

ENGINEERING EXHIBIT

Application for Minor Modification of Construction Permit Digital Replacement Translator Television Station

prepared for

Gray Television Licensee, LLC

WOIO(DT) Shaker Heights, OH

Facility ID 39746

DRT Ch. 18 (digital) 15 kW

Gray Television Licensee, LLC (“Gray”) is the licensee of television station WOIO(DT), Shaker Heights OH, Facility ID 39746. WOIO’s operation includes a Digital Replacement Translator (“DRT”) facility on Channel 24 (BLCDT-20110817AAW) to aid in serving Akron, OH and other nearby communities. As a result of the Special Displacement Window,¹ a Construction Permit (“CP” file# 0000054106) authorizes the WOIO DRT to operate on Channel 18 at 11 kW effective radiated power (“ERP”) with a directional antenna. *Gray* proposes herein a minor modification of the displacement CP to utilize a different directional antenna pattern and increased ERP of 15 kW. No change in site location is proposed.

The WOIO DRT will continue to utilize the tower structure associated with FCC Antenna Structure Registration number 1047963. As proposed herein, the WOIO DRT will utilize a replacement antenna to be side-mounted on the tower. No change to the overall structure height is proposed.

The proposed directional antenna is a Dielectric model DLP-12H/VP having elliptical polarization. The ERP is 15 kW using a “full service” out of channel emission mask. A plot of the directional antenna’s azimuthal pattern is supplied in Figure 1. Figure 2 depicts the 51 dBμ coverage contour of the licensed Channel 24 DRT facility and those of the Channel 18 CP and proposed facilities, demonstrating compliance with §73.3572 for a minor change.

¹“*Incentive Auction Task Force and Media Bureau Announce Post-Incentive Auction Special Displacement Window April 10, 2018, through May 15, 2018, and Make Location and Channel Data Available,*” Public Notice, DA 18-124, released February 9, 2018.

As with the licensed DRT facility on Channel 24, the proposed DRT Channel 18 coverage contour (51 dBμ) extends beyond WOIO's former analog Grade B contour. Owing to the directional antenna pattern for Channel 18 necessary to provide compliance with the FCC's interference limits to other stations, the proposed Channel 18 DRT facility's contour cannot precisely match that of the licensed Channel 24 DRT facility. In the region outside the WOIO former analog Grade B contour, Figure 3 demonstrates that the proposed Channel 18 DRT facility's contour extends slightly beyond that of the licensed Channel 24 DRT over a small area.

The net change in the DRT's 51 dBμ contour extension beyond the WOIO former Grade B contour is a reduction in population of 1,157 persons and an increase in area of 10.6 square kilometers. This can be considered a *de minimis* increase in the area of coverage contour extension. According to FCC TVStudy analysis, the proposed Channel 18 DRT would achieve an interference-free service population of 1,791,041 persons, which is a reduction in service of 266,074 persons from the 2,057,115 interference-free population of the licensed Channel 24 DRT. Without the additional minor contour extension, the DRT's loss of population would be even higher.

Interference study per OET Bulletin 69² shows that the proposal complies with the FCC's interference protection requirements toward all digital television, television translator, LPTV, and Class A stations (existing and post-auction). FCC processing of this proposal is requested using a **1.0 km cell size and 0.2 km terrain profile increment**. The results, summarized in Table 1, show that any new interference does not exceed the FCC's interference limits (0.5 percent to full power and Class A stations, and 2.0 percent to secondary stations) to any facility except with respect to W43CZ-D which does not present a conflict for the proposal.

The authorized W43CZ-D facility (file# 0000053016, Ch. 18, Facility ID 50138, Mansfield OH) would receive 7.44 percent interference from the proposed WOIO DRT, which

²FCC Office of Engineering and Technology Bulletin number 69, *Longley-Rice Methodology for Evaluating TV Coverage and Interference*, February 6, 2004 ("OET-69"). This analysis employed the FCC's current "TVStudy" software with the default application processing template settings, 1 km cell size, and 0.2 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.

exceeds the 2.0 percent limit towards LPTV stations. However, this is a reduction in the 7.47 percent interference caused to W43CZ-D by the existing WOIO DRT CP facility (0000054106) and is therefore permissible. Table 2 supplies interference study details regarding the impact to W43CZ-D from the authorized and proposed WOIO DRT.

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 10 percent antenna relative field in downward elevations (pattern data shows less than 10 percent relative field at angles 15 – 90 degrees below the horizontal), the calculated signal density near the tower at two meters above ground level attributable to the proposed facility is $0.1 \mu\text{W}/\text{cm}^2$, which is 0.03 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.

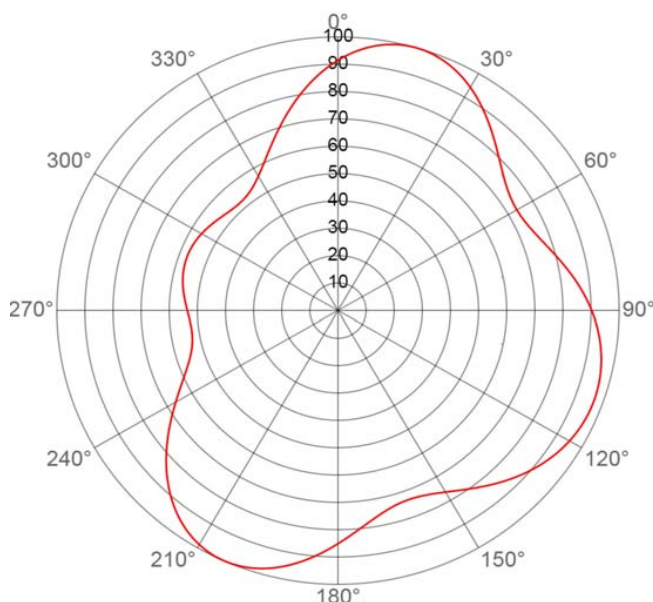
The general public will not be exposed to RF levels attributable to the proposal in excess of the FCC's guidelines. RF exposure warning signs will continue to be posted. With respect to worker safety, the applicant will coordinate exposure procedures with all pertinent stations and will reduce power 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. 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	Antenna Azimuthal Pattern
Figure 2	Coverage Contour Comparison
Figure 3	Coverage Contour Comparison – With Former Analog Grade B
Table 1	TVStudy Analysis of Proposal
Table 2	Interference Study Details Regarding W43CZ-D
Form 2100	Engineering Data for FCC Form 2100

Chesapeake RF Consultants, LLC

Joseph M. Davis, P.E.	June 11, 2019	
207 Old Dominion Road	Yorktown, VA 23692	703-650-9600



Horizontal Polarization AZIMUTH PATTERN

Exhibit No.

Date **3 May 2019**Call Letters **WOIO-DRT**Channel **18**Antenna Type **DLP-12H**Location **Akron OH**Customer **Gray TV WOIO**Gain **1.6 (2.04 dB)****Calculated**Drawing # **h-pattern_ch30**

Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	0.915	36	0.890	72	0.777	108	0.967	144	0.804	180	0.852	216	0.951	252	0.553	288	0.571	324	0.535
1	0.924	37	0.880	73	0.783	109	0.968	145	0.797	181	0.861	217	0.942	253	0.548	289	0.571	325	0.539
2	0.934	38	0.871	74	0.790	110	0.968	146	0.790	182	0.871	218	0.934	254	0.543	290	0.571	326	0.543
3	0.942	39	0.861	75	0.797	111	0.968	147	0.783	183	0.880	219	0.924	255	0.539	291	0.571	327	0.548
4	0.951	40	0.852	76	0.804	112	0.967	148	0.777	184	0.890	220	0.915	256	0.535	292	0.571	328	0.553
5	0.958	41	0.842	77	0.811	113	0.966	149	0.771	185	0.899	221	0.904	257	0.532	293	0.570	329	0.560
6	0.965	42	0.833	78	0.818	114	0.965	150	0.765	186	0.908	222	0.894	258	0.529	294	0.570	330	0.566
7	0.971	43	0.824	79	0.825	115	0.964	151	0.760	187	0.917	223	0.883	259	0.528	295	0.568	331	0.574
8	0.977	44	0.814	80	0.833	116	0.962	152	0.755	188	0.925	224	0.871	260	0.526	296	0.567	332	0.582
9	0.982	45	0.806	81	0.840	117	0.960	153	0.751	189	0.934	225	0.859	261	0.525	297	0.566	333	0.591
10	0.987	46	0.797	82	0.848	118	0.957	154	0.746	190	0.942	226	0.847	262	0.525	298	0.564	334	0.600
11	0.991	47	0.789	83	0.855	119	0.954	155	0.743	191	0.949	227	0.835	263	0.525	299	0.562	335	0.610
12	0.994	48	0.782	84	0.862	120	0.951	156	0.740	192	0.956	228	0.822	264	0.526	300	0.560	336	0.620
13	0.996	49	0.775	85	0.869	121	0.947	157	0.738	193	0.963	229	0.809	265	0.527	301	0.558	337	0.631
14	0.998	50	0.768	86	0.876	122	0.944	158	0.736	194	0.969	230	0.796	266	0.528	302	0.556	338	0.642
15	0.999	51	0.762	87	0.883	123	0.939	159	0.735	195	0.975	231	0.783	267	0.530	303	0.553	339	0.654
16	1.000	52	0.756	88	0.890	124	0.935	160	0.735	196	0.980	232	0.770	268	0.531	304	0.551	340	0.666
17	0.999	53	0.751	89	0.896	125	0.930	161	0.735	197	0.985	233	0.757	269	0.534	305	0.548	341	0.679
18	0.999	54	0.747	90	0.902	126	0.925	162	0.736	198	0.989	234	0.743	270	0.536	306	0.546	342	0.691
19	0.997	55	0.743	91	0.908	127	0.920	163	0.738	199	0.992	235	0.730	271	0.538	307	0.543	343	0.704
20	0.995	56	0.740	92	0.914	128	0.914	164	0.740	200	0.995	236	0.717	272	0.541	308	0.541	344	0.717
21	0.992	57	0.738	93	0.920	129	0.908	165	0.743	201	0.997	237	0.704	273	0.543	309	0.538	345	0.730
22	0.989	58	0.736	94	0.925	130	0.902	166	0.747	202	0.999	238	0.691	274	0.546	310	0.536	346	0.743
23	0.985	59	0.735	95	0.930	131	0.896	167	0.751	203	0.999	239	0.679	275	0.548	311	0.534	347	0.757
24	0.980	60	0.735	96	0.935	132	0.890	168	0.756	204	1.000	240	0.666	276	0.551	312	0.531	348	0.770
25	0.975	61	0.735	97	0.939	133	0.883	169	0.762	205	0.999	241	0.654	277	0.553	313	0.530	349	0.783
26	0.969	62	0.736	98	0.944	134	0.876	170	0.768	206	0.998	242	0.642	278	0.556	314	0.528	350	0.796
27	0.963	63	0.738	99	0.947	135	0.869	171	0.775	207	0.996	243	0.631	279	0.558	315	0.527	351	0.809
28	0.956	64	0.740	100	0.951	136	0.862	172	0.782	208	0.994	244	0.620	280	0.560	316	0.526	352	0.822
29	0.949	65	0.743	101	0.954	137	0.855	173	0.789	209	0.991	245	0.610	281	0.562	317	0.525	353	0.835
30	0.942	66	0.746	102	0.957	138	0.848	174	0.797	210	0.987	246	0.600	282	0.564	318	0.525	354	0.847
31	0.934	67	0.751	103	0.960	139	0.840	175	0.806	211	0.982	247	0.591	283	0.566	319	0.525	355	0.859
32	0.925	68	0.755	104	0.962	140	0.833	176	0.814	212	0.977	248	0.582	284	0.567	320	0.526	356	0.871
33	0.917	69	0.760	105	0.964	141	0.825	177	0.824	213	0.971	249	0.574	285	0.568	321	0.528	357	0.883
34	0.908	70	0.765	106	0.965	142	0.818	178	0.833	214	0.965	250	0.566	286	0.570	322	0.529	358	0.894
35	0.899	71	0.771	107	0.966	143	0.811	179	0.842	215	0.958	251	0.560	287	0.570	323	0.532	359	0.904



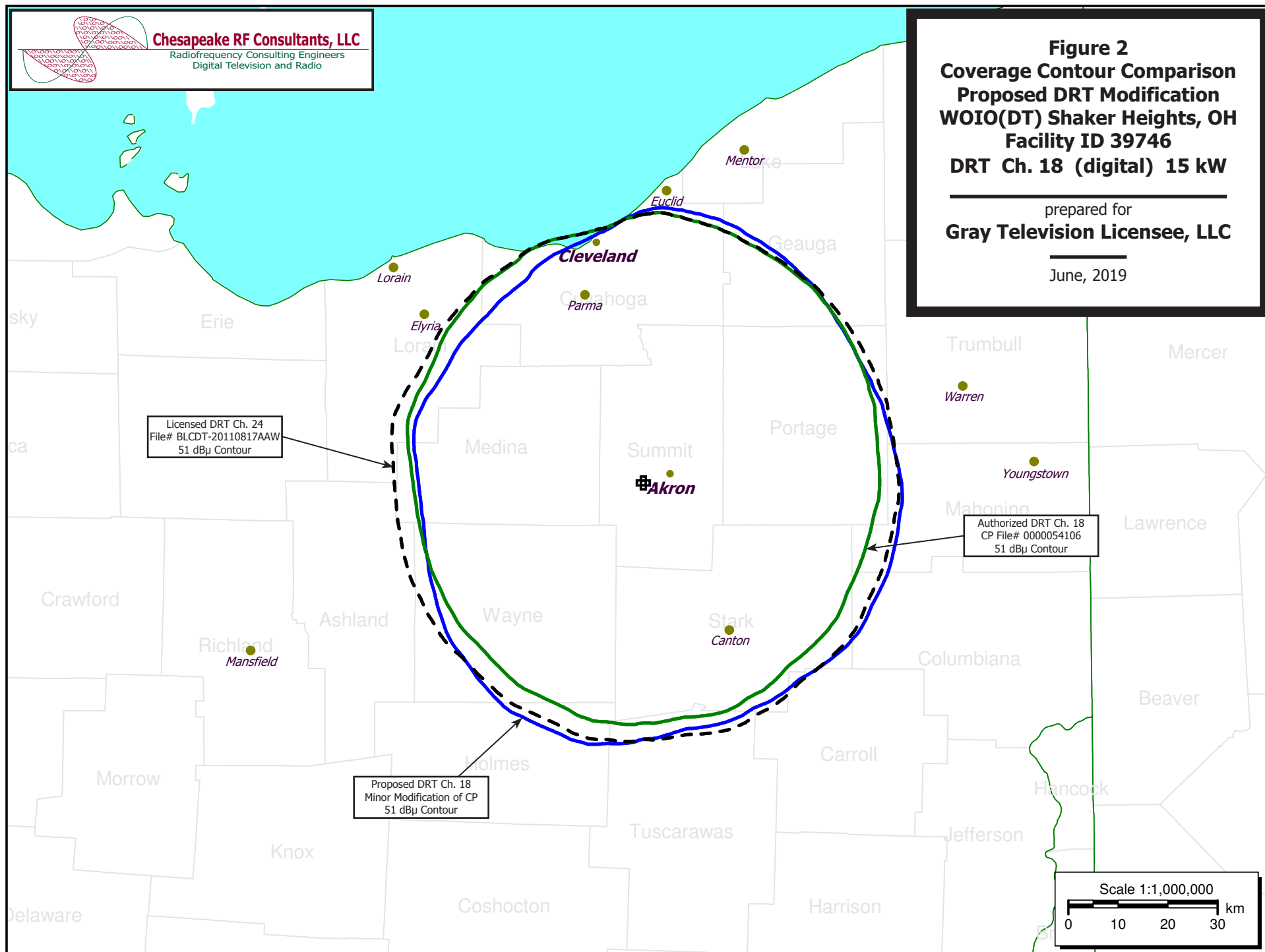
Figure 1
Antenna Azimuthal Pattern
WOIO(DT) Shaker Heights, OH
Facility ID 39746
DRT Ch. 18 (digital) 15 kW

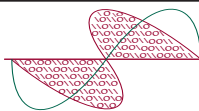
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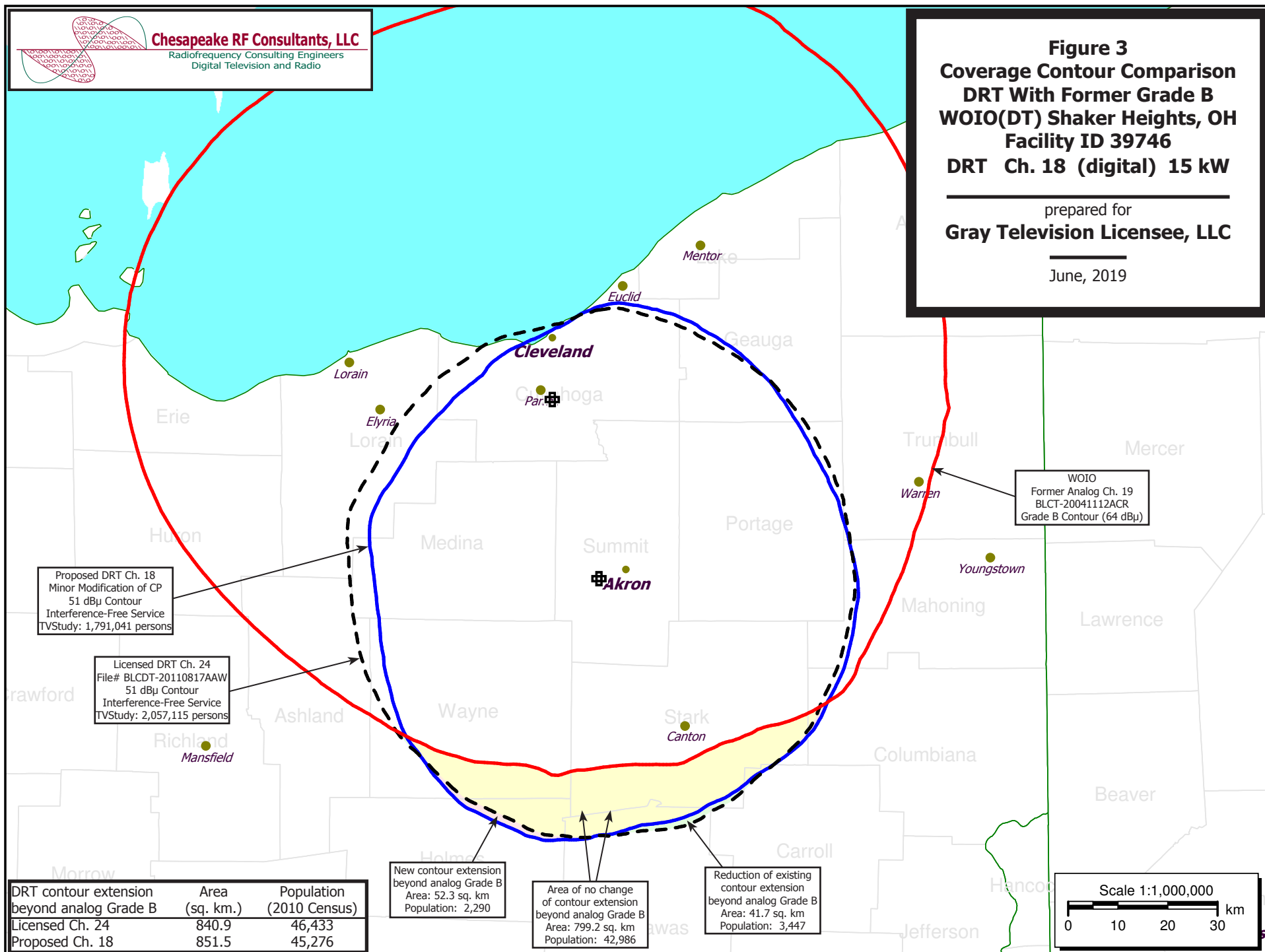


Chesapeake RF Consultants, LLC
Radiofrequency Consulting Engineers
Digital Television and Radio

Figure 3
Coverage Contour Comparison
DRT With Former Grade B
WOIO(DT) Shaker Heights, OH
Facility ID 39746
DRT Ch. 18 (digital) 15 kW

prepared for
Gray Television Licensee, LLC

June, 2019



WOIO
Former Analog Ch. 19
BLCT-20041112ACR
Grade B Contour (64 dBμ)

Proposed DRT Ch. 18
Minor Modification of CP
51 dBμ Contour
Interference-Free Service
TVStudy: 1,791,041 persons

Licensed DRT Ch. 24
File# BLCDT-20110817AAW
51 dBμ Contour
Interference-Free Service
TVStudy: 2,057,115 persons

New contour extension
beyond analog Grade B
Area: 52.3 sq. km
Population: 2,290

Area of no change
of contour extension
beyond analog Grade B
Area: 799.2 sq. km
Population: 42,986

Reduction of existing
contour extension
beyond analog Grade B
Area: 41.7 sq. km
Population: 3,447

DRT contour extension beyond analog Grade B	Area (sq. km.)	Population (2010 Census)
Licensed Ch. 24	840.9	46,433
Proposed Ch. 18	851.5	45,276

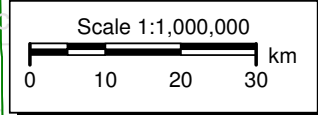


Table 1 WOIO DRT TVStudy Analysis of Proposal (page 1 of 6)



tvstudy v2.2.5 (4uoc83)
Database: localhost, Study: WOIO-DRT18 15kW DLP-H 1.0-0.2 prop, Model: Longley-Rice
Start: 2019.06.10 16:32:55

Study created: 2019.06.10 16:32:55

Study build station data: LMS TV 2019-06-06

Proposal: WOIO D18 LD APP SHAKER HEIGHTS, OH
File number: WOIO-DRT18 15kW DLP-H
Facility ID: 39746
Station data: User record
Record ID: 2699
Country: U.S.

Build options:
Protect pre-transition records not on baseline channel

Search options:
Baseline record excluded if station has CP

Stations potentially affected by proposal:

IX	Call	Chan	Svc	Status	City, State	File Number	Distance
Yes	WBNX-TV	D17	DT	CP	AKRON, OH	BLANK0000028072	36.7 km
Yes	WKYC	D17	DT	LIC	CLEVELAND, OH	BLCDT20090619ADC	36.8
No	W44DC-D	D17	LD	CP	COLUMBUS, OH	BLANK0000054287	172.3
No	WOIW-LD	D17	LD	LIC	Lima, OH	BLANK0000068365	221.0
No	WJMB-CD	D17	DC	LIC	BUTLER, PA	BLDTA20121108ALX	142.5
No	W30CO-D	D17	LD	CP	WHEELING, WV	BLANK0000054635	131.7
No	WFWA	D18	DT	LIC	FORT WAYNE, IN	BLANK0000063130	302.3
No	WDWO-CD	D18	DC	LIC	DETROIT, MI	BLDTA20130108ABZ	213.1
No	WUHO-LP	D18+	LD	CP	KALAMAZOO, MI	BLANK0000071807	362.3
No	WEYI-TV	D18	DT	CP	SAGINAW, MI	BLANK0000034331	297.1
No	WETM-TV	D18	DT	LIC	ELMIRA, NY	BLCDT20090622AFJ	408.4
Yes	W48DY-D	D18	LD	APP	CANTON, OH	BLANK0000072053	79.7
No	WSTR-TV	D18	DT	CP	CINCINNATI, OH	BLANK0000034777	324.6
Yes	WCBZ-CD	D18	DC	LIC	Columbus, OH	BLANK0000069165	158.4
Yes	WKEF	D18	DT	LIC	DAYTON, OH	BLANK0000004293	270.8
No	WPNM-LP	N18z	TX	LIC	LEIPSIC, OH	BLTTL19990407JA	225.8
Yes	W43CZ-D	D18	LD	CP	MANSFIELD, OH	BLANK0000053016	85.6
No	WDTJ-LD	D18	LD	LIC	TOLEDO, OH	BLDTL20121219ABP	176.5
No	WXTM-LD	D18	LD	APP	ERIE, PA	BLANK0000072360	171.6
No	WDBJ	D18	DT	LIC	ROANOKE, VA	BLANK0000055470	447.3
Yes	WLPX-TV	D18	DT	CP	CHARLESTON, WV	BLANK0000034886	288.9
Yes	WLPX-TV	D18	DT	APP	CHARLESTON, WV	BLANK0000069627	289.4
No	WUDL-LD	D19	LD	LIC	DETROIT, MI	BLANK0000008200	202.5
Yes	WKYC	D19	DT	CP	CLEVELAND, OH	BLANK0000034823	36.8
No	WCLL-CD	D19	DC	LIC	COLUMBUS, OH	BLANK0000052505	172.3
No	WFND-LD	D19	LD	LIC	FINDLAY, OH	BLANK0000055157	173.1
No	WYFX-LD	D19	LD	LIC	YOUNGSTOWN, OH	BLDTL20110329AAF	78.6
No	WEPA-LD	D19	LD	CP	ERIE, PA	BNPDTL20100714ACL	171.6
No	WBYD-CD	D19	DC	CP	PITTSBURGH, PA	BLANK0000073059	171.6
No	WSSS-LP	N25z	TX	LIC	STEUBENVILLE, OH	BLTTL19980506JD	114.1
No	WWBP-LP	N25-	TX	LIC	FREEDOM, PA	BLTTL19990124JD	119.3

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied:

Channel: D18
Mask: Full Service
Latitude: 41 3 52.70 N (NAD83)
Longitude: 81 34 58.30 W
Height AMSL: 575.7 m
HAAT: 0.0 m
Peak ERP: 15.0 kW
Antenna: DIE DLP-H 110.0 deg
Elev Pattn: Generic
Elec Tilt: 1.50

Table 1 WOIO DRT TVStudy Analysis of Proposal
(page 2 of 6)



49.1 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	12.6 kW	300.5 m	56.8 km
45.0	9.84	267.4	53.6
90.0	12.2	252.9	53.9
135.0	11.3	251.6	53.4
180.0	10.9	256.2	53.5
225.0	11.0	239.5	52.6
270.0	4.31	230.4	47.3
315.0	4.23	249.7	48.2

Database HAAT does not agree with computed HAAT
Database HAAT: 0 m Computed HAAT: 256 m

**Proposal 24.15 dBu contour crosses Canadian border, coordination required
Distance to Canadian border: 96.1 km

Distance to Mexican border: 2176.6 km

Conditions at FCC monitoring station: Allegan MI
Bearing: 296.8 degrees Distance: 400.5 km

Proposal is not within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:
Bearing: 274.9 degrees Distance: 1991.5 km

No land mobile station failures found

Proposal is not within the Offshore Radio Service protected area

Study cell size: 1.00 km

Profile point spacing: 0.20 km

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

Interference to BLANK0000028072 CP scenario 1

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	WBNX-TV	D17	DT	CP	AKRON, OH	BLANK0000028072	
Undesireds:	WOIO	D18	LD	APP	SHAKER HEIGHTS, OH	WOIO-DRT18 15kW DLP-H	36.7 km
	WJMB-CD	D17	DC	LIC	BUTLER, PA	BLDTA20121108ALX	159.1
	Service area		Terrain-limited		IX-free, before	IX-free, after	Percent New IX
	21263.7	3,638,170	21025.6	3,625,284	21019.7	3,624,932	21010.8 3,623,124
	3443.1	517	3443.1	517	3443.1	517	3443.1 517
(in Canada)							0.04 0.05
							0.00 0.00
Undesired				Total IX	Unique IX, before	Unique IX, after	
WOIO D18 LD APP			8.9	1,808		8.9	1,808
WJMB-CD D17 DC LIC			6.0	352	6.0 352	6.0 352	

Interference to BLCDT20090619ADC LIC scenario 1

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	WKYC	D17	DT	LIC	CLEVELAND, OH	BLCDT20090619ADC	
Undesireds:	WOIO	D18	LD	APP	SHAKER HEIGHTS, OH	WOIO-DRT18 15kW DLP-H	36.8 km
	W16DO-D	D16	DC	LIC	CLEVELAND, OH	BLANK0000001124	0.6
	WQCW	D17	DT	LIC	PORTSMOUTH, OH	BLCDT20100422ABY	323.2
	WJMB-CD	D17	DC	LIC	BUTLER, PA	BLDTA20121108ALX	158.7
	Service area		Terrain-limited		IX-free, before	IX-free, after	Percent New IX
	26091.9	4,157,466	25623.8	4,107,947	25520.4	4,096,621	25509.4 4,093,767
	2643.2	171	2643.2	171	2643.2	171	2643.2 171
(in Canada)							0.04 0.07
							0.00 0.00

Table 1 WOIO DRT TVStudy Analysis of Proposal
(page 3 of 6)



Undesired		Total IX	Unique IX, before	Unique IX, after
WOIO D18 LD APP	12.9	2,988		10.9 2,854
WL6DO-D D16 DC LIC	4.0	337	4.0 337	3.0 239
WQCW D17 DT LIC	81.5	8,167	75.6 7,984	75.6 7,984
WJMB-CD D17 DC LIC	23.9	3,005	17.9 2,822	17.9 2,822

Interference to BLANK0000072053 APP scenario 1

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	W48DY-D	D18	LD	APP	CANTON, OH	BLANK0000072053	
Undesireds:	WOIO	D18	LD	APP	SHAKER HEIGHTS, OH	WOIO-DRT18 15kW DLP-H	79.7 km
	WCBZ-CD	D18	DC	LIC	Columbus, OH	BLANK0000069165	130.6
	W43CZ-D	D18	LD	CP	MANSFIELD, OH	BLANK0000053016	94.3
	WLPX-TV	D18	DT	CP	CHARLESTON, WV	BLANK0000034886	210.8
Service area	Terrain-limited	IX-free, before	IX-free, after	Percent New IX			
2868.2 115,609	2784.2 113,030	2728.3 111,371	2663.4 109,605	2.38 1.59			

Undesired		Total IX	Unique IX, before	Unique IX, after
WOIO D18 LD APP	88.8	2,582		64.9 1,766
WCBZ-CD D18 DC LIC	1.0	13	0.0 0	0.0 0
W43CZ-D D18 LD CP	22.0	705	17.0 296	10.0 111
WLPX-TV D18 DT CP	38.9	1,363	32.9 941	17.0 310

Interference to BLANK0000072053 APP scenario 2

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	W48DY-D	D18	LD	APP	CANTON, OH	BLANK0000072053	
Undesireds:	WOIO	D18	LD	APP	SHAKER HEIGHTS, OH	WOIO-DRT18 15kW DLP-H	79.7 km
	WCBZ-CD	D18	DC	LIC	Columbus, OH	BLANK0000069165	130.6
	W43CZ-D	D18	LD	CP	MANSFIELD, OH	BLANK0000053016	94.3
	WLPX-TV	D18	DT	APP	CHARLESTON, WV	BLANK0000069627	214.7
Service area	Terrain-limited	IX-free, before	IX-free, after	Percent New IX			
2868.2 115,609	2784.2 113,030	2738.3 111,169	2667.4 109,184	2.59 1.79			

Undesired		Total IX	Unique IX, before	Unique IX, after
WOIO D18 LD APP	88.8	2,582		70.9 1,985
WCBZ-CD D18 DC LIC	1.0	13	0.0 0	0.0 0
W43CZ-D D18 LD CP	22.0	705	19.0 297	12.0 112
WLPX-TV D18 DT APP	26.9	1,564	22.9 1,143	13.0 731

Interference to BLANK0000069165 LIC scenario 1

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	WCBZ-CD	D18	DC	LIC	Columbus, OH	BLANK0000069165	
Undesireds:	WOIO	D18	LD	APP	SHAKER HEIGHTS, OH	WOIO-DRT18 15kW DLP-H	158.4 km
	WFWA	D18	DT	LIC	FORT WAYNE, IN	BLANK0000063130	216.4
	WSTR-TV	D18	DT	CP	CINCINNATI, OH	BLANK0000034777	166.5
	WLPX-TV	D18	DT	CP	CHARLESTON, WV	BLANK0000034886	210.2
	WCLL-CD	D19	DC	LIC	COLUMBUS, OH	BLANK0000052505	16.5
Service area	Terrain-limited	IX-free, before	IX-free, after	Percent New IX			
6125.5 1,585,017	6109.4 1,582,955	5406.6 1,544,451	5406.6 1,544,451	0.00 0.00			

Undesired		Total IX	Unique IX, before	Unique IX, after
WOIO D18 LD APP	5.0	168		0.0 0
WFWA D18 DT LIC	3.0	139	0.0 0	0.0 0
WSTR-TV D18 DT CP	95.2	2,123	69.0 1,053	67.0 1,039
WLPX-TV D18 DT CP	80.4	3,533	42.2 2,223	41.2 2,128
WCLL-CD D19 DC LIC	580.5	34,462	550.3 33,857	550.3 33,857

Interference to BLANK0000069165 LIC scenario 2

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	WCBZ-CD	D18	DC	LIC	Columbus, OH	BLANK0000069165	

Table 1 WOIO DRT TVStudy Analysis of Proposal
(page 4 of 6)



Undesireds:	WOIO	D18	LD	APP	SHAKER HEIGHTS, OH	WOIO-DRT18 15kW DLP-H	158.4 km
	WFWA	D18	DT	LIC	FORT WAYNE, IN	BLANK0000063130	216.4
	WSTR-TV	D18	DT	CP	CINCINNATI, OH	BLANK0000034777	166.5
	WLPX-TV	D18	DT	APP	CHARLESTON, WV	BLANK0000069627	190.8
	WCLL-CD	D19	DC	LIC	COLUMBUS, OH	BLANK0000052505	16.5
Service area		Terrain-limited		IX-free, before		IX-free, after	Percent New IX
6125.5 1,585,017		6109.4 1,582,955		5431.8 1,546,056		5430.8 1,545,961	0.02 0.01
Undesired		Total IX		Unique IX, before		Unique IX, after	
WOIO D18 LD APP		5.0 168				1.0 95	
WFWA D18 DT LIC		3.0 139		0.0 0		0.0 0	
WSTR-TV D18 DT CP		95.2 2,123		75.0 1,624		71.0 1,551	
WLPX-TV D18 DT APP		32.2 957		17.1 618		17.1 618	
WCLL-CD D19 DC LIC		580.5 34,462		565.4 34,158		565.4 34,158	

Interference to BLANK000004293 LIC scenario 1

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	WKEF	D18	DT	LIC	DAYTON, OH	BLANK0000004293	
Undesireds:	WOIO	D18	LD	APP	SHAKER HEIGHTS, OH	WOIO-DRT18 15kW DLP-H	270.8 km
	WFWA	D18	DT	LIC	FORT WAYNE, IN	BLANK0000063130	172.6
	WJTS-CD	D18	DC	LIC	JASPER, IN	BLDTL20090212ABK	270.9
	WCBZ-CD	D18	DC	LIC	Columbus, OH	BLANK0000069165	116.9
	WCLL-CD	D19	DC	LIC	COLUMBUS, OH	BLANK0000052505	108.3
Service area		Terrain-limited		IX-free, before		IX-free, after	Percent New IX
29629.1 3,623,588		29379.2 3,615,857		24677.6 3,420,538		24677.6 3,420,538	0.00 0.00
Undesired		Total IX		Unique IX, before		Unique IX, after	
WOIO D18 LD APP		9.0 140				0.0 0	
WFWA D18 DT LIC		2012.4 84,372		1890.7 81,942		1890.7 81,942	
WJTS-CD D18 DC LIC		1.0 167		0.0 0		0.0 0	
WCBZ-CD D18 DC LIC		2805.8 113,257		2108.1 72,103		2105.1 72,098	
WCLL-CD D19 DC LIC		582.0 38,946		5.0 120		5.0 120	

Interference to BLANK0000053016 CP scenario 1

**IX: 7.44% interference caused

See text and Table 2: interference to W43CZ-D is decreased

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	W43CZ-D	D18	LD	CP	MANSFIELD, OH	BLANK0000053016	
Undesireds:	WOIO	D18	LD	APP	SHAKER HEIGHTS, OH	WOIO-DRT18 15kW DLP-H	85.6 km
	WFWA	D18	DT	LIC	FORT WAYNE, IN	BLANK0000063130	231.4
	WSTR-TV	D18	DT	CP	CINCINNATI, OH	BLANK0000034777	241.3
	WCBZ-CD	D18	DC	LIC	Columbus, OH	BLANK0000069165	78.3
	WLPX-TV	D18	DT	CP	CHARLESTON, WV	BLANK0000034886	256.2
	WKYC	D19	DT	CP	CLEVELAND, OH	BLANK0000034823	100.6
	WCLL-CD	D19	DC	LIC	COLUMBUS, OH	BLANK0000052505	94.0
Service area		Terrain-limited		IX-free, before		IX-free, after	Percent New IX
6781.5 363,451		6605.0 355,261		5868.6 329,792		5415.6 305,257	7.72 7.44
Undesired		Total IX		Unique IX, before		Unique IX, after	
WOIO D18 LD APP		590.0 27,220				452.9 24,535	
WFWA D18 DT LIC		7.0 97		0.0 0		0.0 0	
WSTR-TV D18 DT CP		68.0 2,451		0.0 0		0.0 0	
WCBZ-CD D18 DC LIC		650.5 23,567		550.3 20,678		545.3 20,498	
WLPX-TV D18 DT CP		60.0 2,219		5.0 310		2.0 294	
WKYC D19 DT CP		102.2 1,888		80.9 1,592		0.0 0	
WCLL-CD D19 DC LIC		4.0 269		0.0 0		0.0 0	

Interference to BLANK0000053016 CP scenario 2

**IX: 7.44% interference caused

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	W43CZ-D	D18	LD	CP	MANSFIELD, OH	BLANK0000053016	

Table 1 WOIO DRT TVStudy Analysis of Proposal
(page 5 of 6)



Undesireds:	WOIO	D18	LD	APP	SHAKER HEIGHTS, OH	WOIO-DRT18 15kW DLP-H	85.6 km
	WFWA	D18	DT	LIC	FORT WAYNE, IN	BLANK0000063130	231.4
	WSTR-TV	D18	DT	CP	CINCINNATI, OH	BLANK0000034777	241.3
	WCBZ-CD	D18	DC	LIC	Columbus, OH	BLANK0000069165	78.3
	WLPX-TV	D18	DT	APP	CHARLESTON, WV	BLANK0000069627	246.1
	WKYC	D19	DT	CP	CLEVELAND, OH	BLANK0000034823	100.6
	WCLL-CD	D19	DC	LIC	COLUMBUS, OH	BLANK0000052505	94.0

Service area	Terrain-limited	IX-free, before	IX-free, after	Percent New IX
6781.5 363,451	6605.0 355,261	5871.6 330,050	5415.6 305,499	7.76 7.44

Undesired	Total IX	Unique IX, before	Unique IX, after
WOIO D18 LD APP	590.0 27,220	455.9 24,551	
WFWA D18 DT LIC	7.0 97	0.0 0	0
WSTR-TV D18 DT CP	68.0 2,451	0.0 0	0
WCBZ-CD D18 DC LIC	650.5 23,567	565.3 20,891	551.3 20,528
WLPX-TV D18 DT APP	16.0 570	2.0 52	2.0 52
WKYC D19 DT CP	102.2 1,888	80.9 1,592	0.0 0
WCLL-CD D19 DC LIC	4.0 269	0.0 0	0.0 0

Interference to BLANK0000034886 CP scenario 1

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	WLPX-TV	D18	DT	CP	CHARLESTON, WV	BLANK0000034886	
Undesireds:	WOIO	D18	LD	APP	SHAKER HEIGHTS, OH	WOIO-DRT18 15kW DLP-H	288.9 km
	WVVA	D17	DT	CP	BLUEFIELD, WV	BLANK0000027470	144.7
	WCCB	D18	DT	CP	CHARLOTTE, NC	BLANK0000067979	367.8
	WSTR-TV	D18	DT	CP	CINCINNATI, OH	BLANK0000034777	251.2
	WCBZ-CD	D18	DC	LIC	Columbus, OH	BLANK0000069165	210.2
	WPXK-TV	D18	DT	CP	JELLICO, TN	BLANK0000068234	334.2
Service area	Terrain-limited	IX-free, before	IX-free, after	Percent New IX			
30229.9 1,120,938	29465.1 1,042,281	29384.0 1,023,743	29383.0 1,023,699	0.00 0.00			

Undesired	Total IX	Unique IX, before	Unique IX, after
WOIO D18 LD APP	1.0 44	1.0 44	
WVVA D17 DT CP	8.1 21	4.1 13	4.1 13
WCCB D18 DT CP	4.1 0	1.0 0	1.0 0
WSTR-TV D18 DT CP	62.9 18,108	59.9 18,090	59.9 18,090
WCBZ-CD D18 DC LIC	5.0 312	4.0 305	4.0 305
WPXK-TV D18 DT CP	10.1 123	5.1 104	5.1 104

Interference to BLANK0000069627 APP scenario 1

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	WLPX-TV	D18	DT	APP	CHARLESTON, WV	BLANK0000069627	
Undesireds:	WOIO	D18	LD	APP	SHAKER HEIGHTS, OH	WOIO-DRT18 15kW DLP-H	289.4 km
	WVVA	D17	DT	CP	BLUEFIELD, WV	BLANK0000027470	165.6
	WCCB	D18	DT	CP	CHARLOTTE, NC	BLANK0000067979	383.1
	WSTR-TV	D18	DT	CP	CINCINNATI, OH	BLANK0000034777	214.6
	WCBZ-CD	D18	DC	LIC	Columbus, OH	BLANK0000069165	190.8
	WPXK-TV	D18	DT	CP	JELLICO, TN	BLANK0000068234	317.3
Service area	Terrain-limited	IX-free, before	IX-free, after	Percent New IX			
27536.8 1,067,717	27075.9 1,033,985	27017.8 1,030,293	27016.8 1,030,193	0.00 0.01			

Undesired	Total IX	Unique IX, before	Unique IX, after
WOIO D18 LD APP	1.0 100	1.0 100	
WVVA D17 DT CP	2.0 0	2.0 0	2.0 0
WCCB D18 DT CP	1.0 0	1.0 0	1.0 0
WSTR-TV D18 DT CP	48.0 3,393	42.0 3,355	42.0 3,355
WCBZ-CD D18 DC LIC	8.0 334	4.0 296	4.0 296
WPXK-TV D18 DT CP	6.1 3	2.0 3	2.0 3

Interference to BLANK0000034823 CP scenario 1

Call	Chan	Svc	Status	City, State	File Number	Distance
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Table 1 WOIO DRT TVStudy Analysis of Proposal
(page 6 of 6)



Desired:	WKYC	D19	DT	CP	CLEVELAND, OH	BLANK0000034823		
Undesireds:	WOIO	D18	LD	APP	SHAKER HEIGHTS, OH	WOIO-DRT18 15kW DLP-H	36.8	km
	WIPB	D19	DT	CP	MUNCIE, IN	BLANK0000027189	343.3	
	WCLL-CD	D19	DC	LIC	COLUMBUS, OH	BLANK0000052505	193.6	
	WBYD-CD	D19	DC	CP	PITTSBURGH, PA	BLANK0000073059	196.0	
	WOHZ-CD	D20	DC	CP	MANSFIELD, OH	BLANK0000026543	104.1	
<hr/>								
	Service area	Terrain-limited		IX-free, before		IX-free, after		Percent New IX
	26497.7	4,180,300	26006.6	4,130,065	25759.0	4,101,650	25754.1	0.02
	2734.0	171	2734.0	171	2734.0	171	2734.0	0.00
	(in Canada)							0.00

Undesired	Total IX		Unique IX, before		Unique IX, after	
WOIO D18 LD APP	5.0	364			5.0	364
WIPB D19 DT CP	3.0	74	2.0	58	2.0	58
WCLL-CD D19 DC LIC	4.0	43	2.0	27	2.0	27
WBYD-CD D19 DC CP	189.0	22,439	188.0	22,439	188.0	22,439
WOHZ-CD D20 DC CP	54.6	5,891	53.6	5,875	53.6	5,875

Interference to proposal scenario 1
**MX: 29.23% interference received

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	WOIO	D18	LD	APP	SHAKER HEIGHTS, OH	WOIO-DRT18 15kW DLP-H	
Undesireds:	WBNX-TV	D17	DT	CP	AKRON, OH	BLANK0000028072	36.7 km
	WEYI-TV	D18	DT	CP	SAGINAW, MI	BLANK0000034331	297.1
	W48DY-D	D18	LD	APP	CANTON, OH	BLANK0000072053	79.7
	W43CZ-D	D18	LD	CP	MANSFIELD, OH	BLANK0000053016	85.6
	WLPX-TV	D18	DT	CP	CHARLESTON, WV	BLANK0000034886	288.9
	WKYC	D19	DT	CP	CLEVELAND, OH	BLANK0000034823	36.8
	WYFX-LD	D19	LD	LIC	YOUNGSTOWN, OH	BLDTL20110329AAF	78.6
<hr/>							
	Service area	Terrain-limited		IX-free		Percent IX	
	8655.1	2,630,309	8479.1	2,530,724	7094.6	1,791,041	16.33
							29.23

Undesired	Total IX		Unique IX		Prct Unique IX	
WBNX-TV D17 DT CP	405.6	519,058	5.0	1,960	0.06	0.08
WEYI-TV D18 DT CP	10.1	19,036	0.0	0	0.00	0.00
W48DY-D D18 LD APP	17.0	5,287	11.9	1,532	0.14	0.06
W43CZ-D D18 LD CP	358.8	70,674	204.5	14,084	2.41	0.56
WLPX-TV D18 DT CP	3.0	495	0.0	0	0.00	0.00
WKYC D19 DT CP	935.9	707,327	451.6	182,699	5.33	7.22
WYFX-LD D19 LD LIC	225.2	14,285	214.1	13,609	2.52	0.54

Interference to proposal scenario 2
**MX: 29.23% interference received

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	WOIO	D18	LD	APP	SHAKER HEIGHTS, OH	WOIO-DRT18 15kW DLP-H	
Undesireds:	WBNX-TV	D17	DT	CP	AKRON, OH	BLANK0000028072	36.7 km
	WEYI-TV	D18	DT	CP	SAGINAW, MI	BLANK0000034331	297.1
	W48DY-D	D18	LD	APP	CANTON, OH	BLANK0000072053	79.7
	W43CZ-D	D18	LD	CP	MANSFIELD, OH	BLANK0000053016	85.6
	WLPX-TV	D18	DT	APP	CHARLESTON, WV	BLANK0000069627	289.4
	WKYC	D19	DT	CP	CLEVELAND, OH	BLANK0000034823	36.8
	WYFX-LD	D19	LD	LIC	YOUNGSTOWN, OH	BLDTL20110329AAF	78.6
<hr/>							
	Service area	Terrain-limited		IX-free		Percent IX	
	8655.1	2,630,309	8479.1	2,530,724	7094.6	1,791,041	16.33
							29.23

Undesired	Total IX		Unique IX		Prct Unique IX	
WBNX-TV D17 DT CP	405.6	519,058	5.0	1,960	0.06	0.08
WEYI-TV D18 DT CP	10.1	19,036	0.0	0	0.00	0.00
W48DY-D D18 LD APP	17.0	5,287	11.9	1,772	0.14	0.07
W43CZ-D D18 LD CP	358.8	70,674	205.5	14,185	2.42	0.56
WLPX-TV D18 DT APP	1.0	126	0.0	0	0.00	0.00
WKYC D19 DT CP	935.9	707,327	451.6	182,699	5.33	7.22
WYFX-LD D19 LD LIC	225.2	14,285	214.1	13,609	2.52	0.54

Table 2 Interference Study Details Regarding W43CZ-D
(page 1 of 1)



Existing Condition
Authorized WOIO DRT Interference to W43CZ-D CP: 7.47 percent

Study cell size: 1.00 km
Profile point spacing: 0.20 km

Interference to BLANK0000053016 CP scenario 1

****IX: 7.47% interference caused**

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	W43CZ-D	D18	LD	CP	MANSFIELD, OH	BLANK0000053016	
Undesireds:	WOIO	D18	LD	CP	SHAKER HEIGHTS, OH	BLANK0000054106	85.6 km
	WFWA	D18	DT	LIC	FORT WAYNE, IN	BLANK0000063130	231.4
	WSTR-TV	D18	DT	CP	CINCINNATI, OH	BLANK0000034777	241.3
	WCBZ-CD	D18	DC	LIC	Columbus, OH	BLANK0000069165	78.3
	WLPX-TV	D18	DT	CP	CHARLESTON, WV	BLANK0000034886	256.2
	WKYC	D19	DT	CP	CLEVELAND, OH	BLANK0000034823	100.6
	WCLL-CD	D19	DC	LIC	COLUMBUS, OH	BLANK0000052505	94.0
<hr/>							
	Service area	Terrain-limited		IX-free, before		IX-free, after	Percent New IX
	6781.5	363,451	6605.0	355,261	5868.6	329,792	5435.3 305,153 7.38 7.47
<hr/>							
Undesired			Total IX		Unique IX, before		Unique IX, after
WOIO D18 LD CP			553.4	26,981			433.2 24,639
WFWA D18 DT LIC			7.0	97	0.0	0	0.0 0
WSTR-TV D18 DT CP			68.0	2,451	0.0	0	0.0 0
WCBZ-CD D18 DC LIC			650.5	23,567	550.3	20,678	547.3 20,654
WLPX-TV D18 DT CP			60.0	2,219	5.0	310	3.0 294
WKYC D19 DT CP			102.2	1,888	80.9	1,592	0.0 0
WCLL-CD D19 DC LIC			4.0	269	0.0	0	0.0 0

Proposed Condition
Proposed WOIO DRT Interference to W43CZ-D CP: 7.44 percent

Study cell size: 1.00 km
Profile point spacing: 0.20 km

Interference to BLANK0000053016 CP scenario 1

****IX: 7.44% interference caused**

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	W43CZ-D	D18	LD	CP	MANSFIELD, OH	BLANK0000053016	
Undesireds:	WOIO	D18	LD	APP	SHAKER HEIGHTS, OH	WOIO-DRT18 15kW DLP-H	85.6 km
	WFWA	D18	DT	LIC	FORT WAYNE, IN	BLANK0000063130	231.4
	WSTR-TV	D18	DT	CP	CINCINNATI, OH	BLANK0000034777	241.3
	WCBZ-CD	D18	DC	LIC	Columbus, OH	BLANK0000069165	78.3
	WLPX-TV	D18	DT	CP	CHARLESTON, WV	BLANK0000034886	256.2
	WKYC	D19	DT	CP	CLEVELAND, OH	BLANK0000034823	100.6
	WCLL-CD	D19	DC	LIC	COLUMBUS, OH	BLANK0000052505	94.0
<hr/>							
	Service area	Terrain-limited		IX-free, before		IX-free, after	Percent New IX
	6781.5	363,451	6605.0	355,261	5868.6	329,792	5415.6 305,257 7.72 7.44
<hr/>							
Undesired			Total IX		Unique IX, before		Unique IX, after
WOIO D18 LD APP			590.0	27,220			452.9 24,535
WFWA D18 DT LIC			7.0	97	0.0	0	0.0 0
WSTR-TV D18 DT CP			68.0	2,451	0.0	0	0.0 0
WCBZ-CD D18 DC LIC			650.5	23,567	550.3	20,678	545.3 20,498
WLPX-TV D18 DT CP			60.0	2,219	5.0	310	2.0 294
WKYC D19 DT CP			102.2	1,888	80.9	1,592	0.0 0
WCLL-CD D19 DC LIC			4.0	269	0.0	0	0.0 0

Channel and Facility Information

Section	Question	Response
Proposed Community of License	Facility ID	39746
	State	Ohio
	City	SHAKER HEIGHTS
	DRT Channel	18
	Designated Market Area	Cleveland-Akron (Canton)

Antenna Location Data

Section	Question	Response
Antenna Structure Registration	Do you have an FCC Antenna Structure Registration (ASR) Number?	Yes
	ASR Number	1047963
Coordinates (NAD83)	Latitude	41° 03' 52.7" N+
	Longitude	081° 34' 58.3" W-
	Structure Type	GTOWER-Guyed Structure Used for Communication Purposes
	Overall Structure Height	292.3 meters
	Support Structure Height	271.6 meters
	Ground Elevation (AMSL)	331.9 meters
Antenna Data	Height of Radiation Center Above Ground Level	243.8 meters
	Height of Radiation Center Above Mean Sea Level	575.7 meters
	Effective Radiated Power	15 kW

Antenna
Technical Data

Section	Question	Response
Antenna Type	Antenna Type	Directional Custom
	Do you have an Antenna ID?	No
	Antenna ID	
Antenna Manufacturer and Model	Manufacturer:	DIE
	Model	DLP-12H/VP
	Rotation	110 degrees
	Electrical Beam Tilt	1.5
	Mechanical Beam Tilt	Not Applicable
	toward azimuth	
	Polarization	Elliptical
Elevation Radiation 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	
	Out-of-Channel Emission Mask:	Full Service

Directional Antenna Relative Field Values (Pre-rotated Pattern)

Degree	V _A (Authorized Value)	Degree	V _A (Authorized Value)	Degree	V _A (Authorized Value)	Degree	V _A (Authorized Value)
0	0.968	90	0.995	180	0.571	270	0.995
10	0.951	100	0.987	190	0.560	280	0.942
20	0.902	110	0.915	200	0.536	290	0.852
30	0.833	120	0.796	210	0.526	300	0.768
40	0.765	130	0.666	220	0.566	310	0.735
50	0.735	140	0.566	230	0.666	320	0.765
60	0.768	150	0.526	240	0.796	330	0.833
70	0.852	160	0.536	250	0.915	340	0.902
80	0.942	170	0.560	260	0.987	350	0.951

Additional Azimuths

Degree	V _A
94	1.000
266	1.000