



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

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**ENGINEERING EXHIBIT FOR AN  
APPLICATION FOR A CONSTRUCTION PERMIT  
CHANNEL 244 KDOG-FM  
MINNESOTA VALLEY BROADCASTING COMPANY  
NORTH MANKATO, MN**

**CHANNEL 244 11.5 KW (H&V) 150 METERS HAAT**

**July 18, 2004**

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## **TABLE OF CONTENTS**

	<b>Engineering Statement</b>
	<b>FCC Form 301</b>
<b>Engineering Figure 1</b>	<b>Site Location - USGS Map</b>
<b>Engineering Figure 1A</b>	<b>Site Location - Street Map</b>
<b>Engineering Figure 1B</b>	<b>Site Location – Full Size Map (Reduced)</b>
<b>Engineering Figure 1C</b>	<b>Site Location – Aerial Photograph</b>
<b>Engineering Figure 2</b>	<b>Contour Coverage Map</b>
<b>Engineering Figure 3</b>	<b>Contour Coverage Map- Map Info</b>
<b>Engineering Figure 4</b>	<b>Radio Path Study</b>
<b>Engineering Figure 5</b>	<b>FAA Form 7460</b>

**ENGINEERING EXHIBIT FOR AN APPLICATION  
FOR A CONSTRUCTION PERMIT  
KDOG-FM NORTH MANKATO, MN  
FOR MINNESOTA VALLEY BROADCASTING COMPANY  
CHANNEL 244 11.5 KW (H & V) 150 METERS HAAT  
PAGE 1**

**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 Minnesota Valley Broadcasting Company (hereafter “**MVBC**”) in support of an application for authority to modify an existing FM broadcast facility (KDOG) operating on channel 244 (96.7 MHz) at North Mankato, MN. The purpose of this application is to change the antenna location, effective radiated power to 11.5 KW, both in the horizontal and vertical plane, and the antenna center of radiation to 150 meters above the average terrain. This power/height combination is the maximum allowable Class C3 facility permitted under the current rules and regulations.

“**MVBC**” proposes to operate from a site uniquely described by the geographic coordinates:

**(NAD 27)**

44° 08' 34" North Latitude  
94° 06' 36" West Longitude

**(NAD 83)**

44° 08' 33.8" North Latitude  
94° 06' 36.8" West Longitude

Notification to the FAA Great Lakes office was done on July 4, 2004 and a copy of the notification is included as Engineering Figure 5.

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FOR MINNESOTA VALLEY BROADCASTING COMPANY  
CHANNEL 244 11.5 KW (H & V) 150 METERS HAAT  
PAGE 2**

Engineering Figure 1 is a portion of the Mankatio West, Minnesota 7.5 Minute map that shows the exact location of the tower. Engineering Figure 1B is a reduced full-size map. A search was performed for the presence of any other communications facilities located nearby and none were found.

Figure 1C shows an aerial view of the proposed site and that the surrounding area is rural. Because the area is rural, there is not expected to be any problem with blanketing interference. The applicant is aware of the provisions of Section 73.318 of the FCC's Rules and the requirement for satisfying all complaints of blanketing interference that are received within a one-year period. The main studio for the station is located in the North Mankato area.

### **ALLOCATION CONSIDERATIONS**

A review of allotments and assignments on channel 244, on the three immediately upper adjacent, the three immediately lower adjacent channels and the two channels removed by 53 and 54 channels (297 & 298) shows that the site proposed would be in full compliance with Section 73.207.

### **FM CHANNEL SPACING STUDY**

#### KDOG NEW SITE ALLOCATION STUDY

REFERENCE							DISPLAY DATES	
44 08 34 N			CLASS = C3				DATA	07-13-04
94 06 36 W			Current Spacings				SEARCH	07-13-04
----- Channel 244 - 96.7 MHz -----								
Call	Channel		Location		Dist	Azi	FCC	Margin
-----								
KKSR	LIC-Z	244C2	Sartell	MN	180.56	359.4	177.0	3.56
KWWK	LIC	243C2	Rochester	MN	121.32	95.3	117.0	4.32
KTTB	LIC-N	242C1	Glencoe	MN	89.78	9.1	76.0	13.78
KIAQ	LIC	245C1	Clarion	IA	163.47	181.2	144.0	19.47
KNWCFM	LIC	243C	Sioux Falls	SD	206.99	251.2	176.0	30.99
KTCZFM	LIC	246C	Minneapolis	MN	128.36	37.1	96.0	32.36
KNUJFM	CP	297A	Sleepy Eye	MN	53.46	292.8	12.0	41.46
KNUJFM	LIC-N	297A	Sleepy Eye	MN	53.48	292.8	12.0	41.48
KBGY	LIC-N	298C2	Faribault	MN	62.18	82.6	17.0	45.18
KQPR	LIC-Z	241C3	Albert Lea	MN	92.84	128.9	43.0	49.84

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PAGE 3**

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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 Figures 2 & 3. As is readily evident, all of North Mankato, MN is included within the proposed 70 dBu coverage contour as required by the rules. Figure 4 shows that there is no intervening terrain between the proposed transmitter site and the far edge of the city of license.

**DISTANCE TO CONTOURS**

DISTANCES TO CONTOURS (Kilometers):  
Antenna COR elevation (AMSL): 438 meters      Average HAAT: 150 meters  
Frequency: 96.7000 MHz  
Coordinates: N 44° 8' 34"      W 94° 6' 36"  
F(50,50) Curves      Number of Contours: 2

AZ (degs)	HAAT (m)	ERPd (kW)	CONTOUR LEVELS (dBu):	
			70.0	60.0
0.0	144	11.5000	23.0	38.4
45.0	173	11.5000	25.2	41.6
90.0	147	11.5000	23.3	38.8
135.0	146	11.5000	23.2	38.6
180.0	153	11.5000	23.8	39.5
225.0	135	11.5000	22.3	37.4
270.0	134	11.5000	22.3	37.3
315.0	165	11.5000	24.7	40.8

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KDOG-FM NORTH MANKATO, MN  
FOR MINNESOTA VALLEY BROADCASTING COMPANY  
CHANNEL 244 11.5 KW (H & V) 150 METERS HAAT  
PAGE 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 116,621 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 4,797 square kilometers. A computerized integration program determined this area.

**ANSI Power Density Calculations**

The power density at the base of the tower was calculated using the following formula from OST Bulletin Number 65, August, 1997:

$$S = \frac{((0.64)(1.64)(ERP)(1000)(\text{milliwatts/watt}))}{(\pi(R)^2)}$$

where: S = power density in milliwatts per square centimeter

ERP = effective radiated power in watts

R = distance to radiation source in centimeters

$\pi = 3.14$

Using this formula and the values shown below, a power density of 41 mW/cm<sup>2</sup> is found to exist at the base of the tower. This predicted value is 20.5% of the public exposure maximum limit of 0.2 mW/cm<sup>2</sup>.

ERP = 23 Kw watts

R = 15,000 cm.

The ANSI limit is 1.0 mW/cm<sup>2</sup> in this frequency range for a controlled site. Manipulating the above referenced formula, the minimum distance from the antenna required to achieve ANSI guidelines would be 28 meters. The predicted radiation level is well below the ANSI limit for exposure.

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CHANNEL 244 11.5 KW (H & V) 150 METERS HAAT  
PAGE 5**

Access to RF circuitry is restricted. Signs will be 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 is categorically excluded from environmental processing since none of the conditions of Section 1.1306(b)(2) and (3) would be involved for the following reasons:

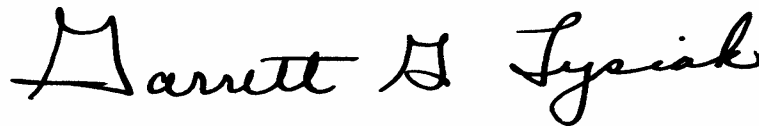
- 1) The site proposed is not in or near any location referenced in Section 1.1306(b)(1) as being of environmental interest.
- 2) The provisions of Section 1.1306(b)(2) relating to the use of high intensity strobe lighting do not apply since this tower is not utilizing this type of lighting.
- 3) Compliance 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 none were found.

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FOR MINNESOTA VALLEY BROADCASTING COMPANY  
CHANNEL 244 11.5 KW (H & V) 150 METERS HAAT  
PAGE 6**

**CONCLUSIONS**

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

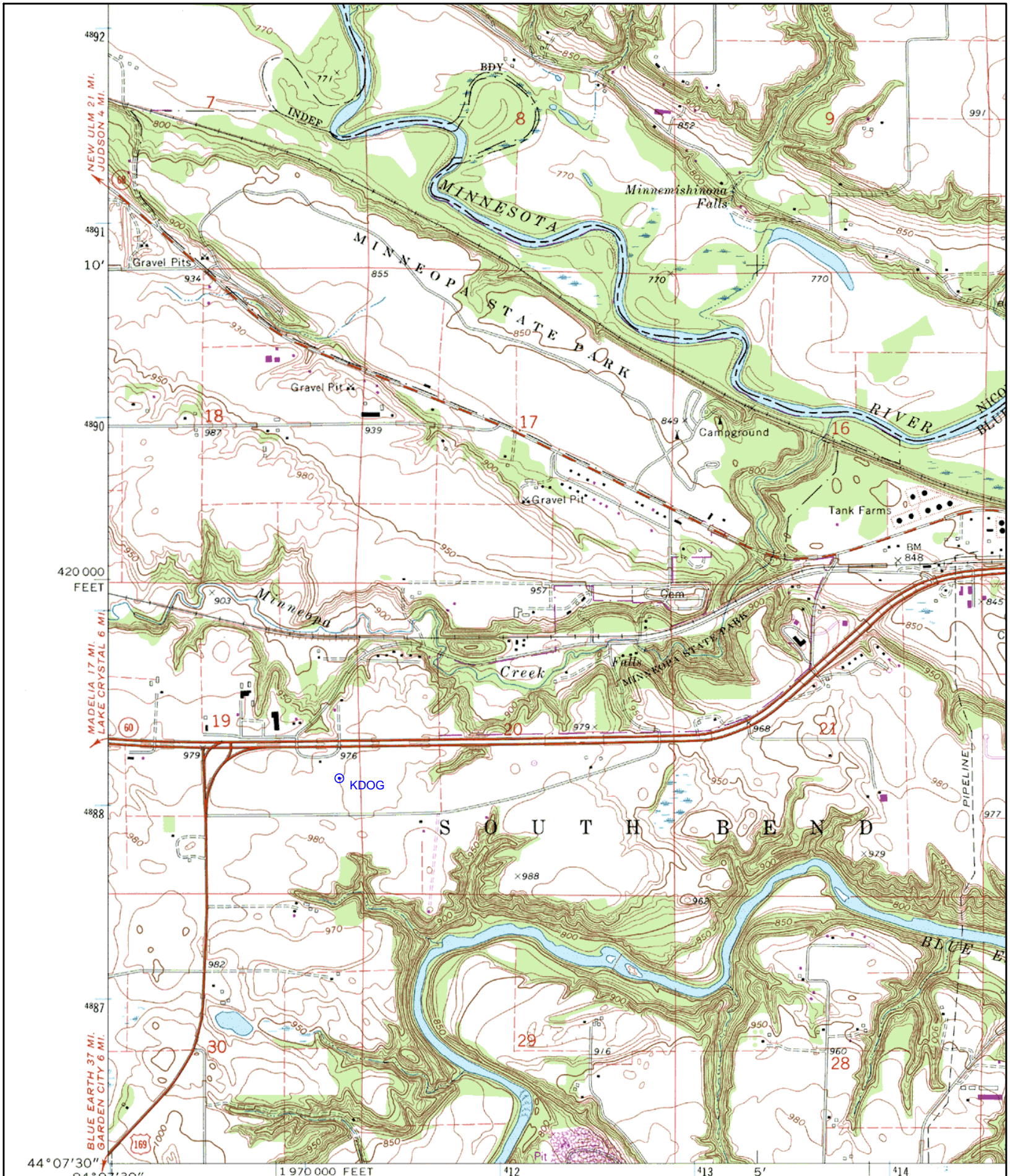
- (1) Implementation of the instant proposal will continue to provide North Mankato with a full time aural broadcast service.
- (2) 116,621 persons in 4,797 square kilometers would have an available signal strength of 60 dBu or greater from the proposed construction location.
- (3) All of North Mankato 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.

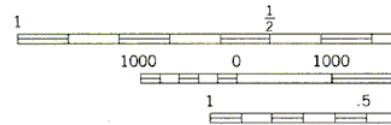
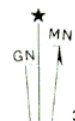
July 18, 2004





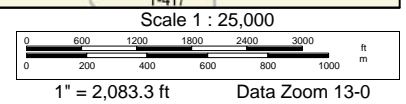
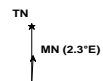
Produced by the United States Geological Survey  
Control by USGS, NOS/NOAA and Minnesota Highway Department  
Topography by photogrammetric methods from aerial photographs  
taken 1973. Field checked 1974  
Projection and 10,000-foot grid ticks: Minnesota coordinate  
system, south zone (Lambert conformal conic)

FIGURE 1 - SITE MAP





**Figure 1A**





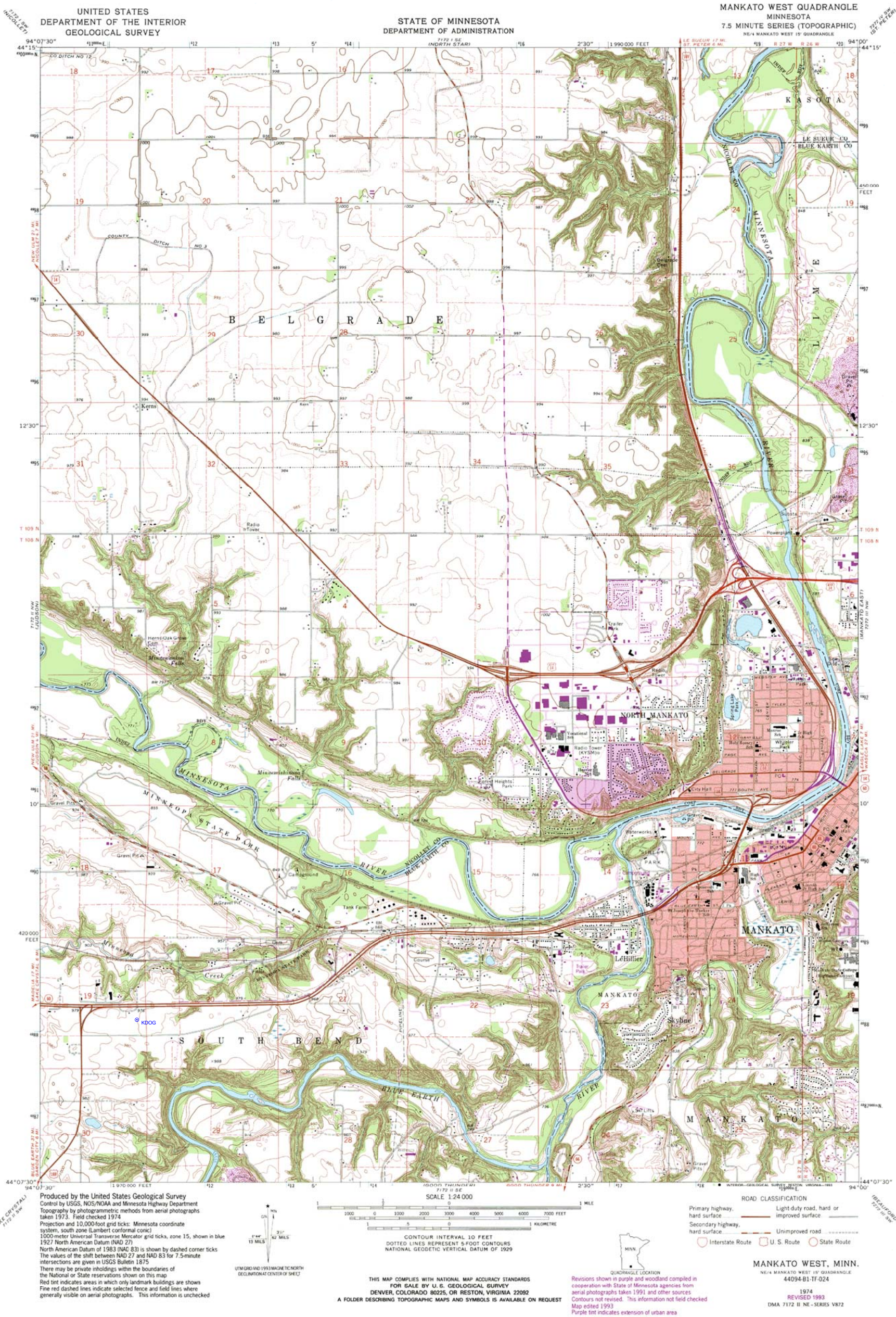


FIGURE 1B - SITE MAP

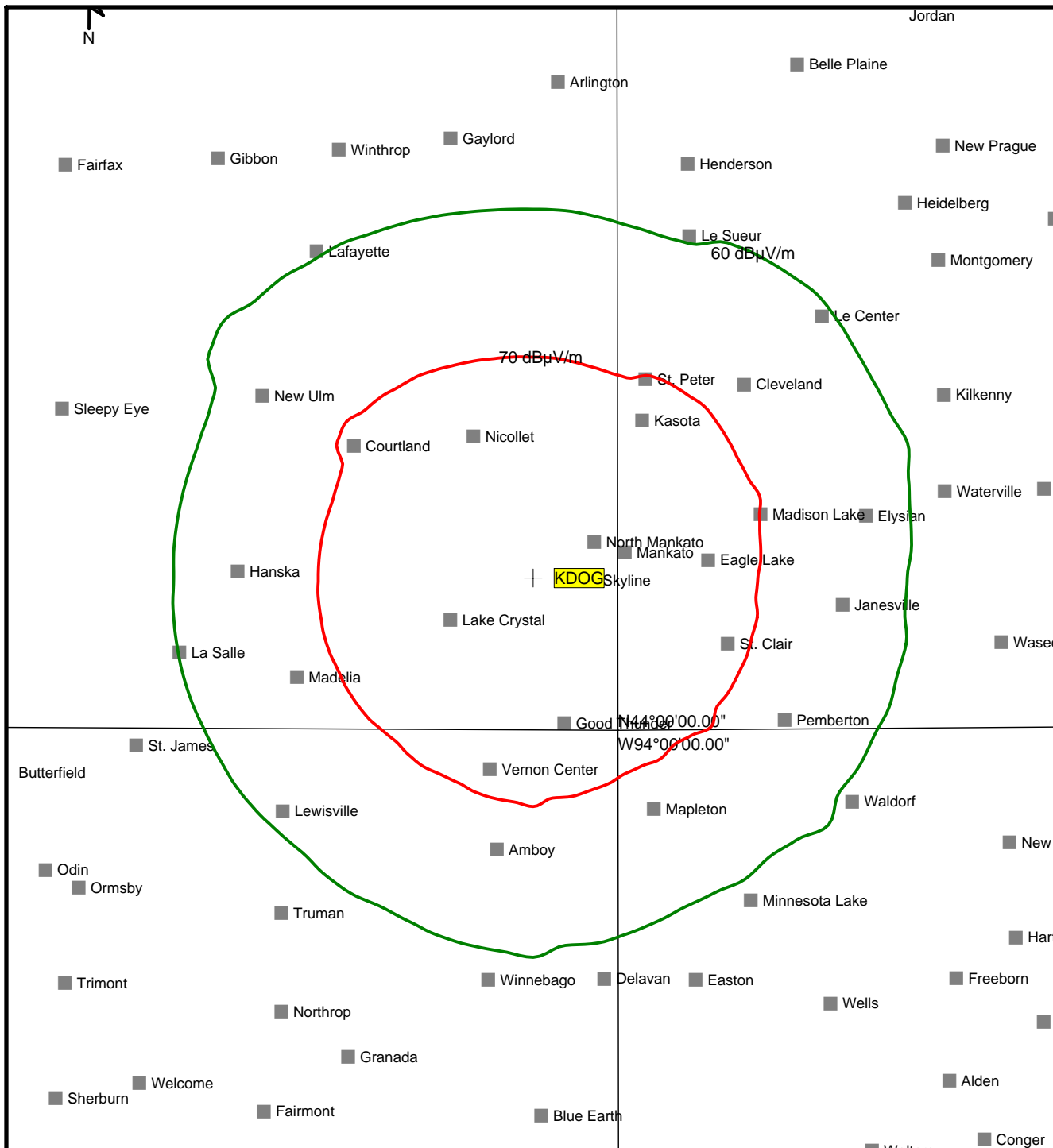




SITE

KDOG

FIGURE 1C - SITE MAP



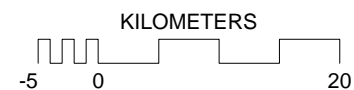
Prop. model: FCC-EDX  
Time: 50.0% Loc.: 50.0%  
Prediction Confidence Margin: 0.0dB  
Climate: Continental Temperate  
Land use (clutter): none  
Atmospheric Abs.: none  
K Factor: 1.333  
RX Antenna - Type: OMNI  
Height: 9.1 m AGL Gain: 0.00 dBd

Field strength at remote

■ = 70.0 dBuV/m  
■ = 60.0 dBuV/m

Display threshold level: -120.0 dBmW

Reference Grid (spacing: 1 degree)



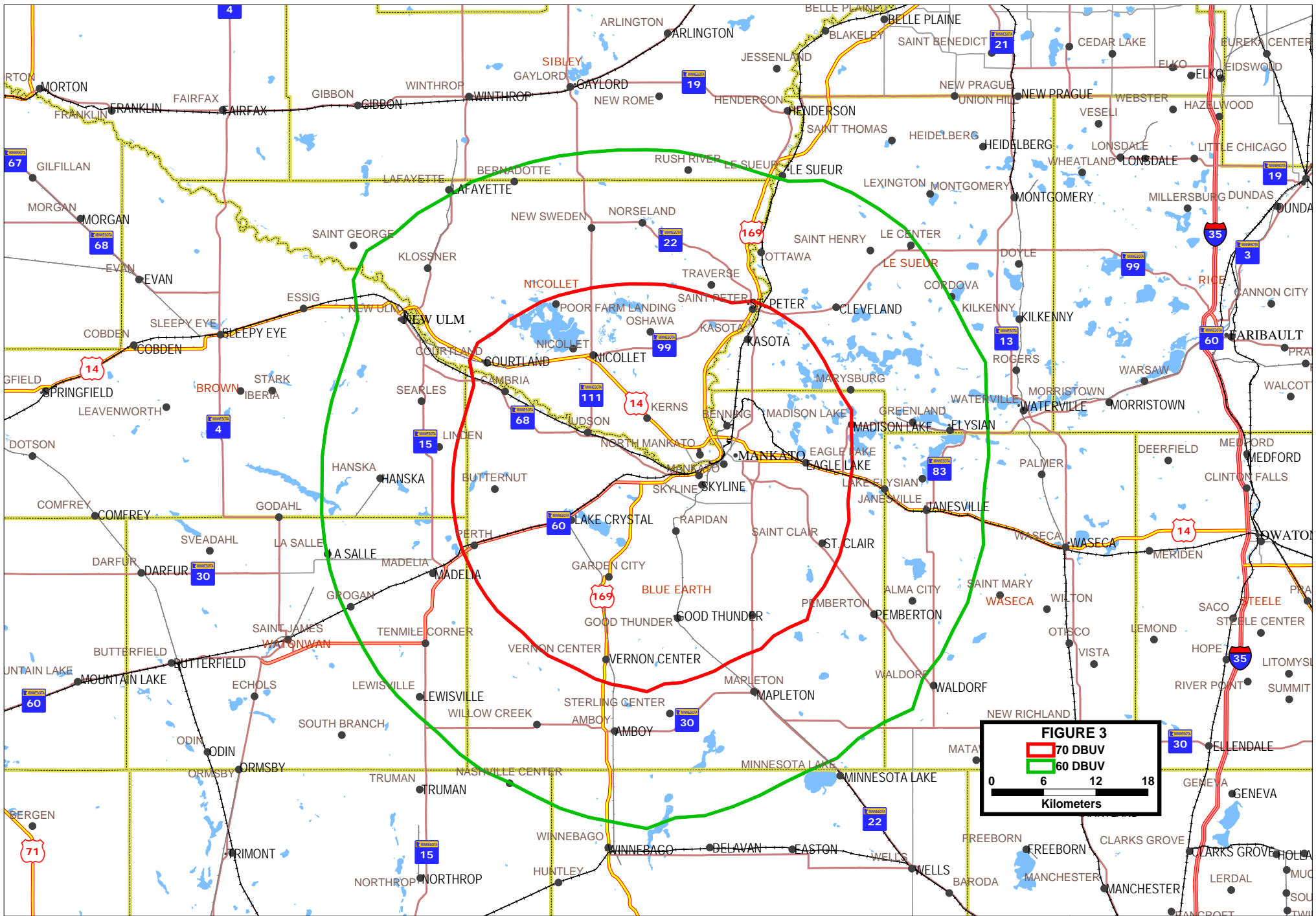
**OWL ENGINEERING, INC**

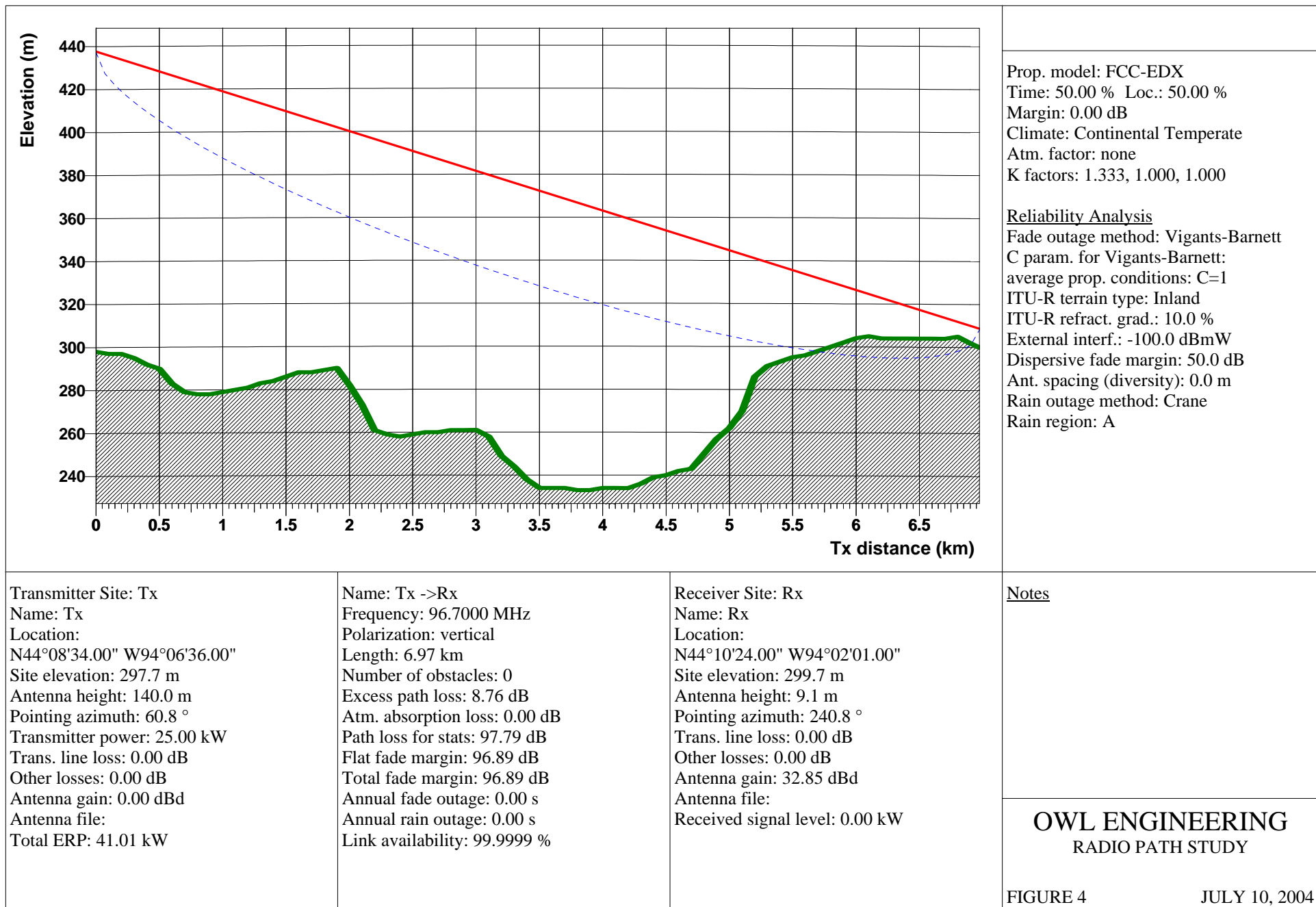
SIGNAL COVERAGE CONTOURS

FIGURE 2

JULY 9, 2004







U.S. Department of Transportation  
Federal Aviation Administration

Failure To Provide All Requested Information May Delay Processing of Your Notice

**Notice of Proposed Construction or Alteration****FOR FAA USA ONLY**

Aeronautical Study Number

**1. Sponsor (person, company, etc. proposing this action):**Attn.of: JOHN LINDERName: LINDER RADIO GROUPAddress: P.O. BOX1420City: MANKATO State: MN Zip: 56002Telephone: (507) 345-8400 Fax: (507) 345-5364**2. Sponsor's Representative (if other than #1):**Attn.of: GARRETT G. LYSIAK, P.E.Name: OWL ENGINEERING, INCAddress: 5844 HAMLINE AVE NCity: SHOREVIEW State: MN Zip: 55126Telephone: (651) 784-7445 Fax: (651) 784-7541**3. Notice of:** ☒ New Construction ☐ Alteration ☐ Existing**4. Duration:** ☒ Permanent ☐ Temporary (   months,   days)**5. Work Schedule:** Beginning   End  **6. Type:** ☒ Antenna Tower ☐ Crane ☐ Building ☐ Power Line☐ Landfill ☐ Water Tank ☐ Other  **7. Marking/Painting and/or Lighting Preferred:**☐ Red Lights and Paint ☐ Dual - Red and Medium Intensity White☒ White - Medium Intensity ☐ Dual - Red and High Intensity White☐ White - High Intensity ☐ Other  **8. FCC Antenna Structure Registration Number (if applicable):****9. Latitude:** 44 ° 08 ' 34.0 "**10. Longitude:** 094 ° 06 ' 36.0 "**11. Datum:** ☐ NAD 83 ☒ NAD 27 ☐ Other:  **12. Nearest:** City: Skyline State: MN**13. Nearest *Public-use* (not private-use) or Military Airport or Heliport:**MKT: MANKATO REGIONAL**14. Distance from #13. to Structure:** 55284 ft.**15. Direction from #13. to Structure:** 240 degrees**16. Site Elevation (AMSL):** 980 ft.**17. Total Structure Height (AGL):** 480 ft.**18. Overall Height (#16. + #17.) (AMSL):** 1460 ft.**19. Previous FAA Aeronautical Study Number (if applicable):**  - OE**20. Description of Location: (Attach a USGS 7.5 minute Quadrangle Map with the precise site marked and any certified survey.)**

USGS SITE MAP INCLUDED

**21. Complete Description of Proposal:**

STEEL GUYED COMMUNICATIONS TOWER WITH FM ANTENNA

Frequency/Power (KW)

96.7 12

Notice is required by 14 Code of Federal Regulations, Part 77 pursuant to 49 U.S.C., Section 44718. Persons who knowingly and willingly violate the notice requirements of part 77 are subject to a civil penalty of \$1,000 per day until the notice is received, pursuant to 49 U.S.C., Section 46301 (a).

I hereby certify that all of the above statements made by me are true, complete, and correct to the best of my knowledge. In addition, I agree to mark and/or light the structure in accordance with established marking &amp; lighting standards as necessary.

Date

07-04-2004

Typed or Printed Name and Title, of Person Filing Notice

GARRETT G. LYSIAK, P.E.

Signature