W285FA; Facility ID No.: 31140
Comprehensive Engineering Exhibit
October 2015

W285FA is seeking a modification for a new location 213 meters above ground level, at an existing site identified by ASR No. 1042694, utilizing a directional Scala ERI LPX-1E 1-bay antenna with 99 watts of effective power. This location is an established broadcast tower supporting several FM stations, and is an element in the WWRC(AM) directional array, as well as adjacent to station WAVA(AM).

Below as **Figure 1** is an overlap and spacing study from which it can be determined that this proposal is within the protected contour of second adjacent channel stations WPRS(FM) and WAVA-FM.

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"[1], allows for the use of U/D Analysis, also known as "signal strength ratio methodology" to be utilized. In this instant case the facilities to be protected are second and third adjacent, thus are to be afforded protection from signals 40 dB stronger than they present in the location of the proposed antenna location.

Figure 2 is a map showing the predicted signal contours of WAVA-FM and WPRS(FM) in the vicinity of the proposed antenna location utilizing the FCC F50:50 curve. WAVA-FM has a stronger signal in the area of this proposed location than WPRS(FM) does. Thus, protection of the WPRS(FM) 62.7 dBu contour from a signal produced by this proposal exceeding 102.7 is required, and by protecting this "weaker" WPRS(FM) signal as compared to WAVA-FM, the protection requirements are demonstrated.

The vertical elevation pattern of the proposed antenna, given in **Figure 3**, was used in the line of sight equation[2] distance table of **Figure 4**, where a 102.7 dBu signal was determined to not reach within 2 meters of ground level. In the image of **Figure 4** it can be seen that no habitable space exists near the antenna above this level, thus demonstrating that a lack of population and/or other factors allow this proposal to be compliant with 74.1204.

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[1] As recently described in FCC 08-242 in connection with BPFT-19981001TA

[2] ReachDistMeters=106.92-(20*(LOG10[DistMeters]/1000)))+[ERPin dBk]

In **Figure 6** the licensed and proposed facilities overlap of 60 dBu contours is shown, as well as the 54 dBu of the proposal and primary station WWDC. Thus this is a qualified fill-in and minor change application.

In accordance with 47 C.F.R. 1.1307(b)(1) Table 1, only "Part 74 – Subpart L" facilities with an ERP greater than 100 watts, are subject to routine environmental evaluation. Since the facility proposed in this application will operate with an ERP of less than 100 watts it is "categorically excluded from making such studies or preparing an EA" [1.1307(b)(1)] the licensee will fully cooperate with other site users to temporarily reduce power or cease broadcasting, as necessary, to protect workers and others having access to the site from excessive levels of RF Radiation.

Figure 1- Overlap and Spacing Study

77-03-26.1 W
Amfm Radio Licenses, Llc

REFERENCE CH# 284D - 104.7 MHz, Pwr= 0.099 kW DA, HAAT= 224.1 M, COR= 303.3 M DISPLAY DATES
38 59 59.6 N. Average Protected F(50-50)= 15.35 km DATA 10-14-15
77 03 26.1 W. Standard Directional SEARCH 10-14-15

CH CALL / CITY	TYPE ANT / STATE	AZI <--	DIST / FILE #	LAT / LNG	PWR(kW) / HAAT(M)	INT(km) / COR(M)	PRO(km) / LICENSEE	*IN* (Overlap in km)	*OUT*
284D W285FA	CP DC_	225.8	5.76	38 57 49.5	0.075	32.6	9.8	-42.2*	-54.5*
Washington	DC	45.8	BPFT20140909AFX	77 06 18.3		302	Amfm Radio Licenses, Llc		
286B WAVA-FM	LIC _CX	208.2	13.64	38 53 30.0	33.000	5.7	63.2	-7.1*	-50.9*
Arlington	VA	28.2	BLH20070426ACO	77 07 55.0	184	250	Salem Media Of Virginia, I		
284B WAYZ	LIC _CN	333.3	86.73	39 41 47.0	8.300	122.2	63.9	-39.3*	2.5
Hagerstown	MD	153.0	BLH19900814KF	77 30 47.0	420	720	Hjv Limited Partnership		
281B WPRS-FM	LIC _CX	156.4	46.18	38 37 07.4	20.000	5.7	65.0	23.8	-20.2*
Waldorf	MD	336.5	BMLH20070809ABE	76 50 39.0	244	295	Radio One Licenses, Llc		
284L1 WYZT-LP	CP ___	92.4	52.27	38 58 44.1	0.071			21.8	1.4
Annapolis	MD	272.8	BNPL20131112AZD	76 27 16.3	36	40	Maryland Hall For The Crea		
285D W285FA	LIC DH_	319.8	12.21	39 05 01.4	0.250	4.7	3.1	3.1	2.5
Rockville	MD	139.7	BLFT20140905AAO	77 08 54.8		221	Amfm Radio Licenses, Llc		
283D W283CD	LIC _C_	273.6	32.34	39 01 03.0	0.160	9.1	6.3	9.2	4.7
Sterling	VA	93.4	BLFT20150316ACF	77 25 48.0		123	Washington Dc Fcc License		
282B WZFT	LIC ZCX	43.1	51.31	39 20 10.0	13.000	2.2	42.3	41.9	8.6
Baltimore	MD	223.3	BLH20090123AAG	76 38 59.0	294	378	Citicasters Licenses, Inc.		
284B WQHQ	LIC _CN	113.4	167.97	38 23 15.0	33.000	132.2	64.3	19.0	33.3
Ocean City-salisbur	MD	294.5	BLH19800505AB	75 17 30.0	186	189	Capstar Tx Llc		
284C1 WPZZ	LIC DCN	201.4	217.74	37 10 15.0	100.000	171.8	72.9	30.7	94.8
Crewe	VA	20.8	BLH19920211KA	77 57 16.0	299	399	Radio One Licenses, Llc		
Transmitter located in Zone 2.									
283A WGRX	LIC ZC_	207.8	90.86	38 16 31.0	2.700	44.1	29.2	31.7	38.9
Falmouth	VA	27.5	BLH20010522AAM	77 32 34.0	150	219	Telemedia Broadcasting, In		
284D W284BE	CP DC_	52.3	103.54	39 33 52.0	0.250	53.3	16.7	41.8	58.9
Havre De Grace	MD	232.9	BPFT20150608AAB	76 06 07.0		207	Hope Christian Church Of M		
285D W285EJ	LIC _C_	42.7	63.43	39 25 04.0	0.010	8.3	5.9	48.0	47.3
White Marsh	MD	223.0	BLFT20090330AJF	76 33 23.0	120	212	Hope Christian Church Of M		

Terrain database is NGDC 30 SEC , R= 73.215 qualifying spacings or FCC minimum Spacings in KM, M= Margin in KM
Contour distances are on direct line to and from reference station. Reference zone= , Co to 3rd adjacent.
All separation margins (if shown) include rounding. Call signs with strikeout need not be protected.
Ant Column: (D= DA Standard, Z= DA 73.215, N= Not DA 73.215, _= Omni), Polarization (C,H,V,E), Beamtilt(Y,N,X)
"*"affixed to 'IN' or 'OUT' values = site inside restricted contour.

Figure 2- Contour Map

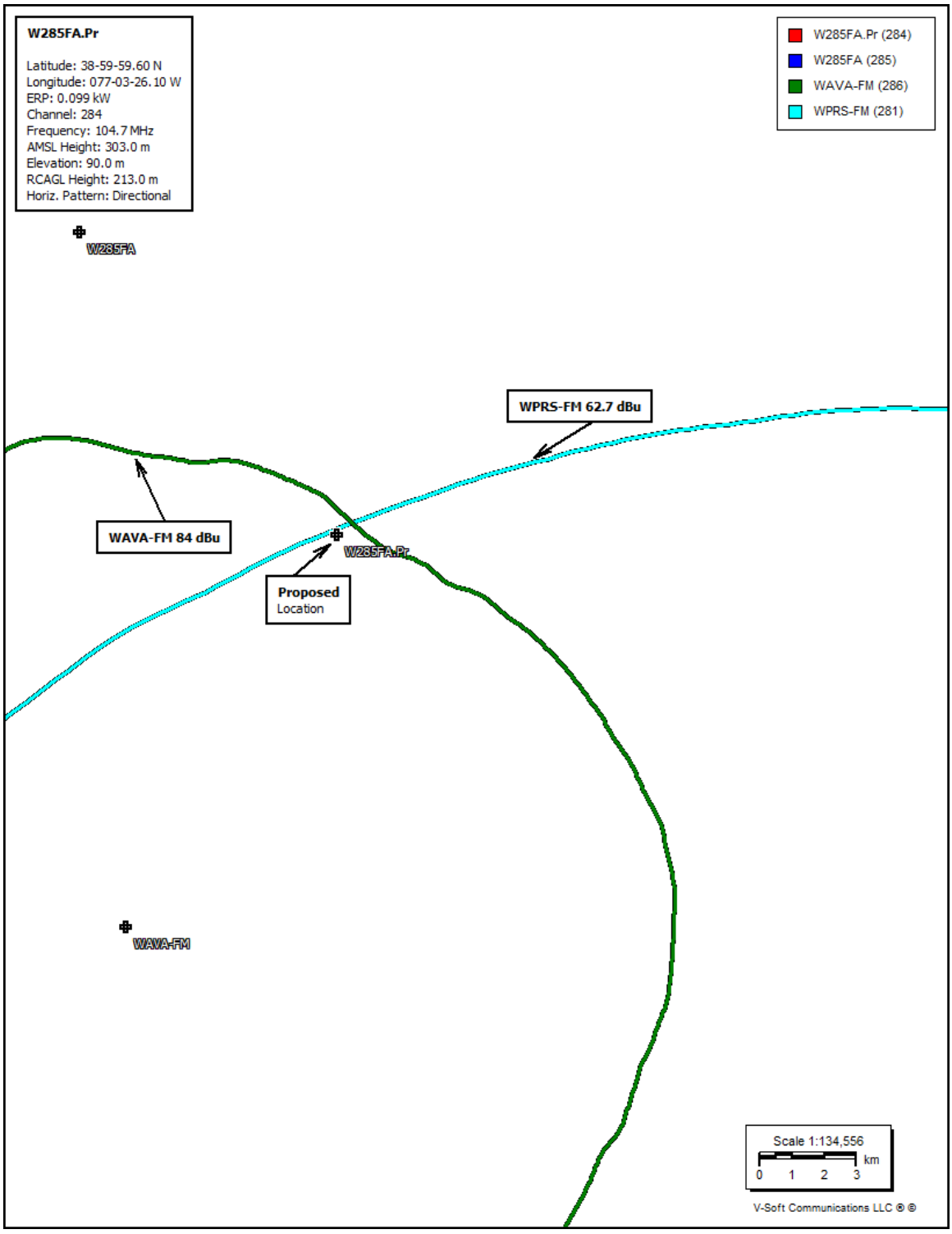

Figure 3- Antenna Elevation Pattern

TABULATED DATA FOR ELEVATION PATTERN

Type: LPX1F
Polarization: Circular

ANGLE	FIELD	dB	ANGLE	FIELD	dB	ANGLE	FIELD	dB	ANGLE	FIELD	dB	ANGLE	FIELD	dB
5.00	0.993	-0.06	-6.75	0.988	-0.11	-27.00	0.819	-1.74	-50.50	0.465	-6.65	-74.00	0.135	-17.42
4.75	0.994	-0.05	-7.00	0.987	-0.11	-27.50	0.812	-1.81	-51.00	0.457	-6.80	-74.50	0.129	-17.77
4.50	0.995	-0.05	-7.25	0.986	-0.12	-28.00	0.806	-1.87	-51.50	0.449	-6.96	-75.00	0.124	-18.13
4.25	0.995	-0.04	-7.50	0.985	-0.13	-28.50	0.799	-1.94	-52.00	0.441	-7.11	-75.50	0.119	-18.50
4.00	0.996	-0.04	-7.75	0.984	-0.14	-29.00	0.793	-2.02	-52.50	0.433	-7.27	-76.00	0.114	-18.87
3.75	0.996	-0.03	-8.00	0.983	-0.15	-29.50	0.786	-2.09	-53.00	0.425	-7.43	-76.50	0.109	-19.26
3.50	0.997	-0.03	-8.25	0.982	-0.16	-30.00	0.780	-2.16	-53.50	0.417	-7.59	-77.00	0.104	-19.65
3.25	0.997	-0.02	-8.50	0.981	-0.17	-30.50	0.773	-2.24	-54.00	0.409	-7.76	-77.50	0.099	-20.06
3.00	0.998	-0.02	-8.75	0.980	-0.18	-31.00	0.766	-2.32	-54.50	0.401	-7.93	-78.00	0.095	-20.47
2.75	0.998	-0.02	-9.00	0.979	-0.19	-31.50	0.759	-2.40	-55.00	0.394	-8.10	-78.50	0.090	-20.90
2.50	0.998	-0.01	-9.25	0.977	-0.20	-32.00	0.752	-2.48	-55.50	0.386	-8.28	-79.00	0.086	-21.34
2.25	0.999	-0.01	-9.50	0.976	-0.21	-32.50	0.745	-2.56	-56.00	0.378	-8.45	-79.50	0.081	-21.79
2.00	0.999	-0.01	-9.75	0.975	-0.22	-33.00	0.738	-2.64	-56.50	0.370	-8.63	-80.00	0.077	-22.25
1.75	0.999	-0.01	-10.00	0.974	-0.23	-33.50	0.731	-2.73	-57.00	0.362	-8.82	-80.50	0.073	-22.73
1.50	0.999	-0.01	-10.50	0.971	-0.26	-34.00	0.723	-2.81	-57.50	0.355	-9.00	-81.00	0.069	-23.22
1.25	1.000	0.00	-11.00	0.968	-0.28	-34.50	0.716	-2.90	-58.00	0.347	-9.19	-81.50	0.065	-23.73
1.00	1.000	0.00	-11.50	0.965	-0.31	-35.00	0.709	-2.99	-58.50	0.339	-9.38	-82.00	0.061	-24.25
0.75	1.000	0.00	-12.00	0.962	-0.33	-35.50	0.701	-3.08	-59.00	0.332	-9.58	-82.50	0.058	-24.79
0.50	1.000	0.00	-12.50	0.959	-0.36	-36.00	0.694	-3.17	-59.50	0.324	-9.78	-83.00	0.054	-25.34
0.25	1.000	0.00	-13.00	0.956	-0.39	-36.50	0.687	-3.27	-60.00	0.317	-9.98	-83.50	0.051	-25.92
0.00	1.000	0.00	-13.50	0.952	-0.42	-37.00	0.679	-3.36	-60.50	0.310	-10.19	-84.00	0.047	-26.51
-0.25	1.000	0.00	-14.00	0.949	-0.46	-37.50	0.671	-3.46	-61.00	0.302	-10.39	-84.50	0.044	-27.13
-0.50	1.000	0.00	-14.50	0.945	-0.49	-38.00	0.664	-3.56	-61.50	0.295	-10.61	-85.00	0.041	-27.77
-0.75	1.000	0.00	-15.00	0.941	-0.53	-38.50	0.656	-3.66	-62.00	0.288	-10.82	-85.50	0.038	-28.44
-1.00	1.000	0.00	-15.50	0.937	-0.56	-39.00	0.648	-3.76	-62.50	0.280	-11.04	-86.00	0.035	-29.13
-1.25	1.000	0.00	-16.00	0.933	-0.60	-39.50	0.641	-3.87	-63.00	0.273	-11.27	-86.50	0.032	-29.85
-1.50	0.999	-0.01	-16.50	0.929	-0.64	-40.00	0.633	-3.97	-63.50	0.266	-11.49	-87.00	0.029	-30.61
-1.75	0.999	-0.01	-17.00	0.925	-0.68	-40.50	0.625	-4.08	-64.00	0.259	-11.73	-87.50	0.027	-31.39
-2.00	0.999	-0.01	-17.50	0.921	-0.72	-41.00	0.617	-4.19	-64.50	0.252	-11.96	-88.00	0.024	-32.22
-2.25	0.999	-0.01	-18.00	0.916	-0.76	-41.50	0.609	-4.30	-65.00	0.245	-12.20	-88.50	0.022	-33.09
-2.50	0.998	-0.01	-18.50	0.912	-0.80	-42.00	0.601	-4.42	-65.50	0.239	-12.45	-89.00	0.020	-34.00
-2.75	0.998	-0.02	-19.00	0.907	-0.85	-42.50	0.593	-4.53	-66.00	0.232	-12.70	-89.50	0.018	-34.96
-3.00	0.998	-0.02	-19.50	0.902	-0.89	-43.00	0.586	-4.65	-66.50	0.225	-12.95	-90.00	0.016	-35.99
-3.25	0.997	-0.02	-20.00	0.897	-0.94	-43.50	0.578	-4.77	-67.00	0.219	-13.21			
-3.50	0.997	-0.03	-20.50	0.892	-0.99	-44.00	0.570	-4.89	-67.50	0.212	-13.47			
-3.75	0.996	-0.03	-21.00	0.887	-1.04	-44.50	0.562	-5.01	-68.00	0.206	-13.74			
-4.00	0.996	-0.04	-21.50	0.882	-1.09	-45.00	0.554	-5.14	-68.50	0.199	-14.01			
-4.25	0.995	-0.04	-22.00	0.877	-1.14	-45.50	0.546	-5.26	-69.00	0.193	-14.29			
-4.50	0.995	-0.05	-22.50	0.871	-1.20	-46.00	0.537	-5.39	-69.50	0.187	-14.58			
-4.75	0.994	-0.05	-23.00	0.866	-1.25	-46.50	0.529	-5.52	-70.00	0.181	-14.87			
-5.00	0.993	-0.06	-23.50	0.860	-1.31	-47.00	0.521	-5.66	-70.50	0.175	-15.16			
-5.25	0.993	-0.06	-24.00	0.855	-1.36	-47.50	0.513	-5.79	-71.00	0.169	-15.47			
-5.50	0.992	-0.07	-24.50	0.849	-1.42	-48.00	0.505	-5.93	-71.50	0.163	-15.77			
-5.75	0.991	-0.08	-25.00	0.843	-1.48	-48.50	0.497	-6.07	-72.00	0.157	-16.09			
-6.00	0.990	-0.08	-25.50	0.837	-1.55	-49.00	0.489	-6.21	-72.50	0.151	-16.41			
-6.25	0.990	-0.09	-26.00	0.831	-1.61	-49.50	0.481	-6.36	-73.00	0.146	-16.74			
-6.50	0.989	-0.10	-26.50	0.825	-1.67	-50.00	0.473	-6.50	-73.50	0.140	-17.07			

Preliminary, subject to final design and review.

Figure 4- Distance to Signal Table

Proposed Antenna: ERI LPX1F
Proposed Power: 0.099 kW
Antenna Height AGL: 213 meters
Interference Contour: 102.7 dBu f(50:10)
tificial Rcv Antenna Height: 2 meters

Fill in "yellow" cells

Distance (Free Space) Equation: =(10^((106.92-[desired dBu]+[ERP in dBk])/20))*1000

Field Strength (dBu) Equation "=106.92-(20*(LOG10[DistMeters]/1000)))+[ERPin dBk]

Depression Angle Below Horizon	Antenna Relative Field	ERP in kW	ERP in dBk	Distance from Ant. to Interf Contour	Distance from Ant. to Artificial Plane	Field Strength in dBu @ Artificial Plane	Distance from Ant. to Ground Level	Field Strength in dBu @ Ground Level
0°	1.000	0.099	-10.04	511.47 m	infinite	---	infinite	---
-5°	0.993	0.098	-10.10	507.89 m	2420.95 m	89.14 dBu	2443.90 m	89.05 dBu
-10°	0.974	0.094	-10.27	498.17 m	1215.10 m	94.96 dBu	1226.62 m	94.87 dBu
-15°	0.937	0.087	-10.61	479.24 m	815.24 m	98.09 dBu	822.97 m	98.00 dBu
-20°	0.892	0.079	-11.04	456.23 m	616.92 m	100.08 dBu	622.77 m	100.00 dBu
-25°	0.843	0.070	-11.53	431.17 m	499.27 m	101.43 dBu	504.00 m	101.34 dBu
-30°	0.780	0.060	-12.20	398.94 m	422.00 m	102.21 dBu	426.00 m	102.13 dBu
-35°	0.709	0.050	-13.03	362.63 m	367.87 m	102.58 dBu	371.35 m	102.49 dBu
-40°	0.633	0.040	-14.02	323.76 m	328.26 m	102.58 dBu	331.37 m	102.50 dBu
-45°	0.554	0.030	-15.17	283.35 m	298.40 m	102.25 dBu	301.23 m	102.17 dBu
-50°	0.473	0.022	-16.55	241.92 m	275.44 m	101.57 dBu	278.05 m	101.49 dBu
-55°	0.394	0.015	-18.13	201.52 m	257.58 m	100.57 dBu	260.02 m	100.49 dBu
-60°	0.317	0.010	-20.02	162.14 m	243.64 m	99.16 dBu	245.95 m	99.08 dBu
-65°	0.245	0.006	-22.26	125.31 m	232.81 m	97.32 dBu	235.02 m	97.24 dBu
-70°	0.181	0.003	-24.89	92.58 m	224.54 m	95.00 dBu	226.67 m	94.92 dBu
-75°	0.124	0.002	-28.18	63.42 m	218.44 m	91.96 dBu	220.51 m	91.88 dBu
-80°	0.077	0.001	-32.31	39.38 m	214.26 m	87.99 dBu	216.29 m	87.91 dBu
-85°	0.041	0.000	-37.79	20.97 m	211.81 m	82.61 dBu	213.81 m	82.53 dBu
-90°	0.016	0.000	-45.96	8.18 m	211.00 m	74.47 dBu	213.00 m	74.39 dBu

Figure 5- Transmitter Location

Figure 6- Minor Change Contours