

Fond du Lac, Wisconsin
Application for Minor Modification of
FM Translator W276CO
On Channel 276
by
David R. Magnum

Technical Exhibit

March 2021

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Declaration

I declare, under penalty of perjury, that I am a technical consultant to broadcasting and other communications systems, that I have over twenty-five years of experience in the engineering of broadcast and other communications systems, that I am familiar with the Federal Communications Commission's Rules found in the Code of Federal Regulations Title 47, that I am a Professional Engineer registered in North Carolina, that I have prepared or supervised the preparation of the attached Technical Exhibit for David R. Magnum, and that all of the facts therein, except for facts of which the Federal Communications Commission may take official notice, are true to the best of my knowledge and belief.



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22 March 2021

Narrative

This Exhibit supports a minor modification application for FM translator W276CO, on Channel 276 in Fond du Lac, Wisconsin. Allocation details are provided in this exhibit. This proposal complies fully with the requirements of 47 C.F.R. §74.1204(a). The proposed modified facilities create no mutual exclusivities with any licensed facilities, construction permits, or applications as shown in the allocation table in this exhibit.

Figure 1 shows the proposed 60 dBu F(50,50) coverage area and the authorized 60 dBu F(50,50) coverage area. Figure 1 shows fill-in status confirmation.

The changes are limited to a change of primary station, an increase in power, and a new omnidirectional antenna. The change from CDBS to LMS produces minor changes in coordinates and elevations.

The minor modification complies with the requirements of Sections 74.1204, 74.1205, 74.1232, and 74.1234.

Allocations

This application proposes service to Fond du Lac, Wisconsin, on channel 276. An updated Table 1: Allocations is included in this exhibit with a list of the stations, construction permits, allocations, and applications studied. All are protected under §74.1204(a) contour protection by this application. The allocations table was prepared using the GLOBE 30 terrain database which is described below.

Where the outgoing protection is provided by interference contours with a separation of less than 3.2 kilometers (2 miles), the lack of overlap is plotted in figures in this exhibit, and

the output of the FM Over program is provided. For this application, there is one (1) facility for which additional detail is provided.

Table and Figure	Call Sign	Location	Channel, class and relationship
2	WOGB	Reedsville, Wisconsin	276C3, co-channel

Table 1: Allocations

REFERENCE		Allocation Study								DISPLAY DATES	
43 46 45.4 N.		CH# 276D - 103.1 MHz, Pwr= 0.25 kw, HAAT= 4.6 M, COR= 269.6 M								DATA 03-22-21	
88 26 39.4 W.		Average Protected F(50-50)= 7.1 km Omni-directional								SEARCH 03-22-21	
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*
276D Fond Du Lac	W276CO!	LIC	CN WI	0.0 0.0	0.00 BLFT20160505AAC	43 46 45.40 88 26 39.40	0.120	270	---Reference--- David R. Magnum		
276C3 Reedsville	W0GB	LIC	CN WI	29.5 209.8	74.13 BLH20130913ABF	44 21 32.00 87 59 07.40	3.600 269	97.7 512	37.7 Cumulus Licensing LLC	-33.6*	3.0
277D Waupun	W277AC	LIC	CN WI	236.1 55.9	27.08 BLFT20190404AAT	43 38 35.00 88 43 25.40	0.250	14.4 331	10.4 Radio Plus, Inc.	5.6	6.5
275B Milwaukee	WHQG	LIC	CN WI	155.2 335.5	89.59 BLH20080717ADP	43 02 49.00 87 58 52.30	50.000 130	73.7 349	60.9 Lakefront Communications,	8.8	14.5
275D Ripon	W275CH	LIC	CN WI	283.0 102.7	34.19 BLFT20140825ABM	43 50 50.90 88 51 35.40	0.013	8.5 369	6.1 Vcy America, Inc.	18.6	17.9
279B Wauwatosa	WXSS	LIC	CN WI	150.0 330.3	87.48 BMLH20010731ABY	43 05 48.00 87 54 18.30	19.500 257	5.9 466	66.3 Entercom License, LLC	74.5	19.6
223B West Bend	WMBZ	LIC	CN WI	163.4 343.5	40.56 BLH19950601KA	43 25 45.90 88 18 02.30	17.500 164	0.0 474	0.0 Magnum Communications, Inc	14.5R	26.1M
278D Appleton	W278AU	LIC	CN WI	6.6 186.6	53.83 BLFT20161027ACG	44 15 37.00 88 22 00.00	0.250	1.1 348	14.6 Woodward Communications, I	42.7	38.1
277D Sheboygan	W277BR	LIC	CN WI	91.4 271.8	54.43 BLFT20080229AAQ	43 45 56.00 87 45 59.30	0.055 44	6.9 248	4.8 The Family Radio Network,	40.5	39.5
277C1 Wisconsin Rapids	WGLX-FM	LIC	CN WI	311.1 130.1	147.83 BLH20170918AAI	44 38 38.90 89 51 12.40	100.000 244	99.8 596	67.9 Nrg License Sub, LLC	41.0	69.7
273B Madison	WNWC-FM	LIC	CN WI	226.4 45.7	119.18 BLED20050913AAJ	43 02 08.00 89 30 25.40	50.000 150	6.5 451	68.4 University of Northwestern	105.6	49.2

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 adj.
 All separation margins (if shown) include rounding. Call signs with exclamation marks 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.
 « = Station meets FCC minimum distance spacing for its class.

Source of Data

Transmitter location, effective radiated power, directional antenna pattern, and elevation data are extracted from the Commission's CDBS (converted to NAD 83) or LMS. All contours for existing and proposed facilities are calculated using height above average terrain calculated at one degree horizontal increments.

The contours were evaluated using terrain extracted from the GLOBE 30 arcsecond terrain database, formatted by V-Soft Communications to work with its allocation and mapping programs.

Table 2: FMOver Protection of WOGB

03-22-2021 Terrain Data: GLOBE 30 Sec FMOver Analysis

WOGB BLH20130913ABF

W276CO

Channel = 276C3
 Max ERP = 3.6 kw
 RCAMSL = 512 m
 N. Lat. 44 21 32.00
 W. Lng. 87 59 07.40
 Protected
 60 dBu

Channel = 276D
 Max ERP = 0.25 kw
 RCAMSL = 269.6 m
 N. Lat. 43 46 45.40
 W. Lng. 88 26 39.40
 Interfering
 40 dBu

Azimuth (degrees)	ERP (kw)	HAAT (m)	Dist (km)	Azimuth (degrees)	ERP (kw)	HAAT (m)	Dist (km)	Actual (dBu)	IX (km)
150.0	003.6000	0245.3	038.0	060.3	000.2500	-0013.7	064.1	26.98	
151.0	003.6000	0245.7	038.0	060.3	000.2500	-0013.8	063.4	27.11	
152.0	003.6000	0246.4	038.0	060.3	000.2500	-0013.8	062.7	27.24	
153.0	003.6000	0247.5	038.1	060.4	000.2500	-0013.8	062.1	27.37	
154.0	003.6000	0249.0	038.2	060.4	000.2500	-0013.9	061.4	27.50	
155.0	003.6000	0250.2	038.3	060.4	000.2500	-0013.9	060.7	27.64	
156.0	003.6000	0251.0	038.3	060.4	000.2500	-0013.9	060.1	27.77	
157.0	003.6000	0251.4	038.3	060.4	000.2500	-0013.9	059.4	27.91	
158.0	003.6000	0251.6	038.3	060.3	000.2500	-0013.8	058.7	28.05	
159.0	003.6000	0251.7	038.3	060.3	000.2500	-0013.7	058.1	28.19	
160.0	003.6000	0251.5	038.3	060.1	000.2500	-0013.6	057.4	28.32	
161.0	003.6000	0251.1	038.3	060.0	000.2500	-0013.4	056.8	28.46	
162.0	003.6000	0250.5	038.3	059.8	000.2500	-0013.2	056.1	28.60	
163.0	003.6000	0249.8	038.2	059.6	000.2500	-0013.0	055.5	28.74	
164.0	003.6000	0248.8	038.2	059.4	000.2500	-0012.7	054.8	28.87	
165.0	003.6000	0247.3	038.1	059.1	000.2500	-0012.3	054.2	29.01	
166.0	003.6000	0245.6	038.0	058.8	000.2500	-0012.0	053.6	29.14	
167.0	003.6000	0244.2	037.9	058.5	000.2500	-0011.6	053.0	29.27	
168.0	003.6000	0243.7	037.9	058.3	000.2500	-0011.3	052.4	29.40	
169.0	003.6000	0243.5	037.8	058.0	000.2500	-0011.0	051.8	29.54	
170.0	003.6000	0243.0	037.8	057.7	000.2500	-0010.6	051.2	29.67	
171.0	003.6000	0242.3	037.8	057.4	000.2500	-0010.2	050.6	29.80	
172.0	003.6000	0242.0	037.8	057.0	000.2500	-0009.8	050.0	29.92	
173.0	003.6000	0242.2	037.8	056.7	000.2500	-0009.4	049.4	30.05	
174.0	003.6000	0242.7	037.8	056.4	000.2500	-0009.0	048.8	30.19	
175.0	003.6000	0242.8	037.8	056.1	000.2500	-0008.5	048.2	30.31	
176.0	003.6000	0242.5	037.8	055.7	000.2500	-0008.0	047.6	30.44	
177.0	003.6000	0242.0	037.8	055.2	000.2500	-0007.3	047.1	30.56	
178.0	003.6000	0241.3	037.7	054.7	000.2500	-0006.6	046.5	30.69	
179.0	003.6000	0240.5	037.7	054.2	000.2500	-0005.7	046.0	30.81	
180.0	003.6000	0239.7	037.6	053.7	000.2500	-0004.7	045.5	30.94	
181.0	003.6000	0239.0	037.6	053.2	000.2500	-0003.5	045.0	31.07	
182.0	003.6000	0238.5	037.5	052.6	000.2500	-0002.3	044.5	31.20	
183.0	003.6000	0238.1	037.5	052.0	000.2500	-0000.9	044.0	31.33	
184.0	003.6000	0237.5	037.5	051.4	000.2500	0000.4	043.6	31.45	
185.0	003.6000	0237.4	037.5	050.8	000.2500	0001.8	043.1	31.58	
186.0	003.6000	0237.1	037.4	050.2	000.2500	0003.0	042.6	31.71	
187.0	003.6000	0236.9	037.4	049.6	000.2500	0004.2	042.2	31.84	
188.0	003.6000	0236.5	037.4	048.9	000.2500	0005.4	041.8	31.96	
189.0	003.6000	0236.3	037.4	048.2	000.2500	0006.4	041.4	32.09	
190.0	003.6000	0236.3	037.4	047.5	000.2500	0007.3	041.0	32.21	
191.0	003.6000	0236.2	037.4	046.7	000.2500	0008.0	040.6	32.33	
192.0	003.6000	0235.8	037.3	046.0	000.2500	0008.7	040.2	32.44	
193.0	003.6000	0235.4	037.3	045.2	000.2500	0009.5	039.9	32.54	
194.0	003.6000	0235.4	037.3	044.4	000.2500	0010.6	039.6	32.65	
195.0	003.6000	0235.7	037.3	043.5	000.2500	0012.2	039.2	32.76	
196.0	003.6000	0236.0	037.4	042.7	000.2500	0014.3	038.9	32.87	
197.0	003.6000	0236.1	037.4	041.9	000.2500	0017.1	038.6	32.96	
198.0	003.6000	0236.3	037.4	041.0	000.2500	0020.5	038.3	33.06	
199.0	003.6000	0236.7	037.4	040.1	000.2500	0024.9	038.0	33.15	
200.0	003.6000	0237.0	037.4	039.2	000.2500	0030.4	037.8	33.31	
201.0	003.6000	0237.0	037.4	038.2	000.2500	0036.1	037.6	34.58	
202.0	003.6000	0237.0	037.4	037.3	000.2500	0041.1	037.4	35.63	
203.0	003.6000	0237.2	037.4	036.3	000.2500	0045.1	037.2	36.44	
204.0	003.6000	0237.7	037.5	035.3	000.2500	0048.6	037.1	37.11	
205.0	003.6000	0238.1	037.5	034.3	000.2500	0051.8	036.9	37.71	
206.0	003.6000	0238.6	037.5	033.3	000.2500	0054.7	036.8	38.19	
207.0	003.6000	0239.3	037.6	032.3	000.2500	0056.6	036.7	38.51	

208.0	003.6000	0240.0	037.6	031.3	000.2500	0057.4	036.6	38.67
209.0	003.6000	0240.5	037.7	030.3	000.2500	0057.6	036.5	38.72
210.0	003.6000	0240.7	037.7	029.3	000.2500	0057.6	036.5	38.73
211.0	003.6000	0241.0	037.7	028.2	000.2500	0057.6	036.5	38.73
212.0	003.6000	0241.8	037.7	027.2	000.2500	0057.6	036.5	38.73
213.0	003.6000	0242.7	037.8	026.2	000.2500	0057.6	036.5	38.73
214.0	003.6000	0243.4	037.8	025.1	000.2500	0057.6	036.5	38.71
215.0	003.6000	0244.0	037.9	024.1	000.2500	0057.6	036.6	38.68
216.0	003.6000	0244.8	037.9	023.1	000.2500	0057.6	036.7	38.65
217.0	003.6000	0246.1	038.0	022.0	000.2500	0057.6	036.7	38.62
218.0	003.6000	0248.0	038.1	021.0	000.2500	0057.6	036.8	38.59
219.0	003.6000	0250.6	038.3	019.9	000.2500	0057.6	036.9	38.57
220.0	003.6000	0253.2	038.4	018.8	000.2500	0057.6	036.9	38.54
221.0	003.6000	0255.6	038.6	017.8	000.2500	0057.6	037.0	38.50
222.0	003.6000	0257.8	038.7	016.8	000.2500	0057.6	037.2	38.44
223.0	003.6000	0259.7	038.8	015.7	000.2500	0057.6	037.4	38.36
224.0	003.6000	0261.4	038.9	014.8	000.2500	0057.6	037.6	38.27
225.0	003.6000	0262.9	039.0	013.8	000.2500	0057.6	037.9	38.17
226.0	003.6000	0264.3	039.1	012.8	000.2500	0057.6	038.2	38.06
227.0	003.6000	0265.6	039.2	011.9	000.2500	0057.6	038.5	37.93
228.0	003.6000	0266.8	039.3	011.0	000.2500	0057.6	038.8	37.80
229.0	003.6000	0267.9	039.3	010.2	000.2500	0057.6	039.2	37.66
230.0	003.6000	0268.8	039.4	009.4	000.2500	0057.6	039.6	37.51
231.0	003.6000	0269.6	039.4	008.6	000.2500	0057.6	040.0	37.35
232.0	003.6000	0270.3	039.5	007.8	000.2500	0057.6	040.4	37.19
233.0	003.6000	0271.0	039.5	007.1	000.2500	0057.6	040.9	37.02
234.0	003.6000	0271.7	039.6	006.4	000.2500	0057.6	041.4	36.84
235.0	003.6000	0272.5	039.6	005.7	000.2500	0057.6	041.8	36.67
236.0	003.6000	0273.4	039.7	005.0	000.2500	0057.6	042.3	36.49
237.0	003.6000	0274.6	039.7	004.4	000.2500	0057.6	042.8	36.31
238.0	003.6000	0276.2	039.8	003.7	000.2500	0057.6	043.3	36.14
239.0	003.6000	0278.2	040.0	003.1	000.2500	0057.6	043.8	35.96
240.0	003.6000	0280.1	040.1	002.4	000.2500	0057.6	044.4	35.79
241.0	003.6000	0281.9	040.2	001.8	000.2500	0057.5	044.9	35.59
242.0	003.6000	0283.7	040.3	001.3	000.2500	0057.3	045.4	35.39
243.0	003.6000	0285.6	040.4	000.7	000.2500	0057.2	046.0	35.19
244.0	003.6000	0287.5	040.5	000.2	000.2500	0057.1	046.6	34.98
245.0	003.6000	0289.2	040.6	359.7	000.2500	0057.0	047.2	34.78
246.0	003.6000	0290.7	040.7	359.3	000.2500	0056.9	047.8	34.59
247.0	003.6000	0292.2	040.8	358.9	000.2500	0057.0	048.4	34.41
248.0	003.6000	0293.4	040.8	358.5	000.2500	0057.1	049.0	34.22
249.0	003.6000	0294.4	040.9	358.1	000.2500	0057.2	049.7	34.03
250.0	003.6000	0295.1	040.9	357.8	000.2500	0057.3	050.4	33.83
251.0	003.6000	0295.9	041.0	357.5	000.2500	0057.4	051.0	33.63
252.0	003.6000	0296.8	041.0	357.2	000.2500	0057.4	051.7	33.43
253.0	003.6000	0297.7	041.1	357.0	000.2500	0057.5	052.4	33.22
254.0	003.6000	0298.4	041.1	356.8	000.2500	0057.5	053.1	33.02
255.0	003.6000	0298.9	041.2	356.6	000.2500	0057.6	053.8	32.80
256.0	003.6000	0299.3	041.2	356.4	000.2500	0057.6	054.5	32.58
257.0	003.6000	0299.4	041.2	356.3	000.2500	0057.5	055.2	32.36
258.0	003.6000	0299.4	041.2	356.1	000.2500	0057.5	055.9	32.14
259.0	003.6000	0299.6	041.2	356.0	000.2500	0057.5	056.6	31.92
260.0	003.6000	0299.6	041.2	355.9	000.2500	0057.4	057.3	31.70
261.0	003.6000	0299.8	041.2	355.9	000.2500	0057.4	058.0	31.48
262.0	003.6000	0300.1	041.2	355.8	000.2500	0057.3	058.7	31.27
263.0	003.6000	0300.5	041.3	355.7	000.2500	0057.3	059.5	31.05
264.0	003.6000	0300.8	041.3	355.7	000.2500	0057.3	060.2	30.84
265.0	003.6000	0300.6	041.3	355.7	000.2500	0057.3	060.9	30.64
266.0	003.6000	0300.1	041.2	355.7	000.2500	0057.3	061.6	30.44
267.0	003.6000	0299.6	041.2	355.7	000.2500	0057.3	062.3	30.24
268.0	003.6000	0299.1	041.2	355.8	000.2500	0057.3	063.0	30.05
269.0	003.6000	0298.8	041.2	355.8	000.2500	0057.4	063.8	29.86

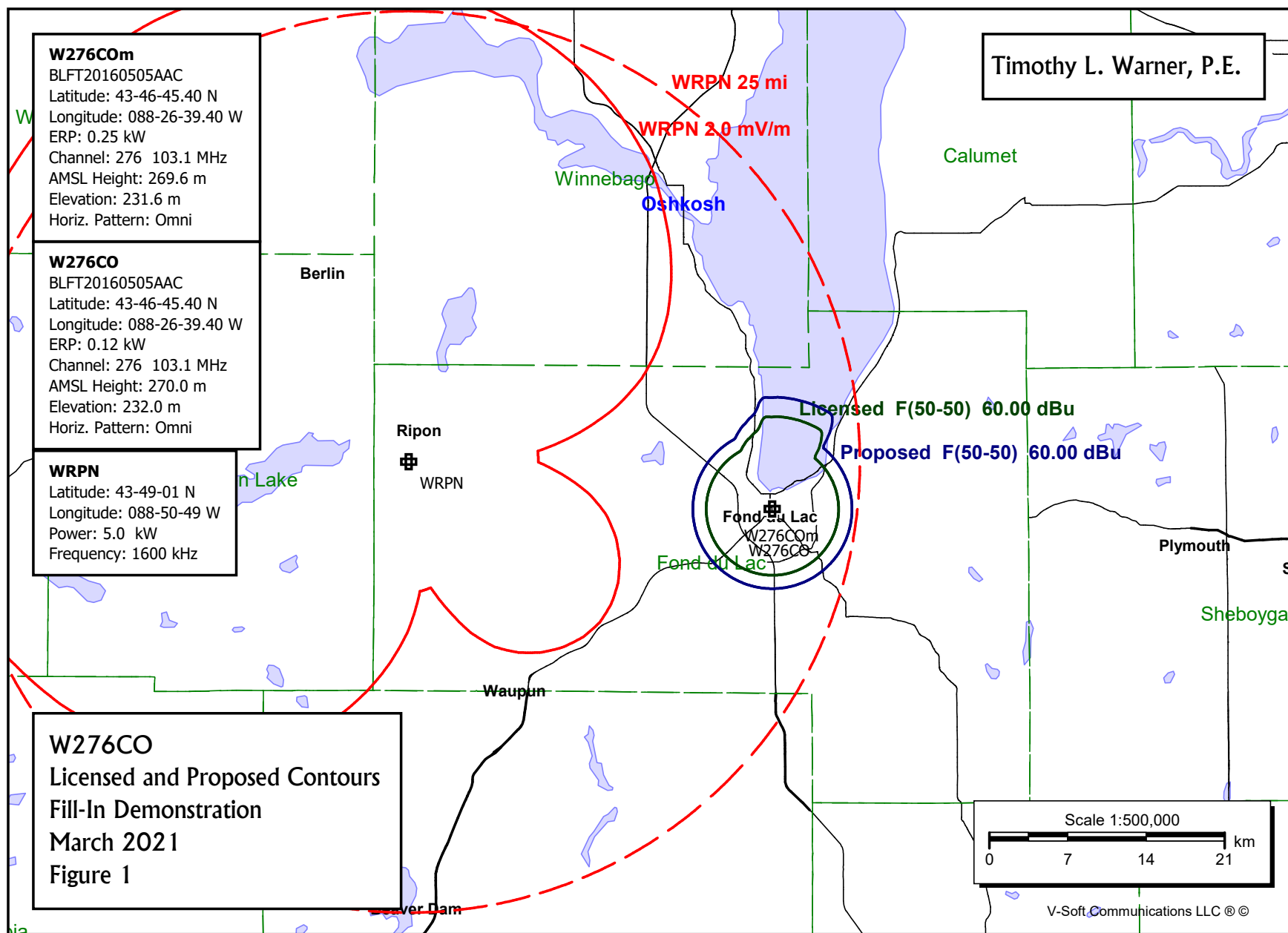


Figure 2: Allocation Study: WOGB
David R. Magnum

FMCommander Single Allocation Study - 03-22-2021 - GLOBE 30 Sec
W276CO's Overlaps (In= -33.59 km, Out= 3.05 km)

W276CO CH 276 D

Lat= 43 46 45.40, Lng= 88 26 39.40

0.25 kW 4.6 m HAAT, 269.6 m COR

Prot.= 60 dBu, Intef.= 40 dBu

WOGB CH 276 C3 BLH20130913ABF

Lat= 44 21 32.00, Lng= 87 59 07.40

3.6 kW 269 m HAAT, 512 m COR

Prot.= 60 dBu, Intef.= 40 dBu

