STEPHEN S. LOCKWOOD, PE, PMP
———
THOMAS M. ECKELS, PE
THOMAS S. GORTON, PE
———
JAMES B. HATFIELD, PE
BENJAMIN F. DAWSON III, PE
ERIK C. SWANSON, PE, PMP
DAVID J. PINION, PE
STEPHEN PUMPLE, M.Eng, MBA, PMP
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)

Modification of FM Translator K260DH
Channel 260D at Longview, WA
To Rebroadcast KBAM(AM) 1270 kHz Longview, WA
August 2021

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.

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.

KKRZ 262C Portland

The proposed translator transmitter site is located within the 60 dBu protected contour of second-adjacent channel station KKRZ 262C Portland. 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
KKRZ 262C	75.23 km 347 deg True	100 kW 479 meters	64.2 dBu F(50,50)	104.2 dBu	362 meters Free Space

Given that the transmitting antenna will be installed at a height of 53.3 meters above ground, and taking into consideration the vertical plane pattern of the Scala FMV-3 0.87 wavelength-spaced antenna, the attached Free Space calculations demonstrate that the interference area will not reach ground level. There is no population within this contour. Therefore, the proposed facility satisfies the requirements of §74.1204(d) with respect to KKRZ.

FMSTUDY.EXE Copyright 2021, Hatfield & Dawson, LLC Version 5.10

SEARCH PARAMETERS FM Database Date: 20210719

Channel: 260A 99.9 MHz

Latitude: 46 10 58.0 (NAD83)

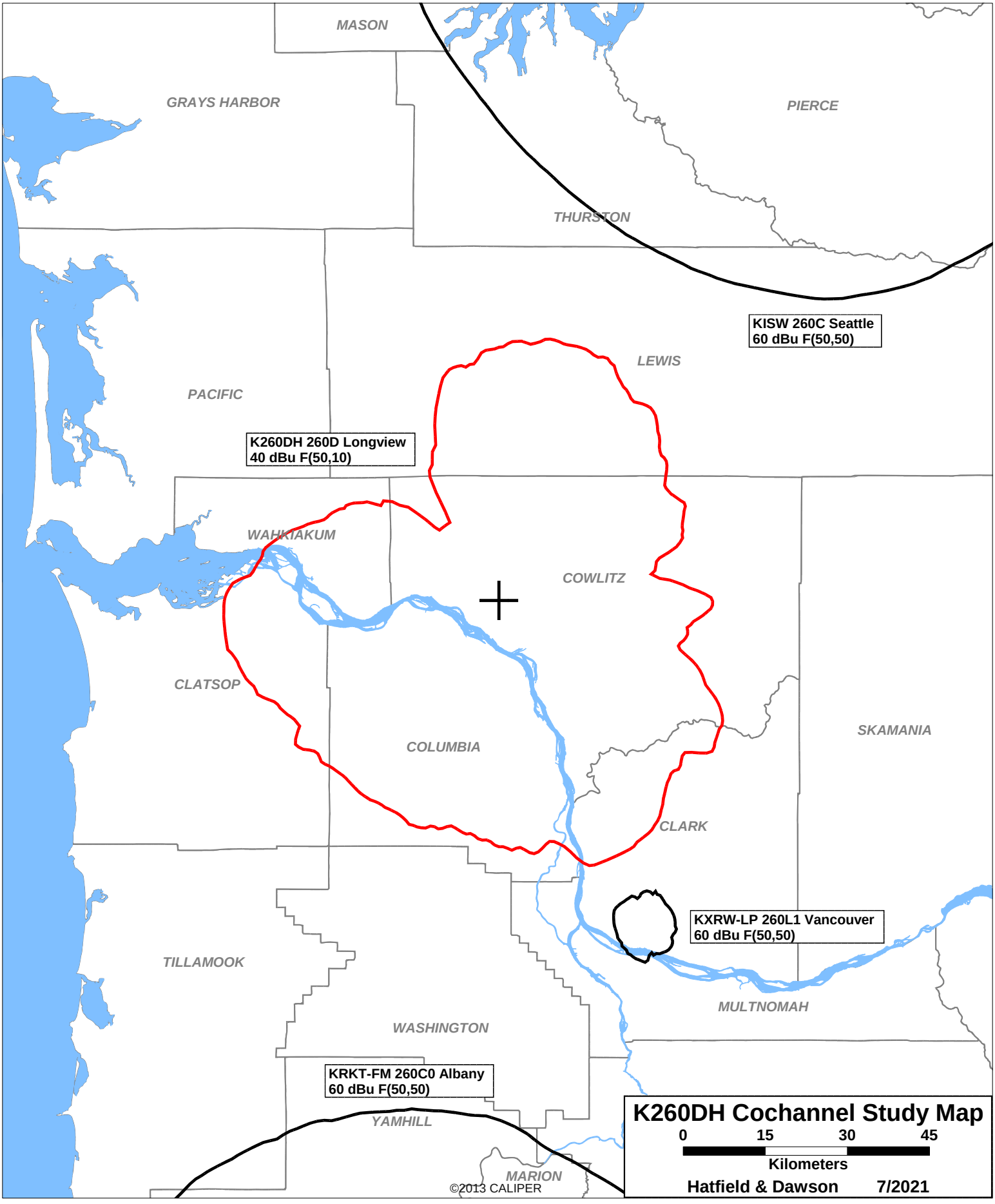
Longitude: 122 57 33.0

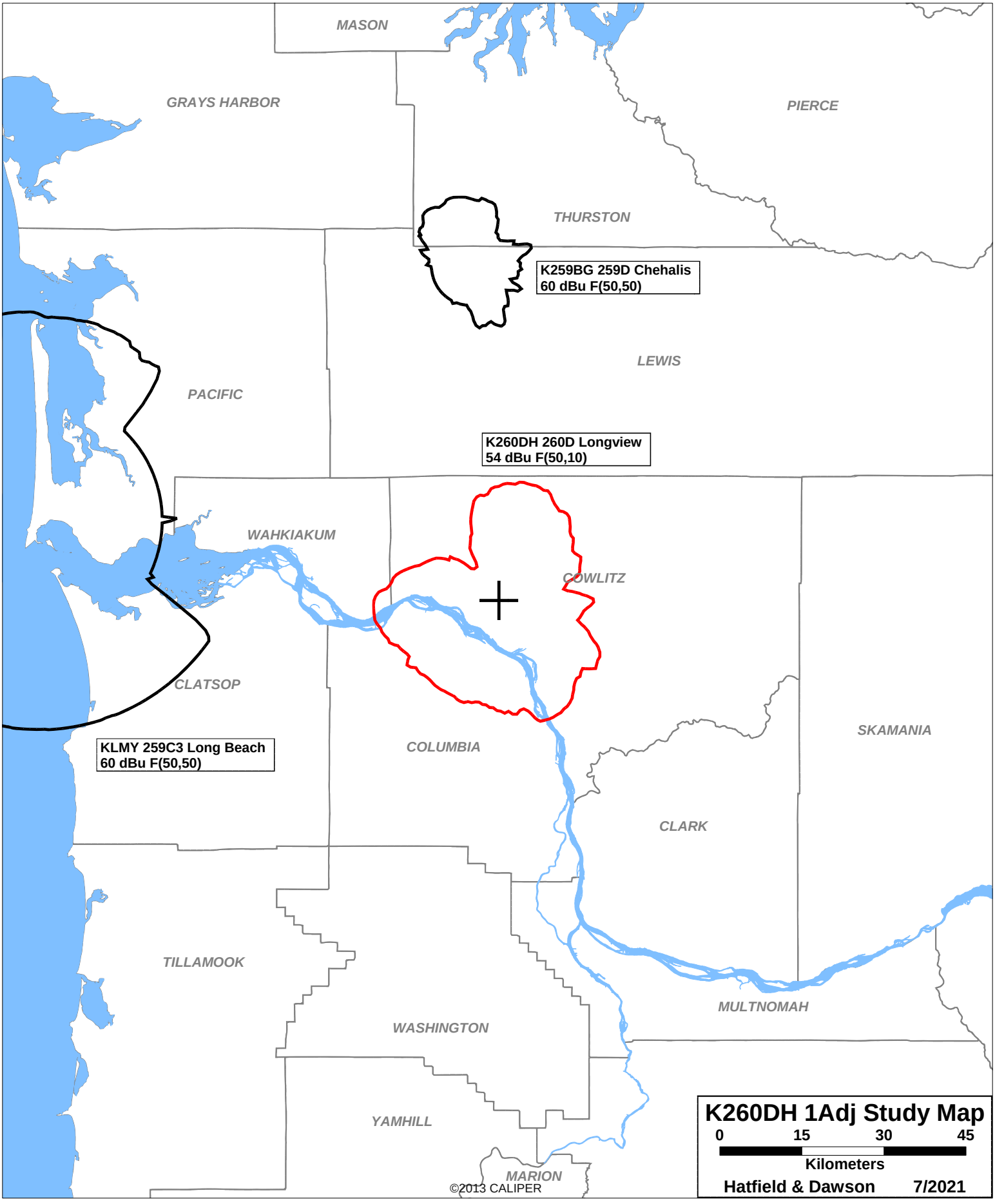
Safety Zone: 50 km

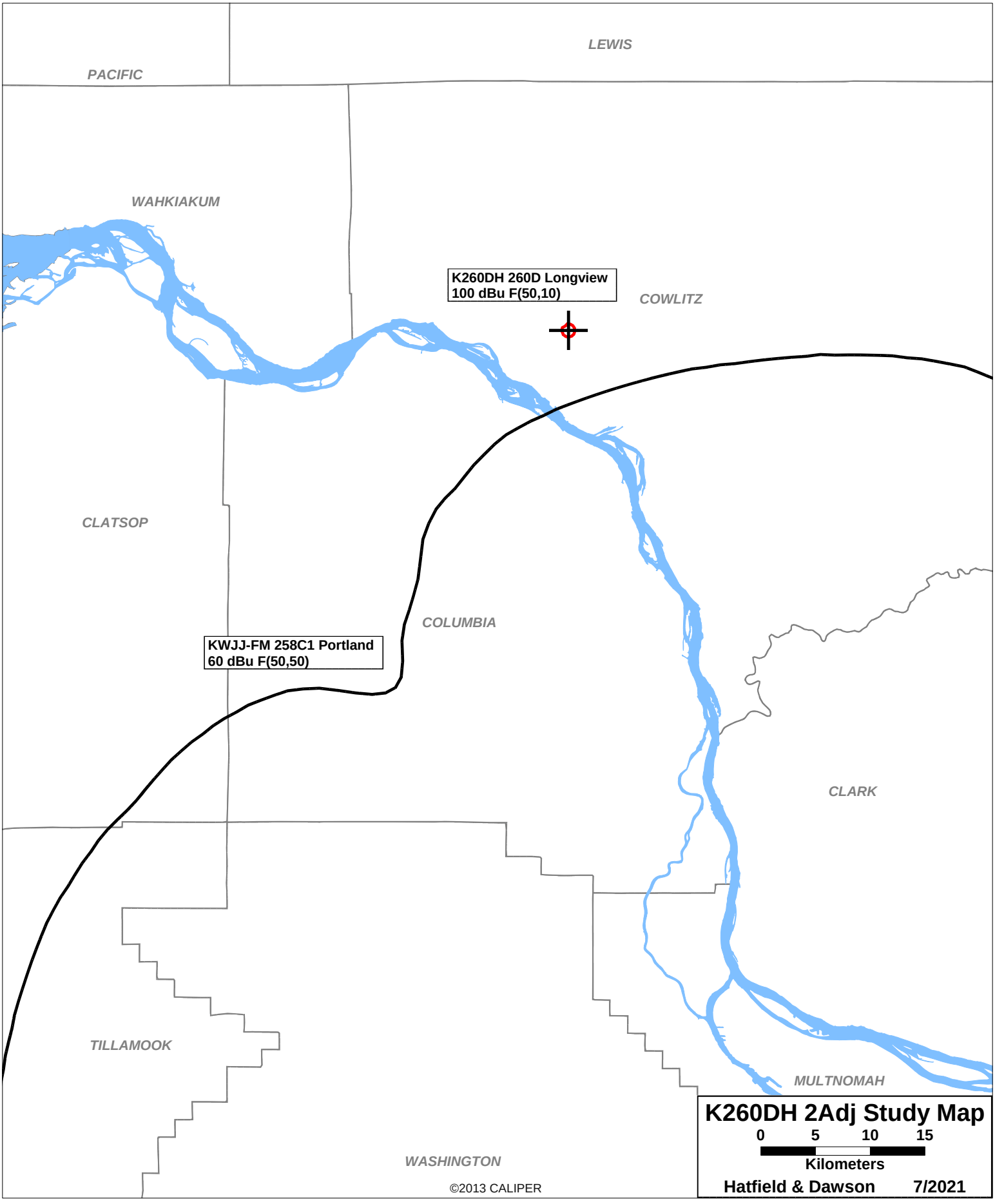
Job Title: K260DH LONGVIEW MOD

Call Status	City St	FCC File No.	Channel Freq.	ERP(kW) HAAT(m)	Latitude Longitude	Bearing deg-True	Dist (km)	Req (km)
KDDS-FM	ELMA		257C	64.000	DA 47 18 45.3	346.1	129.50	95
LIC	WA	BMLH-20090211ABR	99.3	742.0	123 22 19.6	SS	34.50	CLEAR
KWJJ-FM	PORTLAND		258C1	52.000	45 29 19.4	165.1	79.81	75
LIC	OR	BLH-19911106KG	99.5	386.0	122 41 44.3		4.81	CLOSE
K259BG	CHEHALIS		259D	0.250	46 43 51.4	355.2	61.15	0
LIC	WA	BLFT-20130717ABB	99.7	0.0	123 1 32.5		0.00	TRANS
KLMY	LONG BEACH		259C3	25.000	46 18 50.4	280.2	85.62	89
LIC	WA	BLH-20140129ABF	99.7	61.0	124 3 11.6	SS	-3.38	SHORT
KISW	SEATTLE		260C	68.000	DA 47 30 13.4	26.6	164.89	226
LIC	WA	BLH-20080730AKM	99.9	707.0	121 58 33.4	SS	-61.11	SHORT
KGHO-LP	HOQUIAM		260L1	0.100	46 58 21.3	322.4	111.42	67
LIC	WA	BLL-20150316ACP	99.9	3.0	123 51 14.6		44.42	CLEAR
KXRW-LP	VANCOUVER		260L1	0.049	45 39 5.4	154.8	65.25	67
LIC	WA	BLL-20170301ADJ	99.9	43.0	122 36 5.3		-1.75	SHORT
K260DH	LONGVIEW		260D	0.040	46 10 58.4	325.3	0.02	0
LIC	WA	0000152238	99.9	0.0	122 57 33.4		0.00	TRANS
KRKT-FM	ALBANY		260C0	100.000	44 38 45.4	188.2	172.54	215
LIC	OR	BMLH-20050331BAJ	99.9	326.0	123 16 15.4		-42.46	SHORT
KKRZ	PORTLAND		262C	100.000	45 31 20.4	167.3	75.23	95
LIC	OR	BLH-20011214AAE	100.3	470.0	122 44 49.4		-19.77	SHORT
K263BS	CENTRALIA		263D	0.250	46 40 7.4	359.5	54.02	0
LIC	WA	BLFT-20170504AAT	100.5	0.0	122 57 54.5		0.00	TRANS

==== END OF FM SPACING STUDY FOR CHANNEL 260 ====


MASON
GRAYS HARBOR
PIERCE
THURSTON
KISW 260C Seattle
60 dBu F(50,50)
LEWIS
PACIFIC
K260DH 260D Longview
40 dBu F(50,10)
WAHKIAKUM
COWLITZ
CLATSOP
COLUMBIA
SKAMANIA
CLARK
KXRW-LP 260L1 Vancouver
60 dBu F(50,50)
TILLAMOOK
MULTNOMAH
WASHINGTON
KRKT-FM 260C0 Albany
60 dBu F(50,50)
YAMHILL
MARION
©2013 CALIPER
K260DH Cochannel Study Map
0 15 30 45
Kilometers
Hatfield & Dawson 7/2021


MASON
GRAYS HARBOR
PIERCE
THURSTON
K259BG 259D Chehalis
60 dBu F(50,50)
LEWIS
PACIFIC
K260DH 260D Longview
54 dBu F(50,10)
WAHKIAKUM
COWLITZ
CLATSOP
KLMY 259C3 Long Beach
60 dBu F(50,50)
COLUMBIA
SKAMANIA
CLARK
TILLAMOOK
MULTNOMAH
WASHINGTON
YAMHILL
MARION
©2013 CALIPER
K260DH 1Adj Study Map
0 15 30 45
Kilometers
Hatfield & Dawson 7/2021


LEWIS
PACIFIC
WAHKIAKUM
K260DH 260D Longview
100 dBu F(50,10)
COWLITZ
CLATSOP
COLUMBIA
KWJJ-FM 258C1 Portland
60 dBu F(50,50)
CLARK
TILLAMOOK
MULTNOMAH
WASHINGTON
©2013 CALIPER
K260DH 2Adj Study Map
0 5 10 15
Kilometers
Hatfield & Dawson 7/2021

Longview 260D Free Space Interference Area Calculator
Interference Area to KKRZ

Antenna Height: 53.3 meters AGL
Contour Level: 104.2 dBu equals 0.2 V/m
ERP in Watts: 70 Watts

Maximum distance
to interfering contour is: 1186.5 feet equals 361.7 meters

Antenna: FMV3

Depression Angle (degrees)	Scala FMV3 Relative Field	Adjusted ERP (Watts)	Free Space Distance To 104.2 dBu Contour Along the depression angle	Horizontal Distance (meters)	Contour AGL (meters)	
-90	0.020	0.0	7.2 meters	0	46.1	(Straight dow
-89	0.013	0.0	4.7	0.1	48.6	
-88	0.008	0.0	2.9	0.1	50.4	
-87	0.008	0.0	2.9	0.2	50.4	
-86	0.008	0.0	2.9	0.2	50.4	
-85	0.015	0.0	5.4	0.5	47.9	
-84	0.022	0.0	8.0	0.8	45.4	
-83	0.029	0.1	10.5	1.3	42.9	
-82	0.036	0.1	13.0	1.8	40.4	
-81	0.043	0.1	15.6	2.4	37.9	
-80	0.050	0.2	18.1	3.1	35.5	
-79	0.057	0.2	20.6	3.9	33.1	
-78	0.063	0.3	22.8	4.7	31.0	
-77	0.070	0.3	25.3	5.7	28.6	
-76	0.076	0.4	27.5	6.7	26.6	
-75	0.082	0.5	29.7	7.7	24.6	
-74	0.088	0.5	31.8	8.8	22.7	
-73	0.093	0.6	33.6	9.8	21.1	
-72	0.098	0.7	35.4	10.9	19.6	
-71	0.103	0.7	37.3	12.1	18.1	
-70	0.107	0.8	38.7	13.2	16.9	
-69	0.111	0.9	40.2	14.4	15.8	
-68	0.113	0.9	40.9	15.3	15.4	
-67	0.116	0.9	42.0	16.4	14.7	
-66	0.117	1.0	42.3	17.2	14.7	
-65	0.118	1.0	42.7	18.0	14.6	
-64	0.118	1.0	42.7	18.7	14.9	
-63	0.117	1.0	42.3	19.2	15.6	
-62	0.115	0.9	41.6	19.5	16.6	
-61	0.112	0.9	40.5	19.6	17.9	
-60	0.108	0.8	39.1	19.5	19.5	
-59	0.103	0.7	37.3	19.2	21.4	
-58	0.096	0.6	34.7	18.4	23.8	
-57	0.088	0.5	31.8	17.3	26.6	
-56	0.079	0.4	28.6	16.0	29.6	
-55	0.069	0.3	25.0	14.3	32.9	
-54	0.058	0.2	21.0	12.3	36.3	
-53	0.045	0.1	16.3	9.8	40.3	
-52	0.031	0.1	11.2	6.9	44.5	
-51	0.016	0.0	5.8	3.6	48.8	
-50	0.001	0.0	0.4	0.2	53.0	
-49	0.018	0.0	6.5	4.3	48.4	

-48	0.036	0.1	13.0	8.7	43.6	
-47	0.054	0.2	19.5	13.3	39.0	
-46	0.073	0.4	26.4	18.3	34.3	
-45	0.093	0.6	33.6	23.8	29.5	
-44	0.112	0.9	40.5	29.1	25.2	
-43	0.132	1.2	47.7	34.9	20.7	
-42	0.150	1.6	54.2	40.3	17.0	
-41	0.169	2.0	61.1	46.1	13.2	
-40	0.186	2.4	67.3	51.5	10.1	
-39	0.201	2.8	72.7	56.5	7.6	
-38	0.215	3.2	77.8	61.3	5.4	
-37	0.227	3.6	82.1	65.6	3.9	
-36	0.236	3.9	85.4	69.1	3.1	
-35	0.242	4.1	87.6	71.7	3.1	
-34	0.246	4.2	89.0	73.8	3.5	
-33	0.246	4.2	89.0	74.6	4.8	
-32	0.242	4.1	87.6	74.3	6.9	
-31	0.235	3.9	85.0	72.8	9.5	
-30	0.224	3.5	81.0	70.1	12.8	
-29	0.208	3.0	75.2	65.8	16.8	
-28	0.188	2.5	68.0	60.0	21.4	
-27	0.163	1.9	58.9	52.5	26.5	
-26	0.134	1.3	48.4	43.5	32.1	
-25	0.100	0.7	36.2	32.8	38.0	
-24	0.063	0.3	22.8	20.8	44.0	
-23	0.021	0.0	7.6	7.0	50.3	
-22	0.025	0.0	9.0	8.4	49.9	
-21	0.074	0.4	26.7	25.0	43.7	
-20	0.126	1.1	45.6	42.8	37.7	
-19	0.181	2.3	65.4	61.9	32.0	
-18	0.238	4.0	86.1	81.8	26.7	
-17	0.297	6.2	107.5	102.8	21.9	
-16	0.357	8.9	129.1	124.1	17.7	
-15	0.418	12.2	151.1	146.0	14.2	
-14	0.478	16.0	172.9	167.8	11.5	
-13	0.538	20.3	194.7	189.7	9.5	
-12	0.597	25.0	215.9	211.2	8.4	
-11	0.654	29.9	236.5	232.1	8.2	
-10	0.708	35.1	256.0	252.1	8.8	
-9	0.759	40.3	274.3	271.0	10.4	
-8	0.807	45.6	291.9	289.1	12.7	
-7	0.850	50.6	307.5	305.2	15.8	
-6	0.888	55.2	321.2	319.5	19.7	
-5	0.922	59.4	333.3	332.0	24.3	
-4	0.950	63.1	343.4	342.6	29.3	
-3	0.971	65.9	351.0	350.5	34.9	
-2	0.987	68.2	357.1	356.9	40.8	
-1	0.997	69.5	360.4	360.4	47.0	
0	1.000	70.0	361.7	361.7	53.3	(Horizontal)

Facilities Proposed

The proposed operation will be on Channel 260D (99.9 MHz) with an effective radiated power of 0.070 kilowatts. Operation is proposed with a 3-element vertically-polarized omnidirectional antenna. The antenna will be side-mounted on an existing tower with FCC Antenna Structure Registration Number 1035328. This is the tower used by AM station KBAM as its radiator.

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 1 element pattern, which is the element pattern for the Scala FMVMP-3 0.87-wave antenna proposed for use. The highest calculated ground level power density occurs at a distance of 9 meters from the base of the antenna support structure. At this point the power density is calculated to be 0.5 μW/cm², which is 0.25% of 200 μW/cm² (the FCC standard for uncontrolled environments).

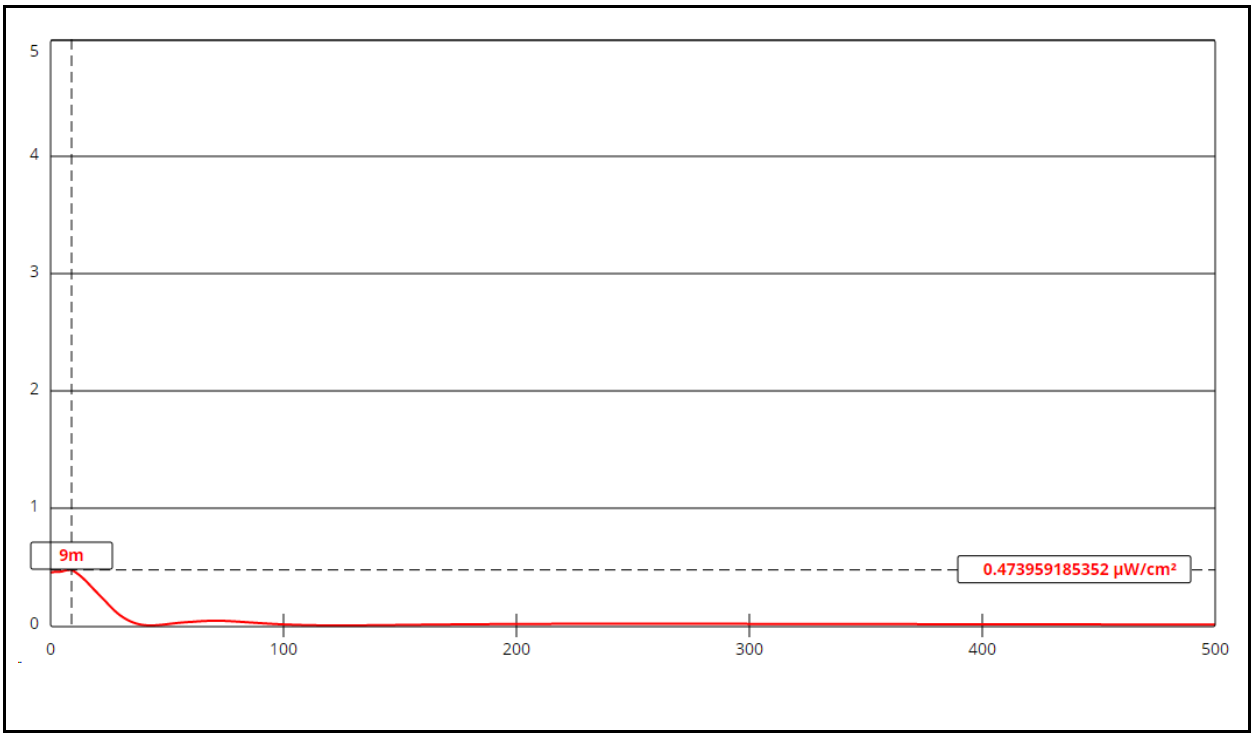
These calculations show that the maximum calculated power density produced at two meters above ground level by the proposed operation alone is less than 5% of the applicable FCC exposure limit at all locations between 1 and 500 meters from the base of the antenna support structure. Section 1.1307(b)(3) of the Commission's Rules 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 KBAM

The translator antenna will be installed on the tower used by AM station KBAM 1270 kHz. KBAM operates with 5 kilowatts nondirectional daytime and 83 watts nondirectional nighttime. The radiator is 102.3 electrical degrees tall, or 28.4% of the station wavelength. Using Tables 1-4 in OET Bulletin No. 65, the fencing distance requirement for this station is 2 meters from the tower base. The tower is fenced to at least this distance.

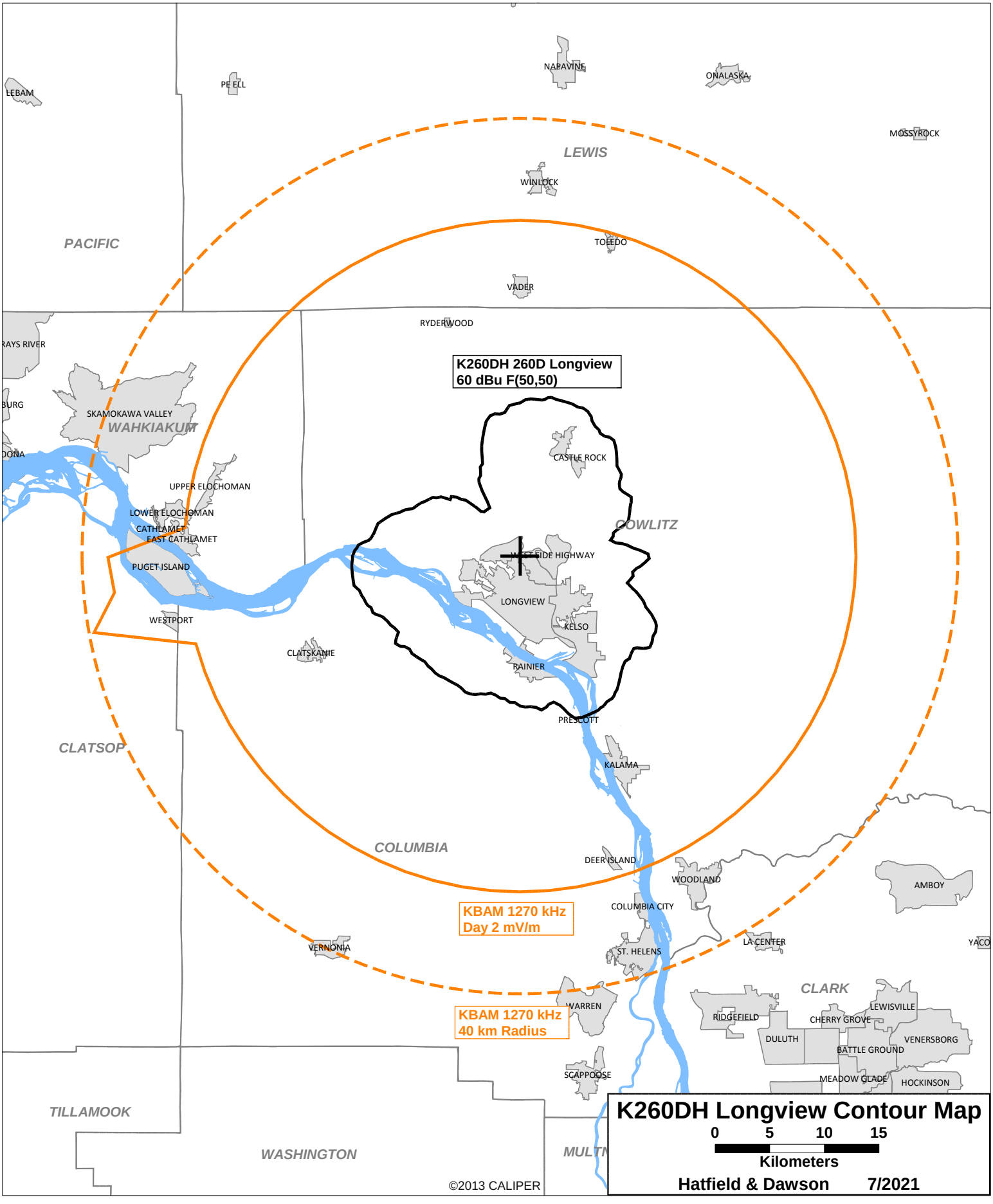


Ground-Level RF Exposure **OET FMModel**

K260DH Longview

Antenna Type:	Scala FMVMP-3 (Type 1)
No. of Elements:	3
Element Spacing:	0.87 wavelength
Distance:	500 meters
Horizontal ERP:	zero watts
Vertical ERP:	70 watts
Antenna Height:	53.3 meters AGL

Maximum Calculated Power Density is 0.5 µW/cm^2 at 9 meters from the antenna structure.


K260DH 260D Longview
60 dBu F(50,50)
KBAM 1270 kHz
Day 2 mV/m
KBAM 1270 kHz
40 km Radius
NAPAVINE
ONALASKA
LEBAM
PE ELL
MOSSYROCK
LEWIS
WINLOCK
PACIFIC
TOLEDO
VADER
RYDERWOOD
RAYS RIVER
SKAMOKAWA VALLEY
WAHKIAKUM
CASTLE ROCK
UPPER ELOCHOMAN
LOWER ELOCHOMAN
CATHLAMET
EAST CATHLAMET
COWLITZ
WESTSIDE HIGHWAY
PUGET ISLAND
LONGVIEW
WESTPORT
KELSO
CLATSKANIE
RAINIER
PRESCOTT
CLATSOP
KALAMA
COLUMBIA
DEER ISLAND
WOODLAND
AMBOY
COLUMBIA CITY
LA CENTER
YACO
VERNONIA
ST. HELENS
CLARK
WARREN
RIDGEFIELD
LEWISVILLE
CHERRY GROVE
DULUTH
VENERSBORG
BATTLE GROUND
SCAPPOOSE
MEADOW GLADE
HOCKINSON
TILLAMOOK
WASHINGTON
MULTN
©2013 CALIPER
K260DH Longview Contour Map
0 5 10 15
Kilometers
Hatfield & Dawson 7/2021