

ENGINEERING EXHIBIT

Application for Construction Permit New Replacement Digital Television Translator

prepared for

Gray Television Licensee, LLC
Proposed Digital Translator
Staunton, VA Ch. 51 0.5 kW

Gray Television Licensee, LLC (“*Gray*”) is the licensee of television station WHSV-TV, Facility ID 4688, analog Ch. 3 and digital Ch. 49, Harrisonburg, VA. Pursuant to the procedures proposed in MB Docket 08-253,¹ *Gray* herein proposes to construct a new replacement digital television translator station on Channel 51 to aid in serving Staunton, VA and vicinity.

The proposed digital translator facility will employ the existing Channel 51 antenna system currently utilized by full power television station WVPT(TV), analog Channel 51, Staunton, VA. WVPT will vacate Channel 51 at the end of the transition and continue to operate on its licensed digital Channel 11. No change to the antenna or associated supporting structure is proposed. The overall antenna structure height is less than 61 meters above ground and passes the FCC’s TOWAIR program for the transmitter location, thus FCC antenna structure registration is not necessary.

Figure 1 depicts the 51 dB μ coverage contour of the proposed translator, along with the WHSV-TV analog Channel 3 Grade B contour and WHSV-DT digital Channel 49 noise limited contour. The WHSV-DT digital Channel 49 noise-limited contour falls short of encompassing all of the analog Grade B contour area. The proposed digital translator facility’s contour will cover 4,595 persons that are within the WHSV-TV Grade B contour but beyond the WHSV-DT noise

¹Notice of Proposed Rulemaking, *Amendment of Parts 73 and 74 of the Commission’s Rules to Establish Rules for Replacement Digital Low Power Television Translator Stations*, MB Docket 08-253, FCC 08-278, released December 23, 2008.

limited contour. Thus, the proposed digital translator will provide service to a portion of the area that may lose service when WHSV-TV ceases operation.

Additionally, color tinting on **Figure 1** indicates the service areas for WHSV-DT based on the terrain-dependent Longley-Rice propagation method. Due to mountainous terrain in the Shenandoah Valley region and corresponding terrain blockage, a considerable portion of the area within the WHSV-DT noise limited contour is not expected to realize actual service from WHSV-DT. Those areas tinted blue on **Figure 1** are impacted by terrain blockage and represent potential service loss areas. The analog signal from WHSV-TV's low-band VHF Channel 3 can refract much better over terrain obstructions than the digital UHF Channel 49 facility. Thus, many analog Channel 3 viewers presently utilizing a refracted signal in terrain-shadowed areas may not be able to obtain satisfactory digital reception due to the more significant terrain blockage effect experienced on Channel 49. The proposed digital translator will provide fill-in service to some terrain-blocked areas within the WHSV-DT noise-limited contour. There are 17,236 persons within the proposed translator facility's contour that are also within the WHSV-TV Grade B contour but are not predicted by Longley-Rice to receive adequate digital Channel 49 signal level.

The proposed digital translator's service contour extends beyond the WHSV-TV Grade B contour. In the NPRM for MB Docket 08-253, the Commission stated:

"We recognize that it may be impossible for some full-service stations to site a translator that replaces a loss area without also slightly expanding the station's digital service area. Although we seek to limit these new translators to replacing service in a loss area, and not to expanding service, we tentatively conclude that we should allow *de minimis* expansion of service and seek comment on how to define the term "*de minimis*" in this context. "

For the case at hand, *Gray* has secured use of the existing WVPT Channel 51 antenna system which is located inside the WHSV-TV Grade B contour. The digital translator can be implemented using the existing antenna and building facilities at the WVPT transmitter site thus minimizing resources, eliminating the need to develop a new site, and allowing for expedited implementation. The total population within the proposed digital translator's contour is 142,603 persons, 123,413 (86.54 percent) of which are also within the WHSV-TV Grade B contour. The area where the proposed translator contour extends beyond the WHSV-TV Grade B contour contains a population

of 19,190 persons, which is 13.46 percent of the total population within the proposed translator's contour and 2.03 percent of the total population within the WHSV-TV Grade B contour (943,808 persons). Without some minor extension, it would be impossible to place the translator's service contour along the edge of the analog Grade B contour while filling in all loss areas.

Detailed interference studies per OET Bulletin 69² show that the proposal complies with the Commission's interference protection requirements toward all DTV, television translator, LPTV, and Class A stations. This analysis is based on full-power stations on their post-transition digital channels only, analog full power stations no longer being in service, and employs 2000 census data.³ 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).

Accordingly, the instant proposal complies with §§73.6012 – 73.6020 regarding interference protection to digital television, low power television, television translator, Class A television, and land mobile facilities.

The site is located within the quiet zone area specified in §73.1030(a) requiring coordination with the National Radio Astronomy Observatory ("NRAO") at Green Bank, WV. The proposed digital translator will employ the antenna system to be vacated by full power analog station WVPT. This is a horizontally-polarized slot-fed sheet antenna having over 35 dB suppression towards the protected NRAO areas. Additionally, the antenna's location is on the southeast slope of North Mountain's Elliott Knob and is thus terrain-shielded towards NRAO. The antenna was designed and coordinated with the Naval Research Laboratory in the late 1960's. WVPT is presently licensed

²FCC 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.

³The Commission has not announced procedures regarding interference analysis for digital replacement translators. Since the replacement digital translator service will not operate until the post-transition period, it is assumed that the post-transition scenario with 2000 census data will apply. Additional analysis may be supplied once a Report and Order is issued in MB Docket 08-253 should the adopted procedures materially differ.

with this antenna at 525 kW ERP in the main beam as analog, while the proposed digital translator would involve 0.5 kW ERP (500 Watts) in the main beam. The proposed ERP towards NRAO (at 304 degrees True) is less than 1 Watt, considering the antenna's directivity. The NRAO has been notified and supplied with technical details of this proposal, and does not object. A copy of NRAO's coordination letter is provided as **Attachment 1**. The proposal complies with the limit indicated thereon of 245 Watts maximum ERP at 304 degrees True.

The nearest FCC monitoring station is 244 km distant at Laurel, MD. This exceeds the threshold minimum distance specified in §73.1030(c)(3) that would suggest consideration of the monitoring station. There are no 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 areas requiring international coordination.

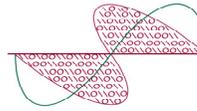
Human Exposure to Radiofrequency Electromagnetic Field (Environmental)

The proposal will involve use of an existing transmitting antenna. 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. No tower construction or change in structure height is proposed. Therefore, it is believed that this application may be categorically excluded from environmental processing pursuant to §1.1306 of the Commission's rules.

The proposed transmitting location is on Elliott Knob on North Mountain overlooking Staunton. There are other transmitting facilities at this site area, including WVPT-DT Ch. 11 and WTON-FM Ch. 232B1, both Staunton, VA. *Gray* will participate in a radiofrequency ("RF") electromagnetic field exposure safety program, along with other broadcasters and FCC licensees that utilize the Elliott Knob site area. The access road to the Elliott Knob site area requires a four wheel drive vehicle via a locked gate at the bottom of the mountain. The applicant believes that because the location is remote and is not likely to be visited by the general public, the antenna site area qualifies as an "occupational/controlled" area according to the guidelines in FCC OET Bulletin 65.

Following construction of the proposed facility, *Gray* will conduct RF exposure measurements (and/or detailed calculations) to evaluate the level of RF exposure resulting from the digital translator facility. As necessary, based on these results and considering all emitters, appropriate exposure abatement procedures will be established and followed, in order to comply with the Commission's exposure limits. Such abatement procedures may involve the restriction of access to certain areas and/or facility modifications to reduce RF levels.

Considering the post-construction measurement and an appropriate abatement program, the general public and workers will not be exposed to RF levels attributable to the proposal in excess of the Commission's guidelines. RF exposure warning signs will continue to be posted. With respect to worker safety, authorized personnel will be trained and/or supervised as necessary for access to any "controlled" areas. *Gray* 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.

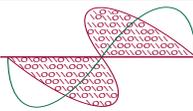
Joseph M. Davis, P.E.
April 29, 2009

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

List of Attachments

Figure 1	Coverage Contour Comparison
Table 1	Interference Analysis Results Summary
Attachment 1	NRAO Coordination Letter
Form 346	Saved Version of Engineering Sections from FCC Form at Time of Upload

This material was entered April 29, 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.

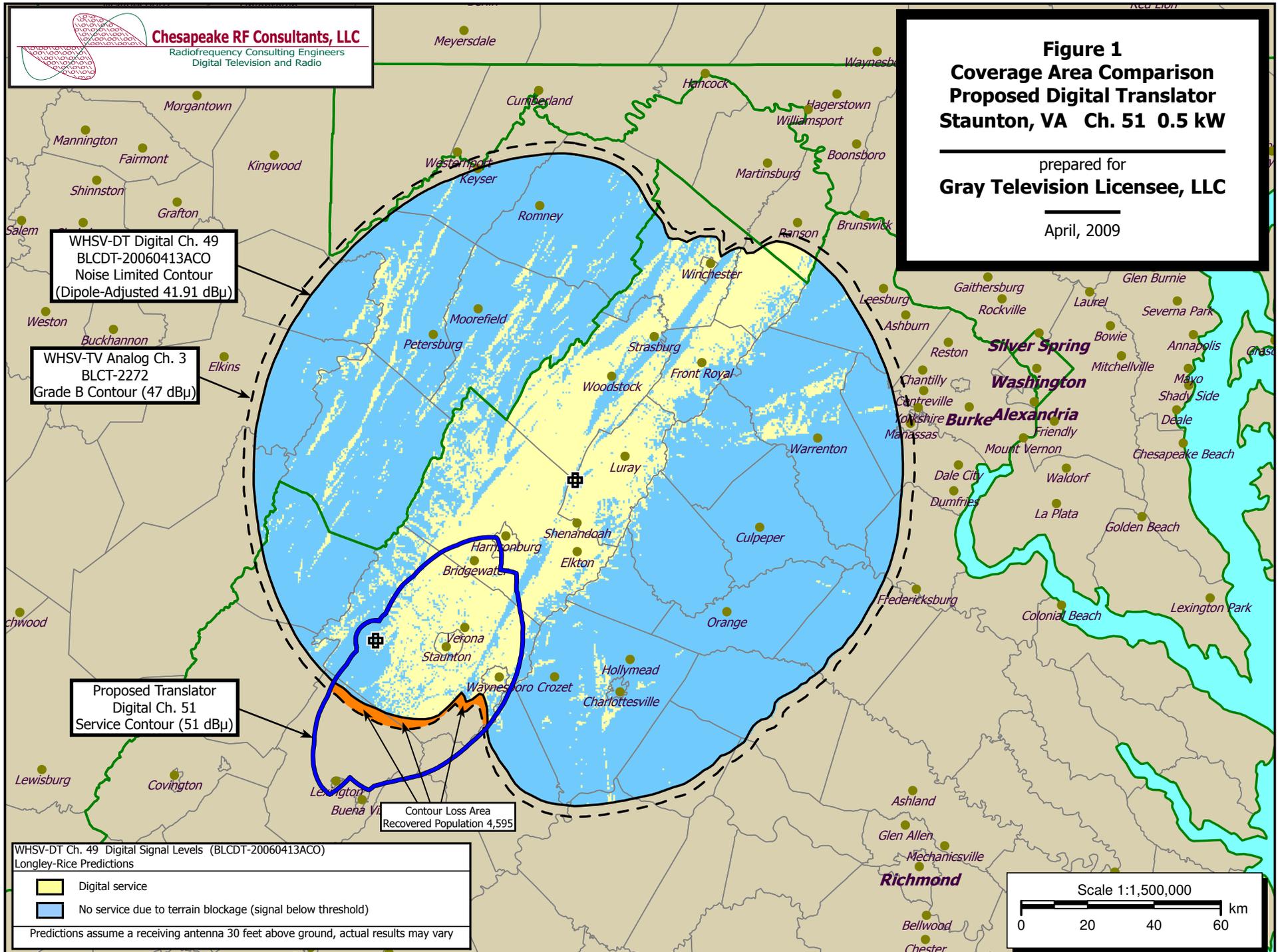


Chesapeake RF Consultants, LLC
 Radiofrequency Consulting Engineers
 Digital Television and Radio

Figure 1
Coverage Area Comparison
Proposed Digital Translator
Staunton, VA Ch. 51 0.5 kW

prepared for
Gray Television Licensee, LLC

April, 2009



WHSV-DT Digital Ch. 49
 BLCDT-20060413ACO
 Noise Limited Contour
 (Dipole-Adjusted 41.91 dBu)

WHSV-TV Analog Ch. 3
 BLCT-2272
 Grade B Contour (47 dBu)

Proposed Translator
 Digital Ch. 51
 Service Contour (51 dBu)

Contour Loss Area
 Recovered Population 4,595

WHSV-DT Ch. 49 Digital Signal Levels (BLCDT-20060413ACO)
 Longley-Rice Predictions

	Digital service
	No service due to terrain blockage (signal below threshold)

Predictions assume a receiving antenna 30 feet above ground, actual results may vary

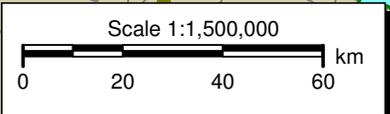
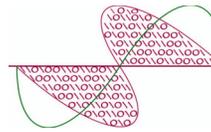


Table 1
Post-Transition
OET-69 Interference Analysis Results Summary



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

prepared for
Gray Television Licensee, LLC
 Proposed Digital Translator
 Staunton, VA Ch. 51 0.5 kW

Ch.	Call	City/State	Dist (km)	Status	Application Ref. No.	---Population (2000 Census)---	
						Baseline	New Interference
50	W50CM	CHARLOTTESVILLE VA	75.4	LIC	BLTT-20031106AJK	---	none
50	WTLU-CA	LYNCHBURG VA	107.6	LIC	BLTTA-20040812AAE	---	none
50	W50DE	MARTINSBURG WV	180.2	LIC	BLTT-20040510ABB	---	none
50	W50BD	MOOREFIELD WV	97.5	LIC	BLTT-19890920IL	---	none
50	WOAY-TV	OAK HILL WV	162.4	LIC	BLCDDT-20070426AAK	---	none
50	WOAY-TV	OAK HILL WV	162.4	CP	BPCDDT-20080619AID	---	none
51	WETA-DR	WASHINGTON DC	212.9	APP	BPRM-20080620AOX	---	none
51	W51EB	REHOBOTH DE	371.9	CP	BNPTTL-20000828ASR	---	none
51	WAGV	HARLAN KY	389.1	LIC	BLCDDT-20061012AAS	---	none
51	W51CK	TALBERT KY	353.2	LIC	BLTTL-20001201AAA	---	none
51	W51EA	OCEAN CITY MD	365.2	CP MOD	BMPPTL-20060403ANM	---	none
51	WFMY-TV	GREENSBORO NC	259.3	LIC	BLCDDT-20050628AAB	---	none
51	WEPX	GREENVILLE NC	350.3	CP MOD	BMPDDT-20080620AJW	---	none
51	W51EE-D	MARION NC	366.0	LIC	BLDDT-20080929AHK	---	none
51	W51BI	KIRTLAND OH	403.7	LIC	BLTT-19941013JD	---	none
51	W51BI	KIRTLAND OH	403.7	CP	BDFDDT-20060223ABH	---	none
51	W51CY	CHAMBERSBURG PA	230.6	CP	BDFDDT-20060307ACN	---	none
51	W51CY	CHAMBERSBURG PA	230.6	LIC	BLTT-20020812ACR	---	none
51	WTAE-TV	PITTSBURGH PA	238.9	LIC	BLCDDT-20041014AEY	---	none
51	W51DO	HAMPTON VA	279.9	LIC	BLTTL-20040213AFO	---	none
51	WAPV-LP	HONAKER VA	269.7	LIC	BLTT-19810601IN	---	none
51	WRID-LD	RICHMOND VA	166.9	CP	BDCCDTL-20061027ADC	---	none
51	W51EF-D	ROANOKE VA	103.1	CP	BDCCDTL-20061013AAR	238,880	4 (0.00%)
51	WWPX-DR	MARTINSBURG WV	142.3	APP	BPRM-20080619ALR	4,352,971	12,608 (0.29%) *
51	W51EG-D	PARKERSBURG WV	229.3	LIC	BLDDT-20081103ACQ	---	none
52	WFMA-LP	FARMVILLE VA	123.9	LIC	BLTTL-19941205JA	---	none
54	WEDD-LP	ROANOKE, ETC. VA	131.0	LIC	BLTT-19971001JC	---	none
54	W54BG	MOOREFIELD WV	97.5	LIC	BLTT-19890920IM	---	none
58	W58DK	RUCKERSVILLE, ETC. VA	85.7	LIC	BLTT-20030131AEU	---	none

* WWPX-DT rulemaking petition for Ch. 51 is mutually exclusive with WETA-DT rulemaking petition for Channel 51. Calculated interference from proposed digital translator to WWPX-DT's rulemaking (0.29%) omits interference from WETA-DT petition.



NATIONAL RADIO ASTRONOMY OBSERVATORY

POST OFFICE BOX 2
GREEN BANK, WV 24944-0002
NRQZ OFFICE TELEPHONE (304)456-2107
[HTTP://WWW.GB.NRAO.EDU/](http://www.gb.nrao.edu/)

FAX (304)456-2276
NRQZ@NRAO.EDU

Attachment 1

(page 1 of 2)

April 28, 2009

Gray Television
WHSV-TV
50 North Main Street
Harrisonburg, VA 22802

inre:

Radio Service Code:	DTV
Applicant:	Addressee
Fixed transmitter location:	Elliot Knob, VA
Coordinates:	38-09-54N
Operating Frequency:	079-18-51W
Emission Designator(s):	Evaluated for DTV operation on Channel 51 / 692 MHz
Purpose of application:	Modification of call sign WHSV-TV
FCC File Number:	Shall be provided by applicant
NRAO Coordination:	NRQZ#5779/26MAR09

Dear Applicant:

The National Radio Quiet Zone (NRQZ) office evaluated the proposed Elliot Knob, VA transmitter to determine the possible interference impact on our highly sensitive radio astronomy operations.

The National Radio Astronomy Observatory (NRAO), Green Bank, WV, does not object unless and until the **special condition** of the station license limits the effective radiated power relative to a dipole (ERPd) antenna to **245 watts** at 304 degrees true azimuth bearing.

A summary of the evaluation is to follow.

NROZ Compliance Engineering

1. Engineering submitted by Joe Davis, Chesapeake RF Consultants, April 24, 2009, indicates that the site will meet the requested ERPd limit.
2. Prior to site activation, the applicant shall arrange for a site inspection to verify implementation of the submitted and approved engineering.



NATIONAL RADIO ASTRONOMY OBSERVATORY

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FAX (304)456-2276
NRQZ@NRAO.EDU

April 28, 2009
Page 2 of 2
NRQZ#5779/26MAR09

Attachment 1

(page 2 of 2)

To assist in the regulatory requirements of this transmitter, the National Radio Quiet Zone office requests that:

Regulatory

1. The FCC places a special condition on the station license.
2. The coordinator attaches this Letter of Concurrence to the FCC application.
3. The applicant provides the NRQZ office notice of their official filing with the FCC per section 47CFR1.924 (a) (2).

The Sugar Grove Research Station, Sugar Grove, WV does not object to the granting of the referenced modification.

The National Radio Astronomy Observatory, Green Bank, WV, **does not object** to and **recommends for approval** this modification of call sign **WHSV-TV** by the FCC.

This letter **constitutes coordination** of assignment in the National Radio Quiet Zone as required by the FCC Rules and Regulations 47CFR1.924.

If I can be of assistance, please feel free to contact me.

Sincerely,

Paulette W. Woody
Interference Office
NRQZ Administrator

File: 5779.doc

PWW:pww

Cc: Joe Davis, Chesapeake RF Consultants

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:
51

2. Translator Input Channel No. : 49

3. Primary station proposed to be rebroadcast:

Facility Identifier	Call Sign	City	State	Channel
4688	WHSV-DT	HARRISONBURG	VA	49

4. Antenna Location Coordinates: (NAD 27)
 Latitude:
 Degrees 38 Minutes 09 Seconds 54 North South
 Longitude:
 Degrees 79 Minutes 18 Seconds 51 West East

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

6. Antenna Location Site Elevation Above Mean Sea Level: 1326 meters

7. Overall Tower Height Above Ground Level: 9.8 meters

8. Height of Radiation Center Above Ground Level: 6 meters

9. Maximum Effective Radiated Power (ERP): 0.5 kW

10. Transmitter Output Power: 0.012 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 RCA Model TFU-15JDA

b. Electrical Beam Tilt: 0.75 degrees Not Applicable

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

Degrees	Value	Degrees	Value	Degrees	Value	Degrees	Value	Degrees	Value	Degrees	Value
0	0.016	10	0.016	20	0.029	30	0.151	40	0.501	50	0.989
60	0.638	70	0.7	80	0.7	90	0.692	100	0.661	110	0.646
120	0.638	130	0.638	140	0.638	150	0.646	160	0.661	170	0.668
180	0.716	190	0.603	200	0.851	210	0.359	220	0.120	230	0.040
240	0.018	250	0.016	260	0.016	270	0.016	280	0.016	290	0.016
300	0.016	310	0.016	320	0.016	330	0.016	340	0.016	350	0.016
Additional Azimuths	49	1.0	64	0.861	182	0.785	196	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.

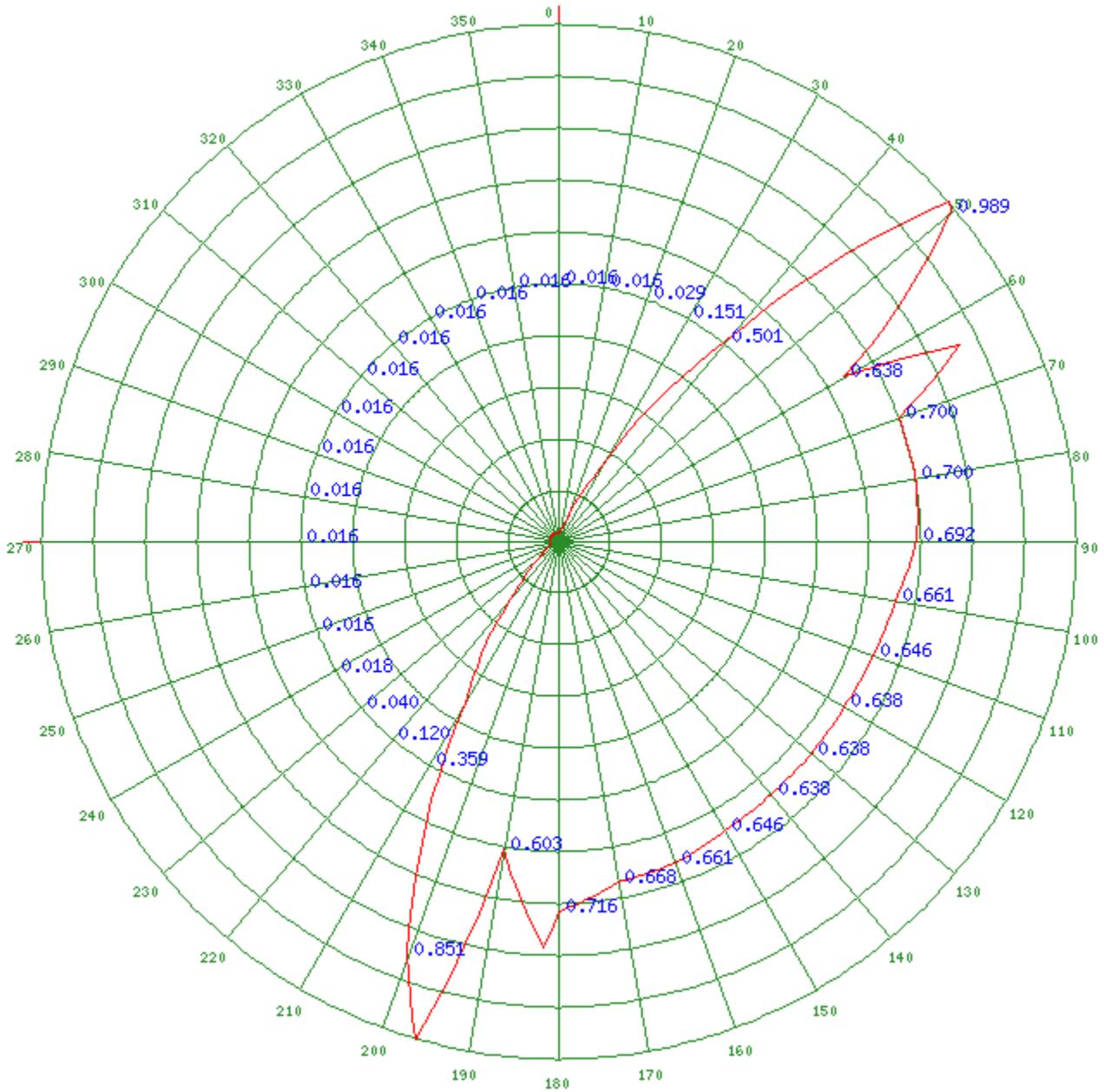
SECTION III PREPARER'S CERTIFICATION

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 4/29/2009	
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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