

Comprehensive Technical Statement

Metroplex Communications, Inc.
Application for Minor Change
W232CR, 94.3 MHz, Alton, IL

Introduction

The following changes are proposed:

- Effective radiated power
- Directional antenna pattern
- Antenna model

Data Sources

Distances were calculated using the FCC method defined in 73.208 of the Commission's Rules.

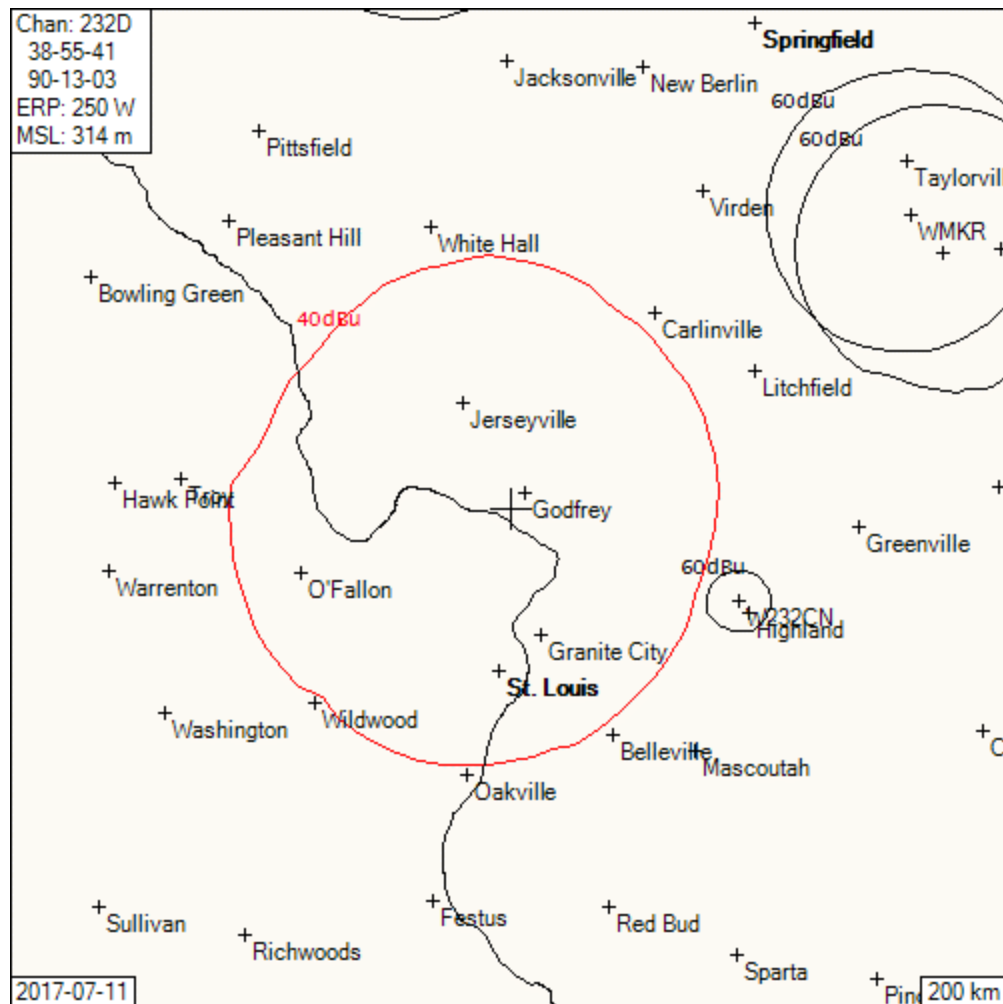
All contours shown in this report were generated using antenna center above mean sea level, NAD-27 coordinates, and the FCC online HAAT calculator, which uses 30-second terrain data.

Dates shown on the maps represent the last change date in the CDBS downloads in use at the time this statement was prepared.

Detailed Interference Study

The following collection of maps and the narrative accompanying each show that no prohibited overlap will occur between the proposed facility and any potentially conflicting co-channel or first-adjacent facility or proposal. Interfering f(50,10) contours are shown as red polygons, and protected f(50,50) contours are shown as black polygons.

Map 1 – Co-channel Outbound Interference



There is no overlap of the interfering contour with the protected contour of any station or proposal. W232CN (Facility ID 157622) is close.

In the following tabulation, the first six columns show the calculation of distance to the W232CN 60 dBu f(50,50) contour, followed by the latitude and longitude of the point described by the azimuth and distance from the transmitter. The following columns show the calculation of the interfering f(50,10) signal from the proposal at each point, and the margin below the 40 dBu limit. (A negative margin indicates prohibited overlap.) The interfering signal strength does not exceed the 40 dBu limit.

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az	eRel	kW	terht	eah	km	lat	lon	km	brg	eRel	kW	terht	eah	fs	margin
263	1	0.013	146.3	111.7	6.59	38 45 18.56	89 46 03.51	43.52	116.1	0.556	0.077	148.7	165.3	39.00	1.00
264	1	0.013	146.3	111.7	6.59	38 45 22.26	89 46 04.06	43.46	116.0	0.556	0.077	148.9	165.1	39.02	0.98
265	1	0.013	146.1	111.9	6.60	38 45 25.95	89 46 04.75	43.39	115.9	0.556	0.077	149.0	165.0	39.04	0.96
266	1	0.013	146.1	111.9	6.60	38 45 29.67	89 46 05.13	43.33	115.7	0.556	0.077	149.1	164.9	39.06	0.94
267	1	0.013	146.2	111.8	6.59	38 45 33.40	89 46 05.31	43.28	115.6	0.556	0.077	149.3	164.7	39.08	0.92
268	1	0.013	146.3	111.7	6.59	38 45 37.13	89 46 05.41	43.23	115.5	0.556	0.077	149.4	164.6	39.09	0.91
269	1	0.013	146.6	111.4	6.58	38 45 40.86	89 46 05.18	43.18	115.3	0.556	0.077	149.5	164.5	39.10	0.90
270	1	0.013	146.7	111.3	6.58	38 45 44.58	89 46 05.11	43.13	115.2	0.556	0.077	149.6	164.4	39.12	0.88
271	1	0.013	146.8	111.2	6.58	38 45 48.30	89 46 04.95	43.09	115.0	0.556	0.077	149.8	164.2	39.13	0.87
272	1	0.013	147.0	111.0	6.57	38 45 52.01	89 46 04.59	43.05	114.9	0.555	0.077	149.8	164.2	39.14	0.86
273	1	0.013	147.6	110.4	6.55	38 45 55.70	89 46 03.67	43.02	114.8	0.555	0.077	149.8	164.2	39.15	0.85
274	1	0.013	148.3	109.7	6.53	38 45 59.35	89 46 02.55	43.00	114.6	0.555	0.077	149.9	164.1	39.16	0.84
275	1	0.013	148.9	109.1	6.52	38 46 02.98	89 46 01.45	42.97	114.5	0.555	0.077	149.9	164.1	39.17	0.83
276	1	0.013	149.5	108.5	6.50	38 46 06.59	89 46 00.27	42.95	114.3	0.555	0.077	149.9	164.1	39.18	0.82
277	1	0.013	150.0	108.0	6.48	38 46 10.18	89 45 59.13	42.93	114.2	0.555	0.077	150.0	164.0	39.18	0.82
278	1	0.013	150.3	107.7	6.47	38 46 13.78	89 45 58.15	42.91	114.0	0.555	0.077	150.0	164.0	39.19	0.81
279	1	0.013	150.4	107.6	6.47	38 46 17.39	89 45 57.33	42.88	113.9	0.555	0.077	150.0	164.0	39.20	0.80
280	1	0.013	150.4	107.6	6.47	38 46 20.99	89 45 56.56	42.85	113.7	0.555	0.077	150.0	164.0	39.21	0.79
281	1	0.013	150.4	107.6	6.47	38 46 24.59	89 45 55.71	42.83	113.6	0.555	0.077	150.0	164.0	39.22	0.78
282	1	0.013	150.3	107.7	6.47	38 46 28.20	89 45 54.90	42.80	113.4	0.555	0.077	149.9	164.1	39.24	0.76
283	1	0.013	150.2	107.8	6.48	38 46 31.80	89 45 54.01	42.78	113.3	0.555	0.077	149.9	164.1	39.25	0.75
284	1	0.013	150.1	107.9	6.48	38 46 35.38	89 45 53.04	42.75	113.1	0.555	0.077	149.9	164.1	39.26	0.74
285	1	0.013	150.1	107.9	6.48	38 46 38.93	89 45 51.87	42.74	113.0	0.554	0.077	149.9	164.1	39.26	0.74
286	1	0.013	150.1	107.9	6.48	38 46 42.46	89 45 50.61	42.72	112.8	0.554	0.077	149.9	164.1	39.27	0.73
287	1	0.013	150.2	107.8	6.48	38 46 45.95	89 45 49.16	42.71	112.7	0.554	0.077	149.9	164.1	39.27	0.73
288	1	0.013	150.2	107.8	6.48	38 46 49.44	89 45 47.75	42.70	112.5	0.554	0.077	149.9	164.1	39.28	0.72
289	1	0.013	150.2	107.8	6.48	38 46 52.92	89 45 46.26	42.69	112.4	0.554	0.077	149.8	164.2	39.28	0.72
290	1	0.013	150.2	107.8	6.48	38 46 56.37	89 45 44.70	42.69	112.2	0.554	0.077	149.8	164.2	39.28	0.72
291	1	0.013	150.2	107.8	6.48	38 46 59.80	89 45 43.06	42.68	112.1	0.554	0.077	149.8	164.2	39.28	0.72
292	1	0.013	150.2	107.8	6.48	38 47 03.21	89 45 41.34	42.68	111.9	0.554	0.077	149.8	164.2	39.28	0.72
293	1	0.013	150.3	107.7	6.47	38 47 06.56	89 45 39.43	42.69	111.8	0.554	0.077	149.9	164.1	39.28	0.72
294	1	0.013	150.3	107.7	6.47	38 47 09.92	89 45 37.56	42.69	111.6	0.554	0.077	149.9	164.1	39.27	0.73
295	1	0.013	150.3	107.7	6.47	38 47 13.25	89 45 35.61	42.70	111.5	0.554	0.077	150.0	164.0	39.27	0.73
296	1	0.013	150.4	107.6	6.47	38 47 16.51	89 45 33.48	42.71	111.3	0.554	0.077	150.0	164.0	39.26	0.74
297	1	0.013	150.5	107.5	6.47	38 47 19.74	89 45 31.28	42.72	111.1	0.554	0.077	150.1	163.9	39.25	0.75
298	1	0.013	150.7	107.3	6.46	38 47 22.90	89 45 28.90	42.74	111.0	0.553	0.077	150.1	163.9	39.24	0.76
299	1	0.013	151.0	107.0	6.45	38 47 25.97	89 45 26.33	42.76	110.8	0.553	0.077	150.2	163.8	39.22	0.78
300	1	0.013	151.3	106.7	6.44	38 47 29.00	89 45 23.70	42.79	110.7	0.553	0.077	150.3	163.7	39.20	0.80
301	1	0.013	151.5	106.5	6.44	38 47 32.04	89 45 21.12	42.81	110.6	0.553	0.077	150.4	163.6	39.19	0.81
302	1	0.013	151.7	106.3	6.43	38 47 35.04	89 45 18.46	42.84	110.4	0.553	0.077	150.5	163.5	39.17	0.83
303	1	0.013	151.8	106.2	6.43	38 47 38.05	89 45 15.85	42.87	110.3	0.553	0.076	150.6	163.4	39.15	0.85
304	1	0.013	151.9	106.1	6.43	38 47 41.03	89 45 13.17	42.89	110.1	0.553	0.076	150.7	163.3	39.13	0.87
305	1	0.013	151.9	106.1	6.43	38 47 44.03	89 45 10.54	42.92	110.0	0.553	0.076	150.8	163.2	39.11	0.89
306	1	0.013	152.0	106.0	6.42	38 47 46.93	89 45 07.73	42.96	109.8	0.553	0.076	151.0	163.0	39.09	0.91
307	1	0.013	152.1	105.9	6.42	38 47 49.79	89 45 04.86	42.99	109.7	0.553	0.076	151.1	162.9	39.07	0.93
308	1	0.013	152.2	105.8	6.42	38 47 52.61	89 45 01.92	43.03	109.5	0.553	0.077	151.2	162.8	39.05	0.95
309	1	0.013	152.3	105.7	6.41	38 47 55.39	89 44 58.93	43.07	109.4	0.553	0.077	151.3	162.7	39.03	0.97
310	1	0.013	152.4	105.6	6.41	38 47 58.12	89 44 55.87	43.11	109.3	0.553	0.077	151.5	162.5	39.00	1.00

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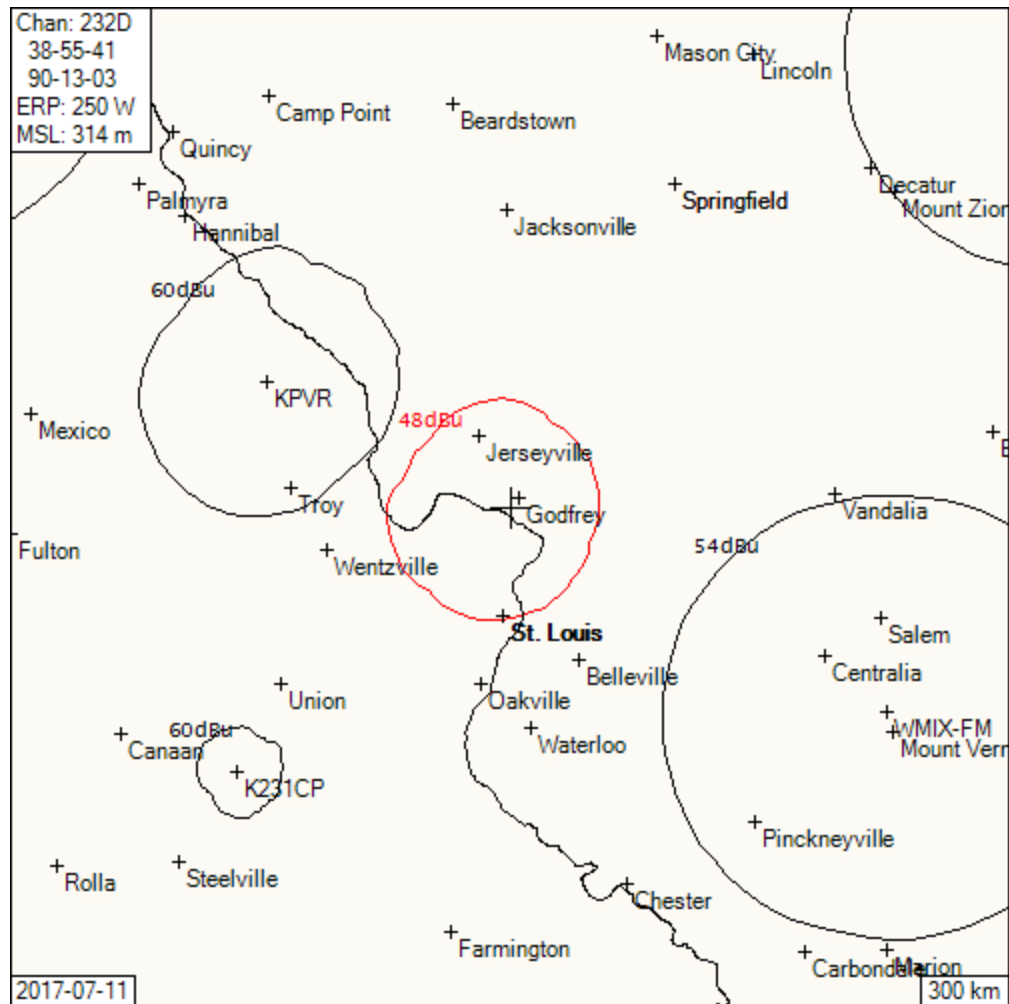
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Map 2 – First Adjacent Outbound Interference



WMIX-FM is Class B, so the interfering contour is 48 dBu f(50,10). The proposal does not overlap WMIX. KPVR is Class C3, so the interfering contour is 54 dBu f(10,10). The 54 dBu contour is contained within the 48 dBu contour, and there is no overlap with KPVR.

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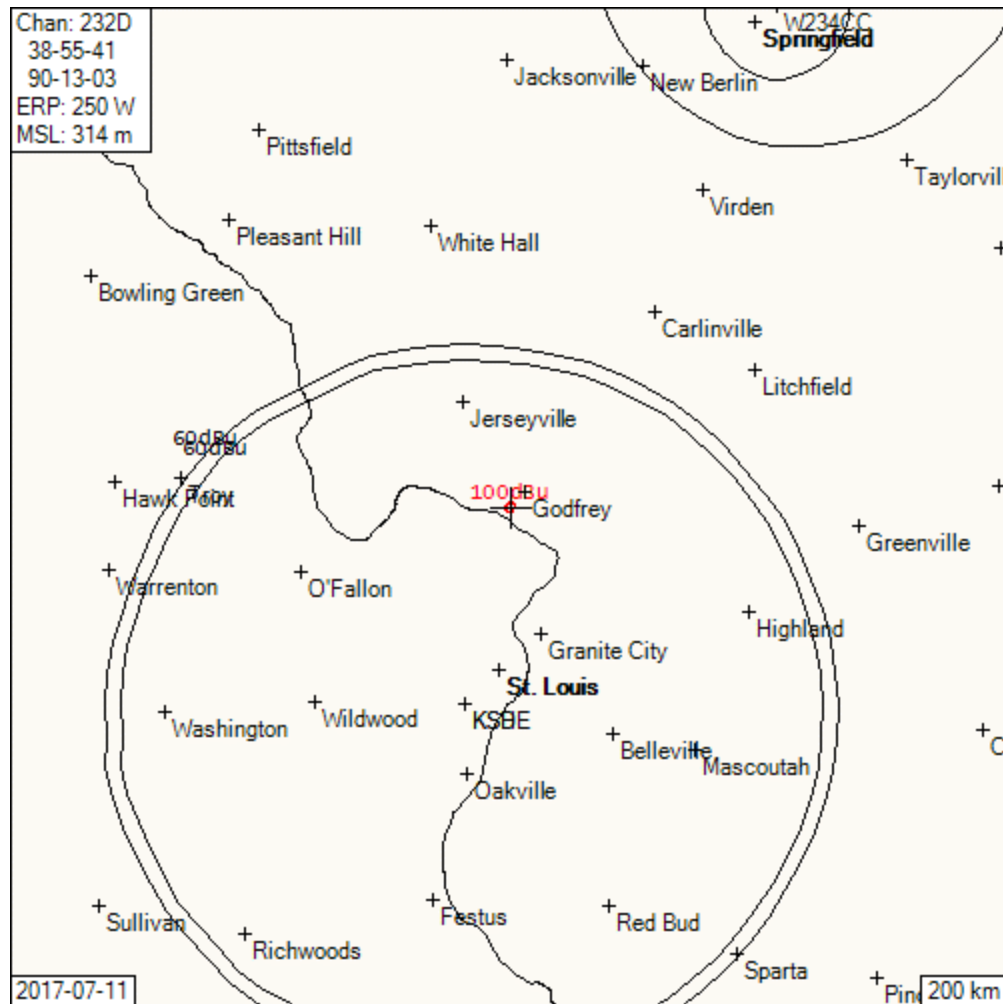
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Map 3 – Second/Third Adjacent Outbound Interference Detail



The proposed site is within the protected contours of Class C0 KSHE (Facility ID 19523) and Class C1 KSD (Facility ID 20360).

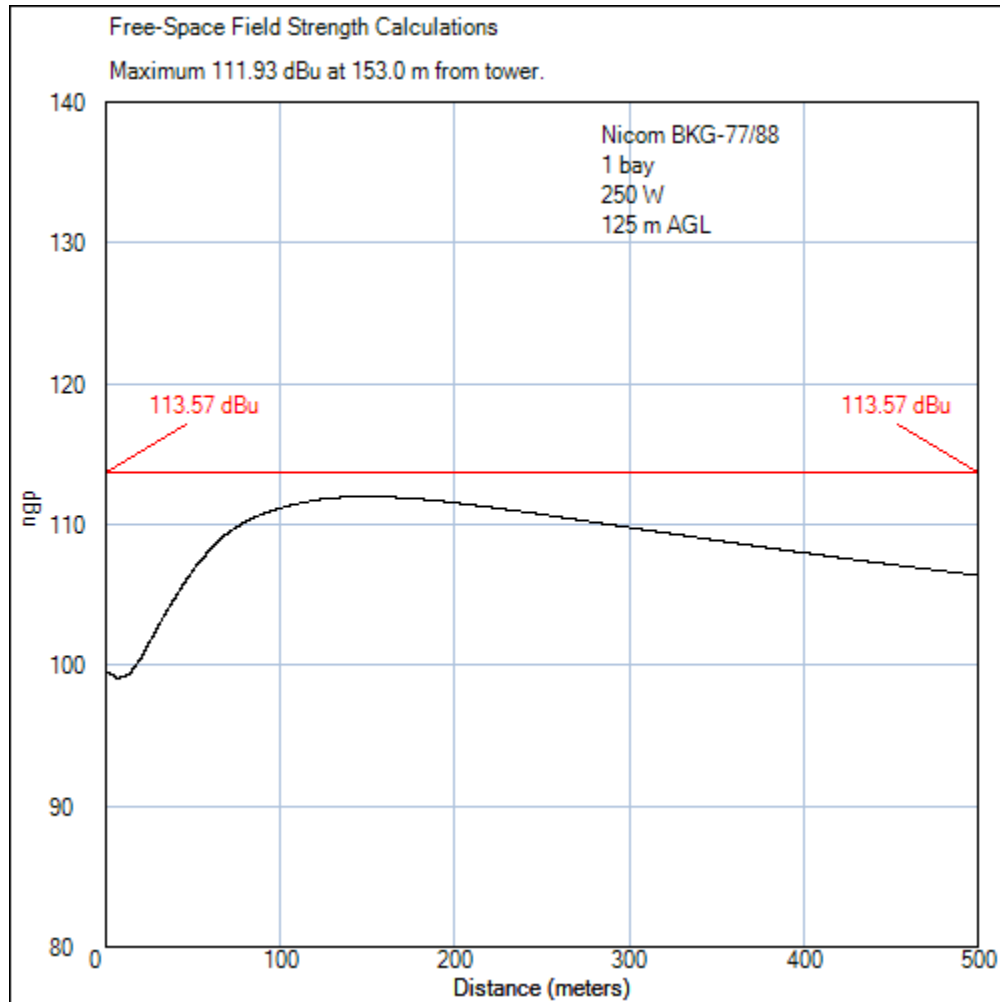
At the proposed site, the KSHE f(50,50) signal strength is 74.87 dBu, and the KSD f(50,50) signal strength is 73.57 dBu. As the weaker signal, KSD is the more critical, and it sets the interfering signal strength at 113.57 dBu.

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The proposed antenna is a Nicom BKG-77. The antenna will be mounted 125 m above ground.



The interfering free-space signal along the ground is plotted as a black curve, and the 113.57 dBu limit as a red line.

The maximum signal is 111.93 dBu, less than the 113.57 dBu limit.

The following table includes the calculations every five meters out to 200 m. (The actual calculations used in the plot were done in 0.1 m intervals out to 500 m.)

dist	depr	srange	eRel	dBk	dBu
0.0	90.00	125.0	0.105	-25.60	99.39
5.0	87.71	125.1	0.101	-25.90	99.09
10.0	85.43	125.4	0.103	-25.80	99.16
15.0	83.16	125.9	0.109	-25.26	99.67
20.0	80.91	126.6	0.121	-24.38	100.50
25.0	78.69	127.5	0.139	-23.13	101.69
30.0	76.50	128.5	0.160	-21.91	102.83
35.0	74.36	129.8	0.184	-20.74	103.93
40.0	72.26	131.2	0.208	-19.66	104.91
45.0	70.20	132.9	0.236	-18.56	105.91
50.0	68.20	134.6	0.265	-17.55	106.79
55.0	66.25	136.6	0.293	-16.68	107.55
60.0	64.36	138.7	0.323	-15.83	108.26
65.0	62.53	140.9	0.353	-15.08	108.88
70.0	60.75	143.3	0.380	-14.43	109.38
75.0	59.04	145.8	0.405	-13.86	109.79
80.0	57.38	148.4	0.430	-13.35	110.16
85.0	55.78	151.2	0.453	-12.89	110.45
90.0	54.25	154.0	0.476	-12.48	110.70
95.0	52.77	157.0	0.497	-12.09	110.92
100.0	51.34	160.1	0.518	-11.74	111.11
105.0	49.97	163.2	0.538	-11.40	111.28
110.0	48.65	166.5	0.558	-11.08	111.42
115.0	47.39	169.9	0.578	-10.78	111.54
120.0	46.17	173.3	0.597	-10.50	111.66
125.0	45.00	176.8	0.616	-10.23	111.75
130.0	43.88	180.3	0.633	-9.99	111.81
135.0	42.80	184.0	0.649	-9.78	111.86
140.0	41.76	187.7	0.665	-9.57	111.89
145.0	40.76	191.4	0.680	-9.38	111.91
150.0	39.81	195.3	0.694	-9.19	111.92
155.0	38.88	199.1	0.708	-9.03	111.92
160.0	38.00	203.0	0.719	-8.89	111.89
165.0	37.15	207.0	0.730	-8.75	111.86
170.0	36.33	211.0	0.741	-8.63	111.82
175.0	35.54	215.1	0.751	-8.51	111.77
180.0	34.78	219.1	0.761	-8.39	111.72
185.0	34.05	223.3	0.770	-8.29	111.67
190.0	33.34	227.4	0.779	-8.19	111.60
195.0	32.66	231.6	0.787	-8.10	111.53
200.0	32.01	235.8	0.795	-8.01	111.46

The columns are the distance in meters from the tower, the depression angle at that distance, slant range in meters, antenna relative field at the depression angle, effective radiated power in dBk, and the free space field strength for that power at the slant range. The maximum value in the tabulation is 111.92 dBu at 150 and 155 m from the tower. This is consistent with the maximum of 111.93 dBu at 153.0 m determined by the calculations behind the plot.

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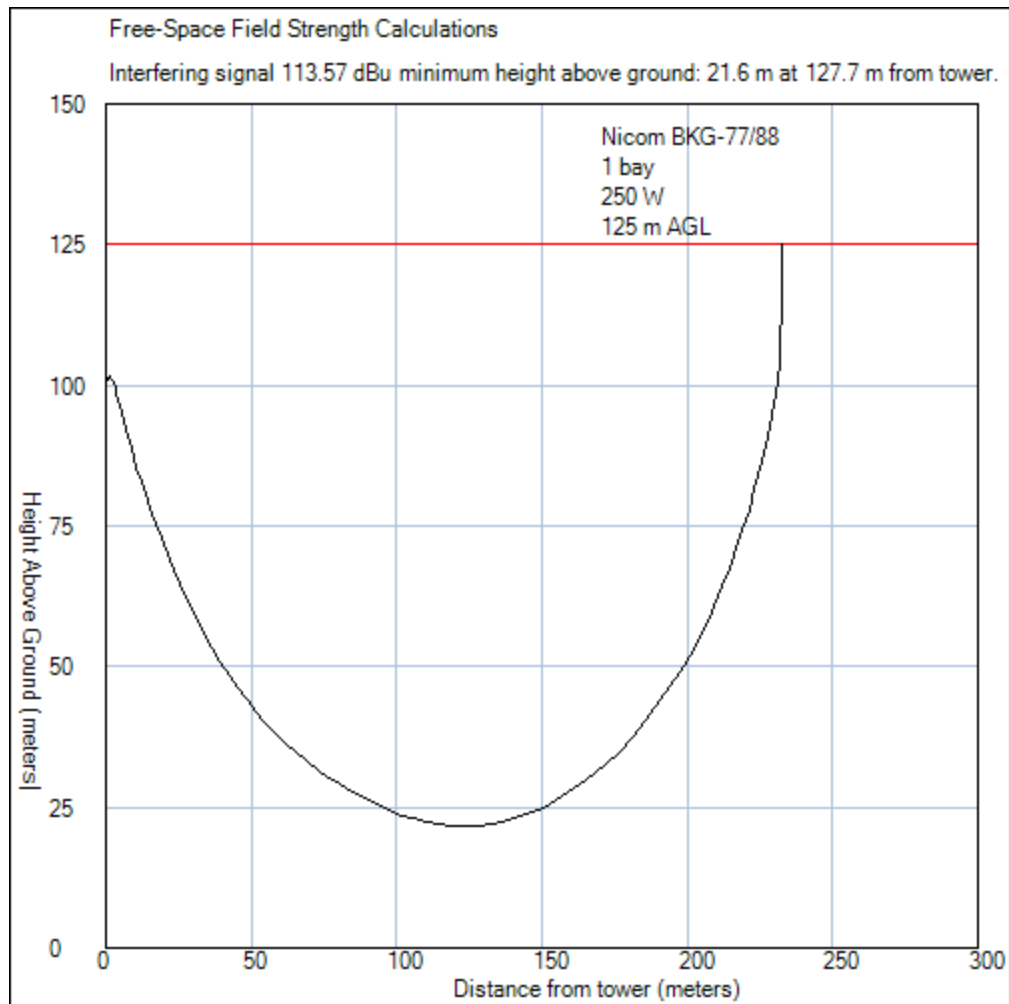
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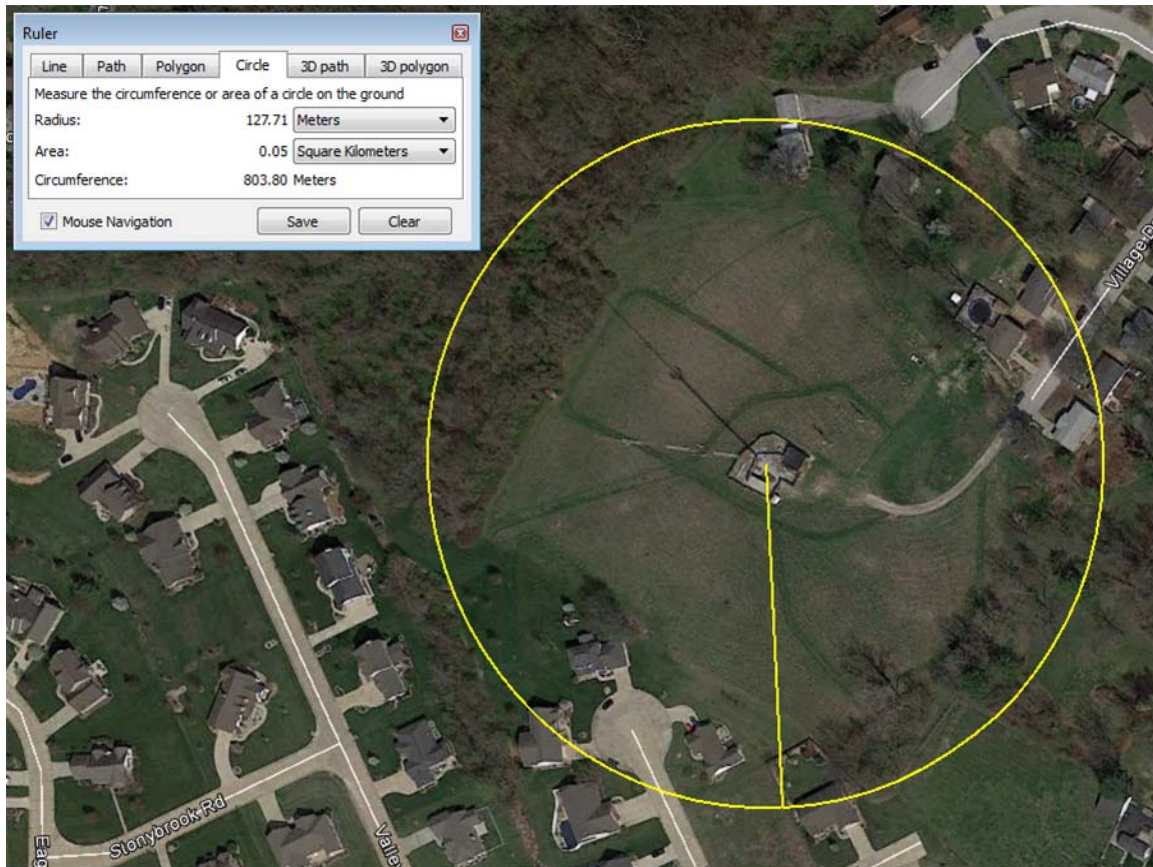
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This plot shows the height above ground of the interfering signal:



Its closest approach to the ground is at 127.7 m from the tower, where it is 21.6 m above ground.

As shown in this Google Earth image including a 127.7 m circle, no tall buildings or high terrain exist in the area:



It is therefore submitted that the proposal comports with 74.1204(d) in that the interference area will not exist in a populated area.

IF Separation requirements

The nearest IF-separated record is KLLT in Columbia, IL. The sites are separated by more than 40 km, against a requirement of 12 km.

Channel 6 Interference

The proposed facility is not on a channel that is implicated in channel 6 interference.

International

The FM Agreements with Canada and Mexico require evaluation and potential coordination of any proposal within 320 km of the border.

The distance to the nearest point along the US/Canada border is 687 km. Coordination with Canada is not required.

The distance to the nearest point along the US/Mexico border is 1,443 km. Coordination with Mexico is not required.

Quiet Zones

The proposed site is outside the National Radio Quiet Zone (National Radio Astronomy Observatory Notification Area) in West Virginia.

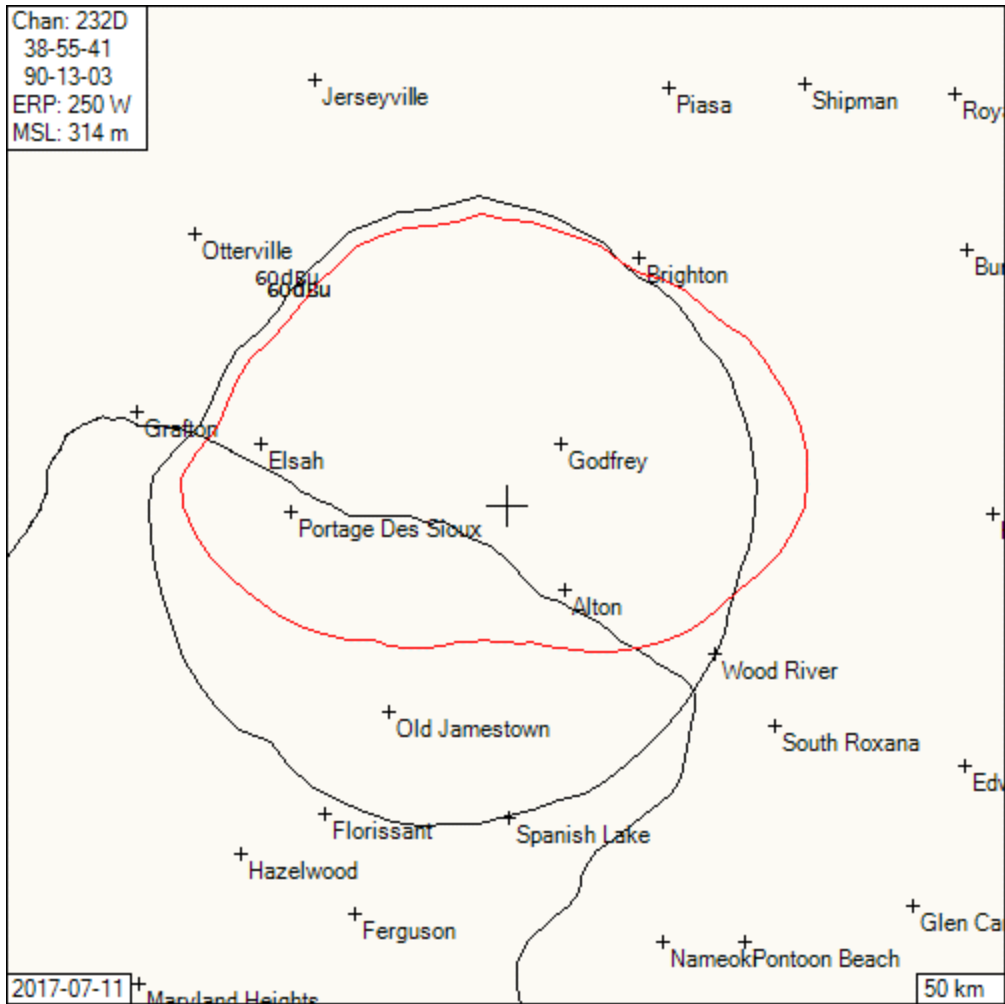
The proposed site is outside the Arecibo Observatory notification area in Puerto Rico.

The proposed site is not within a 100 km extension of the Table Mountain Radio Receiving Zone in Colorado.

Protected Monitoring Stations

The nearest Protected Monitoring Station is 544 km distant, in Allegan, MI. This is well beyond any potential 80 dBu contour.

Minor Change



The existing 60 dBu f(50,50) contour is shown as a red polygon. The proposed 60 dBu f(50,50) contour is shown as a black polygon. The contours overlap.

No change is proposed to the frequency.

Therefore, the proposal is for a minor change.

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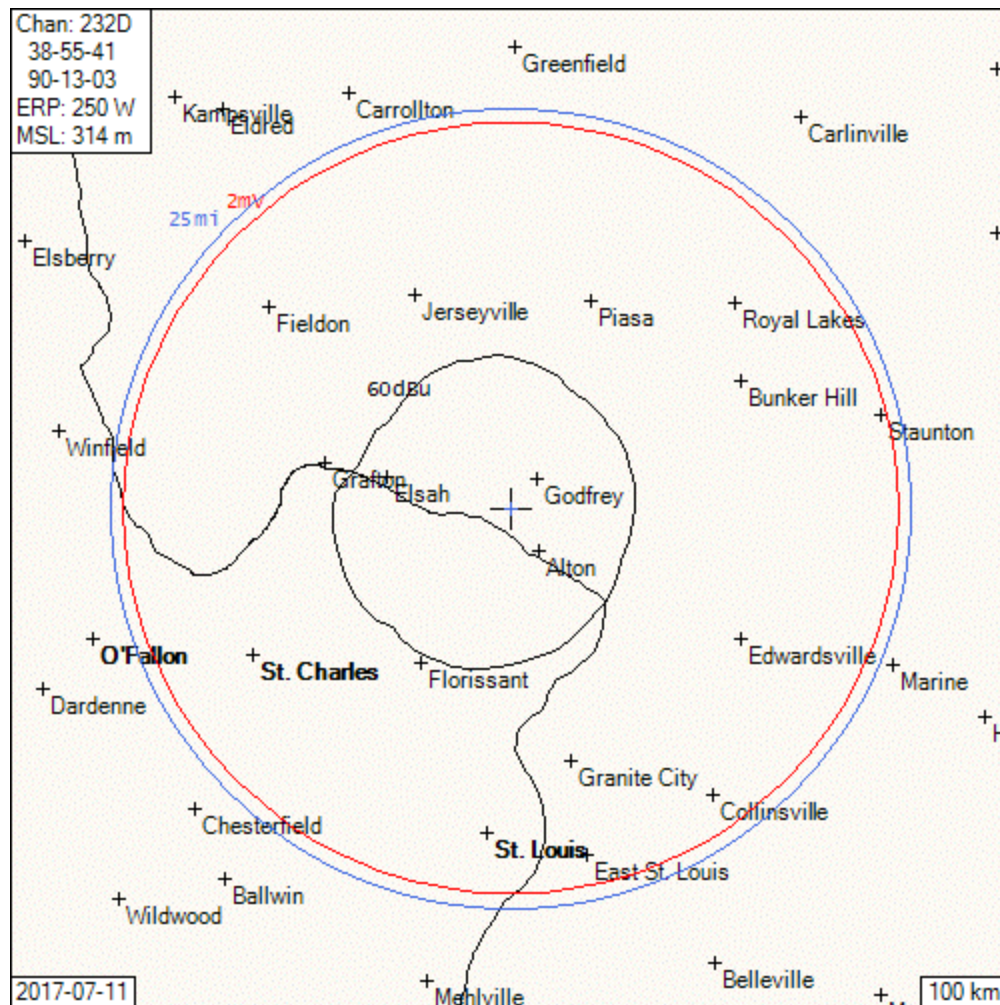
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Fill-In Translator



The proposed primary station is WBZG (AM), Alton, IL, FCC Facility ID # 41384.

The proposed 60 dBu f(50,50) contour is shown as a black polygon. The WBZG 2 mV/m contour is shown as a red polygon. The 25 mile circle around the WBZG transmitter is shown in blue.

The proposed 60 dBu f(50,50) contour falls entirely within the 25 mile circle and the 2 mV/m contour. W232CR and KBGZ are commonly owned. Therefore, the proposal qualifies as fill-in service.

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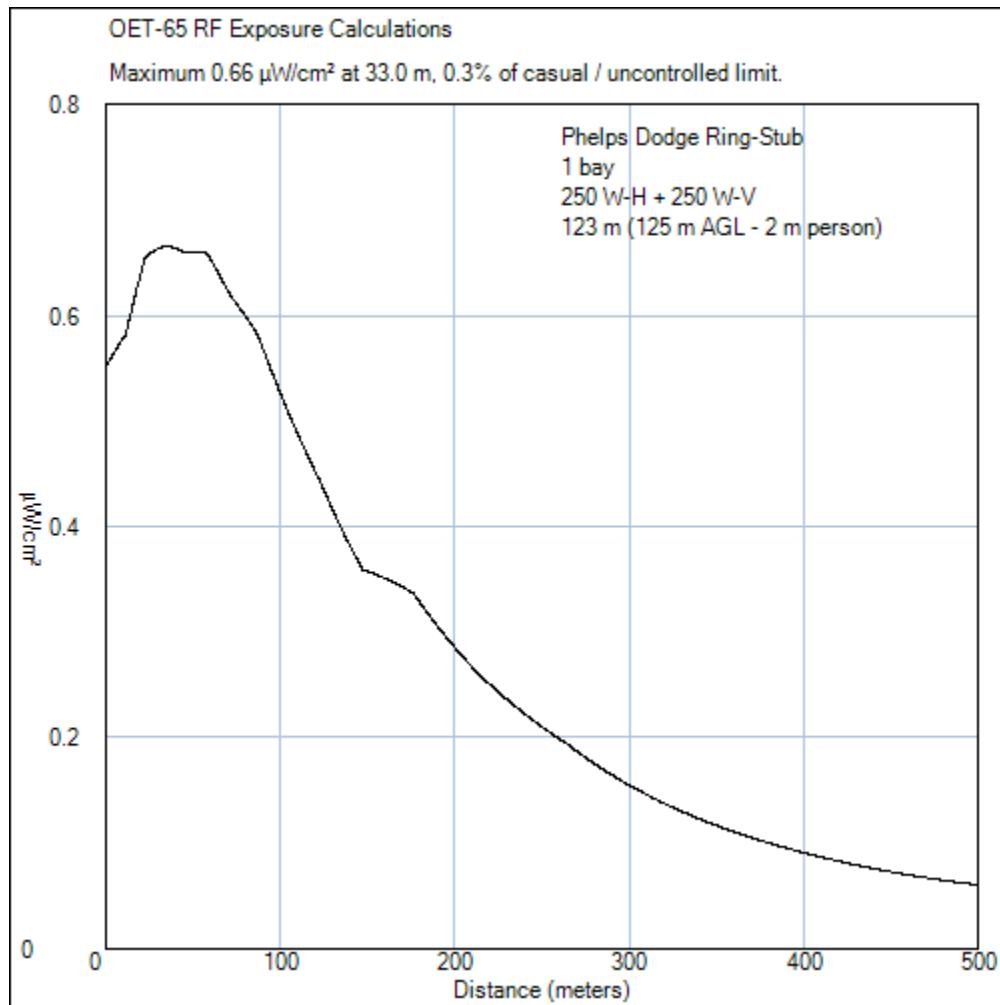
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Environmental

The proposed site is an existing tower, ASR # 1023824. No construction, excavation, or increase to the height of the tower is proposed.

The proposed effective radiated power is 250 W-H + 250 W-V. The one-bay antenna will be mounted 125 m above ground level. Assuming the worst-case OET Type 1 antenna model, the OET-65 algorithm returns a maximum exposure of less than 1% of the limit for casual / uncontrolled exposure:



Appropriate access controls and safety signage are provided. The applicant agrees to reduce power or shut down in order to protect workers on the tower.

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Form 349 Tech Box Data

Channel	232
Primary Station	Facility ID 41384 WBGZ (AM) Alton, IL
Delivery Method	Other (Terrestrial)
Coordinates (NAD-27)	38 55 41 N Lat 90 13 03 W Lon
Coordinates (NAD-83)	38 55 41 N Lat 90 13 03 W Lon
ASR	1023824
Site Elevation AMSL	189 m
Overall Tower Height AGL	126 m
Radiation Center AGL	125 m
Effective Radiated Power	250 W-H + 250 W-V
Antenna type	Directional
Manufacturer / Model	NIC BKG-77-1

-0-