

Asheville, North Carolina  
Application for Minor Modification of FM Translator W300CR  
On Channel 300  
by  
Western North Carolina Public Radio, Inc.

Exhibit 13  
Interference Analysis

August 2016

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Declaration

I declare, under penalty of perjury, that I am a technical consultant to broadcasting and other communications systems, that I have over twenty-five years of experience in the engineering of broadcast and other communications systems, that I am familiar with the Federal Communications Commission's Rules found in the Code of Federal Regulations Title 47, that I am a Professional Engineer registered in North Carolina, that I have prepared or supervised the preparation of the attached Exhibit 13, Interference Analysis, for Western North Carolina Public Radio, Inc., and that all of the facts therein, except for facts of which the Federal Communications Commission may take official notice, are true to the best of my knowledge and belief.



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22 August 2016

### Narrative

This Exhibit supports an amendment to a minor modification application for FM translator W300CR, on Channel 300 in Asheville, North Carolina. Allocation details are provided in this exhibit. This proposal complies fully with the requirements of 74 C.F.R. §74.1204(a). The proposed modified facilities create no mutual exclusivities with any licensed facilities, construction permits, or applications as shown in the allocation table in this exhibit.

Figure 1 shows the authorized 60 dBu F(50,50) coverage area, and the proposed 60 dBu F(50,50) coverage area. Figure 1 shows fill-in status confirmation. As shown on Figure 1, the proposed modification is a minor modification of the authorized facilities.

The changes are limited to a change in directional antenna make, model and pattern, and increase in elevation of 2 meters, and a change in location of less than 10 meters, not changing the geographical coordinates.

### Allocations

This application proposes service to Asheville, North Carolina, on channel 300. An updated Table 1: Allocations is included in this exhibit with a list of the stations, construction permits, allocations, and applications studied. All are protected under §74.1204(a) contour protection by this application. The allocations table was prepared using the NED 03 arcsecond terrain database which is described below. Where the outgoing protection is provided by interference contours with a separation of less than 3.2 kilometers (2 miles), the lack of overlap is plotted in figures in this exhibit, and the output of the FM Over program is provided. For this application, there is one (1) facility for which additional detail is provided.

Table and Figure	Call Sign	Location	Channel, class and relationship
3	WIVK-FM	Knoxville, Tennessee	299C, first adjacent

Table 1: Allocations

Allocation Study												
Western North Carolina Public Radio, Inc.												
REFERENCE	CH# 300D - 107.9 MHz, Pwr= 0.25 kW DA, HAAT= -1.9 M, COR= 706 M										DISPLAY DATES	
35 35 49.0 N.	Average Protected F(50-50)= 7.1 km										DATA	08-22-16
82 33 18.0 W.	Standard Directional										SEARCH	08-22-16
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*	
300C Charlotte	WLNK	LIC	CX NC	101.4 282.2	126.81 BMLH20140722AEM	35 21 51.0 81 11 13.0	100.000 516	190.6 763	86.6 Greater Media	-70.9*	16.3	In
299C Knoxville	WIVK-FM	LIC	CX TN	283.7 103.0	103.62 BLH20081017ABY	35 48 41.0 83 40 10.0	91.000 633	138.3 1014	93.8 Radio License Holding	-42.0*	0.5	Cbc,
300D Asheville	W300CR!	CP	DC NC	0.0 0.0	0.00 BNPFT20130830AMF	35 35 49.0 82 33 18.0	0.250 -1	14.0 704	4.4 Western North Carolina Pub	-21.1	-28.1	
Facility being modified.												
299D Hendersonville	W299BZ	LIC	DC NC	162.3 342.3	30.22 BLFT20150717AAO	35 20 15.0 82 27 12.0	0.250	13.5 711	8.1 Radio Hendersonville, Inc.	7.1	9.7	
298D Black Mountain	W298AY	LIC	C NC	79.3 259.4	19.25 BLFT20070808ACI	35 37 44.0 82 20 46.0	0.010 77	0.2 1010	9.6 Western North Carolina Pub	11.9	7.9	
297C0 Anderson	WJMZ-FM	LIC	C SC	182.6 2.6	99.39 BMLH20010628AAA	34 42 07.0 82 36 19.0	100.000 308	9.1 544	67.8 Sm-wjnz, LLC	79.5	30.6	
Downgraded from Class C to C0 09/09/2008.												
299D Berea	W299BO	LIC	DV SC	169.4 349.5	74.73 BLFT20160509EIU	34 56 05.0 82 24 16.0	0.099	13.9 584	9.9 Fmx LLC	50.4	50.8	
300D Elizabethton	W300CC	LIC	C TN	20.3 200.5	87.43 BLFT20150203ABX	36 20 06.0 82 12 55.0	0.250 25	23.8 649	7.1 Cb Radio, Inc.	55.8	51.7	
300L1 Salem	WFBS-LP	LIC	SC	201.9 21.7	90.19 BLL20150921ADC	34 50 33.6 82 55 28.6	0.016 75	359	Salem Radio Inc	62.0	56.1	
300L1 Piedmont	WXRU-LP	LIC	SC	175.4 355.5	96.81 BMLL20141124BIS	34 43 37.3 82 28 12.8	0.100 28	292	Benjamin Banneker Lodge No	67.6	60.6	
297D Valdese	W297CX	LIC	DC NC	80.4 261.0	86.89 BLFT20130426ABN	35 43 21.6 81 36 28.2	0.250 311	0.4 691	15.2 Radio Training Network, In	79.3	70.3	
299L1 Greenville	NEW	CP	SC	165.8 345.9	90.60 BNPL20131114AHD	34 48 19.1 82 18 36.9	0.079 34	305	Monsignor Andrew K. Gwynn,	72.9	75.0	

Terrain database is NED 03 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 adj.  
 All separation margins (if shown) include rounding. Call signs with exclamation marks 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: WSKY, WISE

### Source of Data

Transmitter location, effective radiated power, directional antenna pattern, and elevation data are extracted from the Commission's CDBS. All contours for existing and proposed facilities are calculated using height above average terrain calculated at one degree horizontal increments.

The contours were evaluated using terrain extracted from the National Elevation Dataset (NED) 03 terrain database. The NED 03 database is derived from the USGS National Elevation Dataset 30 meter terrain database. The USGS National Elevation Dataset has been developed by merging the highest-resolution, best-quality elevation data available across the United States into a seamless raster format. NED is the result of the maturation of the USGS effort to provide 1:24,000-scale Digital Elevation Model (DEM) data for the conterminous US and 1:63,360-scale DEM data for Alaska. The terrain data is formatted by V-Soft Communications® for use with its FMCommander allocations and Probe™ mapping programs.

All population data is from 2010 U.S. Census PL data files. Population is counted by considering the location of the centroid of each census block. The data for each block is counted if it falls within the area being counted.

**Table 3: FM Over Output for Protection of WIVK-FM**

08-22-2016      Terrain Data: NED 03 SEC      FMOver Analysis

WIVK-FM    BLH20081017ABY

W300CR.C

Channel = 299C  
 Max ERP = 91 kw  
 RCAMSL = 1014 m  
 N. Lat. 35 48 41.0  
 W. Lng. 83 40 10.0  
 Protected  
 60 dBu

Channel = 300D  
 Max ERP = 0.25 kw  
 RCAMSL = 706 m  
 N. Lat. 35 35 49.0  
 W. Lng. 82 33 18.0  
 Interfering  
 54 dBu

Azimuth (degrees)	ERP (kw)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kw)	HAAT (m)	Dist (km)	Actual (dBu)	IX (km)
043.0	091.0000	0716.2	095.3	339.6	000.2461	0069.4	099.4	21.64	
044.0	091.0000	0716.0	095.3	340.0	000.2500	0068.9	097.9	22.01	
045.0	091.0000	0712.9	095.1	340.4	000.2500	0068.5	096.4	22.34	
046.0	091.0000	0711.1	095.1	340.7	000.2500	0067.1	094.8	22.62	
047.0	091.0000	0706.5	094.9	341.0	000.2500	0063.9	093.3	22.86	
048.0	091.0000	0704.4	094.8	341.4	000.2500	0060.7	091.7	23.08	
049.0	091.0000	0702.6	094.7	341.8	000.2500	0059.8	090.1	23.41	
050.0	091.0000	0704.5	094.8	342.2	000.2500	0055.8	088.6	23.59	
051.0	091.0000	0704.1	094.8	342.6	000.2500	0052.8	087.1	23.81	
052.0	091.0000	0705.2	094.8	343.0	000.2500	0051.6	085.6	24.12	
053.0	091.0000	0704.0	094.8	343.3	000.2500	0049.8	084.0	24.40	
054.0	091.0000	0702.7	094.7	343.7	000.2500	0047.2	082.4	24.62	
055.0	091.0000	0698.9	094.6	344.0	000.2500	0044.5	080.8	24.82	
056.0	091.0000	0700.0	094.6	344.3	000.2500	0041.6	079.2	24.99	
057.0	091.0000	0703.5	094.8	344.8	000.2500	0039.8	077.7	25.20	
058.0	091.0000	0704.1	094.8	345.2	000.2500	0038.6	076.1	25.44	
059.0	091.0000	0706.2	094.9	345.6	000.2500	0036.1	074.6	25.57	
060.0	091.0000	0707.5	094.9	346.0	000.2500	0034.3	073.0	25.73	
061.0	091.0000	0707.5	094.9	346.3	000.2500	0034.3	071.4	26.04	
062.0	091.0000	0707.1	094.9	346.6	000.2500	0033.5	069.8	26.27	
063.0	091.0000	0708.4	095.0	347.0	000.2500	0031.2	068.2	26.34	
064.0	091.0000	0709.0	095.0	347.3	000.2500	0029.6	066.6	26.51	
065.0	091.0000	0710.2	095.0	347.7	000.2500	0029.2	065.0	26.81	
066.0	091.0000	0709.9	095.0	348.0	000.2500	0028.9	063.4	27.12	
067.0	091.0000	0706.6	094.9	348.1	000.2500	0028.8	061.7	27.44	
068.0	091.0000	0705.0	094.8	348.4	000.2500	0028.8	060.1	27.77	
069.0	091.0000	0703.4	094.8	348.6	000.2500	0029.0	058.4	28.11	
070.0	091.0000	0701.2	094.7	348.7	000.2500	0029.2	056.8	28.46	
071.0	091.0000	0700.0	094.6	348.9	000.2500	0029.3	055.1	28.81	
072.0	091.0000	0701.4	094.7	349.2	000.2500	0029.0	053.5	29.16	
073.0	091.0000	0699.6	094.6	349.3	000.2500	0028.9	051.9	29.52	
074.0	091.0000	0696.5	094.5	349.3	000.2500	0028.9	050.2	29.88	
075.0	091.0000	0694.9	094.4	349.4	000.2500	0028.8	048.6	30.23	
076.0	091.0000	0694.2	094.4	349.4	000.2500	0028.7	046.9	30.60	
077.0	091.0000	0692.8	094.4	349.5	000.2500	0028.7	045.3	31.00	
078.0	091.0000	0694.1	094.4	349.6	000.2500	0028.4	043.6	31.44	
079.0	091.0000	0694.1	094.4	349.6	000.2500	0028.3	042.0	31.90	
080.0	091.0000	0691.9	094.3	349.5	000.2500	0028.7	040.3	32.40	
081.0	091.0000	0689.2	094.2	349.2	000.2500	0029.0	038.7	32.93	
082.0	091.0000	0685.2	094.1	348.9	000.2500	0029.3	037.1	33.48	
083.0	091.0000	0685.3	094.1	348.7	000.2500	0029.1	035.4	34.05	
084.0	091.0000	0686.0	094.1	348.4	000.2500	0028.9	033.8	34.65	
085.0	091.0000	0683.4	094.0	347.9	000.2500	0028.9	032.2	35.27	
086.0	091.0000	0688.0	094.2	347.8	000.2500	0029.1	030.5	35.97	
087.0	091.0000	0688.5	094.2	347.3	000.2500	0029.6	028.9	36.78	
088.0	091.0000	0684.7	094.1	346.4	000.2500	0034.2	027.3	38.65	
089.0	091.0000	0676.1	093.7	344.9	000.2500	0039.6	025.8	40.82	
090.0	091.0000	0667.1	093.4	343.1	000.2500	0051.1	024.4	44.12	
091.0	091.0000	0664.6	093.3	341.6	000.2500	0060.3	022.9	46.68	
092.0	091.0000	0662.0	093.2	339.8	000.2483	0069.2	021.4	48.91	
093.0	091.0000	0662.2	093.2	338.0	000.2308	0063.9	019.9	49.15	
094.0	091.0000	0657.7	093.0	335.3	000.2063	0073.3	018.5	50.92	
095.0	091.0000	0655.2	092.9	332.3	000.1810	0077.3	017.2	51.93	
096.0	091.0000	0649.4	092.7	328.5	000.1482	0087.6	016.0	53.17	
097.0	091.0000	0646.3	092.6	324.2	000.1130	0088.2	014.9	52.90	
098.0	091.0000	0649.5	092.7	319.9	000.0823	0086.7	013.7	52.82	
099.0	091.0000	0658.4	093.1	315.2	000.0664	0077.8	012.4	52.71	
100.0	091.0000	0668.2	093.4	309.5	000.0499	0073.8	011.2	52.87	



101.0	091.0000	0674.3	093.7	302.2	000.0398	0069.5	010.3	52.88
102.0	091.0000	0675.9	093.7	293.3	000.0534	0051.9	009.9	52.61
103.0	091.0000	0678.1	093.8	283.7	000.1122	0029.3	009.6	51.46
104.0	091.0000	0674.9	093.7	274.2	000.1863	-0043.0	009.9	53.17
105.0	091.0000	0671.3	093.5	265.5	000.2183	-0059.5	010.5	52.88
106.0	091.0000	0668.9	093.5	257.8	000.2225	0008.8	011.2	51.69
107.0	091.0000	0666.1	093.3	251.3	000.2270	0033.4	012.2	51.10
108.0	091.0000	0663.9	093.3	245.9	000.2369	0048.0	013.3	52.92
109.0	091.0000	0657.9	093.0	241.9	000.2458	0055.0	014.6	52.64
110.0	091.0000	0659.4	093.1	237.8	000.2500	0053.9	015.8	51.58
111.0	091.0000	0651.7	092.8	235.4	000.2500	0052.2	017.3	50.00
112.0	091.0000	0646.3	092.6	233.2	000.2500	0050.7	018.8	48.46
113.0	091.0000	0636.2	092.2	231.8	000.2500	0052.1	020.4	47.39
114.0	091.0000	0628.2	091.9	230.6	000.2500	0052.3	021.9	46.18
115.0	091.0000	0618.8	091.6	229.7	000.2500	0051.3	023.5	44.78
116.0	091.0000	0610.4	091.2	228.9	000.2500	0048.0	025.1	43.00
117.0	091.0000	0611.0	091.3	227.6	000.2500	0038.7	026.6	40.11
118.0	091.0000	0610.3	091.2	226.5	000.2500	0007.7	028.1	37.22
119.0	091.0000	0614.4	091.4	225.3	000.2500	0009.0	029.6	36.43
120.0	091.0000	0619.3	091.6	224.2	000.2500	0013.7	031.1	35.72
121.0	091.0000	0622.5	091.7	223.4	000.2500	0016.1	032.6	35.10
122.0	091.0000	0619.7	091.6	223.0	000.2500	0016.2	034.2	34.50
123.0	091.0000	0612.5	091.3	223.0	000.2500	0016.2	035.8	33.91
124.0	091.0000	0607.6	091.1	222.9	000.2500	0015.8	037.4	33.35
125.0	091.0000	0596.3	090.7	223.2	000.2500	0016.5	039.1	32.81
126.0	091.0000	0596.4	090.7	223.0	000.2500	0015.9	040.6	32.31
127.0	091.0000	0589.5	090.5	223.1	000.2500	0016.4	042.2	31.83
128.0	091.0000	0580.7	090.1	223.4	000.2500	0016.2	043.8	31.38
129.0	091.0000	0569.3	089.6	223.8	000.2500	0014.1	045.4	30.96
130.0	091.0000	0561.9	089.3	224.1	000.2500	0013.7	047.0	30.57
131.0	091.0000	0558.5	089.1	224.2	000.2500	0013.7	048.6	30.23
132.0	091.0000	0555.6	089.0	224.3	000.2500	0013.5	050.1	29.89
133.0	091.0000	0552.0	088.8	224.5	000.2500	0013.1	051.7	29.55
134.0	091.0000	0542.5	088.3	225.0	000.2500	0011.3	053.3	29.21
135.0	091.0000	0534.8	087.8	225.5	000.2500	0007.8	054.8	28.88
136.0	091.0000	0520.7	087.0	226.4	000.2500	0004.5	056.3	28.56
137.0	091.0000	0505.2	086.1	227.3	000.2500	0031.3	057.8	28.41
138.0	091.0000	0487.5	085.0	228.3	000.2500	0046.6	059.3	30.00
139.0	091.0000	0469.2	083.9	229.5	000.2500	0050.6	060.8	30.04
140.0	091.0000	0447.3	082.3	230.9	000.2500	0052.8	062.3	29.86
141.0	091.0000	0430.9	081.1	232.0	000.2500	0052.0	063.7	29.41
142.0	091.0000	0428.5	080.9	232.2	000.2500	0052.1	065.1	29.07
143.0	091.0000	0425.1	080.7	232.4	000.2500	0052.4	066.5	28.75
144.0	091.0000	0422.6	080.5	232.6	000.2500	0052.2	067.9	28.38
145.0	091.0000	0418.9	080.2	232.9	000.2500	0051.5	069.3	28.00
146.0	091.0000	0421.3	080.4	232.8	000.2500	0051.7	070.7	27.67
147.0	091.0000	0426.8	080.8	232.6	000.2500	0052.2	072.2	27.36
148.0	091.0000	0425.6	080.7	232.7	000.2500	0051.9	073.6	27.00
149.0	091.0000	0427.7	080.8	232.7	000.2500	0051.9	075.0	26.66
150.0	091.0000	0422.0	080.4	233.2	000.2500	0050.7	076.3	26.26
151.0	091.0000	0415.3	079.9	233.7	000.2500	0049.4	077.6	25.86
152.0	091.0000	0412.8	079.7	234.0	000.2500	0049.9	079.0	25.58
153.0	091.0000	0414.6	079.9	234.0	000.2500	0050.0	080.4	25.26
154.0	091.0000	0417.6	080.1	234.1	000.2500	0050.1	081.8	24.93
155.0	091.0000	0420.3	080.3	234.1	000.2500	0050.2	083.2	24.60
156.0	091.0000	0421.0	080.4	234.3	000.2500	0050.5	084.6	24.29
157.0	091.0000	0409.5	079.5	235.0	000.2500	0052.5	085.8	24.11
158.0	091.0000	0397.1	078.6	235.8	000.2500	0051.0	086.9	23.76
159.0	091.0000	0407.7	079.4	235.5	000.2500	0051.8	088.5	23.44
160.0	091.0000	0425.7	080.7	234.9	000.2500	0052.3	090.2	23.06
161.0	091.0000	0448.0	082.3	234.2	000.2500	0050.4	092.0	22.54
162.0	091.0000	0467.9	083.8	233.7	000.2500	0049.4	093.8	22.08

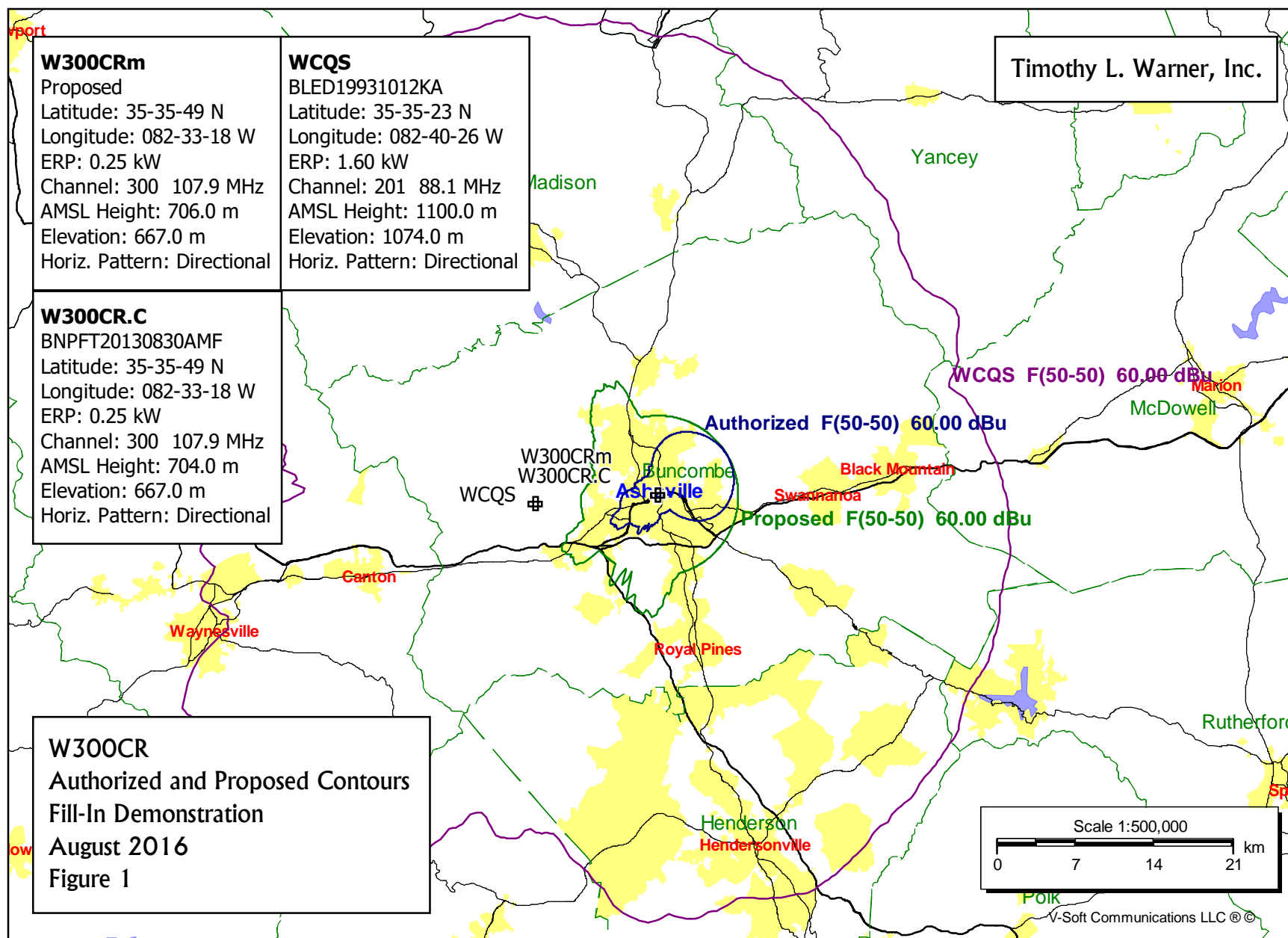


Figure 2: Proposed W300CR Antenna Pattern  
Pre-Rotation Antenna Pattern....

Azimuth (deg)	Relative Field
0.0	1.0
10.0	1.0
20.0	1.0
30.0	1.0
40.0	1.0
50.0	1.0
60.0	1.0
70.0	1.0
80.0	1.0
90.0	1.0
100.0	1.0
110.0	1.0
120.0	1.0
130.0	1.0
140.0	1.0
150.0	1.0
160.0	1.0
170.0	1.0
180.0	1.0
190.0	1.0
200.0	1.0
210.0	1.0
220.0	1.0
230.0	1.0
240.0	1.0
250.0	0.955
260.0	0.94
270.0	0.93
280.0	0.77
290.0	0.5
300.0	0.385
310.0	0.45
320.0	0.575
330.0	0.805
340.0	1.0
350.0	1.0

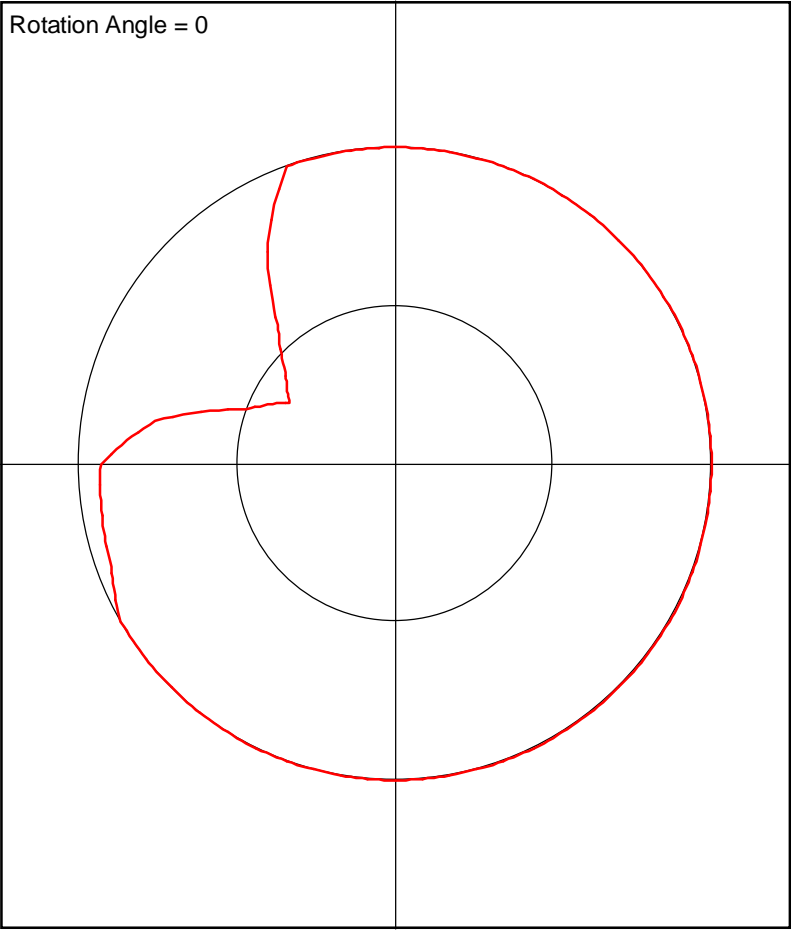


Figure 3: Allocation Study: WIVK-FM  
Western North Carolina Public Radio, Inc.

FMCommander Single Allocation Study - 08-22-2016 - NED 03 SEC  
W300CR.C's Overlaps (In= -42.01 km, Out= 0.46 km)

W300CR.C CH 300 D DA  
Lat= 35 35 49.0, Lng= 82 33 18.0  
0.25 kW -1.9 m HAAT, 706 m COR  
Prot.= 60 dBu, Intef.= 54 dBu

WIVK-FM CH 299 C BLH20081017ABY  
Lat= 35 48 41.0, Lng= 83 40 10.0  
91.0 kW 633 m HAAT, 1014 m COR  
Prot.= 60 dBu, Intef.= 54 dBu

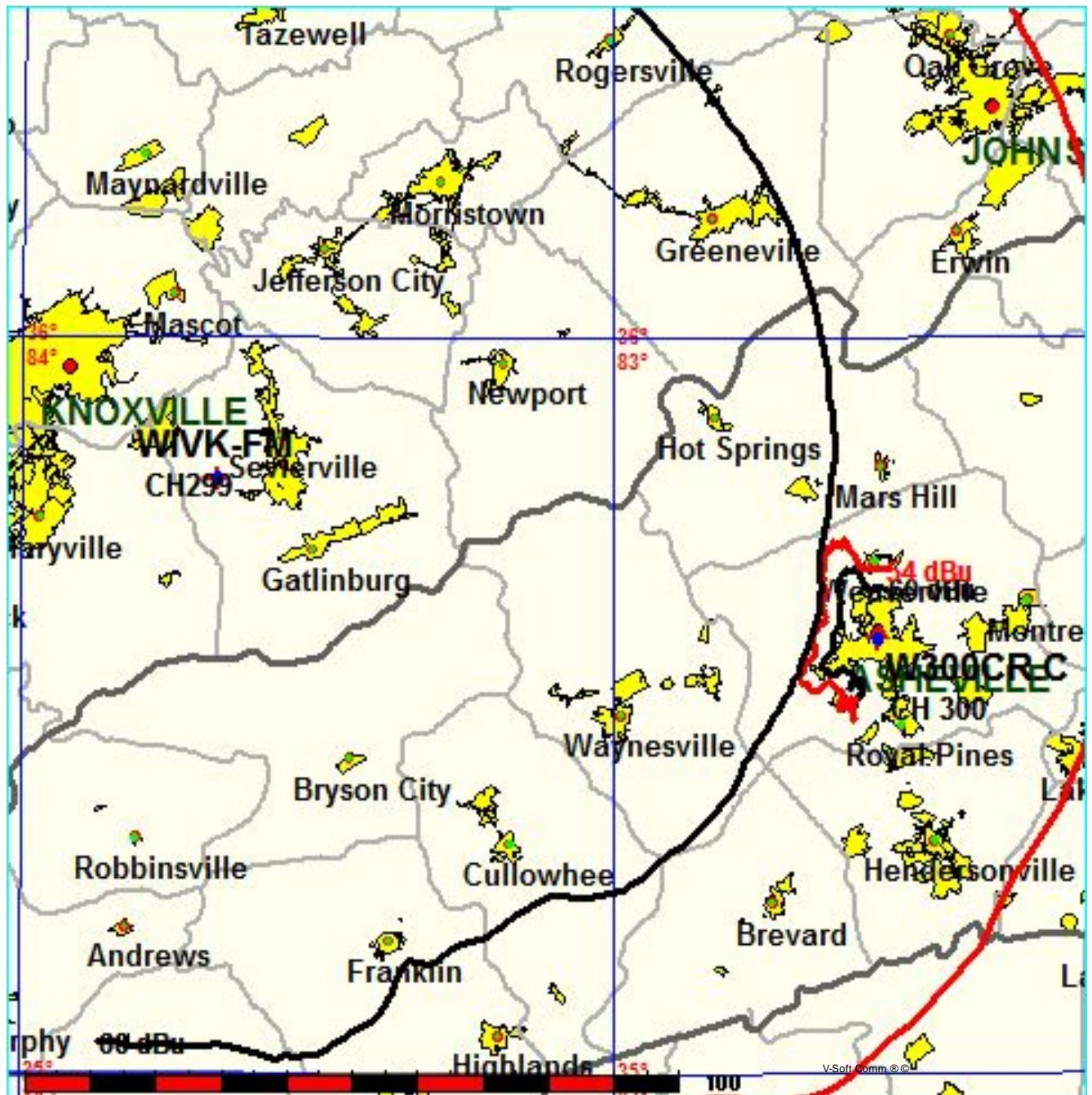


Figure 3A: Allocation Study: WIVK-FM Detail  
Western North Carolina Public Radio, Inc.

FMCommander Single Allocation Study - 08-22-2016 - NED 03 SEC  
W300CR.C's Overlaps (In= -42.01 km, Out= 0.46 km)

W300CR.C CH 300 D DA  
Lat= 35 35 49.0, Lng= 82 33 18.0  
0.25 kW -1.9 m HAAT, 706 m COR  
Prot.= 60 dBu, Intef.= 54 dBu

WIVK-FM CH 299 C BLH20081017ABY  
Lat= 35 48 41.0, Lng= 83 40 10.0  
91.0 kW 633 m HAAT, 1014 m COR  
Prot.= 60 dBu, Intef.= 54 dBu

