

APPLICATION FOR A
MAJOR AMENDMENT TO
AN LPFM BROADCAST
STATION HAVING
FACILITY ID 196306 FCC
FILE BNPL-20131112BLW
KANSAS CITY, MO

July 10, 2014

Prepared For:

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1.0 PURPOSE OF LPFM MAJOR AMENDMENT APPLICATION

The Int. Radio Project of Kansas City (“IRPKC”) filed for an LPFM broadcast station during the October 15 – November 14, 2013 LPFM filing window. The proposed facility has subsequently been identified as Mutually Exclusive “MX” in Public Notice DA-2397¹ which consists of the following filings:

#	Group	State	City	Chan	Applicant	File Number	Facility ID
711	168	KS	Kansas City	284	Centro Cristiano Agua Viva	20131030AIO	194610
712	168	KS	Kansas City	284	Iglesia Pentecostal Casa De Dios Para Las Naciones Inc.	20131114ACV	194452
713	168	MO	Kansas City	284	Mutual Musicians Foundation, Inc	20131114ARG	195973
714	168	MO	Kansas City	284	The Int. Radio Project Of Kansas City	20131112BLW	196306

Pursuant to Public Notice FCC 14-96² released on July 9, 2014, the FCC has identified Facility ID 194610 having File Number BNPL-20131030AIO and Facility ID 195973 having file Number BNPL-20131114ARG as Time Share tentative selectees for MX group 168.

Pursuant to Public Notice DA-2308³ major amendments, such as non-adjacent channel changes and otherwise prohibited site relocations of greater than 5.6 kilometers, will only be allowed after the Commission identifies tentative selectees among the MX groups.

In response the above reference Public Notices, the instant major amendment application is being filed in an expeditiously manner to change the channel from 284 to channel 249. Since channel 249 is 35 channels below channel 284 it is not +/- three channels or to an intermediate frequency (+/- 53 or 54) channel which would be a minor amendment.

Upon approval of the instant major amendment, the LPFM shall be broken from MX group 168 and will not enter into any new MX situations with any other applicants or licensees.

¹ See *Media bureau identifies mutually exclusive applications filed in the LPFM window and announces 60-day settlement period; CDBS is now accepting form 318 amendments*, Public Notice, DA 13-2397 (MB 2013) Released: December 16, 2013

² *Commission Identifies Tentative Selectees in 79 Groups of Mutually Exclusive Applications Filed In the LPFM Window; Announces A 30-Day Petition To Deny Period And A 90 - Day Period To File Voluntary Time-Share Proposals And Major Change Amendments* Public Notice, FCC 12-96 Released: July 9, 2014

³ See *Media Bureau Provides Further Guidance On The Processing of Form 318 Applications Filed in the LPFM Window*, Public Notice, DA 13-2308 (MB 2013) Released: December 3, 2013

2.0 AMENDED TECHNICAL PARAMETERS

The instant major amendment shall entail modifying the following technical parameters

2.1 FCC Form 318 – Section VI – Question 1 - Channel

The channel is herein amended from 284 to 249 and is classified as a major amendment which is allowable during the 90 day filing period beginning July 10, 2014

3.0 STATION TRANSMITTER LOCATION

The proposed transmitter site shall be located at the studio with the following address and resulting site geographical coordinates.

3.1 Transmitter Site Physical Address

The studio and transmitter is located at the following physical address:

1601 E 18th street
Kansas city, MO 64108

3.2 Transmitter Site Geographic Coordinates (NAD27)

The following transmitter site coordinates were determined using a 7.5 minutes series U.S. Geological Survey topographic quadrangle map then checked for consistency using a GIS program:

N. Latitude 39° 05' 27.5"
W. Longitude 94° 33' 45.9"

3.3 Antenna Structure Registration

The proposed structure consists of a 3 story 30' building with a 19' mast erected from the rooftop. The combined structure and mast height of the roof mounted antenna system does not require an Antenna Structure Registration "ASR" number since the mast atop the roof meets the 6.1 meter (20-foot) rule criteria. Output resulting from the FCC's TOWAIR program is demonstrated in Appendix A.

4.0 ANTENNA AND SITE ELEVATIONS

The applicant proposes to use the studio roof top to erect a mast in which to mount the LPFM antenna. The pertinent elevations are as described:

- 4.1 Height of Site Above Mean Sea Level (AMSL)
831ft / 253.3m (rounded to 253m for FCC Application)
- 4.2 Overall Height of Support Structure (Building) Above Ground Level (AGL)
30ft / 9.1m
- 4.3 Overall Height of Mast above Rooftop
19ft / 5.8m
- 4.4 Overall Height of Mast (AGL)
49ft / 14.9m (Rounded to 15m for FCC Application)
- 4.5 LPFM antenna height above rooftop
18ft / 5.5m
- 4.6 LPFM antenna height (AGL)
48ft / 14.6m (Rounded to 15m for FCC Application)
- 4.7 LPFM antenna height (AMSL)
879ft / 267.9m
- 4.8 LPFM antenna Height Above Average Terrain (HAAT)
26ft / 8m (Refer to Appendix B for HAAT Calculations produced from the FCC's Website)

5.0 LPFM EFFECTIVE RADIATED POWER

Pursuant to 47 C.F.R. Section 73.811(a) entitled "Maximum facilities", LPFM stations will be authorized to operate with maximum facilities of 100 watts ERP at 30 meters HAAT. An LPFM station with a HAAT that exceeds 30 meters will not be permitted to operate with an ERP greater than that which would result in a 60 dBu contour of 5.6 kilometers. In no event will an ERP less than one watt be authorized. No facility will be authorized in excess of one watt ERP at 450 meters HAAT.

Since the calculated HAAT is 8m as demonstrated in Appendix B, the applicant shall employ a 100 Watt ERP and is thus well within 47 C.F.R. Section 73.811(a) compliance.

6.0 ALLOCATION ANALYSIS AND REQUEST FOR WAIVER

A major amendment from channel 284 to channel 249 will break the instant applicant from MX group 168 and bring the facility into technical compliance.

6.1 LPFM Short Space Study for Channel 249

Appendix C is a channel study which demonstrates the distance separation requirements of 47 C.F.R. Section 73.807. As demonstrated the proposed LPFM facility is short spaced to the following second adjacent channel facilities:

KMBZ-FM FCC File No.: BLH-20030423AAV
KLRX-FM Reserved RM-10017
KLRX-FM FCC File No.: BMLED-20080102ABC

6.2 Second Adjacent Channel Short Spacing Waiver for KMBZ-FM

Appendix D demonstrates that using the Undesired-to-Desired signal ratio method, the distance from the LPFM proposed antenna to the KMBZ-FM protected contour is 5 meters. The antenna is proposed to be mounted above the top of a building such that the radiation center is 5.5 meters above the top-most occupied floor. The interference zone does not contact occupants nor does it intersect with nearby occupied structures, thus no population will be subject to interference from the proposed station according to the undesired-to-desired ratio method. As such, a wavier is respectfully requested for the proposed LPFM second-adjacent channel short-spacing with KMBZ-FM, FCC File No. BLH-20030423AAV, facility ID 2449 and of which is not an existing station designated with a Radio Reading Service.

6.3 Second Adjacent Channel Short Spacing Waiver for KLRX-FM (Reserved allocation)

Appendix D demonstrates that using the Undesired-to-Desired signal ratio method, the distance from the LPFM proposed antenna to the reserved KLRX-FM allocation using its maximized parameters (100kw ERP, omnidirectional antenna, HAAT 299 meters, allocated coordinates) is 1 meter. The antenna is proposed to be mounted above the top of a building such that the radiation center is 5.5 meters above the top-most occupied floor. The interference zone does not contact occupants nor does it intersect with nearby occupied structures, thus no population will be subject to interference from the proposed station according to the undesired-to-desired ratio method. As such, a wavier is respectfully requested for the proposed LPFM second-adjacent channel short-spacing with the reserved allocation for KLRX-FM, FCC File No. RM-10017, facility ID 4933 and of which is not an existing station designated with a Radio Reading Service.

6.4 Second Adjacent Channel Short Spacing Waiver for KLRX-FM (Licensed)

Appendix D demonstrates that using the Undesired-to-Desired signal ratio method, the distance from the LPFM proposed antenna to the KLRX-FM protected contour is 5 meters. The antenna is proposed to be mounted above the top of a building such that the radiation center is 5.5 meters above the top-most occupied floor. The interference zone does not contact occupants nor does it intersect with nearby occupied structures, thus no population will be subject to interference from the proposed station according to the undesired-to-desired ratio method. As such, a waiver is respectfully requested for the proposed LPFM second-adjacent channel short-spacing with KLRX-FM, FCC File No. BMLED-20080102ABC, facility ID 4933 and of which is not an existing station designated with a Radio Reading Service.

7.0 INTERFERENCE TO TRANSLATOR OR BOOSTER INPUT SIGNALS

Pursuant to the requirements of 47 C.F.R. Section 73.827(a), Appendix E lists the following FM translator stations which are located within 10 km of the proposed LPFM site and are subject to potential third adjacent-channel interference to the reception of their input channel from their parent station from the herein proposed LPFM facility:

K205ER FCC File No: BLFT-20031210ACS
Input Channel: KSIV-FM Ch. 218

K257DZ FCC File No: BPFT-20120827AEJ
Input Channel: KLRX(FM) Ch. 247

K268CF FCC File No: BLFT-20121212ACA
Input Channel: KCCV(AM) Ch. 0

K273BZ FCC File No: BLFT-20101112ACD
Input Channel: KCMO-FM Ch. 235

K275BQ FCC File No: BMLFT-20111207ALR
Input Channel: KCXL(AM) Ch. 0

K279BI FCC File No: BLFT-20100309ABW
Input Channel: KCFX(FM) Ch. 266

K300CH FCC File No: BLFT-20120330AOG
Input Channel: KCFX(FM) Ch. 266

K300CH FCC File No: BPFT-20120709ABX
Input Channel: KCFX(FM) Ch. 266

None of the listed translators or boosters has an input channel that is third-adjacent to the proposed LPFM facility; as such the proposed LPFM facility will not cause interference to the input signals of and surrounding FM translator or FM booster stations.

8.0 CHANNEL 6 TELEVISION STATIONS

Section 47 C.F.R. Section 73.825 TV Channel 6 interference is not a factor for LPFM stations operating on channels 221 – 300 and thus is not applicable to the instant application for further analysis.

9.0 AM STATION PROXIMITY

Pursuant to 47 C.F.R. Section 1.30002(e), the addition of an antenna-supporting structure on a building shall be considered construction subject to the analysis and notification requirement only if the height of the antenna-supporting structure ALONE exceeds the 60 and 36 electrical degree threshold in Section 1.30002(a) and 1.30002(b) for a non-direction and directional AM facility respectively.

The proposed support structure in this instance extends 5.8 meters above the roof top. A worst case proposed support structure height in electrical degrees shall be calculated using the highest frequency on the AM band of 1600 kHz which subsequently has the highest wavelength and thus is the most prone to vertical radiators. As such the worst case proposed structure height in electrical degrees is as follows:

$$\text{AM Wavelength} = 300/1.6 = 187.5 \text{ meters}$$

$$\text{Prop. Support Structure. Ht. in elec. Deg.} = (5.8/187.5)(360) = 11.1 \text{ electrical degrees}$$

As demonstrated the calculated height in electrical degrees is well below the 60 and 36 electrical degree thresholds for non-directional and directional AM facilities respectively. As such, the proposed LPFM facility and its support structure are not subject to the moment method analysis and 30 day advance notification of the commencement of construction of the proposed rooftop support structure

10.0 NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)

10.1 General Environmental Requirements

The proposed support structure and antenna will not:

- Require high intensity white lighting.
- Is not located in an official designated wilderness area or wildlife preserve.
- Does not threaten the existence or habitat of endangered species.
- Does not affect districts, sites, buildings, structures or objects significant in American history, architecture, archaeology, engineering or culture that are listed in the National Register of Historic Places or are eligible for listing.
- Does not affect Indian religious sites.
- Is not located in a floodplain
- Does not require construction that involves significant changes in surface features (e.g., wetland fill, deforestation or water diversion).

10.2 Radio Frequency Radiation (RFR) Compliance.

Appendix F is a RFR analysis which demonstrates that the peak RFR exposure is 65.1% of the most restrictive permissible exposure threshold standing anywhere on the roof top in any proximity to the proposed support structure. Pursuant to OET Bulletin 65, since the proposed operation exceeds 5% of the most permissible exposure at any location 2 meters above the roof top, it is considered a significant contributor to RFR exposure and other sources of RFR must be taken into account for a cumulative RFR analysis. Since there are no other RF sources in the area to contribute to a cumulative RFR analysis, Appendix F is considered the cumulative RFR analysis. It should be further noted that access to the roof top where the antenna is located is restricted to the general public. The instant application is compliant with the FCC limits for human exposure to RFR and thus is excluded from further environmental processing.

11.0 CONCLUSION

As demonstrated a major amendment to the proposed facility shall remove it from MX group 168 and place it to a channel where it will not be mutual exclusive with any other facilities when considering the requested second adjacent channel waivers. On all other accounts, the proposed facility is well within compliance on all regulatory matters.

12.0 CERTIFICATION

The foregoing statement and the report regarding the aforementioned engineering work are true and correct to the best of my knowledge. Executed on July 10, 2014.

KESSLER AND GEHMAN ASSOCIATES, INC.



Ryan Wilhour
Consulting Engineer

APPENDIX A - FCC TOWAIR Study

Antenna Structure Registration (ASR) filing determination was calculated from the FCC's structure registration tool:

<http://wireless2.fcc.gov/UlsApp/AsrSearch/towairSearch.jsp>

Results are as follows:

DETERMINATION Results	
Structure does not require registration. The structure meets the 6.10-meter (20-foot) Rule criteria.	
Your Specifications	
NAD83 Coordinates	
Latitude	39-05-27.5 north
Longitude	094-33-46.7 west
Measurements (Meters)	
Overall Structure Height (AGL)	14.9
Support Structure Height (AGL)	9.1
Site Elevation (AMSL)	253.3
Structure Type	
BMAST - Building with Mast	

APPENDIX B - Height Above Average Terrain Calculation

The Height Above Average Terrain (HAAT) was calculated from the FCC's HAAT Calculator tool:

http://transition.fcc.gov/mb/audio/bickel/haat_calculator.html

Results are as follows:

Antenna Height Above Average Terrain Calculations -- Input

Latitude **39 5 27.5 North**
Longitude **94 33 45.9 West** (NAD 27)

Height of antenna radiation center above mean sea level [RCAMSL] = **267.9** meters

Number of Evenly Spaced Radials = 8 0° is referenced to True North

Calculated HAAT= 8. meters

(Antenna Height Above Average Terrain)
using the 30 second FCC/NGDC terrain data)

Antenna Radiation Center Heights Above Individual Radials:

0.0°	-0.1 meters
45.0°	39.1 meters
90.0°	-6.5 meters
135.0°	-5.9 meters
180.0°	-2.7 meters
225.0°	-35.2 meters
270.0°	36.0 meters
315.0°	38.4 meters

APPENDIX C - Short Spacing Study for Channel 249

The Int. Radio Project Of Kansas City

REFERENCE		DISPLAY DATES
39 05 27.5 N.	CLASS = L1	DATA 07-10-14
94 33 45.9 W.	Current Spacings to 2nd Adj.	SEARCH 07-10-14

----- Channel 249 - 97.7 MHz -----

Call	Channel	Location	Azi	Dist	FCC	Margin
KMBZ-FM	LIC 251C0	Kansas City	KS 151.0	8.73	83.5	-74.8
KLRX	RSV-A 247C1	Lee's Summit	MO 233.9	3.53	72.5	-69.0
KLRX	LIC-N 247C1	Lee's Summit	MO 90.3	7.88	72.5	-64.6
KPOW-FM	LIC 249C1	La Monte	MO 91.8	112.22	110.5	1.7
K249DT	CP 249D	Atchison	KS 318.4	73.31	31.5	41.8
KSNP	LIC-N 249C2	Burlington	KS 219.8	133.29	90.5	42.8
K249DT	LIC 249D	Atchison	KS 311.6	79.43	31.5	47.9
1582079	APP 249L1	Topeka	KS 269.2	95.99	23.5	72.5

RSV-R = reserved - needs protection, RSV-A = allocation.
All separation margins include rounding

APPENDIX D - Short Spacing Waiver Calculations

Short Spacing Undesired-to-Desired Ratio Calculation to second-adjacent channel facility:

KMBZ-FM FCC File No.: BLH-20030423AAV

Undesired-to-Desired Ratio Method:

BLH-20030423AAV f(50,50) signal: 103.5 dBu⁴⁵

Second-adjacent protection: + 40 dB

Interference-zone boundary: 143.5 dBu

Distance to 143.5 dBu: 5 m (HAAT = 30 m, ERP ≤ 0.1 kW)⁴

KLRX-FM FCC File No.: RM-10017

Undesired-to-Desired Ratio Method:

RM-10017 f(50,50) signal: 114.1 dBu⁴⁵

Second-adjacent protection: + 40 dB

Interference-zone boundary: 154.1 dBu

Distance to 154.1 dBu: 1 m (HAAT = 30 m, ERP ≤ 0.1 kW)⁴

KLRX-FM FCC File No.: BMLED-20080102ABC

Undesired-to-Desired Ratio Method:

BMLED-20080102ABC f(50,50) signal: 102.5 dBu⁴⁵

Second-adjacent protection: + 40 dB

Interference-zone boundary: 142.5 dBu

Distance to 142.5 dBu: 5 m (HAAT = 30 m, ERP ≤ 0.1 kW)⁴

⁴ tvfms_metric() C-language subroutine as distributed by the FCC. At distances less than or equal to 1.5 km, tvfms_metric() uses the free-space method.

⁵ FCC HAAT Calculator web page,
http://transition.fcc.gov/mb/audio/bickel/haat_calculator.html

APPENDIX E – Translator and Booster Proximity

The proposed transmitter site proximity to FM boosters and translators was determined using the FCC's FMQuery tool:

<http://www.fcc.gov/encyclopedia/fm-query-broadcast-station-search>

Results are as follows:

Boosters within 10km of the proposed LPFM transmitter site:

Search Parameters

Service:	FB
Search radius:	10.00 km
Center lat / lon:	N 39 5 27.50 W 94 33 45.90
Lower Channel	200
Upper Channel	300

*** 0 FM Records within 10.00 km distance of 39° 5' 27.50" N, 94° 33' 45.90" W ***

Translators within 10km of the proposed LPFM transmitter site:

Search Parameters

Service:	FX
Search radius:	10.00 km
Center lat / lon:	N 39 5 27.50 W 94 33 45.90
Lower Channel	200
Upper Channel	300

Call	Class	Channel	Service	Frequency	Status	City	State	Country	File Number	Docket
K205ER	205	D	FX	88.9 MHz	LIC	RAYTOWN	MO	US	BLFT-20031210ACS	
K257DZ	257	D	FX	99.3 MHz	APP	BUTLER	MO	US	BPFT-20120827AEJ	
K268CF	268	D	FX	101.5 MHz	LIC	KANSAS CITY	MO	US	BLFT-20121212ACA	
K273BZ	273	D	FX	102.5 MHz	LIC	BONNER SPRINGS	KS	US	BLFT-20101112ACD	
K275BQ	275	D	FX	102.9 MHz	LIC	KANSAS CITY	MO	US	BMLFT-20111207ALR	
K279BI	279	D	FX	103.7 MHz	LIC	KANSAS CITY	MO	US	BLFT-20100309ABW	
K300CH	300	D	FX	107.9 MHz	LIC	LEES SUMMIT	MO	US	BLFT-20120330AOG	
K300CH	300	D	FX	107.9 MHz	CP	LEES SUMMIT	MO	US	BPFT-20120709ABX	

*** 8 FM Records within 10.00 km distance of 39° 5' 27.50" N, 94° 33' 45.90" W ***

APPENDIX F - Far Field Exposure to RF Emissions

A theoretical analysis has been conducted of the human exposure to radio frequency radiation ("RFR") using the calculation methodology described in OET Bulletin 65, Edition 97-01. The RFR analysis is conducted pursuant to the following methodology:

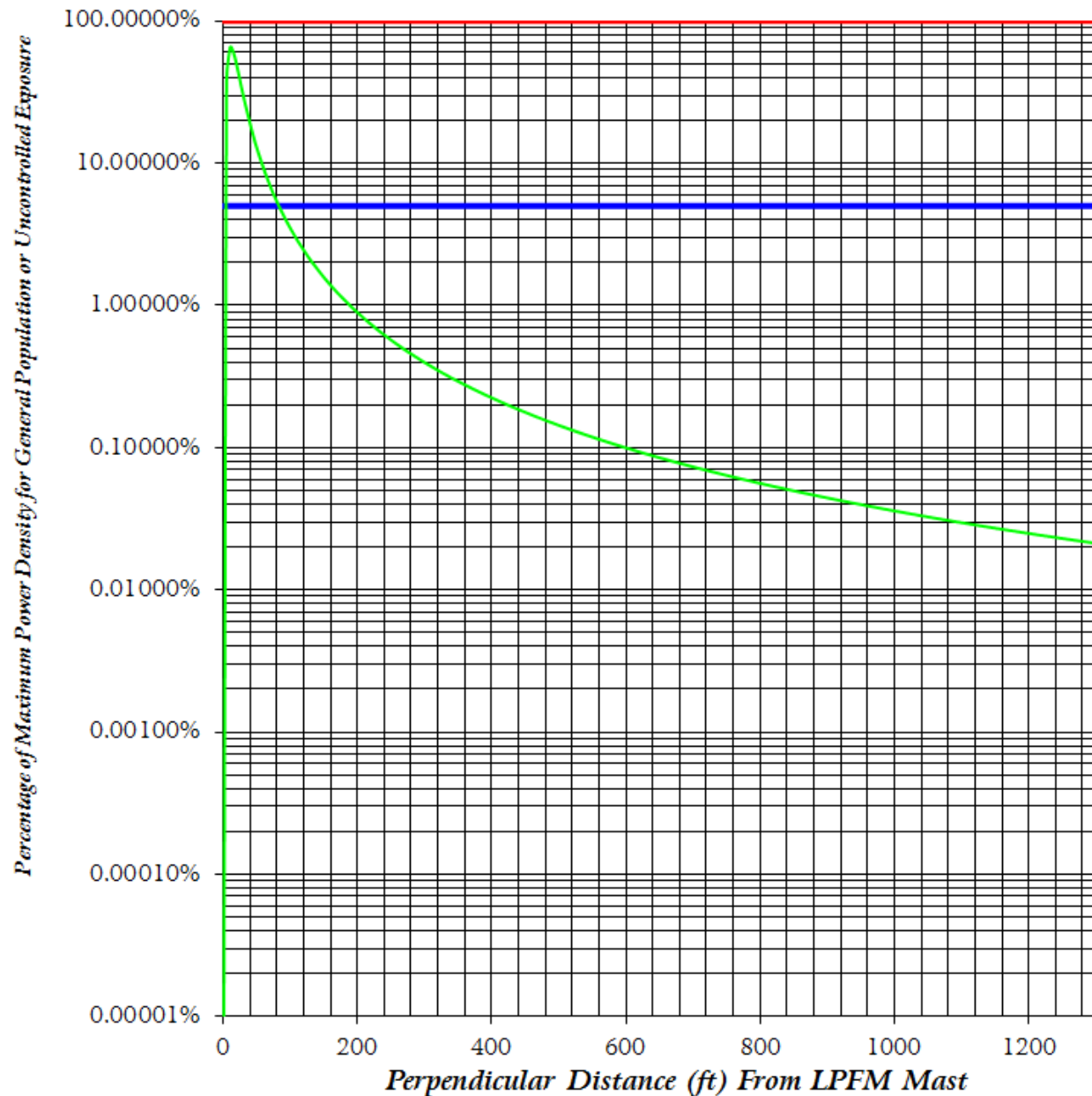
Terrain⁶ extraction is compiled from the support structure site, if the support structure is on a rooftop with no higher elevations (e.g., elevator shaft) then flat terrain is compiled. Terrain is extracted using radial lengths of 0.25 miles in 0.001 mile increments for 360 radials. The power density is calculated for each terrain point at 6 feet above ground level using the elevation and azimuth pattern of the proposed broadcast antenna. The power density calculations are conducted using the lower edge of the proposed channel frequency. To account for ground reflections, a coefficient of 1.6 was included in the calculation.

The resulting cylindrical polar analysis is then summarized into a coordinate plane graph using the following methodology:

Starting from the origin the maximum calculated RFR value is determined among the 360 degree radials for each 0.001 mile increment, the value is then converted into a percentage of the maximum allowable general population or uncontrolled exposure and plotted as a function of perpendicular distance from the tower.

⁶ Terrain extraction is based upon a 3 arc second point spacing terrain database.

FAR FIELD EXPOSURE TO RF EMISSIONS



- Maximum Allowable General Population or Uncontrolled Exposure
- 5 % of Maximum General Population or Uncontrolled Exposure
- Percentage of Maximum General Population or Uncontrolled Exposure