

***APPLICATION FOR MODIFICATION  
OF CONSTRUCTION PERMIT - DISPLACEMENT***

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**K44FK – WATERLOO, IOWA  
FACILITY ID: 67879**

**DIGITAL NETWORKS—MIDWEST, LLC**

**APRIL 2019**

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**4.23.2019**

## **APPLICATION FOR CONSTRUCTION PERMIT - DISPLACEMENT**

The following engineering statement and attached exhibits have been prepared for **Digital Networks-Midwest, LLC** ("Midwest"), licensee of low power television station K44FK at Waterloo, Iowa, and are in support of their application for construction permit for displacement.<sup>1</sup> K44FK is licensed to operate as an analog low power television station on channel 44. This application seeks to change the channel associated with the facility. K44FK, when constructed, will commence operation as a digital low power facility.

The current license for the low power facility specifies operation on channel 44 as an analog facility. An unbuilt construction permit was also issued for channel 44, but both authorizations are displaced by the incentive auction. The current license authorizes operation with a maximum effective radiated power of 9.1 kw at a center of radiation of 391 meters above mean sea level utilizing a non-directional antenna. The proposed facility would operate on channel 31 with a maximum effective radiated power of 2.9 kW at a center of radiation of 338.1 meters above mean sea level utilizing a directional antenna. The proposed antenna for this facility is a composite array consisting of four Kathrein-Scala PR-TV antennas. Two of these antennas are oriented at 40 degrees true, and the other two are oriented at 220 degrees true. Equal power is to be fed to each of the antennas.

The technical parameters proposed under this application represent a minor change to the existing license for K44FK. Exhibit E-1 provides a comparison between the licensed 74 dBu F(50,50) and proposed 51 dBu F(50,90) service contours. As this map demonstrates, overlap

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<sup>1</sup> The Facility ID for K44FK at Waterloo, Iowa is 67879.

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exists between these two contours. Additionally, the proposed site is located within 30 miles of the licensed site.

Exhibit E-2 is the output from *TVStudy* for the proposed facility. This study demonstrates that there are no interference check failures to any proposed or authorized facility. The proposed facility is therefore in compliance with the relevant interference protection sections of the Commission's Rules.

The proposed facility would not constitute a significant environmental impact, and is exempt from environmental processing. The proposed antenna would be mounted to an existing tower that is registered with the Commission. The addition of the antenna to this tower would not increase the already existing environmental impact present from the structure.

In addition, the proposed facility would not result in human exposure at ground level to radiofrequency radiation in excess of the Commission's safety standards. Using the equations in Supplement A of *OET Bulletin 65*, the calculated worst-case power density at ground level assuming a downward radiation relative field of 0.3 is  $11.2 \mu\text{W}/\text{cm}^2$ . This value is below the upper limit of the uncontrolled environment condition. Midwest certifies it will coordinate with all other users of the site to ensure that workers and other personnel are not exposed to levels of radiofrequency radiation in excess of the applicable safety standards. Coordination activities will include, but are not necessarily limited to, a reduction in transmitter power or cessation of operation.

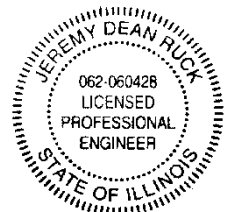
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The proposed facility complies with the provisions of Section 74.709 of the Commission's Rules. No land mobile protection issues have been identified based on the tables in that section of the rules, or on the output of *TVStudy*. The proposed facility also complies with Sections 74.793(e)-(h) and 74.793(h) of the Commission's Rules.

The preceding statement and attached exhibits have been prepared by me, or under my direction, and are true and accurate to the best of my belief and knowledge.



Above signature is digitized copy of actual signature  
License Expires November 30, 2019

Jeremy D. Ruck, PE  
April 23, 2019

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**K44FK**

BLTT19990601JD  
Latitude: 42-26-44.95 N  
Longitude: 092-22-29.67 W  
ERP: 9.10 kW  
Channel: 44-  
Frequency: 652.5 MHz  
AMSL Height: 391.0 m  
Horiz. Pattern: Omni  
Prop Model: None

**K44FK-D.X**

Latitude: 42-11-05.10 N  
Longitude: 092-37-45.50 W  
ERP: 2.90 kW  
Channel: 31  
Frequency: 575.0 MHz  
AMSL Height: 338.1 m  
Horiz. Pattern: Directional  
Prop Model: None

*Jeremy Ruck & Associates, Inc.*

- Proposed 51 dBu F(50,90) Contour
- Licensed 74 dBu F(50,50) Contour
- Area of Contour Overlap
- Proposed 30 mile site radius

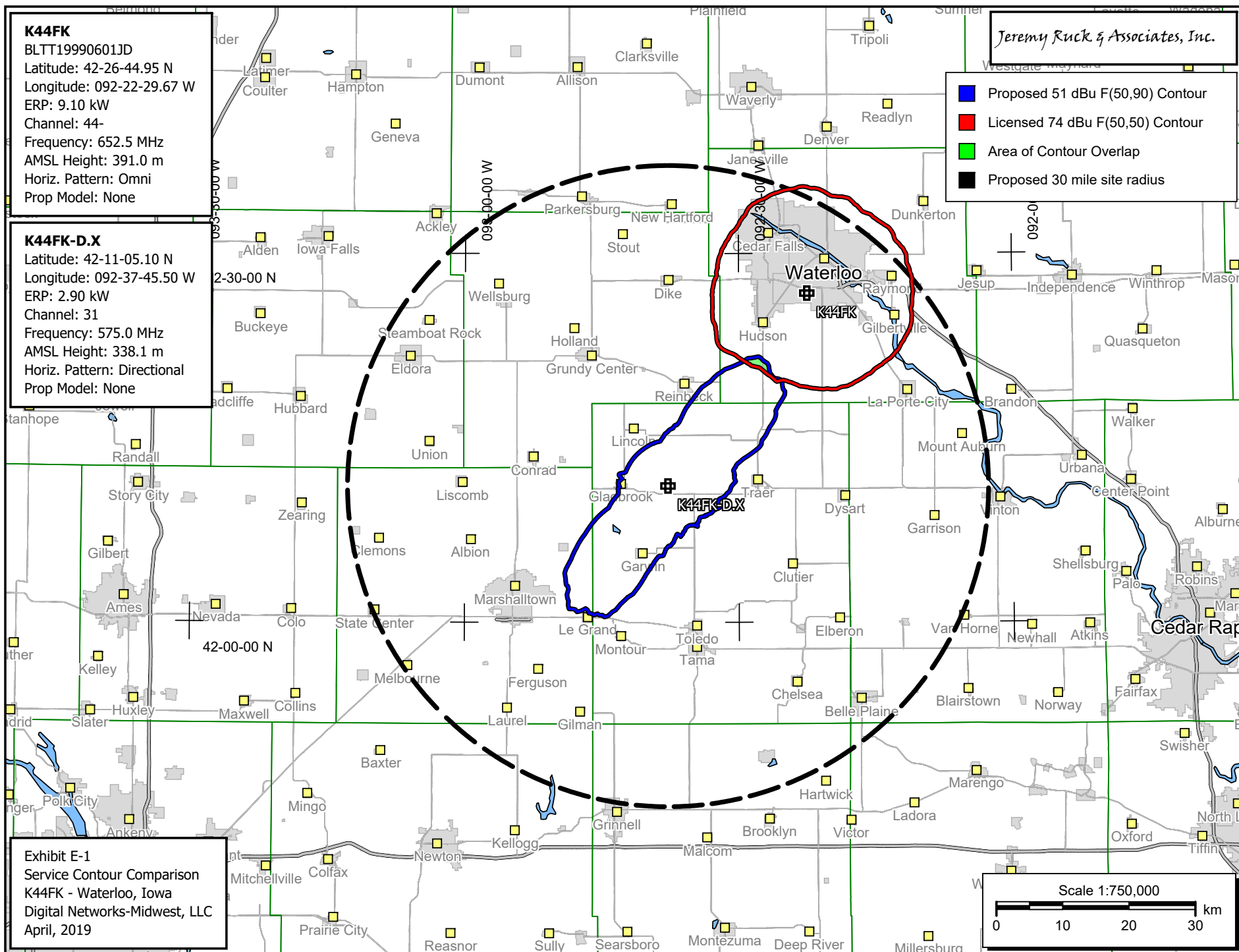


Exhibit E-1  
Service Contour Comparison  
K44FK - Waterloo, Iowa  
Digital Networks-Midwest, LLC  
April, 2019

Scale 1:750,000

0 10 20 30 km

## Exhibit E-2 - TVStudy Interference Study

tvstudy v2.2.5 (4uoc83)

Database: 127.0.0.1, Study: K44FK Channel 31 2900 W ERP PR-TV x4 Array ATC 418075, Model: Longley-Rice  
Start: 2019.04.23 13:58:16

Study created: 2019.04.23 13:58:16

Study build station data: LMS TV 2019-04-22

Proposal: K44FK.X D31 LD APP WATERLOO, IA  
File number: BLANK0000022313  
Facility ID: 67879  
Station data: User record  
Record ID: 21  
Country: U.S.

Build options:

Protect pre-transition records not on baseline channel

Stations potentially affected by proposal:

IX	Call	Chan	Svc	Status	City, State	File Number	Distance
Yes	KMIK-LD	D30	LD	CP	CEDAR FALLS, IA	BLANK0000052697	49.2 km
No	KLJB	D30	DT	CP	DAVENPORT, IA	BLANK0000034774	210.3
No	K30NF-D	D30	LD	CP	KEOKUK, IA	BLANK0000010604	178.5
No	K30NI-D	D30	LD	CP	ALBERT LEO, MN	BNPDTL20100510AJS	179.2
Yes	KMKI-LD	D31	LD	CP	CEDAR FALLS, IA	BLANK0000052698	49.2
No	K39IW-D	D31	LD	CP	LANSING, IA	BLANK0000035575	173.1
No	WFLD	D31	DT	LIC	CHICAGO, IL	BLANK0000055195	413.6
No	WESV-LD	D31	LD	CP	CHICAGO, IL	BLANK0000053952	413.6
No	WQAD-TV	D31	DT	CP	MOLINE, IL	BLANK0000034243	210.3
No	W33AY-D	D31	LD	CP	SPRINGFIELD, IL	BLANK0000051745	368.4
No	W31DT-D	D31	LD	CP	STERLING - DIXON, IL	BDCCDTL20110726AJF	251.6
No	K31EF-D	D31	LD	LIC	FROST, MN	BLDTT20090730ACQ	188.3
No	K31PG-D	D31	LD	LIC	GRANITE FALLS, MN	BLANK0000068153	376.0
No	K31NT-D	D31	LD	LIC	JACKSON, MN	BLANK0000064445	248.8
No	WDMI-LD	D31	LD	LIC	MINNEAPOLIS, MN	BLDTL20100809CIU	323.6
No	K49AJ-D	D31	LD	CP	OLIVIA, MN	BLANK0000053920	338.6
No	K31LN-D	D31	LD	CP	ROCHESTER, MN	BNPDTL20100309AAW	201.0
No	K31KX-D	D31	LD	CP	ST CHARLES, MN	BNPDTL20090825BXU	201.6
No	K31KV-D	D31	LD	LIC	ST. JAMES, MN	BLDTL20120625AAY	266.8
No	KCWE	D31	DT	LIC	KANSAS CITY, MO	BLCDT20051014ABT	379.6
No	KDNL-TV	D31	DT	LIC	ST. LOUIS, MO	BLCDT20021216AAE	445.4
No	KBLT-LD	D31	LD	LIC	LINCOLN, NE	BLANK0000004413	371.2
No	KLKN	D31	LD	LIC	LINCOLN, NE	BLCDT20090903AAK	373.5
No	KMTV-TV	D31	DT	CP	OMAHA, NE	BLANK0000026767	298.2
No	W31DN-D	D31	LD	CP	EAU CLAIRE, WI	BNPDTL20090825AYR	302.3
No	WITI	D31	DT	CP	MILWAUKEE, WI	BLANK0000062874	399.8
No	W38EX-D	D31	LD	APP	WAUSAU, WI	BLANK0000071942	395.0
No	KFKZ-LD	D32	LD	LIC	CEDAR FALLS, IA	BLANK0000069608	62.6
No	KQCT-LP	D32-	LD	CP	DAVENPORT, IA	BLANK0000068394	210.3
No	K41DD-D	D32	LD	CP	DES MOINES, IA	BLANK0000053618	109.7
No	WTJR	D32	DT	LIC	QUINCY, IL	BLCDT20091110ADL	269.0
No	K32LB-D	D32	LD	CP	ALBERT LEO, MN	BNPDTL20100510AJT	179.2
No	WIFS	D32	DT	LIC	JANESVILLE, WI	BLCDT20040930BHL	274.4

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied:

Channel: D31  
Mask: Full Service  
Latitude: 42 11 5.10 N (NAD83)  
Longitude: 92 37 45.50 W  
Height AMSL: 348.1 m  
HAAT: 46.2 m  
Peak ERP: 2.90 kW  
Antenna: SCA PR-TV x4 Array 2@0 2@180 40.0 deg  
Elev Pattn: Generic

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## Exhibit E-2 - TVStudy Interference Study

50.4 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	0.045 kW	44.5 m	9.7 km
45.0	2.58	46.7	26.3
90.0	0.027	68.0	10.6
135.0	0.025	40.6	7.9
180.0	0.045	51.4	10.5
225.0	2.58	41.1	24.9
270.0	0.027	44.9	8.6
315.0	0.025	32.7	7.1

Distance to Canadian border: 656.5 km

Distance to Mexican border: 1587.3 km

Conditions at FCC monitoring station: Grand Island NE  
Bearing: 255.7 degrees Distance: 502.2 km

Proposal is not within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:  
Bearing: 262.1 degrees Distance: 1076.8 km

Study cell size: 1.00 km  
Profile point spacing: 1.00 km

Maximum new IX to full-service and Class A: 0.50%  
Maximum new IX to LPTV: 2.00%

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Interference to BLANK0000052697 CP scenario 1

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	KMIK-LD	D30	LD	CP	CEDAR FALLS, IA	BLANK0000052697	
Undesireds:	K44FK.X	D31	LD	APP	WATERLOO, IA	BLANK0000022313	49.2 km
	KGAN	D29	DT	LIC	CEDAR RAPIDS, IA	BLCDDT20140416AAI	40.9
	KLJB	D30	DT	CP	DAVENPORT, IA	BLANK0000034774	206.4
	K30NF-D	D30	LD	LIC	KEOKUK, IA	BLANK0000010562	248.4
	K30FN-D	D30	LD	LIC	ST. JAMES, MN	BLDTL20100416AAI	257.4
Service area		Terrain-limited		IX-free, before		IX-free, after	Percent New IX
6143.7	204,032	6138.7	204,008	5677.3	200,069	5677.3 200,069	0.00 0.00
Undesired		Total IX		Unique IX, before		Unique IX, after	
K44FK.X	D31 LD APP	1.0	0			0.0 0	
KGAN	D29 DT LIC	459.3	3,937	454.4	3,911	454.4 3,911	
KLJB	D30 DT CP	7.0	28	2.0	2	1.0 2	

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Interference to BLANK0000052698 CP scenario 1

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	KMKI-LD	D31	LD	CP	CEDAR FALLS, IA	BLANK0000052698	
Undesireds:	K44FK.X	D31	LD	APP	WATERLOO, IA	BLANK0000022313	49.2 km
	K39LW-D	D31	LD	CP	LANSING, IA	BLANK0000035575	124.0
	WQAD-TV	D31	DT	CP	MOBILE, IL	BLANK0000034243	206.4
	KFKZ-LD	D32	LD	LIC	CEDAR FALLS, IA	BLANK0000069608	41.3
Service area		Terrain-limited		IX-free, before		IX-free, after	Percent New IX
6120.6	203,336	6115.6	203,312	6082.6	203,210	5918.3 201,123	2.70 1.03
Undesired		Total IX		Unique IX, before		Unique IX, after	
K44FK.X	D31 LD APP	167.2	2,090			164.3 2,087	
K39LW-D	D31 LD CP	3.0	5	1.0	0	1.0 0	
WQAD-TV	D31 DT CP	18.1	49	11.0	17	8.1 14	

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## Exhibit E-2 - TVStudy Interference Study

KFKZ-LD D32 LD LIC      19.0      80      14.0      53      14.0      53

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Interference to proposal scenario 1  
19.73% interference received

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	K44FK.X	D31	LD	APP	WATERLOO, IA	BLANK0000022313	
Undesireds:	KMKI-LD	D31	LD	CP	CEDAR FALLS, IA	BLANK0000052698	49.2 km
	WQAD-TV	D31	DT	CP	MOLINE, IL	BLANK0000034243	210.3
Service area		Terrain-limited		IX-free		Percent IX	
679.3      5,078		678.3      5,078		481.9      4,076		28.96      19.73	
Undesired		Total IX		Unique IX		Prcnt Unique IX	
KMKI-LD D31 LD CP		196.4      1,002		195.4      961		28.81      18.92	
WQAD-TV D31 DT CP		1.0      41		0.0      0		0.00      0.00	

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