

## **ENGINEERING EXHIBIT**

### **Application for Minor Modification of Licensed FM Facility**

prepared for

**Ramar Communications, Inc.**

KXTQ-FM Lubbock, TX

Facility ID 4019

Ch. 293C2 (106.5 MHz) 22.5 kW 227 m

*Ramar Communications, Inc. (“Ramar”)* is the licensee of KXTQ-FM, Channel 293C2, Facility ID 4019, Lubbock, TX. KXTQ-FM is licensed (file number BLH-19920323KC) to operate at 34 kW effective radiated power (“ERP”) and 179 meters antenna height above average terrain (“HAAT”). *Ramar* proposes herein to relocate KXTQ-FM to an adjacent tower structure, increase the antenna HAAT to 227 meters and decrease the ERP to 22.5 kW.

KXTQ-FM will employ a new transmitting antenna to be side-mounted on the tower structure associated with FCC Antenna Structure Registration number 1248244, located 0.02 km from the existing KXTQ-FM facility. The antenna will be shared with *Ramar’s* stations KLBB-FM (Ch. 229C1, Facility ID 55062, Lubbock TX) and KTTU-FM (Ch. 247C2, Facility ID 54684, New Deal TX). No change to overall structure height will result from this proposal.

The proposed KXTQ-FM operation at 22.5 kW ERP and 227 meters antenna HAAT represents a maximum Class C2 facility pursuant to §73.211. The principal community of Lubbock is encompassed by the proposed KXTQ-FM 70 dBμ coverage contour. The attached Figure 1 supplies a coverage contour map for the proposed facility.

An allocation spacing summary table for the proposed transmitter site is provided in Table 1. The proposed KXTQ-FM site location meets the §73.207 minimum distance separation requirements with respect to all other stations, allotments, and proposals, as contained within the FCC’s LMS database.

The nearest FCC monitoring station is 764 km distant at Douglas AZ. This exceeds the threshold minimum distance specified in §73.1030(c)(3) that would suggest consideration of the monitoring station. The proposed site is also located outside the areas specified in §73.1030(a)(1) and §73.1030(b). There are no authorized AM stations within 3 km of the site. The site is located beyond the international coordination zones for FM stations.

### **Human Exposure to Radiofrequency Electromagnetic Field (Environmental)**

The proposed KXTQ-FM operation was evaluated for human exposure to RF energy using the procedures outlined in the FCC's OET Bulletin Number 65. The proposed transmitting antenna, Dielectric model DCRM12DC50R(SP), is an EPA Type 5 (Four-Piece Spiral) consisting of twelve elements at nonuniform spacing. The spacing between seven of the bays is 1.096 wavelength and the spacing between four of the bays is 0.548 wavelength as listed below.

Bay Spacing at 106.5 MHz	
Bay 1 to Bay 2	0.548 wavelength
Bay 2 to Bay 3	1.096 wavelength
Bay 3 to Bay 4	1.096 wavelength
Bay 4 to Bay 5	1.096 wavelength
Bay 5 to Bay 6	0.548 wavelength
Bay 6 to Bay 7	1.096 wavelength
Bay 7 to Bay 8	0.548 wavelength
Bay 8 to Bay 9	1.096 wavelength
Bay 9 to Bay 10	1.096 wavelength
Bay 10 to Bay 11	1.096 wavelength
Bay 11 to Bay 12	0.548 wavelength

Since the FCC's "FMModel" software analysis<sup>1</sup> cannot consider nonuniform bay spacing, and the dominant spacing is the larger spacing, using the larger spacing (1.096 wavelength) with FMModel would be conservative by providing the worst-case result. The FMModel graph in Figure 2 depicts calculated power density levels attributable to the proposed facility at locations near the tower at a height of two meters above ground level. That analysis shows that the maximum calculated RF electromagnetic field attributable to KXTQ-FM is  $5.0 \mu\text{W}/\text{cm}^2$ , which is 2.5 percent of the general population / uncontrolled maximum permitted exposure limit. This is

---

<sup>1</sup>"Office of Engineering and Technology Announces Updates to FMModel Software," Public Notice, DA 16-340, March 31, 2016. FMModel is available at <https://www.fcc.gov/oet/software/fmmodel>.

below the five percent threshold limit described in §1.1307(b) regarding sites with multiple emitters, categorically excluding the applicant from responsibility for taking any corrective action in the areas where the proposal's contribution is less than five percent.

The general public will not be exposed to RF levels attributable to the proposal in excess of the FCC's guidelines. RF exposure warning signs will continue to be posted. With respect to worker safety, the applicant will coordinate exposure procedures with all pertinent stations and will reduce power or cease operation as necessary to protect persons having access to the site, tower, or antenna from RF electromagnetic field exposure in excess of FCC guidelines. This exhibit is limited to the evaluation of exposure to RF electromagnetic field.

*List of Attachments*

Figure 1	Proposed Coverage Contours
Figure 2	RF Electromagnetic Field – FCC FMModel Results
Table 1	Proposed Transmitter Site §73.207 Allocation Spacing Study
Form 2100	Saved Version of Engineering Sections of FCC Form at Time of Upload

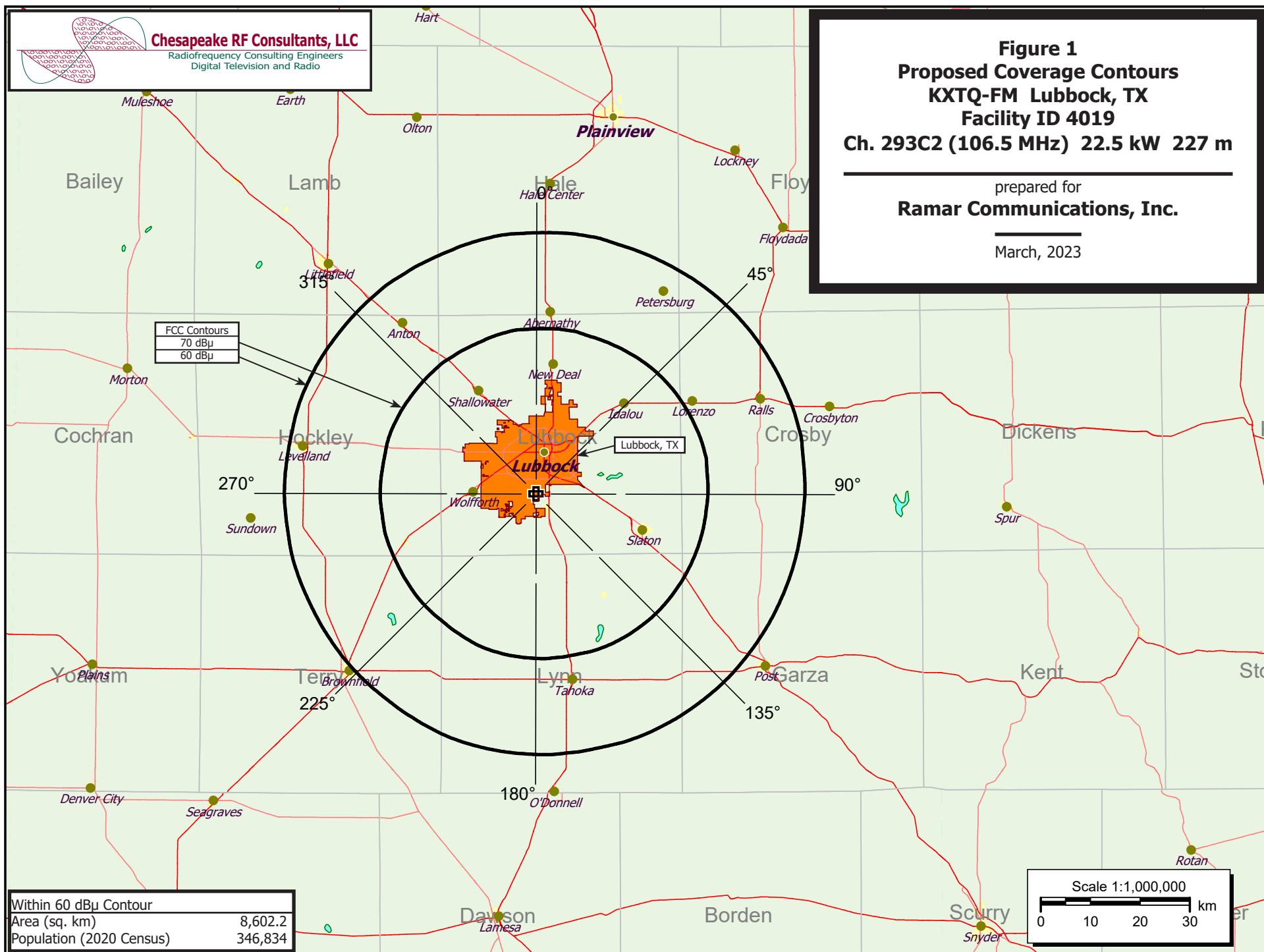
**Chesapeake RF Consultants, LLC**

Joseph M. Davis, P.E.	March 20, 2023	
207 Old Dominion Road	Yorktown, VA 23692	703-650-9600



prepared for  
**Ramar Communications, Inc.**

March, 2023



**Figure 2**

**RF Electromagnetic Field**

**FCC FMModel Results**

**KXTQ-FM Lubbock, TX**

**Facility ID 4019**

**Ch. 293C2 (106.5 MHz) 22.5 kW 227 m**

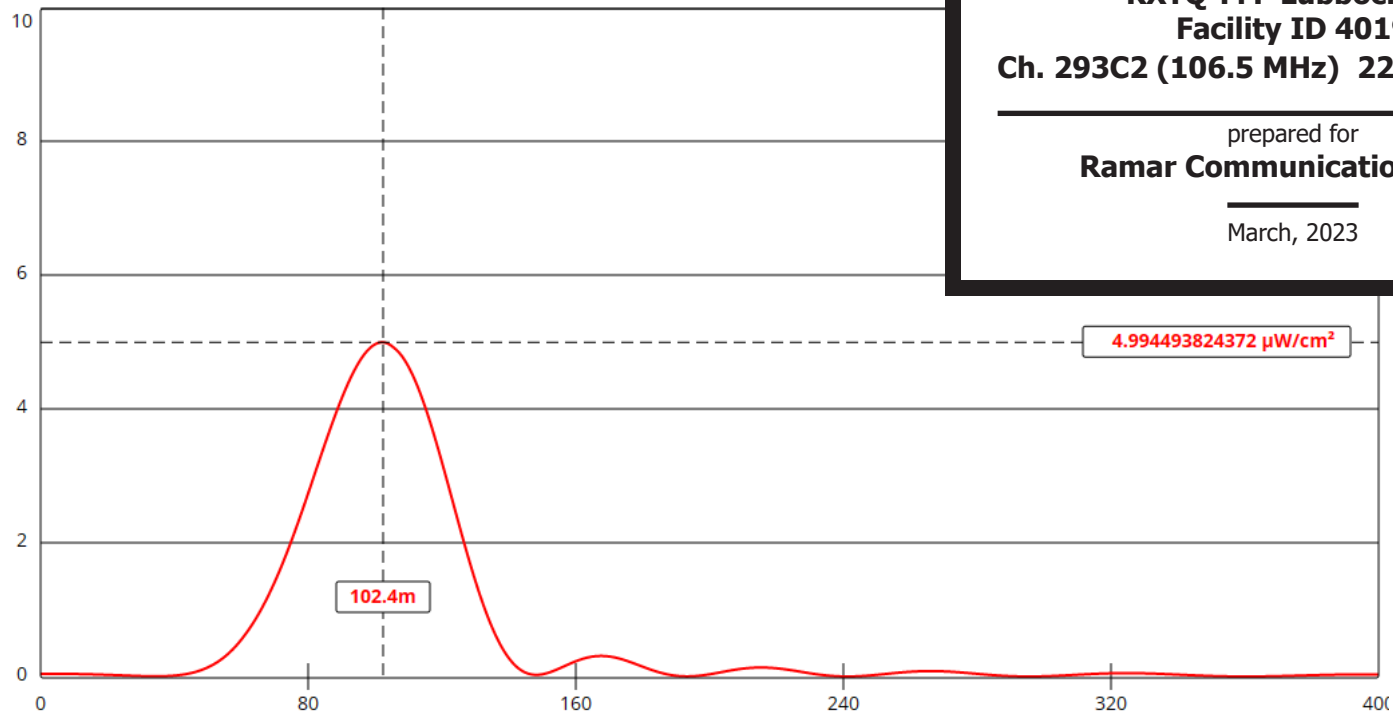
---

prepared for

**Ramar Communications, Inc.**

---

March, 2023



View Tabular Results +

Channel Selection	Channel 293 (106.5 MHz) ▾		
Antenna Type +	EPA Type 5: Three-Piece or Four-Piece Spiral ▾		
Height (m)	<input type="text" value="228.7"/>	Distance (m)	<input type="text" value="400"/>
ERP-H (W)	<input type="text" value="22500"/>	ERP-V (W)	<input type="text" value="22500"/>
Num of Elements	<input type="text" value="12"/>	λ	<input type="text" value="1.096"/>
Num of Points	<input type="text" value="500"/>	<input type="button" value="Apply"/>	

**Table 1**  
**Proposed Transmitter Site**  
**§73.207 Allocation Spacing Study**  
prepared for  
**Ramar Communications, Inc.**  
**KXTQ-FM Lubock, TX**

REFERENCE  
33 30 08.30 N. CLASS = C2  
101 52 21.30 W. Current Spacings to 3rd Adj.  
----- Channel 293 - 106.5 MHz -----

DISPLAY DATES  
DATA 03-16-23  
SEARCH 03-16-23

Call	Channel	Location		Azi	Dist	FCC	Margin	
AU9158951VAC	294A	Dickens	TX	79.0	105.99	106.0	-0.01	*
KSEM LIC	292A	Seminole	TX	218.8	114.10	106.0	8.1	
KFLP-FM LIC-N	291C3	Floydada	TX	42.6	70.56	56.0	14.6	
KCHX LIC	294C1	Midland	TX	182.8	176.25	158.0	18.3	
KPAN-FM LIC	292C2	Hereford	TX	340.5	152.05	130.0	22.1	
AU9812527VAC	293A	Knox City	TX	91.7	193.22	166.0	27.2	
KKYN-FM LIC-Z	295C2	Plainview	TX	12.1	86.33	58.0	28.3	
KEND LIC-N	293C1	Roswell	NM	268.0	265.39	224.0	41.4	
KSEL-FM LIC	290C1	Portales	NM	303.8	151.38	79.0	72.4	
AU9158923VAC	292A	Memphis	TX	41.8	183.41	106.0	77.4	
AU9458055VAC	240A	Dickens	TX	81.8	97.11	15.0	82.1	
KAUM LIC	296A	Colorado City	TX	143.3	153.86	55.0	98.9	

\* Satisfies §73.207 when rounded to the nearest kilometer per §73.208(c) (8)

Channel and  
Facility  
Information

Section	Question	Response
Proposed Community of License	State	Texas
	City	LUBBOCK
	Channel	293
	Frequency	106.5
Facility Type	Facility Type	Commercial
Station Class	Station Class	C2

Antenna  
Location Data

Section	Question	Response
Antenna Structure Registration	Do you have an FCC Antenna Structure Registration (ASR) Number?	Yes
	ASR Number	1248244
Coordinates (NAD83)	Latitude	33° 30' 08.3" N+
	Longitude	101° 52' 21.3" W-
	Structure Type	GTOWER-Guyed Structure Used for Communication Purposes
	Overall Structure Height	297.2 meters
	Support Structure Height	295.7 meters
	Ground Elevation (AMSL)	977.5 meters
Antenna Data	Height of Radiation Center Above Ground Level	Horizontal:230.7 meters Vertical:230.7 meters
	Height of Radiation Center Above Average Terrain	Horizontal:227.2 meters Vertical:227.2 meters
	Height of Radiation Center Above Mean Sea Level	Horizontal:1208.2 meters Vertical:1208.2 meters
	Effective Radiated Power	Horizontal:22.5 kW Vertical: 22.5 kW
	Proposed Allotment or Assignment - Coordinates (NAD83)	Latitude
Longitude		

Antenna  
Technical Data

Section	Question	Response
Antenna Type	Antenna Type	Non-Directional

**Directional Antenna Relative Field Value**

Degree	Value	Degree	Value	Degree	Value	Degree	Value
--------	-------	--------	-------	--------	-------	--------	-------

**Additional Azimuths**

Degree	Value
--------	-------

**Technical  
Certifications**

Section	Question	Response
<b>Environmental Effect</b>	Would a Commission grant of Authorization for this location be an action which may have a significant environmental effect? (See 47 C.F.R. Section 1.1306)	No
<b>Broadcast Facility</b>	Does the proposed facility comply with the applicable engineering standards and assignment requirements of 47 C.F.R. Sections 73.203, 73.207, 73.213, 73.315, 73.509, 73.515, 73.525, and 73.1125?	Yes
<b>Contour Protection</b>	Does the proposed facility request processing pursuant to the contour protection provisions of 47 C.F.R Section 73.215?	No
<b>Community of License Change - Section 307(b)</b>	Is the application being submitted to change the facility's community of license? If 'Yes', an exhibit is required containing information demonstrating that the proposed community of license change constitutes a preferential arrangement of assignments under Section 307(b) of the Communications Act of 1934, as amended (47 U.S.C. Section 307(b))	No