

August 2023
FM Translator K209CF
Kearney, Nebraska Channel 211D
Allocation Study

Allocation Study

This application proposes modification of FM translator K209CF to operate on its second-adjacent channel 211D.

The attached spacing study shows the spacing between the proposed translator site and the location of cochannel and adjacent channel stations and proposals. This study was made with the Commission's Class A spacing requirements, and individual situations were examined to determine the lack of prohibited contour overlap per the requirements of §74.1204 of the Rules. The attached allocation study maps demonstrate compliance with the Commission's Rules for protection of FM broadcast stations and FM translators as outlined in §74.1204.

The attached spacing study demonstrates compliance with §73.207 of the Commission's Rules regarding spacing restrictions to stations which are 53 or 54 channels removed from the proposed operation. There are no IF spacing channel requirements to LPFM stations.

KYHK 208A Kearney

The proposed translator transmitter site is located within the 60 dBu protected contour of third-adjacent channel station KYHK 208A Kearney. The following calculation, performed using the *Living Way* methodology, demonstrates interference protection to that station.

| Protected Station | Distance & Bearing to Proposal | Station ERP and HAAT on that azimuth | Station Field Strength at Proposal | Corresponding Translator Interfering Contour | Distance to Translator Interfering Contour |
|-------------------|--------------------------------|--------------------------------------|------------------------------------|--|--|
| KYHK 208A | 0.01 km (dna) deg T | 1 kW (dna) meters | 146.9 dBu Free Space | 186.9 dBu | <0.1 meters Free Space |

KYHK is located on the same tower as the proposed operation, and the 0.01 km distance utilized for this calculation was assumed in order to avoid a "divide by zero" error in the calculation. The 186.9 dBu contour extends less than 0.1 meters from the antenna and does not reach ground level.

There is no population within this contour. Therefore, the proposed facility is believed to satisfy the requirements of §74.1204(d) with respect to KYHK.

Non-Fill-In Translator ERP

The proposed facility will operate as a non-fill-in translator. The highest 30-degree-increment radial HAAT value is 119 meters on the 120-degree radial, which by reference to §73.1235(b) allows for a maximum omnidirectional ERP of 205 watts. This calculation used the 3-second terrain database.

TV Channel 6

Section 74.1205 of the Commission's Rules specifies a threshold distance of 135 kilometers for FM translators operating on Channel 211. There is no TV Channel 6 station located within this threshold distance. The nearest (KWNB-TV) is located 160 kilometers distant.

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SEARCH PARAMETERS

FM Database Date: 20230811

Channel: 211A 90.1 MHz
 Latitude: 40 43 42.0 (NAD83)
 Longitude: 99 7 48.3
 Safety Zone: 50 km
 Job Title: KEARNEY 211

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| Call Status | City St | FCC File No. | Channel Freq. | ERP(kW) HAAT(m) | Latitude Longitude | Bearing deg-True | Dist (km) | Req (km) |
|----------------|--------------------|------------------|------------------|--------------------|--------------------------|---------------------|-----------------|--------------|
| K208GD LIC | GRAND ISLAND NE | 0000108506 | 208D 89.5 | 0.125 0.0 | 40 54 41.4 98 22 48.8 | 71.9 | 66.45 0.00 | 0 TRANS |
| KYHK LIC | KEARNEY NE | 0000218327 | 208A 89.5 | 1.000 106.0 | 40 43 42.0 99 7 48.3 | 0.0 | 0.00 -31.00 | 31 SHORT |
| K209CF LIC | KEARNEY NE | BLFT-20170315AAP | 209D 89.7 | 0.250 0.0 | 40 43 42.0 99 7 48.3 | 0.0 | 0.00 0.00 | 0 TRANS |
| KCVG LIC | HASTINGS NE | BLED-20170112AAV | 210C3 89.9 | 16.000 99.3 | 40 47 11.0 98 22 1.2 | 84.0 | 64.76 -24.24 | 89 SHORT |
| K210CB LIC | BROKEN BOW NE | BLFT-19980619TD | 210D 89.9 | 0.250 0.0 | 41 26 15.0 99 43 53.4 | 327.6 | 93.58 0.00 | 0 TRANS |
| KNEF LIC | FRANKLIN NE | BLED-20121105AAE | 211A 90.1 | 0.100 -18.0 | 40 6 10.0 98 57 3.3 | 167.6 | 71.11 -43.89 | 115 SHORT |
| K211DP LIC | ALMA NE | BLFT-20010531ACN | 211D 90.1 | 0.250 0.0 | 40 7 7.0 99 22 28.4 | 197.1 | 70.81 0.00 | 0 TRANS |
| KZLW LIC | GRETN NE | BLED-20110228AAL | 211C1 90.1 | 100.000 21.0 | 41 12 27.0 96 40 39.1 | 74.7 | 213.20 13.20 | 200 CLEAR |
| KFJS LIC | NORTH PLATTE NE | 0000206942 | 211C3 90.1 | 13.200 128.0 | 41 12 13.0 100 44 0.0 | 292.0 | 144.92 2.92 | 142 CLOSE |
| K212GG LIC | GRAND ISLAND NE | BLFT-20170417AAZ | 212D 90.3 | 0.250 0.0 | 40 54 50.0 98 23 8.2 | 71.5 | 66.10 0.00 | 0 TRANS |
| KMNE-FM LIC | BASSETT NE | BLED-20150701ACF | 212C0 90.3 | 100.000 402.0 | 42 20 5.0 99 29 3.4 | 350.7 | 180.84 28.84 | 152 CLEAR |
| K212GI LIC | HASTINGS NE | BLFT-20180720AAS | 212D 90.3 | 0.250 0.0 | 40 35 46.0 98 20 40.2 | 102.3 | 68.04 0.00 | 0 TRANS |
| KQQA CP | SHELTON NE | 0000162599 | 213C3 90.5 | 10.000 45.0 | 40 46 43.0 98 44 39.3 | 80.1 | 33.06 -8.94 | 42 SHORT |
| KQQA LIC | SHELTON NE | BLED-20161123AAC | 213A 90.5 | 0.600 45.0 | 40 46 43.0 98 44 39.3 | 80.1 | 33.06 2.06 | 31 CLOSE |

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SEARCH PARAMETERS

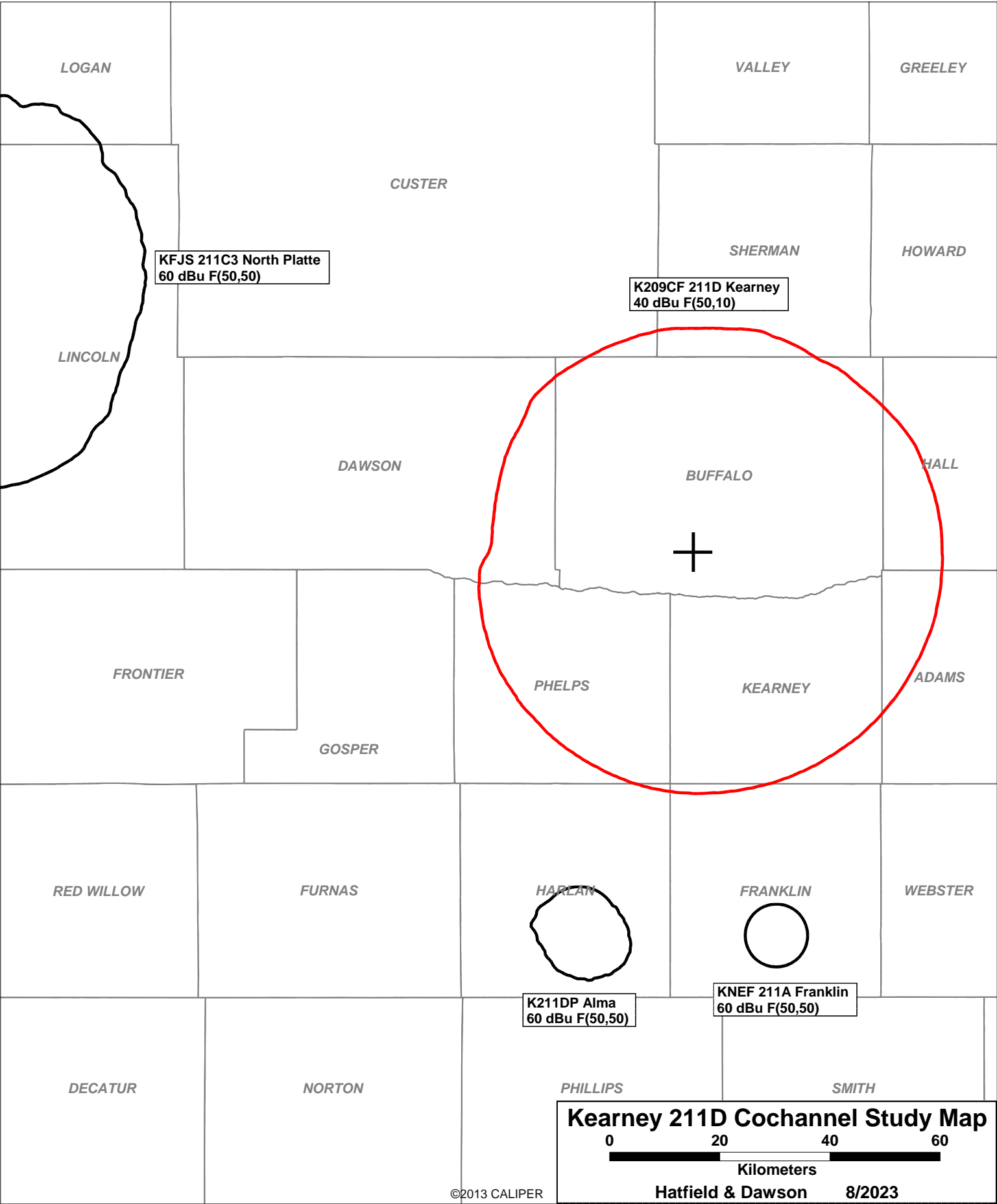
FM Database Date: 20230811

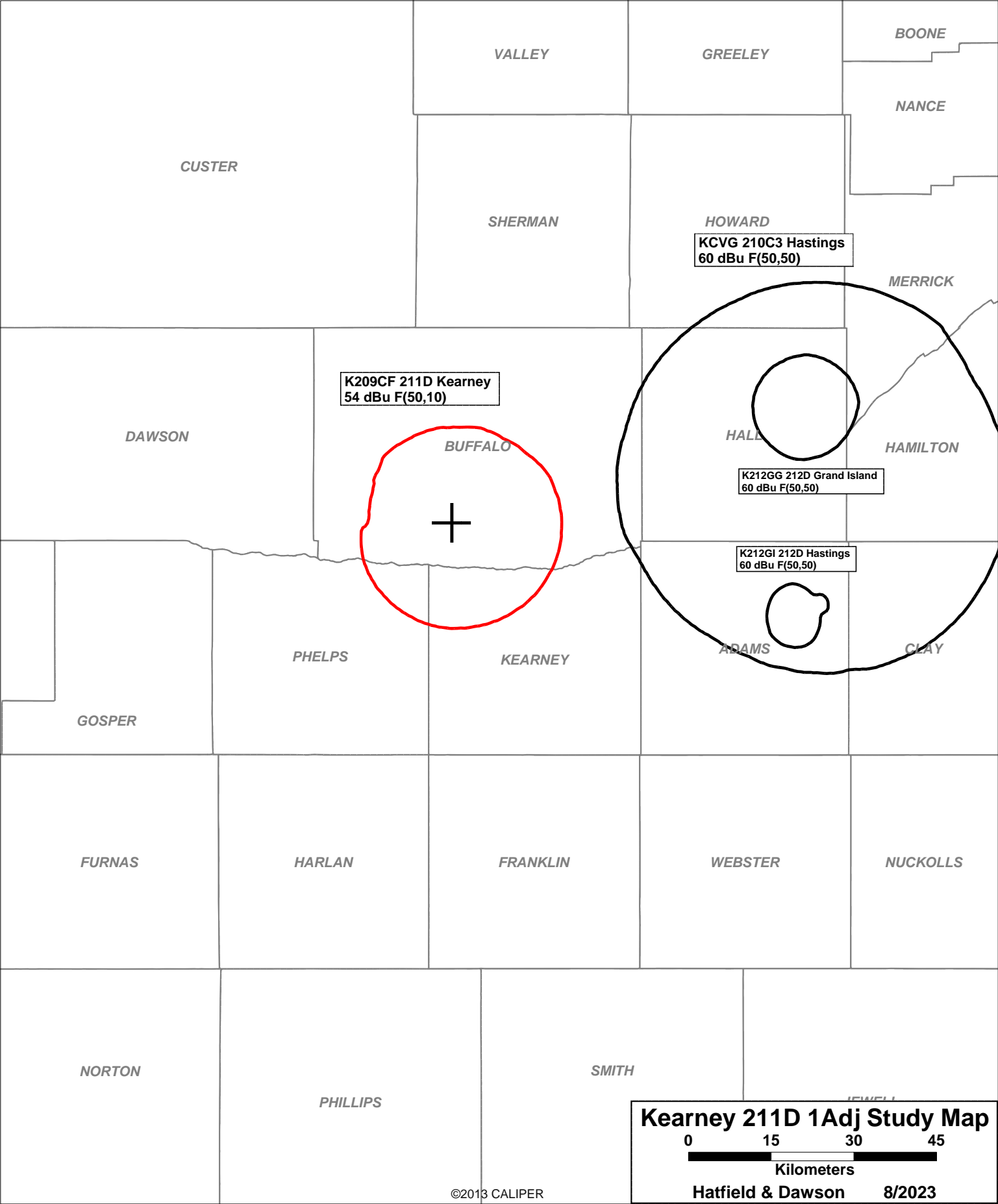
Channel: 211A 90.1 MHz
 Latitude: 40 43 42.0 (NAD83)
 Longitude: 99 7 48.3
 Safety Zone: 50 km
 Job Title: KEARNEY 211

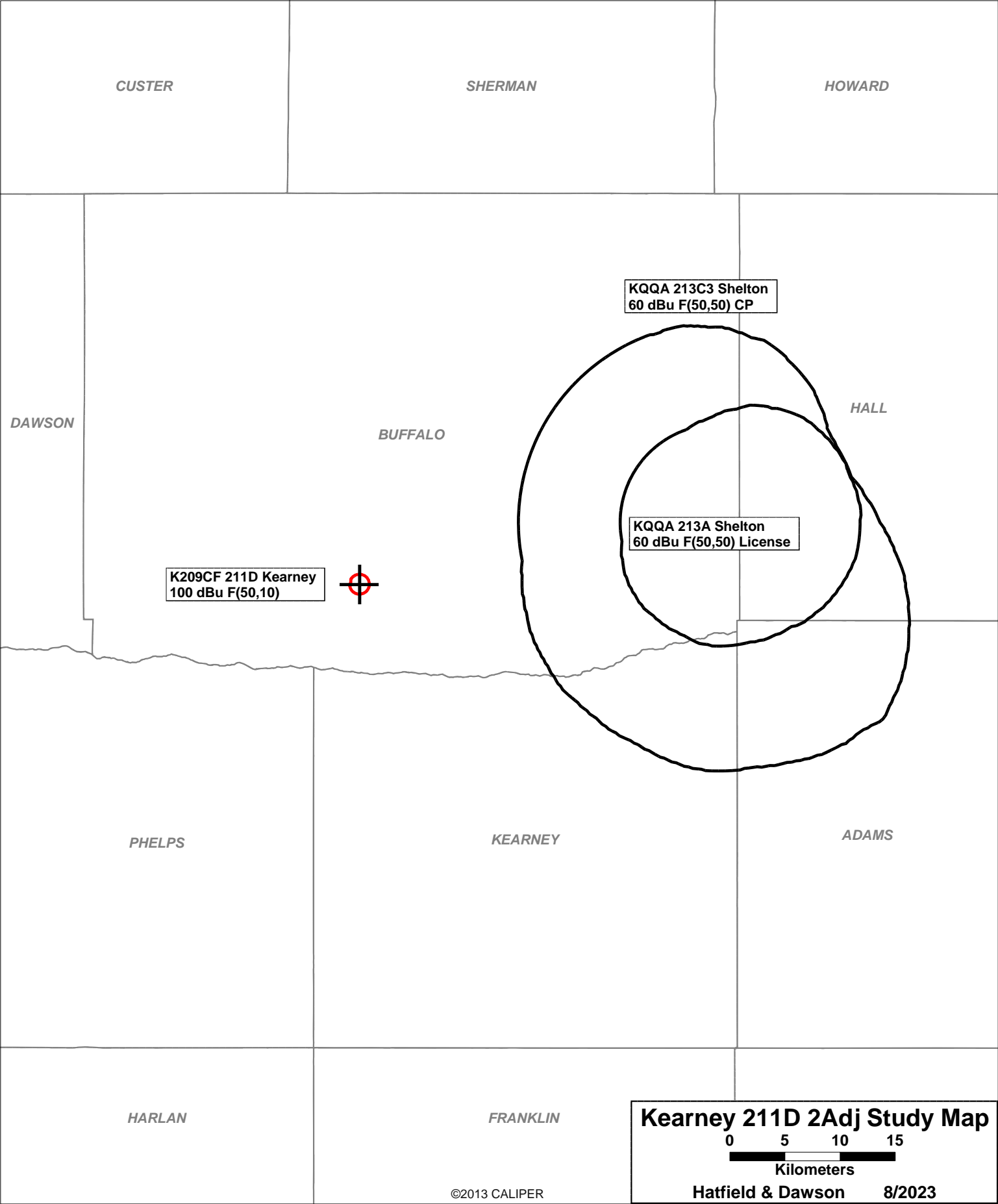
Page 2

| Call Status | City St | FCC File No. | Channel Freq. | ERP(kW) HAAT(m) | Latitude Longitude | Bearing deg-True | Dist (km) | Req (km) |
|----------------|--------------|------------------|------------------|--------------------|-----------------------|---------------------|--------------|-------------|
| KNFA | GRAND ISLAND | | 214A | 1.300 | 40 54 50.0 | 71.2 | 65.10 | 31 |
| LIC | NE | BLD-20100218AAL | 90.7 | 58.3 | 98 23 53.2 | | 34.10 | CLEAR |
| K214DK | HOLDREGE | | 214D | 0.250 | 40 24 58.0 | 218.3 | 44.18 | 0 |
| LIC | NE | BLFT-19991001ACC | 90.7 | 0.0 | 99 27 12.4 | | 0.00 | TRANS |
| KNEY-LP | KEARNEY | | 265L1 | 0.100 | 40 44 23.0 | 70.8 | 3.86 | 0 |
| LIC | NE | 0000124886 | 100.9 | 20.0 | 99 5 13.0 | | 0.00 | LPFM |

===== END OF FM SPACING STUDY FOR CHANNEL 211 =====







August 2023
FM Translator K209CF
Kearney, Nebraska Channel 211D
RF Exposure Study

Facilities Proposed

The proposed operation will be on Channel 211D (90.1 MHz) with an effective radiated power of 205 watts. Operation is proposed with an antenna to be mounted on an existing tower with FCC Antenna Structure Registration Number 1258437.

RF Exposure Calculations

The power density calculations shown below were made using the techniques outlined in OET Bulletin No. 65. "Ground level" calculations in this report have been made at a reference height of 2 meters above ground to provide a worst-case estimate of exposure for persons standing on the ground in the vicinity of the tower. The equation shown below was used to calculate the ground level power density figures from each antenna.

$$S(\mu W / cm^2) = \frac{33.4 \times AdjERP(Watts)}{D^2}$$

Where: *AdjERP(Watts)* is the maximum lobe effective radiated power times the element pattern factor times the array pattern factor.

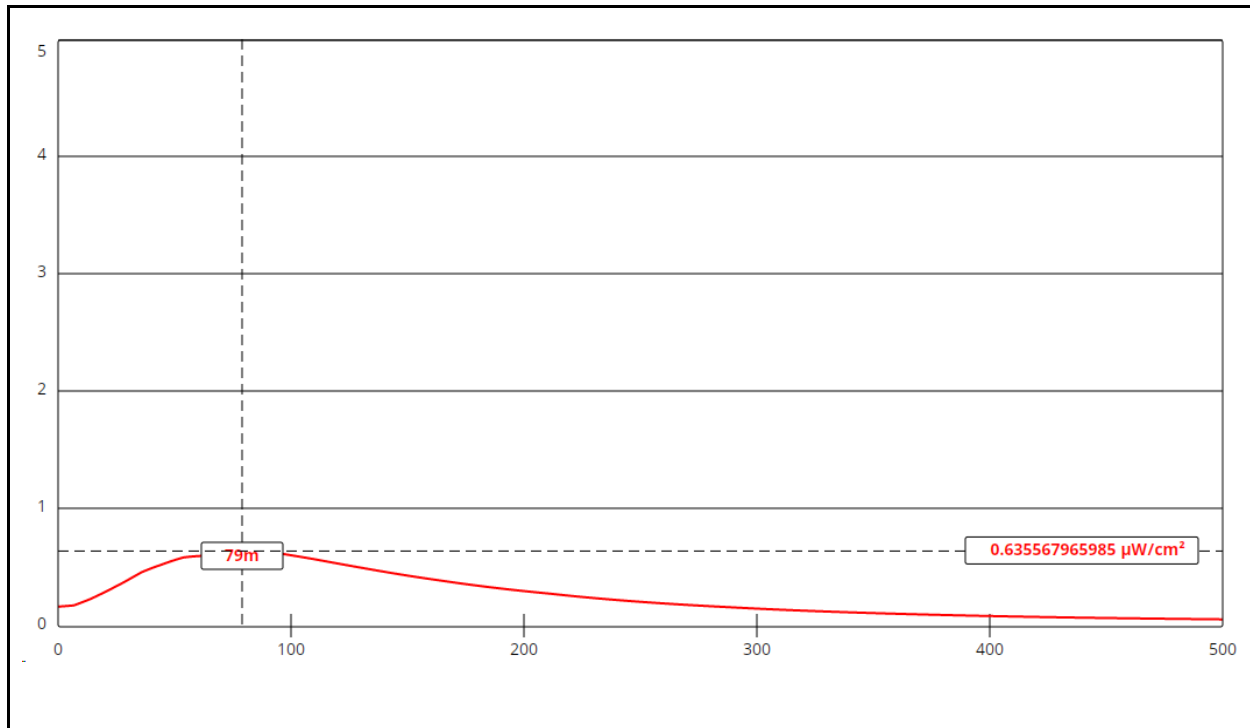
D is the distance in meters from the center of radiation to the calculation point.

Ground level power densities have been calculated for locations extending from the base of the tower to a distance of 500 meters. Values past this point are increasingly negligible.

Calculations of the power density produced by the proposed antenna system assume a Type 2 element pattern, which is the element pattern for the Bext TFC2K-1 antenna proposed for use. The highest calculated ground level power density occurs at a distance of 79 meters from the base of the antenna support structure. At this point the power density is calculated to be 0.6 $\mu W/cm^2$, which is 0.3% of 200 $\mu W/cm^2$ (the FCC standard for uncontrolled environments).

These calculations show that the maximum calculated power density produced at two meters above ground level by the proposed operation alone is less than 5% of the applicable FCC exposure limit at all locations between 1 and 500 meters from the base of the antenna support structure. Section 1.1307 of the Commission's Rules exempts applications for new facilities or modifications to existing facilities from the requirement of preparing an environmental assessment when the calculated emissions from the applicants proposed facility are predicted to be less than 5% of the applicable FCC exposure limit. Therefore, the proposed facility is in compliance with Section 1.1301 *et seq* and no further analysis of RF exposure at this site is required in this application.

The permittee/licensee in coordination with other users of the site must reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency exposure in excess of FCC guidelines.



Ground-Level RF Exposure

OET FMModel

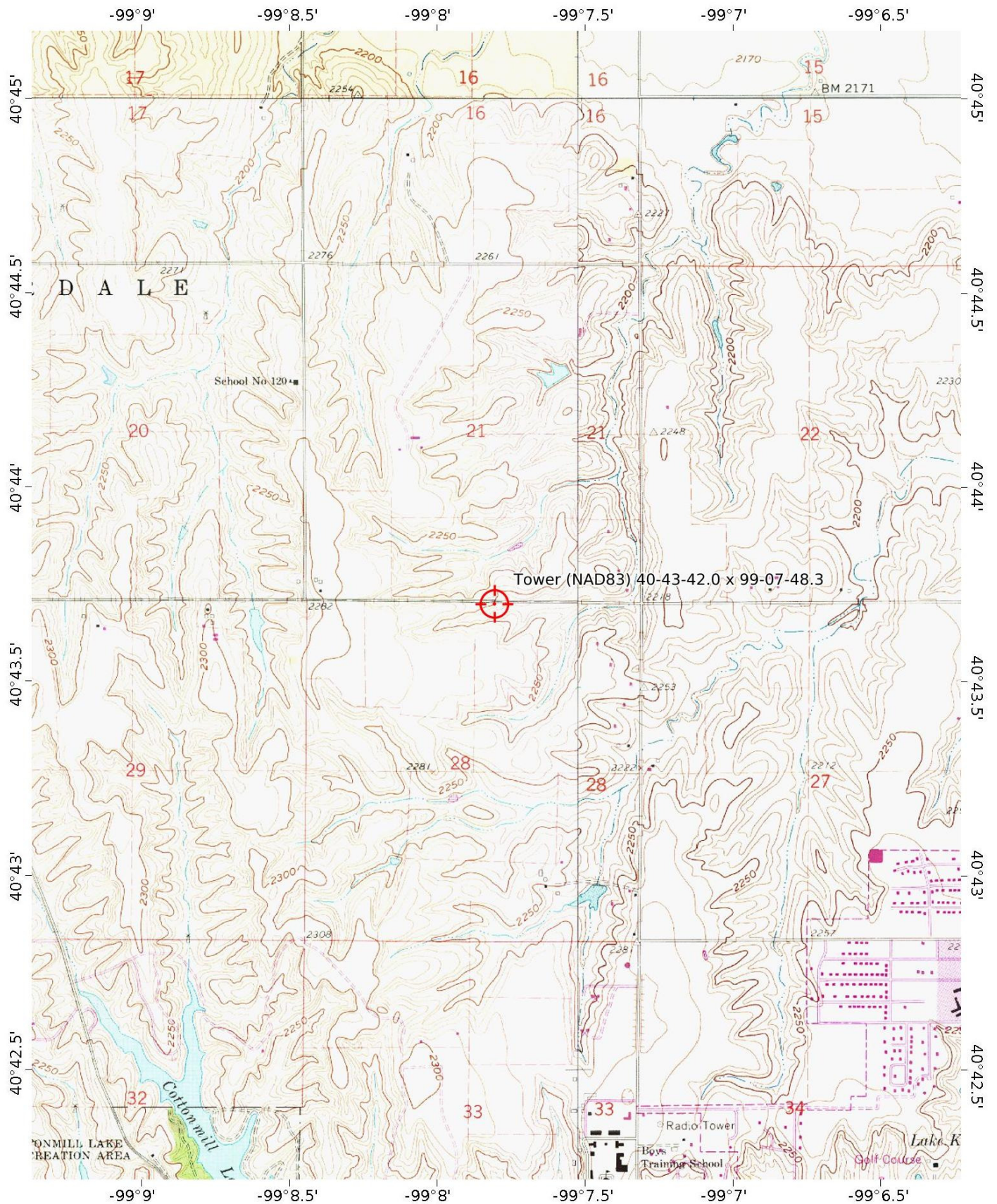
Kearney 211D

Antenna Type: Bext TFC2K-1
No. of Elements: 1
Element Spacing: 1.0 wavelength

Distance: 500 meters
Horizontal ERP: 205 W
Vertical ERP: 205 W

Antenna Height: 79 meters AGL

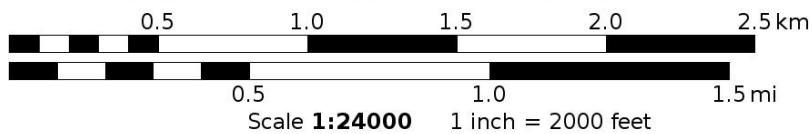
Maximum Calculated Power Density is 0.6 $\mu\text{W}/\text{cm}^2$ at 79 meters from the antenna structure.



Mercator Projection

WGS84

UTM Zone 14T



Hatfield & Dawson Consulting Engineers

