

## **ENGINEERING EXHIBIT**

### **Displacement Application for Digital Low Power Television Flash-Cut Construction Permit**

prepared for

#### **Gray Television Licensee, LLC**

W16CE Charleston, WV

Facility ID 36921

Ch. 47 (digital) 15 kW

*Gray Television Licensee, LLC* (“Gray”) is the licensee of Low Power Television station W16CE, analog Channel 16, Charleston, WV, Facility ID 36921 (BLTTL-20030606ABF). The W16CE licensed operation on Channel 16 is displaced pursuant to §73.3572(a)(4)(iii). *Gray* proposes herein to change W16CE to Channel 47 and “flash cut” to digital operation. No change in site location is specified.

The W16CE site is located 188.2 km from WKHA(DT) (Ch. 16, BLEDT-20020205AAW, Hazard, KY), co-channel to W16CE. This full power digital station is within the 265 km distance specified in §73.3572(a)(4)(iv)(A) that triggers displacement relief qualification for W16CE. Further, W16CE is predicted to receive interference from the Construction Permit facility of first-adjacent station WQCW(DT) (Ch. 17, Portsmouth, OH, BPCDT-20080618ADI) affecting 2.7 percent of the W16CE service population.

The proposed facility will operate on Channel 47 using a “simple” out of channel emission mask. **Figure 1** depicts the coverage contour of the proposed facility, as well as that of the W16CE licensed analog Channel 16 facility. The use of the same transmitter site and the service area overlap shown demonstrates compliance with §73.3572 for a minor change.

The proposed antenna is an ERI model ALP8L2-HSBR-47. The proposed antenna system will be side-mounted on an existing antenna support structure, in place of the existing Channel 16

antenna. The tower is associated with FCC Antenna Structure Registration (“ASR”) number 1061555.<sup>1</sup> No change to the overall structure height is proposed.

A detailed interference study per OET Bulletin 69<sup>2</sup> shows that the proposal complies with the Commission’s interference protection requirements toward all digital television, television translator, LPTV, and Class A stations. The results, summarized in **Table 1**, show that any new interference does not exceed the Commission’s interference limits (0.5 percent to full power and Class A stations and 2.0 percent to secondary stations).

The W16CE site is located 372 km from the U.S. – Canadian border. The worst-case 19.5 dB $\mu$  F(50,10) co-channel DTV-to-DTV interfering contour is depicted in **Figure 2** and does not extend across the border. Thus it is believed that the instant proposal complies with all international agreements at this time.

The nearest FCC monitoring station is 429 km distant at Laurel, MD. This exceeds by a large margin the threshold minimum distance specified in §73.1030(c)(3) that would suggest consideration of the monitoring station. The site is not located within the areas requiring coordination with “quiet” zones specified in §73.1030(a) and (b). There are no AM stations within 3.2 kilometers of the site, based on information contained within the Commission’s database.

### **Human Exposure to Radiofrequency Electromagnetic Field (Environmental)**

The proposal will involve use of a replacement side-mounted transmitting antenna, with no change to overall structure height. The use of existing transmitting locations has been characterized as being environmentally preferable by the Commission, according to Note 1 of §1.1306 of the FCC Rules. Therefore, it is believed that this application may be categorically excluded from environmental processing pursuant to §1.1306 of the Commission’s rules.

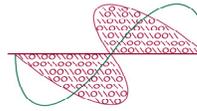
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<sup>1</sup>The geographic coordinates differ from licensed values by a one-second change in longitude in order to conform to the current Antenna Structure Registration data. No change in actual site location is proposed.

<sup>2</sup>FCC Office of Engineering and Technology Bulletin number 69, *Longley-Rice Methodology for Evaluating TV Coverage and Interference*, February 6, 2004 (“OET-69”). The implementation of OET-69 for this study followed the guidelines of OET-69 as specified therein. A cell size of 1 km was employed. Comparisons of various results of this computer program (run on a Sun Sparc processor) to the Commission’s implementation of OET-69 show excellent correlation.

The proposed operation was evaluated for human exposure to RF energy using the procedures outlined in the Commission's OET Bulletin Number 65. Based on OET-65 equation (10), and considering 30 percent antenna relative field in downward elevations, the calculated signal density near the tower at two meters above ground level attributable to the proposed facility is  $19.6 \mu\text{W}/\text{cm}^2$ , which is 4.4 percent of the general population/uncontrolled maximum permitted exposure limit. This is below the five percent threshold limit described in §1.1307(b) regarding sites with multiple emitters, categorically excluding the applicant from responsibility for taking any corrective action in the areas where the proposal's contribution is less than five percent.

The general public will not be exposed to RF levels attributable to the proposal in excess of the FCC's guidelines. RF exposure warning signs will continue to be posted. With respect to worker safety, the applicant will coordinate exposure procedures with all pertinent stations and will reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from RF electromagnetic field exposure in excess of FCC guidelines.



### **Certification**

The undersigned hereby certifies that the foregoing statement and associated attachments were prepared by him or under his direction, and that they are true and correct to the best of his knowledge and belief.

A handwritten signature in blue ink, appearing to read "Joseph M. Davis". The signature is fluid and cursive.

Joseph M. Davis, P.E.  
September 23, 2009

**Chesapeake RF Consultants, LLC**  
11993 Kahns Road  
Manassas, VA 20112  
703-650-9600

### List of Attachments

Figure 1	Coverage Contour Comparison
Figure 2	Interfering Contour to Canada
Table 1	Interference Analysis Results Summary
Form 346	Saved Version of Engineering Sections from FCC Form at Time of Upload

*This material was entered September 23, 2009 for filing electronically. Since the FCC's electronic filing system may be accessed by anyone with the applicant's name and password, and electronic data may otherwise be altered in an unauthorized fashion, we cannot be responsible for changes made subsequent to our entry of this data and related attachments.*

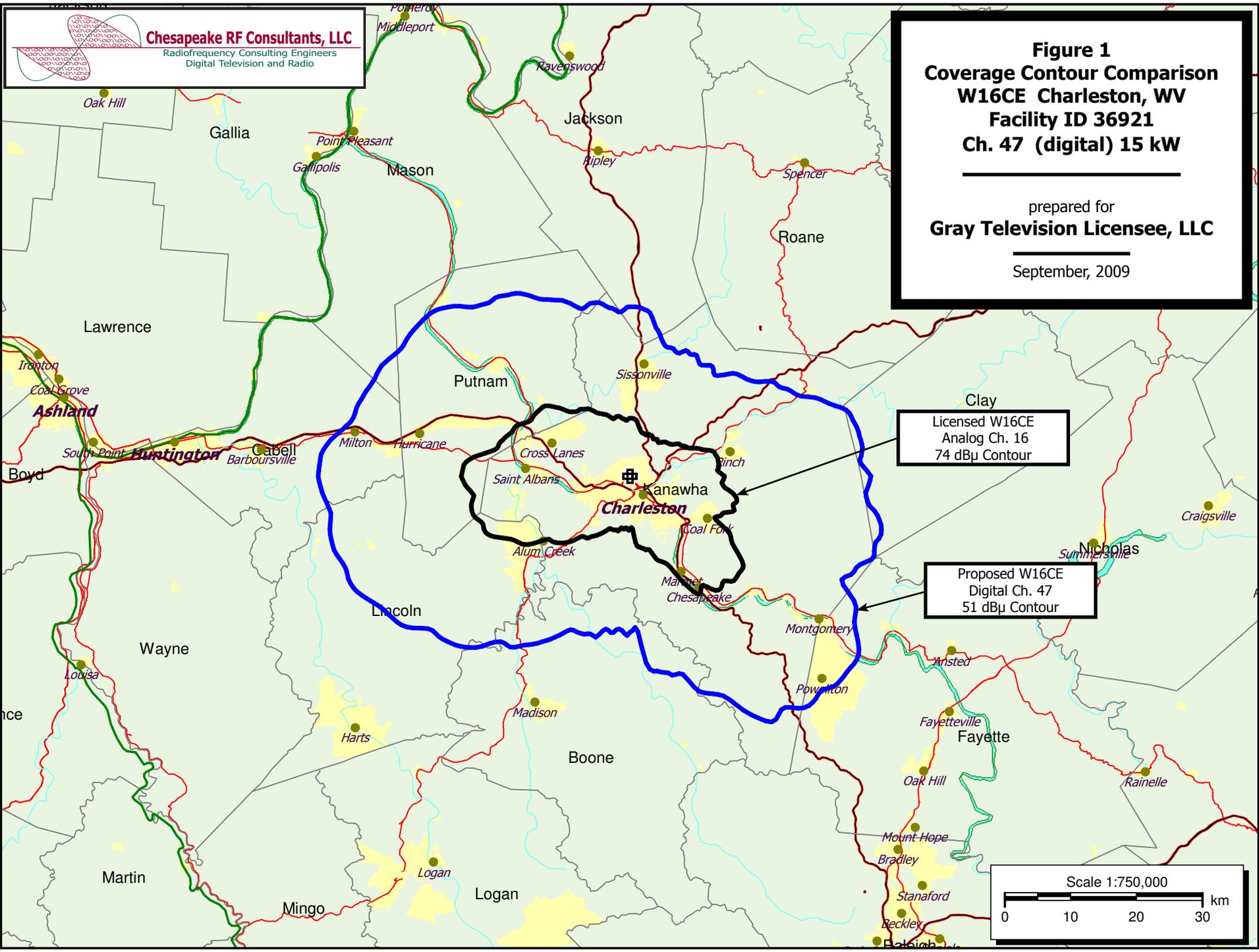
**Figure 1**  
**Coverage Contour Comparison**  
**W16CE Charleston, WV**  
**Facility ID 36921**  
**Ch. 47 (digital) 15 kW**

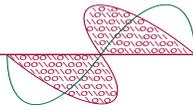
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prepared for  
**Gray Television Licensee, LLC**

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September, 2009



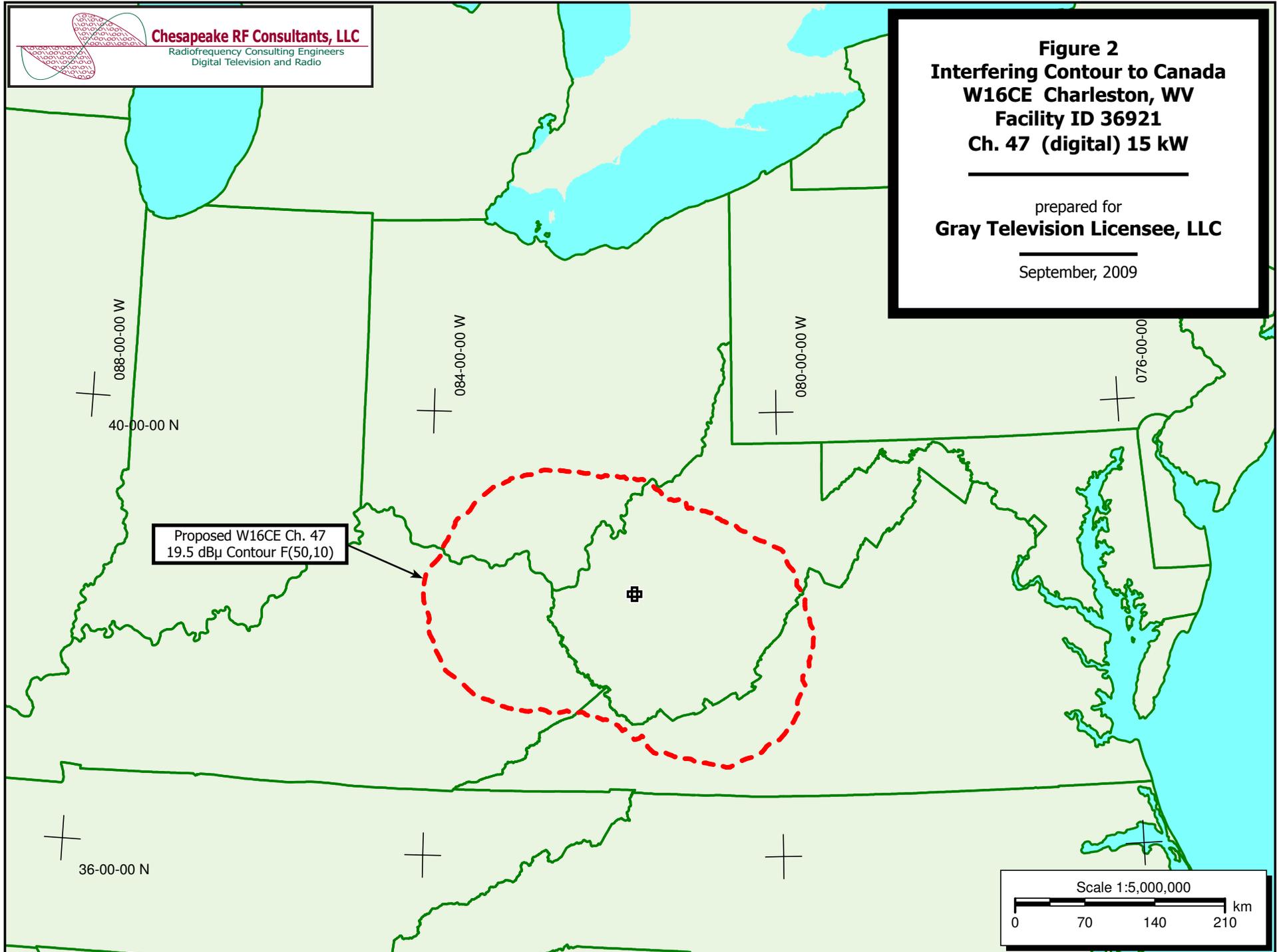


**Chesapeake RF Consultants, LLC**  
Radiofrequency Consulting Engineers  
Digital Television and Radio

**Figure 2**  
**Interfering Contour to Canada**  
**W16CE Charleston, WV**  
**Facility ID 36921**  
**Ch. 47 (digital) 15 kW**

prepared for  
**Gray Television Licensee, LLC**

September, 2009



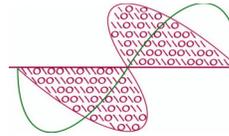
**Table 1**

**Interference Analysis Results Summary**

prepared for

**Gray Television Licensee, LLC**

W16CE Charleston, WV



**Chesapeake RF Consultants, LLC**

Radiofrequency Consulting Engineers  
Digital Television and Radio

W16CE	USERRECORD-01	CHARLESTON	WV US
Channel 47	ERP 15. kW	HAAT 107. m	RCAMSL 00358 m
SIMPLE MASK			
Latitude 038-22-31		Longitude 0081-39-21	
Dir Antenna Make CDB Model 00000000016994 Beam tilt N Ref Azimuth 200.			

Ch.	Call	City/State	Dist (km)	Status	Application Ref. No.	---Population (2000 Census)---	
						Baseline	New Interference
45	WVCW-LP	HUNTINGTON WV	49.3	LIC	BLTTL-20031117ACK	---	none
45	W45BW	PARKERSBURG WV	105.5	LIC	BLTT-20001027AAE	---	none
46	WWHO	CHILLICOTHE OH	184.5	LIC	BLCDT-20021025AAA	---	none
46	WVVA	BLUEFIELD WV	131.2	CP MOD	BMPCDT-20060707ABJ	1,035,868	70 (0.01%)
46	W21CJ	CLARKSBURG WV	154.6	APP	BDISDTL-20090618ADF	---	none
47	WMDO-CA	WASHINGTON DC	401.9	LIC	BLTTA-20080428AAQ	---	none
47	WAVE	LOUISVILLE KY	363.7	LIC	BLCDT-20030306ABQ	---	none
47	WJZY	BELMONT NC	337.8	CP MOD	BMPCDT-20080319ACZ	---	none
47	W57BG	CANTON/WAYNESVILLE NC	331.2	CP	BDISDTT-20060316ACS	---	none
47	W57BG	CANTON/WAYNESVILLE NC	331.2	APP	BDISDTT-20090824ACK	---	none
47	W47DM-D	CULLOWHEE NC	367.3	LIC	BLDTT-20090615AAQ	---	none
47	WGSR-LP	REIDSVILLE NC	295.2	CP	BDISDTL-20071212ABC	---	none
47	WRLM	CANTON OH	305.1	LIC	BLCDT-20060222AAK	---	none
47	WOTH-LD	CINCINNATI OH	260.1	LIC	BLDTL-20081201DCM	---	none
47	W47DI-D	COLUMBUS OH	218.3	CP	BDCCDTL-20061012ACV	---	none
47	WLMO-LP	LIMA OH	338.4	APP	BDISDTL-20090623AAZ	---	none
47	W47AB	MANSFIELD OH	269.0	CP	BDFCDTT-20061006ABG	---	none
47	W47AB	MANSFIELD OH	269.0	APP	BMPDTT-20090602AAH	---	none
47	W47AB	MANSFIELD OH	269.0	LIC	BLTT-20060403BEH	---	none
47	W65CG	PITTSBURGH PA	270.5	CP MOD	BMPPTT-20040526ACB	---	none
47	W65CG	PITTSBURGH PA	270.5	CP	BDFCDTT-20060331BCD	---	none
47	W65CG	PITTSBURGH PA	270.5	APP	BSTA-20090826ABI	---	none
47	W31BU	GREENVILLE SC	388.2	APP	BPTTL-20011018AFO	---	none
47	WUPV	ASHLAND VA	391.6	LIC	BLCDT-20060210ABA	---	none
47	NEW	HARRISONBURG VA	243.4	APP	BNPDTL-20090825AQX	---	none
47	W40BM	LYNCHBURG VA	223.8	CP	BDISDTT-20060330ALW	---	none
48	W57AG	PARKERSBURG WV	93.2	CP	BPTT-20050309AAC	---	none
50	WTZP-LP	PORTSMOUTH OH	123.2	LIC	BLTTL-20080925AGF	---	none

**SECTION III - ENGINEERING DATA (Digital)**

**TECHNICAL SPECIFICATIONS**

Ensure that the specifications below are accurate. Contradicting data found elsewhere in this application will be disregarded. All items must be completed. The response "on file" is not acceptable.

**TECH BOX**

1. Channel Number:  
47

2. Translator Input Channel No. :

3. Primary station proposed to be rebroadcast:

Facility Identifier	Call Sign	City	State	Channel
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4. Antenna Location Coordinates: (NAD 27)  
Latitude:  
Degrees 38 Minutes 22 Seconds 31  North  South  
Longitude:  
Degrees 81 Minutes 39 Seconds 21  West  East

5. Antenna Structure Registration Number: 1061555  
 Not Applicable [Exhibit 10]  Notification filed with FAA

6. Antenna Location Site Elevation Above Mean Sea Level: 307.9 meters

7. Overall Tower Height Above Ground Level: 59.4 meters

8. Height of Radiation Center Above Ground Level: 50.0 meters

9. Maximum Effective Radiated Power (ERP): 15.0 kW

10. Transmitter Output Power: 0.765 kW

11. a. Transmitting Antenna:  
Before selecting Directional "Off-the-Shelf", refer to "Search for Antenna Information" under [CDBS Public Access](http://fjallfoss.fcc.gov/prod/cdbs/pubacc/prod/cdbs_pa.htm) (http://fjallfoss.fcc.gov/prod/cdbs/pubacc/prod/cdbs\_pa.htm). Make sure that the Standard Pattern is marked Yes and that the relative field values shown match your values. Enter the Manufacturer (Make) and Model exactly as displayed in the Antenna Search.  
 Nondirectional  Directional "Off-the-shelf"  Directional composite  
Manufacturer ERI Model ALP8L2-HSBR-47

b. Electrical Beam Tilt: 0.5 degrees  Not Applicable

c. Directional Antenna Relative Field Values:  N/A (Nondirectional or Directional "Off-the-shelf")  
Rotation (Degrees): 200  No Rotation

Degrees	Value	Degrees	Value	Degrees	Value	Degrees	Value	Degrees	Value	Degrees	Value
0	0.246	10	0.269	20	0.364	30	0.549	40	0.765	50	0.923
60	0.992	70	0.994	80	0.936	90	0.818	100	0.664	110	0.513
120	0.386	130	0.282	140	0.211	150	0.177	160	0.161	170	0.146
180	0.137	190	0.146	200	0.161	210	0.177	220	0.211	230	0.282
240	0.386	250	0.513	260	0.664	270	0.818	280	0.936	290	0.994
300	0.992	310	0.923	320	0.765	330	0.549	340	0.364	350	0.269
Additional Azimuths		65	1.0	295	1.0						

Relative Field Polar Plot

**NOTE: In addition to the information called for in this section, an explanatory exhibit providing full particulars must be submitted for each question for which a "No" response is provided.**

12. Out-of-channel Emission Mask:  Simple  Stringent

**CERTIFICATION**

13. **Interference** : The proposed facility complies with all of the following applicable rule sections. 47.C.F.R Sections 74.709, 74.793(e), 74.793(f), 74.793(g), 74.793(h), 74.794(b) and 73.1030.  Yes  No  
See Explanation in [Exhibit 11]

14. **Environmental Protection Act.** The proposed facility is excluded from environmental processing under 47. C.F.R. Section 1.1306 (i.e., The facility will not have a significant environmental impact and complies with the maximum permissible radiofrequency electromagnetic exposure limits for controlled and uncontrolled environments). Unless the applicant can determine RF compliance, an **Exhibit is required.**  Yes  No  
See Explanation in [Exhibit 12]  
By checking "Yes" above, the applicant also certifies that it, in coordination with other users of the site, will reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency electromagnetic exposure in excess of FCC guidelines.

15. **Channels 52-59.** If the proposed channel is within channels 52-59, the applicant certifies compliance with the following requirements, as applicable:

The applicant is applying for a digital companion channel for which no suitable channel from channel 2-51 is available.

Pursuant to Section 74.786(d), the applicant has notified, within 30 days of filing this application, all commercial wireless licenses of the spectrum comprising the proposed TV channel and the first adjacent channels thereto, for which the proposed digital LPTV or TV translator antenna site lies inside the licensed geographic boundaries of the wireless licensees or within 75 miles and 50 miles, respectively, of the geographic boundaries of co-channel and adjacent-channel wireless licensees.

16. **Channels 60-69.** If the proposed channel is within channels 60-69, the applicant certifies compliance with the following requirements, as applicable:

Pursuant to Section 74.786(e), the applicant has notified, within 30 days of filing this application, all commercial wireless licenses of the spectrum comprising the proposed TV channel and the first adjacent channels thereto, for which the proposed digital LPTV or TV translator antenna site lies inside the licensed geographic boundaries of the wireless licensees or within 75 miles and 50 miles, respectively, of the geographic boundaries of co-channel and adjacent-channel wireless licensees.

Pursuant to Section 74.786(e), the applicant proposing operation on channel 63, 64, 68 and 69 ("public safety channels") has secured a coordinated spectrum use agreements(s) with 700 MHz public safety regional planning committee(s) and state administrator(s) of the region(s) and state(s) within which the antenna site of the digital LPTV or TV translator station is proposed to locate, and those adjoining regions and states with boundaries within 75 miles of the proposed station location.

Pursuant to Section 74.786(e), the applicant for a channel adjacent to channel 63, 64, 68 or 69 has notified, within 30 days of filing this application, the 700 MHz public safety regional planning committee(s) and state administrator(s) of the region and state containing the proposed digital LPTV or TV translator antenna site and regions and states whose geographic boundaries lie within 50 miles of the proposed LPTV or TV translator antenna site.

**PREPARERS CERTIFICATION ON PAGE 3 MUST BE COMPLETED AND SIGNED.**

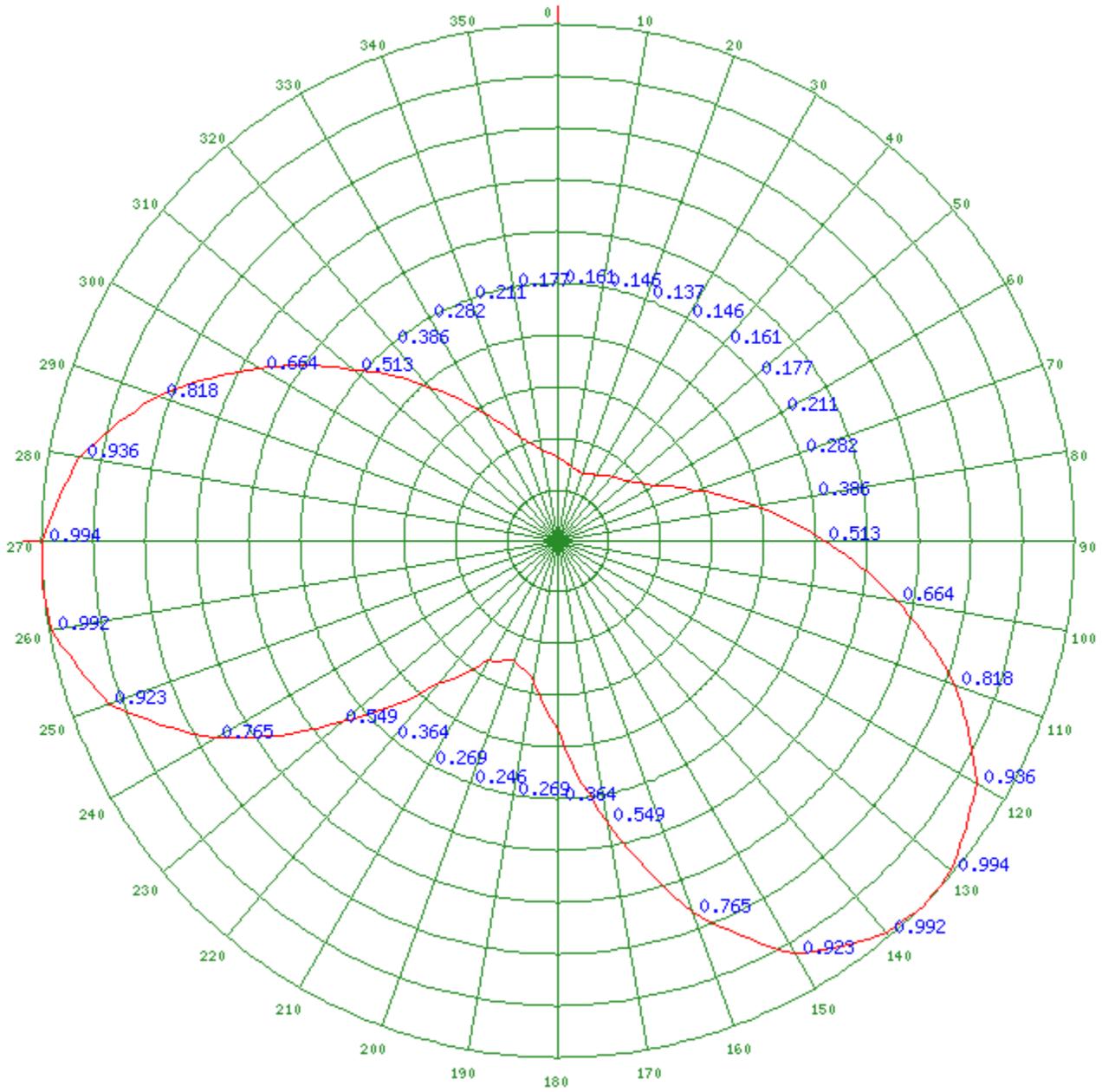
**SECTION III PREPARER'S CERTIFICATION**

I certify that I have prepared Section III (Engineering Data) on behalf of the applicant, and that after such preparation, I have examined and found it to be accurate and true to the best of my knowledge and belief.

Name JOSEPH M. DAVIS, P.E.		Relationship to Applicant (e.g., Consulting Engineer) CONSULTING ENGINEER	
Signature		Date 9/23/2009	
Mailing Address CHESAPEAKE RF CONSULTANTS, LLC 11993 KAHNS ROAD			
City MANASSAS		State or Country (if foreign address) VA	Zip Code 20112 -
Telephone Number (include area code) 7036509600		E-Mail Address (if available) JOSEPH.DAVIS@RF-CONSULTANTS.COM	

Any specified rotation has already been applied to the plotted pattern.  
Field strength values shown on a rotated pattern may differ from the listed values  
because intermediate azimuths are interpolated between entered azimuths.

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