

TECHNICAL EXHIBIT
BORINQUEN BROADCASTING CO., INC.
APPLICATION FOR NEW FM TRANSLATOR STATION
FOR AM STATION WVJP - FACILITY ID 6442
CHANNEL 279D 250 WATTS ND

MAY 9, 2018

TECHNICAL EXHIBIT
BORINQUEN BROADCASTING CO., INC.
APPLICATION FOR NEW FM TRANSLATOR STATION
FOR AM STATION WVJP - FACILITY ID 6442
CHANNEL 279D 250 WATTS ND

Table of Contents

	Technical Statement
Figure 1	Fill-In Compliance Determination
Figure 2	Allocation Study FX Channel 279D
Figure 3	Calculations of Interfering Contour to WVJP-FM
Figure 4	Graph of Interfering Contour to WVJP-FM
Appendix 1	Notification to Arecibo Astronomical Observatory

TECHNICAL EXHIBIT
BORINQUEN BROADCASTING CO., INC.
APPLICATION FOR NEW FM TRANSLATOR STATION
FOR AM STATION WVJP - FACILITY ID 6442
CHANNEL 279D 250 WATTS ND

Technical Narrative

The technical exhibit, of which this narrative is part, has been prepared on behalf of Borinquen Broadcasting Co., Inc., licensee of a AM radio station WVJP, 1110 KHz in Caguas, PR, Facility ID 6442. Borinquen Broadcasting Co., Inc. is requesting a new FM translator to serve as a fill-in translator for AM radio station WVJP.

Proposed Transmitter Location

The proposed transmitting facility would operate on channel 279 using a Micronetixx FMP-1, a single bay, circularly polarized antenna, side-mounted on an existing tower. The proposed site location, 14.6 miles from the WVJP antenna site, is described by the following NAD27 geographic coordinates:

18° 08' 48.9" North

65° 48' 48.9" West

It is proposed to side mount the antenna radiation center (RC) at a height of 45 meters (148 feet) above ground on an existing tower at a site with an elevation of 13 meters AMSL. Thus, the antenna RC will be mounted at a height of 58 meters AMSL, which corresponds to a HAAT of -69 meters. The permissible ERP of 250 Watts allowed under the proposed conditions is requested. The proposed tower currently is being used by AM station WALO 1240 KHz, in Humacao, PR. It is proposed to mount the proposed FM translator antenna on this tower using a properly designed isolator, as to not affect the operation of WALO or the FM translator. The WALO antenna impedance will be measured before and after the FM translator antenna is installed, and should there be a significant impedance change, a new license application for WALO will be filed.

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 48 meter registered tower, ASRN 1203471.

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 3.4 % 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, 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 500 watts (circular polarization) and an antenna radiation center height above ground of 45 m, the calculated power density will not exceed $6.8 \mu\text{W}/\text{cm}^2$. Therefore, the calculated RF exposure at 2 m above ground will not exceed 3.4 % of the limit of $200 \mu\text{W}/\text{cm}^2$ for the general population and uncontrolled environments.

Since the total RF exposure will not exceed 5 % OF the FCC limits for uncontrolled environments, the proposal complies with the FCC limits for human exposure to RF radiation.

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 transmissions of the proposed FM translator will be reduced or terminated as necessary to prevent RF exposure above the FCC recommended limits.

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

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 stations. The closest FCC monitoring station to the proposed operation is located at Santa Isabel, PR, at a distance of 45.0 kilometers. The proposed operation will produce field strengths much lower than 10 mV/m at the FCC station in Santa Isabel, PR.

Quiet Zone Notification

As required by FCC rules pertaining to radio Quiet Zones, Section 73.1030(a), the National Astronomy and Ionosphere Center (NAIC) in Arecibo, Puerto Rico has been notified of this application. A copy of the notification letter to the Arecibo Observatory of the proposed facility is included herein as Appendix 1.

AM Stations within 3.2 kilometers

Other than WALO, in whose tower the proposed translator antenna will be mounted, there are no AM stations located within 3.2 km of the proposed site. Since the existing tower AM station WALO, for which no structural changes are contemplated, is proposed, and a properly isolated FM antenna will be used, the proposal is believed to be compliant with Section 47 CFR 73.1692.

.

Fill-In Compliance and Allocation Considerations

Figure 1 is a Fill-In Compliance map. As shown in Figure 1, the proposed translator 60 dBu contour will be contained within a 25 mile radius of WVJP. Figure 2 summarizes the allocation study for the proposed facility. As indicated in Figure 2, there is no co-channel or first-adjacent full-service station, translator, or LPFM facility to be concerned, as far as causing interference to by the proposed facility.

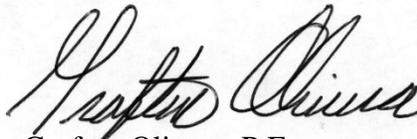
The proposed FM station will operate on Channel 279, second adjacent channel to WVJP-FM, Channel 277B. The, the protection requirements of the undesired signal from the proposal is 40 dB higher that the desired signal of this station. WVJP-FM is predicted to put a signal of 93.6 dBm at the proposed FX site. The proposed transmitter site is located 15.17 kilometers from station WVJP-FM, which operates with an ERP of 26 kW and HAAT of 592 meters. The predicted WVJP-FM F(50,50) field strength at the proposed site is 93.6 dBu.

Using the U/D ratio of 40 dB, the proposed F(50,10) interfering signal is 133.6 dBu, thus this contour defines the maximum extent of predicted interference.

Since an ERP of 250 watts is proposed, the 133.6 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 133.6 dBu contour would reach is 108 feet at a horizontal distance of 39 feet from the transmitting antenna. This is graphically depicted in Figure 4. Therefore, no harmful interference is predicted to WVJP-FM as a result of the proposed facility. Figure 3 is a tabulation and Figure 4 a graphic representation of the computed distances and heights of the predicted 133.6 dBu contour under these assumptions.

The predicted contours were calculated in accordance with Section 73.313 of the FCC Rules, using the V-Soft FMCommander@2016 software in conjunction with the 30 second Global terrain database; contour calculation were made using an evenly spaced set of radials. The antenna height elevations of the facilities was used in conjunction with the propagation prediction curves of Section 73.333 to determine distances to contours.

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



Grafton Olivera, P.E.

Consulting Engineer

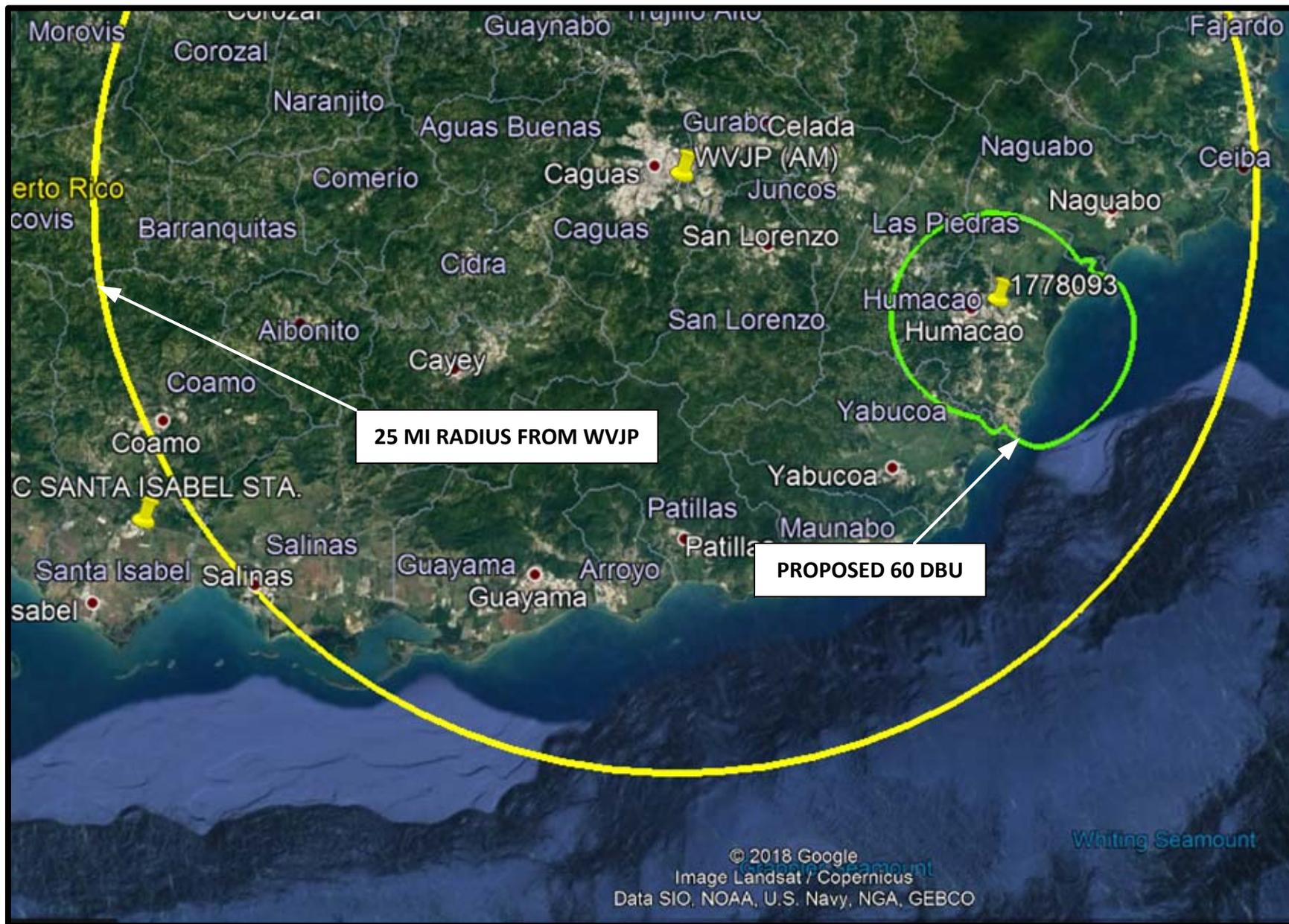
5119 60th Drive E

Bradenton, Florida 34203

(941) 329-6001

May 9, 2018

FIGURE 1



**AM FILL-IN COMPLIANCE MAP – NEW FM TRANSLATOR FOR WVJP (AM)
CH 279D (103.7 MHZ) - 0.250 KW ND
HUMACAO, PUERTO RICO**

Figure 2

Allocation Study – Proposed NEW FX Facility CH 279D for WVJP (AM)

Call	Type	Ch	Location	Azi	Dist	In	Out	
WVJP-FM	LIC	277B	Caguas	PR	343.9	15.17	-0.8	-81.5*
1778093	APP	279D	Humacao	PR	0.0	0.00	---	
WZIN	LIC	282B	Charlotte Amali	VI	75.0	91.96	72.8	0.0
W279BU	LIC-D	279D	San Juan	PR	295.4	34.62	6.3	0.9
WXLX	LIC	279B	Lajas	PR	263.5	146.03	2.5	44.9
WVJP-FM2	LIC-D	277D	Fajardo	PR	45.0	21.31	13.4	7.9
WYQE«	LIC-N	225A	Naguabo	PR	45.5	21.17	9.5R	11.7M
WVJP-FM3	CP-D	277D	Salinas	PR	263.1	44.68	36.0	12.4
WERR	LIC	281B	Vega Alta	PR	280.3	90.90	76.2	12.4
WERR-FM1	LIC-D	281D	Caguas	PR	298.6	28.95	21.7	19.9
1775824	APP	280D	Guayama	PR	236.0	38.35	21.1	20.1
1781752	APP	280D	Guayama	PR	236.0	38.35	21.1	20.1

End of Screen List, Cardinal Radials = 12

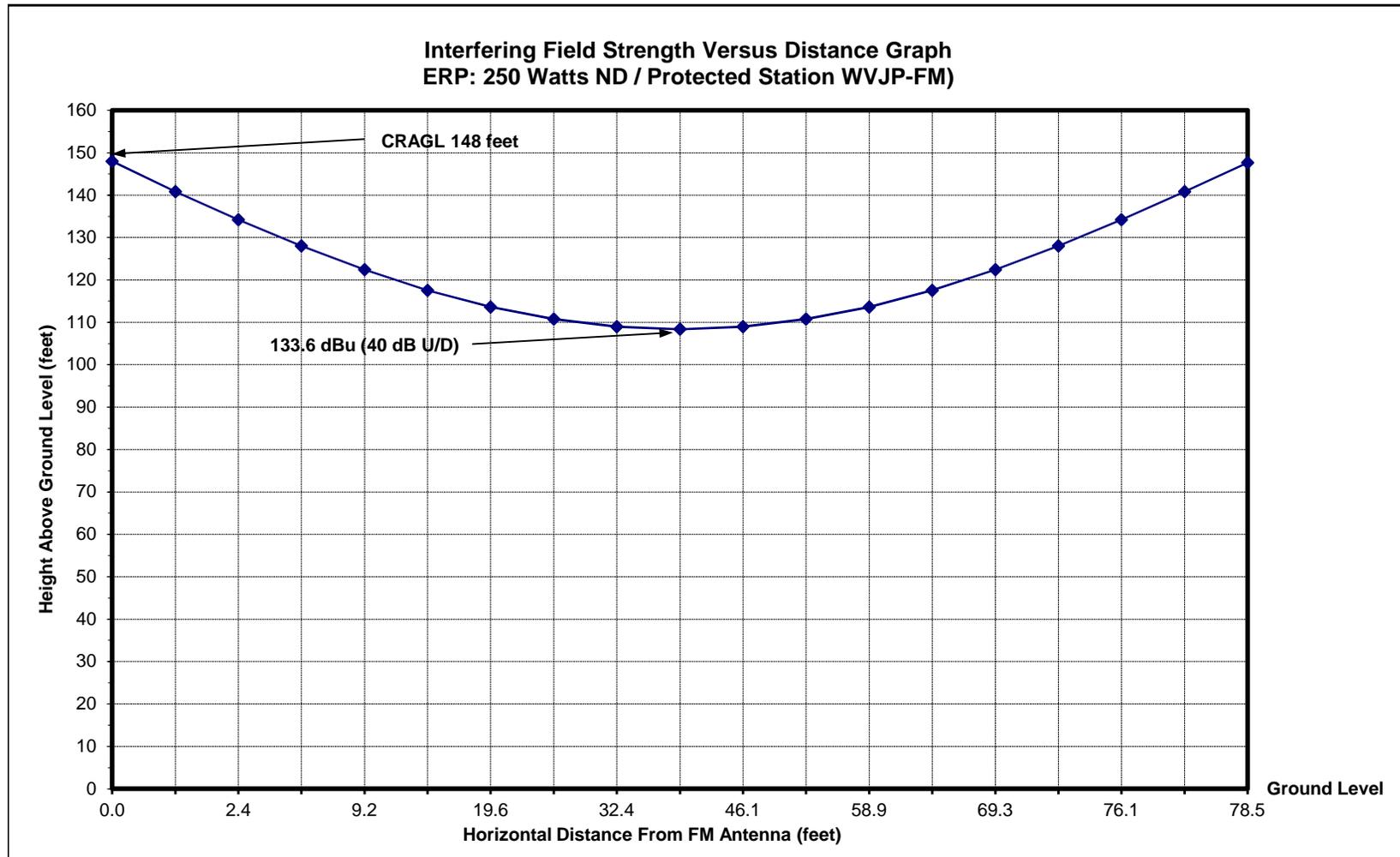
CH	CALL	TYPE	ANT STATE	AZI	DIST	LAT LMG	PWR(kw)	INT(km)	PRO(km)	*IN*	*OUT*
277B	WVJP-FM	LIC	DC	343.9	15.17	18 16 41.0	26.000	8.9	95.1	-0.8	-81.5*
Caguas		PR		163.9	BLH20140911ABF	65 51 12.0	592	817	Borinquen Broadcasting Co.		
279D	1778093	APP	C	0.0	0.00	18 08 48.9	0.250		---	---	---
Humacao		PR		0.0	BNPFT20180131AMM	65 48 48.9		58	Borinquen Broadcasting Co.		
282B	WZIN	LIC	DC	75.0	91.96	18 21 35.0	44.000	9.7	90.3	72.8	0.0
Charlotte Amalie		VI		255.2	BLH20050325AOC	64 58 19.0	493	501	Pan Caribbean Broadcasting		
279D	W279BU	LIC	DC	295.4	34.62	18 16 49.3	0.250	24.4	4.1	6.3	0.9
San Juan		PR		115.3	BLFT20161014AAY	66 08 35.3		543	Aurio A. Matos Barreto		
279B	WXLX	LIC	DC	263.5	146.03	17 59 37.0	50.000	136.9	63.1	2.5	44.9
Lajas		PR		83.1	BLH19940113KE	67 11 09.0	139	171	Radio X Broadcasting Corpo		
277D	WVJP-FM2	LIC	DC	45.0	21.31	18 16 57.0	2.000	0.4	12.2	13.4	7.9
Fajardo		PR		225.0	BLFTB20110908ACO	65 40 15.0	201	300	Borinquen Broadcasting Co.		
225A	WYQE	LIC	NCN	45.5	21.17	18 16 50.0	3.900	0.0	0.0	9.5R	11.7M
Naguabo		PR		225.6	BLH19950106KB	65 40 13.0	229	326	Fajardo Broadcasting Co.,		
277D	WVJP-FM3	CP	DC	263.1	44.68	18 05 54.0	3.000	1.6	30.4	36.0	12.4
Salinas		PR		83.0	BNPFTB20160114ABS	66 14 00.0	475	867	Borinquen Broadcasting Co.		
281B	WERR	LIC	DC	280.3	90.90	18 17 29.0	50.000	7.7	74.9	76.2	12.4
Vega Alta		PR		100.0	BLH20080708AJO	66 39 39.0	301	672	Radio Redentor		
281D	WERR-FM1	LIC	DC	298.6	28.95	18 16 17.0	0.006	0.2	7.5	21.7	19.9
Caguas		PR		118.5	BLFTB20060921AOC	66 03 16.0		357	Radio Redentor, Inc.		
280D	1775824	APP	C	236.0	38.35	17 57 13.0	0.250	10.1	7.1	21.1	20.1
Guayama		PR		55.9	BNPFT20180125AAJ	66 08 51.0		54	wifredo G. Blanco-pi		
280D	1781752	APP	C	236.0	38.35	17 57 13.0	0.250	10.1	7.1	21.1	20.1
Guayama		PR		55.9	BNPFT20180418AAQ	66 08 51.0		54	wifredo G. Blanco-pi		

Terrain database is GLOBE 30 Sec , R= 73.215 qualifying spacings or FCC minimum spacings in KM, M= Margin in KM
 In & out distances between contours are shown at closest points. Reference zone= East Zone, Co to 3rd adjacent.
 All separation margins (if shown) include rounding.
 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.
 < = Station meets FCC minimum distance spacing for its class.
 Reference station has protected zone issue: Arecibo AM tower

Figure 3

Desired (dBu)	93.6	WVJP-FM	93.6			
	40.0					
Undesired (dBu)	133.6					
				RCAGL-FT	RCAGL-M	
NEW FX FOR WVJP	CHANNEL:	279	148	45.1		
				RCAGL-M	RCAGL-FT	
Interfering Field Strength Vs. Distance Graph			45	148		
Antenna: Micronetixx 1-Bay Antenna						
RC AGL	148	feet	IX TO:	ERP:	0.25	kW
Interfering Contour	133.6	dBu	WVJP-FM		-6.020599913	dBk
Signal from Station	93.6	dBu				
Depression Angle	VRF	ERP (dBk)	Distance to Contour (m)**	Distance to Contour (feet)**	Horiz. Dist. (feet)	Height AGL (feet)
90	0.000	-330.3	0.0	0	0	148
85	0.087	-27.2	2.1	7	1	141
80	0.174	-21.2	4.2	14	2	134
75	0.259	-17.8	6.2	20	5	128
70	0.342	-15.3	8.2	27	9	122
65	0.423	-13.5	10.1	33	14	118
60	0.500	-12.0	12.0	39	20	114
55	0.574	-10.8	13.7	45	26	111
50	0.643	-9.9	15.4	50	32	109
45	0.707	-9.0	16.9	56	39	108
40	0.766	-8.3	18.3	60	46	109
35	0.819	-7.8	19.6	64	53	111
30	0.866	-7.3	20.7	68	59	114
25	0.906	-6.9	21.7	71	64	118
20	0.940	-6.6	22.5	74	69	122
15	0.966	-6.3	23.1	76	73	128
10	0.985	-6.2	23.6	77	76	134
5	0.996	-6.1	23.8	78	78	141
0	1.000	-6.0	23.9	79	79	148

Figure 4



Appendix 1

Grafton Olivera, P.E.

Consulting Engineer

May 9, 2018

Via email (prcz@naic.edu)

Angel M. Vázquez, Spectrum Manager
National Astronomy and Ionosphere Center
Arecibo Observatory
HC3 Box 53995
Arecibo, PR 00612

Gentlemen:

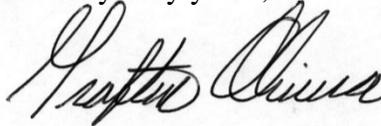
On behalf of our client, Borinquen Broadcasting Co., Inc., licensee of AM radio station WVJP, 1110 KHz in Caguas, PR, Facility ID 6442, in accordance with Section 73.1030 of FCC Rules, we hereby notify of a proposed new FM translator station for AM station WVJP. The particulars of the proposal are as follows:

Proposed Facility:

Geographical coordinates of antenna location (NAD27): 18-08-48.9 / 65-48-48.9
Antenna RC height: 45 m AGL; 58 m AMSL
Maximum Antenna Gain (horizontal plane): 0 dBd
Operating channel: 279D (103.7 MHz)
Type of emission: F3E
Effective isotropic radiated power: 0.41 kW – Circular Polarization

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

Very truly yours,



Grafton Olivera, P.E.
5119 60th Drive E
Bradenton, FL 34203

Tel. 941-323-0381
Email: Grafton.Olivera@me.com