WICE-LP

Hendersonville, North Carolina

Application for Minor Modification

On Channel 246 Class L1

by

Ebenezer Pentecostal Radio Service

Engineering Exhibit

Height Above Average Terrain

July 2009

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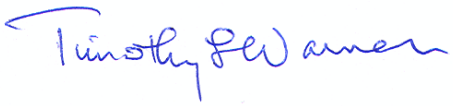
Table of Contents

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 Engineering Exhibit for the Ebenezer Pentecostal Radio Service, 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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Narrative

This Exhibit provides details of Protection under §73.807 for the proposed change of Height Above Average Terrain ("HAAT") and a change in effective radiated power ("ERP").

The construction permit issued in response to application file number BMPL-20090626AAX lists a HAAT of 105.3 meters. This exhibit provides documentation of a HAAT of 30 meters, using the standard methodology of 47 C.F.R. §73.313.

Table 4 provides all channel adjacencies where the margin compared to the spacings in §73.807 are no more than 75 kilometers. Rounding of 0.5 kilometers is shown.

There is a short spaced FM translator application, BNPFT-20030312ARH, Balfour, North Carolina, proposing operation on channel 247D first adjacent. Because no change in site is proposed, this application does not affect the short spaced relationship.

This facility is also short spaced to WFHC-LP, Hendersonville, North Carolina, channel 247L1 first adjacent. This facility has an existing time share agreement with WFHC-LP. Because no change in site is proposed, this application does not affect the short spaced relationship.

Figure 1 shows the authorized and proposed facilities. For the proposed facilities, the 60 dBu F(50,50) contour is calculated and plotted with three different terrain databases: dark blue representing the NED03 database, bright green representing the USGS 3 arcsecond database, and red representing the NGDC 30 arcsecond terrain database. All contours are based on the identical radiating center height above mean sea level and the identical ERP. The terrain databases are described below. Note that the contours do not have significant variance.

Height Above Average Terrain and Effective Radiated Power

Table 1 lists the HAAT for the eight cardinal radials specified in §73.313 using the latest NED 03 second terrain data. The computer program extracting the terrain data uses procedures of §73.313, referenced in §73.813. As Figure 1 shows, there are significant arcs where the distance to the 60 dBu contour is fixed by the minimum distance predicted for 30 meters or lower HAAT. The ERP should therefore be 100 Watts. All allocation and coverage studies in this Exhibit were prepared using the NED 03 terrain database as described below.

Section 73.313(d)(1) is specific in requiring the use of 8 (eight) cardinal radials. The distance of 3 to 16 kilometers for the averaging of terrain is specified in §73.313(d). There are methods of adjusting the averaging in cases where the 3 to 16 kilometer distance extends over water and/or over foreign territory (§73.313(d)(2)) or where terrain anomalies may require supplemental calculations (§73.313(e)) in addition to the standard method. While Table 1 shows a range of heights above average terrain, it is well within the usual range. There are no terrain obstructions between the site and the community of license. None of the radials extends outside the land area of the United States.

Table 1: Height Above Average Terrain per Section 73.313

Bearing (degrees)	HAAT (meters)
0	5.1
45	-12.1
90	136.2
135	47.2
180	101.8
225	-42.0
270	-22.6
315	24.5
Average	29.76
Minimum	-42.0
Maximum	136.2

The NED03 terrain data used in this exhibit is the most recent 3 arcsecond terrain database available from the USGS. As a cross check, the HAAT was computed using an earlier USGS 3 arcsecond terrain database and the 30 arcsecond terrain database from NGDC. Averages were prepared for 8 cardinal radials, 36 radials, and 360 radials. Those averages are presented in Table 2, along with a summary of the maximum value obtained (37.61 meters), the minimum (29.76 meters), an average of the averages, and the standard deviation. Note that none of the averages approach 105.3 meters.

Table 2: Height Above Average Terrain In Different Databases With Different Numbers of Radials

Terrain Source	30 arcsecond NGDC	3 arcsecond USGS	3 arcsecond NED03
8 cardinal radial average	32.11	30.48	29.76
36 radial average	37.61	35.39	34.91
360 radial average	37.26	35.34	34.31
Max	37.61		
Median	34.91		
Mean	34.13		
Min	29.76		
Standard Deviation	2.79		

As a further cross check, the HAAT for each of the 360 radials for each database was compared. Specifically, for three comparisons, the HAAT on each radial determined from the NED03 terrain database was subtracted from the corresponding average determined using the 30 arcsecond terrain database for the first column, the USGS 3 second average was subtracted from the NED03 average for the second column, and the 30 second NGDC average was subtracted from the USGS 3 second average for the third column. The top line average is the average of 360 differences. Note that the largest difference is less than 3 meters, with a

standard deviation no more than 6.66 meters. It is to be expected that the 3 second terrain databases have significantly more terrain information than the 30 second database, and that the two different 3 second terrain databases are closer to each other.

Table 3: Comparison of 360 Radial Height Above Average Terrain

Comparison	30 sec - NED03	NED03 – 3 sec	3 sec – 30 sec
Average	-2.95	-1.03	-1.93
Standard Deviation	6.66	4.71	5.10
Median	-2.75	-0.50	-2.30
Min	-32.50	-17.40	-21.50
Max	22.70	21.00	20.70

Comparison of Terrain Data

To demonstrate the data underlying the different averages, terrain profiles were prepared using each of the three terrain databases used for the HAAT studies. Figure 2 shows the True North (0°) radial for each database, from the transmit antenna to a hypothetical receive antenna 9.1 meters above a receive point at 16.0 kilometers which is set at a presumed elevation of 850 meters above mean sea level. The artificial receive elevation is used to increase the comparability of the vertical scale and the Fresnel Zone plot.

The NED03 profile at the top of the page shows significantly more terrain detail than the USGS 3 arcsecond profile in the middle of the page. As expected, the profile based on 30 arcsecond data exhibits significant smoothing. Along the profile, terrain elevation points were extracted at 0.1 kilometer intervals. At the WICE-LP site, the 3 arcsecond terrain data points are spaced approximately 92 meters of latitude and 76 meters of longitude from each other. Terrain data points are therefore more frequent than sample points, but not significantly so. For the 30 arcsecond terrain data, the points are spaced approximately 920 meters of latitude and 760 meters of longitude. Extracting data at 100 meter intervals means that more than 7

data points on each radial will represent a linear interpolation between the same 2 terrain elevation points. The 30 arcsecond profile shows the result as a series of line segments.

Four points are highlighted on the profiles, showing how the NED03 profile has a lower elevation at points A and C and higher elevations at points B and D. While 30 arcsecond terrain data provides useful averages, particularly in moderate terrain, the greater detail in the 3 arcsecond terrain databases increases the accuracy. In this particular terrain, the averages obtained with the most accurate data show that the 30 second terrain data underestimates the height of the terrain (overestimates the HAAT) by something less than 3 meters regardless of the number of radials used.

Figure 1 provides additional validation that the variance in coverage prediction based on the differing terrain databases is minor, particularly when compared to the difference in coverage between each of the databases at the proposed ERP and that computed when the HAAT is shown as 105.3 meters with the corresponding reduction in ERP.

Source of Data

Transmitter location, ERP, directional antenna pattern, and elevation data are extracted from the Commission's CDBS. All contours for existing and proposed facilities are calculated using HAAT calculated at one-degree horizontal increments. Terrain data for the comparative contours is extracted from the V-Soft Communications NED 03 terrain database. The NED 03 database is derived from the USGS National Elevation Data 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.

For comparative purposes, data is also extracted from the NGDC 30 arcsecond terrain database and the USGS 3 arcsecond terrain database.

Table 4: Proposed Allocation

Timothy L. Warner, Inc.
Asheville, North Carolina

Ebenezer Pentecostal Radio Service
Allocation Study

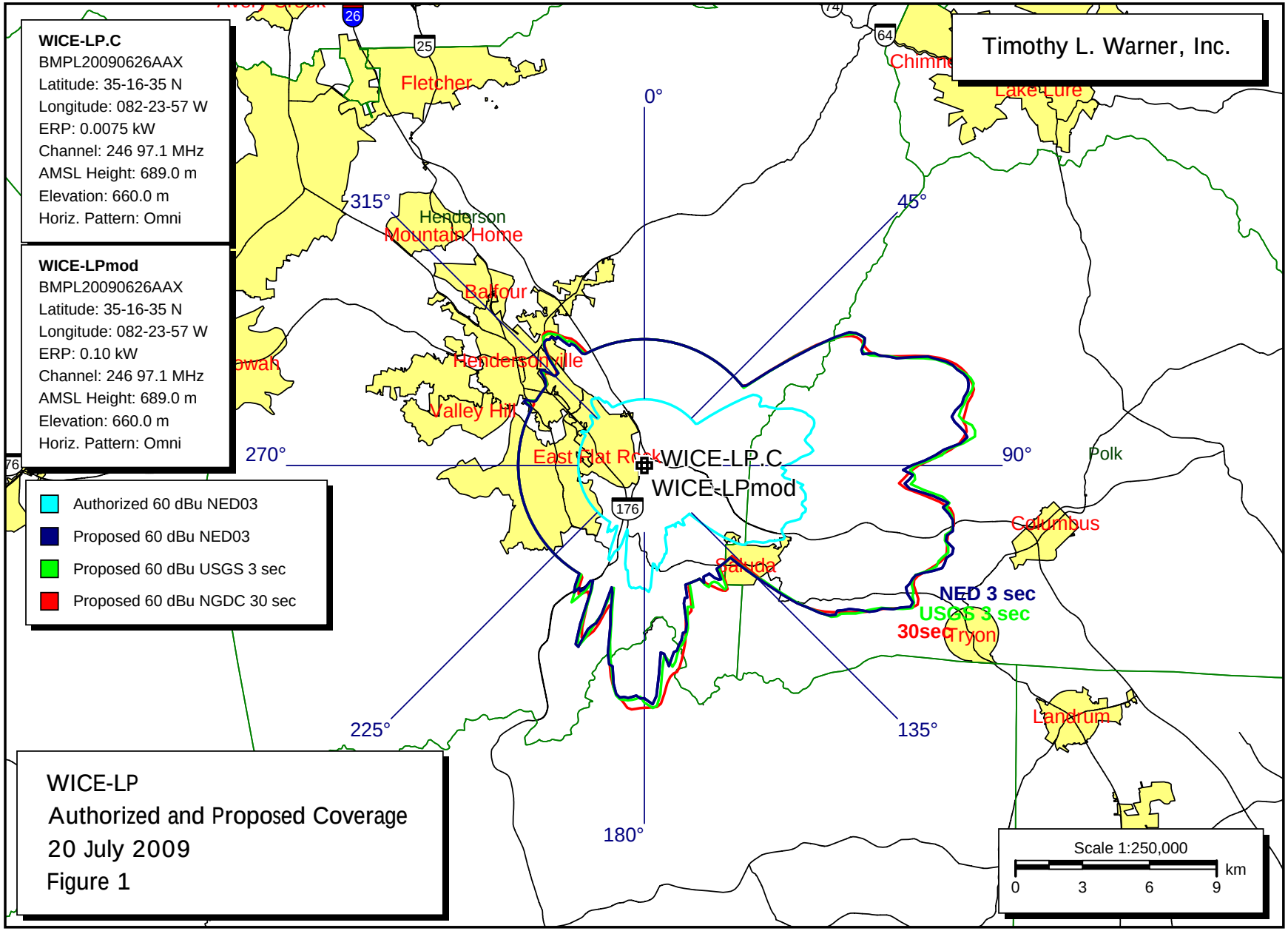
REFERENCE
35 16 35.0 N.
82 23 57.0 W.

CLASS = L1
Current Spacings to 3rd Adj.

DISPLAY DATES
DATA 07-18-09
SEARCH 07-20-09

Channel 246 - 97.1 MHz

Call		Channel	Location		Azi	Dist	FCC	Margin
WICE-LP	CP	246L1	Hendersonville	NC	0.0	0.0	23.5	-23.5
626602	APP-D	247D	Balfour	NC	317.3	11.7	27.5	-15.8
WFHC-LP	CP	247L1	Hendersonville	NC	323.7	8.6	13.5	-4.9
DWZRQ.	CP	243A	Biltmore Forest	NC	343.0	29.4	28.5	1.0
Application for Interim Authorization Authority terminated 980116								
870831MK	APP	243A	Biltmore Forest	NC	342.9	29.5	28.5	1.0
AMENDED 871116-Initial Decision affirmed by review board 910408-COA# 92-1645								
WOXL-FM	LIC-Z	243C3	Biltmore Forest	NC	324.5	42.8	39.5	3.3
643543	APP-D	249D	Chimney Rock	NC	33.7	26.3	20.5	5.8
649550	APP	300D	Hendersonville	NC	288.6	11.6	4.5	7.1
970915TG	APP	248D	Brevard	NC	247.2	27.7	20.5	7.2
Translator for WLFJ, Greenville, SC								
WBZT-FM	LIC-Z	244A	Mauldin	SC	180.3	39.4	28.5	10.9
WXBQ-FM	LIC-D	245C	Bristol	VA	10.4	130.5	119.5	11.0
634608	APP-D	246D	Lake Toxaway	NC	253.3	55.6	38.5	17.1
649301	APP	247D	Black Mountain	NC	7.0	39.4	20.5	18.9
W249AR	LIC	249D	Asheville	NC	324.5	42.8	20.5	22.3
632628	APP	247D	Canton	NC	304.1	51.1	27.5	23.6
WKBC-FM	LIC-D	247C	North Wilkesboro	NC	51.9	145.3	119.5	25.8
W247AB	LIC	247D	Greenville	SC	180.1	47.1	20.5	26.6
Translator For WNCW, Spindale, NC								
649562	APP	247D	Asheville	NC	337.7	41.1	14.5	26.6
WKKT	LIC-D	245C	Statesville	NC	78.4	148.3	119.5	28.8
W237AR	APP-D	246D	Hazelwood, Etc.	NC	288.0	67.6	38.5	29.1
649553	APP	300D	Asheville	NC	338.4	38.2	4.5	33.8
W246BU	LIC	246D	Spartanburg	SC	117.4	60.2	25.5	34.7
649213	APP-D	299D	Weaverville	NC	337.7	41.2	4.5	36.7
649571	APP	299D	Pickens	SC	209.5	48.1	4.5	43.6
626601	APP-D	300D	Weaverville	NC	344.2	49.4	4.5	44.9
W249CB	LIC	249D	Six Mile	SC	213.3	58.1	7.5	50.6
629805	APP	299D	Liberty	SC	206.3	58.3	4.5	53.8
WSRV	LIC	246C	Gainesville	GA	226.6	184.9	129.5	55.4
640955	APP	243D	Shelby	NC	87.8	73.1	13.5	59.6
WNCC-FM	LIC-N	244A	Franklin	NC	265.6	88.5	28.5	60.0
WJXB-FM	LIC	248C	Knoxville	TN	300.9	161.0	92.5	68.5
W243BX	LIC	243D	Valdese	NC	55.1	87.2	13.5	73.7
WSRV	APP	246C0	Gainesville	GA	229.4	196.6	121.5	75.1
WPCX-LP	LIC	246L1	Clinton	SC	151.9	102.0	23.5	78.5
W249CC	CP -D	249D	Dillard	GA	246.3	101.4	20.5	80.9
WLNK	LIC	300C	Charlotte	NC	84.6	110.7	27.5	83.2
W249AH	LIC-D	249D	Johnson City	TN	2.8	110.2	20.5	89.7


WICE-LP.C
BMPL20090626AAX
Latitude: 35-16-35 N
Longitude: 082-23-57 W
ERP: 0.0075 kW
Channel: 246 97.1 MHz
AMSL Height: 689.0 m
Elevation: 660.0 m
Horiz. Pattern: Omni
WICE-LPmod
BMPL20090626AAX
Latitude: 35-16-35 N
Longitude: 082-23-57 W
ERP: 0.10 kW
Channel: 246 97.1 MHz
AMSL Height: 689.0 m
Elevation: 660.0 m
Horiz. Pattern: Omni
Authorized 60 dBu NED03
Proposed 60 dBu NED03
Proposed 60 dBu USGS 3 sec
Proposed 60 dBu NGDC 30 sec
Timothy L. Warner, Inc.
WICE-LP.C
WICE-LPmod
0°
45°
90°
135°
180°
225°
270°
315°
Fletcher
Henderson
Mountain Home
Balfour
Hendersonville
Valley Hill
East Flat Rock
Columbus
Saluda
Tryon
Landrum
Polk
NED 3 sec
USGS 3 sec
30sec
Scale 1:250,000
km
0
3
6
9
WICE-LP
Authorized and Proposed Coverage
20 July 2009
Figure 1

Timothy L. Warner, Inc.		
WICE-LP	7/20/2009	Figure 2: 0º Radial