



# **OWL ENGINEERING & EMC TEST LABS, INC.**

CONSULTING COMMUNICATIONS ENGINEERS - EMC TEST LABORATORIES

MINNESOTA OFFICE  
5844 Hamline Avenue North, Shoreview, MN 55126  
651-784-7445 • Fax 651-784-7541

800-797-1338

**ENGINEERING EXHIBIT FOR AN  
APPLICATION FOR A CONSTRUCTION PERMIT  
CHANNEL 285 CLASS A WLXR-FM  
MISSISSIPPI VALLEY BROADCASTERS, LLC  
LA CROSSE, WISCONSIN  
REQUEST PROCESSING UNDER SECTION 73.215**

**CHANNEL 285 0.8 KW (H&V) 207 METERS HAAT**

**September 12, 2006**



# **OWL ENGINEERING & EMC TEST LABS, INC.**

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**ENGINEERING STATEMENT**

This engineering exhibit, of which this Statement is a part, was prepared in accordance with the Rules and Regulations of the Federal Communications Commission and pursuant to the provisions of Section III-B of FCC Form 301 on behalf of Mississippi Valley Broadcasters, LLC (hereafter "**MVB**") in support of an application for authority to modify an existing FM broadcast facility (WLXR) Class A operating on channel 285 (104.9 MHz) at La Crosse, Wisconsin. The purpose of this application is to change the antenna location, effective radiated power to 0.8 KW, both in the horizontal and vertical plane, and the antenna center of radiation to 207 meters above the average terrain. This power/height combination is an allowable Class A facility permitted under the current rules and regulations. The proposed antenna location is 4 km from the currently licensed facility.

"**MVB**" proposes to operate from a site uniquely described by the geographic coordinates:

**(NAD 27)**

43° 43' 17" North Latitude  
91° 17' 24" West Longitude

**(NAD 83)**

N 43° 43' 16.9" North Latitude  
W 91° 17' 24.5" West Longitude

Notification to the FAA Great Lakes Regional office was done on September 12, 2006 and a copy of the notification is included as Engineering Figure 5. An application for a construction permit for modification of a commonly-owned radio station KQEG is being filed simultaneously to propose location on the same tower.

Engineering Figure 1 is a portion of the Brownsville, Minnesota 7.5 minute map that shows the exact location of the proposed site. A search was performed for the presence of any other communications facilities located nearby and none were found.



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**COVERAGE CONTOURS**

The three-to-sixteen-kilometer average terrain elevations were derived from the Defense Mapping Agency 3-second topography database.

The effective antenna radiation center height for each of the eight standard 45-degree spaced radials was used in conjunction with the F(50,50) metric curves of Figure 1 of Section 73.333 of the Rules to determine the distances to the 70 dBu and 60 dBu coverage contours. The contours drawn from the data are depicted on the map included as Engineering Figure 3. Although the proposed 70 dBu contour will not encompass all of La Crosse, Wisconsin, more than 80% of La Crosse will have 70 dBu coverage, in accordance with current FM application processing policies.

**DISTANCE TO CONTOURS**

DISTANCES TO CONTOURS (Kilometers):  
 Antenna COR elevation (AMSL): 466 meters      Average HAAT: 201 meters  
 Frequency: 104.9000 MHz  
 Coordinates: N 43 43 17.00      W 91 17 24.00  
 F(50,10) Curves      Number of Contours: 2

AZ (degs)	HAAT (m)	ERPd (kW)	CONTOUR LEVELS (dBu):	
			70.0	60.0
0.0	262	0.8000	16.2	29.9
45.0	218	0.8000	14.8	27.3
90.0	204	0.8000	14.2	26.4
135.0	222	0.8000	14.9	27.5
180.0	193	0.8000	13.8	25.6
225.0	155	0.8000	12.3	22.9
270.0	166	0.8000	12.8	23.7
315.0	190	0.8000	13.7	25.4

**POPULATION AND AREA DATA**

Based on the 2000 U.S. Census of Population, the numbers of persons enclosed by the proposed 60 dBu coverage contour are 115,453 persons. The population count was made through the employment of a computer program containing a database including the geographic coordinates of the centroids of population groupings. The area within the proposed 60 dBu coverage contour is 2,426 square kilometers. A computerized integration program determined this area.

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**Interference Study**

The spacing study shows that the proposed new tower site will have several predicted short-spaced conditions with WNFM, WFBZ and KVIK. The short-spaced conditions with WNFM and WFBZ are eliminated by a mutual agreement between the stations. The short-spaced condition with KVIK is eliminated by the use of contour protection using the provisions of Section 73.215. Figure 4 shows the interference contours between the proposed new location of WLXR and KVIK. Figure 4A is an expanded view to show that no overlap occurs. The contour to distance data is tabulated below.

**Proposed WLXR Contours**

**F(50,50) Contours**

DISTANCES TO CONTOURS (Kilometers):  
 Antenna COR elevation (AMSL): 466 meters      Average HAAT: 201 meters  
 Frequency: 104.9000 MHz  
 Coordinates: N 43 43 17.00      W 91 17 24.00  
 F(50,50) Curves      Number of Contours: 1

AZ (degs)	HAAT (m)	ERPd (kW)	CONTOUR LEVELS (dBu): 60.0
210.0	176	0.8000	23.3
211.0	178	0.8000	23.4
212.0	177	0.8000	23.4
213.0	174	0.8000	23.2
214.0	173	0.8000	23.1
215.0	173	0.8000	23.1
216.0	172	0.8000	23.1
217.0	171	0.8000	23.0
218.0	167	0.8000	22.7
219.0	166	0.8000	22.6
220.0	166	0.8000	22.6
221.0	162	0.8000	22.4
222.0	159	0.8000	22.1
223.0	156	0.8000	21.9
224.0	154	0.8000	21.8
225.0	155	0.8000	21.9
226.0	155	0.8000	21.9
227.0	152	0.8000	21.7
228.0	152	0.8000	21.7
229.0	151	0.8000	21.6
230.0	149	0.8000	21.4
231.0	149	0.8000	21.4
232.0	148	0.8000	21.4
233.0	145	0.8000	21.1
234.0	143	0.8000	21.0
235.0	142	0.8000	20.9

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**F(50,10) Contours**

DISTANCES TO CONTOURS (Kilometers):

Antenna COR elevation (AMSL): 466 meters      Average HAAT: 201 meters

Frequency: 104.9000 MHz

Coordinates: N 43 43 17.00      W 91 17 24.00

F(50,10) Curves      Number of Contours: 1      7

AZ (degs)	HAAT (m)	ERPd (kW)	CONTOUR LEVELS (dBu): 54.0
210.0	176	0.8000	34.4
211.0	178	0.8000	34.6
212.0	177	0.8000	34.5
213.0	174	0.8000	34.2
214.0	173	0.8000	34.1
215.0	173	0.8000	34.1
216.0	172	0.8000	34.1
217.0	171	0.8000	33.9
218.0	167	0.8000	33.6
219.0	166	0.8000	33.4
220.0	166	0.8000	33.4
221.0	162	0.8000	33.1
222.0	159	0.8000	32.7
223.0	156	0.8000	32.4
224.0	154	0.8000	32.3
225.0	155	0.8000	32.3
226.0	155	0.8000	32.4
227.0	152	0.8000	32.1
228.0	152	0.8000	32.1
229.0	151	0.8000	32.0
230.0	149	0.8000	31.8
231.0	149	0.8000	31.8
232.0	148	0.8000	31.7
233.0	145	0.8000	31.3
234.0	143	0.8000	31.2
235.0	142	0.8000	31.0

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**KVIK Contours**

**F(50,50) Contours**

DISTANCES TO CONTOURS (Kilometers):  
 Antenna COR elevation (AMSL): 518 meters Average HAAT: 178 meters  
 Frequency: 104.7000 MHz  
 Coordinates: N 43 17 13.00 W 91 53 3.00  
 F(50,50) Curves Number of Contours: 1 7

AZ (degs)	HAAT (m)	ERPd (kW)	CONTOUR LEVELS (dBu): 60.0
35.0	197	1.9500	30.0
36.0	198	1.9500	30.1
37.0	202	1.9500	30.3
38.0	205	1.9500	30.5
39.0	206	1.9500	30.6
40.0	205	1.9500	30.5
41.0	204	1.9500	30.5
42.0	203	1.9500	30.4
43.0	203	1.9500	30.4
44.0	203	1.9500	30.4
45.0	202	1.9500	30.3
46.0	202	1.9500	30.3
47.0	201	1.9500	30.2
48.0	201	1.9500	30.2
49.0	202	1.9500	30.3
50.0	203	1.9500	30.4

**F(50,10) Contours**

DISTANCES TO CONTOURS (Kilometers):  
 Antenna COR elevation (AMSL): 518 meters Average HAAT: 178 meters  
 Frequency: 104.7000 MHz  
 Coordinates: N 43 17 13.00 W 91 53 3.00  
 F(50,10) Curves Number of Contours: 1 7

AZ (degs)	HAAT (m)	ERPd (kW)	CONTOUR LEVELS (dBu): 54.0
35.0	197	1.9500	44.8
36.0	198	1.9500	44.9
37.0	202	1.9500	45.3
38.0	205	1.9500	45.7
39.0	206	1.9500	45.8
40.0	205	1.9500	45.7
41.0	204	1.9500	45.6
42.0	203	1.9500	45.5
43.0	203	1.9500	45.4
44.0	203	1.9500	45.4
45.0	202	1.9500	45.4
46.0	202	1.9500	45.3
47.0	201	1.9500	45.2
48.0	201	1.9500	45.2
49.0	202	1.9500	45.3
50.0	203	1.9500	45.4

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**ANSI Power Density Calculations**

The proposed antenna will be energized such that it produces an effective radiated power of 0.8 kW from a center of radiation 139 meters above ground level. There is also another FM station proposed to be located on the tower KQEG. Using the FCC FM Model program the maximum RF Radiation level assuming the combined power levels of KQEG and WLXR with type 3 antennas the predicted radiation levels are:

<b>STATION</b>	<b>Power Density (<math>\mu\text{w}/\text{cm}^2</math>)</b>	<b>% of maximum uncontrolled</b>
KQEG	16.2	8.13
WLXR	.44	2.2
<b>TOTAL</b>	<b>20.6</b>	<b>10.33</b>

Based on the calculations it was determined that the RF radiation would be only 10.33% of the uncontrolled limit.

Access to RF circuitry is restricted by a metal fence that surrounds the property that limits access to the public. Signs are posted warning of the potential danger. When persons require access to the site, tower or antenna for maintenance purposes, the transmitter power will be reduced or completely eliminated to comply with ANSI guidelines. Hence, the conditions of Section 1.1306(b)(3) would not be involved.

**ENVIRONMENTAL IMPACT STATEMENT**

The instant proposal satisfies the following conditions for exclusion from environmental processing under Section 1.1306(b)(2) and (3):

- 1) The site proposed is not in or near any location referenced in Section 1.1306(b)(1) as being of environmental interest.
- 2) The provisions of Section 1.1306(b)(2) relating to the use of high intensity strobe lighting do not apply since this tower is not utilizing this type of lighting.
- 3) Compliance to Section 1.1306(b)(3) regarding human exposure to RF radiation was examined for multiple sources. A search was made about the proposed site coordinates to locate any additional sources of RF radiation and the proposed WLXR and KQEG facilities were found. The total combined exposure is predicted to be 10.33% of the limit for an uncontrolled environment.

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The applicant is undertaking a review of the instant proposal under Section 106 of the National Historic Preservation Act. The application will be amended accordingly upon conclusion of that review.

**CONCLUSIONS**

Based on the engineering studies provided, the following conclusions can be obtained:

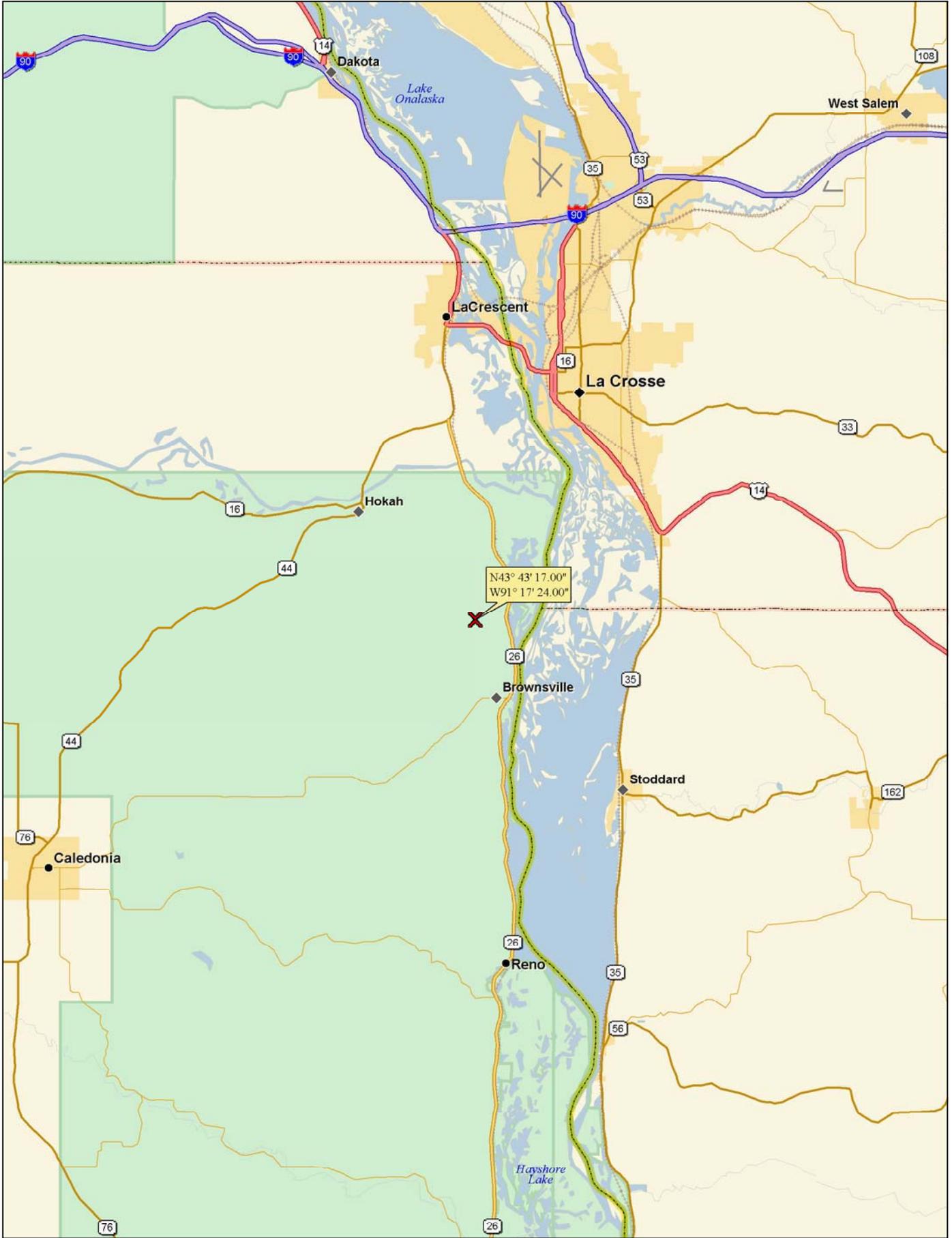
- (1) Implementation of the instant proposal will continue to provide La Crosse with a full time aural broadcast service.
- (2) 115,453 persons in 2,426 square kilometers would have an available signal strength of 60 dBu or greater from the proposed construction location.
- (3) La Crosse would be served with a signal of 70 dBu or greater from the proposed construction site.
- (4) The proposal is in complete conformance with all technical rules of the Federal Communications Commission.



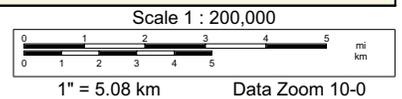
Garrett G. Lysiak, P.E.  
September 12, 2006



FIGURE 1 SITE MAP



**FIGURE 1A - SITE MAP**



1" = 5.08 km      Data Zoom 10-0



**X** NEW

FIGURE 2 AERIAL PHOTO

Prop. model: FCC-EDX  
 Time: 10.0% Loc.: 50.0%  
 Prediction Confidence Margin: 0.0dB  
 Climate: Continental Temperate  
 Land use (clutter): none  
 Atmospheric Abs.: none  
 K Factor: 1.333  
 RX Antenna - Type: OMNI  
 Height: 9.2 m AGL Gain: 0.00 dBd

Field strength at remote  
█ = 70.0 dBμV/m  
█ = 60.0 dBμV/m

Display threshold level: -120.0 dBmW

Sites  
 Site: new  
 N43°43'17.00" W91°17'24.00" 329.0 m  
 new Tx.Ht.AGL: 137.0 m Total ERPd: 0.80kW  
 Grp: 1 omni-horizontal/0.0° 104.9000 MHz

Reference Grid (spacing: 30')

KILOMETERS  
 -5 0 15

**OWL ENGINEERING, INC**  
 COVERAGE CONTOURS

SEPTEMBER 12, 2006

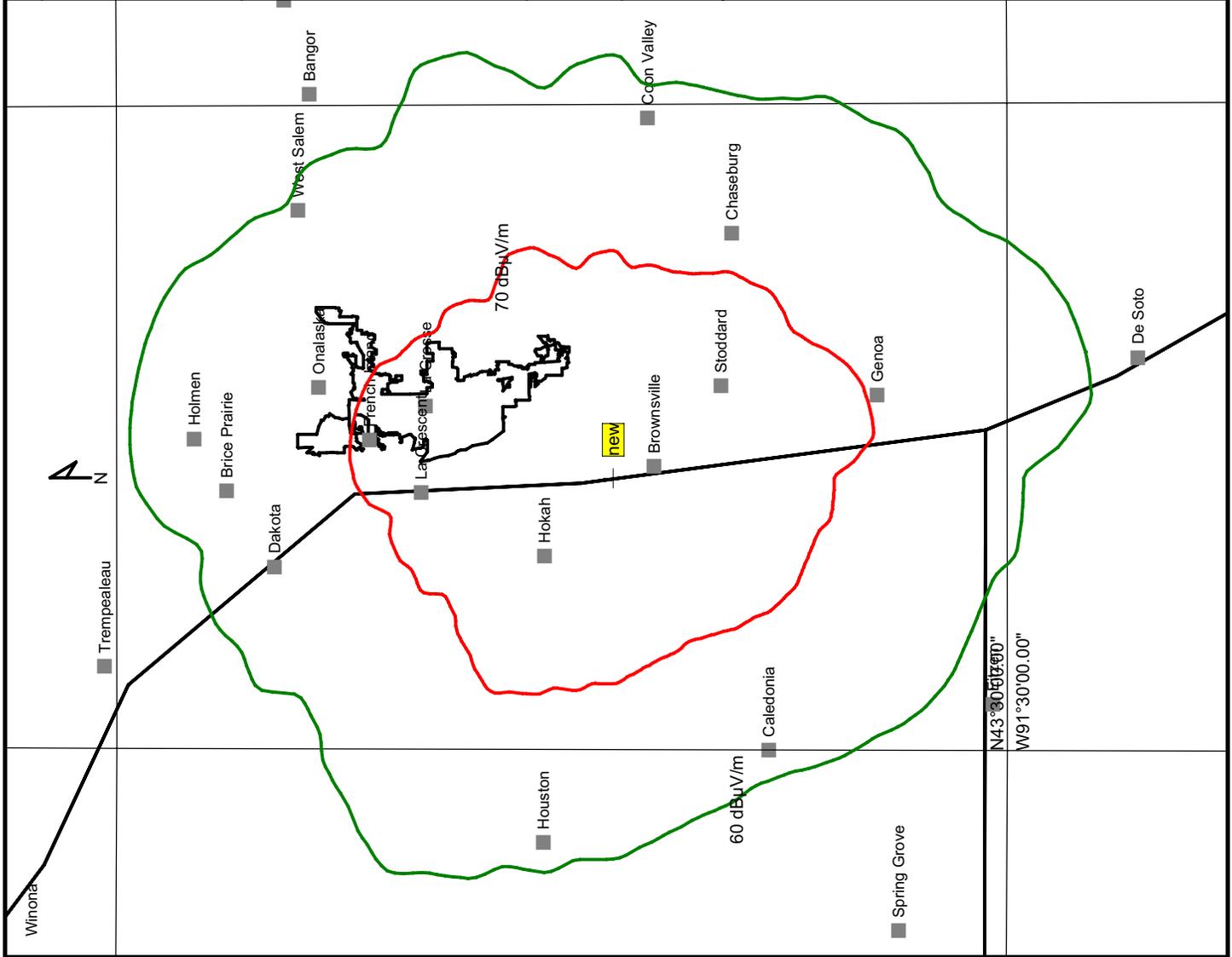


FIGURE 3

Prop. model: FCC-EDX  
 Time: 10.0% Loc.: 50.0%  
 Prediction Confidence Margin: 0.0dB  
 Climate: Continental Temperate  
 Land use (clutter): none  
 Atmospheric Abs.: none  
 K Factor: 1.333  
 RX Antenna - Type: OMNI  
 Height: 9.2 m AGL Gain: 0.00 dBd

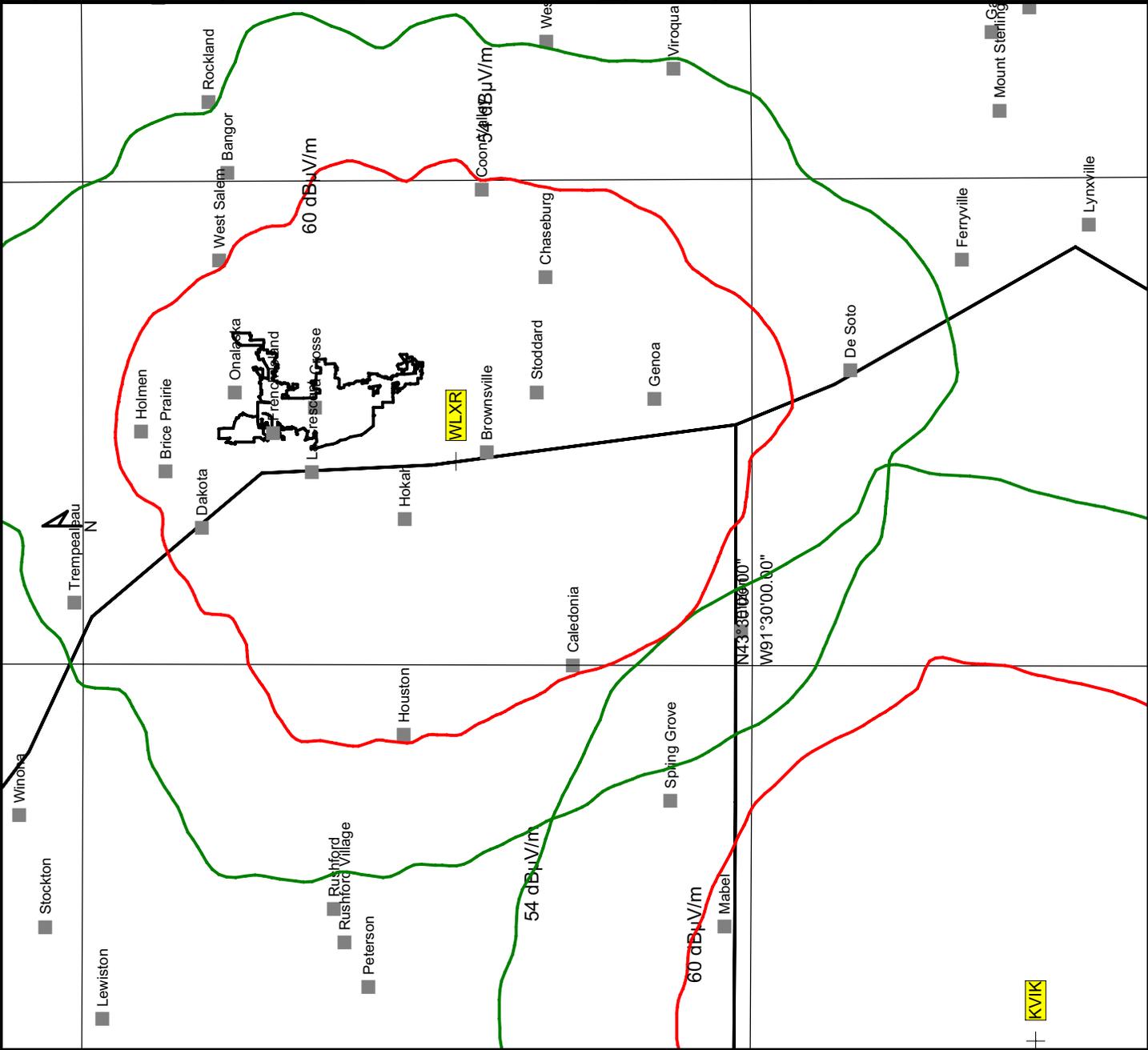
**Interference contour study**  
 Propagation methods: : FCC-EDX 50.0%  
 service contour : FCC-EDX 10.0%  
 1st adjacent interference : FCC-EDX 10.0%  
 = 60.0 dB $\mu$ V/m service contour  
 = 54.0 dB $\mu$ V/m 1st adjacent interference

**Sites**  
 Site: DECORAH  
 N43°17'13.00" W91°53'03.00" 370.0 m  
 KVIK Tx.Ht.AGL: 148.0 m Total ERPd: 1.95kW  
 Grp: 1 omni-horizontal/0.0° 104.7000 MHz

Site: WLXR  
 N43°43'17.00" W91°17'24.00" 329.0 m  
 WLXR Tx.Ht.AGL: 137.0 m Total ERPd: 0.80kW  
 Grp: 1 omni-horizontal/0.0° 104.9000 MHz

Reference Grid (spacing: 30')  
 KILOMETERS  
 -5 0 20

**OWL ENGINEERING, INC**  
 INTERFERENCE CONTOURS WLXR/KVIK  
 FIGURE 4  
 SEPTEMBER 12, 2006



Prop. model: FCC-EDX  
 Time: 10.0% Loc.: 50.0%  
 Prediction Confidence Margin: 0.0dB  
 Climate: Continental Temperate  
 Land use (clutter): none  
 Atmospheric Abs.: none  
 K Factor: 1.333  
 RX Antenna - Type: OMNI  
 Height: 9.2 m AGL Gain: 0.00 dBd

Interference contour study

Propagation methods:  
 service contour : FCC-EDX 50.0%  
 1st adjacent interference : FCC-EDX 10.0%  
 = 60.0 dBμV/m service contour  
 = 54.0 dBμV/m 1st adjacent interference

Sites

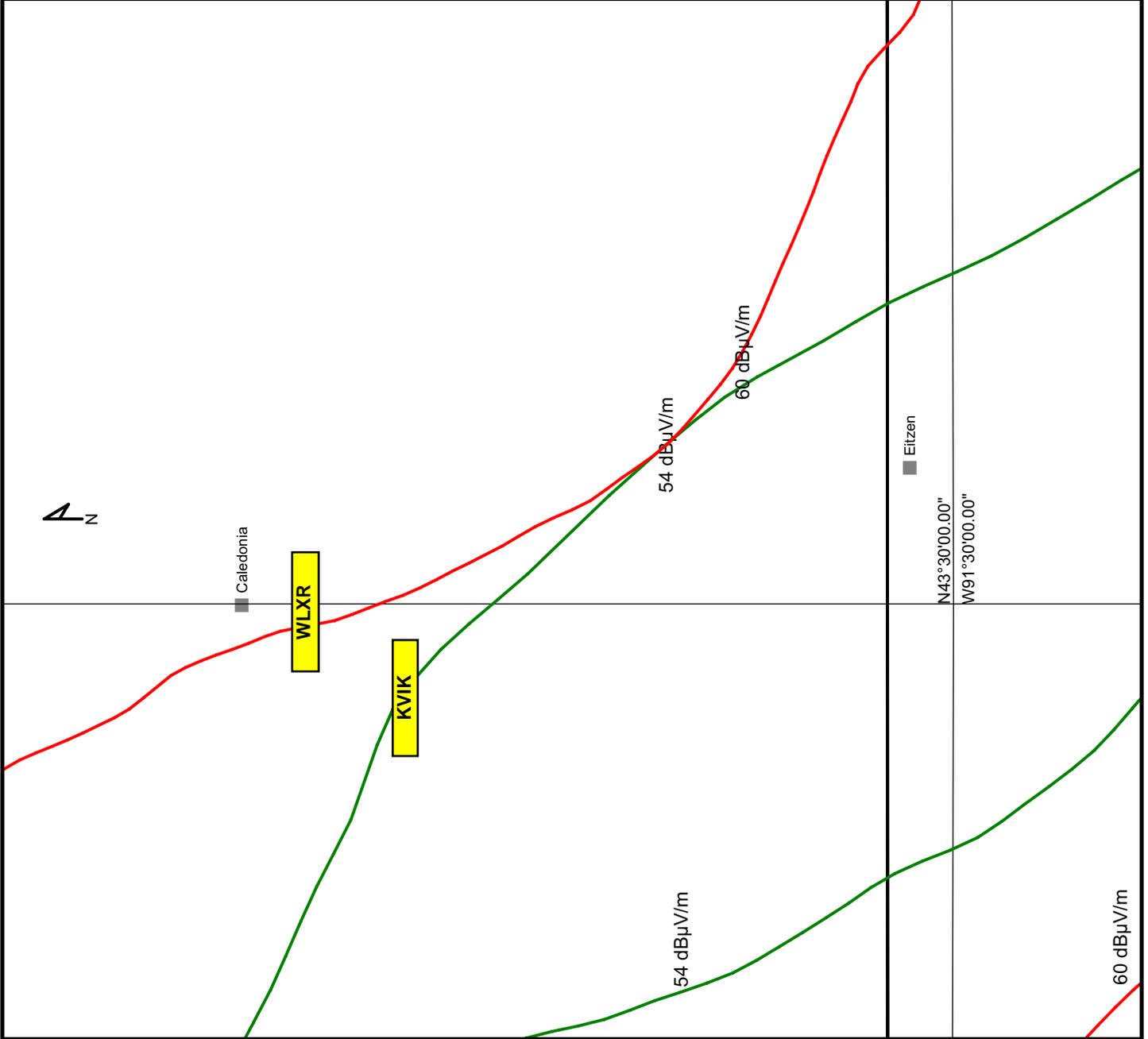
Site: DECORAH  
 N43°17'13.00" W91°53'03.00" 370.0 m  
 KVIK Tx.Ht.AGL: 148.0 m Total ERPd: 1.95kW  
 Grp: 1 omni-horizontal/0.0° 104.7000 MHz

Site: WLXR  
 N43°43'17.00" W91°17'24.00" 329.0 m  
 WLXR Tx.Ht.AGL: 137.0 m Total ERPd: 0.80kW  
 Grp: 1 omni-horizontal/0.0° 104.9000 MHz

Reference Grid (spacing: 30')



**OWL ENGINEERING, INC**  
 INTERFERENCE CONTOURS WLXR/KVIK  
 FIGURE 4A EXPANDED VIEW SEPTEMBER 12, 2006





Prop. model: FCC-EDX  
Time: 50.0% Loc.: 50.0%  
Prediction Confidence Margin: 0.0dB  
Climate: Continental Temperate  
Land use (clutter): none  
Atmospheric Abs.: none  
K Factor: 1.333  
RX Antenna - Type: OMNI  
Height: 9.2 m AGL Gain: 0.00 dBd

Field strength at remote

 = 115.0 dBμV/m

Display threshold level: -120.0 dBmW

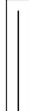
Sites

Site: new

N43°43'17.00" W91°17'24.00" 329.0 m

new Tx.Ht.AGL: 137.0 m Total ERPd: 0.8 kW

Grp: 1 omni-horizontal/0.0° 104.9000 MHz

 Reference Grid (spacing: 30')

METERS



**OWL ENGINEERING, INC**

BLANKETING CONTOUR

SEPTEMBER 12, 2006

FIGURE 6

