

Exhibit E-13

Freespace Interference Study for a given antenna based on Vertical Radiation Pattern

Antenna Make: ETC

Antenna Model: FM-1CP

Depression Angle from <u>Antenna</u>	Antenna Relative <u>Field</u>	ERP <u>Watts</u>	ERP <u>dBk</u>	Distance to Ground from <u>Antenna (km)</u>	Free Space <u>Signal (dBu)</u>	2.5 dB Loss <u>for Reflection</u>	Signal Strength <u>at Ground (dBu)</u>	Circular Distance <u>From Tower (m)</u>	<u>ft</u>
90	0.010	0.010	-50.04	0.2740	68.1	0	68.1	0.00	
85	0.100	0.990	-30.04	0.2750	88.1	0	88.1	23.97	78.65
80	0.180	3.208	-24.94	0.2782	93.1	0	93.1	48.31	158.52
75	0.250	6.188	-22.08	0.2837	95.8	0	95.8	73.42	240.88
70	0.340	11.444	-19.41	0.2916	98.2	0	98.2	99.73	327.21
65	0.430	18.305	-17.37	0.3023	99.9	0	99.9	127.77	419.21
60	0.500	24.750	-16.06	0.3164	100.9	0	100.9	158.19	519.03
55	0.570	32.165	-14.93	0.3345	101.5	0	101.5	191.86	629.48
50	0.640	40.550	-13.92	0.3577	101.9	0	101.9	229.91	754.35
45	0.700	48.510	-13.14	0.3875	102.0	0	102.0	274.00	898.99
40	0.770	58.697	-12.31	0.4263	102.0	0	102.0	326.54	1071.38
35	0.820	66.568	-11.77	0.4777	101.6	0	101.6	391.31	1283.90
30	0.870	74.933	-11.25	0.5480	100.9	0	100.9	474.58	1557.10
25	0.900	80.190	-10.96	0.6483	99.7	0	99.7	587.59	1927.90
20	0.940	87.476	-10.58	0.8011	98.3	0	98.3	752.81	2469.97
15	0.970	93.149	-10.31	1.0587	96.1	0	96.1	1022.58	3355.09
10	0.980	95.080	-10.22	1.5779	92.7	0	92.7	1553.93	5098.45
5	0.990	97.030	-10.13	3.1438	86.8	0	86.8	3131.83	10275.55

Distance to Ground Level assumes flat ground or a site where the ground level is above average terrain in all azimuths.

Maximum ERP	99 watts	Max dBu to Ground Level	102.01
Radiation Center AG	0.274 km		
Radiation Center AG	898.950 ft.		