

**Boone, North Carolina**  
**Application for Minor Modification of FM Translator W243DH**  
**On Channel 243**  
**by**  
**Eastern Airwaves, LLC**

**Exhibit 13**  
**Interference Analysis**

**April 2015**

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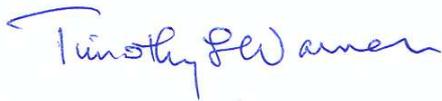
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Declaration

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 Eastern Airwaves, LLC, 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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9 April 2015

### Narrative

This Exhibit supports a minor modification application for FM translator W243DH, on Channel 243 in Boone, North Carolina. Allocation details are provided in this exhibit. This proposal complies fully with the requirements of 74 C.F.R. §74.1204(a), with the exception of facilities protected under 47 C.F.R. §74.1204(d) by the Undesired to Desired (U/D) method described below. 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 licensed facilities.

The modifications consist of a new site, increase in elevation, increase in power, and a new omnidirectional antenna.

### Allocations

This application proposes service to Boone, North Carolina, on channel 243. 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, with the exception of facilities protected by the Undesired to Desired (U/D) method. Facilities protected by the U/D method are listed in Table 2. The allocations table was prepared using the NGDC 30 arcsecond terrain database which is described below.

Table 1: Allocations

Allocation Study											
Eastern Airwaves, LLC											
CH# 243D - 96.5 MHz, Pwr= 0.014 kW, HAAT= 415.0 M, COR= 1444 M											
Average Protected F(50-50)= 12.8 km											
Standard Directional											
DISPLAY DATES											
DATA 04-09-15											
SEARCH 04-09-15											
CH	CALL	TYPE	ANT	AZI.	DIST	LAT.	Pwr(kw)	INT(km)	PRO(km)	*IN*	*OUT*
CITY		STATE		<--	FILE #	LNG.	HAAT(M)	COR(M)	LICENSEE	(Overlap in km)	
243D	W243DH!	CP	C	294.6	0.52	36 14 05.0	0.002	30.3	7.6	-43.7	-57.0
Boone		NC		114.6	BNPFT20130827ADS	81 42 13.0	408	1442	Eastern Airwaves, LLC		
Facility being modified.											
243C2	WOXL-FM	CP	ZCX	231.0	110.99	35 36 04.0	9.500	132.9	55.3	-34.3*	11.8
Biltmore Forest		NC		50.4	BPH20131220HHF	82 39 07.0	339	1064	Saga Communications Of Nor		
One Step Application											
240D	W240CV	CP	C	294.6	0.52	36 14 05.0	0.003	0.1	8.8	-13.5*	-8.5*
Boone		NC		114.6	BNPFT20130827ABR	81 42 13.0	405	1439	Positive Alternative Radio		
Protected by U/D study, see text and figures.											
243C1	WXCC	LIC	ZCX	341.0	150.54	37 30 48.0	75.000	150.4	62.6	-11.9	45.7
Williamson		WV		160.6	BLH20071205ABF	82 15 20.0	339	759	East Kentucky Radio Networ		
Transmitter site is in Zone II											
245C	WXBQ-FM	LIC	DCN	299.7	45.17	36 25 59.0	75.000	3.8	55.4	27.4	-10.5*
Bristol		VA		119.4	BLH19950914KB	82 08 11.0	683	1308	Bristol Broadcasting Company		
Protected by U/D study, see text and figures.											
243C3	WOXL-FM	LIC	ZCX	231.0	110.99	35 36 04.0	2.100	107.3	41.6	-8.7	25.7
Biltmore Forest		NC		50.4	BLH20101130AJQ	82 39 07.0	339	1064	Saga Communications Of Nor		
241C	WHQC	LIC	DC	153.0	108.34	35 21 44.0	100.000	11.5	83.9	83.6	23.3
Shelby		NC		333.3	BLH20111221ADF	81 09 19.0	533	768	Clear Channel Broadcasting		
243A	870831MK	APP	CN	222.8	106.04	35 31 50.0	0.265	67.3	21.2	27.3	37.9
Biltmore Forest		NC		42.4	BPH19870831MK	82 29 42.0	339	1067	Biltmore Forest Broadcasti		
AMENDED 871116-Initial Decision affirmed by review board 910408-COA# 92-1645											
240C2	WRZK	LIC	ZCX	292.6	86.14	36 31 36.0	7.400	3.7	48.1	68.2	36.2
Colonial Heights		TN		112.1	BLH20031125ALT	82 35 13.0	382	841	Holston Valley Broadcastin		
245C	WKKT	LIC	DCN	133.5	112.56	35 31 57.0	100.000	5.2	56.5	93.8	54.2
Statesville		NC		314.0	BLH19860402KB	80 47 47.0	472	710	Capstar Tx Llc		
241D	W241AL	LIC	C	10.6	75.56	36 54 07.0	0.010	0.2	11.8	64.5	63.5
Marion		VA		190.7	BLFT20070613AAZ	81 32 30.0	384	1140	Positive Alternative Radio		
245C1	WKKT	APP	DCX	139.0	138.65	35 17 14.5	52.000	8.7	68.8	116.5	69.1
Statesville		NC		319.6	BPH20150121ABH	80 41 44.8	391	591	Capstar Tx Llc		

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 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.

**Table 2: Facilities Protected by U/D Method**

Facility	W240CV Boone, North Carolina	WXBQ-FM Bristol, Virginia
Relationship	240D, third adjacent	245C, second adjacent
Distance (km)	0.42	45.18
Bearing (degrees)	294.6	299.7
ERP (kW, on azimuth)	.003	3.53
HAAT (m, on azimuth)	523.0	563.2
Ratio	40	40
Signal Strength (dBu)	87.3	64.5
Translator Signal Strength	127.3	104.5
Translator distance (km)	.011	.156

**Undesired to Desired Method under §74.1204(d)**

Protection to some facilities is provided through the use of Undesired to Desired Signal Strength Ratio (U/D) calculations. Table 2 lists the parameters studied. The proposed antenna is a Shively 6832-3 three level antenna, with specified reduced bay to bay spacing. The elevation pattern is shown in Figure 2. The elevation of the 127.3 dBu and 104.5 dBu contours are shown in Figure 3.

The W240CV field strength calculated at ground level at the proposed W243DH site is 87.3 dBu, using the FM Curves calculator on the FCC web site. For the translator interference contour, free space calculations are used. The corresponding 127.3 dBu field strength distance is .011 kilometers in the horizontal plane. The proposed antenna location is 24 meters above ground. As Figure 3 shows, the 127.3 dBu signal level does not reach ground level. The minimum elevation of the 127.3 dBu signal is more than 20 meters above ground.

The WXBQ-FM field strength calculated at ground level at the proposed W243DH site is 64.5 dBu, using the FM Curves calculator on the FCC web site. For the translator interference contour, free space calculations are used. The corresponding 104.5 dBu field strength distance is .156 kilometers in the horizontal plane. The proposed antenna location is

24 meters above ground. As Figure 3 shows, the 104.5 dBu signal level does not reach ground level beyond 125 meters from the tower site.

Figure 4 is a topographic map of the transmitter site, showing that the site is on a mountain ridge. Figure 5 is an aerial photograph of the site, showing the low numbers of structures in the area of interest. Figure 6 is a Google Earth map with 105 meter radius and 156 meter radius lines plotted. As shown, there is only one structure within the 105 meter radius, a transmitter building for two way radio services within a fenced enclosure. There is a house North of the tower, on land 10 meters lower than the tower base. The clearance is more than 7 meters (23 feet ) at the house site. The next closest site is beyond the 104.5 dBu signal. There is no population within the predicted interference area and therefore this facility is permitted under §74.1204(d).

The applicant recognizes that the U/D method is only a tool for predicting likely interference. Should any actual interference be experienced, the applicant will cooperate fully in correcting the interference. Corrective steps may require changes in the transmitting antenna or other steps which would require Commission authorization, may require that the translator cease operation except for brief equipment tests, or may require filtering at the receivers which report interference.

#### 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 NGDC 30 arcsecond terrain database, formatted by V-Soft Communications to match the database in use at the Commission..

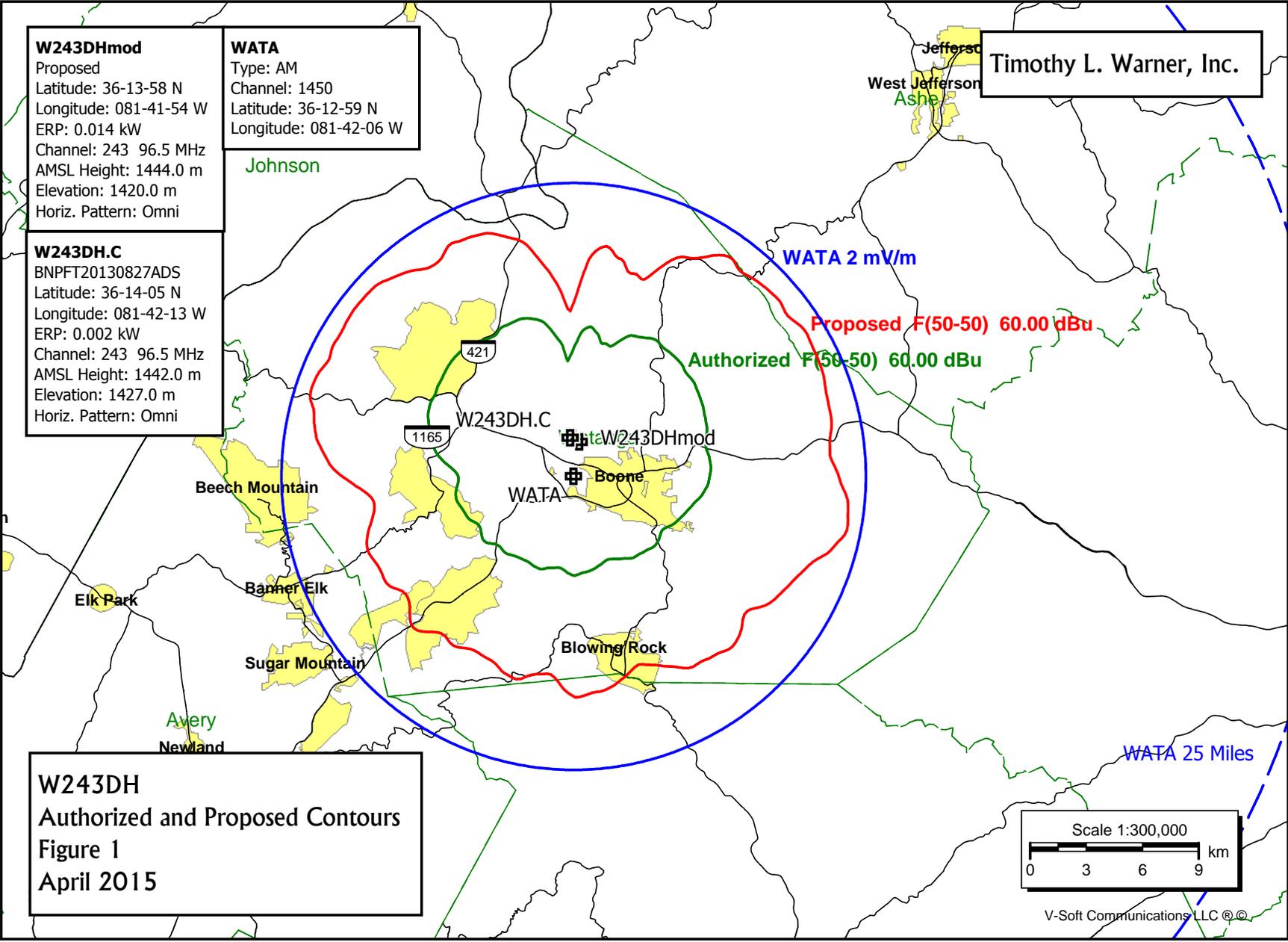
All population data is from 2010 U.S. Census PL data files. Population is counted by considering the location of the centroid of each census block. The data for each block is counted if it falls within the area being counted.

**W243DHmod**  
 Proposed  
 Latitude: 36-13-58 N  
 Longitude: 081-41-54 W  
 ERP: 0.014 kW  
 Channel: 243 96.5 MHz  
 AMSL Height: 1444.0 m  
 Elevation: 1420.0 m  
 Horiz. Pattern: Omni

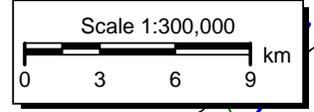
**WATA**  
 Type: AM  
 Channel: 1450  
 Latitude: 36-12-59 N  
 Longitude: 081-42-06 W

**W243DH.C**  
 BNPFT20130827ADS  
 Latitude: 36-14-05 N  
 Longitude: 081-42-13 W  
 ERP: 0.002 kW  
 Channel: 243 96.5 MHz  
 AMSL Height: 1442.0 m  
 Elevation: 1427.0 m  
 Horiz. Pattern: Omni

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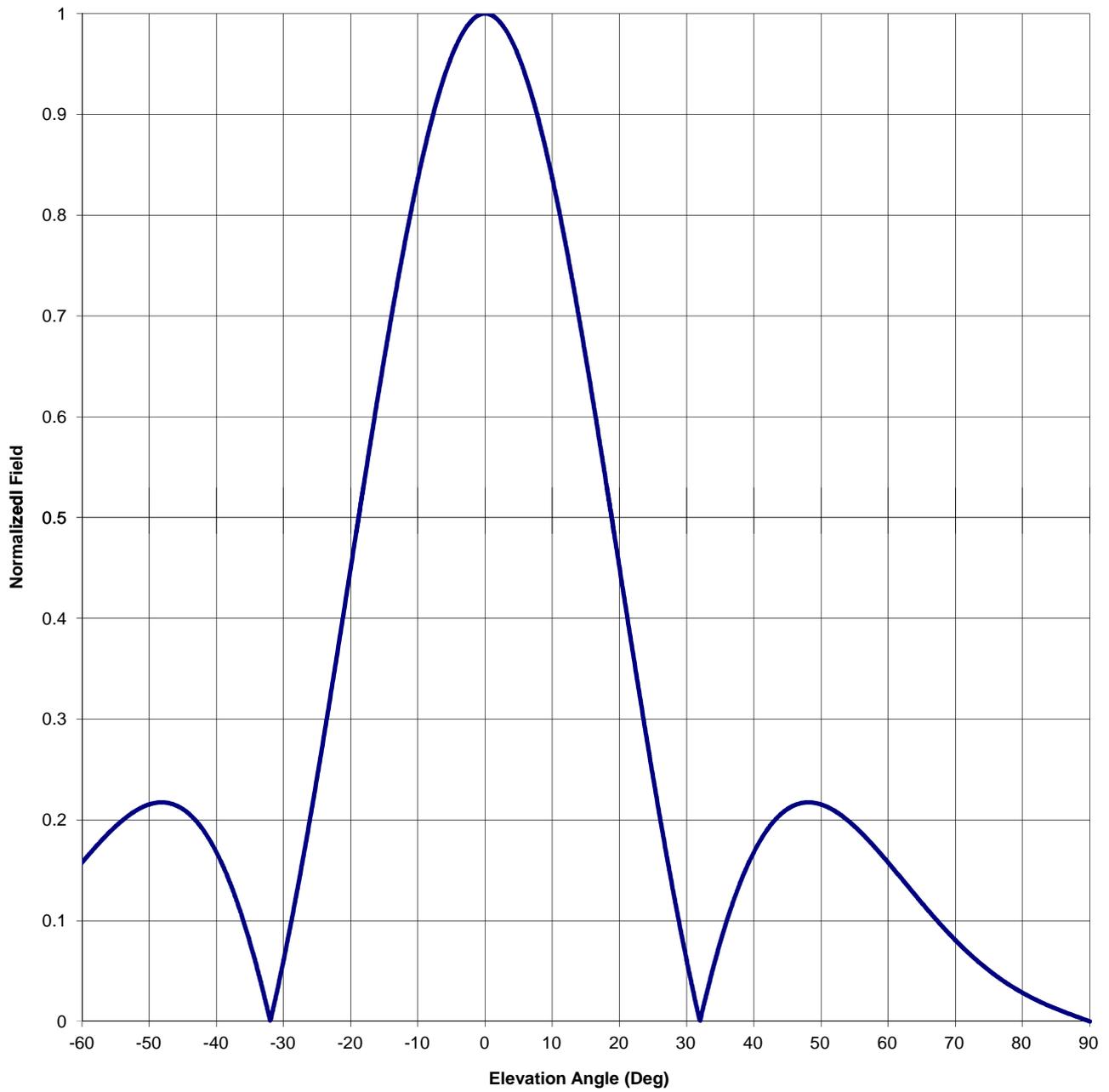
**W243DH**  
 Authorized and Proposed Contours  
 Figure 1  
 April 2015

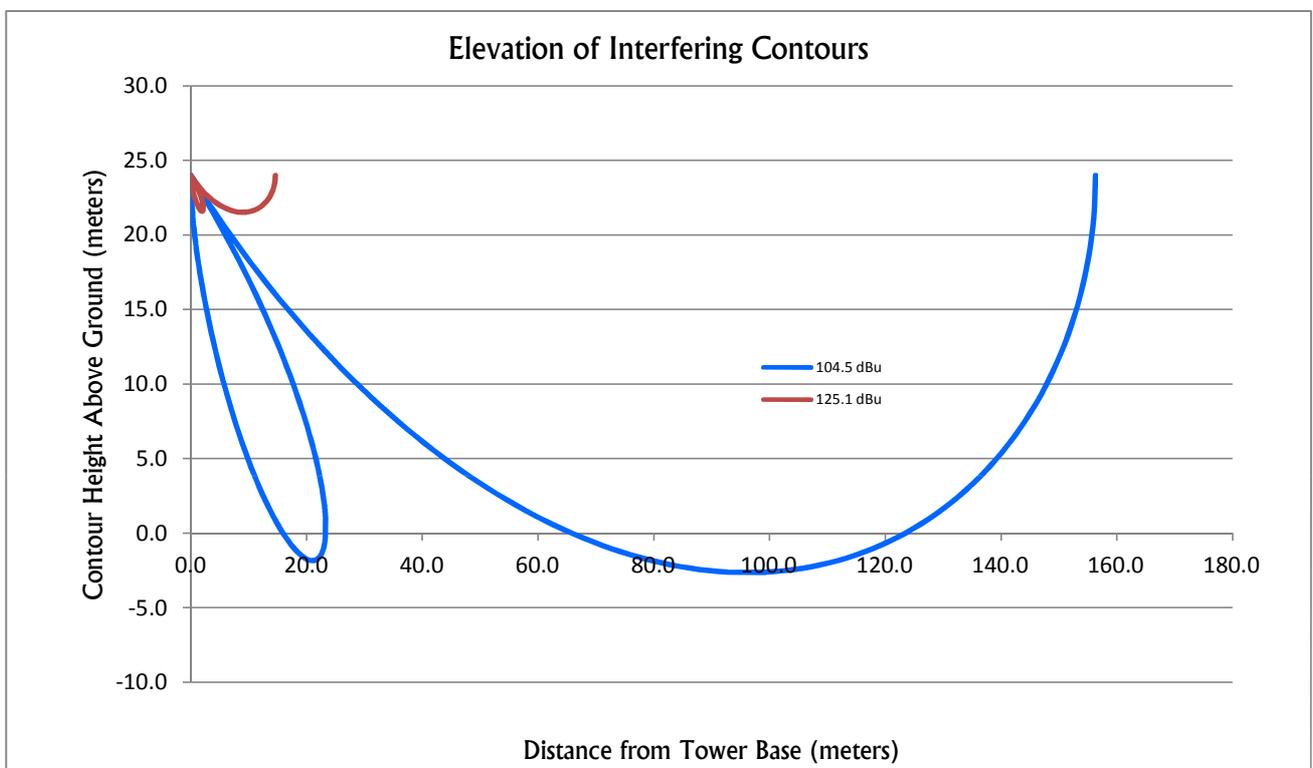


Antenna Mfg.: Shively  
Antenna Type: 6832-3  
Station: W243DH  
Frequency: 96.5  
Channel #: 243  
Figure: 2

Date: 4/9/2015

Beam Tilt	0	
Gain (Max)	1.226	0.886 dB
Gain (Horizon)	1.226	0.886 dB





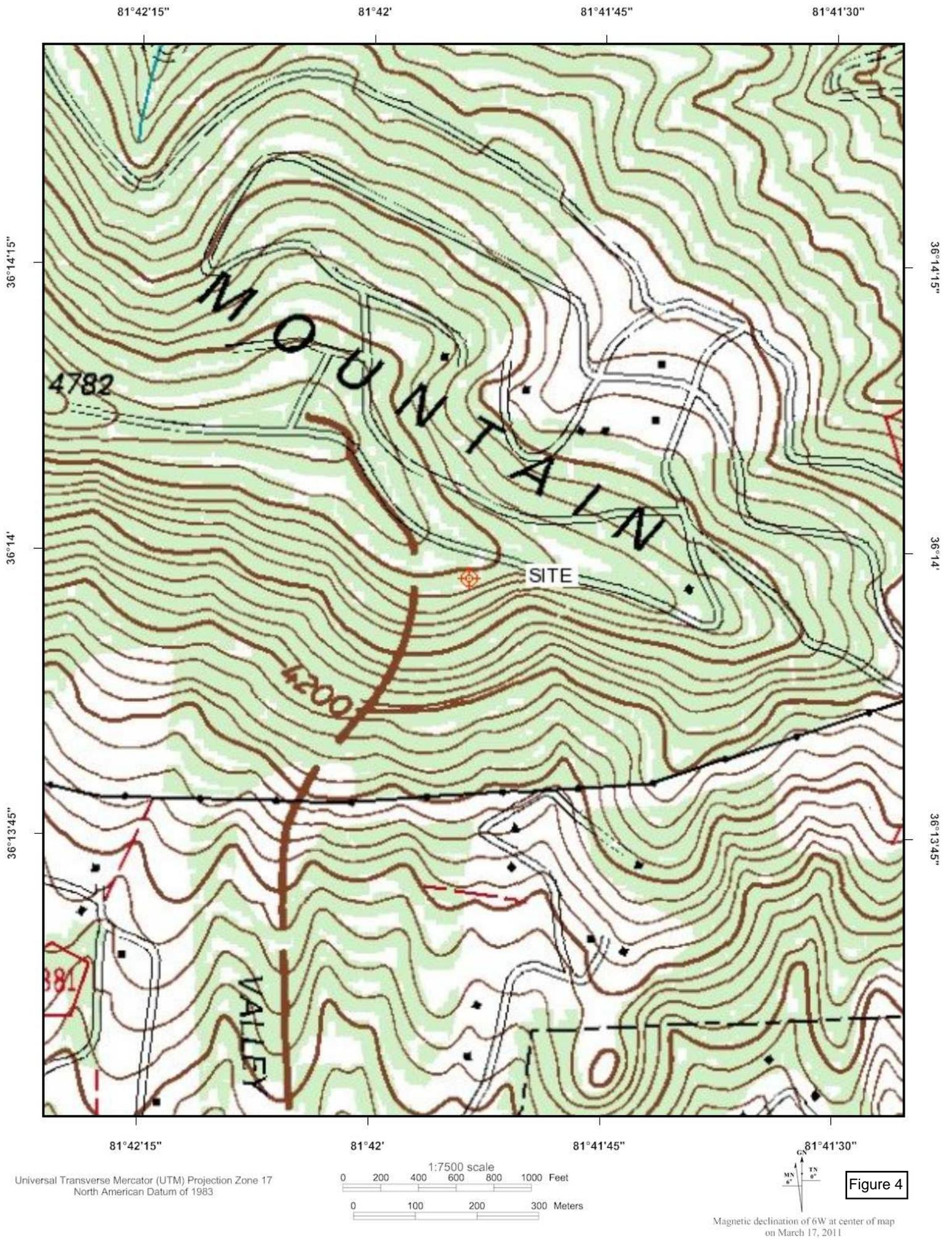


Figure 4

81°42'

81°41'55"

81°41'50"

81°41'45"

36°14'05"

36°14'05"

36°14'

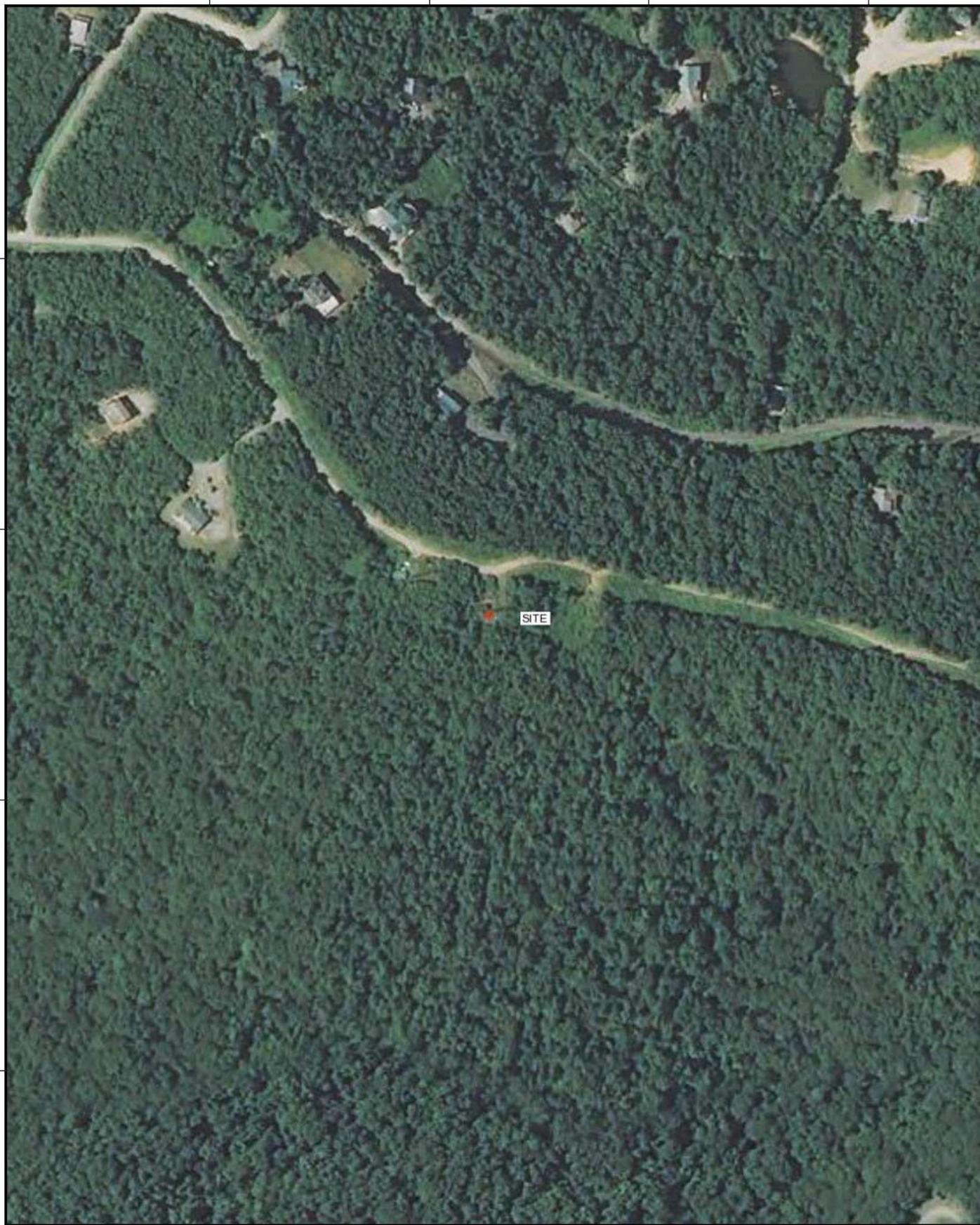
36°14'

36°13'55"

36°13'55"

36°13'50"

36°13'50"



81°42'

81°41'55"

81°41'50"

81°41'45"

Universal Transverse Mercator (UTM) Projection Zone 17  
North American Datum of 1983

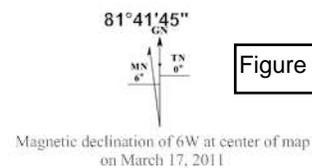
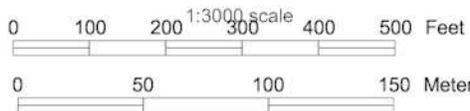


Figure 5



Google earth



Figure 6  
Aerial Photo of Site  
105 and 156 Meter Circles