

ENGINEERING EXHIBIT

Incentive Auction Channel Reassignment

Application for Digital Class A Television Station Construction Permit

prepared for

Ramar Communications, Inc. KXTQ-CD Lubbock, TX Facility ID 55055 Ch. 24 5.3 kW

Ramar Communications, Inc. ("Ramar") is the licensee of Class A television station KXTQ-CD, Channel 46, Facility ID 55055, Lubbock, TX. *Ramar* herein proposes construction of the KXTQ-CD post-auction facility on Channel 24. Reassignment of KXTQ-CD from Channel 46 to Channel 24 was specified in the *Incentive Auction Closing and Channel Reassignment Public Notice* ("*CCRPN*", DA 17-317, released April 13, 2017).

The proposed Channel 24 operation will employ a new antenna system to be side-mounted on the KXTQ-CD tower, at a higher elevation (by 12.2 meters) than the present KXTQ-CD antenna. The tower structure corresponds to FCC Antenna Structure Registration number 1248244. The proposed antenna is a horizontally polarized nondirectional RFS model STA16-HP and the proposed effective radiated power ("ERP") is 5.3 kW.

Although KXTQ-CD is licensed as nondirectional (file #0000001265), which should have been the basis for protection and reassignment through the incentive auction, the *CCRPN* specifies a directional antenna pattern (antenna ID# 20052). FCC staff has informally advised that the incorporation of a directional pattern in the KXTQ-CD reassignment facility parameters was inadvertent, however *Ramar's* initial Construction Permit application due July 12, 2017 must nonetheless specify a facility that conforms to the reassignment. *Ramar* will have opportunity to apply for further increase of the proposed KXTQ-CD facility at the appropriate expansion window, when the 1 percent contour distance expansion limit will not apply.



Along a few azimuths the proposed KXTQ-CD Class A protected contour extends beyond that of the *CCRPN* reassignment value of 9.63 kW ERP. The proposal complies with §73.3700(b)(1)(ii) as described in the following.

The proposed nondirectional facility results in variations in coverage contour location from the reassignment facility which includes the inadvertent directional pattern. Therefore, KXTQ-CD qualifies under §73.3700(b)(1)(ii)(A) for a contour extension due to the loss of coverage area that would otherwise result from implementation of the new channel assignment.

Interference study per FCC OET Bulletin 69^1 shows that the proposal complies with the 0.5 percent limit of new interference caused to pertinent nearby post-auction full service and Class A television stations and reassignments as required by §§73.6017 - 73.6018. The interference study output report is provided as Table 1. This satisfies §73.3700(b)(1)(ii)(C) for the proposed Class A protected contour extension.

The amount of contour extension does not exceed one percent in any direction. Figure 1 supplies a coverage contour comparison of the proposed KXTQ-CD facility to the reassignment facility's contour and a one percent extension distance of the reassignment facility's contour. Here, the contour level is adjusted with the dipole factor to match FCC application processing. Table 1's results also demonstrate that the proposed contour is within the baseline contour plus one percent. Therefore the proposed contour extension complies with §73.3700(b)(1)(ii)(B).

The proposed KXTQ-CD facility's terrain-limited population provides a 99.7 percent match of the *CCRPN* baseline facility, as detailed in the following table. The OET Bulletin 69 report summary in Table 1 also concludes that the proposed service area population is more than 95 percent of the baseline population.

¹FCC Office of Engineering and Technology Bulletin number 69, *Longley-Rice Methodology for Evaluating TV Coverage and Interference*, February 6, 2004 ("OET-69"). This analysis employed the FCC's current "TVStudy" software with the default application processing template settings, 2 km cell size, and 1 km terrain increment. Comparisons of various results of this computer program (run on a Mac processor) to the FCCs implementation of TVStudy show excellent correlation.



Terrain Limited Population - Match of Reassignment			
Population Summary (2010 Census)	Reassignment		
OET Bulletin 69: TVStudy	Parameters	Proposed	
Within Noise Limited Contour	313,632	312,633	
Not affected by terrain losses	313,632	312,633	
Match of Reassignment		99.68%	

The nearest FCC monitoring station is 764 km distant at Douglas, AZ. This exceeds by a large margin the threshold minimum distance specified in \$73.1030(c)(3) that would suggest consideration of the monitoring station. The site is not located within the areas requiring coordination with "quiet" zones specified in \$73.1030(a) and (b). The site location is beyond the border areas requiring international coordination. There are no authorized AM stations within 3 kilometers of the site.

Human Exposure to Radiofrequency Electromagnetic Field (Environmental)

The proposed operation was evaluated for human exposure to RF energy using the procedures outlined in the FCC's OET Bulletin Number 65. Based on OET-65 equation (10), and considering 15 percent antenna relative field in downward elevations (pattern data shows less than 15 percent relative field at angles 10 to 90 degrees below the antenna), the calculated signal density near the tower at two meters above ground level attributable to the proposed facility is $0.05 \,\mu\text{W/cm}^2$, which is 0.02 percent of the general population/uncontrolled maximum permitted exposure limit. This is well 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.

Engineering Exhibit Ramar Communications, Inc. (KXTQ-CD)



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List of Attachments

Figure 1 Proposed Contour Expansion OET Bulletin 69 Interference Study Table 1 Form 2100 Saved Version of Engineering Sections from FCC Form at Time of Upload

Chesapeake RF Consultants, LLC

Joseph M. Davis, P.E.	July 9, 2017	
207 Old Dominion Road	Yorktown, VA 23692	703-650-9600



Table 1KXTQ-CDOET Bulletin 69 Interference Study(page 1 of 3)



Distance

160.9 km

0.0

0.0

461.0

461.4

309.5

246.3

9.0

9.0

tvstudy v2.2.2 Database: localhost, Study: KXTQ-CD 5.3KW PROP, Model: Longley-Rice Start: 2017.07.09 11:53:20 Study created: 2017.07.09 11:53:13 Study build station data: LMS TV 2017-07-08 LMSTV Proposal: KXTQ-CD D24 DC APP LUBBOCK, TX File number: KXTQ-CD 5.3KW PROP Facility ID: 55055 Station data: User record Record ID: 823 Country: U.S. Stations potentially affected: Chan Svc Status City, State Call File Number KPEJ-TV D23 DT LIC ODESSA, TX BLCDT20060629AGO D23 DT APP D23 DT BL BLANK0000026475 KLCW-TV WOLFFORTH, TX KLCW-TV WOLFFORTH, TX DTVBL77719 D24 DT LIC KNAT-TV ALBUQUERQUE, NM BLCDT20130710AAN KOKH-TV D24 DT LIC OKLAHOMA CITY, OK BLCDT20041207ACV K24HH-D D24 DC LIC KTEL-TV D25 DT LIC WICHITA FALLS, TX BLDTL20101026ABY BLCDT20081125ADK CARLSBAD, NM KTTZ-TV D25 DT APP LUBBOCK, TX BLANK0000026301 KTTZ-TV D25 DT BL LUBBOCK, TX DTVBL65355 No non-directional AM stations found within 0.8 km No directional AM stations found within 3.2 km Record parameters as studied: Channel: D24 Mask: Stringent Latitude: 33 30 8.30 N (NAD83) Longitude: 101 52 21.30 W Height AMSL: 1248.8 m HAAT: 0.0 m Peak ERP: 5.30 kW Antenna: Omnidirectional 49.8 dBu contour: Azimuth ERP HAAT Distance 0.0 deg 5.30 kW 267.4 m 49.6 km 45.0 5.30 5.30 5.30 5.30 280.2 50.3 50.6 285.9 90.0 135.0 283.5 50.5 5.30 49.7 180.0 268.9 48.9 225.0 5.30 253.7 5.30 5.30 247.0 250.9 48.5 270.0 315.0 48.8 Database HAAT does not agree with computed HAAT Database HAAT: 0 m Computed HAAT: 267 m Proposal service area is within baseline plus 1.0% Proposal service area population is more than 95.0% of baseline Distance to Canadian border: 1722.5 km Distance to Mexican border: 404.8 km Conditions at FCC monitoring station: Douglas AZ Bearing: 255.2 degrees Distance: 762.4 km Proposal is not within the West Virginia quiet zone area Conditions at Table Mountain receiving zone: Bearing: 338.9 degrees Distance: 793.4 km

Table 1 KXTQ-CD OET Bulletin 69 Interference Study (page 2 of 3) (page 2 of 3) (page 2 of 3)



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Study cell size: 2.00 km
Profile point spacing: 1.00 km
Maximum new IX to full-service and Class A: 0.50%
Maximum new IX to LPTV: 2.00%
_____
                       _____
Interference to BLCDT20060629AGO LIC, scenario 1
Proposal causes no interference.
_____
Interference to BLCDT20060629AGO LIC, scenario 2
Proposal causes no interference.
_____
Interference to BLANK0000026475 APP, scenario 1
Proposal causes no interference.
                    _____
Interference to DTVBL77719 BL, scenario 1
Proposal causes no interference.
_____
Interference to BLCDT20130710AAN LIC, scenario 1
Proposal causes no interference.
   _____
Interference to BLCDT20041207ACV LIC, scenario 1
Proposal causes no interference.
_____
Interference to BLCDT20041207ACV LIC, scenario 2
Proposal causes no interference.
_____
Interference to BLCDT20041207ACV LIC, scenario 3
Proposal causes no interference.
_____
                        _____
Interference to BLCDT20041207ACV LIC, scenario 4
Proposal causes no interference.
_____
Interference to BLCDT20041207ACV LIC, scenario 5
Proposal causes no interference.
_____
Interference to BLCDT20041207ACV LIC, scenario 6
Proposal causes no interference.
                        _____
Interference to BLCDT20041207ACV LIC, scenario 7
Proposal causes no interference.
   _____
Interference to BLCDT20041207ACV LIC, scenario 8
Proposal causes no interference.
_____
Interference to BLDTL20101026ABY LIC, scenario 1
Proposal causes no interference.
_____
Interference to BLDTL20101026ABY LIC, scenario 2
Proposal causes no interference.
_____
                        _____
Interference to BLCDT20081125ADK LIC, scenario 1
Proposal causes no interference.
_____
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Table 1
(page 3 of 3)KXTQ-CDOET Bulletin 69 Interference Study



Interference to BLCDT20081125ADK LIC, scenario 2 Proposal causes no interference.

Interference	e to BLANK	0000026301 APP,	, scenario 1			
Desired:	Call KTTZ-TV	Chan Svc Sta D25 DT API	atus City, State P LUBBOCK, TX		File Number BLANK0000026301	Distance
Undesireds:	KXTQ-CD KXTQ-CD KTEL-TV KZBZ-CD KMID	D24DCBLD24DCAPD25DTL10D26zDCL10D26DTL10	LUBBOCK, TX P LUBBOCK, TX C CARLSBAD, NM C CLOVIS, NM C MIDLAND, TX		DTVBL55055 KXTQ-CD 5.3KW PROP BLCDT20081125ADK BLANK0000001641 BLCDT20110218AAS	9.0 km 9.0 249.1 154.6 169.1
Serv 16606.0	vice area 380,240	Terrain-1 16566.1	limited IX-free 380,225 15978.7	, before 379,690	IX-free, after 16070.7 379,725	Percent New IX -0.58 -0.01
Undesired KXTQ-CD D24 KXTQ-CD D24	DC BL DC APP	та 587.5 495.4	Dtal IX Unique IX 535 587.5 500	, before 535	Unique IX, after 495.4 500	
Interference	e to DTVBL	65355 BL, scena	ario 1			
Desired:	Call KTTZ-TV	Chan Svc Sta D25 DT BL	atus City, State LUBBOCK, TX		File Number DTVBL65355	Distance
Undesireds:	KXTQ-CD KXTQ-CD KTEL-TV KZBZ-CD KMID	D24DCBLD24DCAPID25DTLICD26zDCLICD26DTLIC	LUBBOCK, TX P LUBBOCK, TX C CARLSBAD, NM C CLOVIS, NM C MIDLAND, TX		DTVBL55055 KXTQ-CD 5.3KW PROP BLCDT20081125ADK BLANK0000001641 BLCDT20110218AAS	9.0 km 9.0 249.1 154.6 169.1
Serv 16438.0	vice area 380,069	Terrain-1 16354.2	limited IX-free 380,000 15206.3	, before 376,387	IX-free, after 15330.4 376,471	Percent New IX -0.82 -0.02
Undesired KXTQ-CD D24 KXTQ-CD D24	DC BL DC APP	Та 1147.9 1023.8	Dtal IX Unique IX 3,613 1147.9 3,529	, before 3,613	Unique IX, after 1023.8 3,529	
Interference	e to propo	sal, scenario i	 1			
Desired:	Call KXTQ-CD	Chan Svc Sta D24 DC API	atus City, State P LUBBOCK, TX		File Number KXTQ-CD 5.3KW PROP	Distance
Undesireds:	KLCW-TV K24HH-D KTTZ-TV	D23 DT AP D24 DC LI D25 DT AP	P WOLFFORTH, TX C WICHITA FALLS, P LUBBOCK, TX	TX	BLANK0000026475 BLDTL20101026ABY BLANK0000026301	0.0 km 309.5 9.0
Serv 7760.9	vice area 312 , 633	Terrain-1 7729.0	limited 312,633 7729.0	IX-free 312,633	Percent IX 0.00 0.00	

Channel and	
Facility	
Information	

Section	Question	Response
Proposed Community of License	Facility ID	55055
	State	Texas
	City	LUBBOCK
	DCA Channel	24

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	TOWER-A free standing or guyed struct
	Overall Structure Height	289.6 meters
	Support Structure Height	288.0 meters
	Ground Elevation (AMSL)	977.5 meters
Antenna Data	Antenna Data Height of Radiation Center Above Ground Level	
	Height of Radiation Center Above Mean Sea Level	1248.8 meters
	Effective Radiated Power	5.3 kW

Antenna Technical Data	Section	Question	Response
	Antenna Type	Antenna Type	Non-Directional
		Do you have an Antenna ID?	
		Antenna ID	
	Antenna Manufacturer and	Manufacturer:	RFS
	Model	Model	STA16-HP
		Rotation	
		Electrical Beam Tilt	0.5
		Mechanical Beam Tilt	Not Applicable
		toward azimuth	
		Polarization	Horizontal
	Elevation Radiation Pattern	Does the proposed antenna propose elevation radiation patterns that vary with azimuth for reasons other than the use of mechanical beam tilt?	No
		Uploaded file for elevation antenna (or radiation) pattern data	
		Out-of-Channel Emission Mask:	Stringent

Construction Permit Certifications	Section	Question	Response
	Post-Incentive Auction Expedited Processing	It will operate on the DTV channel for this station as established in the post-incentive auction channel reassignment public notice.	Yes
		It will operate post-incentive auction facilities that do not expand the noise-limited service contour in any direction beyond that established by the post-incentive auction channel reassignment public notice.	No
		It will operate post-incentive auction facilities that match or reduce by no more than five percent with respect to predicted population from those defined in the post-incentive auction channel reassignment public notice.	
		The antenna structure to be used by this facility has been registered by the Commission and will not require re- registration to support the proposed antenna, OR the FAA has previously determined that the proposed structure will not adversely affect safety in air navigation and this structure qualifies for later registration under the Commission's phased registration plan, OR the proposed installation on this structure does not require notification to the FAA pursuant to 47 C.F.R. Section 17.7.	Yes
	Environmental Effect	Would a Commission grant of Authorization for this location be an action which may have a significant environmental effect? (See Section 1.1306 of 47 C.F.R.)	No
	Broadcast Facility	The proposed facility complies with all of the following applicable rule sections. 47 C.F.R. Sections 74.709, 74.793 (e), 74.793(f), 74.793(g), 74.793(h)	Yes