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November 4, 2022

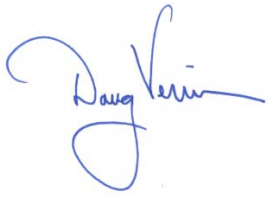
Engineering Statement – WHWA, State of Wisconsin - Educational Communications Board

Due to its analysis of the TPO required for WHWA, station engineers required a three-bay EPA # 3 antenna. Since the construction permit specified an EPA type #3 two-bay antenna, the applicant hereby submits a modified RFR analysis. No change to the height of the center of radiation or to the proposed radiated power will take place from that already submitted within the construction permit application.

Pages #2 through #5 compose a study of the composite power densities, at head height, at distances from the tower base (using the formulas found in OET 65 as modified by the EPA calculations). This tower holds the antennas of WUWS and the proposed WHWA. The transmission site is fully fenced, gated, and locked with posted warning signs. The maximum power density, calculated at head height, for the two antennas is 14.08 $\mu W/cm^2$ at 36 meters from the tower base. There are only the two described radiators at the transmission site, which is within a fully controlled area, as is explained in the on-file construction permit application.

The applicant will reduce power or terminate transmissions to protect workers on the tower.

Consequently, this application meets all RF hazard requirements for the license-to-cover. The applicant is requesting program test authority.



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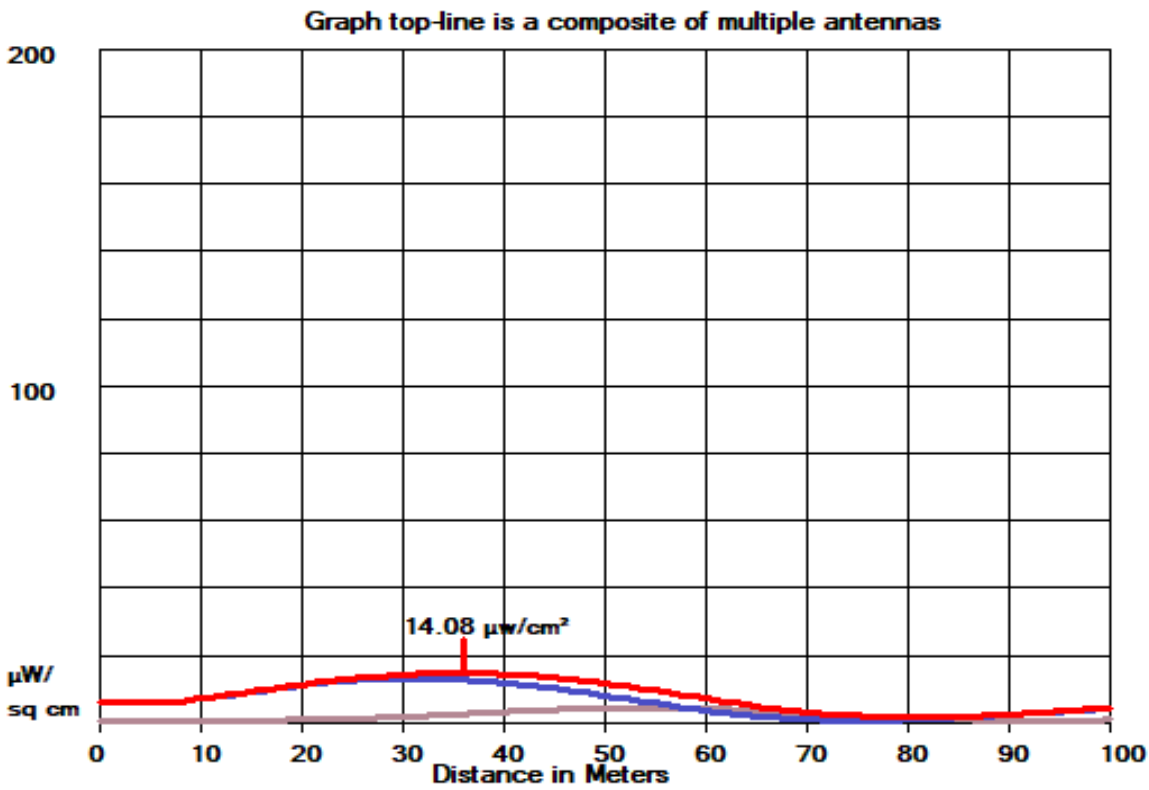

HORZ. DISTANCE FROM RADIATOR(S) vs POWER DENSITY (Microwatt/Square cm)

Dist(Meters)	Total (uW/cm2)	Percent of Max(1000)
0	5.559	0.6
1	5.556	0.6
2	5.548	0.6
3	5.534	0.6
4	5.514	0.6
5	5.489	0.5
6	5.459	0.5
7	5.424	0.5
8	5.705	0.6
9	6.103	0.6
10	6.502	0.7
11	6.903	0.7
12	7.303	0.7
13	7.701	0.8
14	8.095	0.8
15	8.513	0.9
16	8.978	0.9
17	9.437	0.9
18	9.888	1.0
19	10.328	1.0
20	10.755	1.1
21	11.167	1.1
22	11.562	1.2
23	11.907	1.2
24	12.223	1.2
25	12.515	1.3
26	12.783	1.3

Dist (M)	Total (uW/cm2)	Percent of Max
27	13.024	1.3
28	13.239	1.3
29	13.425	1.3
30	13.581	1.4
31	13.74	1.4
32	13.876	1.4
33	13.978	1.4
34	14.048	1.4
35	14.083	1.4
36	14.085	1.4
37	14.053	1.4
38	13.987	1.4
39	13.90	1.4
40	13.805	1.4
41	13.672	1.4
42	13.502	1.4
43	13.298	1.3
44	13.059	1.3
45	12.789	1.3
46	12.488	1.2
47	12.159	1.2
48	11.807	1.2
49	11.469	1.1
50	11.105	1.1
51	10.717	1.1
52	10.309	1.0
53	9.883	1.0
54	9.443	0.9
55	8.99	0.9
56	8.529	0.9
57	8.061	0.8
58	7.591	0.8
59	7.087	0.7
60	6.588	0.7
61	6.101	0.6
62	5.627	0.6
63	5.169	0.5
64	4.729	0.5
65	4.309	0.4
66	3.91	0.4
67	3.533	0.4
68	3.18	0.3
69	2.852	0.3
70	2.55	0.3
71	2.275	0.2
72	2.027	0.2
73	1.806	0.2
74	1.612	0.2
75	1.445	0.1

Dist (M)	Total (uW/cm2)	Percent of Max
76	1.305	0.1
77	1.191	0.1
78	1.104	0.1
79	1.042	0.1
80	1.005	0.1
81	0.992	0.1
82	1.002	0.1
83	1.035	0.1
84	1.087	0.1
85	1.16	0.1
86	1.251	0.1
87	1.36	0.1
88	1.485	0.1
89	1.625	0.2
90	1.778	0.2
91	1.944	0.2
92	2.12	0.2
93	2.306	0.2
94	2.50	0.2
95	2.70	0.3
96	2.906	0.3
97	3.117	0.3
98	3.33	0.3
99	3.545	0.4
100	3.768	0.4

Antennas used in this study - 11-04-2022 - Head height used

EPA Type 3: Opposed "U" dipole-, 3B Spac= .9, H=25 kW, V=25 kW, 73 M AG
EPA Type 1: Ring-stub or any unknown,6B Spac= 0.5,H=24.5 kW, V=24.5 kW,85 M AG

Antenna #1: WHWA SHPX-3AE - Color Blue EPA #3
Antenna #2: WUWS SHIVELY 6810 - Lite Brown Color - EPA #1
Antenna 1 + 2 Added - Color Red

Declaration:

I, Douglas L. Vernier, declare that I have received training as an engineer from the University of Michigan School of Engineering. That, I have received degrees from the University in the field of Broadcast Telecommunications. That, I have been active in broadcast consulting for over 30 years;

That, I have held a Federal Communications Commission First Class Radiotelephone License continually since 1964. In 1985, this license was reissued by the Commission as a lifetime General Radiotelephone license no. PG-16-16464;

That, I am certified as a Professional Broadcast Engineer (#50258) by the Society of Broadcast Engineers, Indianapolis, Indiana. (Re-certified 1/2006.)

That, my qualifications are a matter of record with the Federal Communications Commission;

That, I have been retained by State Of Wisconsin - Educational Communications Board to prepare the engineering showings appended hereto:

That, I have prepared these broadcast engineering showings, the technical information contained in same and the facts stated within are true of my knowledge;

That, under penalty of perjury, I declare that the foregoing is correct.

Douglas L. Vernier

Executed of November 4, 2022