

***COMPREHENSIVE TECHNICAL EXHIBIT  
APPLICATION FOR CONSTRUCTION PERMIT***

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PROPOSED NEW NCE FM STATION  
SPENCER, IOWA  
89.9 MHz / CHANNEL 210C3

ST. GABRIEL COMMUNICATIONS

NOVEMBER 2021

## **APPLICATION FOR CONSTRUCTION PERMIT**

The following engineering statement and attached exhibits have been prepared for **St. Gabriel Communications** ("Gabriel"), applicant for a new non-commercial educational FM station to serve Spencer, Iowa, and are in support of their application for construction permit for that facility.

The proposed facility would operate on FM channel 210 as a class C3 facility. It is proposed that the facility operate with a maximum effective radiated power of 22.0 kW at a center of radiation of 507.2 meters above mean sea level, 66.8 meters above ground level utilizing a non-directional antenna. The antenna elevation above mean sea level corresponds to center of radiation elevation of 84.3 meters above average terrain. The Commission's 30-meter terrain database was utilized to determine average terrain for the proposed facility, and in the generation of contours depicted within this technical exhibit.

The proposed technical parameters comply with the provisions of Section 73.515 of the Commission's Rules. Residents of the region, including the community of license, Spencer, Iowa, will be provided with toll-free telephone access to the main studio.

The proposed technical parameters for the new facility under this application comply with the interference protection requirements of Sections 73.207, 73.509, and 73.525 of the Commission's Rules. Sections 73.213 and 73.215 are not applicable.

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Exhibit E-2 is the tabular interference study pursuant to Section 73.509 for the proposed technical parameters. This tabular study is graphically depicted in the contour map in Exhibit E-3. From this tabulation and map, it is apparent that no prohibited contour overlap would result from the proposed technical parameters.

The proposed technical parameters comply with the intermediate frequency spacing provisions of Section 73.207 of the Commission's Rules. Exhibit E-4 is a single channel spacing study for the proposed facility. This study demonstrates that there are no spacing conflicts to proposed or authorized facilities on FM channels 263 or 264. This single channel spacing study also demonstrates that there are no television channel six broadcast facilities located within the affected distance of Section 73.525 of 196 kilometers.

The proposed facility would comply with relevant international agreements. Exhibit E-5 illustrates the proposed site location, as well as a 320-kilometer radius centered on the site. As this map demonstrates, the proposed site is located in excess of this distance from either the Canadian or Mexican border.

The map in Exhibit E-6 illustrates the proposed 60 dBu service contour along with other NCE 60 dBu service contours that intersect or overlap the proposed service contour. In this particular region, there are no unbuilt construction permits that require consideration, thus the other contours depicted on this map are all for licensed facilities operating on channels below 221.

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This map demonstrates that the proposed technical parameters would not result in any new first local NCE service. The proposed technical parameters do, however, result in areas where a new second local NCE service would be provided. These areas, indicated by a magenta color on the map in Exhibit E-6 have a total resident population of 11,115 persons by the 2010 Census data. The total population within the predicted 60 dBu service contour is 42,873 persons in an area of 3,831 square kilometers, excluding water. The areas where the proposed technical parameters would provide a 2<sup>nd</sup> local NCE service have a resident population of 25.9 percent of the total population within the 60 dBu service contour.

Gabriel has obtained reasonable site assurance for use of the site. The site is owned/managed by SBA Towers IV, LLC. The undersigned engineer spoke by telephone with Mr. Kent Meier at (414) 788-1133 concerning reasonable site assurance for use of the site, which they designate as IA12581-A. Mr. Meier stated that reasonable site assurance is granted to Gabriel for use of the site. This telephone conversation occurred on Monday October 18, 2021.

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

Additionally, the proposed facility would not constitute a radiofrequency radiation exposure hazard to persons in the vicinity of the structure. It is proposed that a type-3 antenna with four elements spaced 1.0 wavelength apart be utilized. *FM Model* calculates a maximum power density

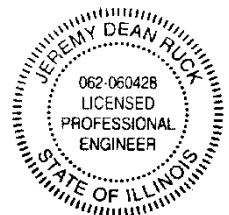
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of 30.4  $\mu\text{W}/\text{cm}^2$  at a distance of 26 meters from the tower base. Gabriel certifies that it will coordinate with all other users of the site to ensure that workers and other persons are not exposed to levels of radiofrequency radiation in excess of the Commission's safety standards. Coordination activities will include, but are not necessarily limited to, a reduction in transmitter power or cessation of operation.

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, 2021

Jeremy D. Ruck, PE  
November 4, 2021

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11.4.2021

**NEW.X**  
Proposed  
Latitude: 43-13-46.50 N  
Longitude: 095-07-56.20 W  
ERP: 22.00 kW  
Channel: 210  
Frequency: 89.9 MHz  
AMSL Height: 507.2 m  
Horiz. Pattern: Omni  
Prop Model: FCC Contour

Jeremy Ruck & Associates, Inc.

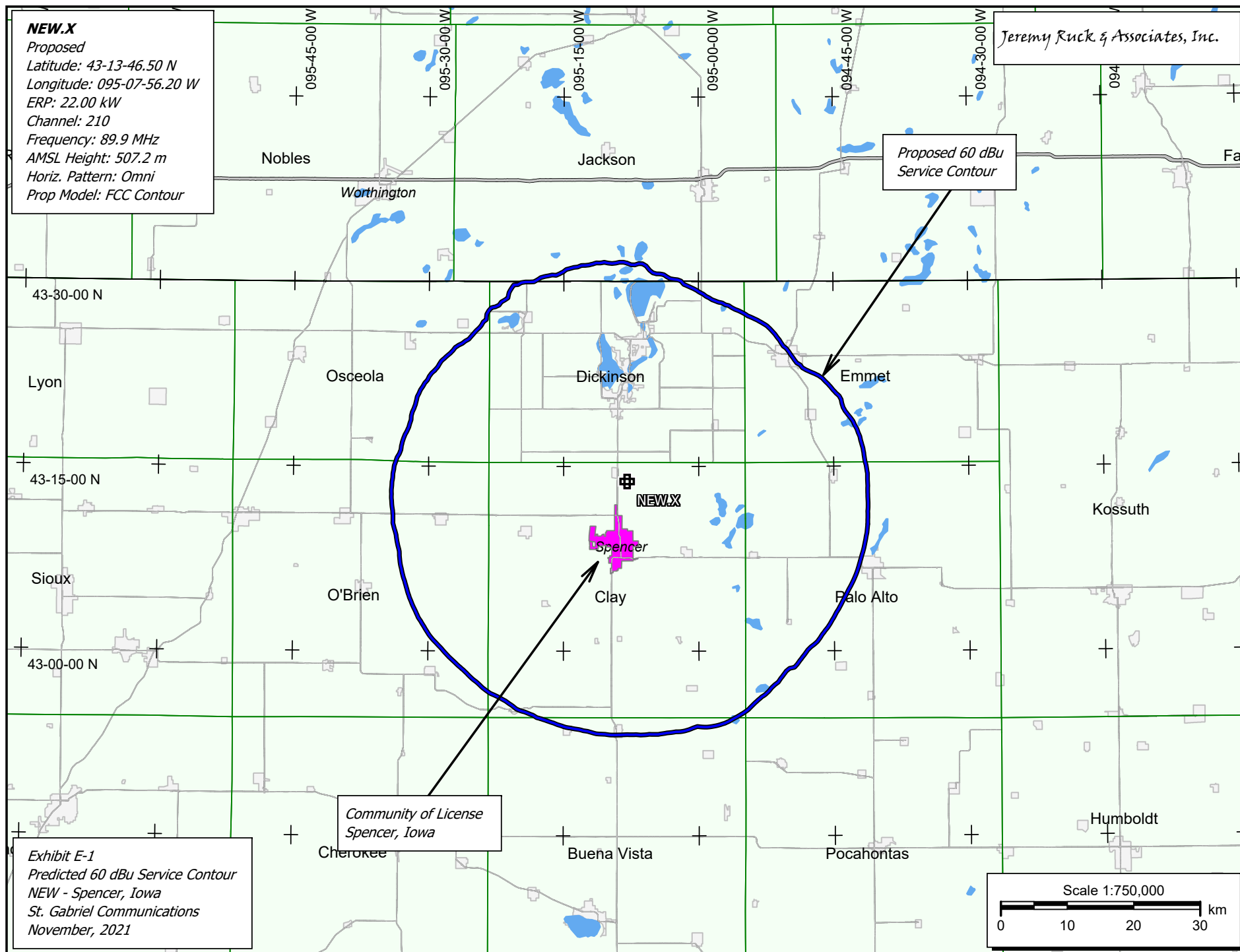
Proposed 60 dBu  
Service Contour

Community of License  
Spencer, Iowa

Exhibit E-1  
Predicted 60 dBu Service Contour  
NEW - Spencer, Iowa  
St. Gabriel Communications  
November, 2021

Scale 1:750,000

0 10 20 30 km



Jeremy Ruck & Associates, Inc.  
Consulting Engineers

Exhibit E-2 - Tabular Interference Study

NEW - Spencer, Iowa

REFERENCE 43 13 46.50 N.  
95 07 56.20 W.  
CH# 210C3 - 89.9 MHz, Pwr= 22 kw, HAAT= 84.8 M, COR= 507.2 M  
Average Protected F(50-50)= 35.34 km  
Omni-directional

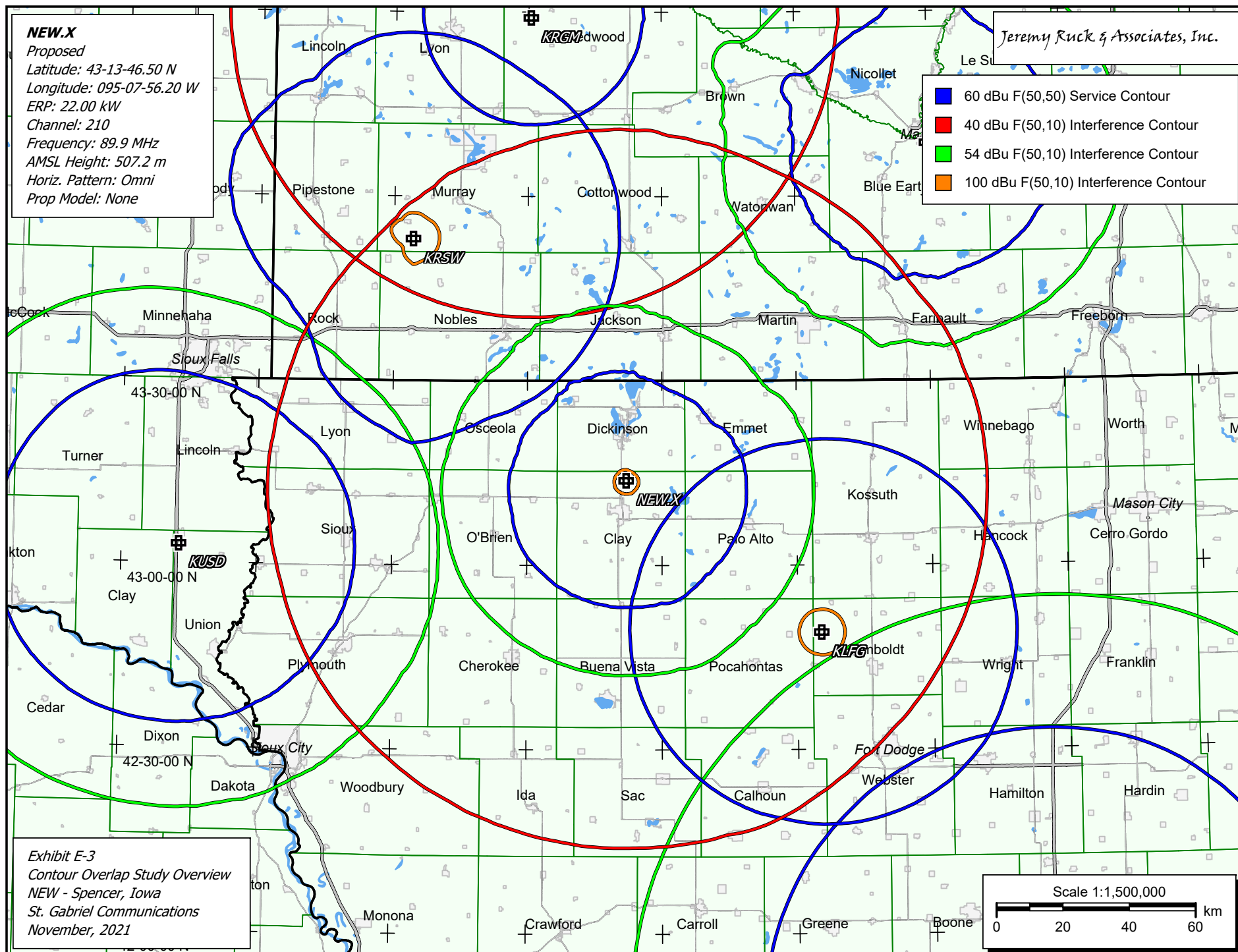
DISPLAY DATES  
DATA 11-03-21  
SEARCH 11-03-21

CH CITY	CALL	TYPE STATE	ANT STATE	AZI <--	DIST FILE #	LAT LNG	PWR(kw) HAAT(M)	INT(km) COR(M)	PRO(km) LICENSEE	*IN* (Overlap in km)	*OUT*
210C3 Marshall	KRGM	LIC _CN MN		348.5 168.2	142.41 BLED20150604ABF	44 29 02.80 95 29 28.00	4.250 163	90.4 493	32.4 University Of Northwestern	18.8	3.9
208C1 Fort Dodge	KLFG	LIC _CN IA		127.8 308.3	74.36 BLED20180706AAE	42 49 02.90 94 24 41.90	34.000 257	6.9 608	58.0 Educational Media Foundati	30.2	12.5
209C1 Vermillion	KUSD	LIC _CN SD		262.1 81.0	135.71 BLED19920212KA	43 02 59.90 96 47 13.10	32.000 202	77.9 614	52.7 South Dakota Board Of Dire	22.0	26.8
207C1 Worthington	KRSW	LIC DCN MN		318.8 138.3	97.00 BLED19941220KA	43 53 00.90 95 55 45.10	100.000 169	7.5 689	60.6 Minnesota Public Radio	56.3	33.1
211C Ames	WOI-FM	LIC _CN IA		141.3 322.3	200.99 BLED978	41 48 32.90 93 36 53.70	100.000 454	122.1 745	82.2 Iowa State University Of S	40.9	60.6
209C2 Mankato	KMSU	LIC _CN MN		41.5 222.3	136.18 BLED20091202ABZ	44 08 30.90 94 00 06.80	17.000 133	60.9 425	40.3 Minnesota State University	44.0	44.5
06 -- Sioux City	K06QG-D«	LI _HN IA		231.5 50.8	113.95 0000151992	42 35 12.00 96 13 20.00	0.300	27.3 956	28.5	55.7R	58.2M
06 -- Sioux Falls	K06QJ-D«	CP _Y SD		285.6 104.5	132.35 BNPDVL-20100723AQN	43 32 17.10 96 42 51.49	3.000	24.1 476	13.5	37.6R	94.8M

Terrain database is FCC 30 meter , R= 73.215 qualifying spacings or FCC minimum Spacings in KM, M= Margin in KM  
In & Out distances between contours are shown at closest points. Reference zone= - Zone 2, Co to 3rd adjacent.  
All separation margins (if shown) include rounding.  
Ant Column: (D= DA Standard, Z= DA 73.215, N= Not DA 73.215, \_= Omni), Polarization (C,H,V,E), Beamtilt(Y,N,X)  
« = Station meets FCC minimum distance spacing for its class.

**NEW.X***Proposed**Latitude: 43-13-46.50 N**Longitude: 095-07-56.20 W**ERP: 22.00 kW**Channel: 210**Frequency: 89.9 MHz**AMSL Height: 507.2 m**Horiz. Pattern: Omni**Prop Model: None**Jeremy Ruck & Associates, Inc.*

- 60 dBu F(50,50) Service Contour
- 40 dBu F(50,10) Interference Contour
- 54 dBu F(50,10) Interference Contour
- 100 dBu F(50,10) Interference Contour

*Exhibit E-3**Contour Overlap Study Overview**NEW - Spencer, Iowa**St. Gabriel Communications**November, 2021*

Scale 1:1,500,000

0 20 40 60 km



Jeremy Ruck & Associates, Inc.  
Consulting Engineers  
Exhibit E-4 - Single Channel Spacing Study  
NEW - Spencer, Iowa

REFERENCE		DISPLAY DATES
43 13 46.50 N.	CLASS = C3	DATA 11-03-21
95 07 56.20 W.	Current Spacings to 3rd Adj.	SEARCH 11-04-21
----- Channel 210 - 89.9 MHz -----		

Call	Channel	Location	Azi	Dist	FCC	Margin
-----						
K06QG-D	LI 06 --	Sioux City	IA 231.5	114.12	195.5	-81.4
K06QJ-D	CP 06 --	Sioux Falls	SD 285.6	132.70	195.5	-62.8
KRGM	LIC 210C3	Marshall	MN 348.5	142.34	152.5	-10.2
KUSD	LIC 209C1	Vermillion	SD 262.1	136.09	143.5	-7.4
KLFG	LIC 208C1	Fort Dodge	IA 127.8	74.47	75.5	-1.0
KYEJ-LP	LIC 211L1	Fairmont	MN 46.0	67.10	66.5	0.6
KMSU	LIC 209C2	Mankato	MN 41.5	136.31	116.5	19.8
KRSW	LIC-D 207C1	Worthington	MN 318.8	97.08	75.5	21.6
WOI-FM	LIC 211C	Ames	IA 141.3	201.10	175.5	25.6
KSFS	LIC 211C3	Sioux Falls	SD 285.5	136.76	98.5	38.3
KWIT	LIC 212C1	Sioux City	IA 228.2	123.96	75.5	48.5

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All separation margins include rounding

**NEW.X**

Proposed

Latitude: 43-13-46.50 N

Longitude: 095-07-56.20 W

ERP: 22.00 kW

Channel: 210

Frequency: 89.9 MHz

AMSL Height: 507.2 m

Horiz. Pattern: Omni

Prop Model: None

Jeremy Ruck & Associates, Inc.

Proposed Site  
320 kilometer Radius

NEW.X

Exhibit E-5  
International Agreement Compliance  
NEW - Spencer, Iowa  
St. Gabriel Communications  
November, 2021

Scale 1:8,000,000

0 110 220 330 km

**NEW.X**

Proposed

Latitude: 43-13-46.50 N

Longitude: 095-07-56.20 W

ERP: 22.00 kW

Channel: 210

Frequency: 89.9 MHz

AMSL Height: 507.2 m

Horiz. Pattern: Omni

Prop Model: None

Jeremy Ruck &amp; Associates, Inc.

- Proposed 60 dBu Service Contour
- 60 dBu Service Contour of Other NCE Station Considered
- Area of New 1st Local NCE Service (None)
- Area of New 2nd Local NCE Service
- Area of 3rd or Greater Local NCE Service

