

July 2020
FM Translator K221BA
Grangeville, Idaho Channel 221D
Allocation Study

Allocation Study

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.

KORT-FM 224C2 Grangeville

The proposed translator transmitter site is located within the 60 dBu protected contour of third-adjacent channel station KORT-FM 224C2 Grangeville. 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
KORT-FM 224C2	0.06 km 93 deg True	1.0 kW 701 meters	131.4 dBu Free Space	171.4 dBu	0.3 meters Free Space

The 171.4 dBu contour extends just 0.3 meters from the translator antenna per a Free Space calculation 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 KORT-FM, which in any case is the station to be rebroadcast.

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.

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SEARCH PARAMETERS FM Database Date: 20200727

Channel: 221A 92.1 MHz Page 1

Latitude: 45 51 47.5 (NAD83)

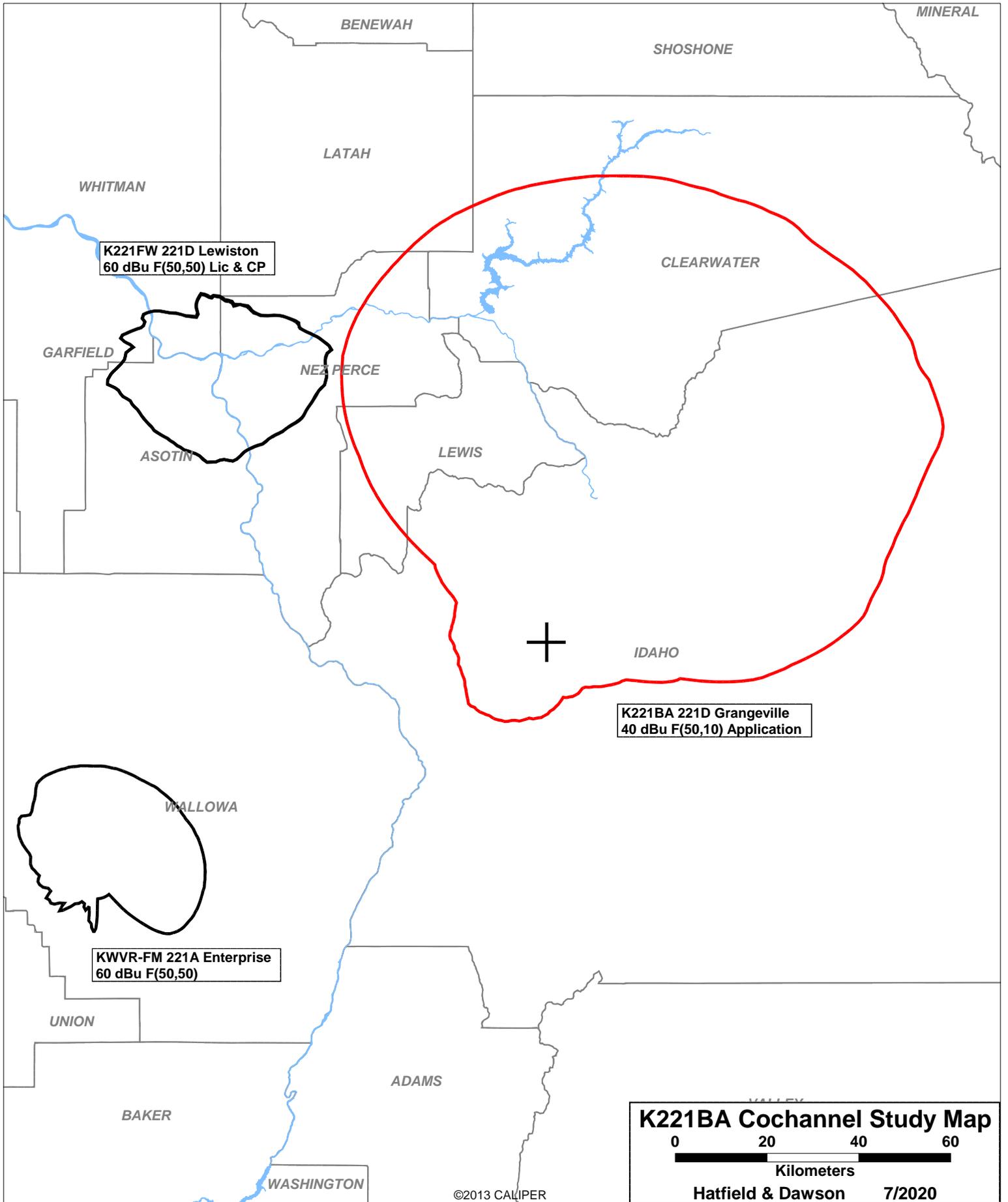
Longitude: 116 7 24.6

Safety Zone: 50 km

Job Title: K221BA GRANGEVILLE

Call Status	City St	FCC File No.	Channel Freq.	ERP(kW) HAAT(m)	Latitude Longitude	Bearing deg-True	Dist (km)	Req (km)
KRFA-FM LIC	MOSCOW ID	BLED-20090312ABT	219C1 91.7	28.000 282.0	46 40 53.6 116 58 16.6	324.7	112.01 37.01	75 CLEAR
K221FW CP	LEWISTON ID	BPFT-20180625AAS	221D 92.1	0.099 0.0	46 27 21.5 117 2 51.5	313.1	97.14 0.00	0 TRANS
K221FW LIC	LEWISTON ID	BLFT-20130701ADF	221D 92.1	0.099 0.0	46 27 20.5 117 2 53.5	313.1	97.15 0.00	0 TRANS
K221BA LIC	KAMIAH ID	BLFT-19811123IK	221D 92.1	0.020 0.0	DA 46 11 29.6 116 2 3.5	10.6	37.15 0.00	0 TRANS
KWVR-FM LIC	ENTERPRISE OR	BLH-20161123AAV	221A 92.1	0.032 534.0	45 23 55.5 117 23 20.6	242.8 SS	111.37 -3.63	115 SHORT
K222DL LIC	RIGGINS ID	0000112348	222D 92.3	0.165 0.0	45 25 21.2 116 18 50.5	196.9	51.18 0.00	0 TRANS
KORT-FM LIC	GRANGEVILLE ID	BMLH-20190731AAT	224C2 92.7	1.000 717.0	45 51 47.6 116 7 27.5	272.8	0.06 -54.94	55 SHORT
K274BK LIC	KAMIAH, ETC. ID	BLFT-20041215ADU	274D 102.7	0.019 0.0	DA 46 10 16.6 116 2 18.5	10.8	34.87 0.00	0 TRANS

===== END OF FM SPACING STUDY FOR CHANNEL 221 =====



**K221FW 221D Lewiston
60 dBu F(50,50) Lic & CP**

**K221BA 221D Grangeville
40 dBu F(50,10) Application**

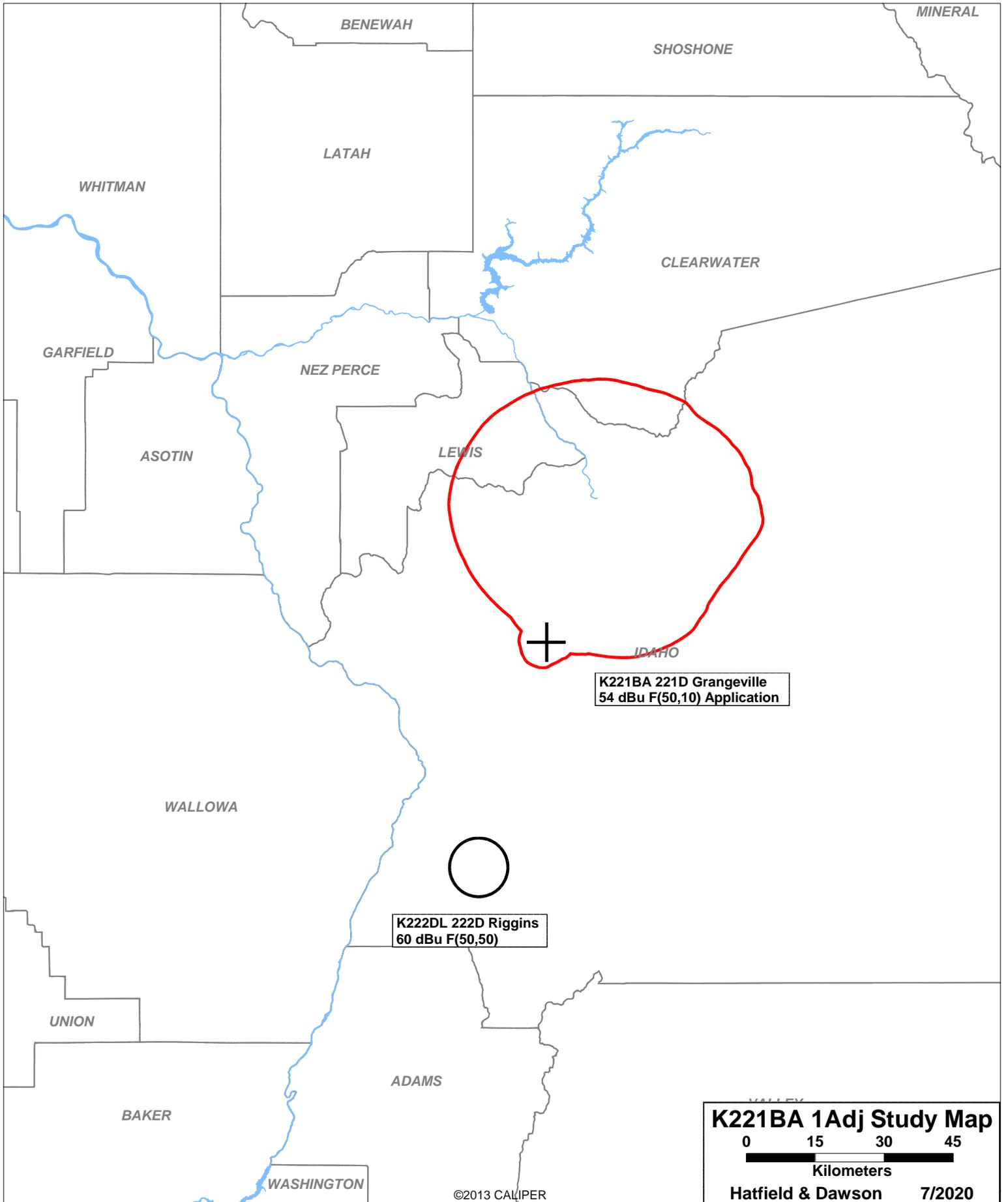
**KWVR-FM 221A Enterprise
60 dBu F(50,50)**

K221BA Cochannel Study Map

0 20 40 60

Kilometers

Hatfield & Dawson 7/2020



**K221BA 221D Grangeville
54 dBu F(50,10) Application**

**K222DL 222D Riggins
60 dBu F(50,50)**

K221BA 1Adj Study Map
0 15 30 45
Kilometers
Hatfield & Dawson 7/2020

July 2020
FM Translator K221BA
Grangeville, Idaho Channel 221D
RF Exposure Study

Facilities Proposed

The proposed operation will be on Channel 221D (92.1 MHz) with a maximum lobe effective radiated power of 250 watts. Operation is proposed with an antenna to be mounted on an existing wooden pole at the High Camp electronics site.

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.

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 K221BA antenna system assume a Type 1 element pattern, which is the "worst case" element pattern, assumed by the FCC for the Scala model CL-FM(V) antenna which will be used. The highest calculated ground level power

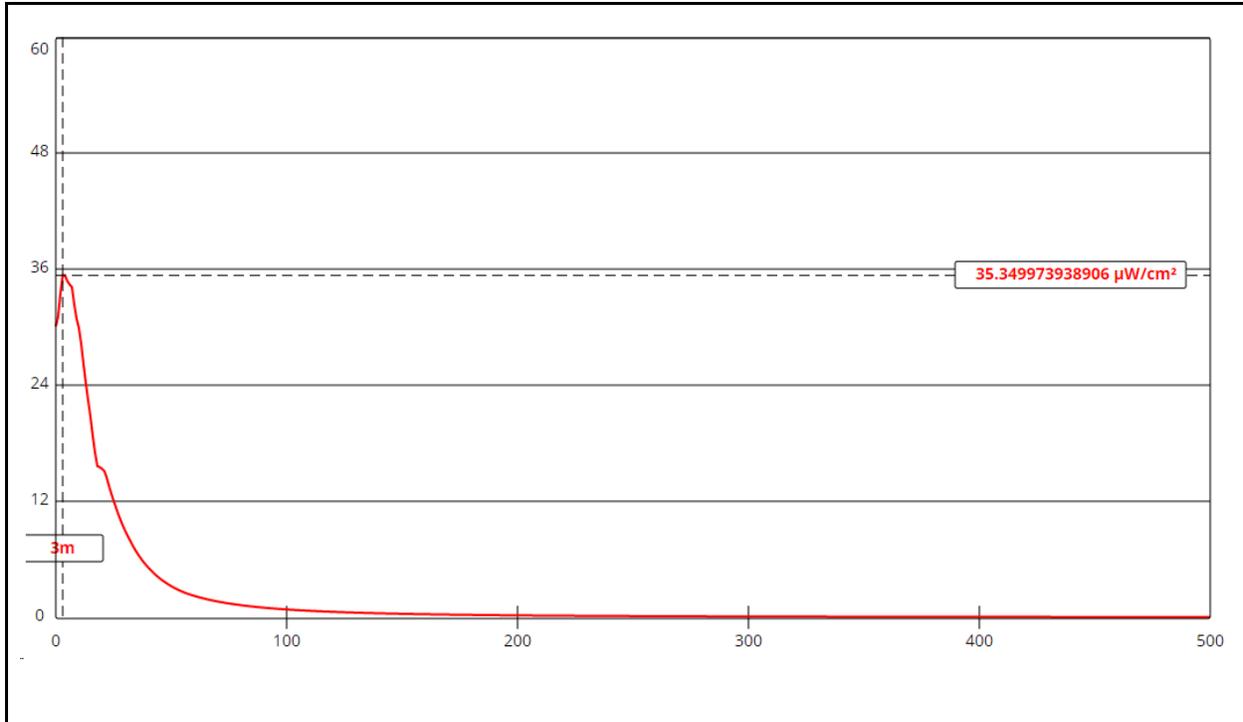
density occurs at a distance of 3 meters from the base of the antenna support structure. At this point the power density is calculated to be 35.3 $\mu\text{W}/\text{cm}^2$.

Calculations of the power density produced by K221BA and the other stations at this transmitter site are summarized in the following table:

Call	Avg or Peak ERP Antenna Model	Relative Field	Height AGL	Calculated Max Exposure	Gen Pub FCC Limit	% of Limit
K221BA	0.250 kW V SCA CL-FM(V)	FMMModel Type 1	17 m	35.3 $\mu\text{W}/\text{cm}^2$	200 $\mu\text{W}/\text{cm}^2$	17.65%
KORT-FM 224C2	1.000 kW H 1.000 kW V ERI 100A-2F	FMMModel Type 4	23 m	31.0 $\mu\text{W}/\text{cm}^2$	200 $\mu\text{W}/\text{cm}^2$	15.50%
KKAG 202A	0.050 kW H 0.050 kW V SWR FMEC-1	FMMModel Type 2	26 m	1.6 $\mu\text{W}/\text{cm}^2$	200 $\mu\text{W}/\text{cm}^2$	0.80%
K207EJ	0.010 kW V TEL ANT90D	FMMModel Type 1	14 m	2.2 $\mu\text{W}/\text{cm}^2$	200 $\mu\text{W}/\text{cm}^2$	1.10%
K209FH	0.010 kW H 0.010 kW V NIC BKG77-1	FMMModel Type 2	21 m	0.5 $\mu\text{W}/\text{cm}^2$	200 $\mu\text{W}/\text{cm}^2$	0.25%
KKRH 215C1	1.900 kW H 1.900 kW V PSI FM-2	FMMModel Type 2	17 m	106.7 $\mu\text{W}/\text{cm}^2$	200 $\mu\text{W}/\text{cm}^2$	53.35%
K217DR	0.010 kW V TEL ANT90D	FMMModel Type 1	14 m	2.2 $\mu\text{W}/\text{cm}^2$	200 $\mu\text{W}/\text{cm}^2$	1.10%
K245CH	0.190 kW V SCA CLFMV	FMMModel Type 1	20 m	18.7 $\mu\text{W}/\text{cm}^2$	200 $\mu\text{W}/\text{cm}^2$	9.35%
Worst-case Total						99.1%

These calculations show that the maximum calculated power density produced at two meters above ground level by the proposed operation of K221BA and the present/authorized operation of the other stations at this site (were their maxima to coincide, which they do not) is 99.1% of 200 $\mu\text{W}/\text{cm}^2$ (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

K221BA Grangeville

Antenna Type: Scala CL-FM(V) (Type 1)

No. of Elements: 1

Element Spacing: 1.0 wavelength

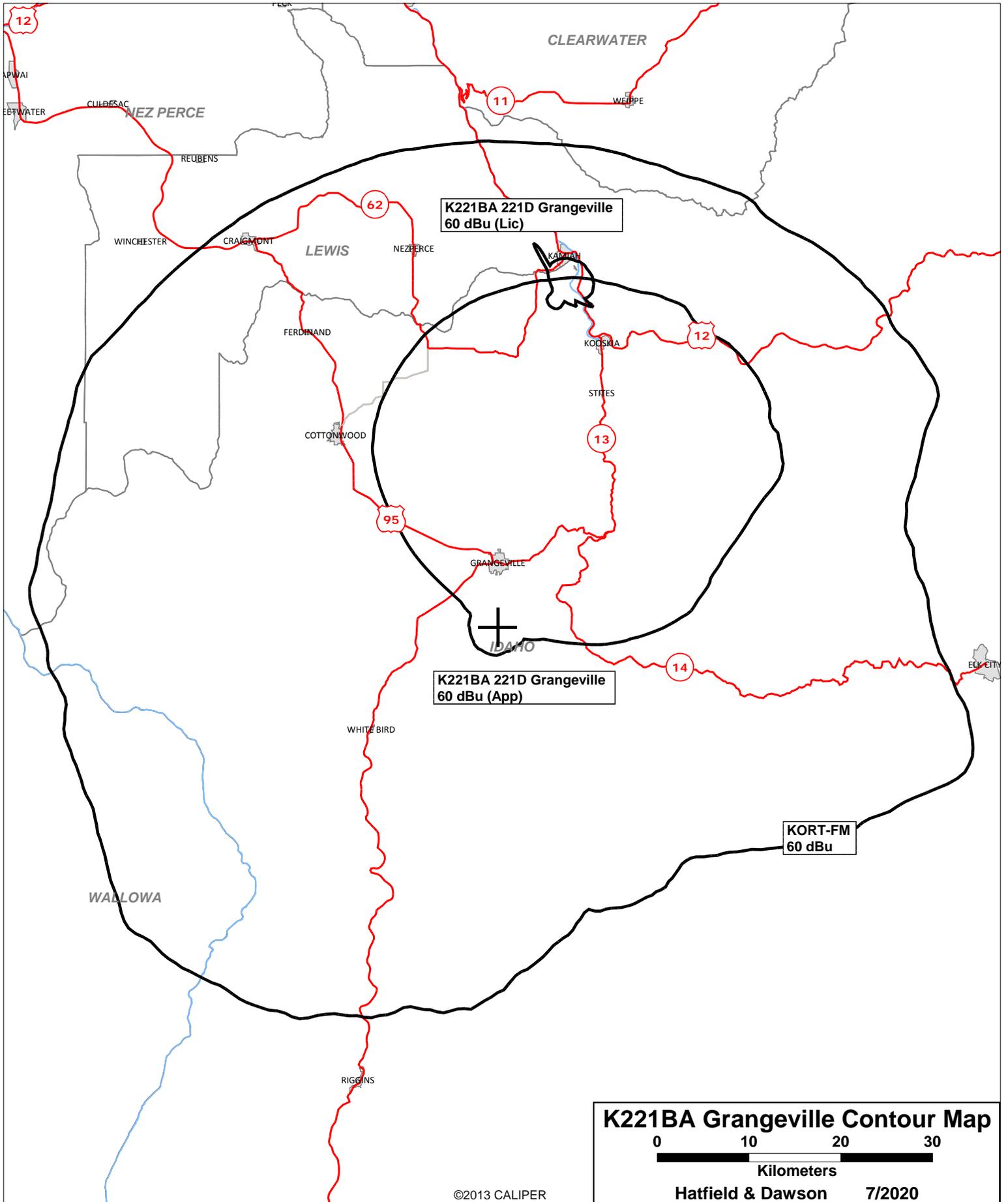
Distance: 500 meters

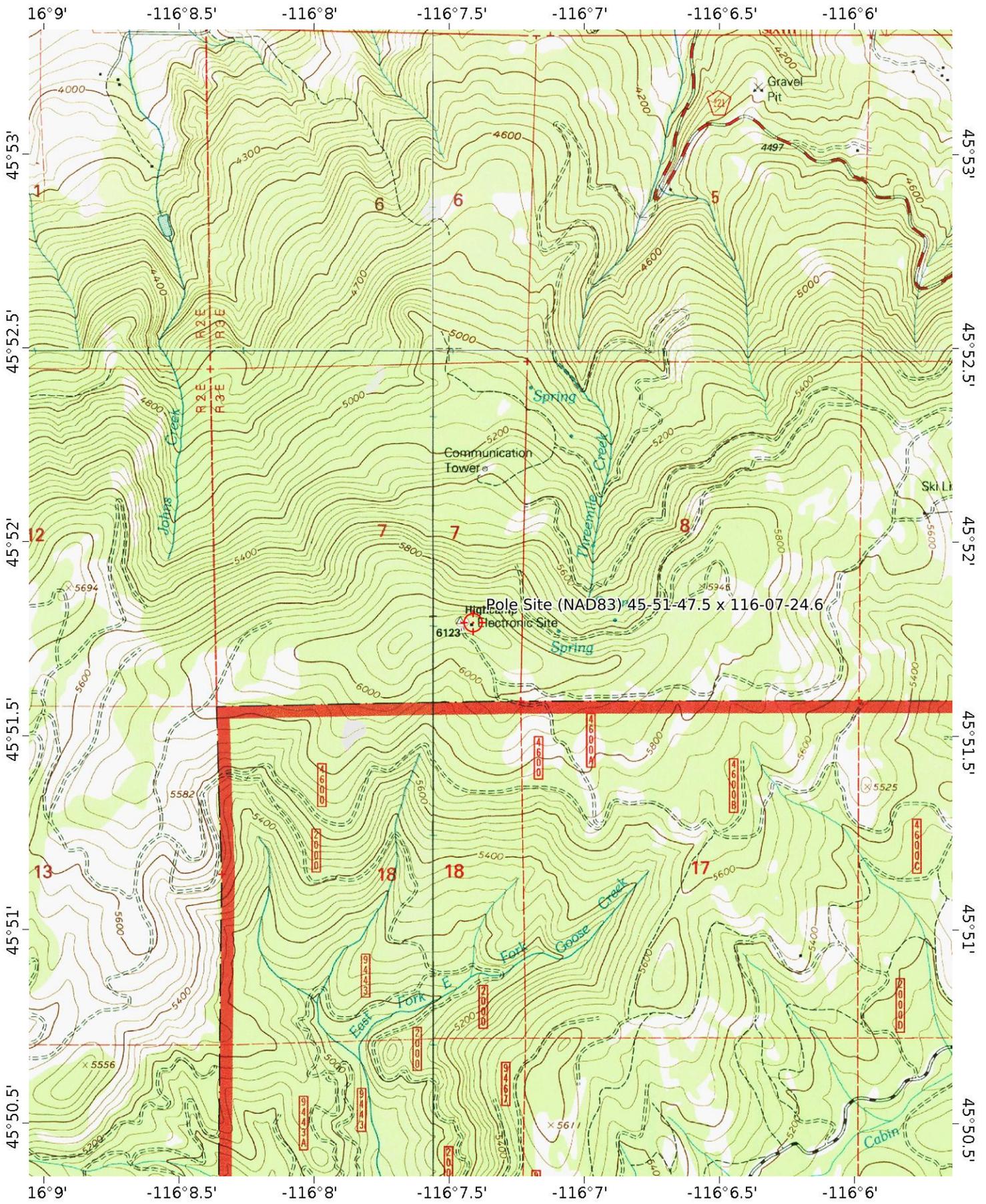
Horizontal ERP: zero kW

Vertical ERP: 0.250 kW

Antenna Height: 17 meters AGL

Maximum Calculated Power Density is 35.3 μW/cm² at 3 meters from the antenna structure.





Mercator Projection
 WGS84
 USNG Zone 11TNL
 CalTopo

