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**Proposed Translator
Channel 233D at Eastlake, WA
To Rebroadcast KTTH(AM) 770 kHz Seattle, WA
March 2018**

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

The proposed facility will operate with an ERP of less than 100 watts. Therefore there are no spacing restrictions to stations which are 53 or 54 channels removed from the proposed operation.

KUOW-FM 235C1 Seattle

The proposed translator transmitter site is located within the 60 dBu protected contour of second-adjacent channel station KUOW-FM 235C1 Seattle. 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
KUOW-FM 235C1	2.50 km 331 deg True	100 kW 231 meters	117.46 dBu F(50,50)	157.46 dBu	0.5 meters Free Space

The 157.46 dBu contour from the proposed facility extends only 0.5 meters from the antenna and does not reach either ground level or the rooftop 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 KUOW-FM.

KSWD 231C Seattle

The proposed translator transmitter site is located within the 60 dBu protected contour of second-adjacent channel station KSWD 231C Seattle. 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
KSWD 231C	30.50 km 299 deg True	73 kW 789 meters	88.15 dBu F(50,50)	128.15 dBu	13.7 meters Free Space

The attached Free Space calculations take into account the elevation pattern of the Scala CA5FMCP antenna to be used, as well as the antenna height above the rooftop level, and demonstrate that the 128.15 dBu contour will not overlap the building atop which the antenna will be mounted. There is no population within this contour. Therefore, the proposed facility is believed to satisfy the requirements of §74.1204(d) with respect to KSWD.

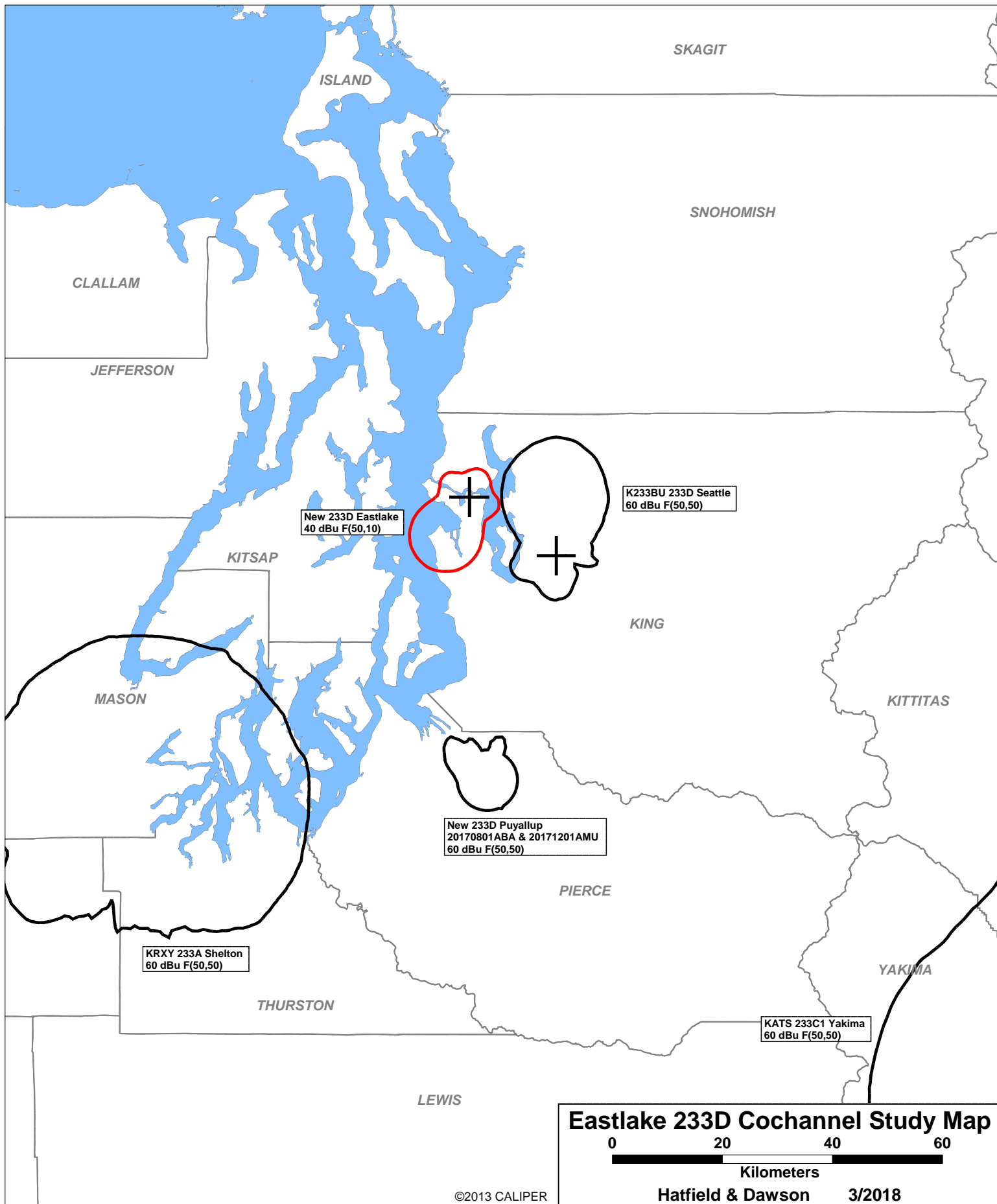
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SEARCH PARAMETERS                               FM Database Date: 180316
Channel: 233A      94.5 MHz                      Page 1
Latitude:  47 38  9
Longitude: 122 19 26
Safety Zone:  50 km
Job Title: EASTLAKE 233

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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)
KSWD	SEATTLE		231C	73.000	47-30-17	118.5	30.50	95
LIC	WA	BMLH-30522ACI	94.1	698.0	121-58-04		-64.50	SHORT
CFBT-FM	VANCOUVER		233C	90.000	49-21-17	346.5	196.78	247
	BC	-00928CA1	94.5	617.6	122-57-25		-50.22	SHORT
NEW-T	EASTLAKE		233D	0.025	47-38-09	0.0	0.00	0
APP	WA	BNPFT-80130AEC	94.5	0.0	122-19-26		0.00	TRANS
KLYK	KELSO		233A	3.000	46-16-49	195.7	156.45	115
LIC	WA	BLH-30305AAA	94.5	145.0	122-52-34	SS	41.45	CLEAR
	OAK HARBOR		233A	0.000	48-17-36	342.2	76.87	115
VAC	WA	RM-11328*	94.5	0.0	122-38-31		-38.13	SHORT
NEW-T	PUYALLUP		233D	0.090	47-10-41	175.7	51.04	0
APP	WA	BNPFT-71201AMU	94.5	104.0	122-16-24		0.00	TRANS
NEW-T	PUYALLUP		233D	0.090	47-10-41	175.7	51.04	0
APP	WA	BNPFT-70801ABA	94.5	0.0	122-16-24		0.00	TRANS
K233BU	SEATTLE		233D	0.099	47-32-35	122.3	19.31	0
LIC	WA	BLFT-70531ADG	94.5	446.0	122-06-25		0.00	TRANS
KRXY	SHELTON		233A	0.830	47-08-20	228.3	82.75	115
LIC	WA	BLH-31112AYX	94.5	271.9	123-08-23	SS	-32.25	SHORT
KATS	YAKIMA		233C1	100.000	46-31-59	131.0	184.75	200
LIC	WA	BLH-840625CS	94.5	277.0	120-30-14		-15.25	SHORT
	SOOKE		234A	0.000	48-24-09	313.0	126.25	98
	BC	RM-	94.7	0.0	123-34-20		28.25	CLEAR
KUOW-FM	SEATTLE		235C1	100.000	47-36-58	151.2	2.50	75
LIC	WA	BMLD-40623ABY	94.9	224.0	122-18-28		-72.50	SHORT
KCMS	EDMONDS		287C1	54.000	47-32-40	121.9	19.21	22
LIC	WA	BLH-10212AAE	105.3	385.0	122-06-26		-2.79	SHORT

===== END OF FM SPACING STUDY FOR CHANNEL 233 =====



Free Space Interference Area Calculator

Interference Area to KSWD

Antenna Height: 6.1 meters Above Rooftop
 Contour Level: 128.15 dBu equals 2.6 V/m
 ERP in Watts: 37 Watts

Maximum distance
 to interfering contour is: 54.7 feet equals 16.7 meters

Antenna: CA5FMCP

Depression Angle (degrees)	Scala CA5FMCP Relative Field	Adjusted ERP (Watts)	Free Space Distance To 128.15 dBu Contour Along the depression angle	Horizontal Distance (meters)	Contour height above rooftop (meters)
-90	0.157	0.9	2.6 meters	0	3.5
-89	0.156	0.9	2.6	0.0	3.5
-88	0.154	0.9	2.6	0.1	3.5
-87	0.153	0.9	2.6	0.1	3.6
-86	0.151	0.8	2.5	0.2	3.6
-85	0.150	0.8	2.5	0.2	3.6
-84	0.148	0.8	2.5	0.3	3.6
-83	0.147	0.8	2.5	0.3	3.7
-82	0.145	0.8	2.4	0.3	3.7
-81	0.143	0.8	2.4	0.4	3.7
-80	0.142	0.7	2.4	0.4	3.8
-79	0.140	0.7	2.3	0.4	3.8
-78	0.139	0.7	2.3	0.5	3.8
-77	0.138	0.7	2.3	0.5	3.9
-76	0.136	0.7	2.3	0.5	3.9
-75	0.135	0.7	2.3	0.6	3.9
-74	0.135	0.7	2.3	0.6	3.9
-73	0.135	0.7	2.3	0.7	3.9
-72	0.134	0.7	2.2	0.7	4.0
-71	0.134	0.7	2.2	0.7	4.0
-70	0.134	0.7	2.2	0.8	4.0
-69	0.136	0.7	2.3	0.8	4.0
-68	0.137	0.7	2.3	0.9	4.0
-67	0.139	0.7	2.3	0.9	4.0
-66	0.140	0.7	2.3	1.0	4.0
-65	0.142	0.7	2.4	1.0	4.0
-64	0.151	0.8	2.5	1.1	3.8
-63	0.161	1.0	2.7	1.2	3.7
-62	0.171	1.1	2.9	1.3	3.6
-61	0.180	1.2	3.0	1.5	3.5
-60	0.190	1.3	3.2	1.6	3.4
-59	0.201	1.5	3.4	1.7	3.2
-58	0.213	1.7	3.6	1.9	3.1
-57	0.224	1.9	3.7	2.0	3.0
-56	0.235	2.0	3.9	2.2	2.8
-55	0.247	2.3	4.1	2.4	2.7
-54	0.263	2.6	4.4	2.6	2.5
-53	0.280	2.9	4.7	2.8	2.4
-52	0.296	3.2	4.9	3.0	2.2
-51	0.313	3.6	5.2	3.3	2.0
-50	0.329	4.0	5.5	3.5	1.9
-49	0.348	4.5	5.8	3.8	1.7

-48	0.367	5.0	6.1	4.1	1.5
-47	0.386	5.5	6.4	4.4	1.4
-46	0.405	6.1	6.8	4.7	1.2
-45	0.423	6.6	7.1	5.0	1.1
-44	0.444	7.3	7.4	5.3	1.0
-43	0.465	8.0	7.8	5.7	0.8
-42	0.486	8.7	8.1	6.0	0.7
-41	0.507	9.5	8.5	6.4	0.5
-40	0.528	10.3	8.8	6.7	0.4
-39	0.548	11.1	9.1	7.1	0.3
-38	0.568	11.9	9.5	7.5	0.3
-37	0.588	12.8	9.8	7.8	0.2
-36	0.608	13.7	10.1	8.2	0.1
-35	0.628	14.6	10.5	8.6	0.1
-34	0.646	15.4	10.8	8.9	0.1
-33	0.664	16.3	11.1	9.3	0.1
-32	0.682	17.2	11.4	9.7	0.1
-31	0.700	18.1	11.7	10.0	0.1
-30	0.718	19.1	12.0	10.4	0.1
-29	0.734	19.9	12.2	10.7	0.2
-28	0.749	20.8	12.5	11.0	0.2
-27	0.765	21.7	12.8	11.4	0.3
-26	0.780	22.5	13.0	11.7	0.4
-25	0.796	23.4	13.3	12.0	0.5
-24	0.810	24.3	13.5	12.3	0.6
-23	0.824	25.1	13.7	12.7	0.7
-22	0.838	26.0	14.0	13.0	0.9
-21	0.852	26.9	14.2	13.3	1.0
-20	0.866	27.7	14.4	13.6	1.2
-19	0.876	28.4	14.6	13.8	1.3
-18	0.885	29.0	14.8	14.0	1.5
-17	0.895	29.6	14.9	14.3	1.7
-16	0.905	30.3	15.1	14.5	1.9
-15	0.915	31.0	15.3	14.7	2.1
-14	0.922	31.5	15.4	14.9	2.4
-13	0.930	32.0	15.5	15.1	2.6
-12	0.937	32.5	15.6	15.3	2.8
-11	0.945	33.0	15.8	15.5	3.1
-10	0.952	33.5	15.9	15.6	3.3
-9	0.958	34.0	16.0	15.8	3.6
-8	0.964	34.4	16.1	15.9	3.9
-7	0.970	34.8	16.2	16.1	4.1
-6	0.976	35.2	16.3	16.2	4.4
-5	0.982	35.7	16.4	16.3	4.7
-4	0.986	36.0	16.5	16.4	5.0
-3	0.989	36.2	16.5	16.5	5.2
-2	0.993	36.5	16.6	16.6	5.5
-1	0.996	36.7	16.6	16.6	5.8
0	1.000	37.0	16.7	16.7	6.1

Facilities Proposed

The proposed operation will be on Channel 233D (94.5 MHz) with a maximum-lobe effective radiated power of 37 watts. Operation is proposed with a Scala CA5FMCP antenna which will be mounted on pole on a rooftop at the KTTH studio building in Seattle.

The proposed antenna support structure will 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.

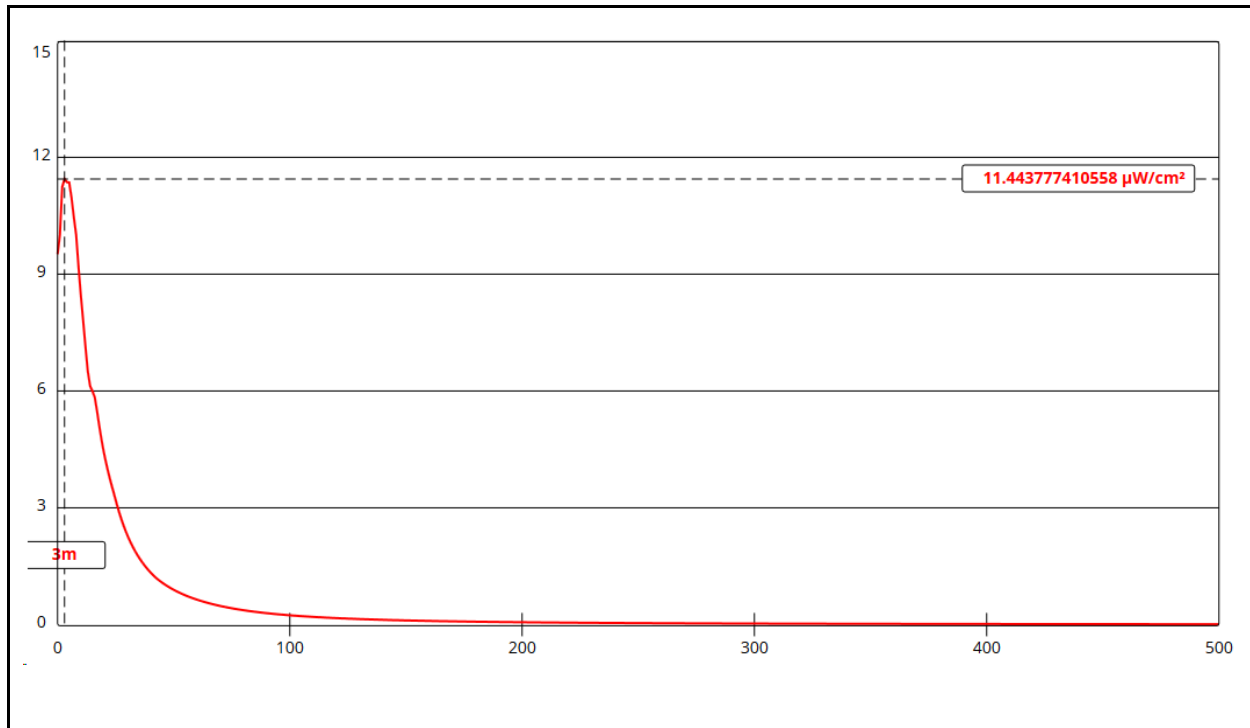
D is the distance in meters from the center of radiation to the calculation point.

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 1 element pattern, which is the element pattern used in the FMModel software for the Scala CA5FMCP antenna proposed for use. The highest calculated ground level power density occurs at a distance of 3 meters from the base of the antenna support structure. At this point the power density is calculated to be 11.4 $\mu W/cm^2$, which is 5.7% of 200 $\mu W/cm^2$ (the FCC standard for uncontrolled environments).

The antenna will be installed 6.1 meters above the rooftop of the building. The highest calculated rooftop-level power density occurs at a distance of 1 meters from the base of the antenna support structure. At this point the power density is calculated to be $88.3 \mu\text{W}/\text{cm}^2$, which is 44.2% of $200 \mu\text{W}/\text{cm}^2$ (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 exposure in excess of FCC guidelines.



Ground-Level RF Exposure

OET FMModel

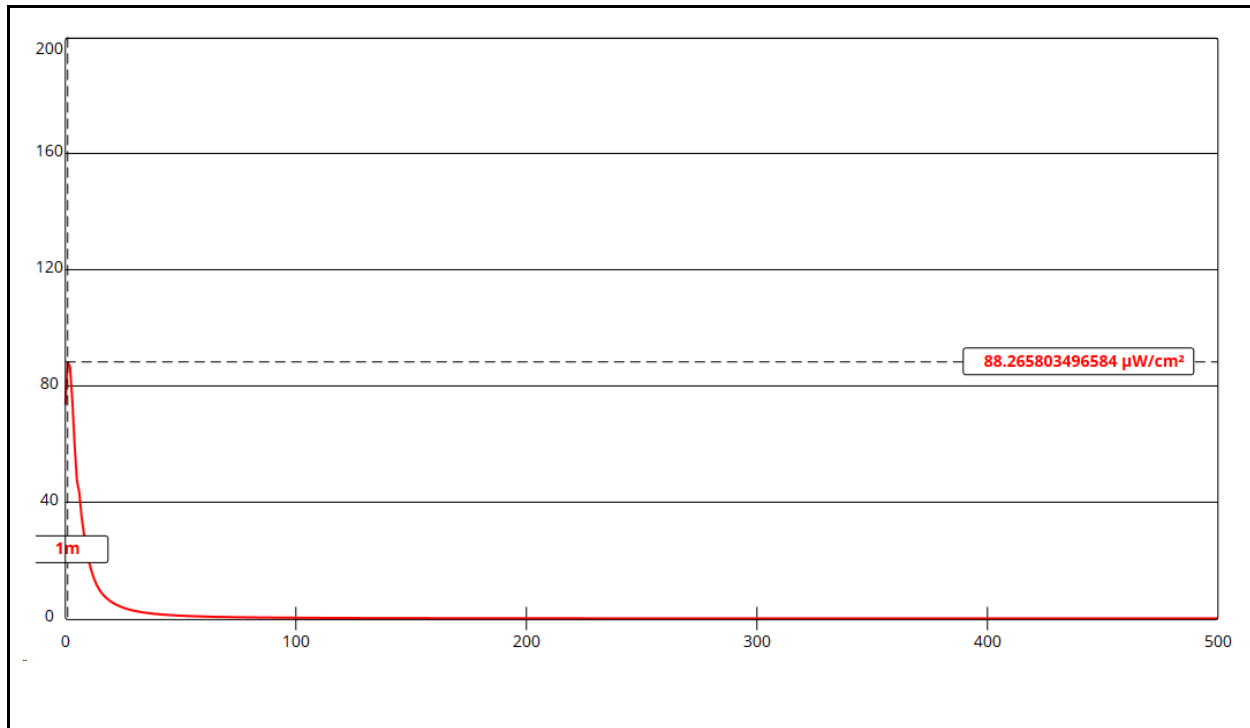
Eastlake 233D

Antenna Type: Scala CA5FMCP (Type 1)
No. of Elements: 1
Element Spacing: 1.0 wavelength

Distance: 500 meters
Horizontal ERP: 37 W
Vertical ERP: 37 W

Antenna Height: 13.4 meters AGL

Maximum Calculated Power Density is 11.4 $\mu\text{W}/\text{cm}^2$ at 3 meters from the antenna structure.



Rooftop-Level RF Exposure

OET FMModel

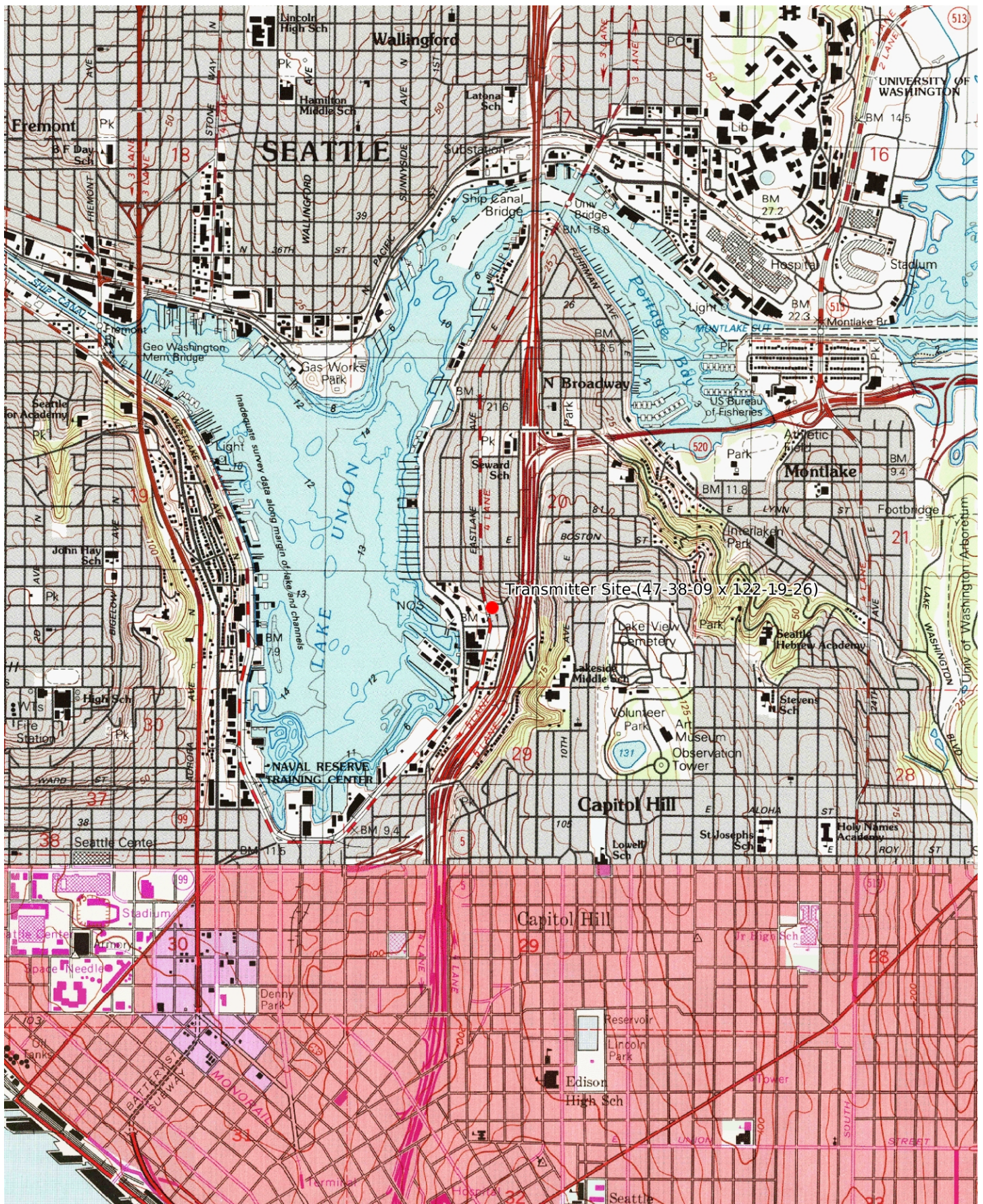
Eastlake 233D

Antenna Type: Scala CA5FMCP (Type 1)
No. of Elements: 1
Element Spacing: 1.0 wavelength

Distance: 500 meters
Horizontal ERP: 37 W
Vertical ERP: 37 W

Antenna Height: 6.1 meters above rooftop

Maximum Calculated Power Density is 88.3 $\mu\text{W}/\text{cm}^2$ at 1 meters from the antenna structure.



Mercator Projection
 NAD27 Conus
 USNG Zone 10TET
 CalTopo.com

