

**W296BO  
250 MILE AM WAIVER TO  
CLEVELAND, OH FOR WJMO(AM) (#41389)  
ON CHANNEL 233  
PURSUANT TO DA-1491**

The modified W296BO translator will rebroadcast WJMO(AM) (facility ID # 41389).  
The proposed facility is located 161.38 miles from the existing, licensed facility.

**Distance between**

**N Latitude 41 30 48.00, W Longitude 81 36 5.00 (Point 1)**

**and N Latitude 39 52 59.00, W Longitude 83 48 17.00 (Point 2)**

**259.720 kilometers; 161.382 miles**

**Allocation discussion:**

All exhibits utilize the FCC 30 second terrain database.

- E1 Channel study
- E1A Interference analysis to WQMX
- E1B Aerial photographs and street views of interference area
- E1C Canadian compliance
- E1D DA
- E2 60 dBu and 2 mV/m contours
- E3 ASR

A channel study is included as E1 demonstrating compliance with §74.1204 with the exception of 2nd adjacent channel station WQMX. E1C demonstrates that the proposed 34 dBu(50:10) contour does not exceed 60 km where it crosses the Canadian border.

A plot of the proposed 60 dBu contour is provided as E2 showing that it is entirely contained within primary station WJMO(AM)'s 2 mV/m and 40 km radius.

**WQMX analysis:**

The proposed facility will be located inside the protected contour of WQMX on 235B. Interference analyses have been conducted based on the U/D ratio of +40 dB at the proposed site and are included as E1A and E1B. The buildings within the interference contour were thoroughly reviewed using Google Street View.

The 101.9 dBu (50:10) interference contour is at least 32.0 meters above ground within the first 190 meters from the tower. A street view of the closest buildings which are 2 stories at 23 meters is provided. The tallest building within the 190 meters radius is the six story stadium at a maximum height of 20 meters for a person in the highest stairwell (assuming 12 feet per story- see E1B for Google Street Views) located west of the tower at distances of 95 to 173 meters. At these distances the interfering contour clears the ground by 42.1 meters and the top of the stadium by 22.1 meters.

The tallest buildings outside the 190 meter radius are twelve (12) story buildings at a range of 340-720 meters from the tower. The interference contour clears the ground by at least 54.25 meters beyond 190 meters from the tower (see E1A) based on a maximum DA field of 1.0.

However, the interfering contour over each of the six tallest buildings has been individually evaluated based on the actual antenna field in that direction. All other buildings identified were significant shorter than these.

(1) 12 story building at Euclid and Mayfield (N41-30-31.5 W81-36-20.8) is located at 627 meters at 215.6 degrees azimuth. Its height is 44 meters or 42 meters for a person standing on the highest floor. The interference contour at that point is 60 meters AGL or 18 meters above the highest person (see E1A1).

(2) The Seidman Cancer Center (N41-30-28 W81-36-21) is located at 720 meters at 211 degrees azimuth. The interference contour is 77 meters AGL at that point or 25 meters above the nine story, 52meter building (see E2A2). The actual height of a person on the top floor would more likely be about 42 meters with 35 meter clearance.

(3) The Clarke Tower (N41-30-52 W 81-36-20) on the Case Western Reserve campus is at a distance of 369 meters at 289.7 degrees azimuth. It is 11 stories or a reported 43 meters. The interfering contour at that point is 63.5 meters AGL and clears the top floor by at least 20 meters (see E1A3).

(4) The 1st apartment building on Mayfield road is at N 41-30-32.5 W 81-36-09.5 and 489 meters at 192.3 degrees azimuth. The building is 12 stories or 42 meters to the top occupied floor and the interference contour at that point is 56.2 meters AGL or 14 meters above any occupied space (see E1A4).

(5) One Triangle Place, a 12 story apartment building on Mayfield road, is located at N 41-30-32.3 W 81-36-12.6 or 515 meters at an azimuth of 200 degrees. The interference contour at this point is 56 meters AGL or 14 meters above the highest occupied space (see E1A5).

(6) One Triangle Place building #2 is last tall structure located within the interference contour at N 41-30-34.4 W 81-36-12.2 or a distance of 451 meters at 201.6 degrees azimuth. The interference contour at this point is 55.4 meters AGL or 13.2 meters above the highest occupied space (see E1A6).

It is clear from exhibits E1A and E1B that the interference contour will not reach any populated area or major highways. Based on this showing, a waiver of Section 74.1204 is requested in accordance with *Living Way Ministries, Inc.* (FCC 08-242).

#### **RF Exposure Calculation:**

The proposed facility will utilize a six bay Bext TFC-2K full wavelength spaced, circularly polarized antenna with a center of radiation at 102 meters AGL on existing tower ASR#1014404. The RF contribution of the proposed translator was calculated based on a worst case F factor of 1.0 using the formula included below to be 1.34  $\mu\text{Watts}/\text{cm}^2$  or 0.67% of the maximum permissible 200 microwatts/cm<sup>2</sup> exposure for general population/uncontrolled exposure, and well below the 5% of that limit which requires consideration. The proposed translator clearly complies with Commission RF radiation limits.

$$S \text{ (RF in } \mu\text{Watts}/\text{cm}^2) = \frac{33.4 (F^2 \text{ Vertical Factor}) \times (H \text{ ERP} + V \text{ ERP in Watts})}{R^2 \text{ (distance to radiation center in meters} - 2 \text{ m)}}$$

Charles M. Anderson 7-16-2016

E1 CHANNEL STUDY											
Blue Chip Broadcasting Licenses, Ltd.											
REFERENCE		CH# 233D - 94.5 MHz, Pwr= 0.2 kW DA, HAAT= 0.0 M, COR= 313 M							DISPLAY DATES		
41 30 48.0 N.		Average Protected F(50-50)= 6.71 km							DATA 07-16-16		
81 36 05.0 W.		Standard Directional							SEARCH 07-16-16		
CH CITY	CALL	TYPE STATE	ANT STATE	AZI <--	DIST FILE #	LAT LNG	PWR(kw) HAAT(M)	INT(km) COR(M)	PRO(km) LICENSEE	*IN* (Overlap in km)	*OUT* (1)
233D Cleveland	W233CE	CP	DC_	0.0	0.00	41 30 48.0	0.200	36.5	10.8	-47.3*	-47.3* (1)
		OH		0.0	BPFT20160129AQW	81 36 05.0		313	Blue Chip Broadcasting Lic		
235B Medina	WQMX	LIC	_CX	183.3	47.94	41 04 58.0	16.000	5.6	65.1	32.0	-18.7* (2)
		OH		3.2	BMLH20140625AOS	81 38 02.0	268	587	Rubber City Radio Group, I		
233B Port Clinton	WXKR	LIC	ZCX	270.0	139.02	41 30 03.0	30.000	129.8	64.0	-3.4	16.8
		OH		88.9	BLH20080910ACQ	83 16 16.0	188	374	Cumulus Licensing LLC		
231B Canton	WHBC-FM	LIC	_C_	160.8	72.38	40 53 53.0	45.000	5.7	63.6	58.0	7.2
		OH		341.0	BMLH19880406KA	81 19 07.0	157	509	Alpha Media Licensee LLC		
233B Pittsburgh	WWSW-FM	LIC	_CN	130.5	177.69	40 27 48.0	50.000	151.3	74.8	21.0	69.6
		PA		311.6	BMLH19821004BH	80 00 18.0	247	558	Amfm Radio Licenses, L.L.c		
232B Chatham	AL8509		___	334.2	109.64	42 24 00.0	50.000	77.2	65.0	21.7	21.8
		ON		153.8		82 11 00.0	150	327			
232B			_HN	338.1	110.87	42 26 14.0	50.000	75.2	62.3	24.9	25.7
		ON		157.7		82 06 23.0	134	320			
236B Grove City	WWGY	LIC	DEN	105.2	107.72	41 15 08.0	19.000	5.5	64.9	95.6	40.0
		PA		286.0	BLH19880926KA	80 21 28.0	245	590	Fm Radio Licenses, LLC		
233D Canton	W233CE	CP	_C_	169.2	76.85	40 50 03.0	0.210	26.0	7.7	41.3	41.5
		OH		349.3	BMPFT20160129ACD	81 25 49.0		398	Living Bread Radio, Inc.		

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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= 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

- (1) This construction permit will be dsmissed and superceded by the identical  
WJMO facility proposed herein.
- (2) See Technical Report and E1A and E1B for disproval of interference.

E1A

W296B0 CLEVELAND, OH WORST CASE (DA FIELD 1.0)

74.1204(d) Showing

Translator or LPFM Maximum Licensed ERP = 0.2

Translator or LPFM Antenna Height AG = 102 Meters

MOD Antenna Model = BEXT TFC2K-6FULL

Protected Station's Contour = 62.28369 dBu

Translator's or LPFM's full Interference contour 102.28369

Review Azimuth = 201.6 Degrees True

Relative Field on the horizon at Review Azimuth = 1.000

Translator/LPFM ERP on the horizon at Review Azimuth = 0.2 kW

Distance between stations = 47.9 km

Protected Station= WQMX, 16 kW, 587 M Meters COR AMSL

Depression Angle From Horizon(Deg)	Vertical Relative Field	Horizontal Relative Field	ERP (kw)	Dist to IX Contour Along Dep. Angle(m)	Dist to IX Contour From Tower Base(m)	Height IX Above Ground (m)
00.00	1.0	1.0	0.2000	762.6592	762.6592	102.000
01.00	0.986	1.0	0.1944	751.9819	751.8674	088.876
02.00	0.947	1.0	0.1794	722.2383	721.7983	076.794
03.00	0.886	1.0	0.1570	675.7160	674.7900	066.636
04.00	0.804	1.0	0.1293	613.1780	611.6843	059.227
05.00	0.707	1.0	0.1000	539.2000	537.1482	055.006
06.00	0.599	1.0	0.0718	456.8328	454.3302	054.248
07.00	0.484	1.0	0.0469	369.1270	366.3756	057.015
08.00	0.367	1.0	0.0269	279.8959	277.1720	063.046
09.00	0.252	1.0	0.0127	192.1901	189.8239	071.935
10.00	0.145	1.0	0.0042	110.5856	108.9055	082.797
11.00	0.047	1.0	0.0004	035.8450	035.1864	095.160
12.00	0.037	1.0	0.0003	028.2184	027.6018	096.133
13.00	0.106	1.0	0.0022	080.8419	078.7699	083.815
14.00	0.158	1.0	0.0050	120.5002	116.9208	072.848
15.00	0.194	1.0	0.0075	147.9559	142.9144	063.706
16.00	0.213	1.0	0.0091	162.4464	156.1535	057.224
17.00	0.217	1.0	0.0094	165.4970	158.2656	053.613
18.00	0.207	1.0	0.0086	157.8705	150.1437	053.215
19.00	0.185	1.0	0.0068	141.0919	133.4051	056.065
20.00	0.153	1.0	0.0047	116.6869	109.6498	062.091
21.00	0.114	1.0	0.0026	086.9431	081.1684	070.842
22.00	0.071	1.0	0.0010	054.1488	050.2059	081.716
23.00	0.026	1.0	0.0001	019.8291	018.2528	094.252
24.00	0.018	1.0	0.0001	013.7279	012.5410	096.416
25.00	0.058	1.0	0.0007	044.2342	040.0898	083.306
26.00	0.094	1.0	0.0018	071.6900	064.4345	070.573
27.00	0.122	1.0	0.0030	093.0444	082.9032	059.759
28.00	0.143	1.0	0.0041	109.0603	096.2945	050.799
29.00	0.154	1.0	0.0047	117.4495	102.7237	045.059
30.00	0.157	1.0	0.0049	119.7375	103.6957	042.131
31.00	0.151	1.0	0.0046	115.1615	098.7127	042.687
32.00	0.137	1.0	0.0038	104.4843	088.6077	046.632
33.00	0.116	1.0	0.0027	088.4685	074.1959	053.817
34.00	0.09	1.0	0.0016	068.6393	056.9046	063.617
35.00	0.061	1.0	0.0007	046.5222	038.1088	075.316
36.00	0.029	1.0	0.0002	022.1171	017.8931	089.000

(1)

## E1A continued

37.00	0.003	1.0	0.0000	002.2880	001.8273	100.623
38.00	0.034	1.0	0.0002	025.9304	020.4334	086.036
39.00	0.062	1.0	0.0008	047.2849	036.7472	072.243
40.00	0.087	1.0	0.0015	066.3513	050.8281	059.350
41.00	0.106	1.0	0.0022	080.8419	061.0121	048.963
42.00	0.12	1.0	0.0029	091.5191	068.0119	040.762
43.00	0.129	1.0	0.0033	098.3830	071.9528	034.903
44.00	0.132	1.0	0.0035	100.6710	072.4167	032.068
45.00	0.129	1.0	0.0033	098.3830	069.5673	032.433
46.00	0.122	1.0	0.0030	093.0444	064.6341	035.069
47.00	0.111	1.0	0.0025	084.6552	057.7347	040.087
48.00	0.097	1.0	0.0019	073.9779	049.5009	047.024
49.00	0.08	1.0	0.0013	061.0127	040.0280	055.953
50.00	0.061	1.0	0.0007	046.5222	029.9039	066.362
51.00	0.042	1.0	0.0004	032.0317	020.1582	077.107
52.00	0.022	1.0	0.0001	016.7785	010.3299	088.778
53.00	0.003	1.0	0.0000	002.2880	001.3769	100.173
54.00	0.015	1.0	0.0000	011.4399	006.7242	092.745
55.00	0.031	1.0	0.0002	023.6424	013.5607	082.633
56.00	0.045	1.0	0.0004	034.3197	019.1913	073.548
57.00	0.058	1.0	0.0007	044.2342	024.0917	064.902
58.00	0.068	1.0	0.0009	051.8608	027.4821	058.020
59.00	0.076	1.0	0.0012	057.9621	029.8527	052.317
60.00	0.081	1.0	0.0013	061.7754	030.8877	048.501
61.00	0.085	1.0	0.0014	064.8260	031.4283	045.302
62.00	0.087	1.0	0.0015	066.3513	031.1501	043.415
63.00	0.087	1.0	0.0015	066.3513	030.1229	042.881
64.00	0.086	1.0	0.0015	065.5887	028.7522	043.049
65.00	0.081	1.0	0.0013	061.7754	026.1074	046.012
66.00	0.079	1.0	0.0012	060.2501	024.5059	046.959
67.00	0.075	1.0	0.0011	057.1994	022.3496	049.348
68.00	0.07	1.0	0.0010	053.3861	019.9988	052.501
69.00	0.064	1.0	0.0008	048.8102	017.4920	056.432
70.00	0.058	1.0	0.0007	044.2342	015.1290	060.433
71.00	0.052	1.0	0.0005	039.6583	012.9115	064.502
72.00	0.046	1.0	0.0004	035.0823	010.8410	068.635
73.00	0.041	1.0	0.0003	031.2690	009.1422	072.097
74.00	0.035	1.0	0.0002	026.6931	007.3576	076.341
75.00	0.03	1.0	0.0002	022.8798	005.9217	079.900
76.00	0.025	1.0	0.0001	019.0665	004.6126	083.500
77.00	0.021	1.0	0.0001	016.0158	003.6028	086.395
78.00	0.017	1.0	0.0001	012.9652	002.6956	089.318
79.00	0.013	1.0	0.0000	009.9146	001.8918	092.268
80.00	0.01	1.0	0.0000	007.6266	001.3243	094.489
81.00	0.008	1.0	0.0000	006.1013	000.9544	095.974
82.00	0.006	1.0	0.0000	004.5760	000.6368	097.469
83.00	0.004	1.0	0.0000	003.0506	000.3718	098.972
84.00	0.003	1.0	0.0000	002.2880	000.2392	099.725
85.00	0.002	1.0	0.0000	001.5253	000.1329	100.480
86.00	0.001	1.0	0.0000	000.7627	000.0532	101.239
87.00	0.001	1.0	0.0000	000.7627	000.0399	101.238
88.00	0.0	1.0	0.0000	000.0763	000.0027	101.924
89.00	0.0	1.0	0.0000	000.0763	000.0013	101.924
90.00	0.0	1.0	0.0000	000.0763	000.0000	101.924

(2)

(1) Lowest clearance outside 190 meter zone.

(2) Loest clearance within 190 meter zone is 32 meters. Tallest building 15 m.

E1A1

W296B0 CLEVELAND, OH EUCLID AND MAYFIELD 12 STORY BUILDING AT 627 METERS

74.1204(d) Showing

Translator or LPFM Maximum Licensed ERP = 0.2

Translator or LPFM Antenna Height AG = 102 Meters

MOD Antenna Model = BEXT TFC2K-6 FULL WAVELENGTH SPACED

Protected Station's Contour = 62.28369 dBu

Translator's or LPFM's full Interference contour 102.28369

Review Azimuth = 215.6 Degrees True

Relative Field on the horizon at Review Azimuth = 0.989

Translator/LPFM ERP on the horizon at Review Azimuth = 0.195 kW

Distance between stations = 47.9 km

Protected Station= WQMX, 16 kW, 587 M Meters COR AMSL

Depression Angle From Horizon(Deg)	Vertical Relative Field	Horizontal Relative Field	ERP (kw)	Dist to IX Contour Along Dep. Angle(m)	Dist to IX Contour From Tower Base(m)	Height IX Above Ground (m)
00.00	1.00	0.99	0.1977	758.2996	758.2996	102.000
01.00	0.986	0.99	0.1922	747.6834	747.5695	088.951
02.00	0.947	0.99	0.1773	718.1097	717.6723	076.938
03.00	0.886	0.99	0.1552	671.8534	670.9326	066.838
04.00	0.804	0.99	0.1278	609.6729	608.1877	059.471
05.00	0.707	0.99	0.0988	536.1178	534.0777	055.274
06.00	0.599	0.99	0.0709	454.2214	451.7331	054.521
07.00	0.484	0.99	0.0463	367.0170	364.2813	057.272
08.00	0.367	0.99	0.0266	278.2959	275.5876	063.269
09.00	0.252	0.99	0.0126	191.0915	188.7388	072.107
10.00	0.145	0.99	0.0042	109.9534	108.2830	082.907

(1)

(1) Contours clears by 60 meters AGL at building.

E1A2

W296B0 CLEVELAND, OH - SEIDMAN CANCER CENTER AT 720 METERS

74.1204(d) Showing

Translator or LPFM Maximum Licensed ERP = 0.2

Translator or LPFM Antenna Height AG = 102 Meters

MOD Antenna Model = BEXT TFC2K-6FULL

Protected Station's Contour = 62.28369 dBu

Translator's or LPFM's full Interference contour 102.28369

Review Azimuth = 210.95 Degrees True

Relative Field on the horizon at Review Azimuth = 0.978

Translator/LPFM ERP on the horizon at Review Azimuth = 0.191 kW

Distance between stations = 47.9 km

Protected Station= WQMX, 16 kW, 587 M Meters COR AMSL

Depression Angle From Horizon(Deg)	Vertical Relative Field	Horizontal Relative Field	ERP (kw)	Dist to IX Contour Along Dep. Angle(m)	Dist to IX Contour From Tower Base(m)	Height IX Above Ground (m)
00.00	1.0	0.98	0.1956	754.2618	754.2618	102.000
01.00	0.986	0.98	0.1902	743.7022	743.5889	089.021
02.00	0.947	0.98	0.1754	714.2860	713.8508	077.072
03.00	0.886	0.98	0.1536	668.2760	667.3601	067.025
04.00	0.804	0.98	0.1265	606.4265	604.9493	059.698
05.00	0.707	0.98	0.0978	533.2631	531.2339	055.523

(1)

(1) Interference contour clears ground by at least 77 meters. 25 meters above building and higher above occupied area.



E1A3

W296B0 CLEVELAND, OH - CLARKE TOWER ANALYSIS AT 369 METERS

74.1204(d) Showing

Translator or LPFM Maximum Licensed ERP = 0.2

Translator or LPFM Antenna Height AG = 102 Meters

MOD Antenna Model = BEXT TFC2K-6FULL

Protected Station's Contour = 62.28369 dBu

Translator's or LPFM's full Interference contour 102.28369

Review Azimuth = 289.7 Degrees True

Relative Field on the horizon at Review Azimuth = 0.649

Translator/LPFM ERP on the horizon at Review Azimuth = 0.084 kW

Distance between stations = 47.9 km

Protected Station= WQMX, 16 kW, 587 M Meters COR AMSL

Depression Angle From Horizon(Deg)	Vertical Relative Field	Horizontal Relative Field	ERP (kw)	Dist to IX Contour Along Dep. Angle(m)	Dist to IX Contour From Tower Base(m)	Height IX Above Ground (m)
00.00	1.0	0.65	0.1298	614.4023	614.4023	102.000
01.00	0.986	0.65	0.1262	605.8007	605.7084	091.427
02.00	0.947	0.65	0.1164	581.8390	581.4846	081.694
03.00	0.886	0.65	0.1019	544.3604	543.6144	073.510
04.00	0.804	0.65	0.0839	493.9795	492.7762	067.542
05.00	0.707	0.65	0.0649	434.3824	432.7295	064.141
06.00	0.599	0.65	0.0466	368.0270	366.0109	063.531
07.00	0.484	0.65	0.0304	297.3707	295.1542	065.760
08.00	0.367	0.65	0.0175	225.4857	223.2912	070.618
09.00	0.252	0.65	0.0082	154.8294	152.9232	077.779
10.00	0.145	0.65	0.0027	089.0883	087.7349	086.530

(1)

(1) Clears ground by at least 63.5 meters and 11 story building by 20 meters.

E1A4

W296B0 CLEVELAND, OH MAYFIELD ROAD 12 STORY AT 489 METERS/ 192.38 DEGREES

74.1204(d) Showing

Translator or LPFM Maximum Licensed ERP = 0.2

Translator or LPFM Antenna Height AG = 102 Meters

MOD Antenna Model = BEXT TFC2K-6FULL

Protected Station's Contour = 62.28369 dBu

Translator's or LPFM's full Interference contour 102.28369

Review Azimuth = 192.8 Degrees True

Relative Field on the horizon at Review Azimuth = 0.921

Translator/LPFM ERP on the horizon at Review Azimuth = 0.17 kW

Distance between stations = 47.9 km

Protected Station= WQMX, 16 kW, 587 M Meters COR AMSL

Depression Angle From Horizon(Deg)	Vertical Relative Field	Horizontal Relative Field	ERP (kw)	Dist to IX Contour Along Dep. Angle(m)	Dist to IX Contour From Tower Base(m)	Height IX Above Ground (m)
00.00	1.00	0.92	0.1842	731.9939	731.9939	102.000
01.00	0.986	0.92	0.1791	721.7460	721.6361	089.404
02.00	0.947	0.92	0.1652	693.1983	692.7760	077.808
03.00	0.886	0.92	0.1446	648.5466	647.6578	068.058
04.00	0.804	0.92	0.1191	588.5231	587.0895	060.947
05.00	0.707	0.92	0.0921	517.5197	515.5504	056.895
06.00	0.599	0.92	0.0661	438.4643	436.0624	056.168
07.00	0.484	0.92	0.0432	354.2851	351.6443	058.824
08.00	0.367	0.92	0.0248	268.6418	266.0274	064.612
09.00	0.252	0.92	0.0117	184.4625	182.1914	073.144
10.00	0.145	0.92	0.0039	106.1391	104.5266	083.569

(1)

(1) Contour clears ground by at least 56.2 meters. Building is 42 meters.

E1A5

W296B0 CLEVELAND, OH ONE TRIANGLE PLACE (MAYFIELD ROAD 12 STORY #2) AT 515 METERS/200 DEGREES

74.1204(d) Showing

Translator or LPFM Maximum Licensed ERP = 0.2

Translator or LPFM Antenna Height AG = 102 Meters

MOD Antenna Model = BEXT TFC2K-6FULL

Protected Station's Contour = 62.28369 dBu

Translator's or LPFM's full Interference contour 102.28369

Review Azimuth = 200 Degrees True

Relative Field on the horizon at Review Azimuth = 0.945

Translator/LPFM ERP on the horizon at Review Azimuth = 0.179 kW

Distance between stations = 47.9 km

Protected Station= WQMX, 16 kW, 587 M Meters COR AMSL

Depression Angle From Horizon(Deg)	Vertical Relative Field	Horizontal Relative Field	ERP (kW)	Dist to IX Contour Along Dep. Angle(m)	Dist to IX Contour From Tower Base(m)	Height IX Above Ground (m)
00.00	1.00	0.95	0.1890	741.3894	741.3894	102.000
01.00	0.986	0.95	0.1837	731.0100	730.8987	089.242
02.00	0.947	0.95	0.1695	702.0958	701.6681	077.497
03.00	0.886	0.95	0.1484	656.8710	655.9708	067.622
04.00	0.804	0.95	0.1222	596.0771	594.6251	060.420
05.00	0.707	0.95	0.0945	524.1624	522.1678	056.316
06.00	0.599	0.95	0.0678	444.0923	441.6595	055.580
07.00	0.484	0.95	0.0443	358.8325	356.1578	058.269
08.00	0.367	0.95	0.0255	272.0899	269.4420	064.132
09.00	0.252	0.95	0.0120	186.8301	184.5300	072.773
10.00	0.145	0.95	0.0040	107.5015	105.8683	083.333

(1)

(1) Contour clears ground by at least 55.6 meters. Building is 42 meters.

E1A6

W296B0 CLEVELAND, OH TRIANGLE PLACE 12 STORY TOWER #2 (MAYFIELD ROAD) AT 451 METERS/201.6 DEGREES

74.1204(d) Showing

Translator or LPFM Maximum Licensed ERP = 0.2

Translator or LPFM Antenna Height AG = 102 Meters

MOD Antenna Model = BEXT TFC2K-6FULL

Protected Station's Contour = 62.28369 dBu

Translator's or LPFM's full Interference contour 102.28369

Review Azimuth = 201.6 Degrees True

Relative Field on the horizon at Review Azimuth = 0.951

Translator/LPFM ERP on the horizon at Review Azimuth = 0.181 kW

Distance between stations = 47.9 km

Protected Station= WQMX, 16 kW, 587 M Meters COR AMSL

Depression Angle From Horizon(Deg)	Vertical Relative Field	Horizontal Relative Field	ERP (kw)	Dist to IX Contour Along Dep. Angle(m)	Dist to IX Contour From Tower Base(m)	Height IX Above Ground (m)
00.00	1.0	0.95	0.1902	743.8175	743.8175	102.000
01.00	0.986	0.95	0.1850	733.4041	733.2924	089.200
02.00	0.947	0.95	0.1706	704.3952	703.9661	077.417
03.00	0.886	0.95	0.1493	659.0223	658.1192	067.509
04.00	0.804	0.95	0.1230	598.0293	596.5726	060.284
05.00	0.707	0.95	0.0951	525.8790	523.8779	056.167
06.00	0.599	0.95	0.0683	445.5467	443.1059	055.428
07.00	0.484	0.95	0.0446	360.0077	357.3242	058.126
08.00	0.367	0.95	0.0256	272.9811	270.3244	064.008
09.00	0.252	0.95	0.0121	187.4420	185.1343	072.678
10.00	0.145	0.95	0.0040	107.8535	106.2150	083.271

(1)

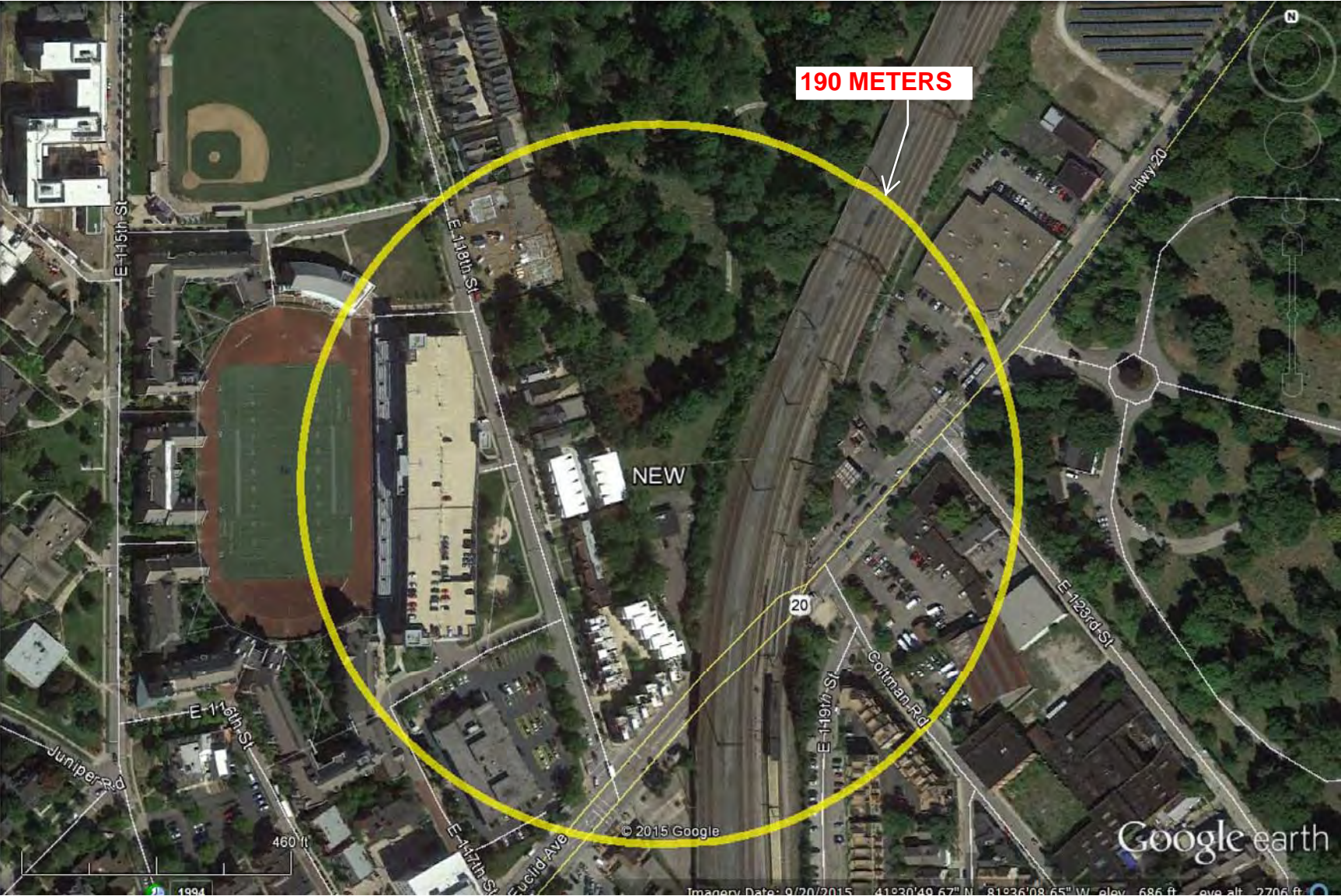
(1) Contour clears ground by at least 55.4 meters. Building is 42 meters.

## E1B PROPOSED SITE AREA

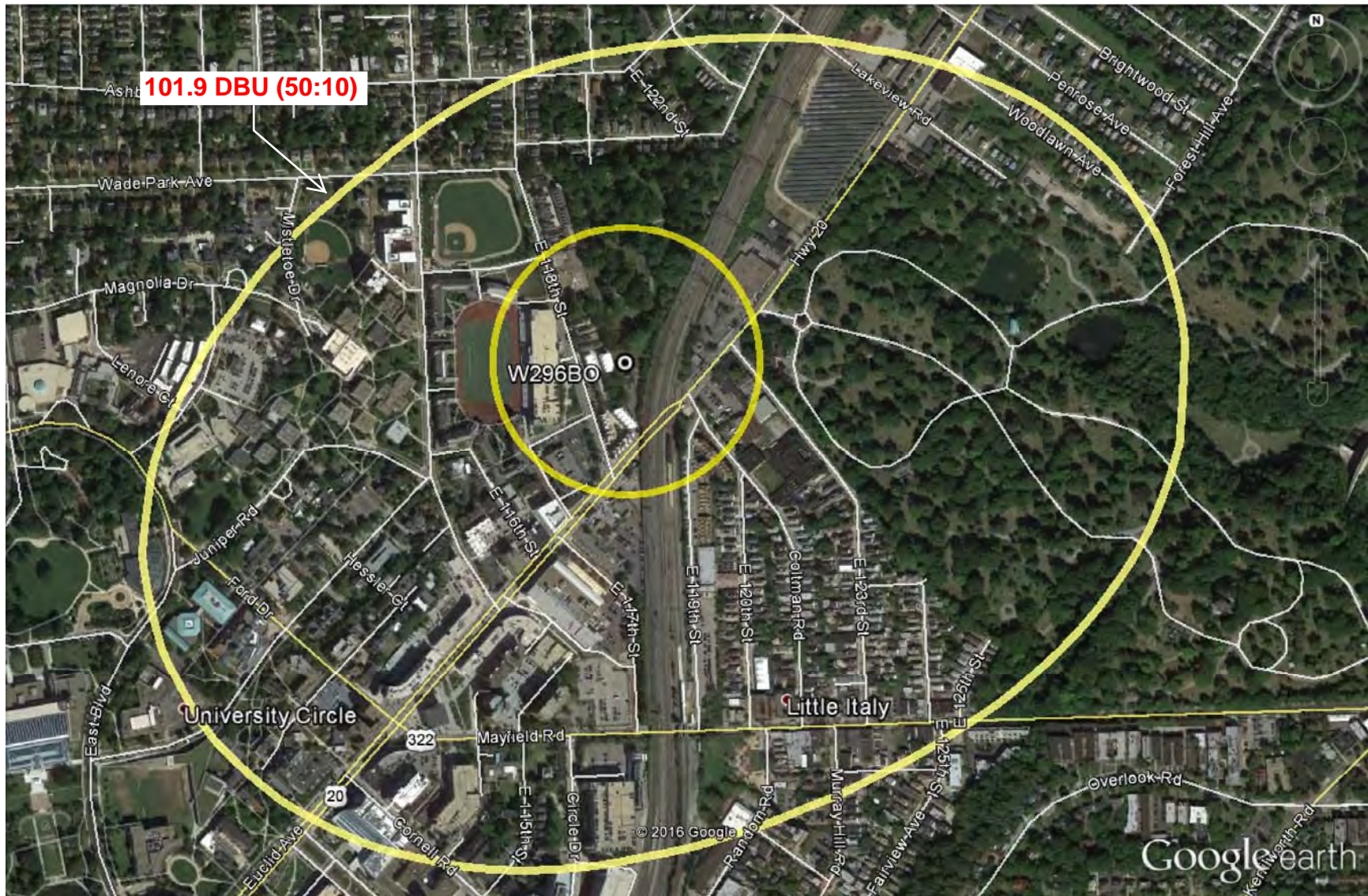




E1B 190 METER RADIUS FROM TOWER









## E1B BUILDINGS CLOSEST TO TOWER





E1B STADIUM 95-173 METERS WEST





## E1B STADIUM

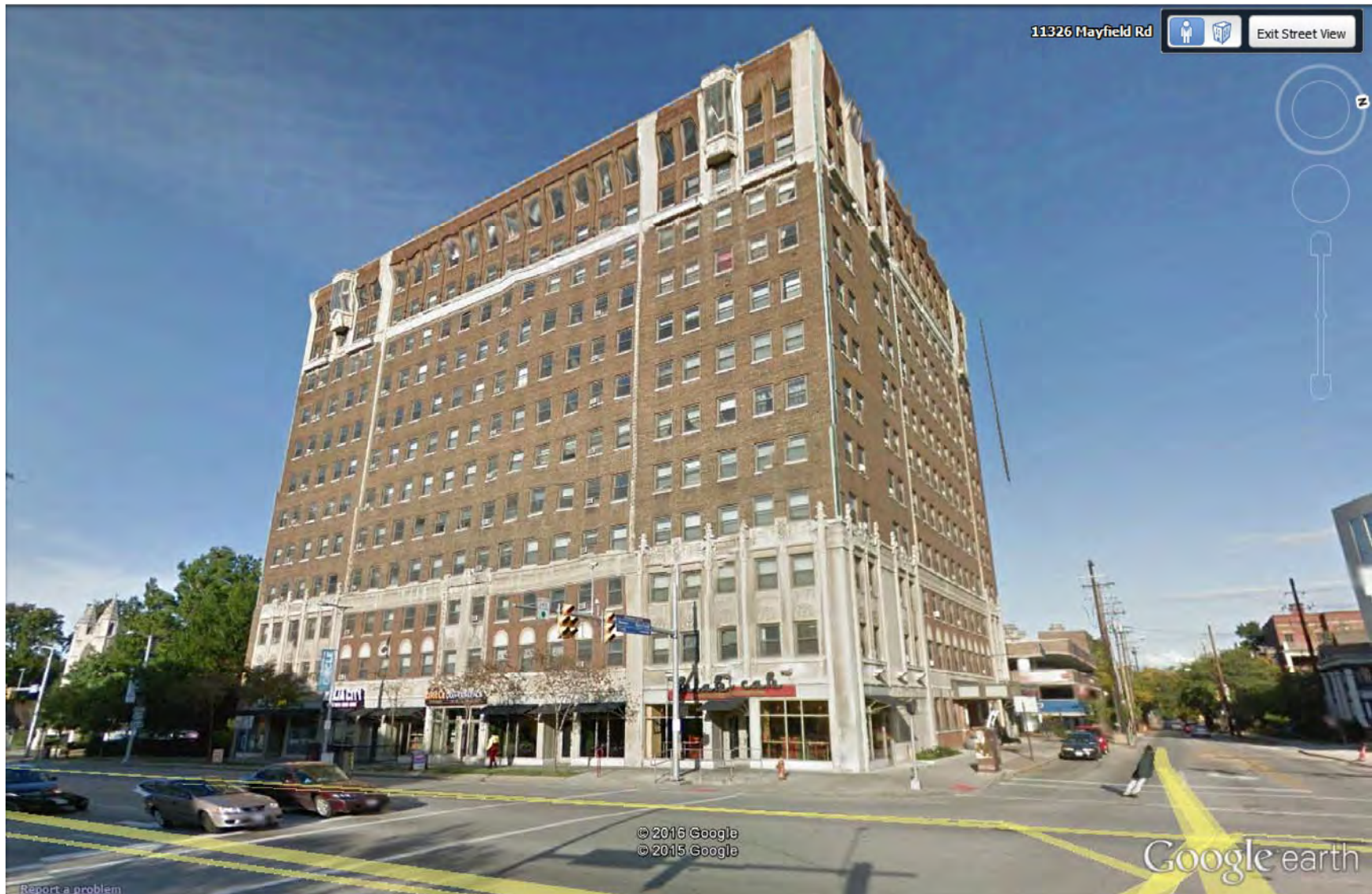




E1B 12 STORY BUILDING AT EUCLID AND MAYFIELD N41-30-31.5 W 81-36-20.8 720M @215.6 DEG



## E1B ANOTHER VIEW OF MAYFIELD AND EUCLID BUILDING





E1B SEIDMAN CANCER CENTER N41-30-28 W81-36-21 720 METERS@211 DEGREES

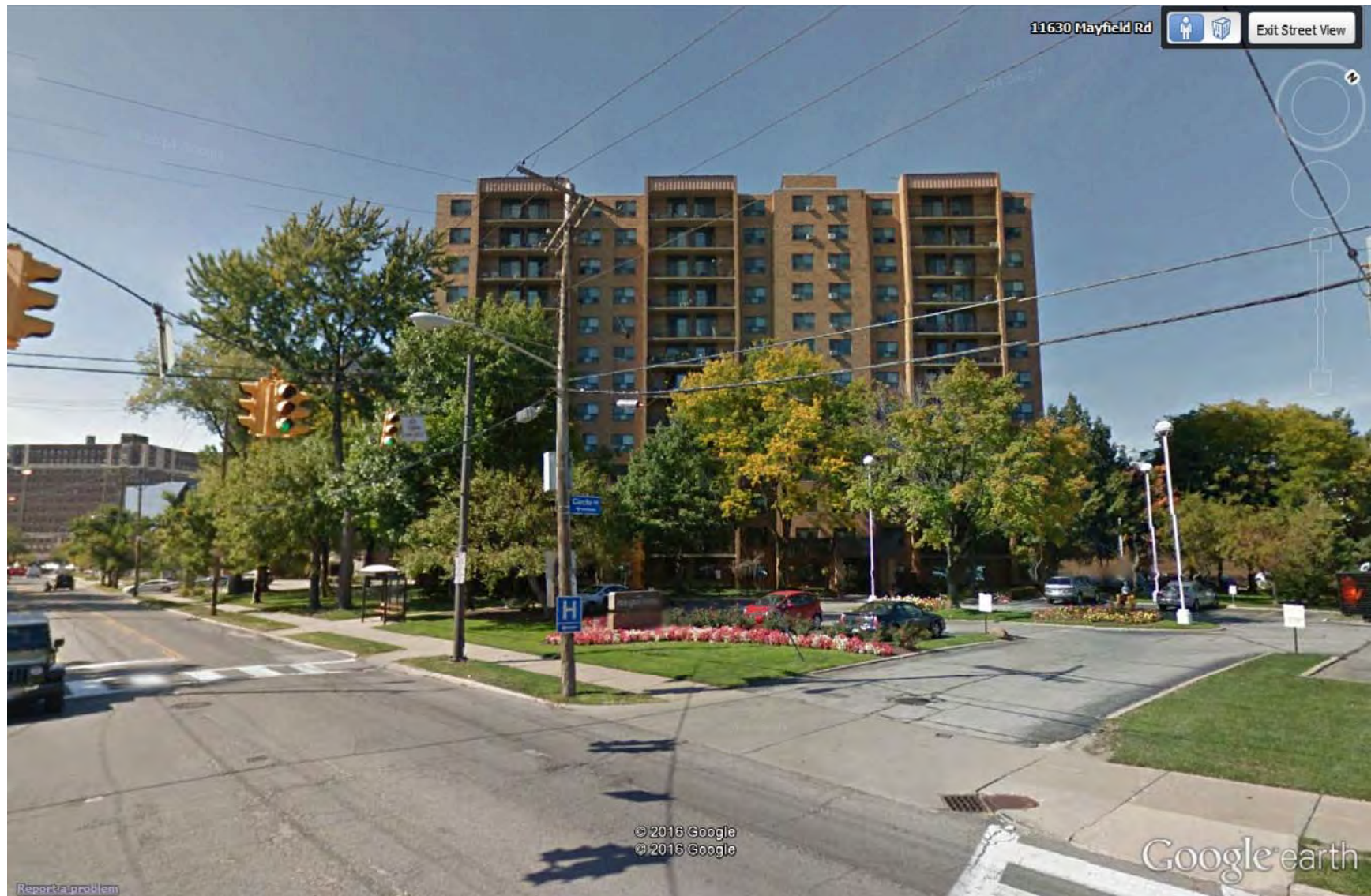


E1B CLARKE TOWER N41-30-52 W81-36-20 369M @289.7 DEGREES 11 STORIES



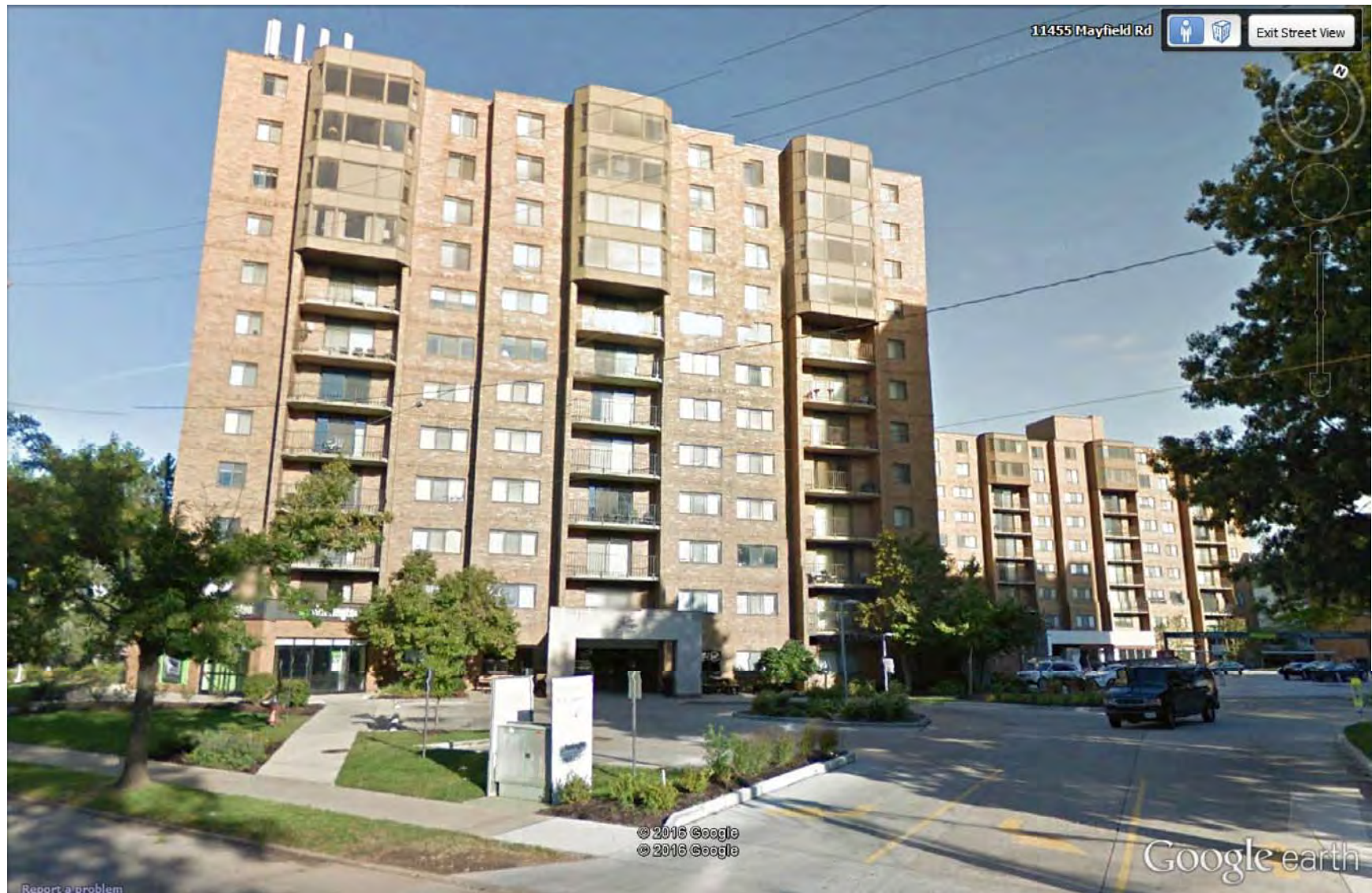


E1B 12 STORY APARTMENTS ON MAYFIELD N41-30-32.5 W81-36-09.5 489M@192.3 DEGREES



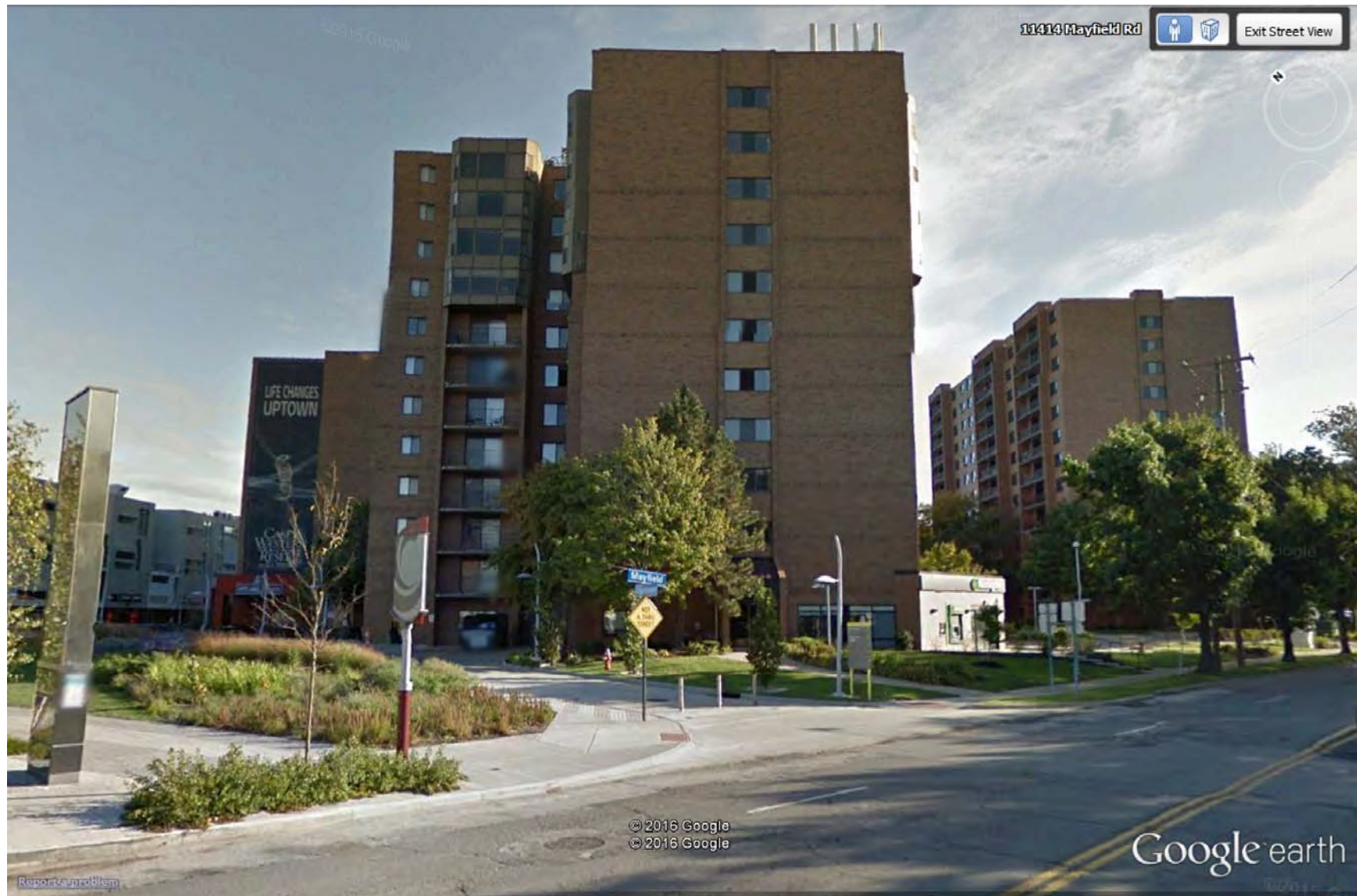


E1B ONE TRIANGLE PLACE 12 STORIES N41-30-32.3 W 81-36-12.6 515M @200 DEGREES





E1B ONE TRIANGLE TOWER #2 12 STORIES N41-30-34.4 W81-36-12.2 451 M @201.6 DEGREES



# EXHIBIT E1C

## W296BO

Latitude: 41-30-48 N  
Longitude: 081-36-05 W  
ERP: 0.20 kW  
Channel: 233  
Frequency: 94.5 MHz  
AMSL Height: 313.0 m  
Elevation: 211.0 m  
Horiz. Pattern: Directional

60 KM RADIUS

PROPOSED 34 DBU (50:10)

CANADA BORDER

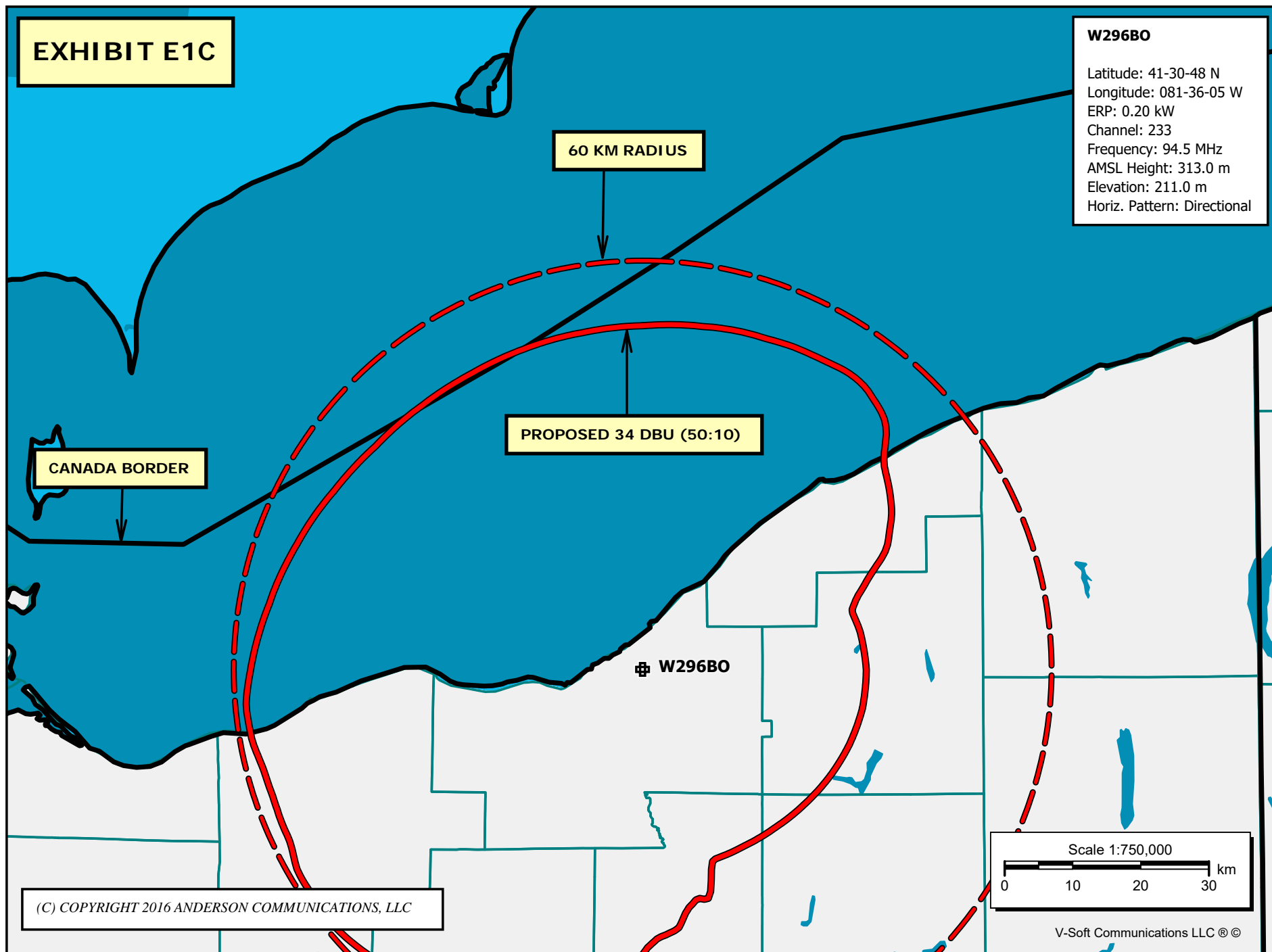
W296BO

Scale 1:750,000

0 10 20 30 km

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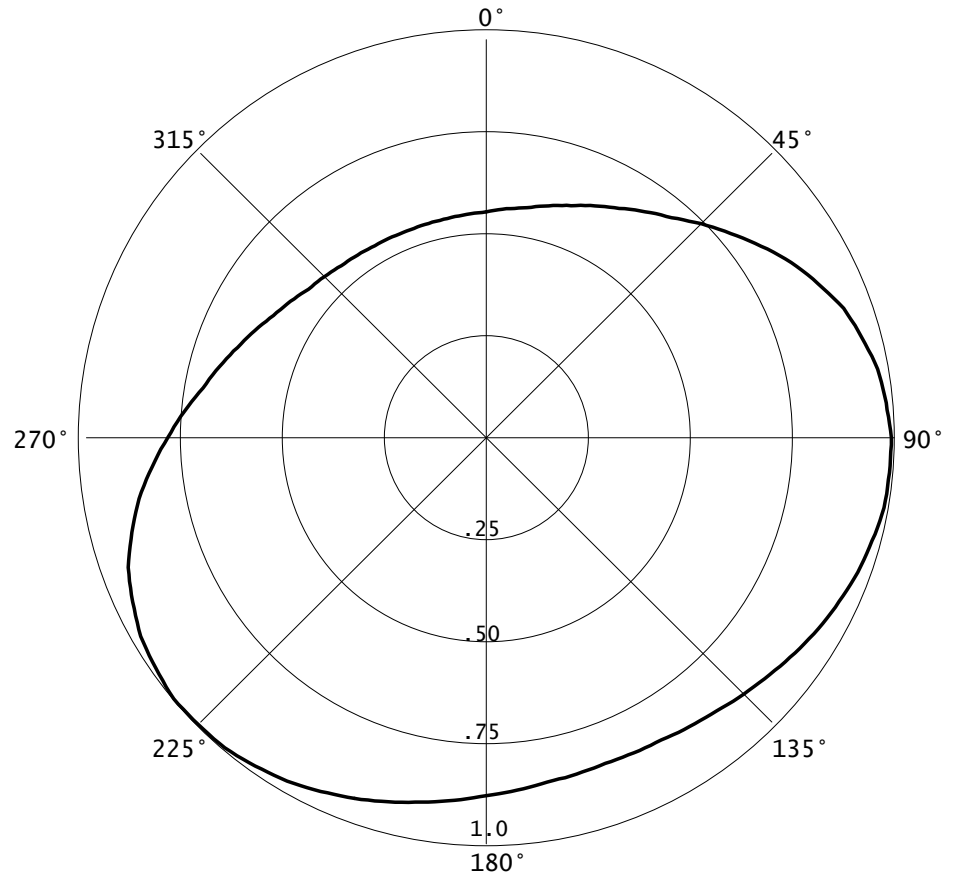
# E1D DA

01-27-2016

RMS(V)= .819

Graph is Relative Field

Azi	Field	dBk	kw
000	0.556	-12.088	0.062
010	0.575	-11.796	0.066
020	0.608	-11.312	0.074
030	0.652	-10.705	0.085
040	0.707	-10.001	0.100
050	0.782	-09.126	0.122
060	0.863	-08.269	0.149
070	0.932	-07.601	0.174
080	0.974	-07.219	0.190
090	0.993	-07.051	0.197
100	0.990	-07.077	0.196
110	0.969	-07.263	0.188
120	0.940	-07.527	0.177
130	0.907	-07.838	0.165
140	0.878	-08.120	0.154
150	0.859	-08.310	0.148
160	0.853	-08.371	0.146
170	0.861	-08.290	0.148
180	0.881	-08.090	0.155
190	0.911	-07.799	0.166
200	0.945	-07.481	0.179
210	0.976	-07.201	0.191
220	0.997	-07.016	0.199
230	1.000	-06.990	0.200
240	0.978	-07.183	0.191
250	0.934	-07.583	0.174
260	0.864	-08.259	0.149
270	0.781	-09.137	0.122
280	0.705	-10.026	0.099
290	0.649	-10.745	0.084
300	0.602	-11.398	0.072
310	0.569	-11.887	0.065
320	0.553	-12.135	0.061
330	0.546	-12.246	0.060
340	0.545	-12.262	0.059
350	0.548	-12.214	0.060



## EXHIBIT E2

### W296BO

Latitude: 41-30-48 N  
Longitude: 081-36-05 W  
ERP: 0.20 kW  
Channel: 233  
Frequency: 94.5 MHz  
AMSL Height: 313.0 m  
Elevation: 211.0 m  
Horiz. Pattern: Directional

WJMO 25 MILE RADIUS

PROPOSED 60 DBU

W296BO

Cleveland

WJMO

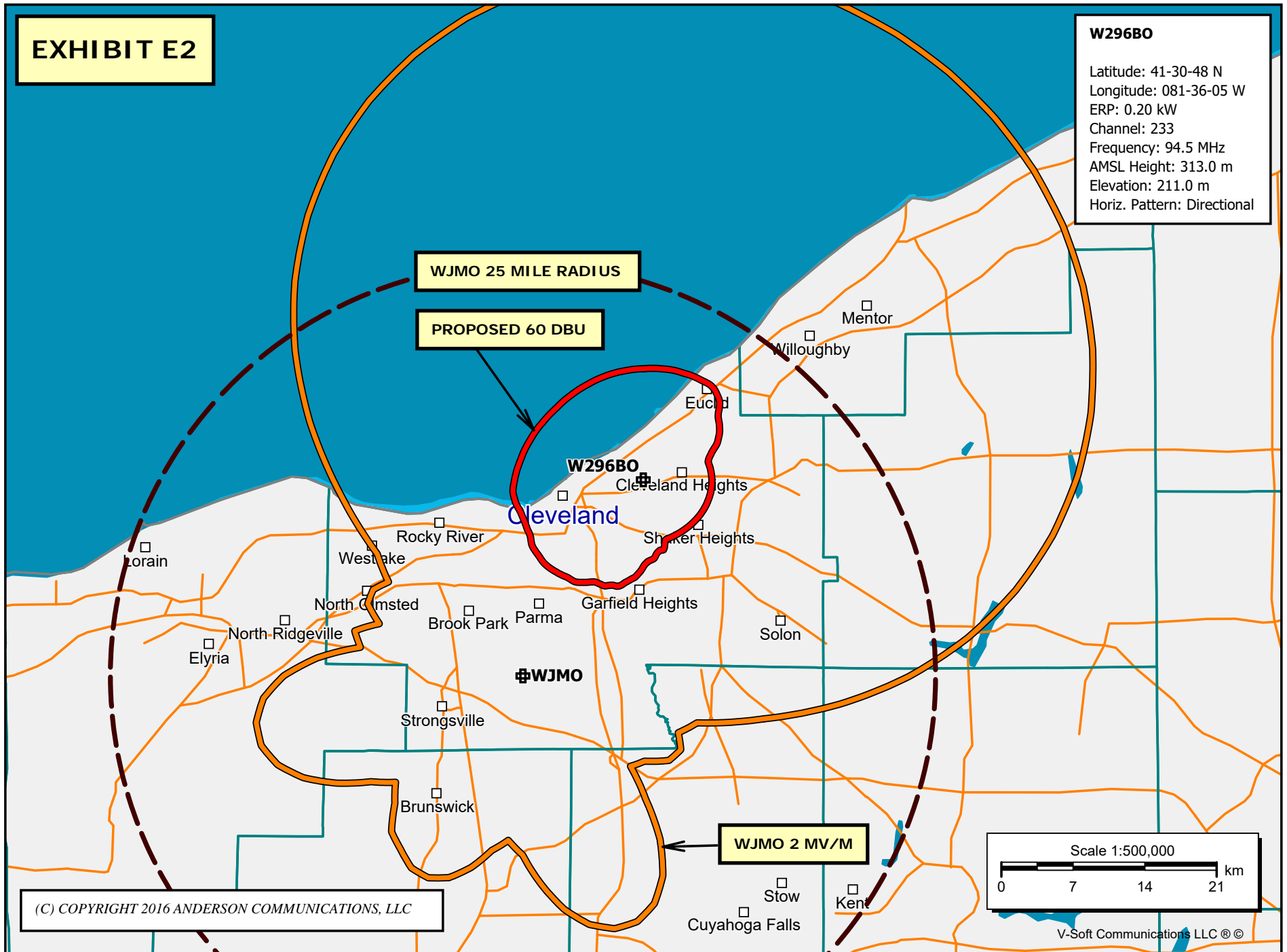
WJMO 2 MV/M

Scale 1:500,000

0 7 14 21 km

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V-Soft Communications LLC ©



# E3 Registration 1014404

 [Map Registration](#)

## Registration Detail

Reg Number	1014404	Status	Constructed
File Number	A0600512	Constructed	06/21/1983
EMI	No	Dismantled	
NEPA	No		

## Antenna Structure

Structure Type TOWER - Free standing or Guyed Structure used for Commu

### Location (in NAD83 Coordinates)

Lat/Long	41-30-48.0 N 081-36-04.0 W	Address	11821 EUCLID AVE
City, State	CLEVELAND , OH		
Zip	44106	County	CUYAHOGA
Center of AM Array		Position of Tower in Array	

### Heights (meters)

Elevation of Site Above Mean Sea Level	Overall Height Above Ground (AGL)
210.6	109.1
Overall Height Above Mean Sea Level	Overall Height Above Ground w/o Appurtenances
319.7	108.2

### Painting and Lighting Specifications

FCC Paragraphs 1, 3, 12, 21

### FAA Notification

FAA Study	FAA Issue Date
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### Owner & Contact Information

FRN	0007164544	Owner Entity Type
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#### Owner

Blue Chip Broadcasting Licenses, Ltd  
Attention To: Sonya Hall-Harris  
5900 Princess Garden Pkwy  
Lanham , MD 20706

P: (301)306-1111  
F:  
E: sharris@radio-one.com

#### Contact

Hall-Harris , Sonya  
5900 Princess Garden Pkwy  
Lanham , MD 20706

P: (301)306-1111  
F:  
E: sharris@radio-one.com

### Last Action Status

Status	Constructed	Received	07/28/2008
Purpose	Admin Update	Entered	07/28/2008
Mode	Interactive		

### Related Applications

07/28/2008	A0600512	- Admin Update (AU)
07/25/2003	A0335903	- Change Owner (OC)
02/25/1997	A0079270	- New (NE)

## 6 Bay TFC2K 96.1MHz

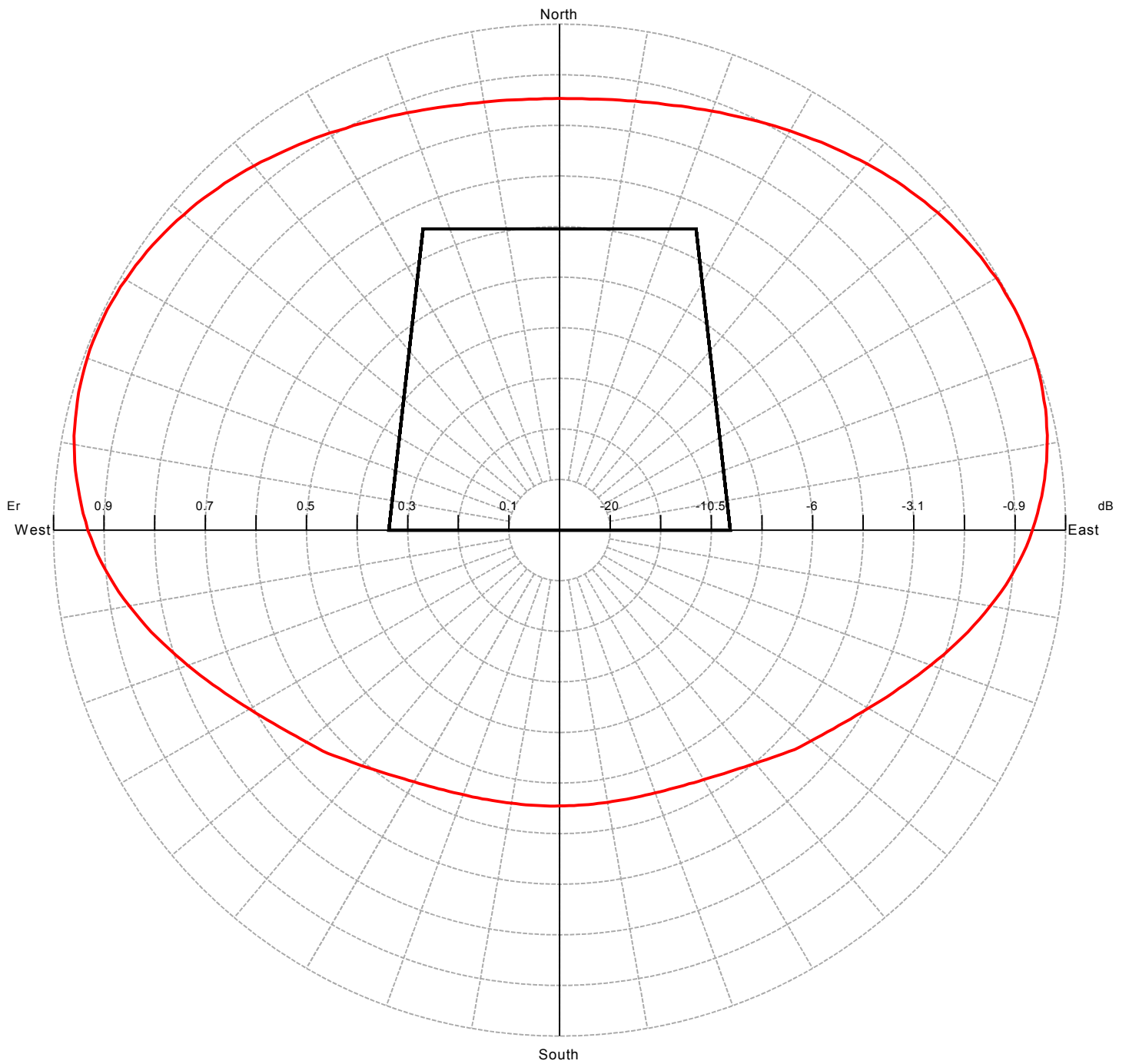
June 5, 2015



**Geometrical and electrical data of antenna System**

	<i>Power</i> (%)	<i>Tilt</i> (°)	<i>Az.</i> (°/N)	<i>Phase</i> (°)	<i>V dist.</i> (m)	<i>Scr-d</i> (cm)	<i>Scr-Az</i> (°/N)	<i>Rot.</i> (1÷4)	<i>Type</i> (1÷2)	<i>L cables</i> (cm)	<i>Car. phase</i> (°)
1	16.667	0	0	0 +0.0	6.50	0.0	0.0	1	1	0.0	0.0
2	16.667	0	0	0 +0.0	3.90	0.0	0.0	1	1	0.0	0.0
3	16.667	0	0	0 +0.0	1.30	0.0	0.0	1	1	0.0	0.0
4	16.667	0	0	0 +0.0	-1.30	0.0	0.0	1	1	0.0	0.0
5	16.667	0	0	0 +0.0	-3.90	0.0	0.0	1	1	0.0	0.0
6	16.667	0	0	0 +0.0	-6.50	0.0	0.0	1	1	0.0	0.0

# Horizontal diagram at 0.0° tilt (Total Antenna)



0.0° Tilt (Total Antenna), Gain (dBd): 4.26

ERP T.Max(KW): 2.668 ERP E.Max(KW): 2.168



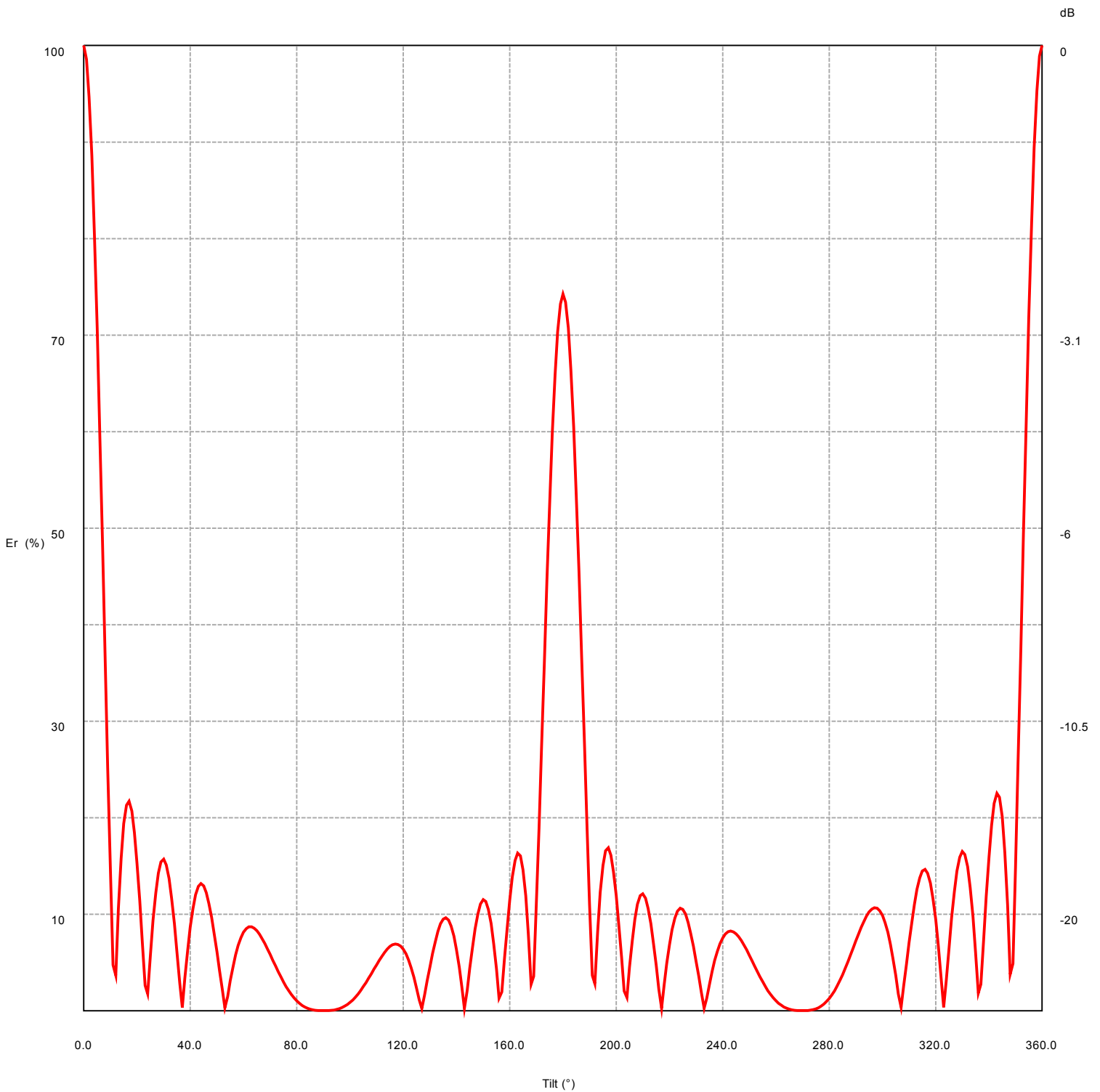
### Horizontal diagram at 0.0° tilt (Total Antenna)

Az (°)	Er (%)	ERP (KW)	Az (°)	Er (%)	ERP (KW)	Az (°)	Er (%)	ERP (KW)
0.0	85.3	1.578	60.0	99.7	2.154	120.0	70.5	1.076
1.0	85.3	1.578	61.0	99.8	2.158	121.0	69.8	1.056
2.0	85.3	1.578	62.0	99.8	2.158	122.0	69.1	1.036
3.0	85.4	1.582	63.0	99.9	2.163	123.0	68.6	1.019
4.0	85.4	1.582	64.0	100.0	2.168	124.0	68.0	1.001
5.0	85.5	1.585	65.0	100.0	2.168	125.0	67.4	0.984
6.0	85.6	1.589	66.0	100.0	2.168	126.0	66.8	0.969
7.0	85.7	1.593	67.0	100.0	2.168	127.0	66.3	0.953
8.0	85.8	1.596	68.0	100.0	2.168	128.0	65.8	0.939
9.0	85.9	1.600	69.0	99.9	2.163	129.0	65.3	0.925
10.0	86.1	1.608	70.0	99.9	2.163	130.0	64.9	0.912
11.0	86.2	1.611	71.0	99.8	2.158	131.0	64.4	0.900
12.0	86.4	1.619	72.0	99.7	2.154	132.0	64.0	0.888
13.0	86.6	1.626	73.0	99.5	2.149	133.0	63.6	0.876
14.0	86.7	1.630	74.0	99.3	2.139	134.0	63.0	0.860
15.0	86.9	1.637	75.0	99.1	2.129	135.0	62.5	0.847
16.0	87.2	1.649	76.0	99.0	2.124	136.0	62.0	0.833
17.0	87.4	1.656	77.0	98.7	2.114	137.0	61.5	0.820
18.0	87.6	1.664	78.0	98.4	2.100	138.0	61.1	0.809
19.0	87.9	1.676	79.0	98.2	2.090	139.0	60.6	0.796
20.0	88.1	1.683	80.0	97.8	2.076	140.0	60.2	0.785
21.0	88.4	1.695	81.0	97.5	2.061	141.0	59.7	0.774
22.0	88.6	1.703	82.0	97.2	2.047	142.0	59.4	0.765
23.0	88.9	1.715	83.0	96.7	2.028	143.0	59.0	0.755
24.0	89.2	1.726	84.0	96.4	2.014	144.0	58.7	0.746
25.0	89.5	1.738	85.0	95.9	1.996	145.0	58.3	0.738
26.0	89.8	1.750	86.0	95.5	1.978	146.0	58.1	0.731
27.0	90.2	1.763	87.0	95.0	1.955	147.0	57.7	0.723
28.0	90.5	1.775	88.0	94.5	1.937	148.0	57.5	0.716
29.0	90.8	1.787	89.0	94.0	1.915	149.0	57.2	0.709
30.0	91.1	1.799	90.0	93.4	1.893	150.0	56.9	0.703
31.0	91.4	1.812	91.0	92.9	1.871	151.0	56.7	0.698
32.0	91.7	1.825	92.0	92.3	1.848	152.0	56.5	0.693
33.0	92.0	1.837	93.0	91.6	1.821	153.0	56.3	0.687
34.0	92.5	1.854	94.0	91.0	1.794	154.0	56.2	0.684
35.0	92.8	1.867	95.0	90.3	1.767	155.0	56.0	0.679
36.0	93.1	1.880	96.0	89.6	1.739	156.0	55.8	0.674
37.0	93.4	1.893	97.0	88.9	1.712	157.0	55.6	0.671
38.0	93.8	1.906	98.0	88.0	1.681	158.0	55.5	0.668
39.0	94.2	1.924	99.0	87.2	1.650	159.0	55.4	0.665
40.0	94.5	1.937	100.0	86.4	1.620	160.0	55.3	0.662
41.0	94.8	1.951	101.0	85.6	1.590	161.0	55.2	0.661
42.0	95.2	1.964	102.0	84.8	1.560	162.0	55.1	0.658
43.0	95.5	1.978	103.0	83.9	1.528	163.0	55.0	0.656
44.0	95.8	1.991	104.0	83.2	1.500	164.0	54.9	0.655
45.0	96.2	2.005	105.0	82.3	1.469	165.0	54.9	0.653
46.0	96.4	2.014	106.0	81.4	1.438	166.0	54.8	0.652
47.0	96.7	2.028	107.0	80.6	1.409	167.0	54.8	0.650
48.0	97.1	2.042	108.0	79.8	1.380	168.0	54.7	0.649
49.0	97.3	2.052	109.0	78.9	1.349	169.0	54.6	0.647
50.0	97.6	2.066	110.0	78.1	1.322	170.0	54.6	0.647
51.0	97.8	2.076	111.0	77.2	1.293	171.0	54.6	0.646
52.0	98.1	2.085	112.0	76.4	1.267	172.0	54.6	0.646
53.0	98.3	2.095	113.0	75.6	1.240	173.0	54.6	0.646
54.0	98.5	2.105	114.0	74.8	1.214	174.0	54.6	0.646
55.0	98.7	2.114	115.0	74.0	1.188	175.0	54.5	0.644
56.0	99.0	2.124	116.0	73.3	1.166	176.0	54.5	0.644
57.0	99.2	2.134	117.0	72.6	1.142	177.0	54.5	0.644
58.0	99.3	2.139	118.0	71.9	1.120	178.0	54.5	0.644
59.0	99.4	2.144	119.0	71.1	1.098	179.0	54.5	0.644

### Horizontal diagram at 0.0° tilt (Total Antenna)

Az (°)	Er (%)	ERP (KW)	Az (°)	Er (%)	ERP (KW)	Az (°)	Er (%)	ERP (KW)
180.0	54.5	0.644	240.0	70.7	1.084	300.0	99.0	2.124
181.0	54.6	0.646	241.0	71.4	1.106	301.0	98.9	2.119
182.0	54.6	0.646	242.0	72.1	1.128	302.0	98.7	2.114
183.0	54.6	0.646	243.0	72.8	1.149	303.0	98.5	2.105
184.0	54.6	0.646	244.0	73.5	1.173	304.0	98.4	2.100
185.0	54.6	0.647	245.0	74.2	1.195	305.0	98.2	2.090
186.0	54.6	0.647	246.0	75.0	1.221	306.0	97.9	2.080
187.0	54.7	0.649	247.0	75.8	1.245	307.0	97.7	2.071
188.0	54.8	0.650	248.0	76.6	1.272	308.0	97.5	2.061
189.0	54.8	0.650	249.0	77.4	1.298	309.0	97.3	2.052
190.0	54.8	0.652	250.0	78.2	1.325	310.0	96.9	2.038
191.0	54.9	0.653	251.0	79.0	1.352	311.0	96.7	2.028
192.0	55.0	0.655	252.0	79.8	1.380	312.0	96.5	2.019
193.0	55.0	0.656	253.0	80.6	1.409	313.0	96.2	2.005
194.0	55.1	0.658	254.0	81.4	1.438	314.0	95.8	1.991
195.0	55.1	0.659	255.0	82.3	1.469	315.0	95.5	1.978
196.0	55.3	0.662	256.0	83.2	1.500	316.0	95.3	1.969
197.0	55.3	0.664	257.0	83.9	1.528	317.0	95.0	1.955
198.0	55.5	0.667	258.0	84.7	1.557	318.0	94.6	1.942
199.0	55.5	0.668	259.0	85.5	1.586	319.0	94.3	1.928
200.0	55.6	0.671	260.0	86.3	1.616	320.0	94.0	1.915
201.0	55.8	0.675	261.0	87.1	1.647	321.0	93.6	1.902
202.0	56.0	0.679	262.0	87.9	1.677	322.0	93.2	1.884
203.0	56.1	0.682	263.0	88.7	1.704	323.0	92.9	1.871
204.0	56.2	0.685	264.0	89.4	1.732	324.0	92.6	1.858
205.0	56.4	0.690	265.0	90.1	1.759	325.0	92.3	1.846
206.0	56.6	0.695	266.0	90.8	1.786	326.0	91.9	1.833
207.0	56.8	0.700	267.0	91.4	1.813	327.0	91.6	1.820
208.0	57.0	0.705	268.0	92.0	1.836	328.0	91.3	1.808
209.0	57.3	0.711	269.0	92.6	1.858	329.0	91.0	1.795
210.0	57.5	0.716	270.0	93.2	1.884	330.0	90.7	1.783
211.0	57.7	0.723	271.0	93.6	1.902	331.0	90.3	1.767
212.0	58.0	0.729	272.0	94.2	1.924	332.0	89.9	1.754
213.0	58.3	0.736	273.0	94.6	1.942	333.0	89.7	1.746
214.0	58.6	0.744	274.0	95.1	1.960	334.0	89.4	1.734
215.0	58.9	0.753	275.0	95.5	1.978	335.0	89.1	1.722
216.0	59.3	0.762	276.0	95.9	1.996	336.0	88.8	1.711
217.0	59.6	0.771	277.0	96.4	2.014	337.0	88.5	1.699
218.0	60.0	0.779	278.0	96.7	2.028	338.0	88.3	1.691
219.0	60.4	0.790	279.0	97.1	2.042	339.0	88.0	1.679
220.0	60.8	0.801	280.0	97.4	2.057	340.0	87.8	1.672
221.0	61.2	0.812	281.0	97.7	2.071	341.0	87.5	1.660
222.0	61.6	0.824	282.0	97.9	2.080	342.0	87.3	1.653
223.0	62.1	0.835	283.0	98.2	2.090	343.0	87.1	1.645
224.0	62.6	0.849	284.0	98.4	2.100	344.0	86.9	1.637
225.0	63.1	0.862	285.0	98.6	2.109	345.0	86.7	1.630
226.0	63.6	0.876	286.0	98.9	2.119	346.0	86.5	1.622
227.0	64.0	0.888	287.0	99.0	2.124	347.0	86.3	1.615
228.0	64.4	0.898	288.0	99.1	2.129	348.0	86.2	1.611
229.0	64.8	0.910	289.0	99.2	2.134	349.0	86.0	1.604
230.0	65.2	0.923	290.0	99.3	2.139	350.0	85.9	1.600
231.0	65.7	0.935	291.0	99.4	2.144	351.0	85.8	1.596
232.0	66.1	0.948	292.0	99.4	2.144	352.0	85.7	1.593
233.0	66.6	0.963	293.0	99.4	2.144	353.0	85.6	1.589
234.0	67.2	0.979	294.0	99.4	2.144	354.0	85.5	1.585
235.0	67.7	0.994	295.0	99.4	2.144	355.0	85.4	1.582
236.0	68.3	1.010	296.0	99.4	2.144	356.0	85.4	1.582
237.0	68.9	1.029	297.0	99.3	2.139	357.0	85.3	1.578
238.0	69.5	1.046	298.0	99.2	2.134	358.0	85.3	1.578
239.0	70.1	1.066	299.0	99.2	2.134	359.0	85.3	1.578

# Vertical diagram at an azimuth of 65.0°



65.0° Az. (Total Antenna), Gain (dBd): 4.26

ERP T.Max(KW): 2.668 ERP E.Max(KW): 2.168

### Vertical diagram at an azimuth of 65.0°

Dep (°)	Er (%)	ERP (KW)	Dep (°)	Er (%)	ERP (KW)	Dep (°)	Er (%)	ERP (KW)
0.0	100.0	2.168	60.0	8.1	0.014	120.0	6.4	0.009
1.0	98.6	2.106	61.0	8.5	0.016	121.0	5.9	0.008
2.0	94.7	1.943	62.0	8.7	0.016	122.0	5.3	0.006
3.0	88.6	1.702	63.0	8.7	0.016	123.0	4.4	0.004
4.0	80.4	1.402	64.0	8.6	0.016	124.0	3.5	0.003
5.0	70.7	1.085	65.0	8.3	0.015	125.0	2.4	0.001
6.0	59.9	0.777	66.0	7.9	0.014	126.0	1.1	0.000
7.0	48.4	0.507	67.0	7.5	0.012	127.0	0.2	0.000
8.0	36.7	0.292	68.0	7.0	0.011	128.0	1.7	0.001
9.0	25.2	0.138	69.0	6.4	0.009	129.0	3.1	0.002
10.0	14.5	0.046	70.0	5.8	0.007	130.0	4.6	0.005
11.0	4.7	0.005	71.0	5.2	0.006	131.0	5.9	0.008
12.0	3.7	0.003	72.0	4.6	0.005	132.0	7.2	0.011
13.0	10.6	0.024	73.0	4.1	0.004	133.0	8.2	0.015
14.0	15.8	0.054	74.0	3.5	0.003	134.0	9.0	0.018
15.0	19.4	0.082	75.0	3.0	0.002	135.0	9.5	0.020
16.0	21.3	0.098	76.0	2.5	0.001	136.0	9.6	0.020
17.0	21.7	0.102	77.0	2.1	0.001	137.0	9.4	0.019
18.0	20.7	0.093	78.0	1.7	0.001	138.0	8.8	0.017
19.0	18.5	0.074	79.0	1.3	0.000	139.0	7.7	0.013
20.0	15.3	0.051	80.0	1.0	0.000	140.0	6.3	0.009
21.0	11.4	0.028	81.0	0.8	0.000	141.0	4.5	0.004
22.0	7.1	0.011	82.0	0.6	0.000	142.0	2.5	0.001
23.0	2.6	0.001	83.0	0.4	0.000	143.0	0.2	0.000
24.0	1.8	0.001	84.0	0.3	0.000	144.0	2.1	0.001
25.0	5.8	0.007	85.0	0.2	0.000	145.0	4.4	0.004
26.0	9.4	0.019	86.0	0.1	0.000	146.0	6.6	0.009
27.0	12.2	0.032	87.0	0.1	0.000	147.0	8.5	0.016
28.0	14.3	0.044	88.0	0.0	0.000	148.0	10.0	0.022
29.0	15.4	0.052	89.0	0.0	0.000	149.0	11.1	0.026
30.0	15.7	0.053	90.0	0.0	0.000	150.0	11.5	0.029
31.0	15.1	0.049	91.0	0.0	0.000	151.0	11.3	0.028
32.0	13.7	0.041	92.0	0.0	0.000	152.0	10.5	0.024
33.0	11.6	0.029	93.0	0.0	0.000	153.0	9.0	0.018
34.0	9.0	0.018	94.0	0.1	0.000	154.0	6.9	0.010
35.0	6.1	0.008	95.0	0.1	0.000	155.0	4.3	0.004
36.0	2.9	0.002	96.0	0.2	0.000	156.0	1.3	0.000
37.0	0.3	0.000	97.0	0.3	0.000	157.0	2.0	0.001
38.0	3.4	0.003	98.0	0.5	0.000	158.0	5.3	0.006
39.0	6.2	0.008	99.0	0.7	0.000	159.0	8.6	0.016
40.0	8.7	0.016	100.0	0.9	0.000	160.0	11.5	0.029
41.0	10.6	0.024	101.0	1.1	0.000	161.0	13.9	0.042
42.0	12.0	0.031	102.0	1.4	0.000	162.0	15.6	0.052
43.0	12.9	0.036	103.0	1.7	0.001	163.0	16.3	0.058
44.0	13.2	0.038	104.0	2.1	0.001	164.0	16.0	0.056
45.0	12.9	0.036	105.0	2.5	0.001	165.0	14.6	0.046
46.0	12.2	0.032	106.0	2.9	0.002	166.0	11.9	0.031
47.0	11.1	0.027	107.0	3.4	0.002	167.0	7.9	0.014
48.0	9.7	0.020	108.0	3.8	0.003	168.0	2.8	0.002
49.0	8.0	0.014	109.0	4.3	0.004	169.0	3.6	0.003
50.0	6.1	0.008	110.0	4.8	0.005	170.0	10.9	0.026
51.0	4.2	0.004	111.0	5.2	0.006	171.0	18.9	0.078
52.0	2.2	0.001	112.0	5.7	0.007	172.0	27.4	0.163
53.0	0.3	0.000	113.0	6.1	0.008	173.0	36.1	0.283
54.0	1.5	0.000	114.0	6.4	0.009	174.0	44.7	0.433
55.0	3.1	0.002	115.0	6.7	0.010	175.0	52.7	0.603
56.0	4.5	0.004	116.0	6.8	0.010	176.0	59.9	0.778
57.0	5.8	0.007	117.0	6.9	0.010	177.0	65.9	0.941
58.0	6.8	0.010	118.0	6.9	0.010	178.0	70.4	1.073
59.0	7.6	0.012	119.0	6.7	0.010	179.0	73.2	1.162

### Vertical diagram at an azimuth of 65.0°

Dep (°)	Er (%)	ERP (KW)	Dep (°)	Er (%)	ERP (KW)	Dep (°)	Er (%)	ERP (KW)
180.0	74.2	1.195	240.0	7.5	0.012	300.0	9.9	0.021
181.0	73.4	1.169	241.0	7.9	0.014	301.0	9.1	0.018
182.0	70.7	1.085	242.0	8.2	0.015	302.0	8.1	0.014
183.0	66.4	0.955	243.0	8.3	0.015	303.0	6.9	0.010
184.0	60.5	0.793	244.0	8.2	0.015	304.0	5.4	0.006
185.0	53.4	0.618	245.0	8.0	0.014	305.0	3.7	0.003
186.0	45.3	0.446	246.0	7.7	0.013	306.0	1.7	0.001
187.0	36.8	0.293	247.0	7.3	0.011	307.0	0.4	0.000
188.0	28.0	0.170	248.0	6.8	0.010	308.0	2.6	0.001
189.0	19.3	0.081	249.0	6.3	0.009	309.0	4.8	0.005
190.0	11.1	0.027	250.0	5.8	0.007	310.0	7.0	0.011
191.0	3.7	0.003	251.0	5.2	0.006	311.0	9.1	0.018
192.0	2.8	0.002	252.0	4.6	0.005	312.0	11.0	0.026
193.0	8.2	0.014	253.0	4.1	0.004	313.0	12.6	0.034
194.0	12.3	0.033	254.0	3.5	0.003	314.0	13.8	0.041
195.0	15.1	0.049	255.0	3.0	0.002	315.0	14.5	0.045
196.0	16.6	0.060	256.0	2.5	0.001	316.0	14.6	0.046
197.0	16.9	0.062	257.0	2.1	0.001	317.0	14.2	0.044
198.0	16.1	0.056	258.0	1.7	0.001	318.0	13.2	0.038
199.0	14.4	0.045	259.0	1.3	0.000	319.0	11.6	0.029
200.0	11.9	0.031	260.0	1.0	0.000	320.0	9.4	0.019
201.0	8.9	0.017	261.0	0.8	0.000	321.0	6.8	0.010
202.0	5.5	0.007	262.0	0.6	0.000	322.0	3.7	0.003
203.0	2.0	0.001	263.0	0.4	0.000	323.0	0.4	0.000
204.0	1.4	0.000	264.0	0.3	0.000	324.0	3.1	0.002
205.0	4.5	0.004	265.0	0.2	0.000	325.0	6.5	0.009
206.0	7.3	0.011	266.0	0.1	0.000	326.0	9.6	0.020
207.0	9.5	0.019	267.0	0.1	0.000	327.0	12.3	0.033
208.0	11.0	0.026	268.0	0.0	0.000	328.0	14.5	0.046
209.0	11.9	0.031	269.0	0.0	0.000	329.0	15.9	0.055
210.0	12.1	0.032	270.0	0.0	0.000	330.0	16.5	0.059
211.0	11.7	0.029	271.0	0.0	0.000	331.0	16.2	0.057
212.0	10.6	0.024	272.0	0.0	0.000	332.0	14.9	0.048
213.0	9.0	0.018	273.0	0.1	0.000	333.0	12.8	0.035
214.0	7.0	0.011	274.0	0.1	0.000	334.0	9.8	0.021
215.0	4.7	0.005	275.0	0.2	0.000	335.0	6.1	0.008
216.0	2.2	0.001	276.0	0.3	0.000	336.0	1.8	0.001
217.0	0.3	0.000	277.0	0.5	0.000	337.0	2.7	0.002
218.0	2.7	0.002	278.0	0.7	0.000	338.0	7.4	0.012
219.0	4.9	0.005	279.0	1.0	0.000	339.0	11.9	0.031
220.0	6.8	0.010	280.0	1.3	0.000	340.0	15.9	0.055
221.0	8.4	0.015	281.0	1.6	0.001	341.0	19.2	0.080
222.0	9.6	0.020	282.0	2.1	0.001	342.0	21.5	0.100
223.0	10.3	0.023	283.0	2.6	0.001	343.0	22.5	0.110
224.0	10.6	0.024	284.0	3.1	0.002	344.0	22.1	0.106
225.0	10.5	0.024	285.0	3.7	0.003	345.0	20.1	0.088
226.0	10.0	0.022	286.0	4.4	0.004	346.0	16.4	0.058
227.0	9.2	0.018	287.0	5.1	0.006	347.0	10.9	0.026
228.0	8.0	0.014	288.0	5.8	0.007	348.0	3.8	0.003
229.0	6.7	0.010	289.0	6.5	0.009	349.0	4.9	0.005
230.0	5.2	0.006	290.0	7.2	0.011	350.0	14.9	0.048
231.0	3.6	0.003	291.0	8.0	0.014	351.0	25.9	0.146
232.0	1.9	0.001	292.0	8.6	0.016	352.0	37.5	0.306
233.0	0.3	0.000	293.0	9.3	0.019	353.0	49.4	0.530
234.0	1.3	0.000	294.0	9.8	0.021	354.0	61.0	0.807
235.0	2.7	0.002	295.0	10.2	0.023	355.0	71.9	1.121
236.0	4.1	0.004	296.0	10.5	0.024	356.0	81.4	1.438
237.0	5.2	0.006	297.0	10.7	0.025	357.0	89.4	1.733
238.0	6.2	0.008	298.0	10.6	0.024	358.0	95.3	1.970
239.0	6.9	0.010	299.0	10.4	0.023	359.0	98.9	2.121