ENGINEERING EXHIBIT

Application for Construction Permit

prepared for

North Texas Public Broadcasting, Inc.
KKXT(FM) Dallas, TX
Facility ID 55768
Ch. 219C0 (91.7 MHz) 19.5 kW 572 m

North Texas Public Broadcasting, Inc. ("NTPB") is the licensee of non-commercial educational FM radio station KKXT(FM) Ch. 219C, Dallas, TX (BLED-20000410ABF). KKXT is licensed to operate with 100 kW effective radiated power ("ERP") and an antenna height above average terrain ("HAAT") of 335 meters. *NTPB* herein proposes to relocate KKXT to a new transmitting location.

As specified herein, the KKXT facility will be relocated 1.2 km and will operate at 19.5 kW maximum nondirectional ERP and 572 meters antenna HAAT. This ERP / HAAT combination conforms to a Class C0 facility.[1]

The proposed KKXT facility will utilize an existing shared antenna which is top-mounted on the tower structure associated with FCC Antenna Structure Registration number 1053452. The other FM stations licensed to utilize this antenna are KBFB(FM) (Ch. 250C, Dallas TX, Facility ID 9627, BLH-20100721EEI), KJKK(FM) (Ch. 262C, Dallas TX, Facility ID 63779, BMLH-20060323ADD), KRLD-FM (Ch. 287C, Dallas TX, Facility ID 1087, BMLH-20060323ABT), and KMVK(FM) (Ch. 298C1, Fort Worth TX, Facility ID 23440, BLH-20041112AEJ). Under a separate application to be filed contemporaneously, *NTPB* is also proposing to relocate KERA(FM) (Ch. 211C0, Facility ID 49323, Dallas TX) to also utilize the same shared antenna as that proposed herein for KKXT.

[1]The licensed parameters of 100 kW at 335 meters also conform to Class C0. KKXT's present Class C designation was authorized before Class C0 was established. The proposed modification of KKXT now specifies Class C0 as required by §73.211.

The antenna is a Shively model 6014-8/3 having 0.5 degrees of electrical beamtilt. Figure 1 provides the antenna's elevation pattern on KKXT's channel. The maximum ERP will be 19.5 kW and the ERP at the horizontal is 19.29 kW.

The principal community of Dallas is encompassed by the proposed KKXT 60 dBμ coverage contour as depicted in the coverage contour map of Figure 2. The change in site location is only 1.2 km, clearly complying with §73.3573(a)(1) regarding a minor modification. Figure 2 also supplies a coverage contour comparison of the licensed and proposed facilities.

Allocation Considerations

The following FM facilities are close enough to the proposed transmitter site to warrant study in regard to prohibited overlap under §73.509 of the Commission's Rules:

Call		Channel	Location		File Number	Azi(°T)	Dist(km)
KDKR	LIC	217C	Decatur	TX	BLED-20090206AAM	328.0	105.34
KYFA-FM	LIC	218A	Ginger	TX	BLED-20101217ABL	74.1	117.90
KYFB	LIC	218A	Denison	TX	BLED-20070220ABF	16.4	129.45
KPIT	LIC	219A	Pittsburg	TX	BLED-20080604ABI	73.4	185.78
KQOS	LIC	219C2	Albany	TX	BLED-20120706AAT	272.7	233.80
KPFC	LIC	220A	Callisburg	TX	BLED-19980427KA	357.8	120.51

The attached Figures 3, 4, and 5 depict the pertinent protected and interfering contours of the stations listed and the proposed KKXT facility. Co-channel stations and first-adjacent channel stations protected and interfering contours are depicted in Figures 3 and 4, respectively. Regarding first-adjacent stations, Figure 4A supplies a detailed map of the contours which are close but do not overlap with KYFA-FM (Ch. 218A, Ginger TX). Figure 5 provides an allocation map regarding second and third adjacent stations. These exhibits demonstrate that no prohibited contour overlap will exist with respect to these facilities.

The allocation study described above concludes that the KKXT proposal is in compliance with §73.509 regarding prohibited contour overlap with respect to all nearby stations. The contour locations were determined using the actual ERP and height above terrain along each radial for each facility, as specified in §73.509(c). For the facilities under study, the antenna elevation above mean sea level, geographic coordinates, and ERP (including directional antenna relative field values, where

appropriate) were retrieved from the FCC's engineering database. The requisite contours were determined using U.S.G.S. 3-second digitized terrain data along each radial of interest from each transmitter site and an implementation of the Commission's TVFMFS computer program which simulates the FM propagation curves. The F(50,10) distances are used to calculate distance to interfering contours, however if the distance is less than 16 km the F(50,50) curves are used, as specified by §73.509(c)(2).

A spacing study as required by §73.507(a) and (c) regarding facilities on Channels 221 – 222 and those differing in frequency by 10.6 or 10.8 MHz from the proposal is summarized in the following. The proposed facility meets the minimum distance separation requirements of §73.207 in all such instances.

Call Lat	Channel Lon	Location File#		Azi (°T)	Dist (km)	Req'd (km)	Margin (km)
KTFW-FM LIC 32 16 31.0	221C1 98 01 22.0	Glen Rose BLH19990429KC	TX	251.2	105.35	94.0	11.4
KXEZ LIC 33 16 31.0	221A 96 22 02.0	Farmersville BLH20050304AAF	TX	35.7	94.80	86.0	8.8
KBRQ LIC 31 49 29.3	273C1 97 09 32.2	Hillsboro BLH20120914ACT	TX	192.4	86.16	37.0	49.2

TV Channel 6 Considerations

Under §73.525(a)(1), an affected TV Channel 6 station must be considered with a proposed non-commercial educational facility on Channel 219 if the distance between the respective transmitter sites is 159 km or less. No authorized Channel 6 full power or Class A television station is located within 159 km of the proposed site. Accordingly, the proposal complies with the television Channel 6 protection criteria of §73.525.

Other Allocation Matters

The nearest FCC monitoring station is 577 km distant at Kingsville, TX. This exceeds by a great 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). There are no authorized AM

broadcast stations located within 3 km of the proposed site. The site location is beyond the border areas requiring international coordination.

Human Exposure to Radiofrequency Electromagnetic Field

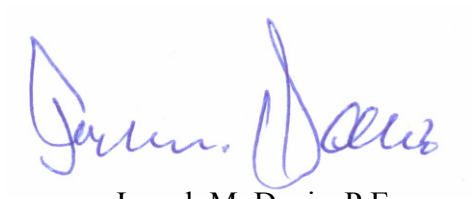
The proposed operation was evaluated for human exposure to RF energy using the procedures outlined in the Commission's OET Bulletin Number 65. Based on OET-65 equation (10), and considering a worst-case situation of 100 percent field in downward elevations, the calculated RF electromagnetic field near the tower at two meters above ground level attributable to the proposed facility is 5.0 $\mu W/cm^2$, which is 2.5 percent of the general population/uncontrolled maximum permitted exposure limit. This is 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 calculated RF exposure will be much lower when the antenna's actual elevation pattern is considered.

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. An existing antenna will be employed and no tower work is required to carry out this proposal.

Certification

The undersigned hereby certifies that the foregoing statement and associated attachments were prepared by him or under his direction, and that they are true and correct to the best of his knowledge and belief.



Joseph M. Davis, P.E.
December 8, 2013

Chesapeake RF Consultants, LLC
207 Old Dominion Road
Yorktown, VA 23692
703-650-9600

List of Attachments

Figure 1	Antenna Elevation Pattern
Figure 2	Proposed and Licensed Coverage Contours
Figure 3	Co-Channel Allocation Study
Figure 4, 4A	First-Adjacent Channel Allocation Study
Figure 5	Second and Third-Adjacent Channel Allocation Study
Form 340	Saved Version of Engineering Sections from FCC Form at Time of Upload

This material was entered December 8, 2013 for filing electronically. Since the FCC's electronic filing system may be accessed by anyone with the applicant's account number and password, and electronic data may otherwise be altered in an unauthorized fashion, we cannot be responsible for changes made subsequent to our entry of this data and related attachments.

Antenna Mfg.:	**Shively Labs**			**Date: 12/5/2013**
Antenna Type:	**6014-8/3-(0.9)SS-0.5BT**			
Station:	**KKXT**	**Beam Tilt**	**0.5**	
Frequency:	**91.7**	**Gain (Max)**	**3.980**	**5.998 dB**
Channel #:	**219**	**Gain (Horizon)**	**3.937**	**5.951 dB**

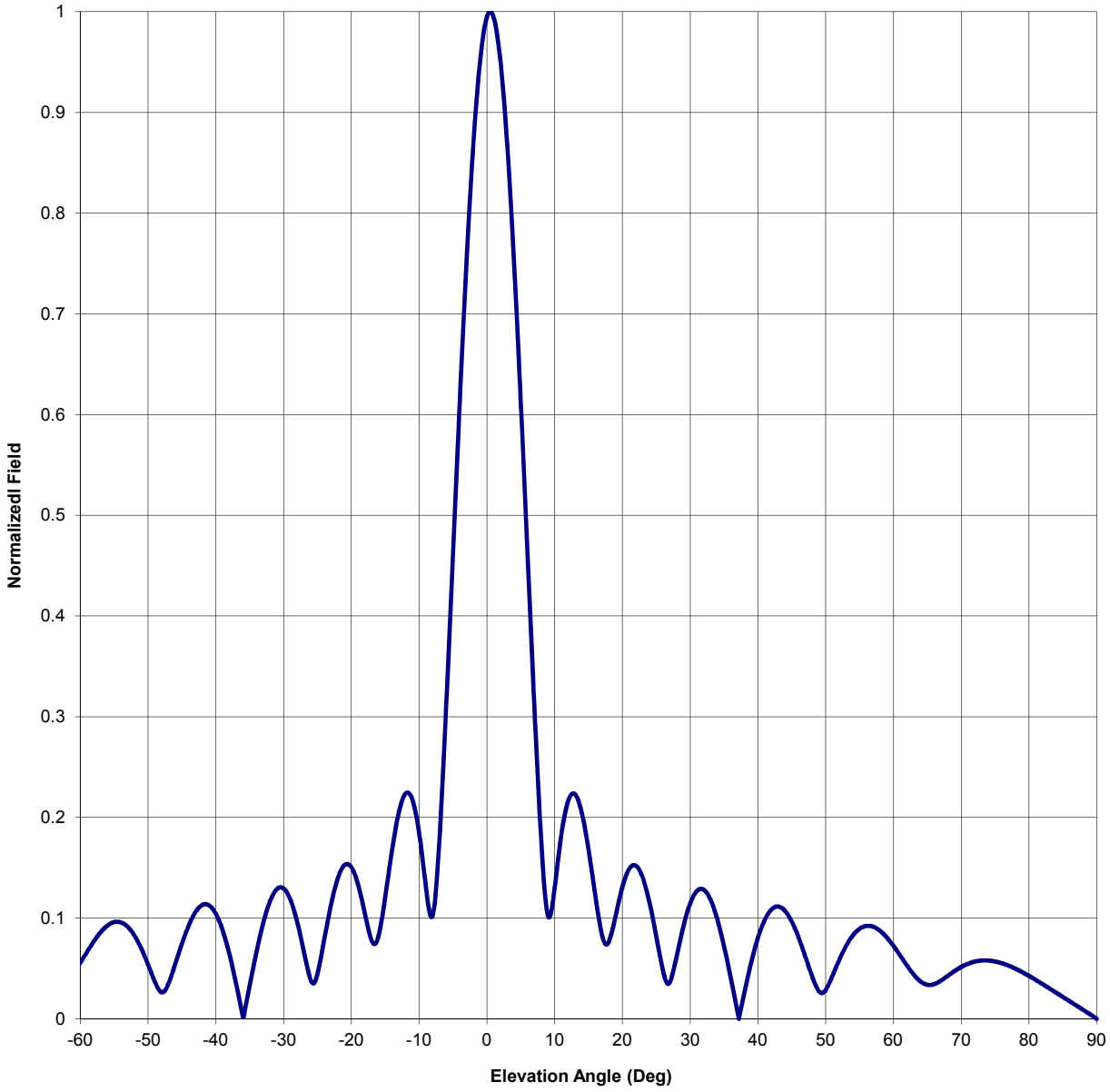
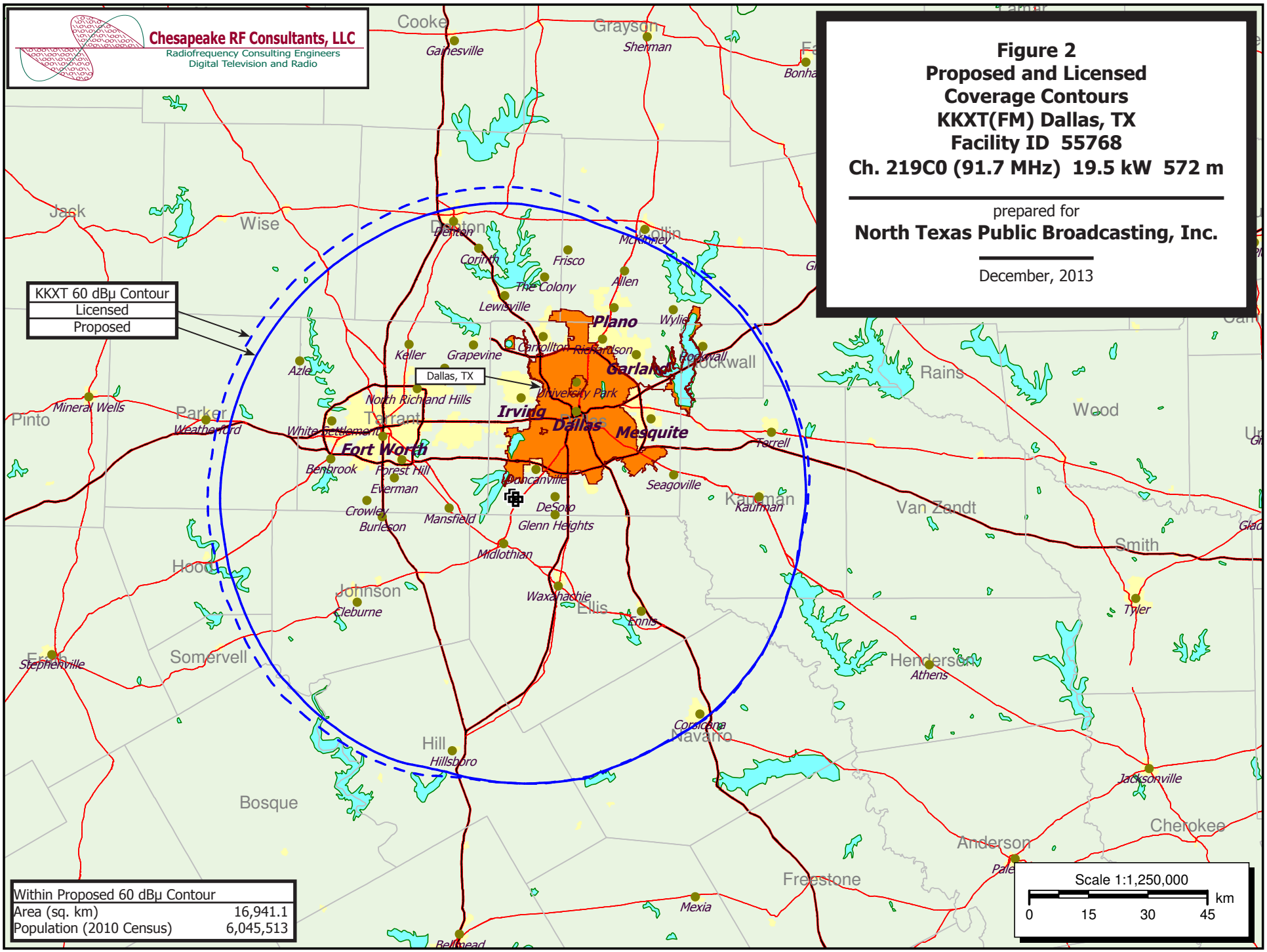


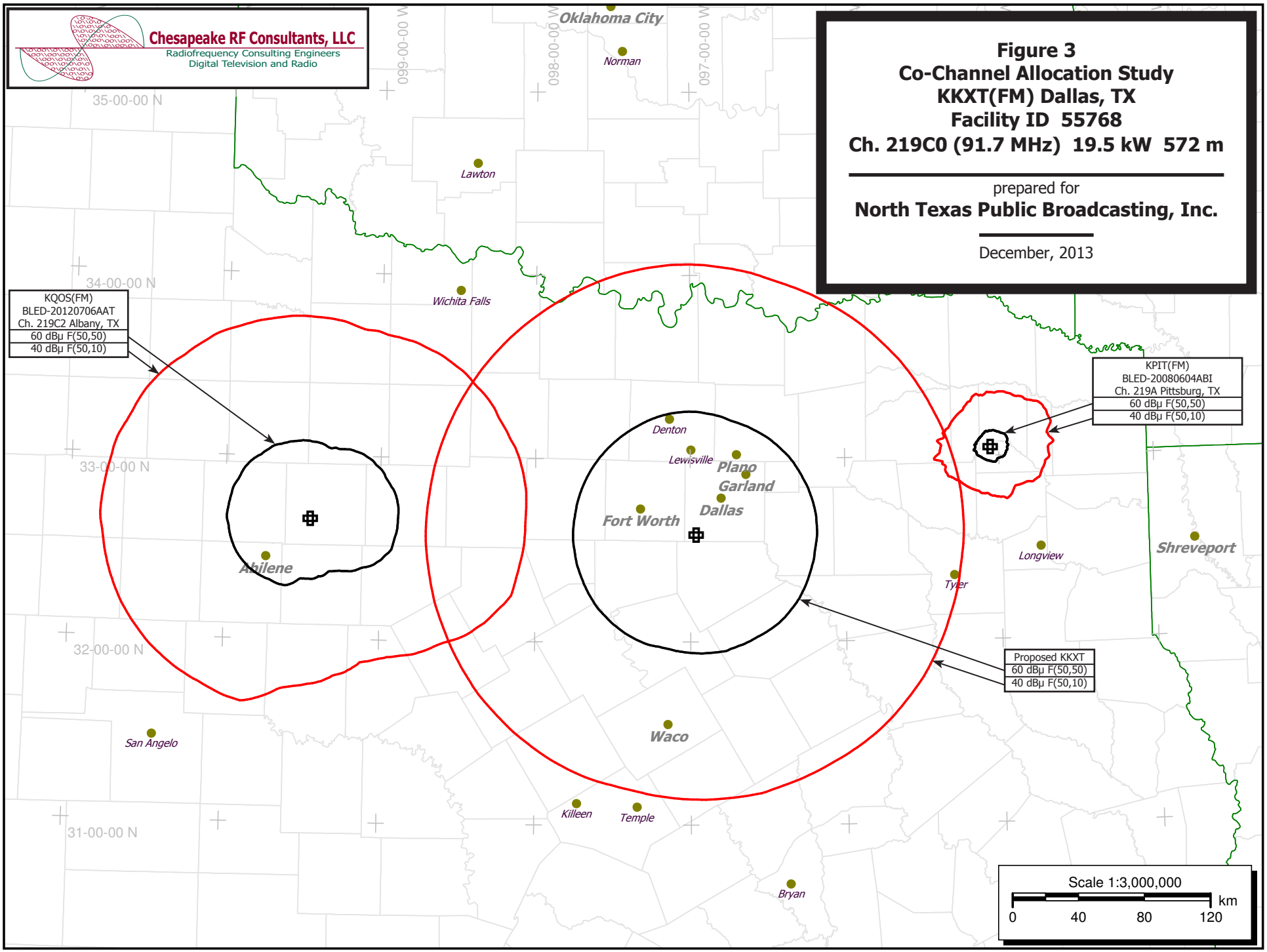
Figure 1
Antenna Elevation Pattern
KKXT(FM) Dallas, TX
Facility ID 55768
Ch. 219C0 (91.7 MHz) 19.5 kW 572 m

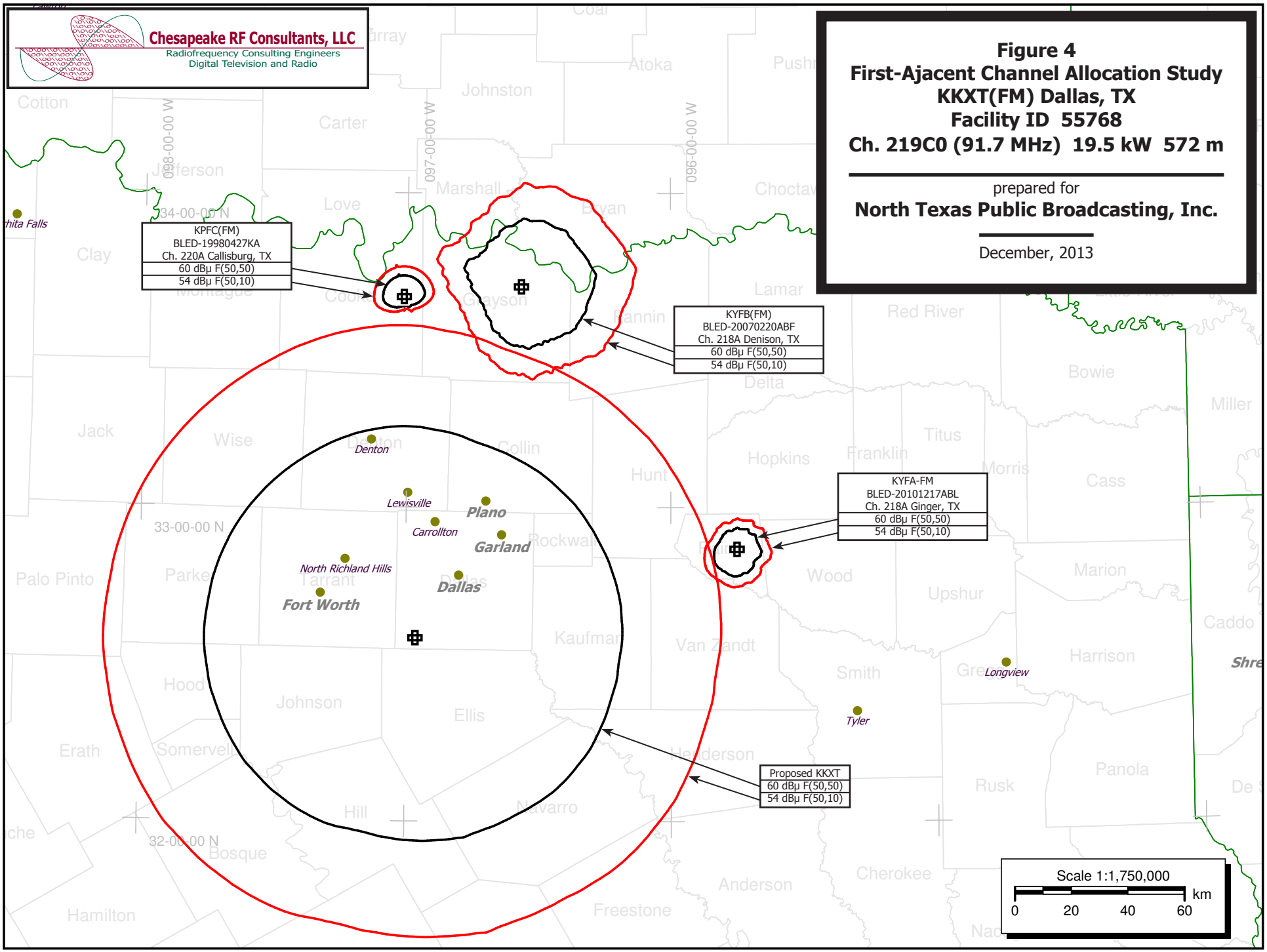
prepared for
North Texas Public Broadcasting, Inc.

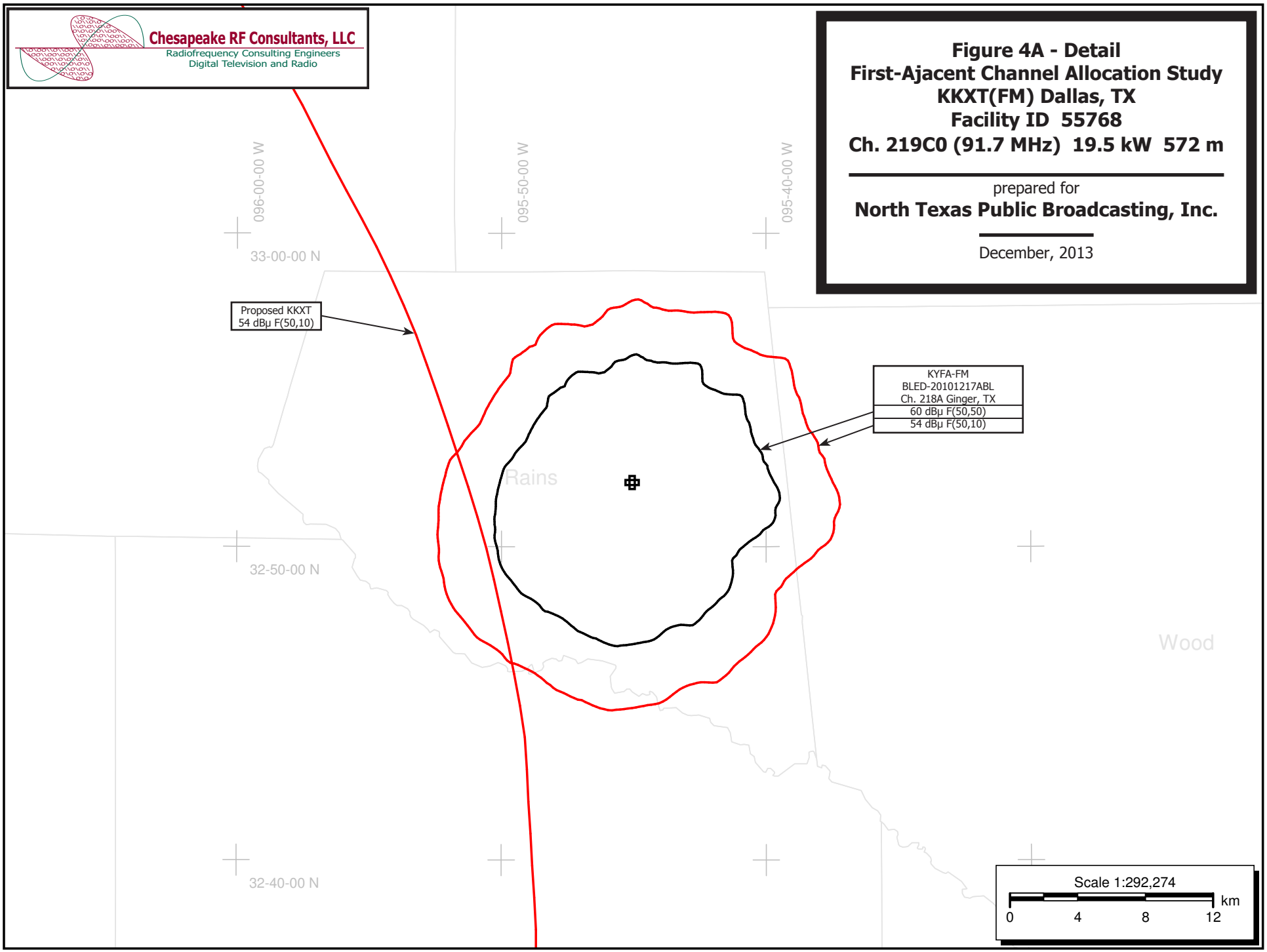
December, 2013

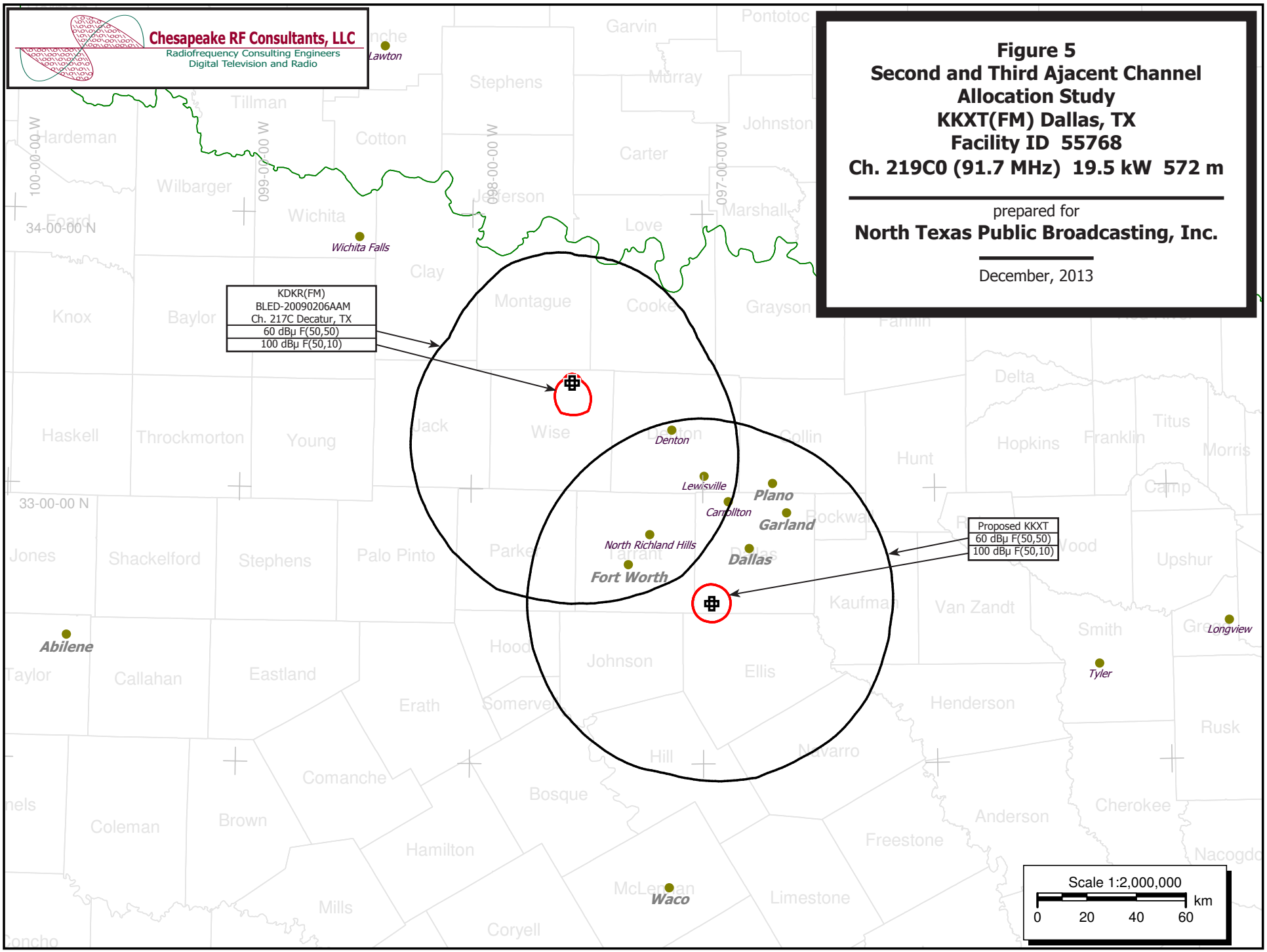
Chesapeake RF Consultants, LLC
Radiofrequency Consulting Engineers
Digital Television and Radio


Chesapeake RF Consultants, LLC
Radiofrequency Consulting Engineers
Digital Television and Radio
Figure 2
Proposed and Licensed
Coverage Contours
KKXT(FM) Dallas, TX
Facility ID 55768
Ch. 219C0 (91.7 MHz) 19.5 kW 572 m
prepared for
North Texas Public Broadcasting, Inc.
December, 2013
KKXT 60 dBµ Contour
Licensed
Proposed
Dallas, TX
Within Proposed 60 dBµ Contour
Area (sq. km) 16,941.1
Population (2010 Census) 6,045,513
Scale 1:1,250,000
km
0 15 30 45
Cooke
Grayson
Jack
Wise
Denton
Collin
Rockwall
Rains
Wood
Pinto
Parker
Tarrant
Hood
Johnson
Somervell
Hill
Bosque
Ellis
Navarro
Van Zandt
Smith
Henderson
Anderson
Cherokee
Freestone
Gainesville
Sherman
Denton
McKinney
Corinth
Frisco
The Colony
Allen
Lewisville
Plano
Wylie
Keller
Grapevine
Carrollton
Richardson
Rowlett
Garland
Azle
North Richland Hills
University Park
Irving
Dallas
Mesquite
Mineral Wells
Weatherford
White Settlement
Fort Worth
Benbrook
Forest Hill
Everman
Crowley
Burleson
Mansfield
Duncanville
DeSoto
Glenn Heights
Seagoville
Kaufman
Torrell
Midlothian
Waxahachie
Cleburne
Ennis
Tyler
Stephenville
Athens
Corsicana
Hillsboro
Mexia
Jacksonville


Chesapeake RF Consultants, LLC
Radiofrequency Consulting Engineers
Digital Television and Radio
Figure 3
Co-Channel Allocation Study
KKXT(FM) Dallas, TX
Facility ID 55768
Ch. 219C0 (91.7 MHz) 19.5 kW 572 m
prepared for
North Texas Public Broadcasting, Inc.
December, 2013
KQOS(FM)
BLED-20120706AAT
Ch. 219C2 Albany, TX
60 dBµ F(50,50)
40 dBµ F(50,10)
KPIT(FM)
BLED-20080604ABI
Ch. 219A Pittsburg, TX
60 dBµ F(50,50)
40 dBµ F(50,10)
Proposed KKXT
60 dBµ F(50,50)
40 dBµ F(50,10)
Oklahoma City
Norman
Lawton
Wichita Falls
Abilene
San Angelo
Denton
Lewisville
Plano
Garland
Dallas
Fort Worth
Waco
Killeen
Temple
Bryan
Longview
Tyler
Shreveport
35-00-00 N
34-00-00 N
33-00-00 N
32-00-00 N
31-00-00 N
099-00-00 W
098-00-00 W
097-00-00 W
Scale 1:3,000,000
km
0
40
80
120


Chesapeake RF Consultants, LLC
Radiofrequency Consulting Engineers
Digital Television and Radio
Figure 4
First-Ajacent Channel Allocation Study
KKXT(FM) Dallas, TX
Facility ID 55768
Ch. 219C0 (91.7 MHz) 19.5 kW 572 m
prepared for
North Texas Public Broadcasting, Inc.
December, 2013
KPFC(FM)
BLED-19980427KA
Ch. 220A Callisburg, TX
60 dBµ F(50,50)
54 dBµ F(50,10)
KYFB(FM)
BLED-20070220ABF
Ch. 218A Denison, TX
60 dBµ F(50,50)
54 dBµ F(50,10)
KYFA-FM
BLED-20101217ABL
Ch. 218A Ginger, TX
60 dBµ F(50,50)
54 dBµ F(50,10)
Proposed KKXT
60 dBµ F(50,50)
54 dBµ F(50,10)
Denton
Lewisville
Plano
Carrollton
Garland
North Richland Hills
Dallas
Fort Worth
Longview
Tyler
Scale 1:1,750,000
km
0
20
40
60


Chesapeake RF Consultants, LLC
Radiofrequency Consulting Engineers
Digital Television and Radio
Figure 4A - Detail
First-Ajacent Channel Allocation Study
KKXT(FM) Dallas, TX
Facility ID 55768
Ch. 219C0 (91.7 MHz) 19.5 kW 572 m
prepared for
North Texas Public Broadcasting, Inc.
December, 2013
096-00-00 W
095-50-00 W
095-40-00 W
33-00-00 N
32-50-00 N
32-40-00 N
Proposed KKXT
54 dBµ F(50,10)
KYFA-FM
BLED-20101217ABL
Ch. 218A Ginger, TX
60 dBµ F(50,50)
54 dBµ F(50,10)
Rains
Wood
Scale 1:292,274
km
0
4
8
12


Chesapeake RF Consultants, LLC
Radiofrequency Consulting Engineers
Digital Television and Radio
Figure 5
Second and Third Ajacent Channel
Allocation Study
KKXT(FM) Dallas, TX
Facility ID 55768
Ch. 219C0 (91.7 MHz) 19.5 kW 572 m
prepared for
North Texas Public Broadcasting, Inc.
December, 2013
KDKR(FM)
BLED-20090206AAM
Ch. 217C Decatur, TX
60 dBµ F(50,50)
100 dBµ F(50,10)
Proposed KKXT
60 dBµ F(50,50)
100 dBµ F(50,10)
Scale 1:2,000,000
km
0 20 40 60
Lawton
Wichita Falls
Denton
Lewisville
Plano
Carrollton
Garland
North Richland Hills
Fort Worth
Dallas
Abilene
Waco
Tyler
Longview
34-00-00 N
33-00-00 N

Section VII Preparer's Certification

I certify that I have prepared Section VII (Engineering Data) on behalf of the applicant, and that after such preparation, I have examined and found it to be accurate and true to the best of my knowledge and belief.

Name	Relationship to Applicant (e.g., Consulting Engineer)
JOSEPH M. DAVIS, P.E.	CONSULTING ENGINEER
Signature	Date
	12/08/2013

Mailing Address
CHESAPEAKE RF CONSULTANTS, LLC
207 OLD DOMINION ROAD

City	State or Country (if foreign address)	Zip Code
YORKTOWN	VA	23692-
Telephone Number (include area code)	E-Mail Address (if available)	
7036509600	JOSEPH.DAVIS@RF-CONSULTANTS.COM	

WILLFUL FALSE STATEMENTS ON THIS FORM ARE PUNISHABLE BY FINE AND/OR IMPRISONMENT (U.S. CODE, TITLE 18, SECTION 1001), AND/OR REVOCATION OF ANY STATION LICENSE OR CONSTRUCTION PERMIT (U.S. CODE, TITLE 47, SECTION 312(a)(1)), AND/OR FORFEITURE (U.S. CODE, TITLE 47, SECTION 503).

Section VII - FM Engineering

TECHNICAL SPECIFICATIONS

Ensure that the specifications below are accurate. Contradicting data found elsewhere in this application will be disregarded. All items must be completed. The response "on file" is not acceptable.

TECH BOX

1. Channel Number: 219

2. Class (select one):
○ D ○ A ○ B1 ○ B ○ C3 ○ C2 ○ C1 ◉ C0 ○ C

3. Antenna Location Coordinates: (NAD 27)
Latitude:
Degrees 32 Minutes 35 Seconds 02 ◉ North ○ South

Longitude:
Degrees 96 Minutes 57 Seconds 48 ◉ West ○ East

4. Proposed Assignment Coordinates: (NAD 27) - RESERVED CHANNELS ABOVE 220 ONLY ☑ Not Applicable
Latitude:
Degrees Minutes Seconds ○ North ○ South

Longitude:
Degrees Minutes Seconds ○ West ○ East

5. Antenna Structure Registration Number: 1053452
☐ Not Applicable ☐ Notification filed with FAA

6.	Overall Tower Height Above Ground Level:	527.6 meters	
7.	Height of Radiation Center Above Mean Sea Level:	764.1 meters(H)	764.1 meters(V)
8.	Height of Radiation Center Above Ground Level:	514.8 meters(H)	514.8 meters(V)
9.	Height of Radiation Center Above Average Terrain:	571.7 meters(H)	571.7 meters(V)
10.	Effective Radiated Power:	19.29 kW(H)	19.29 kW(V)
11.	Maximum Effective Radiated Power: (Beam-Tilt Antenna ONLY) ☐ Not Applicable	19.5 kW(H)	19.5 kW(V)

12. Directional Antenna Relative Field Values: ☑ Not applicable (Nondirectional)
Rotation (Degrees): ☐ No Rotation

Degrees	Value	Degrees	Value	Degrees	Value	Degrees	Value	Degrees	Value	Degrees	Value
0		10		20		30		40		50	
60		70		80		90		100		110	
120		130		140		150		160		170	
180		190		200		210		220		230	
240		250		260		270		280		290	
300		310		320		330		340		350	

Additional Azimuths											

Relative Field Polar Plot

NOTE: In addition to the information called for in this section, an explanatory exhibit providing full particulars must be submitted for each question for which a "No" response is provided.

CERTIFICATION

AUXILIARY ANTENNA APPLICANTS ARE NOT REQUIRED TO RESPOND TO ITEMS 13-17. PROCEED TO ITEM 18.

13. **Main Studio Location.** The proposed main studio location complies with 47 C.F.R. Section 73.1125. (•) Yes ( ) No

See Explanation in [Exhibit 15]

14. **Community Coverage.** The proposed facility complies with 47 C.F.R. Section 73.315. (Channels 221 and above) or 47 C.F.R. Section 73.515 (Channels 220 and below). (•) Yes ( ) No

See Explanation in [Exhibit 16]

15. **Interference.** The proposed facility complies with all of the following applicable rule sections. Check all that apply: (•) Yes ( ) No

See Explanation in [Exhibit 17]

Contour Overlap Requirements.
a. [x] 47 C.F.R. Section 73.509
Exhibit Required. [Exhibit 18]

Spacing Requirements.
b. [x] 47 C.F.R. Section 73.207 with respect to station(s)

Grandfathered Short-Spaced.
c. [ ] 47 C.F.R. Section 73.213(a) with respect to station(s)
Exhibit Required. [Exhibit 19]

Contour Protection.
d. [ ] 47 C.F.R. Section 73.215(a) with respect to station(s)
Exhibit Required. [Exhibit 20]

Television Channel 6 Protection.
e. [ ] 47 C.F.R. Section 73.525 with respect to station(s)
Exhibit Required. [Exhibit 21]

16. **Reserved Channels Above 220.**
a. **Availability of Channels.** The proposed facility complies with the assignment requirements of 47 C.F.R. Section 73.203. ( ) Yes ( ) No

See Explanation in [Exhibit 22]

17. **International Borders.** The proposed antenna location is not within 320 kilometers of the common border between the United States and Canada or Mexico. (•) Yes ( ) No ( ) Canada ( ) Mexico

If "No," specify the country and provide an exhibit of compliance with all provisions of the relevant International Agreement. [Exhibit 23]

18. **Environmental Protection Act.** The proposed facility is excluded from environmental processing under 47. C.F.R. Section 1.1306 (i.e., The facility will not have a significant environmental impact and complies with the maximum permissible radiofrequency electromagnetic exposure limits for controlled and uncontrolled environments). Unless the applicant can determine compliance through the use of the RF worksheets in Worksheet #7, an **Exhibit is required.** (•) Yes ( ) No

See Explanation in [Exhibit 24]

By checking "Yes" above, the applicant also certifies that it, in coordination with other users of the site, will reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency electromagnetic exposure in excess of FCC guidelines.

19. **Community of License Change - Section 307(b).** If the application is being submitted to change the facility's community of license, then the applicant certifies that it has attached an exhibit containing information demonstrating that the proposed community of license change comports with the fair distribution of service policies underlying Section 307(b) of the Communications Act of 1934, as amended (47 U.S.C. Section 307(b)). ( ) Yes ( ) No (•) N/A

[Exhibit 25]

An exhibit is required unless this question is not applicable.

PREPARER'S CERTIFICATION ON PAGE 8 MUST BE COMPLETED AND SIGNED.