

**ENGINEERING EXHIBIT
IN SUPPORT OF AN APPLICATION FOR
MODIFICATION OF CONSTRUCTION PERMIT
STATION WWJ - DETROIT, MICHIGAN
950 kHz - 50 kW, U, DA-2**

Applicant: Infinity Broadcasting Operations, Inc.

MARCH, 2002

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STATEMENT OF JAMES D. SADLER

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**STATEMENT OF JAMES D. SADLER
IN SUPPORT OF AN APPLICATION
FOR MODIFICATION OF CONSTRUCTION PERMIT
STATION WWJ - DETROIT, MICHIGAN
950 kHz - 50 kW, U, DA-2**

Applicant: Infinity Broadcasting Operations, Inc.

I am a Technical Consultant, an employee in the firm of Carl T. Jones Corporation, with offices located in Springfield, Virginia. My qualifications as a technical consultant are a matter of record with the Federal Communications Commission.

Radio Station WWJ, Detroit, Michigan, is licensed to operate on 950 kHz at a power of 5 kW during daytime hours and 50 kW during nighttime hours employing a directional nighttime antenna system. WWJ holds FCC Construction Permit, File Number BP-19990528AB, granted January 13, 2000, which authorizes the co-location of the daytime facilities at the licensed nighttime site, an increase in daytime power to 50 kilowatts and the use of a five-tower directional antenna system for daytime operation¹. The construction permit specifies no changes to the nighttime directional antenna system. WWJ is currently operating with its new daytime facilities at reduced power under special temporary authority.

¹WWJ was issued a license for the 50 kilowatt directional nighttime operation on August 30, 2000 (FCC File Number BL-19990409DC). The 50 kilowatt daytime operation uses five of the six antennas used in the nighttime antenna system.

This office has been authorized by Infinity Broadcasting Operations, Inc., licensee of Radio Station WWJ, Detroit, Michigan, to prepare this engineering statement, Section III-A of FCC Form 301, and the associated exhibits in support of an Application for Modification of Construction Permit. By means of this minor change application, it is proposed to modify the daytime directional antenna pattern by adding augmentation over three spans. Data provided in the simultaneously filed Application for License supports the proposed directional antenna pattern modification. No other changes are proposed. No actual construction is proposed in the instant application.

DIRECTIONAL ANTENNA PATTERN MODIFICATION

During the adjustment of the daytime directional antenna pattern, it was determined that the radiation on the 50° and 183° monitored radial bearings could not be reduced below the daytime authorized standard pattern values specified in the construction permit. On the 211.5° monitored radial, the measured inverse distance field is within 7 percent of the corresponding standard pattern value for that direction. As a result, it is proposed to augment the daytime directional antenna pattern in the following manner:

Proposed Daytime Pattern Augmentation

<u>Central Azimuth (deg. T.)</u>	<u>Span (deg. T.)</u>	<u>Authorized Radiation (mV/m)</u>	<u>Proposed Radiation (mV/m)</u>
50	20	114.9	288.1
183	30	113.1	142.8
211.5	25	149.5	166.4

The daytime horizontal plane modified standard pattern radiation has been calculated in accordance with the equations set forth in Section 73.150 and Section 73.152 of the FCC Rules. A polar plot and tabulation of the proposed daytime horizontal plane modified standard radiation pattern are contained herein as Figures 1 and 2, respectively.

DAYTIME ALLOCATION STUDY

Stations requiring particular study in the spans of augmentation and the pertinent field strength contours associated with those stations are shown on Figures 3 through 6. Detailed station data employed in the daytime allocation study is provided in Figure 7. All field strength contours were calculated using the "equivalent distance" method for paths consisting of more than one conductivity. Conductivity data employed in the calculation of field strength contours was obtained from FCC Figure M-3 and the Agreement Between the Government of the United States of American and the Government of Canada Relating to the AM Broadcasting Service in the Medium Frequency Band, Ottawa, 1984.

The licensed daytime operation of WWJ has existing prohibited overlap of field strength contours with all four stations addressed herein. In accordance with the Rules, the proposed facility will either eliminate or provide a net decrease in the area of overlap with the four stations. With the exception of these stations, prohibited overlap of field strength contours is not predicted to occur with any other existing or proposed station.

DAYTIME TOWER NUMBER DESIGNATIONS

It is proposed to modify the daytime tower number designations issued in the daytime construction permit, in order to reduce confusion in the WWJ tower numbering scheme and provide some agreement between the daytime and the nighttime directional antenna numbering. The authorized and proposed daytime tower number designations and associated tower registration numbers follows:

<u>Authorized Day</u>			<u>Proposed Day</u>		
<u>Tower Number</u>	<u>Description</u>	<u>Registration Number</u>	<u>Tower Number</u>	<u>Description</u>	<u>Registration Number</u>
1	North-Center	1029784	1	North-Center	1029784
2	Northwest	1029786	2	Northwest	1029786
3	South-Center	1029787	3	Southwest	1029789
4	Southeast	1029788	4	South-Center	1029787
5	Southwest	1029789	5	Southeast	1029788

ENVIRONMENTAL CONSIDERATIONS

There are no physical modifications proposed to the authorized facility; therefore, the proposal is categorically excluded from environmental processing per Section 47 CFR 1.1306 of the Rules.

SUMMARY

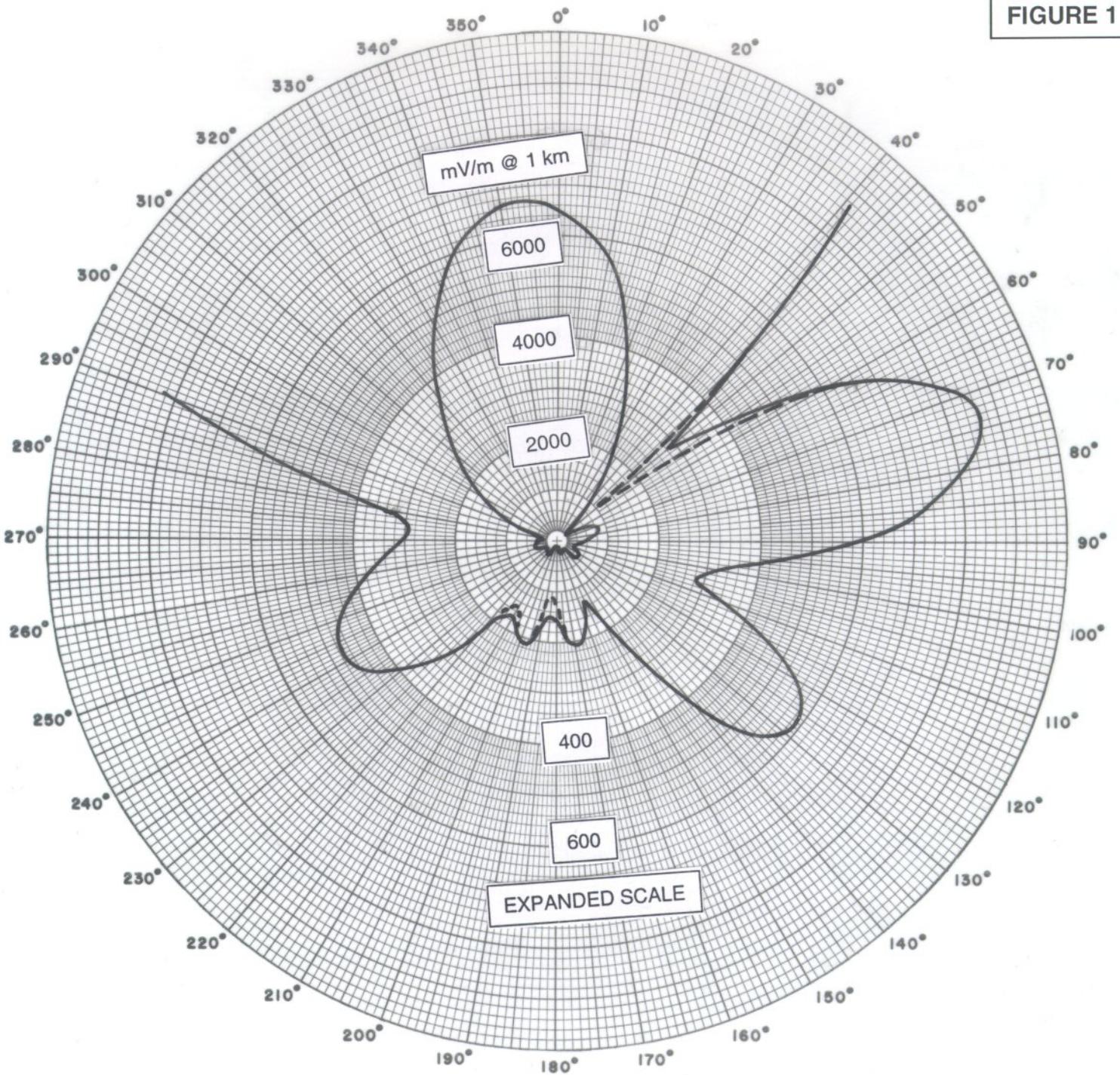
It is submitted that this statement, FCC Form 301, Section III-A, and the attached exhibits comply with the Rules and Regulations of the Federal Communications Commission, that they were prepared by me or under my direct supervision and are believed to be true and correct.

DATED: March 8, 2002

James D. Sadler

Carl T. Jones Corporation
7901 Yarnwood Court
Springfield, Virginia 22153
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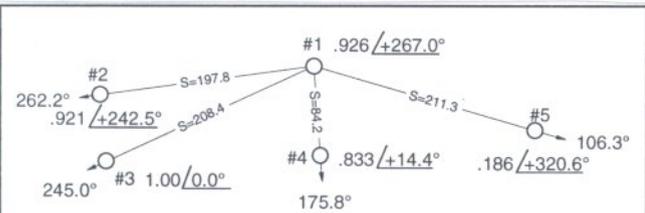
FIGURE 1



MODIFIED PATTERN ———
 STANDARD PATTERN - - - - -
 WITHIN MODIFIED

PATTERN AUGMENTATION

AZ (deg. T)	SPAN (deg.)	FIELD (mV/m)
50	20	288.1
183	30	142.8
211.5	25	166.4



**PROPOSED DAYTIME HORIZONTAL PLANE
 MODIFIED STANDARD RADIATION PATTERN**

WWJ - DETROIT, MICHIGAN
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THEO RSS = 3302 mV/m
 THEO RMS = 2392 mV/m
 MOD STD RMS = 2514 mV/m
 TOWER HEIGHT - 1, 4 = 168'
 2, 3, 5 = 138'

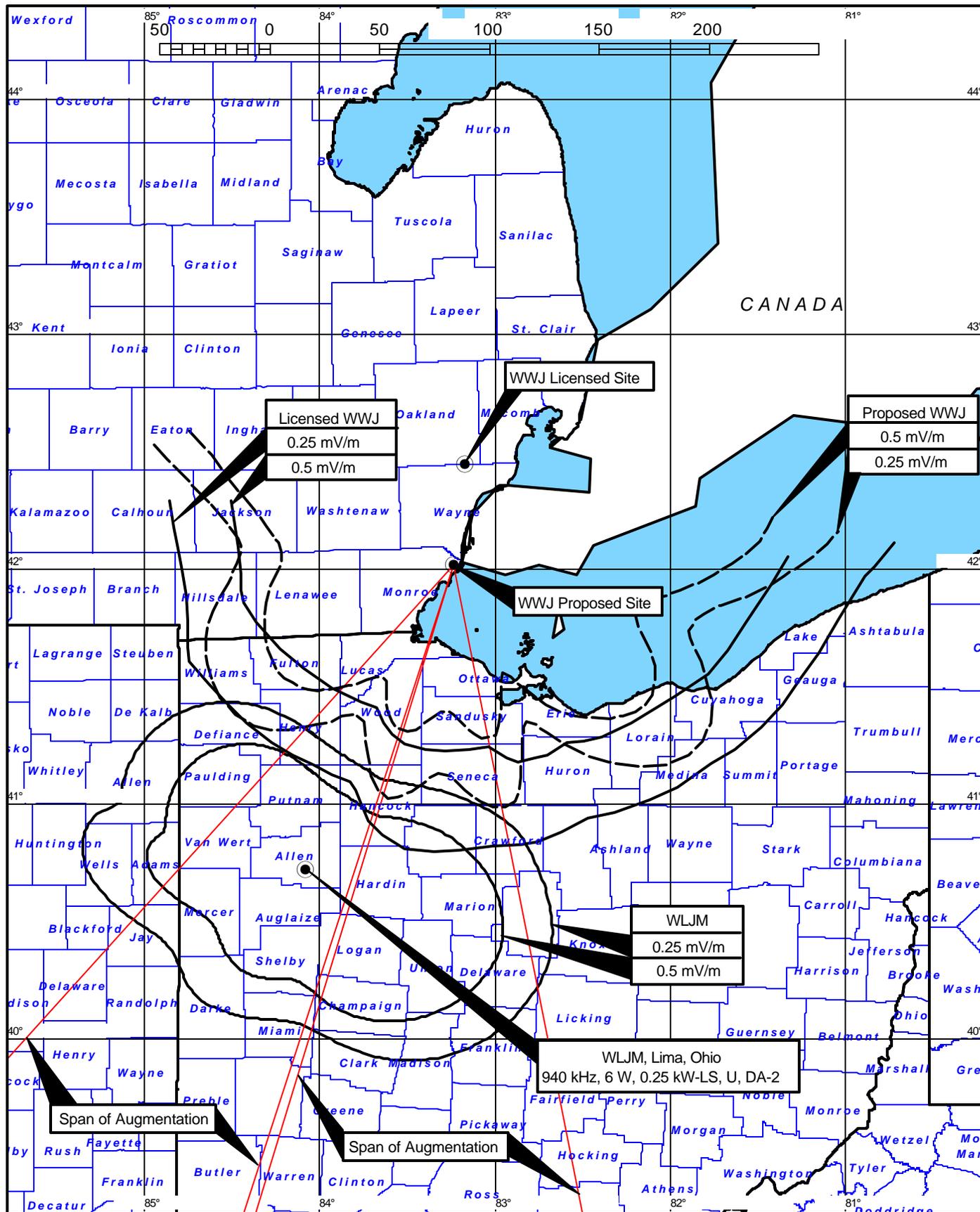
CENTER OF ARRAY
 NORTH LATITUDE: 42° 01' 09"
 WEST LONGITUDE: 83° 14' 23"

CARL T. JONES CORPORATION

**TABULATION OF PROPOSED DAYTIME
HORIZONTAL PLANE MODIFIED RADIATION PATTERN
STATION WWJ - DETROIT, MICHIGAN
950 kHz - 50 kW, U, DA-2**

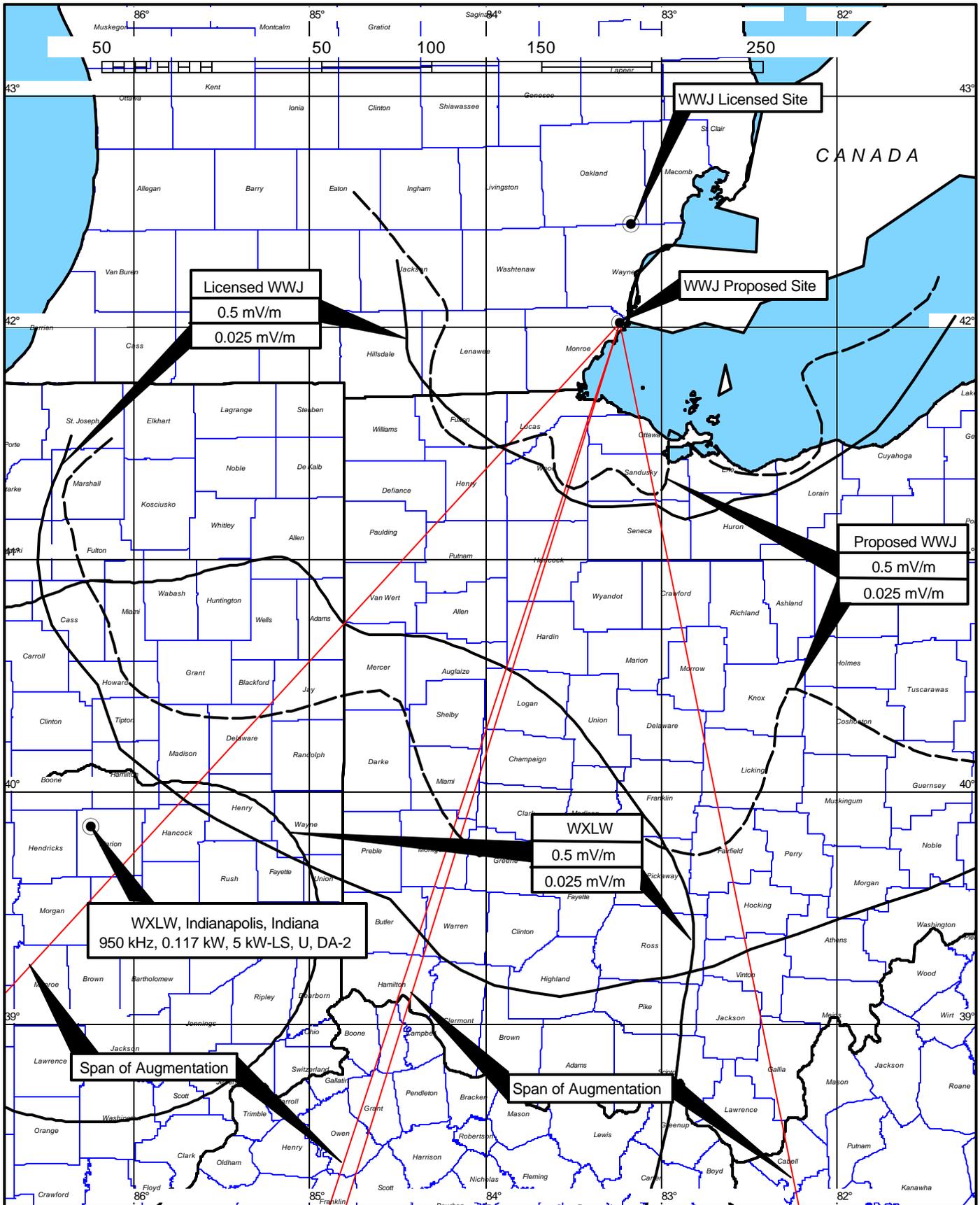
Azimuth (deg)	Radiation at 1 kilometer			Azimuth (deg)	Radiation at 1 kilometer		
	Theoretical (mV/m)	Standard (mV/m)	Modified (mV/m)		Theoretical (mV/m)	Standard (mV/m)	Modified (mV/m)
0.00	6169.39	6478.44		180.00	88.98	127.45	152.02
5.00	5805.21	6096.08		185.00	75.80	117.68	145.30
10.00	5265.94	5529.92		190.00	128.30	160.19	172.78
15.00	4591.59	4821.95		195.00	171.20	199.57	201.38
20.00	3833.26	4025.85		200.00	179.99	207.93	208.13
25.00	3045.15	3198.59		205.00	154.55	183.98	190.65
30.00	2277.00	2392.42		210.00	119.38	152.40	168.44
35.00	1568.30	1649.00		215.00	135.71	166.79	179.40
40.00	945.75	996.81		220.00	211.33	238.23	240.81
45.00	424.49	454.06	490.99	225.00	298.01	324.70	
50.00	71.79	114.88	288.10	230.00	370.21	398.27	
55.00	336.64	363.95	409.10	235.00	417.36	446.71	
60.00	567.66	602.31		240.00	437.26	467.24	
65.00	719.07	759.99		245.00	433.63	463.49	
70.00	797.85	842.21		250.00	413.50	442.74	
75.00	812.03	857.02		255.00	384.15	412.57	
80.00	770.20	813.34		260.00	350.28	377.87	
85.00	682.20	721.53		265.00	313.75	340.65	
90.00	560.44	594.81		270.00	279.85	306.37	
95.00	422.82	452.35		275.00	273.41	299.88	
100.00	301.73	328.47		280.00	342.70	370.13	
105.00	258.81	285.25		285.00	509.84	542.31	
110.00	321.02	348.04		290.00	762.89	805.71	
115.00	420.78	450.24		295.00	1089.33	1147.08	
120.00	504.97	537.25		300.00	1480.63	1557.07	
125.00	550.17	584.15		305.00	1929.20	2027.52	
130.00	546.52	580.36		310.00	2427.16	2549.99	
135.00	493.03	524.89		315.00	2965.71	3115.20	
140.00	396.91	425.67		320.00	3534.20	3711.92	
145.00	273.58	300.05		325.00	4118.25	4325.04	
150.00	149.64	179.45		330.00	4697.42	4933.05	
155.00	92.31	130.04		335.00	5243.38	5506.23	
160.00	142.65	173.06		340.00	5720.05	6006.67	
165.00	186.60	214.25		345.00	6086.46	6391.38	
170.00	188.05	215.64	216.40	350.00	6302.47	6618.16	
175.00	148.42	178.33	187.62	355.00	6335.88	6653.23	

Figure 3



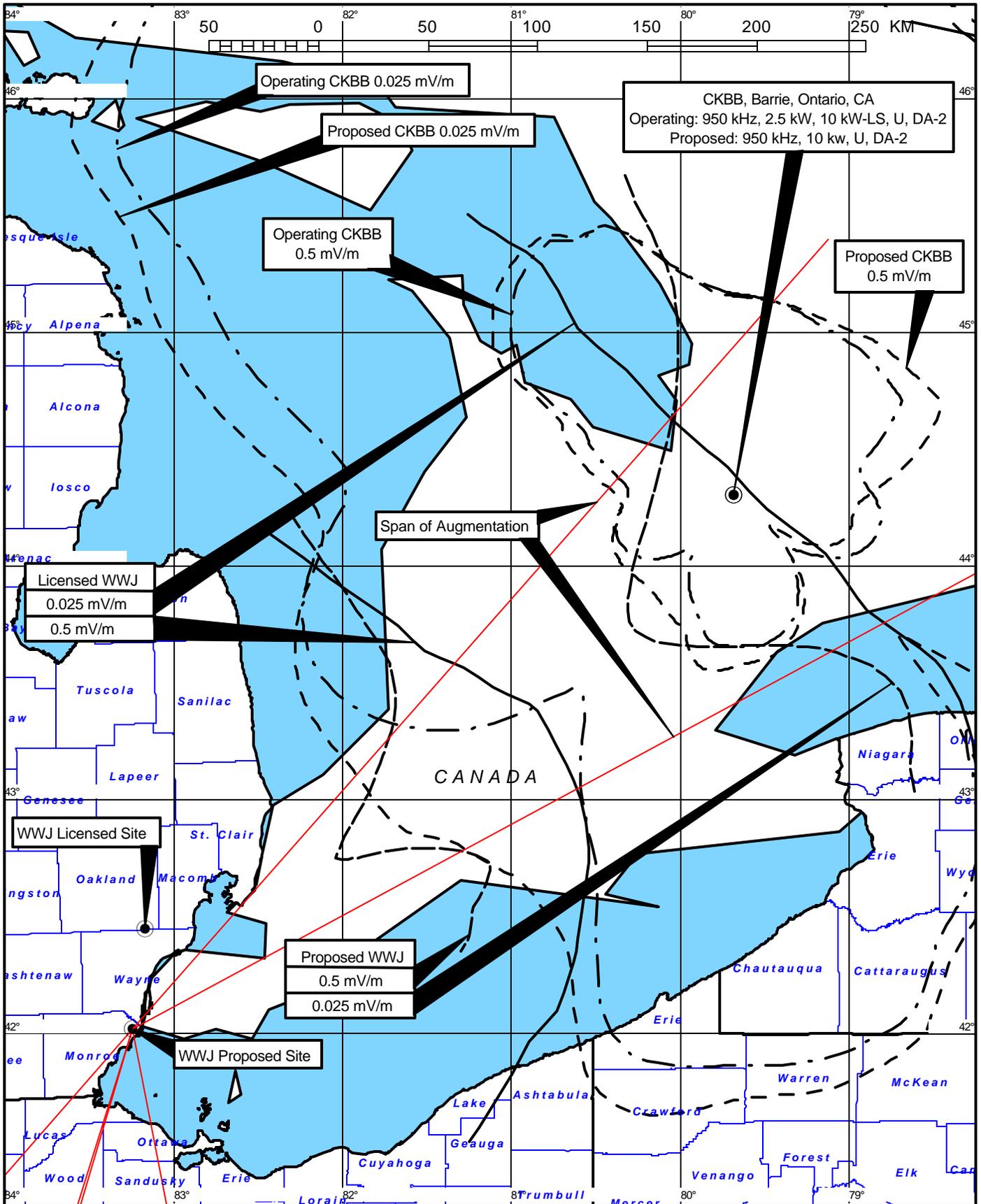
DAYTIME ALLOCATION STUDY - STATION WLJM
 STATION WWJ, DETROIT, MICHIGAN
 950 kHz, 50 kW, U, DA-2
 MARCH, 2002

Figure 4



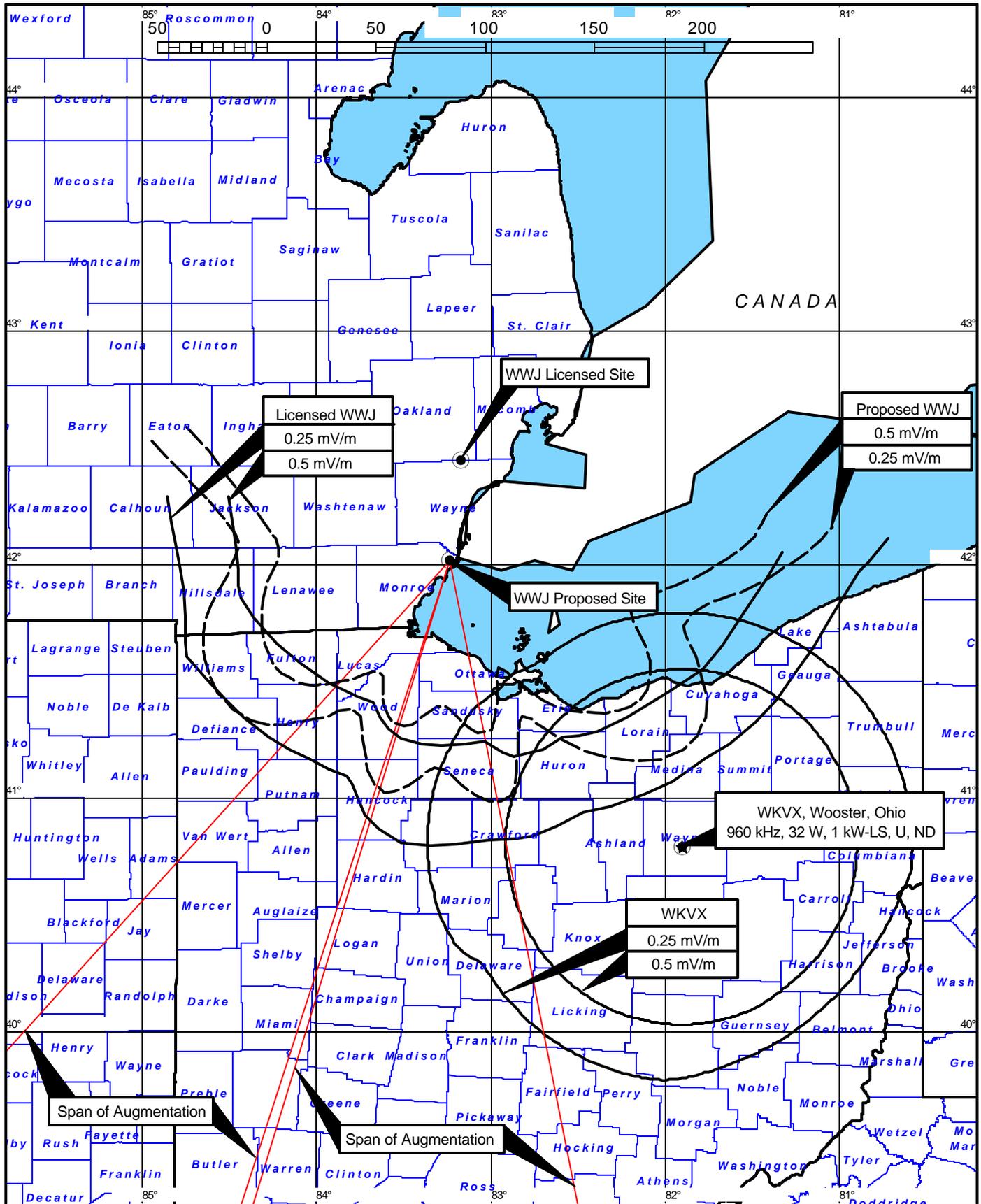
DAYTIME ALLOCATION STUDY - STATION WXLW
STATION WWJ, DETROIT, MICHIGAN
950 kHz, 50 kW, U, DA-2
MARCH, 2002

Figure 5



DAYTIME ALLOCATION STUDY - STATION CKBB
STATION WWJ, DETROIT, MICHIGAN
950 kHz, 50 kW, U, DA-2
MARCH, 2002

Figure 6



DAYTIME ALLOCATION STUDY - STATION WKVX
 STATION WWJ, DETROIT, MICHIGAN
 950 kHz, 50 kW, U, DA-2
 MARCH, 2002

**DAYTIME ALLOCATION STUDY
DETAILED STATION DATA
STATION WWJ - DETROIT, MICHIGAN
950 kHz - 50 kW, U, DA-2**

Station WLJM, Lima, Ohio
BL-820811AB
940 kHz, 0.006 kW, 0.25 kW-LS, U, DA-2

40° 43' 21" North Latitude
84° 05' 04" West Longitude

Daytime Theoretical RMS = 141.54 mV/m

<u>Tower Number</u>	<u>Field Ratio</u>	<u>Phase (deg)</u>	<u>Spacing (deg)</u>	<u>Orientation (deg T)</u>	<u>Height (deg)</u>
1	1.00	0.0	0.0	0.0	82.4
2	0.60	-11.5	186.0	33.0	82.4

Station WXLW, Indianapolis, Indiana
950 kHz, 0.117 kW, 5 kW-LS, U, DA-2

39° 51' 05" North Latitude
86° 14' 39" West Longitude

Daytime Parameters
Theoretical RMS = 704.89 mV/m

<u>Tower Number</u>	<u>Field Ratio</u>	<u>Phase (deg)</u>	<u>Spacing (deg)</u>	<u>Orientation (deg T)</u>	<u>Height (deg)</u>
1	0.50	-107.6	0.0	0.0	83.5
2	0.97	1.25	90.0	0.0	83.5
3	0.50	107.6	180.0	0.0	83.5

Pattern Augmentation

<u>Azimuth (deg T)</u>	<u>Span (deg)</u>	<u>Radiation (mV/m)</u>	<u>Azimuth (deg T)</u>	<u>Span (deg)</u>	<u>Radiation (mV/m)</u>
0.0	14.0	30.09	270.0	40.0	473.15
8.0	14.0	28.16	300.0	20.0	69.20
15.0	14.0	28.16	310.0	14.0	39.59
26.0	20.0	32.19	317.0	14.0	40.23
36.0	14.0	39.27	324.0	14.0	39.91
43.0	14.0	40.23	335.0	20.0	32.19
50.0	14.0	40.23	345.0	16.0	28.16
60.0	20.0	72.42	353.0	14.0	28.97

Station CKBB, Barrie, Ontario, Canada
Operating Notification
950 kHz, 2.5 kW, 10 kW-LS, U, DA-2

44° 18' 06" North Latitude
79° 40' 56" West Longitude

Daytime Parameters
Theoretical RMS = 957.56 mV/m

<u>Tower Number</u>	<u>Field Ratio</u>	<u>Phase (deg)</u>	<u>Spacing (deg)</u>	<u>Orientation (deg T)</u>	<u>Height (deg)</u>
1	1.00	0.0	0.0	0.0	90.0
2	1.77	155.0	70.0	176.0	90.0
3	1.00	320.0	130.0	176.0	90.0

Station CKBB, Barrie, Ontario, Canada
Proposed Notification
950 kHz, 10 kW, U, DA-2

44° 18' 06" North Latitude
79° 40' 56" West Longitude

Daytime Parameters
Theoretical RMS = 1055.0 mV/m

<u>Tower Number</u>	<u>Field Ratio</u>	<u>Phase (deg)</u>	<u>Spacing (deg)</u>	<u>Orientation (deg T)</u>	<u>Height (deg)</u>
1	1.000	0.0	0.0	0.0	90.0
2	0.484	127.8	166.66	170.8	90.0
3	0.669	-144.3	107.0	6.0	90.0

Station WKVX, Wooster, Ohio
960 kHz, 0.032 kW, 1kW-LS, U

40° 47' 31" North Latitude
81° 54' 17" West Longitude

Theoretical RMS = 333.13 mV/m
Tower Height = 132.5°