

Technical Report WBUT(AM) New 247D

This technical report is submitted for the Auction 100 long form application for a new fill-in translator at channel 247 to serve as a fill-in facility to rebroadcast WBUT(AM) 1050 kHz at Butler, PA, FCC facility I.D. no. 71241.

New 247D Translator Analysis:

An overlap study in exhibit E-1 shows the new 247D translator is within the second adjacent WLER-FM(FM) 249A and WRRK(FM) 245B protected contours. The translator is co-located with WLER-FM; as a result, the +40 dBu F(50-10) interfering contour is zero. A tabulation of the 100.48 +40 dBu F(50-10) contour within WRRK(FM) (exhibit E-2) using the vertical elevation pattern of the PSI FML six bay, 0.9 wavelength spaced antenna (exhibit E-3) shows the interfering contour will not encompass any population, major roads or buildings beyond a distance of 110 meters from the base of the tower (exhibit E-4). Based on this showing, a waiver of Section 74.1204 is requested, in accordance with *Living Way Ministries, Inc.* (FCC 08-242). The 60 dBu F(50-50) contour is contained within the WBUT(AM) 2.0 mV/m daytime contour (exhibit E-5).

Antenna System:

The new 247D translator is to be located on the existing tower, ASR #1027197, at coordinates:

40 53 51N 79 53 22W NAD 27.

A PSI FML 6 bay, 0.9 wavelength spaced, directional antenna (exhibit E-6) will be mounted at a COR AGL of 81 meters, 482 meters AMSL and operate at 0.250 kW ERP.

RF Exposure Calculation:

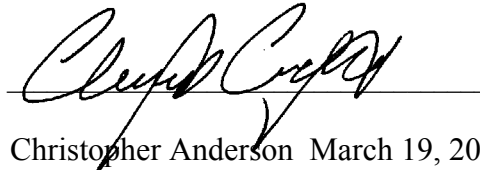
The RF contribution was calculated using the formula from the OET Bulletin 65:

$$S \text{ (RF in microwatts/cm}^2\text{)} = \frac{33.4 \times F^2 \times (H \text{ ERP} + V \text{ ERP in watts})}{R^2 \text{ (height of radiation center in meters}^2\text{)}}$$

Using a worst case vertical (F) factor of 1.0, the RF is calculated to be 2.68 $\mu\text{W/cm}^2$ to the ground, which is well below 5% of the 200 $\mu\text{W/cm}^2$ maximum permissible for general public exposure allowing exclusion from consideration.

Conclusion:

It is concluded that the application for a new 247D translator facility for WBUT(AM) complies with all Commission rules and policies.



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E-1 WBUT(AM) New 247D Overlap Study

REFERENCE 40 53 51.0 N. 79 53 22.0 W.											
CH# 247D - 97.3 MHz, Pwr= 0.25 kW DA, HAAT= 105.0 M, COR= 482 M Average Protected F(50-50)= 13.18 km Standard Directional											
DISPLAY DATES DATA 03-19-18 SEARCH 03-19-18											
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*	
247B Wheeling	WKWK-FM	LIC_CN WV	217.9 37.4	112.41 BLH19801203AF	40 05 49.0 80 42 06.0	50.000 128	135.4 456	63.4 Capstar Tx, Lic	-34.4*	0.9	
249A Butler	WLER-FM	LIC_CN PA	0.0 0.0	0.00 BMLH19920604KF	40 53 51.0 79 53 22.0	4.600 114	2.5 496	26.4 Butler County Radio Networ	-14.4*	-27.5*(1)	
245B Braddock	WRRK	LIC_CN PA	183.8 3.7	54.13 BLH19851230KA	40 24 42.0 79 55 53.0	45.000 162	6.4 479	68.0 Wpnt Media Subsidiary, Lic	35.1	-15.5*(2)	
247A Spangler	WPCL	LIC_ZEN PA	115.0 295.7	101.25 BMLED19971016KA	40 30 27.0 78 48 14.0	1.750 186	87.6 783	31.9 Central Pennsylvani a Chris	0.0	23.3	
247D Jeannette	W247CX	LIC_V_ PA	151.4 331.6	53.71 BLFT20171113ABL	40 28 22.0 79 35 09.0	0.045	17.0 406	5.3 Lhtc Media, Inc.	23.2	0.8	
248B St. Marys	WDDH	LIC_CN PA	48.2 228.9	121.01 BLH19950314KB	41 37 04.0 78 48 14.0	19.500 244	77.2 810	65.1 Laurel Media, Inc.	30.3	27.5	
244A Mercer	WLLF	LIC_CN PA	324.9 144.7	56.39 BLH19871130KD	41 18 43.0 80 16 39.0	1.400 148	2.0 523	24.4 Cumulus Li censing Lic	41.8	30.9	
247D Latrobe	W247CX	APP_DC_ PA	154.6 334.9	91.21 BPFT20171219ABK	40 09 20.0 79 25 43.0	0.090	45.8 641	13.2 Lhtc Media, Inc.	32.9	32.4	
300B Pittsburgh	WDSY-FM	LIC_CX PA	190.7 10.6	48.05 BMLH20070226AAY	40 28 20.0 79 59 41.0	17.500 252	74.8 567	25.1 Cbs Radio Stations Inc.	14.5R	33.6M	
248D Monroeville	W248AR	LIC_C_ PA	166.7 346.8	69.50 BLFT20110511AHG	40 17 20.0 79 42 04.0	0.118 148	19.7 470	13.1 Broadcast Communi cations,	36.2	36.1	
246B Ashtabula	WREO-FM	LIC_C_ OH	324.2 143.6	126.36 BMLH19980622KA	41 48 58.0 80 46 52.0	50.000 152	72.8 394	60.1 Media One Hol dings, Lic	41.0	39.6	
249D West View	W249BD	LIC_DVN PA	193.3 13.2	55.10 BLFT19930927TL	40 24 54.0 80 02 20.0	0.190 86	0.5 394	7.5 Family Stations, Inc.	42.2	44.2	

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.
 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) The New 247D is co-located with WLER-FM 249A. As a result, the +40 dBu F(50-10) contour is zero.
- (2) The +40 100.48 dBu F(50-10) contour within the second adjacent WRRK(FM) 245B protected contour (exhibit E-2) does not encompass any population, major roads or buildings beyond a distance of 110 meters from the base of the tower, as shown in exhibit E-4.

E-2 100.48 +40 F(50-10) dBu Tabulation Within WRRK(FM) 245B

New 247D Butler, PA, Showing Protection to WRRK
74.1204(d) Study - Using FCC 30 SEC Terrain Database
Translator or LPFM Maximum Licensed ERP = 0.25
Translator or LPFM Antenna Height AG = 81 Meters
New 247D Antenna Model = PSI-FML-6-90% spacing

Protected Station's Contour = 60.48193 dBu
Translator's or LPFM's full Interference contour 100.48193

Review Azimuth = 0 Degrees True
Relative Field on the horizon at Review Azimuth = 1.000
Translator/LPFM ERP on the horizon at Review Azimuth = 0.25 kW
Distance between stations = 54.1 km
Protected Station= WRRK, 45 kW, 479 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) (1)
00.00	1.0	1.0	0.2500	1049.2368	1049.2368	081.000
01.00	0.986	1.0	0.2430	1034.5475	1034.3899	062.945
02.00	0.943	1.0	0.2223	989.4303	988.8276	046.469
03.00	0.875	1.0	0.1914	918.0822	916.8240	032.951
04.00	0.785	1.0	0.1541	823.6509	821.6445	023.545
05.00	0.677	1.0	0.1146	710.3333	707.6303	019.090
06.00	0.577	1.0	0.0832	605.4096	602.0931	017.717
07.00	0.43	1.0	0.0462	451.1718	447.8089	026.016
08.00	0.302	1.0	0.0228	316.8695	313.7857	036.900
09.00	0.18	1.0	0.0081	188.8626	186.5374	051.455
10.00	0.067	1.0	0.0011	070.2989	069.2309	068.793
11.00	0.031	1.0	0.0002	032.5263	031.9287	074.794
12.00	0.111	1.0	0.0031	116.4653	113.9202	056.786
13.00	0.171	1.0	0.0073	179.4195	174.8210	040.639
14.00	0.21	1.0	0.0110	220.3397	213.7947	027.695
15.00	0.228	1.0	0.0130	239.2260	231.0746	019.084
16.00	0.228	1.0	0.0130	239.2260	229.9588	015.060
17.00	0.21	1.0	0.0110	220.3397	210.7119	016.579
18.00	0.178	1.0	0.0079	186.7641	177.6233	023.287
19.00	0.136	1.0	0.0046	142.6962	134.9219	034.543
20.00	0.088	1.0	0.0019	092.3328	086.7645	049.420
21.00	0.037	1.0	0.0003	038.8218	036.2432	067.088
22.00	0.013	1.0	0.0000	013.6401	012.6469	075.890
23.00	0.058	1.0	0.0008	060.8557	056.0180	057.222
24.00	0.097	1.0	0.0024	101.7760	092.9770	039.604
25.00	0.126	1.0	0.0040	132.2038	119.8174	025.128
26.00	0.145	1.0	0.0053	152.1393	136.7419	014.307
27.00	0.153	1.0	0.0059	160.5332	143.0361	008.119
28.00	0.151	1.0	0.0057	158.4347	139.8896	006.619
29.00	0.138	1.0	0.0048	144.7947	126.6403	010.802
30.00	0.118	1.0	0.0035	123.8099	107.2226	019.095
31.00	0.091	1.0	0.0021	095.4805	081.8428	031.824
32.00	0.059	1.0	0.0009	061.9050	052.4984	048.195
33.00	0.025	1.0	0.0002	026.2309	021.9991	066.714
34.00	0.009	1.0	0.0000	009.4431	007.8287	075.719
35.00	0.042	1.0	0.0004	044.0679	036.0983	055.724
36.00	0.071	1.0	0.0013	074.4958	060.2684	037.212
37.00	0.095	1.0	0.0023	099.6775	079.6060	021.013
38.00	0.114	1.0	0.0032	119.6130	094.2563	007.359
39.00	0.126	1.0	0.0040	132.2038	102.7417	-002.199 (1)
40.00	0.131	1.0	0.0043	137.4500	105.2928	-007.351
41.00	0.13	1.0	0.0042	136.4008	102.9430	-008.487
42.00	0.122	1.0	0.0037	128.0069	095.1277	-004.653
43.00	0.109	1.0	0.0030	114.3668	083.6426	003.002
44.00	0.091	1.0	0.0021	095.4805	068.6830	014.674
45.00	0.069	1.0	0.0012	072.3973	051.1926	029.807
46.00	0.045	1.0	0.0005	047.2157	032.7988	047.036
47.00	0.02	1.0	0.0001	020.9847	014.3116	065.653
48.00	0.006	1.0	0.0000	006.2954	004.2125	076.322
49.00	0.031	1.0	0.0002	032.5263	021.3392	056.452
50.00	0.054	1.0	0.0007	056.6588	036.4196	037.597
51.00	0.075	1.0	0.0014	078.6928	049.5230	019.844
52.00	0.094	1.0	0.0022	098.6283	060.7216	003.280
53.00	0.108	1.0	0.0029	113.3176	068.1962	-009.499
54.00	0.119	1.0	0.0035	124.8592	073.3904	-020.013
55.00	0.127	1.0	0.0040	133.2531	076.4308	-028.155
56.00	0.13	1.0	0.0042	136.4008	076.2743	-032.081
57.00	0.13	1.0	0.0042	136.4008	074.2892	-033.395
58.00	0.126	1.0	0.0040	132.2038	070.0574	-031.115
59.00	0.12	1.0	0.0036	125.9084	064.8476	-026.925
60.00	0.111	1.0	0.0031	116.4653	058.2326	-019.862
61.00	0.099	1.0	0.0025	103.8744	050.3593	-009.851
62.00	0.086	1.0	0.0018	090.2344	042.3625	001.328
63.00	0.072	1.0	0.0013	075.5450	034.2967	013.689
64.00	0.057	1.0	0.0008	059.8065	026.2174	027.246
65.00	0.041	1.0	0.0004	043.0187	018.1805	042.012
66.00	0.026	1.0	0.0002	027.2802	011.0958	056.078
67.00	0.011	1.0	0.0000	011.5416	004.5097	070.376
68.00	0.003	1.0	0.0000	003.1477	001.1792	078.081
69.00	0.017	1.0	0.0001	017.8370	006.3922	064.348
70.00	0.029	1.0	0.0002	030.4279	010.4069	052.407
71.00	0.04	1.0	0.0004	041.9695	013.6639	041.317
72.00	0.049	1.0	0.0006	051.4126	015.8874	032.104
73.00	0.057	1.0	0.0008	059.8065	017.4857	023.807

E-2 100.48 +40 F(50-10) dBu Tabulation Within WRRK(FM) 245B, cont.

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) (1)
74.00	0.064	1.0	0.0010	067.1512	018.5094	016.450
75.00	0.068	1.0	0.0012	071.3481	018.4662	012.083
76.00	0.072	1.0	0.0013	075.5450	018.2760	007.699
77.00	0.073	1.0	0.0013	076.5943	017.2300	006.369
78.00	0.074	1.0	0.0014	077.6435	016.1430	005.053
79.00	0.072	1.0	0.0013	075.5450	014.4147	006.843
80.00	0.07	1.0	0.0012	073.4466	012.7539	008.669
81.00	0.066	1.0	0.0011	069.2496	010.8330	012.603
82.00	0.062	1.0	0.0010	065.0527	009.0536	016.580
83.00	0.056	1.0	0.0008	058.7573	007.1607	022.681
84.00	0.05	1.0	0.0006	052.4618	005.4838	028.826
85.00	0.042	1.0	0.0004	044.0679	003.8408	037.100
86.00	0.035	1.0	0.0003	036.7233	002.5617	044.366
87.00	0.026	1.0	0.0002	027.2802	001.4277	053.757
88.00	0.018	1.0	0.0001	018.8863	000.6591	062.125
89.00	0.009	1.0	0.0000	009.4431	000.1648	071.558
90.00	0.001	1.0	0.0000	001.0492	000.0000	079.951

(1) The +40 100.48 F(50-10) dBu contour does not encompass any population, major roads, or buildings to a distance of 110 meters from the base of the tower, as shown in the aerial photo in exhibit E-3.

E-3 New 247D Antenna Vertical Elevation Pattern Tabulation



Propagation Systems Inc.

Elevation Pattern Tabulation

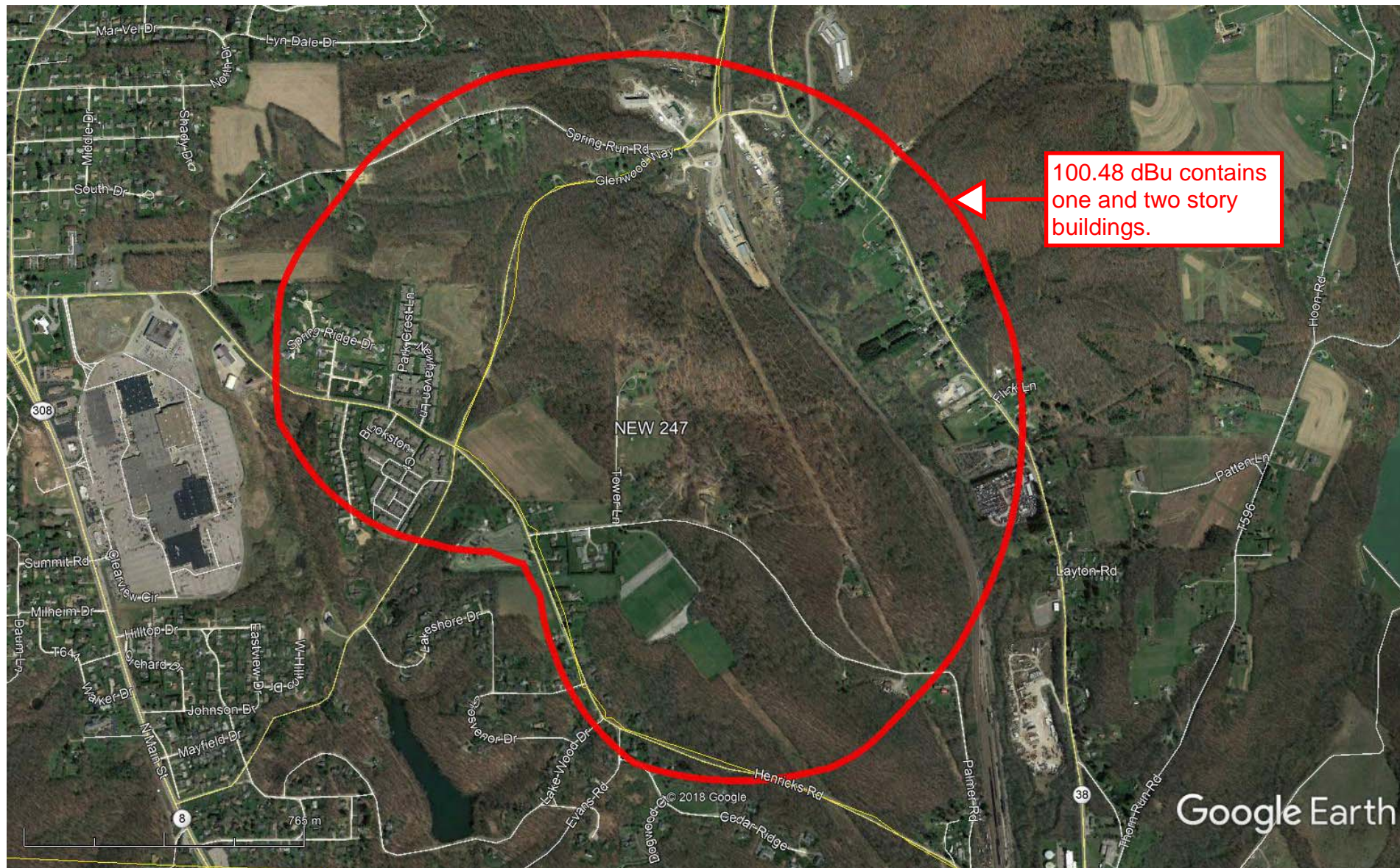
Antenna: PSIFML-6A-90WS

Bay spacing: 9/10-wave

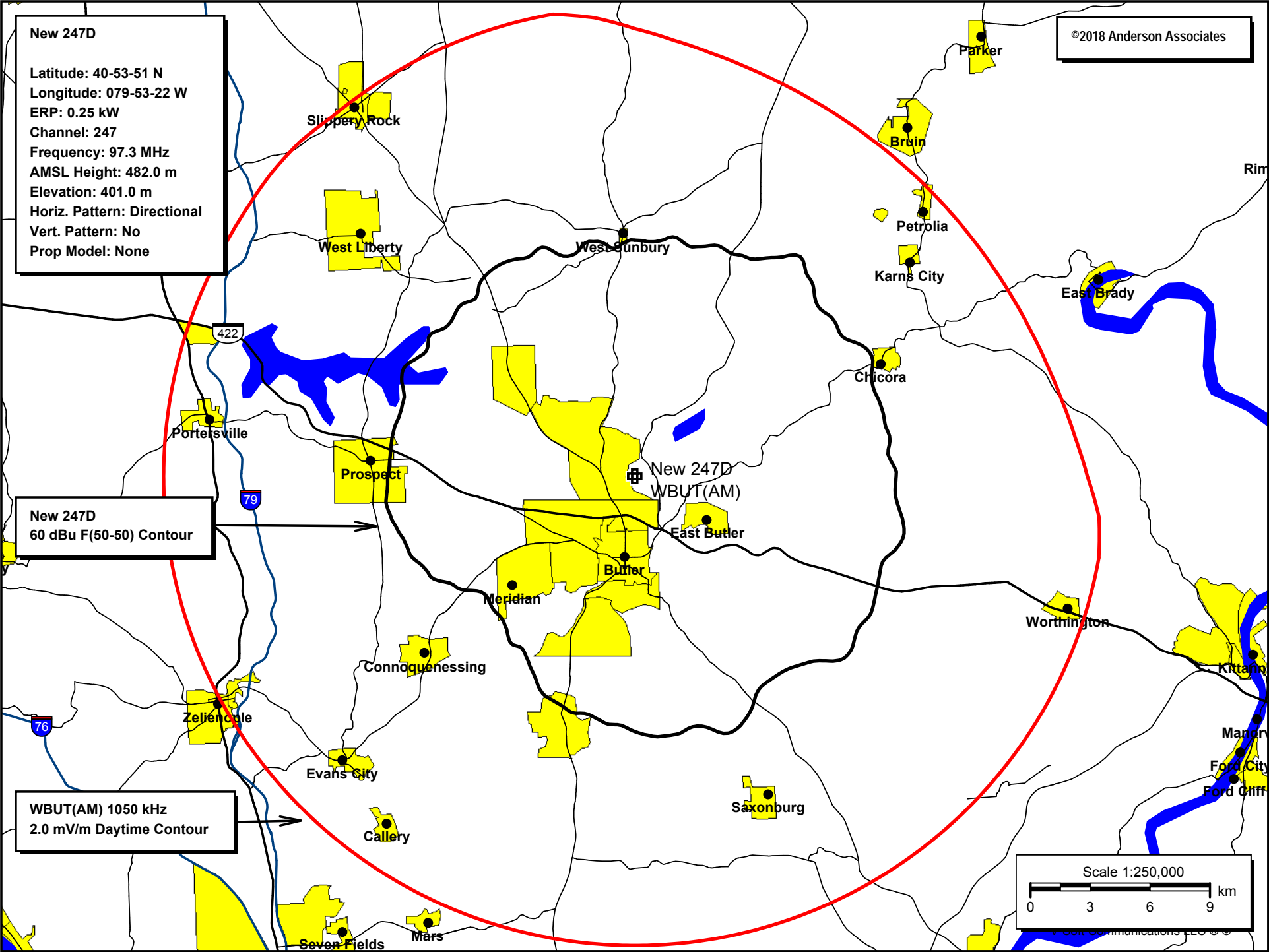
Angle	Field	dB	Angle	Field	dB	Angle	Field	dB
-90.0	0.001	-60.000	-50.0	0.054	-25.289	-10.0	0.067	-23.463
-89.0	0.009	-40.974	-49.0	0.031	-30.198	-9.0	0.180	-14.909
-88.0	0.018	-35.027	-48.0	0.006	-44.795	-8.0	0.302	-10.392
-87.0	0.026	-31.580	-47.0	0.020	-34.045	-7.0	0.430	-7.331
-86.0	0.035	-29.194	-46.0	0.045	-26.877	-6.0	0.557	-5.083
-85.0	0.042	-27.448	-45.0	0.069	-23.174	-5.0	0.677	-3.383
-84.0	0.050	-26.073	-44.0	0.091	-20.828	-4.0	0.785	-2.099
-83.0	0.056	-25.027	-43.0	0.109	-19.256	-3.0	0.875	-1.155
-82.0	0.062	-24.199	-42.0	0.122	-18.264	-2.0	0.943	-0.507
-81.0	0.066	-23.561	-41.0	0.130	-17.741	-1.0	0.986	-0.126
-80.0	0.070	-23.098	-40.0	0.131	-17.651	0.0	1.000	0.000
-79.0	0.072	-22.802	-39.0	0.126	-18.009	1.0	0.986	-0.126
-78.0	0.074	-22.658	-38.0	0.114	-18.878	2.0	0.943	-0.505
-77.0	0.073	-22.694	-37.0	0.095	-20.432	3.0	0.876	-1.154
-76.0	0.072	-22.894	-36.0	0.071	-23.005	4.0	0.785	-2.098
-75.0	0.068	-23.288	-35.0	0.042	-27.636	5.0	0.678	-3.381
-74.0	0.064	-23.926	-34.0	0.009	-40.974	6.0	0.557	-5.079
-73.0	0.057	-24.841	-33.0	0.025	-31.989	7.0	0.430	-7.325
-72.0	0.049	-26.127	-32.0	0.059	-24.570	8.0	0.303	-10.383
-71.0	0.040	-27.992	-31.0	0.091	-20.842	9.0	0.180	-14.902
-70.0	0.029	-30.770	-30.0	0.118	-18.571	10.0	0.067	-23.443
-69.0	0.017	-35.484	-29.0	0.138	-17.181	11.0	0.031	-30.284
-68.0	0.003	-49.542	-28.0	0.151	-16.443	12.0	0.111	-19.113
-67.0	0.011	-39.244	-27.0	0.153	-16.304	13.0	0.171	-15.345
-66.0	0.026	-31.731	-26.0	0.145	-16.782	14.0	0.210	-13.556
-65.0	0.041	-27.668	-25.0	0.126	-17.988	15.0	0.228	-12.823
-64.0	0.057	-24.910	-24.0	0.097	-20.281	16.0	0.228	-12.852
-63.0	0.072	-22.875	-23.0	0.058	-24.659	17.0	0.210	-13.562
-62.0	0.086	-21.289	-22.0	0.013	-37.600	18.0	0.178	-14.990
-61.0	0.099	-20.066	-21.0	0.037	-28.751	19.0	0.136	-17.325
-60.0	0.111	-19.124	-20.0	0.088	-21.152	20.0	0.088	-21.152
-59.0	0.120	-18.438	-19.0	0.136	-17.335	21.0	0.037	-28.715
-58.0	0.126	-17.978	-18.0	0.178	-14.990	22.0	0.013	-37.701
-57.0	0.130	-17.731	-17.0	0.210	-13.562	23.0	0.058	-24.659
-56.0	0.130	-17.721	-16.0	0.228	-12.852	24.0	0.097	-20.294
-55.0	0.127	-17.957	-15.0	0.228	-12.823	25.0	0.126	-17.999
-54.0	0.119	-18.471	-14.0	0.210	-13.549	26.0	0.145	-16.782
-53.0	0.108	-19.305	-13.0	0.171	-15.345	27.0	0.153	-16.304
-52.0	0.094	-20.571	-12.0	0.111	-19.101	28.0	0.151	-16.443
-51.0	0.075	-22.446	-11.0	0.031	-30.241	29.0	0.138	-17.181



E-4 100.48 dBu (50:10) Aerial View



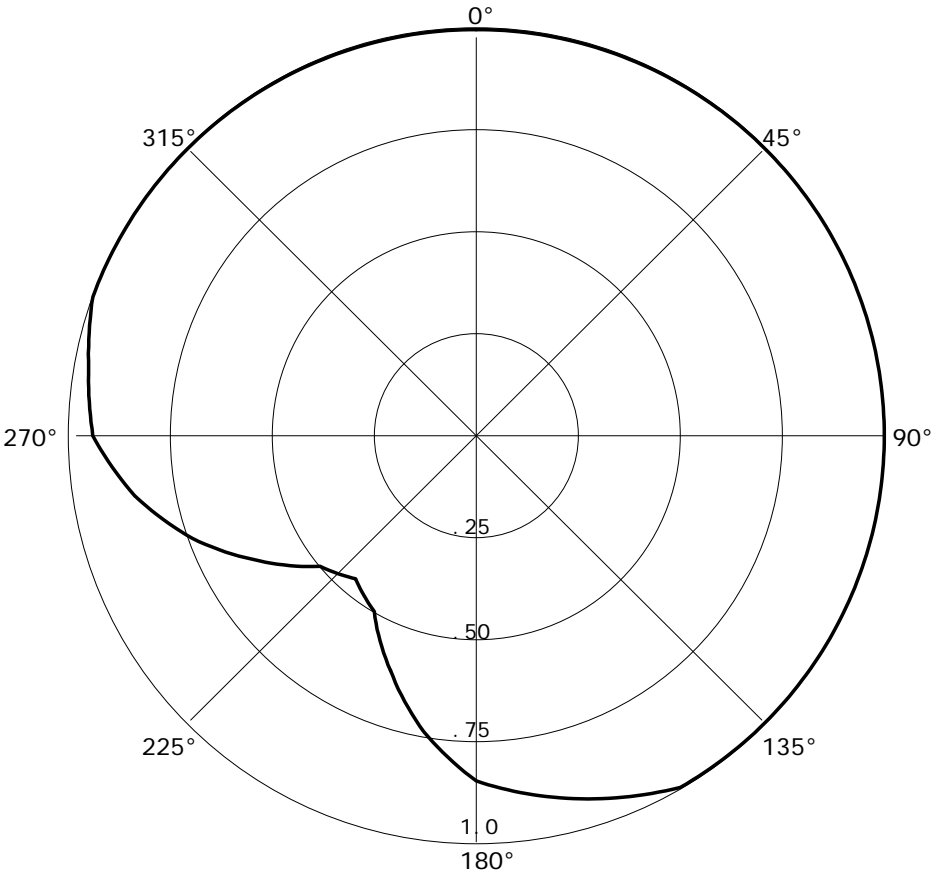
E-5 New 247D 60 dBu Contour Plot



E-6 DA

RMS(V)= .921 Graph is Relative Field

Azi	Field	dBk	kW
000	1.000	-06.021	0.250
010	1.000	-06.021	0.250
020	1.000	-06.021	0.250
030	1.000	-06.021	0.250
040	1.000	-06.021	0.250
050	1.000	-06.021	0.250
060	1.000	-06.021	0.250
070	1.000	-06.021	0.250
080	1.000	-06.021	0.250
090	1.000	-06.021	0.250
100	1.000	-06.021	0.250
110	1.000	-06.021	0.250
120	1.000	-06.021	0.250
130	1.000	-06.021	0.250
140	1.000	-06.021	0.250
150	1.000	-06.021	0.250
160	0.950	-06.466	0.226
170	0.900	-06.936	0.202
180	0.850	-07.432	0.181
190	0.740	-08.636	0.137
200	0.615	-10.243	0.095
210	0.500	-12.041	0.063
220	0.460	-12.765	0.053
230	0.500	-12.041	0.063
240	0.615	-10.243	0.095
250	0.740	-08.636	0.137
260	0.850	-07.432	0.181
270	0.940	-06.558	0.221
280	0.965	-06.330	0.233
290	1.000	-06.021	0.250
300	1.000	-06.021	0.250
310	1.000	-06.021	0.250
320	1.000	-06.021	0.250
330	1.000	-06.021	0.250
340	1.000	-06.021	0.250
350	1.000	-06.021	0.250



E-7 New Translator Tower ASR

ASR Registration 1027197

Registration Detail

Reg Number	1027197	Status	Constructed
File Number	A0983828	Constructed	11/22/2015
EMI	No	Dismantled	
NEPA	No		

Antenna Structure

Structure Type GTOWER - Guyed Structure Used for Communication Purposes

Location (in NAD83 Coordinates)

Lat/Long	40-53-51.0 N 079-53-21.0 W	Address	PALMER RD CENTER TWP 3 MI N
City, State	BUTLER , PA		
Zip	16001	County	BUTLER
Center of AM Array		Position of Tower in Array	

Heights (meters)

Elevation of Site Above Mean Sea Level	Overall Height Above Ground (AGL)
401.0	98.4
Overall Height Above Mean Sea Level	Overall Height Above Ground w/o Appurtenances
499.4	98.4

Painting and Lighting Specifications

FAA Chapters 4, 8, 12
Paint and Light in Accordance with FAA Circular Number 70/7460-1K

FAA Notification

FAA Study	2014-AEA-3588-OE	FAA Issue Date	06/26/2014
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Owner & Contact Information

FRN	0003773181	Owner Entity	Corporation
		Type	

Owner

Butler County Radio Network, Inc	P: (724)287-5778
Attention To: Scott W. Briggs	F:
252 Pillow Street	E: sbriggs@bcrnetwork.com
BUTLER , PA 16001	

Contact

Briggs , Scott W	P: (724)287-5778
Attention To: Scott Briggs	F:
252 Pillow Street	E: sbriggs@bcrnetwork.com
Butler , PA 16001	

Last Action Status

Status	Constructed	Received	11/23/2015
Purpose	Notification	Entered	11/23/2015