

THOMAS M. ECKELS, PE
STEPHEN S. LOCKWOOD, PE
DAVID J. PINION, PE
ERIK C. SWANSON, PE

THOMAS S. GORTON, PE
MICHAEL H. MEHIGAN, PE

JAMES B. HATFIELD, PE
BENJAMIN F. DAWSON III, PE
CONSULTANTS

HATFIELD & DAWSON
CONSULTING ELECTRICAL ENGINEERS
9500 GREENWOOD AVE. N.
SEATTLE, WASHINGTON 98103

TELEPHONE (206) 783-9151
FACSIMILE (206) 789-9834
E-MAIL hatdaw@hatdaw.com

MAURY L. HATFIELD, PE
(1942-2009)
PAUL W. LEONARD, PE
(1925-2011)

**FM Translator K278CU
Channel 278D at Aberdeen, WA
To Rebroadcast KBKW(AM) 1450 kHz Aberdeen, WA
January 2019**

Allocation Study

The instant application proposes a minor modification of the construction permit for FM translator K278CU at Aberdeen, Washington, by raising the center of radiation to a higher position on the tower.

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 map demonstrates 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.

KFOO 275C Centralia

The proposed translator transmitter site is located within the 60 dBu protected contour of third-adjacent channel station KFOO 275C Centralia. 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
KFOO 275C	45.57 km 264 deg True	70 kW 633 meters	78.5 dBu F(50,50)	118.5 dBu	132 meters Free Space

The attached map of the proposed transmitter site depicts the 118.5 dBu contour from the proposed facility, which extends at most 132 meters from the antenna per a Free Space calculation. There is no population within this contour. Therefore, the proposed facility is believed to satisfy the requirements of §74.1204(d) with respect to KFOO.

K280GE 280D Aberdeen (License)

The proposed translator transmitter site is located within the 60 dBu protected contour of second-adjacent channel station K280GE 280D Aberdeen. 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
K280GE 280D	0.16 km 195 deg True	0.160 kW 113 meters	114.9 dBu F(50,50)	154.9 dBu	2.0 meters Free Space

The 154.9 dBu contour from the proposed facility extends at most 2 meters from the 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 K280GE (License).

K280GE 281D Aberdeen (CP)

The proposed translator transmitter site is located within the 60 dBu protected contour of third-adjacent channel station K280GE 281D Aberdeen (CP). 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
K280GE 281D	0.16 km 195 deg True	0.250 kW 113 meters	116.8 dBu F(50,50)	156.8 dBu	1.6 meters Free Space

The 156.8 dBu contour from the proposed facility extends at most 1.6 meters from the 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 K280GE (CP).

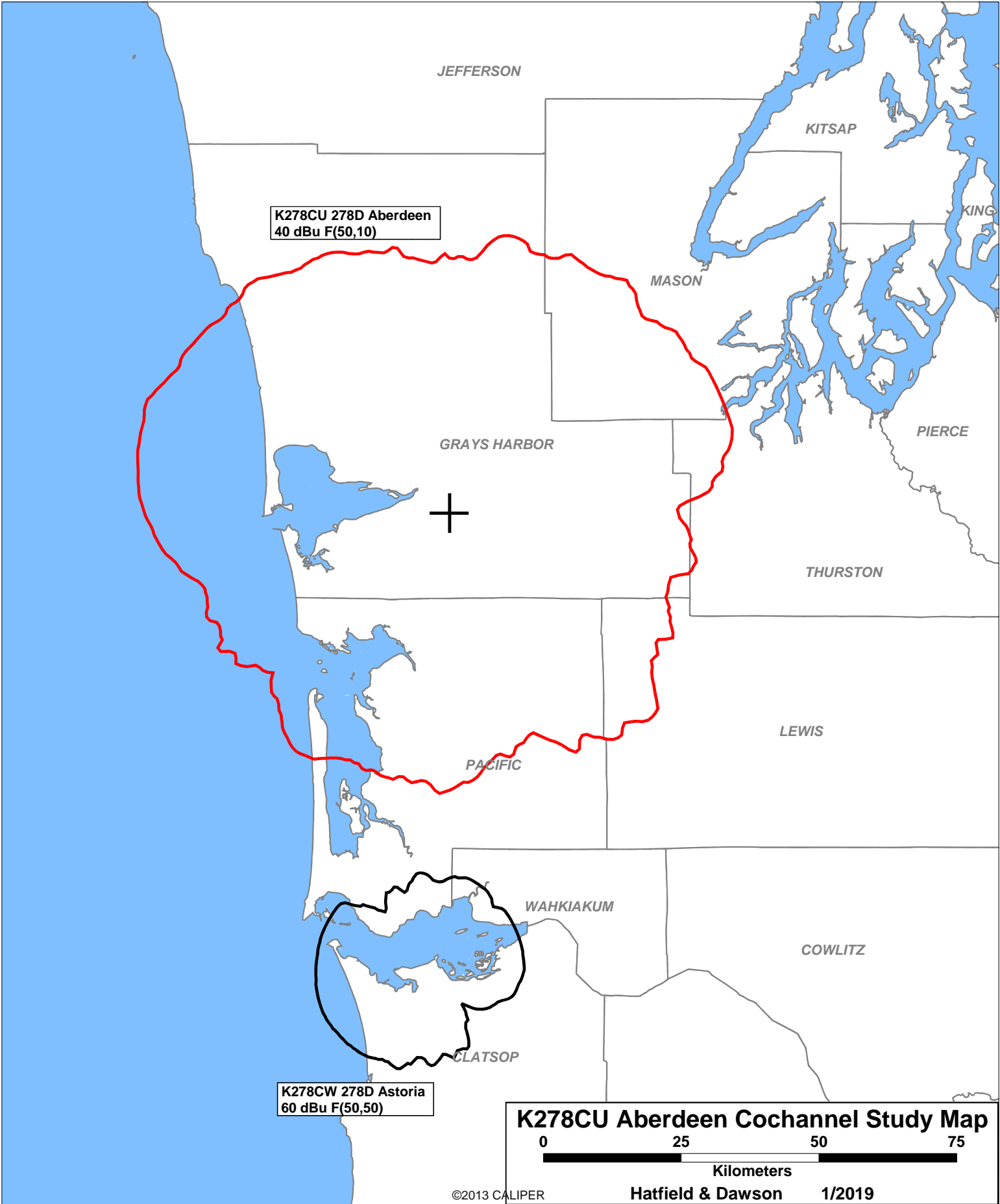
```

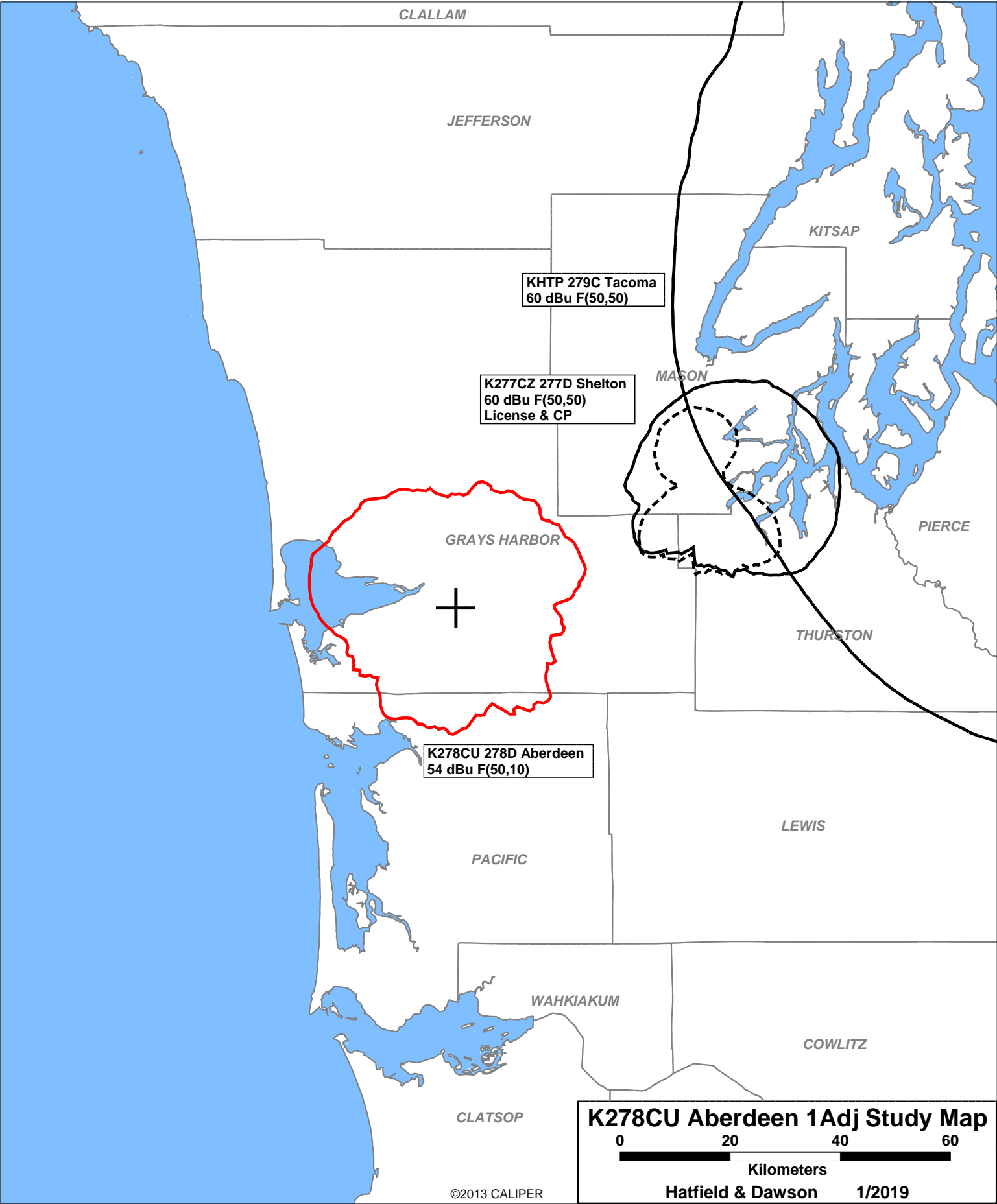
=====
SEARCH PARAMETERS                               FM Database Date: 190102
Channel: 278A    103.5 MHz                      Page    1
Latitude:  46 55 55
Longitude: 123 43 59
Safety Zone:  50 km
Job Title: K278CU ABERDEEN

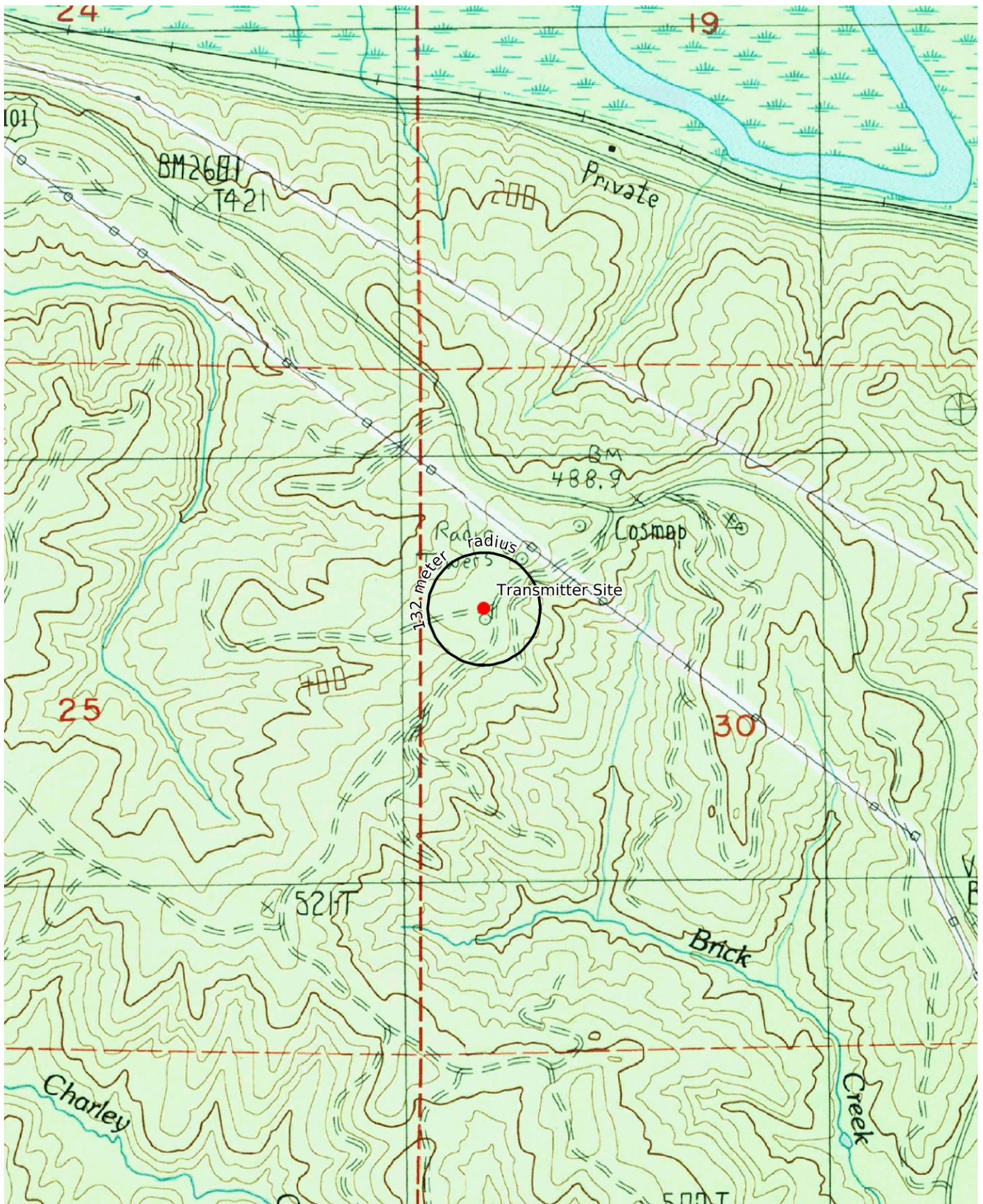
```

Call Status	City St	FCC File No.	Channel Freq.	ERP(kW) HAAT(m)	Latitude Longitude	Bearing deg-True	Dist (km)	Req (km)
K224DR LIC	ABERDEEN WA	BLFT-91221AGF	224D 92.7	0.115 179.0	46-55-55 123-44-04	286.3	0.11 0.00	0 TRANS
K225BY LIC	OLYMPIA WA	BLFT-40626AAA	225D 92.9	0.140 0.0	47-00-20 122-56-36	81.9	60.65 0.00	0 TRANS
KFNY LIC	CENTRALIA WA	BLH-50126ABD	275C 102.9	70.000 668.0	46-58-31 123-08-16	83.7	45.57 -49.43	95 SHORT
KKCW LIC	BEAVERTON OR	BLH-11214AAF	277C 103.3	100.000 470.0	45-31-21 122-44-45	153.8	174.20 9.20	165 CLOSE
K277CZ LIC	SHELTON WA	BLFT-51002ADI	277D 103.3	0.250 0.0	47-08-20 123-08-23	62.7	50.63 0.00	0 TRANS
K277CZ CP	SHELTON WA	BPFT-71004ABL	277D 103.3	0.250 0.0	47-08-20 123-08-23	62.7	50.63 0.00	0 TRANS
CHQMFM	VANCOUVER BC	-	278C 103.5	100.000 611.0	49-21-17 122-57-25	11.8	275.52 28.52	247 CLEAR
K278CW CP	ASTORIA OR	BNPFT-80424AAI	278D 103.5	0.250 216.0	46-10-56 123-48-10	183.7	83.51 0.00	0 TRANS
K278CU CP	ABERDEEN WA	BNPFT-71204ACT	278D 103.5	0.250 182.0	46-55-55 123-43-59	0.0	0.00 0.00	0 TRANS
KHTP LIC	TACOMA WA	BLH-80730AKI	279C 103.7	68.000 707.0	47-30-14 121-58-29	63.8	147.59 -17.41	165 SHORT
ABSOLUTE MINIMUM 73.215 SPACING = 142 KM								
K280GE LIC	ABERDEEN WA	BLFT-41014AAT	280D 103.9	0.160 0.0	46-56-00 123-43-57	15.3	0.16 0.00	0 TRANS
K280FF LIC	CHEHALIS WA	BLFT-50906ABY	280D 103.9	0.040 86.0	46-36-43 122-57-15	120.7	69.32 0.00	0 TRANS
KVAS-FM LIC	ILWACO WA	BLH-60213ACC	280C3 103.9	11.000 151.0	46-10-56 123-48-09	183.7 SS	83.51 41.51	42 CLEAR
K280GE CP	ABERDEEN WA	BPFT-81105AAY	281D 104.1	0.250 0.0	46-56-00 123-43-57	15.3	0.16 0.00	0 TRANS
K281AD LIC	OLYMPIA WA	BLFT-931228TD	281D 104.1	0.050 94.0	47-03-10 122-50-45	78.4	68.81 0.00	0 TRANS

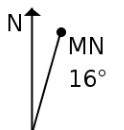
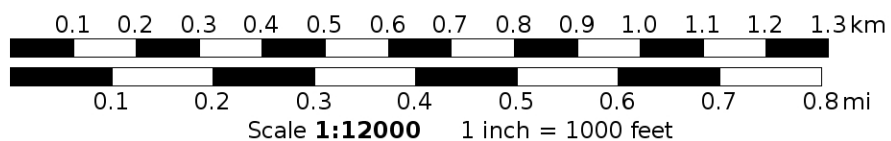
===== END OF FM SPACING STUDY FOR CHANNEL 278 =====







Mercator Projection
NAD27 Conus
USNG Zone 10TDS
CalTopo.com



Facilities Proposed

The proposed operation will be on Channel 278D (103.5 MHz) with an effective radiated power of 0.250 kilowatts. Operation is proposed with a 2-element circularly-polarized omnidirectional antenna. The antenna will be side-mounted on an existing tower on Cosmopolis Hill.

The proposed antenna support structure does 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.

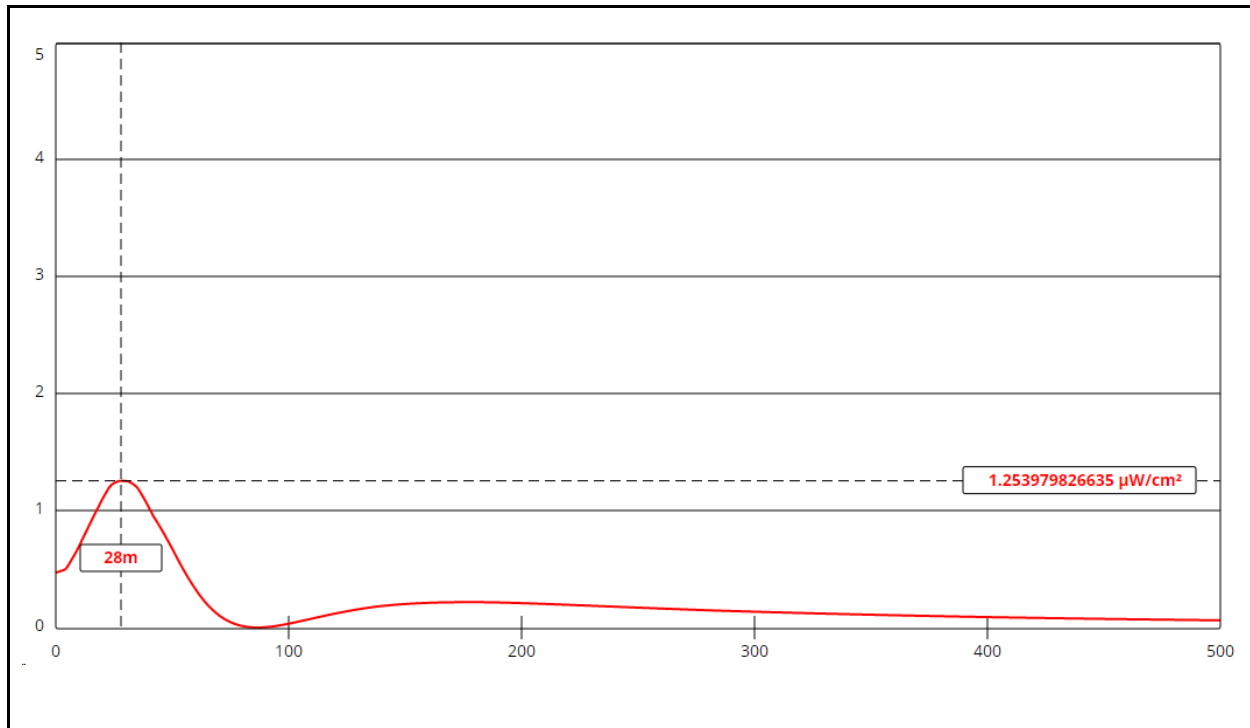
Ground level power densities have been calculated for locations extending from the base of the tower to a distance of 500 meters. Values past this point are increasingly negligible.

Calculations of the power density produced by the proposed antenna system assume a Type 2 element pattern, which is the element pattern for the PSI FML-2 antenna proposed for use. The highest calculated ground level power density occurs at a distance of 28 meters from the base of the antenna support structure. At this point the power density is calculated to be 1.3 $\mu W/cm^2$, which is 0.7% 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(b)(3) of the Commission's Rules excludes 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.



Ground-Level RF Exposure

OET FMModel

K278CU Aberdeen

Antenna Type: PSI FML-2 (Type 2)
No. of Elements: 2
Element Spacing: 1.0 wavelength

Distance: 500 meters
Horizontal ERP: 250 watts
Vertical ERP: 250 watts

Antenna Height: 52 meters AGL

Maximum Calculated Power Density is $1.3 \mu\text{W}/\text{cm}^2$ at 28 meters from the antenna structure.