

Engineering Statement

prepared for

Gray Television Licensee, LLC

KCBD(DT) Lubbock, TX

Facility ID 27507

Ch. 36 1000 kW 282 m

This engineering statement has been prepared on behalf of *Gray Television Licensee, LLC* (“*Gray*”), licensee of KCBD (Facility ID 27507, Lubbock TX) in support of a *Petition for Rulemaking* to amend §73.622(i)¹ by changing KCBD’s digital television channel assignment. KCBD is licensed to operate on Channel 11 (File# 0000010766). As described herein, *Gray* requests substitution of Channel 36 in lieu of Channel 11 for KCBD.

The KCBD Channel 11 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 36 would place KCBD 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 KCBD’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 KCBD 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.

¹The post-incentive auction transition period ended on July 13, 2020, pursuant to the *Incentive Auction Closing and Channel Reassignment Public Notice* (DA 17-317, released April 13, 2017). The FCC’s rules have not yet been amended to reflect all new full power channel assignments in a revised Table of Allotments. Because the Table has not yet been amended, it is understood that FCC’s Media Bureau will continue to refer to the Post-Transition Table of DTV Allotments, 47 CFR § 73.622(i) (2018), for the purpose of post-auction channel change rulemaking proceedings.

The proposed KCBD Channel 36 facility will utilize a different transmitting location which is 5.5 km distant from the licensed KCBD Channel 11 site. The proposed Channel 36 operation will employ the existing UHF broadband directional antenna that is top-mounted on the tower structure associated with FCC Antenna Structure Registration number 1248244. *Gray* owns the broadband antenna, which is currently shared by KJTV (Ch. 35, Fac ID 55031, Lubbock TX) and *Gray's* station KLCW-TV (Ch. 23, Fac ID 77719, Wolfforth TX). No change to the overall structure height will result.

The licensed KCBD Channel 11 facility operates with 41 kW effective radiated power (“ERP”) nondirectional at 234 meters antenna height above average terrain (“HAAT”). *Gray* proposes herein to utilize 1000 kW ERP directional on Channel 36 at 282 meters antenna HAAT.

A summary of the licensed Channel 11 and proposed Channel 36 technical parameters is provided in the following.

Licensed Channel 11 Parameters (file# 0000010766)

FacID	Call	Ch	City	St	Lat	Lon	RCAMSL	HAAT	ERP	DA
27507	KCBD	11	LUBBOCK	TX	333229.9	1015013.6	1208.2	234	41	ND

Proposed Channel 36 Parameters

FacID	Call	Ch	City	St	Lat	Lon	RCAMSL	HAAT	ERP	DA
27507	KCBD	36	LUBBOCK	TX	333008.3	1015221.3	1263.7	282.1	1000	DA

The proposed directional antenna azimuthal pattern is plotted in Figure 1. A map is supplied as Figure 2, which depicts the standard predicted coverage contours. As demonstrated thereon, the proposed facility complies with §73.625(a)(1) as the entire community of Lubbock will be encompassed by the 48 dB μ contour.

Interference study per FCC OET Bulletin 69² shows that the proposal complies with the 0.5 percent limit of new interference caused to pertinent nearby full service and Class A television

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, 2 km cell size, and 1 km terrain increment.

stations and reassignments as required by §73.616. The interference study output report is provided as Table 1. No predicted interference is caused to any other relevant facility.

Figure 3 shows that the proposed Channel 36 noise limited service contour (“NLSC”) will fall short of matching that of the licensed Channel 11 facility. The proposed Channel 36 facility will operate at 1000 kW ERP, the maximum permissible power for a UHF digital television station, and at an antenna HAAT that is increased by 48.1 meters beyond that of the licensed facility. The existing top-mounted UHF broadband antenna is directional, having a wide cardioid pattern oriented to the west. However, even a theoretical operation with a nondirectional pattern at 1000 kW ERP would also result in an NLSC that insufficiently matches that of the licensed Channel 11 KCBD.

The proposed KCBD Channel 36 NLSC loss areas are depicted in Figure 3 along with the NLSC of overlapping alternative authorized television services. The stations providing the alternative services are listed in Table 2. The areas on Figure 3 that are tinted yellow, nearly all of the loss area, represent locations where there are less than 5 other TV services remaining in the loss area. A summary of the number of alternative services for the loss area is provided on the map and in the following table.

Loss Area Analysis – Standard FCC Contours

KCBD Population Within NLSC	(2010 census)
Licensed Ch. 11 Total:	414,829
Proposed Ch. 36 Total:	406,628
Gain Area Population:	0
Loss Area Population:	8,201
Common Area Population:	406,628
Number of Other Services	<u>Loss Pop</u>
0	2,929
1	1,814
2	432
3	2,707
4	276
5 or more	43
Total Change	8,201
Total less than 5 services	8,158
Total less than 5 (percentage)	1.97%

Comparisons of various results of this computer program (run on a Mac processor) to the FCCs implementation of TVStudy show excellent correlation.

The licensed Channel 11 facility’s NLSC encompasses 414,829 persons and the proposed Channel 36 facility’s NLSC would encompass 406,628 persons. The resulting NLSC loss population is 8,201 persons, of which 8,158 persons would have less than five other services representing 1.97 percent of the total population within the licensed KCBD Channel 11 NLSC.

The results of additional loss area analysis are provided in Figure 4, now to consider terrain-limited coverage predictions of the licensed Channel 11 facility and the proposed Channel 36 operation. Here, the FCC’s TVStudy computer program was used to determine terrain-limited coverage predictions at locations beyond the proposed Channel 36 NLSC. The study area was set using the “fixed geography” option to match the KCBD licensed Channel 11 NLSC. Default cell size and profile step settings were employed. The analysis included examination of each cell that is located beyond the Channel 36 NLSC and beyond the NLSC of at least five other stations (the same, yellow-tinted area as Figure 3) as bounded by the existing Channel 11 facility’s NLSC. Cells in this region were counted as lost service if they are predicted to have terrain-limited service from the licensed Channel 11 facility and not from the proposed Channel 36. The results regarding the number of alternative services for the loss area is provided on Figure 4 and in the following table.

Loss Area Analysis – Terrain-Limited

KCBD Terrain-Limited Population TVStudy at Fixed Geography Area	(2010 census)
Licensed Ch. 11 Total	414,091
Number of Other Services	<u>Loss Pop</u>
0	326
1	5
2	18
3	1
4	0
5 or more	0
Total Loss	350
Total less than 5 services	350
Total less than 5 (percentage)	0.08%

This analysis shows that nearly all of the terrain-limited service population achieved by the licensed KCBD within its NLSC will receive terrain-limited service from the proposed Channel 36. Here, the count of other services where terrain-limited service is lost provides the number of other stations that provide NLSC coverage to each cell. The determination of terrain-

limited service loss considers each cell that is located within the existing Channel 11 facility's NLSC, beyond the Channel 36 NLSC, and beyond the NLSC of at least five other stations (the yellow tinted area on Figure 4). This analysis shows that the terrain-limited loss population is only 350 persons, all having less than five other services and representing 0.08 percent of the total terrain-limited population within the licensed KCBD Channel 11 NLSC. The FCC has previously found that population loss of less than 500 persons is *de minimis*,³ and the predicted population loss in this case is only 350 persons who would not otherwise be well-served.

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 population that is predicted to lose service is considered as *de minimis*.

List of Attachments

Figure 1	Antenna Azimuthal Pattern
Figure 2	Proposed Coverage Contours
Figure 3	Coverage Contour Comparison; Loss Area Analysis – Standard FCC Contours
Figure 4	Loss Area Analysis – Terrain-Limited Method
Table 1	TVStudy Analysis of Proposal
Table 2	Overlapping Authorized Alternate Television Services

Chesapeake RF Consultants, LLC

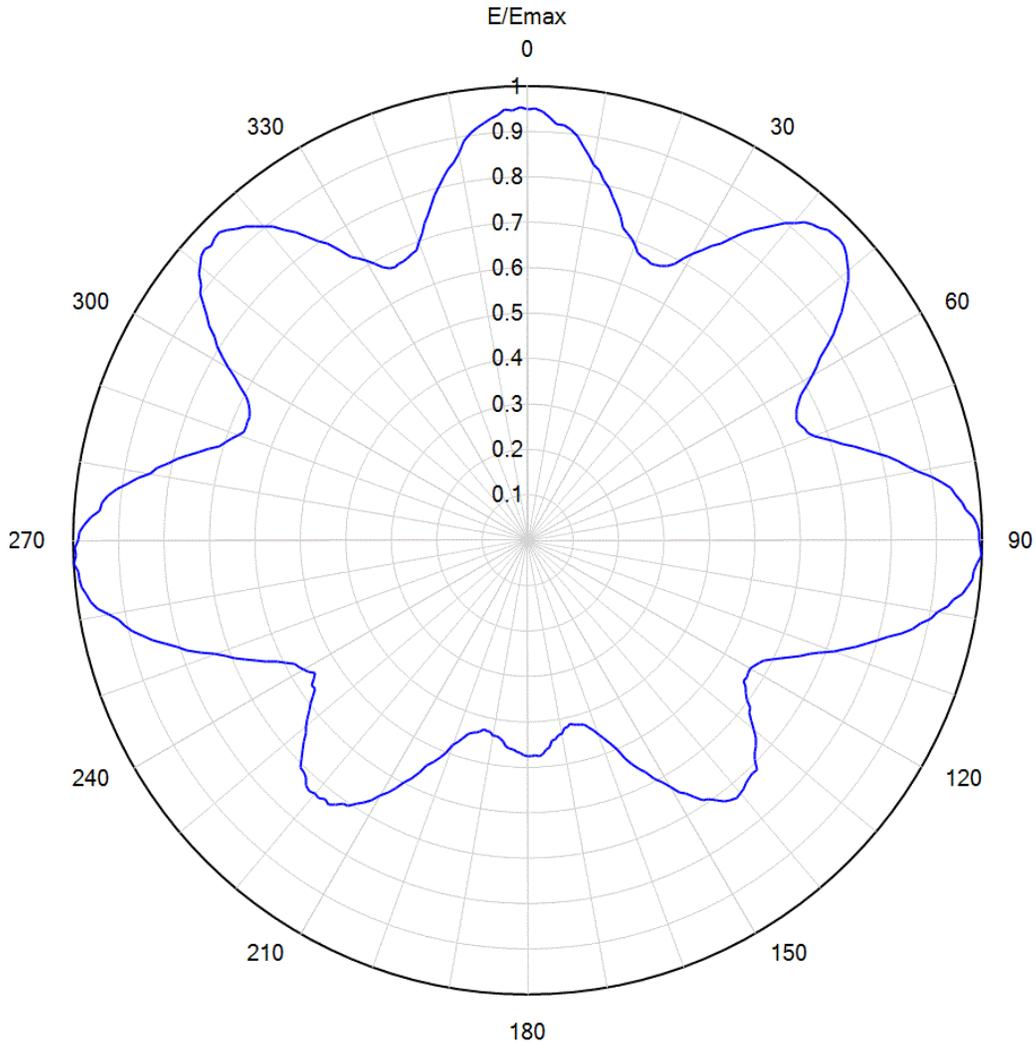
Joseph M. Davis, P.E. February 8, 2021
207 Old Dominion Road Yorktown, VA 23692 703-650-9600

³See *WSET, Inc.*, 80 FCC 2d 233, 246 (1980).



Rotate Pattern
270 Degrees

Horizontal Radiation Pattern



Model: PPHR64U3313
Location:
Customer:
Date: January 29, 2021

Polarisation: Horizontal
Frequency: 605.00 MHz
Directivity: 1.8 (2.47 dB)
Elevation Angle: 0.70 degrees



Figure 1
Antenna Azimuthal Pattern
KCBD(DT) Lubbock, TX
Facility ID 27507
Ch. 36 1000 kW 282 m

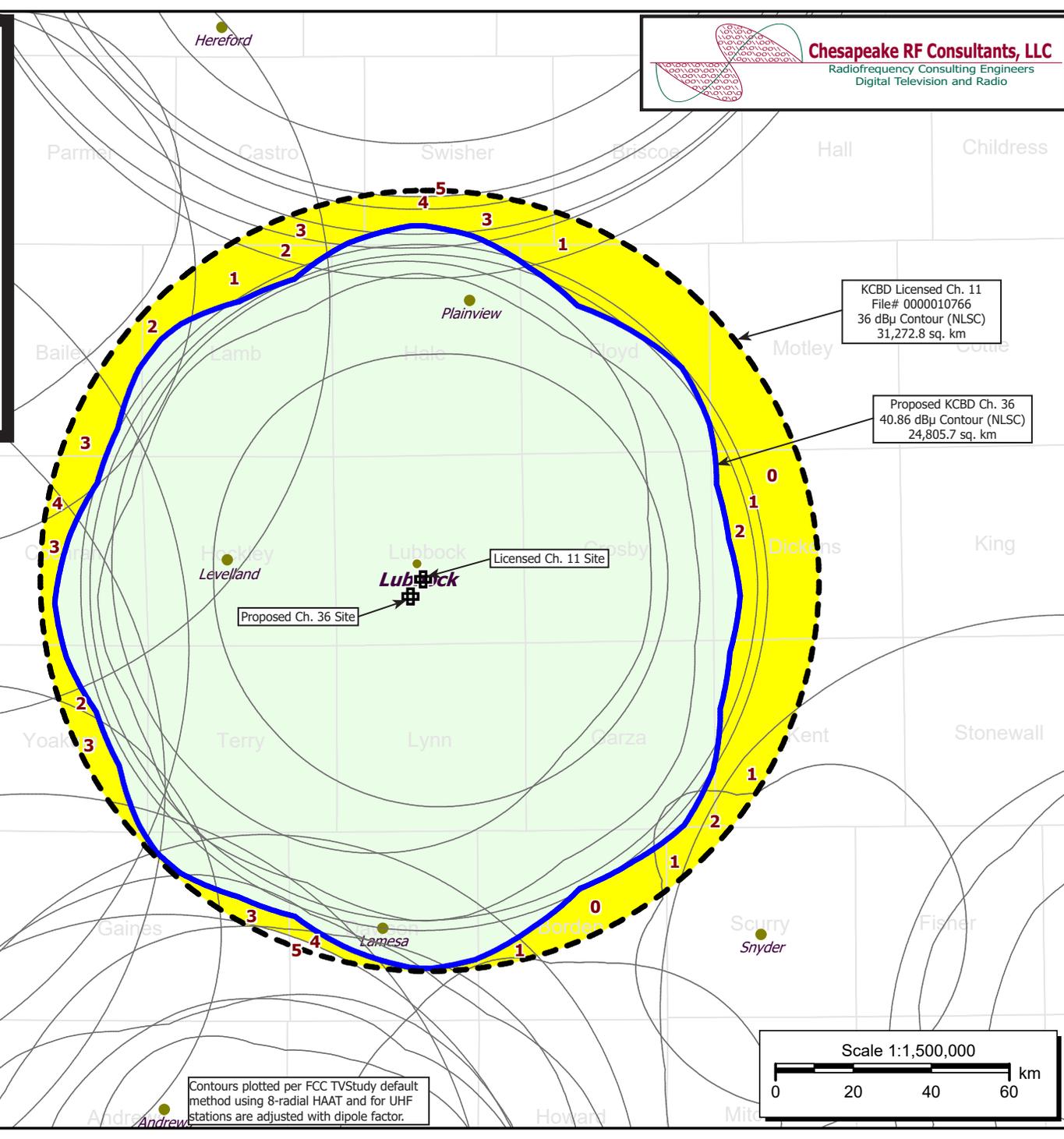
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February, 2021

Figure 3
Coverage Contour Comparison
Gain-Loss Area Analysis
Standard FCC Contours
Alternate TV Services
KCBD(DT) Lubbock, TX
Facility ID 27507
Ch. 36 1000 kW 282 m

prepared for
Gray Television Licensee, LLC

February, 2021



KCBD Licensed Ch. 11
 File# 0000010766
 36 dBu Contour (NLSC)
 31,272.8 sq. km

Proposed KCBD Ch. 36
 40.86 dBu Contour (NLSC)
 24,805.7 sq. km

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

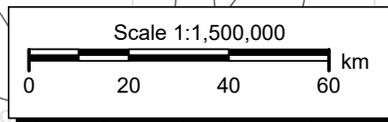
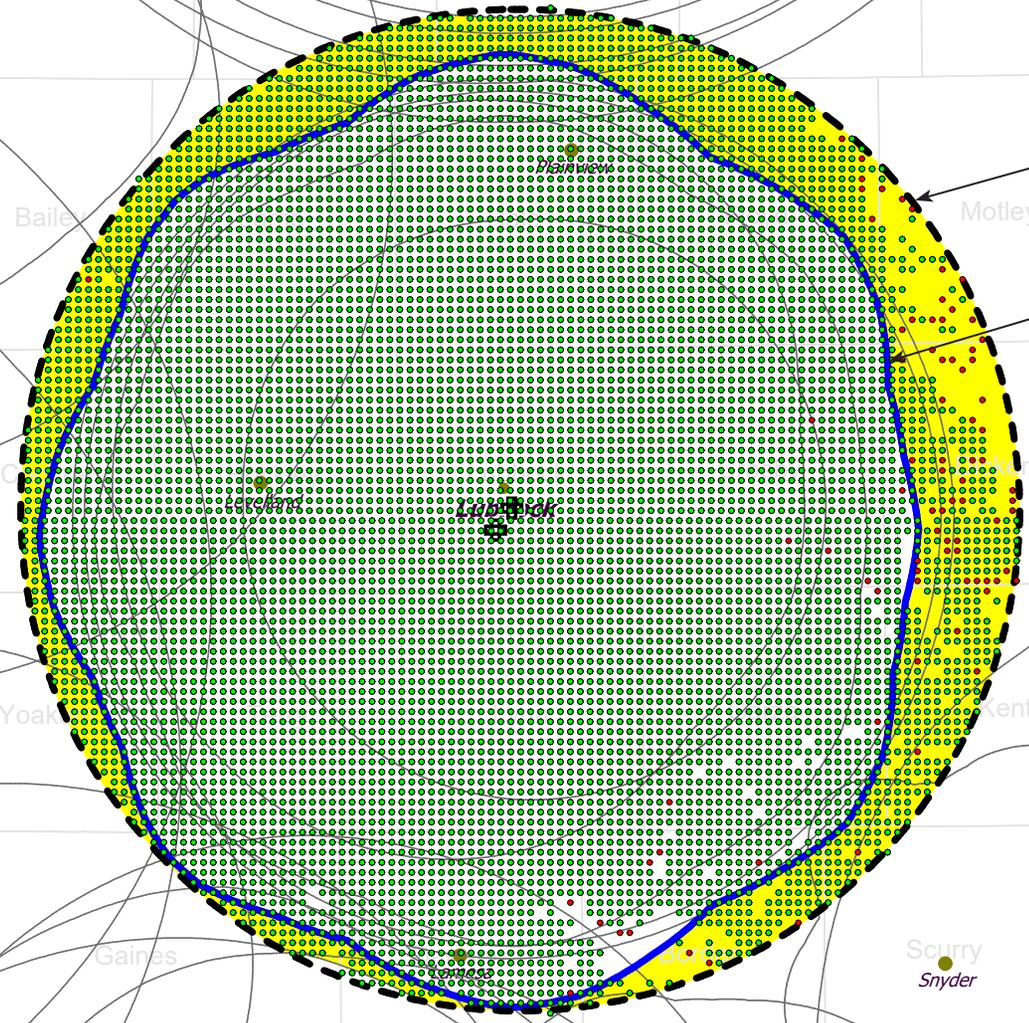


Figure 4
Loss Area Analysis
Terrain-Limited Method
KCBD(DT) Lubbock, TX
Facility ID 27507
Ch. 36 1000 kW 282 m

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FCC "TVStudy" Analysis (default settings)
 Terrain-Limited Results

● No Loss	Cells Having Terrain-Limited Service From Licensed Ch. 11 Terrain-Limited Service Is Provided for Proposed Ch. 23
● Loss	Cells Having Terrain-Limited Service From Licensed Ch. 11 Terrain-Limited Service Is Lost for Proposed Ch. 23

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

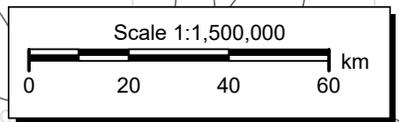


Table 1 KCBD TVStudy Analysis of Proposal
(page 1 of 2)



tvstudy v2.2.5 (4uoc83)
Database: localhost, Study: KCBD 36prop, Model: Longley-Rice
Start: 2021.02.05 10:45:33

Study created: 2021.02.05 10:45:33

Study build station data: LMS TV 2021-02-05

Proposal: KCBD D36 DT APP Lubbock, TX
File number: KCBD 36prop
Facility ID: 27507
Station data: User record
Record ID: 3465
Country: U.S.
Zone: II

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	KJTV-TV	D35	DT	LIC	LUBBOCK, TX	BLANK0000074582	0.0 km
No	KASY-TV	D36	DT	LIC	ALBUQUERQUE, NM	BLANK0000074897	461.1
No	KASY-TV	D36	DT	APP	ALBUQUERQUE, NM	BLANK0000134573	461.1
No	KXTX-TV	D36	DT	LIC	DALLAS, TX	BLANK0000074968	468.1

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied:

Channel: D36
Latitude: 33 30 8.30 N (NAD83)
Longitude: 101 52 21.30 W
Height AMSL: 1263.7 m
HAAT: 282.1 m
Peak ERP: 1000 kW
Antenna: RFS PHPR64U3313 Ch36 0.0 deg
Elev Pattn: Generic
Elec Tilt: 0.70

40.9 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	990 kW	282.3 m	94.7 km
45.0	475	295.1	89.5
90.0	228	300.8	84.2
135.0	464	298.4	89.8
180.0	976	283.8	94.8
225.0	924	268.6	91.9
270.0	899	261.9	90.4
315.0	895	265.8	91.1

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

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%

Table 1 KCBD TVStudy Analysis of Proposal
 (page 2 of 2)



 Interference to proposal scenario 1

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	KCBD	D36	DT	APP	Lubbock, TX	KCBD 36prop	

	Service area	Terrain-limited	IX-free	Percent IX										
24612.4	406,239	24388.2	406,216	24388.2				406,216	0.00					0.00
			406,216	0.00					0.00					
				0.00										

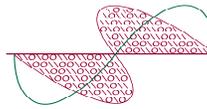


Table 2

Overlapping Authorized Alternate Television Services

prepared for

Gray Television Licensee, LLC

KCBD Lubbock, TX

Call Sign	Ch.	Facility ID	Status	File Number	Community
KOSA-TV	7	6865	CP	0000036068	Odessa, TX
KVII-TV	7	40446	CP	0000035799	Amarillo, TX
KOBR	8	62272	Lic	BLCDT-20090619AAX	Roswell, NM
KACV-TV	9	1236	Lic	BLEDT-20111222AXJ	Amarillo, TX
KWES-TV	9	42007	Lic	BLCDT-20121210ACW	Odessa, TX
KBIM-TV	10	48556	Lic	0000067866	Roswell, NM
KFDA-TV	10	51466	Lic	BLCDT-20111114BLB	Amarillo, TX
KVIH-TV	12	40450	Lic	0000035800	Clovis, NM
KCIT	15	33722	Lic	4834	Amarillo, TX
KMLM-DT	15	53541	Lic	0000064406	Odessa, TX
KXVA	15	62293	Lic	BLCDT-20110520ADO	Abilene, TX
KPTB-DT	16	53544	Lic	BLCDT-20090210AFA	Lubbock, TX
KSAN-TV	16	307	Lic	0000004868	San Angelo, TX
KPCB-DT	17	77452	Lic	BLCDT-20090210AFB	Snyder, TX
KPTF-DT	18	81445	Lic	BLCDT-20090612AEB	Farwell, TX
KUPB	18	86263	Lic	BLCDT-20090615ABW	Midland, TX
KAMR-TV	19	8523	Lic	BLCDT-20080519ACZ	Amarillo, TX
KIDY	19	58560	Lic	BLCDT-20110520ADN	San Angelo, TX
KTXS-TV	20	308	CP	0000035779	Sweetwater, TX
KRWB-TV	21	84157	Lic	BLCDT-20090619ABH	Roswell, NM
KLCW-TV	23	77719	Lic	0000074584	Wolfforth, TX
KPEJ-TV	23	12524	Lic	BLCDT-20060629AGO	Odessa, TX
KTEL-TV	25	83707	Lic	BLCDT-20081125ADK	Carlsbad, NM
KTTZ-TV	25	65355	Lic	0000063358	Lubbock, TX
KMID	26	35131	Lic	BLCDT-20110218AAS	Midland, TX
KAMC	27	40820	CP	0000052586	Lubbock, TX
KRPV-DT	27	53539	Lic	BLCDT-20090211ABQ	Roswell, NM
KPBT-TV	28	50044	Lic	0000063946	Odessa, TX
KRBC-TV	29	306	Lic	BLCDT-20070831AAK	Abilene, TX
KUPT	29	27431	Lic	BLCDT-20081125ADR	Hobbs, NM
KTAB-TV	30	59988	CP	0000029890	Abilene, TX
KWWT	30	84410	CP	0000036063	Odessa, TX
KEYU	31	83715	Lic	BLCDT-20130815AAW	Borger, TX
KLBK-TV	31	3660	Lic	0000078650	Lubbock, TX
KENW	32	18338	Lic	BLEDT-20030219ADP	Portales, NM
KCWO-TV	33	42008	Lic	BLCDT-20090818AAN	Big Spring, TX