

ENGINEERING EXHIBIT

Application for Construction Permit

prepared for

Ramar Communications, Inc.

KTTU-FM New Deal, TX

Facility ID 54684

Ch. 247C2 (97.3 MHz) 22.5 kW 228 m

Ramar Communications, Inc. ("Ramar") is the licensee of KTTU-FM, Channel 247C2, Facility ID 54684, New Deal, TX. KTTU-FM is licensed (file number BLH-20080325AHU) to operate with a directional antenna at 30.5 kW effective radiated power ("ERP") and 187 meters antenna height above average terrain ("HAAT"). *Ramar* proposes herein to change KTTU-FM to nondirectional operation, decrease the ERP to 22.5 kW, and increase the antenna HAAT to 228 meters.

No change in site location is proposed. KTTU-FM will employ a new transmitting antenna to be side-mounted on the tower structure associated with FCC Antenna Structure Registration number 1248244. No change to overall structure height will result from this proposal.

The proposed KTTU-FM operation at 22.5 kW ERP and 228 meters antenna HAAT represents a maximum Class C2 facility pursuant to §73.211. The principal community of New Deal is encompassed by the proposed KTTU-FM 70 dB μ 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. Contour protection pursuant to §73.215 is specified with respect to the Construction Permit ("CP", BNPH-20151013AIU) for a new FM station on Channel 248C3 at Girard, TX. The 117.0 distance from KTTU-FM to the Girard CP satisfies the minimum separation requirements of §73.215(e).

Figure 2 depicts the pertinent protected and interfering contours for the proposed KTTU-FM with those of the Girard CP. The new FM station at Girard is authorized pursuant to §73.215, therefore the Girard CP's authorized facility parameters (25 kW ERP at 85 m HAAT) are utilized. The contour locations were determined using USGS 3 arc second digitized terrain data along each radial and an implementation of the FCC's TVFMFS computer program which simulates the FM propagation curves. As shown on Figure 2, no prohibited contour overlap will exist.

This proposal for KTTU-FM requests a 10.0 km change in the location of the allotment reference point for vacant Channel 248C2 at Denver City, TX to 32° 52' 47" N-Lat, 103° 03' 24" W-Lon. An allocation spacing summary is provided in Table 2 which demonstrates compliance with §73.207 with respect to KTTU-FM as well as all authorized facilities, proposed stations, and allotments contained in the FCC's CDBS. Figure 3 supplies a map depicting the uniform terrain city-grade contour radius from the allotment point, which totally encompasses the principal community of Denver City (community boundaries based on 2010 Census data).

The proposed KTTU-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 CDBS 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 KTTU-FM operation was evaluated for human exposure to RF energy using the procedures outlined in the FCC's OET Bulletin Number 65. The transmitting antenna will be an EPA Type 3 ("opposed U dipole" such as ERI model SHP-4AC) consisting of four

elements at 1.0 wavelength spacing. According to the FCC's "FMModel" software analysis,¹ the graph in Figure 4 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 the proposed KTTU-FM is $2.5 \mu\text{W}/\text{cm}^2$, which is 1.3 percent of the general population/uncontrolled maximum permitted exposure limit. This is 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 and the tower will continue to be fenced. 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.

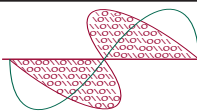
List of Attachments

Figure 1	Proposed Coverage Contours
Figure 2	§73.215 Contour Protection
Figure 3	Ch. 248C2 Denver City TX - Allotment Point Principal Community Coverage
Figure 4	RF Electromagnetic Field – FCC FMModel Results
Table 1	Proposed Transmitter Site §73.207 Allocation Spacing Study
Table 2	Ch. 248C2 Denver City TX §73.207 Allocation Spacing Study
Form 301	Saved Version of Engineering Sections from FCC Form at Time of Upload

Chesapeake RF Consultants, LLC

Joseph M. Davis, P.E.	February 28, 2019	
207 Old Dominion Road	Yorktown, VA 23692	703-650-9600

¹"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>.

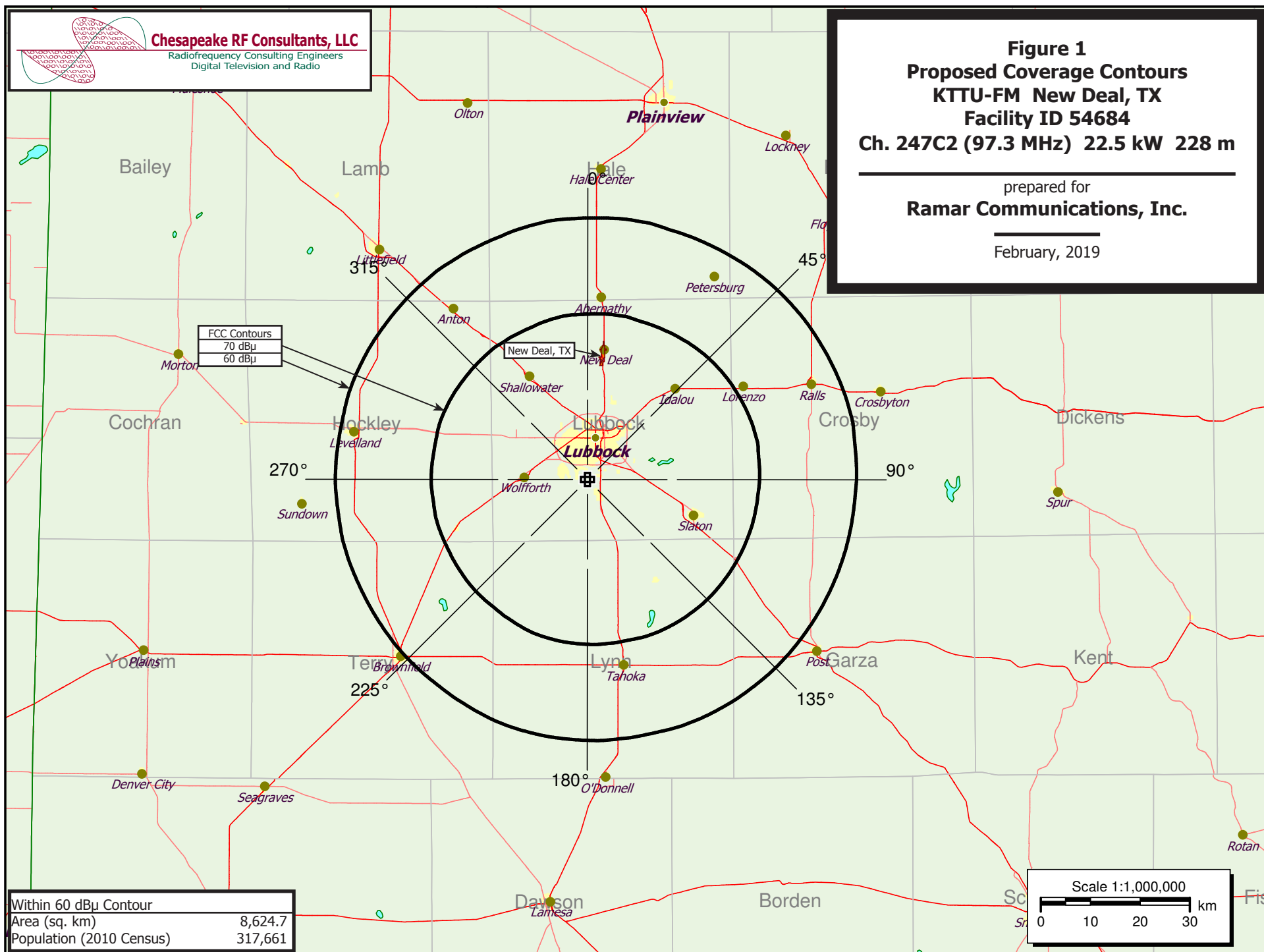


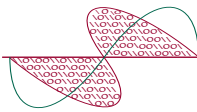
Chesapeake RF Consultants, LLC
Radiofrequency Consulting Engineers
Digital Television and Radio

Figure 1
Proposed Coverage Contours
KTTU-FM New Deal, TX
Facility ID 54684
Ch. 247C2 (97.3 MHz) 22.5 kW 228 m

prepared for
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February, 2019





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Figure 2
§73.215 Contour Protection
KTTU-FM New Deal, TX
Facility ID 54684
Ch. 247C2 (97.3 MHz) 22.5 kW 228 m

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Proposed KTTU-FM
60 dBμ F(50,50)
54 dBμ F(50,10)

New (FM) Ch. 248C3 Girard, TX
§73.215 Authorization
CP BNPH-20151013AIU 25 kW 85 m
60 dBμ F(50,50)
54 dBμ F(50,10)

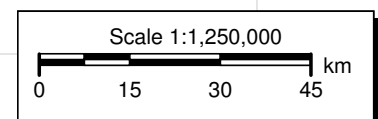


Figure 3
Proposed New Allotment Point
Principal Community Coverage
Ch. 248C2 Denver City, TX

prepared for
Ramar Communications, Inc.

February, 2019

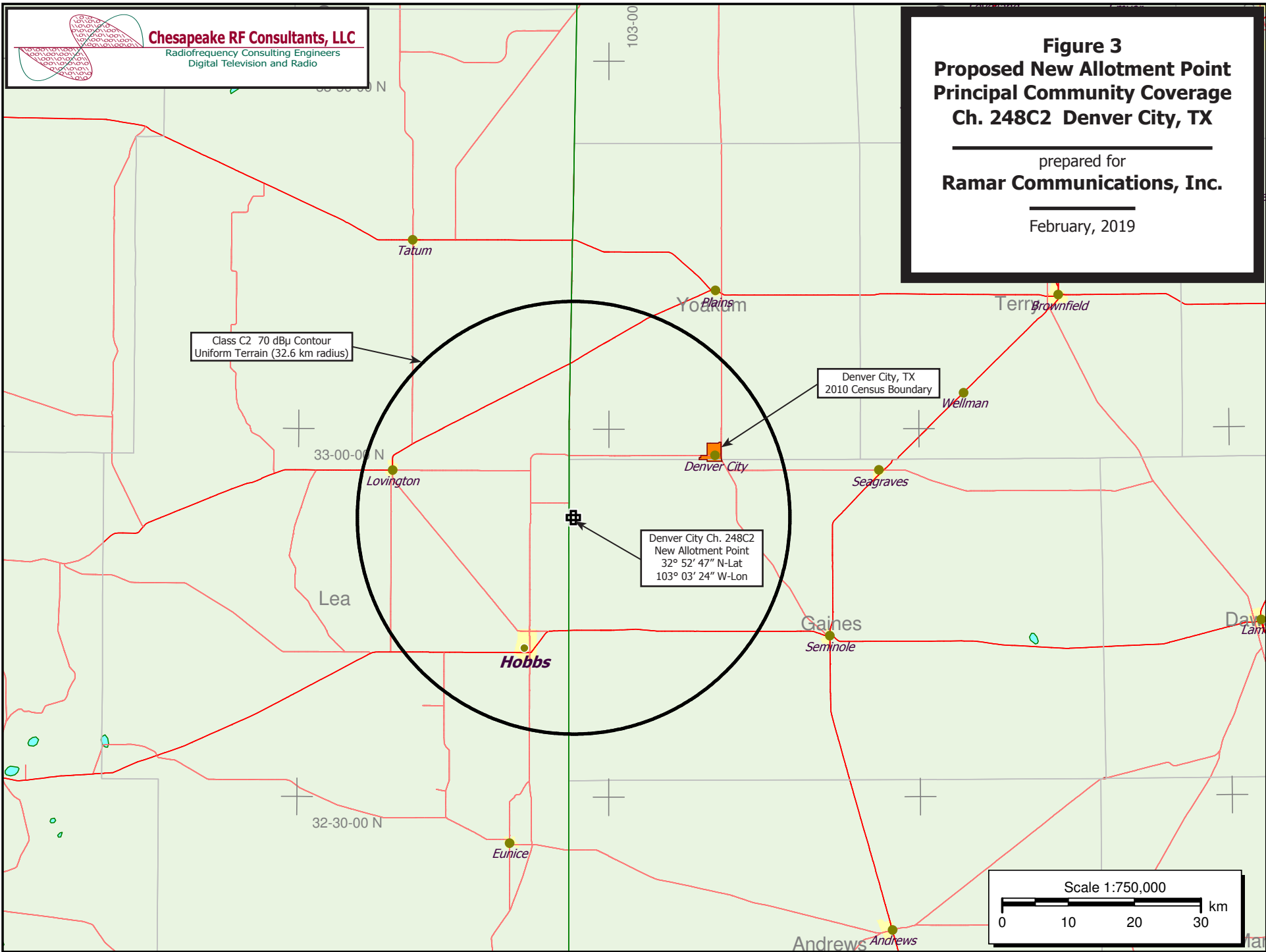
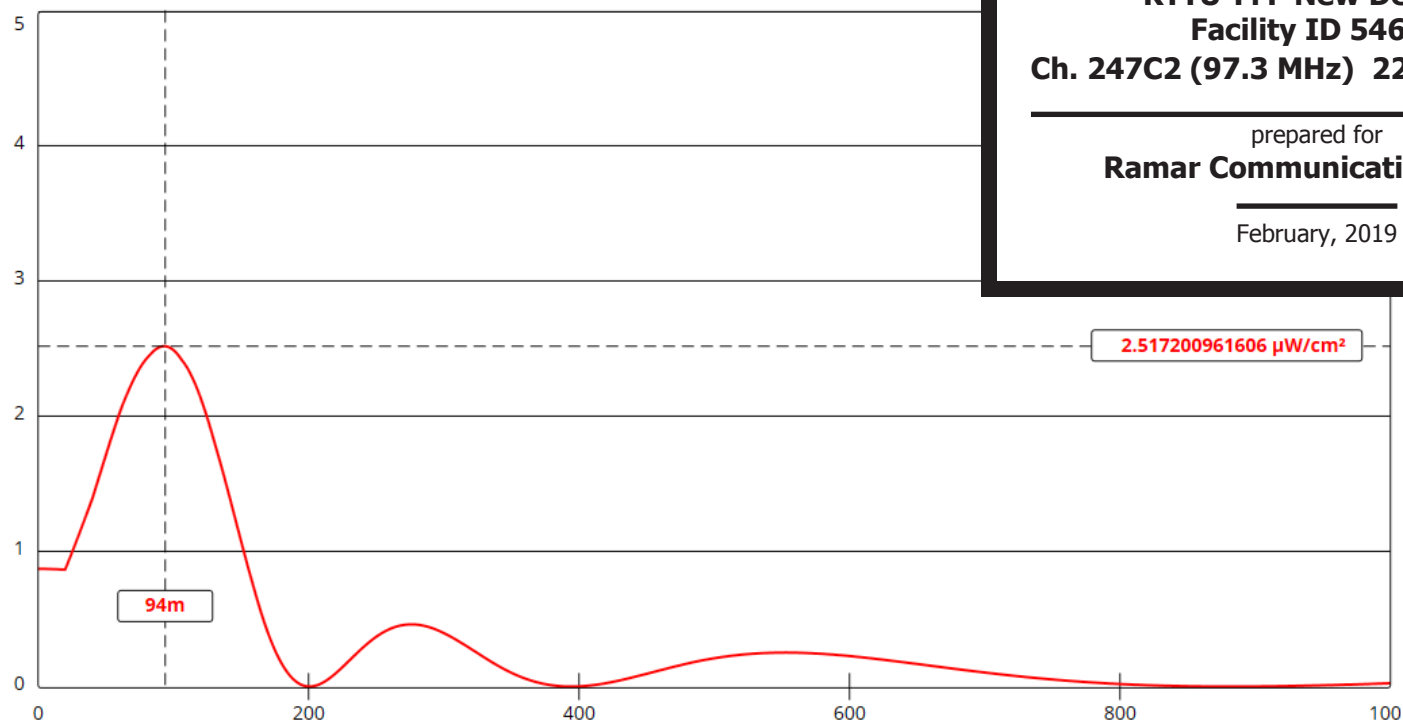


Figure 4
RF Electromagnetic Field
FCC FMModel Results
KTTU-FM New Deal, TX
Facility ID 54684
Ch. 247C2 (97.3 MHz) 22.5 kW 228 m

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[View Tabular Results +](#)

Channel Selection	Channel 247 (97.3 MHz) ▼		
Antenna Type +	EPA Type 3: Opposed U Dipole ▼		
Height (m)	<input type="text" value="229.6"/>	Distance (m)	<input type="text" value="1000"/>
ERP-H (W)	<input type="text" value="22500"/>	ERP-V (W)	<input type="text" value="22500"/>
Num of Elements	<input type="text" value="4"/>	Element Spacing (λ)	<input type="text" value="1"/>
Num of Points	<input type="text" value="500"/>	<input type="button" value="Apply"/>	

Table 2
Ch. 248C2 Denver City, TX
§73.207 Allocation Spacing Study
prepared for
Ramar Communications, Inc.

Proposed Allotment Point for Vacant Ch. 248C2 at Denver City, TX
32° 52' 47" N-Lat 103° 03' 24" W-Lon

REFERENCE		DISPLAY DATES
32 52 47.0 N.	CLASS = C2 Int = B	DATA 02-28-19
103 03 24.0 W.	Current Spacings to 3rd Adj.	SEARCH 02-28-19
----- Channel 248 - 97.5 MHz -----		

Call	Channel	Location	Azi	Dist	FCC	Margin
AL0213	VAC	248C2 Denver City TX	54.2	10.04	190.0	-180.0
<u>Existing Allotment Point for Vacant Ch. 248C2 at Denver City, TX</u>						
KTTU-FM	LIC	247C2 New Deal TX	57.5	130.25	130.0	0.25
<u>Licensed and Proposed KTTU-FM Ch. 247C2</u>						
KWNF	CP	249A O'donnell	TX	84.2	115.09	106.0 9.1
KMCM	LIC	245C1 Odessa	TX	140.5	114.00	79.0 35.0
NEW	CP	248C3 Girard	TX	74.7	228.69	177.0 51.7
KBCQ-FM	LIC	246C1 Roswell	NM	295.6	136.28	79.0 57.3
KDNZ	LIC	247A Pecos	TX	195.0	167.71	106.0 61.7
KODM	LIC	250C1 Odessa	TX	145.4	146.04	79.0 67.0
KGKL-FM	LIC	248C1 San Angelo	TX	121.0	292.65	224.0 68.7
KKCL-FM	LIC	251C2 Lorenzo	TX	57.2	132.41	58.0 74.4

Section III-B - FM Engineering**TECHNICAL SPECIFICATIONS**

Ensure that the specifications below are accurate. Contradicting data found elsewhere in this application will be disregarded. All items must be completed. The response "on file" is not acceptable.

TECH BOX

1.	Channel Number: 247
2.	Class (select one): <input type="radio"/> A <input type="radio"/> B1 <input type="radio"/> B <input type="radio"/> C3 <input checked="" type="radio"/> C2 <input type="radio"/> C1 <input type="radio"/> C0 <input type="radio"/> C <input type="radio"/> D
3.	Antenna Location Coordinates: (NAD 27) Latitude: Degrees 33 Minutes 30 Seconds 8 <input checked="" type="radio"/> North <input type="radio"/> South Longitude: Degrees 101 Minutes 52 Seconds 20 <input checked="" type="radio"/> West <input type="radio"/> East
4.	Proposed Allotment or Assignment Coordinates: (NAD 27) <input checked="" type="checkbox"/> Not Applicable Latitude: Degrees Minutes Seconds <input type="radio"/> North <input type="radio"/> South Longitude: Degrees Minutes Seconds <input type="radio"/> West <input type="radio"/> East
5.	Antenna Structure Registration Number: 1248244 <input type="checkbox"/> Not Applicable <input type="checkbox"/> Notification filed with FAA
6.	Overall Tower Height Above Ground Level: 297meters
7.	Height of Radiation Center Above Mean Sea Level: 1209 meters(H) 1209 meters(V)
8.	Height of Radiation Center Above Ground Level: 232meters(H) 232meters(V)
9.	Height of Radiation Center Above Average Terrain: 228meters(H) 228meters(V)
10.	Effective Radiated Power: 22.5 kW(H) 22.5 kW(V)
11.	Maximum Effective Radiated Power: <input checked="" type="checkbox"/> Not Applicable (Beam-Tilt Antenna ONLY) kW(H) kW(V)
12.	Directional Antenna Relative Field Values: <input checked="" type="checkbox"/> Not applicable (Nondirectional) Rotation (Degrees): <input type="checkbox"/> No Rotation

Degrees	Value	Degrees	Value	Degrees	Value	Degrees	Value	Degrees	Value	Degrees	Value
0		10		20		30		40		50	
60		70		80		90		100		110	
120		130		140		150		160		170	
180		190		200		210		220		230	
240		250		260		270		280		290	
300		310		320		330		340		350	
Additional Azimuths											

[Relative Field Polar Plot](#)

NOTE: In addition to the information called for in this section, an explanatory exhibit providing full particulars must be submitted for each question for which a "No" response is provided.

CERTIFICATION

AUXILIARY ANTENNA APPLICANTS ARE NOT REQUIRED TO RESPOND TO ITEMS 13-16. PROCEED TO ITEM 17.

13.	Availability of Channels. The proposed facility complies with the allotment requirements of 47 C.F.R. Section 73.203.	<input checked="" type="radio"/> Yes <input type="radio"/> No See Explanation in [Exhibit 27]
14.	Community Coverage. The proposed facility complies with 47 C.F.R. Section 73.315.	<input checked="" type="radio"/> Yes <input type="radio"/> No See Explanation in [Exhibit 28]

15. Main Studio Location. The proposed main studio location complies with 47 C.F.R. Section 73.1125.	<input checked="" type="radio"/> Yes <input type="radio"/> No See Explanation in [Exhibit 29]
16. Interference. The proposed facility complies with all of the following applicable rule sections: Check all those that apply: Separation Requirements. <input checked="" type="checkbox"/> a) 47 C.F.R. Section 73.207 Grandfathered Short-Spaced. <input type="checkbox"/> b) 47 C.F.R. Section 73.213(a) with respect to station(s): [Exhibit 31] Exhibit required <input type="checkbox"/> c) 47 C.F.R. Section 73.213(b) with respect to station(s): [Exhibit 32] Exhibit required <input type="checkbox"/> d) 47 C.F.R. Section 73.213(c) with respect to station(s): [Exhibit 33] Exhibit required. Contour Protection <input checked="" type="checkbox"/> e) 47 C.F.R. Section 73.215 with respect to station(s): [Exhibit 34] Exhibit required.	<input checked="" type="radio"/> Yes <input type="radio"/> No See Explanation in [Exhibit 30]
17. Environmental Protection Act. The proposed facility is excluded from environmental processing under 47. C.F.R. Section 1.1306 (i.e., The facility will not have a significant environmental impact and complies with the maximum permissible radiofrequency electromagnetic exposure limits for controlled and uncontrolled environments). Unless the applicant can determine compliance through the use of the RF worksheets in Appendix A, an Exhibit is required. By checking "Yes" above, the applicant also certifies that it, in coordination with other users of the site, will reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency electromagnetic exposure in excess of FCC guidelines.	<input checked="" type="radio"/> Yes <input type="radio"/> No See Explanation in [Exhibit 35]
18. Community of License Change - Section 307(b). If the application is being submitted to change the facility's community of license, then the applicant certifies that it has attached an exhibit containing information demonstrating that the proposed community of license change constitutes a preferential arrangement of station assignments under Section 307(b) of the Communications Act of 1934, as amended (47 U.S.C. Section 307(b)). An exhibit is required unless this question is not applicable.	<input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> N/A [Exhibit 36]
PREPARERS CERTIFICATION ON PAGE 3 MUST BE COMPLETED AND SIGNED.	

SECTION III - PREPARER'S CERTIFICATION

I certify that I have prepared Section III (Engineering Data) on behalf of the applicant, and that after such preparation, I have examined and found it to be accurate and true to the best of my knowledge and belief.

Name JOSEPH M. DAVIS, P.E.	Relationship to Applicant (e.g., Consulting Engineer) CONSULTING ENGINEER	
Signature	Date 2/28/2019	
Mailing Address CHESAPEAKE RF CONSULTANTS, LLC 207 OLD DOMINION ROAD		
City YORKTOWN	State or Country (if foreign address) VA	Zip Code 23692 -
Telephone Number (include area code) 7036509600	E-Mail Address (if available) JOSEPH.DAVIS@RF-CONSULTANTS.COM	