



OWL ENGINEERING & EMC TEST LABS, INC.

CONSULTING COMMUNICATIONS ENGINEERS · EMC TEST LABORATORIES

5844 Hamline Avenue North, Shoreview, MN 55126
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**ENGINEERING EXHIBIT FOR A MINOR
CHANGE APPLICATION FOR A
TRANSLATOR K292HI
SUBARCTIC MEDIA, LLC
BMPFT-20180419AAG
FACILITY ID# 202097
CHANNEL 292D 106.3 MHZ**

CHANNEL 292D 0.25 KW (H&V) 31 METERS HAAT

May 4, 2021



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TABLE OF CONTENTS

Engineering Statement

Figure 1	Site Location - USGS Map
Figure 2	Aerial Site Map
Figure 3	Allocation Study
Figure 4	Proposed Contour



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 349 on behalf of Subarctic Media, LLC (Hereafter "Subarctic") in support of an application for authority to modify an existing FM Translator Construction permit (BNPFT-20180419AAG). The purpose of this application is to modify the site location using a power output of 250 watts ERP and 31 meters HAAT and provide coverage for KFSP-AM. This power/height combination is an allowable Class D facility permitted under the current rules and regulations. The station was to be co-located at an KTOE AM tower. However, the location will now be on an existing tower on the property that is not part of the AM antenna array.

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

**NAD 83
N 44° 10" 2.3."
W 93° 54' 37"**

Engineering Figure 1 is a portion of the Mankato East, MN 7.5-minute USGS map that shows the exact location of the antenna. Figure 2 is an aerial view of the site. The applicant is aware of the provisions of §74.1203 of the FCC's Rules and the requirement for satisfying all complaints of interference that are received.

ALLOCATION CONSIDERATIONS

A review of allotments and assignments on channel 292, on the three immediately upper adjacent, the three immediately lower adjacent channels show that the site proposed has no short-spaced conditions and fully complies with the Rules. The results of the allocation study are shown in Figure 3.



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COVERAGE CONTOURS

The three-to-sixteen-kilometer average terrain elevations were derived from the NGDC 30 - second terrain database.

The effective antenna radiation center height for each of the twelve standard 30-degree spaced radials was used in conjunction with the F (50, 50) metric curves of Figure 1 of §73.333 of the Rules to determine the distances to the 60 dBuV coverage contour.

DISTANCES TO CONTOURS (Kilometers):
 Antenna COR elevation (AMSL): 329 meters Average HAAT: 31 meters
 Frequency: 106.3000 MHz
 Coordinates: N 44° 10' 2.30" W 93° 54' 37.00"
 F(50,50) Curves Number of Contours: 1

AZ (degs)	HAAT (m)	ERPd (kW)	CONTOUR LEVELS (dBuV): 60.0
0.0	25	0.2500	7.1
30.0	20	0.2500	7.1
60.0	11	0.2500	7.1
90.0	11	0.2500	7.1
120.0	14	0.2500	7.1
150.0	25	0.2500	7.1
180.0	24	0.2500	7.1
210.0	39	0.2500	8.0
240.0	33	0.2500	7.5
270.0	60	0.2500	10.1
300.0	51	0.2500	9.2
330.0	55	0.2500	9.6

Figure 4 shows the present licensed KFSP-AM 2 mv/m contour and the proposed 60 dBuV coverage contour. As can be seen, the proposed contour is contained within the KFSP-AM contour and shows all of Mankato, Minnesota is covered by it.

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:

$$S = \frac{0.64 \times 1.64 \times ERP \times 1000}{\pi(R^2)}$$

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



The site is considered to be a controlled site since access to the tower area is restricted.

Using:

ERP = 0.50 KW (0.25 KW Vertical & 0.25 KW Horizontal)
R = 2,130 cm.

Using this formula and the values shown below, a power density of $1.37 \mu\text{W}/\text{cm}^2$ is found to exist at the base of the tower. This predicted value is 0.1% of the Controlled exposure limit of $1,000 \mu\text{W}/\text{cm}^2$.

Access to RF circuitry is restricted since the antenna is mounted on a fenced tower that restricts public access. 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 §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 §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 §1.1306(b)(1) as being of environmental interest.
- 2) The provisions of §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 §1.1306(b)(3) regarding human exposure to RF radiation.

CONCLUSIONS

Based on the engineering studies provided, the proposal is in complete conformance with all technical rules of the Federal Communications Commission.

Garrett G. Lysiak, P.E.
May 5, 2020

(NORTH STAR)

093° 55' 59.0953" W
044° 11' 26.1083" N

(ST PETER)

MANKATO EAST QUADRANGLE
MINNESOTA
TOPOGRAPHIC SERIES (CLEVELAND)

093° 53' 14.1718" W
044° 11' 26.1083" N

(MANKATO WEST)

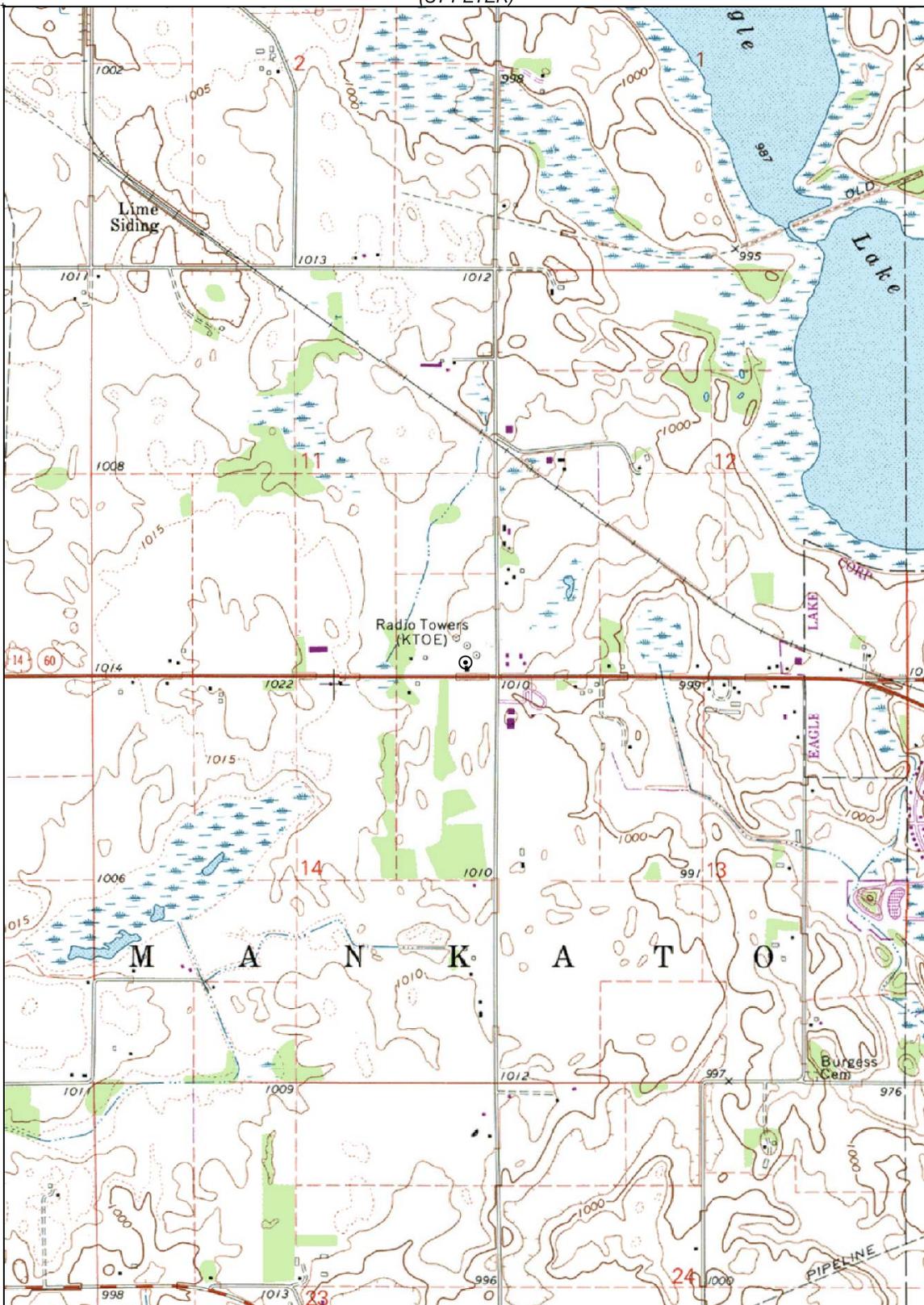
(MADISON LAKE)

044° 08' 38.5221" N
093° 55' 59.0953" W

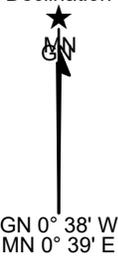
044° 08' 38.5221" N
093° 53' 14.1718" W

(GOOD THUNDER)

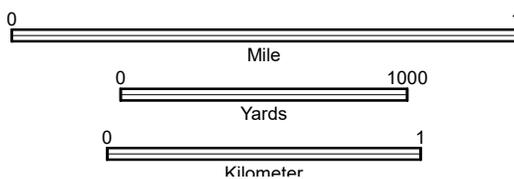
(ST CLAIR)



Declination

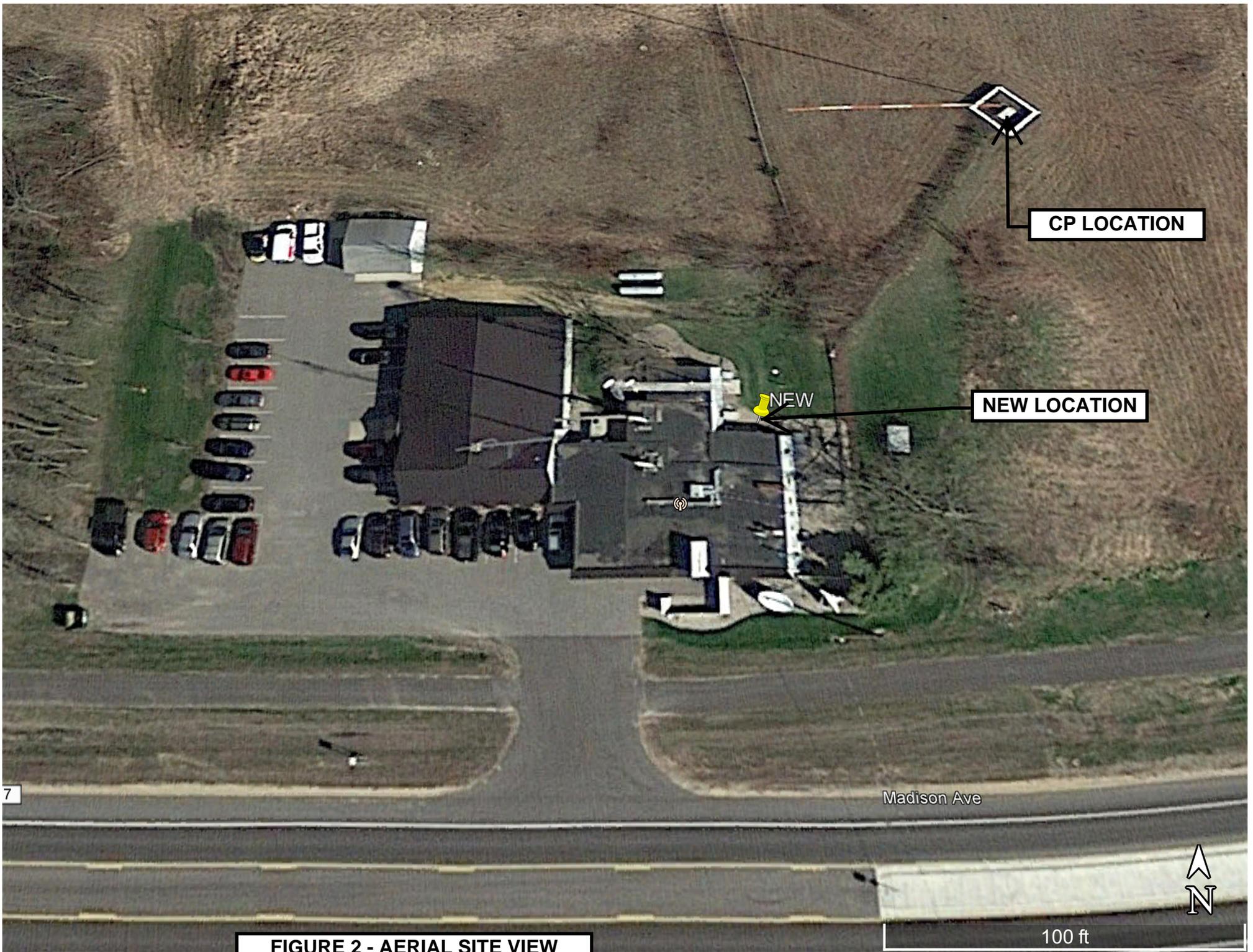


(BEAUFORD)
SCALE 1:24000



CONTOUR INTERVAL 10 FT
[BASE MAP VERTICAL DATUM]

MANKATO EAST, MN
JAN 1, 1993



7

Madison Ave

CP LOCATION

NEW LOCATION

NEW

FIGURE 2 - AERIAL SITE VIEW

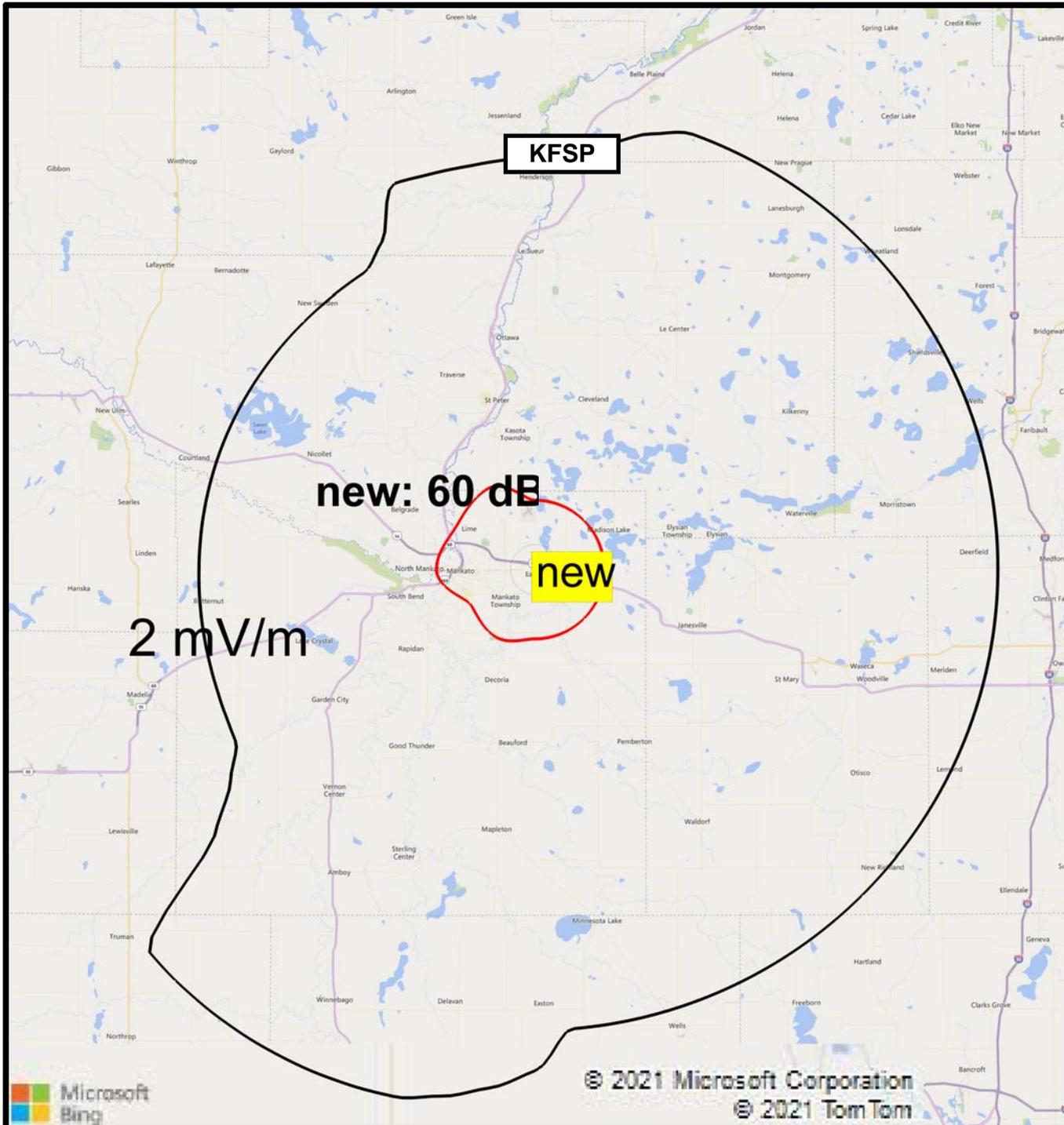
100 ft



FIGURE 3 - ALLOCATION STUDY

REFERENCE	CH#	Subarctic Media, LLC							DISPLAY DATES		
44 10 02.30 N.	292D	- 106.3 MHz, Pwr= 0.25 kW, HAAT= 29.9 M, COR= 329.8 M							DATA 05-03-21		
93 54 37.00 W.		Average Protected F(50-50)= 7.09 km							SEARCH 05-06-21		
		Omni-directional									
CH CITY	CALL	TYPE STATE	ANT	AZI <--	DIST FILE #	LAT LNG	PWR(kW) HAAT(M)	INT(km) COR(M)	PRO(km) LICENSEE	*IN* (Overlap in km)	*OUT*
292D	K292HI	CP _CN MN		47.8	0.06	44 10 03.60	0.250		---Reference---		
Mankato				227.8	0000122419	93 54 35.00		357	Subarctic Media, LLC		
293C1	KFMC-FM	LIC _CN MN		217.7	75.46	43 37 44.80	100.000	85.3	55.8	-17.8*	8.3
Fairmont				37.3	BLH19850225LM	94 29 00.89	113	478	City Of Lakes Media, Inc.		
292D	K292GU	LIC _CN MN		107.7	44.23	44 02 43.90	0.250	50.7	15.4	-13.6*	5.1
Waseca				288.0	BLFT20160728ADD	93 23 02.79		493	Main Street Broadcasting,		
290C3	KRRW	LIC _CN MN		307.6	56.20	44 28 24.90	23.000	4.1	38.8	41.7	16.0
Winthrop				127.2	BLH20080708AKE	94 28 15.90	105	413	Subarctic Media, LLC		
239A	KMKO-FM	LIC ZCN		247.7	33.74	44 03 05.90	6.000	239953700	00000000000000.0		
									15283980000000000000.0		
									10.0R	23.7M	
Lake Crystal		MN		67.4	BLH20050914AAE	94 17 59.90	100	407	Alpha 3e Licensee LLC Debt		
292A	WEVR-FM	LIC NCN WI		50.8	128.22	44 53 18.90	6.000	91.3	31.7	29.9	72.6
River Falls				231.7	BLH19981112KK	92 39 02.70	100	393	Hanten Broadcasting Compan		
294D	K294DF	CP _CN MN		38.2	41.65	44 27 39.90	0.250	1.1	9.9	33.5	30.4
New Prague				218.4	BNPFT20171205ACC	93 35 08.80		381	Ingstad Brothers Broadcast		
238A	KCHK-FM	LIC NCN		38.2	41.66	44 27 39.90	6.000	239953700	00000000000000.0		
									15283980000000000000.0		
									10.0R	31.7M	
New Prague		MN		218.4	BLH20051103ABJ	93 35 08.80	100	418	Ingstad Brothers Broadcast		
291C1	KLSS-FM	LIC _CN IA		150.3	130.86	43 08 30.91	100.000	78.6	49.0	45.2	71.0
Mason City				330.9	BMLH20171113AAO	93 06 40.70	96	442	Alpha 3e Licensee LLC Debt		
293D	K293BA	LIC _CN MN		47.2	66.52	44 34 18.80	0.196	12.9	9.2	46.5	47.0
Elko				227.6	BLFT20061228AAR	93 17 41.69	83	394	Minn-Iowa Christian Broadc		
289D	K289AE	LIC DCN MN		97.8	62.21	44 05 18.91	0.170	0.8	11.8	54.3	49.0
Owatonna				278.4	BLFT19990804TE	93 08 25.70	103	475	Minnesota Public Radio		
295D	K295BD	LIC _CN MN		250.7	63.28	43 58 38.80	0.085	0.6	10.0	52.6	52.1
St. James				70.2	BLFT20070906AFR	94 39 18.90	90	425	Minnesota Public Radio		
291C3	KLCI	LIC _CN MN		8.3	120.35	45 14 19.90	9.100	57.2	38.4	55.5	71.8
Elk River				188.5	BLH20010710AAW	93 41 14.89	164	453	Milestone Radio LLC		

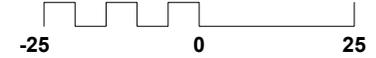
Terrain database is USGS 03 SEC



Field strength at remote

■ = 60.0 dBuV/m
Display threshold level: -120.0 dBmW
RX Antenna - Type: ISOTROPIC
Height: 9.1 m AGL Gain: 0.00 dBd

KILOMETERS



OWL ENGINEERING, INC.

FIGURE 4 - SIGNAL CONTOURS

MAY 5, 2021