

RUSTING SPROCKET ARTS
KVNX-LP 97.5 FM VANCOUVER, WASHINGTON
FAC ID NO. 196313

MINOR CHANGE OF LICENSED FACILITY

PROPOSED: **ANTENNA COORDINATES ARE BEING MOVED 35 M**
FROM LICENSED SITE - ALL OTHER PARAMETERS UNCHANGED

Channel	248
New Location:	45° 39' 35.5" N 122° 23' 38.5" W-- NAD 83
	45° 39' 35.0" N 122° 23' 43.0" W -- NAD 27
Antenna AGL	11.7 m (co-location/combined KOUV-LP)
Tower Total	14.6 m
Antenna Ground	251 m
Antenna COR	262.7 m
HAAT	30 m*
Power	100 w

*FCC HAAT Calculation:

Input Data	
Latitude	45° 39' 35.5" North
Longitude	122° 23' 38.5" West (NAD 83)
Height of antenna radiation center above mean sea level: 262.7 meters AMSL	
Number of Evenly Spaced Radials = 8 0° is referenced to True North	
Results	
Calculated HAAT = 30 meters	
Antenna Height Above Average Terrain calculated using 1 km GLOBE terrain data	
Individual "Radial HAAT" Values, in meters	
0°	-102.1 m
45°	-401.9 m
90°	-61.9 m
135°	95.7 m
180°	189.3 m
225°	199.4 m
270°	177.9 m
315°	147.3 m

Rusting Sprocket Art

REFERENCE
 45 39 34.92 N. CLASS = L1
 122 23 42.83 W. Current Spacings to 2nd Adj.
 ----- Channel 248 - 97.5 MHz -----

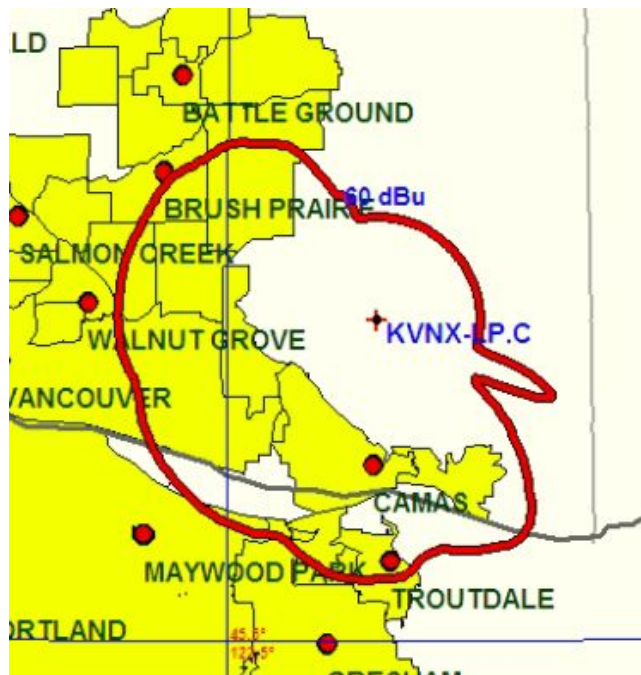
DISPLAY DATES
 DATA 01-20-20
 SEARCH 03-12-20

Call	Channel	Location	Azi	Dist	FCC	Margin
*KYCH-FM LIC	246C	Portland	OR	231.0	30.18	92.5 -62.3
*AL2094 USE	250C1	Aloha	OR	231.0	30.18	72.5 -42.3
*KLVP LIC	250C1	Aloha	OR	231.0	30.18	72.5 -42.3
**K248DD LIC-D	248D	Portland	OR	207.4	25.85	38.5 -12.7
K248CN LIC	248D	Ariel	WA	323.5	49.43	31.5 17.9
K248BS LIC	248D	Newberg	OR	234.0	57.57	38.5 19.1
ALLO USE	247C	Tacoma	WA	316.8	151.85	119.5 32.4
K248CN APP	248D	Longview	WA	327.8	66.35	31.5 34.9
ALLO USE	248C1	Bend	OR	316.8	151.85	110.5 41.4
ALLO USE	248C1	Basin City	WA	316.8	151.85	110.5 41.4
AL8465 USE	249C	Oakville	WA	330.1	166.75	119.5 47.3

Reference station has protected zone issue: Canada
 All separation margins include rounding

*See Second Adjacent Waiver
 **BMPL-20140623AAH (KVNK-LP) was granted 07/17/2014 followed by BMPFT-20160729ABV (K248DD) granted 08/18/2016, establishing grandfathered short space at 23.1 km. Proposed is 25.66 km from K238DD. 25.85 km > 23.1 km; passes.

60 dBu FCC Contour

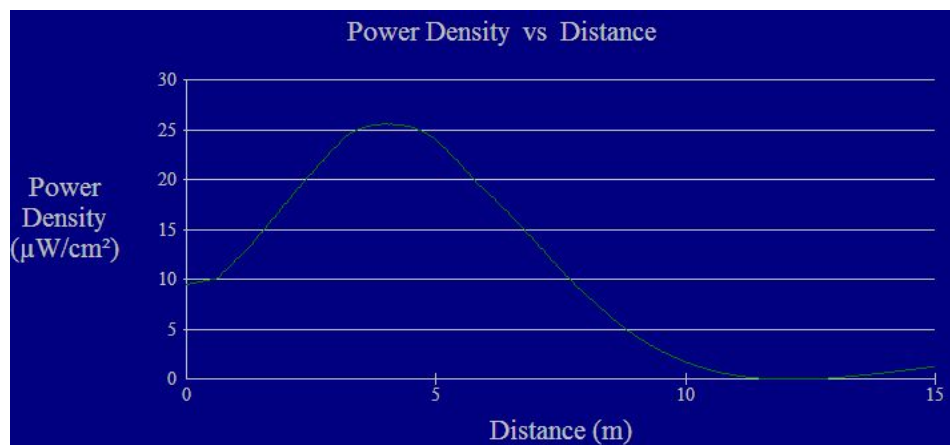


TOWAIR (PASS)

DETERMINATION Results	
Structure does not require registration. The structure meets the 6.10-meter (20-foot) Rule criteria.	
Your Specifications	
NAD83 Coordinates	
Latitude	45-39-35.5 north
Longitude	122-23-38.5 west
Measurements (Meters)	
Overall Structure Height (AGL)	14.5
Support Structure Height (AGL)	9
Site Elevation (AMSL)	251
Structure Type	
TREE - When used as a support for an antenna	

Environmental Compliance

A two bay double-v antenna was used to gauge the maximum RF for the proposal in OET program FM Model for Windows demonstrating a peak exposure of $25.6 \mu\text{W}/\text{cm}^2$ 3.7 from the antenna for a person 1.7 meters standing under the antenna considering full wave spacing. This is 13% of the FCC Maximum Permissible Exposure (MPR) for $200 \mu\text{W}/\text{cm}^2$ for Unrestricted Areas so the proposal passes compliance.



Second Adjacent Waiver Request

License respectfully requests a "second adjacent channel waiver" with regards to Section 47 C.F.R. Section 73.807 of the FCC rules based upon the "Living Way" precedence (Living Way Ministries, Inc., Memorandum Opinion and Order, 17 FCC Red 17054, 17056, ¶ 5 (2002), recon. denied 23 FCC Red 15070 (2008)). This will be accomplished by used Free Space methodology of calculation.

Using U/D methodology, at the proposed KVNK-LP transmitter location KYCH has a signal strength of 83.6 dBu and KLVP has a signal strength of 80.9 dBu. Interference will occur when the smaller of two station's (KLVP) signal strength's interfering signal exceeds the desired signal by 40 dbu. So the area of predicted interference would then be bounded by the 120.9 dBu contour.

The distance to this contour, using free space method:

$$D = (7.01 * P^{1/2}) / E,$$

where P is power (watts), E is field strength (v/m), and D is distance to contour (meters):

P = 100 w, E = 120.9 dBu D = 63.1 meters

However, the field strength of the proposed LPFM's antenna system falls quickly at depression angles below the horizon. Using elevation pattern data provided by Scala for a vertical dipole antenna setup (Model FMVP3 - <https://www.kathreinusa.com/patterns/product-number-fmvp/>), the distance to the 120.9 dBu contour at various depression angles is tabulated below. The data shows that the lowest point at which the signal strength rises to 120.9 dBu is 8.7 meters below the center of radiation of the antenna system, or 3 meter above the ground. Therefore, this is sufficient clearance, and the interference area encompasses zero population. The table below show that the lowest elevation point of the 120.9 F(50,10) interfering contour is 3 meters above ground. The antenna is located in a rural area on private property. 3 m feet is sufficient to clear the one-story private residence on the property.

Due to zero population within this radiation radius, this meets the "Living Way" Criteria to qualify for a Waiver of 47 C.F.R. Section 73.807.

Thus, the applicant requests second adjacent waiver based upon evidence no interference is proposed.

A MAX ERP
B DEPRESSION ANGLE
C RELATIVE FIELD
D dB FROM RELATIVE
E ERP
F ANGULAR DISTANCE TO 120.9 dBu CONTOUR
G VERTICAL DISTANCE (below antenna)
H HORIZONTAL DISTANCE TO 120.9 dBu CONTOUR

I CLEARANCE OF CONTOUR ABOVE GROUND

A	B	C	D	E	F	G	H	I
100	-90	0.02	-33.94	0.04	1.2	1.1	0	10.6
100	-89	0.013	-37.62	0.02	0.8	0.7	0	11
100	-88	0.01	-40	0.01	0.6	0.5	0	11.2
100	-87	0.01	-40	0.01	0.6	0.5	0	11.2
100	-86	0.01	-40	0.01	0.6	0.5	0	11.2
100	-85	0.015	-36.47	0.02	0.9	0.8	0	10.9
100	-84	0.022	-33.13	0.05	1.3	1.2	0.1	10.5
100	-83	0.029	-30.69	0.09	1.8	1.7	0.2	10
100	-82	0.036	-28.83	0.13	2.2	2.1	0.3	9.6
100	-81	0.043	-27.29	0.19	2.7	2.6	0.4	9.1
100	-80	0.05	-26.02	0.25	3.1	3	0.5	8.7
100	-79	0.057	-24.9	0.32	3.5	3.4	0.6	8.3
100	-78	0.063	-23.95	0.40	4	3.9	0.8	7.8
100	-77	0.07	-23.1	0.49	4.4	4.2	0.9	7.5
100	-76	0.076	-22.37	0.58	4.8	4.6	1.1	7.1
100	-75	0.082	-21.69	0.68	5.2	5	1.3	6.7
100	-74	0.088	-21.11	0.77	5.5	5.2	1.5	6.5
100	-73	0.093	-20.59	0.87	5.9	5.6	1.7	6.1
100	-72	0.098	-20.15	0.97	6.2	5.8	1.9	5.9
100	-71	0.103	-19.74	1.06	6.5	6.1	2.1	5.6
100	-70	0.107	-19.41	1.15	6.7	6.2	2.2	5.5
100	-69	0.111	-19.12	1.22	6.9	6.4	2.4	5.3
100	-68	0.113	-18.9	1.29	7.1	6.5	2.6	5.2
100	-67	0.116	-18.72	1.34	7.3	6.7	2.8	5
100	-66	0.117	-18.61	1.38	7.4	6.7	3	5
100	-65	0.118	-18.54	1.40	7.4	6.7	3.1	5
100	-64	0.118	-18.55	1.40	7.4	6.6	3.2	5.1
100	-63	0.117	-18.62	1.37	7.4	6.5	3.3	5.2
100	-62	0.115	-18.77	1.33	7.2	6.3	3.3	5.4
100	-61	0.112	-19	1.26	7	6.1	3.3	5.6
100	-60	0.108	-19.34	1.16	6.8	5.8	3.4	5.9
100	-59	0.103	-19.77	1.05	6.4	5.4	3.2	6.3

100	-58	0.096	-20.34	0.92	6	5	3.1	6.7
100	-57	0.088	-21.07	0.78	5.5	4.6	2.9	7.1
100	-56	0.079	-22	0.63	5	4.1	2.7	7.6
100	-55	0.069	-23.2	0.48	4.3	3.5	2.4	8.2
100	-54	0.058	-24.79	0.33	3.6	2.9	2.1	8.8
100	-53	0.045	-26.96	0.20	2.8	2.2	1.6	9.5
100	-52	0.031	-30.19	0.10	1.9	1.4	1.1	10.3
100	-51	0.016	-36.02	0.03	0.9	0.6	0.5	11.1
100	-50	0.01	-40	0.01	0.6	0.4	0.3	11.3
100	-49	0.018	-35.12	0.03	1.1	0.8	0.7	10.9
100	-48	0.036	-28.99	0.13	2.2	1.6	1.4	10.1
100	-47	0.054	-25.32	0.29	3.4	2.4	2.3	9.3
100	-46	0.073	-22.69	0.54	4.6	3.3	3.1	8.4
100	-45	0.093	-20.65	0.86	5.8	4	4.1	7.7
100	-44	0.112	-18.99	1.26	7	4.8	5	6.9
100	-43	0.132	-17.62	1.73	8.3	5.6	6	6.1
100	-42	0.15	-16.45	2.26	9.5	6.3	7	5.4
100	-41	0.169	-15.47	2.84	10.6	6.9	8	4.8
100	-40	0.186	-14.63	3.44	11.7	7.5	8.9	4.2
100	-39	0.201	-13.93	4.05	12.7	7.9	9.8	3.8
100	-38	0.215	-13.36	4.61	13.5	8.3	10.6	3.4
100	-37	0.227	-12.9	5.13	14.3	8.6	11.4	3.1
100	-36	0.236	-12.55	5.56	14.9	8.7	12	3
100	-35	0.242	-12.31	5.87	15.3	8.7	12.5	3
100	-34	0.246	-12.19	6.04	15.5	8.6	12.8	3.1
100	-33	0.246	-12.18	6.05	15.5	8.4	13	3.3
100	-32	0.242	-12.31	5.87	15.3	8.1	12.9	3.6
100	-31	0.235	-12.58	5.52	14.8	7.6	12.6	4.1
100	-30	0.224	-13.01	5.00	14.1	7	12.2	4.7
100	-29	0.208	-13.65	4.32	13.1	6.3	11.4	5.4
100	-28	0.188	-14.54	3.52	11.8	5.5	10.4	6.2
100	-27	0.163	-15.76	2.65	10.2	4.6	9	7.1
100	-26	0.134	-17.47	1.79	8.4	3.6	7.5	8.1
100	-25	0.1	-19.96	1.01	6.3	2.6	5.7	9.1

100	-24	0.063	-24.05	0.39	3.9	1.5	3.5	10.2
100	-23	0.021	-33.55	0.04	1.3	0.5	1.1	11.2
100	-22	0.025	-32.19	0.06	1.5	0.5	1.3	11.2
100	-21	0.074	-22.66	0.54	4.6	1.6	4.2	10.1
100	-20	0.126	-18	1.58	7.9	2.7	7.4	9
100	-19	0.181	-14.85	3.27	11.4	3.7	10.7	8
100	-18	0.238	-12.46	5.68	15	4.6	14.2	7.1
100	-17	0.297	-10.55	8.81	18.7	5.4	17.8	6.3
100	-16	0.357	-8.95	12.74	22.5	6.1	21.6	5.6
100	-15	0.418	-7.59	17.42	26.3	6.8	25.4	4.9
100	-14	0.478	-6.41	22.86	30.2	7.3	29.3	4.4
100	-13	0.538	-5.38	28.97	34	7.6	33.1	4.1
100	-12	0.597	-4.48	35.65	37.7	7.8	36.8	3.9
100	-11	0.654	-3.69	42.76	41.3	7.8	40.5	3.9
100	-10	0.708	-2.99	50.23	44.7	7.7	44	4
100	-9	0.759	-2.39	57.68	47.9	7.4	47.3	4.3
100	-8	0.807	-1.86	65.16	51	7	50.5	4.7
100	-7	0.85	-1.42	72.11	53.6	6.5	53.2	5.2
100	-6	0.888	-1.03	78.89	56.1	5.8	55.7	5.9
100	-5	0.921	-0.72	84.72	58.1	5	57.8	6.7
100	-4	0.949	-0.46	89.95	59.9	4.1	59.7	7.6
100	-3	0.971	-0.26	94.19	61.3	3.2	61.2	8.5
100	-2	0.987	-0.12	97.27	62.3	2.1	62.2	9.6
100	-1	0.996	-0.03	99.31	62.9	1	62.8	10.7
100	0	1	0	100.00	63.2	0	63.2	11.7
100	1	0.996	-0.03	99.31	62.9	1	62.8	10.7
100	2	0.987	-0.12	97.27	62.3	2.1	62.2	9.6
100	3	0.971	-0.26	94.19	61.3	3.2	61.2	8.5
100	4	0.949	-0.46	89.95	59.9	4.1	59.7	7.6
100	5	0.921	-0.71	84.92	58.2	5	57.9	6.7
100	6	0.888	-1.03	78.89	56.1	5.8	55.7	5.9
100	7	0.85	-1.42	72.11	53.6	6.5	53.2	5.2
100	8	0.807	-1.86	65.16	51	7	50.5	4.7
100	9	0.759	-2.39	57.68	47.9	7.4	47.3	4.3

100	10	0.708	-2.99	50.23	44.7	7.7	44	4
100	11	0.654	-3.69	42.76	41.3	7.8	40.5	3.9
100	12	0.597	-4.48	35.65	37.7	7.8	36.8	3.9
100	13	0.538	-5.38	28.97	34	7.6	33.1	4.1
100	14	0.478	-6.41	22.86	30.2	7.3	29.3	4.4
100	15	0.418	-7.59	17.42	26.3	6.8	25.4	4.9
100	16	0.357	-8.95	12.74	22.5	6.1	21.6	5.6
100	17	0.297	-10.55	8.81	18.7	5.4	17.8	6.3
100	18	0.238	-12.46	5.68	15	4.6	14.2	7.1
100	19	0.181	-14.85	3.27	11.4	3.7	10.7	8
100	20	0.126	-18	1.58	7.9	2.7	7.4	9
100	21	0.074	-22.66	0.54	4.6	1.6	4.2	10.1
100	22	0.025	-32.19	0.06	1.5	0.5	1.3	11.2
100	23	0.021	-33.56	0.04	1.3	0.5	1.1	11.2
100	24	0.063	-24.05	0.39	3.9	1.5	3.5	10.2
100	25	0.1	-19.97	1.01	6.3	2.6	5.7	9.1
100	26	0.134	-17.47	1.79	8.4	3.6	7.5	8.1
100	27	0.163	-15.76	2.65	10.2	4.6	9	7.1
100	28	0.188	-14.54	3.52	11.8	5.5	10.4	6.2
100	29	0.208	-13.65	4.32	13.1	6.3	11.4	5.4
100	30	0.224	-13.01	5.00	14.1	7	12.2	4.7
100	31	0.235	-12.58	5.52	14.8	7.6	12.6	4.1
100	32	0.242	-12.31	5.87	15.3	8.1	12.9	3.6
100	33	0.246	-12.18	6.05	15.5	8.4	13	3.3
100	34	0.246	-12.19	6.04	15.5	8.6	12.8	3.1
100	35	0.242	-12.31	5.87	15.3	8.7	12.5	3
100	36	0.236	-12.55	5.56	14.9	8.7	12	3
100	37	0.227	-12.9	5.13	14.3	8.6	11.4	3.1
100	38	0.215	-13.36	4.61	13.5	8.3	10.6	3.4
100	39	0.201	-13.93	4.05	12.7	7.9	9.8	3.8
100	40	0.186	-14.63	3.44	11.7	7.5	8.9	4.2
100	41	0.169	-15.47	2.84	10.6	6.9	8	4.8
100	42	0.15	-16.45	2.26	9.5	6.3	7	5.4
100	43	0.132	-17.62	1.73	8.3	5.6	6	6.1

100	44	0.112	-18.99	1.26	7	4.8	5	6.9
100	45	0.093	-20.65	0.86	5.8	4	4.1	7.7
100	46	0.073	-22.69	0.54	4.6	3.3	3.1	8.4
100	47	0.054	-25.32	0.29	3.4	2.4	2.3	9.3
100	48	0.036	-28.99	0.13	2.2	1.6	1.4	10.1
100	49	0.018	-35.12	0.03	1.1	0.8	0.7	10.9
100	50	0.01	-40	0.01	0.6	0.4	0.3	11.3
100	51	0.016	-36.03	0.02	0.9	0.6	0.5	11.1
100	52	0.031	-30.19	0.10	1.9	1.4	1.1	10.3
100	53	0.045	-26.96	0.20	2.8	2.2	1.6	9.5
100	54	0.058	-24.79	0.33	3.6	2.9	2.1	8.8
100	55	0.069	-23.2	0.48	4.3	3.5	2.4	8.2
100	56	0.079	-22	0.63	5	4.1	2.7	7.6
100	57	0.088	-21.07	0.78	5.5	4.6	2.9	7.1
100	58	0.096	-20.34	0.92	6	5	3.1	6.7
100	59	0.103	-19.77	1.05	6.4	5.4	3.2	6.3
100	60	0.108	-19.34	1.16	6.8	5.8	3.4	5.9
100	61	0.112	-19	1.26	7	6.1	3.3	5.6
100	62	0.115	-18.77	1.33	7.2	6.3	3.3	5.4
100	63	0.117	-18.62	1.37	7.4	6.5	3.3	5.2
100	64	0.118	-18.55	1.40	7.4	6.6	3.2	5.1
100	65	0.118	-18.54	1.40	7.4	6.7	3.1	5
100	66	0.117	-18.61	1.38	7.4	6.7	3	5
100	67	0.116	-18.72	1.34	7.3	6.7	2.8	5
100	68	0.113	-18.9	1.29	7.1	6.5	2.6	5.2
100	69	0.111	-19.12	1.22	6.9	6.4	2.4	5.3
100	70	0.107	-19.41	1.15	6.7	6.2	2.2	5.5
100	71	0.103	-19.74	1.06	6.5	6.1	2.1	5.6
100	72	0.098	-20.15	0.97	6.2	5.8	1.9	5.9
100	73	0.093	-20.59	0.87	5.9	5.6	1.7	6.1
100	74	0.088	-21.11	0.77	5.5	5.2	1.5	6.5
100	75	0.082	-21.69	0.68	5.2	5	1.3	6.7
100	76	0.076	-22.37	0.58	4.8	4.6	1.1	7.1
100	77	0.07	-23.1	0.49	4.4	4.2	0.9	7.5

100	78	0.063	-23.95	0.40	4	3.9	0.8	7.8
100	79	0.057	-24.9	0.32	3.5	3.4	0.6	8.3
100	80	0.05	-26.02	0.25	3.1	3	0.5	8.7
100	81	0.043	-27.29	0.19	2.7	2.6	0.4	9.1
100	82	0.036	-28.83	0.13	2.2	2.1	0.3	9.6
100	83	0.029	-30.69	0.09	1.8	1.7	0.2	10
100	84	0.022	-33.13	0.05	1.3	1.2	0.1	10.5
100	85	0.015	-36.47	0.02	0.9	0.8	0	10.9
100	86	0.01	-40	0.01	0.6	0.5	0	11.2
100	87	0.01	-40	0.01	0.6	0.5	0	11.2
100	88	0.01	-40	0.01	0.6	0.5	0	11.2
100	89	0.013	-37.62	0.02	0.8	0.7	0	11
100	90	0.02	-33.94	0.04	1.2	1.1	0	10.6