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EVOLUTION BROADCASTING, LLC
FM TRANSLATOR STATION - W226CJ
FM CHANNEL 226D - 93.1 MHZ
FCC FACILITY ID: 141653
PANAMA CITY, FLORIDA

JANUARY 2019

ENGINEERING EXHIBIT

IN SUPPORT OF

APPLICATION FOR AUTHORITY TO
CONSTRUCT OR MAKE CHANGES IN AN
FM TRANSLATOR OR FM BOOSTER STATION

ENGINEERING EXHIBIT

**EVOLUTION BROADCASTING, LLC
FM TRANSLATOR STATION - W226CJ
FM CHANNEL 226D - 93.1 MHZ
FCC FACILITY ID: 141653
PANAMA CITY, FLORIDA**

JANUARY 2019

TABLE OF CONTENTS:

	Narrative Engineering Statement
Figure 1	Proposed Service Contour with Primary Station AM/FM Translator Fill-In Service
Figure 2-1	FM Channel Study - Contour Overlap Study
Figure 2-2	Waiver Request 47 CFR §74.1204(d) 3 rd Adjacent Channel Facility Interference Contour(s) No Population within Contour.

**EVOLUTION BROADCASTING, LLC
FM TRANSLATOR STATION - W226CJ
FM CHANNEL 226D - 93.1 MHZ
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PANAMA CITY, FLORIDA**

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NARRATIVE ENGINEERING STATEMENT:

The engineering exhibit, of which this narrative is part, was prepared on behalf of EVOLUTION BROADCASTING, LLC, in support of an application to modify the license of W226CJ (BLFT-20180220ABY). The station will CONTINUE to provide "fill-in" service for co-owned and licensed AM Broadcast Station WPCF, Panama City Beach, Florida, FCC Facility ID: 13012.

This proposal is for an increase in effective radiated power ("ERP") only. No other changes are proposed.

The applicant proposes to increase the "ERP" of the facility from 0.2 kW (200 watts) to 0.23 kW (230 watts) using the existing circular (H & V) polarized antenna.

The licensed (existing) antenna is a Shively "SHI 6812-2-HW" a non-directional 2-Bay circularly polarized (H & V) antenna with half-wave (HW) spacing between the two elements (bays). The use of half-wave spacing is required in order to reduce the downward radiation (signal) of any possible interfering contours to second or third adjacent facilities.

Included exhibits/figures/or tables in support of this application

Map exhibit **Figure 1** demonstrates continuing compliance with the translator fill-in requirements. No change in the primary station is proposed.

A FM channel contour overlap study (tabulation) is included as **Figure 2-1**. As the study shows no prohibitive contour overlap (to any populated areas) with any other facility is predicted to occur **WHEN** the downward radiation from the proposed antenna is considered as demonstrated in **Figure 2-2**.

Waiver Request 3rd Adjacent Channel Contour Figure 2-2

No prohibitive overlap occurs when the vertical elevation relative field pattern is considered, as detailed in Figure 2-2.

As the predicted interference contour from this proposal does not reach the surface and remains above ground level at all location in which persons reside, no interference to populated or traveled areas occurs within the interference contour area.

Figure 2-2 contains the details of the vertical radiation plane relative field values from the proposed antenna as well as detailed calculations of the radiated interference contour distances and elevation above ground and additionally a photographic image (Google Earth Satellite Photo) of the predicted interference contour superimposed upon it. To the extent necessary, waiver of the relevant sections concerning contour overlap and protection to the 3rd adjacent channel **station(s)** identified in the channel study is requested as no population (i.e., a lack of population) is within the predicted interference area.

Other Considerations

The "blanketing" contour of a 0.23 kilowatt FM station extends 0.19 kilometers (190 meters). The applicant recognizes its responsibility to remedy complaints of blanketing interference as required by 47 CFR 73.318, and to protect existing or

proposed facilities in accordance with the Commission's applicable rules. An intermodulation study has been conducted and no adverse impact on existing facilities or pending applications is anticipated. The applicant clearly recognizes its responsibility to remedy interference complaints to existing stations resulting from its proposed operation.

Environmental Considerations:

The applicant believes its proposal will not significantly affect the environment for the following reasons:

The proposal does not meet any of the criteria specified in Section 1.1307 of the FCC Rules. More specifically, the proposed facilities are not known to fall within any of the categories enumerated in Sections 1.1307(a)(1)-(7) and will not involve the use of high intensity white lights.

Furthermore, operation of the proposed facility will not involve the exposure of workers or the general public to levels of radio frequency electromagnetic fields exceeding guidelines adopted by the Federal Communications Commission. (The current FCC guidelines are based upon criteria contained in the National Council of Radiation Protection and Measurements (NCRP) Report No.86 (1986) and ANSI/IEEE C95.1-1992.)

The results of the FCC FM Model output indicate that the power density from this proposal using a "Type 1" EPA model antenna (a worst-case radiator) with a 2-Bay 0.5 wavelength spacing between the elements and located 130 meters above ground is predicted to be 0.1 $\mu\text{W}/\text{cm}^2$ or less.

The computed power density is 0.01% of the Commission's guideline for a controlled area and 0.05% for an uncontrolled area. This level is well below the

FM Translator - W226CJ
Minor Change Application
January 2019

Commission's guideline for maximum exposure levels to electromagnetic fields (less than 1%) and no further study is required.

The applicant will fully-cooperate and coordinate with all site users as required by the Commission's rules.

Summary

The proposed FM translator will continue to operate as a fill-in translator for AM Broadcast Station WPCF Panama City Beach, Florida, with a maximum ERP 0.23-kilowatts (H & V) on FM Channel 226D.

Operation as proposed herein would not cause/increase any normally prohibited contour overlap, and would not have any significant impact on the environment.

The proposed operation is fully in compliance with all areas of the Commission's rules and applicable international agreements, and seeks the appropriate and routine waivers of the Commission's rules where required.

January 28, 2019

A handwritten signature in blue ink, reading "Timothy Z. Sawyer". The signature is written in a cursive style with a horizontal line underneath.

Timothy Z. Sawyer, Consulting Engineer

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W226CJ (APP)

FCC Application:
FCC FacID: 141653
NAD 27 Latitude: 30-10-44 N
NAD 27 Longitude: 085-46-55 W
ERP: 0.23 kW
Channel: 226 Frequency: 93.1 MHz
Antenna AMSL Height: 135.0 m
Elevation: 5.0 m
Horiz. Pattern: Omni

FILL-IN TRANSLATOR COMPLIANCE

W226CJ APPLICATION - 60 DBU FCC F(50M50) CONTOUR
PRIMARY STATION - WPCF (AM) 2 MV/M GW CONTOUR
OR 25 MILE RADIUS

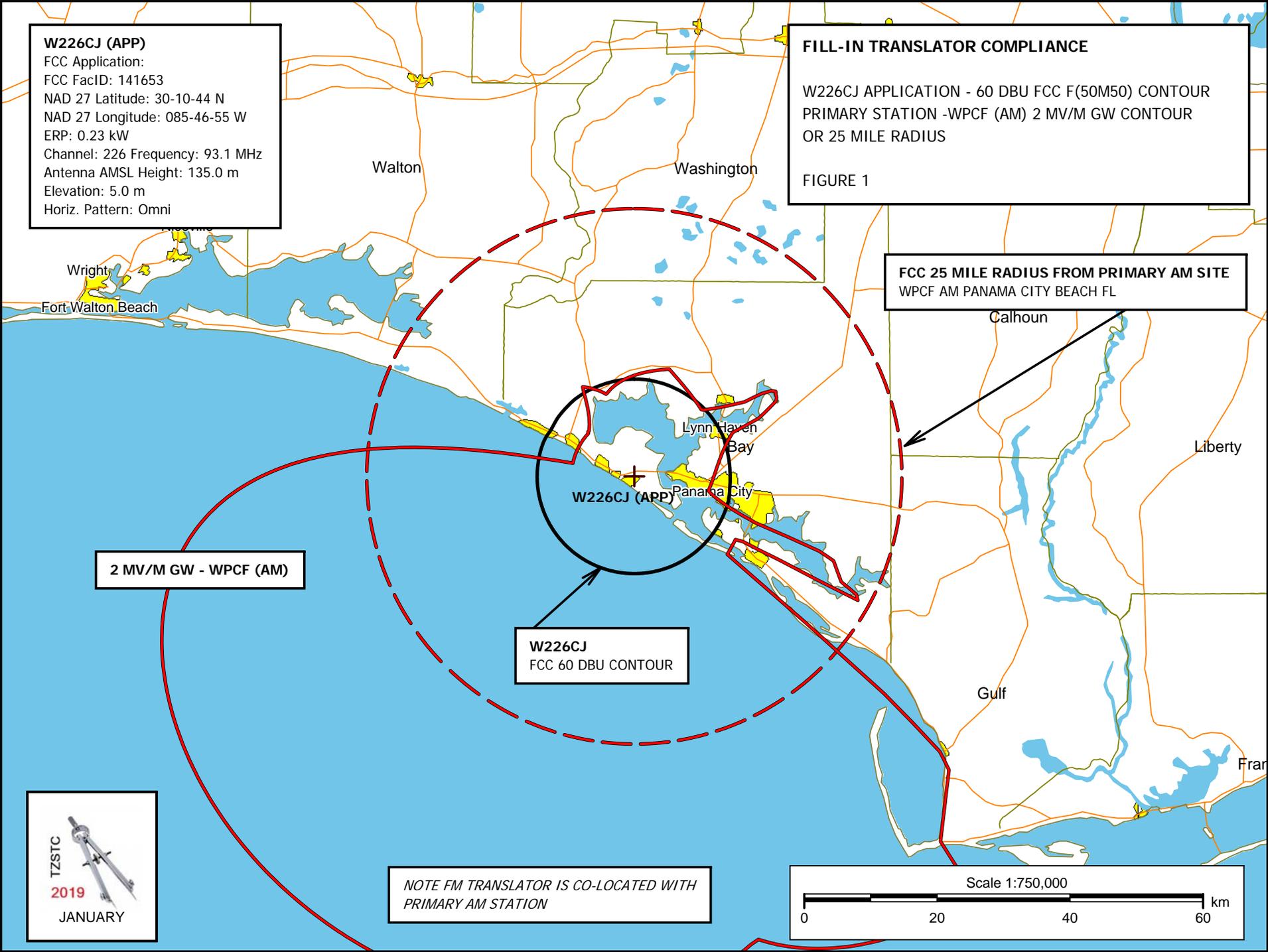
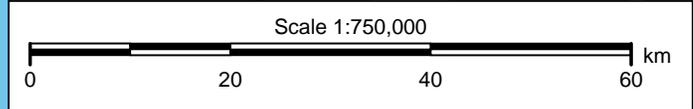
FIGURE 1

FCC 25 MILE RADIUS FROM PRIMARY AM SITE
WPCF AM PANAMA CITY BEACH FL

2 MV/M GW - WPCF (AM)

W226CJ
FCC 60 DBU CONTOUR

*NOTE FM TRANSLATOR IS CO-LOCATED WITH
PRIMARY AM STATION*



W226CJ Minor Change Application

Evolution Broadcasting, LLC

REFERENCE CH# 226D - 93.1 MHz, Pwr= 0.23 kW, HAAT= 0.0 M, COR= 135 M
 30 10 44.0 N. Average Protected F(50-50)= 6.9 km
 85 46 55.0 W. Omni- non-directional

CH CITY	CALL	TYPE	ANT STATE	AZI. <--	DIST FILE #	LAT. LNG.	Pwr(kw) HAAT(M)	INT(km) COR(M)	PRO(km) LICENSEE	*IN* (Overlap in km)	*OUT*
226D Panama City	W226CJ!	LIC	C FL	0.0 0.0	0.00 BLFT20180220ABY	30 10 44.0 85 46 55.0	0.200		---Reference---		
223C1 Panama City	WPAP	LIC	CX FL	37.2 217.4	46.46 BLH20130802ABG	30 30 42.0 85 29 17.2	100.000 280	10.2 324	72.6 Clear Chan. B/casting Lice	21.7	-27.2 (#1)
229C2 Port St. Joe	WTKP	CP	ZCN FL	96.6 276.8	34.66 BPH20160829ACO	30 08 33.3 85 25 28.3	46.000 147	5.9 157	51.6 Omni Broadcasting, Llc	14.3	-18.0 (#2)
227C2 Shalimar	WNCV	LIC	NCX FL	287.9 107.5	84.86 BLH20060802AYR	30 24 38.0 86 37 22.0	50.000 143	77.8 148	51.9 Cumulus Licensing Llc	-7.6	10.8
227C2 Shalimar	WNCV	APP	NCX FL	288.1 107.6	85.44 BPH20181113AAO	30 24 50.3 86 37 40.2	50.000 134	76.6 140	50.9 Cumulus Licensing Llc	-5.8	12.4
226C2 Blakely	WBBK-FM	LIC	NCX GA	29.0 209.3	142.32 BLH20040914AAU	31 17 55.0 85 03 18.0	45.000 100	131.0 163	46.8 Alabama Media, Llc	-3.2	46.5
228C2 Port St. Joe	WTKP	LIC	NCN FL	128.4 308.6	64.27 BLH19940613KM	29 49 09.0 85 15 34.0	14.500 204	4.8 204	46.4 Omni Broadcasting, Llc	44.8	16.8

Terrain database is NGDC 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.
 Ant Colum: (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.

** Closest AM Facility is WPCF, PANAMA CITY BEACH, FL, L, ND2 at 0.0° at a distance of 0.0 km
 Facility is okay with respect to FCC monitoring stations.
 Facility is okay toward West Virginia Quiet Zone.
 Facility is okay toward Table Mountain.

** No change to antenna system mounted on co-owned and co-located AM station WPCF, Panama City Beach, FL

WAIVER REQUEST - NO POPULATION WITHIN INTERFERENCE CONTOUR - INTERFERENCE CONTOUR DOES NOT EXTEND TO GROUND LEVEL
 #1 WPAP (LIC) 3rd adjacent channel - full protection to this licensed facility is provided as shown in Figure 2-2
 #2 WTKP (CP) 3rd adjacent channel - full protection to this CP facility is provided as shown in Figure 2-2

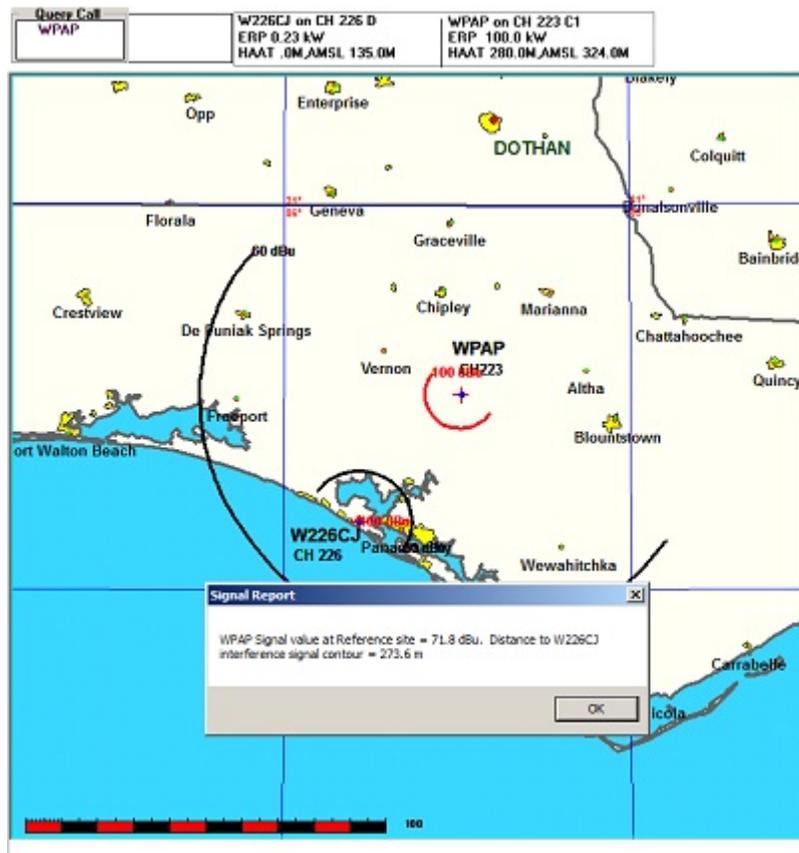
THIRD-ADJACENT CHANNEL WAIVER REQUEST

To: WPAP, Panama City, FL
BLH20130802ABG

Basis for Waiver Request: No population within predicted interference contour area.

Third-Adjacent Channel Station WPAP, is predicted to have a signal level of 71.8 dBu at the proposed site (the reference site). The D/U (desired to undesired) signal ratio is 40 dBu. Thus, the interfering signal level from this proposal is $71.8 + 40 = 111.8$ dBu to WPAP.

The map below shows the calculated predicted signal level from third-adjacent facility at the proposed translator site, and the predicted interfering contour distance (maximum horizontal distance).



As detailed on the following pages, the interference signal from this proposal does not reach the ground, or any populated or traveled areas and cannot cause interference to any populated areas when the downward radiation characteristics of the specified antenna system are used.

There are no tall building, roof tops, or occupied spaces within the interference contour from this proposal. No interference is predicted to occur to a populated area.

Applicant believes that it has demonstrate that due to lack of population within the interference contour that it is in compliance with the Commission’s rules - however, should a waiver of the rules with regards to the third-adjacent station contour overlap be necessary, it respectfully requests that said waiver be granted. A grant is in the public interest in that it has been demonstrated that no harm will occur and that no population is present within the elevated contour.

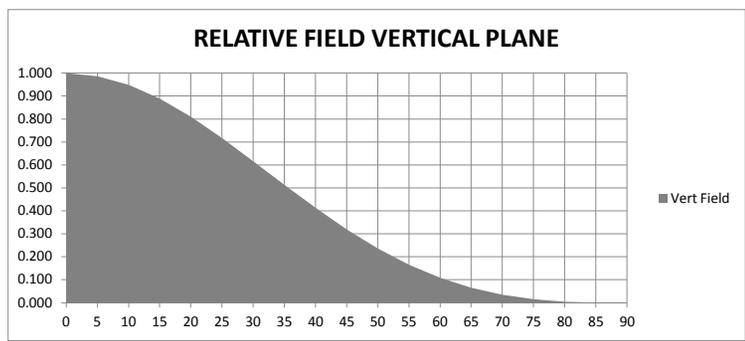
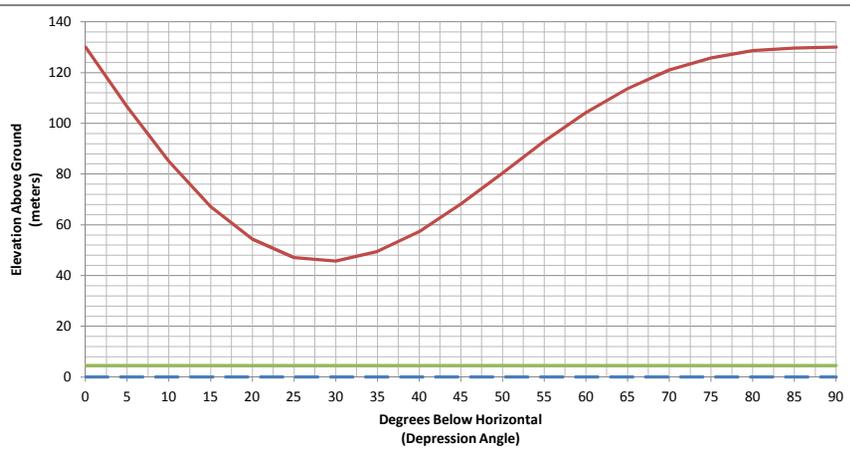
Antenna	
Manufacturer	SHI
Model	6812-2-HW
Number of Bays	2
Inter-Bay Spacing	0.5 (HALF WAVE)

Center of Radiation:	130	m AGL
Effective Radiated Power (ERP):	230	Watts
Interference Contour FS:	111.8	dBu
E Field Strength:	0.30409	V/m
Free Space Impedance:	377	Ohms
Power Density:	0.00024528	W/m ²
Maximum Free Space Distance:	273.17	meters

FIGURE 2-2 - WAIVER TO THIRD CHANNEL STATION WPAP
INTERFERENCE CONTOUR DOES NOT REACH GROUND LEVEL
NO POPULATION WITHIN CONTOUR

111.8 DBU FREE SPACE
INTERFERENCE CONTOUR PLOTTED ABOVE GROUND LEVEL

DEPRESSION ANGLE	RELATIVE		ERP WATTS	IN METERS			
	FIELD	POWER		VECTOR LENGTH	HORIZONTAL	VERTICAL	AGL
0	1.0000	1.0000	230.00	273.17	273.17	0.00	130.00
5	0.9870	0.9742	224.06	269.62	268.59	23.50	106.50
10	0.9490	0.9006	207.14	259.24	255.30	45.02	84.98
15	0.8890	0.7903	181.77	242.85	234.57	62.85	67.15
20	0.8100	0.6561	150.90	221.27	207.92	75.68	54.32
25	0.7180	0.5155	118.57	196.13	177.76	82.89	47.11
30	0.6170	0.3807	87.56	168.54	145.96	84.27	45.73
35	0.5140	0.2642	60.77	140.41	115.02	80.53	49.47
40	0.4140	0.1714	39.42	113.09	86.63	72.69	57.31
45	0.3200	0.1024	23.55	87.41	61.81	61.81	68.19
50	0.2370	0.0562	12.92	64.74	41.61	49.59	80.41
55	0.1660	0.0276	6.34	45.35	26.01	37.15	92.85
60	0.1090	0.0119	2.73	29.78	14.89	25.79	104.21
65	0.0660	0.0044	1.00	18.03	7.62	16.34	113.66
70	0.0350	0.0012	0.28	9.56	3.27	8.98	121.02
75	0.0160	0.0003	0.06	4.37	1.13	4.22	125.78
80	0.0050	0.0000	0.01	1.37	0.24	1.35	128.65
85	0.0010	0.0000	0.00	0.27	0.02	0.27	129.73
90	0.0000	0.0000	0.00	0.00	0.00	0.00	130.00



111.8 DBU FREE-SPACE INTERFERENCE CONTOUR ~ 274 METER GROUND RADIUS



NO OCCUPIED ROOFS OR OTHER OCCUPIED AREAS WITHIN THE INTERFERENCE CONTOUR THAT EXCEED THE MINIMUM ELEVATION OF THE INTERFERENCE CONTOUR ABOVE GROUND

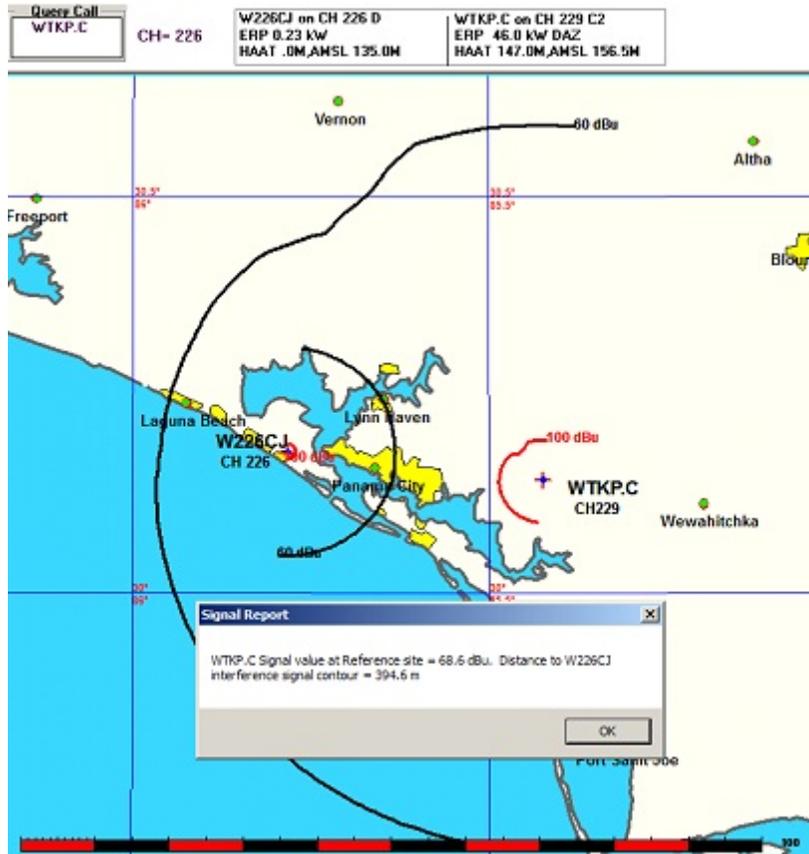
THIRD-ADJACENT CHANNEL WAIVER REQUEST

To: WTKP (CP), Port St. Joe
BPH-20160829ACO

Basis for Waiver Request: No population within predicted interference contour area.

Third-Adjacent Channel Station WTKP (a construction permit) is predicted to have a signal level of 68.6 dBu at the proposed site (the reference site). The D/U (desired to undesired) signal ratio is 40 dBu. Thus, the interfering signal level from this proposal is $68.6 + 40 = 108.6$ dBu to WTKP’s construction permit contour.

The map below shows the calculated predicted signal level from the third-adjacent facility at the proposed translator site, and the predicted interfering contour distance (maximum horizontal distance).



As detailed on the following pages, the interference signal from this proposal does not reach the ground, or any populated or traveled areas and cannot cause interference to any populated areas when the downward radiation characteristics of the specified antenna system are used.

There are no tall building, roof tops, or occupied spaces within the interference contour from this proposal. No interference is predicted to occur to a populated area.

Applicant believes that it has demonstrate that due to lack of population within the interference contour that it is in compliance with the Commission’s rules - however, should a waiver of the rules with regards to the third-adjacent station contour overlap be necessary, it respectfully requests that said waiver be granted. A grant is in the public interest in that it has been demonstrated that no harm will occur and that no population is present within the elevated contour.

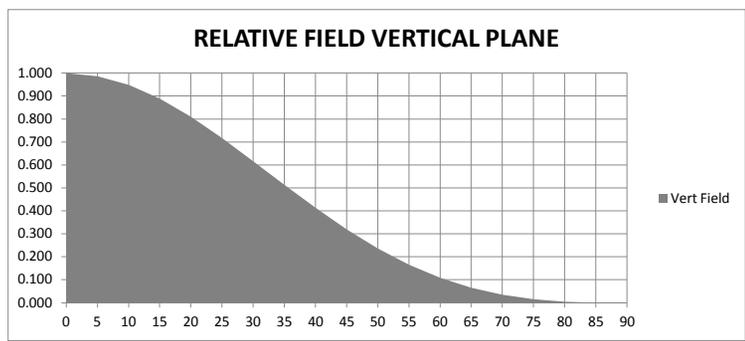
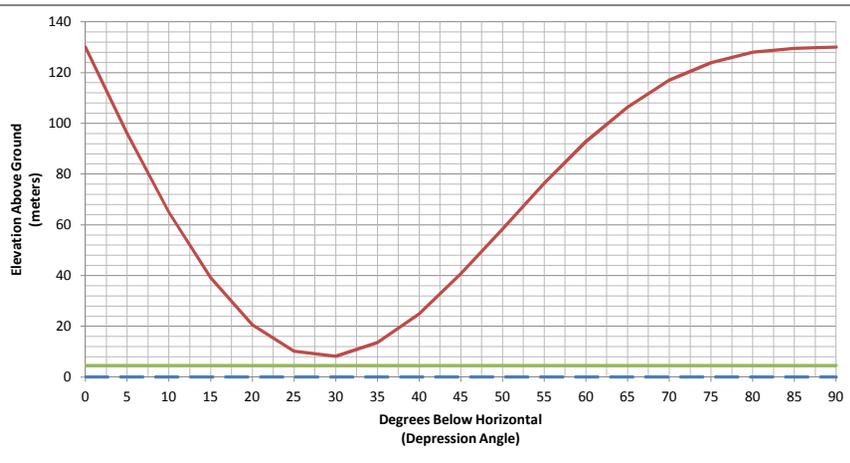
Antenna	
Manufacturer	SHI
Model	6812-2-HW
Number of Bays	2
Inter-Bay Spacing	0.5 (HALF WAVE)

Center of Radiation:	130	m AGL
Effective Radiated Power (ERP):	230	Watts
Interference Contour FS:	108.6	dBu
E Field Strength:	0.21038	V/m
Free Space Impedance:	377	Ohms
Power Density:	0.00011740	W/m ²
Maximum Free Space Distance:	394.85	meters

FIGURE 2-2 - WAIVER TO THIRD CHANNEL STATION WTKP (CP)
INTERFERENCE CONTOUR DOES NOT REACH GROUND LEVEL
NO POPULATION WITHIN CONTOUR

108.6 DBU FREE SPACE
INTERFERENCE CONTOUR PLOTTED ABOVE GROUND LEVEL

DEPRESSION ANGLE	RELATIVE		ERP WATTS	IN METERS			
	FIELD	POWER		VECTOR LENGTH	HORIZONTAL	VERTICAL	AGL
0	1.0000	1.0000	230.00	394.85	394.85	0.00	130.00
5	0.9870	0.9742	224.06	389.71	388.23	33.97	96.03
10	0.9490	0.9006	207.14	374.71	369.02	65.07	64.93
15	0.8890	0.7903	181.77	351.02	339.06	90.85	39.15
20	0.8100	0.6561	150.90	319.83	300.54	109.39	20.61
25	0.7180	0.5155	118.57	283.50	256.94	119.81	10.19
30	0.6170	0.3807	87.56	243.62	210.98	121.81	8.19
35	0.5140	0.2642	60.77	202.95	166.25	116.41	13.59
40	0.4140	0.1714	39.42	163.47	125.22	105.07	24.93
45	0.3200	0.1024	23.55	126.35	89.34	89.34	40.66
50	0.2370	0.0562	12.92	93.58	60.15	71.69	58.31
55	0.1660	0.0276	6.34	65.54	37.59	53.69	76.31
60	0.1090	0.0119	2.73	43.04	21.52	37.27	92.73
65	0.0660	0.0044	1.00	26.06	11.01	23.62	106.38
70	0.0350	0.0012	0.28	13.82	4.73	12.99	117.01
75	0.0160	0.0003	0.06	6.32	1.64	6.10	123.90
80	0.0050	0.0000	0.01	1.97	0.34	1.94	128.06
85	0.0010	0.0000	0.00	0.39	0.03	0.39	129.61
90	0.0000	0.0000	0.00	0.00	0.00	0.00	130.00



108.6 DBU FREE-SPACE INTERFERENCE CONTOUR ~ 395 METER GROUND RADIUS



NO OCCUPIED ROOFS OR OTHER OCCUPIED AREAS WITHIN THE INTERFERENCE CONTOUR THAT EXCEED THE MINIMUM ELEVATION OF THE INTERFERENCE CONTOUR ABOVE GROUND