

ENGINEERING EXHIBIT

Application for Post-Transition Digital Television Station Construction Permit

prepared for

CBS Corporation
WJZ-DT Baltimore, MD
Facility ID 25455
Ch. 13 28.8 kW 295 m

CBS Corporation (“*CBS*”) is the licensee of television station WJZ-TV, analog Channel 13 and digital Channel 38, Baltimore, MD. *CBS* herein proposes construction of the WJZ-DT post-transition digital facility on Channel 13. This channel was established in Appendix B of the Seventh Report and Order in MB Docket 87-278.

The instant proposal specifies an effective radiated power (“ERP”) of 28.8 kW at 295 meters antenna height above average terrain (“HAAT”), with a directional antenna. The proposed coverage extends beyond that of the Appendix B parameters of 21.4 kW ERP and 312 meters HAAT. The Appendix B facility incorporates a theoretical directional antenna pattern due to the impact of non-uniform terrain and the differences in the F(50,50) and F(50,90) propagation curves. Further, the Appendix B theoretical directional antenna pattern has additional suppression in some azimuths due to the facility reduction taken by WJZ-DT to maintain its first-round channel election (BFRCC-20050811AAV).

The proposed digital Channel 13 operation will employ a new directional antenna system intended to match the theoretical Appendix B pattern as closely as possible. The antenna will be installed as part of a replacement stack of antennas top-mounted on the existing WJZ-TV candelabra antenna supporting structure, having FCC Antenna Structure Registration (“ASR”) number 1035558. There are presently three stacks of antennas on this shared¹ tower structure, and the

¹ The other television stations utilizing antenna stacks on the shared tower structure are WBAL-TV (Facility ID 65696) and WMAR-TV (Facility ID 59442) both Baltimore, MD.

proposal involves replacement of one of the three stacks. No change to the overall structure height is required to carry out this proposal.

The proposed WJZ-DT antenna system is a Dielectric model THV-10A13/VP-R C150SP. Elliptical polarization is proposed (25 percent vertical polarization). The maximum horizontally polarized ERP is 28.8 kW, and the maximum vertically polarized ERP is 7.2 kW. The vertically polarized component will not exceed the horizontally polarized component at any azimuth. The directional antenna’s azimuthal patterns are depicted in **Figures 1** and **1A** for horizontal and vertical polarization, respectively. **Figures 2** and **2A** provide the theoretical vertical plane (elevation) pattern².

A map is supplied as **Figure 3**, which depicts the standard predicted coverage contours. This map includes the boundaries of Baltimore, WJZ-DT’s principal community. As demonstrated thereon, the proposed facility complies with §73.625(a)(1), as the entire principal community will be encompassed by the 43 dBμ contour.

The proposed WJZ-DT facility’s predicted service population provides a 102.4 percent match of the Appendix B facility, as detailed in the table below.

Post-Transition Population Summary		
Population Summary (2000 Census) OET Bulletin 69 method	Appendix B	Proposed
Within Noise Limited Contour	8,094,973	8,296,764
Not affected by terrain losses	7,849,268	8,064,026
Lost to all interference	396,291	430,630
Net DTV Service	7,452,977	7,633,396
Match of Appendix B	---	102.42%

² These patterns are supplied in terms of relative field. In recent years, FCC Staff have not required pattern data in dBk format however such patterns are available upon request.

Freeze Waiver Request

A waiver of the Commission's August 3, 2004 "freeze" concerning expansion in service area³ is requested. The proposal complies with the criteria for a freeze waiver request outlined in the Report and Order in the Third Periodic Review.⁴ WJZ-DT will change channel for post-transition operation and will employ a new antenna.

The map attached as **Figure 4** supplies a comparison of the 36 dB μ digital service contours corresponding to the proposed WJZ-DT facility and the Appendix B parameters. As shown thereon, the amount of contour extension does not exceed five miles at any azimuth.

Absent the waiver, the WJZ-DT directional ERP would have to be reduced to 10.2 kW to avoid a contour extension. At this power level, the resulting DTV service contour would not cover 524,563 persons within a land area of 3,953 sq. km that are presently within the WJZ-TV analog Grade B contour. The potential loss area is depicted in **Figure 4A**. The interference-free service population for WJZ-DT operation at 10.2 kW ERP would be 6,968,908 persons, which is a 93.5 percent match of the WJZ-DT Appendix B population and would fail to satisfy the Commission's goal of at least a 95 percent population match.

A detailed interference study per OET Bulletin 69⁵ shows that the proposal complies with the 0.5 percent limit of new interference caused to other stations' Appendix B facilities, as summarized on the following page. Protection requirements towards authorized Class A stations are also satisfied.

³Public Notice "Freeze on the Filing of Certain TV and DTV Requests for Allotment or Service Area Changes," DA 04-2446, released August 3, 2004.

⁴Third Periodic Review of the Commission's Rules and Policies Affecting the Conversion to Digital Television, MB Docket No. 07-91, FCC 07-228, released December 31, 2007.

⁵FCC 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 standard cell size of 2 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.

Post-Transition Interference Analysis Summary

Ch	Call Sign	State/City Facility ID	Power (kW) HAAT (m)	Dist (km) Bear (°T)	Appendix B	New Interference	
					Baseline Population (2000 Census)	From Proposal Population	Percent
12	WWPX-DT	WV MARTINSBURG 23264	23 314	122.5 276.9	2,471,227	7,148	0.29%
12	WHYY-DT	DE WILMINGTON 72338	14.9 294	144.2 56.5	8,180,711	241	0.00%
12	WWBT-DT	VA RICHMOND 30833	5.41 241	216.2 200.3	--- no interference caused ---		
13	WYOU-DT	PA SCRANTON 17010	30 471	215.6 17.5	2,482,591	7,104	0.29%
13	WNET-DT	NJ NEWARK 18795	3.2 500	272.2 54.9	19,241,379	8,195	0.04%
13	WVEC-DT	VA HAMPTON 74167	19.1 344	280.0 176.7	1,937,361	443	0.02%
13	WQED-DT	PA PITTSBURGH 41315	12.6 210	309.1 294.7	2,933,759	0	0.00%
13	WSET-DT	VA LYNCHBURG 73988	19.6 568	344.0 230.1	1,169,218	232	0.02%
13	WNYA-DT	MA PITTSFIELD 136751	12.6 396	427.7 30.3	--- no interference caused ---		

Other Allocation Considerations

The nearest FCC monitoring station is 23.9 km distant at Laurel, MD. Using the FCC propagation curves, the proposed F(50,90) signal level at the monitoring station is 9.55 mV/m, which is below the 10 mV/m threshold of §73.1030(c) for further analysis. Further, the proposal represents a decrease in signal level from the current WJZ-TV analog Channel 13 facility, which operates at 316 kW ERP and results in a F(50,50) signal of 42.2 mV/m at the monitoring station. The site is located outside the areas specified in §73.1030(a)(1) and §73.1030(b). Thus, notification of the instant proposal to the National Radio Astronomy Observatory at Green Bank, West Virginia, or the Table Mountain Radio Receiving Zone in Boulder County, Colorado is not required. There are

no authorized AM stations within 3.2 kilometers of the site, based on information contained within the Commission's database. The site location is beyond the border zones that would require international coordination.

Human Exposure to Radiofrequency Electromagnetic Field (Environmental)

The proposed transmitting antenna stack will be installed on an existing antenna support structure in place of an existing stack of similar dimensions. 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.

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 15 percent antenna relative field in downward elevations (pattern data shows less than 15 percent relative field at angles 20 to 90 degrees below the antenna), the calculated signal density near the tower at two meters above ground level attributable to the proposed facility is $0.28 \mu\text{W}/\text{cm}^2$, which is 0.14 percent of the general population/uncontrolled maximum permitted exposure limit. This is well 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.

The environmental subjects listed under §1.1307(a) are not considered herein. Section 1.1307(a) matters are covered by the structure owner as certified in the associated FCC Antenna Structure Registration number 1035558.

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.

Joseph M. Davis, P.E.
March 6, 2008

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

List of Attachments

Figure 1, 1A Antenna Horizontal Plane Pattern
Figure 2, 2A Antenna Vertical Plane (Elevation) Pattern
Figure 3 Proposed Coverage Contours
Figure 4 Coverage Contour Comparison
Figure 4A Potential Loss Area Without Waiver
Form 301 Saved Version of Engineering Sections from FCC Form at Time of Upload

This material was entered March 6, 2008 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.

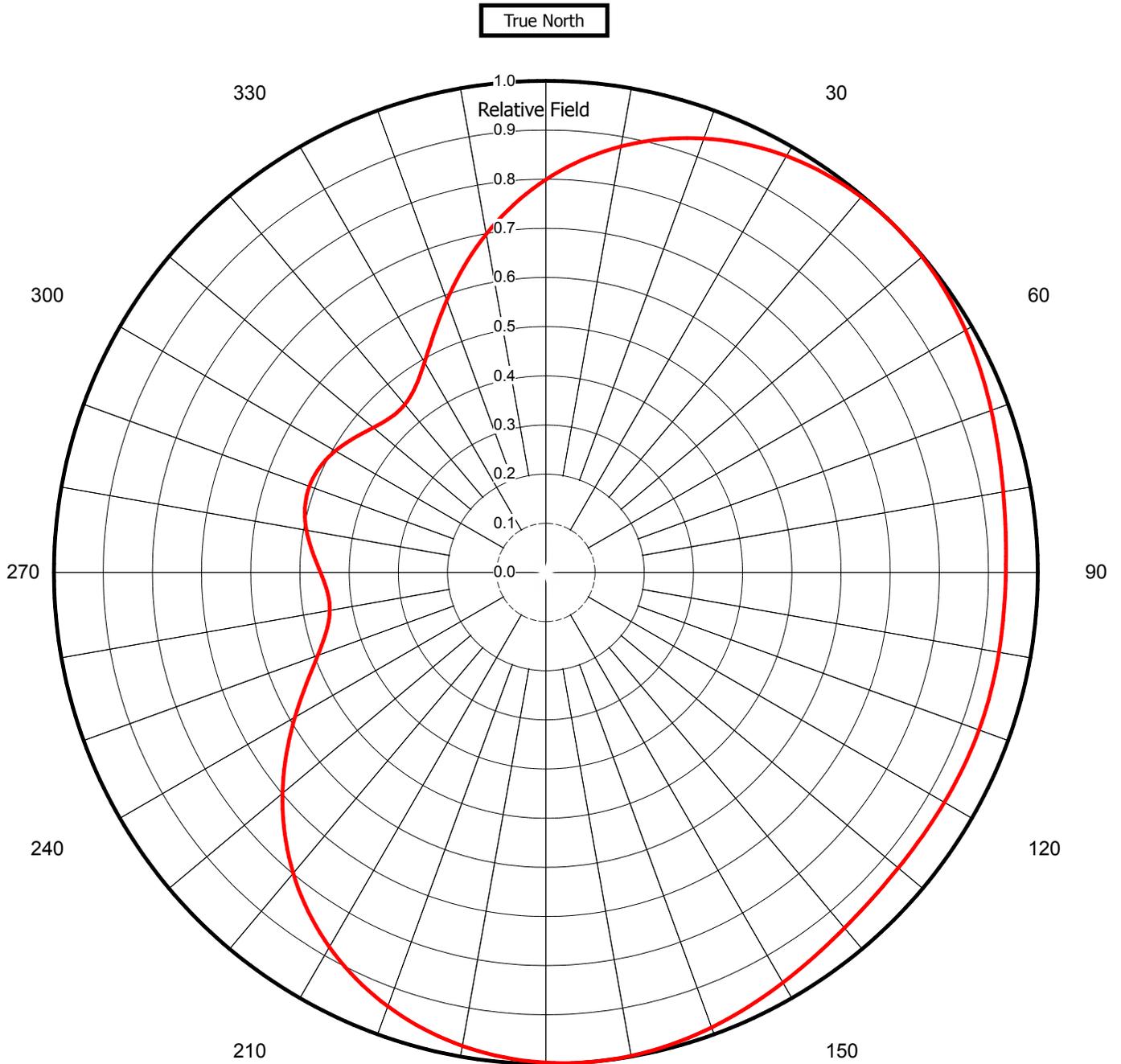


Figure 1
Antenna Horizontal Plane
Pattern - Horizontal Polarization

Proposal Number	C-01512	Revision:	5
Date	30-Jan-08		
Call Letters	WJZ-DT	Channel	13
Location	Baltimore, MD		
Customer			
Antenna Type	THV-10A13/VP-R C150SP		

AZIMUTH PATTERN

Gain	1.50	(1.76 dB)	Frequency	213.00 MHz
Calculated / Measured		Calculated	Drawing #	THV-4C150 HP





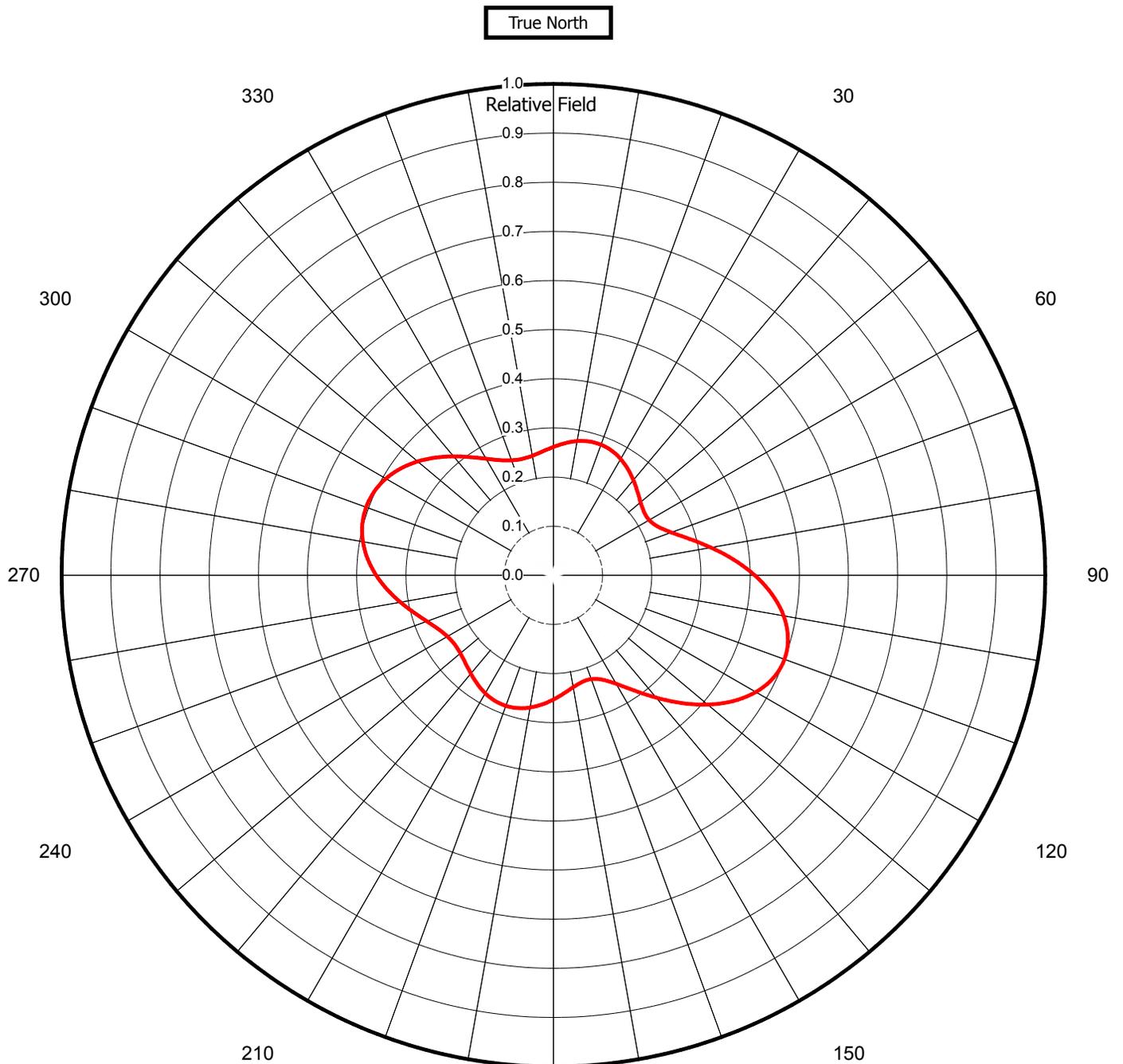
Proposal Number **C-01512** Revision: **5**
Date **30-Jan-08**
Call Letters **WJZ-DT** Channel **13**
Location **Baltimore, MD**
Customer
Antenna Type **THV-10A13/VP-R C150SP**

Figure 1A
Antenna Horizontal Plane
Pattern - Vertical Polarization

AZIMUTH PATTERN/VERTICAL POLARIZATION

Gain **2.50 (3.98 dB)**
Calculated / Measured **Calculated**

Frequency **213.00 MHz**
Drawing # **THV-4C250 VP**

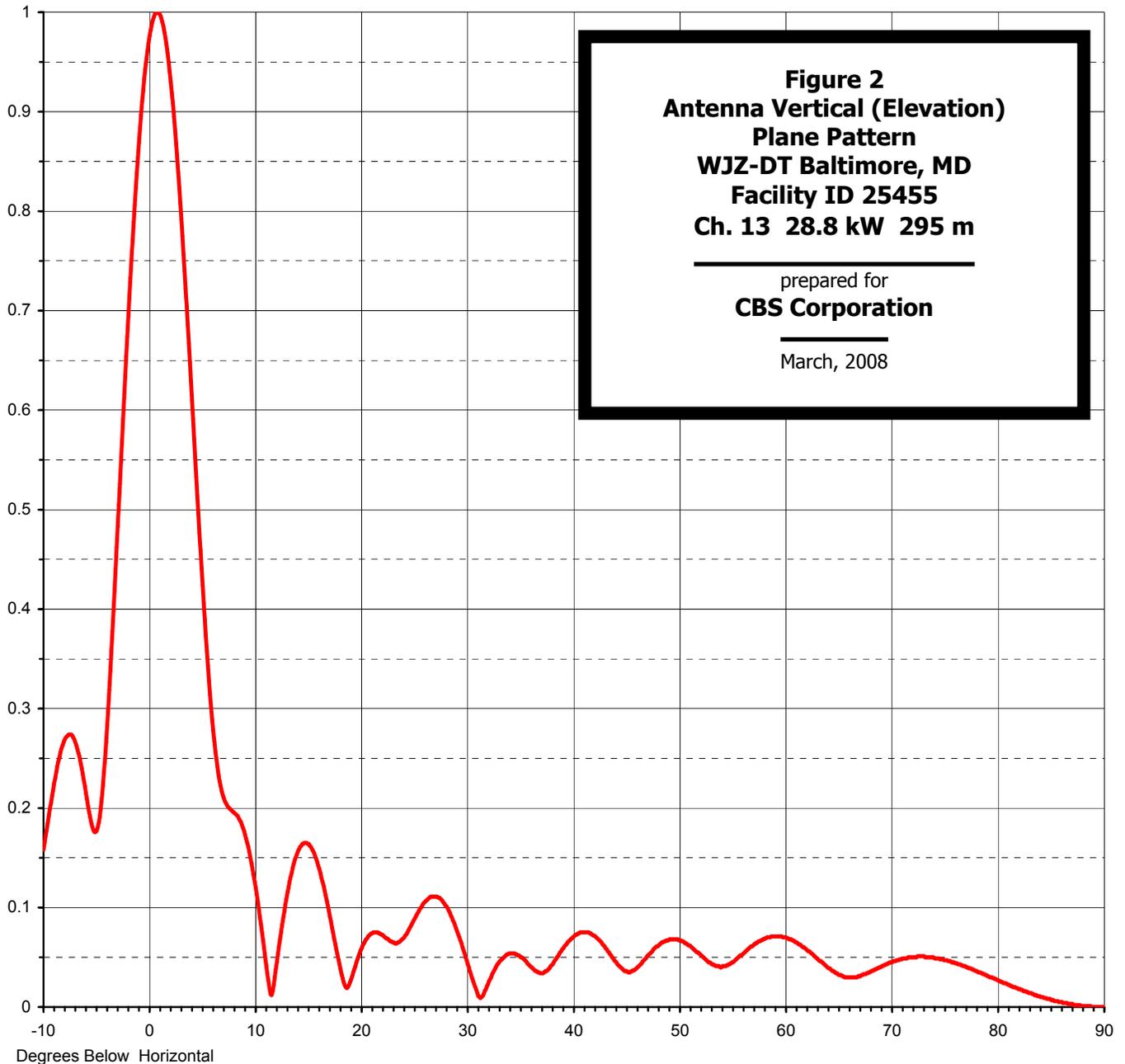




Proposal Number **C-01512** Revision: **5**
Date **30-Jan-08**
Call Letters **WJZ-DT** Channel **13**
Location **Baltimore, MD**
Customer
Antenna Type **THV-10A13/VP-R C150SP**

ELEVATION PATTERN

RMS Gain at Main Lobe	10.00 (10.00 dB)	Beam Tilt	0.75 deg
RMS Gain at Horizontal	9.50 (9.78 dB)	Frequency	213.00 MHz
Calculated / Measured	Calculated	Drawing #	10V100075-90

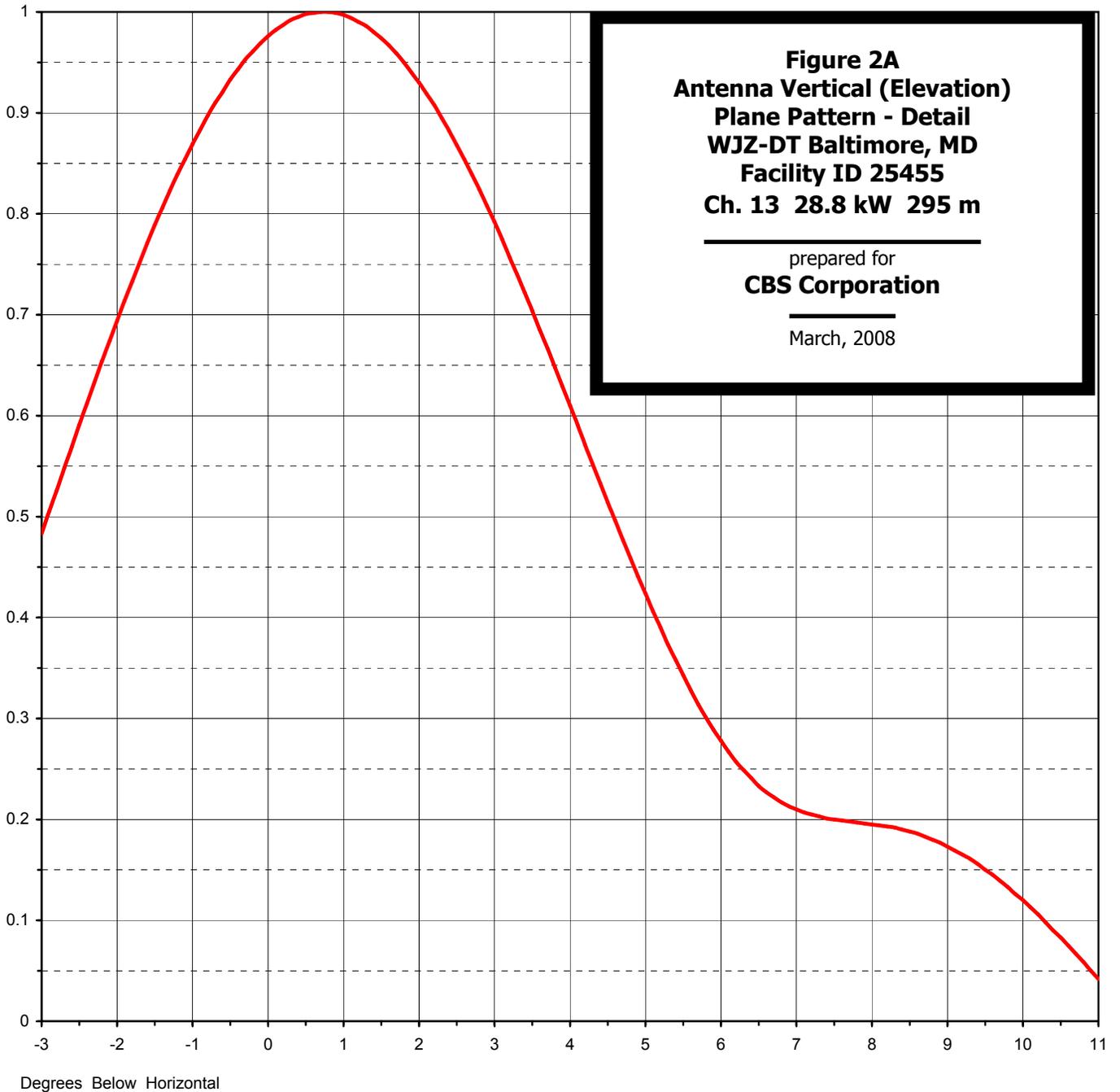


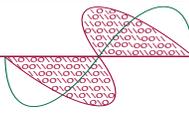


Proposal Number **C-01512** Revision: **5**
Date **30-Jan-08**
Call Letters **WJZ-DT** Channel **13**
Location **Baltimore, MD**
Customer
Antenna Type **THV-10A13/VP-R C150SP**

ELEVATION PATTERN

RMS Gain at Main Lobe **10.00 (10.00 dB)** Beam Tilt **0.75 deg**
RMS Gain at Horizontal **9.50 (9.78 dB)** Frequency **213.00 MHz**
Calculated / Measured **Calculated** Drawing # **10V100075**

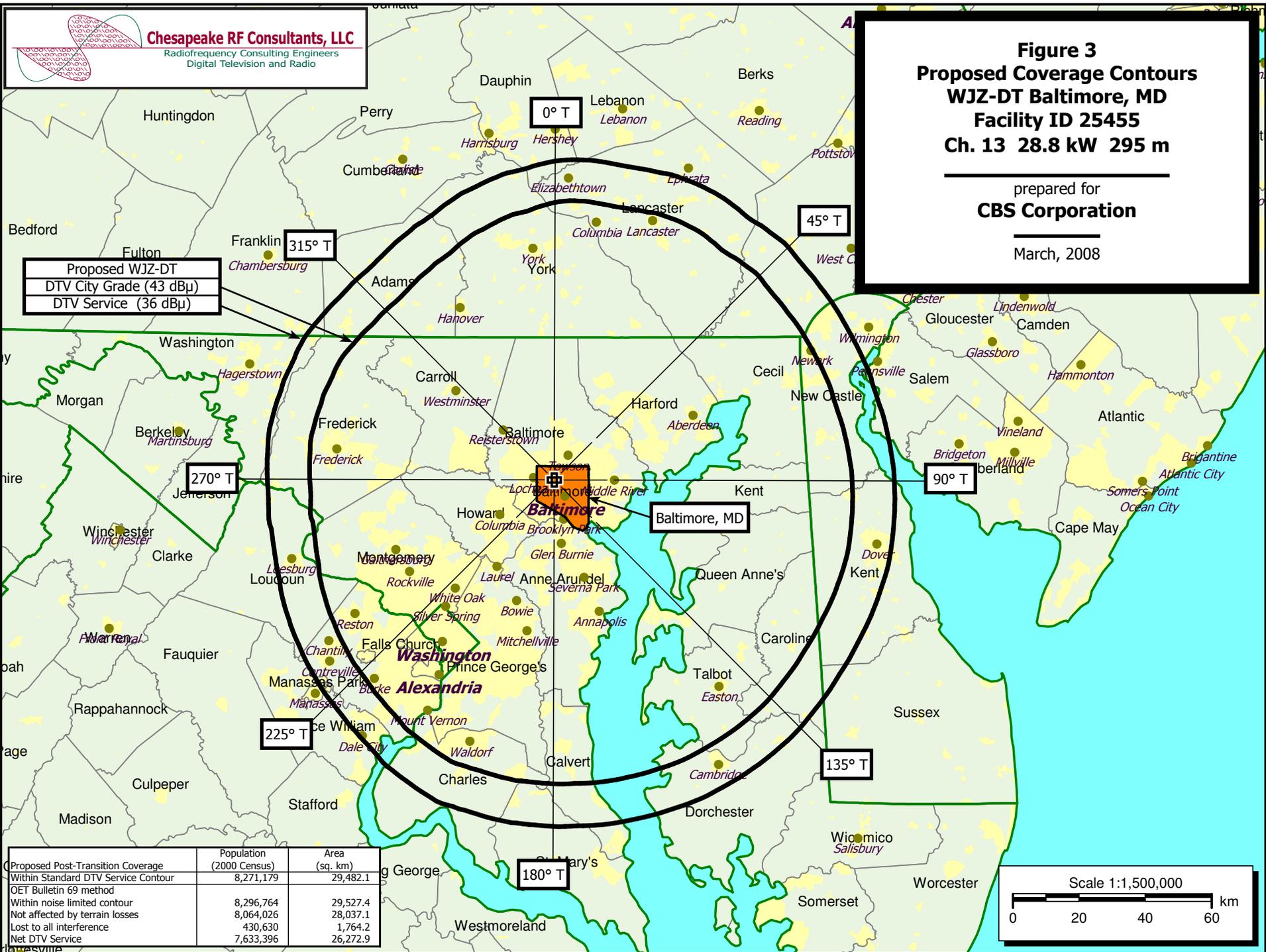




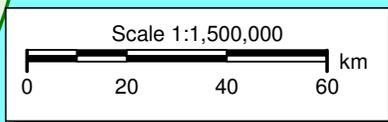
Chesapeake RF Consultants, LLC
 Radiofrequency Consulting Engineers
 Digital Television and Radio

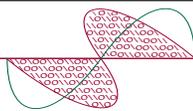
Figure 3
Proposed Coverage Contours
WJZ-DT Baltimore, MD
Facility ID 25455
Ch. 13 28.8 kW 295 m

prepared for
CBS Corporation
 March, 2008



	Population (2000 Census)	Area (sq. km)
Proposed Post-Transition Coverage		
Within Standard DTV Service Contour	8,271,179	29,482.1
OET Bulletin 69 method		
Within noise limited contour	8,296,764	29,527.4
Not affected by terrain losses	8,064,026	28,037.1
Lost to all interference	430,630	1,764.2
Net DTV Service	7,633,396	26,272.9





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Radiofrequency Consulting Engineers
Digital Television and Radio

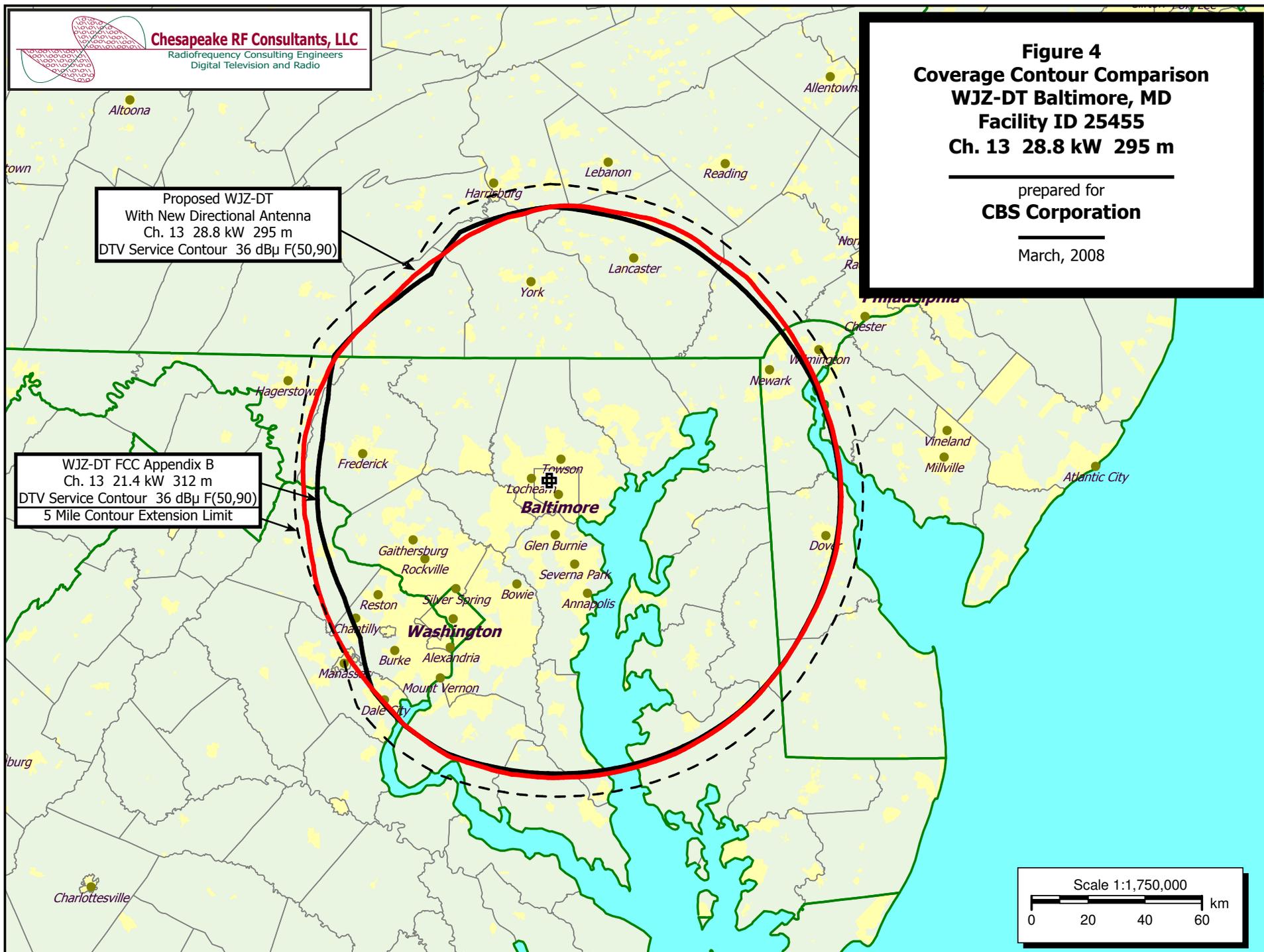
Figure 4
Coverage Contour Comparison
WJZ-DT Baltimore, MD
Facility ID 25455
Ch. 13 28.8 kW 295 m

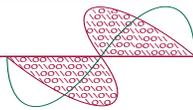
prepared for
CBS Corporation

March, 2008

Proposed WJZ-DT
With New Directional Antenna
Ch. 13 28.8 kW 295 m
DTV Service Contour 36 dBμ F(50,90)

WJZ-DT FCC Appendix B
Ch. 13 21.4 kW 312 m
DTV Service Contour 36 dBμ F(50,90)
5 Mile Contour Extension Limit





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Radiofrequency Consulting Engineers
Digital Television and Radio

Figure 4A
Potential Loss Area Without Waiver
WJZ-DT Baltimore, MD
Facility ID 25455
Ch. 13 28.8 kW 295 m

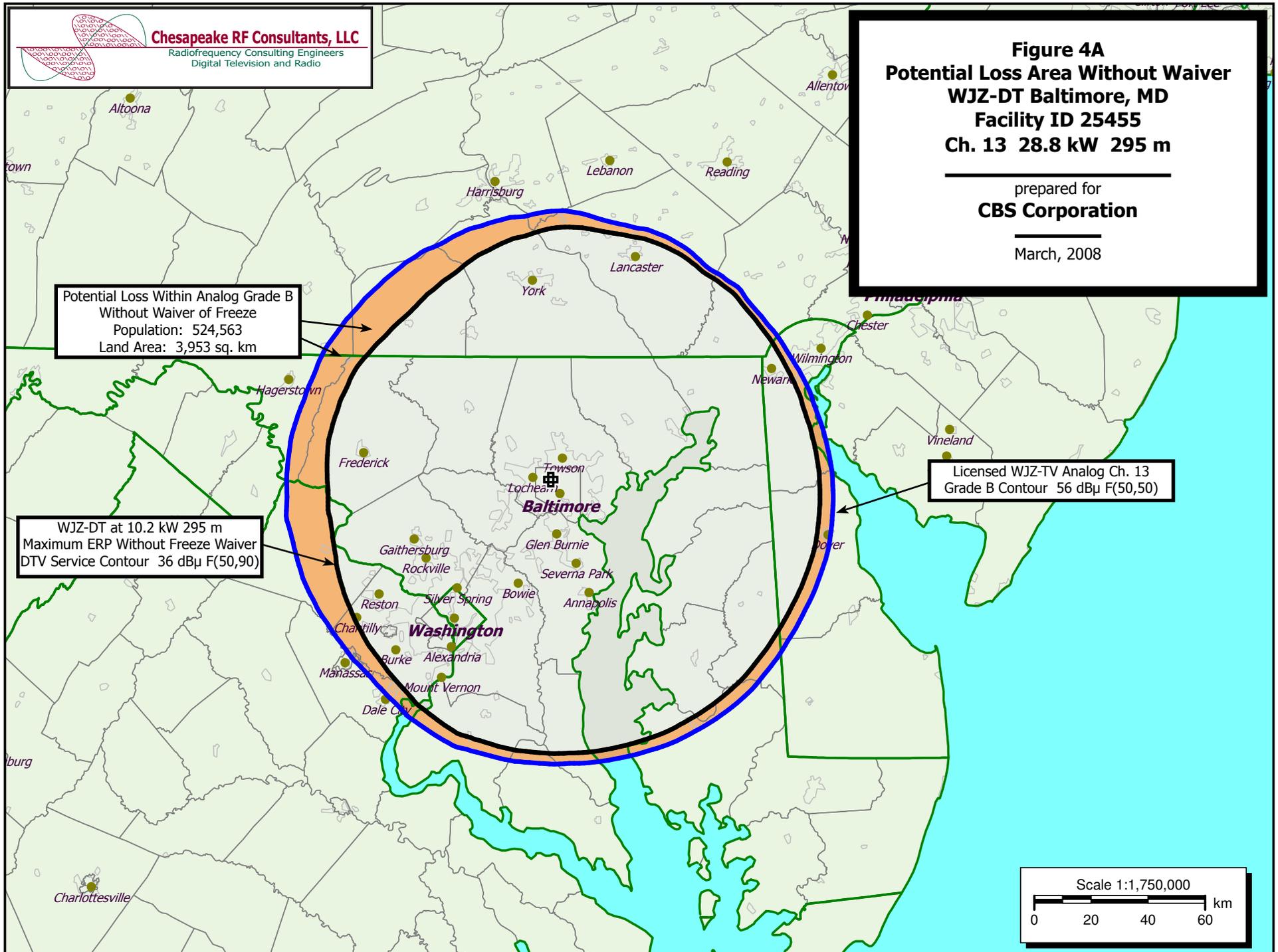
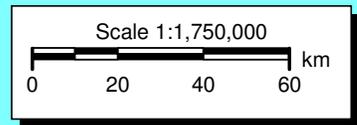
prepared for
CBS Corporation

March, 2008

Potential Loss Within Analog Grade B
Without Waiver of Freeze
Population: 524,563
Land Area: 3,953 sq. km

WJZ-DT at 10.2 kW 295 m
Maximum ERP Without Freeze Waiver
DTV Service Contour 36 dBμ F(50,90)

Licensed WJZ-TV Analog Ch. 13
Grade B Contour 56 dBμ F(50,50)



SECTION III-D - DTV Engineering	
Complete Questions 1-5, and provide all data and information for the proposed facility, as requested in Technical Specifications, Items 1-13.	
<p>Pre-Transition Certification Checklist: An application concerning a pre-transition channel must complete questions 1(a)-(c), and 2-5. A correct answer of "Yes" to all of the questions will ensure an expeditious grant of a construction permit application to change pre-transition facilities. However, if the proposed facility is located within the Canadian or Mexican borders, coordination of the proposal under the appropriate treaties may be required prior to grant of the application. An answer of "No" will require additional evaluation of the applicable information in this form before a construction permit can be granted.</p> <p>Post-Transition Expedited Processing. An application concerning a post-transition channel must complete questions 1(a), (d)-(e), and 2-5. A station applying for a construction permit to build its post-transition channel will receive expedited processing if its application (1) does not seek to expand the noise-limited service contour in any direction beyond that established by Appendix B of the Seventh Report and Order in MB Docket No. 87-268 establishing the new DTV Table of Allotments in 47 C.F.R. § 73.622(i) ("new DTV Table Appendix B"); (2) specifies facilities that match or closely approximate those defined in the new DTV Table Appendix B facilities; and (3) is filed within 45 days of the effective date of Section 73.616 of the rules adopted in the Report and Order in the Third DTV Periodic Review proceeding, MB Docket No. 07-91.</p>	
1. The proposed DTV facility complies with 47 C.F.R. Section 73.622 in the following respects:	
(a) It will operate on the DTV channel for this station as established in 47 C.F.R. Section 73.622.	<input checked="" type="radio"/> Yes <input type="radio"/> No
(b) It will operate a pre-transition facility from a transmitting antenna located within 5.0 km (3.1 miles) of the DTV reference site for this station as established in 47 C.F.R. Section 73.622.	<input type="radio"/> Yes <input checked="" type="radio"/> No
(c) It will operate a pre-transition facility with an effective radiated power (ERP) and antenna height above average terrain (HAAT) that do not exceed the DTV reference ERP and HAAT for this station as established in 47 C.F.R. Section 73.622.	<input type="radio"/> Yes <input checked="" type="radio"/> No
(d) It will operate at post-transition facilities that do not expand the noise-limited service contour in any direction beyond that established by Appendix B of the Seventh Report and Order in MB Docket No. 87-268 establishing the new DTV Table of Allotments in 47 C.F.R. § 73.622(i) ("new DTV Table Appendix B").	<input type="radio"/> Yes <input checked="" type="radio"/> No <input type="radio"/> N/A
(e) It will operate at post-transition facilities that match or reduce by no more than five percent with respect to predicted population from those defined in the new DTV Table Appendix B.	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> N/A
2. The proposed facility will not have a significant environmental impact, including exposure of workers or the general public to levels of RF radiation exceeding the applicable health and safety guidelines, and therefore will not come within 47 C.F.R. Section 1.1307. Applicant must submit the Exhibit called for in Item 13.	<input checked="" type="radio"/> Yes <input type="radio"/> No
3. Pursuant to 47 C.F.R. Section 73.625, the DTV coverage contour of the proposed facility will encompass the allotted principal community.	<input checked="" type="radio"/> Yes <input type="radio"/> No
4. The requirements of 47 C.F.R. Section 73.1030 regarding notification to radio astronomy installations, radio receiving installations and FCC monitoring stations have either been satisfied or are not applicable.	<input checked="" type="radio"/> Yes <input type="radio"/> No
5. The antenna structure to be used by this facility has been registered by the Commission and will not require registration to support the proposed antenna, OR the FAA has previously determined that the proposed structure will not adversely effect safety in air navigation and this structure qualifies for later registration under the Commission's phased registration plan, OR the proposed installation on this structure does not require notification to the FAA pursuant to 47 C.F.R. Section 17.7.	<input checked="" type="radio"/> Yes <input type="radio"/> No

SECTION III-D - DTV Engineering	
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:	DTV 13 Analog TV, if any 13
2. Zone:	<input checked="" type="radio"/> I <input type="radio"/> II <input type="radio"/> III
3. Antenna Location Coordinates: (NAD 27)	Latitude: Degrees 39 Minutes 20 Seconds 05 <input checked="" type="radio"/> North <input type="radio"/> South Longitude: Degrees 76 Minutes 39 Seconds 03 <input checked="" type="radio"/> West <input type="radio"/> East
4. Antenna Structure Registration Number: 1035558	<input type="checkbox"/> Not Applicable <input type="checkbox"/> Notification filed with FAA
5. Antenna Location Site Elevation Above Mean Sea Level:	97 meters
6. Overall Tower Height Above Ground Level:	304 meters
7. Height of Radiation Center Above Ground Level:	281 meters
8. Height of Radiation Center Above Average Terrain :	295 meters

9. Maximum Effective Radiated Power (average power): 28.8 kW

10. Antenna Specifications:

a. Manufacturer DIE Model THV-10A13/VP-R C150SP

b. Electrical Beam Tilt:
0.75 degrees Not Applicable

c. Mechanical Beam Tilt:
degrees toward azimuth
degrees True Not Applicable
Attach as an Exhibit all data specified in 47 C.F.R. Section 73.625(c). [Exhibit 42]

d. Polarization:
 Horizontal Circular Elliptical

e. Directional Antenna Relative Field Values: Not applicable (Nondirectional)

[For a composite directional (not off-the-shelf) antenna, press the following button to fill in the relative field values subform.]
[Relative Field Values]

10e. Directional Antenna Relative Field Values

[Fill in this subform for a composite directional (not off-the-shelf) antenna, only.]

e. Directional Antenna Relative Field Values:
Rotation (Degrees): No Rotation

Degrees	Value	Degrees	Value	Degrees	Value	Degrees	Value	Degrees	Value	Degrees	Value
0	0.799	10	0.88	20	0.939	30	0.978	40	0.997	50	0.999
60	0.985	70	0.964	80	0.944	90	0.935	100	0.935	110	0.937
120	0.935	130	0.935	140	0.944	150	0.964	160	0.985	170	0.999
180	0.997	190	0.978	200	0.939	210	0.88	220	0.799	230	0.699
240	0.589	250	0.493	260	0.446	270	0.458	280	0.494	290	0.512
300	0.494	310	0.458	320	0.446	330	0.493	340	0.589	350	0.699
Additional Azimuths		46	1	174	1						

Relative Field Polar Plot

If a directional antenna is proposed, the requirements of 47 C.F.R. Sections 73.625(c) must be satisfied. **Exhibit required.** [Exhibit 43]

11. Does the proposed facility satisfy the pre-transition interference protection provisions of 47 C.F.R. Section 73.623(a) (Applicable only if **Certification Checklist** Items 1(a), (b), or (c) are answered "No.") and/or the post-transition interference protection provisions of 47 C.F.R. Section 73.616? Yes No [Exhibit 44]

If "No," attach as an Exhibit justification therefor, including a summary of any related previously granted waivers.

12. If the proposed facility will not satisfy the coverage requirement of 47 C.F.R. Section 73.625, attach as an Exhibit justification therefore. (Applicable only if **Certification Checklist** item 3 is answered "No.") [Exhibit 45]

13. **Environmental Protection Act. Submit in an Exhibit** the following: [Exhibit 46]
If **Certification Checklist** Item 2 is answered "Yes," a brief explanation of why an Environmental Assessment is not required. Also describe in the Exhibit the steps that will be taken to limit RF radiation exposure to the public and to persons authorized access to the tower site.

By checking "Yes" to **Certification Checklist** Item 2, 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.

If **Certification Checklist** Item 2 is answered "No," an Environmental Assessment as required by 47 C.F.R Section 1.1311.

PREPARERS CERTIFICATION ON SECTION III 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 3/7/2008	
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	

WILLFUL FALSE STATEMENTS ON THIS FORM ARE PUNISHABLE BY FINE AND/OR IMPRISONMENT (U.S. CODE, TITLE 18, SECTION 1001), AND/OR REVOCATION OF ANY STATION LICENSE OR CONSTRUCTION PERMIT (U.S. CODE, TITLE 47, SECTION 312(a)(1)), AND/OR FORFEITURE (U.S. CODE, TITLE 47, SECTION 503).

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.

