

ENGINEERING EXHIBIT
AMENDMENT TO
APPLICATION FOR CONSTRUCTION PERMIT
WLXX-AM LICENSE CORP.
RADIO STATION WRTO
CHICAGO, ILLINOIS

FACILITY ID 11196

October 28, 2004

1200 KHZ 20 KW-D 4.5 KW-N U DA-2

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1200 KHZ 20 KW-D, 4.5 KW-N DA-2 U

Engineering Statement

The Engineering Exhibit of which this Statement is part was prepared on behalf of WLXX-AM License Corp., licensee of AM broadcast station WRTO Chicago, Illinois. Station WRTO currently operates on 1200 kHz employing power of 10 kilowatts daytime and 1 kilowatt nighttime, with different directional antenna patterns day and night. The station's facility identification number is 11196. Due to the expiration of the current transmitter site lease and the inability to obtain an extension, a new transmitter site is being proposed. At the proposed location, station WRTO will continue to operate on 1200 kilohertz, but with daytime power increased to 20 kilowatts and nighttime power increased to 4.5 kilowatts. Different directional antenna patterns will be used daytime and nighttime. See FCC File Number BP-20030922ADN.

The FCC letter of August 17, 2004, indicated that the nighttime proposal of WRTO would enter the nighttime limit of stations WCHB and WKST. Also, a typographical error for the electrical height of one of the nighttime towers was noted. This amendment addresses the nighttime allocation situation and for ease of study, a complete supporting engineering exhibit is being submitted, totally replacing the existing exhibit.

According to the FCC's TOWAIR computer program, notification of tower construction to the FAA and registration of the towers is not necessary. The proposal complies with the technical rules of the Federal Communications Commission.

Proposed Transmitter Location

The antenna system for WRTO will be located at a site on the south side of 127th Street approximately 0.5 miles east of Halsted Avenue. The site and vicinity is shown on the map Figure 1. The geographic coordinates for the center of the array, as scaled from the *Blue Island, IL* 7-1/2 minute quadrangle map are:

41° 39' 43" North Latitude

87° 37' 48" West Longitude.

AM broadcast station WNWI Oak Lawn, Illinois, which operates on 1080 kHz and employs a nighttime directional antenna system, is located 2.5 kilometers from the proposed site. There are no FM or TV broadcast stations located within 6 kilometers of the proposed site.

Proposed Antenna System

The proposed WRTO antenna system will consist of six uniform cross section, guyed towers, each having an overall height of 60.7 meters (199 feet) above ground level (243.6 meters AMSL). The radiating portion of the antenna element is 59.4 meters (195 feet) in height above the base insulator. A sketch of an antenna element is shown in Figure 2. Painting and lighting of the towers for aeronautical navigation purposes is not proposed.

The towers and associated ground system are shown on Figure 3, which also shows pertinent property boundaries. The ground system will consist of 120 equally spaced copper wire radials (No. 10 AWG) buried approximately 15 centimeters. Each radial will be 62.5 meters (205 feet) in length except where shortened and bonded to a 10 cm (4 inch) copper strap between towers.

Directional Antenna Patterns

Specifications for the daytime and nighttime directional antenna patterns are shown on Figure 4. A total of six towers will be employed for nighttime operation, with four of those towers used for the daytime operation.

Figures 5 and 6 describe the daytime standard radiation pattern graphically and numerically. The nighttime standard radiation pattern is described in Figures 10 and 11.

Daytime Field Strength Contours

The predicted daytime field strength contours are shown in the two sheets of Figure 7. The proposed 1,000 mV/m contour as shown on Sheet 1 of Figure 7 covers 22,236 persons, which is 0.96 percent of the population within the proposed 25 mV/m contour. The proposal therefore meets the requirements of 47 CFR 73.25(g). The applicant recognizes the responsibility to satisfy reasonable complaints of blanketing interference.

The proposed 5 mV/m contour covers all of the city limits of Chicago as shown on Sheet 2 of Figure 7.

Daytime Allocation Study

The two sheets of Figure 8 show the daytime allocation situation. The proposal meets requirements of 47 CFR 73.37 with regard to all pertinent stations except for grandfathered overlap with station WOWO Fort Wayne, Indiana. Overlap of the WOWO 0.25 mV/m contour with the existing WRTO 0.5 mV/m contour involves an area of 430 square kilometers. The WRTO proposal reduces this overlap to 363 square kilometers. Overlap details are shown on Sheet 2 of Figure 8.

Nighttime Field Strength Contours

The two sheets of Figure 12 show the nighttime 1,000 mV/m, 25 mV/m and 10.5 mV/m contours. The 1,000 mV/m contour contains 5,230 persons or 0.48 percent of the population within the 25 mV/m contour, therefore the proposal complies with 47 CFR 73.25(g). As previously mentioned, the applicant recognizes the responsibility to satisfy all reasonable complaints of blanketing interference and outlined in the FCC rules.

The 10.5 mV/m nighttime interference-free contour results from a single limit from 1200 kHz station WOAI San Antonio, Texas. See Sheet 10 of Figure 13. As will be noted from Sheet 2 of Figure 12, the proposed 10.5 mV/m contour covers 72.7 percent of Chicago. The 10.5 mV/m contour produced by the existing operation covers 59.1 percent of Chicago. The WRTO proposal thereby provides for substantial additional coverage of the principal community during nighttime hours. If waiver of 47CFR 73.25(i) is needed, it is hereby requested.

Nighttime Allocation Study

Figure 13 provides information regarding the existing nighttime allocation situation for the current WRTO operation, the permissible fields from the proposed location and the calculation of the nighttime interference-free signal level for WRTO.

Currently, WRTO enters the 50-percent RSS limit of 1200 kHz station KFNW West Fargo, North Dakota. The RSS limit of station KFNW is made up of contributions from WOAI and WRTO. When the proposal of WRTO is granted, WRTO will drop out of the limit. The nighttime proposal therefore complies with the requirements of 47 CFR 73.182 and Note 1 following the tabulation in 47 CFR 73.182(q).

Sheet 9 of Figure 13 is a map showing the nighttime 0.5 mV/m 50-percent skywave contour for WOAI. Also shown is the proposed WRTO 0.025 mV/m contour, and as will be noted, there is no contour overlap.

Critical Hours Study

During critical hours, the two hours after local sunrise and the two hours before local sunset, the proposed WRTO operation protects the 0.1 mV/m contour of Class A station WOAI San Antonio, Texas in accordance with 47 CFR 73.187. The 0.1 mV/m groundwave contour for WOAI is shown on Sheet 1 of Figure 14. Points on the contour employed for study are shown on this map.

Calculations showing the permitted radiation from WRTO during critical hours are shown on Sheet 2 of Figure 14. The proposed radiated field does not exceed the permissible field on any azimuth.

Environmental Considerations

The proposed WRTO operation was evaluated in terms of both the electric and magnetic field components, which will be present at the base of each tower. Using Table 2 of Supplement A to OET Bulletin 65, *Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields*, the worse case interpolated distance at which the electric and magnetic fields would fall below ANSI guidelines is approximately 3 meters. Accordingly, the area surrounding the base of each tower will be appropriately restricted by a fence having a minimum radius of 3 meters (10 feet). If after construction and adjustment of the directional antenna patterns, measured data indicates lower power density than estimated, the distance from the tower to the fence may be reduced. The fence will assure that persons on the station property but outside of the fenced tower areas will not be exposed to radiofrequency field levels in excess of those specified in the FCC Bulletin. In addition, warning signs will be posted.

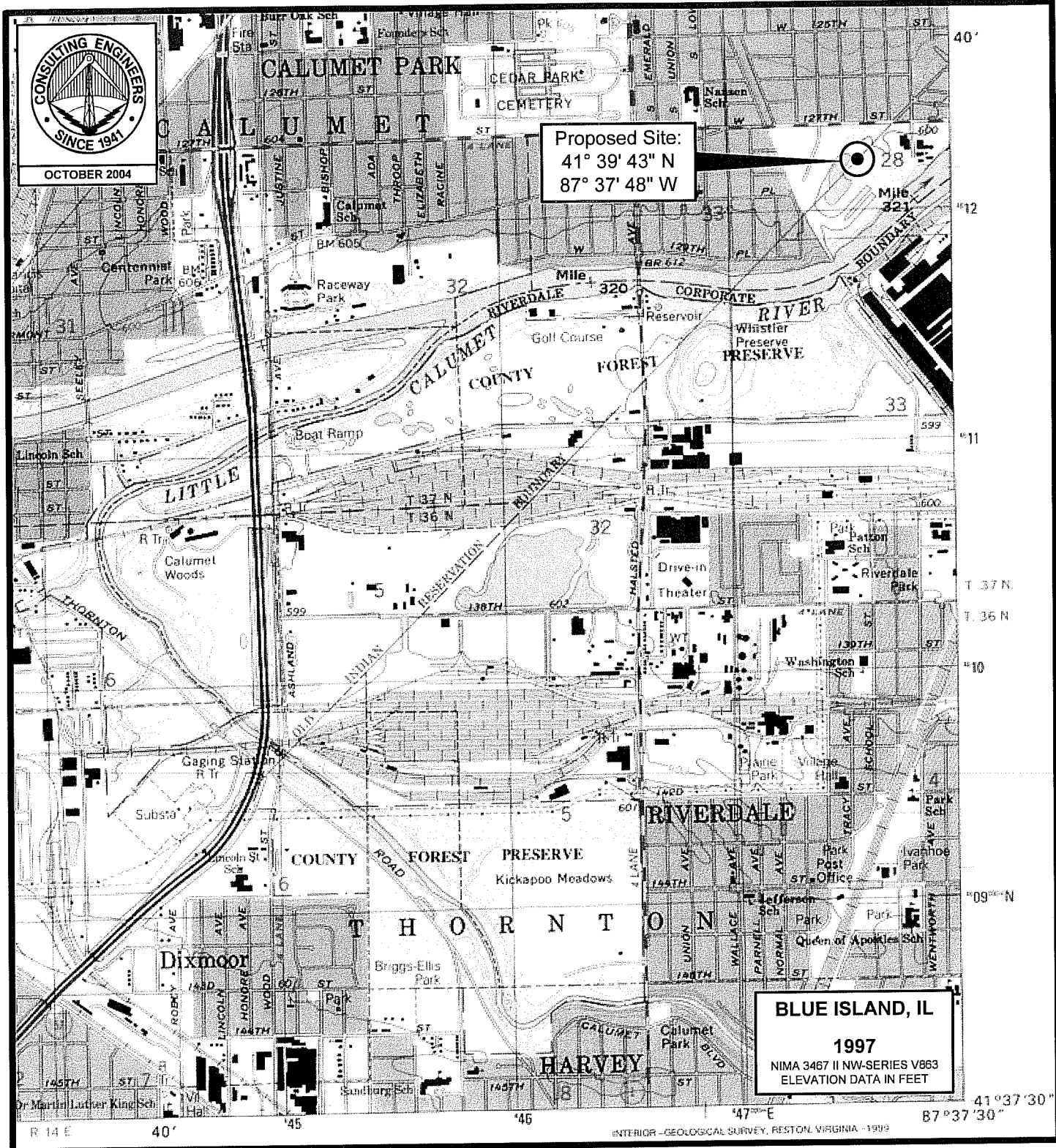
Ownership Maps

The two maps of Figure 15 provide information used in the ownership study.



Louis R. du Treil, Sr.
du Treil, Lundin & Rackley, Inc.
201 Fletcher Avenue
Sarasota, Florida 34237-6019
941 329 6000

October 28, 2004



PROPOSED TRANSMITTER SITE

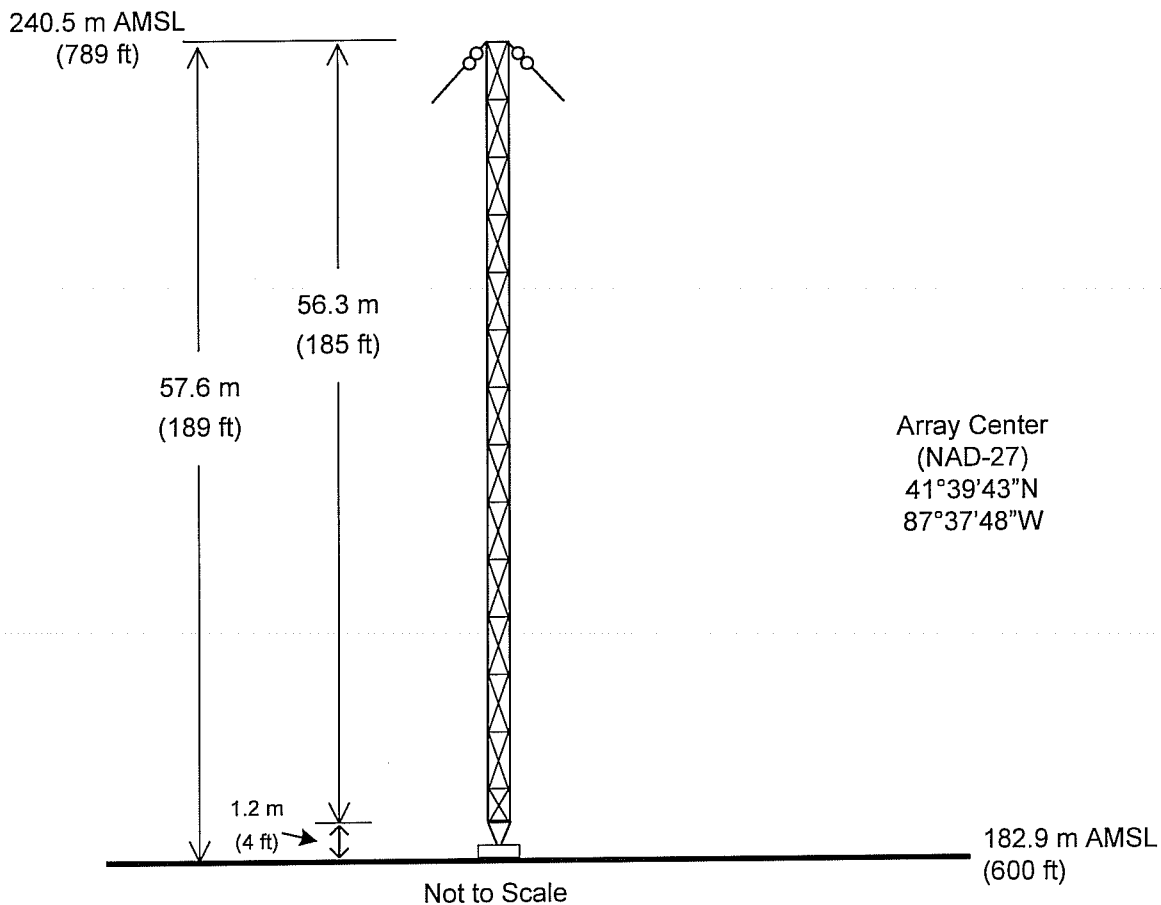
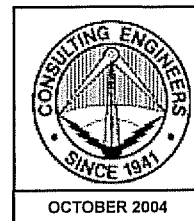
AM STATION WRTO
CHICAGO, ILLINOIS

1200 kHz 20 KW-D 4.5 KW-N DA-2 U

du Treil, Lundin & Rackley, Inc. Sarasota, Florida

Figure 2

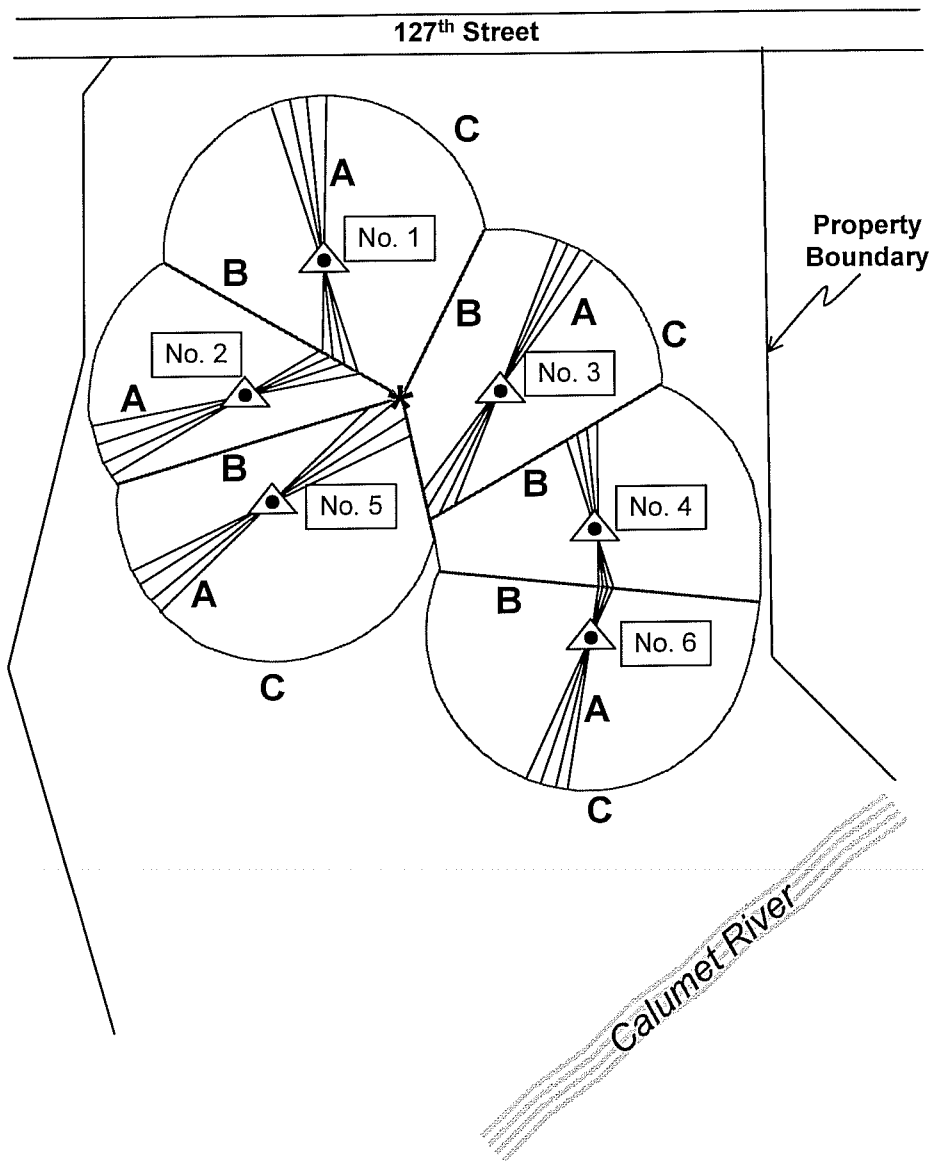
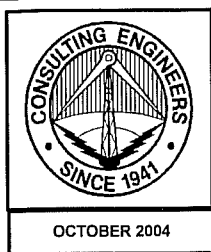
**SIX IDENTICAL TOWERS
TO BE USED**



ANTENNA ELEMENTS

AM STATION WRTO
CHICAGO, ILLINOIS
1200 kHz 20 KW-D 4.5 KW-N DA-2 U

du Treil, Lundin & Rackley, Inc. Sarasota, Florida



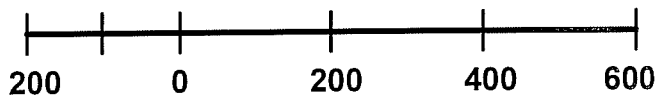
ARRAY CENTER *

41° 39' 43" N
87° 37' 48" W

GROUND SYSTEM:

- A: About each tower. 120 equally spaced copper wire radial (#10 AWG), 205 feet in length except where terminated at a 4" copper strap between towers. Radials silver soldered to strap, and buried 6 to 8 inches.
- B. Four inch copper strap between towers.
- C. Extent of ground radials.

Scale (feet)



PROPERTY PLAT AND GROUND SYSTEM

AM STATION WRTO
CHICAGO, ILLINOIS
1200 KHz 20 KW-D, 4.5 KW-N DA-2 U

du Treil, Lundin & Rackley, Inc. Sarasota, Florida

TECHNICAL EXHIBIT
AMENDMENT TO
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RADIO STATION WRTO
CHICAGO, ILLINOIS

1200 KHz 20 KW-D 4.5 KW-N U DA-2

Specification for Daytime and Nighttime
Directional Antenna Systems

Frequency: 1200 kHz

Hours of Operation: Unlimited

Power: 20 kW (Day), 4.5 kW (Night)

Number of Towers: 6

Type of Tower: Guyed, Uniform Cross-section,
base-insulated

All Towers - height above base insulator 56.3 m (185 ft)

All Towers - overall height 57.6 m (189 ft)

Tower Arrangement:

Tower No.	Spacing (deg.) / (m)	Orientation (deg. True)
1	0.0/0.0	0.0
2	88.5/61.4	207.8
3	125.2/86.9	125.8
4	225.0/156.1	134.7
5	140.0/97.2	189.9
6	264.4/183.5	143.7

Element Field Parameters:

Daytime:

<u>Tower No.</u>	<u>Field Ratio</u>	<u>Phase (degrees)</u>
1	1.000	0.0
2	0.450	+142.2
3	1.507	+63.3
4	0.928	+141.7

Nighttime:

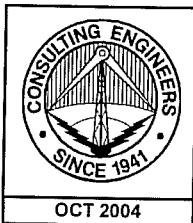
<u>Tower No.</u>	<u>Field Ratio</u>	<u>Phase (degrees)</u>
1	0.345	-85.8
2	1.000	0.0
3	0.261	-4.1
4	0.806	+23.1
5	0.952	+123.6
6	0.610	+149.1

Ground System:

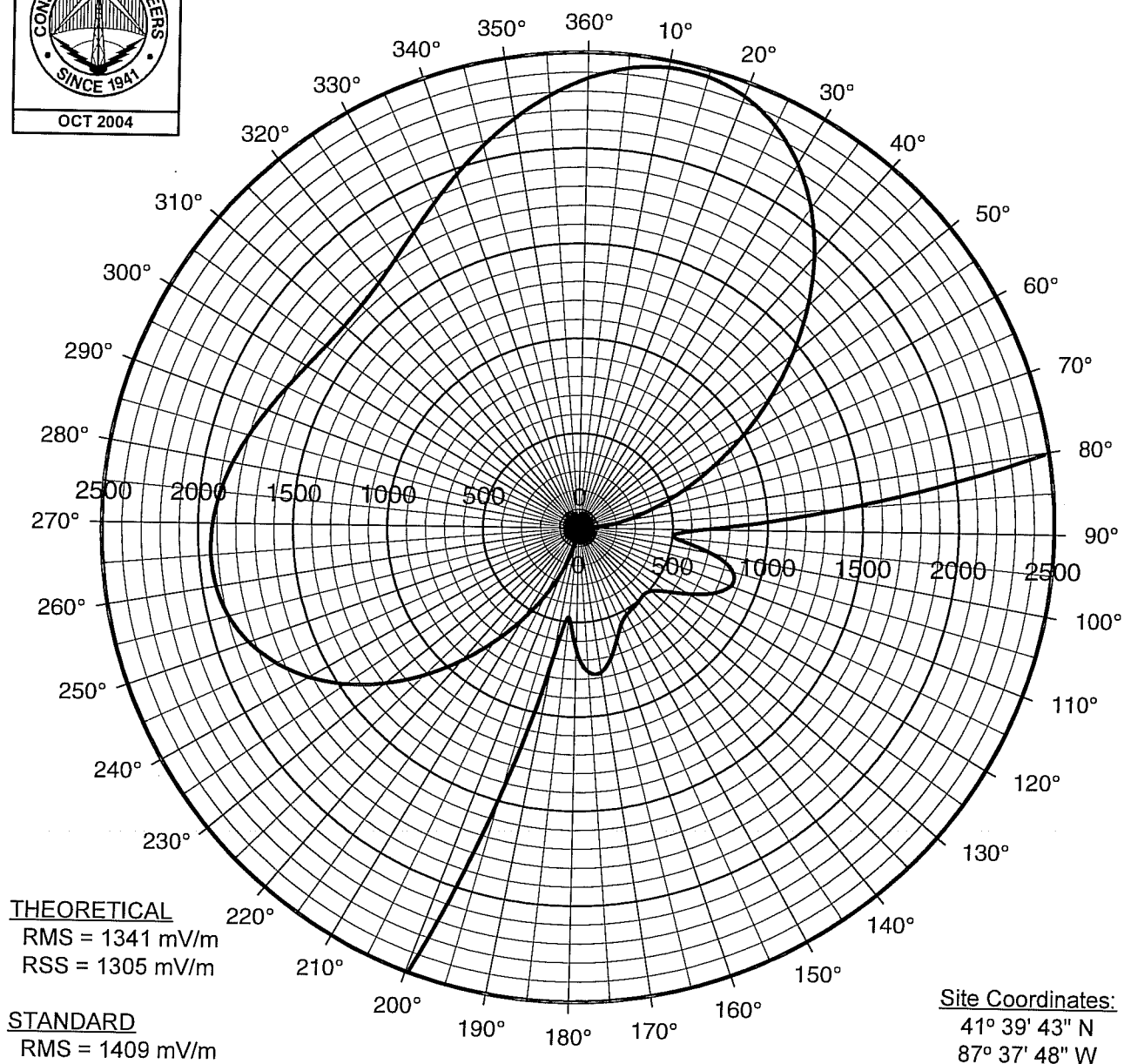
Installed about the base of each tower are 120 evenly spaced, buried copper wire radials (#10 AWG), extending 62.5 meters (205 ft) from all towers except where shortened and bonded to transverse copper strap between towers.

Geographic Coordinates of
Center of Antenna Array:

41° 39' 43" North Latitude
87° 37' 48" West Longitude



Outside Curve: 10x Scale

DIRECTIONAL ANTENNA PATTERN

<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	81.2
2	0.450	+142.2	88.5	207.8	81.2
3	1.507	+63.3	125.2	125.8	81.2
4	0.928	+141.7	225.0	134.7	81.2

**PROPOSED DAYTIME HORIZONTAL PLANE
STANDARD RADIATION PATTERN**

RADIO STATION WRTO
CHICAGO, ILLINOIS
1200 KHZ 20 KW-D 4.5 KW-N DA-2 U

du Treil, Lundin & Rackley, Inc. Sarasota, Florida

TECHNICAL EXHIBIT
APPLICATION FOR
MODIFICATION OF CONSTRUCTION PERMIT
RADIO STATION WRTO
CHICAGO, ILLINOIS

1200 KHZ 20 KW-D 4.5 KW-N U DA-2

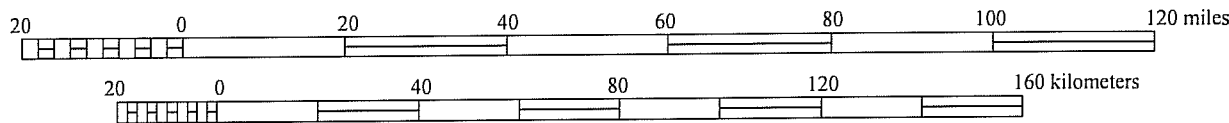
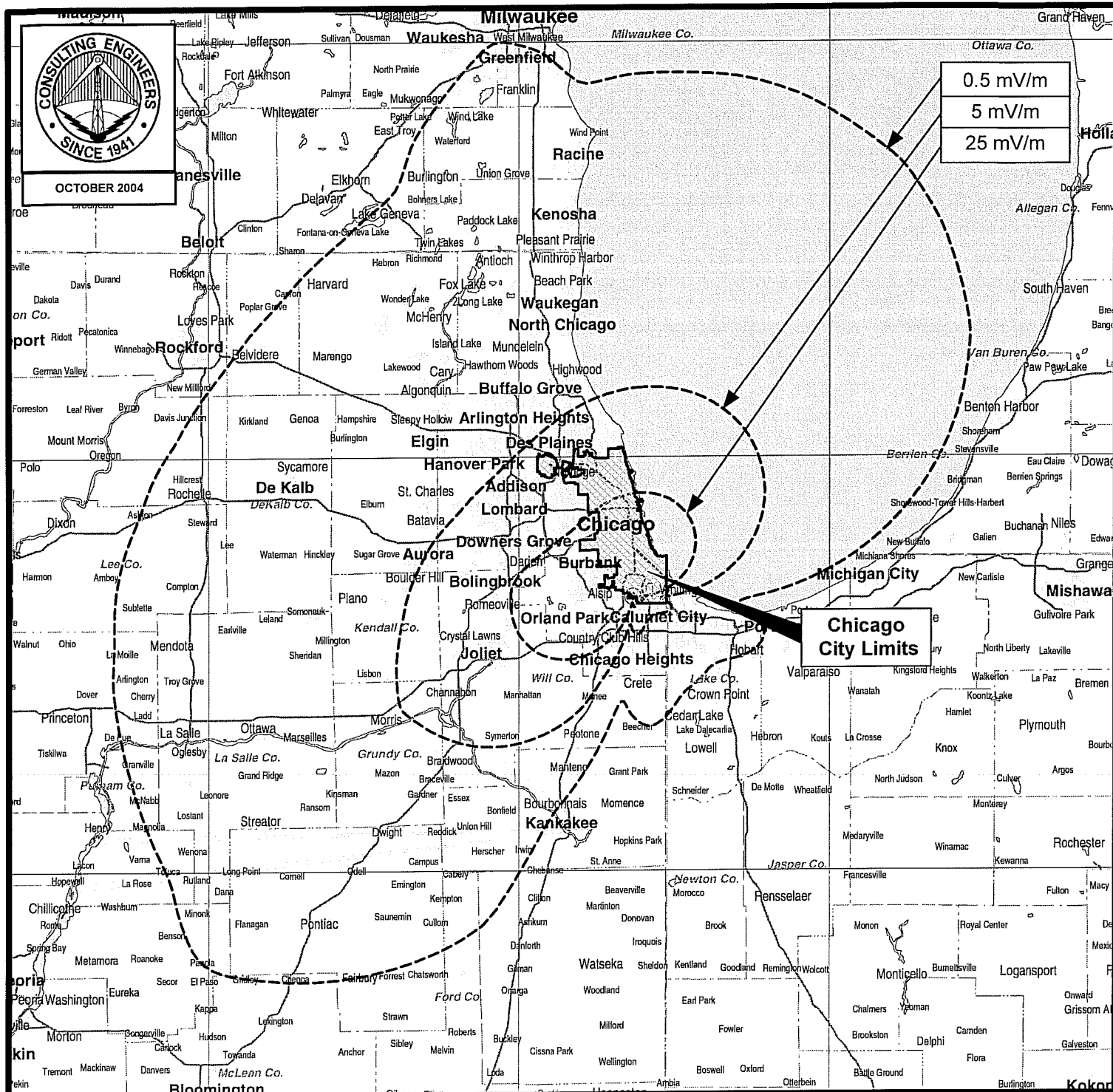
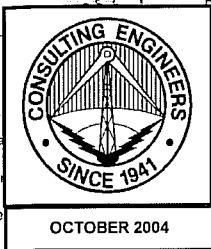
DAYTIME RADIATION PATTERN
(Radiation Values at One Kilometer)

<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	81.2
2	0.450	+142.2	88.5	207.8	81.2
3	1.507	+63.3	125.2	125.8	81.2
4	0.928	+141.7	225.0	134.7	81.2

<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>
20	1.0	1341	1305	44.7	1409

<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	2352	90	65.8	180	63.7	270	1908
5	2416	95	50.8	185	47.5	275	1878
10	2451	100	71.0	190	70.8	280	1836
15	2451	105	84.2	195	147	285	1788
20	2413	110	85.7	200	257	290	1738
25	2335	115	78.7	205	394	295	1691
30	2217	120	67.6	210	555	300	1653
35	2062	125	57.2	215	732	305	1626
40	1875	130	50.9	220	919	310	1616
45	1665	135	49.5	225	1108	315	1624
50	1439	140	50.4	230	1290	320	1652
55	1207	145	51.3	235	1457	325	1701
60	979	150	52.4	240	1604	330	1770
65	763	155	55.7	245	1725	335	1855
70	566	160	62.4	250	1817	340	1954
75	395	165	70.9	255	1879	345	2060
80	252	170	77.1	260	1914	350	2167
85	140	175	75.8	265	1922	355	2267

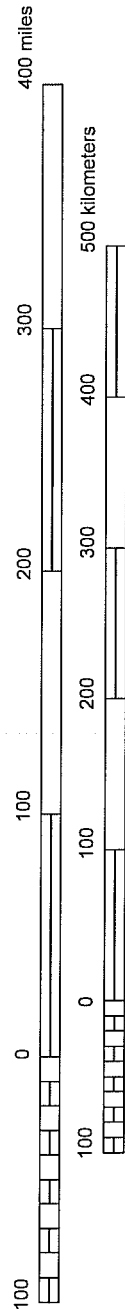
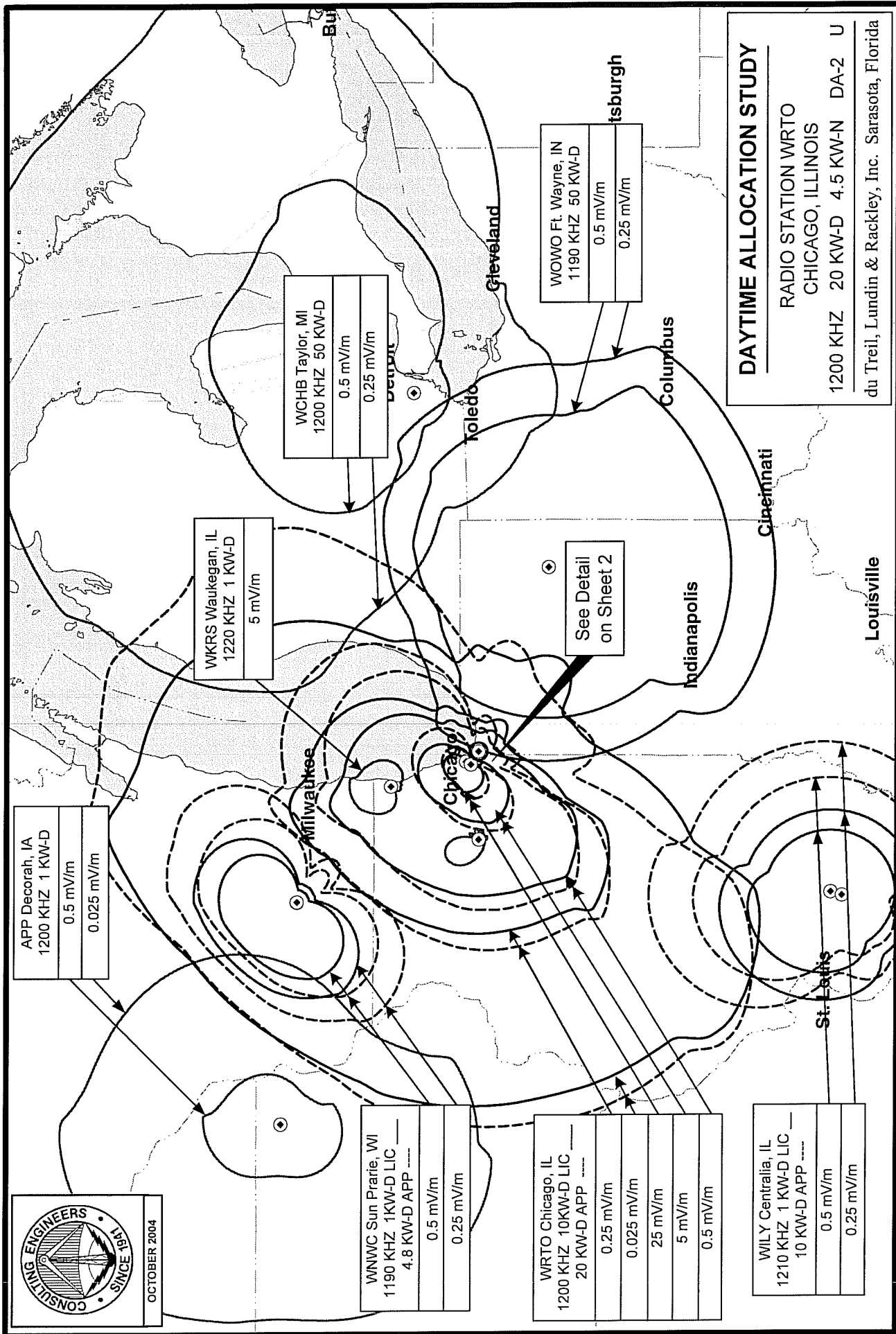
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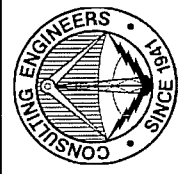
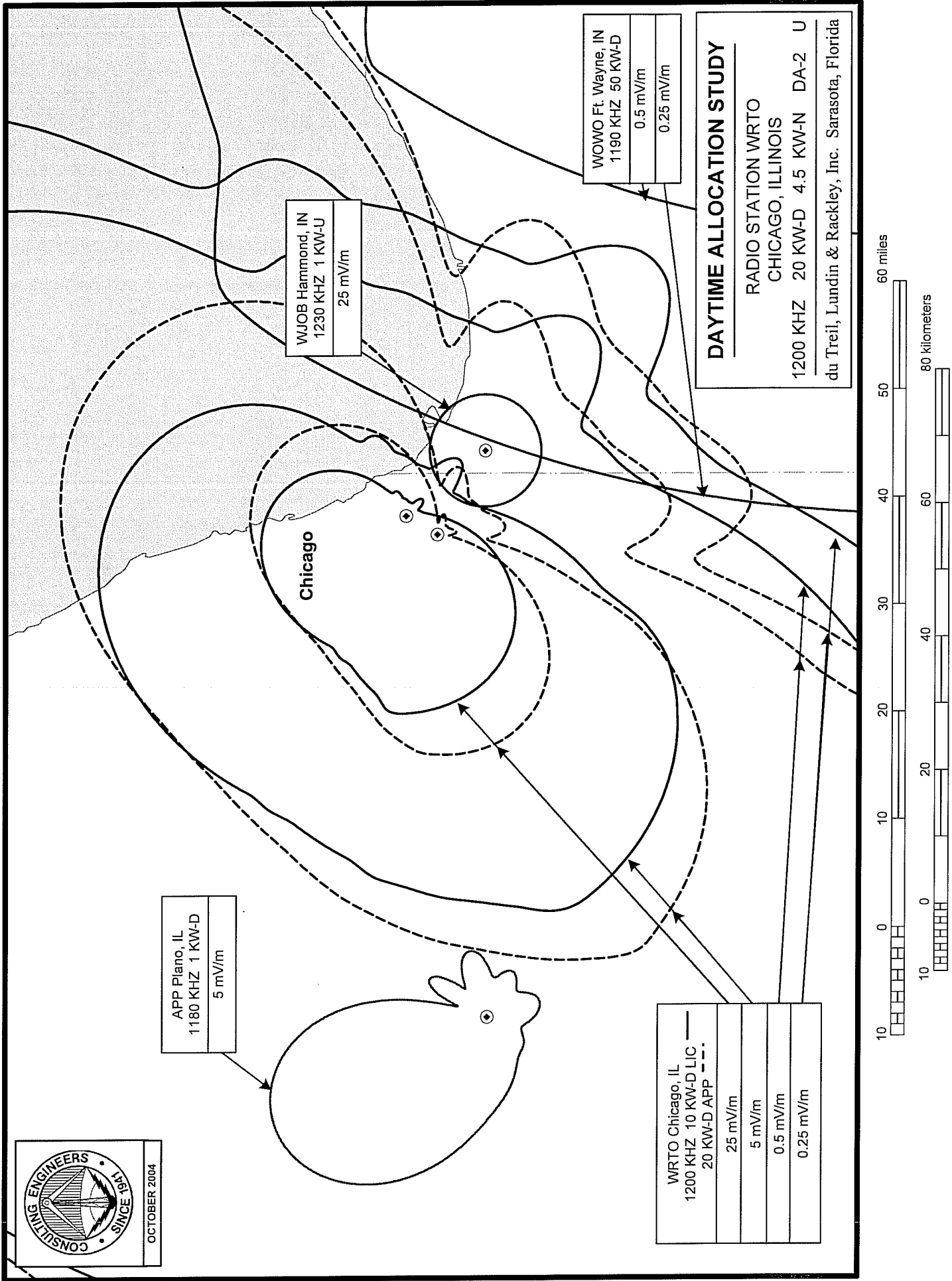


PROPOSED DAYTIME FIELD STRENGTH CONTOURS

RADIO STATION WRTO
CHICAGO, ILLINOIS
1200 KHz 20 KW-D 4.5 KW-N DA-2 U

du Treil, Lundin & Rackley, Inc. Sarasota, Florida





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RADIO STATION WRTO
CHICAGO, ILLINOIS

1200 KHZ 20 KW-D 4.5 KW-N U DA-2

Data Employed in Calculation of Groundwave Contours

Station WVIV Chicago, IL (License)

1200 kHz 10 KW-D, 1 KW-N, DA-2, U

41-42-14 87-35-47

Radiation: Daytime Standard Radiation Pattern

Conductivity: FCC Figure M-3

Station WVIV Chicago, IL (Proposed)

1200 kHz 20 KW-D, 4.5 KW-N, DA-2, U

41-39-43 87-37-48

Radiation: Proposed Daytime Standard Radiation Pattern (Figure 5)

Conductivity: FCC Figure M-3

New Plano, IL

1180 kHz 1 KW-D, 0.4 KW-N, DA-2, U

41-35-36 88-29-45

Radiation: Proposed Daytime Standard Radiation Pattern

Conductivity: FCC Figure M-3

WOWO Fort Wayne, IN (License)

1190 kHz 50 KW-D, 9.8 KW-N, DA-N, U

40-59-47 85-21-06

Radiation: 383 mV/m/KM/KW

Conductivity: FCC Figure M-3

WCHB Taylor, MI (License)

1200 KW 50 KW-D, 15-KW N, DA-2 U

42-09-24 83-19-56

Radiation: Daytime Standard Radiation Pattern

Conductivity: FCC Figure M-3

New Decorah, IA

1200 1 KW-D, 0.25 KW-N, DA-2, U

43-17-36 91-45-20

Radiation: Proposed Daytime Standard Radiation Pattern

Conductivity: FCC Figure M-3

WILY Centralia, IL (License)

1210 kHz 1 KW-D, D

38-34-44 89-06-46

Radiation: 311 mV/m/KM/KW

Conductivity: FCC Figure M-3

WILY Centralia, IL (CP)

1210 kHz 10 KW-D, DA-D

38-28-55 89-08-56

Radiation: Proposed Daytime Standard Radiation Pattern

Conductivity: FCC Figure M-3

WKRS Waukegan, IL (License)

1220 kHz 1 KW-D, 0.09 KW-N, DA-2, U

42-20-59 87-52-53

Radiation: Daytime Standard Radiation Pattern

Conductivity: FCC Figure M-3

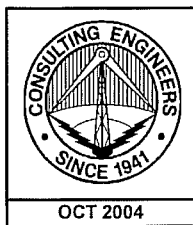
WJOB Hammond, IN (License)

1230 kHz 1 KW, U

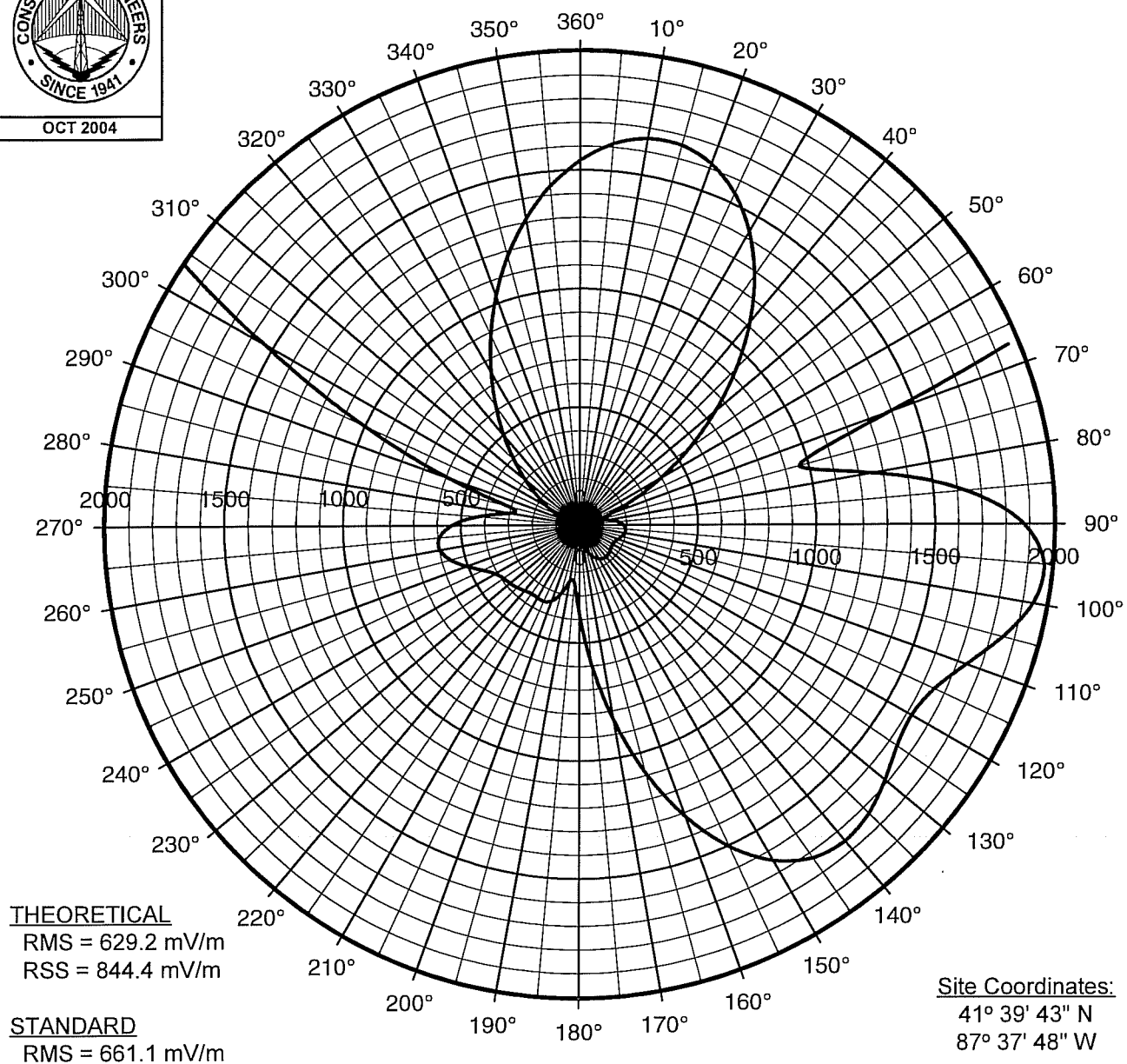
41-35-49 87-28-45

Radiation: 336 mV/m/KM/KW

Conductivity: FCC Figure M-3



Outside Curve: 10x Scale

DIRECTIONAL ANTENNA PATTERN

<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	0.345	-85.8	0.0	0.0	81.2
2	1.000	0.0	88.5	207.8	81.2
3	0.261	-4.1	125.2	125.8	81.2
4	0.806	+23.1	225.0	134.7	81.2
5	0.952	+123.6	140.0	189.9	81.2
6	0.610	+149.1	264.4	143.7	81.2

PROPOSED NIGHTTIME HORIZONTAL PLANE STANDARD RADIATION PATTERN

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CHICAGO, ILLINOIS
1200 KHZ 20 KW-D 4.5 KW-N DA-2 U

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CHICAGO, ILLINOIS

1200 KHZ 20 KW-D 4.5 KW-N U DA-2

NIGHTTIME RADIATION PATTERN
(Radiation Values at One Kilometer)

Tower Number	Field Ratio	Phase (deg.)	Spacing (deg.)	Bearing (deg.)	Height (deg.)
1	0.345	-85.8	0.0	0.0	81.2
2	1.000	0.0	88.5	207.8	81.2
3	0.261	-4.1	125.2	125.8	81.2
4	0.806	+23.1	225.0	134.7	81.2
5	0.952	+123.6	140.0	189.9	81.2
6	0.610	+149.1	264.4	143.7	81.2
Input Power (kW)	Loop Loss (ohms)	Theo. RMS (mV/m)	Theo. RSS (mV/m)	Q Factor (mV/m)	Standard RMS (mV/m)
4.5	1.0	629.2	844.4	21.2	661.1

Standard Radiation Pattern
(at One Kilometer)

Azimuth	Elevation Angle in Degrees						
Angle (deg)	0 (mV/m)	5 (mV/m)	10 (mV/m)	15 (mV/m)	20 (mV/m)	25 (mV/m)	30 (mV/m)
0	1540	1532	1507	1465	1408	1335	1249
5	1615	1605	1576	1529	1464	1383	1288
10	1655	1645	1614	1562	1493	1406	1304
15	1658	1647	1614	1562	1490	1401	1297
20	1620	1609	1577	1525	1454	1367	1265
25	1543	1532	1502	1453	1387	1304	1208
30	1429	1420	1393	1349	1290	1216	1130
35	1284	1277	1254	1218	1168	1105	1032
40	1116	1111	1094	1065	1027	978	919
45	934	930	919	900	873	839	797
50	747	745	739	730	715	696	670
55	564	564	564	563	560	554	544
60	395	396	401	407	414	420	424
65	249	251	258	269	283	299	314
70	138	140	146	157	173	194	218
75	95.4	93.4	89.1	87.1	93.5	111	137
80	125	120	107	87.3	66.7	58.3	73.8
85	163	158	143	120	89.3	56.4	36.4
90	187	183	168	145	115	79.0	40.9
95	197	192	180	159	131	97.2	59.5
100	194	190	180	162	137	108	73.7
105	185	182	173	158	138	112	82.9
110	174	171	164	152	135	114	89.1
115	165	163	157	147	133	115	94.1
120	162	160	155	146	134	118	99.3
125	164	162	157	148	137	122	105
130	169	167	162	153	141	126	110
135	173	171	166	157	145	130	114
140	175	173	168	158	146	132	116
145	173	171	165	156	144	130	115
150	165	163	157	149	138	125	111
155	151	149	144	137	127	116	104
160	132	130	127	121	113	104	94.2
165	109	108	105	101	95.4	89.2	83.1
170	84.0	83.5	82.0	79.6	76.7	73.7	71.3
175	59.2	59.1	58.8	58.5	58.3	58.6	60.1

Standard Radiation Pattern
(at One Kilometer)

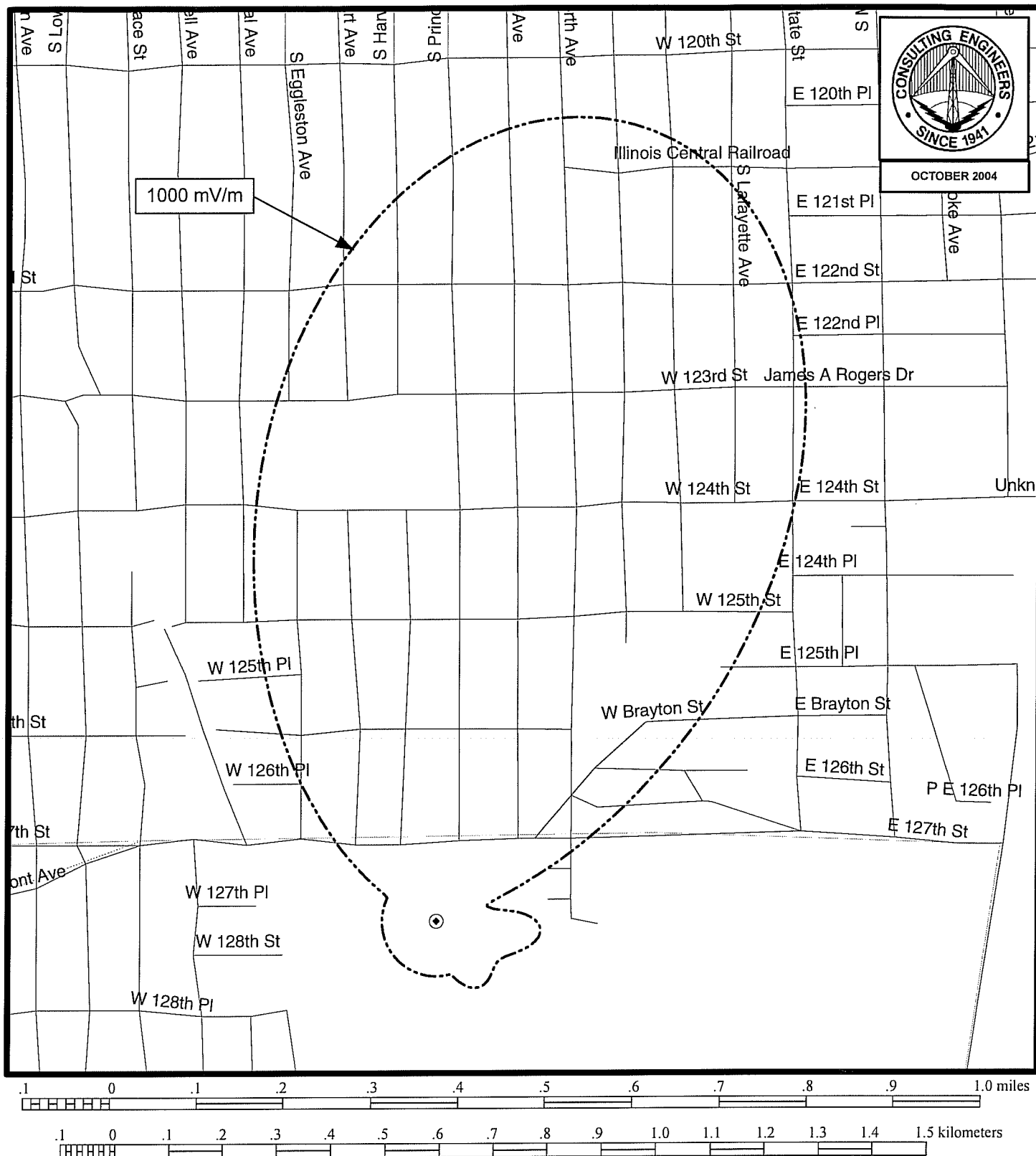
Azimuth	Elevation Angle in Degrees						
Angle (deg)	35 (mV/m)	40 (mV/m)	45 (mV/m)	50 (mV/m)	55 (mV/m)	60 (mV/m)	65 (mV/m)
0	1150	1040	922	799	674	551	432
5	1179	1061	937	808	679	552	432
10	1191	1068	939	807	676	549	429
15	1182	1058	928	797	667	542	423
20	1152	1031	905	777	651	530	415
25	1102	988	869	748	629	513	403
30	1034	930	821	711	600	492	389
35	949	859	764	665	566	468	373
40	852	778	698	614	528	441	355
45	747	690	627	559	486	411	335
50	638	599	553	501	443	381	315
55	529	507	478	442	399	349	294
60	424	418	405	384	355	317	273
65	327	335	336	329	313	287	252
70	240	260	273	278	273	257	232
75	166	193	216	231	236	230	212
80	104	137	167	189	203	204	195
85	55.6	91.0	126	154	173	182	178
90	23.1	55.2	92.4	125	148	162	163
95	23.1	30.9	67.4	101	128	145	150
100	39.1	23.9	51.1	83.6	111	130	139
105	52.6	32.0	44.0	71.9	98.5	119	129
110	63.2	43.2	44.5	65.3	89.5	109	121
115	71.9	53.6	49.4	63.0	83.6	102	114
120	79.7	62.7	55.7	63.5	80.2	97.3	109
125	86.6	70.6	62.0	65.7	78.7	93.8	105
130	92.6	77.0	67.6	68.5	78.5	91.7	102
135	96.9	81.9	72.2	71.4	79.2	90.6	100
140	99.3	84.9	75.5	74.0	80.3	90.3	98.9
145	99.3	86.1	77.6	76.2	81.6	90.6	98.4
150	96.9	85.4	78.4	77.8	83.1	91.3	98.4
155	92.3	83.1	78.3	79.0	84.7	92.5	99.0
160	85.7	79.6	77.5	80.1	86.4	94.1	100
165	78.1	75.5	76.5	81.1	88.4	96.1	101
170	70.2	71.5	75.7	82.4	90.6	98.4	103
175	63.1	68.2	75.5	84.2	93.3	101	106

Standard Radiation Pattern
(at One Kilometer)

Azimuth	Elevation Angle in Degrees						
Angle	0	5	10	15	20	25	30
(deg)	(mV/m)	(mV/m)	(mV/m)	(mV/m)	(mV/m)	(mV/m)	(mV/m)
180	37.7	37.9	38.5	39.8	42.0	45.6	50.8
185	24.4	24.4	24.9	26.6	30.2	36.2	44.5
190	24.0	23.4	22.1	21.6	24.4	31.3	41.5
195	29.4	28.3	25.5	22.7	23.3	29.8	41.1
200	33.4	32.1	28.5	24.4	23.7	30.0	42.2
205	34.8	33.3	29.2	24.5	23.5	30.7	44.2
210	34.8	33.1	28.6	23.4	22.9	31.7	46.9
215	34.9	33.1	28.1	22.4	22.6	33.3	50.3
220	35.9	33.8	28.3	22.0	23.0	35.5	54.2
225	37.2	34.9	28.8	22.0	23.9	38.3	58.8
230	38.3	35.8	29.0	21.8	25.0	41.5	63.8
235	39.2	36.5	29.1	21.7	26.6	45.3	69.4
240	41.1	38.2	30.4	23.1	29.4	49.8	75.7
245	45.0	42.0	34.1	27.1	34.0	55.3	82.7
250	50.7	47.6	39.6	32.8	39.7	61.6	90.3
255	56.5	53.3	45.1	38.3	45.5	68.3	98.5
260	60.2	56.8	48.2	41.7	50.2	74.9	107
265	59.9	56.3	47.3	41.7	53.5	81.7	117
270	54.5	50.5	41.4	38.5	56.6	89.5	128
275	43.6	39.4	30.8	35.0	62.0	100	142
280	30.3	26.4	22.5	39.9	74.1	116	160
285	30.3	30.0	36.7	59.7	95.6	139	184
290	57.0	59.4	69.8	92.8	128	170	215
295	99	103	114	137	170	210	253
300	153	157	169	191	222	260	300
305	219	223	235	256	285	320	356
310	297	301	313	332	359	389	420
315	388	392	403	421	443	468	492
320	494	497	507	521	539	557	572
325	614	616	623	633	644	654	659
330	745	746	749	754	757	757	751
335	885	885	885	882	877	865	846
340	1031	1029	1024	1014	998	974	941
345	1176	1172	1162	1144	1117	1081	1033
350	1314	1309	1293	1267	1229	1179	1118
355	1438	1431	1410	1376	1328	1266	1191

Standard Radiation Pattern
(at One Kilometer)

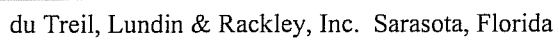
Azimuth Angle (deg)	Elevation Angle in Degrees						
	35 (mV/m)	40 (mV/m)	45 (mV/m)	50 (mV/m)	55 (mV/m)	60 (mV/m)	65 (mV/m)
180	57.7	66.3	76.2	86.6	96.5	104	108
185	54.6	66.0	77.9	89.7	100	108	112
190	53.8	67.2	80.8	93.5	104	112	115
195	54.9	69.8	84.6	98.1	109	117	119
200	57.3	73.5	89.2	103	115	122	123
205	60.7	78.0	94.7	109	121	127	128
210	64.8	83.3	101	116	127	133	133
215	69.7	89.3	108	123	134	140	139
220	75.1	96.0	115	131	142	147	145
225	81.2	103	123	139	150	154	151
230	87.8	111	132	148	159	162	158
235	95.0	120	141	158	168	171	165
240	103	129	151	168	178	180	172
245	111	139	162	179	189	189	180
250	121	149	173	191	200	200	189
255	130	160	185	203	212	210	198
260	141	173	199	217	225	222	207
265	153	186	213	231	238	234	217
270	167	201	229	247	253	247	227
275	183	219	247	265	269	261	238
280	203	240	268	284	287	275	250
285	227	264	291	306	306	291	262
290	257	293	318	330	327	308	275
295	294	327	349	357	350	326	288
300	337	367	384	387	374	345	301
305	388	412	423	420	400	365	315
310	445	462	466	455	428	385	330
315	510	518	513	493	457	407	344
320	580	578	563	533	487	428	358
325	656	642	615	573	517	449	372
330	736	709	668	614	547	470	385
335	817	775	721	655	576	490	398
340	897	841	773	693	603	507	408
345	974	903	820	728	628	523	418
350	1044	958	862	758	648	536	425
355	1103	1005	897	782	664	545	430



PROPOSED NIGHTTIME FIELD STRENGTH CONTOURS

RADIO STATION WRTO
CHICAGO, ILLINOIS
1200 KHz 20 KW-D 4.5 KW-N DA-2 U

du Treil, Lundin & Rackley, Inc. Sarasota, Florida



ENGINEERING EXHIBIT
AMENDMENT TO
APPLICATION FOR CONSTRUCTION PERMIT
WLXX-AM LICENSE CORP.
RADIO STATION WRTO
CHICAGO, ILLINOIS

1200 KHZ 20 KW-D 4.5 KW-N U DA-2

NIGHTTIME ALLOCATION STUDY
EXISTING OPERATION
41-42-14 87-35-47

Toward Station	Freq. (kHz)	GC Dist. (km)	Bear (degT)	Angles Min Max (deg) (deg)		Skywav Mult. (mV/m)	50% Ex-RSS (mV/m)	25% Ex-RSS (mV/m)	Req. Prot. (mV/m)	Perm. Vert-Rad mV/m@1km
KMYL	1190	2349.1	255.1	0.0	0.5	8.67	5.42	5.88	1.47	8471.9
KMYL	1190	2349.1	255.1	0.0	0.5	8.67	5.42	5.88	1.47	8471.9
KMYL	1190	2349.1	255.1	0.0	0.5	8.67	5.42	5.88	1.47	8471.9
KXXMX	1190	2777.7	261.9	0.0	0.0	6.01	7.92	7.92	1.98	16468.8
KXXMX	1190	2798.7	262.5	0.0	0.0	5.89	7.57	8.44	2.11	17919.2
WIXL	1190	1575.7	157.1	1.7	5.1	20.03	17.39	17.39	4.35	10855.4
WIXL	1190	1575.7	157.1	1.7	5.1	20.03	17.39	17.39	4.35	10855.4
WPSP	1190	1785.7	155.6	0.6	3.6	16.31	14.56	14.56	3.64	11156.7
WGKA	1190	920.	162.	6.8	12.5	47.07	33.34	33.34	8.34	8854.8
WOWO	1190	203.2	112.	34.9	49.2	284.82	3.79	4.02	1.00	176.4
WOWO	1190	203.2	112.	34.9	49.2	284.82	3.79	4.02	1.00	176.4
WOWO	1190	203.1	112.1	34.9	49.2	284.89	3.79	4.02	1.00	176.3
WBIS	1190	948.6	101.9	6.5	12.0	40.09	42.75	45.46	11.36	14173.
WBIS	1190	948.6	101.9	6.5	12.0	40.09	42.75	45.46	11.36	14173.
WBIS	1190	990.	104.4	6.0	11.3	37.58	40.53	40.53	10.13	13479.9
KPHN	1190	654.7	245.6	10.9	18.6	75.59	5.06	5.66	1.41	935.8
KPHN	1190	654.7	245.6	10.9	18.6	75.59	5.06	5.66	1.41	935.8
KPHN	1190	654.7	245.6	10.9	18.6	75.59	5.06	5.66	1.41	935.8
KPHN	1190	654.7	245.6	10.9	18.6	75.59	5.06	5.66	1.41	935.8
WLIB	1190	1131.3	90.6	4.7	9.4	28.12	27.46	27.46	6.86	12206.2
WLIB	1190	1131.3	90.6	4.7	9.4	28.12	27.46	27.46	6.86	12206.2
KEX	1190	2824.7	290.3	0.0	0.0	3.6	2.38	2.38	.60	8281.9
KEX	1190	2824.7	290.3	0.0	0.0	3.6	2.38	2.38	.60	8281.9
WBMJ	1190	3299.3	135.4	0.0	0.0	5.52	12.56	14.89	3.72	33730.
KFXR	1190	1250.	221.3	3.8	8.0	28.76	9.18	9.18	2.30	3990.2
CHMG	1200	2326.7	313.	0.0	0.0	6.84	19.13	19.88	9.57	6991.2
CHMG	1200	2326.7	313.	0.0	0.0	6.84	19.13	19.88	9.57	6991.2
CKXM	1200	2869.2	297.3	0.0	0.0	4.	4.17	4.83	2.09	2607.2
WINNI	1200	1158.6	323.3	6.8	6.8	49.29	17.08	17.95	8.16	827.3
CFGO	1200	1034.	63.4	8.2	8.2	60.73	19.42	26.56	9.71	799.6
CFGO	1200	1030.	63.7	8.2	8.2	61.12	19.42	26.36	9.71	794.4
SSM	1200	592.8	23.9	16.6	16.6	112.28	80.55	80.55	40.27	1793.4
CKOT	1200	582.7	76.3	16.9	16.9	113.49	15.48	18.55	7.74	341.
RED	1200	2559.5	164.8	0.0	0.0	2.12	7.76	9.45	3.88	9145.
HJNF	1200	4391.	162.5	0.0	0.0	.61	9.82	12.31	4.91	40048.1
HJCD	1200	4359.3	158.9	0.0	0.0	.62	12.17	14.14	6.09	48850.5
HJLJ	1200	4098.	159.9	0.0	0.0	.71	13.95	14.59	6.97	49041.3
HJBZ	1200	3645.4	152.5	0.0	0.0	.91	12.97	13.75	6.48	35550.3
HJLR	1200	4248.2	156.	0.0	0.0	.66	11.87	13.42	5.94	45321.2
HJBX	1200	4397.8	157.8	0.0	0.0	.61	12.36	14.44	6.18	50572.4
TIBSB	1200	3549.1	173.4	0.0	0.0	.97	4.78	5.81	2.39	12322.6

NIGHTTIME ALLOCATION STUDY

EXISTING OPERATION

41-42-14 87-35-47

Toward Station	Freq. (kHz)	GC Dist. (km)	Bear (degT)	Angles		Skywav Mult. (mV/m)	50% Ex-RSS (mV/m)	25% Ex-RSS (mV/m)	Req. Prot. (mV/m)	Perm. Vert-Rad mV/m@1km
				Min (deg)	Max (deg)					
CMJQ	1200	2632.9	151.9	0.0	0.0	1.97	7.04	8.38	3.52	8935.
CMGM	1200	2326.3	159.9	0.0	0.0	2.73	9.96	10.77	4.98	9137.1
HIMR	1200	3039.5	143.2	0.0	0.0	1.39	9.93	12.04	4.96	17859.
HIBS	1200	3109.7	140.6	0.0	0.0	1.32	10.37	11.23	5.19	19648.
TGRJ	1200	3056.7	184.8	0.0	0.0	1.37	3.58	3.9	1.79	6523.4
4VRD	1200	2792.3	145.6	0.0	0.0	1.7	10.54	11.41	5.27	15488.9
HRDS	1200	3135.7	179.8	0.0	0.0	1.29	4.12	4.41	2.06	7966.9
XEAGA	1200	2591.3	216.4	0.0	0.0	5.15	37.51	37.51	18.76	18220.8
XE	1200	2783.4	238.8	0.0	0.0	4.31	19.32	19.32	9.66	11206.2
XENVA2	1200	2031.3	233.6	0.8	0.8	9.96	51.61	51.61	25.81	12951.2
XE	1200	2895.4	205.9	0.0	0.0	3.91	20.45	20.45	10.22	13077.5
XE	1200	2986.8	210.6	0.0	0.0	3.63	19.04	19.04	9.52	13115.7
XEITC	1200	2661.	211.9	0.0	0.0	4.82	32.85	32.85	16.42	17045.5
XEZI	1200	2772.2	213.	0.0	0.0	4.35	28.15	28.15	14.07	16166.4
XEQY1	1200	2746.1	208.3	0.0	0.0	4.46	27.34	27.34	13.67	15338.2
XE	1200	2710.2	201.2	0.0	0.0	4.6	24.34	24.34	12.17	13218.4
XEWT	1200	2616.2	230.4	0.0	0.0	5.02	31.85	31.85	15.93	15853.1
XEWT	1200	2616.2	230.4	0.0	0.0	5.02	31.85	31.85	15.93	15853.1
XEYF	1200	2527.6	243.7	0.0	0.0	5.51	23.5	23.5	11.75	10662.8
XENVA2	1200	2575.	251.8	0.0	0.0	5.24	15.08	15.08	7.54	7197.9
XENVA2	1200	1998.1	210.2	1.0	1.0	10.43	52.16	52.16	26.08	12501.9
XE	1200	2660.	193.3	0.0	0.0	4.82	19.7	19.7	9.85	10213.
XE	1200	2697.6	195.9	0.0	0.0	4.66	20.69	20.69	10.35	11108.5
XEPW1	1200	2526.2	204.5	0.0	0.0	5.52	34.63	34.63	17.31	15685.8
XEPW	1200	2529.4	204.5	0.0	0.0	5.5	34.48	34.48	17.24	15670.3
YNRP1	1200	3185.8	176.8	0.0	0.0	1.24	4.65	5.18	2.32	9338.1
HOB 31	1200	3816.9	167.3	0.0	0.0	.82	7.85	9.12	3.92	23842.3
WQLS	1200	1149.6	170.9	4.5	9.2	33.55	19.42	19.42	4.85	723.5
NEW	1200	3010.7	282.5	0.0	0.0	3.7	16.09	17.47	4.37	5897.9
KYAA	1200	2958.7	270.4	0.0	0.0	4.78	6.27	6.49	1.62	1699.5
WPTK	1200	1741.9	161.3	0.8	3.9	17.15	14.65	15.18	3.79	1106.4
WPTK	1200	1741.9	161.3	0.8	3.9	17.15	14.65	15.18	3.79	1106.4
NEW	1200	1589.3	160.4	1.6	5.0	19.85	13.33	15.5	3.87	975.6
THOND	1200	383.9	298.8	19.7	31.0	149.25	14.57	14.57	10.14	339.8
BOISE	1200	2348.1	284.8	0.0	0.5	6.15	7.21	7.21	1.80	1466.5
WKOX	1200	1335.3	81.8	3.1	7.1	19.42	13.36	16.43	4.11	1057.4
WKOX	1200	1335.3	81.8	3.1	7.1	19.42	13.36	16.43	4.11	1057.4
WKOX	1200	1355.1	81.8	3.0	6.9	18.84	12.73	15.87	3.97	1052.6
WKOX	1200	1355.2	81.8	3.0	6.9	18.84	12.73	15.87	3.97	1052.6
WCHB	1200	356.2	80.5	21.2	33.1	164.32	16.82	17.81	4.45	135.5
KXLO	1200	1825.6	296.5	0.4	3.3	9.26	5.75	6.76	1.69	912.6

NIGHTTIME ALLOCATION STUDY
EXISTING OPERATION
41-42-14 87-35-47

Toward Station	Freq. (kHz)	GC Dist. (km)	Bear (degT)	Angles Min Max (deg) (deg)		Skywav Mult. (mV/m)	50% Ex-RSS (mV/m)	25% Ex-RSS (mV/m)	Req. Prot. (mV/m)	Perm. Vert-Rad mV/m@1km
WSML	1200	936.	128.8	6.6	12.2	43.86	10.25	11.6	2.90	330.7
*KFNW	1200	930.7	310.6	6.7	12.3	35.91	8.34	8.84	4.15	578.4
KING	1200	1128.4	84.4	4.7	9.4	27.42	19.66	23.8	5.95	1084.7
WTLA	1200	953.6	76.4	6.4	11.9	36.32	15.94	20.	5.00	688.4
WRKK	1200	904.9	89.9	7.0	12.8	41.86	20.15	22.4	5.60	668.7
WKST	1200	607.2	95.7	12.0	20.1	81.	12.86	13.99	3.50	215.9
WGDL	1200	3259.4	136.7	0.0	0.0	5.67	18.14	21.62	5.40	4763.8
WOAI	1200	1654.5	218.3	1.2	4.5	18.4	2.63	3.38	.85	229.7
WAGE	1200	890.8	105.5	7.2	13.0	45.02	11.05	12.47	3.12	346.4
YVOZ	1200	4008.2	143.9	0.0	0.0	.75	11.19	11.19	5.59	37447.3
YVWH	1200	3947.8	152.6	0.0	0.0	.77	16.	16.	8.00	51867.7
CMJQ	1200	2632.9	151.9	0.0	0.0	1.97	7.04	8.38	3.52	8935.
CMGM	1200	2326.3	159.9	0.0	0.0	2.73	9.96	10.77	4.98	9137.1
CMJQ	1200	2632.9	151.9	0.0	0.0	1.97	7.04	8.38	3.52	8935.
CMGM	1200	2326.3	159.9	0.0	0.0	2.73	9.96	10.77	4.98	9137.1
NEW	1210	2316.6	253.	0.0	0.7	9.03	14.07	14.52	3.63	20103.7
KQTL	1210	2328.	250.1	0.0	0.6	9.14	12.14	12.14	3.03	16598.7
KQEQ	1210	2804.5	269.1	0.0	0.0	5.39	12.07	14.15	3.54	32814.
KEBR	1210	2863.5	274.7	0.0	0.0	4.76	8.78	10.31	2.58	27075.8
KEBR	1210	2863.5	274.7	0.0	0.0	4.76	8.78	10.31	2.58	27075.8
NEW	1210	2713.6	260.7	0.0	0.0	6.35	10.91	12.49	3.12	24587.8
KPRZ	1210	2768.5	259.4	0.0	0.0	6.21	7.85	9.84	2.46	19821.1
WNMA	1210	1878.	157.1	0.2	3.0	15.07	10.73	11.75	2.94	9745.5
WNMA	1210	1878.	157.1	0.2	3.0	15.07	10.73	11.75	2.94	9745.5
NEW	1210	1474.3	158.4	2.3	5.9	22.34	14.31	14.31	3.58	8008.9
WKTT	1210	1474.3	158.4	2.3	5.9	22.34	14.31	14.31	3.58	8008.9
KZOO	1210	6842.6	274.	0.0	0.0	1.02	1.31	1.41	.35	17184.6
WSKR	1210	1279.3	194.7	3.5	7.7	28.47	10.17	10.99	2.75	4826.5
BIXBY	1210	953.9	231.	6.4	11.9	43.48	7.86	8.42	2.10	2420.6
KGYN	1210	1310.8	249.3	3.3	7.4	24.81	5.37	5.55	1.39	2795.8
KGYN	1210	1109.6	233.7	4.9	9.7	34.04	7.42	8.35	2.09	3065.7
KGYN	1210	1090.2	232.7	5.1	9.9	35.08	7.53	8.34	2.09	2972.3
KGYN	1210	1090.2	232.7	5.1	9.9	35.08	7.53	8.34	2.09	2972.3
WPHT	1210	1076.7	96.1	5.2	10.1	31.51	2.71	3.47	.87	1376.8
WHYO	1210	3323.	136.1	0.0	0.0	5.47	11.9	14.23	3.56	32485.6
KOKK	1210	906.6	292.6	7.0	12.7	40.29	5.37	5.59	1.40	1734.7
WTCK	1210	742.1	195.9	9.3	16.2	65.29	12.18	12.18	3.05	2331.9
NEW	1210	1488.6	230.	2.2	5.8	21.28	23.78	24.86	6.22	14604.3
NEW	1210	1599.4	210.6	1.5	4.9	19.68	12.33	13.29	3.32	8440.5
NEW	1210	1962.4	212.4	0.0	2.5	14.1	12.2	14.57	3.64	12923.
NEW	1210	1819.1	233.5	0.4	3.4	15.12	26.55	26.55	6.64	21955.4
NEW	1210	1952.8	211.6	0.0	2.6	14.23	15.83	18.37	4.59	16132.9
NEW	1210	1953.2	211.6	0.0	2.6	14.23	15.7	18.26	4.56	16043.3
KUBR	1210	1968.8	212.5	0.0	2.5	14.02	12.22	14.62	3.65	13034.7
KUNF	1210	2272.5	265.7	0.0	0.9	8.38	11.06	14.67	3.67	21877.8
KNWX	1210	2788.2	294.7	0.0	0.0	3.33	11.99	13.15	3.29	49307.
KZTS	1210	2624.9	292.4	0.0	0.0	4.11	9.4	11.1	2.78	33795.1
KRSV	1210	1921.1	281.2	0.0	2.8	9.91	16.17	16.17	4.04	20391.3
KKHI	1210	1493.6	274.1	2.1	5.7	17.38	25.56	25.56	6.39	18382.2

* WVIV enters the 50% RSS limit of KFNW.

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Toward Station	Freq. (kHz)	GC Dist. (km)	Bear (degT)	Angles		Skywav Mult. (mV/m)	50% Ex-RSS (mV/m)	25% Ex-RSS (mV/m)	Req. Prot. (mV/m)	Perm. Vert-Rad mV/m@1km
				Min (deg)	Max (deg)					
KMYL	1190	2345.2	255.1	0.0	0.5	8.71	5.42	5.88	1.47	8434.4
KMYL	1190	2345.2	255.1	0.0	0.5	8.71	5.42	5.88	1.47	8434.4
KMYL	1190	2345.2	255.1	0.0	0.5	8.71	5.42	5.88	1.47	8434.4
KXXM	1190	2774.3	261.9	0.0	0.0	6.04	7.92	7.92	1.98	16395.1
KXXM	1190	2795.4	262.5	0.0	0.0	5.91	7.57	8.44	2.11	17840.4
WIXL	1190	1572.5	156.9	1.7	5.1	20.12	17.39	17.39	4.35	10808.5
WIXL	1190	1572.5	156.9	1.7	5.1	20.12	17.39	17.39	4.35	10808.5
WIXL	1190	1572.5	156.9	1.7	5.1	20.12	17.39	17.39	4.35	10808.5
WPSP	1190	1782.6	155.5	0.6	3.6	16.37	14.56	14.56	3.64	11114.4
WGKA	1190	916.4	161.7	6.9	12.5	47.39	33.34	33.34	8.34	8794.2
WOWO	1190	204.1	110.5	34.7	49.0	283.99	3.79	4.02	1.00	176.9
WOWO	1190	204.1	110.5	34.7	49.0	283.99	3.79	4.02	1.00	176.9
WOWO	1190	204.1	110.5	34.7	49.0	283.99	3.79	4.02	1.00	176.9
WOWO	1190	204.1	110.5	34.7	49.0	284.07	3.79	4.02	1.00	176.8
WBIS	1190	950.4	101.5	6.5	12.0	40.1	42.75	45.46	11.36	14207.4
WBIS	1190	950.4	101.5	6.5	12.0	40.1	42.75	45.46	11.36	14207.4
WBIS	1190	950.4	101.5	6.5	12.0	40.1	42.75	45.46	11.36	14207.4
WBIS	1190	991.6	104.1	6.0	11.3	37.51	40.53	40.53	10.13	13505.7
KPHN	1190	650.3	245.9	11.0	18.7	76.42	5.06	5.66	1.41	925.6
KPHN	1190	650.3	245.9	11.0	18.7	76.42	5.06	5.66	1.41	925.6
KPHN	1190	650.3	245.9	11.0	18.7	76.42	5.06	5.66	1.41	925.6
KPHN	1190	650.3	245.9	11.0	18.7	76.42	5.06	5.66	1.41	925.6
WLIB	1190	1134.1	90.4	4.7	9.3	28.02	27.46	27.46	6.86	12248.4
WLIB	1190	1134.1	90.4	4.7	9.3	28.02	27.46	27.46	6.86	12248.4
KEX	1190	2823.7	290.4	0.0	0.0	3.61	2.38	2.38	.60	8256.7
KEX	1190	2823.7	290.4	0.0	0.0	3.61	2.38	2.38	.60	8256.7
WBMJ	1190	3297.9	135.3	0.0	0.0	5.53	12.56	14.89	3.72	33681.2
KFXR	1190	1244.7	221.3	3.8	8.1	29.1	9.18	9.18	2.30	3957.9
CHMG	1200	2327.8	313.1	0.0	0.0	6.84	19.13	19.88	9.57	6998.4
CHMG	1200	2327.8	313.1	0.0	0.0	6.84	19.13	19.88	9.57	6998.4
CKXM	1200	2868.9	297.4	0.0	0.0	4.1	4.17	4.83	2.09	2606.5
WINNI	1200	1160.7	323.6	6.8	6.8	49.12	15.01	17.11	8.16	831.0
CFGO	1200	1038.6	63.2	8.1	8.1	60.28	19.42	25.46	9.71	805.5
CFGO	1200	1034.5	63.6	8.2	8.2	60.68	19.42	25.29	9.71	800.2
SAULT	1200	598.2	23.9	16.4	16.4	111.64	80.55	80.55	40.27	1803.7
CKOT	1200	586.6	75.9	16.8	16.8	113.03	15.48	18.55	7.74	342.4
REDGT	1200	2555.7	164.7	0.0	0.0	2.13	7.76	9.45	3.88	9106.4
HJNF	1200	4387.4	162.5	0.0	0.0	.61	9.82	12.31	4.91	39982.9
HJCD	1200	4356.1	158.8	0.0	0.0	.62	12.17	14.14	6.09	48772.2
HJIJ	1200	4094.6	159.8	0.0	0.0	.71	13.95	14.59	6.97	48972.4
HJBZ	1200	3642.5	152.5	0.0	0.0	.91	12.97	13.75	6.48	35472.5
HJLR	1200	4245.1	156.1	0.0	0.0	.66	11.87	13.42	5.94	45252.1
HJBX	1200	4394.5	157.8	0.0	0.0	.61	12.36	14.44	6.18	50489.7
TIBSB	1200	3544.8	173.3	0.0	0.0	.97	4.78	5.81	2.39	12284.6
CMJQ	1200	2630.1	151.8	0.0	0.0	1.97	7.04	8.38	3.52	8912.4
CMGM	1200	2322.9	159.7	0.0	0.0	2.73	9.96	10.77	4.98	9110.4
HIMR	1200	3037.4	143.1	0.0	0.0	1.39	9.93	12.04	4.96	17833.3
HIBS	1200	3107.8	140.5	0.0	0.0	1.32	10.37	11.23	5.19	19618.3

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Toward Station	Freq. (kHz)	GC Dist. (km)	Bear (degT)	Angles		Skywav Mult. (mV/m)	50% Ex-RSS (mV/m)	25% Ex-RSS (mV/m)	Req. Prot. (mV/m)	Perm. Vert-Rad mV/m@1km
				Min (deg)	Max (deg)					
TGRJ	1200	3051.8	184.8	0.0	0.0	1.38	3.58	3.9	1.79	6499.7
4VRD	1200	2790.1	145.5	0.0	0.0	1.71	10.54	11.41	5.27	15461.6
HRDS	1200	3131.1	179.7	0.0	0.0	1.3	4.12	4.41	2.06	7936.2
XEAGA	1200	2585.9	216.4	0.0	0.0	5.18	37.51	37.51	18.76	18115.2
XE	1200	2778.6	238.8	0.0	0.0	4.33	19.32	19.32	9.66	11157.
XENVA2	1200	2026.3	233.7	0.8	0.8	10.03	51.61	51.61	25.81	12863.4
XE	1200	2890.	205.9	0.0	0.0	3.93	20.45	20.45	10.22	13017.6
XE	1200	2981.4	210.6	0.0	0.0	3.65	19.04	19.04	9.52	13058.1
XEITC	1200	2655.6	211.8	0.0	0.0	4.84	32.85	32.85	16.42	16957.5
XEZI	1200	2766.8	213.	0.0	0.0	4.38	28.15	28.15	14.07	16085.1
XEQY1	1200	2740.7	208.2	0.0	0.0	4.48	27.34	27.34	13.67	15262.9
XE	1200	2704.9	201.1	0.0	0.0	4.63	24.34	24.34	12.17	13155.5
XEWT	1200	2611.1	230.4	0.0	0.0	5.05	31.85	31.85	15.93	15777.7
XEWT	1200	2611.1	230.4	0.0	0.0	5.05	31.85	31.85	15.93	15777.7
KEYF	1200	2523.1	243.8	0.0	0.0	5.54	23.5	23.5	11.75	10610.8
XENVA2	1200	2570.9	251.8	0.0	0.0	5.26	15.08	15.08	7.54	7166.4
XENVA2	1200	1992.7	210.1	1.0	1.0	10.52	52.16	52.16	26.08	12392.6
XE	1200	2654.8	193.2	0.0	0.0	4.85	19.7	19.7	9.85	10164.6
XE	1200	2692.4	195.9	0.0	0.0	4.68	20.69	20.69	10.35	11054.
XEPW1	1200	2520.8	204.4	0.0	0.0	5.55	34.63	34.63	17.31	15592.6
XEPW	1200	2524.	204.4	0.0	0.0	5.53	34.48	34.48	17.24	15579.7
YNRP1	1200	3181.3	176.7	0.0	0.0	1.25	4.65	5.18	2.32	9308.1
HOB 31	1200	3813.	167.3	0.0	0.0	.83	7.85	9.12	3.92	23784.5
WQLS	1200	1145.4	170.7	4.6	9.2	33.78	19.42	19.42	4.85	718.6
CRESC	1200	3009.	282.6	0.0	0.0	3.72	16.09	17.47	4.37	5878.8
KYAA	1200	2956.	270.5	0.0	0.0	4.79	6.27	6.49	1.62	1693.8
WPTK	1200	1738.4	161.2	0.8	3.9	17.23	14.65	15.18	3.79	1101.2
WPTK	1200	1738.4	161.2	0.8	3.9	17.23	14.65	15.18	3.79	1101.2
THONO	1200	1585.8	160.3	1.6	5.0	19.94	13.33	15.5	3.87	971.2
DECOR	1200	383.8	299.6	19.7	31.0	149.44	10.46	10.46	9.13	305.9
BOISE	1200	2346.6	284.9	0.0	0.5	6.17	7.21	7.21	1.80	1460.5
WVIV	1200	5.4	.	0.0	0.0	.	10.41	10.41	2.60	1460.5
WKOX	1200	1338.7	81.6	3.1	7.1	19.35	13.36	16.43	4.11	1061.3
WKOX	1200	1338.7	81.6	3.1	7.1	19.35	13.36	16.43	4.11	1061.3
WKOX	1200	1358.6	81.6	3.0	6.9	18.77	12.73	15.87	3.97	1056.5
WKOX	1200	1358.6	81.6	3.0	6.9	18.77	12.73	15.87	3.97	1056.5
WCHB	1200	359.8	79.8	21.0	32.8	162.48	16.82	17.81	3.16	97.2
KXLO	1200	1825.1	296.6	0.4	3.3	9.29	5.75	6.76	1.69	909.7
WSML	1200	935.3	128.4	6.6	12.2	43.94	10.25	11.6	2.90	330.1
KFNW	1200	931.6	310.9	6.7	12.3	35.89	7.24	7.8	3.73	520.4
KINGS	1200	1131.6	84.2	4.7	9.4	27.31	19.66	23.8	5.95	1089.3
WTLA	1200	957.5	76.2	6.4	11.9	36.1	15.94	19.37	4.84	670.8
WRKK	1200	907.7	89.5	7.0	12.7	41.68	20.15	22.4	5.60	671.8
WKST	1200	609.5	95.2	11.9	20.0	80.58	12.86	13.99	2.79	173.1
WGDL	1200	3257.9	136.6	0.0	0.0	5.68	18.14	21.62	5.40	4756.2
WOAI	1200	1649.1	218.3	1.3	4.5	18.52	2.63	3.38	.85	228.1
WAGE	1200	892.3	105.1	7.2	13.0	44.93	11.05	12.47	3.12	347.1
YVOZ	1200	4006.1	143.8	0.0	0.0	.75	11.19	11.19	5.59	37447.3
YVWH	1200	3944.9	152.6	0.0	0.0	.77	16.	16.	8.00	51800.5
CMJQ	1200	2630.1	151.8	0.0	0.0	1.97	7.04	8.38	3.52	8912.4
CMGM	1200	2322.9	159.7	0.0	0.0	2.73	9.96	10.77	4.98	9110.4

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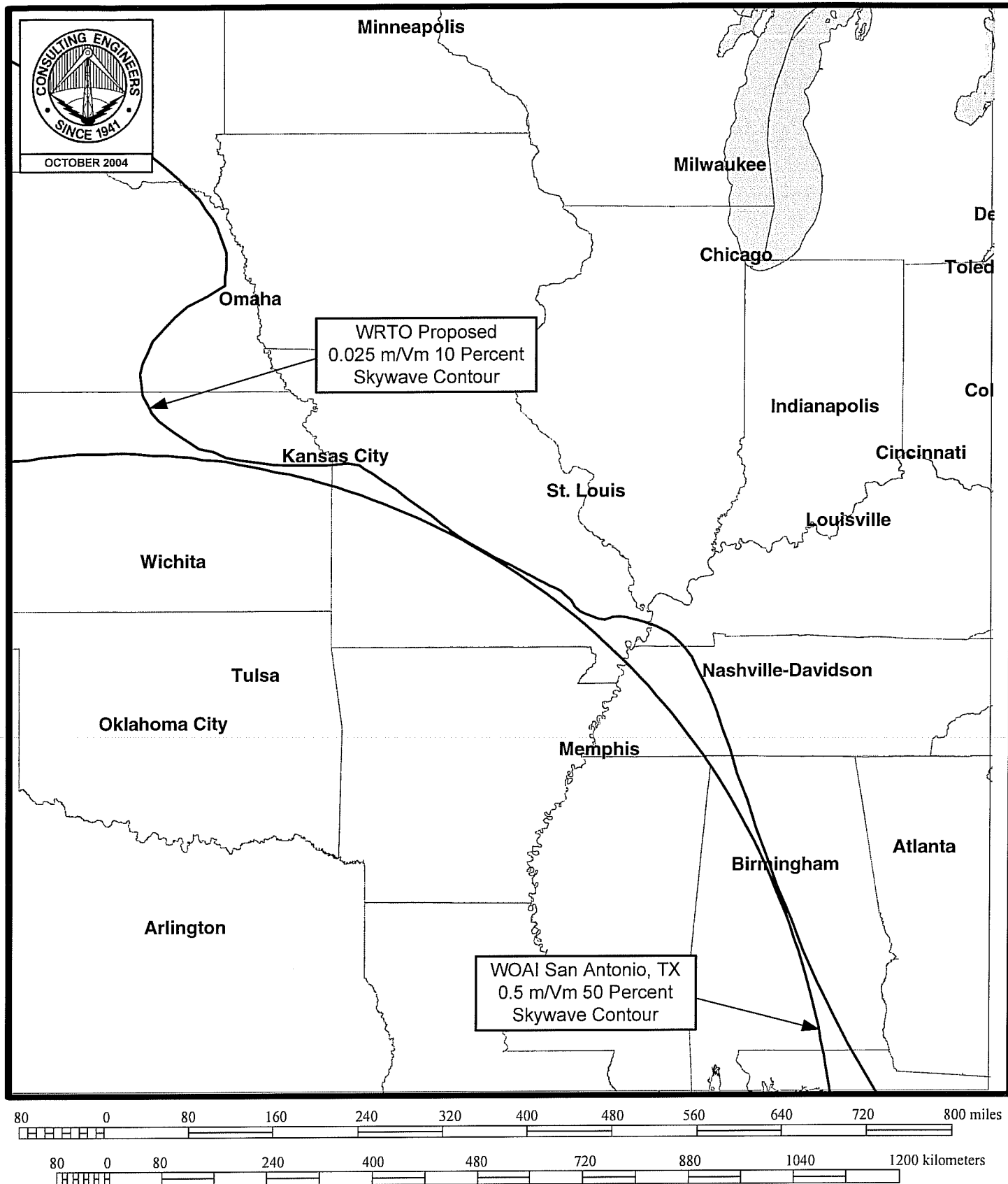
Toward Station	Freq. (kHz)	GC Dist. (km)	Bear (degT)	Angles		Skywav Mult. (mV/m)	50% Ex-RSS (mV/m)	25% Ex-RSS (mV/m)	Req. Prot. (mV/m)	Perm. Vert-Rad mV/m@1km
				Min (deg)	Max (deg)					
CMJQ	1200	2630.1	151.8	0.0	0.0	1.97	7.04	8.38	3.52	8912.4
CMGM	1200	2322.9	159.7	0.0	0.0	2.73	9.96	10.77	4.98	9110.4
NEW	1210	2312.5	253.1	0.0	0.7	9.07	14.07	14.52	3.63	20012.8
KQTL	1210	2323.8	250.1	0.0	0.6	9.19	12.14	12.14	3.03	16515.6
KQEQ	1210	2801.7	269.2	0.0	0.0	5.41	12.07	14.15	3.54	32674.6
KEBR	1210	2861.1	274.7	0.0	0.0	4.78	8.78	10.31	2.58	26956.9
KEBR	1210	2861.1	274.7	0.0	0.0	4.78	8.78	10.31	2.58	26956.9
SANJA	1210	2710.1	260.8	0.0	0.0	6.38	10.91	12.49	3.12	24491.4
KPRZ	1210	2764.9	259.5	0.0	0.0	6.23	7.85	9.84	2.46	19735.3
WNMA	1210	1874.8	156.9	0.2	3.0	15.13	10.73	11.75	2.94	9708.2
WNMA	1210	1874.8	156.9	0.2	3.0	15.13	10.73	11.75	2.94	9708.2
SILVER	1210	1471.	158.2	2.3	5.9	22.44	14.31	14.31	3.58	7971.8
WKTT	1210	1471.	158.2	2.3	5.9	22.44	14.31	14.31	3.58	7971.8
KZOO	1210	6840.1	274.	0.0	0.0	1.03	1.31	1.41	.35	17134.3
WSKR	1210	1274.1	194.6	3.6	7.8	28.68	10.17	10.99	2.75	4789.9
BIXBY	1210	948.7	231.1	6.5	12.0	43.91	7.86	8.42	2.10	2396.9
KGYN	1210	1306.6	249.4	3.3	7.4	24.98	5.37	5.55	1.39	2777.
KGYN	1210	1104.6	233.8	4.9	9.7	34.33	7.42	8.35	2.09	3039.9
KGYN	1210	1085.2	232.8	5.1	10.0	35.39	7.53	8.34	2.09	2945.8
WPHT	1210	1079.	95.8	5.2	10.1	31.42	2.71	3.47	.87	1380.8
WHOY	1210	3321.5	136.	0.0	0.0	5.48	11.9	14.23	3.56	32432.3
KOKK	1210	905.8	292.9	7.0	12.7	40.39	5.37	5.59	1.40	1730.3
WTCK	1210	736.9	195.8	9.4	16.3	66.05	12.18	12.18	3.05	2305.
ABLINE	1210	1483.5	230.1	2.2	5.8	21.44	23.78	24.86	6.22	14497.3
BAYCTY	1210	1594.	210.6	1.6	4.9	19.81	12.33	13.29	3.32	8383.8
DONNA	1210	1957.	212.4	0.0	2.5	14.18	12.2	14.57	3.64	12848.2
FTSTCK	1210	1814.1	233.5	0.5	3.4	15.21	26.55	26.55	6.64	21825.5
HARL	1210	1947.4	211.6	0.0	2.6	14.31	15.83	18.37	4.59	16039.4
SANBE	1210	1947.8	211.6	0.0	2.6	14.31	15.7	18.26	4.56	15950.3
KUBR	1210	1963.4	212.5	0.0	2.5	14.11	12.22	14.62	3.65	12955.2
KUNF	1210	2269.4	265.8	0.0	0.9	8.42	11.06	14.67	3.67	21786.8
KNWX	1210	2787.6	294.8	0.0	0.0	3.34	11.99	13.15	3.29	49159.5
KZTS	1210	2624.1	292.4	0.0	0.0	4.12	9.4	11.1	2.78	33664.
KRSV	1210	1919.3	281.4	0.0	2.8	9.95	16.17	16.17	4.04	20305.3
KKHI	1210	1491.1	274.2	2.2	5.7	17.47	25.56	25.56	6.39	18290.6

PERMISSIBLE RADIATION TOWARD WOAI
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Toward Contour	Freq. (kHz)	GC Dist. (km)	Bear (degT)	Angles		Skywav Mult. (mV/m)	50% Ex-RSS (mV/m)	25% Ex-RSS (mV/m)	Req. Prot. (mV/m)	Perm. Vert-Rad mV/m@1km
				Min (deg)	Max (deg)					
WOAI	1200	930.9	256.0	6.7	12.3	43.09	.50	.50	.50	58.02
WOAI	1200	846.6	253.4	7.7	13.9	50.47	.50	.50	.50	49.53
WOAI	1200	768.	249.9	8.9	15.6	59.16	.50	.50	.50	42.26
WOAI	1200	697.6	245.1	10.1	17.3	68.94	.50	.50	.50	36.26
WOAI	1200	638.5	238.9	11.3	19.1	79.09	.50	.50	.50	31.61
WOAI	1200	594.4	231.2	12.3	20.6	88.18	.50	.50	.50	28.35
WOAI	1200	569.4	222.3	12.9	21.5	94.2	.50	.50	.50	26.54
WOAI	1200	566.2	212.7	13.0	21.6	95.36	.50	.50	.50	26.22
WOAI	1200	585.6	203.5	12.5	20.9	91.37	.50	.50	.50	27.36
WOAI	1200	626.	195.3	11.5	19.5	83.42	.50	.50	.50	29.97
WOAI	1200	683.7	188.5	10.4	17.7	73.68	.50	.50	.50	33.93
WOAI	1200	754.9	183.3	9.1	15.9	63.82	.50	.50	.50	39.17
WOAI	1200	836.3	179.4	7.9	14.1	54.84	.50	.50	.50	45.59
WOAI	1200	925.2	176.6	6.8	12.4	47.07	.50	.50	.50	53.11
WOAI	1200	1019.3	174.7	5.7	10.9	40.57	.50	.50	.50	61.63
WOAI	1200	1117.2	173.6	4.8	9.6	35.18	.50	.50	.50	71.06
WOAI	1200	1217.7	173.0	4.0	8.4	30.74	.50	.50	.50	81.34
WOAI	1200	1320.	172.8	3.3	7.3	27.07	.50	.50	.50	92.36
WOAI	1200	1423.1	173.1	2.6	6.3	24.03	.50	.50	.50	104.03
WOAI	1200	1526.5	173.6	2.0	5.5	21.5	.50	.50	.50	116.31
WOAI	1200	1629.5	174.4	1.4	4.7	19.38	.50	.50	.50	129.00
WOAI	1200	1731.5	175.4	0.9	4.0	17.59	.50	.50	.50	142.10
WOAI	1200	1832.2	176.6	0.4	3.3	16.08	.50	.50	.50	155.50
WOAI	1200	1931.	178.0	0.0	2.7	14.79	.50	.50	.50	169.06
WOAI	1200	2027.5	179.5	0.0	2.2	13.68	.50	.50	.50	182.71
WOAI	1200	2121.3	181.1	0.0	1.6	12.73	.50	.50	.50	196.39
WOAI	1200	2211.8	182.8	0.0	1.2	11.91	.50	.50	.50	210.00
WOAI	1200	2298.9	184.6	0.0	0.8	11.19	.50	.50	.50	223.43
WOAI	1200	2381.7	186.5	0.0	0.4	10.57	.50	.50	.50	236.54
WOAI	1200	2460.6	188.5	0.0	0.0	10.02	.50	.50	.50	249.43
WOAI	1200	2534.7	190.5	0.0	0.0	9.55	.50	.50	.50	261.78
WOAI	1200	2603.6	192.6	0.0	0.0	9.14	.50	.50	.50	273.67
WOAI	1200	2667.8	194.7	0.0	0.0	8.77	.50	.50	.50	285.03
WOAI	1200	2726.	196.8	0.0	0.0	8.46	.50	.50	.50	295.65
WOAI	1200	2778.9	199.0	0.0	0.0	8.18	.50	.50	.50	305.59
WOAI	1200	2825.6	201.3	0.0	0.0	7.94	.50	.50	.50	314.74
WOAI	1200	2866.2	203.5	0.0	0.0	7.74	.50	.50	.50	323.08
WOAI	1200	2900.2	205.8	0.0	0.0	7.57	.50	.50	.50	330.34
WOAI	1200	2928.1	208.1	0.0	0.0	7.42	.50	.50	.50	336.79
WOAI	1200	2949.5	210.4	0.0	0.0	7.3	.50	.50	.50	342.37
WOAI	1200	2964.5	212.7	0.0	0.0	7.21	.50	.50	.50	346.88
WOAI	1200	2972.6	215.0	0.0	0.0	7.14	.50	.50	.50	350.29
WOAI	1200	2974.2	217.3	0.0	0.0	7.09	.50	.50	.50	352.66
WOAI	1200	2969.	219.6	0.0	0.0	7.06	.50	.50	.50	353.96
WOAI	1200	2957.5	221.8	0.0	0.0	7.06	.50	.50	.50	354.21

PERMISSIBLE RADIATION TOWARD WOAI
PROPOSED OPERATION
41-39-43 87-37-49

Toward Station	Freq. (kHz)	GC Dist. (km)	Bear (degT)	Angles		Skywav Mult. (mV/m)	50% Ex-RSS (mV/m)	25% Ex-RSS (mV/m)	Req. Prot. (mV/m)	Perm. Vert-Rad mV/m@1km
				Min (deg)	Max (deg)					
WOAI	1200	2939.2	224.1	0.0	0.0	7.08	.50	.50	.50	353.26
WOAI	1200	2915.	226.3	0.0	0.0	7.12	.50	.50	.50	351.37
WOAI	1200	2884.3	228.6	0.0	0.0	7.18	.50	.50	.50	348.38
WOAI	1200	2848.	230.8	0.0	0.0	7.26	.50	.50	.50	344.35
WOAI	1200	2805.8	232.9	0.0	0.0	7.37	.50	.50	.50	339.31
WOAI	1200	2757.9	235.0	0.0	0.0	7.51	.50	.50	.50	333.07
WOAI	1200	2704.7	237.1	0.0	0.0	7.67	.50	.50	.50	325.86
WOAI	1200	2646.7	239.1	0.0	0.0	7.87	.50	.50	.50	317.74
WOAI	1200	2583.8	241.1	0.0	0.0	8.1	.50	.50	.50	308.49
WOAI	1200	2516.7	243.1	0.0	0.0	8.38	.50	.50	.50	298.47
WOAI	1200	2445.4	244.9	0.0	0.1	8.7	.50	.50	.50	287.39
WOAI	1200	2370.5	246.7	0.0	0.4	9.08	.50	.50	.50	275.45
WOAI	1200	2292.1	248.4	0.0	0.8	9.51	.50	.50	.50	262.83
WOAI	1200	2210.6	250.1	0.0	1.2	10.02	.50	.50	.50	249.40
WOAI	1200	2126.6	251.6	0.0	1.6	10.62	.50	.50	.50	235.49
WOAI	1200	2040.	253.1	0.0	2.1	11.32	.50	.50	.50	220.91
WOAI	1200	1951.2	254.5	0.0	2.6	12.14	.50	.50	.50	205.95
WOAI	1200	1860.8	255.7	0.2	3.1	13.1	.50	.50	.50	190.83
WOAI	1200	1768.9	256.8	0.7	3.7	14.25	.50	.50	.50	175.46
WOAI	1200	1675.7	257.8	1.1	4.3	15.6	.50	.50	.50	160.23
WOAI	1200	1581.7	258.6	1.6	5.0	17.22	.50	.50	.50	145.21
WOAI	1200	1487.	259.2	2.2	5.8	19.15	.50	.50	.50	130.56
WOAI	1200	1392.2	259.6	2.8	6.6	21.48	.50	.50	.50	116.38
WOAI	1200	1297.5	259.7	3.4	7.5	24.29	.50	.50	.50	102.91
WOAI	1200	1203.4	259.5	4.1	8.5	27.7	.50	.50	.50	90.24
WOAI	1200	1110.4	258.9	4.9	9.6	31.86	.50	.50	.50	78.46
WOAI	1200	1019.3	257.7	5.7	10.9	36.94	.50	.50	.50	67.68



PREDICTED COVERAGE CONTOURS

AM STATION WRTO
CHICAGO, ILLINOIS

1200 kHz 20 KW-D 4.5 KW-N DA-2 U

du Treil, Lundin & Rackley, Inc. Sarasota, Florida

RADIO STATION WRTO
CHICAGO, ILLINOIS
1200 HKZ 20 KW-D 4.5 KW-N DA-Z U

WVIV NIGHT LIMIT

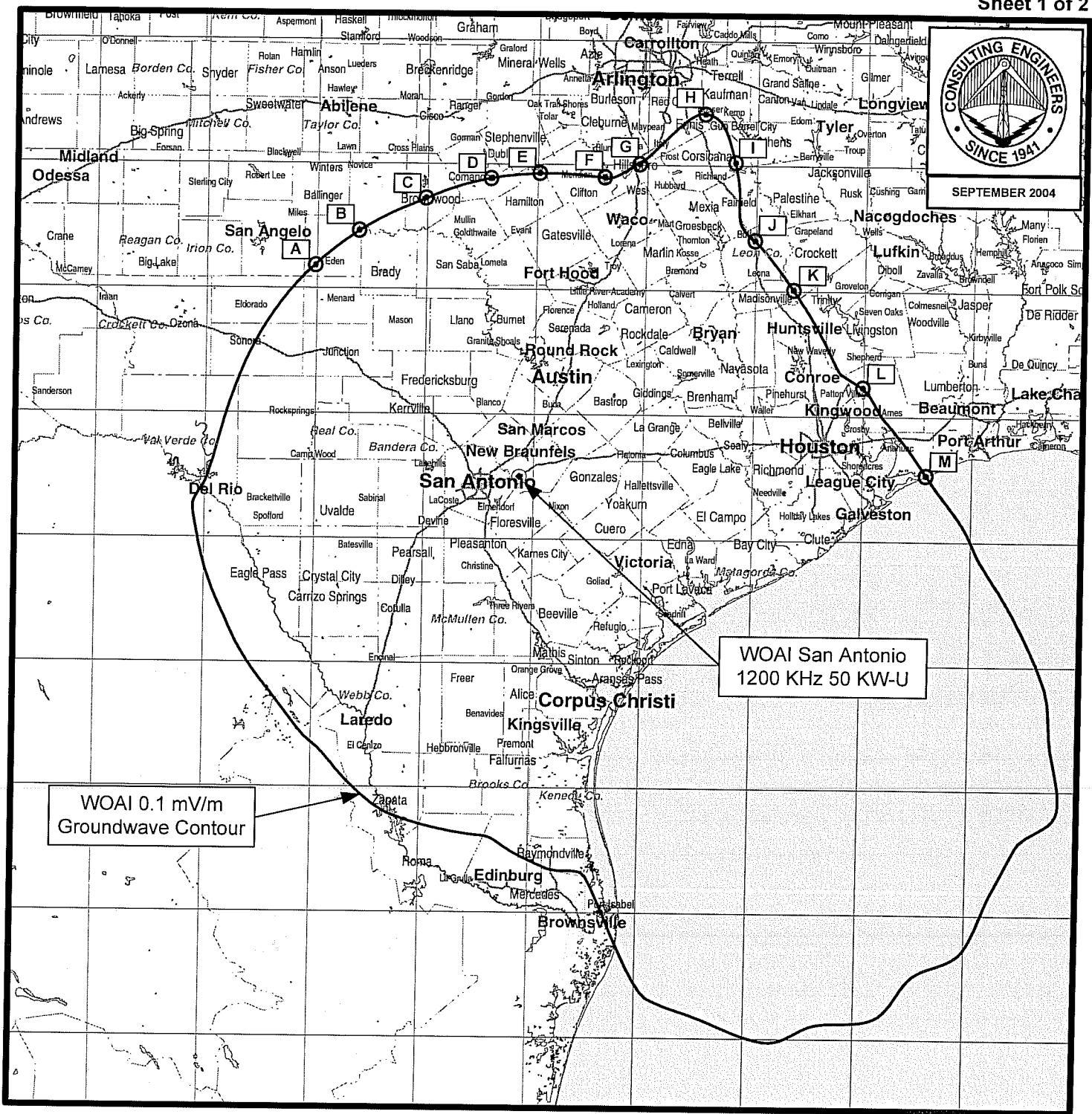
From Station(Call)	WOAI	WOWO	WPHT	WKST	WCHB	KFNW	HJBZ
Frequency(kHz)	1200.000	1190.000	1210.000	1200.000	1200.000	1200.000	1200.000
G.C. Distance(km)	1649.100	204.100	1079.000	609.500	359.800	931.600	3642.500
Slant Distance (km)	1661.164	285.750	1097.410	641.496	411.641	952.814	3648.017
Bearing degrees	32.124	292.007	284.076	279.950	262.647	124.481	339.355
Mid-Pt Latitude(deg)	35.700	41.330	40.990	41.360	41.930	44.330	26.800
Geo. M.P. Lat.	46.000	52.180	52.170	52.380	52.850	54.680	38.100
Min-Angle(deg)	1.270	34.730	5.160	11.910	20.990	6.680	0.000
Max-Angle(deg)	4.520	49.030	10.050	20.030	32.770	12.280	0.000
Horiz. Rad (mV/m)	2833.590	575.870	2742.510	100.650	46.080	146.290	934.800
Max Vert. Rad. (mV/m)	2830.273	314.677	2695.160	97.997	42.825	143.955	934.800
Skywave Mult.	18.519	283.991	31.422	80.578	162.481	35.887	5.276
Night Limit (mV/m)	10.483	1.787	1.694	1.579	1.392	1.033	0.986

PROP.

From Station(Call)	RED GATE	WOWO	WAGE	HJLR	YVOZ	CKOT	YVWH
Frequency(kHz)	1200.000	1190.000	1200.000	1200.000	1200.000	1200.000	1200.000
G.C. Distance(km)	2555.700	204.100	892.300	4245.100	4006.100	586.600	3944.900
Slant Distance (km)	2563.562	285.750	914.437	4249.776	4011.078	619.713	3950.000
Bearing degrees	347.954	292.007	291.626	342.186	333.352	260.620	339.600
Mid-Pt Latitude(deg)	30.520	41.330	40.500	23.890	26.460	42.250	25.540
Geo. M.P. Lat.	41.560	52.180	51.610	35.190	37.870	53.260	36.850
Min-Angle(deg)	0.000	34.730	7.150	0.000	0.000	12.460	0.000
Max-Angle(deg)	0.000	49.030	12.980	0.000	0.000	20.840	0.000
Horiz. Rad (mV/m)	489.300	125.830	92.760	934.800	934.800	58.370	692.000
Max Vert. Rad. (mV/m)	489.300	153.789	94.998	934.800	934.800	40.994	692.000
Skywave Mult.	9.274	283.991	44.927	4.419	4.393	82.877	4.761
Night Limit (mV/m)	0.908	0.873	0.854	0.826	0.821	0.679	0.659

RSS Night Limit to station

50 % Exclusion = 10.483 mV/m from WOAI
25 % Exclusion = 10.483 mV/m from WOAI
0 % Exclusion = 11.372



SEPTEMBER 2004

CRITICAL HOURS STUDY

WOAI 0.1 mV/m PROTECTED CONTOUR

RADIO STATION WRTO
CHICAGO, ILLINOIS
1200 KHz 20 KW-D 4.5 KW-N DA-2 U

du Treil, Lundin & Rackley, Inc. Sarasota, Florida

ENGINEERING EXHIBIT
AMENDMENT TO
APPLICATION FOR CONSTRUCTION PERMIT
WLXX-AM LICENSE CORP.
RADIO STATION WVIV
CHICAGO, ILLINOIS

FACILITY ID 11196

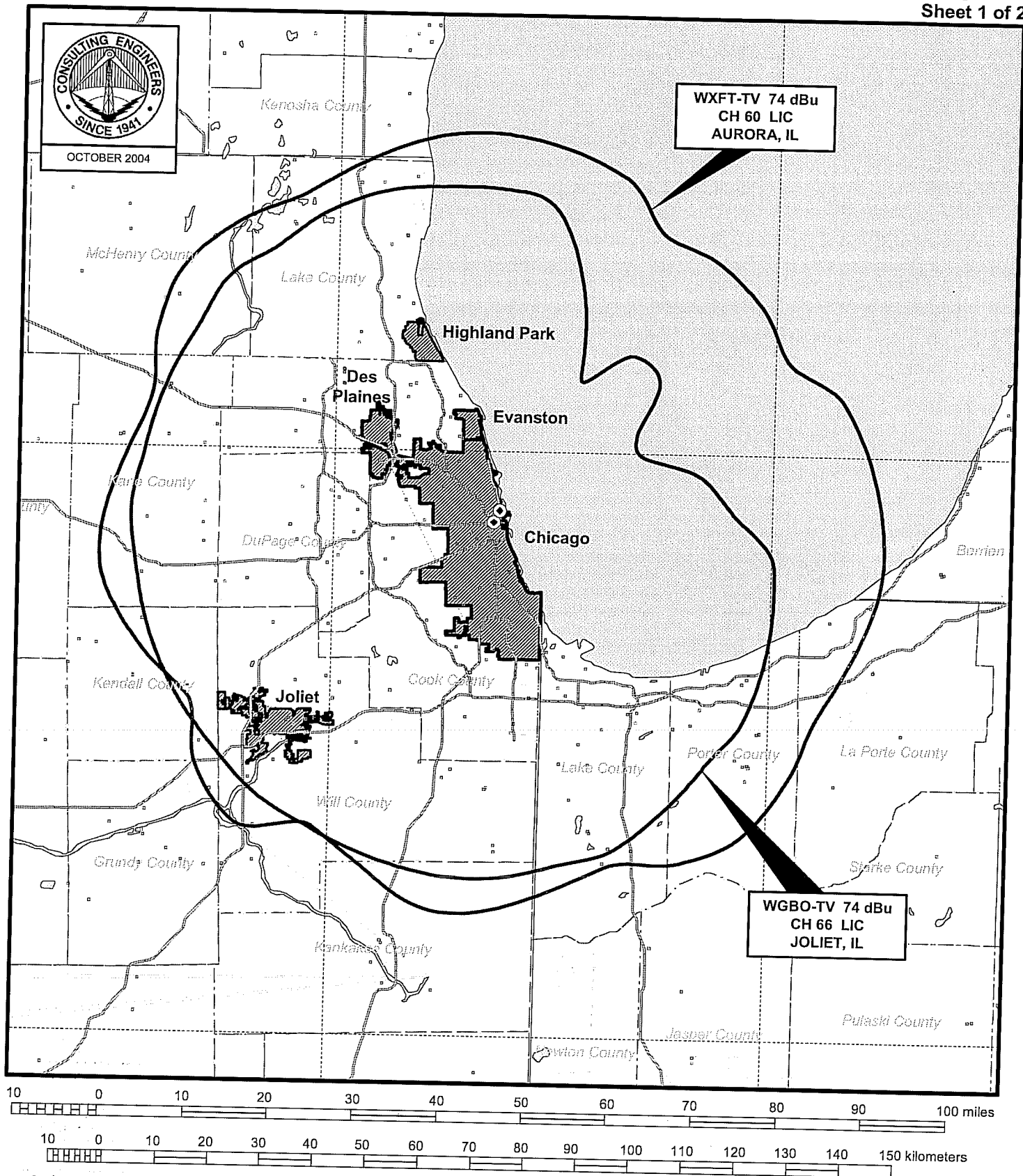
1200 KHZ 20 KW-D 4.5 KW-N U DA-2

Permissible Radiation During
Critical Hours

Point* ID	Geographic Coordinates	From Proposed WVIV to WOAI		Permissible Field (mV/m)	Proposed** Field (mV/m)
		Distance (km)	Az(deg T)		
A	31-11-24 100-00-00	1604.0	227.5	1,415	1,200
B	31-30-36 99-32-24	1548.8	227.1	1,249	1,185
C	31-43-12 99-00-00	1498.0	226.2	1,197	1,152
D	31-54-00 98-27-00	1449.8	225.1	1,131	1,111
E	31-55-12 98-00-00	1421.9	223.8	1,108	1,063
F	31-56-24 97-25-12	1387.4	222.0	1,047	995
G	32-00-00 97-05-24	1363.8	221.1	1,036	961
H	32-27-00 96-29-24	1290.4	220.4	946	934
I	32-00-00 96-11-24	1316.2	218.1	1,009	847
J	31-22-48 96-00-00	1365.4	215.9	1,122	765
K	31-00-00 95-38-24	1385.0	213.7	1,159	685
L	30-13-12 95-00-00	1434.3	209.9	1,346	551
M	29-32-24 94-25-48	1480.4	206.7	1,510	446

* See Sheet 1 of Figure 14

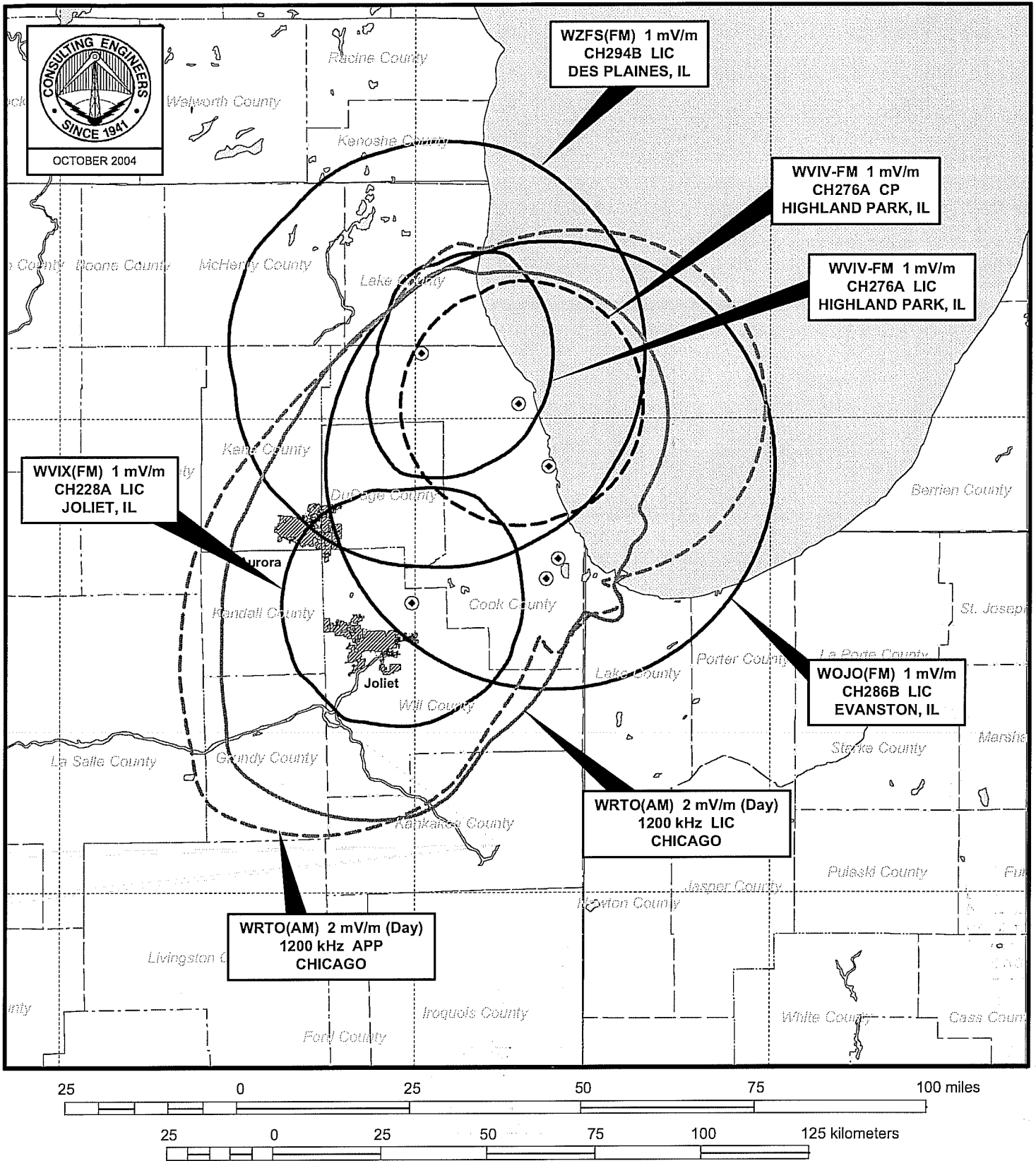
** The highest fields over the elevation arc of interest occur at ground level.



PREDICTED TV GRADE A CONTOURS

RADIO-TELEVISION CROSS OWNERSHIP
CHICAGO, ILLINOIS

du Treil, Lundin & Rackley, Inc. Sarasota, Florida



PREDICTED RADIO STATION CONTOURS

RADIO-TELEVISION CROSS OWNERSHIP
CHICAGO, ILLINOIS

du Treil, Lundin & Rackley, Inc. Sarasota, Florida