ENGINEERING EXHIBIT

Application for Minor Modification of Digital Low Power Television Station Construction Permit

prepared for

WBOC, Inc.
WRUE-LD Salisbury, MD
Facility ID 187720
Ch. 19 15 kW Directional

WBOC, Inc. ("WBOC") is the permittee of unbuilt digital Low Power Television station WRUE-LD, Channel 19, Salisbury MD, Facility ID 187720. WRUE-LD is authorized to operate pursuant to a Construction Permit ("CP", file# 0000071640) with 15 kW effective radiated power ("ERP"), directional. *WBOC* herein seeks a modification of the CP to reduce the antenna height and to change the directional antenna. No change in site location or ERP is proposed.

The WRUE-LD site is associated with FCC Antenna Structure Registration number 1035996 and a new side-mounted antenna will be utilized. The antenna will be centered 124.4 meters above ground level, which is 9.7 meters lower than the currently authorized height. The site is located more than 75 miles (121 km) from the reference coordinates of the markets listed in Appendix A of DA 09-1487[1].

The proposed antenna is a Dielectric model DLP-12B having horizontal 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 coverage contour of the proposed facility as well as those of the existing WRUE-LD authorization and the original CP facility (file# BNPDTL-20100709AIT), demonstrating compliance with §73.3572 for a minor change.

[1] *"Commencement of Rural, First-come, First-served digital licensing for Low Power Television and TV Translators Beginning August 25, 2009 and Commencement of Nationwide, First-come, First-served Digital Licensing for Low Power Television and TV Translator Services Beginning January 25, 2010,"* Public Notice, DA 09-1487, Released June 29, 2009.

Interference study per OET Bulletin 69[2] shows that the proposal complies with the FCC's interference protection requirements toward all digital television, television translator, LPTV, and Class A stations. The results, summarized in Table 1, show that any new interference does not exceed the FCC's interference limits (0.5 percent to full power and Class A stations, and 2.0 percent to secondary stations) to any facility.

Human Exposure to Radiofrequency Electromagnetic Field (Environmental)

The proposed facility 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 10 percent antenna relative field in downward elevations (pattern data shows 10 percent or less relative field at angles 10 to 90 degrees below the antenna), the calculated power density attributable to the proposed facility at locations near the transmitter site at a height of two meters above ground level is 0.3 $\mu W/cm^2$, which is 0.1 percent of the general population / uncontrolled maximum permissible 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.

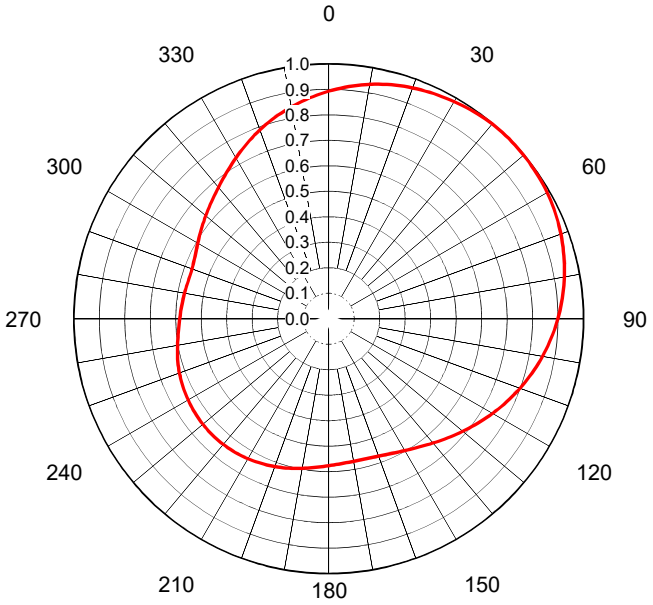
[2]FCC Office of Engineering and Technology Bulletin number 69, *Longley-Rice Methodology for Evaluating TV Coverage and Interference*, February 6, 2004 ("OET-69"). This analysis employed the FCC's current "TVStudy" software with the default application processing template settings, 1 km cell size, and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

List of Attachments

Figure 1	Antenna Azimuthal Pattern
Figure 2	Coverage Contour Comparison
Table 1	TVStudy Analysis of Proposal
Form 2100	Saved Version of Engineering Sections from FCC Form at Time of Upload

Chesapeake RF Consultants, LLC
Joseph M. Davis, P.E. March 25, 2021
207 Old Dominion Road Yorktown, VA 23692 703-650-9600

Dielectric®



AZIMUTH PATTERN
Horizontal Polarization

In Free Space

Proposal No.	**0**
Date	**14-Apr-20**
Call Letters	**WRUE-LD**
Channel	**19**
Frequency	**503 MHz**
Antenna Type	**ANT DLP12B**
Gain	**1.76 (2.45dB)**
	Calculated

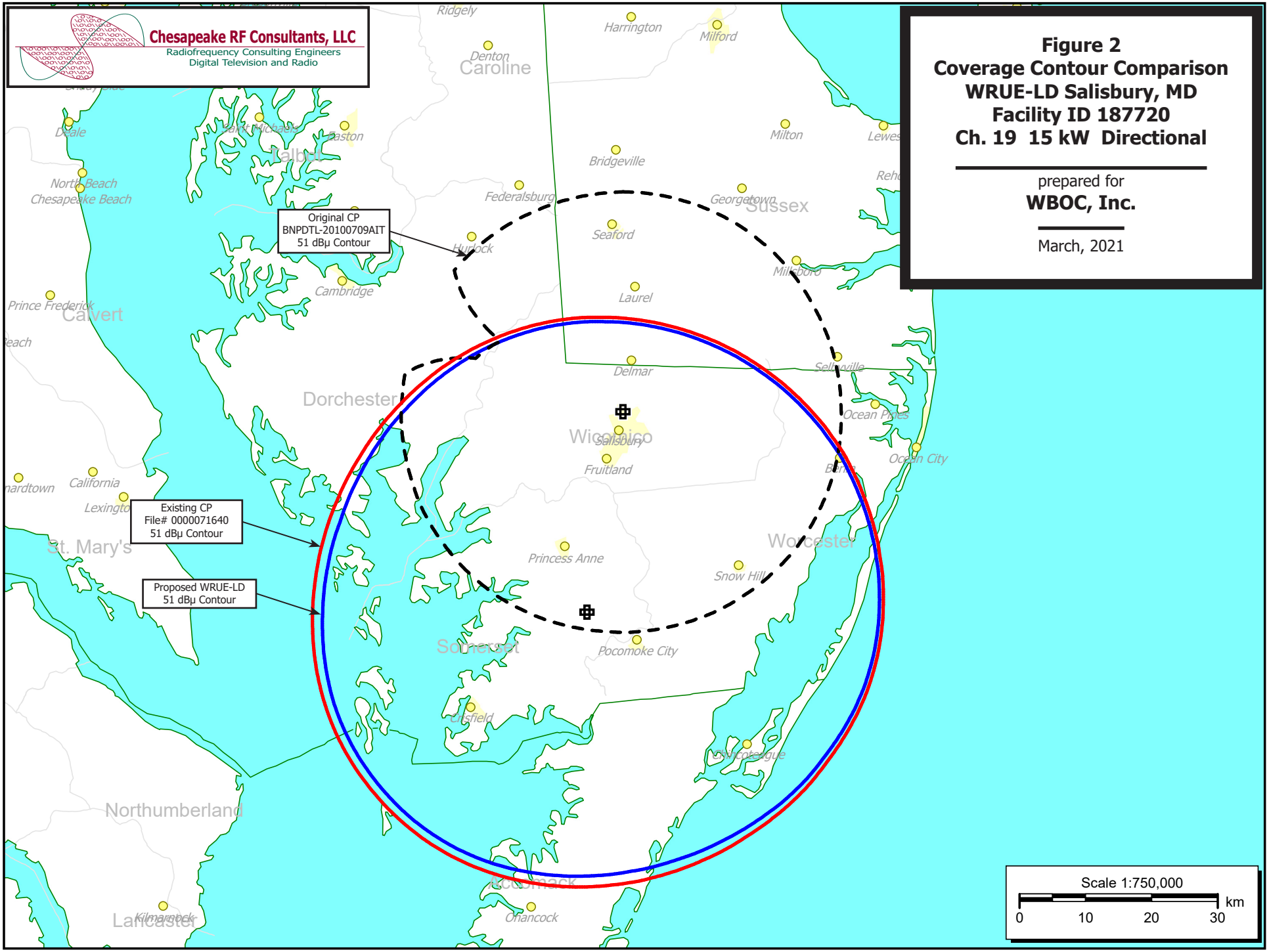
Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	0.893	36	0.994	72	0.964	108	0.810	144	0.619	180	0.577	216	0.641	252	0.619	288	0.570	324	0.694
1	0.897	37	0.995	73	0.961	109	0.804	145	0.615	181	0.578	217	0.642	253	0.618	289	0.570	325	0.699
2	0.902	38	0.996	74	0.958	110	0.799	146	0.612	182	0.580	218	0.643	254	0.616	290	0.571	326	0.705
3	0.906	39	0.997	75	0.955	111	0.793	147	0.608	183	0.582	219	0.643	255	0.613	291	0.572	327	0.711
4	0.910	40	0.998	76	0.952	112	0.787	148	0.604	184	0.584	220	0.644	256	0.611	292	0.573	328	0.716
5	0.914	41	0.999	77	0.949	113	0.782	149	0.601	185	0.586	221	0.644	257	0.609	293	0.575	329	0.722
6	0.919	42	0.999	78	0.946	114	0.776	150	0.597	186	0.588	222	0.645	258	0.607	294	0.577	330	0.728
7	0.923	43	0.999	79	0.942	115	0.771	151	0.594	187	0.590	223	0.645	259	0.605	295	0.579	331	0.734
8	0.927	44	1.000	80	0.939	116	0.765	152	0.591	188	0.592	224	0.645	260	0.602	296	0.581	332	0.740
9	0.930	45	1.000	81	0.935	117	0.759	153	0.589	189	0.594	225	0.645	261	0.600	297	0.584	333	0.747
10	0.934	46	1.000	82	0.932	118	0.754	154	0.586	190	0.596	226	0.645	262	0.598	298	0.587	334	0.753
11	0.938	47	0.999	83	0.928	119	0.748	155	0.583	191	0.598	227	0.645	263	0.596	299	0.590	335	0.759
12	0.941	48	0.999	84	0.924	120	0.742	156	0.581	192	0.600	228	0.645	264	0.594	300	0.593	336	0.765
13	0.944	49	0.999	85	0.920	121	0.737	157	0.579	193	0.603	229	0.645	265	0.592	301	0.596	337	0.771
14	0.948	50	0.998	86	0.916	122	0.731	158	0.577	194	0.605	230	0.644	266	0.590	302	0.600	338	0.777
15	0.951	51	0.998	87	0.912	123	0.726	159	0.575	195	0.607	231	0.644	267	0.589	303	0.603	339	0.783
16	0.954	52	0.998	88	0.908	124	0.720	160	0.574	196	0.609	232	0.643	268	0.587	304	0.607	340	0.789
17	0.956	53	0.997	89	0.904	125	0.714	161	0.573	197	0.611	233	0.643	269	0.586	305	0.610	341	0.795
18	0.959	54	0.996	90	0.899	126	0.709	162	0.571	198	0.614	234	0.642	270	0.584	306	0.614	342	0.801
19	0.962	55	0.996	91	0.895	127	0.703	163	0.570	199	0.616	235	0.641	271	0.583	307	0.618	343	0.806
20	0.964	56	0.995	92	0.890	128	0.698	164	0.569	200	0.618	236	0.640	272	0.582	308	0.622	344	0.812
21	0.966	57	0.994	93	0.886	129	0.692	165	0.569	201	0.619	237	0.640	273	0.581	309	0.625	345	0.817
22	0.968	58	0.993	94	0.881	130	0.687	166	0.568	202	0.621	238	0.639	274	0.580	310	0.629	346	0.823
23	0.971	59	0.992	95	0.876	131	0.682	167	0.568	203	0.623	239	0.638	275	0.579	311	0.633	347	0.828
24	0.973	60	0.990	96	0.872	132	0.676	168	0.568	204	0.625	240	0.637	276	0.578	312	0.637	348	0.834
25	0.975	61	0.989	97	0.867	133	0.671	169	0.568	205	0.627	241	0.636	277	0.577	313	0.641	349	0.839
26	0.977	62	0.987	98	0.862	134	0.666	170	0.568	206	0.628	242	0.634	278	0.576	314	0.646	350	0.844
27	0.979	63	0.985	99	0.857	135	0.661	171	0.568	207	0.630	243	0.633	279	0.575	315	0.650	351	0.849
28	0.980	64	0.983	100	0.852	136	0.656	172	0.569	208	0.632	244	0.632	280	0.574	316	0.654	352	0.854
29	0.982	65	0.981	101	0.847	137	0.651	173	0.569	209	0.633	245	0.631	281	0.573	317	0.659	353	0.859
30	0.984	66	0.979	102	0.842	138	0.646	174	0.570	210	0.634	246	0.629	282	0.572	318	0.663	354	0.864
31	0.986	67	0.977	103	0.836	139	0.641	175	0.571	211	0.636	247	0.628	283	0.572	319	0.668	355	0.869
32	0.988	68	0.975	104	0.831	140	0.637	176	0.572	212	0.637	248	0.626	284	0.571	320	0.673	356	0.874
33	0.990	69	0.972	105	0.826	141	0.632	177	0.573	213	0.638	249	0.625	285	0.570	321	0.678	357	0.879
34	0.991	70	0.970	106	0.820	142	0.628	178	0.574	214	0.639	250	0.623	286	0.570	322	0.683	358	0.883
35	0.993	71	0.967	107	0.815	143	0.624	179	0.575	215	0.640	251	0.621	287	0.570	323	0.688	359	0.888

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Radiofrequency Consulting Engineers
Digital Television and Radio

Figure 1
Antenna Azimuthal Pattern
WRUE-LD Salisbury, MD
Facility ID 187720
Ch. 19 15 kW Directional

prepared for
WBOC, Inc.

March, 2021


Chesapeake RF Consultants, LLC
Radiofrequency Consulting Engineers
Digital Television and Radio
Figure 2
Coverage Contour Comparison
WRUE-LD Salisbury, MD
Facility ID 187720
Ch. 19 15 kW Directional
prepared for
WBOC, Inc.
March, 2021
Original CP
BNPDTL-20100709AIT
51 dBµ Contour
Existing CP
File# 0000071640
51 dBµ Contour
Proposed WRUE-LD
51 dBµ Contour
Scale 1:750,000
km
0
10
20
30
Ridgely
Denton
Caroline
Harrington
Milford
Milton
Bridgeville
Federalsburg
Georgetown
Sussex
Seaford
Laurel
Delmar
Dorchester
Wicomico
Salisbury
Fruitland
Princess Anne
Somerset
Pocomoke City
Worcester
Snow Hill
Ocean City
Ocean Pines
Cambridge
Easton
Talbot
North Beach
Chesapeake Beach
Prince Frederick
Calvert
California
St. Mary's
Northumberland
Lancaster
Kilmarnock
Onancock
Onley
Chincoteague

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```
tvstudy v2.2.5 (4uoc83)
Database: localhost,  Study: WRUE-LD prop MOD,  Model: Longley-Rice
Start: 2021.03.25 09:41:47

Study created: 2021.03.25 09:41:47

Study build station data: LMS TV 2021-03-23

    Proposal: WRUE-LD D19 LD APP SALISBURY, MD
 File number: WRUE-LD prop MOD
 Facility ID: 187720
Station data: User record
   Record ID: 3577
     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
No   W18BB-D   D18        LD  LIC     ELIZABETH CITY, NC       BLDTL20110720ACI        209.4 km
No   W18BS     N18z       TX  LIC     HAMPTON, VA              BLTTL19961118JG         132.9
Yes  W18EG-D   D18        LD  LIC     ONANCOCK, VA             BLDTT20120614AAG         30.9
No   DWVBN-LP  D18+       LD  APP     VIRGINIA BEACH, VA       BLANK0000054622         155.9
No   W19DY-D   D19        LD  CP      CRESAPTOWN, MD           BMPDTL20121012AAA       321.4
No   WUNC-TV   D19        LD  LIC     CHAPEL HILL, NC          BLANK0000115730         372.4
No   WYDO      D19        DT  LIC     GREENVILLE, NC           BLANK0000129688         366.5
No   WGSR-LD   D19        LD  LIC     REIDSVILLE, NC           BLANK0000072219         404.8
No   WZBJ-CD   D19        DC  LIC     LYNCHBURG, VA            BLANK0000086464         319.2
Yes  WAVY-TV   D19        DT  LIC     PORTSMOUTH, VA           BLANK0000125371         162.3
No   WYSJ-CA   D19        DC  LIC     YORKTOWN, VA             BLANK0000001579         134.5
No   WQAW-LD   D20        LD  LIC     LAKE SHORE, MD           BLANK0000122659         129.7
Yes  W20EO-D   D20        LD  CP      SALISBURY, MD            BLANK0000072872          32.8
No   WGNT      D20        DT  LIC     PORTSMOUTH, VA           BLANK0000118341         163.2
No   WAZT-CD   D20        DC  LIC     VIENNA, VA               BLANK0000081642         220.8
No   WAZT-CD   D20        DC  CP      VIENNA, VA               BLANK0000121163         197.8
No   W23CX     N23+       TX  LIC     SALISBURY, MD            BLTTL20070730AKY         33.6

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied:

    Channel: D19
       Mask: Full Service
   Latitude:  38  6 46.70 N (NAD83)
  Longitude:  75 39 14.70 W
Height AMSL: 130.5 m
       HAAT: 0.0 m
   Peak ERP: 15.0 kW
    Antenna: Die DLP12B 0.0 deg
Elev Pattrn: Generic
  Elec Tilt: 1.50

49.3 dBu contour:
Azimuth      ERP       HAAT   Distance
  0.0 deg   12.0 kW   124.3 m   45.8 km
 45.0       15.0      122.4     46.8
 90.0       12.1      126.2     46.0
135.0       6.57      126.1     42.9
180.0       4.99      128.7     41.7
225.0       6.22      128.1     42.8
270.0       5.12      128.6     41.8
315.0       6.36      127.4     42.9

Database HAAT does not agree with computed HAAT
Database HAAT: 0 m   Computed HAAT: 126 m
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Digital Television and Radio

Distance to Canadian border: 592.9 km

Distance to Mexican border: 2406.3 km

Conditions at FCC monitoring station: Laurel MD
Bearing: 319.5 degrees Distance: 154.7 km

Proposal is not within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:
Bearing: 284.4 degrees Distance: 2547.8 km

No land mobile station failures found

Study cell size: 1.00 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 BLDTT20120614AAG LIC scenario 1

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	W18EG-D	D18	LD	LIC	ONANCOCK, VA	BLDTT20120614AAG	
Undesireds:	WRUE-LD	D19	LD	APP	SALISBURY, MD	WRUE-LD prop MOD	30.9 km

Service area		Terrain-limited		IX-free, before		IX-free, after		Percent New IX	
4330.5	49,878	4330.5	49,878	4330.5	49,878	4297.3	49,614	0.77	0.53

Undesired	Total IX	Unique IX, before	Unique IX, after
WRUE-LD D19 LD APP	33.2	264	33.2	264

Interference to BLANK0000125371 LIC scenario 1

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	WAVY-TV	D19	DT	LIC	PORTSMOUTH, VA	BLANK0000125371	
Undesireds:	WRUE-LD	D19	LD	APP	SALISBURY, MD	WRUE-LD prop MOD	162.3 km
	WYDO	D19	DT	LIC	GREENVILLE, NC	BLANK0000129688	204.7
	WZBJ-CD	D19	DC	LIC	LYNCHBURG, VA	BLANK0000086464	242.2
	WGNT	D20	DT	LIC	PORTSMOUTH, VA	BLANK0000118341	1.5

Service area		Terrain-limited		IX-free, before		IX-free, after		Percent New IX	
30232.2	2,081,427	30227.2	2,081,427	28610.5	2,054,478	28512.1	2,054,121	0.34	0.02

Undesired	Total IX		Unique IX, before		Unique IX, after	
WRUE-LD D19 LD APP	99.5	358			98.5	357
WYDO D19 DT LIC	1541.9	24,578	1529.8	23,415	1529.8	23,415
WZBJ-CD D19 DC LIC	2.0	1,114	0.0	0	0.0	0
WGNT D20 DT LIC	84.8	2,420	74.7	2,371	74.7	2,371

Interference to BLANK0000072872 CP scenario 1

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	W20EO-D	D20	LD	CP	SALISBURY, MD	BLANK0000072872	
Undesireds:	WRUE-LD	D19	LD	APP	SALISBURY, MD	WRUE-LD prop MOD	32.8 km
	WAZT-CD	D20	DC	LIC	VIENNA, VA	BLANK0000081642	209.9
	WMPT	D21	DT	LIC	ANNAPOLIS, MD	BLANK0000084314	110.3

Service area		Terrain-limited		IX-free, before		IX-free, after		Percent New IX	
4145.4	181,362	4145.4	181,362	4145.4	181,362	4075.8	180,638	1.68	0.40

Undesired	Total IX	Unique IX, before	Unique IX, after
WRUE-LD D19 LD APP	69.6	724	69.6	724

Table 1 WRUE-LD TVStudy Analysis of Proposal

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

Interference to proposal scenario 1
2.95% interference received

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	WRUE-LD	D19	LD	APP	SALISBURY, MD	WRUE-LD prop MOD	
Undesireds:	W18EG-D	D18	LD	LIC	ONANCOCK, VA	BLDTT20120614AAG	30.9 km
	WAVY-TV	D19	DT	LIC	PORTSMOUTH, VA	BLANK0000125371	162.3

Service area		Terrain-limited		IX-free		Percent IX	
6055.3	173,902	6055.3	173,902	5888.2	168,773	2.76	2.95

Undesired	Total IX		Unique IX		Prcnt Unique IX	
W18EG-D D18 LD LIC	166.1	5,105	166.1	5,105	2.74	2.94
WAVY-TV D19 DT LIC	1.0	24	1.0	24	0.02	0.01

Channel and Facility Information

Section	Question	Response
Facility ID	187720	
State	Maryland	
City	SALISBURY	
LPD Channel	19	

Antenna Location Data

Section	Question	Response
Antenna Structure Registration	Do you have an FCC Antenna Structure Registration (ASR) Number?	Yes
	ASR Number	1035996
Coordinates (NAD83)	Latitude	38° 06' 46.7" N+
	Longitude	075° 39' 14.7" W-
	Structure Type	GTOWER-Guyed Structure Used for Communication Purposes
	Overall Structure Height	161.0 meters
	Support Structure Height	161.0 meters
	Ground Elevation (AMSL)	6.1 meters
Antenna Data	Height of Radiation Center Above Ground Level	124.4 meters
	Height of Radiation Center Above Mean Sea Level	130.5 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:	Dielectric
	Model	DLP-12B
	Rotation	0.0 degrees
	Electrical Beam Tilt	1.5
	Mechanical Beam Tilt	Not Applicable
	toward azimuth	
	Polarization	Horizontal
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	Value	Degree	Value	Degree	Value	Degree	Value
0	0.893	**90**	0.899	**180**	0.577	**270**	0.584
10	0.934	**100**	0.852	**190**	0.596	**280**	0.574
20	0.964	**110**	0.799	**200**	0.618	**290**	0.571
30	0.984	**120**	0.742	**210**	0.634	**300**	0.593
40	0.998	**130**	0.687	**220**	0.644	**310**	0.629
50	0.998	**140**	0.637	**230**	0.644	**320**	0.673
60	0.990	**150**	0.597	**240**	0.637	**330**	0.728
70	0.970	**160**	0.574	**250**	0.623	**340**	0.789
80	0.939	**170**	0.568	**260**	0.602	**350**	0.844

Additional Azimuths

Degree	V_A
45	1.000