July 2016
FM Translator K270CL
Bellingham, Washington Channel 270D
Allocation Study

250 Mile Window CP Modification
This application is being filed as a modification of a "250 Mile Window Application" construction permit. K227CG was granted a construction permit on Channel 270 to relocate for use with AM station KWLE during the First Modification Window, as K270CL. This application proposes a change to a tower which is located 2 kilometers from the authorized site.

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 demonstrates compliance with the Commission's Rules for protection of FM broadcast stations and FM translators as outlined in §74.1204.

The 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.

K267BS 267D Bellingham: The proposed translator transmitter site is located within the 60 dBu protected contour of third-adjacent channel station K267BS Bellingham. 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
K267BS	5.40 km 234 deg True	0.034 kW 198 meters	71.9 dBu F(50,50)	111.9 dBu	see following

Given that the transmitting antenna will be installed at a height of 26 meters above ground, and taking into consideration the vertical plane pattern of the Scala FMVMP-2 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 K267BS.

Canadian Stations and Allotments: As is demonstrated by the attached map exhibit, the 34 dBu F(50,10) and 48 dBu F(50,10) contours from the proposed facility will not cross the border or overlap any Canadian land areas. Therefore, this proposal fully protects all Canadian allotments and stations in accordance with the requirements of the *Working Arrangement for the Allotment and Assignment of FM Broadcasting Channels Under the Agreement Between the Government of Canada and the Government of the United States of America Relating to the FM Broadcasting Service*, as amended in 1997.

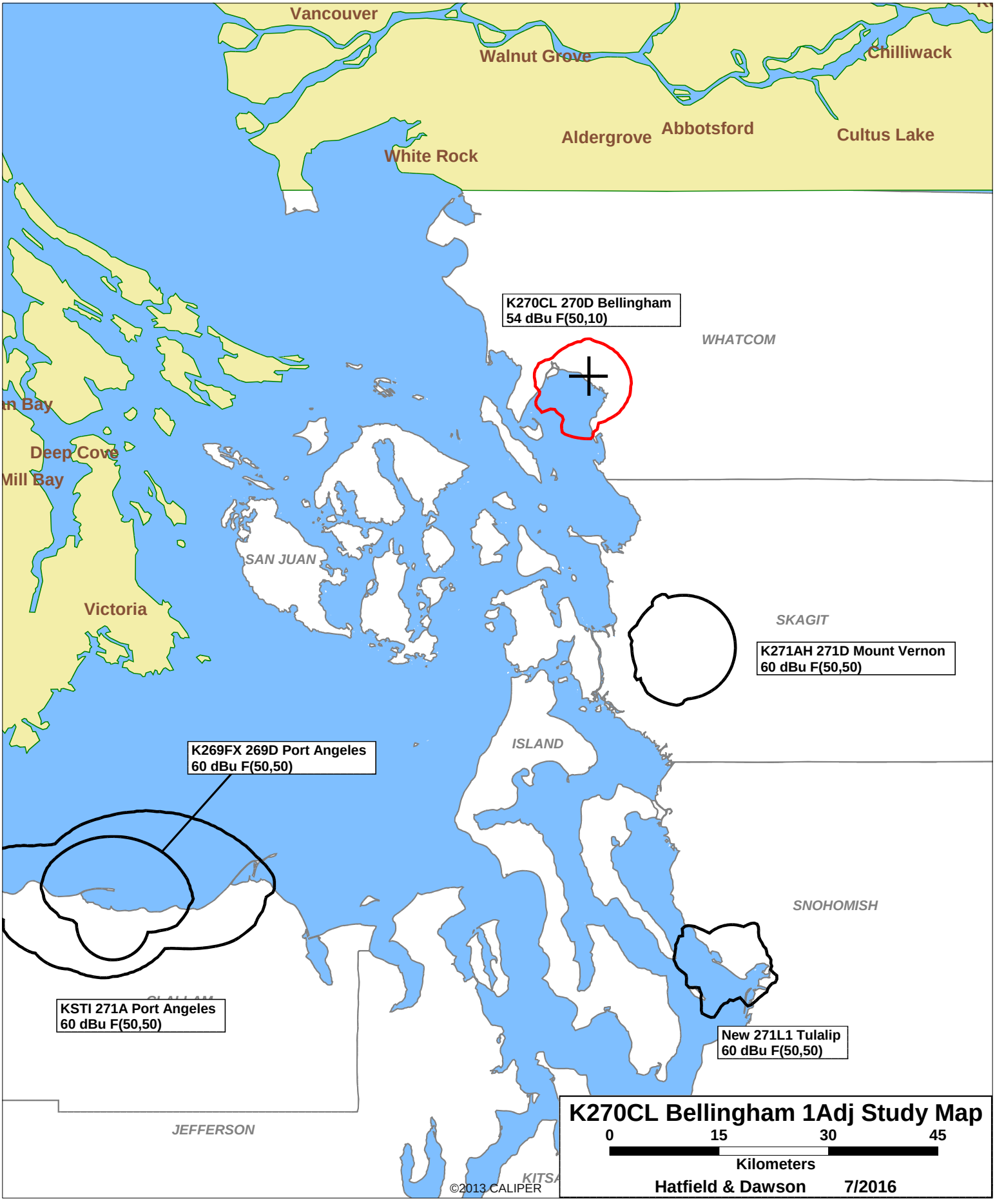
SEARCH PARAMETERS FM Database Date: 160705
Channel: 270A 101.9 MHz
Latitude: 48 46 22
Longitude: 122 31 15
Safety Zone: 50 km
Job Title: K270CL MOD

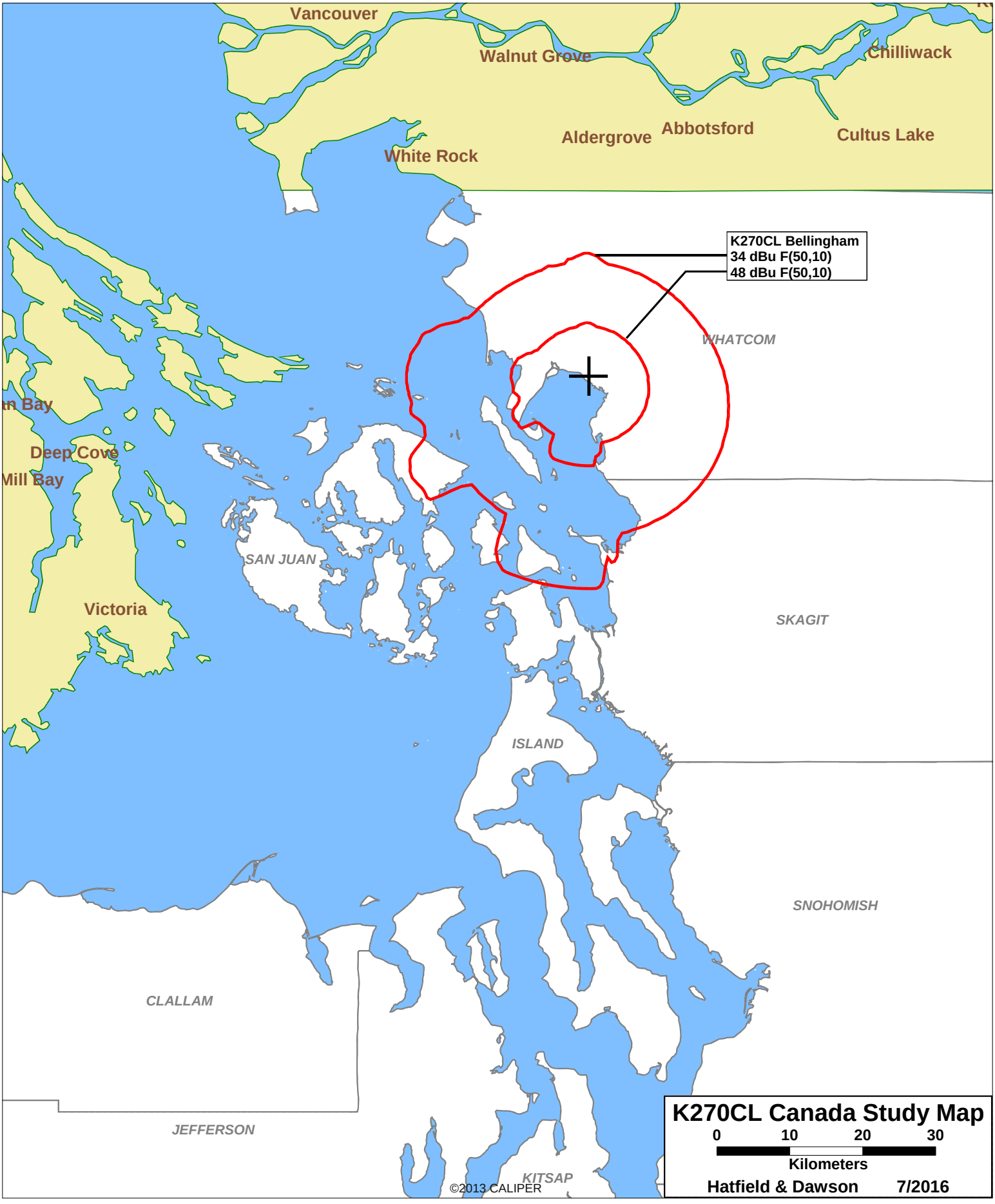
Call Status	City St FCC File No.	Channel Freq.	ERP(kW) HAAT(m)	Latitude Longitude	Bearing deg-True	Dist (km)	Req (km)
	VICTORIA	217C	0.000	48-35-41	255.6	77.87	29
	BC RM-	91.3	0.0	123-32-37		48.87	CLEAR
	VICTORIA	217C	0.000	48-35-41	255.6	77.87	29
	BC RM-	91.3	0.0	123-32-37		48.87	CLEAR
NEW	VICTORIA	217C	3.500 DA	48-35-41	255.6	77.87	29
	BC -	91.3	494.0	123-32-37		48.87	CLEAR
K267BS	BELLINGHAM	267D	0.034	48-48-04	54.2	5.40	0
LIC	WA BLFT-50522AFY	101.3	194.0	122-27-40		0.00	TRANS
	ABBOTSFORD	269A	0.000	49-03-09	32.6	36.98	98
	BC -	101.7	0.0	122-14-53		-61.02	SHORT
	ABBOTSFORD	269A	0.000	49-04-20	14.4	34.40	98
	BC -	101.7	0.0	122-24-12		-63.60	SHORT
CBUE-FM	HOPE	269A	0.135	49-23-17	49.2	105.69	98
	BC -	101.7	-510.0	121-25-06		7.69	CLOSE
	NANAIMO	269A	0.000	49-13-20	295.4	119.35	98
	BC RM-	101.7	0.0	124-00-07		21.35	CLEAR
K269FX	PORT ANGELES	269D	0.060	48-05-56	221.4	99.48	0
LIC	WA BLFT-30215ABO	101.7	171.0	123-24-18		0.00	TRANS
	MAPLE RIDGE	270A	0.000	49-12-57	353.2	49.62	151
	BC RM-	101.9	0.0	122-36-05		-101.38	SHORT
CITRFM	VANCOUVER	270A	0.000	49-16-07	316.3	76.73	151
	BC -	101.9	0.0	123-15-01		-74.27	SHORT
CITRFM	VANCOUVER	270A	1.800 DA	49-16-07	316.3	76.73	151
	BC -	101.9	103.0	123-15-01		-74.27	SHORT
CITRFM	VANCOUVER	270D	0.049 DA	49-16-07	316.3	76.73	0
	BC -	101.9	103.0	123-15-01		0.00	TRANS
CFUVFM	VICTORIA	270B	0.000	48-25-00	237.8	73.90	210
	BC -	101.9	0.0	123-22-00		-136.10	SHORT

SEARCH PARAMETERS FM Database Date: 160705
Channel: 270A 101.9 MHz
Latitude: 48 46 22
Longitude: 122 31 15
Safety Zone: 50 km
Job Title: K270CL MOD

Call Status	City St FCC File No.	Channel Freq.	ERP(kW) HAAT(m)		Latitude Longitude	Bearing deg-True	Dist (km)	Req (km)
CFUVFM	VICTORIA	270A	2.290		48-27-52	239.7	67.52	151
	BC -	101.9	58.0		123-18-35		-83.48	SHORT
K270CL	BELLINGHAM	270D	0.020	DA	48-47-26	356.5	1.98	0
CP MOD	WA BMPFT-60129AMC	101.9	0.0		122-31-21		0.00	TRANS
KCSC-LP	MUKILTEO	270L1	0.004		47-51-31	170.2	103.15	67
LIC	WA BLL-50622AAB	101.9	148.0		122-17-04		36.15	CLEAR
CBUF-1	CHILLIWACK	271A	0.081		49-06-36	52.5	62.03	98
	BC -	102.1	199.0		121-50-47		-35.97	SHORT
CFSI-FM	-SALT SPRING ISLAND	271D	0.020	DA	48-46-00	269.8	72.66	0
	BC -10717CA1	102.1	391.0		123-30-33		0.00	CLS=D
CISWFM	WHISTLER	271A	0.380		50-03-30	346.5	147.20	98
	BC -	102.1	180.0		123-00-12		49.20	CLEAR
K271AH	MOUNT VERNON	271D	0.250		48-26-20	160.7	39.34	0
LIC	WA BLFT-30723ABN	102.1	0.0		122-20-40		0.00	TRANS
KSTI	PORT ANGELES	271A	3.600	DA	48-05-51	223.8	103.62	72
LIC	WA BLH-41112AMY	102.1	-82.0		123-29-09	SS	31.62	CLEAR
NEW	TULALIP	271L1	0.047		48-03-18	166.1	82.21	56
CP	WA BNPL-31112BWO	102.1	44.0		122-15-17		26.21	CLEAR
KMRE-LP	BELLINGHAM	272L1	0.100		48-45-07	127.2	3.84	29
LIC	WA BLL-60713ABX	102.3	-23.7		122-28-45		-25.16	SHORT
NOTE:	NO ANALYSIS REQUIRED							
KAVZ-LP	DEMING	273L1	0.100		48-47-23	85.4	24.47	29
LIC	WA BLL-70413AFU	102.5	-200.0		122-11-20		-4.53	SHORT
NOTE:	NO ANALYSIS REQUIRED							

==== END OF FM SPACING STUDY FOR CHANNEL 270 ====


Vancouver
Walnut Grove
Chilliwack
Aldergrove
Abbotsford
Cultus Lake
White Rock
K270CL 270D Bellingham
54 dBu F(50,10)
WHATCOM
Deep Cove
Mill Bay
SAN JUAN
Victoria
SKAGIT
K271AH 271D Mount Vernon
60 dBu F(50,50)
ISLAND
K269FX 269D Port Angeles
60 dBu F(50,50)
SNOHOMISH
KSTI 271A Port Angeles
60 dBu F(50,50)
New 271L1 Tulalip
60 dBu F(50,50)
JEFFERSON
K270CL Bellingham 1Adj Study Map
0 15 30 45
Kilometers
Hatfield & Dawson 7/2016
©2013 CALIPER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34 dBu F(50,10)
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WHATCOM
Deep Cove
SAN JUAN
Victoria
SKAGIT
ISLAND
SNOHOMISH
CLALLAM
JEFFERSON
KITSAP
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K270CL Canada Study Map
0 10 20 30
Kilometers
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K270CL Bellingham Free Space Interference Area Calculator
Interference Area to K267BS

Antenna Height: 26 meters AGL
Contour Level: 111.9 dBu equals 0.4 V/m
ERP in Watts: 46 Watts

Maximum distance
to interfering contour is: 396.4 feet equals 120.8 meters

Antenna: FMV2

Depression Angle (degrees)	Scala FMV2 Relative Field	Adjusted ERP (Watts)	Free Space Distance To 111.9 dBu Contour Along the depression angle	Horizontal Distance (meters)	Contour AGL (meters)
-90	0.023	0.0	2.8 meters	0	23.2
-89	0.015	0.0	1.8	0.0	24.2
-88	0.009	0.0	1.1	0.0	24.9
-87	0.009	0.0	1.1	0.1	24.9
-86	0.009	0.0	1.1	0.1	24.9
-85	0.018	0.0	2.2	0.2	23.8
-84	0.026	0.0	3.1	0.3	22.9
-83	0.035	0.1	4.2	0.5	21.8
-82	0.043	0.1	5.2	0.7	20.9
-81	0.052	0.1	6.3	1.0	19.8
-80	0.060	0.2	7.2	1.3	18.9
-79	0.069	0.2	8.3	1.6	17.8
-78	0.078	0.3	9.4	2.0	16.8
-77	0.087	0.3	10.5	2.4	15.8
-76	0.095	0.4	11.5	2.8	14.9
-75	0.104	0.5	12.6	3.3	13.9
-74	0.113	0.6	13.6	3.8	12.9
-73	0.122	0.7	14.7	4.3	11.9
-72	0.131	0.8	15.8	4.9	10.9
-71	0.139	0.9	16.8	5.5	10.1
-70	0.148	1.0	17.9	6.1	9.2
-69	0.157	1.1	19.0	6.8	8.3
-68	0.165	1.3	19.9	7.5	7.5
-67	0.173	1.4	20.9	8.2	6.8
-66	0.181	1.5	21.9	8.9	6.0
-65	0.189	1.6	22.8	9.7	5.3
-64	0.196	1.8	23.7	10.4	4.7
-63	0.204	1.9	24.6	11.2	4.0
-62	0.210	2.0	25.4	11.9	3.6
-61	0.216	2.1	26.1	12.7	3.2
-60	0.222	2.3	26.8	13.4	2.8
-59	0.227	2.4	27.4	14.1	2.5
-58	0.232	2.5	28.0	14.9	2.2
-57	0.235	2.5	28.4	15.5	2.2
-56	0.238	2.6	28.7	16.1	2.2
-55	0.240	2.6	29.0	16.6	2.3
-54	0.241	2.7	29.1	17.1	2.4
-53	0.242	2.7	29.2	17.6	2.6
-52	0.241	2.7	29.1	17.9	3.1
-51	0.239	2.6	28.9	18.2	3.6
-50	0.235	2.5	28.4	18.2	4.3
-49	0.231	2.5	27.9	18.3	4.9

-48	0.225	2.3	27.2	18.2	5.8
-47	0.217	2.2	26.2	17.9	6.8
-46	0.208	2.0	25.1	17.5	7.9
-45	0.198	1.8	23.9	16.9	9.1
-44	0.185	1.6	22.3	16.1	10.5
-43	0.171	1.3	20.7	15.1	11.9
-42	0.156	1.1	18.8	14.0	13.4
-41	0.138	0.9	16.7	12.6	15.1
-40	0.119	0.7	14.4	11.0	16.8
-39	0.098	0.4	11.8	9.2	18.6
-38	0.076	0.3	9.2	7.2	20.3
-37	0.051	0.1	6.2	4.9	22.3
-36	0.025	0.0	3.0	2.4	24.2
-35	0.002	0.0	0.2	0.2	25.9
-34	0.032	0.0	3.9	3.2	23.8
-33	0.062	0.2	7.5	6.3	21.9
-32	0.094	0.4	11.4	9.6	20.0
-31	0.128	0.8	15.5	13.2	18.0
-30	0.163	1.2	19.7	17.0	16.2
-29	0.199	1.8	24.1	21.0	14.3
-28	0.235	2.5	28.4	25.1	12.7
-27	0.273	3.4	33.0	29.4	11.0
-26	0.311	4.5	37.6	33.8	9.5
-25	0.350	5.6	42.3	38.3	8.1
-24	0.389	7.0	47.0	42.9	6.9
-23	0.428	8.4	51.7	47.6	5.8
-22	0.468	10.1	56.5	52.4	4.8
-21	0.507	11.8	61.3	57.2	4.0
-20	0.545	13.7	65.9	61.9	3.5
-19	0.584	15.7	70.6	66.7	3.0
-18	0.621	17.7	75.0	71.3	2.8
-17	0.657	19.8	79.4	75.9	2.8
-16	0.693	22.1	83.7	80.4	2.9
-15	0.726	24.3	87.7	84.7	3.3
-14	0.759	26.5	91.6	88.9	3.8
-13	0.790	28.7	95.4	93.0	4.5
-12	0.820	31.0	99.1	96.9	5.4
-11	0.847	33.0	102.4	100.5	6.5
-10	0.873	35.1	105.5	103.9	7.7
-9	0.896	37.0	108.3	107.0	9.1
-8	0.918	38.8	110.9	109.9	10.6
-7	0.936	40.3	113.1	112.3	12.2
-6	0.953	41.8	115.1	114.5	14.0
-5	0.967	43.0	116.8	116.4	15.8
-4	0.978	44.0	118.2	117.9	17.8
-3	0.989	45.0	119.4	119.3	19.7
-2	0.994	45.5	120.1	120.0	21.8
-1	0.998	45.8	120.5	120.5	23.9
0	1.000	46.0	120.8	120.8	26.0

July 2016
FM Translator K270CL
Bellingham, Washington Channel 270D
RF Exposure Study

Facilities Proposed

The proposed operation will be on Channel 270D (101.9 MHz) with a maximum lobe effective radiated power of 46 watts. Operation is proposed with an antenna to be mounted on an existing tower with FCC Antenna Structure Registration Number 1292502.

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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.

Calculations of the power density produced by the proposed antenna system have been made assuming that the antenna will radiate 100% power straight down to a point 2 meters above ground at the base of the tower (24 meters below the antenna). Under this worst-case assumption, the highest calculated ground level power density from this proposal occurs at the base of the antenna support structure. At this point the power density is calculated to be 2.7 $\mu W/cm^2$, which is 1.3% 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 radiation in excess of FCC guidelines.

Transmitter Site Map
FM Translator K270CL
Bellingham, WA 7/2016

TN
MN (16.1°E)

Scale 1 : 24,000
1 cm = 240.0 m Data Zoom 13-1