

TECHNICAL EXHIBIT
MINOR CHANGE APPLICATION
AM STATION WAUK (FACILITY ID 70771)
WAUKESHA, WISCONSIN

FEBRUARY 7, 2006

1510 KHZ 23 KW-D, 20 KW-CH DA-D D

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Table of Contents

	Technical Narrative
Figure 1	Plat of Transmitter Site
Figure 2	Sketch of Antenna Elements
Figure 3	Specifications for Daytime Directional Antenna System
Figure 4	Proposed Daytime Standard Radiation Pattern
Figure 5	Field Strength Contours
Figure 6	Allocation Study
Figure 7	Groundwave Conductivity Data
Figure 8	Photographs of Site

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Technical Narrative

This Technical Exhibit supports an application for construction permit for AM Class D station WAUK, currently licensed on 1510 kilohertz (kHz) to Waukesha, Wisconsin. By means of this application, the applicant proposes to modify its directional antenna array pattern and increase its daytime power.

The Federal Aviation Administration (FAA) is not being notified, as the newly proposed tower is the same overall height as the existing two towers, all of which are less than 200 feet and pass the FAA's TOWAIR minimum slope requirement. Neither of the existing two towers is registered with the FCC.

Proposed Transmitter Location

There is no proposed change to the licensed transmitter site. There is a change to the center of the array coordinates due to the addition of a third tower. The new center of the 3-tower array for the proposed directional operation is located at the following NAD 27 geographic coordinates:

43° 01' 02" North Latitude
88° 11' 43" West Longitude

The existing two towers and the proposed new tower all have an overall height of 46.6 meters (153 feet) and an electrical height of 83 degrees (45.7 meters).

Photographs of the transmitter site are shown in Figure 7. The ground system will consist of 120 equally spaced copper wire radials about each tower. The radials will extend $\frac{1}{4}\lambda$ (50 meters) from the tower base, except where truncated by the property boundary.

Blanketing

The population within the 1000 mV/m contour is 3,930 people. This is less than 1% of the population within the 25 mV/m contour (698,400). There are no AM stations located within 5 kilometers for the WAUK transmitter site.

Daytime Coverage

The proposed daytime field strength contours are depicted in Figure 5. As indicated, the proposed daytime 5 mV/m contour will completely encompass the city limits of Waukesha. The slightly reduced 20 kW, critical hours operation will also comply with the city coverage requirements. The Waukesha city limits were obtained from information contained in the TIGER 2000 U.S. Census files. Ground conductivity data obtained from the WAUK proof-of-performance was used in determining the extent of coverage for all WAUK contours (see Figure 7).

Daytime Allocation Study

A daytime allocation study was made utilizing FCC Figure M-3 as shown on Figure 5. Daytime field strength contours were calculated in accordance with § 73.183. Ground conductivity data obtained from the WAUK proof-of-performance was used in determining the extent of coverage for all WAUK contours (see Figure 7). Based on this analysis, the proposed facility will comply with all relevant allocation criteria. The stations of concern that are shown on the maps in Figure 5 are tabulated below:

WGEZ, 1490 kHz, Beloit, WI
WPJX, 1500 kHz, Zion, IL
WJKN, 1510 kHz, Jackson, MI
WWHN, 1510 kHz, Joliet, IL
WLUV, 1520 kHz, Loves Park, IL
NEW(app), 1520 kHz, Howard, WI (BNP-20041029AFF)
WTKM, 1540 kHz, Hartford, WI

As tabulated below, the proposal will reduce the existing contour overlap with three other stations: WPJX, WWHN and WLUV.

	Overlap Received from WPJX	Overlap Caused to WPJX
Licensed WAUK	758 sq km	770 sq km
Proposed WAUK	745 sq km	743 sq km
Net Change	-13 sq km	-27 sq km

	Overlap Received from WWHN	Overlap Caused to WWHN
Licensed WAUK	3135 sq km	1361 sq km
Proposed WAUK	3026 sq km	1328 sq km
Net Change	-109 sq km	-33 sq km

	Overlap Received from WLUV	Overlap Caused to WLUV
Licensed WAUK	35 sq km	115 sq km
Proposed WAUK	34 sq km	113 sq km
Net Change	-1 sq km	-2 sq km

The proposed operation does not result in any prohibited contour overlap with any other station. The proposed 0.025 mV/m interfering contour does not enter into Canada. Therefore, no Canadian allocation studies or coordination is required.

Critical Hours Operation

The critical hours operation will also protect the above listed stations in the daytime allocation study. Since the critical hours operation utilizes the same directional pattern as the daytime operation and a lower power level (20 kW instead of 23 kW), the critical hours operation contours will be completely within the daytime contours. Thus, no adverse allocation impact will result from the critical hours operation in excess of the proposed daytime operation.

There are no Canadian Class A stations of concern on 1510 kHz. There are two domestic Class A stations that require study: WLAC (Nashville, TN) and KGA (Spokane, WA). A few azimuthal bearings of concern towards both stations and their required protections and the proposed WAUK radiation (20 kW directional operation) in those directions are tabulated below:

Study Point	Coordinates	Distance (km)	Bearing (°T)	Required Protection (mV/m) ¹	Proposed Radiation (mV/m) ²
KGA-1	48-14-56 N 115-04-12 W	2174	295	1465	1419
KGA-2	47-54-05 N 114-54-15 W	2158	294	1425	1400
KGA-3	47-37-40 N 114-54-14 W	2157	293	1400	1380
KGA-4	45-54-44 N 116-14-12 W	2255	288	1530	1276
WLAC-1	37-31-30 N 88-09-21 W	605	179	340	127
WLAC-2	37-52-14 N 87-19-14 W	576	172	310	157
WLAC-3	37-49-13 N 86-41-51 W	591	167	290	177
WLAC-4	37-42-28 N 85-55-44 W	620	161	265	204

¹ Protections along 0.1 mV/m daytime groundwave contour, using standard M3 conductivity and Section 73.187.

² Maximum horizontal radiation (0 degree vertical angle)

Ground Level Radiofrequency Electromagnetic Field Exposure

Fences restricting access will be installed about each tower to assure that persons on the property outside the fenced area will not be exposed to radiofrequency field levels in excess of those recommended by ANSI. Once authorized and constructed, power density measurements will be made to determine the appropriate minimum distance needed for each fence. In addition, warning signs will be posted. It is noted that this statement only addresses the potential for radiofrequency electromagnetic field exposure.

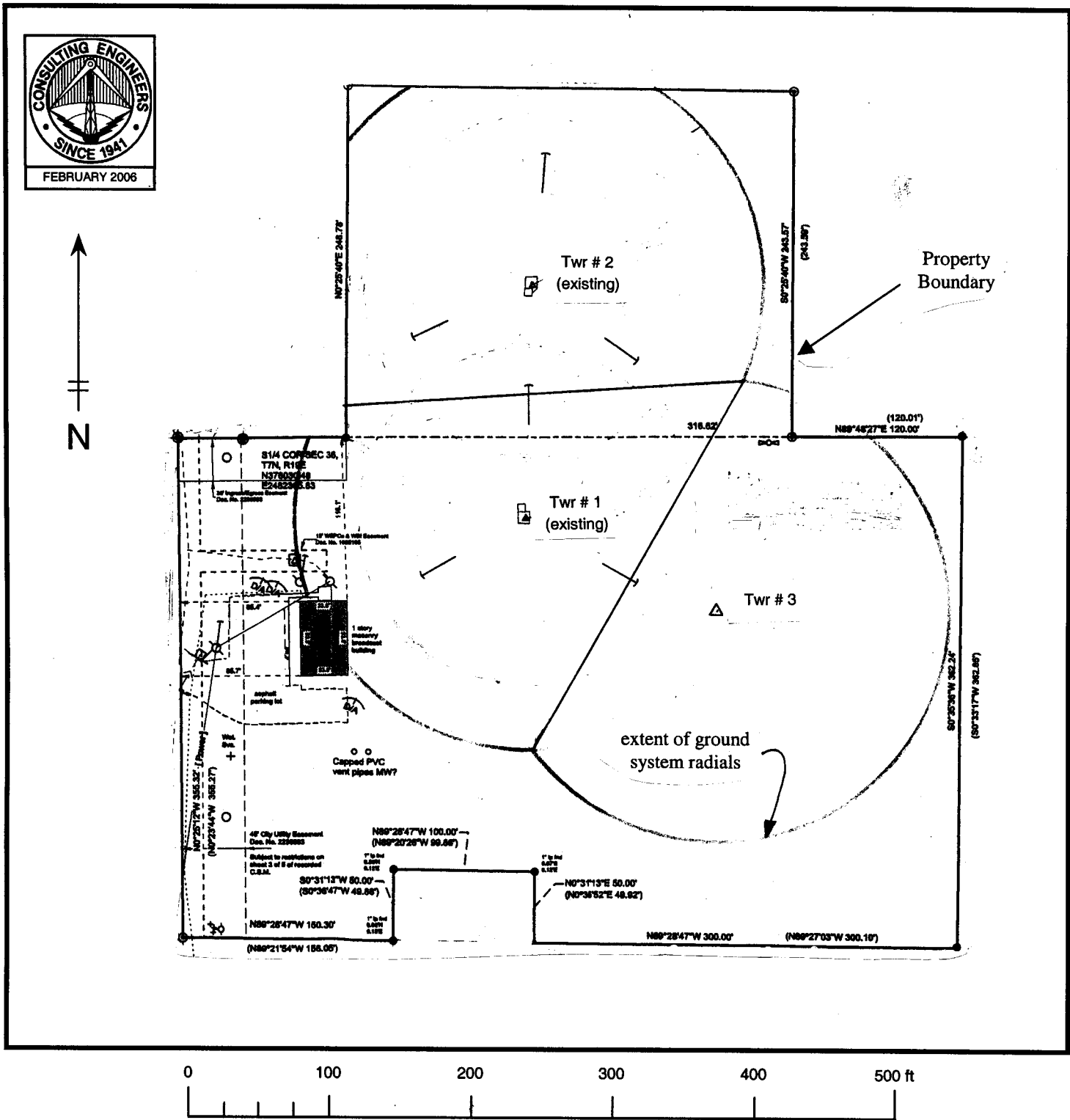


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February 7, 2006

Figure 1



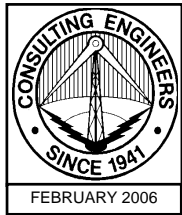
PLAT OF TRANSMITTER SITE

AM STATION WAUK

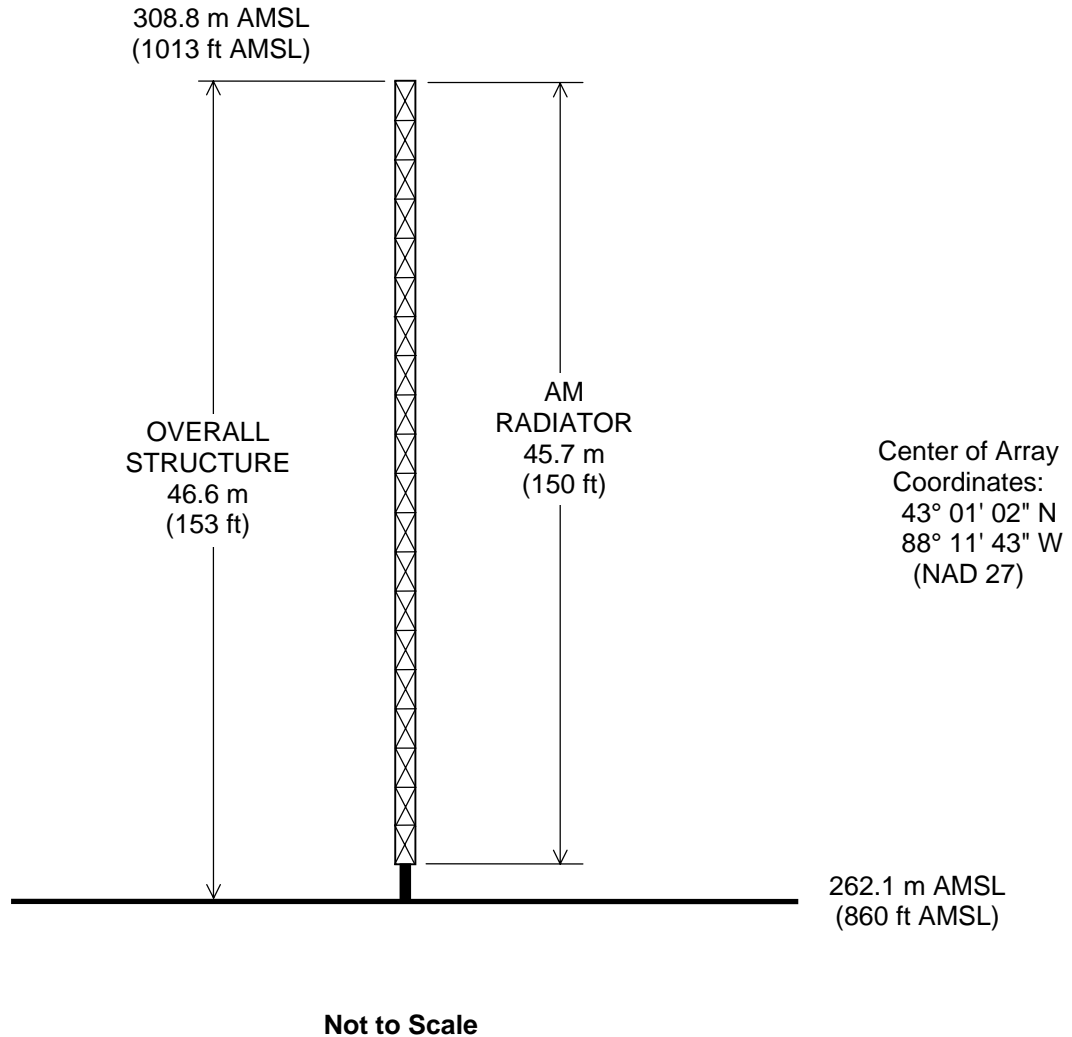
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Registration Not Required



SKETCH OF ANTENNA ELEMENTS

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Specifications for Directional Antenna System

Frequency	1510 kHz
Hours of Operation	Daytime
Power	23 kW (Day), 20 kW (Critical Hours)
Number of Towers	3
Type of Tower	Uniform cross-section, triangular, guyed, base-insulated
Electrical Height	83.0° (45.7 m)
Overall height above ground	46.6 m (153 ft)

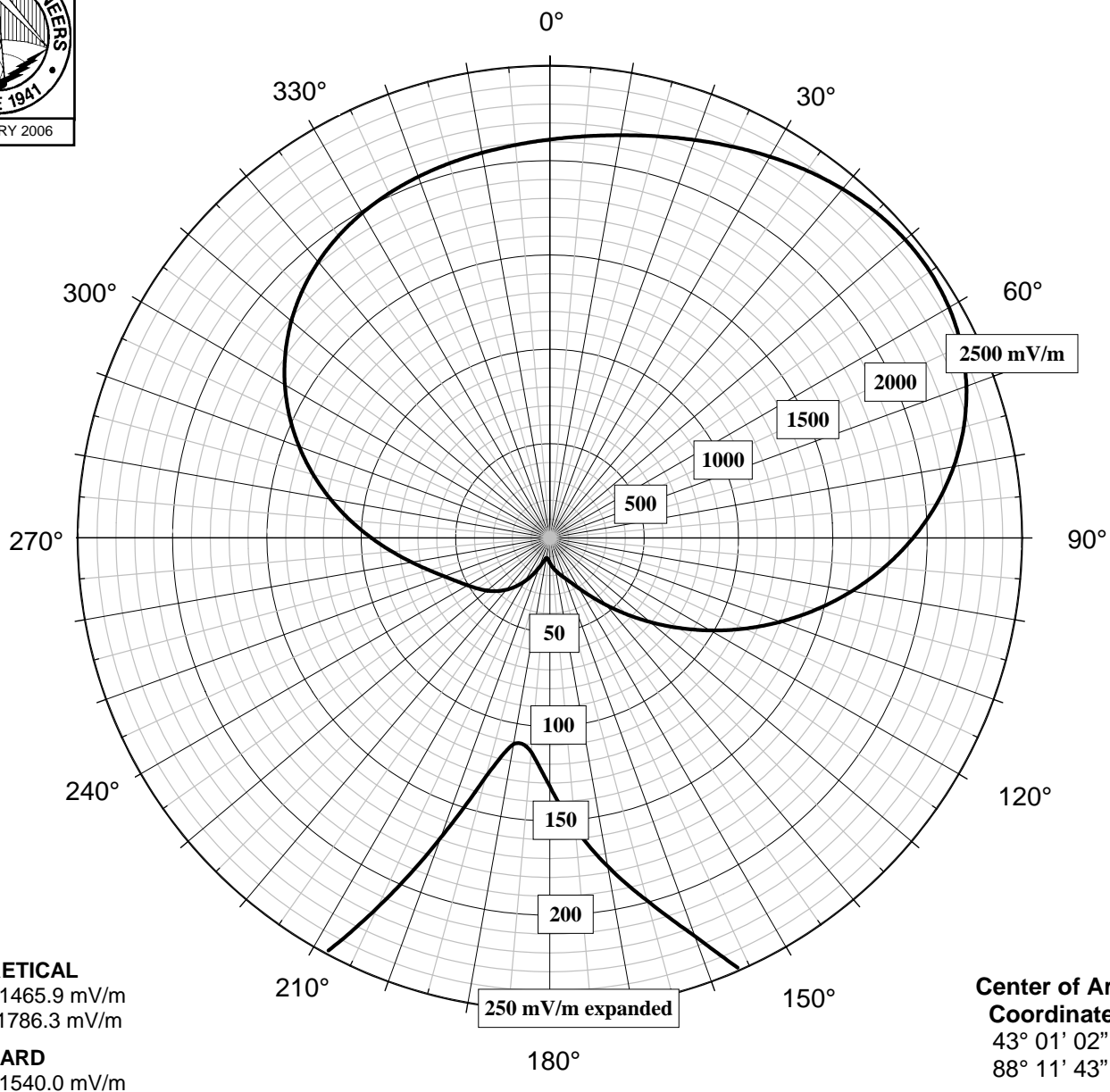
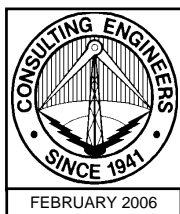
Tower Arrangement	Tower	Spacing	Orientation
	<u>No.</u>	<u>(deg.)/(m)</u>	<u>(deg. True)</u>
	1	0/0	0
	2	90/49.6	3
	3	82.6/45.6	116.1

Element Parameters	Tower	Field	Phase
	<u>No.</u>	<u>Ratio</u>	<u>(degrees)</u>
	1	1.000	0.0
	2	0.969	-114.4
	3	0.339	-134.5

Ground System:

120 evenly spaced radials, $\frac{1}{4}\lambda$ in length about each tower. Radials will be truncated at the property line if necessary.

Geographic Coordinates of center	43° 01' 02" North
Longitude	88° 11' 43" West
of Antenna Array (NAD 27)	Longitude



DIRECTIONAL PATTERN PARAMETERS

<u>TOWER</u>	<u>FIELD RATIO</u>	<u>PHASE (DEGREES)</u>	<u>SPACING (DEGREES)</u>	<u>ORIENTATION (DEGREES T.)</u>	<u>TOWER HEIGHT (DEGREES)</u>
1	1.000	0.0	0.0	0.0	83.0
2	0.969	-114.4	90.0	3.0	83.0
3	0.339	-134.5	82.6	116.1	83.0

**PROPOSED DAYTIME HORIZONTAL PLANE
STANDARD RADIATION PATTERN**

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AM STATION WAUK
WAUKESHA, WISCONSIN
1510 KHZ 23 KW-D, 20 KW-CH DA-D D

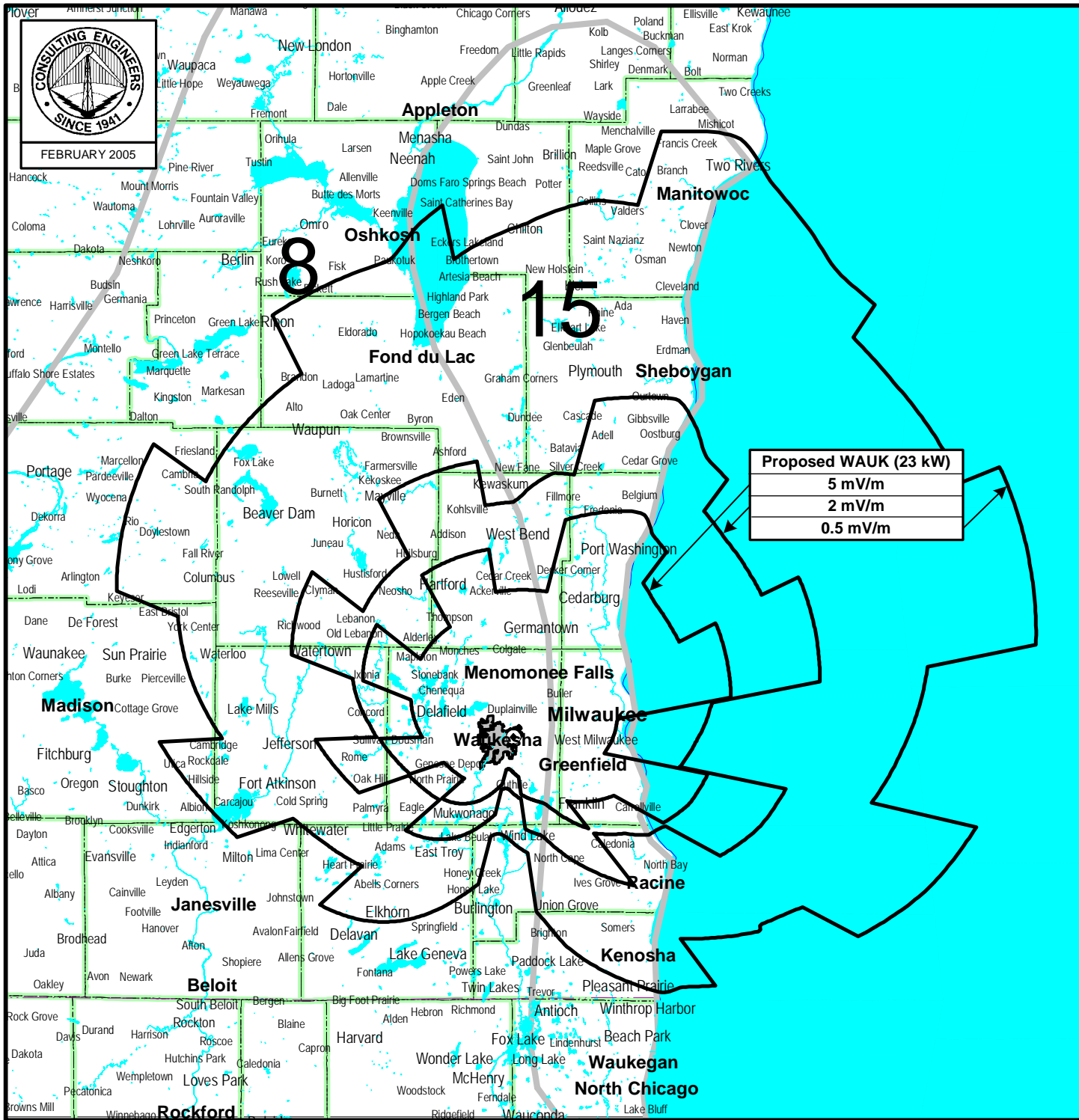
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DAYTIME RADIATION PATTERN
(Radiation Values at One Kilometer)

<u>Tower Number</u>	<u>Field Ratio</u>	<u>Phase (deg.)</u>	<u>Spacing (deg.)</u>	<u>Bearing (deg.)</u>	<u>Height (deg.)</u>
1	1.000	0.0	0.0	0.0	83.0
2	0.969	-114.4	90.0	3.0	83.0
3	0.339	-134.5	82.6	116.1	83.0

<u>Input Power (kW)</u>	<u>Loop Loss (ohms)</u>	<u>Theo. RMS (mV/m)</u>	<u>Theo. RSS (mV/m)</u>	<u>Q Factor (mV/m)</u>	<u>Standard RMS (mV/m)</u>
23	1.0	1466	1786	48.0	1540

<u>Azimuth (mV/m)</u>	<u>Field (mV/m)</u>	<u>Azimuth (mV/m)</u>	<u>Field (mV/m)</u>	<u>Azimuth (mV/m)</u>	<u>Field (mV/m)</u>	<u>Azimuth (mV/m)</u>	<u>Field (mV/m)</u>
0	2111	90	1926	180	132	270	946
5	2137	95	1781	185	114	275	1061
10	2167	100	1626	190	111	280	1180
15	2203	105	1465	195	131	285	1299
20	2244	110	1301	200	169	290	1414
25	2288	115	1139	205	216	295	1522
30	2333	120	981	210	266	300	1622
35	2376	125	832	215	315	305	1711
40	2414	130	694	220	359	310	1788
45	2443	135	571	225	399	315	1854
50	2459	140	465	230	435	320	1909
55	2460	145	377	235	468	325	1953
60	2443	150	309	240	503	330	1988
65	2407	155	259	245	544	335	2015
70	2350	160	225	250	596	340	2037
75	2272	165	199	255	662	345	2055
80	2174	170	177	260	743	350	2072
85	2058	175	154	265	839	355	2090



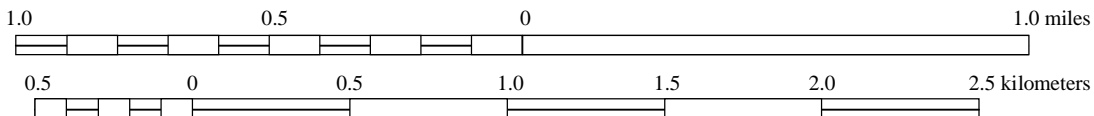
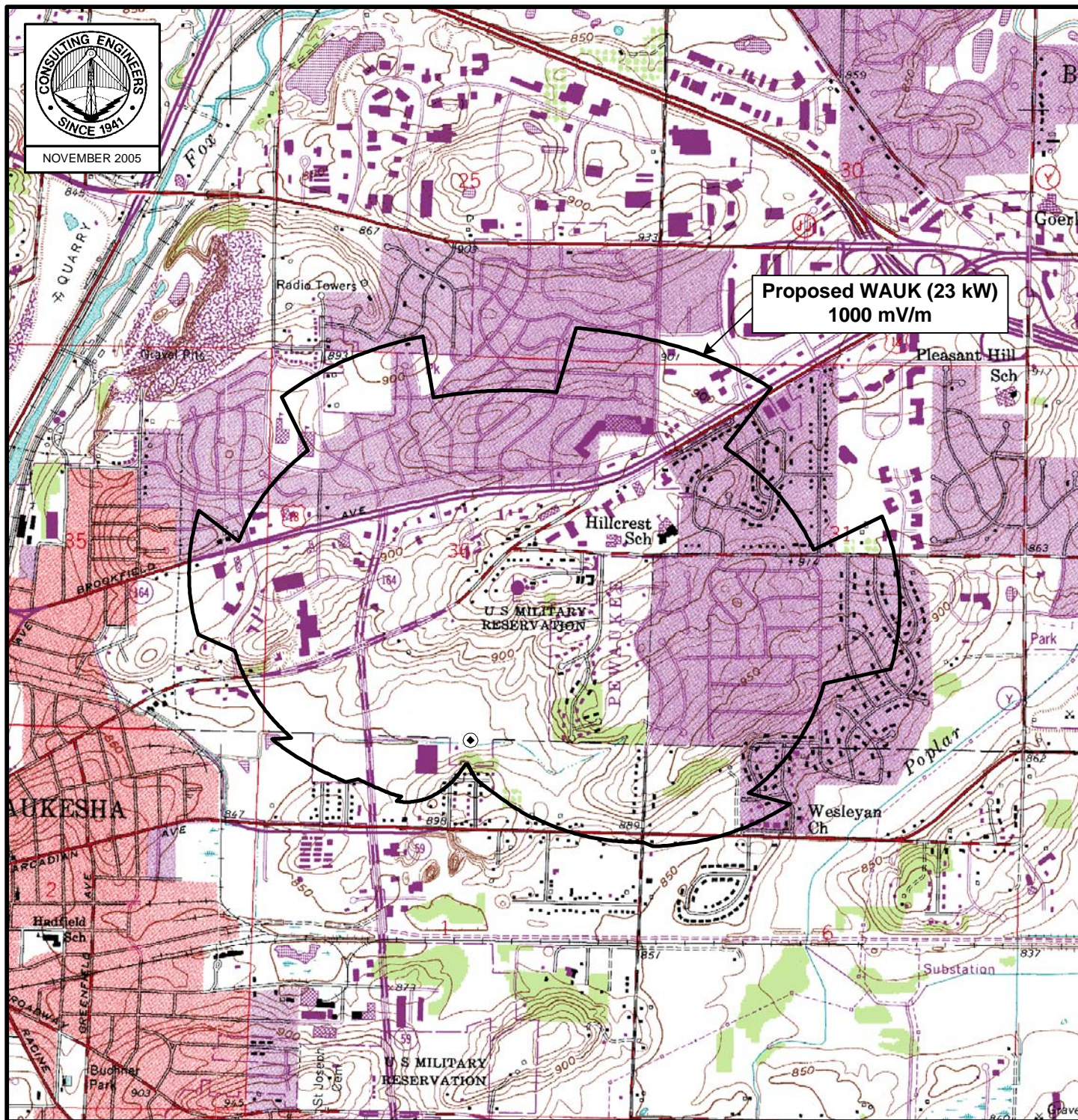
PROPOSED COVERAGE CONTOURS

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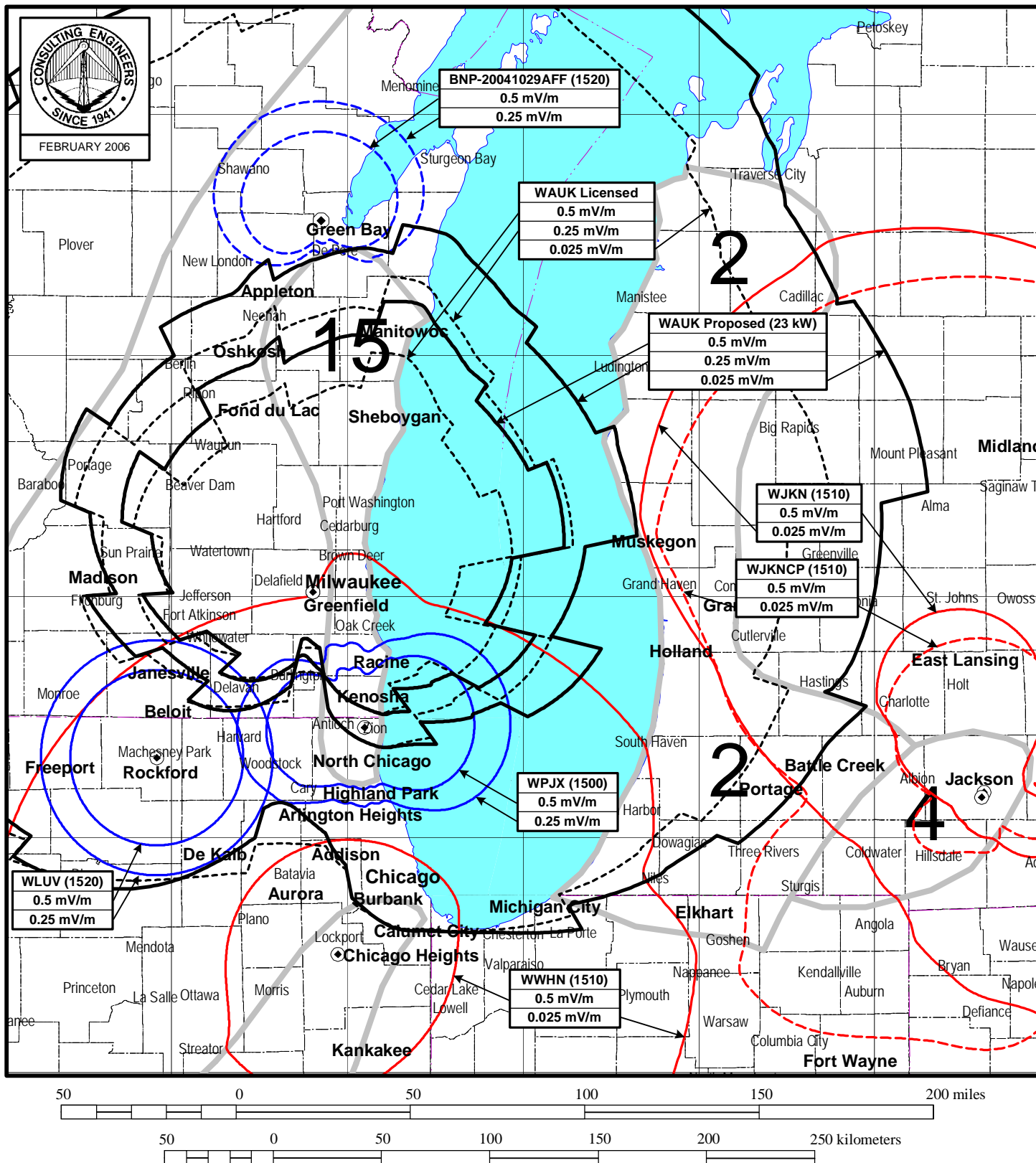
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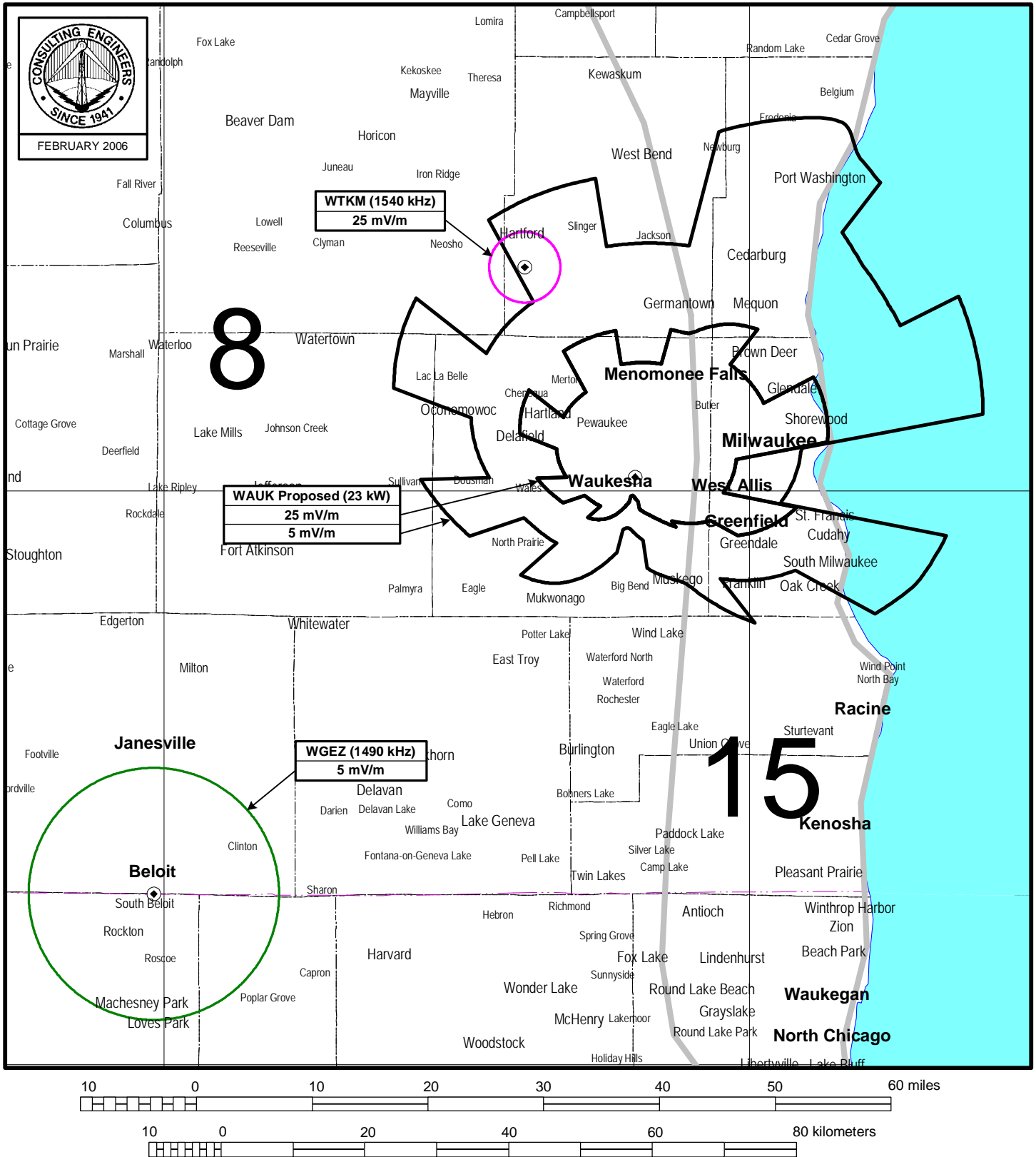
PREDICTED 1000 mV/m COVERAGE CONTOUR

AM STATION WAK
WAUKESHA, WISCONSIN
1510 KHZ 23 KW-D, 20 KW-CH DA-D D

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**CO & 1st ADJACENT CHANNEL
ALLOCATION STUDY**
AM STATION WUK
WAUKESHA, WISCONSIN
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**SECOND & THIRD ADJACENT
CHANNEL ALLOCATION STUDY**

AM STATION WAUK

WAUKESHA, WISCONSIN

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 WAUKESHA, WISCONSIN
 1510 KHZ 23 KW-D, 20 KW-CH DA-D D

Data Employed in Calculation of Groundwave Contours

With the exception of station WAUK, all groundwave contours were calculated using the appropriate directional or non-directional radiation and FCC Figure M-3 conductivity.

WAUK, Waukesha, Wisconsin

1510 kHz 10 kW DA-D

Licensed Coordinates: 43° 01' 00" N, 88° 11' 42" W

Proposed Coordinates: 43° 01' 02" N, 88° 11' 43" W

Standard pattern radiation applied along all azimuths. Measured conductivity applied +/- 10° from measured radial. FCC Figure M-3 conductivity applied beyond the extent of the measurements and on all other azimuths. Measured conductivities were obtained from 1966 WAUK proof-of-performance (BL-11584).

<u>Azimuth(deg.T)</u>	<u>Conductivity/End Distance(mS/m/km)</u>
3	4/4, 5/33.8
50	4/4.8, 5/14.5, 7/30.6
90	4/17.7, 2.5/23.3
130	6/32.6
183	4/29.6
240	4/28.1
280	4/32
320	4/31.8

SITE PHOTOGRAPHS



NORTH



NORTHEAST



EAST



SOUTHEAST



SOUTH



SOUTHWEST



WEST



NORTHWEST