

Comprehensive Engineering Exhibit
W295BF Midlothian, VA
Facility ID No. 139538

This exhibit is for a modification of construction permit BPFT-20120828AAH for W295BF, facility ID 139538 which is seeking a change in antenna location, decrease in antenna height and an increase in power. It is also proposed to change this to a fill-in translator for WBTJ Richmond VA.

It is proposed to locate the transmit antenna 213 meters above ground on a tower identified by registration number 1017637. The proposed antenna is an ERI LP-1E with an ERP of 0.145KW.

Below as Figure 1 is a spacing study from which it can be determined that this proposal is within the protected contour of station WKLR which is on the second adjacent channel. With respect to all other authorized facilities this proposal will not create any prohibited contour overlap.

Section 74.1204(d) states that *“The provisions of this section concerning prohibited overlap will not apply where the area of such overlap lies entirely over water. In addition, an application otherwise precluded by this section will be accepted if it can be demonstrated that no actual interference will occur due to intervening terrain, lack of population or such other factors as may be applicable.”*

We will demonstrate that a lack of population and/ or other factors allow this proposal to be compliant with 74.1204. The process commonly called “Living Way”, as recently described in FCC 08-242 in connection with BPFT-19981001TA, allows for the use of U/D Analysis, also known as “signal strength ratio methodology.” In this instant case the facilities of WKLR and this proposal are second adjacent channels, which are to be afforded protection from signals 40 dB stronger.

Figure 2 is a map showing the predicted signal contour of WKLR at the proposed translator location utilizing the FCC F50:50 curve. WKLR is predicted to present a 74.63 dBu signal at the translator tower location. Thus the 114.63 dB contour (74.63 dBu + 40 dBu) of this proposal is the lowest value predicted to cause interference to WKLR. Also Shown in Figure 2 are the contours of the primary station, this proposal, and that of the currently licensed facility.

Figure 3 depicts the predicted signal strength from the translator both at ground level, and at receiving antenna locations up to 105 meters above ground level of the translator. The 105 meter data is identified in the table as the “artificial plane,” and as can be determined by the columns colored green, at no location from ground level to 105 meters above ground does the predicted signal of the proposed translator exceed that of 40 dB greater than WKLR.

Figure 4 is a photograph of the 227.1 meter overall height support tower. It can be determined from the image that no habitable space exists near the tower which exceeds 105 meters (345 feet) above ground level, thus compliance with Section 74.1204(d) has been demonstrated.

The proposed facilities were evaluated in terms of potential radio frequency radiation exposure at ground level in accordance with OET Bulletin No. 65, “Evaluating Compliance With FCC-Specified Guidelines for Human Exposure to Radio Frequency Radiation.”

The proposed antenna has been evaluated using "FM Model", as being mounted with its center of radiation 213 meters above ground level, with an effective radiated power of 0.145 kilowatts in both the horizontal and vertical planes.

At 2 meters above the surface, at 211 meters from the closest point of approach, this proposal will contribute worst case, 0.0484 microwatts per square centimeter, or 0.00484 percent of the allowable ANSI limit for controlled exposure, and 0.0242 percent of the allowable limit for uncontrolled exposure. This figure is less than 5% of the applicable FCC exposure limit at all locations extending out from the base of the tower. It is therefore believed that this proposal is in compliance with OET Bulletin Number 65 as required by the Federal Communications Commission.

Further, the tower is surrounded by a fence with a locked gate with appropriate warning signs and the applicant will see that signs remain posted in the vicinity of the tower, warning of potential radio frequency hazards at the site. The applicant will cooperate with other users of the tower to reduce power of the facility, or discontinue operation, as necessary to limit human exposure to levels less than specified by the Federal Communications Commission should anyone be required to climb the tower for maintenance or inspection.

Figure 1. Spacing Study

Comstudy 2.2 Search of Channel 241 (96.1 MHz Class D) at 37-30-31.5 N, 77-34-37 W									
Callsign	State	City	Freq	Channel	ERP_w	Class	Status	Distance_km	Clr
W295BF	VA	MIDLOTHIAN	96.1	241	10	D	CP	10.7	-55.95 dB
WKLR	VA	FORT LEE	96.5	243	50000	B	LIC	23.98	-22.40 dB
WKLR	VA	FORT LEE	96.5	243	5000	B	LIC	14.93	-18.17 dB
WKLR	VA	FORT LEE	96.5	243	38000	B	LIC	23.98	-18.89 dB
WROX-FM	VA	EXMORE	96.1	241	23000	B	LIC	141.22	0.10 dB
WFLO-FM	VA	FARMVILLE	95.7	239	50000	B	LIC	74.41	3.80 dB
WGRQ	VA	FAIRVIEW BEACH	95.9	240	2500	A	CP MOD	85.07	14.01 dB
WJDV	VA	BROADWAY	96.1	241	2600	B1	LIC	168.07	15.79 dB
WGRQ	VA	FAIRVIEW BEACH	95.9	240	1900	A	LIC	89.3	15.52 dB
WKLR	VA	FORT LEE	96.5	243	0	B	USE	23.78	17.42 dB
800508AA	VA	CAPE CHARLES	96.1	241	0	B	USE	141.16	17.25 dB
WVKL	VA	NORFOLK	95.7	239	40000	B	LIC	125.08	18.73 dB
W295BF	VA	MIDLOTHIAN	106.9	295	10	D	LIC	20.15	20.2 dB
WHUR-FM	DC	WASHINGTON	96.3	242	16500	B	LIC	165.82	22.71 dB
WJDV	VA	BROADWAY	96.1	241	0	B1	USE	168.6	25.55 dB
W240AF	VA	CHARLOTTESVILLE	95.9	240	50	D	LIC	95.55	25.14 dB
WGRQ	VA	FAIRVIEW BEACH	95.9	240	0	A	USE	89.3	25.07 dB
WBBB	NC	RALEIGH	96.1	241	98000	C0	LIC	226.75	26.04 dB
WPGC-FM	MD	MORNINGSIDE	95.5	238	50000	B	LIC	161.3	28.98 dB
NEW	VA	BERRYVILLE	96.1	241	250	D	APP	181.89	29.66 dB
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WPGC-FM	MD	MORNINGSIDE	95.5	238	40000	B	LIC	163.99	30.81 dB
WEZU-LP	NC	ROANOKE RAPIDS	95.9	240	100	LP100	LIC	115.58	30.63 dB
WSOX	PA	RED LION	96.1	241	13500	B	LIC	279.72	33.85 dB
W241AO	MD	WYE MILLS	96.1	241	80	D	LIC	208.46	34.54 dB
WSOX	PA	RED LION	96.1	241	4500	B	LIC	279.72	34.09 dB
W240BH	VA	GAINESVILLE	95.9	240	100	D	APP	137.89	35.63 dB
WHUR-FM	DC	WASHINGTON	96.3	242	0	B	USE	165.82	36.34 dB
W241AO	MD	WYE MILLS	96.1	241	45	D	CP	224.38	37.13 dB
WROV-FM	VA	MARTINSVILLE	96.3	242	14000	C1	LIC	220.56	37.11 dB
W243BS	VA	FREDERICKSBURG	96.5	243	250	D	LIC	90.06	37.72 dB
WBBB	NC	RALEIGH	96.1	241	0	C0	USE	226.75	38.85 dB
W240BH	VA	GAINESVILLE	95.9	240	4	D	LIC	155.36	38.88 dB
W238BN	VA	ORANGE	95.5	238	19	D	LIC	95.55	39.75 dB
WPNC-FM	NC	PLYMOUTH	95.9	240	2600	A	LIC	198.5	39.51 dB
W244BP	VA	CHARLOTTESVILLE	96.7	244	20	D	LIC	95.67	39.91 dB

Figure 2. Contour Map

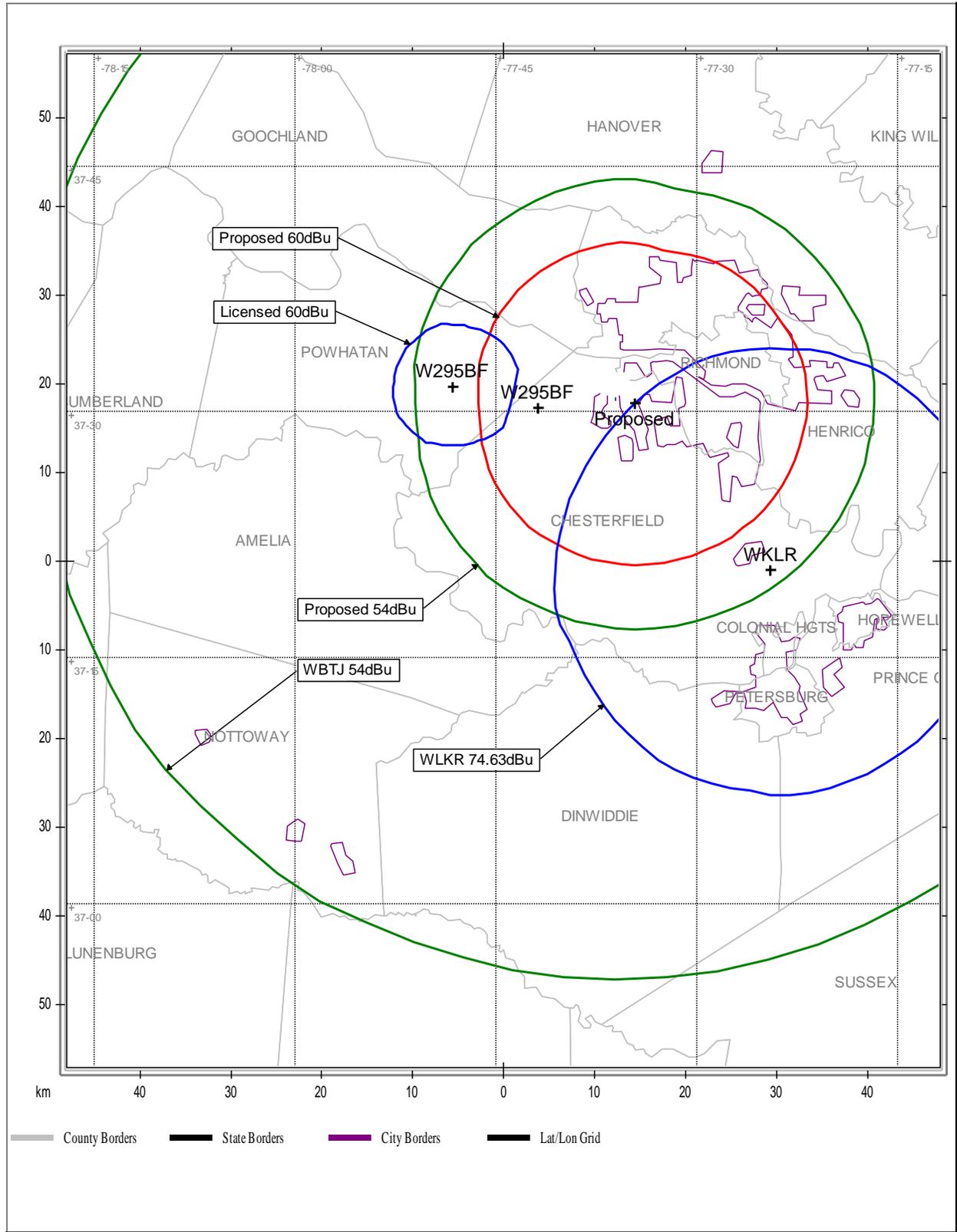


Figure 3. Distance to Interference Contour With Antenna Vertical Pattern

Proposed Antenna:		ERI 1 bay full wave							
Proposed Power:		0.145	kW						
Antenna Height AGL:		213	meters						
Interference Contour:		114.63	dBu f(50:10)						
Artificial Rcv Antenna Height:		105	meters						
Distance (Free Space)		Equation: $= (10^{((106.92 - [\text{desired dBu}] + [\text{ERP in dBk}] / 20)}) * 1000$							
Field Strength (dBu)		Equation: $= 106.92 - (20 * (\text{LOG10}[\text{DistMeters} / 1000])) + [\text{ERP in dBk}]$							
Depression				Distance					
Angle	Antenna			from Ant.	Distance	Field Strength	Distance	Field	
Below	Relative	ERP	ERP	to Interf	from Ant. to	in dBu @	from Ant.	Strength	
Horizon	Field	in kW	in dBk	Contour	Artificial Plane	Artificial Plane	to Ground Level	Ground Level	
0°	1.000	0.145	-8.39	156.74 m	infinite	---	infinite	---	
-5°	0.995	0.144	-8.43	155.96 m	1239.16 m	96.63 dBu	2443.90 m	90.73 dBu	
-10°	0.990	0.142	-8.47	155.17 m	621.95 m	102.57 dBu	1226.62 m	96.67 dBu	
-15°	0.970	0.136	-8.65	152.04 m	417.28 m	105.86 dBu	822.97 m	99.96 dBu	
-20°	0.950	0.131	-8.83	148.90 m	315.77 m	108.10 dBu	622.77 m	102.20 dBu	
-25°	0.920	0.123	-9.11	144.20 m	255.55 m	109.66 dBu	504.00 m	103.76 dBu	
-30°	0.885	0.114	-9.45	138.72 m	216.00 m	110.78 dBu	426.00 m	104.88 dBu	
-35°	0.845	0.104	-9.85	132.45 m	188.29 m	111.57 dBu	371.35 m	105.68 dBu	
-40°	0.800	0.093	-10.32	125.39 m	168.02 m	112.09 dBu	331.37 m	106.19 dBu	
-45°	0.747	0.081	-10.92	117.09 m	152.74 m	112.32 dBu	301.23 m	106.42 dBu	
-50°	0.692	0.069	-11.58	108.47 m	140.98 m	112.35 dBu	278.05 m	106.45 dBu	
-55°	0.630	0.058	-12.40	98.75 m	131.84 m	112.12 dBu	260.02 m	106.22 dBu	
-60°	0.565	0.046	-13.35	88.56 m	124.71 m	111.66 dBu	245.95 m	105.76 dBu	
-65°	0.500	0.036	-14.41	78.37 m	119.16 m	110.99 dBu	235.02 m	105.09 dBu	
-70°	0.729	0.077	-11.13	114.26 m	114.93 m	114.58 dBu	226.67 m	108.68 dBu	
-75°	0.358	0.019	-17.31	56.11 m	111.81 m	108.64 dBu	220.51 m	102.74 dBu	
-80°	0.280	0.011	-19.44	43.89 m	109.67 m	106.68 dBu	216.29 m	100.78 dBu	
-85°	0.208	0.006	-22.03	32.60 m	108.41 m	104.19 dBu	213.81 m	98.29 dBu	
-90°	0.132	0.003	-25.97	20.69 m	108.00 m	100.28 dBu	213.00 m	94.38 dBu	

Figure 4.

