

ENGINEERING REPORT

FM Translator Minor Modification to CP Application

for

**W280FW
Facility ID: 203241**

as an AM Fill-In Translator for
WCVG(AM) – Covington, KY

November 2021

MUNN-REESE

Broadcast Engineering Consultants
Coldwater, MI 49036

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Discussion

This firm has been retained to prepare the required engineering report in support of a Minor Modification to Construction Permit Application for an FM Translator W280FW. The existing construction permit parameters were an AMSL of 217 meters AMSL and an ERP of 0.250 kW. The applicant is not able to install the antenna on the tower as proposed due to structural issues with the tower. This proposal requests an AMSL of 237 meters AMSL and an ERP of 0.099 kW.

The Fill-In Translator will rebroadcast Class D Primary Station WCVG(AM) – Covington, KY (1320 kHz); Facility ID No. 56220.

The Translator as proposed will be mounted on a tower which does not bear an Antenna Structure Registration Number.

The proposed 60 dBμ contour of the Fill-In Translator lies wholly inside the greater of the AM primary daytime 2.0 mV/m contour and a 25 mile radius around the AM site. A map of the proposed service area in relation to the primary station service contour has been included in **Exhibit 1.0**.

It has been determined the Translator may be used in the area without interference to any existing FM broadcast station or facility. General allocation details are found in **Exhibit 2.0**. It is believed sufficient clearance exists precluding the need for additional contour protection showings.

The applicant would like to note the existence of a §74.1204(d) Second/Third Adjacent Channel Given Interference Waiver Request toward WGRR(FM) – Hamilton, OH (CH278B) and WNLT(FM) – Delhi Hills, OH (CH282A) as noted in **Exhibit 2.1**. Protection has been based on the worst case calculated 130.3 dBμ F(50:10) Interference Contour, corresponding to the worst case 90.3 dBμ F(50:50) Protected Contour. Protection has been demonstrated through a downward vertical radiation study. Full protection will be afforded the facility as the interference area that reaches the ground is contained within the property where the antenna will be installed and does not reach any houses or main roads.

The applicant certifies the proposed translator 34 dBu F(50:10) Interference contour does not enter Canadian territory. Documentation of the proposed 34 dBu F(50:10) Interference contour will be supplied upon request.

This translator is not within the affected distance of any TV Channel 6 stations.

The applicant would like to note use of the NED 03 second terrain database for terrain-based showings contained here-in.

Discussion (continued)

RADIATION PROTECTION: The Commission requires an engineering study regarding compliance with the guidelines for human protection from radiofrequency radiation. This report section is in response to that provision of the Rules. The current Federal Communications Commission guidelines for RF radiation protection are set forth in OET Bulletin No. 65 (Edition 97-01), and the accompanying Supplement A, (Edition 97-01).

The FM Broadcast facility proposed in this application will not produce human exposure to radiofrequency radiation in excess of the applicable safety standards specified in §1.1307 of the Commission's rules concerning RF contributors. ***Exhibit 3.0*** provides the details of the study that was made to demonstrate compliance. The facility is properly marked with signs, and entry is restricted by means of fencing with locked doors and/or gates. Any other means as may be required to protect employees and the general public will be employed.

In the event work would be required in proximity to the antenna such that the person or persons working in the area would be potentially exposed to fields in excess of the guidelines set forth in OET Bulletin No. 65 (Edition 97-01), the transmitter power will be reduced or the station will cease operation during the critical period.

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Exhibit 1.0 - W280FW Present and Proposed with WCVG(AM) Contours

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W280FW.P

BNPFT20180424AAS
Latitude: 39-07-12.09 N
Longitude: 084-30-08.01 W
Frequency: 1320 kHz

W280FW.C

BNPFT20180424AAS
Latitude: 39-02-43 N
Longitude: 084-30-30 W
ERP: 0.25 kW
Channel: 280
Frequency: 103.9 MHz
AMSL Height: 217.0 m
Elevation: 162.0 m
Horiz. Pattern: Omni
Vert. Pattern: No
Prop Model: None

W280FW.P

BNPFT20180424AAS
Latitude: 39-07-12.09 N
Longitude: 084-30-08.01 W
ERP: 0.099 kW
Channel: 280
Frequency: 103.9 MHz
AMSL Height: 237.0 m
Elevation: 225.0 m
Horiz. Pattern: Omni
Vert. Pattern: No
Prop Model: None

- WCVG.L
- W280FW.P (280)
- W280FW.C (280)

Circle R = 46.0 km

2.0 mV/m

FCC E(50-50) 60.00 dBu (FCC HAAT)

W280FW.P E(50-50) 60.00 dBu (FCC HAAT)

W280FW.C

Scale 1:500,000

0 7 14 21 km

V-Soft Communications LLC ©

Exhibit 2.0
Reign Enterprizes, LLC

REFERENCE	CH# 280D - 103.9 MHz, Pwr= 0.099 kW, HAAT= 20.9 M, COR= 237 M	DISPLAY DATES
39 07 12.30 N.	Average Protected F(50-50)= 5.62 km	DATA 11-15-21
84 30 07.80 W.	Omni-directional	SEARCH 11-19-21

CH CITY	CALL	TYPE STATE	ANT AZI ---	DIST FILE #	LAT LNG	PWR(kw) HAAT(M)	INT(km) COR(M)	PRO(km) LICENSEE	*IN* (Overlap in km)	*OUT*
278B Hamilton	WGRR	LIC ZCN OH	348.8 168.8	9.09 BLH19940718KB	39 12 01.20 84 31 21.70	11.000 316	4.9 536	64.4 Radio License Holding	-1.4*<	-56.7*< Src
282A Delhi Hills	WNLH	LIC NCN OH	250.5 70.5	5.00 0000145880	39 06 18.20 84 33 24.80	2.000 175	2.4 395	28.7 Educational Media Foundati	-3.0*<	-24.4*<
280D Covington	W280FW	CP _CN KY	183.6 3.6	8.32 BNPFT20180424AAS	39 02 43.20 84 30 29.70	0.250	217	---Reference--- Reign Enterprizes, LLC		
280A Batesville	WRBI	LIC _CN IN	280.3 99.8	65.99 BLH20151021AHW	39 13 25.20 85 15 21.90	2.650 108	75.1 402	24.2 Leeson Media, LLC	-14.7*<	23.3
280A Beavercreek	WZDA	LIC ZCN OH	20.5 200.7	71.49 BMLH20120315ADM	39 43 19.20 84 12 32.80	2.900 146	75.4 413	25.4 Ihm Licenses, LLC	-11.3*<	21.4
281C0 Portsmouth	WPYK	LIC ZCN OH	110.2 291.1	137.71 BLED20181011AAC	38 41 00.30 83 00 45.60	100.000 450	107.6 676	73.1 Educational Media Foundati	24.5	56.7
279A Frankfort	WFRT-FM	LIC _CN KY	199.8 19.6	106.12 BLH19910422KA	38 13 17.30 84 54 51.80	2.500 109	41.6 336	27.5 Southern Belle, LLC	58.9	70.7
281B Muncie	WLBC-FM	LIC _CN IN	327.3 146.8	137.95 BMLH20041020AAB	40 09 40.20 85 22 43.90	41.000 140	70.8 438	59.0 Woof Boom Radio Muncie Lic	61.5	67.6
280A Louisville	WRKA	LIC _CN KY	229.0 48.2	145.26 BMLH20011227AAH	38 15 22.30 85 45 28.90	1.350 149	75.1 304	25.3 Sm-Wrka, LLC	64.6	101.4
283C2 Lexington-Fayette	WLKT	LIC NCN KY	171.9 352.0	117.99 BLH20000217ABS	38 04 09.30 84 18 43.80	50.000 142	5.9 430	52.0 Ihm Licenses, LLC	104.2	65.3
280D Lexington	W280DO	LIC _CN KY	177.4 357.4	122.97 BLFT20070622ADR	38 00 54.30 84 26 17.80	0.250 128	48.4 418	14.4 Educational Media Foundati	68.0	86.7
282D Dayton	W282CD	LIC _CN OH	21.0 201.2	84.07 BLFT20160613ABK	39 49 32.30 84 08 59.20	0.250	1.1 336	13.1 L & D Broadcasters, Inc.,	75.5	70.3
282D Greensburg	W282AZ	LIC _CN IN	286.3 105.7	88.05 BLFT20071105ADN	39 20 18.20 85 29 05.90	0.027 75	0.4 351	5.2 Two Black Cadillacs	82.1	82.2
278D Greensburg	W278BB	LIC _CN IN	286.3 105.7	88.05 BLFT20071105ADP	39 20 18.20 85 29 05.90	0.027 75	0.4 351	5.2 Two Black Cadillacs Inc	82.1	82.2
280A Worthington	WJKR	LIC ZCN OH	51.3 232.2	152.16 BLH20130816ACY	39 58 00.20 83 06 27.70	6.000 99	60.4 350	17.6 North American Broadcastin	86.2	116.0
277A Georgetown	WXZZ	LIC _CN KY	179.3 359.4	117.24 BLH19980929KB	38 03 56.30 84 29 12.80	6.000 100	2.9 387	30.0 Cumulus Licensing LLC	108.0	86.5
279B Bloomington	WFIU	LIC _CN IN	271.4 90.2	171.90 BLED20021223ABE	39 08 31.20 86 29 43.00	29.000 197	78.9 413	66.4 Trustees Of Indiana Univer	87.3	94.2
277D Enon	W277AO	LIC DCN OH	30.2 210.5	99.56 0000112572	39 53 34.20 83 54 55.80	0.250	0.5 361	7.8 93.4		91.1
281L1 Frankfort	WYDX-LP	LIC _CN KY	198.3 18.1	106.13 BLL20180108AAE	38 12 48.20 84 53 04.50	0.064 38	259	92.0 Woods And Waters Land Trus		92.2
279D Greenville	W279BR	LIC _CN OH	353.8 173.7	108.60 BLFT20190924ABP	40 05 28.20 84 38 23.80	0.120	8.4 351	5.9 Educational Media Foundati	94.6	94.7
283B Noblesville	WJJK	LIC _CN IN	299.7 118.6	164.45 BMLH20030828AYT	39 50 25.20 86 10 34.00	50.000 150	5.9 390	64.3 Radio License Holding Src	153.0	98.7
283B Noblesville	AL9217	RSV-A _ IN	299.7 118.6	164.45 RM10153	39 50 25.15 86 10 33.95	50.000 150	5.8 389	64.2 Eastern Airwaves, Llc	153.0	98.8

Terrain database is NED 03 SEC , R= 73.215 qualifying spacings or FCC minimum Spacings in KM, M= Margin in KM
Contour distances are on direct line to and from reference station. Reference zone= East Zone, Co to 3rd adjacent.
All separation margins (if shown) include rounding. Call signs with strikeout need not be protected.
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.
< = Contour Overlap

Exhibit 2.1 - W280FW Proposed with WGRR and WNLT signal strength at W280FW Site in support of a 74.1204(d) Waiver Request

W280FW.P

BNPFT20180424AAS
Latitude: 39-07-12.09 N
Longitude: 084-30-08.01 W

Frequency: 1320 kHz

W280FW.P

BNPFT20180424AAS
Latitude: 39-07-12.09 N
Longitude: 084-30-08.01 W
ERP: 0.099 kW
Channel: 280
Frequency: 103.9 MHz
AMSL Height: 237.0 m
Elevation: 225.0 m
Horiz. Pattern: Omni
Vert. Pattern: No
Prop Model: None

WGRR

BLH19940718KB
Latitude: 39-12-00.99 N
Longitude: 084-31-21.90 W
ERP: 11.00 kW
Channel: 278
Frequency: 103.5 MHz
AMSL Height: 536.0 m
Elevation: 273.0 m
Horiz. Pattern: Directional
Vert. Pattern: No
Prop Model: None

WNLT

0000145880
Latitude: 39-06-17.99 N
Longitude: 084-33-25 W
ERP: 2.00 kW
Channel: 282
Frequency: 104.3 MHz
AMSL Height: 395.0 m
Elevation: 259.0 m
Horiz. Pattern: Omni
Vert. Pattern: No
Prop Model: None

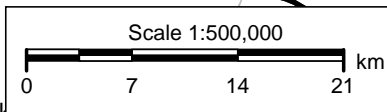
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- WCVG.L
- W280FW.P (280)
- W280FW.C (280)
- WGRR (278)
- WNLT (282)

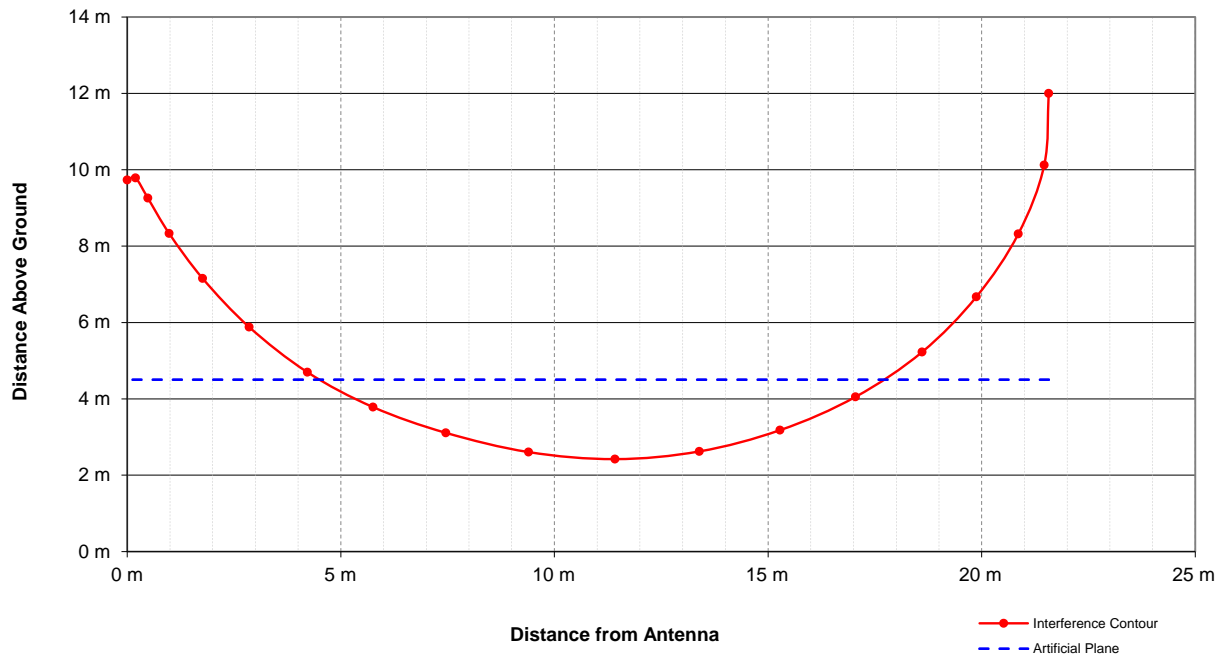
Circle R = 40.0 km

FCC F(50-50) 91.96 dBu (FCC HAAT)

FCC F(50-50) 90.21 dBu (FCC HAAT)



V-Soft Communications LLC ©



Proposed Antenna: Opposed V Dipole
Proposed Power: 0.099 kW
Antenna Height AGL: 12 meters
Interference Contour: 130.2 dBu f(50:10)
Artificial Ground Plane Height: 5 meters
Distance (Free Space) Equation: $= (10^{((106.92 - [\text{desired dBu}] + [\text{ERP in dBk}]) / 20)) * 1000}$
Field Strength (dBu) Equation: $= 106.92 - (20 * (\text{LOG10}[\text{DistMeters} / 1000])) + [\text{ERP in dBk}]$

Depression Angle	Antenna			Distance from Ant.	Distance	Field Strength	Distance	Field Strength
Below Horizon	Relative Field	ERP in kW	ERP in dBk	to Interference Contour	from Ant. to Artificial Plane	in dBu @ Artificial Plane	from Ant. to Ground Level	in dBu @ Ground Level
0°	1.000	0.099	-10.04	21.57 m	infinite	---	---	---
-5°	0.999	0.099	-10.05	21.55 m	86.05 m	118.17 dBu	137.68 m	114.09 dBu
-10°	0.982	0.095	-10.20	21.18 m	43.19 m	124.01 dBu	69.11 m	119.93 dBu
-15°	0.954	0.090	-10.45	20.58 m	28.98 m	127.23 dBu	46.36 m	123.14 dBu
-20°	0.918	0.083	-10.79	19.80 m	21.93 m	129.31 dBu	35.09 m	125.23 dBu
-25°	0.872	0.075	-11.23	18.81 m	17.75 m	130.70 dBu	28.39 m	126.62 dBu
-30°	0.818	0.066	-11.79	17.64 m	15.00 m	131.61 dBu	24.00 m	127.53 dBu
-35°	0.758	0.057	-12.45	16.35 m	13.08 m	132.14 dBu	20.92 m	128.06 dBu
-40°	0.691	0.047	-13.25	14.90 m	11.67 m	132.33 dBu	18.67 m	128.24 dBu
-45°	0.616	0.038	-14.25	13.29 m	10.61 m	132.16 dBu	16.97 m	128.07 dBu
-50°	0.538	0.029	-15.43	11.60 m	9.79 m	131.68 dBu	15.66 m	127.59 dBu
-55°	0.465	0.021	-16.69	10.03 m	9.16 m	130.99 dBu	14.65 m	126.91 dBu
-60°	0.391	0.015	-18.20	8.43 m	8.66 m	129.97 dBu	13.86 m	125.89 dBu
-65°	0.313	0.010	-20.13	6.75 m	8.28 m	128.43 dBu	13.24 m	124.35 dBu
-70°	0.239	0.006	-22.48	5.15 m	7.98 m	126.40 dBu	12.77 m	122.32 dBu
-75°	0.176	0.003	-25.13	3.80 m	7.76 m	123.98 dBu	12.42 m	119.90 dBu
-80°	0.129	0.002	-27.83	2.78 m	7.62 m	121.45 dBu	12.19 m	117.37 dBu
-85°	0.103	0.001	-29.79	2.22 m	7.53 m	119.60 dBu	12.05 m	115.52 dBu
-90°	0.105	0.001	-29.62	2.26 m	7.50 m	119.80 dBu	12.00 m	#NAME?

Exhibit 3.0

Compliance with Radiofrequency Radiation Guidelines

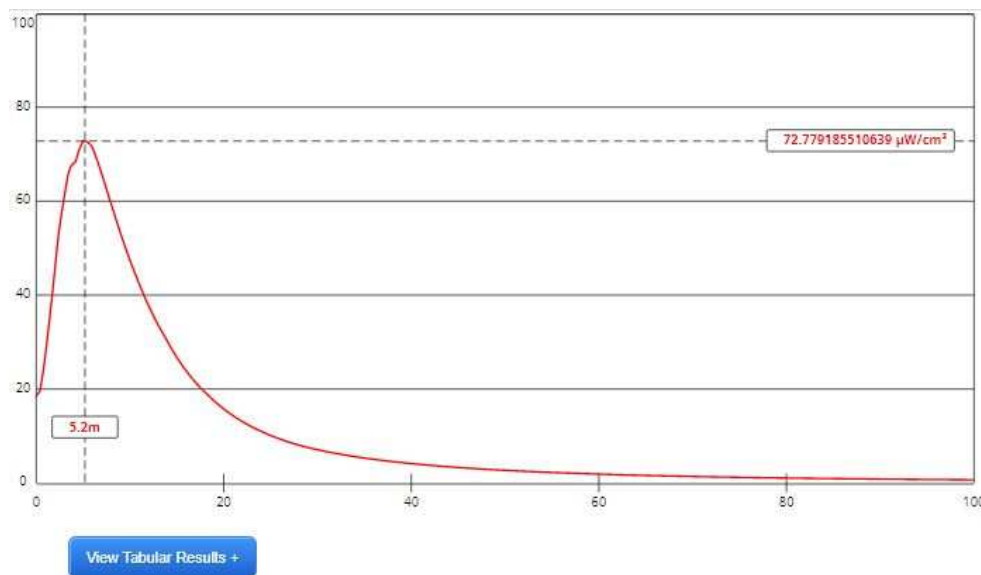
The RF Compliance Study has been evaluated for human exposure to non-ionizing radiofrequency radiation at the transmitter site. The site is intended to house multiple transmitters. The potential for human exposure to non-ionizing radiofrequency radiation at the proposed transmitter site has therefore been evaluated with regards to the §1.1307(b)(3), five percent (5%) contribution rule, for multiple transmitter sites.

The proposed operation will broadcast from an antenna COR mounted 12 meters above ground level (AGL) atop a pole on building rooftop. The minimum distance between the antenna and any people below the antenna is at least 7 meters. The facility will operate with a one bay antenna employing EPA Type 2 elements as defined by *FM Model - Appendix B* issued March 31, 2016¹. This facility will not operate with HD/IBOC facilities at this time.

To evaluate the total exposure to non-ionizing radio-frequency radiation with regards to the single source contribution rules, the individual contribution may be expressed directly in $\mu\text{W}/\text{cm}^2$ units relative to the maximum permissible uncontrolled environment limit of $200 \mu\text{W}/\text{cm}^2$. If the resulting contribution is less than or equal to $200 \mu\text{W}/\text{cm}^2$, the exposure is concluded to be within the guidelines of OET Bulletin No. 65 (Edition 97-01) and §1.1310 for the more restrictive uncontrolled limit. Protection of the uncontrolled limit ($200 \mu\text{W}/\text{cm}^2$) implies protection of the controlled limit ($1000 \mu\text{W}/\text{cm}^2$).

Inspection of the graph below shows the maximum contribution for the uncontrolled environment to be less than $200 \mu\text{W}/\text{cm}^2$ as set forth by §1.1310. Therefore, the facility is in compliance with FCC guidelines. In addition to the protection afforded by the proposed antenna height above ground, the facility is or will be properly marked with signs, and/or entry to the facility will be restricted by means of fencing with locked doors and/or gates if required. Any other means that may be required to protect employees and the general public will also be employed.

In the event work is required in proximity to the antenna(s) such that the person or persons working in the area will be potentially exposed to fields in excess of the current guidelines, an agreement signed by all broadcast parties at the site will be in effect for the offending transmitter(s) to reduce power, or cease operation during the critical period.



¹ The current *FM Model* web-based software application employs the standards as detailed in OET Bulletin No. 65 (Edition 97-01). FM radiofrequency radiation levels have been predicted using both the array pattern, the calculations of which are based on the number of bays in the antenna and wavelength spacing between the bays, and the element pattern. The element pattern has been determined by using measured element data prepared by the EPA and published in "An Engineering Assessment of the Potential Impact of Federal Radiation Protection Guidance on the AM, FM and TV Services," by Paul C. Gailey and Richard Tell - April 1985, U.S. Environmental Protection Agency. The results of the evaluation for the FM station have been shown at the end of this RF compliance discussion. To ensure complete protection, the maximum FM contribution has been assumed without regard to any restricted access fencing distance.

Channel Selection:	Channel 280 (103.9 MHz)		
Antenna Type +	EPA Type 2: Opposed V Dipole		
Height (m)	7	Distance (m)	100
ERP-H (W)	99	ERP-V (W)	99
Num of Elements	1	Element Spacing (λ)	1
Num of Points	500	Apply	

