

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

**FM TRANSLATOR STATION W252CY
ANDERSON, INDIANA
98.3 MHz / 0.100 kW ERP**

THE POWER FOUNDATION

JUNE, 2016

APPLICATION FOR MODIFICATION OF CONSTRUCTION PERMIT

The following engineering statement and attached exhibits have been prepared for **The Power Foundation** ("Power"), permittee of FM translator station W252CY at Anderson, Indiana, and are in support of their application for modification of construction permit.¹ This application seeks to modify the existing construction permit under FCC File No. BNPFT-20130826AEQ.

This application seeks to relocate the translator from its currently authorized site. As a result of the relocation, the elevation data associated with the facility would necessarily change. This application also proposes a change to the maximum effective radiated power, but no change to the channel of operation. Finally, Power also proposes a change in the primary station of the facility, and this change, combined with the relocation, would result in the translator functioning as a fill-in translator.

The proposed facility would operate on FM channel 252 with an effective radiated power of 100 Watts, utilizing a non-directional antenna. The proposed center of radiation is 56.1 meters above ground level, which when combined with the site elevation of 265.2 meters AMSL, yields a center of radiation of 321.3 meters AMSL. All studies in this application are based on the use of the FCC 30-meter terrain database.

The proposed relocation of the facility would constitute a minor change to the existing authorization. Exhibit E-1 illustrates the authorized 60 dBu service contour of the translator along with the proposed 60 dBu service contour. As this map demonstrates, these two contours would

¹ The Facility ID for W252CY at Anderson, Indiana is 143533.

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overlap. In fact, the authorized 60 dBu contour would be wholly contained within the proposed 60 dBu service contour.

The primary station for the translator would be changed to FM broadcast station WLBC-FM at Muncie, Indiana.² The translator intends to translate the HD2 stream of that facility. W252CY would function as a fill-in translator for WLBC-FM. Exhibit E-2 illustrates the predicted 54 dBu service contour of WLBC-FM along with the proposed 54 dBu service contour of the proposed translator.³

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 study. As this study demonstrates, the proposed facility would comply with all of the contour overlap provisions of that section to all proposed and existing facilities with the exception of WGNR-FM and WQME, both licensed to Anderson, Indiana.⁴ This tabular study is graphically depicted in the contour map that comprising Exhibit E-4.

Although there would be normally prohibited contour overlap between the proposed facility, and both WGNR-FM and WQME, the potential interference region would affect zero population. Exhibit E-5 illustrates the WGNR-FM, WQME, and W252CY transmitter sites, along with the WNGR-FM 120.1 dBu service contour, and the WQME 78.74 dBu service contour. As this map demonstrates, both of these contours intersect the proposed W252CY transmitter site.

² The Facility ID for WLBC-FM at Muncie, Indiana is 17602.

³ WLBC-FM is a class B facility, hence the use of the 54 dBu service contour.

⁴ The Facility ID for WGNR-FM is 2215, while 2216 is the Facility ID for WQME.

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Since both of the full power facilities operate second adjacent to the proposed translator facility, interference to either would potentially occur in regions where the translator field strength is at least 40 dBu greater than the corresponding full-power station field strength. Specifically, interference to WGNR-FM would potentially occur in regions where the translator field strength is at least 160.1 dBu, while interference to WQME may occur in regions of 118.74 dBu. Since the latter is the more restrictive of the two values, it will be utilized as the interfering field strength for the purposes of this study.

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:

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

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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 results of these calculations for depression angles of 0 degrees to 90 degrees are tabulated in Exhibit E-6. The data in this exhibit assumes the use of an isotropic radiator.⁵ The proposed translator would be combined with W279CL, and share an antenna. The antenna licensed for W279CL is a three-bay PSIFML-3/0.625 model, which has 5/8 wavelength spacing between the bays at channel 279. The lower frequency utilized by W252CY would result in a smaller bay spacing. Since no vertical plane pattern is available for the element spacing that results from the W252CY operation, a worst-case scenario is considered through the assumption of a relative field at all azimuths and depression angles.

The resulting radii values indicate the volume in which interference may potentially occur relative to the center of radiation of the antenna. As indicated in the table the maximum radius at which the interference field strength may occur is 81.1 meters from the center of the antenna. The following satellite image illustrates the location of the tower utilized, along with an 81.1 meter radius.

⁵ The isotropic radiator is utilized in the sense of uniform radiation in all directions. Calculations in the table are based on an effective radiated power relative to a half-wave dipole antenna.

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As this image demonstrates, one structure exists within the maximum potential interference radius. This solitary structure is the transmitter building utilized by the two translators, and co-located AM station WHBU at Anderson, Indiana. The remainder of the potential interference involves only the WHBU transmitter site, or unpopulated land with no structures or roads. It is therefore respectfully submitted that any potential interference that would result from the facility would impact zero persons.

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6.27.2016

The proposed facility would not constitute a significant environmental impact, and is exempt from environmental processing. No changes to the structure would be necessary to construct this facility. A combiner would be installed within the transmitter building, but no actual construction outside of the building would be required.

The proposed facility would not result in a radiofrequency radiation exposure hazard to persons at the site. Assuming uniform radiation in all directions from the center of radiation elevation, the calculated worst-case power density at two meters above ground level would be $3.15 \mu\text{W}/\text{cm}^2$ based on the equations from Appendix A of *OET Bulletin 65*. This value is well below the upper limit permissible under the uncontrolled environment condition of the applicable safety standard, and is sufficiently low to categorically exclude the facility.

The Power Foundation certifies that it will coordinate with all present and future 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 coordination will include, but is not necessarily limited to, a reduction in transmitter power or cessation of operation.

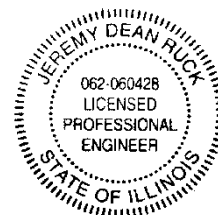
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The preceding statement and attached exhibits have been prepared by me, or under my direction, and are true and accurate to the best of my belief and knowledge.



Above signature is digitized copy of actual signature
License Expires November 30, 2017

Jeremy D. Ruck, PE
June 24, 2016

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W252CY.X

BNPFT20130826AEQ
Latitude: 40-04-24.90 N
Longitude: 085-41-58 W
ERP: 0.10 kW
Channel: 252
Frequency: 98.3 MHz
AMSL Height: 339.0 m
Horiz. Pattern: Omni
Vert. Pattern: No
Prop Model: None

W252CY.C

BNPFT20130826AEQ
Latitude: 40-04-44 N
Longitude: 085-43-24 W
ERP: 0.027 kW
Channel: 252
Frequency: 98.3 MHz
AMSL Height: 343.0 m
Horiz. Pattern: Omni
Vert. Pattern: No
Prop Model: None

Jeremy Ruck & Associates, Inc.

- Proposed W252CY 60 dBu Service Contour
- Authorized W252CY 60 dBu Service Contour
- Area of Contour Overlap

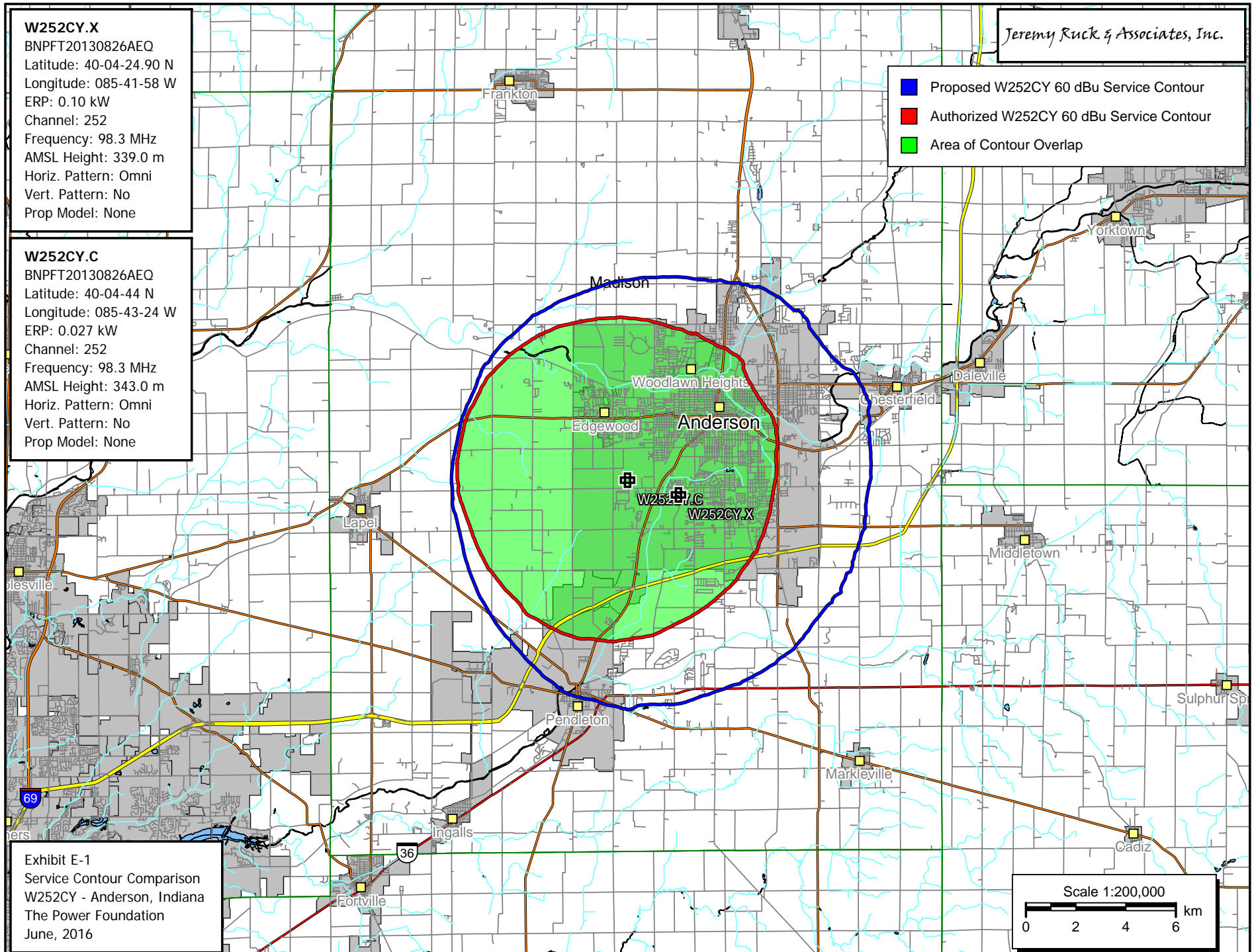
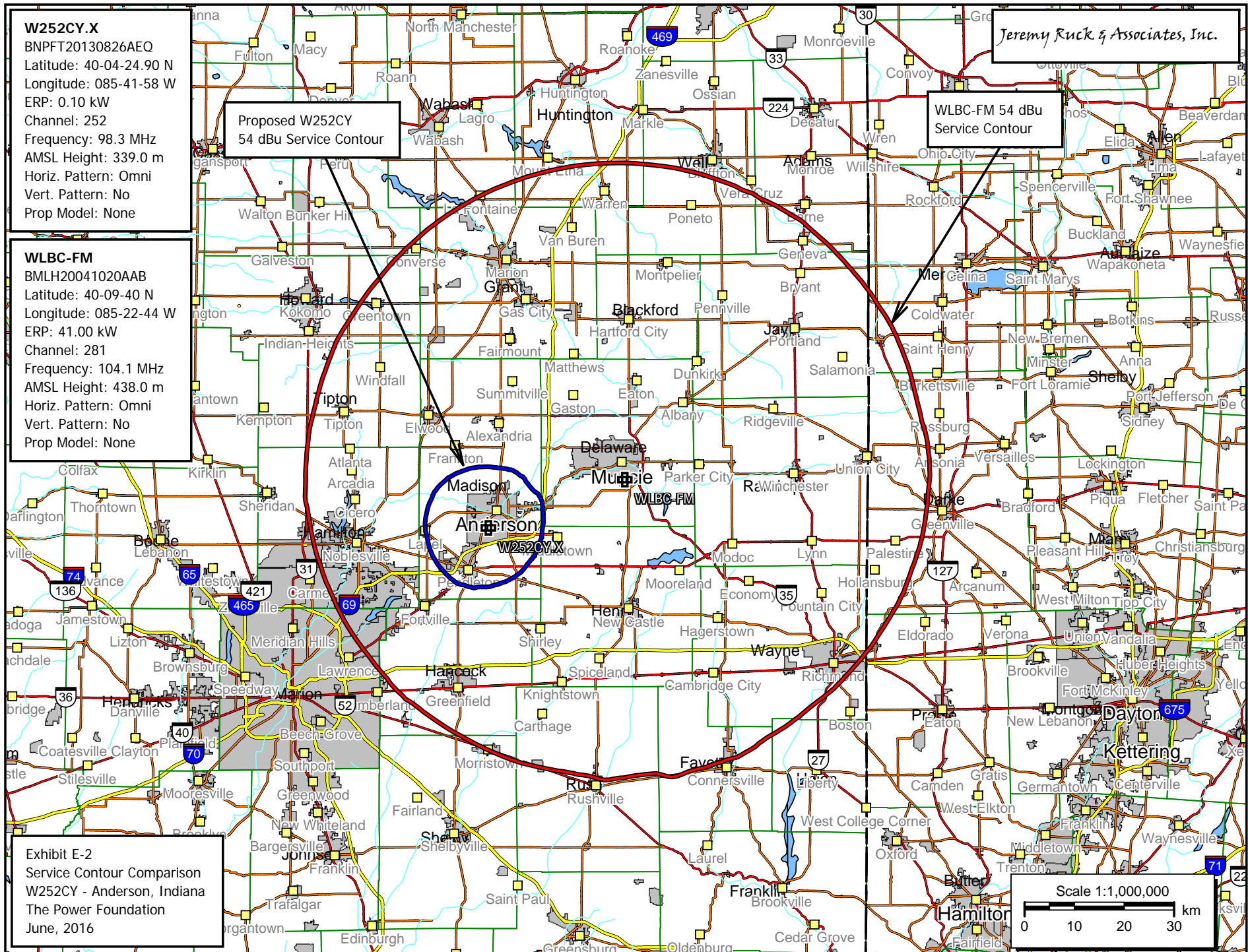


Exhibit E-1
Service Contour Comparison
W252CY - Anderson, Indiana
The Power Foundation
June, 2016



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

Exhibit E-3 - Tabular Interference Study
W252CY - Anderson, Indiana
CH# 252D - 98.3 MHz, Pwr= 0.1 kW, HAAT= 0.0 M, COR= 321 M
Average Protected F(50-50)= 5.64 km
Omni-directional

DISPLAY DATES
DATA 06-22-16
SEARCH 06-22-16

REFERENCE
40 04 25.0 N.
85 41 58.0 W.

CH CITY	CALL	TYPE STATE	ANT AZI <--	DI ST FILE #	LAT LNG	PWR(kW) HAAT(M)	INT(km) COR(M)	PRO(km) LICENSEE	*IN* (Overlap in km)	*OUT*
250B Anderson	WG NR-FM	LIC _C_ IN	213.2 33.2	1.55 BMLD20030908ADX	40 03 43.0 85 42 34.0	50.000 149	5.7 405	63.4 The Moody Bible Institute	-12.1*	-63.3*
252D Anderson	W252CY	CP _C_ IN	286.1 106.1	2.11 BNPFT20130826AEQ	40 04 44.0 85 43 24.0	0.027 78	19.3 343	5.8 The Power Foundation	-25.1*	-30.3*
254A Anderson	WOME	LIC _CN IN	185.8 5.8	10.11 BLH19970512KF	39 58 59.0 85 42 41.0	4.500 117	2.8 390	29.2 Anderson University, Inc.	0.0	-19.7*
252A Plainfield	WUBG	LIC _CN IN	239.0 58.5	67.38 BLH19830131AS	39 45 33.0 86 22 30.0	3.000 91	76.8 341	24.7 Capstar Tx, LLC	-17.1*	16.7
252A Winchester	WZZY	LIC _CN IN	88.2 268.7	64.88 BLH19840716CZ	40 05 23.0 84 56 13.0	3.000 91	74.2 444	22.9 Rodgers Broadcasting Corpo	-15.8*	20.8
253A Peru	WMYK	LIC _CX IN	335.0 154.8	68.26 BMLH20111012ABX	40 37 46.0 86 02 30.0	6.000 100	39.9 339	26.0 Hoosier Am/fm, LLC	20.4	31.1
252D Frankfort	W252CX	CP _C_ IN	288.8 108.3	74.16 BNPFT20130822AEI	40 17 09.0 86 31 38.0	0.250 27	23.8 283	7.1 Kaspar Broadcasting Co, Inc	42.4	40.3
252D Frankfort	W252CX	APP DV_ IN	288.8 108.3	74.16 BMPFT20160616AAL	40 17 09.0 86 31 38.0	0.250	11.0 293	3.4 Kaspar Broadcasting Co, Inc	55.2	43.9
254D Rushville	W254AP	LIC DC_ IN	157.1 337.2	56.10 BLFT20091030ADB	39 36 31.1 85 26 39.0	0.250 12	0.2 302	3.3 Delmar Communications, Inc	49.3	52.1

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= East Zone, Co to 3rd adjacent.
All separation margins (if shown) include rounding. Call signs with strikeout need not be protected.
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.
Reference station has protected zone issue: AM tower

W252CY.X

BNPFT20130826AEQ

Latitude: 40-04-24.90 N

Longitude: 085-41-58 W

ERP: 0.10 kW

Channel: 252

Frequency: 98.3 MHz

AMSL Height: 339.0 m

Horiz. Pattern: Omni

Vert. Pattern: No

Prop Model: None

Jeremy Ruck & Associates, Inc.

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

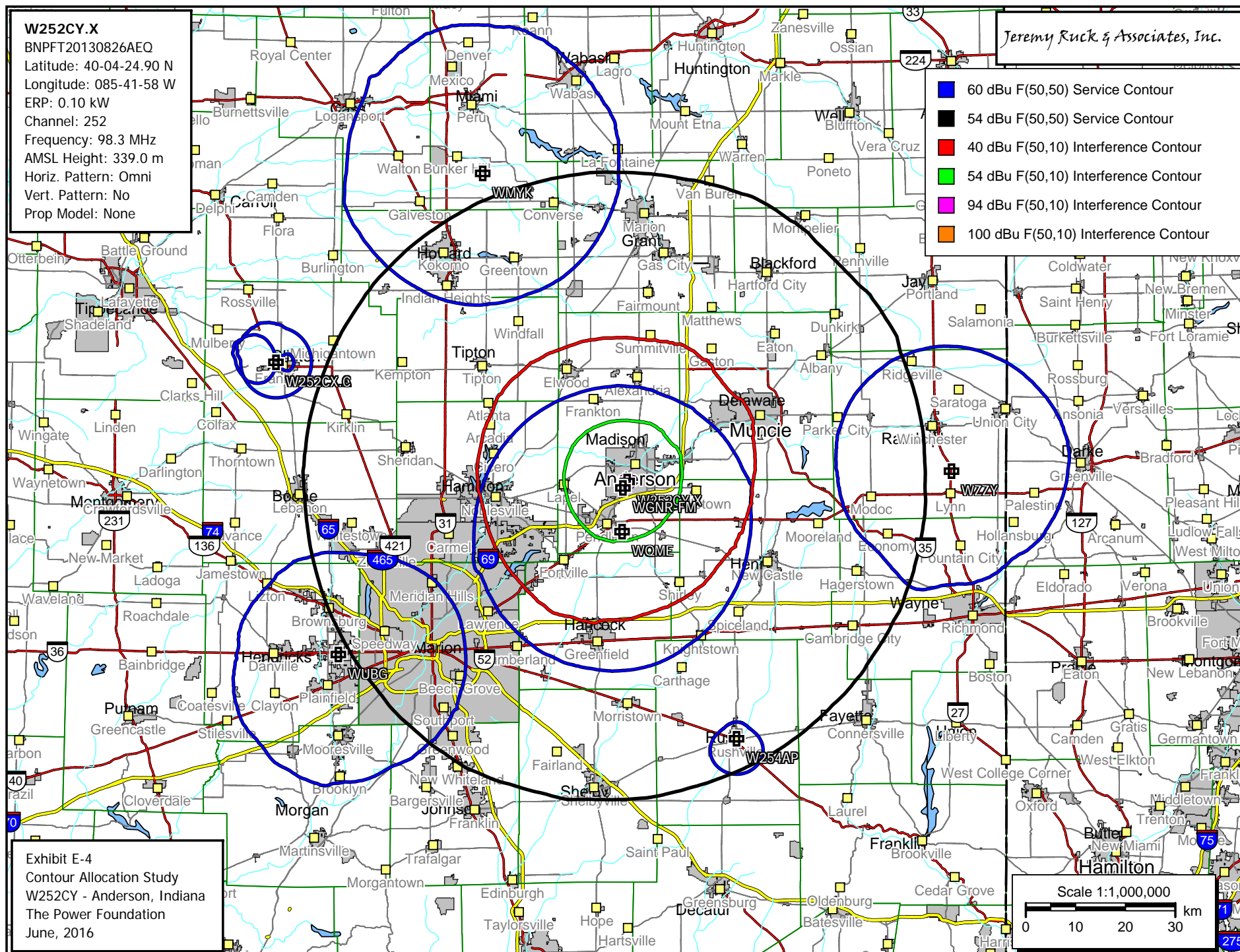


Exhibit E-4
Contour Allocation Study
W252CY - Anderson, Indiana
The Power Foundation
June, 2016

W252CY.X

BNPFT20130826AEQ
Latitude: 40-04-24.90 N
Longitude: 085-41-58 W
ERP: 0.10 kW
Channel: 252
Frequency: 98.3 MHz
AMSL Height: 339.0 m
Horiz. Pattern: Omni
Vert. Pattern: No
Prop Model: None

W252CY Proposed
Transmitter Site

Anderson

Jeremy Ruck & Associates, Inc.

- WGNR-FM 120.10 dBu F(50,50) Service Contour
- WQME 78.74 dBu F(50,50) Service Contour

W252CY.X

WGNR-FM

FCC F(50-50) 120.10 dBu (FCC HAAT)

FCC F(50-50) 78.74 dBu (FCC HAAT)

WGNR-FM 120.1 dBu
Service Contour

Pendleton

WQME

WQME 78.74 dBu
Service Contour

Markleville

Exhibit E-5
Interference Study
W252CY - Anderson, Indiana
The Power Foundation
June, 2016

Scale 1:100,000

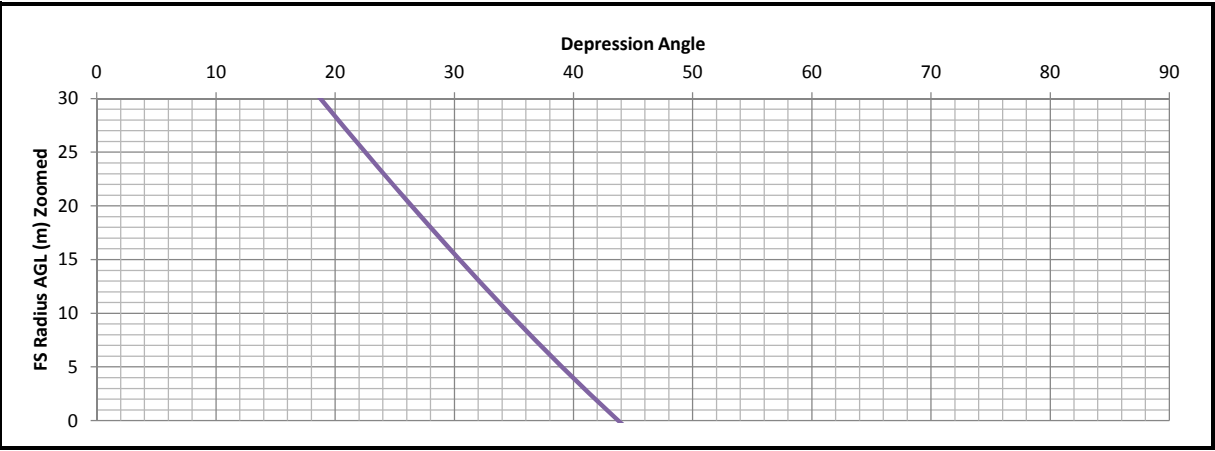
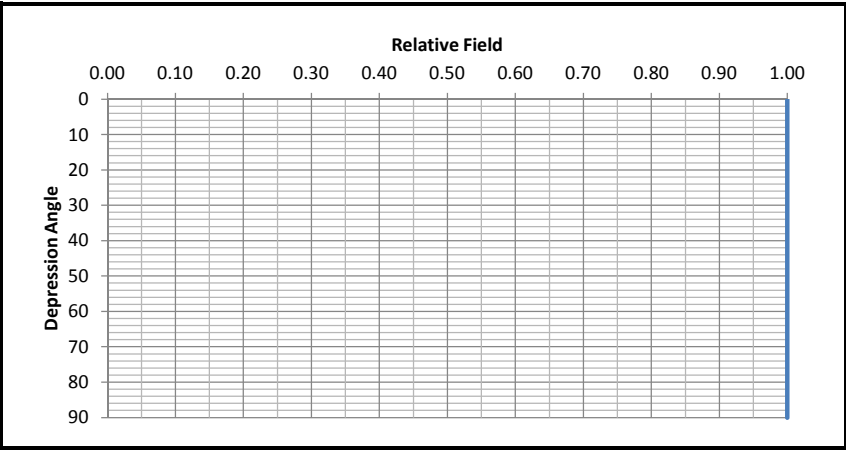
0 1 2 3 km

Exhiibt E-6

Proximity Interference Analysis

W252CY - Anderson, Indiana

Antenna No:	131	⬆	⬆	Center of Radiation:	56.1 m AGL
Manufacturer:	WORST CASE	⬆	⬆	Effective Radiated Power:	100 Watts
Model:	WORST CASE			FS Contour:	118.74 dBu
Number of Bays:	1			E Field Strength:	0.86497 V/m
Bay Spacing:	Lambda			Z0:	377 Ohms
				Power Density:	0.001984534 W/m^2



Depression Angle	Relative Field	Relative Power	ERP Watts	Radii in meters			
				Field Strength	Horizontal	Vertical	AGL
0	1.0000	1.0000	100.00	81.09	81.09	0.00	56.10
1	1.0000	1.0000	100.00	81.09	81.08	1.42	54.68
2	1.0000	1.0000	100.00	81.09	81.04	2.83	53.27
3	1.0000	1.0000	100.00	81.09	80.98	4.24	51.86
4	1.0000	1.0000	100.00	81.09	80.90	5.66	50.44
5	1.0000	1.0000	100.00	81.09	80.79	7.07	49.03
6	1.0000	1.0000	100.00	81.09	80.65	8.48	47.62
7	1.0000	1.0000	100.00	81.09	80.49	9.88	46.22
8	1.0000	1.0000	100.00	81.09	80.30	11.29	44.81
9	1.0000	1.0000	100.00	81.09	80.10	12.69	43.41
10	1.0000	1.0000	100.00	81.09	79.86	14.08	42.02
11	1.0000	1.0000	100.00	81.09	79.60	15.47	40.63
12	1.0000	1.0000	100.00	81.09	79.32	16.86	39.24
13	1.0000	1.0000	100.00	81.09	79.02	18.24	37.86
14	1.0000	1.0000	100.00	81.09	78.68	19.62	36.48
15	1.0000	1.0000	100.00	81.09	78.33	20.99	35.11
16	1.0000	1.0000	100.00	81.09	77.95	22.35	33.75
17	1.0000	1.0000	100.00	81.09	77.55	23.71	32.39
18	1.0000	1.0000	100.00	81.09	77.12	25.06	31.04
19	1.0000	1.0000	100.00	81.09	76.68	26.40	29.70
20	1.0000	1.0000	100.00	81.09	76.20	27.74	28.36
21	1.0000	1.0000	100.00	81.09	75.71	29.06	27.04
22	1.0000	1.0000	100.00	81.09	75.19	30.38	25.72
23	1.0000	1.0000	100.00	81.09	74.65	31.69	24.41
24	1.0000	1.0000	100.00	81.09	74.08	32.98	23.12
25	1.0000	1.0000	100.00	81.09	73.50	34.27	21.83
26	1.0000	1.0000	100.00	81.09	72.89	35.55	20.55
27	1.0000	1.0000	100.00	81.09	72.26	36.82	19.28
28	1.0000	1.0000	100.00	81.09	71.60	38.07	18.03
29	1.0000	1.0000	100.00	81.09	70.93	39.32	16.78
30	1.0000	1.0000	100.00	81.09	70.23	40.55	15.55
31	1.0000	1.0000	100.00	81.09	69.51	41.77	14.33
32	1.0000	1.0000	100.00	81.09	68.77	42.97	13.13
33	1.0000	1.0000	100.00	81.09	68.01	44.17	11.93
34	1.0000	1.0000	100.00	81.09	67.23	45.35	10.75
35	1.0000	1.0000	100.00	81.09	66.43	46.51	9.59
36	1.0000	1.0000	100.00	81.09	65.61	47.67	8.43
37	1.0000	1.0000	100.00	81.09	64.76	48.80	7.30
38	1.0000	1.0000	100.00	81.09	63.90	49.93	6.17
39	1.0000	1.0000	100.00	81.09	63.02	51.03	5.07
40	1.0000	1.0000	100.00	81.09	62.12	52.13	3.97
41	1.0000	1.0000	100.00	81.09	61.20	53.20	2.90
42	1.0000	1.0000	100.00	81.09	60.26	54.26	1.84
43	1.0000	1.0000	100.00	81.09	59.31	55.31	0.79
44	1.0000	1.0000	100.00	81.09	58.33	56.33	-0.23
45	1.0000	1.0000	100.00	81.09	57.34	57.34	-1.24

Depression Angle	Relative Field	Relative Power	ERP Watts	Radii in meters			
				Field Strength	Horizontal	Vertical	AGL
45	1.0000	1.0000	100.00	81.09	57.34	57.34	-1.24
46	1.0000	1.0000	100.00	81.09	56.33	58.33	-2.23
47	1.0000	1.0000	100.00	81.09	55.31	59.31	-3.21
48	1.0000	1.0000	100.00	81.09	54.26	60.26	-4.16
49	1.0000	1.0000	100.00	81.09	53.20	61.20	-5.10
50	1.0000	1.0000	100.00	81.09	52.13	62.12	-6.02
51	1.0000	1.0000	100.00	81.09	51.03	63.02	-6.92
52	1.0000	1.0000	100.00	81.09	49.93	63.90	-7.80
53	1.0000	1.0000	100.00	81.09	48.80	64.76	-8.66
54	1.0000	1.0000	100.00	81.09	47.67	65.61	-9.51
55	1.0000	1.0000	100.00	81.09	46.51	66.43	-10.33
56	1.0000	1.0000	100.00	81.09	45.35	67.23	-11.13
57	1.0000	1.0000	100.00	81.09	44.17	68.01	-11.91
58	1.0000	1.0000	100.00	81.09	42.97	68.77	-12.67
59	1.0000	1.0000	100.00	81.09	41.77	69.51	-13.41
60	1.0000	1.0000	100.00	81.09	40.55	70.23	-14.13
61	1.0000	1.0000	100.00	81.09	39.32	70.93	-14.83
62	1.0000	1.0000	100.00	81.09	38.07	71.60	-15.50
63	1.0000	1.0000	100.00	81.09	36.82	72.26	-16.16
64	1.0000	1.0000	100.00	81.09	35.55	72.89	-16.79
65	1.0000	1.0000	100.00	81.09	34.27	73.50	-17.40
66	1.0000	1.0000	100.00	81.09	32.98	74.08	-17.98
67	1.0000	1.0000	100.00	81.09	31.69	74.65	-18.55
68	1.0000	1.0000	100.00	81.09	30.38	75.19	-19.09
69	1.0000	1.0000	100.00	81.09	29.06	75.71	-19.61
70	1.0000	1.0000	100.00	81.09	27.74	76.20	-20.10
71	1.0000	1.0000	100.00	81.09	26.40	76.68	-20.58
72	1.0000	1.0000	100.00	81.09	25.06	77.12	-21.02
73	1.0000	1.0000	100.00	81.09	23.71	77.55	-21.45
74	1.0000	1.0000	100.00	81.09	22.35	77.95	-21.85
75	1.0000	1.0000	100.00	81.09	20.99	78.33	-22.23
76	1.0000	1.0000	100.00	81.09	19.62	78.68	-22.58
77	1.0000	1.0000	100.00	81.09	18.24	79.02	-22.92
78	1.0000	1.0000	100.00	81.09	16.86	79.32	-23.22
79	1.0000	1.0000	100.00	81.09	15.47	79.60	-23.50
80	1.0000	1.0000	100.00	81.09	14.08	79.86	-23.76
81	1.0000	1.0000	100.00	81.09	12.69	80.10	-24.00
82	1.0000	1.0000	100.00	81.09	11.29	80.30	-24.20
83	1.0000	1.0000	100.00	81.09	9.88	80.49	-24.39
84	1.0000	1.0000	100.00	81.09	8.48	80.65	-24.55
85	1.0000	1.0000	100.00	81.09	7.07	80.79	-24.69
86	1.0000	1.0000	100.00	81.09	5.66	80.90	-24.80
87	1.0000	1.0000	100.00	81.09	4.24	80.98	-24.88
88	1.0000	1.0000	100.00	81.09	2.83	81.04	-24.94
89	1.0000	1.0000	100.00	81.09	1.42	81.08	-24.98
90	1.0000	1.0000	100.00	81.09	0.00	81.09	-24.99

