

APPLICATION FOR CONSTRUCTION PERMIT

PROPOSED NEW FM TRANSLATOR STATION
GILMER, TEXAS
FACILITY ID: 156991
99.9 MHz / 0.250 kW ERP / ND

E-STRING WIRELESS, LTD.

AUGUST, 2013

APPLICATION FOR CONSTRUCTION PERMIT

The following engineering statement and attached exhibits have been prepared for **E-String Wireless, Ltd** ("E-String"), applicant for a new FM translator station to serve Gilmer, Texas, and are in support of their application for construction permit.¹

This application is being filed as the long-form application for the short-form engineering proposal originally submitted in 2003 during the Commission's Translator Auction 83 window. The original short-form proposal was assigned FCC File No. BNPFT-20030317JJV. Ultimately this proposal was assigned to MX Group 462 with one other application. During the settlement window, E-String and the applicant for the other proposal eliminated the mutual exclusivity between the two applications. The technical parameters proposed under this long-form application are identical to those specified for the settlement amendment. The changes to the short-form engineering specified at that time represented a minor change to the original tech-box data.

The proposed facility would operate on channel 260 with an effective radiated power of 250 Watts at a center of radiation of 191.6 meters AMSL.² A non-directional antenna is proposed for use for the facility. The primary station for the proposed translator would be KATG(FM) at Elkhart, Texas.³ Exhibit E-1 illustrates the predicted 60 dBu service contour of the proposed translator along with the 60 dBu service contour of the primary station.

¹ The Facility ID for the proposed translator facility is 156991.

² Average terrain for the proposed facility is defined by the 0 degree true radial on which the average elevation is 92.5 meters AMSL.

³ The Facility ID for KATG(FM) at Elkhart, Texas is 86330.

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The proposed facility would not impact LPFM licensing opportunities within any of the Appendix A markets. The proposed facility is located within the grid buffer of the Tyler-Longview market, as depicted in Exhibit E-2. This market is a spectrum available market at the 20x20 grid. As a result, it is necessary to demonstrate that the proposed facility would not impact LPFM licensing opportunities within the grid on channels 258 through 262. To demonstrate this fact, two different maps have been created.

Exhibit E-3 is the first map to illustrate compliance. This map is relevant to the grid protections on channels 258, 259, 261, and 262. This map depicts the proposed site location along with 28 km and 21 km spacing radii. These radii represent the minimum spacings required for a translator from an LPFM facility on 1st or 2nd adjacent channels assuming the largest range of translator coverage radius. As is indicated on this map, neither of these radii overlap any portion of the Tyler-Longview grid, thus, no impact to the grid would result from the proposed facility on any of these four channels.

Exhibit E-4 provides the analysis for grid impact on channel 260. Under this analysis, the maximum minimum spacing from co-channel LPFM facilities of 39 kilometers, and is plotted. As this map demonstrates, a portion of this radius will overlap the market grid. The points in that portion of the grid, however, are already precluded from LPFM use by spacing limitations to KMOO-FM and FM translator K261CW.

The proposed facility complies with the provisions of Section 74.1204 of the Commission's Rules. Exhibit E-5 is a tabular allocation study for the proposed facility. This study demonstrates

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that the proposed facility would meet all of the contour overlap provisions of Section 74.1204 to all relevant facilities in the region with the exception of KZTK(FM) at White Oak, Texas.⁴ An additional study pursuant to Section 74.1204(d) will demonstrate no interference to populated areas receiving that facility from the proposed facility. Exhibit E-6 is a contour map depicting this tabulation graphically.⁵

Although normally prohibited contour overlap between the proposed facility and KZTK(FM) would occur, the proposed facility would not cause interference to any populated areas. Exhibit E-7 illustrates the location of the proposed translator site, and demonstrates that the 81.4 dBu service contour of KZTK intersects the proposed translator site. As a result, interference to KZTK from the proposed translator could potentially occur in areas where the translator field strength is at least 121.4 dBu.⁶

The power density at the interfering field strength is determined 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 Z₀ is the characteristic impedance of free space of 377 ohms.

The power density is also given by:

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

⁴ The tabular allocation study takes into account the channel change for the Millennium application at Gilmer, Texas.

⁵ The contour depiction for the Millennium facility is omitted from the Exhibit E-8 map.

⁶ Stated interference value based on 40 dB ratio between the two facilities, which are third adjacent to each other.

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Where S is the same units, P is the power in Watts, and R is the distance from the antenna at which this field strength occurs.⁷ 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-8, including the related variables from the above equations. The relative field values utilized in this tabulation were obtained from published manufacturer data. As this exhibit demonstrates, any potential interference to KZTK would be limited to regions above 22.6 meters or 74.1 feet above ground level. This closest point of approach to ground level occurs at a distance of 36.1 meters from the tower base. The image on the next page illustrates the proposed tower location along with a 36.1 meter radius, and confirms no structures or populated areas exist within this region.

⁷ It should be noted that this distance is the distance from the antenna, which will not necessarily be equivalent to the distance from the supporting structure.

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The proposed facility would not create a significant environmental impact, and is exempt from environmental processing. The facility would utilize an existing tower that is registered with the Commission. In addition, the facility would not constitute an RF exposure hazard to the general public.

The Commission's *FM Model* software package predicts a maximum power density at ground level of $1.06 \mu\text{W}/\text{cm}^2$ at a distance of 60 meters from the tower base. This value is low enough the proposed facility categorically excluded. E-String certifies that it will coordinate with all other users of the site to ensure that workers and other personnel having access to the site are not exposed to levels of radiofrequency radiation in excess of the applicable safety standards. Such

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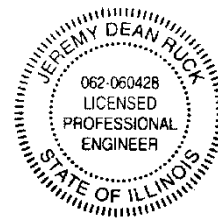
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8.29.2013

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, 2013

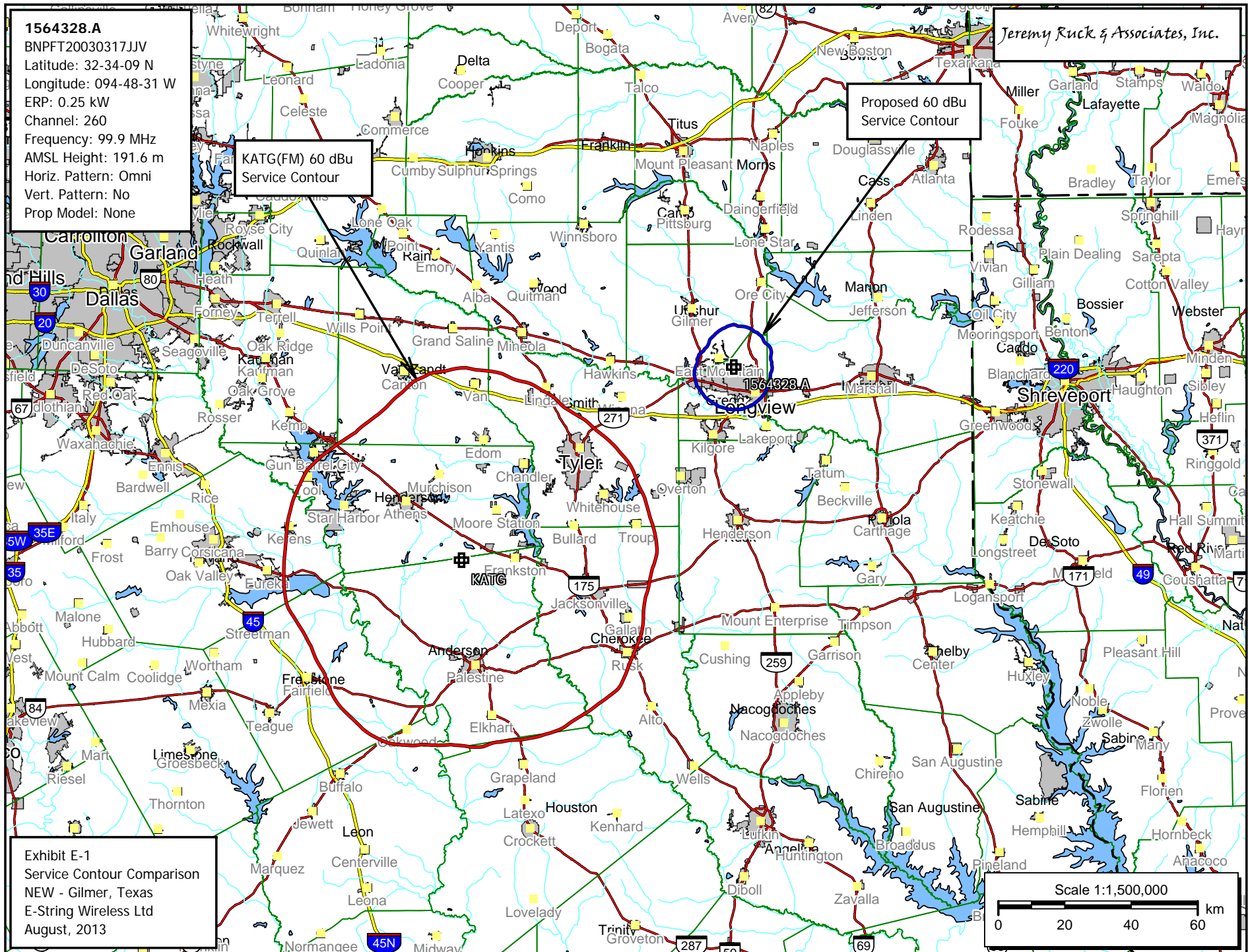
Jeremy D. Ruck, PE
August 29, 2013

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8.29.2013



1564328.A

BNPFT20030317JJV

Latitude: 32-34-09 N

Longitude: 094-48-31 W

ERP: 0.25 kW

Channel: 260

Frequency: 99.9 MHz

AMSL Height: 191.6 m

Horiz. Pattern: Omni

Vert. Pattern: No

Prop Model: None

Jeremy Ruck & Associates, Inc.

Proposed Site Location

1564328.A

Smith

Tyler

Longview

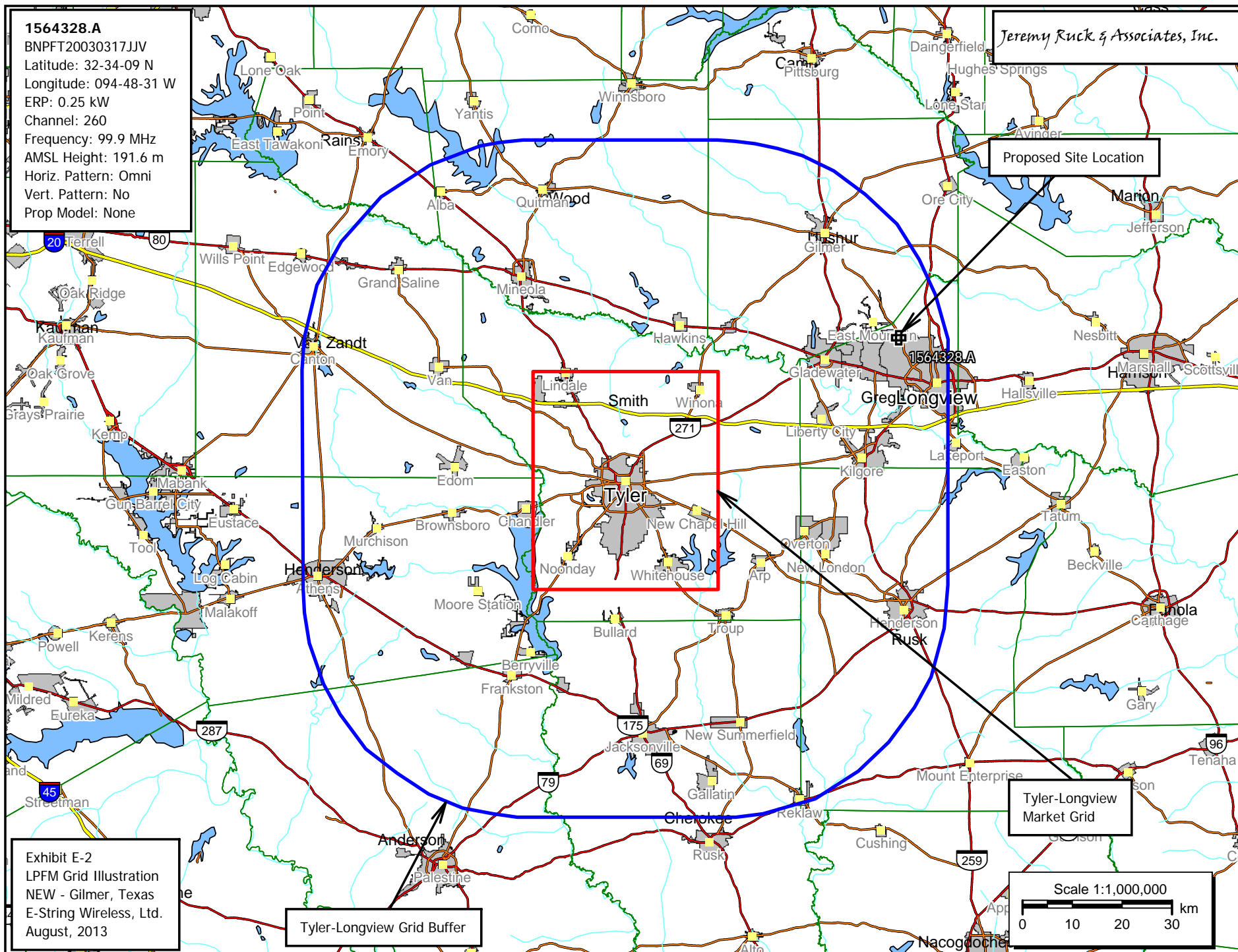
Tyler-Longview
Market Grid

Exhibit E-2
LPFM Grid Illustration
NEW - Gilmer, Texas
E-String Wireless, Ltd.
August, 2013

Tyler-Longview Grid Buffer

Scale 1:1,000,000

0 10 20 30 km



1564328.A

BNPFT20030317JJV

Latitude: 32-34-09 N

Longitude: 094-48-31 W

ERP: 0.25 kW

Channel: 260

Frequency: 99.9 MHz

AMSL Height: 191.6 m

Horiz. Pattern: Omni

Vert. Pattern: No

Prop Model: None

28 km spacing radius

Jeremy Ruck & Associates, Inc.

Proposed Site Location

21 km spacing radius

Exhibit E-3

LPFM Grid Study Chs. 258, 259, 261, 262

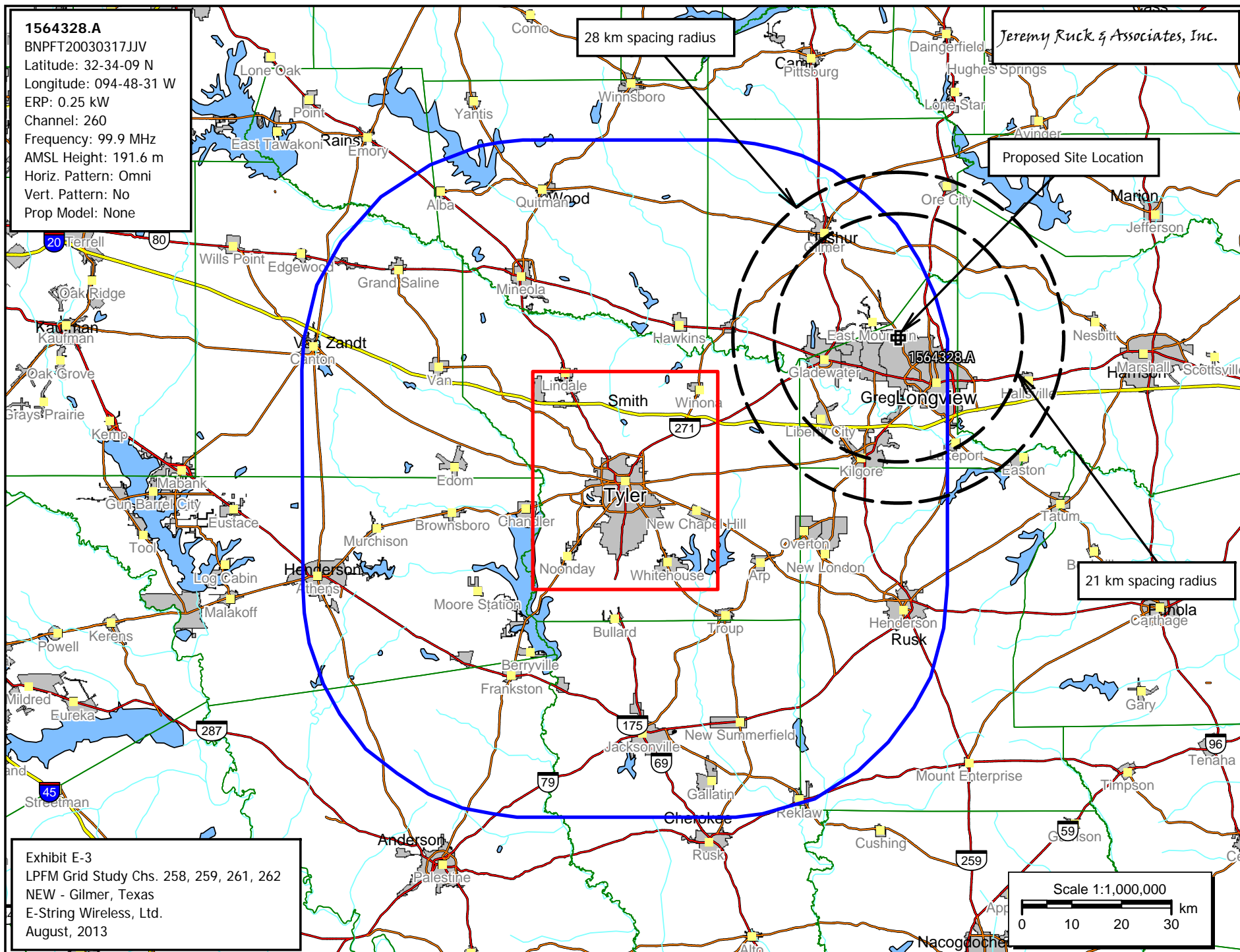
NEW - Gilmer, Texas

E-String Wireless, Ltd.

August, 2013

Scale 1:1,000,000

0 10 20 30 km



1564328.A

BNPFT20030317JJV

Latitude: 32-34-09 N

Longitude: 094-48-31 W

ERP: 0.25 kW

Channel: 260

Frequency: 99.9 MHz

AMSL Height: 191.6 m

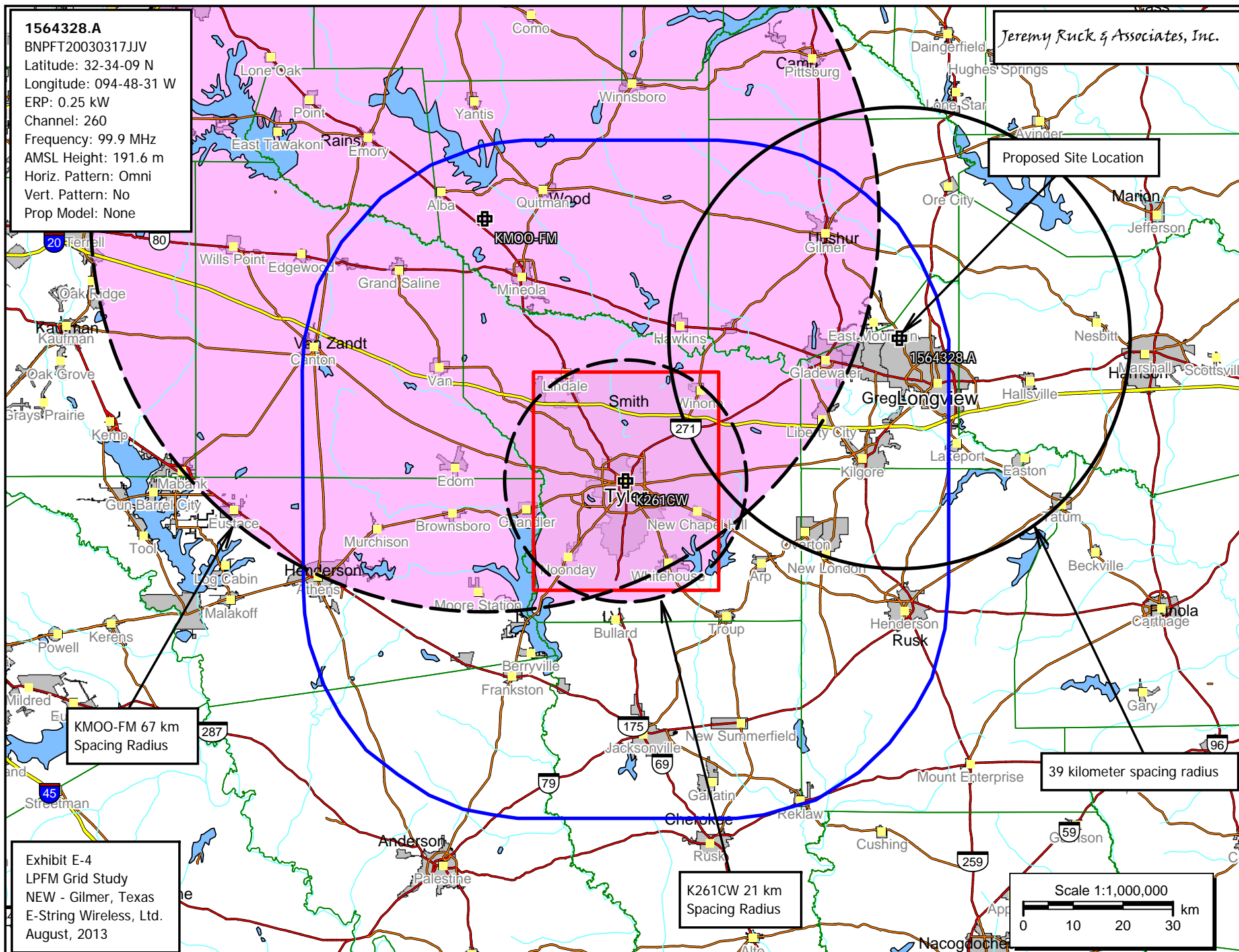
Horiz. Pattern: Omni

Vert. Pattern: No

Prop Model: None

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Proposed Site Location



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

Exhibit E-5 - Tabular Allocation Study

REFERENCE 32 34 09.0 N. CH# 260D - 99.9 MHz, Pwr= 0.25 kW, HAAT= 87.1 M, COR= 191.6 M DISPLAY DATES
94 48 31.0 W. Average Protected F(50-50)= 12.04 km DATA 08-29-13
Omni-directional SEARCH 08-29-13

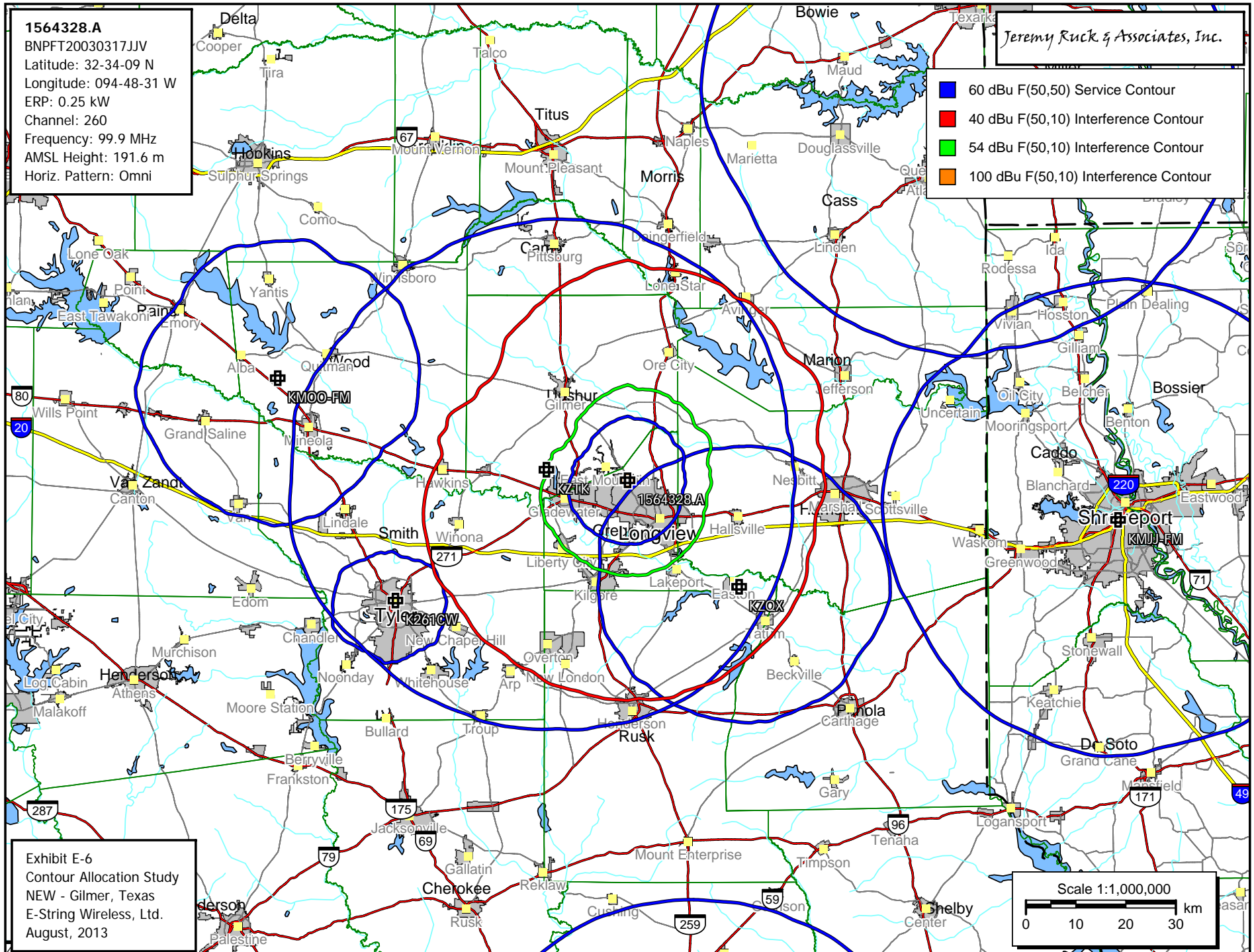
CH CITY	CALL	TYPE ANT STATE	AZI <--	DIST FILE #	LAT LNG	PWR(kW) HAAT(M)	INT(km) COR(M)	PRO(km) LICENSEE	*IN* (Overlap in km)	*OUT*
260D Gilmer	1564328	APP _C_ TX	0.0 0.0	0.00 BNPFT20030317JJV	32 34 09.0 94 48 31.0	0.250	44.1 192	12.8 E-string Wireless, Ltd	-56.9*	-56.9*
257C2 White Oak	KAPW	LIC _NC_ TX	277.4 97.3	16.32 BLH20020528AAU	32 35 17.0 94 58 53.0	34.000 165	5.5 279	49.6 Reynolds Radio, Inc.	-0.6	-34.4*
260A Mileola	KMOO-FM	LIC _C_ TX	286.3 105.9	72.73 BLH19990513KE	32 45 04.0 95 33 18.0	6.000 90	86.7 214	28.4 Hightower Radio, Inc.	-25.3*	6.4
262A Tatum	KZQX	LIC _C_ TX	133.8 313.9	30.83 BLH19990816KC	32 22 37.0 94 34 18.0	2.450 158	2.5 251	29.0 Chalk Hill Communications	16.0	0.7
263D Gilmer	1564450	APP _DC_ TX	314.9 134.8	21.67 BNPFT20030317ISO	32 42 24.0 94 58 22.0	0.250	0.2 200	4.7 Millennium Broadcasting Co	10.6	15.8
261C2 Atlanta	KNRB	LIC _C_ TX	41.2 221.6	101.68 BMLED20040920ACA	33 15 18.0 94 05 16.0	50.000 150	75.4 225	49.7 Family Worship Center Chur	13.9	33.5
259C2 Shreveport	KMJJ-FM	LIC _NCX LA	94.6 275.2	98.16 BLH20100810AAZ	32 29 36.0 93 45 55.0	23.500 163	70.1 216	47.3 Cumulus Licensing Lic	16.6	34.1
261D Tyler	K261CW	LIC _DV_ TX	242.5 62.2	52.20 BLFT20040902AAN	32 21 05.0 95 18 06.0	0.250 96	13.5 240	9.6 North Texas Public Broadca	26.3	24.0
259A Cuney	AL9118	VAC ____ TX	219.2 38.9	84.21 RM10756	31 58 52.0 95 22 24.0	6.000 100	33.6 231	22.1 Charles Crawford	38.7	42.0
261C2 Lufkin	KYBI	LIC _CX TX	174.5 354.6	137.87 BLH20080305ABF	31 20 05.0 94 40 10.0	20.000 240	78.1 319	53.0 Kasa Family Limited Partne	46.9	65.7

Terrain database is FCC NGDC 30 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.
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 protected contour.

1564328.A
BNPFT20030317JJV
Latitude: 32-34-09 N
Longitude: 094-48-31 W
ERP: 0.25 kW
Channel: 260
Frequency: 99.9 MHz
AMSL Height: 191.6 m
Horiz. Pattern: Omni

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- 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



1564328.A

BNPFT20030317JJV
Latitude: 32-34-09 N
Longitude: 094-48-31 W
ERP: 0.25 kW
Channel: 260
Frequency: 99.9 MHz
AMSL Height: 191.6 m
Horiz. Pattern: Omni
Vert. Pattern: No
Prop Model: None

KZTK

BLH20020528AAU
Latitude: 32-35-17 N
Longitude: 094-58-53 W
ERP: 34.00 kW
Channel: 257
Frequency: 99.3 MHz
AMSL Height: 279.0 m
Horiz. Pattern: Omni
Vert. Pattern: No
Prop Model: None

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Proposed Site
Location

FCC F(50-50) 81.40 dBu (FCC HAAT)

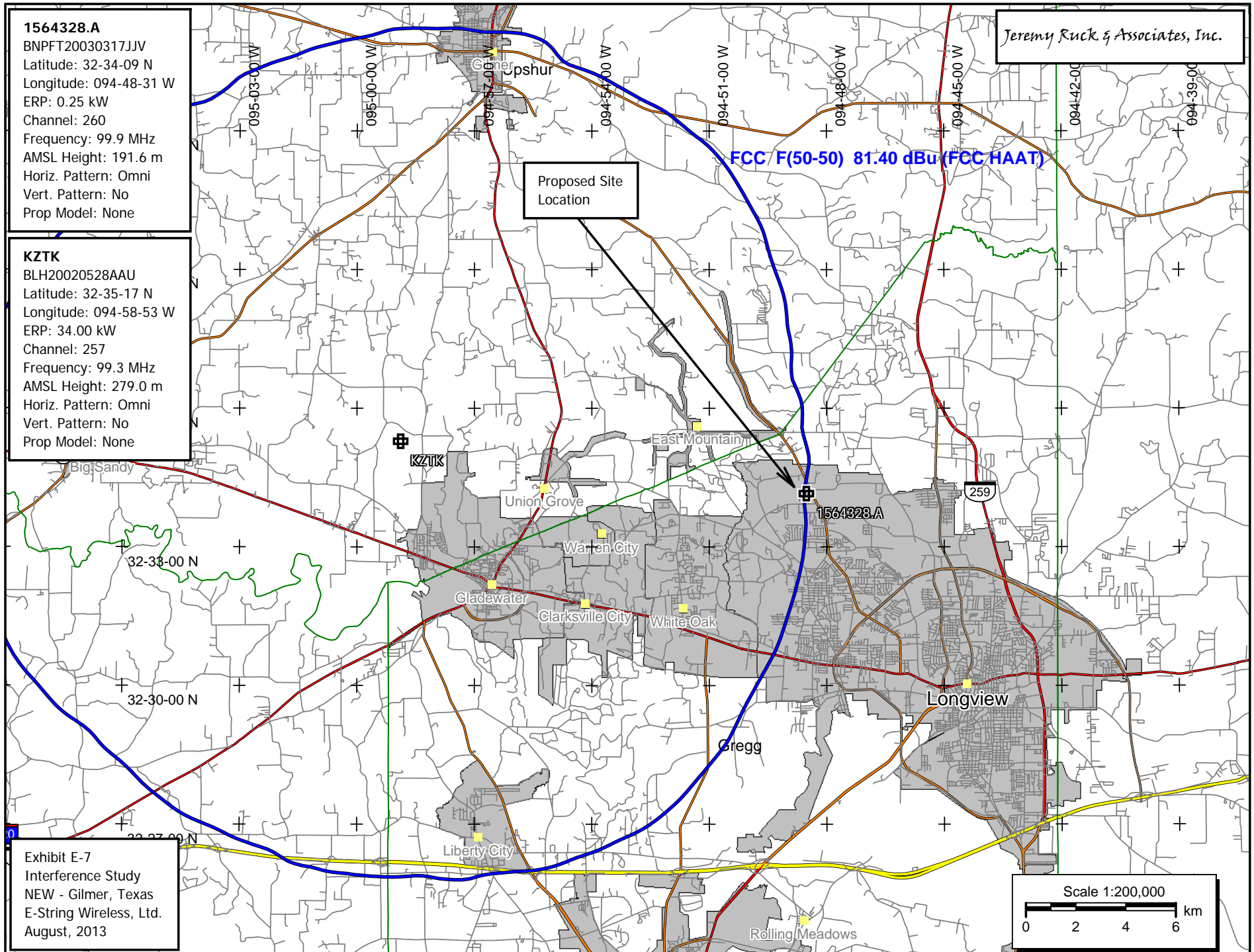


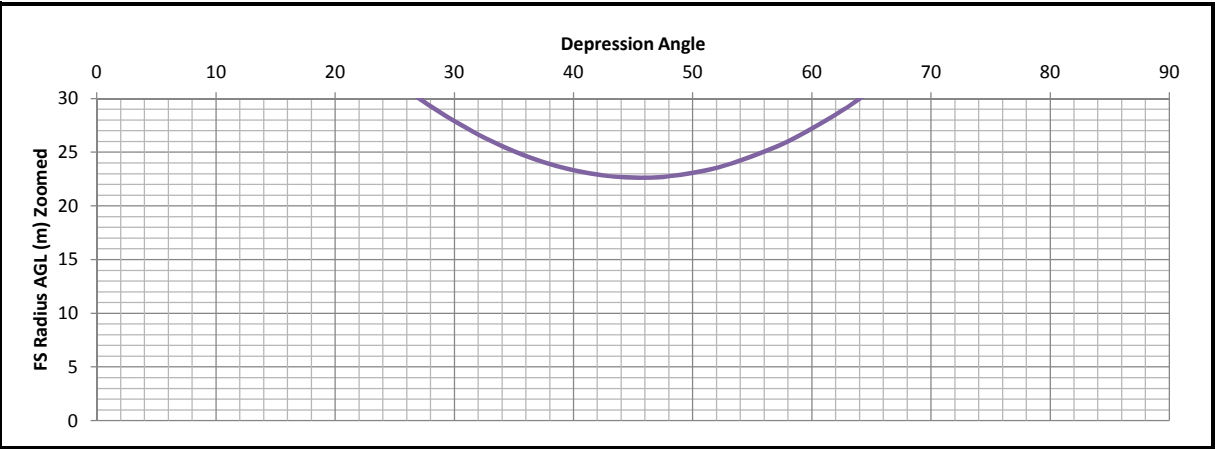
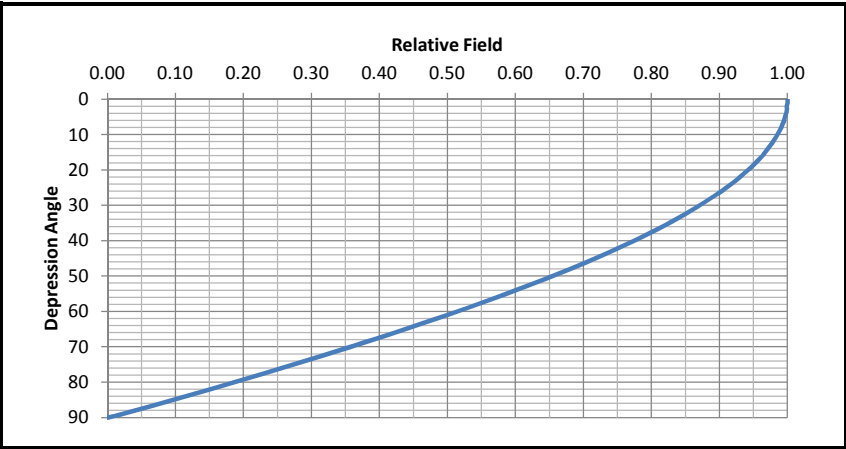
Exhibit E-7
Interference Study
NEW - Gilmer, Texas
E-String Wireless, Ltd.
August, 2013

Exhibit E-8

Translator Proximity Interference Analysis

NEW - Gilmer, Texas (NEW to KZTK)

Antenna No:	62	<div><div></div><div></div><div></div></div>	Center of Radiation:	60 m AGL
Manufacturer:	Shively	<div><div></div><div></div><div></div></div>	Effective Radiated Power:	250 Watts
Model:	6812B-1		FS Contour:	121.4 dBu
Number of Bays:	1		E Field Strength:	1.17490 V/m
Bay Spacing:	Lambda		Z0 (Ohms):	377 Ohms
			Power Density:	0.003661497 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	73.71	73.71	0.00	60.00
1	1.0000	1.0000	250.00	73.71	73.70	1.29	58.71
2	0.9990	0.9980	249.50	73.64	73.59	2.57	57.43
3	0.9990	0.9980	249.50	73.64	73.54	3.85	56.15
4	0.9980	0.9960	249.00	73.56	73.38	5.13	54.87
5	0.9960	0.9920	248.00	73.42	73.14	6.40	53.60
6	0.9950	0.9900	247.51	73.34	72.94	7.67	52.33
7	0.9930	0.9860	246.51	73.20	72.65	8.92	51.08
8	0.9910	0.9821	245.52	73.05	72.34	10.17	49.83
9	0.9880	0.9761	244.04	72.83	71.93	11.39	48.61
10	0.9850	0.9702	242.56	72.61	71.50	12.61	47.39
11	0.9820	0.9643	241.08	72.38	71.05	13.81	46.19
12	0.9790	0.9584	239.61	72.16	70.59	15.00	45.00
13	0.9750	0.9506	237.66	71.87	70.03	16.17	43.83
14	0.9710	0.9428	235.71	71.57	69.45	17.32	42.68
15	0.9670	0.9351	233.77	71.28	68.85	18.45	41.55
16	0.9630	0.9274	231.84	70.98	68.23	19.57	40.43
17	0.9580	0.9178	229.44	70.62	67.53	20.65	39.35
18	0.9530	0.9082	227.05	70.25	66.81	21.71	38.29
19	0.9480	0.8987	224.68	69.88	66.07	22.75	37.25
20	0.9420	0.8874	221.84	69.44	65.25	23.75	36.25
21	0.9360	0.8761	219.02	68.99	64.41	24.73	35.27
22	0.9300	0.8649	216.23	68.55	63.56	25.68	34.32
23	0.9240	0.8538	213.44	68.11	62.70	26.61	33.39
24	0.9170	0.8409	210.22	67.59	61.75	27.49	32.51
25	0.9100	0.8281	207.03	67.08	60.79	28.35	31.65
26	0.9030	0.8154	203.85	66.56	59.83	29.18	30.82
27	0.8950	0.8010	200.26	65.97	58.78	29.95	30.05
28	0.8870	0.7868	196.69	65.38	57.73	30.70	29.30
29	0.8790	0.7726	193.16	64.79	56.67	31.41	28.59
30	0.8710	0.7586	189.66	64.20	55.60	32.10	27.90
31	0.8620	0.7430	185.76	63.54	54.46	32.73	27.27
32	0.8540	0.7293	182.33	62.95	53.38	33.36	26.64
33	0.8450	0.7140	178.51	62.29	52.24	33.92	26.08
34	0.8350	0.6972	174.31	61.55	51.03	34.42	25.58
35	0.8260	0.6823	170.57	60.89	49.87	34.92	25.08
36	0.8160	0.6659	166.46	60.15	48.66	35.35	24.65
37	0.8060	0.6496	162.41	59.41	47.45	35.75	24.25
38	0.7960	0.6336	158.40	58.67	46.24	36.12	23.88
39	0.7850	0.6162	154.06	57.86	44.97	36.41	23.59
40	0.7740	0.5991	149.77	57.05	43.70	36.67	23.33
41	0.7630	0.5822	145.54	56.24	42.45	36.90	23.10
42	0.7520	0.5655	141.38	55.43	41.19	37.09	22.91
43	0.7410	0.5491	137.27	54.62	39.95	37.25	22.75
44	0.7290	0.5314	132.86	53.74	38.65	37.33	22.67
45	0.7170	0.5141	128.52	52.85	37.37	37.37	22.63

Depression Angle	Relative Field	Relative Power	ERP Watts	Radii in meters			
				Field Strength	Horizontal	Vertical	AGL
45	0.7170	0.5141	128.52	52.85	37.37	37.37	22.63
46	0.7050	0.4970	124.26	51.97	36.10	37.38	22.62
47	0.6930	0.4802	120.06	51.08	34.84	37.36	22.64
48	0.6800	0.4624	115.60	50.12	33.54	37.25	22.75
49	0.6670	0.4449	111.22	49.17	32.26	37.11	22.89
50	0.6540	0.4277	106.93	48.21	30.99	36.93	23.07
51	0.6410	0.4109	102.72	47.25	29.73	36.72	23.28
52	0.6280	0.3944	98.60	46.29	28.50	36.48	23.52
53	0.6140	0.3770	94.25	45.26	27.24	36.15	23.85
54	0.6000	0.3600	90.00	44.23	26.00	35.78	24.22
55	0.5860	0.3434	85.85	43.19	24.78	35.38	24.62
56	0.5720	0.3272	81.80	42.16	23.58	34.95	25.05
57	0.5580	0.3114	77.84	41.13	22.40	34.50	25.50
58	0.5440	0.2959	73.98	40.10	21.25	34.01	25.99
59	0.5290	0.2798	69.96	38.99	20.08	33.42	26.58
60	0.5140	0.2642	66.05	37.89	18.94	32.81	27.19
61	0.4990	0.2490	62.25	36.78	17.83	32.17	27.83
62	0.4840	0.2343	58.56	35.68	16.75	31.50	28.50
63	0.4690	0.2200	54.99	34.57	15.69	30.80	29.20
64	0.4530	0.2052	51.30	33.39	14.64	30.01	29.99
65	0.4370	0.1910	47.74	32.21	13.61	29.19	30.81
66	0.4220	0.1781	44.52	31.11	12.65	28.42	31.58
67	0.4060	0.1648	41.21	29.93	11.69	27.55	32.45
68	0.3900	0.1521	38.03	28.75	10.77	26.65	33.35
69	0.3730	0.1391	34.78	27.49	9.85	25.67	34.33
70	0.3570	0.1274	31.86	26.32	9.00	24.73	35.27
71	0.3410	0.1163	29.07	25.14	8.18	23.77	36.23
72	0.3240	0.1050	26.24	23.88	7.38	22.71	37.29
73	0.3070	0.0942	23.56	22.63	6.62	21.64	38.36
74	0.2900	0.0841	21.03	21.38	5.89	20.55	39.45
75	0.2730	0.0745	18.63	20.12	5.21	19.44	40.56
76	0.2560	0.0655	16.38	18.87	4.57	18.31	41.69
77	0.2390	0.0571	14.28	17.62	3.96	17.17	42.83
78	0.2210	0.0488	12.21	16.29	3.39	15.93	44.07
79	0.2040	0.0416	10.40	15.04	2.87	14.76	45.24
80	0.1860	0.0346	8.65	13.71	2.38	13.50	46.50
81	0.1680	0.0282	7.06	12.38	1.94	12.23	47.77
82	0.1510	0.0228	5.70	11.13	1.55	11.02	48.98
83	0.1330	0.0177	4.42	9.80	1.19	9.73	50.27
84	0.1140	0.0130	3.25	8.40	0.88	8.36	51.64
85	0.0960	0.0092	2.30	7.08	0.62	7.05	52.95
86	0.0780	0.0061	1.52	5.75	0.40	5.74	54.26
87	0.0590	0.0035	0.87	4.35	0.23	4.34	55.66
88	0.0400	0.0016	0.40	2.95	0.10	2.95	57.05
89	0.0210	0.0004	0.11	1.55	0.03	1.55	58.45
90	0.0000	0.0000	0.00	0.00	0.00	0.00	60.00

