

Exhibit EE-1: Engineering Statement in support of
FCC FORM 349
APPLICATION FOR AUTHORITY TO CONSTRUCT OR MAKE CHANGES IN AN FM TRANSLATOR OR FM BOOSTER STATION
(For a Minor Change Application of an FM Translator)

This engineering exhibit supports an application for minor change to FM translator W289BY (FID # 138243). W289BY currently receives interference from Co-Channel full powered stations WCHR and WJZ. The coverage options for W289BY are limited by interference protections to co-channel stations, WCHR, WJZ and first adjacent WAIV. By changing from channel 289 to channel 281, interference is reduced because the closest full powered station distance increases from 89km on channel 289 to 144km on channel 281 as shown in figures 4 & 5. This application changes the channel, antenna location, antenna pattern and antenna height. The proposed facility utilizes a directional antenna to protect co-channel translator W281BH (FID# 141576).

The proposed 94.5dB μ contour is within the 54.5 dB μ contour of 2nd adjacent station, WRFF, Philadelphia, PA (FID # 53969). A six bay antenna with 0.75 spacing is used to protect the 54.5dB μ contour of 2nd adjacent WRFF. A D/U analysis shows that no interference reaches any occupied locations or elevated roadways. Therefore this proposal should be acceptable under 74.1204(d) and a "Living Way" waiver is hereby requested.

The proposed facility is in compliance with 47 C.F.R. Section 1.1306 with regards to radio-frequency electromagnetic exposure in that the contribution to the rf environment is less than 5% of the maximum public exposure.

This application was prepared using FCC 30-arc-second terrain data.

This translator will continue to operate as a fill-in facility for WJBR-FM licensed to Wilmington, DE.

Attached as Figures 1 is a color coded map showing the protected contours and interfering contours of all relevant FM facilities.

Figure 2 supports a request for a "living Way" waiver to 2nd adjacent station WRFF.

Figure 3 shows the proposed 1mV/m service contour of this application compared with the 1mV/m service contour of WJBR-FM. Figure 3 also demonstrates that there is 60dB μ overlap between the proposed facility and the currently authorized signal.

Appendix A (attached separately) demonstrates that no harmful interference will occur to adjacent station WRFF.

The proposal is sufficiently distant from all facilities mentioned in 73.1030(a), (b) & (c) so that notification under 73.1030 is not required.

This application specifies a non-adjacent channel pursuant to FCC Public notice DA-19-741A1 regarding MB Docket No. 18-119. Under the rules that are now in effect, translators may change their frequency to non-adjacent channels upon a showing of interference reduction. This instant application includes an exhibit showing that interference will be reduced as a result of the requested channel change (figs 4 and 5).

Respectfully submitted,

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Figure 1: Contour analysis of Ch281, Millville, NJ.

Colors are referenced to the proposed facility.

Other facilities' colors should not overlap the same colors from this proposal. Overlapping colors from one affected station to another is okay.

Key:

Amber = Interfering vs Protected (Co-chan)

Blue or cyan = Interfering vs Protected (1st Adj)

Violet = Interfering vs Protected (2nd/3rd adj)

Proposed power = 0.175kW (175 Watts).

Proposed antenna type: PSI FML-DA 0.75WS, 6 bay, directional

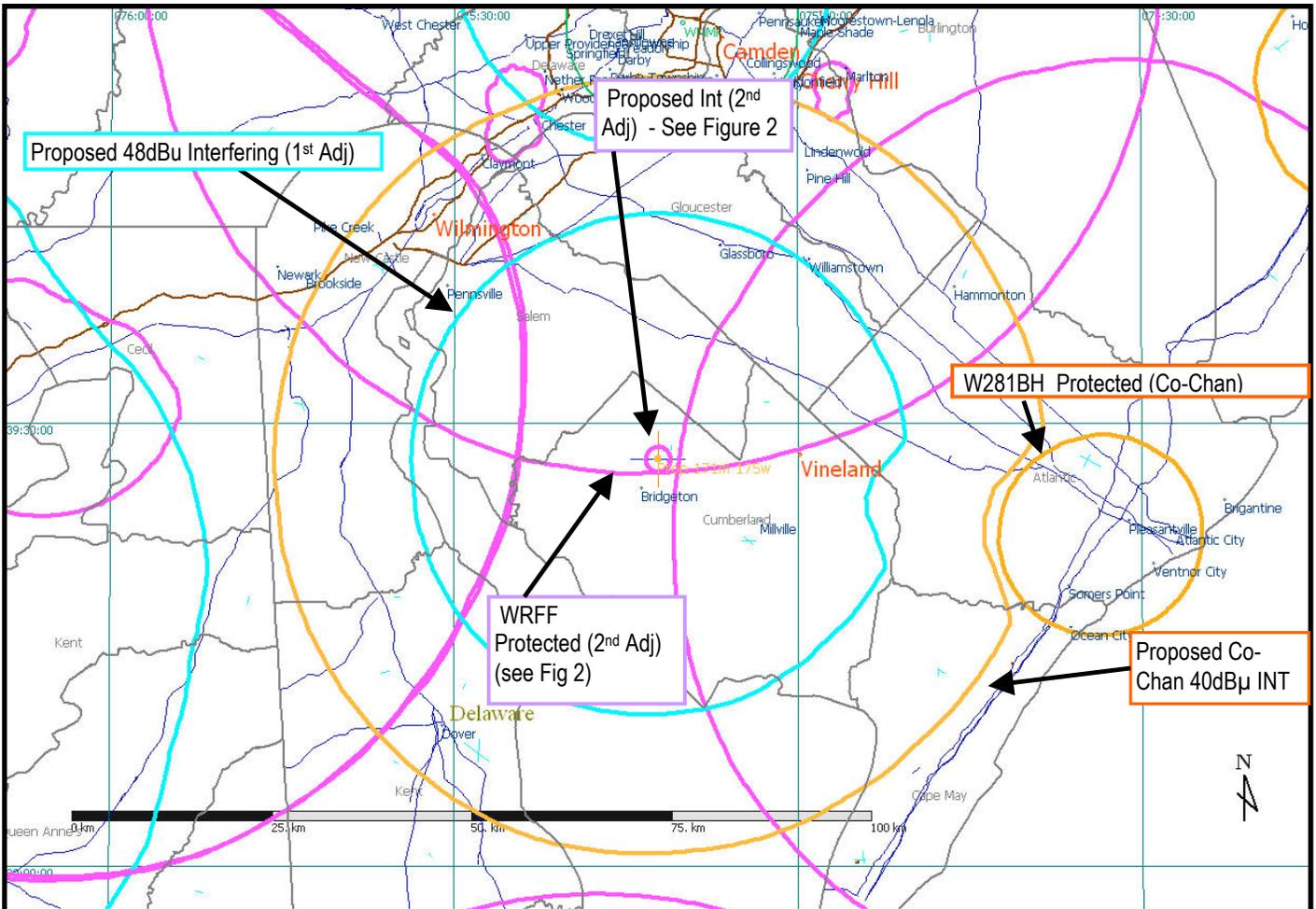
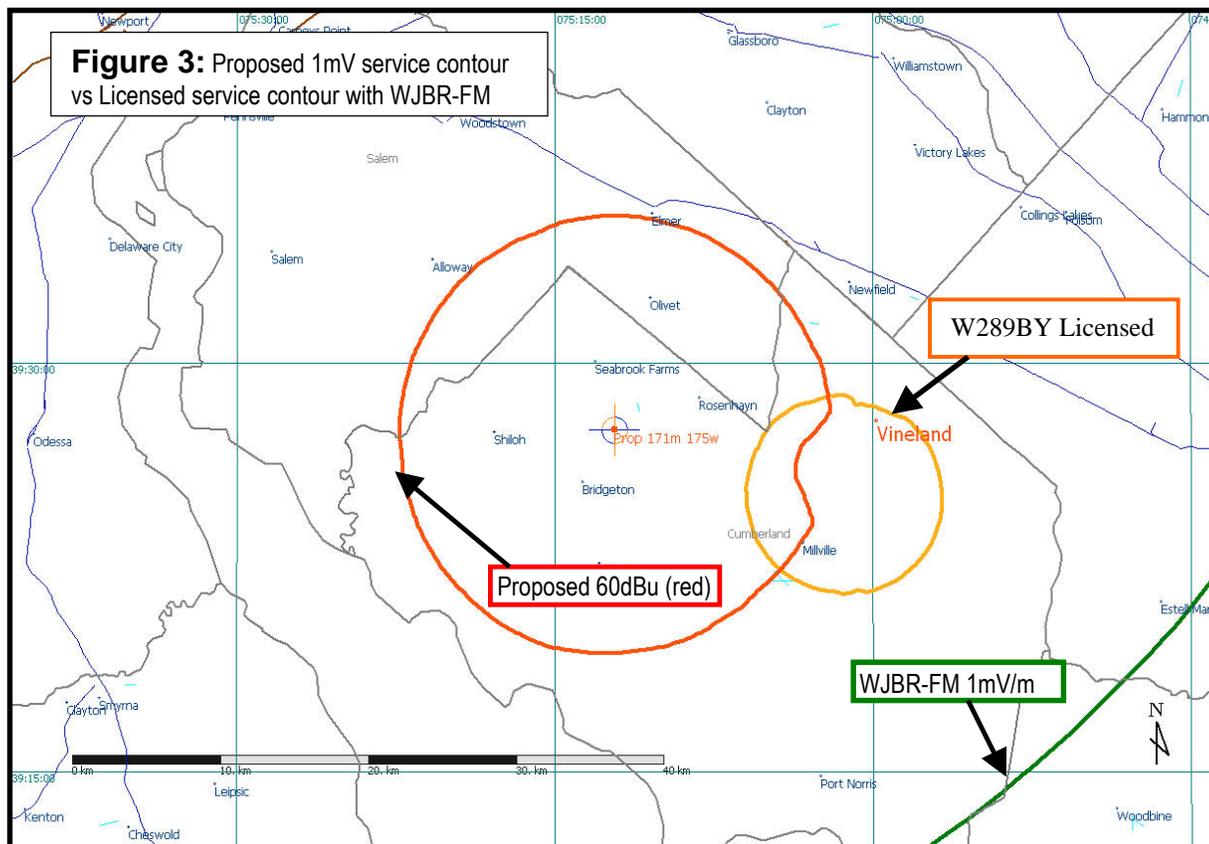
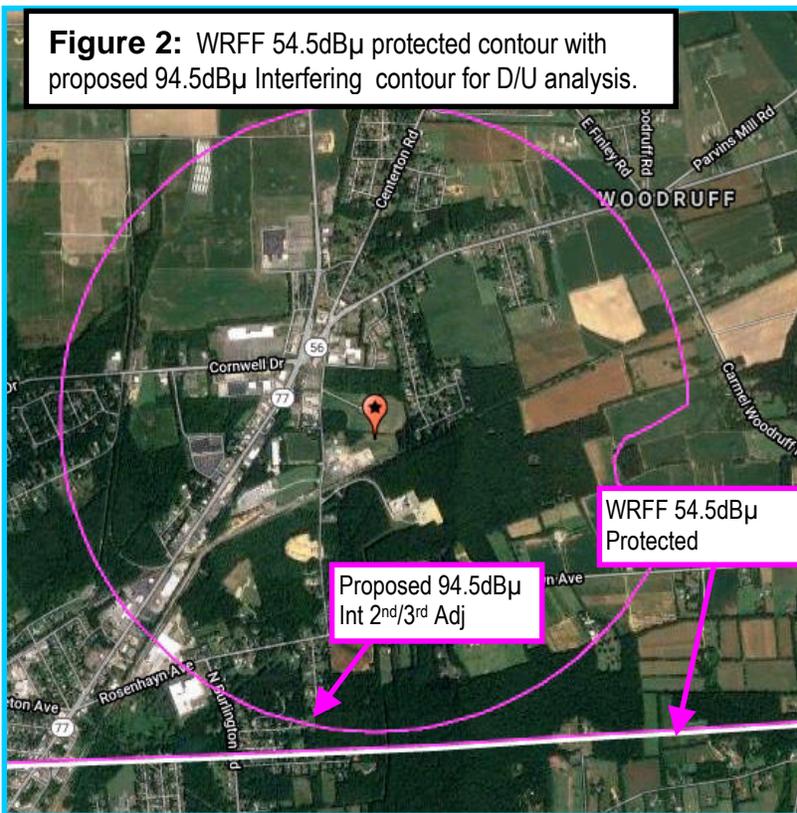


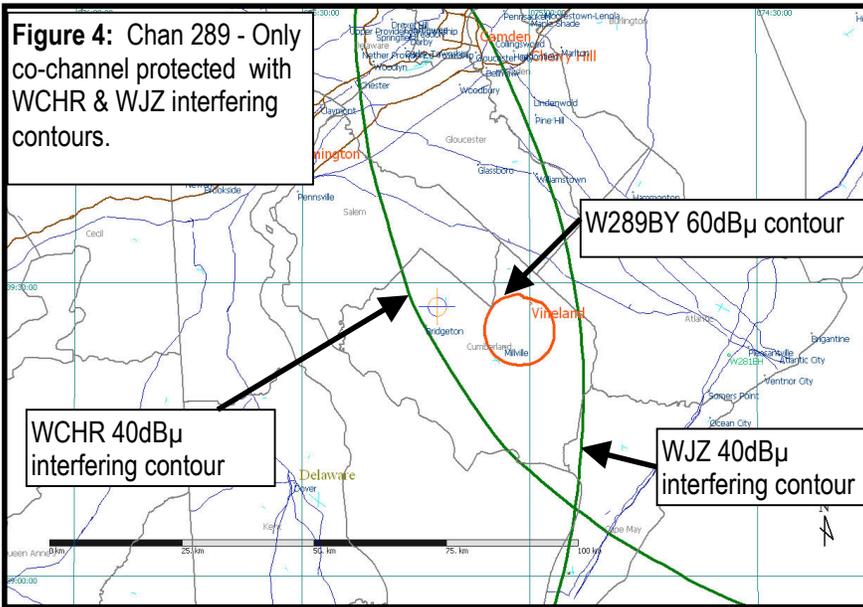
Figure 1 above demonstrates that no prohibited overlap exists on the co-channel, 1st adjacency or the i.f. channels. Prohibited overlap occurs on a 2nd adjacent channel, but is acceptable under 74.1204(d) due to a lack of affected population.

Figure 2 below along with Appendix A show that the operation of the proposed facility will not result in harmful interference to WRFF.

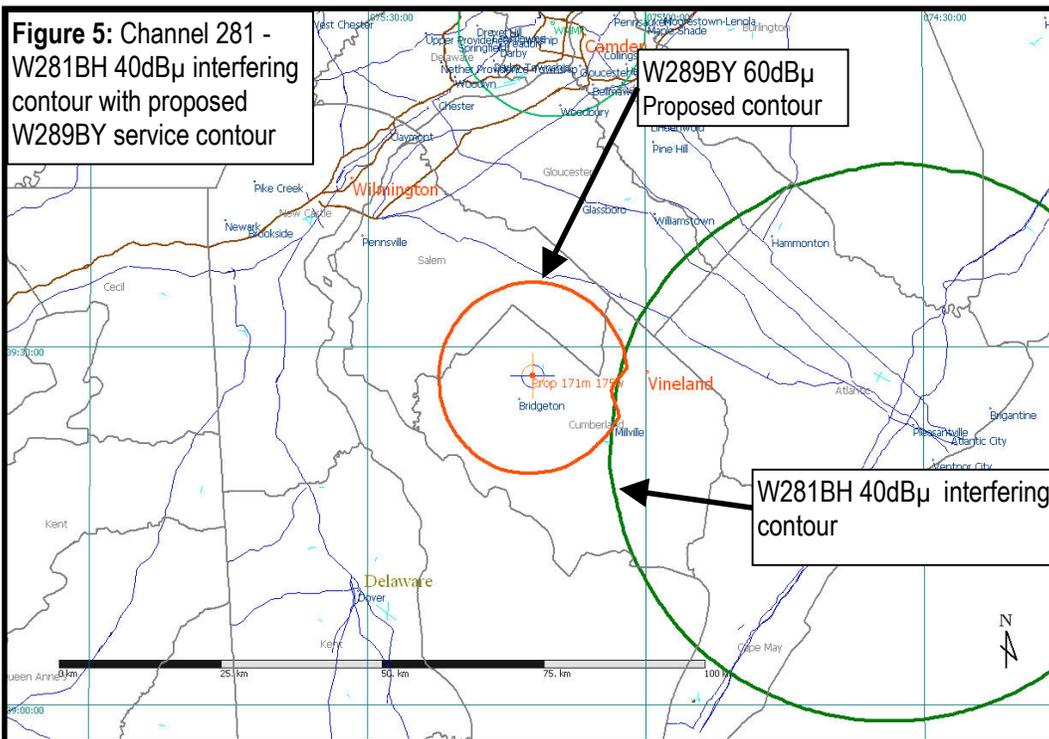


Showing of reduced interference by changing from channel 289 to channel 281

As shown in Figure 4, W289BY is within the 40dBu co-channel interfering contours of both WCHR and WJZ and receives significant interference from both full powered stations.



The licensee of W289BY proposes to remedy the interference by moving to channel 281. There is currently only one operating signal nearby on channel 281, W281BH. As shown in figure 5, the proposed channel 281 facility is substantially outside of the W281BH interfering 40dBu contour. Thus, this move reduces interference.



Desired to Undesired ratio (D/U) studies of the proposed facility vs WRFF Methodology:

The proposed facility's 94dB μ interfering contour is within the protected contour of 2nd adjacent class B station WRFF. The WRFF 54.5dB μ contour encompasses the proposed facility's 94.5dB μ contour. A D/U analysis (attached as Appendix A) shows that no prohibited interference approaches the ground. Except for a strip along hwy 77/56, the affected area is predominately rural and no multi-story buildings are believed to be in the area.

A 6-bay, 3/4wave spaced directional antenna will be employed to prevent the interfering contour from reaching the ground. Spreadsheets were used to calculate the distance to the interfering contours and show the margins of clearance (in dB) at a point two meters AGL. Where the interfering contour reaches near the ground, the table indicates how far from the supporting structure the interference will reach. Although interference does reach the ground at a few locations near the tower, it is always less than 0.5dB over the threshold limit. The result is that the interfering contour does not reach any occupied structure or roadway. The spreadsheet outputs are attached as Appendix A.

Interference Study:

Terms and Methodology

Max ERP: The power specified in the application, expressed in kW.

Angle below the Horizon: The radiation angle below the antenna's horizontal plane.

Field at Angle: The field supplied by the antenna manufacturer for each Angle below the Horizon.

ERP at Angle: The ERP for an Angle given Max ERP & Field:

$$\text{ERP@Angle} = \text{Max ERP} * \text{Field}^2$$

Signal at Point: The predicted signal level assuming Free Space attenuation at a point:

$$\text{Signal} = 106.92 - (20 * \text{Log}(\text{Dist}(\text{km}))) + (10 * \text{Log}(\text{ERP@Angle}(\text{kW})))$$

Distance to Point: The radiation path distance from the antenna to a point.

$$\text{DistToPoint} = \text{Antenna Rad Center in meters AGL} / (\text{Cos}(90^\circ - \text{Angle}^\circ))$$

Distance From Tower: The distance from the tower base to a point.

$$\text{DistToPoint} * \text{Sin}(90^\circ - \text{Angle}^\circ)$$

Interference Threshold = Protected station's predicted contour value at a point +40dBμ

Over Threshold: The FMount that the Proposal's signal exceeds the interference threshold.

$$\text{OverThresh} = \text{Signal} - \text{Interference Threshold value}$$

A negative Over Threshold value indicates no interference.

Notes:

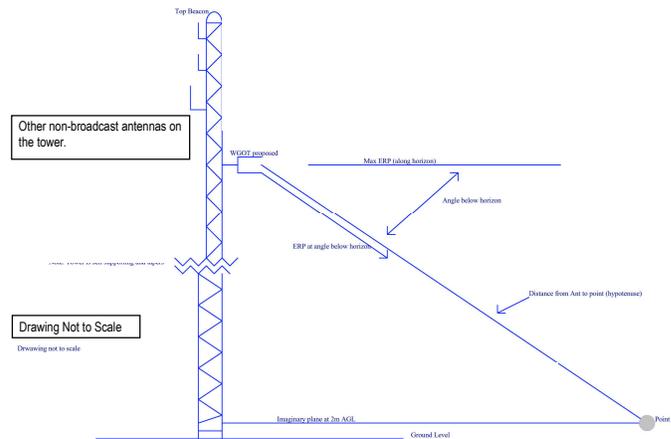
When finding a value for a point two meters above ground, then: $\text{DistToPoint} = \text{Antenna Rad Center in meters above the plane, not ground} / (\text{Cos}(90^\circ - \text{Angle}^\circ)$. Subtracting 2 meters from the antenna RC produces the desired result.

Results:

Appendix A (separately attached to this application) shows the angle and distance to a point 2meters above the ground from the proposed antenna. The table portion of Appendix A also shows the distance to the interfering contour at 175W (0.175kW).

The field strength is calculated at each end point and compared to the worst case protected contour of WRFF (54.5dBμ). Using the manufacturer's specified field elevation data, Appendix A shows that, at 2 meters above the occupied floor, the interference threshold of 94.5dBμ will not reach any occupied space or roadway. No occupied spaces or roads extend into the zone of interference on any radial. It can be concluded that no interference is predicted to occur to WRFF as a result of this proposal.

Exhibit EE-1, tower sketch



Note: The sketch is representative of a typical tower. This installation will be on a short mast located on a rooftop, however, the principles and method used to determine signal levels are unchanged.

Engineering Data:

Tech Box Data:

Channel: **281**

Primary Station: **FID: 14374**
WJBR-FM (99.5 HD2)
Wilmington, DE

Delivery Method: **Other**

Antenna Location Coordinates: (NAD83):

39° 41' 43.3" N

75° 17' 54.8" W

Antenna Structure Registration: **1208476**

Antenna Location Site Elevation Above Mean Sea Level: **30.5 meters**

Overall Tower Height Above Ground Level: **145.7 meters**

Support Structure Height: **134.1 meters**

Height of Radiation Center Above Ground Level: **141 meters (H & V) AGL**

ERP:

0.175 kW (H)

0.175 kW (V)

Transmitting Antenna: Directional 6-bay **PSI FML-6DA.75WS**

Proposal Compliance:

Fill-in Translator: **Yes** (see EE-1)

Section 74.1204, 74.1205: **Yes**. See EE-1

Unattended operation: **Yes**

Multiple Translators: **Yes**

Environmental Effect:

NEPA: **No**. This proposal is excluded from environmental processing: The modeled rf at the closest occupied area is under 5uW/cm2 which is less than 5% of the maximum public exposure level. The antenna is mounted on an existing structure. No changes to structure, lighting, land or water are proposed. Applicant will cease radiating if workers are near the antenna.

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