

ENGINEERING EXHIBIT

Request for Special Temporary Authorization prepared for

Gray Television Licensee, LLC
KTSH-CD Shreveport, LA
Facility ID 70420
Ch. 20 9.2 kW Directional

Gray Television Licensee, LLC (“Gray”), licensee of KTSH-CD (Channel 20, Facility ID 70420, Shreveport LA), requests Special Temporary Authority (“STA”) to operate with parameters at variance. KTSH-CD is licensed (file# 0000071739) to operate with 15 kW effective radiated power (“ERP”) with a directional antenna at 90.0 meters height above ground level (“AGL”). As due diligence following reports of poor reception, it has been determined that the actual KTSH-CD antenna height, directional pattern, and ERP are different from the licensed technical parameters. The license to cover KTSH-CD’s current operation was granted on April 24, 2019 and the KTSH-CD license was subsequently assigned to *Gray* in 2022.¹ *Gray* herein seeks to operate KTSH-CD with the as-built facility pending modifications to the KTSH-CD facility (several options are currently under consideration).

As specified in the KTSH-CD license, the KTSH-CD transmitting facility is located at the tower structure corresponding to FCC Antenna Structure Registration number 1013803. A recent inspection by tower climbers showed that the antenna height, model, and corresponding directional pattern do not match the licensed values. Further, due to lower gain provided by the as-built antenna, the ERP achieved is lower than the licensed value. The licensed and as-built facility data for KTSH-CD are listed below.

	<u>Lic file# 0000071739</u>	<u>Actual, As-Built</u>
Antenna model	Dielectric TLP-12M	Dielectric DLP-8B
Antenna C/R (m AGL)	90.0	93.9
ERP (kW)	15.0	9.2

¹ See LMS file# 0000192904 Notification of Consummation, submitted June 6, 2022.

The proposed STA therefore specifies a Dielectric model DLP-8B antenna at 93.9 meters height above ground level utilizing an ERP of 9.2 kW. A plot of the DLP-8B antenna's azimuthal pattern is supplied in Figure 1.

Customarily the 51 dB μ service contour of an STA operation should not extend beyond that of the licensed facility. For the case at hand, the proposed STA facility's 51 dB μ is generally contained within that of the licensed facility. A minor amount of contour extension will exist for the proposed STA operation as depicted on Figure 2.

The contour extension arises because the licensed directional pattern (TLP-12M) has a deeper minima than the as-built antenna (DLP-8B) as proposed for STA operation. The 51 dB μ contour extension area contains 8,233 persons, which is 2.2 percent of the total population (376,949 persons, 2010 census) within the licensed KTSH-CD facility's 51 dB μ contour. The maximum ERP to avoid a contour extension is 1.0 kW, which would result in a considerable reduction in KTSH-CD's service that has existed since 2019.

Interference study per OET Bulletin 69² shows that the proposed STA operation complies with the FCC's interference protection requirements toward all digital television, television translator, LPTV, and Class A stations. The results, summarized in Table 1, show that any new interference does not exceed the FCC's interference limits (0.5 percent to full power and Class A stations, and 2.0 percent to secondary stations) to any facility.

Regarding RF exposure, calculations per FCC OET Bulletin Number 65 (considering 25 percent antenna relative field in downward elevations) show that the signal density near the tower at two meters above ground level attributable to the proposed facility is 2.3 $\mu\text{W}/\text{cm}^2$, which is 0.7 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

²FCC 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.

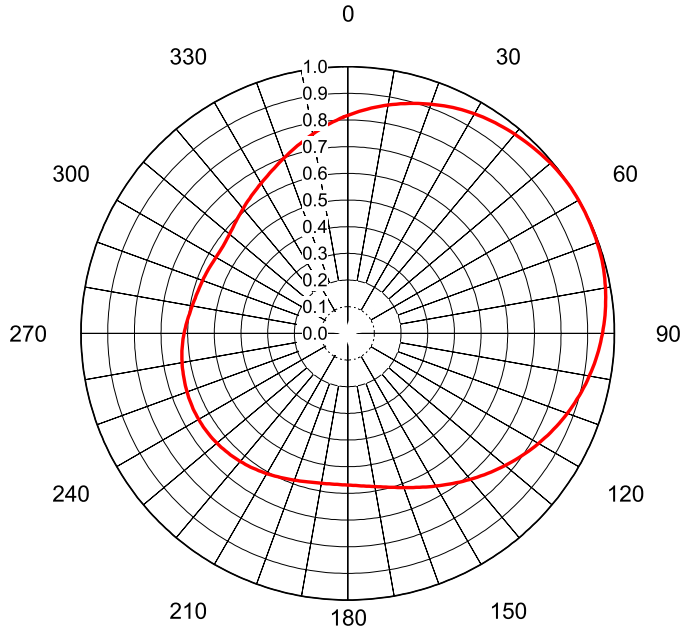
emitters, categorically excluding the applicant from responsibility for taking any corrective action in the areas where the proposal's contribution is less than five percent. The applicant will coordinate exposure procedures with all pertinent stations and will reduce power or cease operation as necessary to protect persons having access to the site, tower, or antenna from RF electromagnetic field exposure in excess of FCC guidelines.

List of Attachments

Figure 1	Antenna Azimuthal Pattern
Figure 2	Coverage Contour Comparison
Table 1	TVStudy Analysis of Proposal

Chesapeake RF Consultants, LLC

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



AZIMUTH PATTERN Horizontal Polarization

Proposal No. **20230920jmd**
 Date **20-Sep-23**
 Call Letters **KTSH-CD**
 Channel **20**
 Frequency **509 MHz**
 Antenna Type **DLP-8B**
 Gain **1.76 (2.45dB)**
 Calculated

Pattern Number **TLP-B-20 Hpol**

Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	0.817	36	0.966	72	0.994	108	0.886	144	0.692	180	0.569	216	0.619	252	0.640	288	0.581
1	0.823	37	0.968	73	0.993	109	0.881	145	0.687	181	0.568	217	0.621	253	0.639	289	0.580
2	0.828	38	0.971	74	0.992	110	0.876	146	0.682	182	0.568	218	0.623	254	0.638	290	0.579
3	0.834	39	0.973	75	0.990	111	0.872	147	0.676	183	0.568	219	0.625	255	0.637	291	0.578
4	0.839	40	0.975	76	0.989	112	0.867	148	0.671	184	0.568	220	0.627	256	0.636	292	0.577
5	0.844	41	0.977	77	0.987	113	0.862	149	0.666	185	0.568	221	0.628	257	0.634	293	0.576
6	0.849	42	0.979	78	0.985	114	0.857	150	0.661	186	0.568	222	0.630	258	0.633	294	0.575
7	0.854	43	0.980	79	0.983	115	0.852	151	0.656	187	0.569	223	0.632	259	0.632	295	0.574
8	0.859	44	0.982	80	0.981	116	0.847	152	0.651	188	0.569	224	0.633	260	0.631	296	0.573
9	0.864	45	0.984	81	0.979	117	0.842	153	0.646	189	0.570	225	0.634	261	0.629	297	0.572
10	0.869	46	0.986	82	0.977	118	0.836	154	0.641	190	0.571	226	0.636	262	0.628	298	0.572
11	0.874	47	0.988	83	0.975	119	0.831	155	0.637	191	0.572	227	0.637	263	0.626	299	0.571
12	0.879	48	0.990	84	0.972	120	0.826	156	0.632	192	0.573	228	0.638	264	0.625	300	0.570
13	0.883	49	0.991	85	0.970	121	0.820	157	0.628	193	0.574	229	0.639	265	0.623	301	0.570
14	0.888	50	0.993	86	0.967	122	0.815	158	0.624	194	0.575	230	0.640	266	0.621	302	0.570
15	0.893	51	0.994	87	0.964	123	0.810	159	0.619	195	0.577	231	0.641	267	0.619	303	0.570
16	0.897	52	0.995	88	0.961	124	0.804	160	0.615	196	0.578	232	0.642	268	0.618	304	0.570
17	0.902	53	0.996	89	0.958	125	0.799	161	0.612	197	0.580	233	0.643	269	0.616	305	0.571
18	0.906	54	0.997	90	0.955	126	0.793	162	0.608	198	0.582	234	0.643	270	0.613	306	0.572
19	0.910	55	0.998	91	0.952	127	0.787	163	0.604	199	0.584	235	0.644	271	0.611	307	0.573
20	0.914	56	0.999	92	0.949	128	0.782	164	0.601	200	0.586	236	0.644	272	0.609	308	0.575
21	0.919	57	0.999	93	0.946	129	0.776	165	0.597	201	0.588	237	0.645	273	0.607	309	0.577
22	0.923	58	0.999	94	0.942	130	0.771	166	0.594	202	0.590	238	0.645	274	0.605	310	0.579
23	0.927	59	1.000	95	0.939	131	0.765	167	0.591	203	0.592	239	0.645	275	0.602	311	0.581
24	0.930	60	1.000	96	0.935	132	0.759	168	0.589	204	0.594	240	0.645	276	0.600	312	0.584
25	0.934	61	1.000	97	0.932	133	0.754	169	0.586	205	0.596	241	0.645	277	0.598	313	0.587
26	0.938	62	0.999	98	0.928	134	0.748	170	0.583	206	0.598	242	0.645	278	0.596	314	0.590
27	0.941	63	0.999	99	0.924	135	0.742	171	0.581	207	0.600	243	0.645	279	0.594	315	0.593
28	0.944	64	0.999	100	0.920	136	0.737	172	0.579	208	0.603	244	0.645	280	0.592	316	0.596
29	0.948	65	0.998	101	0.916	137	0.731	173	0.577	209	0.605	245	0.644	281	0.590	317	0.600
30	0.951	66	0.998	102	0.912	138	0.726	174	0.575	210	0.607	246	0.644	282	0.589	318	0.603
31	0.954	67	0.998	103	0.908	139	0.720	175	0.574	211	0.609	247	0.643	283	0.587	319	0.607
32	0.956	68	0.997	104	0.904	140	0.714	176	0.573	212	0.611	248	0.643	284	0.586	320	0.610
33	0.959	69	0.996	105	0.899	141	0.709	177	0.571	213	0.614	249	0.642	285	0.584	321	0.614
34	0.962	70	0.996	106	0.895	142	0.703	178	0.570	214	0.616	250	0.641	286	0.583	322	0.618
35	0.964	71	0.995	107	0.890	143	0.698	179	0.569	215	0.618	251	0.640	287	0.582	323	0.622



Figure 1
STA Antenna Azimuthal Pattern
KTSH-CD Shreveport, LA
Facility ID 70420
Ch. 20 9.2 kW Directional

prepared for
Gray Television Licensee, LLC

September, 2023



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

Figure 2
STA Coverage Contour Comparison
KTSH-CD Shreveport, LA
Facility ID 70420

Ch. 20 9.2 kW Directional

prepared for
Gray Television Licensee, LLC

September, 2023

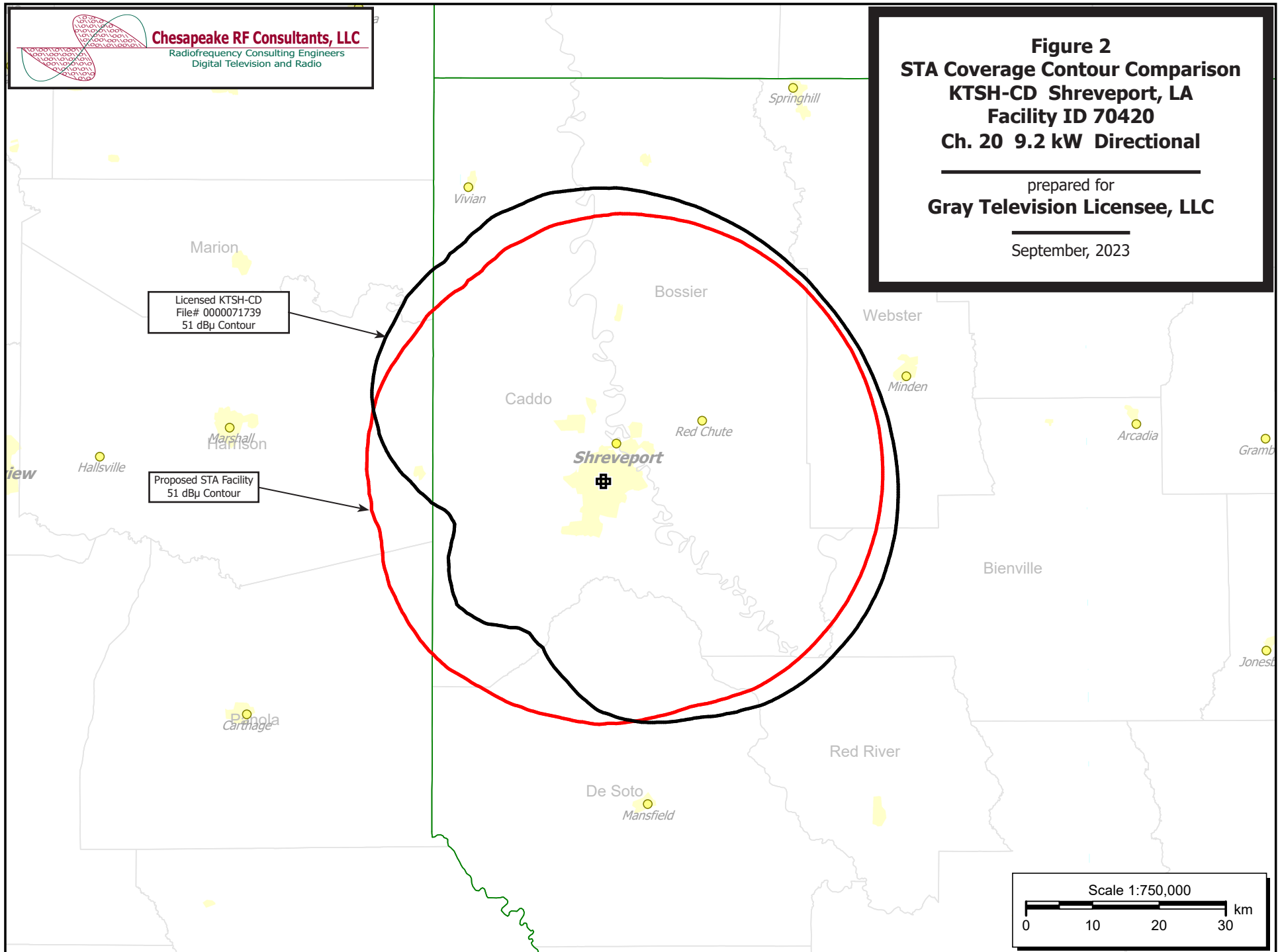


Table 1 KTSH-CD STA TVStudy Analysis of Proposal (page 1 of 3)



tvstudy v2.2.5 (4uoc83)
Database: localhost, Study: KTSH-CD as-built_STA, Model: Longley-Rice
Start: 2023.09.20 16:25:21

Study created: 2023.09.20 16:25:21

Study build station data: LMS TV 2023-09-19

Proposal: KTSH-CD D20 DC APP SHREVEPORT, LA
File number: KTSH-CD as-built_STA
Facility ID: 70420
Station data: User record
Record ID: 121
Country: U.S.

Build options:
Protect LPTV records from Class A

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	KTEV-LD	D19+	LD	LIC	TEXARKANA, AR	BLANK0000212846	107.3 km
No	KTEV-LD	N19+	TX	LIC	TEXARKANA, AR	BLTTL20061211AAB	111.8
No	DDKNTS-LP	D19	LD	APP	NATCHITOCHES, LA	BLDTL20120614AAB	101.3
No	KARD	D19	DT	LIC	WEST MONROE, LA	BLANK0000063972	155.6
No	K200C-D	D20	LD	LIC	EL DORADO, AR	BLANK0000084798	131.9
No	K200L-D	D20	LD	LIC	FORT SMITH, AR	BLANK0000217458	335.1
No	KTEJ	D20	DT	LIC	JONESBORO, AR	BLEDT20110818AAQ	470.5
No	KLRA-CD	D20	DC	LIC	LITTLE ROCK, AR	BLANK0000004217	284.1
No	KZUP-CD	D20	DC	LIC	BATON ROUGE, LA	BLDTA20100308ABT	336.0
No	KLTL-TV	D20	DT	LIC	LAKE CHARLES, LA	BLEDT20100216ABR	242.2
No	W20DW-D	D20	LD	LIC	CLARKSDALE, MS	BLANK0000199038	371.8
No	WMPN-TV	D20	DT	LIC	JACKSON, MS	BLEDT20080807AAP	317.5
No	K200H-D	D20	LD	CP	ARDMORE, OK	BLANK0000168880	340.9
No	K200H-D	D20	LD	LIC	ARDMORE, OK	BLANK0000164559	340.9
No	K20MH-D	D20	LD	LIC	DUNCAN, OK	BLANK0000072559	423.3
No	KQCW-DT	D20	DT	CP	MUSKOGEE, OK	BLANK0000211781	431.4
No	KQCW-DT	D20	DT	LIC	MUSKOGEE, OK	BMLCDT20130823ACR	409.7
No	K200M-D	D20	LD	CP	BEAUMONT, TX	BLANK0000171574	278.0
No	K200M-D	D20	LD	LIC	BEAUMONT, TX	BLANK0000152190	261.2
No	K20KJ-D	D20	LD	LIC	BRYAN, TX	BLANK0000212762	313.2
No	K20PC-D	D20	LD	LIC	CENTERVILLE, TX	BLANK0000164606	228.0
No	K20PC-D	D20	LD	CP	CENTERVILLE, TX	BLANK0000216862	228.0
No	KZCZ-LD	D20	LD	LIC	COLLEGE STATION, TX	BLANK0000078195	353.4
No	KBOP-LD	D20	LD	LIC	DALLAS-FT WORTH, TX	BLDTL20110120ACW	299.9
Yes	KFXK-TV	D20	DT	LIC	LONGVIEW, TX	BLANK0000071623	113.3
No	KUVM-CD	D20	DC	LIC	MISSOURI CITY, TX	BLANK0000071589	363.5
No	KCIB-LD	D21	LD	LIC	EL DORADO, AR	BLDTL20120423AAH	131.4
No	DK02QB	D21	LD	APP	ALEXANDRIA, LA	BDISDTL20090824AGJ	184.7
Yes	KVPO-LD	D21-	LD	LIC	SHREVEPORT, LA	BLANK0000160538	31.2
No	KVPO-LD	D21	LD	CP	SHREVEPORT, LA	BLANK0000198683	14.6
No	K21PE-D	D21	LD	LIC	TYLER, TX	BLANK0000212512	136.1

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied:

Channel: D20
Mask: Full Service
Latitude: 32 28 25.20 N (NAD83)
Longitude: 93 46 13.70 W
Height AMSL: 167.4 m
HAAT: 0.0 m
Peak ERP: 9.20 kW
Antenna: Dielectric-DLP-8B (ID 1010939) 60.0 deg
Elev Pattn: Generic
Elec Tilt: 1.00

Table 1 KTSH-CD STA TVStudy Analysis of Proposal
(page 2 of 3)



49.4 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	6.14 kW	114.5 m	41.6 km
45.0	8.91	114.5	43.5
90.0	8.39	119.0	43.6
135.0	5.07	118.8	41.0
180.0	2.98	116.2	38.1
225.0	3.69	104.6	38.2
270.0	3.46	97.5	37.0
315.0	3.25	109.7	38.0

Database HAAT does not agree with computed HAAT

Database HAAT: 0 m Computed HAAT: 112 m

Distance to Canadian border: 1407.6 km

Distance to Mexican border: 758.2 km

Conditions at FCC monitoring station: Kingsville TX

Bearing: 216.4 degrees Distance: 685.2 km

Proposal is not within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:

Bearing: 312.9 degrees Distance: 1330.3 km

No land mobile station failures found

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%

Interference to BLANK0000071623 LIC scenario 1

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	KFXK-TV	D20	DT	LIC	LONGVIEW, TX	BLANK0000071623	
Undesireds:	KTSH-CD	D20	DC	BL	SHREVEPORT, LA	DTVBL70420	116.2 km
	KTSH-CD	D20	DC	APP	SHREVEPORT, LA	KTSH-CD as-built_STA	113.3
	KTVT	D19	DT	LIC	FORT WORTH, TX	BLANK0000203476	191.1
	KLTL-TV	D20	DT	LIC	LAKE CHARLES, LA	BLEDT20100216ABR	277.8
	KUVM-CD	D20	DC	LIC	MISSOURI CITY, TX	BLANK0000071589	304.5
	KDTX-TV	D21	DT	LIC	DALLAS, TX	BLANK0000075181	193.0

	Service area	Terrain-limited		IX-free, before		IX-free, after	Percent New IX
	30508.7	934,488	30239.3	932,179	29905.9	923,243	29474.2 919,519 1.44 0.40
Undesired				Total IX	Unique IX, before	Unique IX, after	
KTSH-CD D20 DC BL				7.0 33	6.0 13		
KTSH-CD D20 DC APP				446.8 3,796		437.7 3,737	
KTVT D19 DT LIC				231.1 5,726	88.5 3,318	87.5 3,314	
KLTL-TV D20 DT LIC				88.3 3,098	86.2 3,078	82.2 3,043	
KUVM-CD D20 DC LIC				1.0 0	0.0 0	0.0 0	
KDTX-TV D21 DT LIC				150.6 2,507	8.0 99	8.0 99	

Interference to BLANK0000071623 LIC scenario 2

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	KFXK-TV	D20	DT	LIC	LONGVIEW, TX	BLANK0000071623	
Undesireds:	KTSH-CD	D20	DC	BL	SHREVEPORT, LA	DTVBL70420	116.2 km
	KTSH-CD	D20	DC	APP	SHREVEPORT, LA	KTSH-CD as-built_STA	113.3
	KTVT	D19	DT	LIC	FORT WORTH, TX	BLANK0000203476	191.1
	KLTL-TV	D20	DT	LIC	LAKE CHARLES, LA	BLEDT20100216ABR	277.8
	KQCW-DT	D20	DT	LIC	MUSKOGEE, OK	BMLCDT20130823ACR	396.0
	KUVM-CD	D20	DC	LIC	MISSOURI CITY, TX	BLANK0000071589	304.5
	KDTX-TV	D21	DT	LIC	DALLAS, TX	BLANK0000075181	193.0

Table 1 KTSH-CD STA TVStudy Analysis of Proposal
(page 3 of 3)



Service area	Terrain-limited	IX-free, before	IX-free, after	Percent New IX
30508.7 934,488	30239.3 932,179	29904.9 923,243	29473.2 919,519	1.44 0.40
Undesired	Total IX	Unique IX, before	Unique IX, after	
KTSH-CD D20 DC BL	7.0 33	6.0 13		
KTSH-CD D20 DC APP	446.8 3,796		437.7 3,737	
KTVT D19 DT LIC	231.1 5,726	88.5 3,318	87.5 3,314	
KLTL-TV D20 DT LIC	88.3 3,098	86.2 3,078	82.2 3,043	
KQCW-DT D20 DT LIC	1.0 0	1.0 0	1.0 0	
KUVM-CD D20 DC LIC	1.0 0	0.0 0	0.0 0	
KDTX-TV D21 DT LIC	150.6 2,507	8.0 99	8.0 99	

Interference to BLANK0000160538 LIC scenario 1

Desired:	Call KVPO-LD	Chan D21-	Svc LD	Status LIC	City, State SHREVEPORT, LA	File Number BLANK0000160538	Distance
Undesireds:	KTSH-CD	D20	DC	BL	SHREVEPORT, LA	DTVBL70420	26.3 km
	KTSH-CD	D20	DC	APP	SHREVEPORT, LA	KTSH-CD as-built_STA	31.2
	Service area			Terrain-limited	IX-free, before	IX-free, after	Percent New IX
	813.9 104,410			813.9 104,410	812.9 104,195	813.9 104,410	-0.12 -0.21
Undesired				Total IX	Unique IX, before	Unique IX, after	
KTSH-CD D20 DC BL			1.0	215	1.0 215		
KTSH-CD D20 DC APP			0.0	0		0.0 0	

Interference to proposal scenario 1
0.52% interference received

Call	Chan	Svc	Status	City, State	File Number	Distance
Desired: KTSH-CD	D20	DC	APP	SHREVEPORT, LA	KTSH-CD as-built_STA	
Undesireds: KLTL-TV	D20	DT	LIC	LAKE CHARLES, LA	BLEDT20100216ABR	242.2 km
KFXK-TV	D20	DT	LIC	LONGVIEW, TX	BLANK0000071623	113.3
Service area	Terrain-limited	IX-free	Percent IX			
5078.1 385,711	5076.1 385,697	4841.9 383,696	4.61 0.52			
Undesired	Total IX	Unique IX	Prct Unique IX			
KLTL-TV D20 DT LIC	1.0 0	1.0 0	0.02 0.00			
KFXK-TV D20 DT LIC	233.1 2,001	233.1 2,001	4.59 0.52			