

## **Engineering Statement**

prepared for

### **Gray Television Licensee, LLC**

KTRE(DT) Lufkin, TX

Facility ID 68541

Ch. 24 300 kW 140 m

This engineering statement has been prepared on behalf of *Gray Television Licensee, LLC* (“*Gray*”), licensee of KTRE (Facility ID 68541, Lufkin TX) in support of a *Petition for Rulemaking* to amend §73.622(j) by changing KTRE’s digital television channel assignment. KTRE is licensed to operate on Channel 9 (BLCDT-20110613ABY). As described herein, *Gray* requests substitution of Channel 24 in lieu of Channel 9 for KTRE.

The KTRE Channel 9 facility is in the VHF spectrum and has proven to be ineffective for satisfactory viewer reception as discussed herein and elsewhere in the petition. The use of Channel 24 would place KTRE in the UHF spectrum which is known to provide robust signal levels for home reception.

*Gray* has determined that many viewers experience significant difficulty in receiving KTRE’s signal. Problems with digital VHF reception by stations in many markets were widely publicized since the 2009 digital transition date. It has been established that indoor reception is difficult for digital VHF stations such as KTRE due to the longer wavelength signal’s inability to readily pass through buildings (the windows are smaller than the wavelength size), the ineffectiveness of many indoor antennas many of which were designed to emphasize the shorter wavelengths for UHF reception, and high levels of manmade and environmental noise.

In addition to the reception issues inherent to the VHF band, *Gray* has determined that the tower structure supporting the KTRE Channel 9 antenna has significantly deteriorated such that the extensive repairs necessary cannot reasonably be accomplished. Therefore, *Gray* proposes to utilize an adjacent, shorter tower structure to support the proposed Channel 24 antenna and to dismantle the deficient tower structure utilized by the Channel 9 facility.

Gray proposes to implement the Channel 24 substitution with a top-mounted transmitting antenna to be installed on the tower structure associated with FCC Antenna Structure Registration (“ASR”) number 1321053. This tower structure is located 0.04 km (40 meters) from the KTRE Channel 9 tower (ASR number 1047439).

The licensed Channel 9 facility operates with 23.5 kW effective radiated power (“ERP”) nondirectional at 204 meters antenna height above average terrain (“HAAT”). Gray proposes herein to utilize 300 kW ERP nondirectional on Channel 24 at 140 meters antenna HAAT.

A summary of the licensed Channel 9 and proposed Channel 24 technical parameters is provided in the following.

**Licensed Channel 9 Parameters (file# BLCDT-20110613ABY)**

FacID	Call	Ch	City	St	Lat	Lon	RCAMSL	HAAT	ERP	DA
68541	KTRE	9	LUFKIN	TX	312510	944804	284	204	23.5	ND

**Proposed Channel 24 Parameters**

FacID	Call	Ch	City	St	Lat	Lon	RCAMSL	HAAT	ERP	DA
68541	KTRE	24	LUFKIN	TX	312510.3	944804.0	222.8	139.6	300	ND

A map is supplied as Figure 1, which depicts the standard predicted coverage contours. As demonstrated thereon, the proposed facility complies with §73.625(a)(1) as the entire community of Lufkin will be encompassed by the 48 dBμ contour.

Interference study per FCC OET Bulletin 69<sup>1</sup> shows that the proposal complies with the 0.5 percent limit of new interference caused to pertinent nearby full service and Class A television stations as required by §73.616. FCC processing of this proposal is requested using a 1.0 km cell size and 1.0 km terrain profile increment. The interference study output report is provided as Table 1.

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<sup>1</sup>FCC 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, 1 km cell size, and 1 km terrain increment. Comparisons of various results of this computer program (run on a Mac processor) to the FCC’s implementation of TVStudy show excellent correlation.

A coverage contour comparison map is provided in Figure 2, showing that the proposed Channel 24 noise limited service contour (“NLSC”) will fall short of matching that of the licensed Channel 9 facility. The gap between the proposed Channel 24 NLSC and the licensed Channel 9 NLSC is approximately 20 kilometers. *Gray* has determined that constructing a Channel 24 facility having an ERP of 300 kW would be complementary to KTRE’s market size while minimizing service loss. Even at the maximum allowed UHF ERP of 1000 kW for the proposed 140 meters antenna HAAT, there would be a gap of approximately 14 km. Concerning the reduction in antenna height, if the proposed Channel 24 antenna was at the same 204 meter HAAT as the licensed Channel 9 facility (requiring the construction of a new tower), the maximum UHF ERP of 1000 kW on Channel 24 would still fail to provide NLSC replication, leaving an NLSC gap of approximately 6.5 km.

KTRE is a satellite station of KLTV (Ch. 7, Fac ID 68540, Tyler, TX), which provides overlapping NLSC service to KTRE. The proposed KTRE Channel 24 NLSC loss areas are depicted in Figure 2 along with the NLSC of KLTV and other overlapping same-network (ABC) alternative authorized television services. The other television stations that provide overlapping NLSC service into the loss area are KTBS Shreveport LA, KBMT Beaumont TX, and KTRK-TV Houston TX. The areas on Figure 2 that are tinted yellow represent loss area locations that are not encompassed by any other ABC network station’s NLSC. A population summary of the NLSC loss is provided on the map and in the following table.

**Loss Area Analysis – Standard FCC Contours**

KTRE Population Within NLSC	(2010 census)
Licensed Ch. 9 Total:	443,636
Proposed Ch. 24 Total:	245,423
Gain Area Population:	0
Loss Area Population:	198,213
ABC Network NLSC Loss (percentage)	64,825 14.61%

The licensed Channel 9 facility’s NLSC encompasses 443,636 persons and the proposed Channel 24 facility’s NLSC would encompass 245,423 persons. The resulting NLSC loss population is 198,213 persons, of which 64,825 persons would not have an alternative ABC service representing 14.61 percent of the total population within the licensed KTRE Channel 9 NLSC.

The results of additional loss area analysis are provided in Figure 3, now to consider terrain-limited coverage predictions of the licensed Channel 9 facility and the proposed Channel 24 operation. Here, the FCC’s TVStudy computer program was used to determine terrain-limited coverage predictions at locations beyond the proposed Channel 24 NLSC. The study area was set using the “fixed geography” option to match the KTRE licensed Channel 9 NLSC. Study cell size of 1.0 km and 1.0 km terrain profile increment settings were employed. The analysis included examination of each cell that is located beyond the Channel 24 NLSC and beyond the NLSC of any other ABC network station (the same, yellow-tinted area as Figure 2) as bounded by the existing Channel 9 facility’s NLSC. Cells in this region were counted as losing ABC service if they are predicted to have terrain-limited service from the licensed Channel 9 facility and not from the proposed Channel 24. The results are provided on Figure 3 and in the following table.

**Loss Area Analysis – Terrain-Limited**

KTRE Terrain-Limited Population TVStudy at Fixed Geography Area	(2010 census)
Licensed Ch. 9 Total	425,967
ABC Network Loss beyond NLSC (percentage)	448 0.11%

The KTRE licensed Channel 9 facility provides terrain-limited service to 425,967 persons within its NLSC. This analysis shows that nearly all of the terrain-limited service population achieved by the licensed KTRE within the ABC network NLSC loss area will receive terrain-limited service from the proposed Channel 24. The determination of terrain-limited ABC network loss considers each cell that is located within the existing Channel 9 facility’s NLSC, beyond the Channel 24 NLSC, and beyond the NLSC of any other ABC network station (the yellow tinted area on Figure 3). This analysis shows that the terrain-limited ABC network loss population is 448 persons, representing 0.11 percent of the total terrain-limited population within the licensed KTRE Channel 9 NLSC. The FCC has previously found that population loss of less than 500 persons is *de minimis*,<sup>2</sup> and the predicted ABC network loss population loss in this case is 448 persons.

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<sup>2</sup>See *WSET, Inc.*, 80 FCC 2d 233, 246 (1980).

## Conclusion

The proposed channel substitution complies with the FCC's principal community coverage requirements of §73.625 and the interference protection requirements of §73.616. The area of service loss can be considered as *de minimis*.

## List of Attachments

Figure 1	Proposed Coverage Contours
Figure 2	Coverage Contour Comparison; Loss Area Analysis – Standard FCC Contours
Figure 3	Loss Area Analysis – Terrain-Limited Method
Table 1	TVStudy Analysis of Proposal

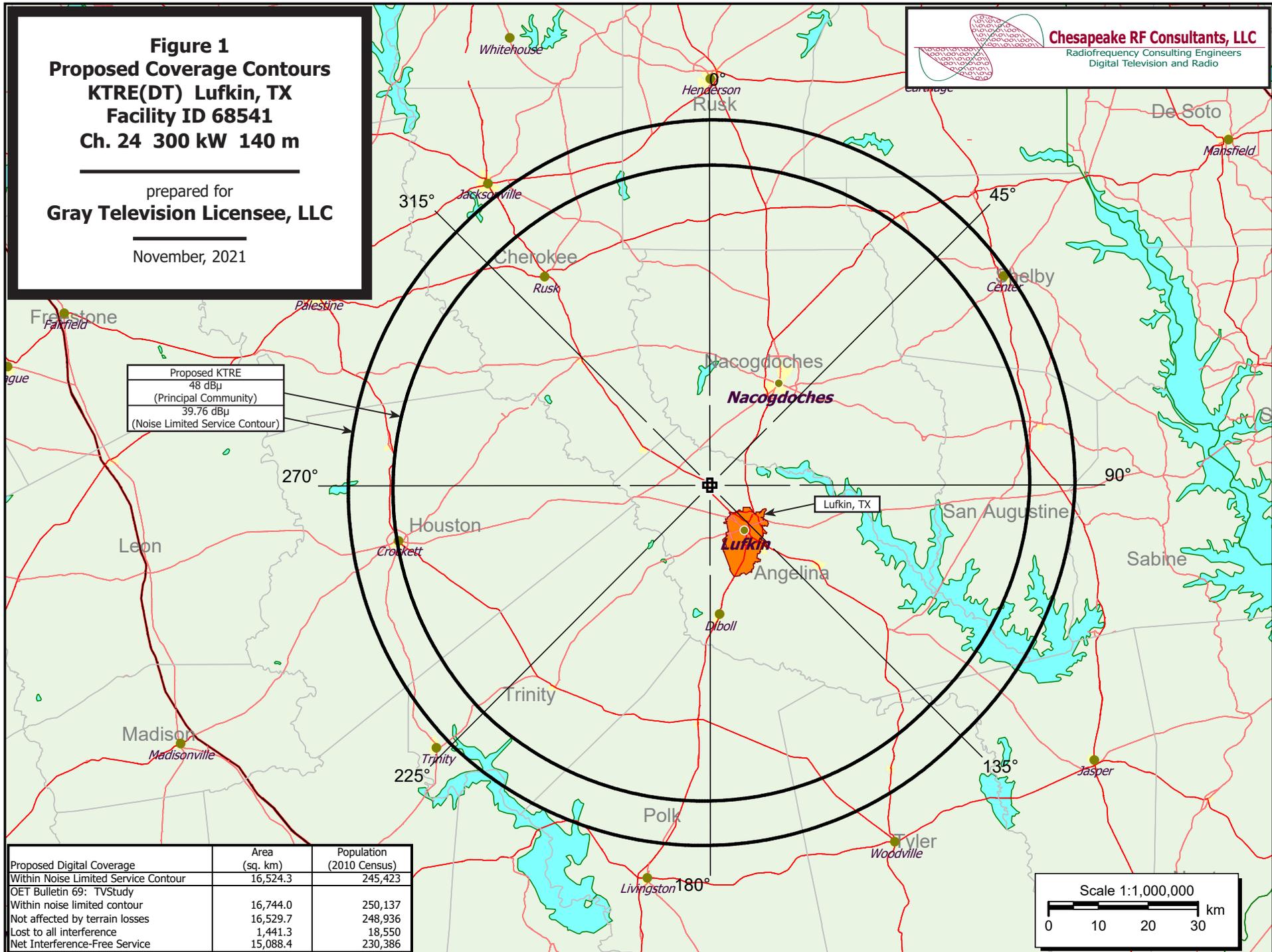
## **Chesapeake RF Consultants, LLC**

Joseph M. Davis, P.E.                      November 8, 2021  
207 Old Dominion Road                      Yorktown, VA 23692                      703-650-9600

**Figure 1**  
**Proposed Coverage Contours**  
**KTRE(DT) Lufkin, TX**  
**Facility ID 68541**  
**Ch. 24 300 kW 140 m**

prepared for  
**Gray Television Licensee, LLC**

November, 2021





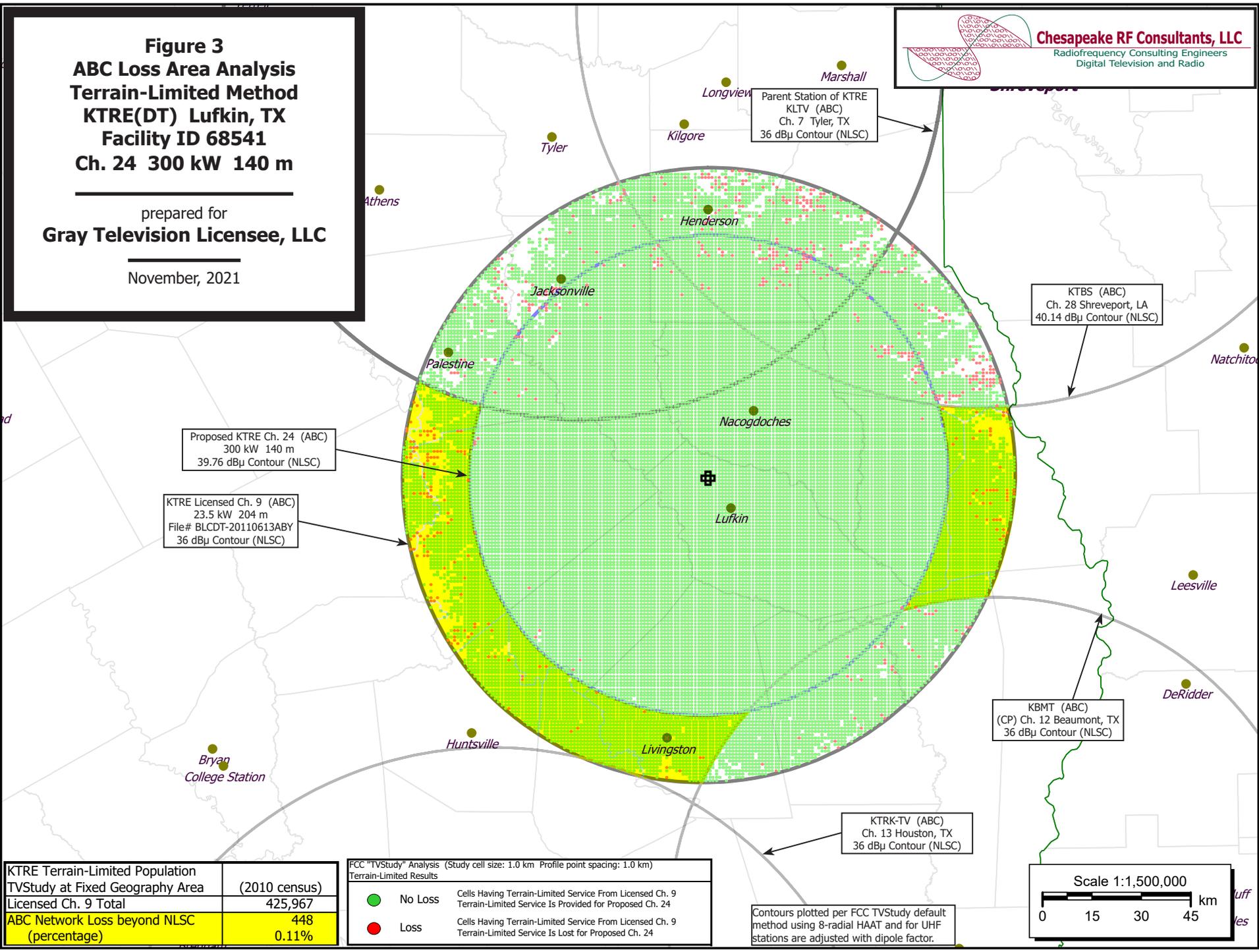
**Figure 3**  
**ABC Loss Area Analysis**  
**Terrain-Limited Method**  
**KTRE(DT) Lufkin, TX**  
**Facility ID 68541**  
**Ch. 24 300 kW 140 m**

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November, 2021



Proposed KTRE Ch. 24 (ABC)  
 300 kW 140 m  
 39.76 dBu Contour (NLSC)

KTRE Licensed Ch. 9 (ABC)  
 23.5 kW 204 m  
 File# BLCDT-20110613ABY  
 36 dBu Contour (NLSC)

Parent Station of KTRE  
 KLTV (ABC)  
 Ch. 7 Tyler, TX  
 36 dBu Contour (NLSC)

KTBS (ABC)  
 Ch. 28 Shreveport, LA  
 40.14 dBu Contour (NLSC)

KBMT (ABC)  
 (CP) Ch. 12 Beaumont, TX  
 36 dBu Contour (NLSC)

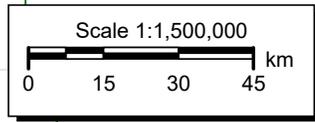
KTRK-TV (ABC)  
 Ch. 13 Houston, TX  
 36 dBu Contour (NLSC)

KTRE Terrain-Limited Population TVStudy at Fixed Geography Area	(2010 census)
Licensed Ch. 9 Total	425,967
ABC Network Loss beyond NLSC (percentage)	448 0.11%

FCC "TVStudy" Analysis (Study cell size: 1.0 km Profile point spacing: 1.0 km)  
 Terrain-Limited Results

<span style="color: green;">●</span> No Loss	Cells Having Terrain-Limited Service From Licensed Ch. 9 Terrain-Limited Service Is Provided for Proposed Ch. 24
<span style="color: red;">●</span> Loss	Cells Having Terrain-Limited Service From Licensed Ch. 9 Terrain-Limited Service Is Lost for Proposed Ch. 24

Contours plotted per FCC TVStudy default method using 8-radial HAAT and for UHF stations are adjusted with dipole factor.



**Table 1 KTRE TVStudy Analysis of Proposal**  
(page 1 of 3)



tvstudy v2.2.5 (4uoc83)

Database: localhost, Study: KTRE prop24 300kW\_1.0-1.0, Model: Longley-Rice  
Start: 2021.11.05 15:01:59

Study created: 2021.11.05 15:01:59

Study build station data: LMS TV 2021-10-29

Proposal: KTRE D24 DT APP LUFKIN, TX  
File number: KTRE prop24 300kW  
Facility ID: 68541  
Station data: User record  
Record ID: 3951  
Country: U.S.  
Zone: III

Search options:

Baseline record excluded if station has CP

Stations potentially affected by proposal:

IX	Call	Chan	Svc	Status	City, State	File Number	Distance
No	KLPB-TV	D23	DT	LIC	LAFAYETTE, LA	BLEDT20130820AAH	269.4 km
No	KSLA	D23	DT	LIC	SHREVEPORT, LA	BLANK0000120697	161.7
No	KLTJ	D23	DT	LIC	GALVESTON, TX	BLEDT20110127ACD	216.4
No	KTXD-TV	D23	DT	LIC	GREENVILLE, TX	BLANK0000080284	242.3
No	KVTN-DT	D24	DT	LIC	PINE BLUFF, AR	BLCDT20071231AFB	430.9
No	WGMB-TV	D24	DT	LIC	BATON ROUGE, LA	BLANK0000113571	357.5
No	KFAM-CD	D24	DC	LIC	LAKE CHARLES, LA	BLANK0000063954	194.8
Yes	KNOE-TV	D24	DT	APP	MONROE, LA	BLANK0000158297	272.0
Yes	KXAS-TV	D24	DT	LIC	FORT WORTH, TX	BLANK0000054717	241.9
Yes	KETH-TV	D24	DT	LIC	HOUSTON, TX	BLEDT20101019ABX	216.4
No	KWEX-DT	D24	DT	LIC	SAN ANTONIO, TX	BLANK0000074958	408.9
No	KPXD-TV	D25	DT	LIC	ARLINGTON, TX	BLANK0000073172	242.6
No	KYAZ	D25	DT	LIC	KATY, TX	BLANK0000125086	217.3

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  
Latitude: 31 25 10.30 N (NAD83)  
Longitude: 94 48 4.00 W  
Height AMSL: 222.8 m  
HAAT: 139.6 m  
Peak ERP: 300 kW  
Antenna: Omnidirectional  
Elev Pattn: Generic  
Elec Tilt: 0.50

39.8 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	300 kW	146.9 m	73.6 km
45.0	300	149.5	73.8
90.0	300	146.4	73.6
135.0	300	121.6	71.4
180.0	300	134.0	72.5
225.0	300	148.8	73.8
270.0	300	138.6	72.9
315.0	300	130.7	72.2

Distance to Canadian border: 1559.8 km

Distance to Mexican border: 619.9 km

Conditions at FCC monitoring station: Kingsville TX  
Bearing: 214.8 degrees Distance: 533.3 km

Proposal is not within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:

**Table 1 KTRE TVStudy Analysis of Proposal**  
(page 2 of 3)



Bearing: 318.8 degrees Distance: 1346.6 km

Study cell size: 1.00 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%

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Interference to BLANK0000158297 APP scenario 1

Call	Chan	Svc	Status	City, State	File Number	Distance
Desired: KNOE-TV	D24	DT	APP	MONROE, LA	BLANK0000158297	
Undesireds: KTRE	D24	DT	APP	LUFKIN, TX	KTRE prop24 300kW	272.0 km
KSLA	D23	DT	LIC	SHREVEPORT, LA	BLANK0000120697	182.6
KVTN-DT	D24	DT	LIC	PINE BLUFF, AR	BLCDT20071231AFB	259.5
WGMB-TV	D24	DT	LIC	BATON ROUGE, LA	BLANK0000113571	221.2
KFAM-CD	D24	DC	LIC	LAKE CHARLES, LA	BLANK0000063954	249.3
WMDN	D24	DT	CP	MERIDIAN, MS	BLANK0000035927	317.9
WLPB-TV	D25	DT	CP	BATON ROUGE, LA	BLANK0000035855	218.8
Service area	Terrain-limited	IX-free, before	IX-free, after	Percent New IX		
46884.0	768,492	46742.0	766,649	44958.2	746,736	44861.4 745,772 0.22 0.13
Undesired	Total IX	Unique IX, before	Unique IX, after			
KTRE D24 DT APP	207.4	3,346	96.8	964		
KSLA D23 DT LIC	189.7	3,884	102.3	1,945		
KVTN-DT D24 DT LIC	263.1	1,544	231.0	1,378		
WGMB-TV D24 DT LIC	1334.0	14,589	1189.4	11,621		
KFAM-CD D24 DC LIC	3.0	47	0.0	0		
WMDN D24 DT CP	144.5	2,539	18.2	35		

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Interference to BLANK0000158297 APP scenario 2

Call	Chan	Svc	Status	City, State	File Number	Distance
Desired: KNOE-TV	D24	DT	APP	MONROE, LA	BLANK0000158297	
Undesireds: KTRE	D24	DT	APP	LUFKIN, TX	KTRE prop24 300kW	272.0 km
KSLA	D23	DT	LIC	SHREVEPORT, LA	BLANK0000120697	182.6
KVTN-DT	D24	DT	LIC	PINE BLUFF, AR	BLCDT20071231AFB	259.5
WGMB-TV	D24	DT	LIC	BATON ROUGE, LA	BLANK0000113571	221.2
KFAM-CD	D24	DC	LIC	LAKE CHARLES, LA	BLANK0000063954	249.3
WMDN	D24	DT	LIC	MERIDIAN, MS	BLCDT20090304ADW	317.9
WLPB-TV	D25	DT	CP	BATON ROUGE, LA	BLANK0000035855	218.8
Service area	Terrain-limited	IX-free, before	IX-free, after	Percent New IX		
46884.0	768,492	46742.0	766,649	44965.3	746,745	44868.5 745,781 0.22 0.13
Undesired	Total IX	Unique IX, before	Unique IX, after			
KTRE D24 DT APP	207.4	3,346	96.8	964		
KSLA D23 DT LIC	189.7	3,884	102.3	1,945		
KVTN-DT D24 DT LIC	263.1	1,544	231.0	1,378		
WGMB-TV D24 DT LIC	1334.0	14,589	1225.9	11,920		
KFAM-CD D24 DC LIC	3.0	47	0.0	0		
WMDN D24 DT LIC	101.0	2,231	11.1	26		

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Interference to BLANK0000054717 LIC scenario 1

Call	Chan	Svc	Status	City, State	File Number	Distance
Desired: KXAS-TV	D24	DT	LIC	FORT WORTH, TX	BLANK0000054717	
Undesireds: KTRE	D24	DT	APP	LUFKIN, TX	KTRE prop24 300kW	241.9 km
KTXD-TV	D23	DT	LIC	GREENVILLE, TX	BLANK0000080284	0.5
KOKH-TV	D24	DT	LIC	OKLAHOMA CITY, OK	BLANK0000121771	332.9
KETH-TV	D24	DT	LIC	HOUSTON, TX	BLEDT20101019ABX	362.6
KWEX-DT	D24	DT	LIC	SAN ANTONIO, TX	BLANK0000074958	388.1
K24HH-D	D24	DC	LIC	WICHITA FALLS, TX	BLDTL20101026ABY	207.0
KPXD-TV	D25	DT	LIC	ARLINGTON, TX	BLANK0000073172	0.7

**Table 1 KTRE TVStudy Analysis of Proposal**  
(page 3 of 3)



Service area	Terrain-limited	IX-free, before	IX-free, after	Percent New IX
42410.9 6,773,737	42024.7 6,770,405	41841.8 6,765,623	41770.4 6,765,167	0.17 0.01
Undesired	Total IX	Unique IX, before	Unique IX, after	
KTRE D24 DT APP	79.6 489		71.5 456	
KTXD-TV D23 DT LIC	59.0 2,660	49.0 2,242	49.0 2,242	
KOKH-TV D24 DT LIC	78.5 776	65.6 683	65.6 683	
KETH-TV D24 DT LIC	16.2 1,182	12.1 1,182	9.1 1,164	
KWEX-DT D24 DT LIC	17.2 28	13.1 28	11.1 13	
K24HH-D D24 DC LIC	22.9 184	9.9 91	9.9 91	
KPXD-TV D25 DT LIC	16.0 463	6.0 45	6.0 45	

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Interference to BLEDT20101019ABX LIC scenario 1

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	KTRE-TV	D24	DT	LIC	HOUSTON, TX	BLEDT20101019ABX	
Undesireds:	KTRE	D24	DT	APP	LUFKIN, TX	KTRE prop24 300kW	216.4 km
	KFAM-CD	D24	DC	LIC	LAKE CHARLES, LA	BLANK0000063954	223.9
	KXAS-TV	D24	DT	LIC	FORT WORTH, TX	BLANK0000054717	362.6
	KWEX-DT	D24	DT	LIC	SAN ANTONIO, TX	BLANK0000074958	268.7
	KYAZ	D25	DT	LIC	KATY, TX	BLANK0000125086	1.0

Service area	Terrain-limited	IX-free, before	IX-free, after	Percent New IX
43511.9 6,088,892	43429.9 6,088,621	43163.6 6,086,543	42720.3 6,079,767	1.03 0.11
Undesired	Total IX	Unique IX, before	Unique IX, after	
KTRE D24 DT APP	595.2 7,789		443.3 6,776	
KFAM-CD D24 DC LIC	1.0 0	1.0 0	0.0 0	
KXAS-TV D24 DT LIC	160.9 1,015	93.9 469	18.0 14	
KWEX-DT D24 DT LIC	137.3 863	70.3 317	58.3 251	
KYAZ D25 DT LIC	34.1 746	34.1 746	34.1 746	

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Interference to proposal scenario 1  
\*\*MX: 7.45% interference received

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	KTRE	D24	DT	APP	LUFKIN, TX	KTRE prop24 300kW	
Undesireds:	KSLA	D23	DT	LIC	SHREVEPORT, LA	BLANK0000120697	161.7 km
	WGMB-TV	D24	DT	LIC	BATON ROUGE, LA	BLANK0000113571	357.5
	KFAM-CD	D24	DC	LIC	LAKE CHARLES, LA	BLANK0000063954	194.8
	KNOE-TV	D24	DT	APP	MONROE, LA	BLANK0000158297	272.0
	KXAS-TV	D24	DT	LIC	FORT WORTH, TX	BLANK0000054717	241.9
	KETH-TV	D24	DT	LIC	HOUSTON, TX	BLEDT20101019ABX	216.4

Service area	Terrain-limited	IX-free	Percent IX
16744.0 250,137	16529.7 248,936	15088.4 230,386	8.72 7.45
Undesired	Total IX	Unique IX	Prcnt Unique IX
KSLA D23 DT LIC	2.0 74	0.0 0	0.00 0.00
WGMB-TV D24 DT LIC	1.0 0	0.0 0	0.00 0.00
KFAM-CD D24 DC LIC	14.2 195	0.0 0	0.00 0.00
KNOE-TV D24 DT APP	408.4 7,445	86.0 2,068	0.52 0.83
KXAS-TV D24 DT LIC	586.0 5,861	193.2 2,871	1.17 1.15
KETH-TV D24 DT LIC	1124.7 13,283	596.4 6,275	3.61 2.52