

***AMENDMENT TO APPLICATION  
FOR MODIFICATION OF CONSTRUCTION PERMIT***

---

**K247CA - OMAHA, NEBRASKA  
FACILITY ID: 156462  
95.5 MHz / 250 W ERP DA**

**E-STRING WIRELESS, LTD**

**AUGUST, 2016**

## **AMENDMENT TO 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 K247CA at Iowa City, Iowa, and are in support of their amendment to application for modification of construction permit.<sup>1</sup> This submission seeks to amend the pending application for K247CA, which is under FCC File No. BMPFT-20160729AOL. That application was filed as a 250-mile window application to relocate the translator from Iowa City, Iowa to Omaha, Nebraska.

Following the submission of the application, it was noted that the application was mutually exclusive with an application filed by Flood Communications, LLC under FCC File No. BPFT-20160729AIT. This amendment eliminates the mutual exclusivity between the two facilities, and appears to permit a grant of both applications. The elimination of the mutual exclusivity is achieved through a relocation and channel change to the E-String application.

The proposed K247CA facility, as amended, would operate on FM channel 258 with a maximum effective radiated power of 250 Watts at a center of radiation of 461 meters above mean sea level utilizing a directional antenna. The antenna model proposed under this amendment is the same as that proposed under the original modification application, although a different rotation azimuth is proposed here.

Exhibit A-1 provides a comparison between the 60 dBu service contour proposed in the original application, and that resulting from the technical parameters specified under this

---

<sup>1</sup> The Facility ID for K247CA is 154642.

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

amendment. As this map demonstrates, a relatively small distance exists between the original modification application transmitter site, and the site proposed here. Additionally, there is a considerable level of 60 dBu contour overlap between the two facilities.

The site proposed under this application continues to comply with the 250 mile relocation limit permissible under the revitalization. Exhibit A-2 illustrates that the site proposed under this amendment is located 232.7 miles from the construction permit site in Iowa City, Iowa.

No change to the primary station specified in the original modification application is proposed under this amendment. The facility will continue to specify KMMQ at Plattsmouth, Nebraska as the primary station. As was discussed in the original modification application, that facility is licensed to NRG License Sub, LLC ("NRG"). The retransmission agreement between the two entities, submitted with the original modification application, is attached to this technical exhibit as Exhibit A-3.

Exhibit A-4 demonstrates that K247CA would continue to qualify as a fill-in translator for KMMQ at Plattsmouth, Nebraska. This exhibit depicts the proposed 60 dBu service contour for K247CA, along with the KMMQ 2 mV/m daytime contour and twenty-five mile site radius. As is demonstrated, the translator 60 dBu contour is contained within both of these constructs.

The proposed facility complies with the provisions of Section 74.1204 of the Commission's Rules. Due to the proposed channel of operation, Section 74.1205 is not applicable. Exhibit A-5 is a tabular interference study for the facility proposed under this amendment. This study demonstrates that the contour overlap provisions of Section 74.1204 would be met by the

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

proposed facility to all relevant authorizations with the exception of FM station KGOR at Omaha, Nebraska, and FM translator K255CJ at Briggs, Nebraska.<sup>2</sup> The interference situation to these full-power facilities is to be studied under Section 74.1204(d) of the Commission's Rules. The tabular interference study is graphically depicted in the contour map that comprises Exhibit A-6.

Although normally prohibited contour overlap would exist between the proposed translator and both KGOR and K255CJ, no interference is predicted to occur within any populated region. Exhibit A-7 illustrates the site proposed for K247CA along with the K255CJ 75.7 dBu service contour and the KGOR 100.75 dBu service contour.

The proposed facility operates second adjacent to KGOR, and third adjacent to K255CJ. As a result, interference to the reception of either of these two facilities may potentially occur in regions where the translator field strength is at least 40 dB above the field strength of either of these two facilities. Specifically, interference to K255CJ may potentially occur in regions where the field strength of K247CA exceeds 115.7 dBu, and to KGOR in regions where the translator field strength is at least 140.75 dBu. Since the former of the two is the more restrictive, it is the limit utilized for analysis purposes.

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.

---

<sup>2</sup> The Facility ID for KGOR at Omaha, Nebraska is 26928. The Facility ID for K255CJ at Briggs, Nebraska is 138732.

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 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:

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

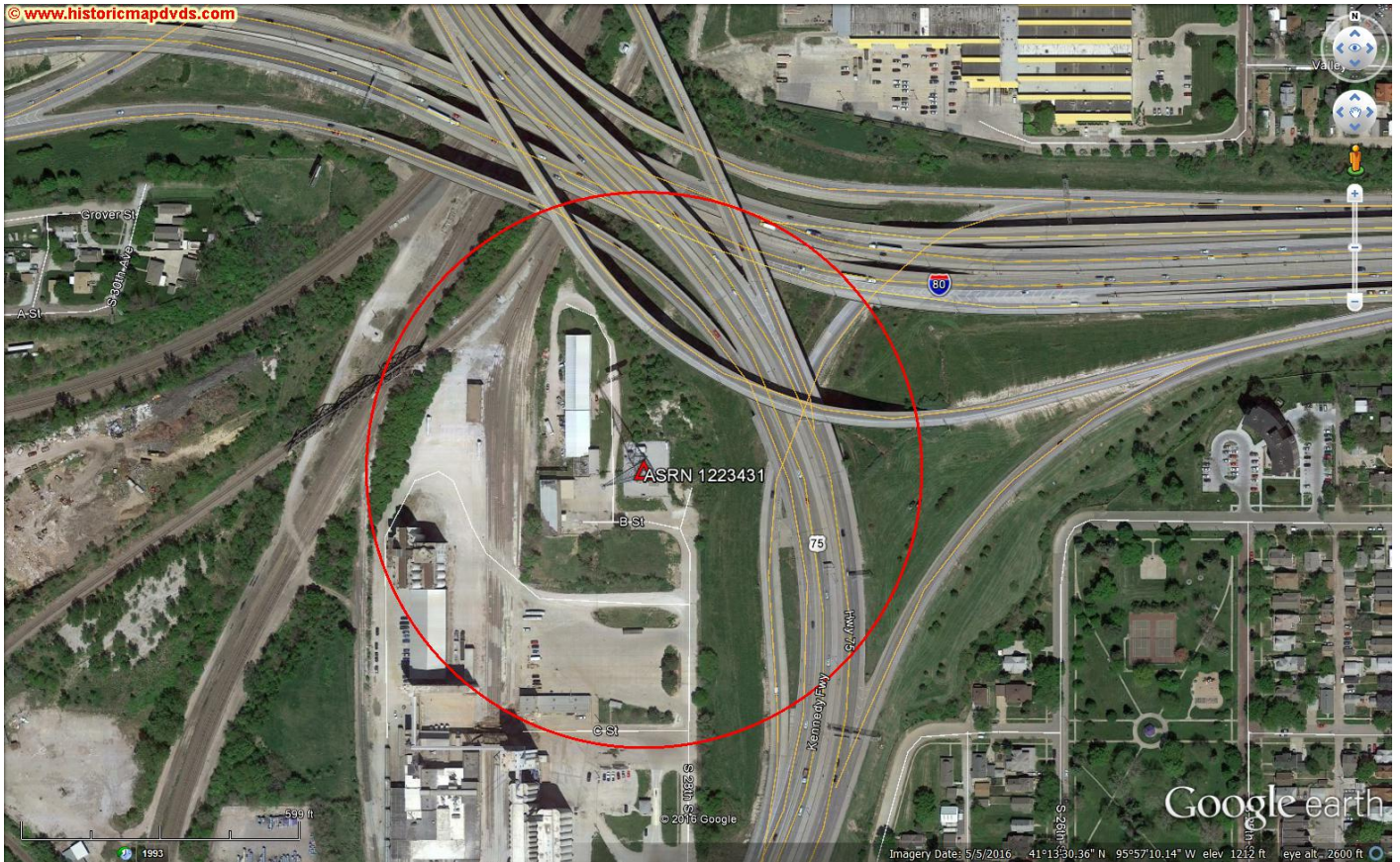
The results of these calculations for depression angles of 0 degrees to 90 degrees are tabulated in Exhibit A-8. The values listed for the relative field at the various depression angles were obtained from published manufacturer data for the proposed antenna. The listed radii values on this tabulation indicate the boundary of the worst-case three-dimensional region in which interference may occur. The worst-case condition results from the fact that the proposed antenna is directional in the horizontal plane, and this tabulation assumes a relative field in that plane of 1.0 at all azimuths. As indicated by the tabulation, the worst-case distance to the boundary of the interference region is 181.95 meters. This distance occurs in the horizontal plane.

The following satellite image illustrates the proposed structure. This image also illustrates a radius centered on the proposed tower site of 181.95 meters as indicated by the red circle.

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



As indicated in this photograph, this radius encompasses portions of the I-80/I-480/US 75 interchange in Omaha. Additionally, portions of the buildings in the immediate vicinity of the tower are also within this radius. The following image illustrates the area at street level.

**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

**8.22.2016**





As can reasonably be inferred from this image, and the proximity analysis spreadsheet, the potential interference region does not involve any structures or populated region, as its closest approach to site elevation is no less than 32.2 meters above the site elevation. As a result, the proposed facility would comply with Section 74.1204(d) of the Commission's Rules.

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

In addition, the proposed facility would not constitute a radiofrequency radiation hazard to persons as the Site. Under as a worst case scenario, using the Appendix A equations, the

JEREMY RUCK & ASSOCIATES, INC.

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

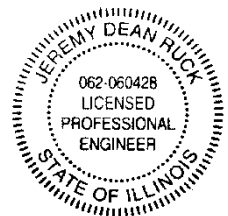
Tel: 309.647.1200  
Fax: 855.332.9537  
jeremyruck.com

8.22.2016

calculated maxim power density at 2 meter above ground is  $1.81\mu\text{W}/\text{cm}^2$  at a distance of 26 meters from the tower. This value complies with the uncontrolled environment condition of the Commission's safety standard, and is sufficiently low 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. Coordination activities will include, but are 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, 2017

Jeremy D. Ruck, PE  
August 22, 2016

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

8.22.2016



**K247CA.X2**

BMPFT20160729AOL  
Latitude: 41-13-29.60 N  
Longitude: 095-57-10.50 W  
ERP: 0.25 kW  
Channel: 258  
Frequency: 99.5 MHz  
AMSL Height: 461.0 m  
Horiz. Pattern: Directional  
Vert. Pattern: No  
Prop Model: None

**K247CA.A**

BMPFT20160729AOL  
Latitude: 41-15-25 N  
Longitude: 095-57-03 W  
ERP: 0.25 kW  
Channel: 244  
Frequency: 96.7 MHz  
AMSL Height: 459.0 m  
Horiz. Pattern: Directional  
Vert. Pattern: No  
Prop Model: None

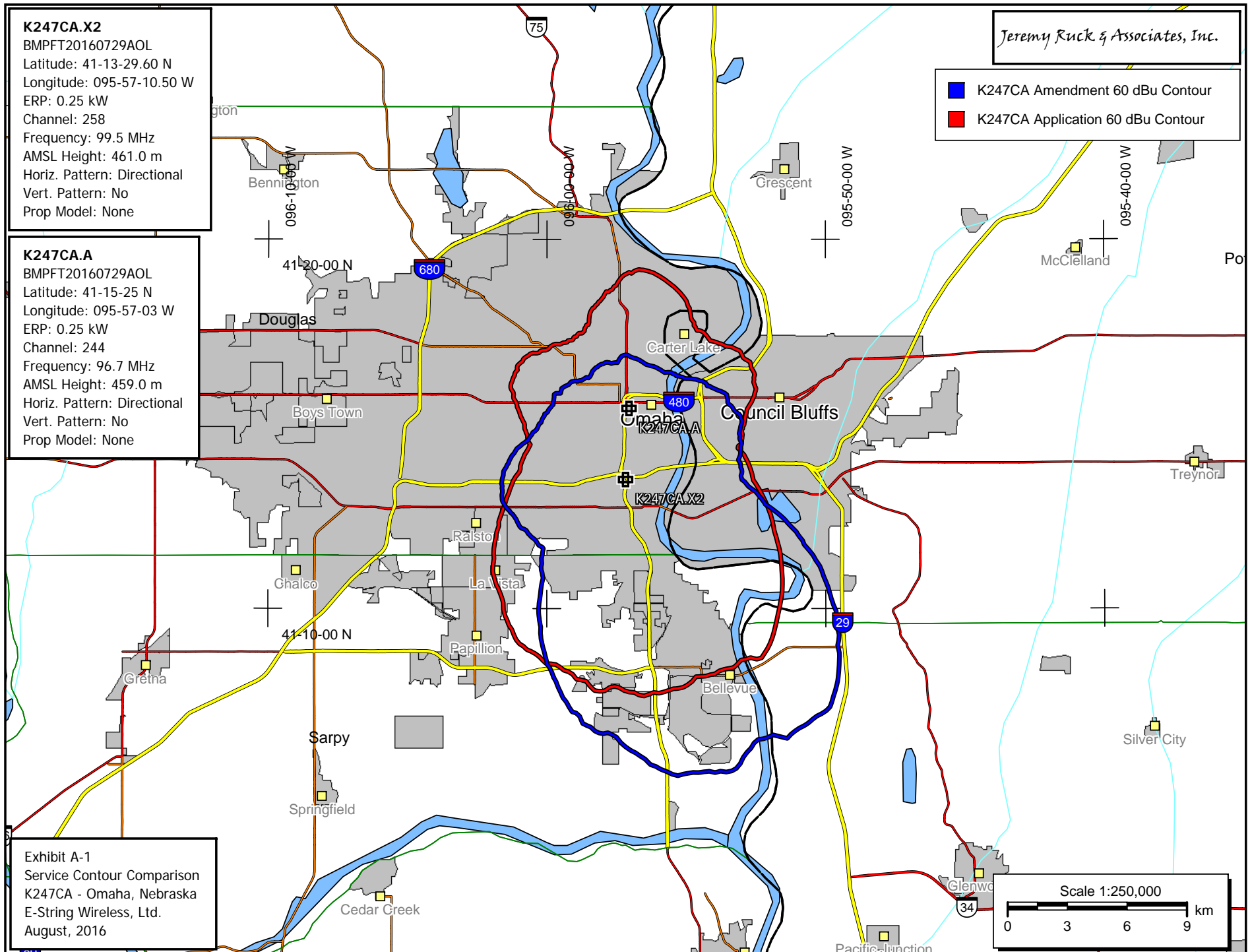
Exhibit A-1  
Service Contour Comparison  
K247CA - Omaha, Nebraska  
E-String Wireless, Ltd.  
August, 2016

*Jeremy Ruck & Associates, Inc.*

- K247CA Amendment 60 dBu Contour
- K247CA Application 60 dBu Contour

Scale 1:250,000

0 3 6 9 km



**K247CA.C**

BNPFT20130930BUP  
Latitude: 41-41-10 N  
Longitude: 091-30-46 W  
ERP: 0.25 kW  
Channel: 247  
Frequency: 97.3 MHz  
AMSL Height: 323.0 m  
Horiz. Pattern: Omni  
Vert. Pattern: No  
Prop Model: None

**K247CA.X2**

BMPFT20160729AOL  
Latitude: 41-13-29.60 N  
Longitude: 095-57-10.50 W  
ERP: 0.25 kW  
Channel: 258  
Frequency: 99.5 MHz  
AMSL Height: 461.0 m  
Horiz. Pattern: Directional  
Vert. Pattern: No  
Prop Model: None

Exhibit A-2  
Relocation Illustration  
K247CA - Omaha, Nebraska  
E-String Wireless, Ltd.  
August, 2016

Jeremy Ruck & Associates, Inc.

Circle R = 402.3 km

Circle R = 374.5 km

K247CA.C

K247CA.X2

K247CA CP Site  
232.7 mile radius

Scale 1:4,000,000

0 50 100 150 km



Exhibit A-3  
Retrans. Agreement

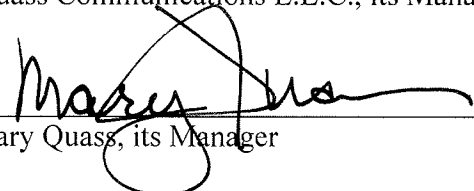
July 26, 2016

To Whom It May Concern:

Licensee NRG License Sub, LLC hereby grants E-String Wireless, LTD. consent to rebroadcast its Omaha, NE, radio station KMMQ-AM (Facility ID 52802) on E-String Wireless' Iowa City, IA, FM Translator K247CA (Facility ID Number 156462, File Number BNPFT-20130930BUP).

NRG License Sub, LLC reserves the right to withdraw the consent to rebroadcast for any reason or no reason whatsoever. This authorization may not be assigned without written permission of NRG License Sub, LLC.

NRG License Sub, LLC  
By Quass Communications L.L.C., its Manager

By:   
Mary Quass, its Manager

---

2875 Mt. Vernon Road SE Cedar Rapids, IA 52403

319.862-0300 - Phone 319.286.9383 - Fax

[www.nrgmedia.com](http://www.nrgmedia.com)

**K247CA.X2**

BMPFT20160729AOL  
Latitude: 41-13-29.60 N  
Longitude: 095-57-10.50 W  
ERP: 0.25 kW  
Channel: 258  
Frequency: 99.5 MHz  
AMSL Height: 461.0 m  
Horiz. Pattern: Directional  
Vert. Pattern: No  
Prop Model: None

Jeremy Ruck & Associates, Inc.

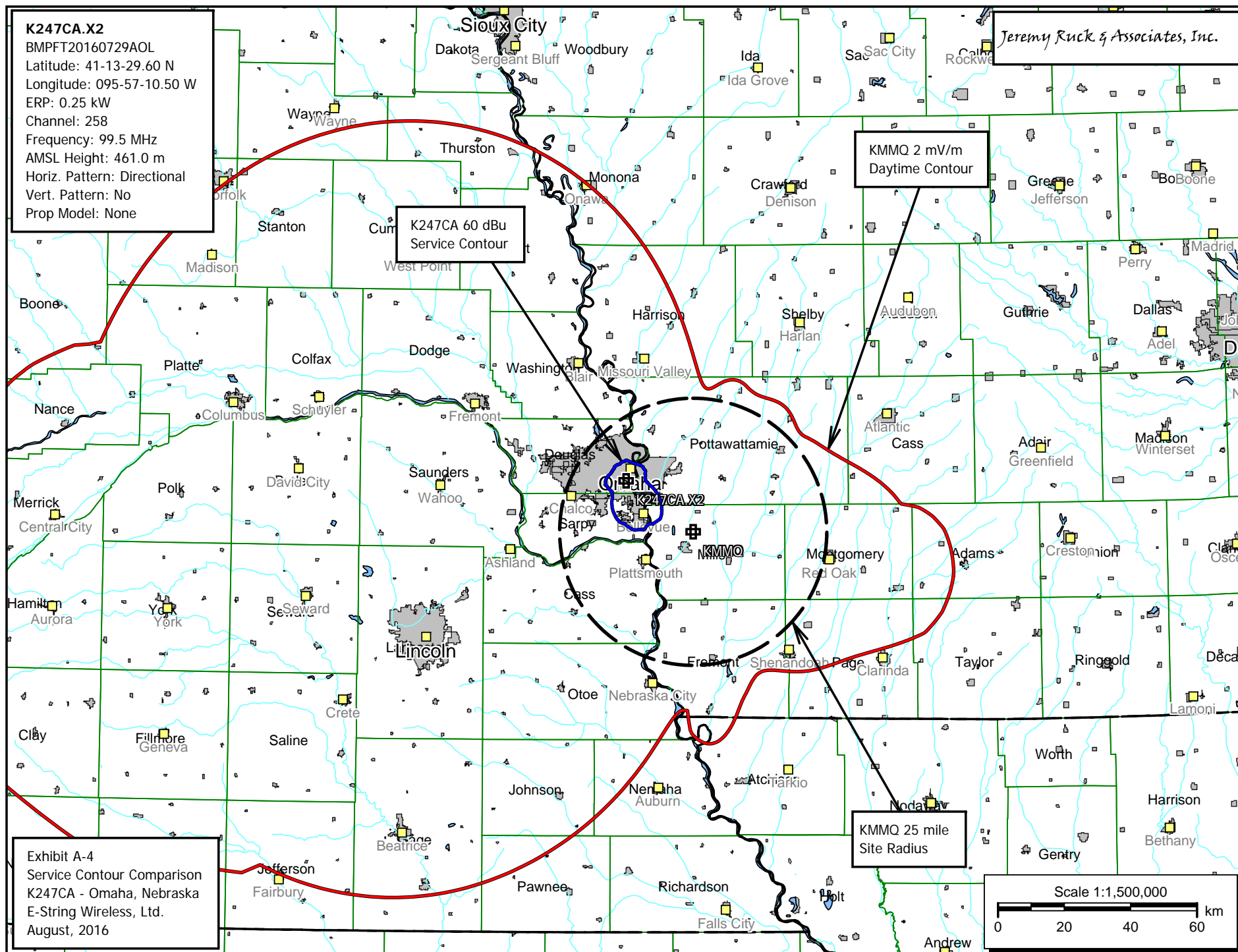
K247CA 60 dBu  
Service Contour

KMMQ 2 mV/m  
Daytime Contour

KMMQ 25 mile  
Site Radius

Exhibit A-4  
Service Contour Comparison  
K247CA - Omaha, Nebraska  
E-String Wireless, Ltd.  
August, 2016

Scale 1:1,500,000  
0 20 40 60 km



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

Exhibit A-5 - Tabular Interference Study  
K247CA - Omaha, Nebraska  
CH# 258D - 99.5 MHz, Pwr= 0.25 kW DA, HAAT= 134.8 M, COR= 461 M  
Average Protected F(50-50)= 14.93 km  
Standard Directional

REFERENCE  
41 13 29.6 N.  
95 57 10.5 W.

DISPLAY DATES  
DATA 08-19-16  
SEARCH 08-19-16

CH CITY	CALL	TYPE STATE	ANT AZI <--	DIST FILE #	LAT LNG	PWR(kW) HAAT(M)	INT(km) COR(M)	PRO(km) LICENSEE	*IN* (Overlap in km)	*OUT*
260CO Omaha	KGOR	LIC _C_ NE	325.9 145.8	11.00 BLH20140506ABG	41 18 24.6 96 01 36.6	115.000 370	11.5 713	78.6 Capstar Tx, Lic	-6.1*	-67.8*
258C1 Le Mars	KKMA	LIC _CN IA	349.8 169.6	142.05 BLH19781206AE	42 28 56.0 96 15 30.0	100.000 241	169.5 613	70.3 Powell Broadcasting Compan	-33.6*	52.0
258C1 Fairbury	KUTT	LIC _CN NE	217.0 36.3	144.44 BLH19941101KB	40 10 57.0 96 58 33.0	100.000 211	163.5 636	65.2 Flood Communications Of Be	-30.0*	51.6
255D Bri ggs	K255CJ	LIC _C_ NE	324.5 144.5	4.41 BLFT20160506ABN	41 15 26.0 95 59 01.0	0.099	0.7 442	10.9 Csn International	-1.8*	-6.7*
258D Nebraska City	K258BO	LIC _C_ NE	173.1 353.1	58.68 BLFT20150416AAW	40 42 03.0 95 52 09.0	0.030	27.0 409	7.9 My Bridge Radio	16.6	0.8
205A Omaha	KYFG	LIC DEX NE	334.1 154.0	10.89 BLED20021218AAZ	41 18 47.0 96 00 36.0	1.500 147	23.5 485	15.8 Bible Broadcasting Network	9.5R	1.4M
257L1 Omaha	KPWM-LP	CP _ NE	261.7 81.5	16.38 BNPL20131114AAP	41 12 12.0 96 08 48.0	0.100 13	367	2.1 Millard Public Schools		1.9
256C1 Cl arinda	KMA-FM	LIC ZCX IA	117.8 298.5	99.98 BLH20100303ACL	40 48 04.0 94 54 06.0	100.000 299	10.4 647	73.4 Kma Broadcasting, L. p.	75.4	26.1

Terrain database is FCC 30 meter , 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.  
All separation margins (if shown) include rounding.  
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 restricted contour.

**K247CA.X2**

BMPFT20160729AOL

Latitude: 41-13-29.60 N

Longitude: 095-57-10.50 W

ERP: 0.25 kW

Channel: 258

Frequency: 99.5 MHz

AMSL Height: 461.0 m

Horiz. Pattern: Directional

Vert. Pattern: No

Prop Model: None

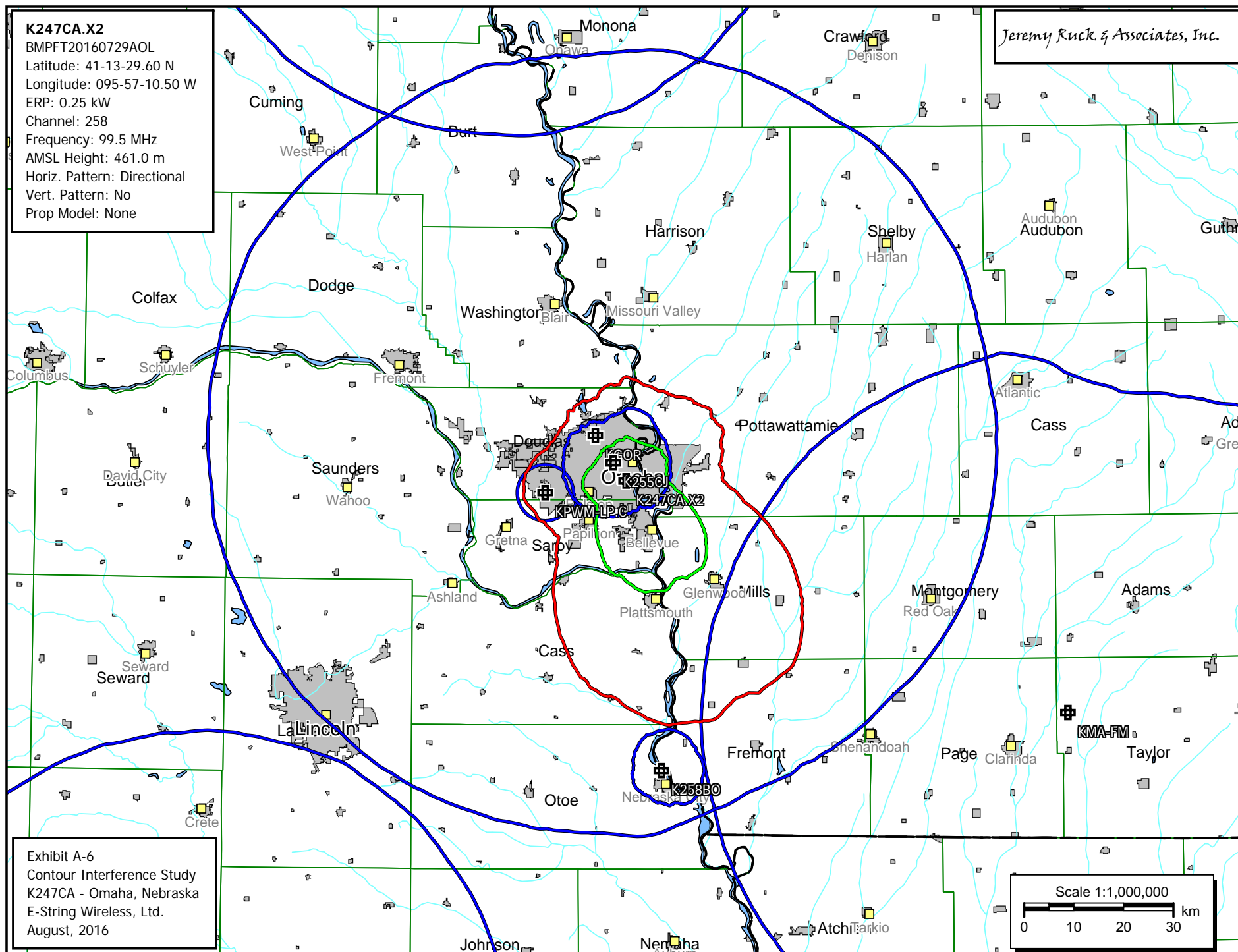
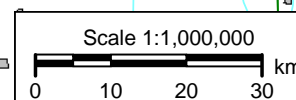
*Jeremy Ruck & Associates, Inc.*

Exhibit A-6  
Contour Interference Study  
K247CA - Omaha, Nebraska  
E-String Wireless, Ltd.  
August, 2016





**K247CA.X2**

BMPFT20160729AOL  
Latitude: 41-13-29.60 N  
Longitude: 095-57-10.50 W  
ERP: 0.25 kW  
Channel: 258  
Frequency: 99.5 MHz  
AMSL Height: 461.0 m  
Horiz. Pattern: Directional  
Vert. Pattern: No  
Prop Model: None

Jeremy Ruck & Associates, Inc.

K255CJ 75.7 dBu  
Service Contour

Omaha

Proposed K247CA  
Transmitter Site

K255CJ Site

FCC F(50-50) 100.75 dBu (FCC HAAT)

FCC F(50-50) 75.70 dBu (FCC HAAT)

K247CA.X2

KGOR 100.75 dBu  
Service Contour

Exhibit A-7  
Interference Study  
K247CA - Omaha, Nebraska  
E-String Wireless, Ltd.  
August, 2016

Scale 1:50,000

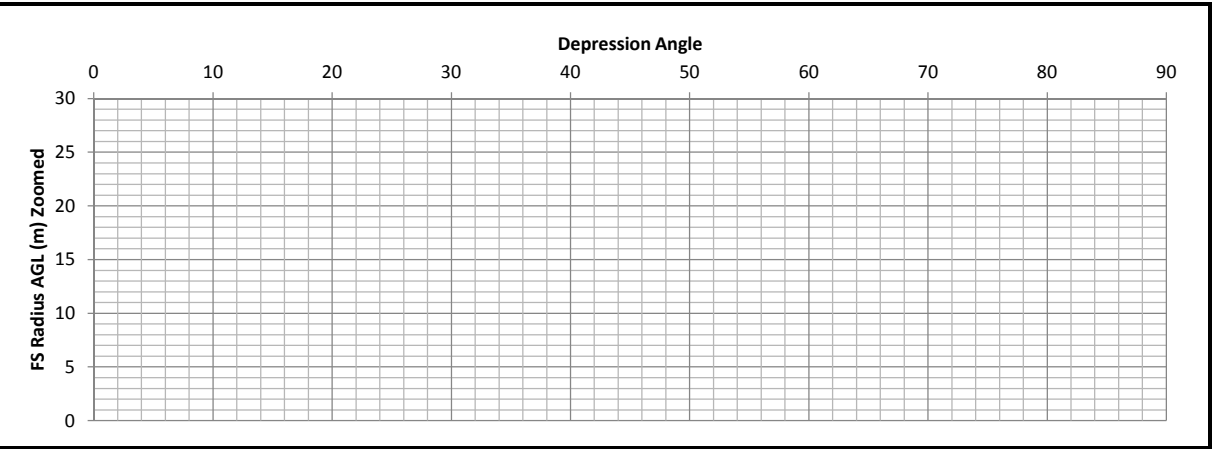
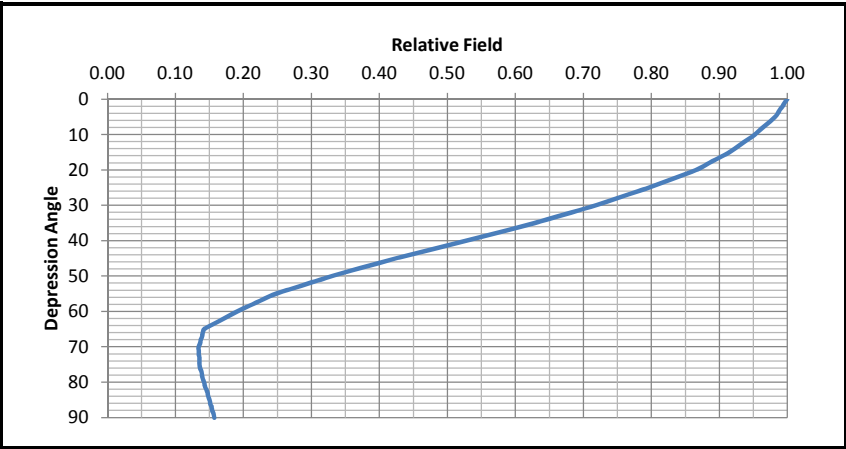
0 0.7 1.4 2.1 km

Exhibit A-8

Proximity Interference Analysis

K247CA - Omaha, Nebraska

Antenna No:	82	<div><div></div><div></div><div></div></div>	Center of Radiation:	98 m AGL
Manufacturer:	Scala	<div><div></div><div></div><div></div></div>	Effective Radiated Power:	250 Watts
Model:	CA5-FM-CPRM		FS Contour:	115.7 dBu
Number of Bays:	N/A		E Field Strength:	0.60954 V/m
Bay Spacing:	Log		Z0:	377 Ohms
			Power Density:	0.000985505 W/m^2



Depression Angle	Relative Field	Relative Power	ERP Watts	Radii in meters			
				Field Strength	Horizontal	Vertical	AGL
0	1.0000	1.0000	250.00	181.95	181.95	0.00	98.00
1	0.9960	0.9920	248.00	181.22	181.20	3.16	94.84
2	0.9930	0.9860	246.51	180.68	180.57	6.31	91.69
3	0.9890	0.9781	244.53	179.95	179.70	9.42	88.58
4	0.9860	0.9722	243.05	179.41	178.97	12.51	85.49
5	0.9820	0.9643	241.08	178.68	178.00	15.57	82.43
6	0.9760	0.9526	238.14	177.59	176.61	18.56	79.44
7	0.9700	0.9409	235.23	176.49	175.18	21.51	76.49
8	0.9640	0.9293	232.32	175.40	173.70	24.41	73.59
9	0.9580	0.9178	229.44	174.31	172.16	27.27	70.73
10	0.9520	0.9063	226.58	173.22	170.59	30.08	67.92
11	0.9450	0.8930	223.26	171.94	168.79	32.81	65.19
12	0.9370	0.8780	219.49	170.49	166.76	35.45	62.55
13	0.9300	0.8649	216.23	169.22	164.88	38.07	59.93
14	0.9220	0.8501	212.52	167.76	162.78	40.58	57.42
15	0.9150	0.8372	209.31	166.49	160.81	43.09	54.91
16	0.9050	0.8190	204.76	164.67	158.29	45.39	52.61
17	0.8950	0.8010	200.26	162.85	155.73	47.61	50.39
18	0.8850	0.7832	195.81	161.03	153.15	49.76	48.24
19	0.8760	0.7674	191.84	159.39	150.71	51.89	46.11
20	0.8660	0.7500	187.49	157.57	148.07	53.89	44.11
21	0.8520	0.7259	181.48	155.02	144.73	55.56	42.44
22	0.8380	0.7022	175.56	152.48	141.37	57.12	40.88
23	0.8240	0.6790	169.74	149.93	138.01	58.58	39.42
24	0.8100	0.6561	164.03	147.38	134.64	59.95	38.05
25	0.7960	0.6336	158.40	144.83	131.26	61.21	36.79
26	0.7800	0.6084	152.10	141.92	127.56	62.21	35.79
27	0.7650	0.5852	146.31	139.19	124.02	63.19	34.81
28	0.7490	0.5610	140.25	136.28	120.33	63.98	34.02
29	0.7340	0.5388	134.69	133.55	116.81	64.75	33.25
30	0.7180	0.5155	128.88	130.64	113.14	65.32	32.68
31	0.7000	0.4900	122.50	127.37	109.17	65.60	32.40
32	0.6820	0.4651	116.28	124.09	105.24	65.76	32.24
33	0.6640	0.4409	110.22	120.82	101.33	65.80	32.20
34	0.6460	0.4173	104.33	117.54	97.45	65.73	32.27
35	0.6280	0.3944	98.60	114.27	93.60	65.54	32.46
36	0.6080	0.3697	92.42	110.63	89.50	65.02	32.98
37	0.5880	0.3457	86.44	106.99	85.44	64.39	33.61
38	0.5680	0.3226	80.66	103.35	81.44	63.63	34.37
39	0.5480	0.3003	75.08	99.71	77.49	62.75	35.25
40	0.5280	0.2788	69.70	96.07	73.59	61.75	36.25
41	0.5070	0.2570	64.26	92.25	69.62	60.52	37.48
42	0.4860	0.2362	59.05	88.43	65.72	59.17	38.83
43	0.4650	0.2162	54.06	84.61	61.88	57.70	40.30
44	0.4440	0.1971	49.28	80.79	58.11	56.12	41.88
45	0.4230	0.1789	44.73	76.97	54.42	54.42	43.58

Depression Angle	Relative Field	Relative Power	ERP Watts	Radii in meters			
				Field Strength	Horizontal	Vertical	AGL
45	0.4230	0.1789	44.73	76.97	54.42	54.42	43.58
46	0.4050	0.1640	41.01	73.69	51.19	53.01	44.99
47	0.3860	0.1490	37.25	70.23	47.90	51.37	46.63
48	0.3670	0.1347	33.67	66.78	44.68	49.62	48.38
49	0.3480	0.1211	30.28	63.32	41.54	47.79	50.21
50	0.3290	0.1082	27.06	59.86	38.48	45.86	52.14
51	0.3130	0.0980	24.49	56.95	35.84	44.26	53.74
52	0.2960	0.0876	21.90	53.86	33.16	42.44	55.56
53	0.2800	0.0784	19.60	50.95	30.66	40.69	57.31
54	0.2630	0.0692	17.29	47.85	28.13	38.71	59.29
55	0.2470	0.0610	15.25	44.94	25.78	36.81	61.19
56	0.2350	0.0552	13.81	42.76	23.91	35.45	62.55
57	0.2240	0.0502	12.54	40.76	22.20	34.18	63.82
58	0.2130	0.0454	11.34	38.76	20.54	32.87	65.13
59	0.2010	0.0404	10.10	36.57	18.84	31.35	66.65
60	0.1900	0.0361	9.03	34.57	17.29	29.94	68.06
61	0.1800	0.0324	8.10	32.75	15.88	28.65	69.35
62	0.1710	0.0292	7.31	31.11	14.61	27.47	70.53
63	0.1610	0.0259	6.48	29.29	13.30	26.10	71.90
64	0.1510	0.0228	5.70	27.47	12.04	24.69	73.31
65	0.1420	0.0202	5.04	25.84	10.92	23.42	74.58
66	0.1400	0.0196	4.90	25.47	10.36	23.27	74.73
67	0.1390	0.0193	4.83	25.29	9.88	23.28	74.72
68	0.1370	0.0188	4.69	24.93	9.34	23.11	74.89
69	0.1360	0.0185	4.62	24.75	8.87	23.10	74.90
70	0.1340	0.0180	4.49	24.38	8.34	22.91	75.09
71	0.1340	0.0180	4.49	24.38	7.94	23.05	74.95
72	0.1340	0.0180	4.49	24.38	7.53	23.19	74.81
73	0.1350	0.0182	4.56	24.56	7.18	23.49	74.51
74	0.1350	0.0182	4.56	24.56	6.77	23.61	74.39
75	0.1350	0.0182	4.56	24.56	6.36	23.73	74.27
76	0.1360	0.0185	4.62	24.75	5.99	24.01	73.99
77	0.1380	0.0190	4.76	25.11	5.65	24.47	73.53
78	0.1390	0.0193	4.83	25.29	5.26	24.74	73.26
79	0.1400	0.0196	4.90	25.47	4.86	25.01	72.99
80	0.1420	0.0202	5.04	25.84	4.49	25.44	72.56
81	0.1430	0.0204	5.11	26.02	4.07	25.70	72.30
82	0.1450	0.0210	5.26	26.38	3.67	26.13	71.87
83	0.1470	0.0216	5.40	26.75	3.26	26.55	71.45
84	0.1480	0.0219	5.48	26.93	2.81	26.78	71.22
85	0.1500	0.0225	5.63	27.29	2.38	27.19	70.81
86	0.1510	0.0228	5.70	27.47	1.92	27.41	70.59
87	0.1530	0.0234	5.85	27.84	1.46	27.80	70.20
88	0.1540	0.0237	5.93	28.02	0.98	28.00	70.00
89	0.1560	0.0243	6.08	28.38	0.50	28.38	69.62
90	0.1570	0.0246	6.16	28.57	0.00	28.57	69.43

