APPLICATION FOR CONSTRUCTION PERMIT

FM TRANSLATOR STATION K246CF
BEAUMONT, TEXAS
107.7 MHZ / 0.001 KW ERP

E-STRING WIRELESS, LTD

AUGUST, 2014

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APPLICATION FOR CONSTRUCTION PERMIT

The following engineering statement and attached exhibits have been prepared for **E-String Wireless, Ltd.** ("E-String"), licensee of FM translator station K246CF at Beaumont, Texas, and are in support of their application for construction permit.[1] This application seeks to modify the licensed K246CF facilities under FCC File No. BLFT-20140707ABZ. The technical facilities in this application represent an interim step necessary for compliance with the Commission's Rules. Upon the completion of construction of the facilities described in this application, E-String will seek to change the channel of operation once more to the planned final technical facilities.

The original application for K246CF was filed during the 2003 FM Translator filing window. During the settlement period in 2013, E-String amended the pending application to remove mutual exclusivity with another pending applicant. The original construction permit for K246CF was modified to relocate it to the KZZB antenna north of Beaumont, Texas. K246CF is authorized as, and continues to be intended to function as a fill-in translator for KZZB, which is an AM facility operating on 990 kHz.[2]

Following grants of the K246CF construction permits, an objection to the grant was raised by the licensee of KTHT(FM) at Cleveland, Texas.[3] KTHT(FM) operates co-channel to the authorized K246CF facilities, and as the engineering exhibits for the K246CF applications demonstrate, the translator 40 dBu F(50,10) interfering contour lies in close proximity to the KTHT(FM) 60 dBu F(50,50) service contour. Due to the proximity of these two contours, the

[1] The Facility ID for K246CF at Beaumont, Texas is 156318.
[2] The nighttime interference-free field strength value for KZZB is 15.13 mV/m.
[3] The Facility ID for KTHT(FM) at Cleveland, Texas is 65308.

potential for interference to KTHT(FM) would potentially be greater than if a greater distance existed between the contours.

In order to mitigate the potential interference to KTHT(FM) from K246CF, and to provide AM fill-in service for KZZB, E-String is proposing two sequential minor changes to the currently authorized K246CF facilities. Both sequential steps in this process would utilize the existing authorized site for K246CF, which is co-located with the primary station for the translator, AM station KZZB at Beaumont, Texas. These two steps consist of the initial channel change proposed under this application, with a subsequent additional channel change. Through this process, the interest of the public would be served, as the potential interference to KTHT(FM) would be eliminated, and important AM fill-in service for KZZB would be achieved. That facility is plagued during nighttime operations by a high interference-field strength. KZZB is an important ethnic programming outlet for the residents of the Beaumont region.

The facility proposed under this application would operate on FM channel 299 with an effective radiated power of 1 Watt vertically polarized. The proposed center of radiation would continue to be located at 93 meters above ground level, which is the currently authorized elevation. The site elevation is 2 meters above mean sea level, thus the proposed center of radiation is 95 meters above mean sea level.

The currently authorized K246CF antenna is a directional log-periodic antenna. This antenna, which is authorized with orientation at 163 degrees true, would continue to be utilized. Although the model of the directional antenna would not change, the antenna would be rotated to

an orientation of 0 degrees true in order to comply with the provisions of Section 74.1204 of the Commission's Rules.

The proposed changes in the technical parameters of the facility would be considered a minor change. Exhibit E-1 illustrates the authorized and proposed 60 dBu service contours. As this map demonstrates, the predicted 60 dBu service contour for the proposed facility would overlap the authorized 60 dBu service contour.

The proposed facility would continue as an AM fill-in translator. Exhibit E-2 illustrates the proposed 60 dBu service contour along with the KZZB 2 mV/m daytime service contour, and a twenty-five mile radius centered on the transmitter location of KZZB. As this exhibit demonstrates, the predicted 60 dBu service contour would be wholly contained within both of these constructs.

The proposed facility would comply with the provisions of Section 74.1204 of the Commission's Rules. Exhibit E-3 is a tabular based interference study for the proposed facility. This study demonstrates that the proposed facility would comply with all of the contour overlap provisions of Section 74.1204 of the Commission's Rules, with the exception of those to KQQK at Beaumont, TX.[4]

Although there would be normally prohibited contour overlap between the proposed facility at KQQK(FM) at Beaumont, Texas, the potential interference region would affect zero population. Exhibit E-5 illustrates the predicted 80.53 dBu service contour of KQQK along with the proposed

[4] The Facility ID for KQQK(FM) at Beaumont, Texas is 19087.

site. As this map demonstrates, the predicted 80.53 dBu service contour of KQQK would intersect the proposed site.

Since K246CF would operate on a channel first adjacent to KQQK(FM), interference to KQQK would potentially occur in regions where the field strength of KQQK is less than 6 dB above the field strength of K246CF. Specifically, this would occur in regions where K246CF is predicted to have a field strength of at least 74.53 dBu.

The power density for the proposed facility 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, Z_0 is the characteristic impedance of free space.

The power density is also given by:

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

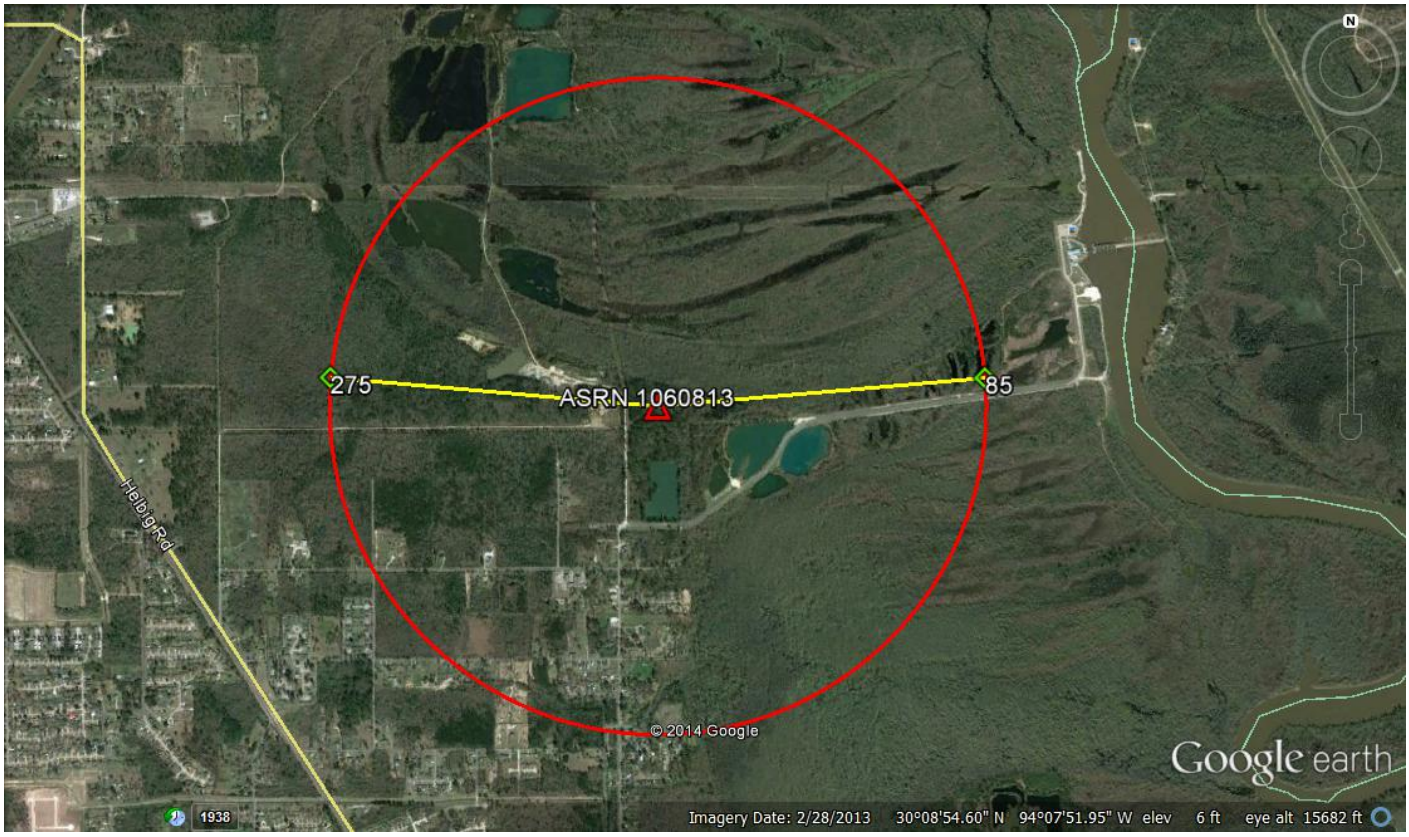
Where S is the same units, P is the power in Watts and R is the distance from the antenna. Rearranging the terms in the equation, it can be solved for the distance to the desired power density as follows:

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

The antenna utilized by the proposed K246CF facility is directional. As a result of the directionality of the antenna, the D/U ratio study will be considered in two parts. The first section is where the relative field from the proposed K246CF antenna is assumed to have a value of 1.0 at all points in the azimuth range of 275 degrees true clockwise to 85 degrees true. The second portion is where the relative field value is assumed to have a value of 0.03, which occurs at all points within the arc of 85 degrees clockwise to 275 degrees true. In this second case, the relative field value is based on the actual data from the manufacturer, while in the first case, the relative field is assumed to be 1.0 to provide a worst case-analysis.

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 assumption of a relative field value of 1.0, and this represents a worst-case scenario. As indicated in this exhibit, regions where the predicted worst-case interference would occur at less than 7 meters above ground are contained within a radius of 1292.5 meters from the tower base. These regions are assumed to exist in within the arc of 275 degrees true clockwise to 85 degrees true.

The following satellite photograph illustrates a 1292.5 meter radius centered on the tower location. In this photograph, it can be seen that in the region of 275 degrees true to 85 degrees true moving clockwise, there are no structures or populated areas.



The following image provides additional detail in the vicinity of the light colored areas to the west-northwest of the tower location. The tower location is indicated by the red triangle with the "ASRN" designation. As depicted, these regions contain no structures.

In the arc where the azimuth ranges from 85 degrees true to 275 degrees true, the relative field of the directional antenna is 0.03. This corresponds to a relative power of 0.009, or an effective radiated power of 0.009 Watts along these azimuths. Exhibit E-7 provides the proximity analysis for this region. As indicated in this tabulation, the potential interference region would lie well above ground, and in the immediate vicinity of the transmit antenna. It can be reasonably inferred from the initial satellite photograph and the tabulation that no population exists in this potential interference region.

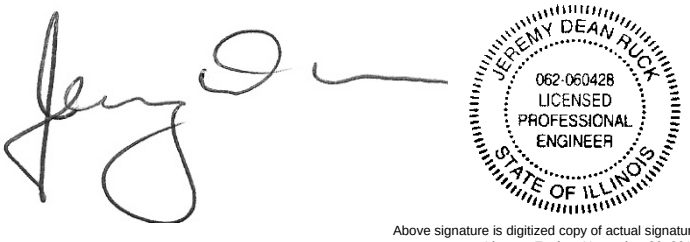
Since no regions where a potential interference situation would exist are present, the proposed facility would comply with the provisions of Section 74.1204(d).

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

Additionally, the proposed facility would not result in a radiofrequency radiation exposure hazard to persons at the site. Under a worst-case analysis pursuant to the equations in Appendix A of *OET Bulletin 65*, the calculated power density at two meters above ground is 0.00403 $\mu W/cm^2$. This value is considerably less than the upper limit permissible under the uncontrolled environment condition. This value is also substantially small enough to categorically exclude the facility.

E-String certifies that 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 will include, but is not necessarily limited to, a reduction in transmitter power, or 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
August 14, 2014

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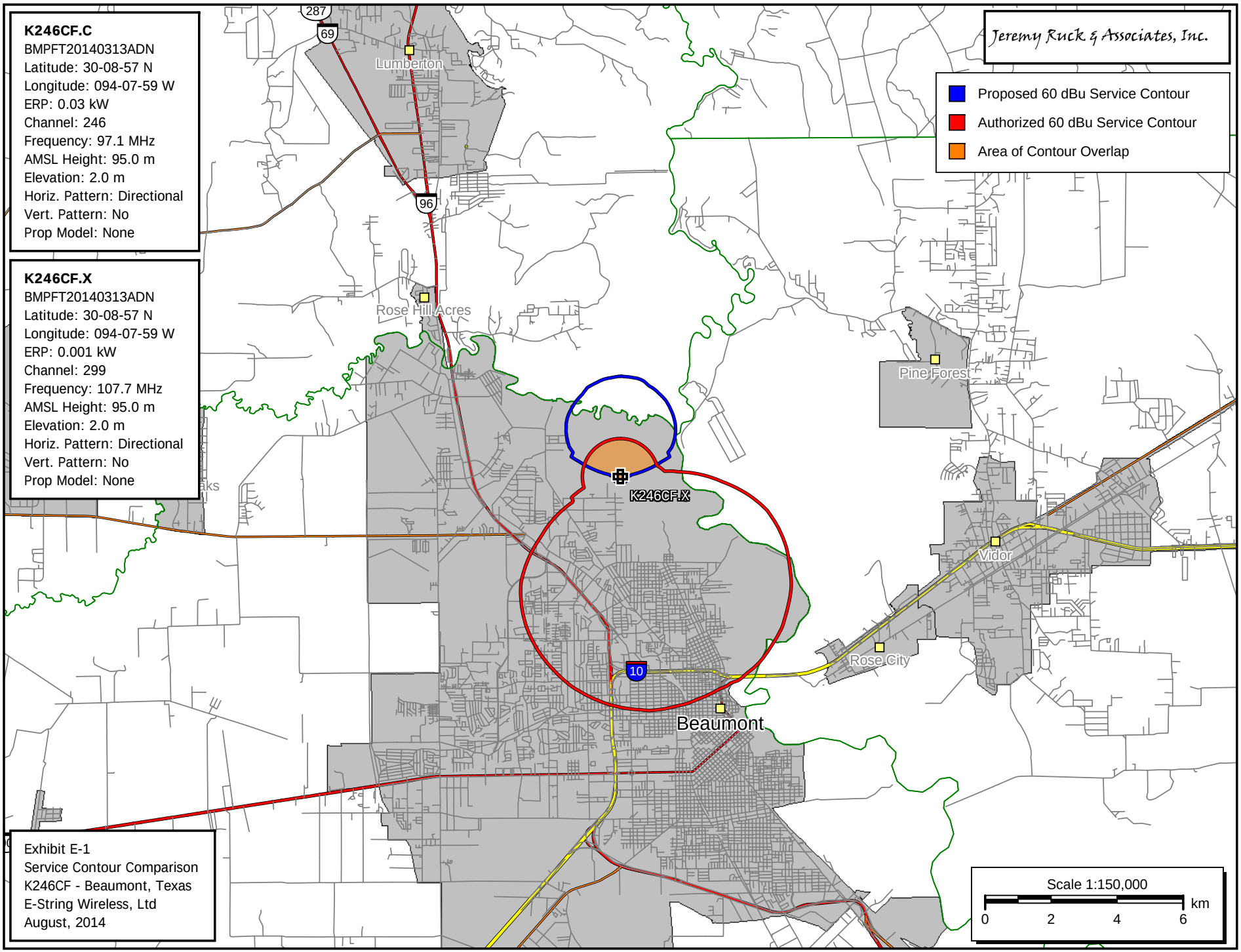

K246CF.C
BMPFT20140313ADN
Latitude: 30-08-57 N
Longitude: 094-07-59 W
ERP: 0.03 kW
Channel: 246
Frequency: 97.1 MHz
AMSL Height: 95.0 m
Elevation: 2.0 m
Horiz. Pattern: Directional
Vert. Pattern: No
Prop Model: None
K246CF.X
BMPFT20140313ADN
Latitude: 30-08-57 N
Longitude: 094-07-59 W
ERP: 0.001 kW
Channel: 299
Frequency: 107.7 MHz
AMSL Height: 95.0 m
Elevation: 2.0 m
Horiz. Pattern: Directional
Vert. Pattern: No
Prop Model: None
Jeremy Ruck & Associates, Inc.
Proposed 60 dBu Service Contour
Authorized 60 dBu Service Contour
Area of Contour Overlap
Lumberton
Rose Hill Acres
Pine Forest
Vidor
Rose City
Beaumont
K246CF.X
287
69
96
10
Exhibit E-1
Service Contour Comparison
K246CF - Beaumont, Texas
E-String Wireless, Ltd
August, 2014
Scale 1:150,000
0
2
4
6
km

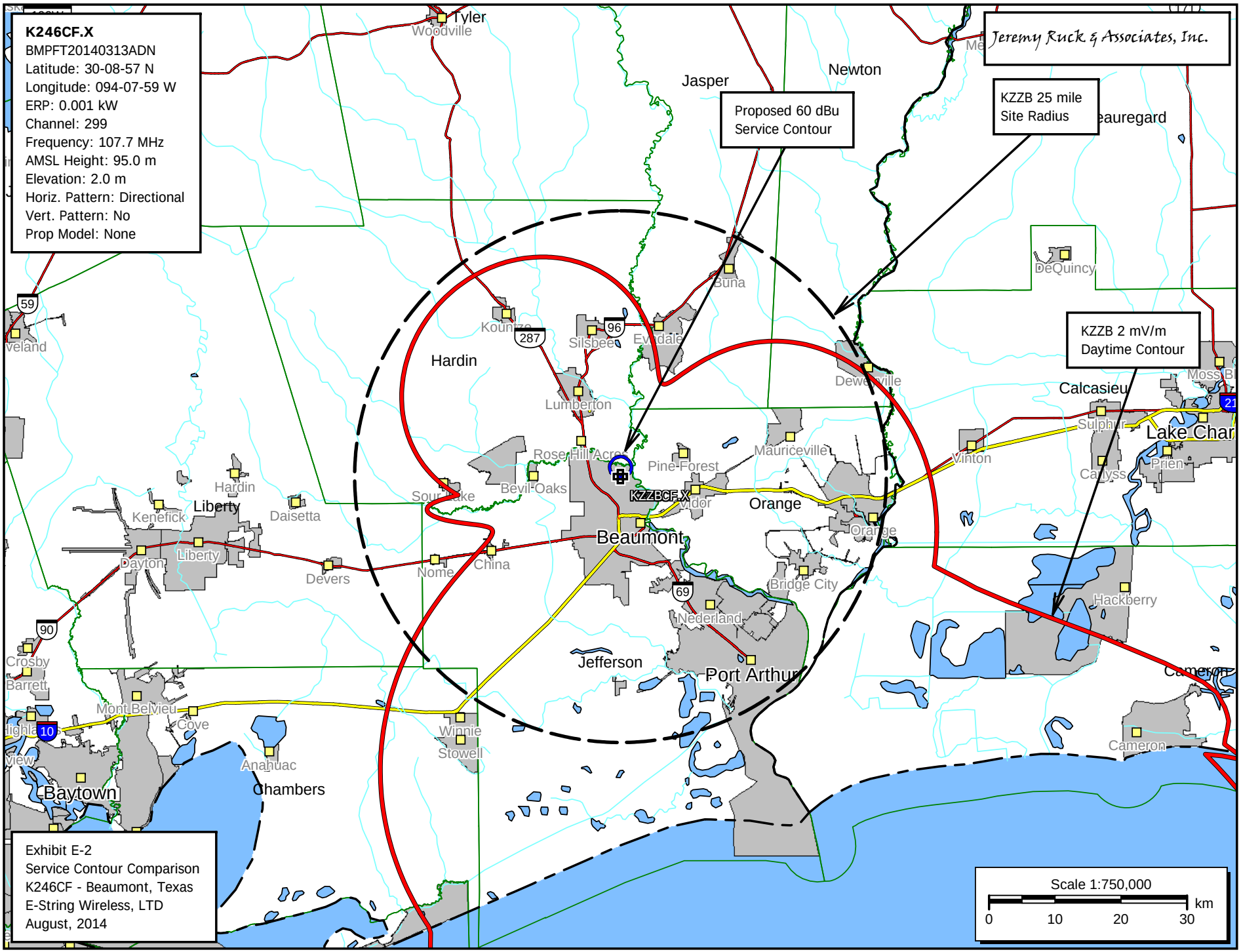


Exhibit E-2
Service Contour Comparison
K246CF - Beaumont, Texas
E-String Wireless, LTD
August, 2014

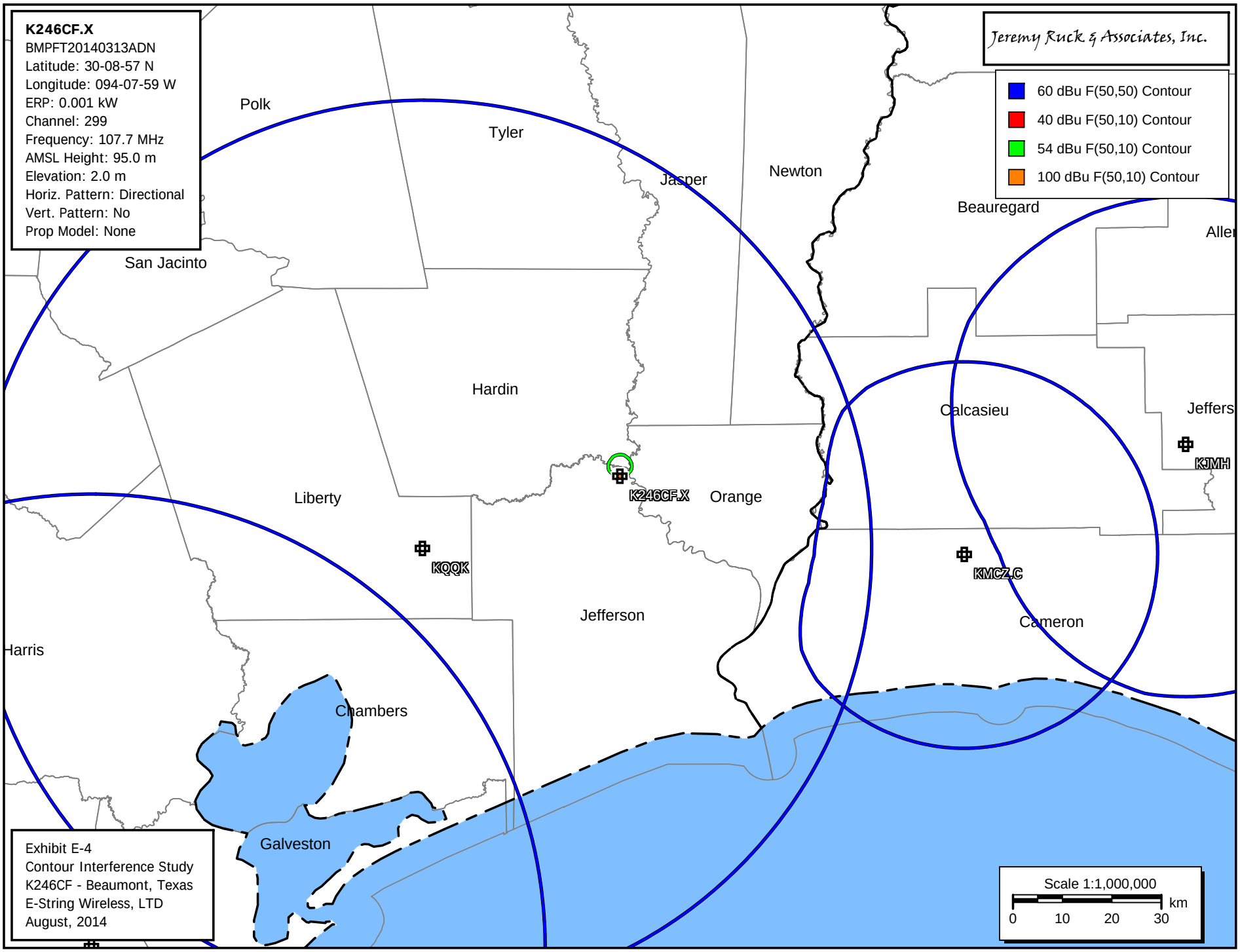
Jeremy Ruck & Associates, Inc.
Consulting Engineers - Canton, Illinois

Exhibit E-3 - Tabular Interference Study
K246CF - Beaumont, Texas

REFERENCE CH# 299D - 107.7 MHz, Pwr= 0.001 kW DA, HAAT= 88.8 M, COR= 95 M DISPLAY DATES
30 08 57.0 N. Average Protected F(50-50)= 2.98 km DATA 08-13-14
94 07 59.0 W. Standard Directional SEARCH 08-14-14

CH CITY	CALL STATE	TYPE	ANT <--	AZI	DIST FILE #	LAT LNG	PWR(kW) HAAT(M)	INT(km) COR(M)	PRO(km) LICENSEE	*IN* (Overlap in km)	*OUT*
300C Beaumont	KQQK TX	LIC	NCX	249.8 69.6	42.39 BMLH20071113AGR	30 01 01.0 94 32 47.0	90.000 596	134.8 611	90.7 Liberman Broadcasting Of H	-93.5*	-48.7*
298C Lake Jackson	KGLK TX	LIC	_C_	228.2 47.6	142.89 BMLH20040903ABA	29 17 16.0 95 13 53.0	98.000 601	136.1 604	91.5 Cox Radio, Inc.	6.1	51.0
296C3 Cameron	KMCZ LA	CP	ZCX	102.9 283.2	71.18 BNPH20120529ACI	30 00 17.0 93 24 44.0	16.500 124	2.9 124	30.2 Valleydale Broadcasting, L	67.0	41.0
298C2 Lake Arthur	KJMH LA	LIC	ZC_	86.8 267.4	114.20 BLH19980902KA	30 12 07.0 92 56 47.0	50.000 141	69.7 143	46.2 Townsquare Media Lake Char	42.8	67.0

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
BMPFT20140313ADN
Latitude: 30-08-57 N
Longitude: 094-07-59 W
ERP: 0.001 kW
Channel: 299
Frequency: 107.7 MHz
AMSL Height: 95.0 m
Elevation: 2.0 m
Horiz. Pattern: Directional
Vert. Pattern: No
Prop Model: None
Jeremy Ruck & Associates, Inc.
60 dBu F(50,50) Contour
40 dBu F(50,10) Contour
54 dBu F(50,10) Contour
100 dBu F(50,10) Contour
Polk
Tyler
Jasper
Newton
Beauregard
San Jacinto
Hardin
Liberty
Orange
Calcasieu
Jeffers
KJMH
K246CF.X
KQQK
KMCZ-C
Jefferson
Cameron
Harris
Chambers
Galveston
Exhibit E-4
Contour Interference Study
K246CF - Beaumont, Texas
E-String Wireless, LTD
August, 2014
Scale 1:1,000,000
0 10 20 30 km

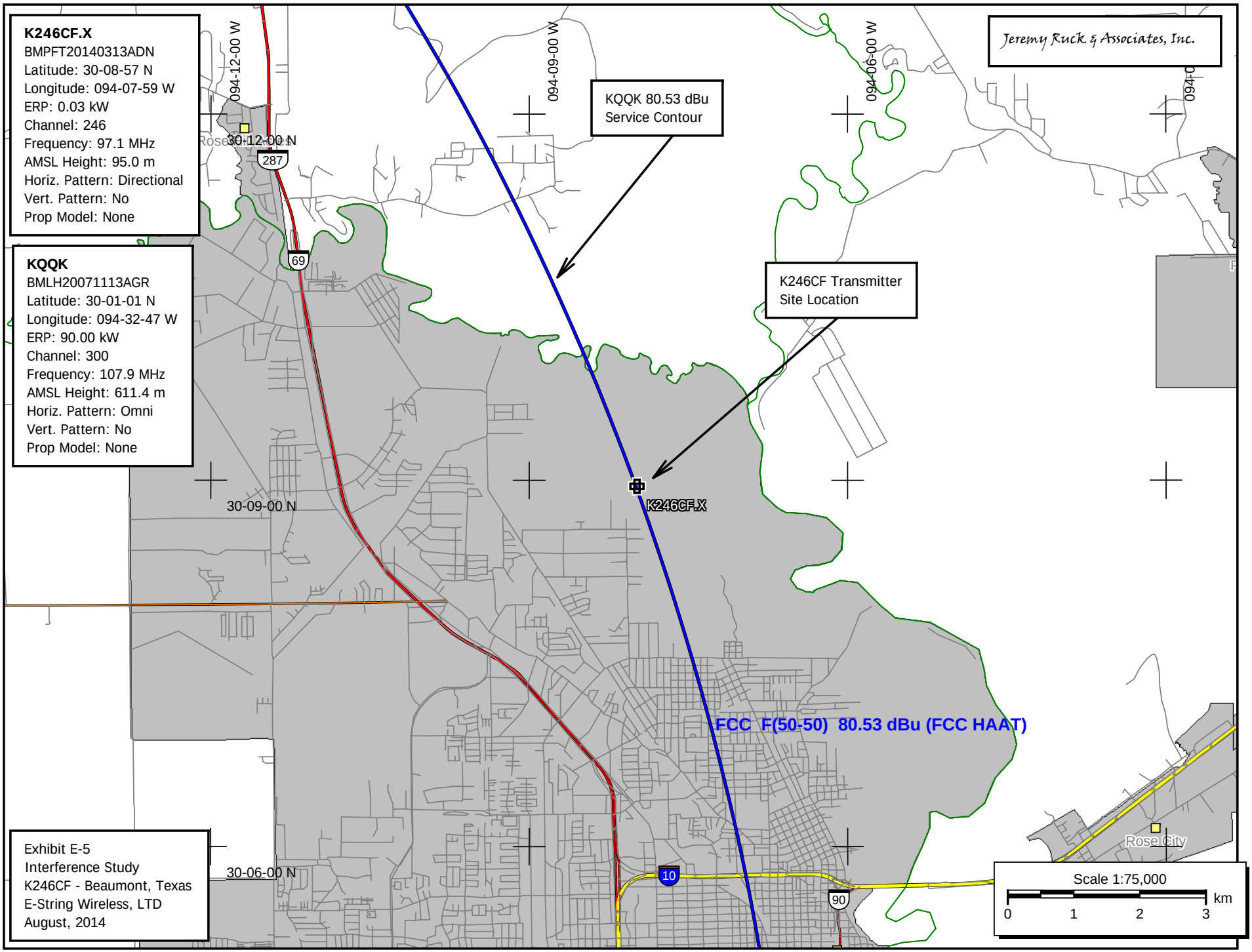
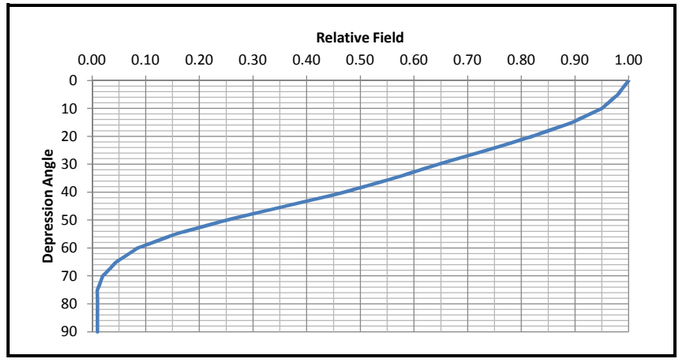
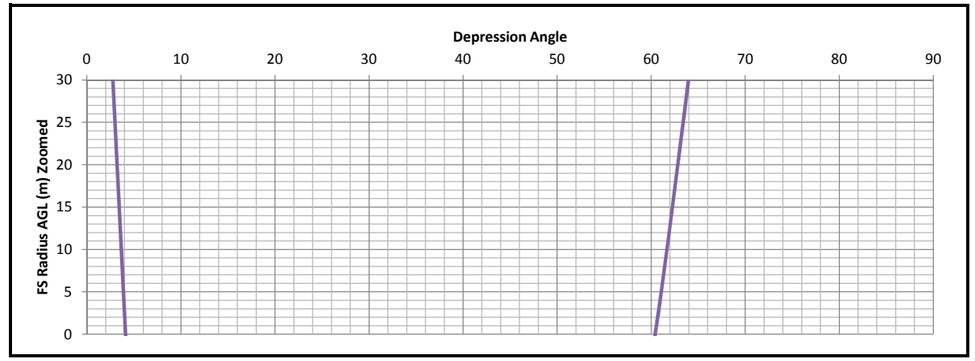

K246CF.X
BMPFT20140313ADN
Latitude: 30-08-57 N
Longitude: 094-07-59 W
ERP: 0.03 kW
Channel: 246
Frequency: 97.1 MHz
AMSL Height: 95.0 m
Horiz. Pattern: Directional
Vert. Pattern: No
Prop Model: None
KQQK
BMLH20071113AGR
Latitude: 30-01-01 N
Longitude: 094-32-47 W
ERP: 90.00 kW
Channel: 300
Frequency: 107.9 MHz
AMSL Height: 611.4 m
Horiz. Pattern: Omni
Vert. Pattern: No
Prop Model: None
Exhibit E-5
Interference Study
K246CF - Beaumont, Texas
E-String Wireless, LTD
August, 2014
Jeremy Ruck & Associates, Inc.
KQQK 80.53 dBu
Service Contour
K246CF Transmitter
Site Location
094-12-00 W
094-09-00 W
094-06-00 W
30-12-00 N
30-09-00 N
30-06-00 N
K246CF.X
FCC F(50-50) 80.53 dBu (FCC HAAT)
Rose City
287
69
10
90
Scale 1:75,000
0 1 2 3 km

Exhibit E-6
Proximity Interference Analysis
K246CF - Beaumont, Texas

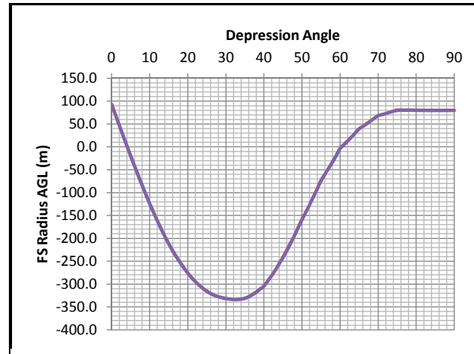
Antenna No:	67	Center of Radiation:	93 m AGL
Manufacturer:	Scala	Effective Radiated Power:	1 Watts
Model:	CL-FM(V)	FS Contour:	74.53 dBu
Number of Bays:	1	E Field Strength:	0.00533 V/m
Bay Spacing:	Log	Z0 (Ohms):	377 Ohms
		Power Density:	7.52764E-08 W/m^2

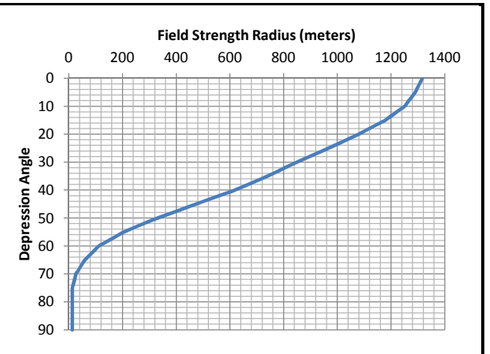


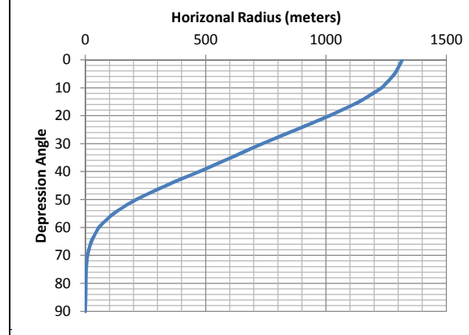


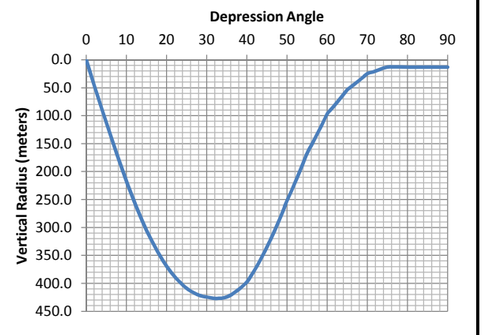
Depression Angle	Relative Field	Relative Power	ERP Watts	Radii in meters			
				Field Strength	Horizontal	Vertical	AGL
0	1.0000	1.0000	1.00	1316.70	1316.70	0.00	93.00
1	0.9960	0.9920	0.99	1311.44	1311.24	22.89	70.11
2	0.9920	0.9841	0.98	1306.17	1305.37	45.58	47.42
3	0.9880	0.9761	0.98	1300.90	1299.12	68.08	24.92
4	0.9840	0.9683	0.97	1295.64	1292.48	90.38	2.62
5	0.9800	0.9604	0.96	1290.37	1285.46	112.46	-19.46
6	0.9740	0.9487	0.95	1282.47	1275.44	134.05	-41.05
7	0.9680	0.9370	0.94	1274.57	1265.07	155.33	-62.33
8	0.9620	0.9254	0.93	1266.67	1254.34	176.29	-83.29
9	0.9560	0.9139	0.91	1258.77	1243.27	196.91	-103.91
10	0.9500	0.9025	0.90	1250.87	1231.86	217.21	-124.21
11	0.9390	0.8817	0.88	1236.38	1213.67	235.91	-142.91
12	0.9280	0.8612	0.86	1221.90	1195.20	254.05	-161.05
13	0.9170	0.8409	0.84	1207.42	1176.47	271.61	-178.61
14	0.9060	0.8208	0.82	1192.93	1157.50	288.60	-195.60
15	0.8950	0.8010	0.80	1178.45	1138.29	305.00	-212.00
16	0.8800	0.7744	0.77	1158.70	1113.81	319.38	-226.38
17	0.8650	0.7482	0.75	1138.95	1089.18	333.00	-240.00
18	0.8500	0.7225	0.72	1119.20	1064.42	345.85	-252.85
19	0.8350	0.6972	0.70	1099.45	1039.55	357.94	-264.94
20	0.8200	0.6724	0.67	1079.70	1014.58	369.28	-276.28
21	0.8030	0.6448	0.64	1057.31	987.09	378.91	-285.91
22	0.7860	0.6178	0.62	1034.93	959.57	387.69	-294.69
23	0.7690	0.5914	0.59	1012.54	932.05	395.63	-302.63
24	0.7520	0.5655	0.57	990.16	904.56	402.73	-309.73
25	0.7350	0.5402	0.54	967.78	877.10	409.00	-316.00
26	0.7170	0.5141	0.51	944.08	848.53	413.86	-320.86
27	0.6990	0.4886	0.49	920.38	820.06	417.84	-324.84
28	0.6810	0.4638	0.46	896.67	791.72	420.96	-327.96
29	0.6630	0.4396	0.44	872.97	763.52	423.23	-330.23
30	0.6450	0.4160	0.42	849.27	735.49	424.64	-331.64
31	0.6280	0.3944	0.39	826.89	708.78	425.88	-332.88
32	0.6120	0.3745	0.37	805.82	683.38	427.02	-334.02
33	0.5950	0.3540	0.35	783.44	657.05	426.69	-333.69
34	0.5790	0.3352	0.34	762.37	632.03	426.31	-333.31
35	0.5620	0.3158	0.32	739.99	606.16	424.44	-331.44
36	0.5440	0.2959	0.30	716.29	579.49	421.02	-328.02
37	0.5250	0.2756	0.28	691.27	552.07	416.02	-323.02
38	0.5070	0.2570	0.26	667.57	526.05	411.00	-318.00
39	0.4880	0.2381	0.24	642.55	499.36	404.37	-311.37
40	0.4700	0.2209	0.22	618.85	474.07	397.79	-304.79
41	0.4480	0.2007	0.20	589.88	445.19	387.00	-294.00
42	0.4260	0.1815	0.18	560.92	416.84	375.33	-282.33
43	0.4040	0.1632	0.16	531.95	389.04	362.79	-269.79
44	0.3820	0.1459	0.15	502.98	361.81	349.40	-256.40
45	0.3600	0.1296	0.13	474.01	335.18	335.18	-242.18

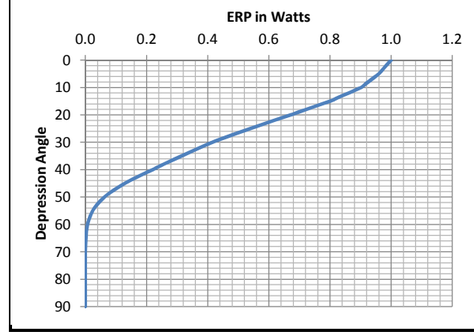
Depression Angle	Relative Field	Relative Power	ERP Watts	Radii in meters			
				Field Strength	Horizontal	Vertical	AGL
45	0.3600	0.1296	0.13	474.01	335.18	335.18	-242.18
46	0.3380	0.1142	0.11	445.05	309.15	320.14	-227.14
47	0.3160	0.0999	0.10	416.08	283.76	304.30	-211.30
48	0.2940	0.0864	0.09	387.11	259.03	287.68	-194.68
49	0.2720	0.0740	0.07	358.14	234.96	270.29	-177.29
50	0.2500	0.0625	0.06	329.18	211.59	252.16	-159.16
51	0.2310	0.0534	0.05	304.16	191.41	236.38	-143.38
52	0.2120	0.0449	0.04	279.14	171.86	219.97	-126.97
53	0.1930	0.0372	0.04	254.12	152.94	202.95	-109.95
54	0.1740	0.0303	0.03	229.11	134.67	185.35	-92.35
55	0.1550	0.0240	0.02	204.09	117.06	167.18	-74.18
56	0.1410	0.0199	0.02	185.66	103.82	153.92	-60.92
57	0.1270	0.0161	0.02	167.22	91.08	140.24	-47.24
58	0.1130	0.0128	0.01	148.79	78.85	126.18	-33.18
59	0.0990	0.0098	0.01	130.35	67.14	111.73	-18.73
60	0.0850	0.0072	0.01	111.92	55.96	96.93	-3.93
61	0.0770	0.0059	0.01	101.39	49.15	88.67	4.33
62	0.0690	0.0048	0.00	90.85	42.65	80.22	12.78
63	0.0610	0.0037	0.00	80.32	36.46	71.56	21.44
64	0.0530	0.0028	0.00	69.79	30.59	62.72	30.28
65	0.0450	0.0020	0.00	59.25	25.04	53.70	39.30
66	0.0400	0.0016	0.00	52.67	21.42	48.11	44.89
67	0.0350	0.0012	0.00	46.08	18.01	42.42	50.58
68	0.0300	0.0009	0.00	39.50	14.80	36.62	56.38
69	0.0250	0.0006	0.00	32.92	11.80	30.73	62.27
70	0.0200	0.0004	0.00	26.33	9.01	24.75	68.25
71	0.0180	0.0003	0.00	23.70	7.72	22.41	70.59
72	0.0160	0.0003	0.00	21.07	6.51	20.04	72.96
73	0.0140	0.0002	0.00	18.43	5.39	17.63	75.37
74	0.0120	0.0001	0.00	15.80	4.36	15.19	77.81
75	0.0100	0.0001	0.00	13.17	3.41	12.72	80.28
76	0.0100	0.0001	0.00	13.17	3.19	12.78	80.22
77	0.0100	0.0001	0.00	13.17	2.96	12.83	80.17
78	0.0100	0.0001	0.00	13.17	2.74	12.88	80.12
79	0.0100	0.0001	0.00	13.17	2.51	12.93	80.07
80	0.0100	0.0001	0.00	13.17	2.29	12.97	80.03
81	0.0100	0.0001	0.00	13.17	2.06	13.00	80.00
82	0.0100	0.0001	0.00	13.17	1.83	13.04	79.96
83	0.0100	0.0001	0.00	13.17	1.60	13.07	79.93
84	0.0100	0.0001	0.00	13.17	1.38	13.09	79.91
85	0.0100	0.0001	0.00	13.17	1.15	13.12	79.88
86	0.0100	0.0001	0.00	13.17	0.92	13.13	79.87
87	0.0100	0.0001	0.00	13.17	0.69	13.15	79.85
88	0.0100	0.0001	0.00	13.17	0.46	13.16	79.84
89	0.0100	0.0001	0.00	13.17	0.23	13.17	79.83
90	0.0100	0.0001	0.00	13.17	0.00	13.17	79.83











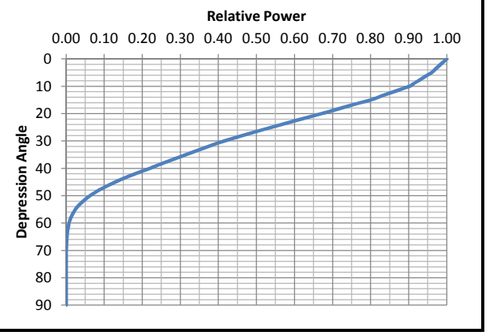
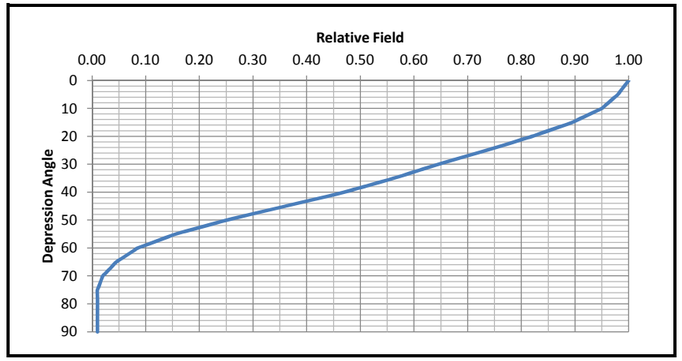
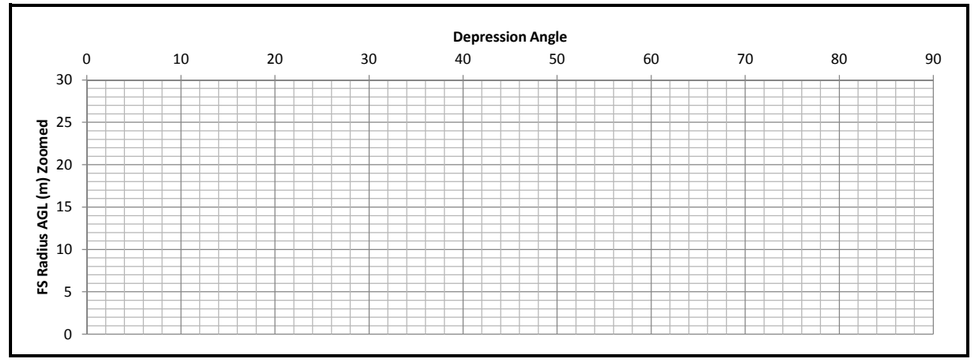
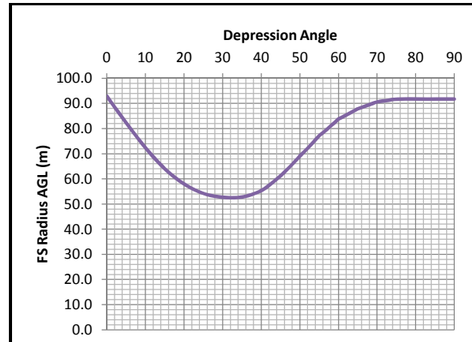
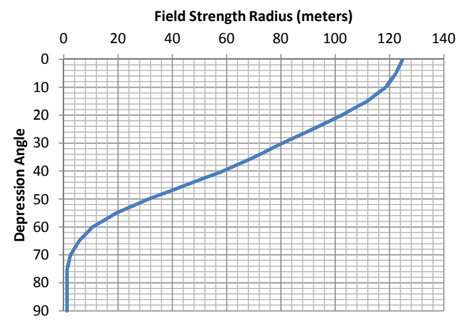
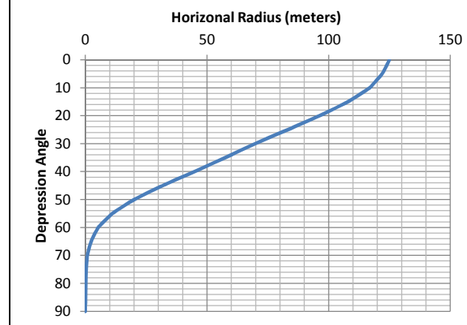
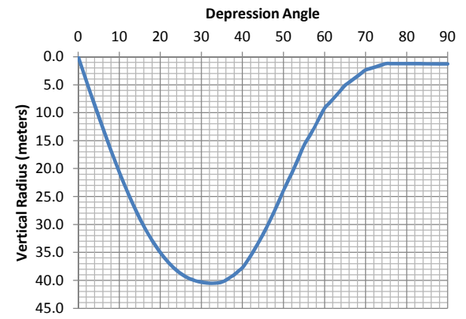
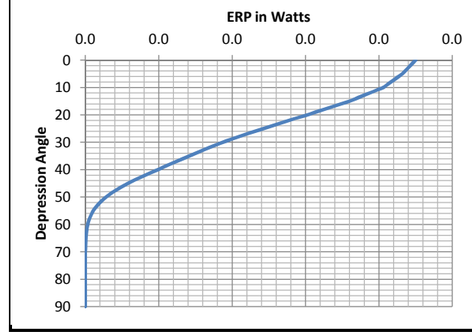
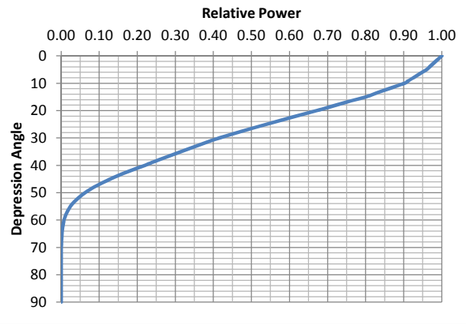


Exhibit E-7
Proximity Interference Analysis
K246CF - Beaumont, Texas

Antenna No:	67	Center of Radiation:	93 m AGL
Manufacturer:	Scala	Effective Radiated Power:	0.009 Watts
Model:	CL-FM(V)	FS Contour:	74.53 dBu
Number of Bays:	1	E Field Strength:	0.00533 V/m
Bay Spacing:	Log	Z0 (Ohms):	377 Ohms
		Power Density:	7.52764E-08 W/m^2





Depression Angle	Relative Field	Relative Power	ERP Watts	Radii in meters			
				Field Strength	Horizontal	Vertical	AGL
0	1.0000	1.0000	0.01	124.91	124.91	0.00	93.00
1	0.9960	0.9920	0.01	124.41	124.39	2.17	90.83
2	0.9920	0.9841	0.01	123.91	123.84	4.32	88.68
3	0.9880	0.9761	0.01	123.41	123.25	6.46	86.54
4	0.9840	0.9683	0.01	122.91	122.62	8.57	84.43
5	0.9800	0.9604	0.01	122.42	121.95	10.67	82.33
6	0.9740	0.9487	0.01	121.67	121.00	12.72	80.28
7	0.9680	0.9370	0.01	120.92	120.01	14.74	78.26
8	0.9620	0.9254	0.01	120.17	119.00	16.72	76.28
9	0.9560	0.9139	0.01	119.42	117.95	18.68	74.32
10	0.9500	0.9025	0.01	118.67	116.86	20.61	72.39
11	0.9390	0.8817	0.01	117.29	115.14	22.38	70.62
12	0.9280	0.8612	0.01	115.92	113.39	24.10	68.90
13	0.9170	0.8409	0.01	114.55	111.61	25.77	67.23
14	0.9060	0.8208	0.01	113.17	109.81	27.38	65.62
15	0.8950	0.8010	0.01	111.80	107.99	28.94	64.06
16	0.8800	0.7744	0.01	109.92	105.67	30.30	62.70
17	0.8650	0.7482	0.01	108.05	103.33	31.59	61.41
18	0.8500	0.7225	0.01	106.18	100.98	32.81	60.19
19	0.8350	0.6972	0.01	104.30	98.62	33.96	59.04
20	0.8200	0.6724	0.01	102.43	96.25	35.03	57.97
21	0.8030	0.6448	0.01	100.31	93.64	35.95	57.05
22	0.7860	0.6178	0.01	98.18	91.03	36.78	56.22
23	0.7690	0.5914	0.01	96.06	88.42	37.53	55.47
24	0.7520	0.5655	0.01	93.93	85.81	38.21	54.79
25	0.7350	0.5402	0.00	91.81	83.21	38.80	54.20
26	0.7170	0.5141	0.00	89.56	80.50	39.26	53.74
27	0.6990	0.4886	0.00	87.31	77.80	39.64	53.36
28	0.6810	0.4638	0.00	85.07	75.11	39.94	53.06
29	0.6630	0.4396	0.00	82.82	72.43	40.15	52.85
30	0.6450	0.4160	0.00	80.57	69.77	40.28	52.72
31	0.6280	0.3944	0.00	78.45	67.24	40.40	52.60
32	0.6120	0.3745	0.00	76.45	64.83	40.51	52.49
33	0.5950	0.3540	0.00	74.32	62.33	40.48	52.52
34	0.5790	0.3352	0.00	72.32	59.96	40.44	52.56
35	0.5620	0.3158	0.00	70.20	57.51	40.27	52.73
36	0.5440	0.2959	0.00	67.95	54.98	39.94	53.06
37	0.5250	0.2756	0.00	65.58	52.37	39.47	53.53
38	0.5070	0.2570	0.00	63.33	49.91	38.99	54.01
39	0.4880	0.2381	0.00	60.96	47.37	38.36	54.64
40	0.4700	0.2209	0.00	58.71	44.97	37.74	55.26
41	0.4480	0.2007	0.00	55.96	42.23	36.71	56.29
42	0.4260	0.1815	0.00	53.21	39.55	35.61	57.39
43	0.4040	0.1632	0.00	50.47	36.91	34.42	58.58
44	0.3820	0.1459	0.00	47.72	34.32	33.15	59.85
45	0.3600	0.1296	0.00	44.97	31.80	31.80	61.20

Depression Angle	Relative Field	Relative Power	ERP Watts	Radii in meters			
				Field Strength	Horizontal	Vertical	AGL
45	0.3600	0.1296	0.00	44.97	31.80	31.80	61.20
46	0.3380	0.1142	0.00	42.22	29.33	30.37	62.63
47	0.3160	0.0999	0.00	39.47	26.92	28.87	64.13
48	0.2940	0.0864	0.00	36.72	24.57	27.29	65.71
49	0.2720	0.0740	0.00	33.98	22.29	25.64	67.36
50	0.2500	0.0625	0.00	31.23	20.07	23.92	69.08
51	0.2310	0.0534	0.00	28.85	18.16	22.42	70.58
52	0.2120	0.0449	0.00	26.48	16.30	20.87	72.13
53	0.1930	0.0372	0.00	24.11	14.51	19.25	73.75
54	0.1740	0.0303	0.00	21.73	12.78	17.58	75.42
55	0.1550	0.0240	0.00	19.36	11.11	15.86	77.14
56	0.1410	0.0199	0.00	17.61	9.85	14.60	78.40
57	0.1270	0.0161	0.00	15.86	8.64	13.30	79.70
58	0.1130	0.0128	0.00	14.12	7.48	11.97	81.03
59	0.0990	0.0098	0.00	12.37	6.37	10.60	82.40
60	0.0850	0.0072	0.00	10.62	5.31	9.20	83.80
61	0.0770	0.0059	0.00	9.62	4.66	8.41	84.59
62	0.0690	0.0048	0.00	8.62	4.05	7.61	85.39
63	0.0610	0.0037	0.00	7.62	3.46	6.79	86.21
64	0.0530	0.0028	0.00	6.62	2.90	5.95	87.05
65	0.0450	0.0020	0.00	5.62	2.38	5.09	87.91
66	0.0400	0.0016	0.00	5.00	2.03	4.56	88.44
67	0.0350	0.0012	0.00	4.37	1.71	4.02	88.98
68	0.0300	0.0009	0.00	3.75	1.40	3.47	89.53
69	0.0250	0.0006	0.00	3.12	1.12	2.92	90.08
70	0.0200	0.0004	0.00	2.50	0.85	2.35	90.65
71	0.0180	0.0003	0.00	2.25	0.73	2.13	90.87
72	0.0160	0.0003	0.00	2.00	0.62	1.90	91.10
73	0.0140	0.0002	0.00	1.75	0.51	1.67	91.33
74	0.0120	0.0001	0.00	1.50	0.41	1.44	91.56
75	0.0100	0.0001	0.00	1.25	0.32	1.21	91.79
76	0.0100	0.0001	0.00	1.25	0.30	1.21	91.79
77	0.0100	0.0001	0.00	1.25	0.28	1.22	91.78
78	0.0100	0.0001	0.00	1.25	0.26	1.22	91.78
79	0.0100	0.0001	0.00	1.25	0.24	1.23	91.77
80	0.0100	0.0001	0.00	1.25	0.22	1.23	91.77
81	0.0100	0.0001	0.00	1.25	0.20	1.23	91.77
82	0.0100	0.0001	0.00	1.25	0.17	1.24	91.76
83	0.0100	0.0001	0.00	1.25	0.15	1.24	91.76
84	0.0100	0.0001	0.00	1.25	0.13	1.24	91.76
85	0.0100	0.0001	0.00	1.25	0.11	1.24	91.76
86	0.0100	0.0001	0.00	1.25	0.09	1.25	91.75
87	0.0100	0.0001	0.00	1.25	0.07	1.25	91.75
88	0.0100	0.0001	0.00	1.25	0.04	1.25	91.75
89	0.0100	0.0001	0.00	1.25	0.02	1.25	91.75
90	0.0100	0.0001	0.00	1.25	0.00	1.25	91.75