Exhibit EE-1: Engineering Statement in support of
LMS FORM 2100, Schedule 349
APPLICATION FOR AUTHORITY TO CONSTRUCT OR MAKE CHANGES IN AN FM TRANSLATOR OR FM BOOSTER STATION
(For an Existing FM Translator)

This engineering exhibit supports as minor modification to the construction permit (CP) of FM translator W288DS (Facility ID 201440), Easton, PA. W288DS is used as a fill-in facility for Class C AM station, WEST (Fac. ID # 36996) This application proposes to change the antenna type, antenna location, channel and power. W288DS will be moving to the channel and antenna and power level occupied formerly by sister translator W258BM. By moving, W288DS improves coverage and reduces interference.

The proposed W288DS 94dBµ contour is within the protected contour of 2nd adjacent stations, WODE, Easton, PA and WAWZ, Zarephath, NJ. Of the two, WAWZ is the weaker signal. WAWZ's 55.5dBµ contour completely encompasses the W288DS proposed 95.5dBµ interfering contour. A D/U analysis shows that no interference reaches or approaches the ground nor any occupied structure or elevated roadway. Therefore this proposal should be acceptable under 74.1204(d) and a "Living Way" waiver is hereby requested.

W288DS protects first adjacent translator W257AI, co-channel class B stations WJBR and WBAI and co channel class A station WUSR. Limited power and a directional antenna are used to protect each of these facilities. Appendix C is the proposed directional antenna pattern.

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 operate as a fill-in facility for WEST, an AM radio station licensed to Easton, PA. The maximum ERP is limited by interference to 90W (0.09kW).

Attached as Figures 1, 2 and 3 are a color coded maps showing the protected contours and interfering contours of all relevant FM facilities.

Figure 4 shows the proposed 1mV service contour of this application compared with the 2mV service contour and 40km ring for WEST. Figure 5 shows that the proposed W288DS service contour completely encompasses the W288DS CP's service contour.

Figures 6 and 7 show that there is decreased interference as a result of this non-adjacent channel change.

Figure 8, Study 1 and Appendix A and Appendix B demonstrate that no harmful interference will occur to adjacent stations WAWZ and WODE.

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

Respectfully submitted
/S/
Kyle Magrill, Consultant
23 October, 2020

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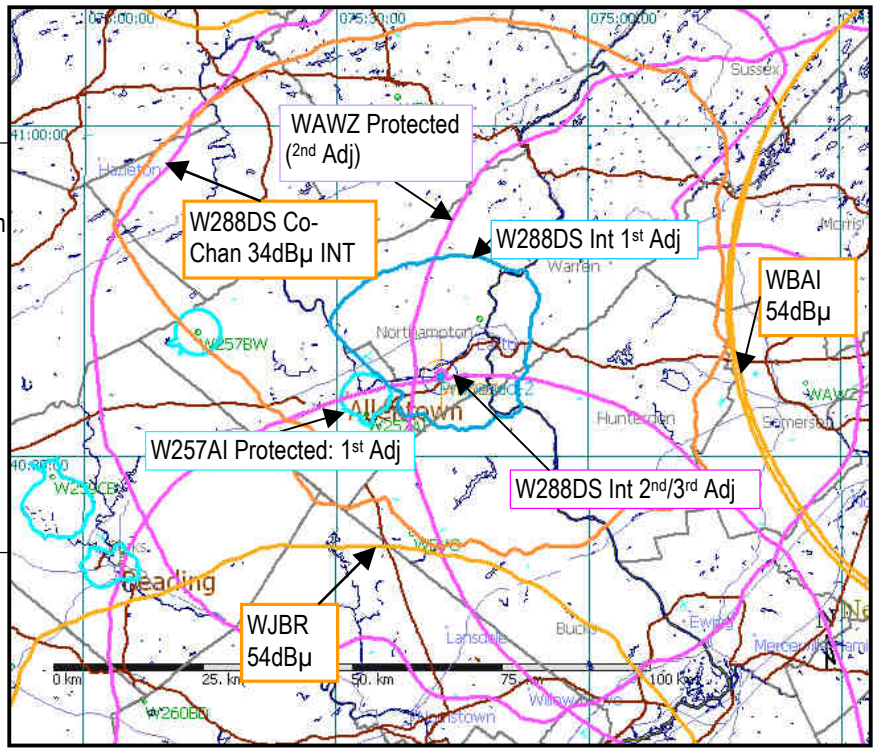
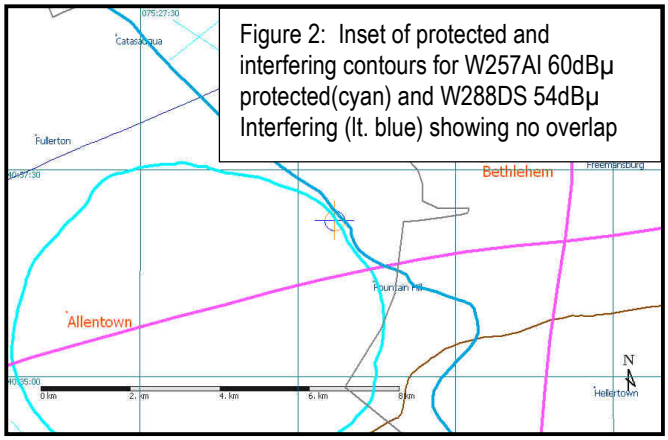
Analysis:

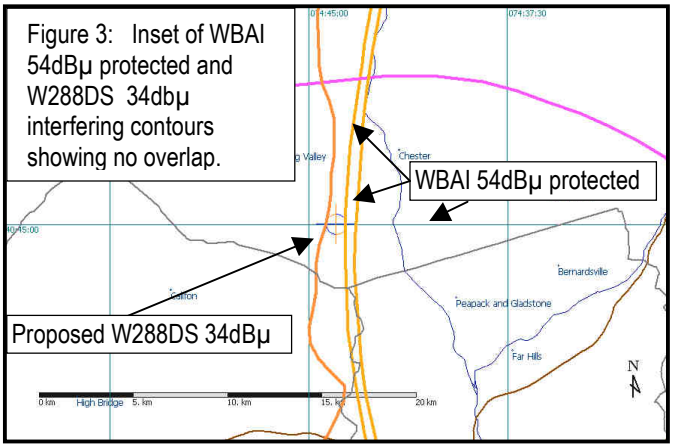
W288DS is a licensed facility inside the Allentown, PA radio market. This application changes antenna type, location, channel and power of the facility.

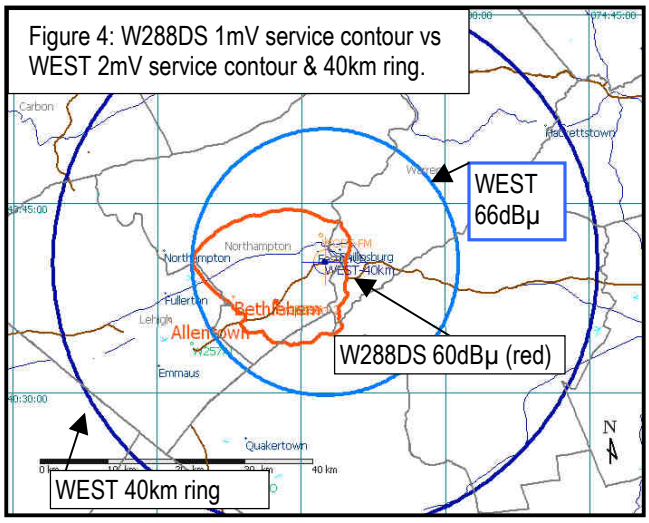
Figure 1: Contour analysis of Ch258, Easton, PA.
Colors are referenced to W288DS proposed.
Other facilities' colors should not overlap the same colors from W288DS. Overlapping colors from one affected station to another is okay.
Key:
Amber = Interfering 34dBμ vs Protected (Co-chan)
Blue or cyan = Interfering 54dBμ vs Protected (1st Adj)
Violet = Interfering 94dBμ vs Protected (2nd/3rd adj)

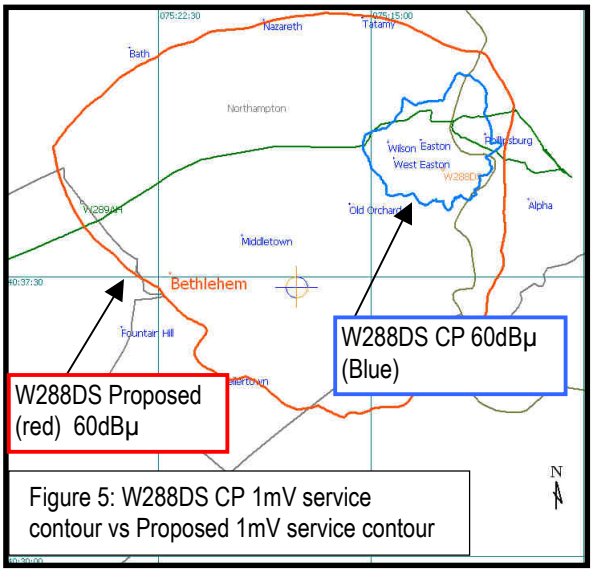
W288DS proposed power = 0.09kW (90 Watts).
W288DS Proposed antenna type: 4-bay, full-wave spaced, directional, composite.











Reduced Interference for non-adjacent channel change.

Figure 6: W288DS CP 60dBµ service contour vs WDAS 54dBµ Interfering.

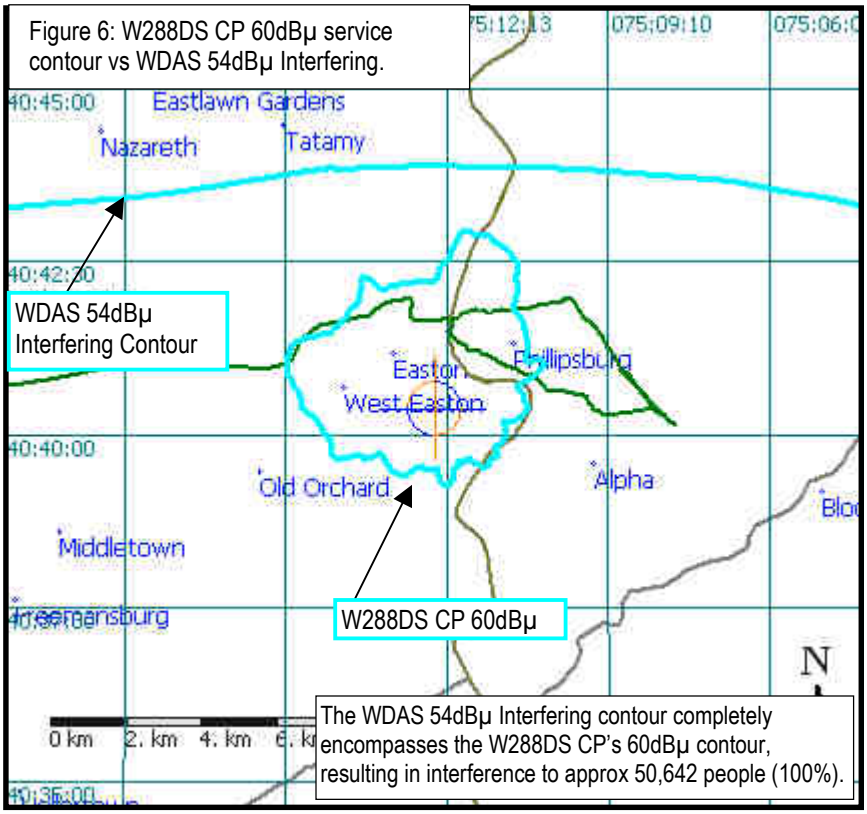
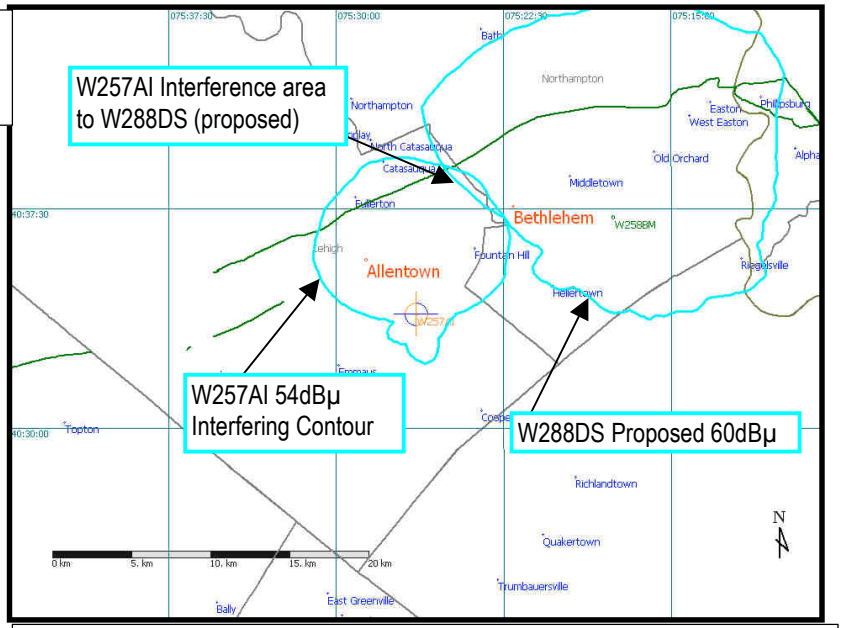


Figure 7: W288DS Proposed 60dBµ service contour vs W257AI 54dBµ Interfering contour.



The W257AI 54dBµ Interfering contour only slightly overlaps a small part of the proposed W288DS 60dBµ contour, resulting in interference to 7,621 people, reducing interference to 43,021 people. W288DS coverage increases to 194,666, people. The percentage of population receiving interference will drop from near 100% to just 3.9%. Therefore, this proposal is shown to reduce interference.

Desired to Undesired ratio (D/U) studies of W288DS vs WAWZ & WODE Methodology:

The WAWZ 55.5dBµ contour encompasses the proposed W288DS 95.5dBµ contour. The WODE 86dBµ contour also encompasses the proposed W288DS location. Since WAWZ has the weaker signal at the W288DS location, demonstrating no interference to WAWZ also demonstrates no interference to WODE. Much of W288DS's interfering contour extends over uninhabited farm and forest. Only part of the signal extends over populated areas. The WAWZ 55.9dBµ encompasses the W288DS location and all affected occupied areas. Therefore 55.9dBµ was used for the study.

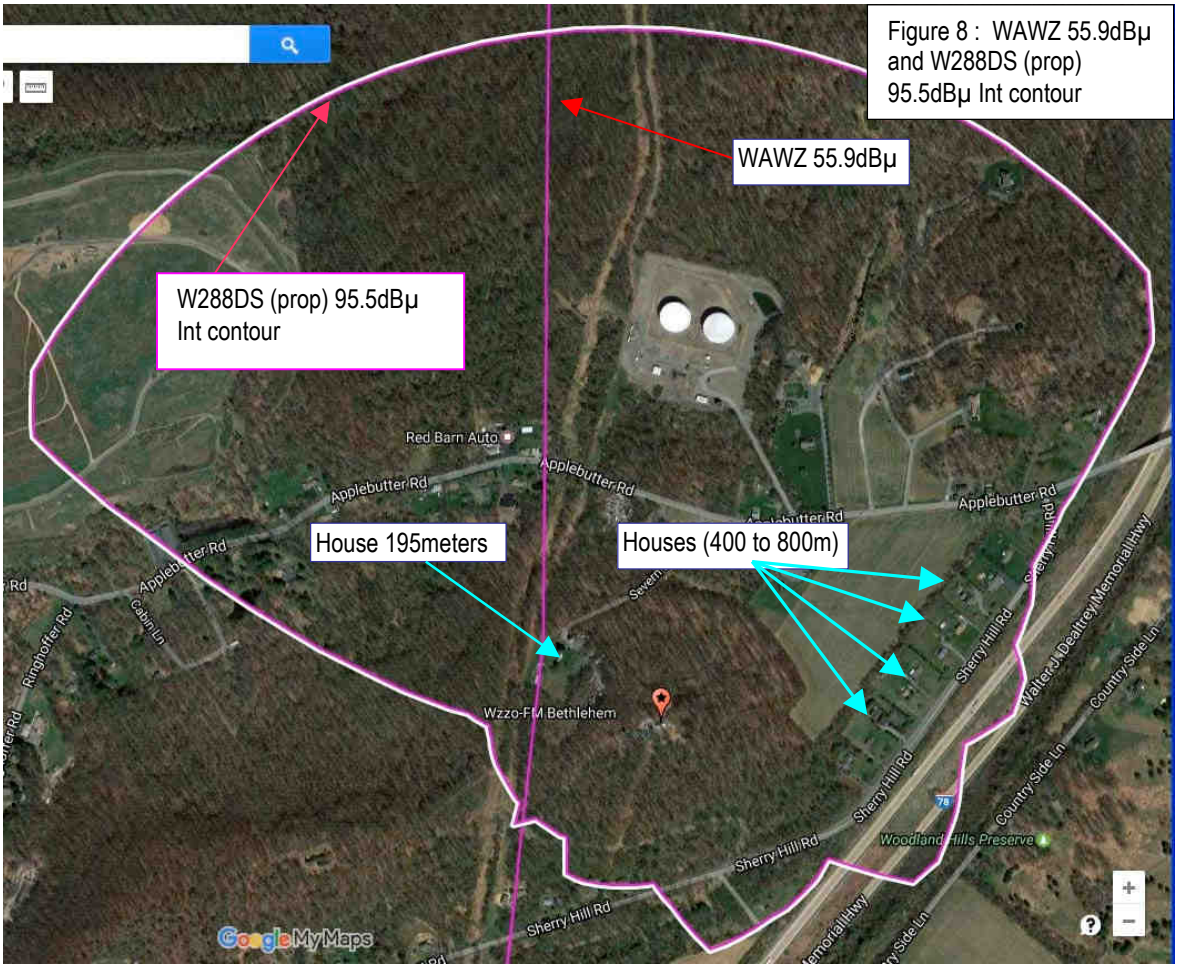


Figure 8 : WAWZ 55.9dBµ and W288DS (prop) 95.5dBµ Int contour

W288DS is located on a hill with steeply descending slopes such that the height of various affected areas are at different elevations relative to the antenna height. Therefore, it was necessary to run two studies to determine that no interference existed to any nearby location. One study (Appendix B) was run to a nearby trailer at 150 meters distance from the tower and 70 meters of differential elevation. It is believed that this structure is unoccupied and was part of an automobile parts yard that is not in active service. However, the structure is clear of interference. The other study (Appendix A) is relevant to two areas. First a house is located 195 meters from the base of the tower. This house is 87 meters below the antenna. Second, a series of houses and highways is located between 400 and 800 meters from the tower. The elevations vary, but the highest elevation is also about 87 meters below the antenna centerline at about 550 meters distance. This is close to the maximum downward reach of the vertical main lobe. Demonstrating no interference to the worst case scenario demonstrates no interference to the other structures or the roads, all of which are lower or vertically further from the main lobe. Though refreshed for this application, this exact same data was submitted and approved for file # BPFT - 20170620ABI for W258BM. The same facilities will be employed, again for this proposal.

All of the affected areas are completely contained within the WAWZ 55.9dBµ contour. Therefore the worst case scenario for interference is 55.9dBµ + 40dBµ =95.9dBµ. Additionally, none of the structures are directly in line with the maximum lobe, however the maximum ERP of 90W was used for all calculations, providing additional margin.

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 tower the interference will reach. In the case of W288DS, a four-bay, approx full-wave spaced antenna will be employed. The result is that the interfering contour does not reach any occupied structure or roadway. The spreadsheet outputs are attached as Appendix A and Appendix B.

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:

ERP@Angle = Max ERP * Field^2

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

Signal = 106.92 - (20 * Log(Dist(km))) + (10 * Log(ERP@Angle(kW)))

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

DistToPoint = Antenna Rad Center in meters AGL/(Cos(90°-Angle°)

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

DistToPoint * Sin(90°-Angle°)

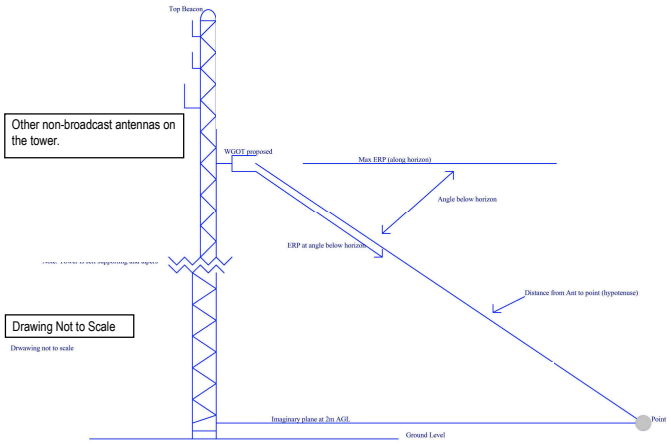
Interference Threshold = Protected station's predicted contour value at a point +40dBμ

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

OverThresh = Signal – Interference Threshold value

A *negative* Over Threshold value indicates no interference.

Exhibit EE-1, Study 1, tower sketch



NOTE: the ground elevation descends steeply from the tower. Therefore the antenna height over the actual ground elevation at the target locations was used, not the ground elevation at the tower base.

Notes:

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

Results:

Appendix A and B (separately attached to this application) show the angle and distance to a point 2meters AGL from the proposed antenna. Table 1 also shows the distance to the interfering contour at 90W (.09kW).

The field strength is calculated at each end point and compared to the worst case protected contour of WAWZ (55.9dBμ). Using the manufacturer's specified field elevation data, Appendix A and B show that, at 2 meters above the ground, the interference threshold of 95.9dBμ will not reach any occupied structure or roadway. No elevated public roads nor occupied multi-story buildings extend into the zone of interference on any radial. It can be concluded that no interference is predicted to occur to WAWZ or WODE as a result of this proposal.

Section VII Engineering Data:
Tech Box Data:

1. Channel: **258**

Primary Station: **FID: 36996**
WEST
Easton, PA
1400 kHz

Delivery Method: **Other**

Antenna Location Coordinates: (NAD83):
40° 37' 13.4" N
75° 17' 35.6" W

Antenna Structure Registration: **1025306**

Antenna Location Site Elevation Above Mean Sea Level: **248 meters**

Overall Tower Height Above Ground Level: **76 meters**

Height of Radiation Center Above Ground Level: **56 meters**

ERP:
0.09 kW (H)
0.09 kW (V)

Transmitting Antenna: **PSI FML-DA or equiv: 4bay, full wave spaced, Composite Directional.**

Fill-in Translator: **Yes** (see EE-1, Figure 2)

Interference: **Yes**
Section 74.1204, **Checked**. See EE-1, Figure 1
Section 74.1205, **Not Checked**.

Unattended operation: **Yes**

Multiple Translators: **Yes**

NEPA: **Yes**. This proposal is excluded from environmental processing: The rf exposure was modeled using "FM Model" for windows (from the FCC website) using a 4-element antenna at a height of 54m. The modeled maximum rf near the base of the tower is far below 1% of the uncontrolled public exposure limit, so no further processing is required. No changes to structure, lighting, land or water are proposed. Applicant will cease radiating if workers are near the antenna.

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