

# *APPLICATION FOR MODIFICATION OF CONSTRUCTION PERMIT*

---

K246CF - BEAUMONT, TEXAS  
FACILITY ID: 156318  
97.1 MHz / 30 W ERP VPOL DA

E-STRING WIRELESS, LTD

MARCH, 2014

## **APPLICATION FOR MODIFICATION OF CONSTRUCTION PERMIT**

The following engineering statement and attached exhibits have been prepared for **E-String Wireless, Ltd** ("E-String"), permittee of FM translator station K246CF at Beaumont, Texas, and are in support of their application for modification of construction permit.<sup>1</sup> The current construction permit for K246CF is under FCC File No. BNPFT-20130830ASR.

K246CF is currently authorized to be constructed with a maximum effective radiated power of 200 Watts at a center of radiation of 71 meters above mean sea level utilizing a directional antenna. The proposed facility would be relocated from the current site to the taller tower in the KZZB AM directional array.<sup>2</sup> From this location, the proposed facility would operate with a maximum effective radiated power of 30 Watts at a center of radiation of 95 meters above mean sea level. A directional antenna is proposed for this new location, while no change in the channel of operation is proposed.

The parameters specified for the proposed facility represent a minor change to the authorized facility. Exhibit E-1 illustrates the predicted 60 dBu service contour of the proposed facility along with the predicted 60 dBu service contour of the authorized facility. As this map demonstrates, there would be contour overlap between the two facilities.

The proposed facility would serve as a fill-in translator for AM broadcast station KZZB. Exhibit E-2 illustrates the predicted 60 dBu service contour of the proposed facility along with the 2 mV/m daytime contour of KZZB, and a twenty-five mile radius centered on the KZZB site. As this

---

<sup>1</sup> The Facility ID for K246CF at Beaumont, Texas is 156318.

<sup>2</sup> The Facility ID for KZZB at Beaumont, Texas is 40485.

JEREMY RUCK & ASSOCIATES, INC.

P.O. Box 415  
221 S. 1st Avenue  
Canton, IL 61520

Tel: 309.647.1200  
Fax: 855.332.9537  
jeremyruck.com

map demonstrates, the 60 dBu service contour of the proposed translator would be wholly contained within both the KZZB 2 mV/m daytime contour and the twenty-five mile site radius. E-String has executed a retransmission agreement with the licensee of KZZB, which authorizes the rebroadcast of KZZB on K246CF.

The proposed facility would comply with the provisions of Section 74.1204 of the Commission's Rules. Due to the channel of operation, Section 74.1205 is not applicable. Exhibit E-3 is a tabular interference study for the proposed facility. This study demonstrates that contour protection would be met to all relevant facilities, with the exception of KFNC(FM) at Mount Belvieu, Texas , and K244EY at Beaumont, Texas. This tabular interference study is graphically depicted in the contour map in Exhibit E-4.

Although there would be normally prohibited contour overlap between the proposed facility and both KFNC(FM) and K244EY, no interference is predicted to occur to any populated area served by either facility. Exhibit E-5 illustrates the proposed K246F site location along with the KFNC(FM) 74.65 dBu and K244EY 60.50 dBu service contours. As this map demonstrates, both of these contours intersect the proposed translator site. Since the proposed translator would operate second adjacent to both of these facilities, interference to either would potentially occur when the field strength of K246CF is at least 40 dB above the field strength of either translator. Specifically, interference to KFNC(FM) may occur in regions where the K246CF field strength is at least 114.65 dBu, and to K244EY when at least 100.5 dBu. Since the latter field strength is the more restrictive value of the two, it will be utilized as the basis for this interference study.

JEREMY RUCK & ASSOCIATES, INC.

P.O. Box 415  
221 S. 1st Avenue  
Canton, IL 61520

Tel: 309.647.1200  
Fax: 855.332.9537  
jeremyruck.com

The power density for the interfering field strength is given by the following equation:

$$S = \frac{E^2}{Z_0}$$

In this equation, S represents the calculated power density in Watts per square meter, E is the electric field intensity, and  $Z_0$  is the characteristic impedance of free space of 377 ohms.

The power density is also given by:

$$S = \frac{P}{4\pi R^2}$$

Where S is the same units, P is the total power in Watts and R is the distance from the antenna. Rearranging the terms in the equation, it can be solved for the distance to the desired power density as follows:

$$R^2 = \frac{P}{4\pi S}$$

The results of these calculations for depression angles of 0 degrees to 90 degrees are tabulated in Exhibit E-6. The data in this exhibit is based on the use of an antenna that is non-directional in the horizontal plane. Therefore, the calculations represent a worst-case scenario for the proposed facility. As the form pages indicate, the proposed facility would utilize a Scala CL-FM antenna, and utilize vertical polarization only. The relative field values listed in Exhibit E-6 were obtained from published manufacturer data.

The resulting radii values indicate the volume in which interference may potentially occur relative to the center of radiation of the antenna. As the table indicates, a region exists where

JEREMY RUCK & ASSOCIATES, INC.

P.O. Box 415  
221 S. 1st Avenue  
Canton, IL 61520

Tel: 309.647.1200  
Fax: 855.332.9537  
jeremyruck.com

potential interference is predicted to reach ground level. Since the tower site is located outside of an incorporated area, any approach of the interference region closer than 7 meters would have the potential of affecting two story structures. As Exhibit E-6 demonstrates, this region exists in a range of radii from 78 meters to 313 meters from the tower base. For simplicity sake, it will be assumed that all regions within 313 meters of the tower base have the potential to receive interference from the proposed translator.

The following image illustrates the tower location along with a radius of 313 meters. As this satellite image demonstrates, there are no occupied structures or highways within the potential interference area. As a result, zero population would be affected.



**JEREMY RUCK & ASSOCIATES, INC.**

P.O. Box 415  
221 S. 1st Avenue  
Canton, IL 61520

Tel: 309.647.1200  
Fax: 855.332.9537  
jeremyruck.com

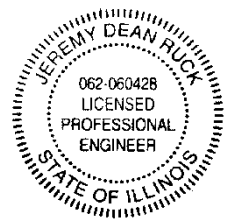
**3.13.2014**

The proposed facility is excluded from environmental processing, and would not constitute a significant environmental impact. The proposed facility would utilize an existing structure that is registered with the Commission. The addition of the translator antenna would not increase the existing environmental impact already present from the structure.

The facility would not constitute a radiofrequency radiation hazard to persons in the vicinity of the structure. Under a worst-case scenario, where the proposed antenna is assumed to radiate uniformly in all directions, the predicted power density at ground level by the equations in OET bulletin 65 does not exceed  $0.116 \mu\text{W}/\text{cm}^2$ . This value is significantly less than the uncontrolled environment condition limit, and therefore does not constitute a hazard.

E-String certifies it will coordinate with all other users of the site to ensure that workers and other personnel are not exposed to levels of radiofrequency radiation in excess of the applicable safety standards. Such coordination may include, but is not necessarily limited to, a reduction in transmitter power, or a cessation of operation.

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, 2015

Jeremy D. Ruck, PE  
March 13, 2014

JEREMY RUCK & ASSOCIATES, INC.

P.O. Box 415  
221 S. 1st Avenue  
Canton, IL 61520

Tel: 309.647.1200  
Fax: 855.332.9537  
jeremyruck.com

3.13.2014

**K246CF.X**

BNPFT20130830ASR  
Latitude: 30-08-57 N  
Longitude: 094-07-59 W  
ERP: 0.03 kW  
Channel: 246  
Frequency: 97.1 MHz  
AMSL Height: 95.0 m  
Horiz. Pattern: Directional  
Vert. Pattern: No  
Prop Model: None

**K246CF.C**

BNPFT20130830ASR  
Latitude: 30-04-43 N  
Longitude: 094-07-51 W  
ERP: 0.20 kW  
Channel: 246  
Frequency: 97.1 MHz  
AMSL Height: 71.0 m  
Horiz. Pattern: Directional  
Vert. Pattern: No  
Prop Model: None

Jeremy Ruck & Associates, Inc.

Authorized 60 dBu  
Service Contour

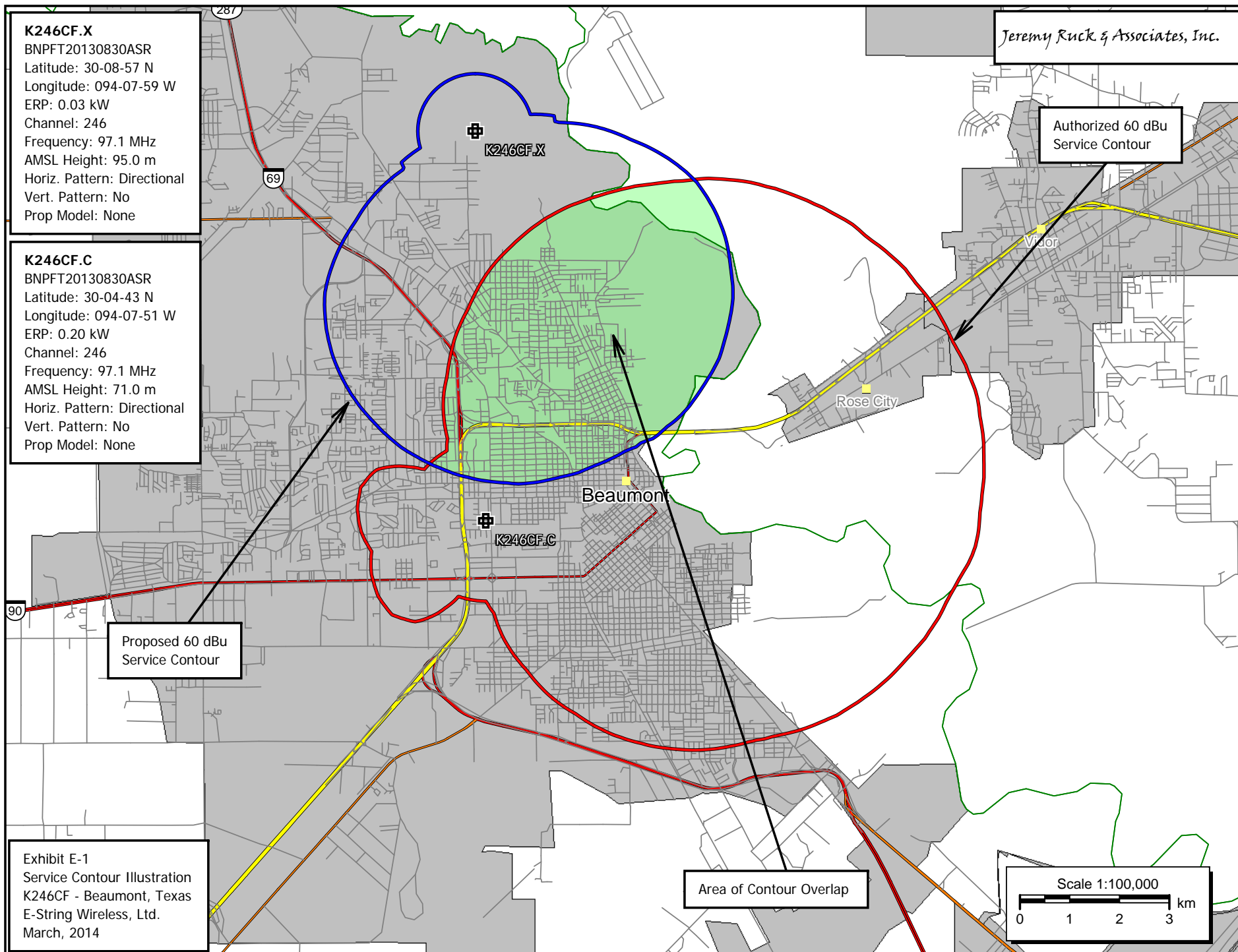
Proposed 60 dBu  
Service Contour

Area of Contour Overlap

Exhibit E-1  
Service Contour Illustration  
K246CF - Beaumont, Texas  
E-String Wireless, Ltd.  
March, 2014

Scale 1:100,000

0 1 2 3 km





**K246CF.X**

BNPFT20130830ASR

Latitude: 30-08-57 N

Longitude: 094-07-59 W

ERP: 0.03 kW

Channel: 246

Frequency: 97.1 MHz

AMSL Height: 95.0 m

Horiz. Pattern: Directional

Vert. Pattern: No

Prop Model: None

KZZB 25 mile  
Site Radius

Jeremy Ruck &amp; Associates, Inc.

KZZB 2 mV/m Daytime  
Service ContourProposed 60 dBu  
Service Contour

Exhibit E-2

Service Contour Comparison

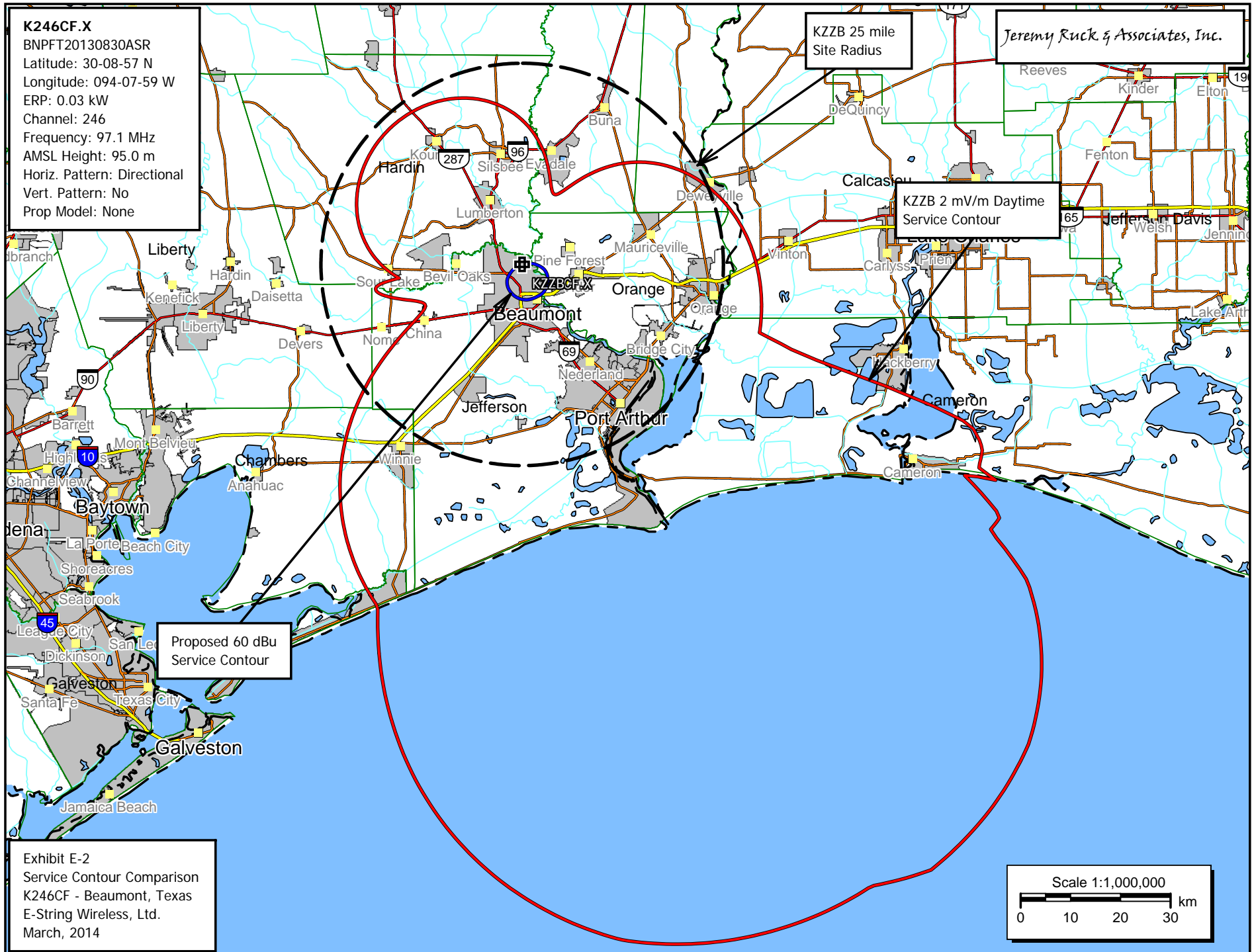
K246CF - Beaumont, Texas

E-String Wireless, Ltd.

March, 2014

Scale 1:1,000,000

0 10 20 30 km





Jeremy Ruck & Associates, Inc.  
Consulting Engineers - Canton, Illinois

Exhibit E-3 - Tabular Interference Study  
K246CF - Beaumont, Texas  
CH# 246D - 97.1 MHz, Pwr= 0.03 kW DA, HAAT= 88.8 M, COR= 95 M  
Average Protected F(50-50)= 7.17 km  
Standard Directional

DISPLAY DATES  
DATA 03-13-14  
SEARCH 03-13-14

REFERENCE  
30 08 57.0 N.  
94 07 59.0 W.

CH CITY	CALL	TYPE ANT STATE	AZI <--	DIST FILE #	LAT LNG	PWR(kW) HAAT(M)	INT(km) COR(M)	PRO(km) LICENSEE	*IN* (Overlap in km)	*OUT*
246C Cleveland	KTHT	LIC_C_ TX	297.0 116.6	95.11 BLH20001031AAA	30 32 06.0 95 01 04.0	100.000 563	196.7 609	91.2 Cox Radio, Inc.	-102.9*	0.1
248C Mont Belvieu	KFNC	LIC_CX TX	207.4 27.3	56.50 BLH20120716AFA	29 41 52.0 94 24 09.0	100.000 597	13.6 598	91.6 Gow Communications, L.L.C.	36.6	-35.3*
246D Beaumont	K246CF	CP_DC_ TX	178.4 358.4	7.84 BNPFT20130830ASR	30 04 43.0 94 07 51.0	0.200 66	32.7 71	4.7 E-string Wireless, Ltd	-30.9*	-21.5
244D Beaumont	K244EY	CP_C_ TX	177.9 357.9	8.22 BNPFT20130830ARB	30 04 31.0 94 07 48.0	0.100 67	0.7 72	8.5 Black Media Works, Inc.	0.5	-0.6*
243D Pinehurst	K243AV	CP_C_ TX	88.2 268.4	31.81 BPFT20130419ABD	30 09 28.0 93 48 08.0	0.098 159	0.7 162	12.8 Educational Media Foundati	26.2	19.0
245L1 Port Arthur	KSAP-LP	LIC____ TX	148.6 328.7	36.20 BLL20120822ABS	29 52 16.0 93 56 14.0	0.100 17	17	21.1 Truth And Education		20.5
245D Buna	K245BT	CP_C_ TX	33.4 213.6	45.11 BNPFT20130813AAL	30 29 15.0 93 52 25.0	0.250 73	15.7 90	10.9 Gerald R. Proctor	27.9	32.6
243D Vinton	K243AV	LIC_C_ LA	83.4 263.7	48.82 BLFT20070702BAN	30 11 55.0 93 37 42.0	0.205 97	1.0 100	12.0 Educational Media Foundati	43.2	36.8

Terrain database is NED 03 SEC, R= 73.215 qualifying spacings or FCC minimum Spacings in KM, M= Margin in KM  
In & Out distances between contours are shown at closest points. Reference zone= West Zone, Co to 3rd adjacent.  
Ant Column: (D= DA Standard, Z= DA 73.215, N= Not DA 73.215, \_= Omni), Polarization (C,H,V,E), Beamtilt(Y,N,X)  
\*\*\*affixed to 'IN' or 'OUT' values = site inside protected contour.  
Reference station has protected zone issue:

**K246CF.X**

BNPFT20130830ASR

Latitude: 30-08-57 N

Longitude: 094-07-59 W

ERP: 0.03 kW

Channel: 246

Frequency: 97.1 MHz

AMSL Height: 95.0 m

Elevation: 2.746 m

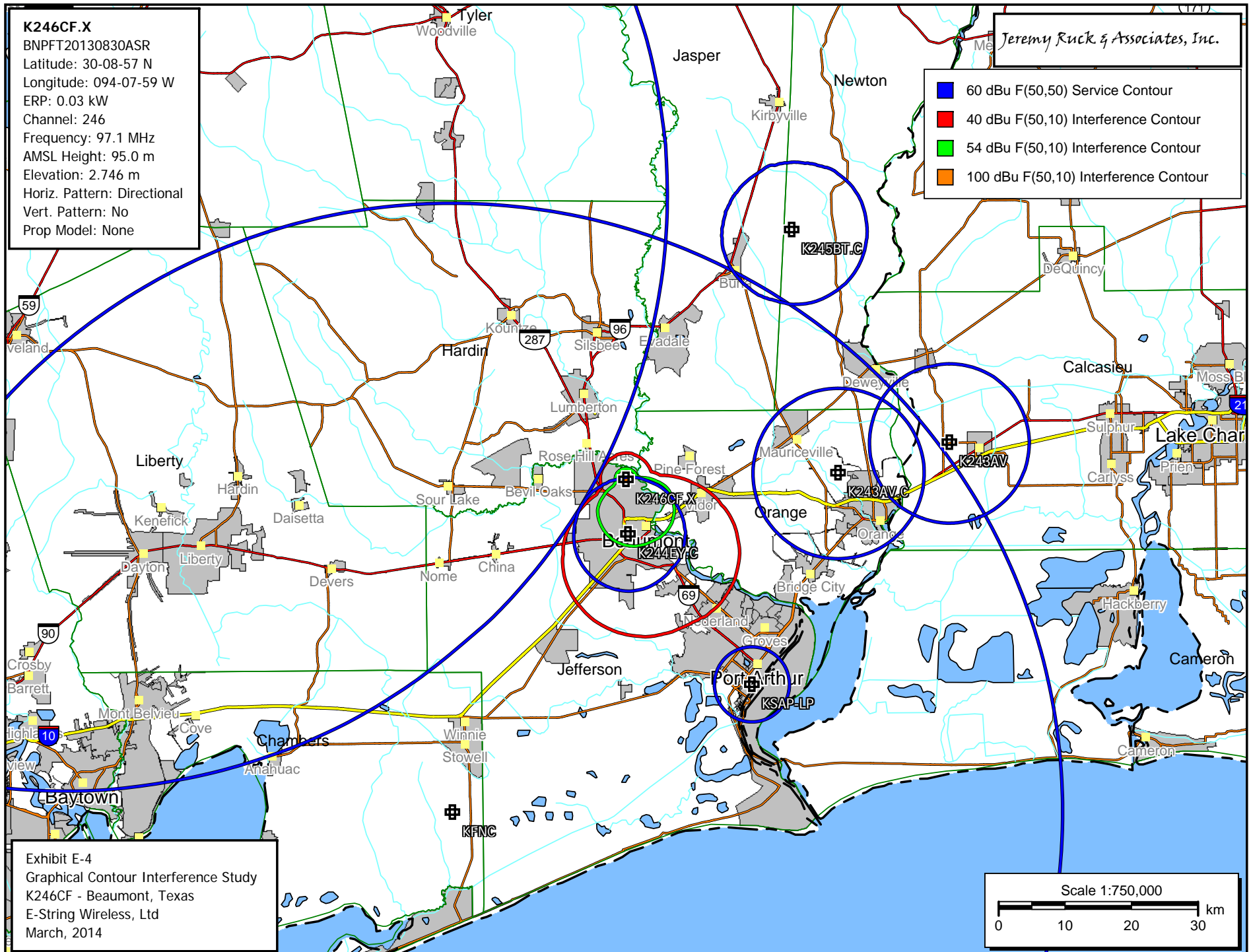
Horiz. Pattern: Directional

Vert. Pattern: No

Prop Model: None

Jeremy Ruck &amp; Associates, Inc.

- 60 dBu F(50,50) Service Contour
- 40 dBu F(50,10) Interference Contour
- 54 dBu F(50,10) Interference Contour
- 100 dBu F(50,10) Interference Contour



**K246CF.X**

BNPFT20130830ASR  
Latitude: 30-08-57 N  
Longitude: 094-07-59 W  
ERP: 0.03 kW  
Channel: 246  
Frequency: 97.1 MHz  
AMSL Height: 95.0 m  
Horiz. Pattern: Directional  
Vert. Pattern: No  
Prop Model: None

**KFNC**

BLH20120716AFA  
Latitude: 29-41-52 N  
Longitude: 094-24-09 W  
ERP: 100.00 kW  
Channel: 248  
Frequency: 97.5 MHz  
AMSL Height: 598.0 m  
Horiz. Pattern: Omni  
Vert. Pattern: No  
Prop Model: None

**K244EY.C**

BNPFT20130830ARB  
Latitude: 30-04-31 N  
Longitude: 094-07-48 W  
ERP: 0.10 kW  
Channel: 244  
Frequency: 96.7 MHz  
AMSL Height: 72.0 m  
Horiz. Pattern: Omni  
Vert. Pattern: No  
Prop Model: None

Exhibit E-5  
Interference Study  
K246CF - Beaumont, Texas  
E-String Wireless, Ltd  
March, 2014

Jeremy Ruck & Associates, Inc.

FCC F(50-50) 74.65 dBu (FCC HAAT)

KFNC 74.65 dBu  
Service Contour

FCC F(50-50) 60.50 dBu (FCC HAAT)

K244EY 60.5 dBu  
Service Contour

Scale 1:187,500

0 2 4 6 km

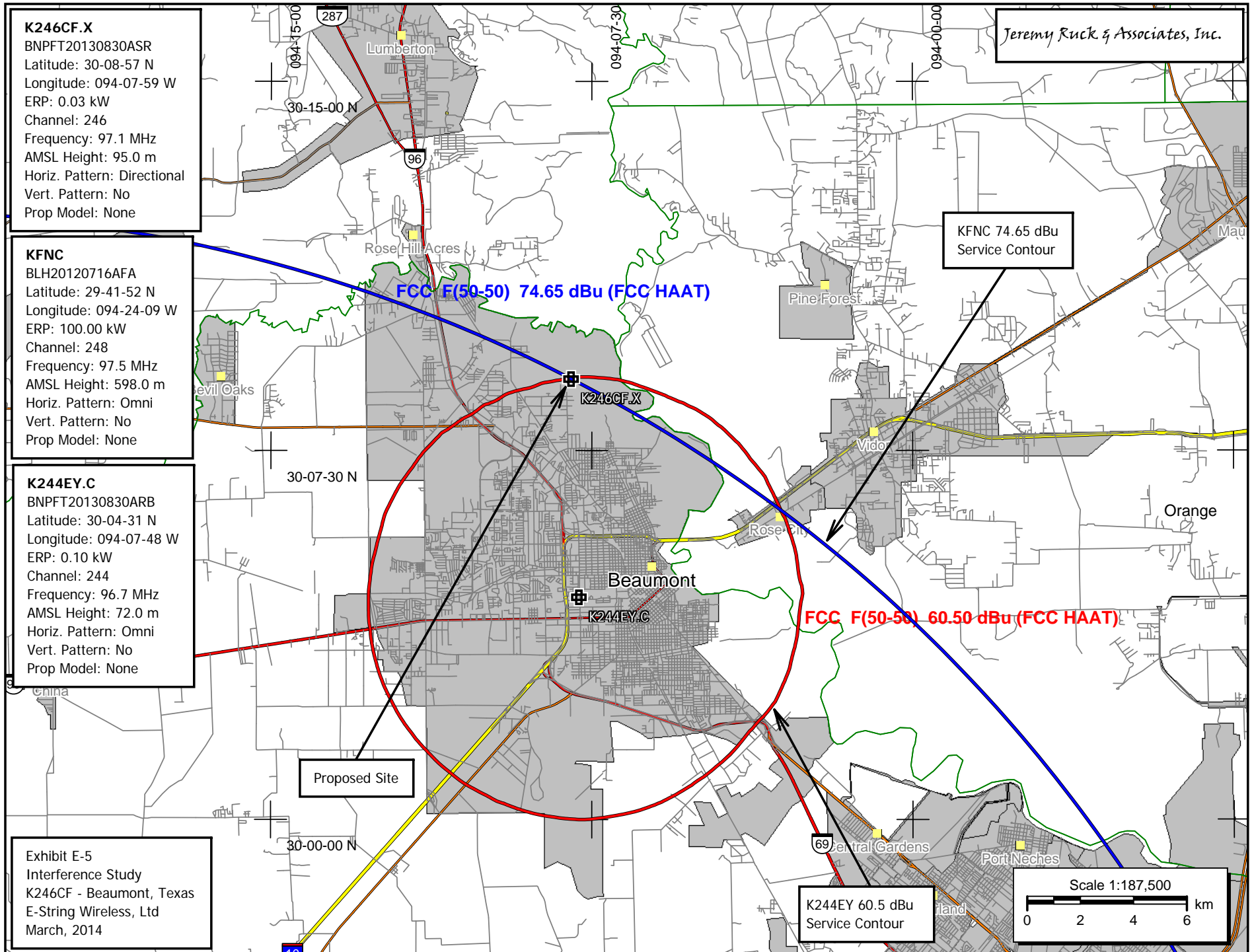
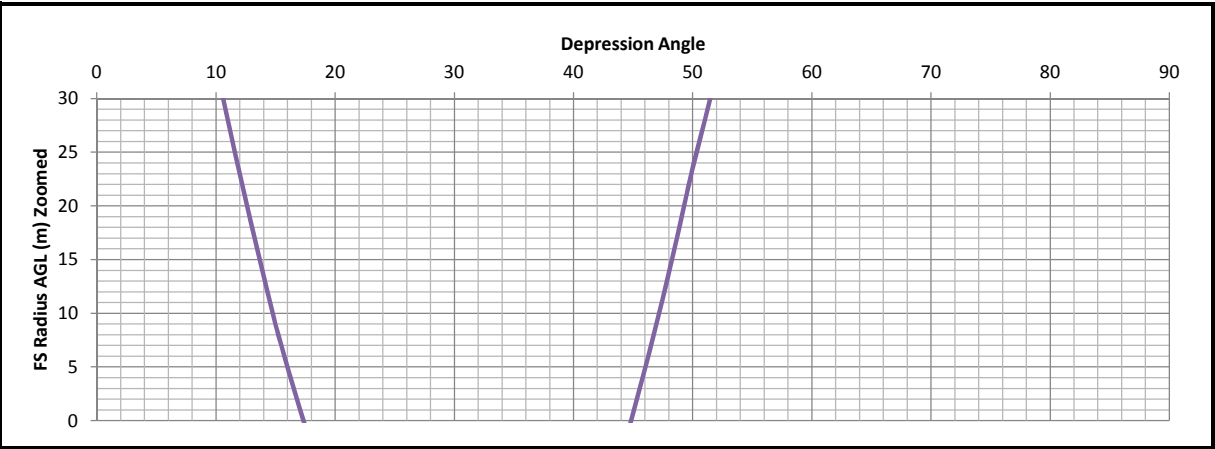
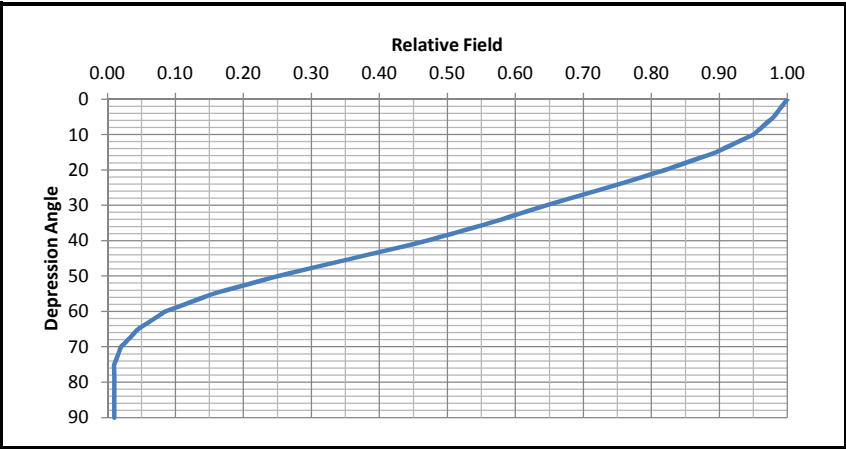


Exhibit E-6

Proximity Interference Analysis

K246CF - Beaumont, Texas

Antenna No:	67	↕	↕	Center of Radiation:	93 m AGL
Manufacturer:	Scala	↕↕↕		Effective Radiated Power:	30 Watts
Model:	CL-FM(V)			FS Contour:	100.5 dBu
Number of Bays:	1			E Field Strength:	0.10593 V/m
Bay Spacing:	Log			Z0 (Ohms):	377 Ohms
				Power Density:	2.97618E-05 W/m^2



Depression Angle	Relative Field	Relative Power	ERP Watts	Radii in meters			
				Field Strength	Horizontal	Vertical	AGL
0	1.0000	1.0000	30.00	362.70	362.70	0.00	93.00
1	0.9960	0.9920	29.76	361.25	361.19	6.30	86.70
2	0.9920	0.9841	29.52	359.80	359.58	12.56	80.44
3	0.9880	0.9761	29.28	358.35	357.86	18.75	74.25
4	0.9840	0.9683	29.05	356.90	356.03	24.90	68.10
5	0.9800	0.9604	28.81	355.45	354.09	30.98	62.02
6	0.9740	0.9487	28.46	353.27	351.34	36.93	56.07
7	0.9680	0.9370	28.11	351.09	348.48	42.79	50.21
8	0.9620	0.9254	27.76	348.92	345.52	48.56	44.44
9	0.9560	0.9139	27.42	346.74	342.47	54.24	38.76
10	0.9500	0.9025	27.08	344.57	339.33	59.83	33.17
11	0.9390	0.8817	26.45	340.58	334.32	64.98	28.02
12	0.9280	0.8612	25.84	336.59	329.23	69.98	23.02
13	0.9170	0.8409	25.23	332.60	324.07	74.82	18.18
14	0.9060	0.8208	24.63	328.61	318.85	79.50	13.50
15	0.8950	0.8010	24.03	324.62	313.56	84.02	8.98
16	0.8800	0.7744	23.23	319.18	306.81	87.98	5.02
17	0.8650	0.7482	22.45	313.74	300.03	91.73	1.27
18	0.8500	0.7225	21.68	308.30	293.21	95.27	-2.27
19	0.8350	0.6972	20.92	302.86	286.36	98.60	-5.60
20	0.8200	0.6724	20.17	297.41	279.48	101.72	-8.72
21	0.8030	0.6448	19.34	291.25	271.90	104.37	-11.37
22	0.7860	0.6178	18.53	285.08	264.32	106.79	-13.79
23	0.7690	0.5914	17.74	278.92	256.74	108.98	-15.98
24	0.7520	0.5655	16.97	272.75	249.17	110.94	-17.94
25	0.7350	0.5402	16.21	266.58	241.61	112.66	-19.66
26	0.7170	0.5141	15.42	260.06	233.74	114.00	-21.00
27	0.6990	0.4886	14.66	253.53	225.89	115.10	-22.10
28	0.6810	0.4638	13.91	247.00	218.09	115.96	-22.96
29	0.6630	0.4396	13.19	240.47	210.32	116.58	-23.58
30	0.6450	0.4160	12.48	233.94	202.60	116.97	-23.97
31	0.6280	0.3944	11.83	227.78	195.24	117.31	-24.31
32	0.6120	0.3745	11.24	221.97	188.24	117.63	-24.63
33	0.5950	0.3540	10.62	215.81	180.99	117.54	-24.54
34	0.5790	0.3352	10.06	210.00	174.10	117.43	-24.43
35	0.5620	0.3158	9.48	203.84	166.97	116.92	-23.92
36	0.5440	0.2959	8.88	197.31	159.63	115.98	-22.98
37	0.5250	0.2756	8.27	190.42	152.07	114.60	-21.60
38	0.5070	0.2570	7.71	183.89	144.91	113.21	-20.21
39	0.4880	0.2381	7.14	177.00	137.55	111.39	-18.39
40	0.4700	0.2209	6.63	170.47	130.59	109.58	-16.58
41	0.4480	0.2007	6.02	162.49	122.63	106.60	-13.60
42	0.4260	0.1815	5.44	154.51	114.82	103.39	-10.39
43	0.4040	0.1632	4.90	146.53	107.17	99.93	-6.93
44	0.3820	0.1459	4.38	138.55	99.67	96.25	-3.25
45	0.3600	0.1296	3.89	130.57	92.33	92.33	0.67

Depression Angle	Relative Field	Relative Power	ERP Watts	Radii in meters			
				Field Strength	Horizontal	Vertical	AGL
45	0.3600	0.1296	3.89	130.57	92.33	92.33	0.67
46	0.3380	0.1142	3.43	122.59	85.16	88.19	4.81
47	0.3160	0.0999	3.00	114.61	78.17	83.82	9.18
48	0.2940	0.0864	2.59	106.63	71.35	79.24	13.76
49	0.2720	0.0740	2.22	98.65	64.72	74.46	18.54
50	0.2500	0.0625	1.88	90.68	58.28	69.46	23.54
51	0.2310	0.0534	1.60	83.78	52.73	65.11	27.89
52	0.2120	0.0449	1.35	76.89	47.34	60.59	32.41
53	0.1930	0.0372	1.12	70.00	42.13	55.91	37.09
54	0.1740	0.0303	0.91	63.11	37.10	51.06	41.94
55	0.1550	0.0240	0.72	56.22	32.25	46.05	46.95
56	0.1410	0.0199	0.60	51.14	28.60	42.40	50.60
57	0.1270	0.0161	0.48	46.06	25.09	38.63	54.37
58	0.1130	0.0128	0.38	40.99	21.72	34.76	58.24
59	0.0990	0.0098	0.29	35.91	18.49	30.78	62.22
60	0.0850	0.0072	0.22	30.83	15.41	26.70	66.30
61	0.0770	0.0059	0.18	27.93	13.54	24.43	68.57
62	0.0690	0.0048	0.14	25.03	11.75	22.10	70.90
63	0.0610	0.0037	0.11	22.12	10.04	19.71	73.29
64	0.0530	0.0028	0.08	19.22	8.43	17.28	75.72
65	0.0450	0.0020	0.06	16.32	6.90	14.79	78.21
66	0.0400	0.0016	0.05	14.51	5.90	13.25	79.75
67	0.0350	0.0012	0.04	12.69	4.96	11.69	81.31
68	0.0300	0.0009	0.03	10.88	4.08	10.09	82.91
69	0.0250	0.0006	0.02	9.07	3.25	8.47	84.53
70	0.0200	0.0004	0.01	7.25	2.48	6.82	86.18
71	0.0180	0.0003	0.01	6.53	2.13	6.17	86.83
72	0.0160	0.0003	0.01	5.80	1.79	5.52	87.48
73	0.0140	0.0002	0.01	5.08	1.48	4.86	88.14
74	0.0120	0.0001	0.00	4.35	1.20	4.18	88.82
75	0.0100	0.0001	0.00	3.63	0.94	3.50	89.50
76	0.0100	0.0001	0.00	3.63	0.88	3.52	89.48
77	0.0100	0.0001	0.00	3.63	0.82	3.53	89.47
78	0.0100	0.0001	0.00	3.63	0.75	3.55	89.45
79	0.0100	0.0001	0.00	3.63	0.69	3.56	89.44
80	0.0100	0.0001	0.00	3.63	0.63	3.57	89.43
81	0.0100	0.0001	0.00	3.63	0.57	3.58	89.42
82	0.0100	0.0001	0.00	3.63	0.50	3.59	89.41
83	0.0100	0.0001	0.00	3.63	0.44	3.60	89.40
84	0.0100	0.0001	0.00	3.63	0.38	3.61	89.39
85	0.0100	0.0001	0.00	3.63	0.32	3.61	89.39
86	0.0100	0.0001	0.00	3.63	0.25	3.62	89.38
87	0.0100	0.0001	0.00	3.63	0.19	3.62	89.38
88	0.0100	0.0001	0.00	3.63	0.13	3.62	89.38
89	0.0100	0.0001	0.00	3.63	0.06	3.63	89.37
90	0.0100	0.0001	0.00	3.63	0.00	3.63	89.37

