

Supplemental Technical Information And Second Adjacent Channel Waiver Request

Channel 261
New Location: 37° 54' 38.5" N 122° 16' 26.0" W -- NAD 83
Antenna AGL 4 m building + 4 m mast
Tower Structural 9.5 m
Tower Total 10 m
Antenna Ground 261 m
Antenna COR 269
HAAT 161 m (see below)
Power 4 watts

Input Data	
Latitude	37° 54' 38.5" North
Longitude	122° 16' 26" West (NAD 83)
Height of antenna radiation center above mean sea level: 269 meters AMSL	
Number of Evenly Spaced Radials = 8 0° is referenced to True North	

Results	
Calculated HAAT = 161 meters	
Antenna Height Above Average Terrain calculated using 1 km GLOBE terrain data	
Individual "Radial HAAT" Values, in meters	
0°	289.7 m
45°	95.1 m
90°	48.9 m
135°	-87.6 m
180°	249.3 m
225°	267.9 m
270°	265.3 m
315°	237.4 m

Select Contour Type:	
<input type="radio"/> F(50,50) Service Contour -- FM and NTSC (analog) TV	
<input type="radio"/> F(50,10) Interfering Contour	
<input type="radio"/> F(50,90) Digital TV Service Contour	

Select Channel Range:	
<input type="radio"/> FM Radio or TV Transmit Channels 2-6	
<input type="radio"/> TV Transmit Channels 7-13	
<input type="radio"/> TV Transmit Channels 14-69	

Find This:	
<input type="radio"/> Field Strength, given a Distance (in km)	
<input type="radio"/> Distance, Given a Field Strength (in dBu)	
<input checked="" type="radio"/> FM ERP, given Distance and Field Strength [F(50,50) Service Contour]	

Find This:	
ERP (kW)	5.64 Distance (km)
HAAT (meters)	60 Field (dBu)

Results:
Calculated ERP (rounded per Section 73.212) = **0.004 kW**
(FM 60 dBu Service Contour only)
Unrounded ERP = 0.003536 kW

TOWAIR

DETERMINATION Results	
Structure does not require registration. The structure meets the 6.10-meter (20-foot) Rule criteria.	
Your Specifications	
NAD83 Coordinates	
Latitude	37-54-38.5 north
Longitude	122-16-26.0 west
Measurements (Meters)	
Overall Structure Height (AGL)	10
Support Structure Height (AGL)	4
Site Elevation (AMSL)	261
Structure Type	
BPOLE - Building with Pole	

CHANNEL SPACING

Call	Channel	Location	Azi	Dist	FCC	Margin
KMVQ-FM	LIC	259B San Francisco CA	209.8	28.57	66.5	-37.9 SHORT
KZST	LIC	261A Santa Rosa CA	328.2	66.51	66.5	0.01
KBRG	LIC	262B San Jose CA	156.8	96.55	96.5	0.05
KGXY-LP	CP	261L1 Point Bonita CA	246.1	24.73	23.5	1.2
KQOD	LIC	261A Stockton CA	83.9	94.38	66.5	27.9
KRCX-FM	LIC	260B Marysville CA	15.2	149.05	96.5	52.6
KZZO	LIC-D	263B Sacramento CA	51.4	131.48	66.5	65.0

SECOND ADJACENT WAIVER REQUEST

The second adjacent channels are (with signal strength at the proposed site):

KMVQ CH 259B 80.5 dBu

Using U/D methodology, interference will occur when KMVQ's signal strength's interfering signal exceeds the desired signal by 40 dBu. So the area of predicted interference would then be bounded by the 120.5 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 = 4 w, E = 120.5 dBu D = 12.7 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 Shively

for a 2-bay 0.5 wave-spaced 6812 antenna the distance to the 120.5 dBu contour at various depression angles is tabulated below. The data shows that the lowest point at which the signal strength rises to 120.5 dBu is 4 meters below the center of radiation of the antenna system, or 0 meters above the roof (4 meter pole (COR) above roof level). Therefore, all the interference area is above the roof, and the interference area encompasses zero population. The table below shows that the lowest elevation point of the 120.5 F(50,10) interfering contour is 0 meters above the roof, or 4 meters above the ground (height of the building).

Due to zero population within this radiation radius, this meets the Living Way criteria for a Waiver of 47 SEC 73.807. Thus, the applicant requests a second adjacent waiver based upon evidence no interference is proposed.

ERP	DEPRESSION ANGLE	RELATIVE FIELD	dB FROM RELATIVE	ERP	ANGULAR DISTANCE TO 120.5 dBu CONTOUR	VERTICAL DISTANCE (below antenna)	HORIZONTAL DISTANCE TO 130.5 dBu CONTOUR	CLEARANCE OF CONTOUR ABOVE GROUND
4	-90	0.00	-100.000	0.00	0	0	0	4
4	-89	0.00	-100.000	0.00	0	0	0	4
4	-88	0.00	-100.000	0.00	0	0	0	4
4	-87	0.00	-100.000	0.00	0	0	0	4
4	-86	0.001	-60.000	0.00	0	0	0	4
4	-85	0.001	-60.000	0.00	0	0	0	4
4	-84	0.001	-60.000	0.00	0	0	0	4
4	-83	0.002	-53.979	0.00	0	0	0	4
4	-82	0.003	-50.458	0.00	0	0	0	4
4	-81	0.004	-47.959	0.00	0	0	0	4
4	-80	0.005	-46.021	0.00	0	0	0	4
4	-79	0.007	-43.098	0.00	0	0	0	4
4	-78	0.008	-41.938	0.00	0.1	0	0	4
4	-77	0.011	-39.172	0.00	0.1	0	0	4
4	-76	0.013	-37.721	0.00	0.1	0	0	4
4	-75	0.016	-35.918	0.00	0.2	0.1	0	3.9
4	-74	0.019	-34.425	0.00	0.2	0.1	0	3.9
4	-73	0.022	-33.152	0.00	0.2	0.1	0	3.9
4	-72	0.026	-31.701	0.00	0.3	0.2	0	3.8

4	-71	0.03	-30.458	0.00	0.3	0.2	0	3.8
4	-70	0.035	-29.119	0.00	0.4	0.3	0.1	3.7
4	-69	0.04	-27.959	0.01	0.5	0.4	0.1	3.6
4	-68	0.046	-26.745	0.01	0.6	0.5	0.2	3.5
4	-67	0.052	-25.680	0.01	0.6	0.5	0.2	3.5
4	-66	0.059	-24.583	0.01	0.7	0.6	0.2	3.4
4	-65	0.066	-23.609	0.02	0.8	0.7	0.3	3.3
4	-64	0.073	-22.734	0.02	0.9	0.8	0.3	3.2
4	-63	0.082	-21.724	0.03	1	0.8	0.4	3.2
4	-62	0.09	-20.915	0.03	1.1	0.9	0.5	3.1
4	-61	0.099	-20.087	0.04	1.3	1.1	0.6	2.9
4	-60	0.109	-19.251	0.05	1.4	1.2	0.7	2.8
4	-59	0.119	-18.489	0.06	1.5	1.2	0.7	2.8
4	-58	0.13	-17.721	0.07	1.7	1.4	0.9	2.6
4	-57	0.142	-16.954	0.08	1.8	1.5	0.9	2.5
4	-56	0.154	-16.250	0.09	2	1.6	1.1	2.4
4	-55	0.166	-15.598	0.11	2.1	1.7	1.2	2.3
4	-54	0.179	-14.943	0.13	2.3	1.8	1.3	2.2
4	-53	0.193	-14.289	0.15	2.5	1.9	1.5	2.1
4	-52	0.207	-13.681	0.17	2.7	2.1	1.6	1.9
4	-51	0.222	-13.073	0.20	2.9	2.2	1.8	1.8
4	-50	0.237	-12.505	0.22	3.1	2.3	1.9	1.7
4	-49	0.253	-11.938	0.26	3.3	2.4	2.1	1.6
4	-48	0.269	-11.405	0.29	3.5	2.6	2.3	1.4
4	-47	0.286	-10.873	0.33	3.7	2.7	2.5	1.3
4	-46	0.303	-10.371	0.37	4	2.8	2.7	1.2
4	-45	0.32	-9.897	0.41	4.2	2.9	2.9	1.1
4	-44	0.338	-9.422	0.46	4.4	3	3.1	1
4	-43	0.357	-8.947	0.51	4.7	3.2	3.4	0.8
4	-42	0.375	-8.519	0.56	4.9	3.2	3.6	0.8
4	-41	0.394	-8.090	0.62	5.2	3.4	3.9	0.6
4	-40	0.414	-7.660	0.69	5.4	3.4	4.1	0.6
4	-39	0.433	-7.270	0.75	5.7	3.5	4.4	0.5
4	-38	0.453	-6.878	0.82	5.9	3.6	4.6	0.4
4	-37	0.473	-6.503	0.89	6.2	3.7	4.9	0.3

4	-36	0.494	-6.125	0.98	6.5	3.8	5.2	0.2
4	-35	0.514	-5.781	1.06	6.8	3.8	5.5	0.2
4	-34	0.535	-5.433	1.14	7	3.9	5.8	0.1
4	-33	0.555	-5.114	1.23	7.3	3.9	6.1	0.1
4	-32	0.576	-4.792	1.33	7.6	4	6.4	0
4	-31	0.597	-4.481	1.43	7.9	4	6.7	0
4	-30	0.617	-4.194	1.52	8.1	4	7	0
4	-29	0.638	-3.904	1.63	8.4	4	7.3	0
4	-28	0.658	-3.635	1.73	8.7	4	7.6	0
4	-27	0.678	-3.375	1.84	8.9	4	7.9	0
4	-26	0.698	-3.123	1.95	9.2	4	8.2	0
4	-25	0.718	-2.878	2.06	9.5	4	8.6	0
4	-24	0.737	-2.651	2.17	9.7	3.9	8.8	0.1
4	-23	0.756	-2.430	2.29	10	3.9	9.2	0.1
4	-22	0.774	-2.225	2.40	10.2	3.8	9.4	0.2
4	-21	0.792	-2.025	2.51	10.4	3.7	9.7	0.3
4	-20	0.81	-1.830	2.62	10.7	3.6	10	0.4
4	-19	0.827	-1.650	2.74	10.9	3.5	10.3	0.5
4	-18	0.843	-1.483	2.84	11.1	3.4	10.5	0.6
4	-17	0.859	-1.320	2.95	11.3	3.3	10.8	0.7
4	-16	0.874	-1.170	3.06	11.5	3.1	11	0.9
4	-15	0.889	-1.022	3.16	11.7	3	11.3	1
4	-14	0.903	-0.886	3.26	11.9	2.8	11.5	1.2
4	-13	0.915	-0.772	3.35	12.1	2.7	11.7	1.3
4	-12	0.928	-0.649	3.44	12.2	2.5	11.9	1.5
4	-11	0.939	-0.547	3.53	12.4	2.3	12.1	1.7
4	-10	0.949	-0.455	3.60	12.5	2.1	12.3	1.9
4	-9	0.959	-0.364	3.68	12.6	1.9	12.4	2.1
4	-8	0.967	-0.291	3.74	12.7	1.7	12.5	2.3
4	-7	0.975	-0.220	3.80	12.9	1.5	12.8	2.5
4	-6	0.981	-0.167	3.85	12.9	1.3	12.8	2.7
4	-5	0.987	-0.114	3.90	13	1.1	12.9	2.9
4	-4	0.992	-0.070	3.94	13.1	0.9	13	3.1
4	-3	0.995	-0.044	3.96	13.1	0.6	13	3.4
4	-2	0.998	-0.017	3.98	13.2	0.4	13.1	3.6

4	-1	0.999	-0.009	3.99	13.2	0.2	13.1	3.8
4	0	1	0.000	4.00	13.2	0	13.2	4
4	1	0.999	-0.009	3.99	13.2	0.2	13.1	3.8
4	2	0.998	-0.017	3.98	13.2	0.4	13.1	3.6
4	3	0.995	-0.044	3.96	13.1	0.6	13	3.4
4	4	0.992	-0.070	3.94	13.1	0.9	13	3.1
4	5	0.987	-0.114	3.90	13	1.1	12.9	2.9
4	6	0.981	-0.167	3.85	12.9	1.3	12.8	2.7
4	7	0.975	-0.220	3.80	12.9	1.5	12.8	2.5
4	8	0.967	-0.291	3.74	12.7	1.7	12.5	2.3
4	9	0.959	-0.364	3.68	12.6	1.9	12.4	2.1
4	10	0.949	-0.455	3.60	12.5	2.1	12.3	1.9
4	11	0.939	-0.547	3.53	12.4	2.3	12.1	1.7
4	12	0.928	-0.649	3.44	12.2	2.5	11.9	1.5
4	13	0.915	-0.772	3.35	12.1	2.7	11.7	1.3
4	14	0.903	-0.886	3.26	11.9	2.8	11.5	1.2
4	15	0.889	-1.022	3.16	11.7	3	11.3	1
4	16	0.874	-1.170	3.06	11.5	3.1	11	0.9
4	17	0.859	-1.320	2.95	11.3	3.3	10.8	0.7
4	18	0.843	-1.483	2.84	11.1	3.4	10.5	0.6
4	19	0.827	-1.650	2.74	10.9	3.5	10.3	0.5
4	20	0.81	-1.830	2.62	10.7	3.6	10	0.4
4	21	0.792	-2.025	2.51	10.4	3.7	9.7	0.3
4	22	0.774	-2.225	2.40	10.2	3.8	9.4	0.2
4	23	0.756	-2.430	2.29	10	3.9	9.2	0.1
4	24	0.737	-2.651	2.17	9.7	3.9	8.8	0.1
4	25	0.718	-2.878	2.06	9.5	4	8.6	0
4	26	0.698	-3.123	1.95	9.2	4	8.2	0
4	27	0.678	-3.375	1.84	8.9	4	7.9	0
4	28	0.658	-3.635	1.73	8.7	4	7.6	0
4	29	0.638	-3.904	1.63	8.4	4	7.3	0
4	30	0.617	-4.194	1.52	8.1	4	7	0
4	31	0.597	-4.481	1.43	7.9	4	6.7	0
4	32	0.576	-4.792	1.33	7.6	4	6.4	0
4	33	0.555	-5.114	1.23	7.3	3.9	6.1	0.1

4	34	0.535	-5.433	1.14	7	3.9	5.8	0.1
4	35	0.514	-5.781	1.06	6.8	3.8	5.5	0.2
4	36	0.494	-6.125	0.98	6.5	3.8	5.2	0.2
4	37	0.473	-6.503	0.89	6.2	3.7	4.9	0.3
4	38	0.453	-6.878	0.82	5.9	3.6	4.6	0.4
4	39	0.433	-7.270	0.75	5.7	3.5	4.4	0.5
4	40	0.414	-7.660	0.69	5.4	3.4	4.1	0.6
4	41	0.394	-8.090	0.62	5.2	3.4	3.9	0.6
4	42	0.375	-8.519	0.56	4.9	3.2	3.6	0.8
4	43	0.357	-8.947	0.51	4.7	3.2	3.4	0.8
4	44	0.338	-9.422	0.46	4.4	3	3.1	1
4	45	0.32	-9.897	0.41	4.2	2.9	2.9	1.1
4	46	0.303	-10.371	0.37	4	2.8	2.7	1.2
4	47	0.286	-10.873	0.33	3.7	2.7	2.5	1.3
4	48	0.269	-11.405	0.29	3.5	2.6	2.3	1.4
4	49	0.253	-11.938	0.26	3.3	2.4	2.1	1.6
4	50	0.237	-12.505	0.22	3.1	2.3	1.9	1.7
4	51	0.222	-13.073	0.20	2.9	2.2	1.8	1.8
4	52	0.207	-13.681	0.17	2.7	2.1	1.6	1.9
4	53	0.193	-14.289	0.15	2.5	1.9	1.5	2.1
4	54	0.179	-14.943	0.13	2.3	1.8	1.3	2.2
4	55	0.166	-15.598	0.11	2.1	1.7	1.2	2.3
4	56	0.154	-16.250	0.09	2	1.6	1.1	2.4
4	57	0.142	-16.954	0.08	1.8	1.5	0.9	2.5
4	58	0.13	-17.721	0.07	1.7	1.4	0.9	2.6
4	59	0.119	-18.489	0.06	1.5	1.2	0.7	2.8
4	60	0.109	-19.251	0.05	1.4	1.2	0.7	2.8
4	61	0.099	-20.087	0.04	1.3	1.1	0.6	2.9
4	62	0.09	-20.915	0.03	1.1	0.9	0.5	3.1
4	63	0.082	-21.724	0.03	1	0.8	0.4	3.2
4	64	0.073	-22.734	0.02	0.9	0.8	0.3	3.2
4	65	0.066	-23.609	0.02	0.8	0.7	0.3	3.3
4	66	0.059	-24.583	0.01	0.7	0.6	0.2	3.4
4	67	0.052	-25.680	0.01	0.6	0.5	0.2	3.5
4	68	0.046	-26.745	0.01	0.6	0.5	0.2	3.5

4	69	0.04	-27.959	0.01	0.5	0.4	0.1	3.6
4	70	0.035	-29.119	0.00	0.4	0.3	0.1	3.7
4	71	0.03	-30.458	0.00	0.3	0.2	0	3.8
4	72	0.026	-31.701	0.00	0.3	0.2	0	3.8
4	73	0.022	-33.152	0.00	0.2	0.1	0	3.9
4	74	0.019	-34.425	0.00	0.2	0.1	0	3.9
4	75	0.016	-35.918	0.00	0.2	0.1	0	3.9
4	76	0.013	-37.721	0.00	0.1	0	0	4
4	77	0.011	-39.172	0.00	0.1	0	0	4
4	78	0.008	-41.938	0.00	0.1	0	0	4
4	79	0.007	-43.098	0.00	0	0	0	4
4	80	0.005	-46.021	0.00	0	0	0	4
4	81	0.004	-47.959	0.00	0	0	0	4
4	82	0.003	-50.458	0.00	0	0	0	4
4	83	0.002	-53.979	0.00	0	0	0	4
4	84	0.001	-60.000	0.00	0	0	0	4
4	85	0.001	-60.000	0.00	0	0	0	4
4	86	0.001	-60.000	0.00	0	0	0	4
4	87	0.00	-100.000	0.00	0	0	0	4
4	88	0.00	-100.000	0.00	0	0	0	4
4	89	0.00	-100.000	0.00	0	0	0	4
4	90	0.00	-100.000	0.00	0	0	0	4

Antenna Mfg.: Shively Labs

Antenna Type: 6812B-HW-2

Station: 0

Frequency: 98.1

Channel #: 251

Beam Tilt 0

Gain (Max) 0.707

Gain (Horizon) 0.707

Date: 11/3/2020

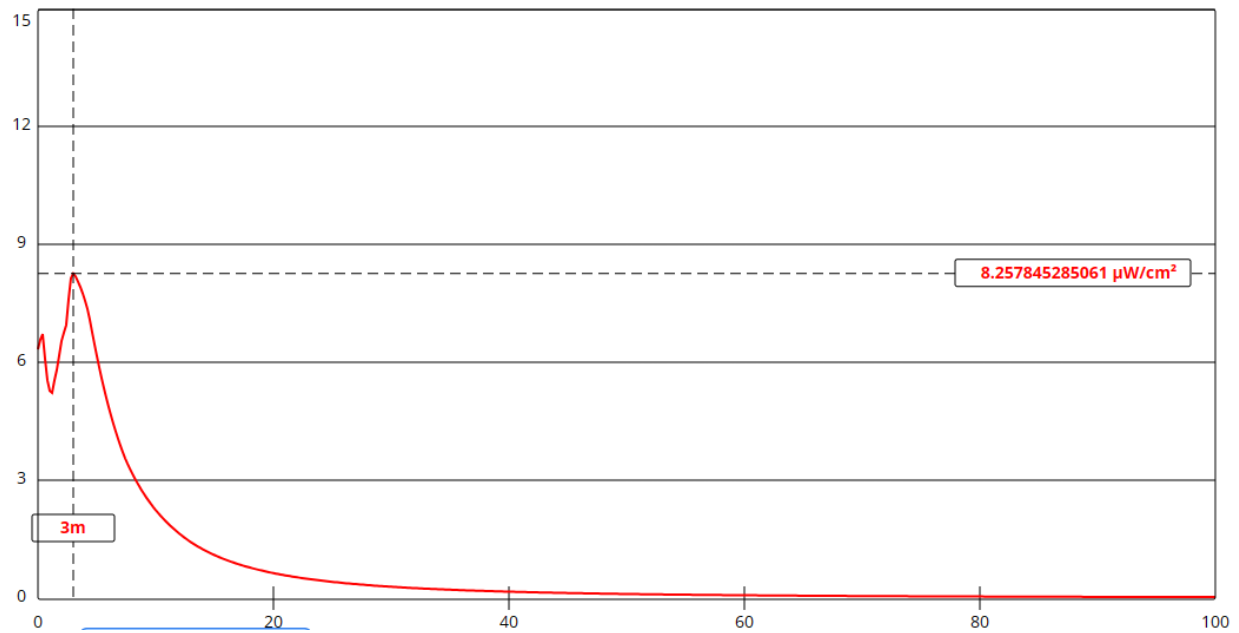
-1.507 dB

-1.507 dB

Figure: Figure 3

Angle of Depression (Deg)	Relative Field	Angle of Depression (Deg)	Relative Field	Angle of Depression (Deg)	Relative Field	Angle of Depression (Deg)	Relative Field
-90	0.000	-44	0.338	0	1.000	46	0.303
-89	0.000	-43	0.357	1	0.999	47	0.286
-88	0.000	-42	0.375	2	0.998	48	0.269
-87	0.000	-41	0.394	3	0.995	49	0.253
-86	0.001	-40	0.414	4	0.992	50	0.237
-85	0.001	-39	0.433	5	0.987	51	0.222
-84	0.001	-38	0.453	6	0.981	52	0.207
-83	0.002	-37	0.473	7	0.975	53	0.193
-82	0.003	-36	0.494	8	0.967	54	0.179
-81	0.004	-35	0.514	9	0.959	55	0.166
-80	0.005	-34	0.535	10	0.949	56	0.154
-79	0.007	-33	0.555	11	0.939	57	0.142
-78	0.008	-32	0.576	12	0.928	58	0.130
-77	0.011	-31	0.597	13	0.915	59	0.119
-76	0.013	-30	0.617	14	0.903	60	0.109
-75	0.016	-29	0.638	15	0.889	61	0.099
-74	0.019	-28	0.658	16	0.874	62	0.090
-73	0.022	-27	0.678	17	0.859	63	0.082
-72	0.026	-26	0.698	18	0.843	64	0.073
-71	0.030	-25	0.718	19	0.827	65	0.066
-70	0.035	-24	0.737	20	0.810	66	0.059
-69	0.040	-23	0.756	21	0.792	67	0.052
-68	0.046	-22	0.774	22	0.774	68	0.046
-67	0.052	-21	0.792	23	0.756	69	0.040
-66	0.059	-20	0.810	24	0.737	70	0.035
-65	0.066	-19	0.827	25	0.718	71	0.030
-64	0.073	-18	0.843	26	0.698	72	0.026
-63	0.082	-17	0.859	27	0.678	73	0.022
-62	0.090	-16	0.874	28	0.658	74	0.019
-61	0.099	-15	0.889	29	0.638	75	0.016
-60	0.109	-14	0.903	30	0.617	76	0.013
-59	0.119	-13	0.915	31	0.597	77	0.011
-58	0.130	-12	0.928	32	0.576	78	0.008
-57	0.142	-11	0.939	33	0.555	79	0.007
-56	0.154	-10	0.949	34	0.535	80	0.005
-55	0.166	-9	0.959	35	0.514	81	0.004
-54	0.179	-8	0.967	36	0.494	82	0.003
-53	0.193	-7	0.975	37	0.473	83	0.002
-52	0.207	-6	0.981	38	0.453	84	0.001
-51	0.222	-5	0.987	39	0.433	85	0.001
-50	0.237	-4	0.992	40	0.414	86	0.001
-49	0.253	-3	0.995	41	0.394	87	0.000
-48	0.269	-2	0.998	42	0.375	88	0.000
-47	0.286	-1	0.999	43	0.357	89	0.000
-46	0.303	0	1.000	44	0.338	90	0.000
-45	0.320			45	0.320		

NIER



A ring/stub was used to gauge the maximum RF for the proposal in OET program FM Model for Windows at 4 watts, 2-bay, 0.5 spacing H+V-polarization. The maximum predicted RF exposure was $8.3 \mu\text{W}/\text{cm}^2$ at 3 m away at roof-level, 4.2% of the FCC Maximum Permissible Exposure (MPR) for $200 \mu\text{W}/\text{cm}^2$ for uncontrolled environments.

The site will have a sign regarding RF exposure hazards to tower climbers posted. If any work needs to be done around the structure the RF power will be temporarily shut off.