

TECHNICAL EXHIBIT
CONSTRUCTION PERMIT APPLICATION
NEW LPFM STATION
VEGA BAJA, PUERTO RICO
CHANNEL 221L100
FACILITY ID 785129

Technical Narrative

The technical exhibit, of which this narrative is part, has been prepared on behalf of *All Media Community Group Corp.*, applicant of a New LPFM station, Facility ID 785129, in Vega Baja, PR.

Proposed Transmitter Location

The proposed transmitting facility would operate on channel 221 (92.1 MHz) using an ERI, 100A-1, 1-bay, circularly polarized antenna, side-mounted on an existing tower. The proposed station location is described by the following NAD 83 geographic coordinates:

18° 26' 36.0" North
66° 25' 54.0" West

It is proposed to side mount the antenna with its RC at a height of 18.3 meters (60 ft.) above ground on an existing 19.8 meter (65 ft.) high tower, with a site elevation of 28 meters AMSL. Thus, the antenna RC will be at a height of 46.3 meters AMSL, which according to the FCC HAAT web utility (using 8 radials) corresponds to a HAAT of -14 meters. For this HAAT of less than 30 meters, the corresponding ERP is 100 Watts or 0.1 kW. The maximum permissible ERP of 100 Watts allowed under these conditions is requested for this LPFM facility. Appendix 1 shows the HAAT calculations.

Tower Registration

The FAA is not being notified of the proposed construction, as it is proposed to side-mount the FM antenna on an existing 19.8 meter (65 ft.) high tower, that according to the FCC TOWAIR utility and the FAA NOTICE CRITERIA tool does not require registration.

Environmental Considerations

The proposal is excluded from environmental processing, as an existing supporting structure is to be employed and the proposal complies with the FCC Rules concerning human exposure to radio frequency (RF) energy.* The proposal would not exceed 9.4 % of the RF exposure limit for general population/uncontrolled environments for the frequency proposed. The calculation of RF energy at 2-m above ground was made under the procedures of OET Bulletin No. 65.† The formula employed is as follows:

$$S = \frac{(33.4)F^2 P}{R^2}$$

where, S = power density in $\mu\text{W}/\text{cm}^2$, F = relative field factor at the angle to the calculation point, P = the total effective radiated power relative to a dipole in watts, and R = distance from the antenna radiation center to the calculation point in meters.

Based on the vertical radiation pattern of the proposed antenna, (Figure 2A), a relative field factor of 0.866 or less for any depression angle equal or greater than 30 degrees below horizon, a total effective radiated power of 100 watts (circular polarization) and an antenna radiation center height above ground of 18.3 m, the calculated power density will not exceed $18.9 \mu\text{W}/\text{cm}^2$. Therefore, the calculated RF exposure at 2 m above ground will not exceed 9.4 % of the limit of $200 \mu\text{W}/\text{cm}^2$ for the general population and uncontrolled environments. As there will not be other significant RF emitters on the supporting structure, the proposal will comply with the FCC RF exposure guidelines.

The antenna system will be restricted from access and appropriate warning signs posted. In the event that personnel are required to climb the structure, the proposed LPFM station transmissions will be suspended for as long as necessary to prevent RF exposure above the FCC recommended limits.

FCC Monitoring Stations

FCC rules pertaining to FCC monitoring stations, Section 73.1030(c), requires that the proposed facility does not produce a field strength greater than 10 mV/m at the FCC

* Given that the proposed ERP will not exceed 100 watts, the proposal is categorically excluded from environmental processing pursuant to Section 1.1307 of the FCC Rules.

† Federal Communications Commission OET Bulletin No. 65, Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields (Edition 97-01, August 1997).

stations. The closest FCC monitoring station to the proposed operation is in Santa Isabel, PR, at a distance of 48 kilometers. The proposed operation will produce field strengths much lower than 10 mV/m at the FCC Santa Isabel, PR station.

Quiet Zone Notification

As required by FCC rules pertaining to radio Quiet Zones, Section 73.1030(a), the National Radio Astronomy Observatory (NRAO) in Arecibo, Puerto Rico is being notified of this application. A copy of the notification letter to the Arecibo Observatory of the proposed facility is included herein as Appendix 2.

AM Stations Within 3.2 km

There are no non-directional AM stations located within 0.80 km of the above specified coordinates, nor any directional AM stations within 3.2 km of these coordinates: the closest AM Facility is WMNT, Manati, PR, ND2 at 257.4° true at a distance of 5.0 km. Thus, the proposal is believed to be compliant with Section 47 CFR 73.1692.

Allocation Considerations

Figure 1 summarizes the allocation study for the proposed facility. As indicated in Figure 1, spacing with respect to co-channel and first adjacent channels is in line with FCC requirements.

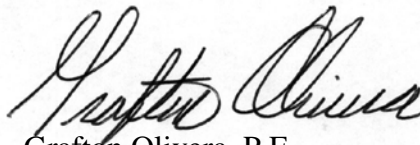
An inspection of the facilities of nearby FM translators shows no translator getting their input signal on the third adjacent channel, or closer, of the proposed facility.

There is a short spacing to second-adjacent full-service FM station WORO, as the proposed LPFM station will operate on Channel 221, second adjacent channel to WORO, Channel 223B. Thus, the protection requirement of the undesired signal from the proposal is 40 dB higher than the desired signal of this station. The proposed LPFM site is located 23.6 kilometers, at a bearing of 333.8° true from WORO; the field strength from this station, F(50,50) at the proposed site, is predicted (V-Soft FMCommander software) to be 88.41 dBu. Using the U/D ratio of 40 dB, the proposed F(50,10) interfering signal is 128.41 dBu; this contour defines the maximum extent of predicted interference to WORO.

Since an ERP of 100 watts is proposed, the 128.4 dBu signal contour is calculated by means of a free-space calculation. Based on free-space calculations the minimum height above ground level that the 128.4 dBu contour would reach is 15 feet high, at a horizontal distance of 45 feet from the transmitting antenna. This is graphically depicted in Figure 2B. Therefore, no harmful interference is predicted to WORO as a result of the proposed LPFM facility. Figure 2A is a table and Figure 2B a graphic representation showing the computed distances to the predicted interfering contour. If waiver of FCC Rules, 47 C.F.R. Section 73.807 is required, waiver of this section of The Rules is respectfully requested.

The predicted contours signal levels were calculated in accordance with Section 73.313 of the FCC Rules, using the V-Soft FMCommander@2023 software in conjunction with the 30-second Global terrain database.

For the reasons stated above, it is believed that the proposed facility is in compliance with the applicable FCC Rules and Regulations.



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December 8, 2023

Figure 1

NEW LPFM APPLICATION VEGA BAJA, PR
NEW LPFM WINDOW 2023

REFERENCE		DISPLAY DATES
18 26 36.00 N.	CLASS = L1	DATA 12-04-23
66 25 54.00 W.	PR & VI Spacings to 2nd Adj.	SEARCH 12-08-23
----- Channel 221 - 92.1 MHz -----		

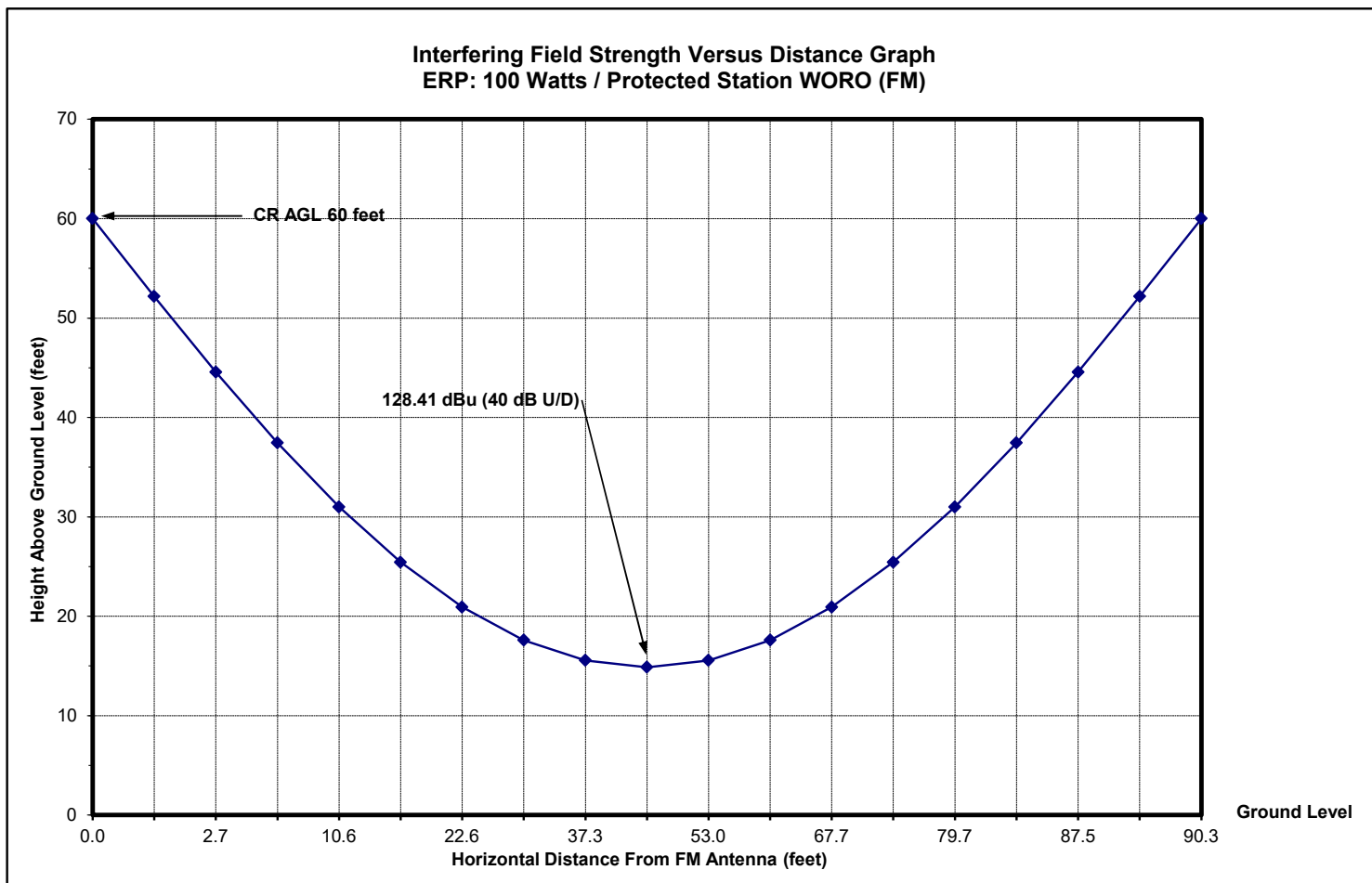
Call	Channel	Location		Azi	Dist	FCC	Margin
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WORO	LIC 223B	Corozal	PR	153.8	23.56	91.5	-67.9
WYAS	LIC-N 221A	Luquillo	PR	98.9	79.71	79.5	0.21
WZET	LIC 221A	Hormigueros	PR	260.1	80.10	79.5	0.6
W221ER	LIC 221D	Arecibo	PR	278.5	27.31	25.5	1.8
WZCA	LIC-D 219A	Quebradillas	PR	275.1	54.28	41.5	12.8
W221EB	LIC 221D	Ponce	PR	200.5	54.66	31.5	23.2
WNNV	LIC-D 219A	San German	PR	237.3	77.35	41.5	35.9
NEW	CP 219C	Carib Broadcasting	VI	90.6	188.25	92.5	95.8
WVSE	LIC 220B1	Christiansted	VI	114.4	185.59	81.5	104.1
NEW/ZCBN	CP 222A	Tortola	VI	90.6	190.01	69.5	120.5
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Reference station has protected zone issue: Arecibo
All separation margins include rounding

Figure 2A

			IX to	Desired dBu	88.41	WORO
			WORO	U/D Ratio - dB	40	
				Undesired dBu	128.41	
All Media Community Group Corp.	CHANNEL:	221	Site Elev. - M	28	RCAGL-M	RCAGL-FT
NEW LPFM VEGA BAJA NESTOR PEREZ	FREQ.	92.1 MHz	RC AGL - M	18.3	18.3	60.0
NAD 83: 18 26 36.0 / 66 25 54.0			RC AMSL - M	46.3		
Interfering Field Strength Vs. Distance Graph			FCC HAAT - M			
Ant.: ERI 100A-1, Cpol, System Gain: 0.42			ERP [FCC] - W	100	0.1	kW
RC: 60 ft. AGL, 15 ft clearance AGL	60.0	feet			-10	dBk
Interfering Contour	128.41	dBu				
Signal from Station	88.41	dBu				
Depression Angle	VRF	ERP (dBk)	Distance to ; (m)**	Distance to Contour (feet)**	Horiz. Dist. (feet)	Height AGL (feet)
90	0.000	-334.3	0.0	0	0	60
85	0.087	-31.2	2.4	8	1	52
80	0.174	-25.2	4.8	16	3	45
75	0.259	-21.7	7.1	23	6	37
70	0.342	-19.3	9.4	31	11	31
65	0.423	-17.5	11.6	38	16	25
60	0.500	-16.0	13.8	45	23	21
55	0.574	-14.8	15.8	52	30	18
50	0.643	-13.8	17.7	58	37	16
45	0.707	-13.0	19.5	64	45	15
40	0.766	-12.3	21.1	69	53	16
35	0.819	-11.7	22.5	74	61	18
30	0.866	-11.2	23.8	78	68	21
25	0.906	-10.9	24.9	82	74	25
20	0.940	-10.5	25.9	85	80	31
15	0.966	-10.3	26.6	87	84	37
10	0.985	-10.1	27.1	89	88	45
5	0.996	-10.0	27.4	90	90	52
0	1.000	-10.0	27.5	90	90	60
					MIN HGT	15

Figure 2B



Appendix 1

Antenna Height Above Average Terrain Calculations -- Results

Input Data

Latitude **18° 26' 36"** North
Longitude **66° 25' 54"** West (NAD 83)

Height of antenna radiation center above mean sea level: **46.3** meters AMSL

Number of Evenly Spaced Radials = **8** 0° is referenced to True North

Results

Calculated HAAT = **-14 meters**

Antenna Height Above Average Terrain calculated
using 1 km [GLOBE terrain data](#)

Individual "Radial HAAT" Values, in meters

0°	45.0 m
45°	43.9 m
90°	27.4 m
135°	-68.8 m
180°	-112.7 m
225°	-103.0 m
270°	11.1 m
315°	46.1 m

[Print Results?](#)

[New Calculation?](#)

Appendix 2

Grafton Olivera, P.E.

Consulting Engineer

December 8, 2023

Via email (avazquez@nrao.edu)

Mr. Angel M. Vazquez
Puerto Rico Coordination Zone Program Administrator
National Radio Astronomy Observatory (NRAO)
520 Edgemont Road
Charlottesville, VA 22903-2475

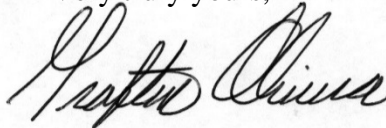
Gentlemen:

On behalf of our client, **All Media Community Group, Corp.**, applicant of a New LPFM station, Facility ID 785129, in Vega Baja, PR., in accordance with Section 73.1030 of FCC Rules, we hereby notify the Observatory of the proposed facility. The particulars of the proposal are as follows:

Geographical coordinates of antenna location (NAD83): 18-26-36.0 / 66-25-54.0
Antenna height: 18.3 m AGL, 46.3 m AMSL
Antenna Gain (horizontal plane): 0 dBd (non-directional)
Operating channel: 221L, 92.1 MHz
Type of emission: F3E
Effective isotropic radiated power: 0.164 kW (100 Watts - Circular Polarization)

Please review this proposal and let me know your findings; feel free to communicate via email (<mailto:Grafton.Olivera@outlook.com>), telephone (941-323-0381) or regular mail.

Very truly yours,



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