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ENGINEERING REPORT

Formerly K265FF, Marion, TX, Channel 212D Minor Mod

ENGINEERING STATEMENT

PROTECTION TO KTSW AND KYFS

All contour non-overlap protection requirements are met with the exception of KTSW, San Marcos, TX (210C3) and KYFS, San Antonio, TX (215C1), discussed below.

KTSW (17.0 kilometers at 359 degrees True) and KYFS (22.1 kilometers at 329 degrees True) are second/third adjacent-channel to the proposed channel 212D facility. The 60 dBu F50,50 service contour of each extends well beyond the proposed 212D transmitter site. Using the well-established *Living Way Ministries* Methodology, no actual interference to any population is predicted to exist to KTSW or KYFS.

Note that a rule waiver of Section 74.1204 for this second/third adjacent-channel protection using the well-established *Living Way Ministries* Methodology is respectfully requested if such a rule waiver is deemed necessary for protection to any station.

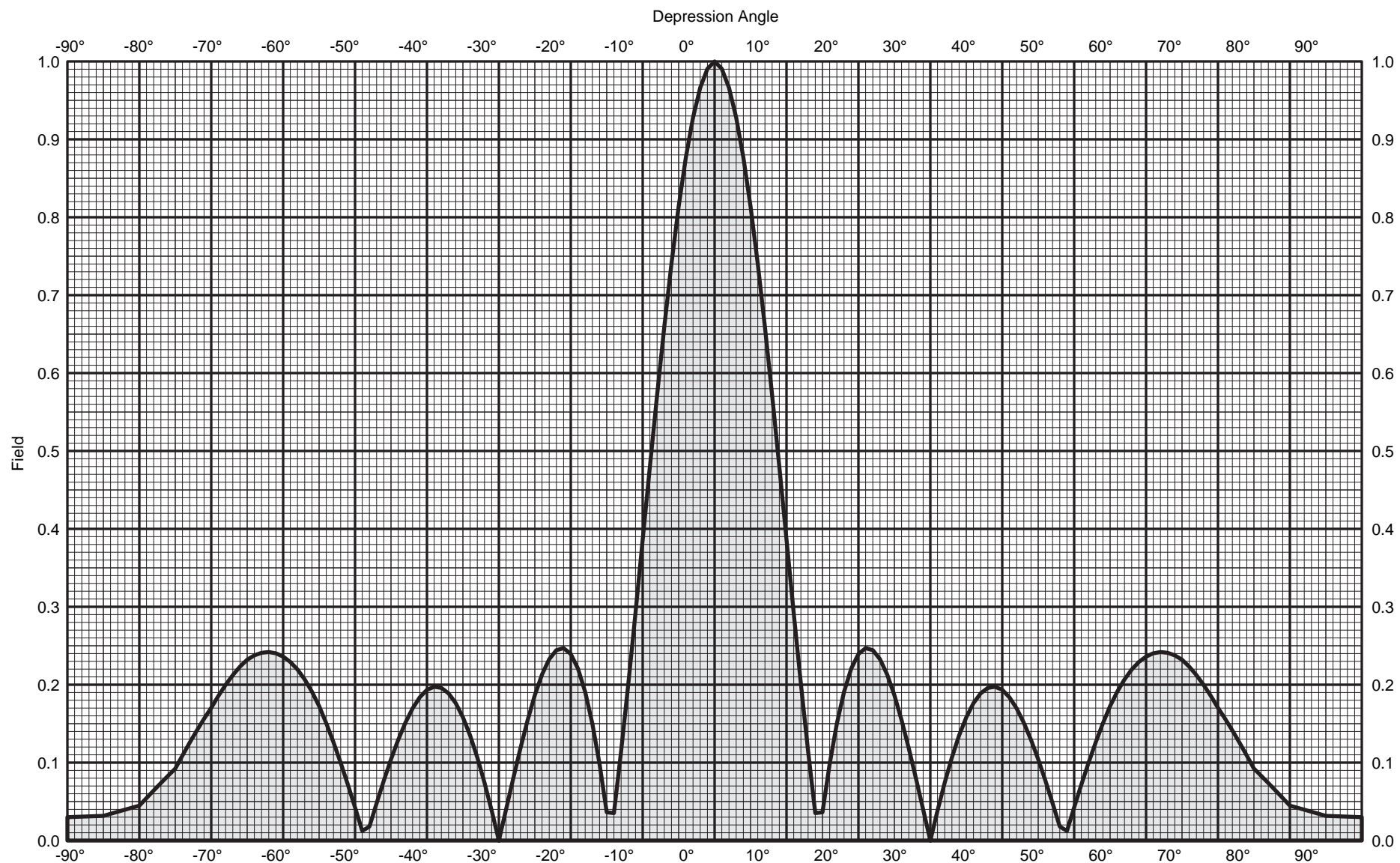
The F50,50 signal strength from KTSW at the proposed 212D transmitter site is at least 60.2 dBu (the “desired” signal of KTSW). The F50,50 signal strength from KYFS at the proposed 212D transmitter site is at least 85 dBu (the other “desired” signal of KYFS). The second/third adjacent-channel protection of Section 74.1204 is an undesired-to-desired (“U/D”) dB signal strength ratio of 40:1. Therefore, predicted interference to KTSW and KYFS from the proposed 212D facility is a signal of greater than or equal to 100.2 dBu.

Figure EE1 is the vertical plane relative field pattern for the proposed Scala CA2-FM/CP four-bay (fullwave spaced) antenna. By adjusting for the vertical plane downward relative field values of the proposed antenna, it is herein demonstrated that the 100.2 dBu interfering signal (using a free space field determination) does not exist at any point at ground level where people reside... (Actually, the study is made to 2 meters above ground level to account for a person’s height.)

Attached as Figure EE2 is a tabulation of various points (at 2 meters above

ground level) from the proposed translator tower base. (Column B is the different distances from the tower base to each studied point.) The actual distance from the antenna to each point is listed in Column C, the hypotenuse of the vertical height (Column A) and the horizontal distance (Column B). Also, the vertical distance from the antenna bottom to the calculated interference signal for each studied point is provided in Column K. Because the calculated distance to the free space interfering signal (Column J) is less than the hypotenuse distance (Column C) and the interfering signal vertical distance (Column K) is less than the vertical distance (Column A) for each studied point, the interfering signal does not reach any studied point. (In other words, the interfering signal does not make it to 2 meters any point within 100 meters of the transmitter site.) As demonstrated by the attached aerial photo, there is no population within 100 meters (328 feet) of the transmitter site. Therefore, pursuant to Section 74.1204(d) of the FCC Rules, KTSW and KYFS are adequately protected by the proposed facility.

FIGURE EE1 (1 of 3)





4 x CA2-FM/CP Array

Frequency: 91.3 MHz

Gain: 6.0 dBd (x 4.0)

Circular Polarization

Vertical stacked 1.0 wavelength

Vertical plane Pattern

Angle	Field	Rel.dB	dBd	PwrMult	Angle	Field	Rel.dB	dBd	PwrMult
-90	0.030	-30.46	-24.46	0.00	-45	0.104	-19.63	-13.63	0.04
-89	0.030	-30.36	-24.36	0.00	-44	0.129	-17.77	-11.77	0.07
-88	0.031	-30.27	-24.27	0.00	-43	0.151	-16.41	-10.41	0.09
-87	0.031	-30.17	-24.17	0.00	-42	0.170	-15.41	-9.41	0.11
-86	0.031	-30.08	-24.08	0.00	-41	0.184	-14.71	-8.71	0.13
-85	0.032	-29.99	-23.99	0.00	-40	0.193	-14.27	-8.27	0.15
-84	0.034	-29.29	-23.29	0.00	-39	0.197	-14.09	-8.09	0.16
-83	0.037	-28.65	-22.65	0.01	-38	0.196	-14.16	-8.16	0.15
-82	0.040	-28.05	-22.05	0.01	-37	0.189	-14.47	-8.47	0.14
-81	0.042	-27.50	-21.50	0.01	-36	0.176	-15.07	-9.07	0.12
-80	0.045	-26.99	-20.99	0.01	-35	0.158	-16.02	-10.02	0.10
-79	0.055	-25.27	-19.27	0.01	-34	0.135	-17.40	-11.40	0.07
-78	0.064	-23.84	-17.84	0.02	-33	0.107	-19.44	-13.44	0.05
-77	0.074	-22.64	-16.64	0.02	-32	0.074	-22.58	-16.58	0.02
-76	0.083	-21.60	-15.60	0.03	-31	0.038	-28.31	-22.31	0.01
-75	0.092	-20.70	-14.70	0.03	-30	0.010	-40.00	-34.00	0.00
-74	0.109	-19.24	-13.24	0.05	-29	0.040	-27.99	-21.99	0.01
-73	0.126	-18.02	-12.02	0.06	-28	0.080	-21.96	-15.96	0.03
-72	0.141	-17.00	-11.00	0.08	-27	0.118	-18.53	-12.53	0.06
-71	0.156	-16.12	-10.12	0.10	-26	0.155	-16.22	-10.22	0.10
-70	0.170	-15.38	-9.38	0.12	-25	0.187	-14.58	-8.58	0.14
-69	0.186	-14.62	-8.62	0.14	-24	0.213	-13.43	-7.43	0.18
-68	0.200	-13.99	-7.99	0.16	-23	0.233	-12.66	-6.66	0.22
-67	0.212	-13.46	-7.46	0.18	-22	0.244	-12.24	-6.24	0.24
-66	0.223	-13.03	-7.03	0.20	-21	0.247	-12.15	-6.15	0.24
-65	0.232	-12.69	-6.69	0.21	-20	0.239	-12.42	-6.42	0.23
-64	0.238	-12.48	-6.48	0.22	-19	0.221	-13.13	-7.13	0.19
-63	0.241	-12.36	-6.36	0.23	-18	0.191	-14.38	-8.38	0.15
-62	0.242	-12.33	-6.33	0.23	-17	0.150	-16.48	-10.48	0.09
-61	0.240	-12.38	-6.38	0.23	-16	0.098	-20.15	-14.15	0.04
-60	0.236	-12.54	-6.54	0.22	-15	0.036	-28.82	-22.82	0.01
-59	0.229	-12.80	-6.80	0.21	-14	0.035	-29.06	-23.06	0.00
-58	0.219	-13.17	-7.17	0.19	-13	0.115	-18.80	-12.80	0.05
-57	0.207	-13.69	-7.69	0.17	-12	0.201	-13.93	-7.93	0.16
-56	0.191	-14.37	-8.37	0.15	-11	0.292	-10.69	-4.69	0.34
-55	0.173	-15.26	-9.26	0.12	-10	0.386	-8.26	-2.26	0.59
-54	0.150	-16.45	-10.45	0.09	-9	0.480	-6.38	-0.38	0.92
-53	0.126	-17.99	-11.99	0.06	-8	0.571	-4.86	1.14	1.30
-52	0.100	-20.02	-14.02	0.04	-7	0.659	-3.62	2.38	1.73
-51	0.072	-22.88	-16.88	0.02	-6	0.741	-2.61	3.39	2.18
-50	0.042	-27.43	-21.43	0.01	-5	0.814	-1.79	4.21	2.64
-49	0.012	-38.15	-32.15	0.00	-4	0.877	-1.14	4.86	3.06
-48	0.018	-34.92	-28.92	0.00	-3	0.928	-0.65	5.35	3.43
-47	0.048	-26.39	-20.39	0.01	-2	0.966	-0.30	5.70	3.72
-46	0.077	-22.28	-16.28	0.02	-1	0.991	-0.08	5.92	3.91
					0	1.000	0.00	6.00	3.98



4 x CA2-FM/CP Array

Frequency: 91.3 MHz

Gain: 6.0 dBd (x 4.0)

Circular Polarization

Vertical stacked 1.0 wavelength

Vertical plane Pattern

Angle	Field	Rel.dB	dBd	PwrMult	Angle	Field	Rel.dB	dBd	PwrMult
0	1.000	0.00	6.00	3.98	45	0.104	-19.63	-13.63	0.04
1	0.991	-0.08	5.92	3.91	46	0.077	-22.28	-16.28	0.02
2	0.966	-0.30	5.70	3.72	47	0.048	-26.39	-20.39	0.01
3	0.928	-0.65	5.35	3.43	48	0.018	-34.92	-28.92	0.00
4	0.877	-1.14	4.86	3.06	49	0.012	-38.16	-32.16	0.00
5	0.814	-1.79	4.21	2.64	50	0.042	-27.43	-21.43	0.01
6	0.741	-2.61	3.39	2.18	51	0.072	-22.88	-16.88	0.02
7	0.659	-3.62	2.38	1.73	52	0.100	-20.02	-14.02	0.04
8	0.572	-4.86	1.14	1.30	53	0.126	-17.99	-11.99	0.06
9	0.480	-6.38	-0.38	0.92	54	0.150	-16.45	-10.45	0.09
10	0.386	-8.26	-2.26	0.59	55	0.173	-15.26	-9.26	0.12
11	0.292	-10.69	-4.69	0.34	56	0.191	-14.37	-8.37	0.15
12	0.201	-13.93	-7.93	0.16	57	0.207	-13.69	-7.69	0.17
13	0.115	-18.80	-12.80	0.05	58	0.219	-13.17	-7.17	0.19
14	0.035	-29.06	-23.06	0.00	59	0.229	-12.80	-6.80	0.21
15	0.036	-28.82	-22.82	0.01	60	0.236	-12.54	-6.54	0.22
16	0.098	-20.15	-14.15	0.04	61	0.240	-12.38	-6.38	0.23
17	0.150	-16.48	-10.48	0.09	62	0.242	-12.33	-6.33	0.23
18	0.191	-14.38	-8.38	0.15	63	0.241	-12.36	-6.36	0.23
19	0.221	-13.13	-7.13	0.19	64	0.238	-12.48	-6.48	0.22
20	0.239	-12.42	-6.42	0.23	65	0.232	-12.69	-6.69	0.21
21	0.247	-12.15	-6.15	0.24	66	0.223	-13.03	-7.03	0.20
22	0.244	-12.24	-6.24	0.24	67	0.212	-13.46	-7.46	0.18
23	0.233	-12.66	-6.66	0.22	68	0.200	-13.99	-7.99	0.16
24	0.213	-13.43	-7.43	0.18	69	0.186	-14.62	-8.62	0.14
25	0.187	-14.58	-8.58	0.14	70	0.170	-15.38	-9.38	0.12
26	0.155	-16.22	-10.22	0.10	71	0.156	-16.12	-10.12	0.10
27	0.118	-18.53	-12.53	0.06	72	0.141	-17.00	-11.00	0.08
28	0.080	-21.96	-15.96	0.03	73	0.126	-18.02	-12.02	0.06
29	0.040	-27.99	-21.99	0.01	74	0.109	-19.24	-13.24	0.05
30	0.010	-40.00	-34.00	0.00	75	0.092	-20.70	-14.70	0.03
31	0.038	-28.31	-22.31	0.01	76	0.083	-21.60	-15.60	0.03
32	0.074	-22.58	-16.58	0.02	77	0.074	-22.64	-16.64	0.02
33	0.107	-19.44	-13.44	0.05	78	0.064	-23.84	-17.84	0.02
34	0.135	-17.40	-11.40	0.07	79	0.055	-25.27	-19.27	0.01
35	0.158	-16.02	-10.02	0.10	80	0.045	-26.99	-20.99	0.01
36	0.176	-15.07	-9.07	0.12	81	0.042	-27.50	-21.50	0.01
37	0.189	-14.47	-8.47	0.14	82	0.040	-28.05	-22.05	0.01
38	0.196	-14.16	-8.16	0.15	83	0.037	-28.65	-22.65	0.01
39	0.197	-14.09	-8.09	0.16	84	0.034	-29.29	-23.29	0.00
40	0.193	-14.27	-8.27	0.15	85	0.032	-29.99	-23.99	0.00
41	0.184	-14.71	-8.71	0.13	86	0.031	-30.08	-24.08	0.00
42	0.170	-15.41	-9.41	0.11	87	0.031	-30.17	-24.17	0.00
43	0.151	-16.41	-10.41	0.09	88	0.031	-30.27	-24.27	0.00
44	0.129	-17.77	-11.77	0.07	89	0.030	-30.36	-24.36	0.00
					90	0.030	-30.46	-24.46	0.00

FIGURE EE2

FREE SPACE FIELD STRENGTH AT A DISTANCE STUDY RESULTS

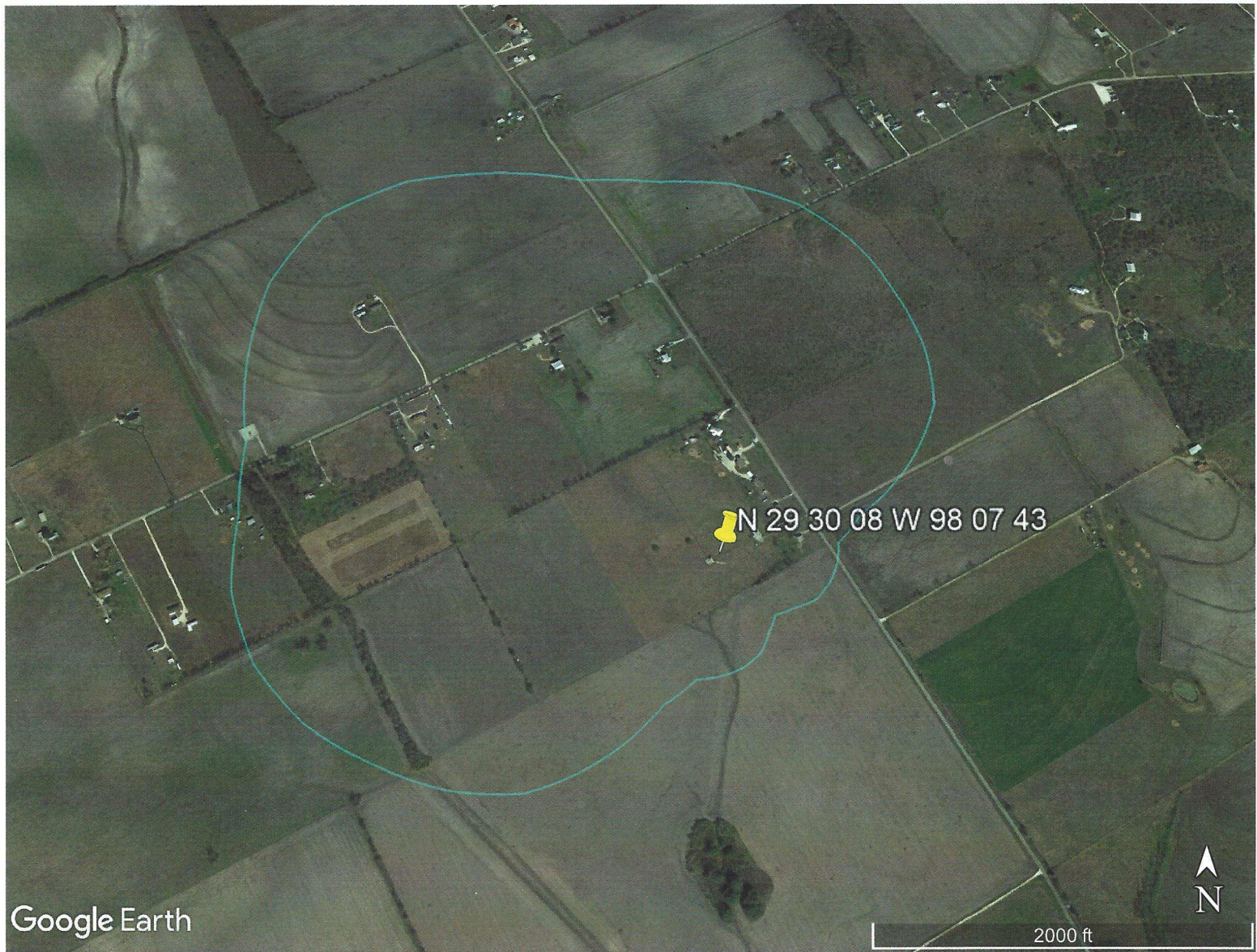
PROJECT: Marion, TX, CHANNEL 212D

18-Sep-17

Pt	Column A Vert Dist From Ant Bottom (meters)	Column B Horiz Dist From Tower Base (meters)	Column C Hypot- enuse Dist fr Ant Bottom (meters)	Column D Down- ward Angle fr Ant Bottom (degrees)	Column E Max ERP (watts)	Column F Max ERP (dBmw)	Column G Pattern Relative Field at Down- ward Angle	Column H Free Space Inter- ferring Signal (dBu)	Column I Adjusted ERP in Down- ward Angle (dBmW)	Column J Interf Distance along Hypot- enuse (meters)	Column K Vert Interf Distance below Antenna (meters)
1	105	0.1	105.0	89.9	250	53.98	0.030	100.2	23.52	32.6	32.6
2	105	20	106.9	79.2	250	53.98	0.055	100.2	28.79	59.8	58.8
3	105	40	112.4	69.1	250	53.98	0.186	100.2	39.37	202.3	189.0
4	105	60	120.9	60.3	250	53.98	0.240	100.2	41.58	261.0	226.6
5	105	80	132.0	52.7	250	53.98	0.126	100.2	35.99	137.0	109.0
6	105	100	145.0	46.4	250	53.98	0.077	100.2	31.71	83.7	60.6
7	105	200	225.9	27.7	250	53.98	0.118	100.2	35.42	128.3	59.7
8	105	300	317.8	19.3	250	53.98	0.239	100.2	41.55	259.9	85.9
9	105	400	413.6	14.7	250	53.98	0.036	100.2	25.11	39.2	9.9
10	105	500	510.9	11.9	250	53.98	0.292	100.2	43.29	317.6	65.3
11	105	600	609.1	9.9	250	53.98	0.480	100.2	47.60	522.0	90.0
12	105	700	707.8	8.5	250	53.98	0.571	100.2	49.11	621.0	92.1
13	105	800	806.9	7.5	250	53.98	0.659	100.2	50.36	716.7	93.3
14	105	900	906.1	6.7	250	53.98	0.741	100.2	51.38	805.9	93.4
15	105	1088	1093.1	5.5	250	53.98	0.814	100.2	52.19	885.3	85.0

NOTE: Study point at 2 meters above ground (or rooftop, see write-up) level.

RESULTS: COLUMN J DISTANCES ARE LESS THAN COLUMN C AND COLUMN K DISTANCES ARE LESS THAN COLUMN A DISTANCES IN ALL INSTANCES; THEREFORE, INTERFERRING SIGNAL DOES NOT EXIST AT ANY LOCATION (TWO METERS OR LESS ABOVE GROUND LEVEL)



100.2 dBu Free Space Loss Contour of Proposed 212D is Shown