

**October 2021
New FM Channel 209A
Browning, Montana
Allocation Study**

Domestic Allocation Study

The attached spacing study shows the co-channel and adjacent channel spacing between stations and demonstrates that the proposed operation meets the IF channel spacing requirements as prescribed in §73.207 of the Commission's Rules.

Individual stations were examined to confirm the lack of prohibited contour overlap as prescribed in §73.509 of the Commission's Rules. The attached allocation study exhibits demonstrate requisite contour protection for the following domestic stations:

Second-adjacent	KUKL	211C1	Kalispell
Third-adjacent	New	212A	Heart Butte*

* This is another and separate application being filed by the Blackfeet Tribe during this filing window.

International Allocation Study

The attached spacing study demonstrates that the proposed facility is fully-spaced to Canadian stations and allotments.

TV Channel 6

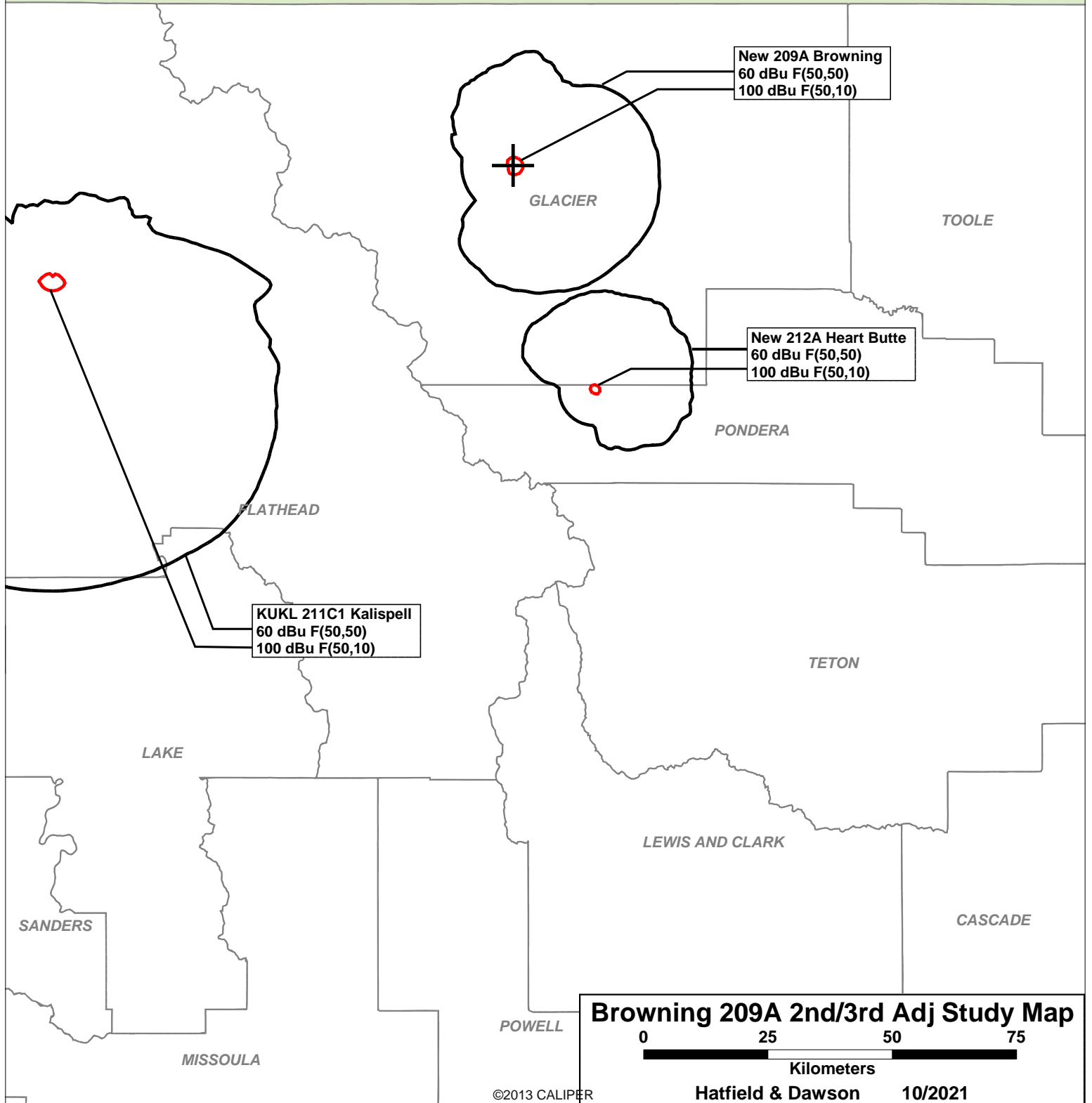
Section 73.525 of the Commission's Rules specifies a threshold distance of 196 kilometers for FM stations operating on Channel 209. There is no domestic full-power TV Channel 6 station located within this threshold distance.

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SEARCH PARAMETERS                               FM Database Date: 20211005
Channel: 209A      89.7 MHz                      Page 1
Latitude: 48 42 22.5 (NAD83)
Longitude: 113 6 1.9
Safety Zone: 50 km
Job Title: BROWNING 209A
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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)
CP	PEIGAN AB		207B 89.3	0.000 0.0	49 46 19.0 113 46 53.4	337.6	128.48 50.48	78 CLEAR
CP	WATERTON NATIONAL AB	PA 208D	208D 89.5	0.000 0.0	49 4 22.9 113 53 58.4	305.2	71.40 0.00	0 CLS=D
ALC	CALGARY AB		209C 89.7	0.000 0.0	51 3 54.2 114 12 50.5	343.5	274.30 27.30	247 CLEAR
KUKL LIC	KALISPELL MT	BLED-20110610ACO	211C1 90.1	1.830 786.0	DA 48 30 21.8 114 20 52.4	256.8	94.65 19.65	75 CLEAR
CP	WATERTON NATIONAL AB	PA 212D	212D 90.3	0.000 0.0	49 4 22.9 113 53 58.4	305.2	71.40 0.00	0 CLS=D
===== BEGINNING SEARCH OF SECONDARY DATABASE =====								
None APP	HEART BUTTE MT		212A 90.3	0.000 0.0	48 18 2.0 112 52 47.0	160.1	47.97 16.97	31 CLEAR

===== END OF FM SPACING STUDY FOR CHANNEL 209 =====

CANADA



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RF Exposure Study**

Facilities Proposed

The proposed operation will be on Channel 209A (89.7 MHz) with an effective radiated power of 1 kilowatt. Operation is proposed with a 2-element circularly-polarized omni-directional antenna. The antenna will be side-mounted on a tower located at Hausman Hill.

The proposed antenna support structure will not exceed 60.96 meters (200 feet) above ground and does not require notification to the Federal Aviation Administration. Therefore, this structure does not require an Antenna Structure Registration Number.

DETERMINATION Results	
Structure does not require registration. There are no airports within 8 kilometers (5 miles) of the coordinates you provided.	
Your Specifications	
NAD83 Coordinates	
Latitude	48-42-22.5 north
Longitude	113-06-01.9 west
Measurements (Meters)	
Overall Structure Height (AGL)	30.5
Support Structure Height (AGL)	30.5
Site Elevation (AMSL)	1557
Structure Type	
GTOWER - Guyed Structure Used for Communication Purposes	

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.

$$S(\mu W / cm^2) = \frac{33.40981 \times AdjERP(Watts)}{D^2}$$

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

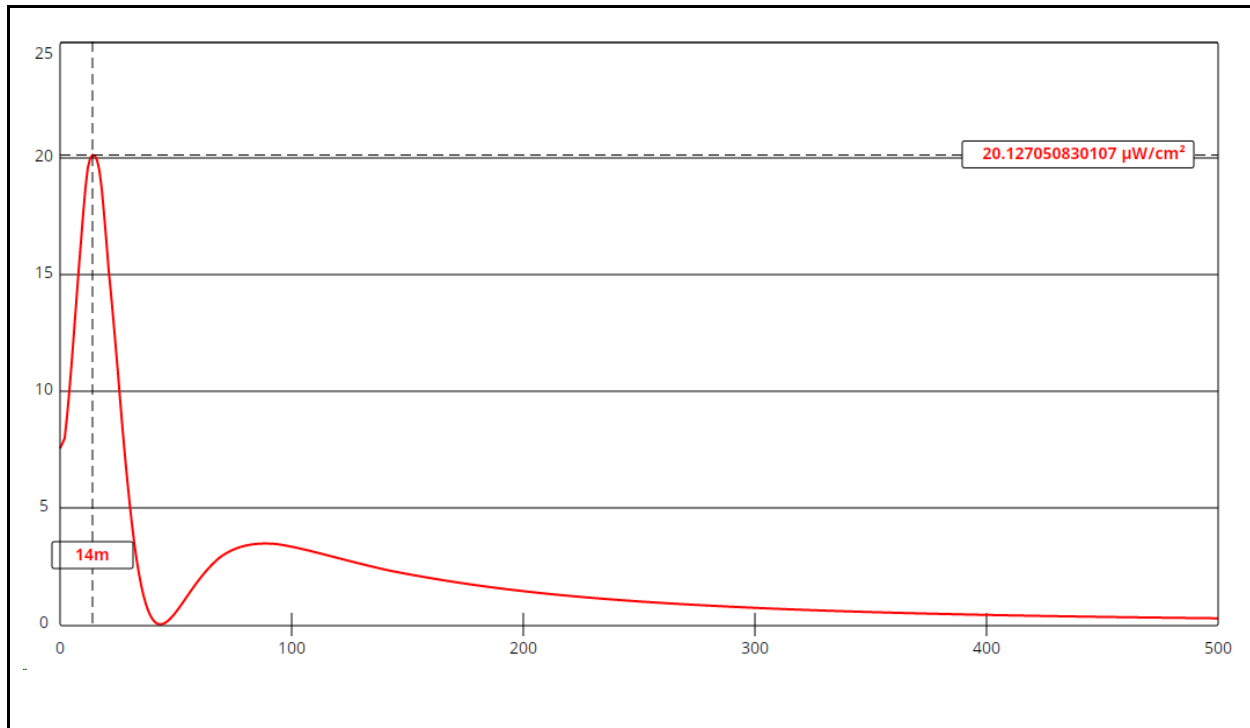
D is the distance in meters from the center of radiation to the calculation point.

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 “double V” antenna proposed for use. The highest calculated ground level power density occurs at a distance of 14 meters from the base of the antenna support structure. At this point the power density is calculated to be 20.1 $\mu W/cm^2$, which is 10.1% of 200 $\mu W/cm^2$ (the FCC standard for uncontrolled environments).

At present, the only other broadcast user of this site is FM translator K216DS. Calculations of the power density produced by the K216DS antenna system assume a Type 1 element pattern, which is the element pattern for the dipole antenna in use. The highest calculated ground level power density occurs at a distance of 2 meters from the base of the antenna support structure. At this point the power density is calculated to be 6.5 $\mu W/cm^2$, which is 3.3% of 200 $\mu W/cm^2$ (the FCC standard for uncontrolled environments).

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

Browning 209A

Antenna Type: Type 2
No. of Elements: 2
Element Spacing: 1.0 wavelength

Distance: 500 meters
Horizontal ERP: 1 kW
Vertical ERP: 1 kW

Antenna Height: 27 meters AGL

Maximum Calculated Power Density is 20.1 $\mu\text{W}/\text{cm}^2$ at 14 meters from the antenna structure.

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Area and Population Calculation Methodology**

Calculation of the area within the 60 dBu contour was performed by the mapping program Maptitude, which includes a function which automatically calculates the area within irregular polygons. In cases where the 60 dBu contour included any large water areas, those were excluded by using a related tool in the program which allows the user to “clip” to the land area within the contour. The software returns the area of the land area.

Total area inside 60 dBu contour:	1522 sq km
Water area excluded:	0 sq km
Total land area inside 60 dBu contour:	1522 sq km

Population was calculated by summing the individual populations of each of the census blocks from the 2010 Census whose centroids are encompassed by the proposed 60 dBu contour.

Population inside 60 dBu contour:	6,880
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CANADA

60 dBu

*Blackfeet Indian
Reservation*

GLACIER

STARR SCHOOL

NORTH BROWNING

BROWNING

SOUTH BROWNING

EAST GLACIER PARK VILLAGE

HEART BUTTE

PONDERA

SANTA RITA

CUT BANK

LITTLE BROWNING

VALER

DUPUYER

FLATHEAD

Browning 209A Contour Map

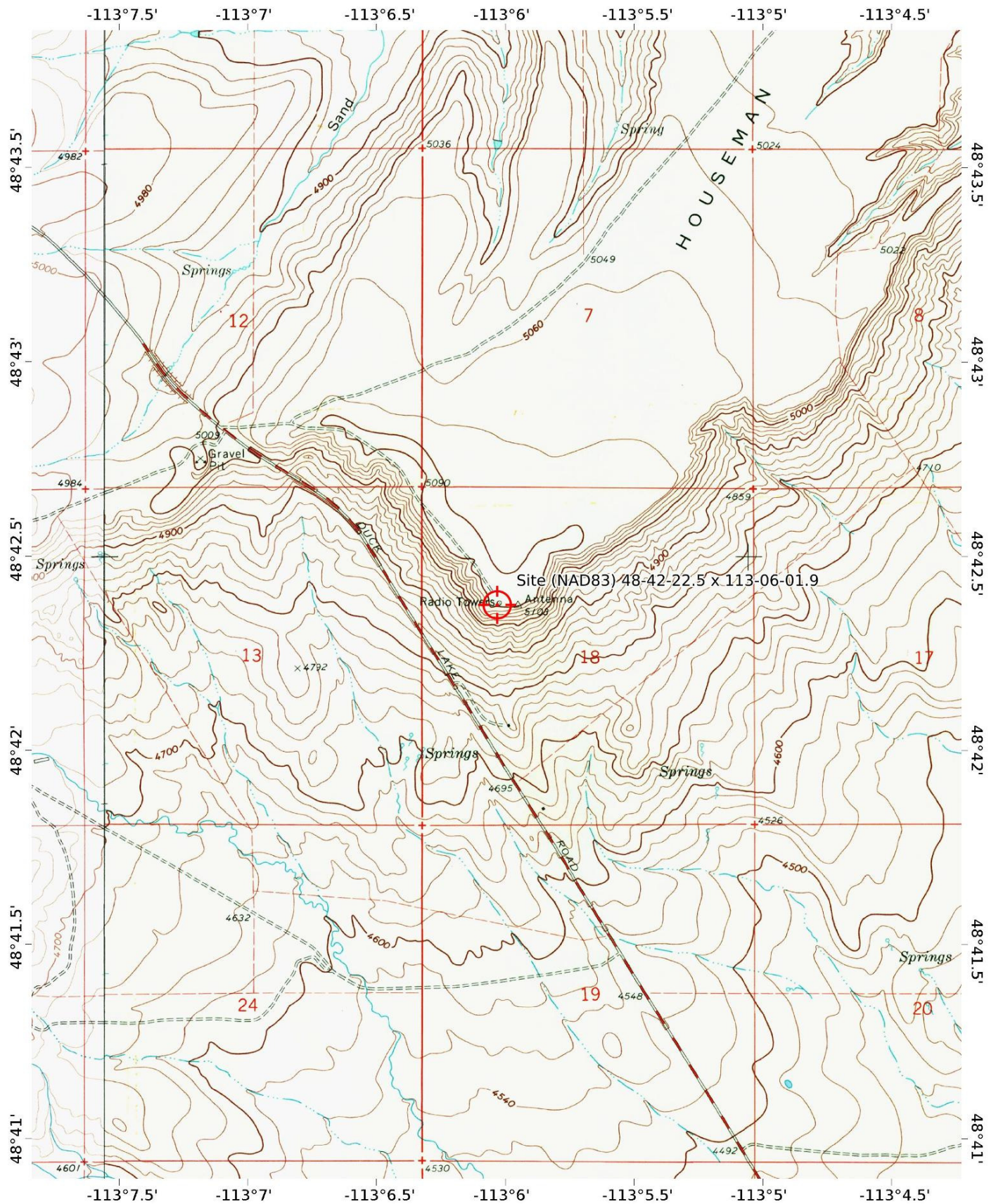
0 10 20 30

Kilometers

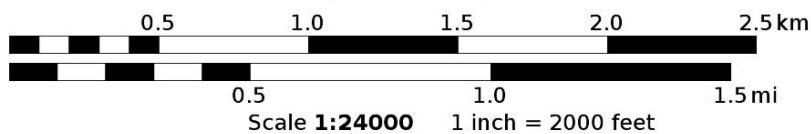
Hatfield & Dawson

10/2021

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Mercator Projection
WGS84
USNG Zone 12UUU
 CALTOPO



Hatfield & Dawson Consulting Engineers