

ENGINEERING EXHIBIT

Incentive Auction Channel Reassignment

Application for Minor Modification of Digital Television Station Construction Permit

prepared for

Gray Television Licensee, LLC

WTAP-TV Parkersburg, WV

Facility ID 4685

Ch. 35 350 kW 202 m

Gray Television Licensee, LLC (“Gray”) is the licensee of digital television station WTAP-TV, Channel 49, Facility ID 4685, Parkersburg WV. Reassignment of WTAP-TV from Channel 49 to Channel 35 was specified in the *Incentive Auction Closing and Channel Reassignment Public Notice* (“CCRPN”, DA 17-317, released April 13, 2017). A Construction Permit (“CP” file# 0000025208) authorizes WTAP-TV to operate on Channel 35 at 740 kW effective radiated power (“ERP”) with a nondirectional antenna at 199 meters height above average terrain (“HAAT”). *Gray* proposes herein a minor modification of the reassignment CP to reduce the ERP to 350 kW, increase antenna HAAT to 202 meters, and change the nondirectional antenna model. No other changes are sought.

As with the current authorization, the proposed Channel 35 operation will employ a new antenna system to be side-mounted on the WTAP-TV tower in lieu of the existing Channel 49 antenna. The existing tower structure corresponds to FCC Antenna Structure Registration number 1239800. No change to the overall structure height will result.

The proposed antenna is an elliptically polarized nondirectional Dielectric model TFU-18JSC/VP-R O4 (25 percent vertical polarization). The horizontally polarized ERP is 350 kW and the vertically polarized ERP is 87.5 kW.

Figure 1 supplies a map that demonstrates compliance with §73.625(a)(1) regarding coverage of the entire principal community. The proposed facility's predicted population exceeds 95 percent of the *CCRPN* baseline facility's population.

At 740 kW ERP, the presently authorized WTAP-TV noise limited service contour ("NLSC") extends beyond that of the *CCRPN* facility and resulted from a minor modification application filed during the second filing window.¹ The modifications sought herein provide an NLSC which also exceeds that of the *CCRPN* facility but is within that of the present authorization. A comparison map of the WTAP-TV authorized, proposed, and reassignment NLSC is provided as Figure 2. Therefore, the proposal complies with the FCC's NLSC expansion "freeze" Public Notice² of April 5, 2013 (DA 13-618) to the extent it may be applicable to reassigned stations such as WTAP-TV.

Interference study per FCC OET Bulletin 69³ shows that the proposal complies with the 0.5 percent limit of new interference caused to pertinent nearby post-auction full service and Class A television stations and reassignments as required by §73.616. The interference study output report is provided as Table 1.

The site location is within the Canadian coordination zone (268 km to the Canada border). No further coordination with Canada should be required, since the proposal seeks a reduced facility from that of the existing authorization and no extension of NLSC will result.

¹Public Notice *"Incentive Auction Task Force and Media Bureau Announce the Opening of the Second Filing Window for Eligible Full Power and Class A Television Station—October 3 Through November 2, 2017"* DA 17-911, released September 20, 2017.

²*"Media Bureau Announces Limitations on the Filing and Processing of Full Power and Class A Television Station Modification Applications, Effective Immediately, and Reminds Stations of Spectrum Act Preservation Mandate,"* DA 13-618, Public Notice, released April 5, 2013.

³FCC Office of Engineering and Technology Bulletin number 69, *Longley-Rice Methodology for Evaluating TV Coverage and Interference*, February 6, 2004. This analysis employed the FCC's current "TVStudy" software with the default application processing template settings, 2 km cell size, and 1 km terrain increment. Comparisons of various results of this computer program (run on a Mac processor) to the FCC's implementation of TVStudy show excellent correlation.

Human Exposure to Radiofrequency Electromagnetic Field (Environmental)

The proposed operation was evaluated for human exposure to RF energy using the procedures outlined in the FCC's OET Bulletin Number 65. Based on OET-65 equation (10), and considering 12 percent antenna relative field in downward elevations (pattern data shows less than 12 percent relative field at angles 10 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 $11.9 \mu\text{W}/\text{cm}^2$, which is 3.3 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. This exhibit is limited to the evaluation of exposure to RF electromagnetic field. No increase in structure height is proposed.

List of Attachments

Figure 1	Proposed Coverage Contours
Figure 2	Coverage Contour Comparison
Table 1	TVStudy Analysis of Proposal
Form 2100	Saved Version of Engineering Sections of FCC Form at Time of Upload

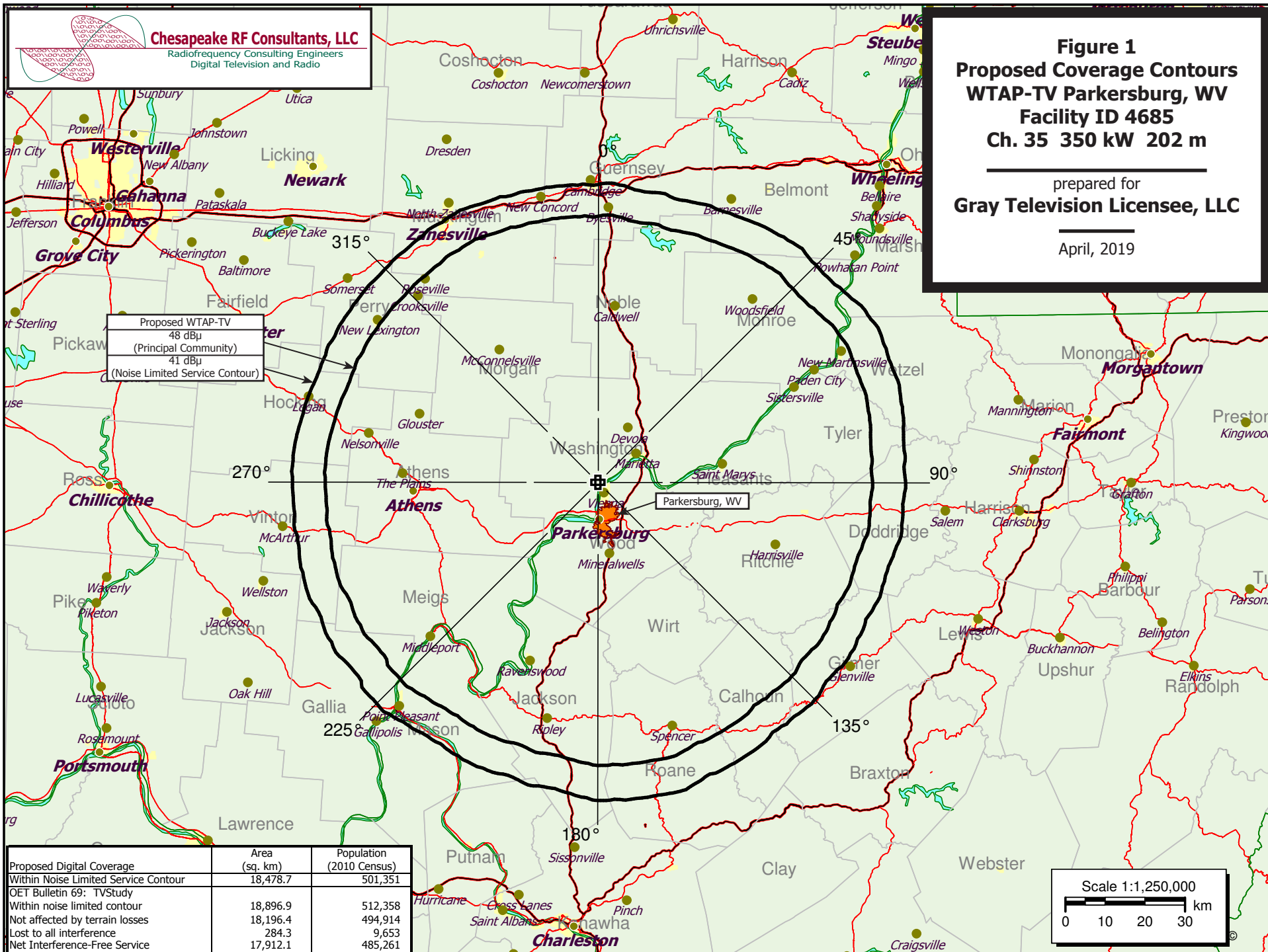
Chesapeake RF Consultants, LLC

Joseph M. Davis, P.E.	April 26, 2019	
207 Old Dominion Road	Yorktown, VA 23692	703-650-9600

Figure 1
Proposed Coverage Contours
WTAP-TV Parkersburg, WV
Facility ID 4685
Ch. 35 350 kW 202 m

prepared for
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April, 2019





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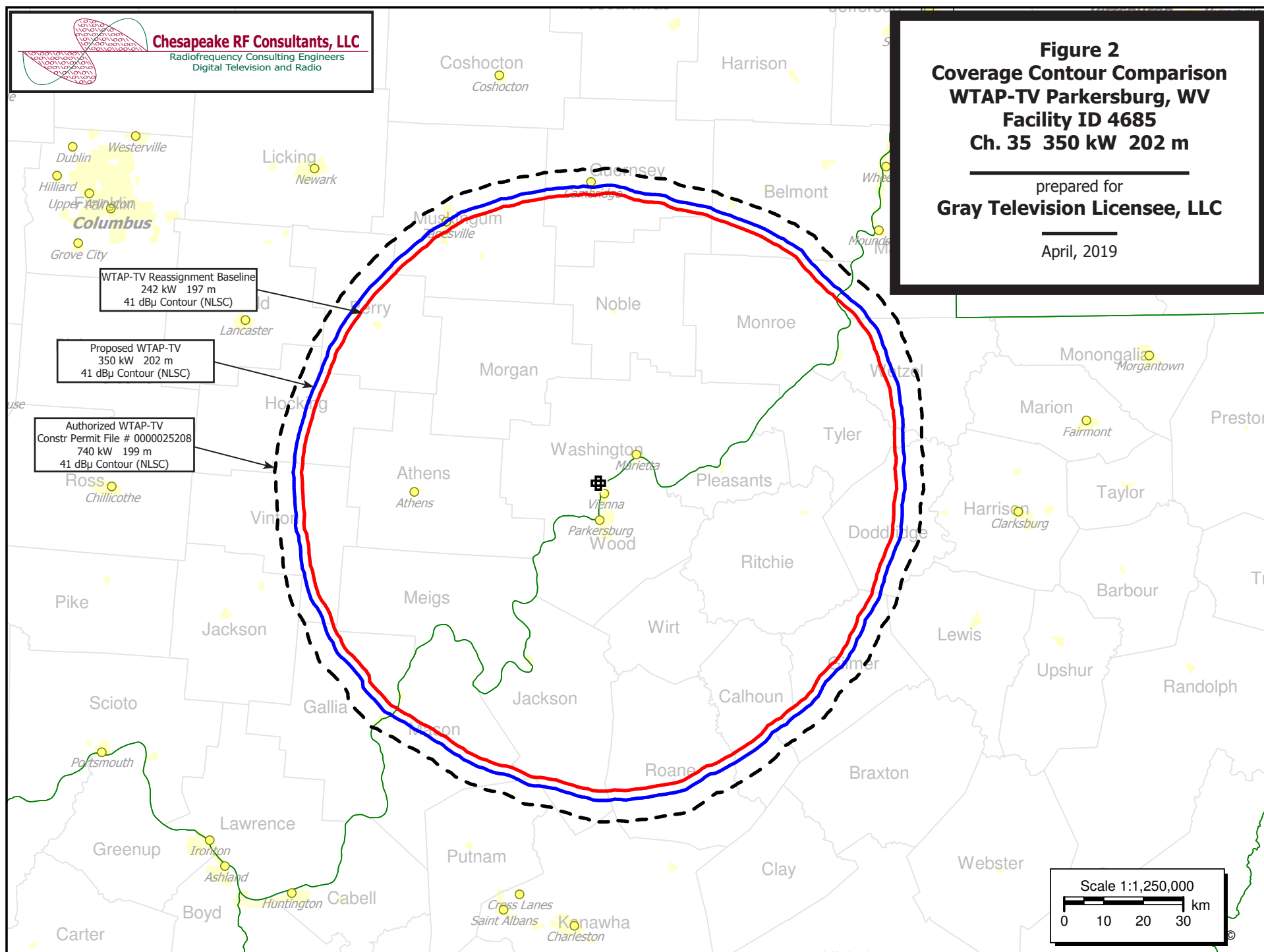


Table 1 WTAP-TV TVStudy Analysis of Proposal (page 1 of 4)



tvstudy v2.2.5 (4uoc83)
Database: localhost, Study: WTAP-TV modify, Model: Longley-Rice
Start: 2019.04.25 13:38:36

Study created: 2019.04.25 13:38:36

Study build station data: LMS TV 2019-04-25

Proposal: WTAP-TV D35 DT APP PARKERSBURG, WV
File number: WTAP-TV modify
Facility ID: 4685
Station data: User record
Record ID: 2693
Country: U.S.
Zone: I

Search options:
Baseline record excluded if station has CP

Stations potentially affected by proposal:

IX	Call	Chan	Svc	Status	City, State	File Number	Distance
No	WKEF	D34	DT	CP	DAYTON, OH	BLANK0000034522	234.3 km
No	WSLS-TV	D34	DT	CP	ROANOKE, VA	BLANK0000029619	269.0
Yes	WNPB-TV	D34	DT	CP	MORGANTOWN, WV	BLANK0000034624	159.3
Yes	WKLE	D35	DT	CP	LEXINGTON, KY	BLANK0000034653	290.1
No	WFMY-TV	D35	DT	CP	GREENSBORO, NC	BLANK0000028086	415.5
Yes	WVIZ	D35	DT	CP	CLEVELAND, OH	BLANK0000034584	226.6
Yes	WPTD	D35	DT	CP	DAYTON, OH	BLANK0000026763	233.8
Yes	WJAC-TV	D35	DT	CP	JOHNSTOWN, PA	BLANK0000027312	247.9
No	WAHU-CD	D35	DC	CP	CHARLOTTESVILLE, VA	BLANK0000034100	307.7
No	WPXW-TV	D35	DT	CP	MANASSAS, VA	BLANK0000068032	386.8
No	WKAS	D36	DT	CP	ASHLAND, KY	BLANK0000034657	134.4
No	WQHS-DT	D36	DT	CP	CLEVELAND, OH	BLANK0000063135	226.2
No	WRGT-TV	D36	DT	CP	DAYTON, OH	BLANK0000034495	234.3
No	WWLM-CD	D36	DC	CP	WASHINGTON, PA	BLANK0000027840	147.3
No	WFXR	D36	DT	CP	ROANOKE, VA	BLANK0000027724	269.2

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied:

Channel: D35
Latitude: 39 20 59.80 N (NAD83)
Longitude: 81 33 55.40 W
Height AMSL: 430.6 m
HAAT: 201.6 m
Peak ERP: 350 kW
Antenna: Omnidirectional
Elev Pattn: Generic
Elec Tilt: 0.75

40.8 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	350 kW	171.9 m	75.3 km
45.0	350	203.7	77.7
90.0	350	202.0	77.6
135.0	350	200.0	77.4
180.0	350	235.3	80.1
225.0	350	219.5	78.9
270.0	350	196.7	77.2
315.0	350	183.7	76.2

**Proposal is within coordination distance of Canadian border
Distance to Canadian border: 268.0 km

Distance to Mexican border: 2061.8 km

Conditions at FCC monitoring station: Laurel MD
Bearing: 91.4 degrees Distance: 408.8 km

Table 1 WTAP-TV TVStudy Analysis of Proposal
(page 2 of 4)



Proposal is not within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:
Bearing: 280.1 degrees Distance: 2017.9 km

Study cell size: 2.00 km
Profile point spacing: 1.00 km

Maximum new IX to full-service and Class A: 0.50%
Maximum new IX to LPTV: 2.00%

Interference to BLANK0000034624 CP scenario 1

Desired:	Call WNPB-TV	Chan D34	Svc DT	Status CP	City, State MORGANTOWN, WV	File Number BLANK0000034624	Distance			
Undesireds:	WTAP-TV	D35	DT	BL	PARKERSBURG, WV	DTVBL4685	159.3 km			
	WTAP-TV	D35	DT	APP	PARKERSBURG, WV	WTAP-TV modify	159.3			
	WRC-TV	D34	DT	CP	WASHINGTON, DC	BLANK0000034340	245.3			
	WKBW-TV	D34	DT	CP	BUFFALO, NY	BLANK0000034829	340.6			
	WKEF	D34	DT	CP	DAYTON, OH	BLANK0000034522	384.1			
	WSLS-TV	D34	DT	CP	ROANOKE, VA	BLANK0000029619	279.3			
	WJAC-TV	D35	DT	CP	JOHNSTOWN, PA	BLANK0000027312	100.2			
Service area		Terrain-limited		IX-free, before		IX-free, after		Percent New IX		
30744.0	2,139,250	27149.1	1,950,901	26590.9	1,931,234	26582.9	1,931,189	0.03	0.00	
Undesired				Total IX	Unique IX, before		Unique IX, after			
WTAP-TV D35 DT BL		23.9	744		19.9		694			
WTAP-TV D35 DT APP		35.9	863				27.9		739	
WRC-TV D34 DT CP		212.3	4,464		188.2		4,229		188.2 4,229	
WKBW-TV D34 DT CP		28.1	3,715		24.1		3,553		24.1 3,553	
WKEF D34 DT CP		27.8	679		23.8		629		19.9 555	
WSLS-TV D34 DT CP		12.0	59		4.0		29		4.0 29	
WJAC-TV D35 DT CP		286.2	10,453		266.0		10,086		266.0 10,086	

Interference to BLANK0000034653 CP scenario 1

Desired:	Call WKLE	Chan D35	Svc DT	Status CP	City, State LEXINGTON, KY	File Number BLANK0000034653	Distance
Undesireds:	WTAP-TV	D35	DT	BL	PARKERSBURG, WV	DTVBL4685	290.2 km
	WTAP-TV	D35	DT	APP	PARKERSBURG, WV	WTAP-TV modify	290.1
	WTWO	D35	DT	CP	TERRE HAUTE, IN	BLANK0000028193	306.5
	WPTD	D35	DT	CP	DAYTON, OH	BLANK0000026763	204.8
	WTCI	D35	DT	CP	CHATTANOOGA, TN	BLANK0000034751	309.0
	WAVE	D36	DT	CP	LOUISVILLE, KY	BLANK0000034345	142.3
Service area		Terrain-limited		IX-free, before		IX-free, after	Percent New IX
15514.6	856,308	14933.8	846,630	14574.4	840,591	14574.4	840,591
						0.00	0.00
Undesired				Total IX	Unique IX, before	Unique IX, after	
WTAP-TV D35 DT BL				376	4.0	40	
WTAP-TV D35 DT APP				387		4.0	40
WTWO D35 DT CP				4.0	0	4.0	0
WPTD D35 DT CP				343.4	5,851	319.6	5,295
WTCI D35 DT CP				8.0	220	0.0	0
WAVE D36 DT CP				7.9	148	7.9	148

Interference to BLANK0000034584 CP scenario 1

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	WVIZ	D35	DT	CP	CLEVELAND, OH	BLANK0000034584	
Undesireds:	WTAP-TV	D35	DT	BL	PARKERSBURG, WV	DTVBL4685	226.5 km
	WTAP-TV	D35	DT	APP	PARKERSBURG, WV	WTAP-TV modify	226.6
	WPTD	D35	DT	CP	DAYTON, OH	BLANK0000026763	284.6
	WJAC-TV	D35	DT	CP	JOHNSTOWN, PA	BLANK0000027312	253.9

Table 1 WTAP-TV TVStudy Analysis of Proposal
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WQHS-DT		D36	DT	CP	CLEVELAND, OH		BLANK0000063135		1.1	
Service area			Terrain-limited		IX-free, before		IX-free, after		Percent New IX	
20303.5	3,745,550	20118.8	3,729,028	19826.6	3,677,647	19814.6	3,677,539	0.06	0.00	
1076.1	0	1076.1	0	1076.1	0	1076.1	0	0.00	0.00	
(in Canada)										
Undesired			Total IX		Unique IX, before		Unique IX, after			
WTAP-TV	D35 DT BL	147.7	22,918	83.8	7,191					
WTAP-TV	D35 DT APP	171.8	23,244			95.9	7,299			
WPTD	D35 DT CP	35.9	1,262	4.0	46	0.0	0			
WJAC-TV	D35 DT CP	116.4	20,671	68.4	5,858	60.4	5,686			
WQHS-DT	D36 DT CP	72.1	22,689	64.0	22,414	64.0	22,414			

Interference to BLANK0000026763 CP scenario 1										
Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance			
	WPTD	D35	DT	CP	DAYTON, OH	BLANK0000026763				
Undesireds:	WTAP-TV	D35	DT	BL	PARKERSBURG, WV	DTVBL4685	233.8 km			
	WTAP-TV	D35	DT	APP	PARKERSBURG, WV	WTAP-TV modify	233.8			
	WKEF	D34	DT	CP	DAYTON, OH	BLANK0000034522	0.6			
	WTWO	D35	DT	CP	TERRE HAUTE, IN	BLANK0000028193	274.7			
	WKLE	D35	DT	CP	LEXINGTON, KY	BLANK0000034653	204.8			
	WVIZ	D35	DT	CP	CLEVELAND, OH	BLANK0000034584	284.6			
	WRGT-TV	D36	DT	CP	DAYTON, OH	BLANK0000034495	0.6			

Service area			Terrain-limited		IX-free, before		IX-free, after		Percent New IX	
25491.2	3,423,417	25327.5	3,411,727	24983.5	3,377,725	24863.7	3,373,519	0.48	0.12	
Undesired			Total IX		Unique IX, before		Unique IX, after			
WTAP-TV	D35 DT BL	144.0	7,602	99.9	6,477					
WTAP-TV	D35 DT APP	275.8	12,054			219.6	10,683			
WKEF	D34 DT CP	88.0	20,167	64.0	14,269	64.0	14,269			
WTWO	D35 DT CP	59.9	3,286	47.9	2,049	47.9	2,049			
WKLE	D35 DT CP	19.9	3,441	12.0	2,629	12.0	2,629			
WVIZ	D35 DT CP	76.3	1,148	40.2	662	28.1	416			
WRGT-TV	D36 DT CP	32.1	6,123	8.0	225	8.0	225			

Interference to BLANK0000027312 CP scenario 1										
Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance			
	WJAC-TV	D35	DT	CP	JOHNSTOWN, PA	BLANK0000027312				
Undesireds:	WTAP-TV	D35	DT	BL	PARKERSBURG, WV	DTVBL4685	247.9 km			
	WTAP-TV	D35	DT	APP	PARKERSBURG, WV	WTAP-TV modify	247.9			
	WNPB-TV	D34	DT	CP	MORGANTOWN, WV	BLANK0000034624	100.2			
	WENY-TV	D35	DT	CP	ELMIRA, NY	BLANK0000034793	253.1			
	WVIZ	D35	DT	CP	CLEVELAND, OH	BLANK0000034584	253.9			
	WPXW-TV	D35	DT	CP	MANASSAS, VA	BLANK0000068032	224.2			
	WITF-TV	D36	DT	APP	HARRISBURG, PA	BLANK0000035782	179.0			

Service area			Terrain-limited		IX-free, before		IX-free, after		Percent New IX	
29189.6	2,219,529	24695.4	1,897,986	23996.7	1,833,539	23960.5	1,825,951	0.15	0.41	
Undesired			Total IX		Unique IX, before		Unique IX, after			
WTAP-TV	D35 DT BL	124.8	29,589	44.3	3,204					
WTAP-TV	D35 DT APP	173.0	39,452			80.4	10,792			
WNPB-TV	D34 DT CP	104.4	7,909	68.2	3,752	68.2	3,752			
WENY-TV	D35 DT CP	76.3	1,270	44.1	951	40.1	846			
WVIZ	D35 DT CP	160.9	37,190	84.4	17,717	76.4	15,547			
WPXW-TV	D35 DT CP	389.3	34,671	333.1	9,564	333.1	9,564			

Interference to proposal scenario 1										
1.95% interference received										
Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance			
	WTAP-TV	D35	DT	APP	PARKERSBURG, WV	WTAP-TV modify				
Undesireds:	WVIZ	D35	DT	CP	CLEVELAND, OH	BLANK0000034584	226.6 km			

Table 1 WTAP-TV TVStudy Analysis of Proposal
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WPTD		D35	DT	CP	DAYTON, OH	BLANK0000026763	233.8
WJAC-TV		D35	DT	CP	JOHNSTOWN, PA	BLANK0000027312	247.9
Service area		Terrain-limited		IX-free		Percent IX	
18896.9	512,358	18196.4		494,914	17912.1	485,261	1.56 1.95
Undesired		Total IX		Unique IX		Prcnt Unique IX	
WVIZ	D35 DT CP	148.6		5,281	76.5	1,779	0.42 0.36
WPTD	D35 DT CP	191.8		7,755	123.7	4,287	0.68 0.87
WJAC-TV	D35 DT CP	16.0		119	12.0	85	0.07 0.02

Channel and Facility Information

Section	Question	Response
Proposed Community of License	Facility ID	4685
	State	West Virginia
	City	PARKERSBURG
	DTV Channel	35
	Designated Market Area	Parkersburg
Facility Type	Facility Type	Commercial
	Station Type	Main
Zone	Zone	1

Antenna Location Data

Section	Question	Response
Antenna Structure Registration	Do you have an FCC Antenna Structure Registration (ASR) Number?	Yes
	ASR Number	1239800
Coordinates (NAD83)	Latitude	39° 20' 59.8" N+
	Longitude	081° 33' 55.4" W-
	Structure Type	TOWER-A free standing or guyed struct
	Overall Structure Height	141.1 meters
	Support Structure Height	140.2 meters
	Ground Elevation (AMSL)	295.7 meters
Antenna Data	Height of Radiation Center Above Ground Level	134.9 meters
	Height of Radiation Center Above Average Terrain	201.6 meters
	Height of Radiation Center Above Mean Sea Level	430.6 meters
	Effective Radiated Power	350 kW

Antenna Technical Data

Section	Question	Response
Antenna Type	Antenna Type	Non-Directional
	Do you have an Antenna ID?	
	Antenna ID	
Antenna Manufacturer and Model	Manufacturer:	DIE
	Model	TFU-18JSC/VP-R O4
	Rotation	
	Electrical Beam Tilt	0.75
	Mechanical Beam Tilt	Not Applicable
	toward azimuth	
	Polarization	Elliptical
DTV and DTS: Elevation Pattern	Does the proposed antenna propose elevation radiation patterns that vary with azimuth for reasons other than the use of mechanical beam tilt?	No
	Uploaded file for elevation antenna (or radiation) pattern data	

**Construction
Permit
Certifications**

Section	Question	Response
Post-Incentive Auction Expedited Processing	It will operate on the DTV channel for this station as established in the post-incentive auction channel reassignment public notice.	Yes
	It will operate post-incentive auction facilities that do not expand the noise-limited service contour in any direction beyond that established by the post-incentive auction channel reassignment public notice.	No
	It will operate post-incentive auction facilities that match or reduce by no more than five percent with respect to predicted population from those defined in the post-incentive auction channel reassignment public notice.	Yes
	The antenna structure to be used by this facility has been registered by the Commission and will not require re-registration to support the proposed antenna, OR the FAA has previously determined that the proposed structure will not adversely affect 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.	Yes
Environmental Effect	Would a Commission grant of Authorization for this location be an action which may have a significant environmental effect? (See Section 1.1306 of 47 C.F.R.)	No
Broadcast Facility	The proposed facility complies with the applicable engineering standards and assignment requirements of 47 C. F.R. Sections 73.616, 73.622(i), 73.623(e), 73.625, 73.1030, and 73.1125.	Yes