

**Comprehensive Technical Exhibit**  
*Application for Construction Permit*  
KVII-DT – Amarillo, Texas  
Barrington Amarillo License LLC  
March, 2008

**General**

The following engineering statement and attached exhibits have been prepared for **Barrington Amarillo License LLC**, licensee of digital television station KVII-DT (Facility ID: 40446) at Amarillo, Texas, and are in support of its application for construction permit for the KVII-DT post transition facilities.

KVII currently operates on channel 7 as an NTSC facility, with current DTV operations on channel 23. In the post-transition environment, KVII-DT will operate on channel 7 pursuant to the Commission's DTV Table of Allotments. This application is therefore being filed to request a construction permit for the post-transition DTV facilities, which will be slightly different than those indicated in the Table of Allotments.

**Discussion of KVII-DT Allotment**

In the Commission's Table of Allotments, KVII-DT is specified as operating in the post-transition environment on channel 7. Appendix B to the order adopting the Table specifies maximum effective radiated power of 21.9 kW at an antenna center of radiation at 518 meters above average terrain, and lists an Antenna ID of 74462 for KVII-DT. The geographic coordinates listed for the allotment are 35-22-29 North Latitude and 101-52-58 West Longitude. The proposed facility would utilize the tower described by ASRN 1054167. This structure is located at NAD27 geographic coordinates of 35-22-30 North Latitude and 101-52-56 West Longitude. There is therefore a slight difference in the actual location of the proposed facility relative to the Appendix B geographic coordinates.

The pattern contained within Antenna ID 74662 is a slightly directional omnioid pattern. This particular pattern is not consistent with the type of antenna currently utilized by KVII-TV, which

is a General Electric TY-53-A. This particular antenna model is considered a non-directional antenna, and is the antenna with which the applicant will operate KVII-DT in the post-transition environment. As a result, the facilities for which the proponent is submitting this application vary slightly from those described in the appropriate Appendix B entry. This variance is a result of the applicant seeking to remove the “directional characteristics” specified in the allotment which resulted from the mathematics the Commission performed to replicate the KVII-TV Grade B service contour as well as the minor coordinate discrepancy.<sup>1</sup>

Even though the facilities specified in this application are at a slight variance from those specified in the Table of Allotments, this application is consistent with the freeze waiver policy established by the Commission at paragraph 151 of the Third Periodic Review of the Commission's Rules and Policies Affecting the Conversion to Digital Television. The applicant therefore respectfully requests a waiver of the filing freeze. Specifically, the proposed facility would allow KVII to utilize the existing NTSC antenna for DTV operation, thereby meeting the first of the three conditions. The second criterion would be met as previously discussed since the noise limited contour would not increase more than five miles in any direction. Finally, the proposed facility will not cause impermissible interference to any other relevant facility. The interference studies demonstrating this fact will be presented later in this technical exhibit.

All technical parameters specified for the proposed KVII-DT facility would be identical to those specified in the table of allotments with the exception of the directional antenna pattern and the slight variance in the geographic coordinates previously mentioned. The proposed facilities specify a relative field of 1.0 at all azimuths.

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<sup>1</sup> Antenna ID 74462 lists a minimum relative field of 0.918 at 180 degrees true. At the allocated ERP this represents an effective radiated power of 18.46 kW.

The removal of the directional characteristics is not being requested in an attempt to expand the coverage of the allotted facilities, but rather is requested in order to allow the station to utilize its current NTSC antenna in the post-transition environment. The map in Exhibit E-1 compares the 36 dBu service contour of the Appendix B facilities (indicated in green) to those proposed in this application (indicated in blue). As this map and the subsequent contour comparison tabulation in Exhibit E-2 demonstrate, these contours are essentially identical, with a maximum expansion of no more than 1.70 kilometers (1.06 miles) along any azimuth beyond the contour established in Appendix B.

**DTV Checklist – FCC Form 301 Section III-D**

The appropriate items on Section III-D of FCC Form 301 have been answered. This application is for the post-transition facilities for KVII-DT. As a result, items 1(a), 1(d), 1(e), and 2-5 have been answered per the instructions. This section of the comprehensive technical exhibit will, however, provide additional information relative to these responses.

The proposed DTV facilities described in this application will operate on the DTV channel established for the station. Specifically, the proposed facilities would utilize channel 7 in the post-transition environment. This is the channel on which the applicant current operates its NTSC facility. A response of “yes” has been provided for this item.

Under item 1(d), a question is posed concerning the expansion of the noise limited service contour beyond the established value indicated in Appendix B. This question has been answered “no” as the proposed facilities expand the noise limited service contour along several azimuths by a *minimal* amount as previously discussed. As previously discussed, this minimal extension of the

noise limited service contour is the result of the removal of the directional characteristics added to a non-directional antenna during the NTSC replication process and a correction of the geographic coordinates. It is respectfully submitted that the consistency of this minimal expansion of the service area with Commission proceedings should not preclude rapid or expedited processing of this application.

The response to item 1(e) is tied to the previous response provided under item 1(d). As with the previous response, this question has been answered “no” since the proposed facility would neither identically match the service area population, nor would it reduce the service area population. Rather, the increase in the service area previously discussed causes a slight increase in the station’s service area population. Specifically, Appendix B lists a service area population of 350 thousand persons. The actual resident population within the allocation contour is 352,103 persons based on 2000 US Census data, while the proposed contour has a resident population of 354,359 persons by the same data. This increase is 0.64 percent with the allocation contour used as the baseline.

The proposed facility will not have a significant environmental impact. The facility, as a result, will not fall under Section 1.1307 of the Commission’s Rules. More detailed information concerning this response will be contained in section of this technical exhibit pertinent to the Tech Box portion of FCC Form 301.

The proposed facility will also comply with the provisions of Section 73.625 of the Commission’s Rules. Additional information concerning this response will be provided in the subsequent Tech Box section of this exhibit.

The requirements of Section 73.1030 of the Commission's Rules are not applicable in this particular case. The proposed facility would not operate in any of the zones described in the referenced section, and is not in close proximity to any of the installations described in that section. Furthermore, the proposed facility is not located in proximity to any of the protected offices described in Section 0.121 of the Commission's Rules. The response of "yes" to this item is thus applicable.

The structure utilized for the facilities described in this application has been registered with the Commission. Specifically an Antenna Structure Registration Number of 1054167 has been assigned to the tower.

**Tech Box – FCC Form 301 Section III-D**

This section of the technical exhibit contains additional information relative to the responses required on the Tech Box section of FCC Form 301. Responses to items numbered 1 through 9 in this section have been answered in the appropriate blanks on the form page.

The antenna that would be utilized by the proposed facility is a General Electric (GE) Model TY-53-A. This is the same antenna that has been in use by the NTSC facility. This antenna is a non-directional antenna with 0.6 degrees of electrical beamtilt and no mechanical beamtilt. Items described under Section 73.625(c)(3) of the Commission's Rules have been omitted from this application since the proposed antenna is considered a non-directional antenna by the Commission's Rules.

The tower utilized by the proposed DTV facility would also be utilized by KACV-DT at Amarillo, Texas. In fact, KACV-DT shares the KVII-DT antenna. No FM facilities are located on the structure nor are any AM facilities located in close proximity to this tower. The tower would not be part of an AM radiation system. The proposed facility therefore complies with Section 73.625(c) of the Commission's Rules.

As indicated on the form pages, the proposed facility would satisfy the post-transition interference protection provisions of Section 73.616 of the Commission's Rules. An interference study has been performed for the other facilities in the region that would potentially be affected by the proposed KVII-DT operation. The facilities considered in these interference studies are listed in the interference tabulation contained as part of Exhibit E-3.

In the creation of the interference study, the assumption was made that many of the stations involved are in the same situation as the applicant with regard to the mathematical directional characteristics applied to non-directional antennas from the NTSC replication calculations. For such facilities listed in Appendix B, the assumption for the basis of the interference calculations was that these facilities would ultimately operate at the allocated parameters with a non-directional antenna. Several of the facilities, however, clearly have directional antennas by virtue of the particular antennas utilized. In those cases, especially where the ultimate post-transition facility was already licensed, the directional pattern identical to that specified under the appropriate Antenna ID in the CDBS was utilized.

One facility under consideration in this study bears special mention, however. This facility is KOAT-DT at Albuquerque, New Mexico (Facility ID: 53928). The table of allotments indicates that this facility will utilize channel 7 in the post-transition environment. The center of radiation above

average terrain listed in the table of allotments is inconsistent with the actual center of radiation listed in the Commission's database for the licensed KOAT NTSC antenna. It is presumed that this facility will utilize the existing NTSC antenna in the post-transition environment. As a result, the parameters utilized for the consideration of KOAT are representative of the actual antenna parameters at that facility. Since the use of these parameters would tend to *increase* the service area of KOAT, the KVII-DT interference calculations result in a more stringent way of determining the interference to this facility.

As Exhibit E-3 demonstrates, the proposed KVII-DT facility would cause a minimal amount of interference to the supposed KOAT-DT facility. These areas of interference, indicated by the polygon on the map, represent 12 square kilometers of area. Within these small areas, a resident population of zero persons is indicated. The proposed facility would therefore not cause impermissible interference to KOAT-DT. Interference to any other relevant facility is not indicated by the Exhibit E-3 study. The proposed facility would therefore be consistent with the requirements of Section 73.616 of the Commission's Rules. It should be noted that the map in Exhibit E-3 has been provided with minimal political detail so as to better illustrate the areas of predicted interference to KOAT-DT.

The proposed KVII-DT facilities would satisfy the principal community coverage requirements of Section 73.625 of the Commission's Rules. Exhibit E-4 is a map illustrating the predicted coverage of the proposed facility. As this map demonstrates, the entire community of license, Amarillo, Texas, would be served with a signal level of greater than 43 dBu. For reference purposes, the 36 dBu F(50,90) service contour has also been indicated on this map.



The proposed KVII-DT facility would not constitute a substantial environmental impact as previously mentioned. The absence of a significant environmental impact by the proposed facility is based on two considerations. The first of these considerations is the fact that the proposed facility would utilize the existing KVII transmission facility. Since no new excavation or construction would result, no additional environmental impact to the area would ensue.

Secondly, the proposed facility would not constitute an RF exposure hazard to persons at the site. In addition to the final KVII-DT facilities, KACV-DT would also utilize the site through combined use of the KVII-DT antenna. For the proposed operation of both facilities, a worst case scenario was assumed utilizing the calculations contained in OET Bulletin 65. The worst case scenario assumes that all energy radiating from the KVII-DT/KACV-DT combined antenna would be directed at the ground. The predicted power density for each facility from this antenna is therefore given by the following equation:

$$S = \frac{33.4(E_{rel})^2(ERP)}{h^2}$$

Since all radiation is assumed to be directed at the ground, the relative field component is assumed to have 1.0 as a value. The effective radiated power is simply the maximum effective radiated power, which in the case of KVII-DT is 21.9 kW and for KACV-DT is 5.0 kW. The denominator term is the height of the center of radiation above ground level minus 2 meters to accommodate the average human height. This term therefore has 482 meters as a value since the center of radiation is 485 meters above ground level. The resulting worst case power density for KVII-DT is  $3.15 \mu\text{W}/\text{cm}^2$ , while a value of  $0.72 \mu\text{W}/\text{cm}^2$  is obtained for KACV-DT. It is assumed that this power density occurs at all points in the vicinity of the tower.

The total predicted power density at ground level is the sum of the contributors, which in this case is  $3.87 \mu\text{W}/\text{cm}^2$ . It is also assumed that this value occurs at all locations in the vicinity of the tower. The uncontrolled environment imposes an upper limit of  $200 \mu\text{W}/\text{cm}^2$  for frequencies between 100 and 300 MHz. Both KVII-DT and KACV-DT fall into this range. Since the sum of the predicted power density from both contributors is less than this upper limit, it is apparent that the proposed facility would not constitute an RF exposure hazard to persons in the vicinity of the site.

In order to protect workers having access to the site from being exposed to levels of non-ionizing radiation which may exceed the applicable safety standards, the applicant certifies that it will coordinate with other present and future users of the site. Such coordination will include, but is not necessarily limited to, a reduction in transmitter power or cessation of operation.

**Affidavit**

The preceding statement and attached exhibits have been prepared by me, or under my direction, and are true and accurate to the best of my belief and knowledge.



Above signature is digitized copy of actual signature  
License Expires November 30, 2009

**Jeremy D. Ruck, PE**  
**March 21, 2008**

**KVII-DT.PRO**

## PROPOSED

Latitude: 35-22-30 N  
Longitude: 101-52-56 W  
ERP: 21.90 kW  
Channel: 7  
Frequency: 177.0 MHz  
AMSL Height: 1525.0 m  
Elevation: 1035.2 m  
Horiz. Pattern: Omni  
Vert. Pattern: Yes  
Elec Tilt: 0.7  
Prop Model: FCC Method

**KVII-DT.ALLOC**

## ALLOCATION

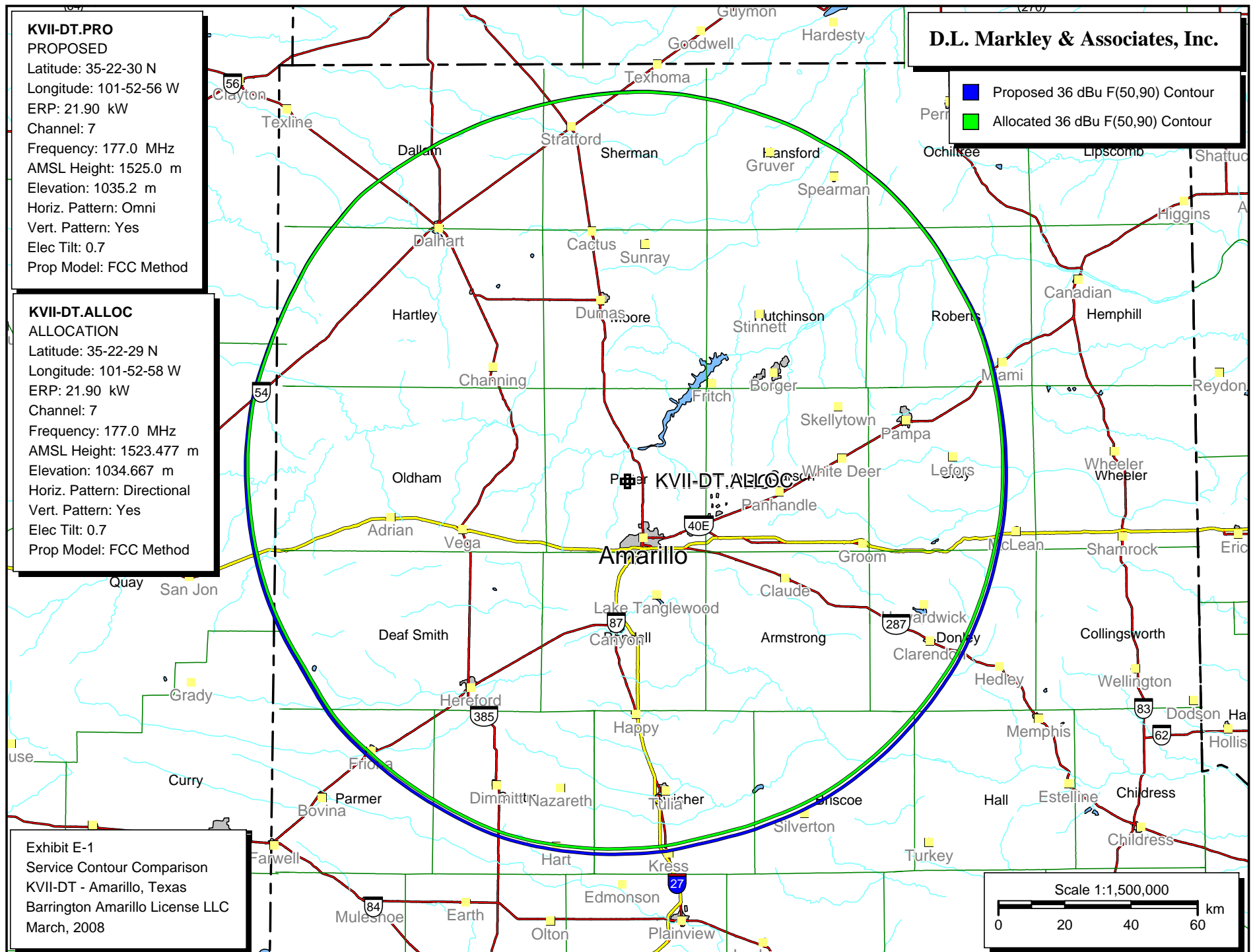
Latitude: 35-22-29 N  
Longitude: 101-52-58 W  
ERP: 21.90 kW  
Channel: 7  
Frequency: 177.0 MHz  
AMSL Height: 1523.477 m  
Elevation: 1034.667 m  
Horiz. Pattern: Directional  
Vert. Pattern: Yes  
Elec Tilt: 0.7  
Prop Model: FCC Method

## Exhibit E-1

Service Contour Comparison  
KVII-DT - Amarillo, Texas  
Barrington Amarillo License LLC  
March, 2008

**D.L. Markley & Associates, Inc.**

- Proposed 36 dBu F(50,90) Contour
- Allocated 36 dBu F(50,90) Contour



**Exhibit E-2 - Comparison of Proposed and Allocated Noise Limited Service Contours**

Azimuth	HAAT in meters	Allocation NL Contour Distance in kilometers	Proposed NL Contour Distance in kilometers	Contour Distance Difference	
				kilometers	miles
0	561.1	117.0	117.0	0.00	0.00
10	567.4	117.4	117.4	0.00	0.00
20	566.9	117.4	117.4	0.00	0.00
30	571.5	117.7	117.7	0.00	0.00
40	570.9	117.6	117.6	0.00	0.00
50	558.4	116.8	116.8	0.00	0.00
60	541.6	115.6	115.8	0.20	0.12
70	532.9	114.9	115.3	0.40	0.25
80	511.9	113.6	114.3	0.70	0.43
90	500.8	112.8	113.8	1.00	0.62
100	491.4	112.2	113.3	1.10	0.68
110	487.7	111.9	113.1	1.20	0.75
120	487.8	111.9	113.1	1.20	0.75
130	480.1	111.3	112.7	1.40	0.87
140	476.5	111.0	112.4	1.40	0.87
150	472.7	110.7	112.2	1.50	0.93
160	463.0	109.9	111.4	1.50	0.93
170	461.0	109.7	111.3	1.60	0.99
180	471.1	110.5	112.1	1.60	0.99
190	483.0	111.4	112.9	1.50	0.93
200	496.0	112.3	113.6	1.30	0.81
210	491.6	112.1	113.3	1.20	0.75
220	495.8	112.5	113.6	1.10	0.68
230	504.5	113.0	114.0	1.00	0.62
240	487.0	112.2	113.1	0.90	0.56
250	501.9	113.0	113.9	0.90	0.56
260	511.4	113.6	114.3	0.70	0.43
270	521.3	114.2	114.8	0.60	0.37
280	532.4	114.9	115.3	0.40	0.25
290	529.2	114.9	115.2	0.30	0.19
300	539.9	115.6	115.7	0.10	0.06
310	559.2	116.8	116.9	0.10	0.06
320	564.8	117.2	117.2	0.00	0.00
330	552.9	116.5	116.5	0.00	0.00
340	547.7	116.2	116.2	0.00	0.00
350	548.7	116.2	116.2	0.00	0.00

**D.L. Markley & Associates, Inc.**

*Consulting Engineers*

2104 West Moss Avenue

Peoria, Illinois 61604

**KVII-DT.PRO**

PROPOSED

Latitude: 35-22-30 N

Longitude: 101-52-56 W

ERP: 21.90 kW

Channel: 7

Frequency: 177.0 MHz

AMSL Height: 1525.0 m

Elevation: 1043.0 m

Horiz. Pattern: Omni

Vert. Pattern: Yes

Elec Tilt: 0.0

Prop Model: Longley/Rice

Climate: Cont temperate

Conductivity: 0.0050

Dielec Const: 15.0

Refractivity: 301.0

Receiver Ht AG: 10.0 m

Receiver Gain: 0 dB

Time Variability: 10.0%

Sit. Variability: 50.0%

ITM Mode: Broadcast

Areas of Predicted  
Interference to KOAT-DT**D.L. Markley & Associates, Inc.**

- ☒ KVII-DT.PRO
- ☐ KMGH-DT
- ☐ KJCT-DT
- ☐ KTSC-DT.A
- ☐ KBSH-DT
- ☐ KOAM-DT
- ☐ KPTS-DT
- ☐ KSWK-DT
- ☒ KOAT-DT
- ☐ KOFT-DT
- ☐ KOBR-DT
- ☐ KOCO-DT.A
- ☐ KWET-DT
- ☐ KJRH-DT
- ☐ KTBC-DT
- ☐ KVIA-DT.A
- ☐ KOSA-DT
- ☐ KLTV-DT
- ☐ KACV-DT
- ☐ WFAA-DT.C
- ☐ KGNS-DT

KVII-DT.PRO  
KACV-DT

KOAT-DT

KOBR-DT

Exhibit E-3

Outgoing Interference Study

KVII-DT - Amarillo, Texas

Barrington Amarillo License LLC

March, 2008

Scale 1:3,000,000

0 40 80 120 km

Exhibit E-3  
Outgoing Interference Population Report  
Study based on proposed KVII-DT facilities.

KVII-DT.PRO (7) Amarillo, TX - PROPOSED  
Broadcast Type: Digital Service: V  
Lat: 35-22-30 N Lng: 101-52-56 W ERP: 21.9 kW AMSL: 1525.0 m  
TV Outgoing Interference Study  
Signal Resolution: 1.0 km  
Consider NTSC Taboo: Yes  
KWX error points are considered to  
be interference free coverage.  
# of radials computed for contours: 72  
Contours calculated using 8 radial HAAT.  
LR Profile Spacing Increment: 0.1 km  
Masked interference points are being counted  
as interference free.  
Pop Centroid DB: 2000 US Census (SF1)

Study Date: 3/12/2008  
TV Database Date: 3/12/2008

Primary Terrain: V-Soft 30 Second US Database  
Secondary Terrain: V-Soft 3 Second US Terrain

Population Database: 2000 US Census (SF1)

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Stations Considered:

Call Letters	City	State	Dist	Bear
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KMGH-DT (7)	Denver	CO	566.5	329.5
KJCT-DT (7)	Grand Junction	CO	696.4	307.7
KTSC-DT.A (8)	Pueblo	CO	409.3	325.2
KBSH-DT (7)	Hays	KS	450.1	29.4
KOAM-DT (7)	Pittsburg	KS	675.8	70.3
KPTS-DT (8)	Hutchinson	KS	472.1	49.7
KSWK-DT (8)	Lakin	KS	280.8	14.0
KOAT-DT (7)	Albuquerque	NM	415.8	268.9
KOFT-DT (8)	Farmington	NM	589.7	286.0
KOBR-DT (8)	Roswell	NM	281.7	218.6
KOCO-DT.A (7)	Oklahoma City	OK	399.1	85.7
KWET-DT (8)	Cheyenne	OK	202.5	82.5
KJRH-DT (8)	Tulsa	OK	566.0	80.9
KTBC-DT (7)	Austin	TX	679.3	144.6
KVIA-DT.A (7)	El Paso	TX	582.0	228.5
KOSA-DT (7)	Odessa	TX	394.7	189.6
KLTV-DT (7)	Tyler	TX	690.9	115.2
KACV-DT (8)	Amarillo	TX	0.0	0.0
WFAA-DT.C (8)	Dallas	TX	548.5	122.9

KGNS-DT (8)      Laredo      TX      878.8      165.6

Call	Area	HUnits	Contour	Masked	Ix	Unmasked	Ix	%
KMGH-DT (7)	0.0	0	3,138,661		0		0	0.0
KJCT-DT (7)	0.0	0	219,103		0		0	0.0
KTSC-DT.A (8)	0.0	0	771,600		0		0	0.0
KBSH-DT (7)	0.0	0	95,989		0		0	0.0
KOAM-DT (7)	0.0	0	560,256		0		0	0.0
KPTS-DT (8)	0.0	0	726,561		0		0	0.0
KSWK-DT (8)	0.0	0	83,073		0		0	0.0
KOAT-DT (7)	12.0	0	978,130		0		0	0.0
KOFT-DT (8)	0.0	0	182,962		0		0	0.0
KOBR-DT (8)	0.0	0	162,341		0		0	0.0
KOCO-DT.A (7)	0.0	0	1,403,729		0		0	0.0
KWET-DT (8)	0.0	0	119,201		0		0	0.0
KJRH-DT (8)	0.0	0	1,308,890		0		0	0.0
KTBC-DT (7)	0.0	0	1,908,865		0		0	0.0
KVIA-DT.A (7)	0.0	0	858,298		0		0	0.0
KOSA-DT (7)	0.0	0	286,480		0		0	0.0
KLTV-DT (7)	0.0	0	808,266		0		0	0.0
KACV-DT (8)	0.0	0	335,319		0		0	0.0
WFAA-DT.C (8)	0.0	0	5,559,801		0		0	0.0
KGNS-DT (8)	0.0	0	219,915		0		0	0.0

	Housing Units	Population
New Mexico		
Guadalupe County		
Total	2,160	4,680
KOAT-DT (7)	0	0
San Miguel County		
Total	14,254	30,126
KOAT-DT (7)	0	0

**KVII-DT.PRO**  
PROPOSED  
Latitude: 35-22-30 N  
Longitude: 101-52-56 W  
ERP: 21.90 kW  
Channel: 7  
Frequency: 177.0 MHz  
AMSL Height: 1525.0 m  
Elevation: 1043.0 m  
Horiz. Pattern: Omni  
Vert. Pattern: Yes  
Elec Tilt: 0.7  
Prop Model: FCC Method

**D.L. Markley & Associates, Inc.**

- Proposed 43 dBu F(50,90) Service Contour
- Proposed 36 dBu F(50,90) Service Contour

