

April 2024
KHUC(FM) Channel 219A
Wenatchee, Washington
Allocation Study

Background

The instant application proposed modification of the original construction permit 0000167882 for KHUC on Channel 219A at Wenatchee. The original application was filed during the 2021 NCE FM filing window, and was granted as the winner of MX Group #219, by Public Notice dated January 24, 2023.

This group consists of three applications proposing service to two different communities in Washington. Iglesia Case de Milagros (ICM) proposes to serve Leavenworth. Upper Columbia Mission Society of Seventh-Day Adventists (UPMS) and First Baptist Church of Riverview (FBC) each proposes to serve Wenatchee. No applicant claims a fair distribution preference. Accordingly, ICM, UPMS and FBC proceed to a point system analysis.

UPMS claims three points as an established local applicant; ICM and FBC do not claim points under this criterion. Each applicant claims two points for diversity of ownership. No applicant claims points as a state-wide network. With respect to technical parameters, ICM's proposed 60 dBu contour would encompass 1,666 square kilometers with a population of 72,249. UPMS's proposed 60 dBu contour would encompass 294 square kilometers with a population of 67,368. FBC's proposed 60 dBu contour would encompass 172 square kilometers with a population of 64,836. No applicant is eligible for points under the best technical proposal criterion because no applicant proposes to serve at least 10% more area and population than the next best proposal. Thus, UPMS is credited with a total of five points, and ICM and FBC are each credited with two points. Accordingly, UPMS is the tentative selectee in Group 219.

Thus there was no fair distribution preference awarded, and no points for best technical proposal awarded, so these factors do not need to be revisited in the context of this application. Furthermore, this application seeks primarily to make an adjustment in the antenna height on the authorized tower, moving up 20 meters to take the space currently occupied by FM booster KZML-FM1, which holds a construction permit to relocate to a different tower site.

Allocation Study

The attached spacing study shows the co-channel and adjacent channel spacing between stations and demonstrates that the proposed operation meets the spacing requirements as prescribed in

§73.207 of the Commission's Rules, with the exception of a short-spacing to the licensed operation of KZUS on Channel 222C2 at Ephrata. Processing pursuant to §73.215 is requested with respect to KZUS, and an allocation study map is included to demonstrate the lack of prohibited contour overlap with that station.

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:

Cochannel	KYFQ	219C1	Tacoma
First-adjacent	KLWS	218C2	Moses Lake
	KPBW	220C2	Brewster
	KDNA	220C1	Yakima

TV Channel 6

Section 73.525 of the Commission's Rules specifies a threshold distance of 159 kilometers for FM stations operating on Channel 219. There is no TV Channel 6 station located within this threshold distance.

SEARCH PARAMETERS

FM Database Date: 20240325

Channel: 219A 91.7 MHz
 Latitude: 47 23 49.0 (NAD83)
 Longitude: 120 16 29.0
 Safety Zone: 50 km
 Job Title: KHUC 219A WENATCHEE

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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)
KYPL LIC	YAKIMA WA	BLED-20100607AIV	216C1 91.1	26.000 242.0	46 30 47.5 120 24 7.2	185.7	98.72 23.72	75 CLEAR
K217AJ LIC	LEAVENWORTH WA	BLFT-20111013AAY	217D 91.3	0.100 0.0	DA 47 36 59.4 120 40 42.3	309.0	39.00 0.00	0 TRANS
K217ER LIC	PATEROS, ETC. WA	BLFT-20030929ATJ	217D 91.3	0.040 0.0	DA 48 0 59.5 119 58 55.2	17.5	72.31 0.00	0 TRANS
K218DF LIC	CLE ELUM WA	0000144257	218D 91.5	0.028 0.0	47 9 45.9 120 47 36.3	236.5	47.10 0.00	0 TRANS
K218CX LIC	YAKIMA WA	BLFT-20180717AAS	218D 91.5	0.011 0.0	46 38 4.5 120 24 23.2	186.8	85.34 0.00	0 TRANS
KLWS LIC	MOSES LAKE WA	BLED-19970609KD	218C2 91.5	7.200 209.0	47 18 49.5 119 34 59.1	99.8	53.07 -52.93	106 SHORT
KHUC CP	WENATCHEE WA	0000167882	219A 91.7	0.730 -330.0	47 23 49.0 120 16 29.0	0.0 SS	0.00 -115.00	115 SHORT
KBLD LIC	KENNEWICK WA	BLED-19980102KA	219C3 91.7	1.800 296.0	46 4 57.4 119 9 43.0	149.5	169.06 27.06	142 CLEAR
KYFQ LIC	TACOMA WA	BLED-20130222ACV	219C1 91.7	4.300 582.0	DA 47 32 52.3 122 48 26.5	276.0	191.66 -8.34	200 SHORT
KPBW LIC	BREWSTER WA	BLED-20120521AAL	220C2 91.9	1.000 755.2	48 2 13.5 119 59 11.2	16.7	74.39 -31.61	106 SHORT
KDNA LIC	YAKIMA WA	BMLED-20060906AB	220C1 91.9	18.500 280.0	46 31 41.4 120 31 7.2	190.9	98.35 -34.65	133 SHORT
K220CQ LIC	BREWSTER, ETC, WA	BLFT-19920225TC	220D 91.9	0.046 0.0	DA 48 2 13.5 119 59 11.2	16.7	74.39 0.00	0 TRANS
K220DV LIC	GRAND COULEE WA	BLFT-19940215TA	220D 91.9	0.046 0.0	DA 47 57 15.5 119 0 13.0	56.5	113.80 0.00	0 TRANS

SEARCH PARAMETERS

FM Database Date: 20240325

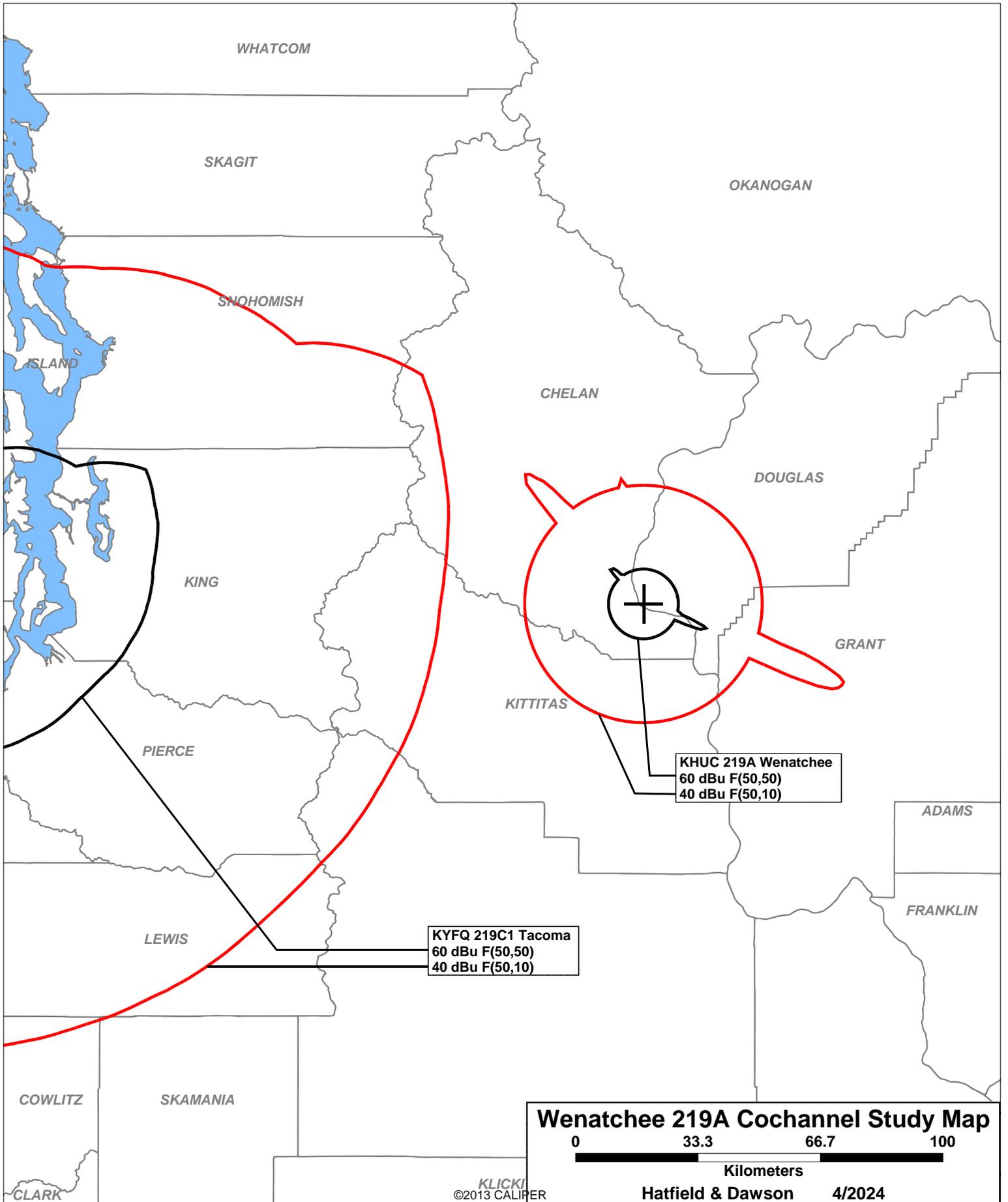
Channel: 219A 91.7 MHz
 Latitude: 47 23 49.0 (NAD83)
 Longitude: 120 16 29.0
 Safety Zone: 50 km
 Job Title: KHUC 219A WENATCHEE

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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)
K220CS LIC	TWISP, ETC. WA	BLFT-19920225TE	220D 91.9	0.046 0.0	DA 48 19 2.5 120 6 57.2	6.5	103.03 0.00	0 TRANS
K221BI LIC	WENATCHEE WA	BLFT-20150618ABE	221D 92.1	0.099 0.0	47 27 43.5 120 21 32.3	318.8	9.64 0.00	0 TRANS
KZUS LIC	EPHRATA WA	BLH-19990108KA	222C2 92.3	26.000 205.0	47 18 17.5 119 35 57.1	101.1 SS	52.06 -2.94	55 SHORT

ABSOLUTE MINIMUM 73.215 SPACING = 49 KM

==== END OF FM SPACING STUDY FOR CHANNEL 219 =====



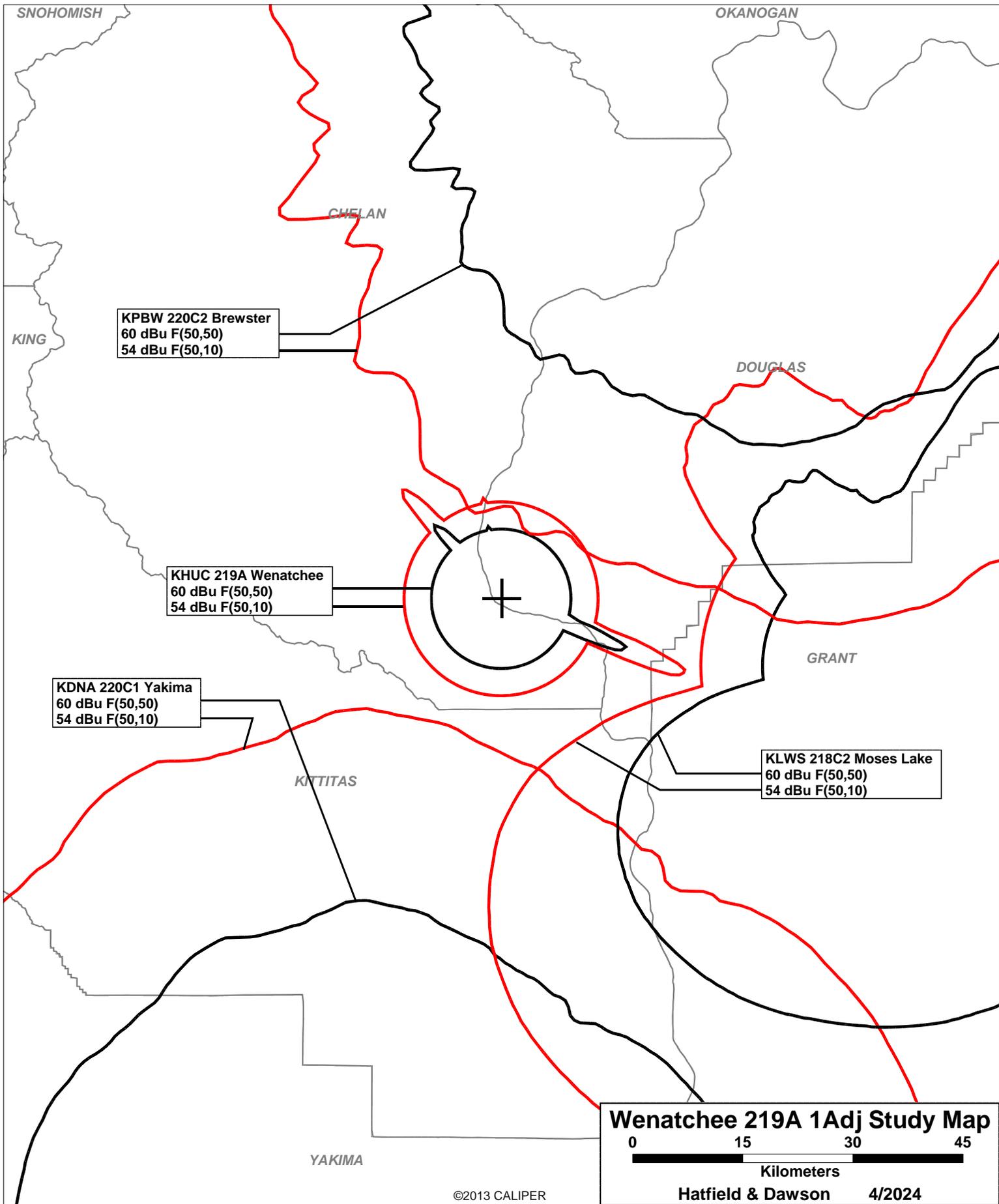
KHUC 219A Wenatchee
60 dBu F(50,50)
40 dBu F(50,10)

KYFQ 219C1 Tacoma
60 dBu F(50,50)
40 dBu F(50,10)

Wenatchee 219A Cochannel Study Map

0 33.3 66.7 100
Kilometers

Hatfield & Dawson 4/2024

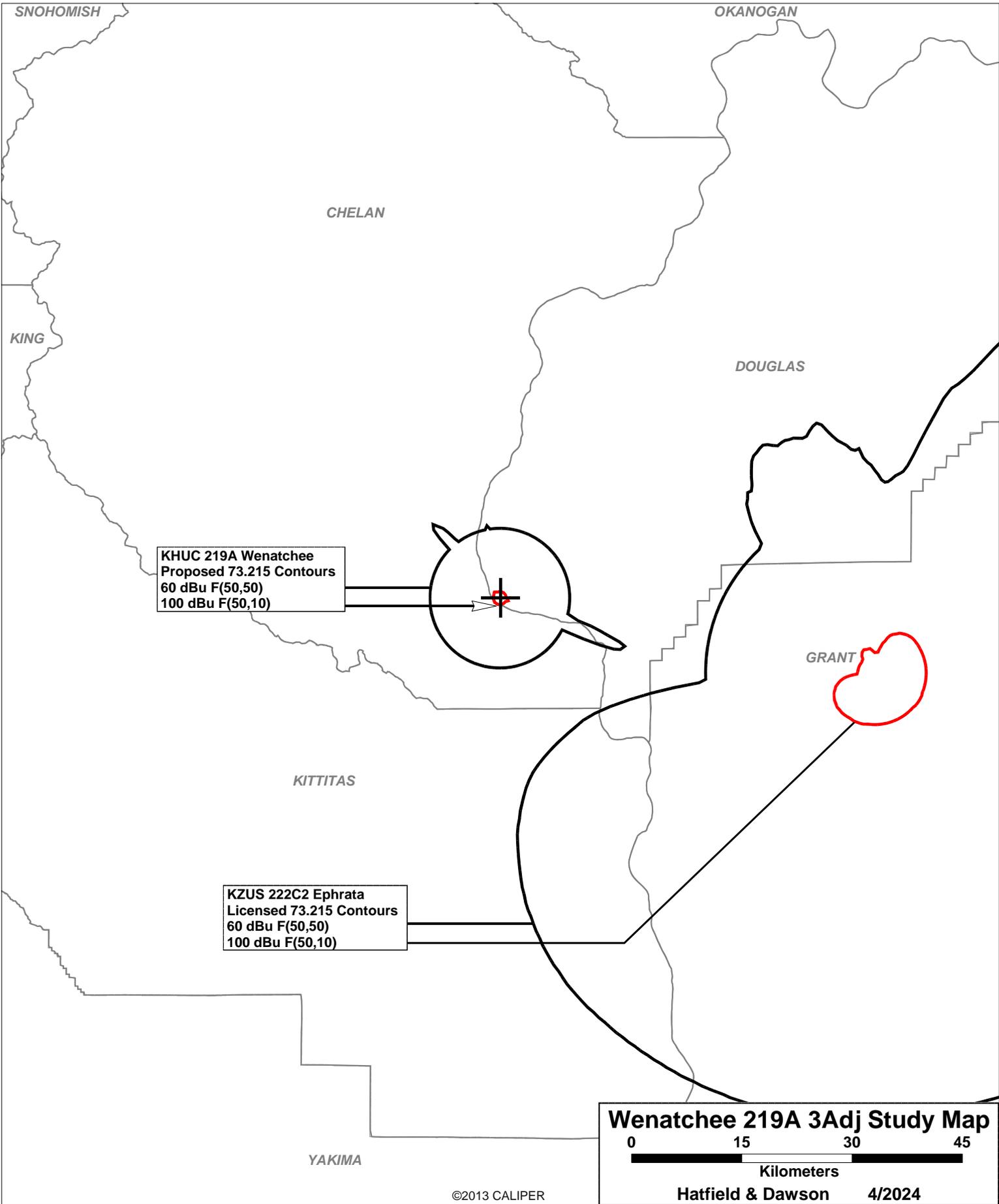


Wenatchee 219A 1Adj Study Map

0 15 30 45

Kilometers

Hatfield & Dawson 4/2024



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KHUC(FM) Channel 219A
Wenatchee, Washington
RF Exposure Study

Facilities Proposed

The proposed operation will be on Channel 219A (91.7 MHz) with an effective radiated power of 0.730 kilowatts. Operation is proposed with an antenna which will be installed on an existing tower with FCC Antenna Structure Registration Number 1033276. This tower is used as the antenna for AM station KYSP.

KHUC will be taking the place of FM booster KZML-FM1 on this tower. The booster holds a construction permit 0000239457 to relocate to a different tower site.

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.

The exact make and model of antenna to be used had not yet been selected. Therefore, calculations of the power density produced by the proposed antenna system assume a Type 1 element pattern, which is the "worst case" element pattern in the Commission's FMModel software. Under this "worst case" assumption, the highest calculated ground level power density occurs at

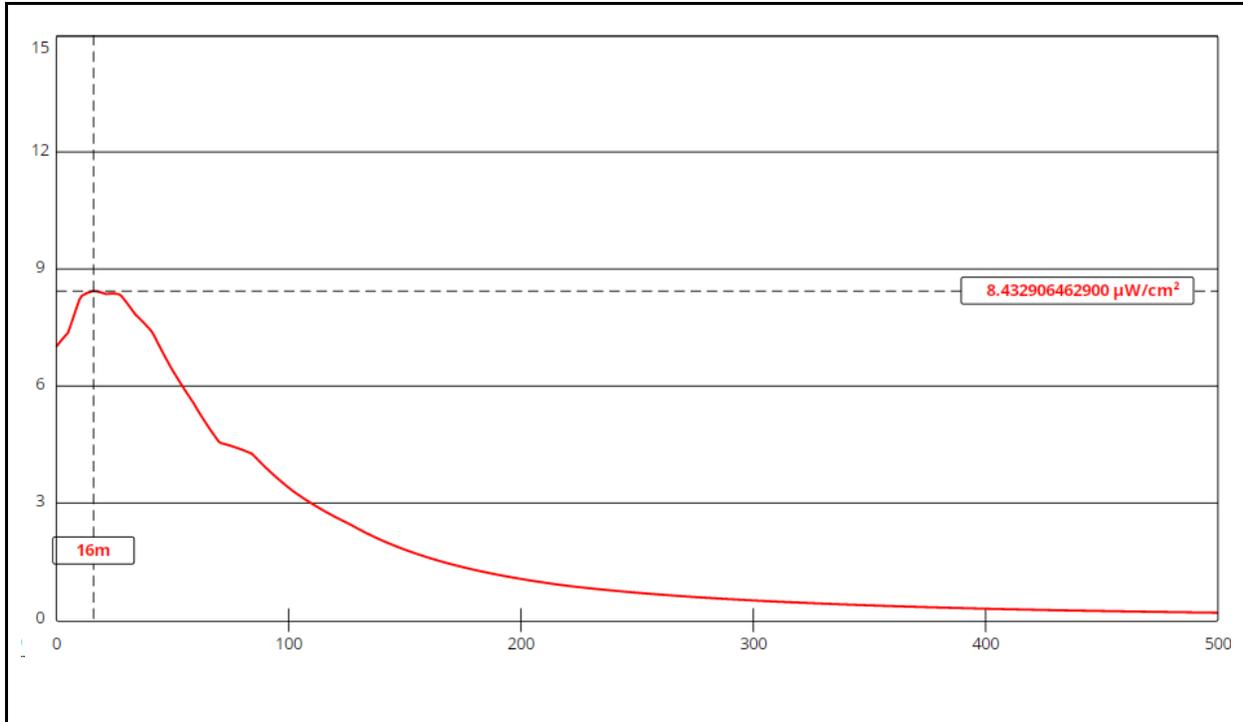
a distance of 16 meters from the base of the antenna support structure. At this point the power density is calculated to be $8.4 \mu\text{W}/\text{cm}^2$, which is 4.2% of $200 \mu\text{W}/\text{cm}^2$ (the FCC standard for uncontrolled environments).

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 applicant's 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.

AM Station Fencing Requirement

KYSP 1340 kHz Wenatchee operates with 1000 watts nondirectional full-time. The tower is 101 electrical degrees tall, or 28.1% of the station wavelength. Using Tables 1-4 in OET Bulletin No. 65, the fencing distance requirement for KYSP is 1 meters from the tower base. The tower is fenced to at least this distance.



Ground-Level RF Exposure

OET FMModel

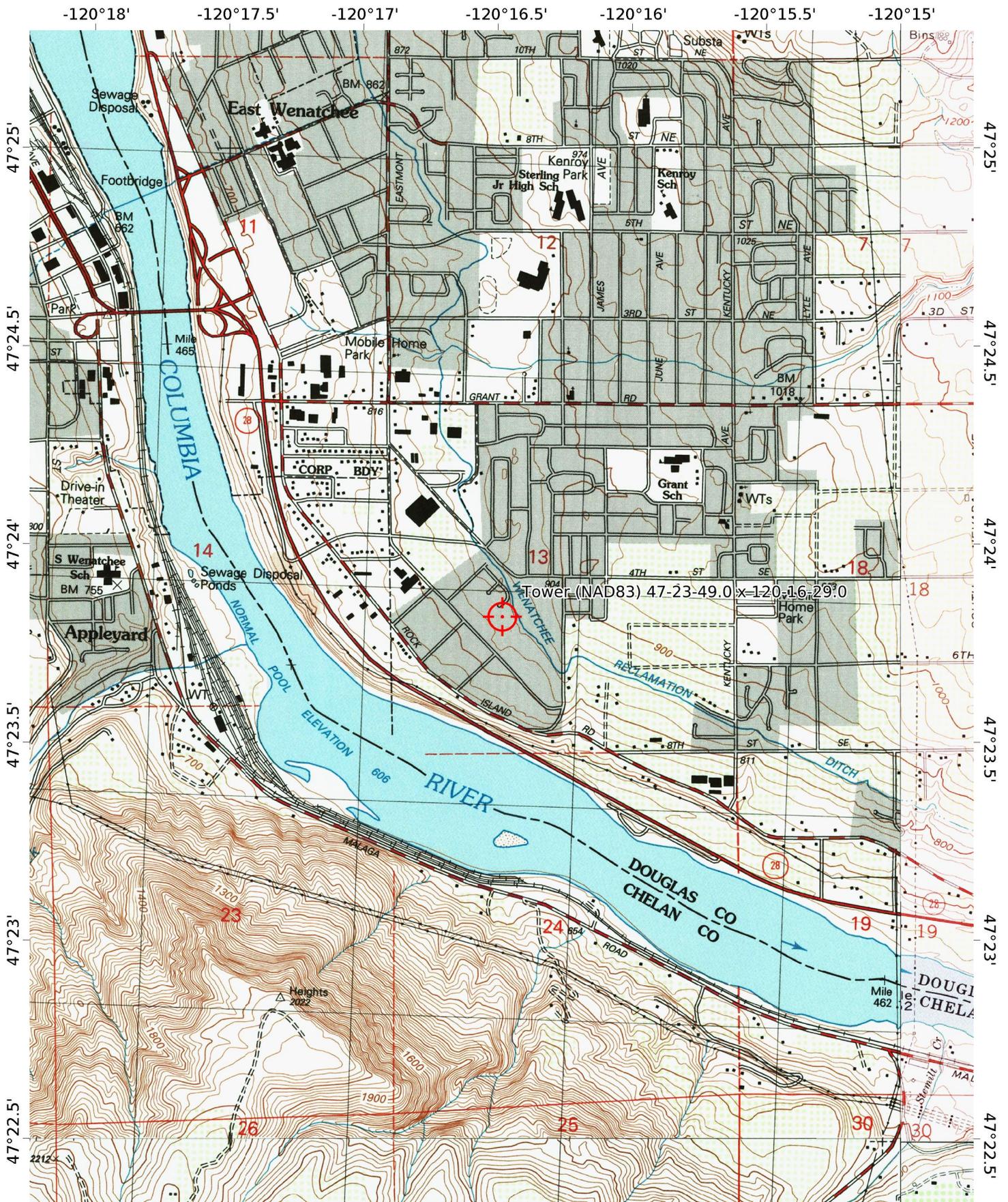
KHUC 219A Wenatchee

Antenna Type: Type 1 assumed
 No. of Elements: 1
 Element Spacing: 1 wavelength

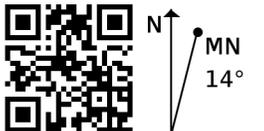
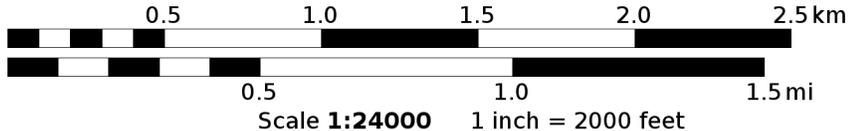
Distance: 500 meters
 Horizontal ERP: 730 W
 Vertical ERP: 730 W

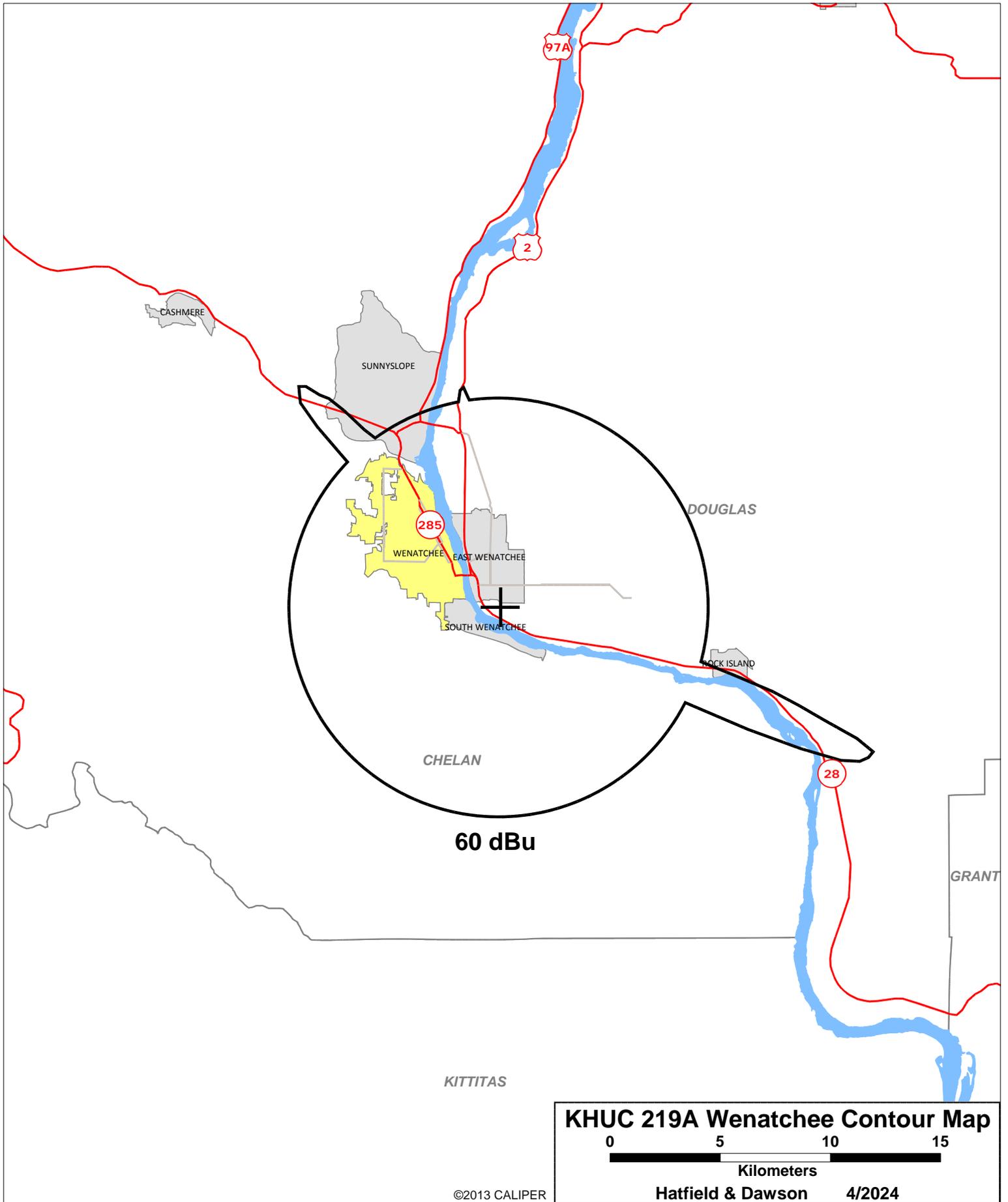
Antenna Height: 61 meters AGL

Maximum Calculated Power Density is 8.4 μW/cm² at 16 meters from the antenna structure.



Mercator Projection
 WGS84
 USNG Zone 10TGT



60 dBu

KHUC 219A Wenatchee Contour Map

0 5 10 15
Kilometers

Hatfield & Dawson 4/2024

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