model (V2.10b) by using the ERI or Jampro JBCP “Rototiller” (EPA) antenna.

WBHJ is located 320 meters away from the base of the structure of WYSF. WBHJ uses Dielectric DCPJ 2 section (full wave spaced) antenna, mounted 200 meters above ground level with 12.2 kilowatts (horizontally & vertically). The power density was calculated considering a conservative downward relative field value of 0.5.

<u>CALL</u>	<u>Service</u>	<u>Channel</u>	<u>Freq.</u>	<u>Polarization</u>	<u>Antenna Height* (AGL)</u>	<u>ERP (kW)</u>	<u>Relative Field Factor</u>	<u>Vertical Predicted Power Density (mW/cm<sup>2</sup>)</u>	<u>FCC Uncontrolled Limit (mW/cm<sup>2</sup>)</u>	<u>Percent of Uncontrolled Limit</u>
WYSF	FS	233	94.5	H&V	170	50.000	1.000	0.0102676	0.200	5.1338%
WYSF	FM	233	94.5	H&V	204	100.000	1.000	0.0095513	0.200	4.7757%
WBHJ	FM	287	105.3	H&V	200	100.000	1.000	0.0055092	0.200	2.7546%
WZRR	FS	258	99.5	H&V	152	50.000	1.000	0.0128796	0.200	6.4398%
WZRR	FM	258	99.5	H&V	204	100.000	1.000	0.0095513	0.200	4.7757%

Total Percentage of ANSI (uncontrolled) value = 23.88%

\* The antenna height indicated above is 2 meters less than the actual antenna height so that the predicted power density consider the 2 meter human height allowance.

WYSF auxiliary facility will produce a power density of 10.27  $\mu\text{W}/\text{cm}^2$  at 68.8 meters from the base of the tower. At 2 meters from the base of the tower, the power density would be 3.55  $\mu\text{W}/\text{cm}^2$ . The highest number is used for this study.

WYSF main facility will produce a power density of 9.55  $\mu\text{W}/\text{cm}^2$  at 54.6 meters from the base of the tower. At 2 meters from the base of the tower, the power density would be 4.9  $\mu\text{W}/\text{cm}^2$ . The highest number is used for this study.

WBHJ facility will produce a power density of 5.5  $\mu\text{W}/\text{cm}^2$  2 meters from the base of the tower.

WZRR auxiliary facility will produce a power density of 12.88  $\mu\text{W}/\text{cm}^2$  at 68.8 meters from the base of the tower. At 2 meters from the base of the tower, the power density would be 4.45  $\mu\text{W}/\text{cm}^2$ . The highest number is used for this study.

WZRR main facility will produce a power density of 9.55  $\mu\text{W}/\text{cm}^2$  at 54.6 meters from the base of the tower. At 2 meters from the base of the tower, the power density would be 4.9  $\mu\text{W}/\text{cm}^2$ . The highest number is used for this study.

Although all facilities will not be radiating simultaneously, they were considered to be so for this study. The results of the study demonstrates that the power density is 23.9% of the limit for “uncontrolled” environments and 4.8% of the limit for “controlled” environments.