

**Modify FM Translator W226CN Vinton, VA
Channel 226D – 93.1 MHz – 0.250 kW DA**

**Proposed Channel 226D – 93.1 MHz – 0.250 kW DA Vinton, VA
August 23, 2023**

Technical Narrative

This Technical Narrative and attached exhibits were prepared on behalf of Backroads Radio, LLC, (“Backroads”), Licensee of W226CN, Channel 226D, Facility ID 200318, Vinton, Virginia. Backroads proposes to modify W226CN to operate on channel 226D (93.1 MHz) with a slightly different directional antenna pattern. The proposed site and antenna are the same as the W226CN licensed site. The tower site is an existing tower that is not registered with an Antenna Structure Registration “ASR” number. W226CN will broadcast from a shared antenna with FM translator W270CU, Facility ID No. 145165, Roanoke, VA. The proposed W226CN facility will be used as a fill-in translator simulcasting co-owned primary station WKBA(AM), 1550 kHz, Facility ID No. 200318, Vinton, VA. Therefore, written retransmission consent is not required. An exhibit is included demonstrating compliance with FCC Section 74.1201(g) “Fill-In Translator”. The proposed W226CN facility would operate on Channel 226D (93.1 MHz) with 250 watts ERP directional with the transmit antenna located at 12 meters height above ground level and 224.4 meters HAAT. An exhibit showing the FCC F(50,50) 60 dBu contours of the W226CN proposed modification and licensed facility overlap. Therefore, it is believed this proposed modification is in compliance with FCC Section 74.1233(a) "Common Overlap".

A channel study is included as an exhibit that assumes a Class A 6 kW facility operating on Channel 226. This study is provided to FCC staff as a convenience to help identify potential

contour overlap issues. Section 74.1204 contour protection exhibits shows protections to co-channel full power FM station WPAW, Channel 226C, Winston-Salem, NC and FM translator K226AT, Channel 226D, Christiansburg, VA, second channel full power FM station WJJS, Channel 228A, Salem, VA and FM translator W224BS, Channel 224D, Roanoke, VA.

Studies have been undertaken to show the proposed facility is in compliance with the FCC's radio frequency emission limits and are attached as exhibits.

W226CN

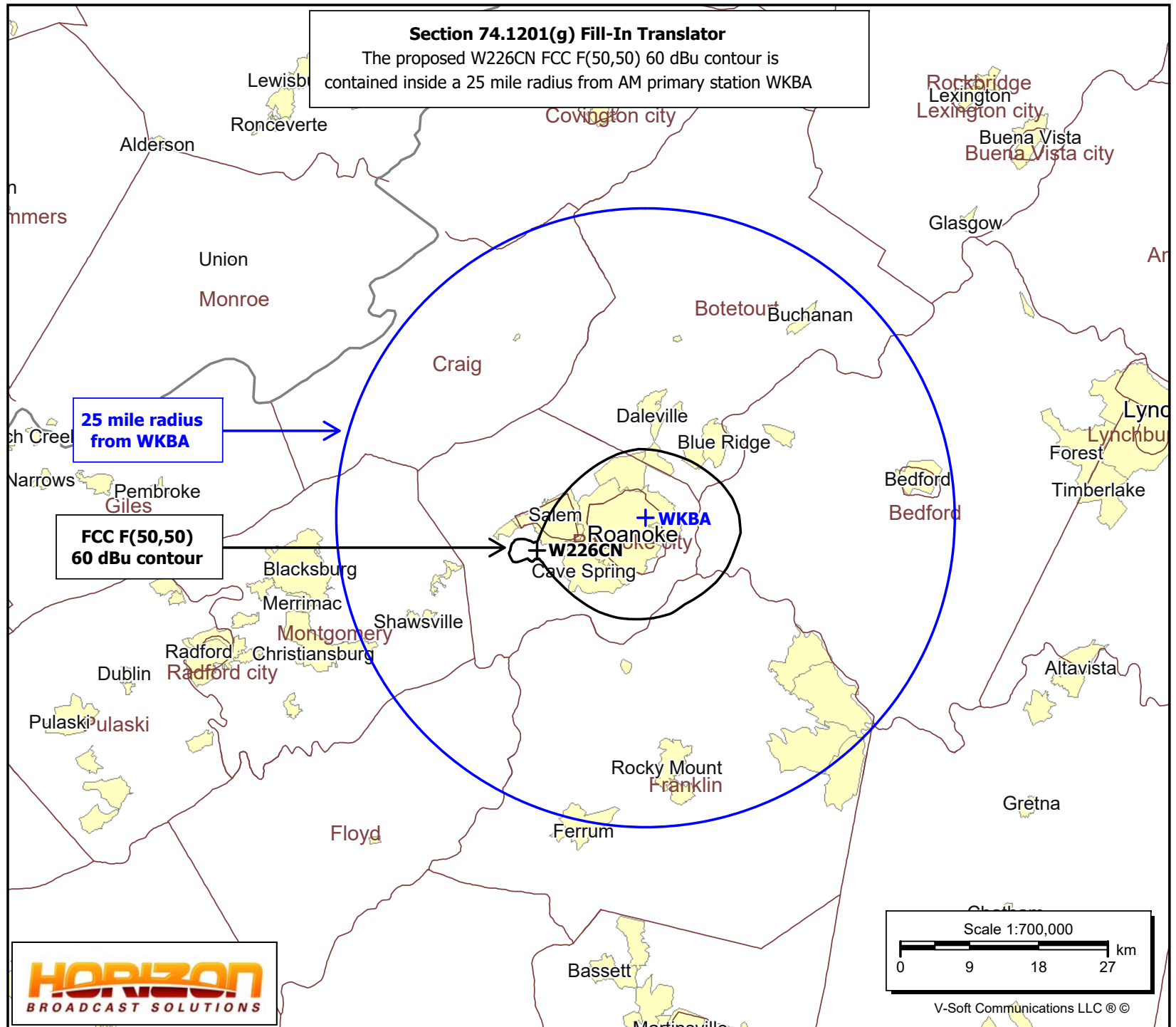
Vinton, VA
0000124966
Latitude: 37-15-06.10 N
Longitude: 080-04-54.60 W
ERP: 0.25 kW
HAAT: 224.44
Channel: 226
Frequency: 93.1 MHz
AMSL Height: 740.0 m
Elevation: 728.0 m
Horiz. Pattern: Directional
Vert. Pattern: No
Prop Model: FCC Model
Loc. Variability: 50.0%
Time Variability: 50.0%
HAAT Mthd: FCC

WKBA

Vinton, VA
Type: AM
Frequency: 1550
Latitude: 37-17-24 N
Longitude: 079-55-22 W
10.0 kW Day

Section 74.1201(g) Fill-In Translator

The proposed W226CN FCC F(50,50) 60 dBu contour is contained inside a 25 mile radius from AM primary station WKBA



W226CN Class A FM Channel Study

REFERENCE		CLASS = A Int = AA		DISPLAY DATES			
37 15 06.1 N.		Current Spacings to 3rd Adj.		DATA 08-23-23			
80 04 54.6 W.		Channel 226 - 93.1 MHz		SEARCH 08-23-23			

Call	Channel	Location	Azi	Dist	FCC	Margin	
Lat.	Lng.	Ant	Power	HAAT			

W226CN	LIC-D 226D	Vinton	VA	0.0	0.0	84.5	-84.5
37 15 06.1	80 04 54.6	DVN	0.250 kW	0 M			
		Backroads Radio, LLC	0000124966				
WPAW	LIC 226C	Winston-Salem	NC	173.3	109.0	225.5	-116.5
36 16 33.5	79 56 25.1	CN	100.000 kW		335 M		
		Audacy License, LLC	BMLH20030303ABL				
Note: See Section 74.1204 Contour Protection: WPAW							
W226AT	LIC 226D	Christiansburg	VA	257.9	33.9	84.5	-50.6
37 11 13.9	80 27 20.3	CN	0.045 kW	0 M			
		Positive Alternative Radio	0000112545				
Note: See Section 74.1204 Contour Protection: W226AT							
WJJS	LIC 228A	Salem	VA	68.7	8.6	30.5	-21.9
37 16 47.5	79 59 28.1	CN	5.800 kW		30 M		
		Ihm Licenses, LLC	BMLH19910801KB				
Note: See Section 74.1204 Contour Protection: WJJS & W224BS							
W224BS	LIC 224D	Roanoke	VA	311.5	9.5	25.5	-16.0
37 18 30.5	80 09 45.2	VN	0.010 kW		476 M		
		CSN International	BLFT20061211ADB				
Note: See Section 74.1204 Contour Protection: WJJS & W224BS							
W279AC	LIC-D 279D	Roanoke	VA	224.1	0.2	9.5	-9.3
37 15 02.4	80 04 59.1	DCN	0.233 kW		229 M		
		Positive Alternative Radio	BMLFT20100706EHK				
WK CJ	LIC-N 227A	White Sulphur Sprin	WV	339.0	65.8	71.5	-5.7
37 48 17.4	80 21 02.3	NCN	1.100 kW		236 M		
		Radio Greenbrier, LLC	BLH20160115AAK				
WCWV	LIC 225B	Summersville	WV	338.2	132.8	112.5	20.3
38 21 38.2	80 38 49.7	CN	14.000 kW		286 M		
		Summit Media Broadcasting,	BMLH20180919ABJ				
WGAG-LP	LIC 226L1	Princeton	WV	280.9	90.8	66.5	24.3
37 24 04.4	81 05 19.3	CN	0.100 kW		-6 M		
		The Denver Foundation, Inc	BLL20040720AAM				
WSVO	LIC 226A	Staunton	VA	40.7	146.2	114.5	31.7
38 14 33.4	78 59 23.1	CN	3.900 kW		125 M		
		Ihm Licenses, LLC	BLH20121113ABR				
W224DV	LIC 224D	Stuart	VA	193.1	71.5	25.5	46.0
36 37 25.7	80 15 48.7	CN	0.250 kW	0 M			
		Patrick Community Media, I	BLFT20190417AAI				
WKHF	LIC 229A	Lynchburg	VA	82.1	81.8	30.5	51.3
37 20 56.5	79 10 04.1	CN	1.600 kW		197 M		
		Truth Broadcasting Corpora	BLH20110302AAF				

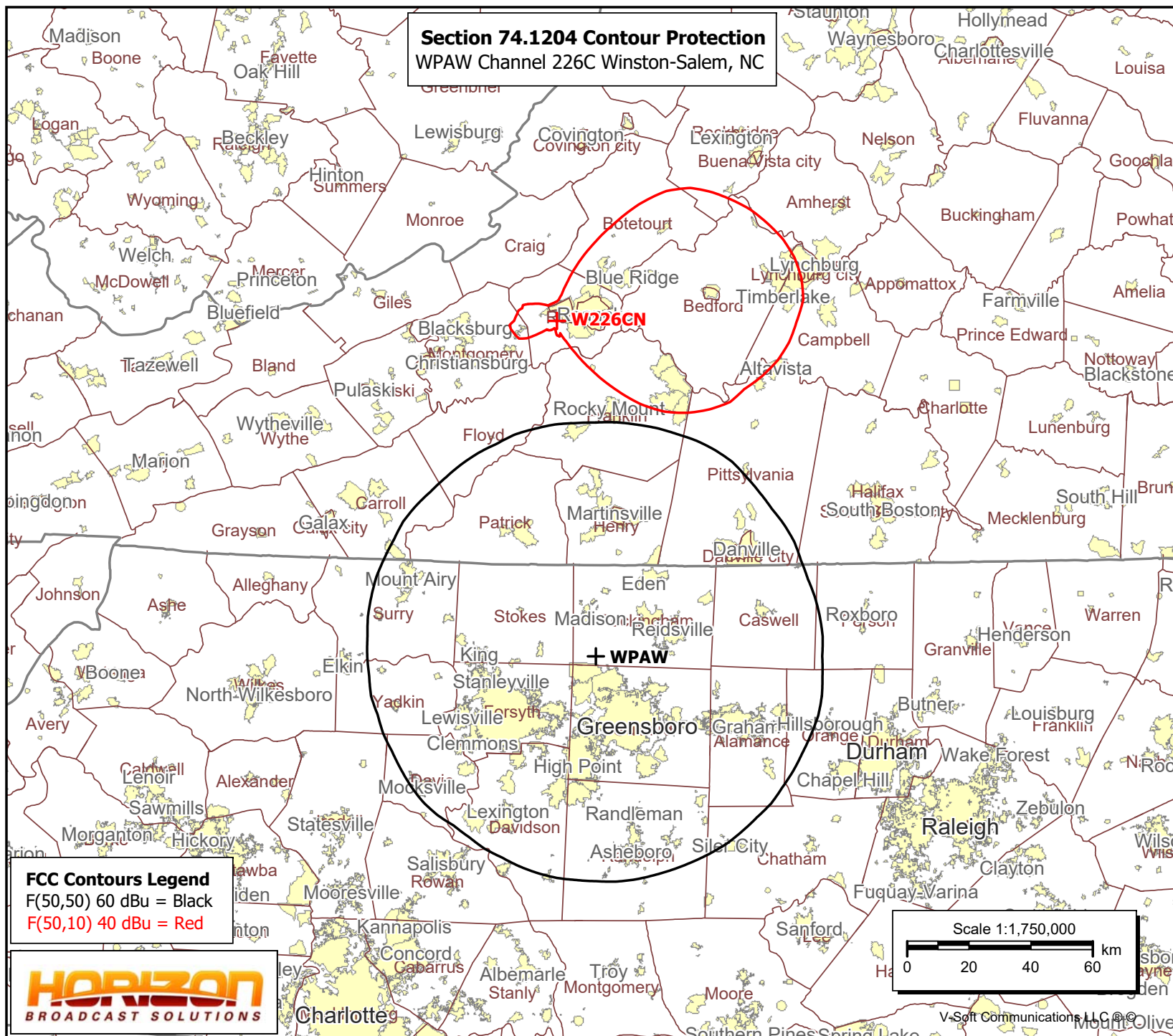
Call	Channel	Location		Azi	Dist	FCC	Margin
Lat.	Lng.	Ant	Power		HAAT		
W227BG	LIC 227D	Timberlake	VA	76.7	87.1	33.5	53.6
37 25 37.5	79 07 25.1	CN	0.250 kW		95 M		
3 Daughters Media, Inc.			BLFT20120823ACA				
WDHR	LIC 226C2	Pikeville	KY	277.0	220.0	165.5	54.5
37 27 57.4	82 33 03.5	CN	22.000 kW		231 M		
Mountain Top Media LLC			BLH20040917ABI				
WHTU	LIC-Z 280A	Big Island	VA	68.5	67.1	9.5	57.6
37 28 14.0	79 22 34.0	ZCN	0.190 kW		540 M		
Ksm Holdings, LLC			0000190123				
W224AF	LIC 224D	Danville	VA	142.0	84.8	25.5	59.3
36 38 56.4	79 29 50.0	CN	0.023 kW		88 M		
Bible Broadcasting Network			BMLFT20120705ABW				

W226CN

Vinton, VA
0000124966
Latitude: 37-15-06.10 N
Longitude: 080-04-54.60 W
ERP: 0.25 kW
HAAT: 224.44
Channel: 226
Frequency: 93.1 MHz
AMSL Height: 740.0 m
Elevation: 728.0 m
Horiz. Pattern: Directional
Vert. Pattern: No
Prop Model: None

WPAW

Winston-Salem, NC
BMLH20030303ABL
Latitude: 36-16-33.50 N
Longitude: 079-56-25.10 W
ERP: 100.00 kW
HAAT: 335.0
Channel: 226
Frequency: 93.1 MHz
AMSL Height: 568.0 m
Elevation: 280.0 m
Horiz. Pattern: Omni
Vert. Pattern: No
Prop Model: FCC Model
Loc. Variability: 50.0%
Time Variability: 50.0%
HAAT Mthd: FCC

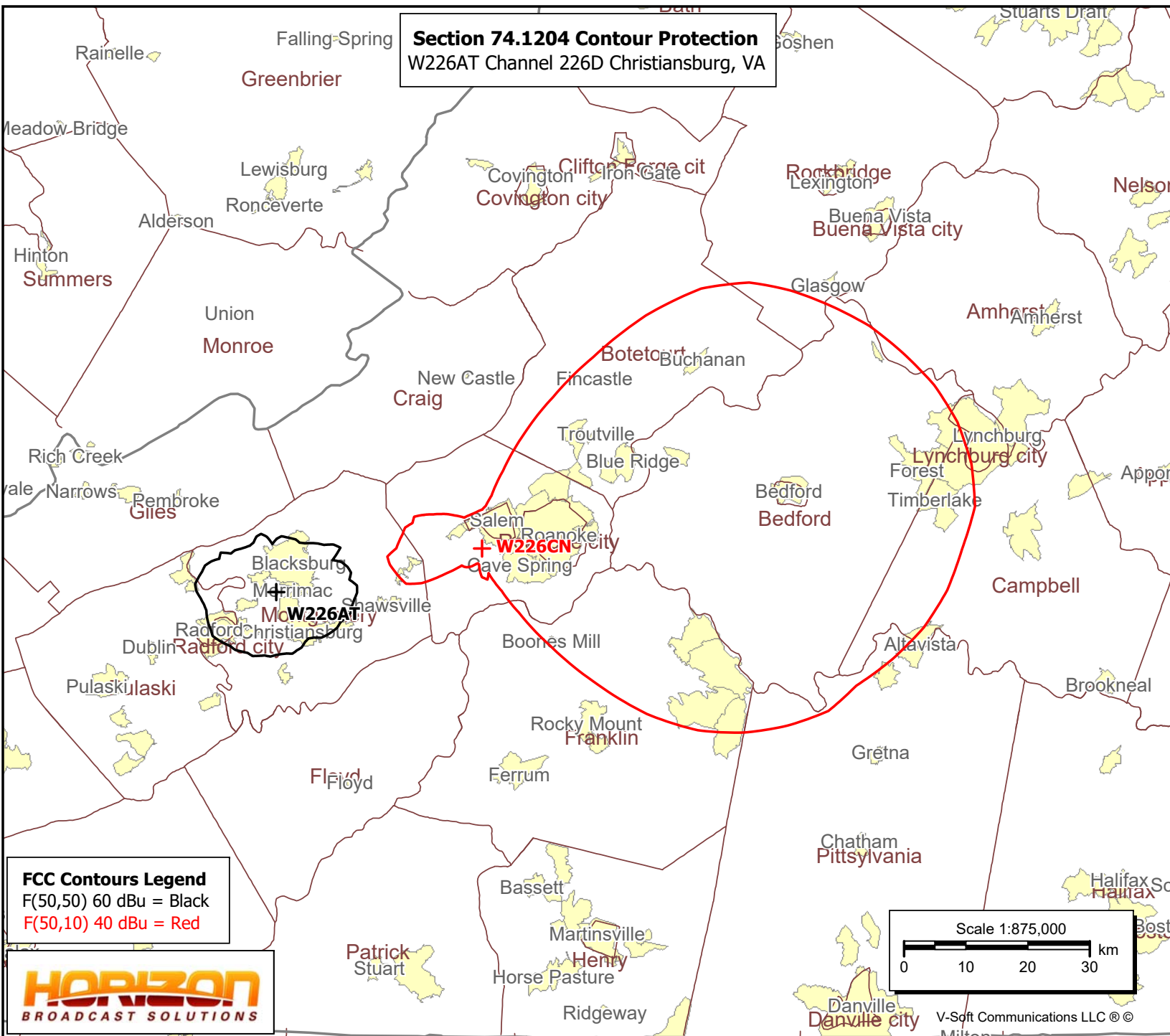
Section 74.1204 Contour Protection
WPAW Channel 226C Winston-Salem, NC

W226CN

Vinton, VA
0000124966
Latitude: 37-15-06.10 N
Longitude: 080-04-54.60 W
ERP: 0.25 kW
HAAT: 224.44
Channel: 226
Frequency: 93.1 MHz
AMSL Height: 740.0 m
Elevation: 728.0 m
Horiz. Pattern: Directional
Vert. Pattern: No
Prop Model: None

W226AT

Christiansburg, VA
0000112545
Latitude: 37-11-13.90 N
Longitude: 080-27-20.30 W
ERP: 0.045 kW
HAAT: 168.4
Channel: 226
Frequency: 93.1 MHz
AMSL Height: 783.0 m
Elevation: 750.0 m
Horiz. Pattern: Omni
Vert. Pattern: No
Prop Model: FCC Model
Loc. Variability: 50.0%
Time Variability: 50.0%
HAAT Mthd: FCC



Section 74.1204

Contour Protection to WJJS & W224BS

This comprehensive exhibit has been prepared to demonstrate that the proposed W226CN modification will not cause prohibited interference to WJJS, Channel 228A, Salem, VA and W224BS, Channel 224DA, Roanoke, VA. This statement demonstrates that a lack of population and/or other factors allow this proposal to be compliant with Section 74.1204. The process commonly called “Living Way,” allows for the use of U/D Analysis, also known as “signal strength ratio methodology.” In this instant case the facilities to be protected are second adjacent and are be afforded protection from signals 40 dB stronger than they present in the location of the proposed antenna location. The WJJS FCC F(50,50) contour at the W226CN application site is 70.4 dBu. The W224BS F(50,50) contour at the W226CN application site is 64.4 dBu. Therefore, the interfering contour to W224BS extends further and W224BS will be shown to demonstrate contour protection to both stations. The W226CN F(50,10) interfering contour with respect to W224BS is the 104.4 dBu contour. The proposed W226CN transmit antenna will be located in a remote mountaintop electronic site with no occupied buildings, The attached Google Earth Screenshot shows the W226CN F(50,10) 104.4 dBu interfering contour in red. With the exception of the equipment building adjacent to the tower, there are no buildings of any kind inside the 104.4 dBu interfering contour. There are no roads or occupied buildings. The nearest building is a residence which is identified on the map. Furthermore, that residence is located at an elevation more than 600 feet lower than the W226CN antenna.

It is believed that the proposed modification to W226CN will not cause prohibited interference to W224BS or WJJS because any interference occurs in a remote and

unpopulated area. Therefore, it is believed the proposed W226CN modification is in compliance with Section 74.1204 contour protection with respect to WJJS and W224BS.

W226CN

Vinton, VA
0000124966
Latitude: 37-15-06.10 N
Longitude: 080-04-54.60 W
ERP: 0.25 kW
HAAT: 224.44
Channel: 226
Frequency: 93.1 MHz
AMSL Height: 740.0 m
Elevation: 728.0 m
Horiz. Pattern: Directional
Vert. Pattern: No
Prop Model: None

WJJS

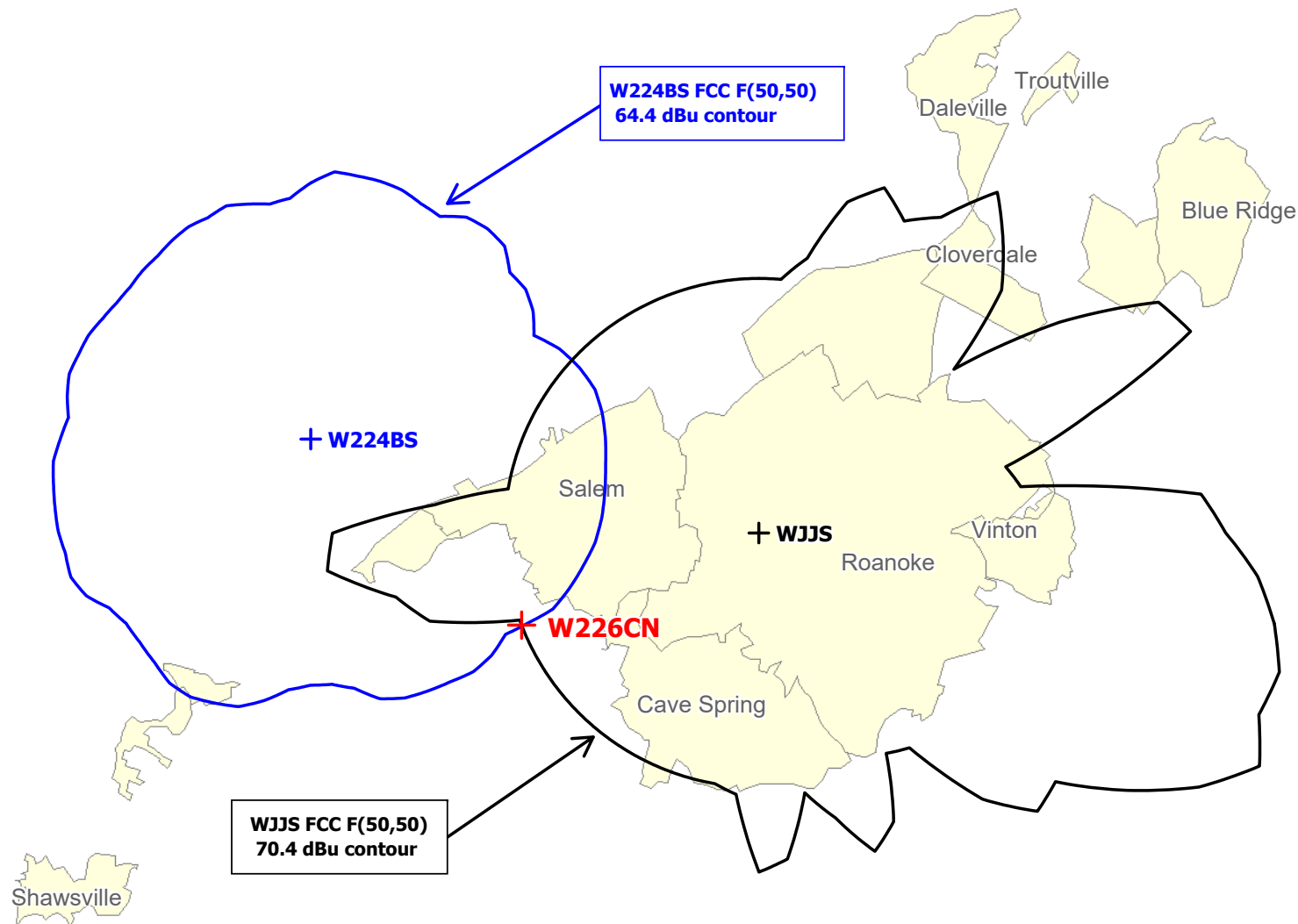
Salem, VA
BMLH19910801KB
Latitude: 37-16-47.50 N
Longitude: 079-59-28.10 W
ERP: 5.80 kW
HAAT: 30.0
Channel: 228
Frequency: 93.5 MHz
AMSL Height: 434.0 m
Elevation: 322.0 m
Horiz. Pattern: Omni
Vert. Pattern: No

W224BS

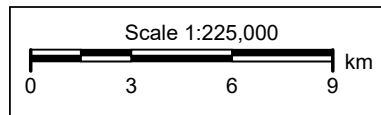
Roanoke, VA
BLFT20061211ADB
Latitude: 37-18-30.50 N
Longitude: 080-09-45.20 W
ERP: 0.01 kW
HAAT: 476.4
Channel: 224
Frequency: 92.7 MHz
AMSL Height: 1025.0 m
Elevation: 988.0 m
Horiz. Pattern: Omni
Vert. Pattern: No

Section 74.1204 Contour Protection

WJJS Channel 228A Salem, VA
W224BS Channel 224D Roanoke, VA



HORIZON
BROADCAST SOLUTIONS



V-Soft Communications LLC ©

Section 74.1204 Contour Protection: W224BS
There are no buildings or population inside the W226CN
interfering contour with respect to W224Bs

W226CN FCC F(50,10)
104.4 dBu Contour

Nearest Occupied
Building

W226CN

1303 ft

Google Earth

Imagery Date: 10/10/2022 37°14'51.47" N 80°04'53.23" W elev 2127 ft eye alt 7734 ft

Human Exposure to Radiofrequency Electromagnetic Field & Section 106 Compliance (Environmental)

A study has been made to determine whether this proposal is in compliance with 47 C.F.R. 1.1307 of the Commission's rules and with OET Bulletin #65, dated August 1997, regarding human exposure to radio frequency radiation in the vicinity of broadcast towers. WVJT Backroads Radio, LLC, ("Backroads"), is the licensee of W226CN, Channel 226D, Facility ID 200318, Vinton, Virginia. Backroads seeks to modify W226CN by making a slight change to the directional antenna pattern. The transmit site and antenna are the current licensed W226CN facilities. The tower is an existing tower 20 meters in overall height that is not registered with an FCC Antenna Structure Registration (ASR) number. The site is located at 37° 15' 06.1" N ~ 80° 04' 54.6" W (NAD 83). The proposed transmit antenna is a side mounted Kathrein-Scala CL-FM horizontally polarized directional antenna. The proposed W226CN facility would operate with 250 watts ERP directional with horizontal polarization at 12 meters above ground level and 224.44 meters HAAT. 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. This modification is believed to be exempt from a Section 106 review by the SHPO/THPO.

The proposed W226CN transmit antenna will also broadcast W270DU, Channel 270D, Facility ID No. 145165 Roanoke, VA. WVJT, LLC, licensee of W270CU, will conduct a spurious emissions study and submit the results as an exhibit with the W270CU license application.

The proposed operation was evaluated for human exposure to RF energy using the procedures outlined in the Commission's OET Bulletin Number 65. The revised FM Model Program does not include the Kathrein-Scala antenna. Therefore, EPA Element Type 1, Ring-and-stub, or any type not otherwise described was selected. Using EPA Element Type 1 antenna selection, the maximum calculated signal density near the tower at two meters above ground level attributable to the proposed facility is $23.155 \mu\text{W}/\text{cm}^2$ at 5.8 meters, which is 11.578 percent of the general population/uncontrolled maximum permitted exposure limit.

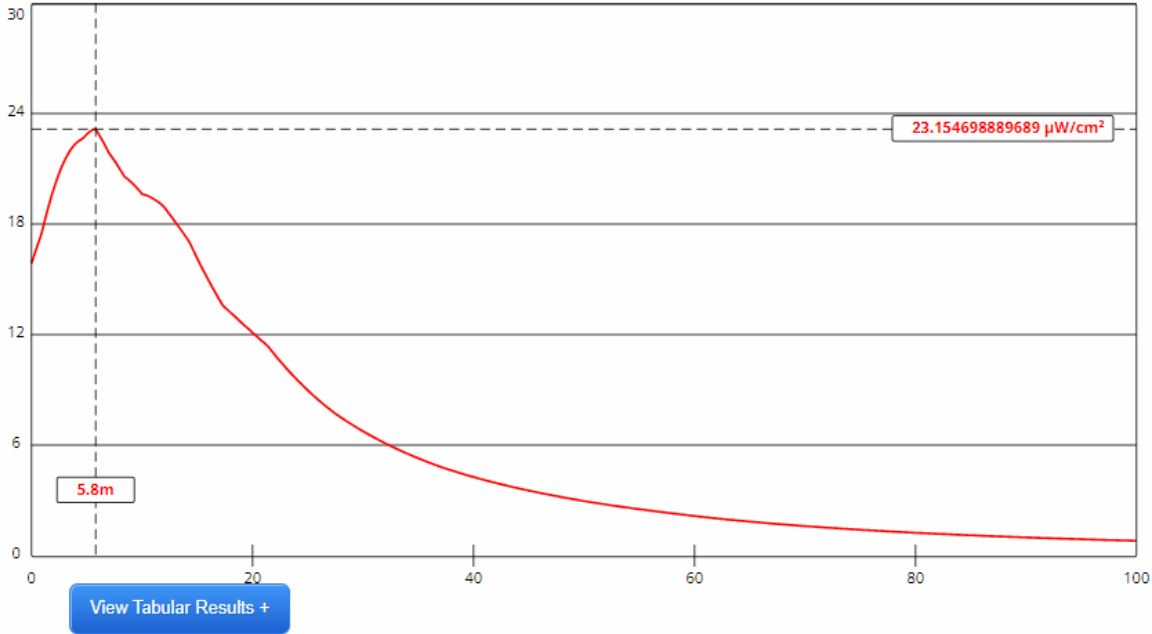
The applicant will see that signs are posted in the vicinity of the tower, warning of potential radio frequency hazards at the site. The applicant will cooperate with other users of the tower to reduce power of the facility, or discontinue operation, as necessary to limit human exposure to levels less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

FM Model

Radio Frequency Safety

- FCC Policy on Human Exposure
- RF Safety Highlighted Releases
- RF Safety FAQ
- FM Model**
- Body Tissue Dielectric Parameters

The FM Model calculator determines the potential exposure from radiofrequency (RF) electromagnetic fields produced by FM broadcast station antennas at ground level. The FM Model software was originally developed by the FCC in 1997 as a standalone executable program and this improved version provides more precise predictions and runs via a JavaScript enabled web browser. The FM Model is originally based on measured data [published in 1985 by the EPA](#). [Show More....](#)



Channel Selection	Channel 226 (93.1 MHz) ▼		
Antenna Type +	EPA Type 1: Ring-and-Stub or "Other" ▼		
Height (m)	<input type="text" value="12"/>	Distance (m)	<input type="text" value="100"/>
ERP-H (W)	<input type="text" value="250"/>	ERP-V (W)	<input type="text" value="0"/>
Num of Elements	<input type="text" value="1"/>	λ	<input type="text" value="1"/>
Num of Points	<input type="text" value="500"/>	<input type="button" value="Apply"/>	