

## Appendix A3

### E7000 Technical Appendices

#### E-7000 Antenna Transmit Pattern Tables

<b>Table</b>	<b>Description</b>	<b>Page</b>
A1	14.0GHz, Co-Polarized H-pol pattern, along tangent to the geostationary plane	A3-2
A2	14.0GHz, Co-Polarized V-pol pattern, along tangent to the geostationary plane	A3-9
A3	14.25GHz, Co-Polarized H-pol pattern, along tangent to the geostationary plane	A3-16
A4	14.25GHz, Co-Polarized V-pol pattern, along tangent to the geostationary plane	A3-23
A5	14.5GHz, Co-Polarized H-pol pattern, along tangent to the geostationary plane	A3-30
A6	14.5GHz, Co-Polarized V-pol pattern, along tangent to the geostationary plane	A3-37
B1	14.0GHz, Co-Polarized H-Pol pattern along perpendicular to the geostationary plane	A3-44
B2	14.0GHz, Co-Polarized V-Pol pattern along perpendicular to the geostationary plane	A3-50
B3	14.25GHz, Co-Polarized H-Pol pattern along perpendicular to the geostationary plane	A3-56
B4	14.25GHz, Co-Polarized V-Pol pattern along perpendicular to the geostationary plane	A3-62
B5	14.5GHz, Co-Polarized H-Pol pattern along perpendicular to the geostationary plane	A3-68
B6	14.5GHz, Co-Polarized V-Pol pattern along perpendicular to the geostationary plane	A3-74
C1	14.0GHz, Cross-Polarized H-Pol pattern along the tangent to the geostationary plane	A3-80
C2	14.0GHz, Cross-Polarized V-Pol pattern along the tangent to the geostationary plane	A3-85
C3	14.25GHz, Cross-Polarized H-Pol pattern along the tangent to the geostationary plane	A3-90
C4	14.25GHz, Cross-Polarized V-Pol pattern along the tangent to the geostationary plane	A3-95
C5	14.5GHz, Cross-Polarized H-Pol pattern along the tangent to the geostationary plane	A3-100
C6	14.5GHz, Cross-Polarized V-Pol pattern along the tangent to the geostationary plane	A3-105

#### E-7000 Link Budget Analysis

<b>Table</b>	<b>Description</b>	<b>Page</b>
D1	Remote to Hub Emission Designator 7M04G7W	A3-110
D2	Remote to Hub Emission Designator 9M72G7W	A3-111
D3	Remote to Hub Emission Designator 21M57G7W	A3-112
D4	Hub to Remote Emission Designator 724K1G7W	A3-113
D5	Hub to Remote Emission Designator 54M0G7W	A3-114

#### E-7000 Antenna Radiation Hazard Study

<b>Description</b>	<b>Page</b>
Remote to Hub Emission Designator 4M05G7W	A3-115

**Data in support of claim that proposed operation meets criteria of VMES Order July 2009**

Applicant RAS Date of Application  
 ID Heading  
 a1 Antenna Manufacture: RAS c Main bore gain (dBi): 36.0  
 a2 Antenna Model: E7000 d Frequency at which gain was measured (GHz): 14.0  
 a3 Antenna ID: RAS e Max input power density (dBW/4kHz): -20.15  
 b Transmit Band (b): 14GHz Pattern ID Table A1  
 Pattern Description: 14.0GHz H-polarization, co-polarized at tangent to the geosynchronous plane for 0°, 37.5°, and 50° skew angle

Offset Angles  (Degrees)	Nominal Co-Pol Gain Along Tangent to Geo Arc			Worst Case Co-Pol Gain Along Tangent to Geo Arc			Worst Case Co-Pol PSD Along Tangent to Geo Arc input PSD = -20.15dBW/4kHz			FCC Mask (dBW/4kHz)	Mask Exceedence
	(dBi)			(dBi)			(dBW/4kHz)				(dB)
	0° Skew	37.5° Skew	50° Skew	0° Skew	37.5° Skew	50° Skew	0° Skew	37.5° Skew	50° Skew		
-180	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-175	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-170	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-165	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-160	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-155	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-150	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-145	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-140	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-135	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-130	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-125	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-120	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-115	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-110	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-105	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-100	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-95	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-90	-15.216	-25.364	-15.983	-15.071	-24.760	-15.754	-35.221	-44.910	-35.904	-14.000	-
-85	-9.797	-19.246	-19.966	-8.818	-19.114	-18.333	-28.968	-39.264	-38.483	-14.000	-
-80	-4.593	-9.637	-8.299	-4.412	-9.111	-8.250	-24.562	-29.261	-28.400	-24.000	-
-75	-19.782	-17.834	-9.576	-15.410	-16.760	-9.547	-35.560	-36.910	-29.697	-24.000	-
-70	-9.968	-5.374	-5.787	-9.392	-4.974	-5.779	-29.542	-25.124	-25.929	-24.000	-
-65	-11.744	-9.804	-15.422	-11.519	-8.933	-11.115	-31.669	-29.083	-31.265	-24.000	-
-60	-9.903	-14.275	-8.134	-9.903	-11.033	-8.134	-30.053	-31.183	-28.284	-24.000	-
-55	-15.387	-11.968	-13.558	-8.087	-11.447	-11.777	-28.237	-31.597	-31.927	-24.000	-
-50	-9.512	-3.405	-7.627	-7.297	-1.396	-7.262	-27.447	-21.546	-27.412	-24.000	2.454
-45	-17.102	-16.375	-10.399	-14.517	-13.339	-6.474	-34.667	-33.489	-26.624	-23.330	-
-40	-11.442	-19.699	-9.311	-9.949	-15.730	-5.737	-30.099	-35.880	-25.887	-22.051	-
-35	-9.357	-10.997	-11.826	-8.033	-10.349	-11.087	-28.183	-30.499	-31.237	-20.602	-
-30	-11.052	-26.423	-15.834	-10.664	-17.206	-11.533	-30.814	-37.356	-31.683	-18.928	-
-25	-7.272	-10.601	-11.709	-5.936	-7.886	-10.790	-26.086	-28.036	-30.940	-16.949	-
-20	-18.021	-27.349	-12.047	-4.520	-10.384	-12.047	-24.670	-30.534	-32.197	-14.526	-
-15	0.590	-14.713	-10.650	0.847	-8.626	-6.357	-19.303	-28.776	-26.507	-11.402	-
-10	-0.791	-9.239	-14.189	4.604	-8.015	-6.750	-15.546	-28.165	-26.900	-7.000	-

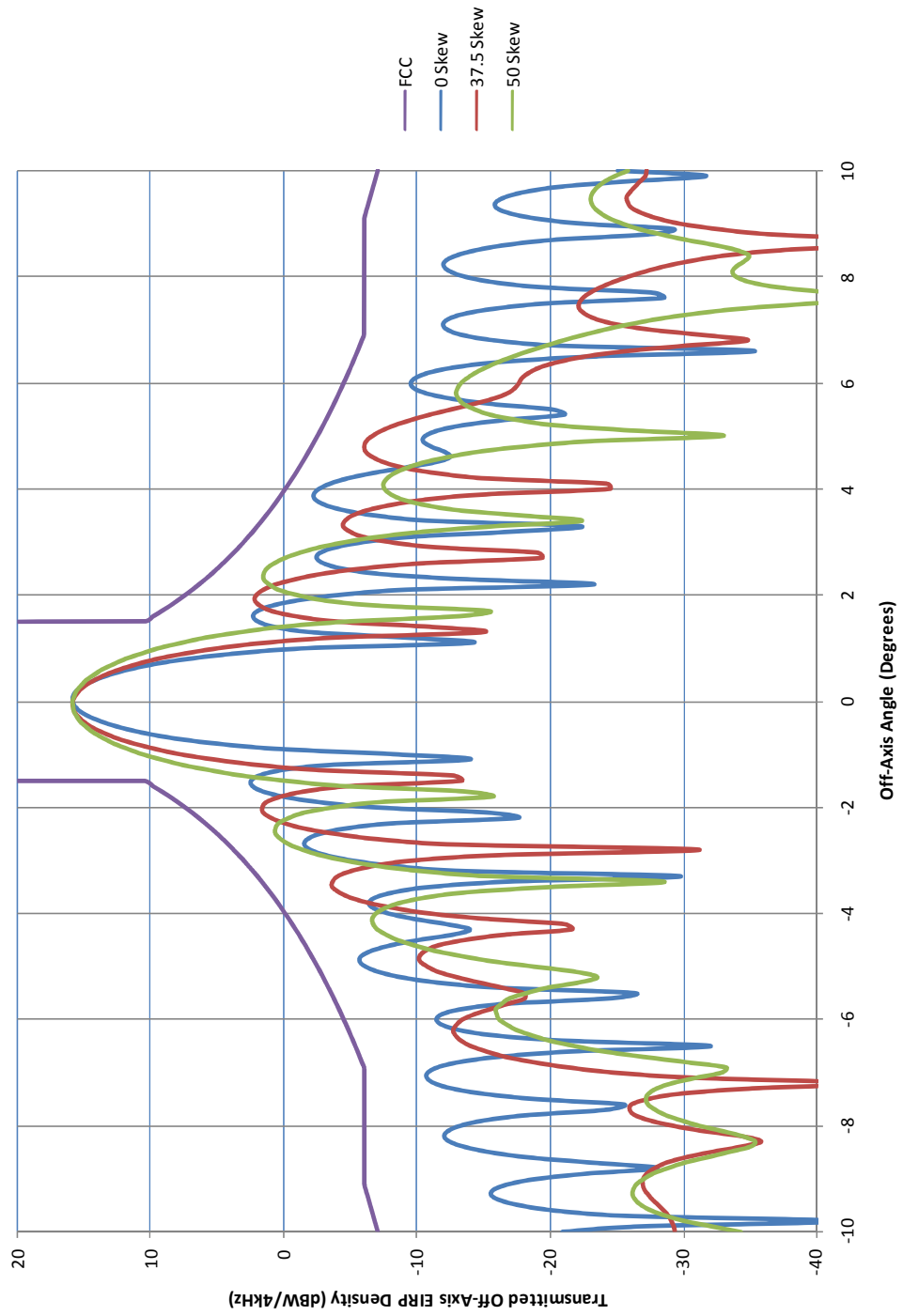
-9.9	-6.408	-9.158	-12.115	4.604	-7.588	-6.292	-15.546	-27.738	-26.442	-6.891	-
-9.8	-21.796	-8.986	-10.069	4.604	-7.230	-6.075	-15.546	-27.380	-26.225	-6.781	-
-9.7	-5.582	-8.760	-8.616	4.574	-6.937	-6.075	-15.576	-27.087	-26.225	-6.669	-
-9.6	-0.307	-8.418	-7.491	4.574	-6.823	-6.075	-15.576	-26.973	-26.225	-6.557	-
-9.5	2.412	-8.015	-6.750	4.574	-6.823	-6.075	-15.576	-26.973	-26.225	-6.443	-
-9.4	3.931	-7.588	-6.292	4.574	-6.823	-6.075	-15.576	-26.973	-26.225	-6.328	-
-9.3	4.574	-7.230	-6.075	4.574	-6.823	-6.075	-15.576	-26.973	-26.225	-6.212	-
-9.2	4.339	-6.937	-6.141	4.574	-6.823	-6.075	-15.576	-26.973	-26.225	-6.095	-
-9.1	3.229	-6.823	-6.375	4.574	-6.823	-6.075	-15.576	-26.973	-26.225	-6.000	-
-9	1.084	-6.868	-6.933	4.618	-6.823	-6.075	-15.532	-26.973	-26.225	-6.000	-
-8.9	-2.745	-7.128	-7.623	6.535	-6.823	-6.075	-13.615	-26.973	-26.225	-6.000	-
-8.8	-7.933	-7.721	-8.718	7.679	-6.823	-6.075	-12.471	-26.973	-26.225	-6.000	-
-8.7	-3.286	-8.564	-9.917	8.080	-6.823	-6.141	-12.070	-26.973	-26.291	-6.000	-
-8.6	1.624	-9.965	-11.606	8.080	-6.823	-6.375	-12.070	-26.973	-26.525	-6.000	-
-8.5	4.618	-11.864	-13.222	8.080	-6.868	-6.933	-12.070	-27.018	-27.083	-6.000	-
-8.4	6.535	-14.080	-14.871	8.080	-7.128	-7.623	-12.070	-27.278	-27.773	-6.000	-
-8.3	7.679	-15.722	-15.300	8.080	-6.239	-8.566	-12.070	-26.389	-28.716	-6.000	-
-8.2	8.080	-14.320	-14.373	8.080	-5.846	-7.783	-12.070	-25.996	-27.933	-6.000	-
-8.1	7.807	-11.393	-12.817	8.080	-5.846	-7.247	-12.070	-25.996	-27.397	-6.000	-
-8	6.874	-9.085	-11.088	8.080	-5.846	-7.082	-12.070	-25.996	-27.232	-6.000	-
-7.9	5.080	-7.349	-9.738	8.080	-5.846	-7.082	-12.070	-25.996	-27.232	-6.000	-
-7.8	1.812	-6.239	-8.566	8.080	-5.846	-7.082	-12.070	-25.996	-27.232	-6.000	-
-7.7	-4.058	-5.846	-7.783	8.813	-5.846	-7.082	-11.337	-25.996	-27.232	-6.000	-
-7.6	-5.397	-5.975	-7.247	9.379	-5.846	-7.082	-10.771	-25.996	-27.232	-6.000	-
-7.5	1.068	-7.173	-7.082	9.379	-4.773	-7.082	-10.771	-24.923	-27.232	-6.000	-
-7.4	5.052	-9.504	-7.253	9.379	-1.182	-7.082	-10.771	-21.332	-27.232	-6.000	-
-7.3	7.477	-14.815	-7.873	9.379	1.443	-7.082	-10.771	-18.707	-27.232	-6.000	-
-7.2	8.813	-23.702	-9.015	9.379	3.508	-6.853	-10.771	-16.642	-27.003	-6.000	-
-7.1	9.379	-10.964	-10.768	9.379	4.920	-3.911	-10.771	-15.230	-24.061	-6.000	-
-7	9.325	-4.773	-12.751	9.379	6.078	-1.754	-10.771	-14.072	-21.904	-6.000	-
-6.9	8.602	-1.182	-13.087	9.379	6.808	0.115	-10.771	-13.342	-20.035	-5.971	-
-6.8	6.943	1.443	-10.061	9.379	7.240	1.455	-10.771	-12.910	-18.695	-5.813	-
-6.7	3.942	3.508	-6.853	9.379	7.415	2.607	-10.771	-12.735	-17.543	-5.652	-
-6.6	-1.544	4.920	-3.911	9.379	7.415	3.346	-10.771	-12.735	-16.804	-5.489	-
-6.5	-11.951	6.078	-1.754	9.325	7.415	3.937	-10.825	-12.735	-16.213	-5.323	-
-6.4	-1.224	6.808	0.115	8.673	7.415	4.130	-11.477	-12.735	-16.020	-5.154	-
-6.3	4.201	7.240	1.455	8.673	7.415	4.184	-11.477	-12.735	-15.966	-4.984	-
-6.2	6.896	7.415	2.607	8.673	7.415	4.184	-11.477	-12.735	-15.966	-4.810	-
-6.1	8.232	7.178	3.346	8.673	7.415	4.184	-11.477	-12.735	-15.966	-4.633	-
-6	8.673	6.731	3.937	8.673	7.415	4.184	-11.477	-12.735	-15.966	-4.454	-
-5.9	8.269	5.836	4.130	8.673	7.415	4.184	-11.477	-12.735	-15.966	-4.271	-
-5.8	6.724	4.605	4.184	8.673	7.415	4.184	-11.477	-12.735	-15.966	-4.086	-
-5.7	3.377	3.291	3.761	11.353	7.415	4.184	-8.797	-12.735	-15.966	-3.897	-
-5.6	-4.318	2.047	3.171	13.017	8.539	4.184	-7.133	-11.611	-15.966	-3.705	-
-5.5	-6.204	2.119	1.891	14.003	9.363	4.184	-6.147	-10.787	-15.966	-3.509	-
-5.4	3.923	3.687	0.361	14.441	9.914	4.503	-5.709	-10.236	-15.647	-3.310	-
-5.3	8.627	5.471	-2.044	14.441	9.935	6.824	-5.709	-10.215	-13.326	-3.107	-
-5.2	11.353	7.155	-3.431	14.441	9.935	8.859	-5.709	-10.215	-11.291	-2.900	-
-5.1	13.017	8.539	-1.836	14.441	9.935	10.326	-5.709	-10.215	-9.824	-2.689	-
-5	14.003	9.363	1.340	14.441	9.935	11.586	-5.709	-10.215	-8.564	-2.474	-
-4.9	14.441	9.914	4.503	14.441	9.935	12.440	-5.709	-10.215	-7.710	-2.255	-
-4.8	14.301	9.935	6.824	14.441	9.935	13.098	-5.709	-10.215	-7.052	-2.031	-
-4.7	13.520	9.499	8.859	14.441	9.935	13.412	-5.709	-10.215	-6.738	-1.802	-
-4.6	12.109	8.543	10.326	14.441	9.935	13.485	-5.709	-10.215	-6.665	-1.569	-
-4.5	10.032	6.569	11.586	14.441	9.935	13.485	-5.709	-10.215	-6.665	-1.330	-
-4.4	7.470	3.540	12.440	14.441	11.794	13.485	-5.709	-8.356	-6.665	-1.086	-
-4.3	6.158	-1.500	13.098	14.301	13.775	13.485	-5.849	-6.375	-6.665	-0.837	-
-4.2	7.929	-0.939	13.412	13.745	15.144	13.485	-6.405	-5.006	-6.665	-0.581	-
-4.1	10.398	4.956	13.485	13.745	15.988	13.485	-6.405	-4.162	-6.665	-0.320	-
-4	12.256	9.171	13.202	13.745	16.499	13.485	-6.405	-3.651	-6.665	-0.051	-

-3.9	13.384	11.794	12.548	13.745	16.499	13.485	-6.405	-3.651	-6.665	0.223	-
-3.8	13.745	13.775	11.398	13.745	16.499	13.485	-6.405	-3.651	-6.665	0.505	-
-3.7	13.261	15.144	9.495	13.745	16.499	13.485	-6.405	-3.651	-6.665	0.795	-
-3.6	11.869	15.988	6.355	13.745	16.499	13.485	-6.405	-3.651	-6.665	1.092	-
-3.5	9.145	16.499	0.010	15.043	16.499	15.591	-5.107	-3.651	-4.559	1.398	-
-3.4	3.272	16.479	-8.420	16.981	16.499	17.396	-3.169	-3.651	-2.754	1.713	-
-3.3	-9.675	16.097	4.538	18.151	16.499	18.712	-1.999	-3.651	-1.438	2.037	-
-3.2	6.744	15.089	9.815	18.591	16.499	19.714	-1.559	-3.651	-0.436	2.371	-
-3.1	12.020	13.312	13.229	18.591	16.499	20.350	-1.559	-3.651	0.200	2.716	-
-3	15.043	10.410	15.591	18.591	16.499	20.746	-1.559	-3.651	0.596	3.072	-
-2.9	16.981	3.896	17.396	18.591	18.582	20.757	-1.559	-1.568	0.607	3.440	-
-2.8	18.151	-11.092	18.712	18.591	20.071	20.757	-1.559	-0.079	0.607	3.821	-
-2.7	18.591	7.373	19.714	18.591	21.083	20.757	-1.559	0.933	0.607	4.216	-
-2.6	18.364	13.065	20.350	18.591	21.680	20.757	-1.559	1.530	0.607	4.626	-
-2.5	17.448	16.243	20.746	18.591	21.748	20.757	-1.559	1.598	0.607	5.051	-
-2.4	15.577	18.582	20.757	18.591	21.748	20.757	-1.559	1.598	0.607	5.495	-
-2.3	11.863	20.071	20.524	20.125	21.748	20.757	-0.025	1.598	0.607	5.957	-
-2.2	2.615	21.083	19.754	21.715	21.748	20.757	1.565	1.598	0.607	6.439	-
-2.1	4.719	21.680	18.601	22.489	21.748	20.757	2.339	1.598	0.607	6.945	-
-2	13.292	21.748	16.372	22.594	21.748	20.757	2.444	1.598	0.607	7.474	-
-1.9	17.503	21.439	12.904	22.594	21.748	23.314	2.444	1.598	3.164	8.031	-
-1.8	20.125	20.400	4.482	22.594	21.748	25.655	2.444	1.598	5.505	8.618	-
-1.7	21.715	18.582	6.601	22.594	22.097	27.745	2.444	1.947	7.595	9.239	-
-1.6	22.489	15.193	15.522	22.594	25.320	29.300	2.444	5.170	9.150	9.897	-
-1.5	22.594	6.795	19.908	22.594	27.901	30.748	2.444	7.751	10.598	10.598	-
-1.4	21.986	7.419	23.314	22.594	29.777	31.847	2.444	9.627	11.697	-	-
-1.3	20.331	17.318	25.655	25.122	31.359	32.880	4.972	11.209	12.730	-	-
-1.2	16.633	22.097	27.745	28.325	32.654	33.656	8.175	12.504	13.506	-	-
-1.1	6.199	25.320	29.300	30.608	33.641	34.378	10.458	13.491	14.228	-	-
-1	11.712	27.901	30.748	32.321	34.496	34.894	12.171	14.346	14.744	-	-
-0.9	20.435	29.777	31.847	33.648	35.104	35.360	13.498	14.954	15.210	-	-
-0.8	25.122	31.359	32.880	34.669	35.557	35.650	14.519	15.407	15.500	-	-
-0.7	28.325	32.654	33.656	35.391	35.873	35.891	15.241	15.723	15.741	-	-
-0.6	30.608	33.641	34.378	35.817	35.988	35.970	15.667	15.838	15.820	-	-
-0.5	32.321	34.496	34.894	36.000	36.000	36.000	15.850	15.850	15.850	-	-
-0.4	33.648	35.104	35.360	36.000	36.000	36.000	15.850	15.850	15.850	-	-
-0.3	34.669	35.557	35.650	36.000	36.000	36.000	15.850	15.850	15.850	-	-
-0.2	35.391	35.873	35.891	36.000	36.000	36.000	15.850	15.850	15.850	-	-
-0.1	35.817	35.988	35.970	36.000	36.000	36.000	15.850	15.850	15.850	-	-
0	36.000	36.000	36.000	36.000	36.000	36.000	15.850	15.850	15.850	-	-
0.1	35.966	35.822	35.873	36.000	36.000	36.000	15.850	15.850	15.850	-	-
0.2	35.698	35.504	35.697	36.000	36.000	36.000	15.850	15.850	15.850	-	-
0.3	35.148	35.046	35.355	36.000	36.000	36.000	15.850	15.850	15.850	-	-
0.4	34.320	34.360	34.965	36.000	36.000	36.000	15.850	15.850	15.850	-	-
0.5	33.216	33.554	34.389	36.000	36.000	36.000	15.850	15.850	15.850	-	-
0.6	31.780	32.486	33.764	35.966	35.822	35.873	15.816	15.672	15.723	-	-
0.7	29.881	31.172	32.914	35.698	35.504	35.697	15.548	15.354	15.547	-	-
0.8	27.288	29.629	32.008	35.148	35.046	35.355	14.998	14.896	15.205	-	-
0.9	23.745	27.549	30.812	34.320	34.360	34.965	14.170	14.210	14.815	-	-
1	18.382	25.050	29.533	33.216	33.554	34.389	13.066	13.404	14.239	-	-
1.1	6.022	21.650	27.841	31.780	32.486	33.764	11.630	12.336	13.614	-	-
1.2	11.071	16.218	25.985	29.881	31.172	32.914	9.731	11.022	12.764	-	-
1.3	18.031	5.196	23.424	27.288	29.629	32.008	7.138	9.479	11.858	-	-
1.4	20.812	9.016	20.381	23.745	27.549	30.812	3.595	7.399	10.662	-	-
1.5	22.064	16.091	15.481	22.445	25.050	29.533	2.295	4.900	9.383	10.598	-
1.6	22.445	19.201	7.141	22.445	22.319	27.841	2.295	2.169	7.691	9.897	-
1.7	22.123	21.051	4.707	22.445	22.319	25.985	2.295	2.169	5.835	9.239	-
1.8	21.047	21.920	12.999	22.445	22.319	23.424	2.295	2.169	3.274	8.618	-
1.9	19.115	22.319	17.058	22.445	22.319	21.641	2.295	2.169	1.491	8.031	-

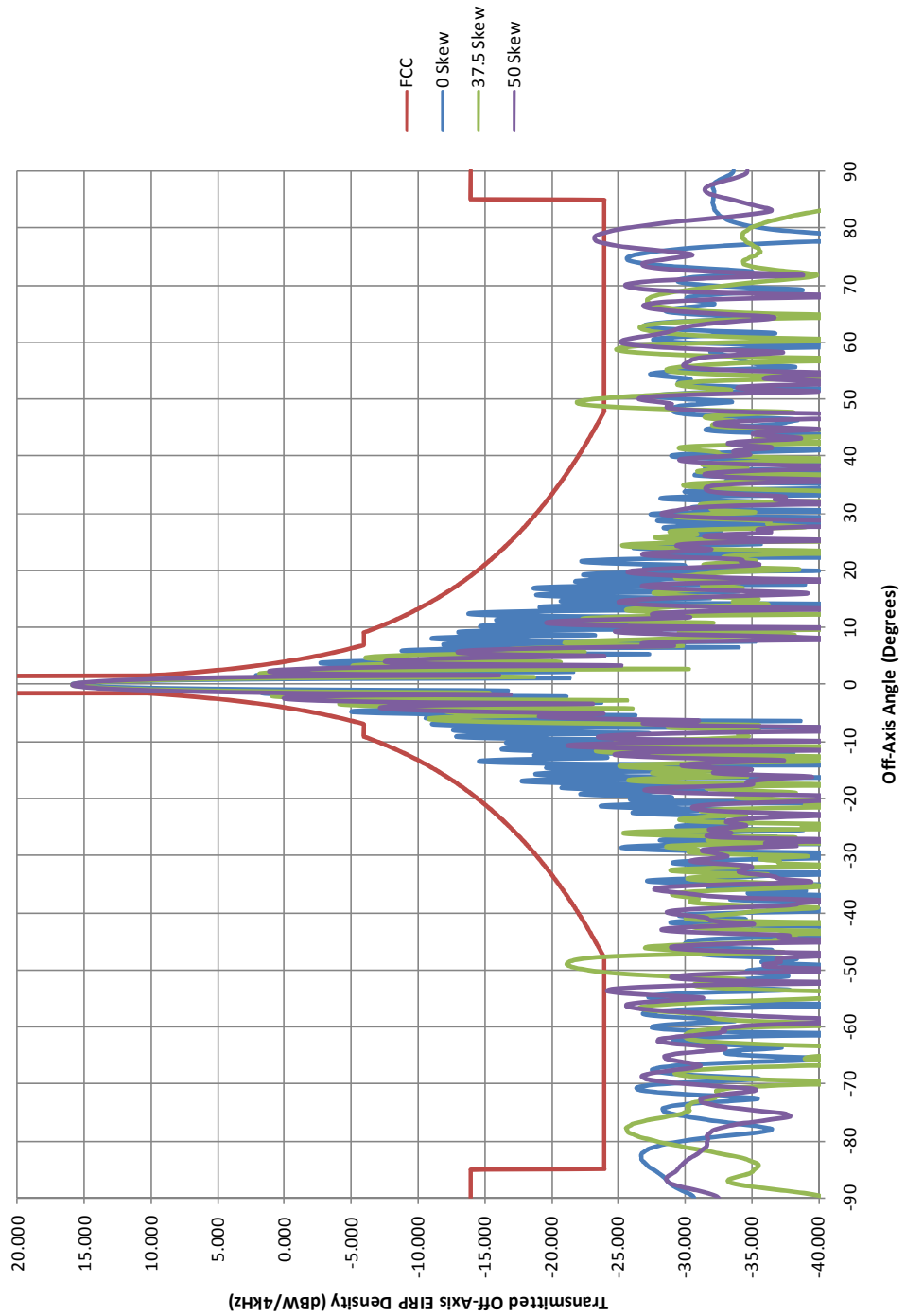
2	16.095	22.208	19.091	22.445	22.319	21.641	2.295	2.169	1.491	7.474	-
2.1	10.973	21.677	20.513	22.445	22.319	21.641	2.295	2.169	1.491	6.945	-
2.2	-3.152	20.773	21.216	22.123	22.319	21.641	1.973	2.169	1.491	6.439	-
2.3	6.635	19.264	21.641	21.047	22.319	21.641	0.897	2.169	1.491	5.957	-
2.4	12.955	17.297	21.636	19.115	22.319	21.641	-1.035	2.169	1.491	5.495	-
2.5	15.753	14.302	21.415	17.674	22.208	21.641	-2.476	2.058	1.491	5.051	-
2.6	17.156	9.669	20.851	17.674	21.677	21.641	-2.476	1.527	1.491	4.626	-
2.7	17.674	0.773	20.058	17.674	20.773	21.641	-2.476	0.623	1.491	4.216	-
2.8	17.395	1.064	18.908	17.674	19.264	21.641	-2.476	-0.886	1.491	3.821	-
2.9	16.251	8.637	17.454	17.674	17.297	21.636	-2.476	-2.853	1.486	3.440	-
3	14.137	12.183	15.497	17.674	15.685	21.415	-2.476	-4.465	1.265	3.072	-
3.1	10.497	14.207	12.991	17.674	15.685	20.851	-2.476	-4.465	0.701	2.716	-
3.2	2.705	15.198	9.435	17.674	15.685	20.058	-2.476	-4.465	-0.092	2.371	-
3.3	-2.115	15.685	4.170	17.768	15.685	18.908	-2.382	-4.465	-1.242	2.037	-
3.4	9.035	15.544	-2.258	17.885	15.685	17.454	-2.265	-4.465	-2.696	1.713	-
3.5	13.263	14.984	2.268	17.885	15.685	15.497	-2.265	-4.465	-4.653	1.398	-
3.6	15.630	13.869	7.013	17.885	15.685	12.991	-2.265	-4.465	-7.159	1.092	-
3.7	17.042	12.077	9.549	17.885	15.685	12.639	-2.265	-4.465	-7.511	0.795	-
3.8	17.768	9.516	11.182	17.885	15.685	12.639	-2.265	-4.465	-7.511	0.505	-
3.9	17.885	4.962	12.090	17.885	15.544	12.639	-2.265	-4.606	-7.511	0.223	-
4	17.500	-4.335	12.557	17.885	14.984	12.639	-2.265	-5.166	-7.511	-0.051	-
4.1	16.671	-4.125	12.639	17.885	13.869	12.639	-2.265	-6.281	-7.511	-0.320	-
4.2	15.361	4.941	12.364	17.885	13.986	12.639	-2.265	-6.164	-7.511	-0.581	-
4.3	13.480	8.703	11.812	17.885	14.090	12.639	-2.265	-6.060	-7.511	-0.837	-
4.4	11.107	11.121	10.861	17.885	14.090	12.639	-2.265	-6.060	-7.511	-1.086	-
4.5	8.827	12.571	9.635	17.500	14.090	12.639	-2.650	-6.060	-7.511	-1.330	-
4.6	7.659	13.464	7.824	16.671	14.090	12.639	-3.479	-6.060	-7.511	-1.569	-
4.7	8.070	13.986	5.577	15.361	14.090	12.364	-4.789	-6.060	-7.786	-1.802	-
4.8	9.077	14.090	2.083	13.480	14.090	11.812	-6.670	-6.060	-8.338	-2.031	-
4.9	9.676	13.958	-2.945	11.107	14.090	10.861	-9.043	-6.060	-9.289	-2.255	-
5	9.515	13.487	-12.888	9.676	14.090	9.635	-10.474	-6.060	-10.515	-2.474	-
5.1	8.583	12.793	-6.208	9.676	14.090	7.824	-10.474	-6.060	-12.326	-2.689	-
5.2	6.737	11.840	-0.320	9.676	14.090	7.001	-10.474	-6.060	-13.149	-2.900	-
5.3	3.548	10.594	2.596	9.676	14.090	7.186	-10.474	-6.060	-12.964	-3.107	-
5.4	-0.915	9.205	4.621	10.368	13.958	7.186	-9.782	-6.192	-12.964	-3.310	-
5.5	0.023	7.545	5.781	10.594	13.487	7.186	-9.556	-6.663	-12.964	-3.509	-
5.6	4.435	5.922	6.617	10.594	12.793	7.186	-9.556	-7.357	-12.964	-3.705	-
5.7	7.496	4.436	7.001	10.594	11.840	7.186	-9.556	-8.310	-12.964	-3.897	-
5.8	9.393	3.371	7.186	10.594	10.594	7.186	-9.556	-9.556	-12.964	-4.086	-
5.9	10.368	2.790	7.069	10.594	9.205	7.186	-9.556	-10.945	-12.964	-4.271	-
6	10.594	2.474	6.799	10.594	7.545	7.186	-9.556	-12.605	-12.964	-4.454	-
6.1	10.194	2.211	6.298	10.594	5.922	7.186	-9.556	-14.228	-12.964	-4.633	-
6.2	9.123	1.661	5.672	10.594	4.436	7.186	-9.556	-15.714	-12.964	-4.810	-
6.3	7.110	0.818	4.856	10.594	3.371	7.186	-9.556	-16.779	-12.964	-4.984	-
6.4	3.542	-0.593	3.940	10.594	2.790	7.069	-9.556	-17.360	-13.081	-5.154	-
6.5	-3.360	-2.574	2.876	10.594	2.474	6.799	-9.556	-17.676	-13.351	-5.323	-
6.6	-15.242	-5.618	1.730	10.194	2.211	6.298	-9.956	-17.939	-13.852	-5.489	-
6.7	-0.529	-10.010	0.473	9.123	1.661	5.672	-11.027	-18.489	-14.478	-5.652	-
6.8	4.268	-14.711	-0.864	8.168	0.818	4.856	-11.982	-19.332	-15.294	-5.813	-
6.9	6.689	-11.445	-2.324	8.168	-0.593	3.940	-11.982	-20.743	-16.210	-5.971	-
7	7.836	-7.491	-3.911	8.168	-2.045	2.876	-11.982	-22.195	-17.274	-6.000	-
7.1	8.168	-4.906	-5.753	8.168	-2.045	1.730	-11.982	-22.195	-18.420	-6.000	-
7.2	7.797	-3.348	-7.892	8.168	-2.045	0.473	-11.982	-22.195	-19.677	-6.000	-
7.3	6.601	-2.487	-10.648	8.168	-2.045	-0.864	-11.982	-22.195	-21.014	-6.000	-
7.4	4.264	-2.047	-14.249	8.168	-2.045	-2.324	-11.982	-22.195	-22.474	-6.000	-
7.5	0.201	-2.045	-19.773	8.168	-2.045	-3.911	-11.982	-22.195	-24.061	-6.000	-
7.6	-8.355	-2.323	-25.640	8.168	-2.045	-5.753	-11.982	-22.195	-25.903	-6.000	-
7.7	-7.572	-2.870	-21.110	8.122	-2.045	-7.892	-12.028	-22.195	-28.042	-6.000	-
7.8	0.632	-3.643	-17.074	8.122	-2.045	-10.648	-12.028	-22.195	-30.798	-6.000	-
7.9	4.439	-4.585	-14.877	8.122	-2.045	-13.585	-12.028	-22.195	-33.735	-6.000	-

8	6.502	-5.724	-13.857	8.122	-2.045	-13.585	-12.028	-22.195	-33.735	-6.000	-
8.1	7.640	-7.013	-13.585	8.122	-2.323	-12.201	-12.028	-22.473	-32.351	-6.000	-
8.2	8.122	-8.550	-13.909	8.122	-2.870	-10.006	-12.028	-23.020	-30.156	-6.000	-
8.3	7.983	-10.491	-14.508	8.122	-3.643	-8.183	-12.028	-23.793	-28.333	-6.000	-
8.4	7.182	-13.008	-14.824	8.122	-4.585	-6.532	-12.028	-24.735	-26.682	-6.000	-
8.5	5.717	-17.164	-13.929	8.122	-5.724	-5.327	-12.028	-25.874	-25.477	-6.000	-
8.6	3.408	-24.437	-12.201	8.122	-7.013	-4.326	-12.028	-27.163	-24.476	-6.000	-
8.7	-0.354	-24.369	-10.006	8.122	-6.752	-3.665	-12.028	-26.902	-23.815	-6.000	-
8.8	-7.353	-16.353	-8.183	7.983	-5.983	-3.192	-12.167	-26.133	-23.342	-6.000	-
8.9	-9.124	-12.402	-6.532	7.182	-5.708	-2.976	-12.968	-25.858	-23.126	-6.000	-
9	-2.302	-9.625	-5.327	5.717	-5.621	-2.944	-14.433	-25.771	-23.094	-6.000	-
9.1	1.249	-7.918	-4.326	4.214	-5.621	-2.944	-15.936	-25.771	-23.094	-6.000	-
9.2	3.222	-6.752	-3.665	4.214	-5.621	-2.944	-15.936	-25.771	-23.094	-6.095	-
9.3	4.162	-5.983	-3.192	4.214	-5.621	-2.944	-15.936	-25.771	-23.094	-6.212	-
9.4	4.214	-5.708	-2.976	4.214	-5.621	-2.944	-15.936	-25.771	-23.094	-6.328	-
9.5	3.509	-5.621	-2.944	4.214	-5.621	-2.944	-15.936	-25.771	-23.094	-6.443	-
9.6	1.988	-5.887	-3.114	4.214	-5.621	-2.944	-15.936	-25.771	-23.094	-6.557	-
9.7	-0.752	-6.262	-3.475	4.214	-5.621	-2.944	-15.936	-25.771	-23.094	-6.669	-
9.8	-5.846	-6.638	-4.013	4.214	-5.621	-2.944	-15.936	-25.771	-23.094	-6.781	-
9.9	-11.599	-7.035	-4.772	4.772	-5.621	-2.944	-15.378	-25.771	-23.094	-6.891	-
10	-4.955	-7.116	-5.730	4.815	-5.621	-2.944	-15.335	-25.771	-23.094	-7.000	-
15	-0.257	-6.097	-14.592	0.350	-5.339	-10.404	-19.800	-25.489	-30.554	-11.402	-
20	-9.493	-13.577	-17.571	-2.697	-11.824	-11.251	-22.847	-31.974	-31.401	-14.526	-
25	-8.058	-22.978	-14.438	-4.282	-18.388	-12.073	-24.432	-38.538	-32.223	-16.949	-
30	-10.060	-22.551	-10.466	-9.649	-8.734	-6.003	-29.799	-28.884	-26.153	-18.928	-
35	-15.233	-10.410	-16.558	-10.205	-8.222	-15.433	-30.355	-28.372	-35.583	-20.602	-
40	-16.790	-10.838	-8.616	-14.083	-10.758	-4.240	-34.233	-30.908	-24.390	-22.051	-
45	-4.603	-9.143	-8.231	-3.457	-9.132	-7.059	-23.607	-29.282	-27.209	-23.330	-
50	-8.741	-5.405	-15.568	-8.276	-3.198	-11.527	-28.426	-23.348	-31.677	-24.000	0.652
55	-12.865	-26.617	-10.525	-11.452	-16.052	-8.533	-31.602	-36.202	-28.683	-24.000	-
60	-20.693	-3.835	-13.493	-18.788	-3.199	-12.121	-38.938	-23.349	-32.271	-24.000	0.651
65	-5.235	-16.095	-22.049	-5.157	-10.571	-17.353	-25.307	-30.721	-37.503	-24.000	-
70	-5.804	-13.114	-15.252	-5.069	-12.611	-11.272	-25.219	-32.761	-31.422	-24.000	-
75	-16.945	-13.325	-10.331	-11.749	-12.317	-9.410	-31.899	-32.467	-29.560	-24.000	-
80	-2.090	-8.459	-7.207	-2.019	-7.493	-6.941	-22.169	-27.643	-27.091	-24.000	1.831
85	-13.929	-8.065	-5.636	-13.084	-7.605	-5.338	-33.234	-27.755	-25.488	-14.000	-
90	-10.744	-17.596	-10.015	-10.602	-17.308	-9.864	-30.752	-37.458	-30.014	-14.000	-
95	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
100	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
105	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
110	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
115	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
120	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
125	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
130	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
135	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
140	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
145	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
150	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
155	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
160	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
165	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
170	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
175	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
180	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-

14.0GHz H-Pol, Nominal Transmitted Co-Pol PSD with -20.15dBW/4KHz at Input



14.25GHz H-Pol Nominal Transmitted Co-Pol PSD with -20.15dBW/4kHz at Input





Data in support of claim that proposed operation meets criteria of VMES Order July 2009

Applicant RAS Date of Application  
 ID Heading  
 a1 Antenna Manufacture: RAS c Main bore gain (dBi): 36.0  
 a2 Antenna Model: E7000 d Frequency at which gain was measured (GHz): 14.0  
 a3 Antenna ID: RAS e Max input power density (dBW/4kHz): -20.15  
 b Transmit Band (b): 14GHz Pattern ID Table A2  
 Pattern Description: 14.0GHz V-polarization, co-polarized at tangent to the geosynchronous plane for 0°, 37.5°, and 50° skew angle

Offset Angles  (Degrees)	Nominal Co-Pol Gain Along Tangent to Geo Arc  (dBi)			Worst Case Co-Pol Gain Along Tangent to Geo Arc  (dBi)			Worst Case Co-Pol PSD Along Tangent to Geo Arc input PSD = -20.15dBW/4kHz  (dBW/4kHz)			FCC Mask (dBW/4kHz)	Mask Exceedence  (dB)
	0? Skew	37.5? Skew	50? Skew	0? Skew	37.5? Skew	50? Skew	0? Skew	37.5? Skew	50? Skew		
	-180	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000
-175	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-170	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-165	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-160	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-155	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-150	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-145	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-140	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-135	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-130	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-125	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-120	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-115	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-110	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-105	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-100	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-95	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-90	-6.425	-18.644	-9.468	-6.227	-18.032	-9.016	-26.377	-38.182	-29.166	-14.000	-
-85	-7.900	-12.186	-5.728	-7.595	-12.051	-5.486	-27.745	-32.201	-25.636	-14.000	-
-80	-4.275	-6.048	-10.600	-3.438	-5.444	-9.740	-23.588	-25.594	-29.890	-24.000	0.412
-75	-12.901	-11.868	-7.984	-9.699	-11.059	-7.370	-29.849	-31.209	-27.520	-24.000	-
-70	-14.725	-25.508	-7.608	-11.245	-13.762	-5.974	-31.395	-33.912	-26.124	-24.000	-
-65	-6.658	-5.653	-13.045	-6.207	-5.404	-10.534	-26.357	-25.554	-30.684	-24.000	-
-60	-8.616	-7.615	-5.518	-8.616	-6.872	-4.018	-28.766	-27.022	-24.168	-24.000	-
-55	-9.018	-20.575	-18.737	-4.856	-12.616	-18.425	-25.006	-32.766	-38.575	-24.000	-
-50	-22.220	-1.930	-20.814	-4.685	-1.359	-11.705	-24.835	-21.509	-31.855	-24.000	2.491
-45	-23.042	-4.017	-9.374	-11.632	-4.017	-8.733	-31.782	-24.167	-28.883	-23.330	-
-40	-5.097	-8.368	-19.923	-5.068	-7.975	-16.970	-25.218	-28.125	-37.120	-22.051	-
-35	-18.208	-6.243	-13.171	-12.538	-6.206	-13.085	-32.688	-26.356	-33.235	-20.602	-
-30	-7.815	-9.427	-8.227	-6.797	-6.861	-5.406	-26.947	-27.011	-25.556	-18.928	-
-25	-14.161	-7.953	-2.584	-5.289	-7.385	-2.179	-25.439	-27.535	-22.329	-16.949	-
-20	-6.959	-13.491	-13.372	-1.748	-10.926	-9.973	-21.898	-31.076	-30.123	-14.526	-
-15	-1.869	-6.451	-16.868	-1.345	-6.262	-9.119	-21.495	-26.412	-29.269	-11.402	-
-10	3.197	-18.551	-4.400	7.673	-3.826	-3.479	-12.477	-23.976	-23.629	-7.000	-

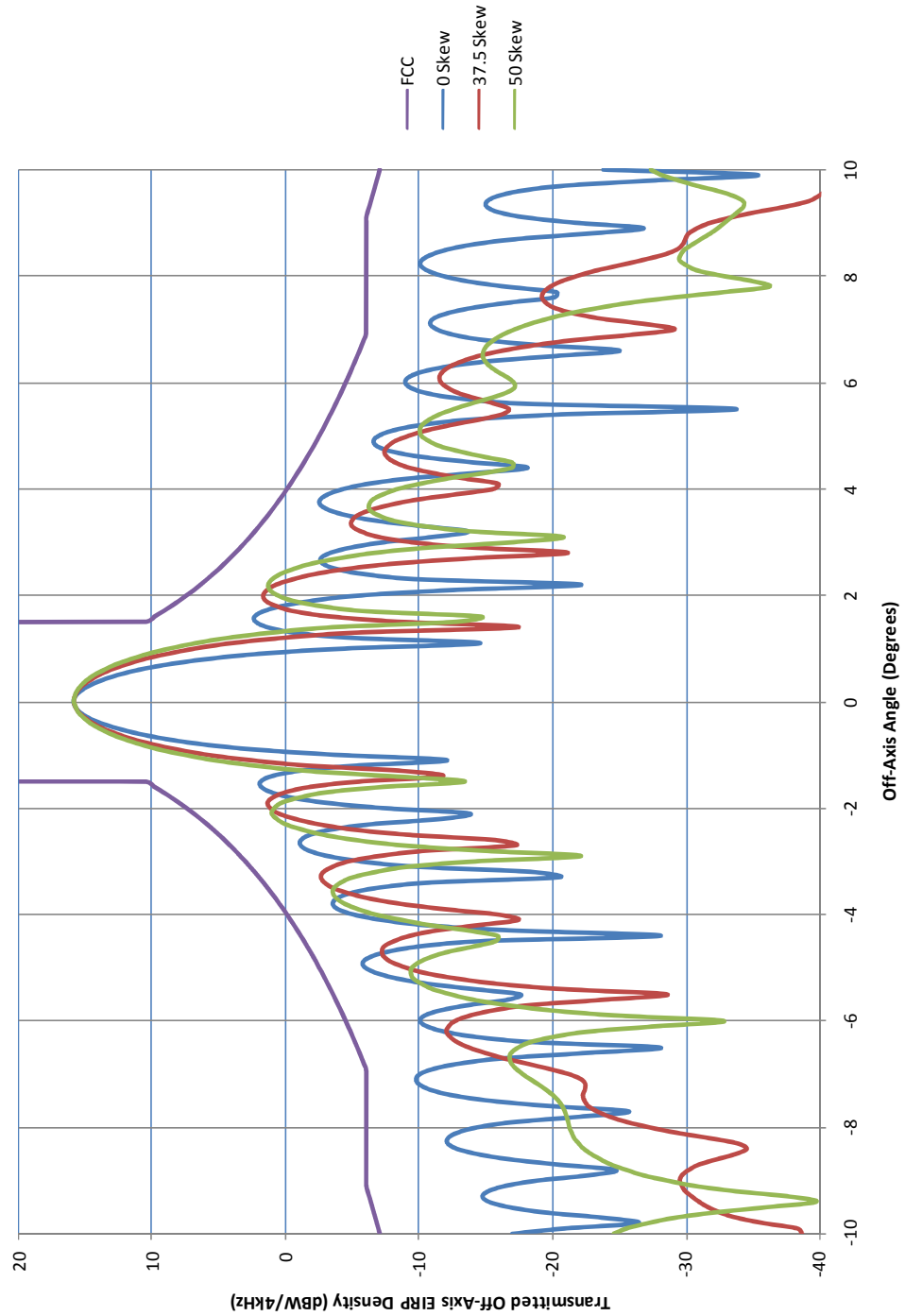
-9.9	-0.744	-18.199	-5.361	7.673	-5.563	-3.479	-12.477	-25.713	-23.629	-6.891	-
-9.8	-6.221	-15.692	-6.970	7.670	-7.773	-3.479	-12.480	-27.923	-23.629	-6.781	-
-9.7	-3.713	-13.682	-8.942	6.960	-9.806	-3.479	-13.190	-29.956	-23.629	-6.669	-
-9.6	0.717	-12.402	-11.938	5.546	-9.551	-3.687	-14.604	-29.701	-23.837	-6.557	-
-9.5	3.406	-11.503	-15.874	5.408	-9.389	-4.400	-14.742	-29.539	-24.550	-6.443	-
-9.4	4.909	-10.840	-19.567	5.408	-9.389	-5.361	-14.742	-29.539	-25.511	-6.328	-
-9.3	5.408	-10.303	-17.575	5.408	-9.389	-5.373	-14.742	-29.539	-25.523	-6.212	-
-9.2	4.988	-9.806	-13.541	5.408	-9.389	-4.230	-14.742	-29.539	-24.380	-6.095	-
-9.1	3.698	-9.551	-10.460	5.408	-9.389	-3.408	-14.742	-29.539	-23.558	-6.000	-
-9	1.314	-9.389	-8.408	5.830	-9.389	-2.711	-14.320	-29.539	-22.861	-6.000	-
-8.9	-2.561	-9.548	-6.603	7.341	-9.389	-2.160	-12.809	-29.539	-22.310	-6.000	-
-8.8	-4.563	-10.052	-5.373	8.013	-9.389	-1.775	-12.137	-29.539	-21.925	-6.000	-
-8.7	-0.333	-10.820	-4.230	8.013	-9.389	-1.445	-12.137	-29.539	-21.595	-6.000	-
-8.6	3.379	-12.138	-3.408	8.013	-9.127	-1.266	-12.137	-29.277	-21.416	-6.000	-
-8.5	5.830	-13.575	-2.711	8.013	-7.123	-1.089	-12.137	-27.273	-21.239	-6.000	-
-8.4	7.341	-14.408	-2.160	8.013	-5.431	-1.002	-12.137	-25.581	-21.152	-6.000	-
-8.3	8.013	-13.709	-1.775	8.013	-4.142	-0.880	-12.137	-24.292	-21.030	-6.000	-
-8.2	7.978	-11.555	-1.445	8.013	-3.201	-0.754	-12.137	-23.351	-20.904	-6.000	-
-8.1	7.295	-9.127	-1.266	8.013	-2.537	-0.560	-12.137	-22.687	-20.710	-6.000	-
-8	5.815	-7.123	-1.089	8.013	-2.251	-0.270	-12.137	-22.401	-20.420	-6.000	-
-7.9	3.049	-5.431	-1.002	8.013	-2.132	0.111	-12.137	-22.282	-20.039	-6.000	-
-7.8	-1.848	-4.142	-0.880	9.230	-2.132	0.622	-10.920	-22.282	-19.528	-6.000	-
-7.7	-5.533	-3.201	-0.754	10.095	-2.132	1.193	-10.055	-22.282	-18.957	-6.000	-
-7.6	0.353	-2.537	-0.560	10.379	-2.028	1.808	-9.771	-22.178	-18.342	-6.000	-
-7.5	4.803	-2.251	-0.270	10.379	-1.095	2.400	-9.771	-21.245	-17.750	-6.000	-
-7.4	7.589	-2.132	0.111	10.379	0.417	2.888	-9.771	-19.733	-17.262	-6.000	-
-7.3	9.230	-2.265	0.622	10.379	2.075	3.252	-9.771	-18.075	-16.898	-6.000	-
-7.2	10.095	-2.319	1.193	10.379	3.813	3.371	-9.771	-16.337	-16.779	-6.000	-
-7.1	10.379	-2.028	1.808	10.379	5.190	3.371	-9.771	-14.960	-16.779	-6.000	-
-7	10.092	-1.095	2.400	10.379	6.393	3.371	-9.771	-13.757	-16.779	-6.000	-
-6.9	9.071	0.417	2.888	10.379	7.264	3.371	-9.771	-12.886	-16.779	-5.971	-
-6.8	7.106	2.075	3.252	10.379	7.812	3.371	-9.771	-12.338	-16.779	-5.813	-
-6.7	3.795	3.813	3.371	10.379	8.089	3.371	-9.771	-12.061	-16.779	-5.652	-
-6.6	-2.430	5.190	3.271	10.379	8.089	3.371	-9.771	-12.061	-16.779	-5.489	-
-6.5	-7.889	6.393	2.740	10.092	8.089	3.371	-10.058	-12.061	-16.779	-5.323	-
-6.4	1.488	7.264	1.857	10.080	8.089	3.371	-10.070	-12.061	-16.779	-5.154	-
-6.3	5.881	7.812	0.119	10.080	8.089	3.371	-10.070	-12.061	-16.779	-4.984	-
-6.2	8.257	8.089	-2.500	10.080	8.089	3.628	-10.070	-12.061	-16.522	-4.810	-
-6.1	9.569	7.927	-7.568	10.080	8.089	6.119	-10.070	-12.061	-14.031	-4.633	-
-6	10.080	7.447	-12.657	10.080	8.089	7.784	-10.070	-12.061	-12.366	-4.454	-
-5.9	9.759	6.351	-4.850	10.080	8.089	9.154	-10.070	-12.061	-10.996	-4.271	-
-5.8	8.551	4.583	0.334	10.080	8.089	9.981	-10.070	-12.061	-10.169	-4.086	-
-5.7	6.428	1.761	3.628	11.830	8.089	10.592	-8.320	-12.061	-9.558	-3.897	-
-5.6	3.526	-3.739	6.119	13.320	9.664	10.771	-6.830	-10.486	-9.379	-3.705	-
-5.5	2.587	-8.435	7.784	14.166	11.096	10.771	-5.984	-9.054	-9.379	-3.509	-
-5.4	6.094	-0.533	9.154	14.365	12.150	10.771	-5.785	-8.000	-9.379	-3.310	-
-5.3	9.521	4.327	9.981	14.365	12.750	10.771	-5.785	-7.400	-9.379	-3.107	-
-5.2	11.830	7.385	10.592	14.365	12.918	10.771	-5.785	-7.232	-9.379	-2.900	-
-5.1	13.320	9.664	10.771	14.365	12.918	10.771	-5.785	-7.232	-9.379	-2.689	-
-5	14.166	11.096	10.697	14.365	12.918	10.771	-5.785	-7.232	-9.379	-2.474	-
-4.9	14.365	12.150	10.197	14.365	12.918	10.771	-5.785	-7.232	-9.379	-2.255	-
-4.8	13.838	12.750	9.314	14.365	12.918	10.771	-5.785	-7.232	-9.379	-2.031	-
-4.7	12.529	12.918	7.983	14.365	12.918	10.771	-5.785	-7.232	-9.379	-1.802	-
-4.6	10.133	12.763	6.064	14.365	12.918	11.502	-5.785	-7.232	-8.648	-1.569	-
-4.5	5.535	12.023	4.420	15.037	12.918	13.401	-5.113	-7.232	-6.749	-1.330	-
-4.4	-7.923	10.843	4.290	16.216	12.918	14.701	-3.934	-7.232	-5.449	-1.086	-
-4.3	3.162	8.850	6.480	16.611	12.918	15.709	-3.539	-7.232	-4.441	-0.837	-
-4.2	9.612	5.777	9.327	16.611	13.820	16.318	-3.539	-6.330	-3.832	-0.581	-
-4.1	12.980	2.690	11.502	16.611	15.405	16.601	-3.539	-4.745	-3.549	-0.320	-
-4	15.037	4.235	13.401	16.611	16.593	16.601	-3.539	-3.557	-3.549	-0.051	-

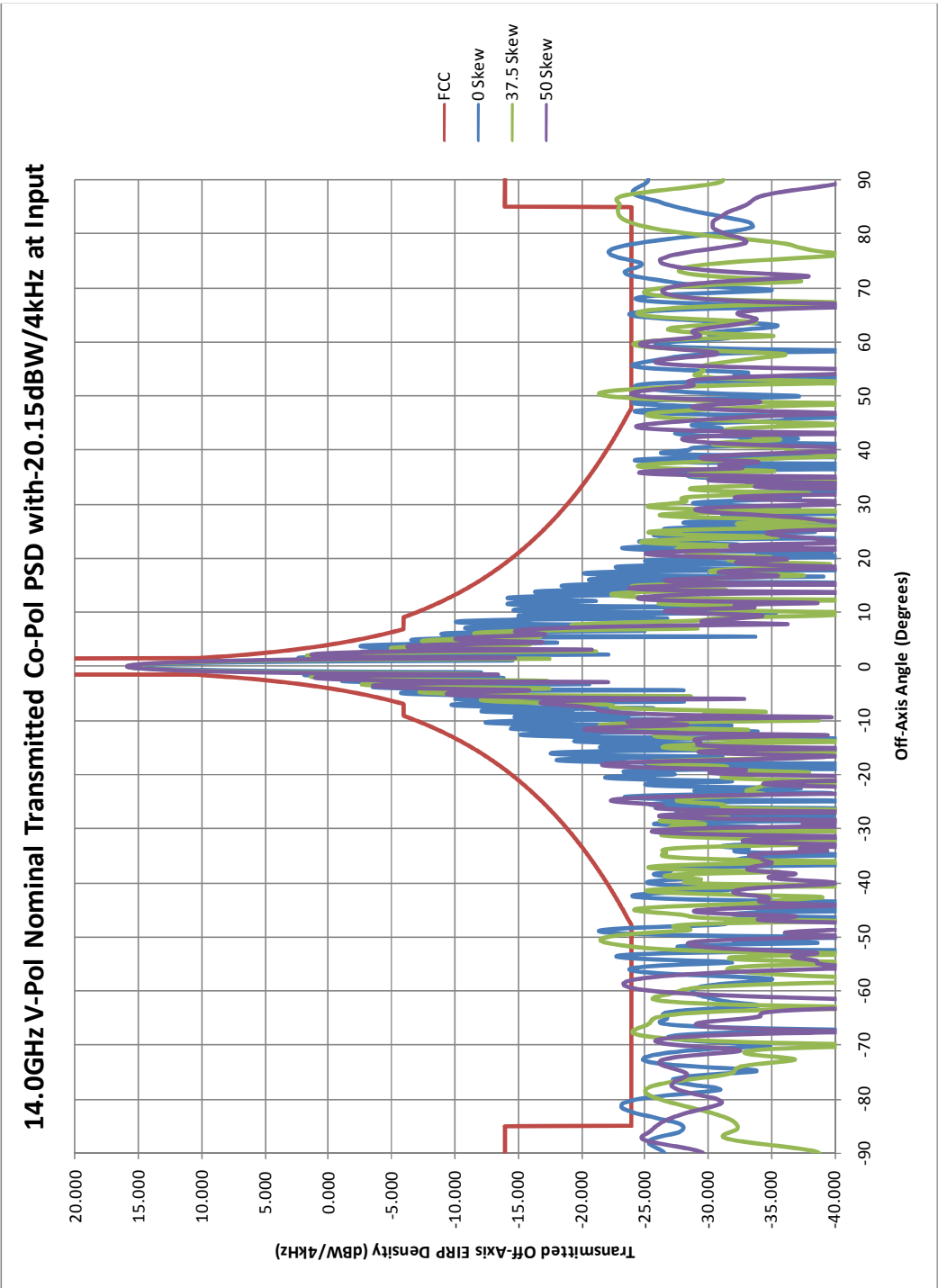
-3.9	16.216	8.165	14.701	16.611	17.218	16.601	-3.539	-2.932	-3.549	0.223	-
-3.8	16.611	11.463	15.709	16.611	17.490	16.601	-3.539	-2.660	-3.549	0.505	-
-3.7	16.318	13.820	16.318	16.611	17.490	16.601	-3.539	-2.660	-3.549	0.795	-
-3.6	15.315	15.405	16.601	16.611	17.490	16.601	-3.539	-2.660	-3.549	1.092	-
-3.5	13.322	16.593	16.528	16.611	17.490	16.601	-3.539	-2.660	-3.549	1.398	-
-3.4	9.425	17.218	16.035	16.990	17.490	16.601	-3.160	-2.660	-3.549	1.713	-
-3.3	-0.317	17.490	15.121	18.392	17.490	16.601	-1.758	-2.660	-3.549	2.037	-
-3.2	1.632	17.311	13.428	19.009	17.490	16.601	-1.141	-2.660	-3.549	2.371	-
-3.1	10.410	16.616	10.929	19.009	17.490	16.601	-1.141	-2.660	-3.549	2.716	-
-3	14.523	15.419	5.965	19.009	17.490	17.323	-1.141	-2.660	-2.827	3.072	-
-2.9	16.990	13.149	-1.961	19.009	17.490	18.956	-1.141	-2.660	-1.194	3.440	-
-2.8	18.392	9.613	5.458	19.009	17.707	20.167	-1.141	-2.443	0.017	3.821	-
-2.7	19.009	2.911	11.319	19.009	19.446	20.829	-1.141	-0.704	0.679	4.216	-
-2.6	18.992	4.435	14.884	19.009	20.669	21.182	-1.141	0.519	1.032	4.626	-
-2.5	18.306	10.972	17.323	19.009	21.267	21.182	-1.141	1.117	1.032	5.051	-
-2.4	16.694	15.137	18.956	19.009	21.486	21.182	-1.141	1.336	1.032	5.495	-
-2.3	13.655	17.707	20.167	19.710	21.486	21.182	-0.440	1.336	1.032	5.957	-
-2.2	8.441	19.446	20.829	21.226	21.486	21.182	1.076	1.336	1.032	6.439	-
-2.1	6.409	20.669	21.182	21.963	21.486	21.182	1.813	1.336	1.032	6.945	-
-2	12.764	21.267	21.005	22.012	21.486	21.182	1.862	1.336	1.032	7.474	-
-1.9	17.072	21.486	20.461	22.012	21.486	21.182	1.862	1.336	1.032	8.031	-
-1.8	19.710	21.098	19.116	22.012	21.486	21.182	1.862	1.336	1.032	8.618	-
-1.7	21.226	20.133	17.026	22.012	21.486	22.451	1.862	1.336	2.301	9.239	-
-1.6	21.963	18.276	12.807	22.012	22.696	25.500	1.862	2.546	5.350	9.897	-
-1.5	22.012	14.636	6.730	22.012	25.924	27.670	1.862	5.774	7.520	10.598	-
-1.4	21.221	8.396	12.219	22.356	28.212	29.574	2.206	8.062	9.424	-	-
-1.3	19.134	11.366	18.568	26.346	30.091	31.017	6.196	9.941	10.867	-	-
-1.2	14.816	18.446	22.451	29.111	31.637	32.269	8.961	11.487	12.119	-	-
-1.1	8.050	22.696	25.500	31.161	32.814	33.287	11.011	12.664	13.137	-	-
-1	16.177	25.924	27.670	32.749	33.841	34.097	12.599	13.691	13.947	-	-
-0.9	22.356	28.212	29.574	33.991	34.601	34.786	13.841	14.451	14.636	-	-
-0.8	26.346	30.091	31.017	34.913	35.183	35.264	14.763	15.033	15.114	-	-
-0.7	29.111	31.637	32.269	35.516	35.630	35.661	15.366	15.480	15.511	-	-
-0.6	31.161	32.814	33.287	35.863	35.863	35.863	15.713	15.713	15.713	-	-
-0.5	32.749	33.841	34.097	36.000	36.000	36.000	15.850	15.850	15.850	-	-
-0.4	33.991	34.601	34.786	36.000	36.000	36.000	15.850	15.850	15.850	-	-
-0.3	34.913	35.183	35.264	36.000	36.000	36.000	15.850	15.850	15.850	-	-
-0.2	35.516	35.630	35.661	36.000	36.000	36.000	15.850	15.850	15.850	-	-
-0.1	35.863	35.863	35.863	36.000	36.000	36.000	15.850	15.850	15.850	-	-
0	36.000	36.000	36.000	36.000	36.000	36.000	15.850	15.850	15.850	-	-
0.1	35.879	35.927	35.934	36.000	36.000	36.000	15.850	15.850	15.850	-	-
0.2	35.502	35.718	35.787	36.000	36.000	36.000	15.850	15.850	15.850	-	-
0.3	34.853	35.379	35.487	36.000	36.000	36.000	15.850	15.850	15.850	-	-
0.4	33.946	34.821	35.059	36.000	36.000	36.000	15.850	15.850	15.850	-	-
0.5	32.743	34.145	34.499	36.000	36.000	36.000	15.850	15.850	15.850	-	-
0.6	31.145	33.237	33.748	35.879	35.927	35.934	15.729	15.777	15.784	-	-
0.7	28.983	32.102	32.892	35.502	35.718	35.787	15.352	15.568	15.637	-	-
0.8	26.119	30.777	31.747	34.853	35.379	35.487	14.703	15.229	15.337	-	-
0.9	22.154	29.011	30.485	33.946	34.821	35.059	13.796	14.671	14.909	-	-
1	15.727	26.926	28.831	32.743	34.145	34.499	12.593	13.995	14.349	-	-
1.1	5.572	24.243	26.917	31.145	33.237	33.748	10.995	13.087	13.598	-	-
1.2	15.198	20.360	24.467	28.983	32.102	32.892	8.833	11.952	12.742	-	-
1.3	19.485	14.700	21.177	26.119	30.777	31.747	5.969	10.627	11.597	-	-
1.4	21.483	2.701	16.655	22.466	29.011	30.485	2.316	8.861	10.335	-	-
1.5	22.367	11.343	7.524	22.466	26.926	28.831	2.316	6.776	8.681	10.598	-
1.6	22.466	16.667	5.522	22.466	24.243	26.917	2.316	4.093	6.767	9.897	-
1.7	21.814	19.478	14.106	22.466	21.812	24.467	2.316	1.662	4.317	9.239	-
1.8	20.385	20.866	17.564	22.466	21.812	21.445	2.316	1.662	1.295	8.618	-
1.9	18.096	21.631	19.636	22.466	21.812	21.445	2.316	1.662	1.295	8.031	-

2	14.462	21.812	20.751	22.466	21.812	21.445	2.316	1.662	1.295	7.474	-
2.1	7.552	21.522	21.324	22.466	21.812	21.445	2.316	1.662	1.295	6.945	-
2.2	-1.976	20.858	21.445	21.814	21.812	21.445	1.664	1.662	1.295	6.439	-
2.3	10.121	19.615	21.171	20.385	21.812	21.445	0.235	1.662	1.295	5.957	-
2.4	14.310	17.962	20.560	18.096	21.812	21.445	-2.054	1.662	1.295	5.495	-
2.5	16.398	15.465	19.517	17.494	21.812	21.445	-2.656	1.662	1.295	5.051	-
2.6	17.381	11.809	18.145	17.494	21.522	21.445	-2.656	1.372	1.295	4.626	-
2.7	17.494	6.058	16.073	17.494	20.858	21.445	-2.656	0.708	1.295	4.216	-
2.8	16.765	-1.008	13.467	17.494	19.615	21.171	-2.656	-0.535	1.021	3.821	-
2.9	15.232	6.363	9.282	17.494	17.962	20.560	-2.656	-2.188	0.410	3.440	-
3	12.744	10.732	3.073	17.494	15.465	19.517	-2.656	-4.685	-0.633	3.072	-
3.1	9.032	13.217	-0.603	17.494	15.178	18.145	-2.656	-4.972	-2.005	2.716	-
3.2	6.486	14.475	6.132	17.533	15.178	16.073	-2.617	-4.972	-4.077	2.371	-
3.3	9.882	15.156	9.788	17.549	15.178	13.894	-2.601	-4.972	-6.256	2.037	-
3.4	13.291	15.178	12.016	17.549	15.178	13.894	-2.601	-4.972	-6.256	1.713	-
3.5	15.500	14.770	13.173	17.549	15.178	13.894	-2.601	-4.972	-6.256	1.398	-
3.6	16.858	13.826	13.833	17.549	15.178	13.894	-2.601	-4.972	-6.256	1.092	-
3.7	17.533	12.323	13.894	17.549	15.178	13.894	-2.601	-4.972	-6.256	0.795	-
3.8	17.549	10.284	13.626	17.549	15.178	13.894	-2.601	-4.972	-6.256	0.505	-
3.9	16.966	7.321	12.838	17.549	15.178	13.894	-2.601	-4.972	-6.256	0.223	-
4	15.792	4.564	11.744	17.549	14.770	13.894	-2.601	-5.380	-6.256	-0.051	-
4.1	13.871	4.227	10.020	17.549	13.826	13.894	-2.601	-6.324	-6.256	-0.320	-
4.2	10.788	6.841	7.953	17.549	12.733	13.894	-2.601	-7.417	-6.256	-0.581	-
4.3	5.922	9.118	5.248	17.549	12.733	13.626	-2.601	-7.417	-6.524	-0.837	-
4.4	2.035	10.882	3.205	16.966	12.733	12.838	-3.184	-7.417	-7.312	-1.086	-
4.5	6.126	11.957	3.225	15.792	12.733	11.744	-4.358	-7.417	-8.406	-1.330	-
4.6	9.882	12.536	5.239	13.871	12.733	10.098	-6.279	-7.417	-10.052	-1.569	-
4.7	12.133	12.733	7.046	13.560	12.733	10.098	-6.590	-7.417	-10.052	-1.802	-
4.8	13.275	12.482	8.559	13.560	12.733	10.098	-6.590	-7.417	-10.052	-2.031	-
4.9	13.560	11.929	9.430	13.560	12.733	10.098	-6.590	-7.417	-10.052	-2.255	-
5	13.170	10.910	9.987	13.560	12.733	10.098	-6.590	-7.417	-10.052	-2.474	-
5.1	12.087	9.574	10.098	13.560	12.733	10.098	-6.590	-7.417	-10.052	-2.689	-
5.2	10.061	7.800	9.940	13.560	12.733	10.098	-6.590	-7.417	-10.052	-2.900	-
5.3	6.483	5.707	9.420	13.560	12.482	10.098	-6.590	-7.668	-10.052	-3.107	-
5.4	-0.464	3.954	8.665	13.560	11.929	10.098	-6.590	-8.221	-10.052	-3.310	-
5.5	-13.589	3.409	7.575	13.170	10.910	10.098	-6.980	-9.240	-10.052	-3.509	-
5.6	2.306	4.458	6.327	12.087	9.574	10.098	-8.063	-10.576	-10.052	-3.705	-
5.7	7.128	5.854	4.926	11.183	8.615	9.940	-8.967	-11.535	-10.210	-3.897	-
5.8	9.579	7.174	3.721	11.183	8.615	9.420	-8.967	-11.535	-10.730	-4.086	-
5.9	10.777	7.993	3.023	11.183	8.615	8.665	-8.967	-11.535	-11.485	-4.271	-
6	11.183	8.494	3.069	11.183	8.615	7.575	-8.967	-11.535	-12.575	-4.454	-
6.1	10.932	8.615	3.570	11.183	8.615	6.327	-8.967	-11.535	-13.823	-4.633	-
6.2	9.951	8.387	4.273	11.183	8.615	5.390	-8.967	-11.535	-14.760	-4.810	-
6.3	8.034	7.852	4.831	11.183	8.615	5.390	-8.967	-11.535	-14.760	-4.984	-
6.4	4.932	6.917	5.223	11.183	8.615	5.390	-8.967	-11.535	-14.760	-5.154	-
6.5	-0.129	5.669	5.390	11.183	8.615	5.390	-8.967	-11.535	-14.760	-5.323	-
6.6	-4.849	3.867	5.322	10.932	8.615	5.390	-9.218	-11.535	-14.760	-5.489	-
6.7	1.051	1.551	5.062	9.951	8.387	5.390	-10.199	-11.763	-14.760	-5.652	-
6.8	5.316	-1.566	4.569	9.311	7.852	5.390	-10.839	-12.298	-14.760	-5.813	-
6.9	7.611	-5.862	3.898	9.311	6.917	5.390	-10.839	-13.233	-14.760	-5.971	-
7	8.834	-9.002	2.990	9.311	5.669	5.390	-10.839	-14.481	-14.760	-6.000	-
7.1	9.311	-6.766	1.901	9.311	3.867	5.322	-10.839	-16.283	-14.828	-6.000	-
7.2	9.085	-3.525	0.505	9.311	1.551	5.062	-10.839	-18.599	-15.088	-6.000	-
7.3	8.072	-1.453	-1.103	9.311	0.939	4.569	-10.839	-19.211	-15.581	-6.000	-
7.4	6.256	-0.039	-3.198	9.311	0.939	3.898	-10.839	-19.211	-16.252	-6.000	-
7.5	3.504	0.647	-5.631	9.311	0.939	2.990	-10.839	-19.211	-17.160	-6.000	-
7.6	0.045	0.939	-8.908	9.492	0.939	1.901	-10.658	-19.211	-18.249	-6.000	-
7.7	-0.107	0.807	-12.685	10.034	0.939	0.505	-10.116	-19.211	-19.645	-6.000	-
7.8	3.571	0.321	-16.035	10.034	0.939	-1.103	-10.116	-19.211	-21.253	-6.000	-
7.9	6.459	-0.473	-14.914	10.034	0.939	-3.198	-10.116	-19.211	-23.348	-6.000	-

8	8.335	-1.659	-12.681	10.034	0.939	-5.631	-10.116	-19.211	-25.781	-6.000	-
8.1	9.492	-3.050	-10.750	10.034	0.939	-8.908	-10.116	-19.211	-29.058	-6.000	-
8.2	10.034	-4.806	-9.864	10.034	0.807	-9.339	-10.116	-19.343	-29.489	-6.000	-
8.3	9.945	-6.552	-9.339	10.034	0.321	-9.339	-10.116	-19.829	-29.489	-6.000	-
8.4	9.277	-8.144	-9.426	10.034	-0.473	-9.339	-10.116	-20.623	-29.489	-6.000	-
8.5	8.023	-9.169	-9.719	10.034	-1.659	-9.339	-10.116	-21.809	-29.489	-6.000	-
8.6	6.000	-9.615	-10.325	10.034	-3.050	-9.339	-10.116	-23.200	-29.489	-6.000	-
8.7	2.728	-9.806	-10.955	10.034	-4.806	-9.339	-10.116	-24.956	-29.489	-6.000	-
8.8	-2.520	-10.044	-11.628	9.945	-6.552	-9.339	-10.205	-26.702	-29.489	-6.000	-
8.9	-6.647	-10.686	-12.186	9.277	-8.144	-9.426	-10.873	-28.294	-29.576	-6.000	-
9	-1.703	-11.650	-12.678	8.023	-9.169	-9.719	-12.127	-29.319	-29.869	-6.000	-
9.1	2.106	-13.183	-13.187	6.000	-9.615	-10.325	-14.150	-29.765	-30.475	-6.000	-
9.2	4.189	-15.032	-13.661	5.084	-9.806	-10.603	-15.066	-29.956	-30.753	-6.095	-
9.3	5.065	-17.202	-14.112	5.084	-10.044	-9.252	-15.066	-30.194	-29.402	-6.212	-
9.4	5.084	-18.923	-14.128	5.084	-10.686	-8.005	-15.066	-30.836	-28.155	-6.328	-
9.5	4.329	-19.744	-13.430	5.084	-11.650	-7.179	-15.066	-31.800	-27.329	-6.443	-
9.6	2.598	-20.244	-12.217	5.084	-13.183	-6.601	-15.066	-33.333	-26.751	-6.557	-
9.7	-0.754	-20.746	-10.603	5.084	-15.032	-6.430	-15.066	-35.182	-26.580	-6.669	-
9.8	-7.547	-22.377	-9.252	5.084	-12.726	-6.430	-15.066	-32.876	-26.580	-6.781	-
9.9	-15.177	-23.537	-8.005	5.491	-11.099	-6.430	-14.659	-31.249	-26.580	-6.891	-
10	-3.646	-22.131	-7.179	5.491	-10.188	-6.430	-14.659	-30.338	-26.580	-7.000	-
15	1.421	-4.666	-10.595	1.693	-3.815	-3.608	-18.457	-23.965	-23.758	-11.402	-
20	-11.820	-13.480	-14.315	-4.892	-10.464	-6.622	-25.042	-30.614	-26.772	-14.526	-
25	-13.137	-5.699	-15.722	-6.395	-5.137	-14.494	-26.545	-25.287	-34.644	-16.949	-
30	-9.199	-6.353	-23.054	-8.680	-5.097	-11.712	-28.830	-25.247	-31.862	-18.928	-
35	-8.881	-12.461	-22.739	-7.841	-8.263	-6.565	-27.991	-28.413	-26.715	-20.602	-
40	-8.300	-16.112	-24.118	-6.143	-14.701	-16.448	-26.293	-34.851	-36.598	-22.051	-
45	-10.551	-17.548	-6.008	-8.588	-10.565	-4.272	-28.738	-30.715	-24.422	-23.330	-
50	-16.923	-1.866	-4.450	-10.144	-1.254	-3.797	-30.294	-21.404	-23.947	-24.000	2.596
55	-6.197	-9.403	-19.858	-4.036	-9.282	-9.662	-24.186	-29.432	-29.812	-24.000	-
60	-7.074	-4.720	-5.098	-5.698	-3.948	-4.478	-25.848	-24.098	-24.628	-24.000	-
65	-3.722	-4.539	-12.326	-3.669	-4.265	-12.158	-23.819	-24.415	-32.308	-24.000	0.181
70	-11.896	-6.543	-6.668	-8.767	-5.056	-6.231	-28.917	-25.206	-26.381	-24.000	-
75	-3.908	-13.238	-6.065	-2.966	-10.489	-6.057	-23.116	-30.639	-26.207	-24.000	0.884
80	-10.257	-8.499	-11.173	-8.483	-6.801	-10.696	-28.633	-26.951	-30.846	-24.000	-
85	-7.278	-2.849	-12.538	-6.510	-2.754	-11.968	-26.660	-22.904	-32.118	-14.000	-
90	-5.140	-11.031	-20.740	-5.049	-10.734	-20.479	-25.199	-30.884	-40.629	-14.000	-
95	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
100	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
105	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
110	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
115	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
120	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
125	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
130	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
135	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
140	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
145	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
150	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
155	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
160	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
165	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
170	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
175	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
180	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-

14.0GHz V-Pol, Nominal Transmitted Co-Pol PSD with -20.15dBW/4KHz at Input





Data in support of claim that proposed operation meets criteria of VMES Order July 2009

Applicant RAS

Date of Application

ID Heading

a1 Antenna Manufacture: RAS c Main bore gain (dBi): 36.0  
 a2 Antenna Model: E7000 d Frequency at which gain was measured (GHz): 14.25  
 a3 Antenna ID: RAS e Max input power density (dBW/4kHz): -20.15  
 b Transmit Band (b): 14GHz Pattern ID Table A3  
 Pattern Description: 14.25GHz H-polarization, co-polarized at tangent to the geosynchronous plane for 0°, 37.5°, and 50° skew angle

Offset Angles  (Degrees)	Nominal Co-Pol Gain Along Tangent to Geo Arc			Worst Case Co-Pol Gain Along Tangent to Geo Arc			Worst Case Co-Pol PSD Along Tangent to Geo Arc input PSD = -20.15dBW/4kHz			FCC Mask (dBW/4kHz)	Mask Exceedence  (dB)
	(dBi)			(dBi)			(dBW/4kHz)				
	0? Skew	37.5? Skew	50? Skew	0? Skew	37.5? Skew	50? Skew	0? Skew	37.5? Skew	50? Skew		
-180	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-175	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-170	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-165	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-160	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-155	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-150	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-145	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-140	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-135	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-130	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-125	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-120	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-115	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-110	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-105	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-100	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-95	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-90	-10.513	-20.397	-12.400	-10.363	-19.781	-12.100	-30.513	-39.931	-32.250	-14.000	-
-85	-7.479	-15.045	-9.306	-7.138	-14.818	-9.061	-27.288	-34.968	-29.211	-14.000	-
-80	-9.637	-7.668	-11.548	-8.380	-6.818	-11.522	-28.530	-26.968	-31.672	-24.000	-
-75	-8.588	-9.805	-16.741	-8.191	-8.964	-14.699	-28.341	-29.114	-34.849	-24.000	-
-70	-8.244	-20.788	-10.170	-6.389	-14.592	-7.986	-26.539	-34.742	-28.136	-24.000	-
-65	-14.690	-20.577	-8.566	-12.831	-18.840	-8.328	-32.981	-38.990	-28.478	-24.000	-
-60	-7.388	-16.212	-13.532	-7.366	-11.453	-12.686	-27.516	-31.603	-32.836	-24.000	-
-55	-7.540	-19.893	-11.088	-7.109	-13.761	-7.907	-27.259	-33.911	-28.057	-24.000	-
-50	-14.973	-2.458	-25.460	-14.465	-1.408	-15.042	-34.615	-21.558	-35.192	-24.000	2.442
-45	-10.191	-15.909	-30.944	-9.780	-11.043	-12.519	-29.930	-31.193	-32.669	-23.330	-
-40	-14.148	-14.274	-8.623	-9.384	-11.725	-8.519	-29.534	-31.875	-28.669	-22.051	-
-35	-18.106	-18.352	-13.539	-7.115	-13.017	-8.459	-27.265	-33.167	-28.609	-20.602	-
-30	-19.012	-18.345	-12.947	-18.712	-10.549	-11.716	-38.862	-30.699	-31.866	-18.928	-
-25	-9.430	-19.793	-13.417	-9.208	-12.862	-11.678	-29.358	-33.012	-31.828	-16.949	-
-20	-6.410	-14.374	-22.636	-5.158	-13.676	-18.400	-25.308	-33.826	-38.550	-14.526	-
-15	-7.547	-12.503	-14.550	0.550	-5.721	-10.986	-19.600	-25.871	-31.136	-11.402	-
-10	1.048	-5.467	-18.714	3.541	-4.601	-1.961	-16.609	-24.751	-22.111	-7.000	-



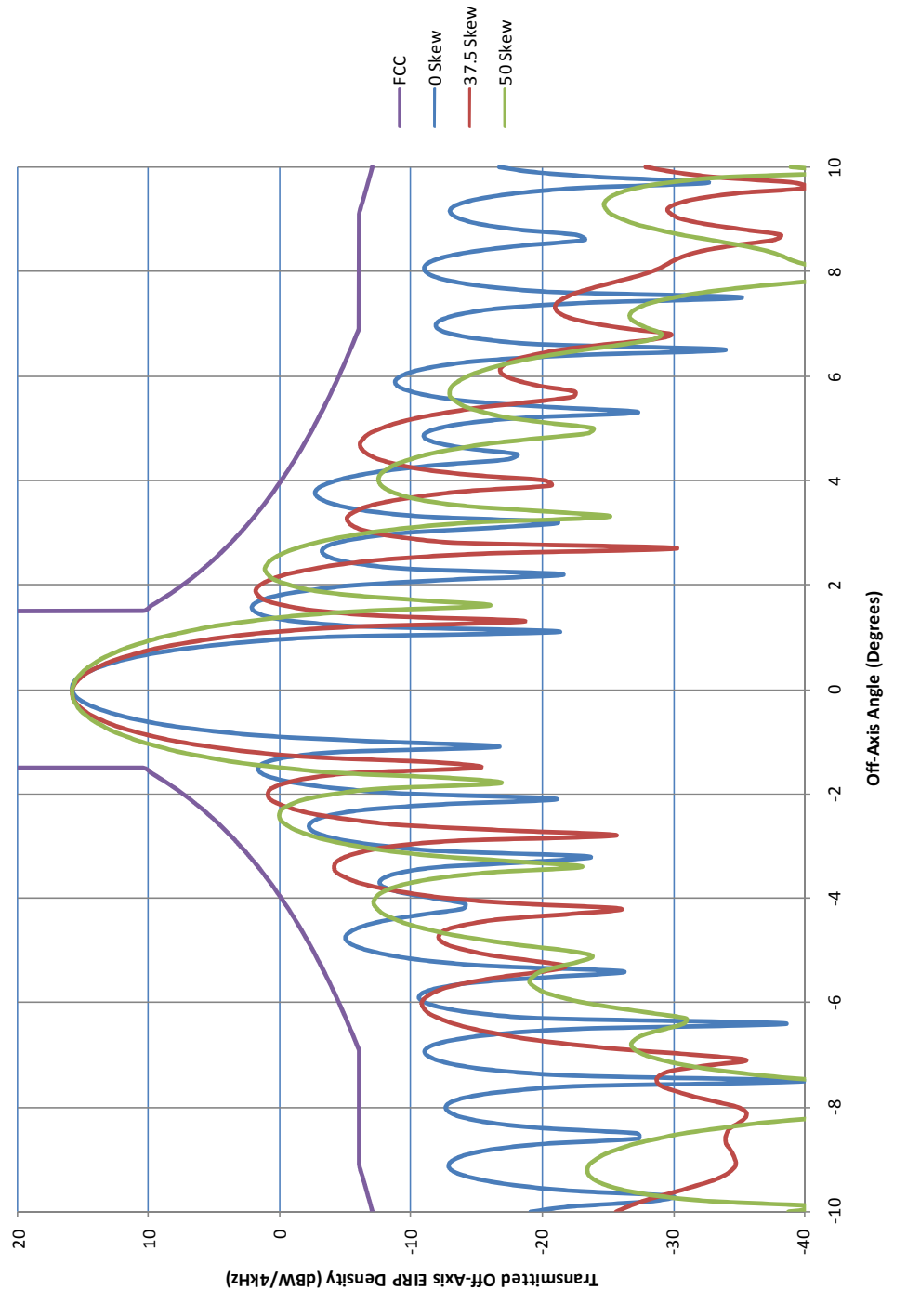
-9.9	-2.050	-6.388	-21.006	4.563	-4.601	-3.142	-15.587	-24.751	-23.292	-6.891	-
-9.8	-8.145	-7.487	-12.856	6.220	-4.601	-3.471	-13.930	-24.751	-23.621	-6.781	-
-9.7	-9.762	-8.804	-8.870	7.094	-4.601	-3.358	-13.056	-24.751	-23.508	-6.669	-
-9.6	-2.190	-10.248	-6.411	7.279	-4.907	-3.358	-12.871	-25.057	-23.508	-6.557	-
-9.5	1.974	-11.587	-4.912	7.279	-5.467	-3.358	-12.871	-25.617	-23.508	-6.443	-
-9.4	4.563	-12.872	-3.977	7.279	-6.388	-3.358	-12.871	-26.538	-23.508	-6.328	-
-9.3	6.220	-13.768	-3.471	7.279	-7.487	-3.358	-12.871	-27.637	-23.508	-6.212	-
-9.2	7.094	-14.309	-3.358	7.279	-8.804	-3.358	-12.871	-28.954	-23.508	-6.095	-
-9.1	7.279	-14.613	-3.490	7.279	-10.248	-3.358	-12.871	-30.398	-23.508	-6.000	-
-9	6.874	-14.548	-3.995	7.279	-11.587	-3.358	-12.871	-31.737	-23.508	-6.000	-
-8.9	5.808	-14.383	-4.658	7.279	-12.872	-3.358	-12.871	-33.022	-23.508	-6.000	-
-8.8	3.744	-14.158	-5.749	7.279	-13.768	-3.358	-12.871	-33.918	-23.508	-6.000	-
-8.7	-0.047	-13.872	-6.959	7.279	-13.822	-3.358	-12.871	-33.972	-23.508	-6.000	-
-8.6	-7.156	-13.822	-8.745	7.279	-13.822	-3.490	-12.871	-33.972	-23.640	-6.000	-
-8.5	-7.059	-13.920	-10.673	7.506	-13.822	-3.995	-12.644	-33.972	-24.145	-6.000	-
-8.4	0.121	-14.169	-13.497	7.506	-13.198	-4.658	-12.644	-33.348	-24.808	-6.000	-
-8.3	3.997	-14.835	-16.627	7.506	-11.484	-5.749	-12.644	-31.634	-25.899	-6.000	-
-8.2	6.132	-15.327	-21.163	7.506	-10.125	-6.959	-12.644	-30.275	-27.109	-6.000	-
-8.1	7.194	-15.398	-25.246	7.506	-8.975	-8.745	-12.644	-29.125	-28.895	-6.000	-
-8	7.506	-14.780	-25.223	7.506	-8.576	-10.673	-12.644	-28.726	-30.823	-6.000	-
-7.9	7.101	-13.198	-24.530	7.506	-8.576	-13.497	-12.644	-28.726	-33.647	-6.000	-
-7.8	5.748	-11.484	-23.839	7.506	-8.576	-13.612	-12.644	-28.726	-33.762	-6.000	-
-7.7	3.009	-10.125	-25.613	7.506	-8.576	-10.968	-12.644	-28.726	-31.118	-6.000	-
-7.6	-2.286	-8.975	-25.787	8.133	-8.576	-9.107	-12.017	-28.726	-29.257	-6.000	-
-7.5	-19.891	-8.576	-21.697	8.957	-8.576	-7.767	-11.193	-28.726	-27.917	-6.000	-
-7.4	-2.732	-8.756	-17.089	9.071	-6.350	-7.013	-11.079	-26.500	-27.163	-6.000	-
-7.3	3.397	-9.733	-13.612	9.071	-2.208	-6.708	-11.079	-22.358	-26.858	-6.000	-
-7.2	6.463	-12.401	-10.968	9.071	1.104	-6.708	-11.079	-19.046	-26.858	-6.000	-
-7.1	8.133	-15.404	-9.107	9.071	3.437	-6.708	-11.079	-16.713	-26.858	-6.000	-
-7	8.957	-11.707	-7.767	9.071	5.418	-6.708	-11.079	-14.732	-26.858	-6.000	-
-6.9	9.071	-6.350	-7.013	9.071	6.903	-6.708	-11.079	-13.247	-26.858	-5.971	-
-6.8	8.368	-2.208	-6.708	9.071	7.988	-6.708	-11.079	-12.162	-26.858	-5.813	-
-6.7	6.659	1.104	-7.018	9.071	8.816	-6.708	-11.079	-11.334	-26.858	-5.652	-
-6.6	3.581	3.437	-7.800	9.071	9.205	-5.630	-11.079	-10.945	-25.780	-5.489	-
-6.5	-2.577	5.418	-9.318	9.071	9.348	-3.158	-11.079	-10.802	-23.308	-5.323	-
-6.4	-18.469	6.903	-10.701	9.553	9.348	-1.418	-10.597	-10.802	-21.568	-5.154	-
-6.3	0.057	7.988	-10.895	9.553	9.348	-0.072	-10.597	-10.802	-20.222	-4.984	-
-6.2	5.089	8.816	-8.347	9.553	9.348	0.650	-10.597	-10.802	-19.500	-4.810	-
-6.1	7.650	9.205	-5.630	9.553	9.348	1.052	-10.597	-10.802	-19.098	-4.633	-
-6	9.030	9.348	-3.158	9.553	9.348	1.052	-10.597	-10.802	-19.098	-4.454	-
-5.9	9.553	9.077	-1.418	9.553	9.348	1.052	-10.597	-10.802	-19.098	-4.271	-
-5.8	9.175	8.407	-0.072	9.553	9.348	1.052	-10.597	-10.802	-19.098	-4.086	-
-5.7	7.731	7.355	0.650	9.553	9.348	1.052	-10.597	-10.802	-19.098	-3.897	-
-5.6	4.873	5.520	1.052	11.555	9.348	1.052	-8.595	-10.802	-19.098	-3.705	-
-5.5	-0.899	3.151	0.781	13.377	9.348	1.052	-6.773	-10.802	-19.098	-3.509	-
-5.4	-6.028	0.075	0.174	14.534	9.077	1.677	-5.616	-11.073	-18.473	-3.310	-
-5.3	3.844	-1.626	-1.290	15.104	8.407	4.451	-5.046	-11.743	-15.699	-3.107	-
-5.2	8.719	0.773	-2.898	15.104	7.998	6.946	-5.046	-12.152	-13.204	-2.900	-
-5.1	11.555	3.838	-3.733	15.104	7.998	8.731	-5.046	-12.152	-11.419	-2.689	-
-5	13.377	5.846	-1.760	15.104	7.998	10.288	-5.046	-12.152	-9.862	-2.474	-
-4.9	14.534	7.281	1.677	15.104	7.998	11.354	-5.046	-12.152	-8.796	-2.255	-
-4.8	15.104	7.956	4.451	15.104	7.998	12.227	-5.046	-12.152	-7.923	-2.031	-
-4.7	15.071	7.998	6.946	15.104	7.998	12.705	-5.046	-12.152	-7.445	-1.802	-
-4.6	14.496	7.477	8.731	15.104	7.998	12.967	-5.046	-12.152	-7.183	-1.569	-
-4.5	13.381	5.903	10.288	15.104	7.998	12.967	-5.046	-12.152	-7.183	-1.330	-
-4.4	11.606	3.296	11.354	15.104	10.316	12.967	-5.046	-9.834	-7.183	-1.086	-
-4.3	9.001	-1.990	12.227	15.104	12.575	12.967	-5.046	-7.575	-7.183	-0.837	-
-4.2	6.222	-5.821	12.705	15.071	14.167	12.967	-5.079	-5.983	-7.183	-0.581	-
-4.1	6.062	2.082	12.967	14.496	15.178	12.967	-5.654	-4.972	-7.183	-0.320	-
-4	8.453	7.279	12.852	13.381	15.870	12.967	-6.769	-4.280	-7.183	-0.051	-

-3.9	10.708	10.316	12.426	12.555	16.025	12.967	-7.595	-4.125	-7.183	0.223	-
-3.8	12.102	12.575	11.532	12.555	16.025	12.967	-7.595	-4.125	-7.183	0.505	-
-3.7	12.555	14.167	10.070	12.555	16.025	12.967	-7.595	-4.125	-7.183	0.795	-
-3.6	12.156	15.178	7.681	12.555	16.025	12.967	-7.595	-4.125	-7.183	1.092	-
-3.5	10.802	15.870	3.702	12.555	16.025	14.274	-7.595	-4.125	-5.876	1.398	-
-3.4	7.890	16.025	-2.956	15.020	16.025	16.284	-5.130	-4.125	-3.866	1.713	-
-3.3	0.798	15.841	1.898	16.808	16.025	17.750	-3.342	-4.125	-2.400	2.037	-
-3.2	-3.349	15.100	7.738	17.730	16.025	18.874	-2.420	-4.125	-1.276	2.371	-
-3.1	7.512	13.682	11.634	17.923	16.025	19.608	-2.227	-4.125	-0.542	2.716	-
-3	12.190	11.420	14.274	17.923	16.025	20.087	-2.227	-4.125	-0.063	3.072	-
-2.9	15.020	6.767	16.284	17.923	17.306	20.166	-2.227	-2.844	0.016	3.440	-
-2.8	16.808	-5.473	17.750	17.923	19.020	20.166	-2.227	-1.130	0.016	3.821	-
-2.7	17.730	2.982	18.874	17.923	20.191	20.166	-2.227	0.041	0.016	4.216	-
-2.6	17.923	10.759	19.608	17.923	20.917	20.166	-2.227	0.767	0.016	4.626	-
-2.5	17.444	14.583	20.087	17.923	21.066	20.166	-2.227	0.916	0.016	5.051	-
-2.4	16.138	17.306	20.166	17.923	21.066	20.166	-2.227	0.916	0.016	5.495	-
-2.3	13.439	19.020	19.991	18.743	21.066	20.166	-1.407	0.916	0.016	5.957	-
-2.2	7.733	20.191	19.261	20.634	21.066	20.166	0.484	0.916	0.016	6.439	-
-2.1	-0.945	20.917	18.132	21.589	21.066	20.166	1.439	0.916	0.016	6.945	-
-2	10.263	21.066	15.888	21.807	21.066	20.166	1.657	0.916	0.016	7.474	-
-1.9	15.597	20.822	12.326	21.807	21.066	23.355	1.657	0.916	3.205	8.031	-
-1.8	18.743	19.811	3.335	21.807	21.066	25.686	1.657	0.916	5.536	8.618	-
-1.7	20.634	17.971	6.971	21.807	22.222	27.774	1.657	2.072	7.624	9.239	-
-1.6	21.589	14.438	15.658	21.807	25.398	29.327	1.657	5.248	9.177	9.897	-
-1.5	21.807	4.943	19.976	21.807	27.961	30.776	1.657	7.811	10.626	10.598	-
-1.4	21.261	8.114	23.355	21.807	29.825	31.874	1.657	9.675	11.724	-	-
-1.3	19.602	17.554	25.686	25.254	31.403	32.908	5.104	11.253	12.758	-	-
-1.2	15.718	22.222	27.774	28.409	32.695	33.682	8.259	12.545	13.532	-	-
-1.1	3.440	25.398	29.327	30.670	33.678	34.404	10.520	13.528	14.254	-	-
-1	12.573	27.961	30.776	32.371	34.532	34.918	12.221	14.382	14.768	-	-
-0.9	20.703	29.825	31.874	33.689	35.134	35.382	13.539	14.984	15.232	-	-
-0.8	25.254	31.403	32.908	34.703	35.583	35.667	14.553	15.433	15.517	-	-
-0.7	28.409	32.695	33.682	35.418	35.893	35.904	15.268	15.743	15.754	-	-
-0.6	30.670	33.678	34.404	35.832	35.998	35.976	15.682	15.848	15.826	-	-
-0.5	32.371	34.532	34.918	36.000	36.000	36.000	15.850	15.850	15.850	-	-
-0.4	33.689	35.134	35.382	36.000	36.000	36.000	15.850	15.850	15.850	-	-
-0.3	34.703	35.583	35.667	36.000	36.000	36.000	15.850	15.850	15.850	-	-
-0.2	35.418	35.893	35.904	36.000	36.000	36.000	15.850	15.850	15.850	-	-
-0.1	35.832	35.998	35.976	36.000	36.000	36.000	15.850	15.850	15.850	-	-
0	36.000	36.000	36.000	36.000	36.000	36.000	15.850	15.850	15.850	-	-
0.1	35.947	35.804	35.860	36.000	36.000	36.000	15.850	15.850	15.850	-	-
0.2	35.654	35.466	35.672	36.000	36.000	36.000	15.850	15.850	15.850	-	-
0.3	35.069	34.984	35.311	36.000	36.000	36.000	15.850	15.850	15.850	-	-
0.4	34.194	34.261	34.902	36.000	36.000	36.000	15.850	15.850	15.850	-	-
0.5	33.031	33.415	34.296	36.000	36.000	36.000	15.850	15.850	15.850	-	-
0.6	31.516	32.288	33.640	35.947	35.804	35.860	15.797	15.654	15.710	-	-
0.7	29.502	30.900	32.745	35.654	35.466	35.672	15.504	15.316	15.522	-	-
0.8	26.721	29.264	31.791	35.069	34.984	35.311	14.919	14.834	15.161	-	-
0.9	22.852	27.037	30.524	34.194	34.261	34.902	14.044	14.111	14.752	-	-
1	16.714	24.339	29.169	33.031	33.415	34.296	12.881	13.265	14.146	-	-
1.1	-1.186	20.577	27.361	31.516	32.288	33.640	11.366	12.138	13.490	-	-
1.2	13.480	14.281	25.368	29.502	30.900	32.745	9.352	10.750	12.595	-	-
1.3	18.914	1.462	22.581	26.721	29.264	31.791	6.571	9.114	11.641	-	-
1.4	21.193	11.936	19.213	22.852	27.037	30.524	2.702	6.887	10.374	-	-
1.5	22.134	17.180	13.589	22.253	24.339	29.169	2.103	4.189	9.019	10.598	-
1.6	22.253	19.711	4.134	22.253	22.004	27.361	2.103	1.854	7.211	9.897	-
1.7	21.663	21.213	9.130	22.253	22.004	25.368	2.103	1.854	5.218	9.239	-
1.8	20.256	21.827	14.567	22.253	22.004	22.581	2.103	1.854	2.431	8.618	-
1.9	17.860	22.004	17.773	22.253	22.004	21.271	2.103	1.854	1.121	8.031	-

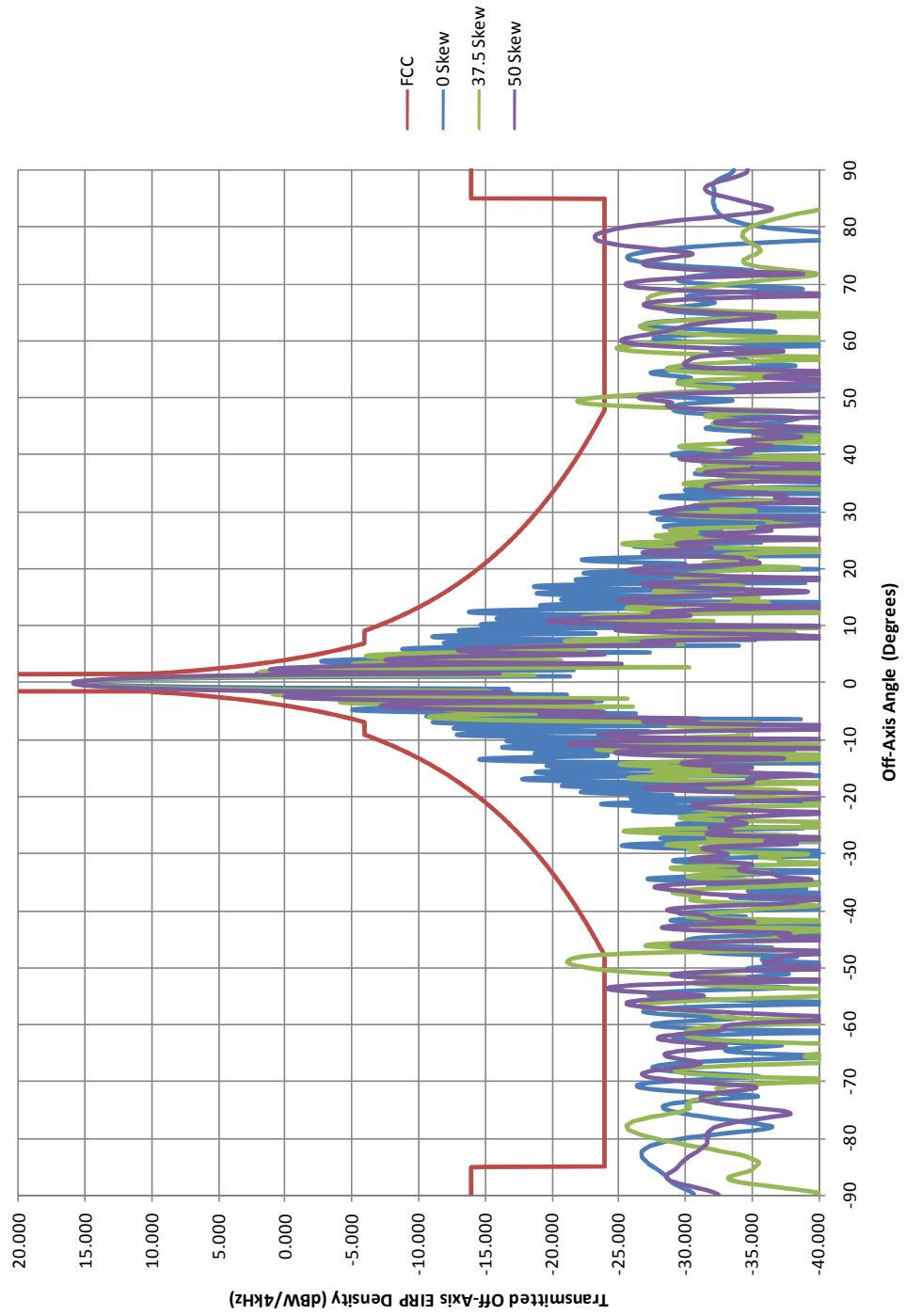
2	14.063	21.657	19.410	22.253	22.004	21.271	2.103	1.854	1.121	7.474	-
2.1	6.994	20.884	20.550	22.253	22.004	21.271	2.103	1.854	1.121	6.945	-
2.2	-1.444	19.694	21.042	21.663	22.004	21.271	1.513	1.854	1.121	6.439	-
2.3	10.032	17.800	21.271	20.256	22.004	21.271	0.106	1.854	1.121	5.957	-
2.4	14.141	15.319	21.087	17.860	22.004	21.271	-2.290	1.854	1.121	5.495	-
2.5	16.060	11.362	20.678	16.864	21.657	21.271	-3.286	1.507	1.121	5.051	-
2.6	16.864	4.309	19.920	16.864	20.884	21.271	-3.286	0.734	1.121	4.626	-
2.7	16.828	-10.138	18.903	16.864	19.694	21.271	-3.286	-0.456	1.121	4.216	-
2.8	15.906	6.182	17.493	16.864	17.800	21.271	-3.286	-2.350	1.121	3.821	-
2.9	13.893	10.632	15.700	16.864	15.319	21.087	-3.286	-4.831	0.937	3.440	-
3	10.384	13.058	13.272	16.864	15.019	20.678	-3.286	-5.131	0.528	3.072	-
3.1	3.528	14.399	10.000	16.864	15.019	19.920	-3.286	-5.131	-0.230	2.716	-
3.2	-0.925	14.938	4.878	17.353	15.019	18.903	-2.797	-5.131	-1.247	2.371	-
3.3	8.696	15.019	-4.957	17.427	15.019	17.493	-2.723	-5.131	-2.657	2.037	-
3.4	13.025	14.471	-0.570	17.427	15.019	15.700	-2.723	-5.131	-4.450	1.713	-
3.5	15.358	13.505	5.508	17.427	15.019	13.272	-2.723	-5.131	-6.878	1.398	-
3.6	16.690	11.832	8.774	17.427	15.019	12.593	-2.723	-5.131	-7.557	1.092	-
3.7	17.353	9.323	10.616	17.427	15.019	12.593	-2.723	-5.131	-7.557	0.795	-
3.8	17.427	5.645	11.764	17.427	15.019	12.593	-2.723	-5.131	-7.557	0.505	-
3.9	16.897	-0.486	12.381	17.427	14.471	12.593	-2.723	-5.679	-7.557	0.223	-
4	15.810	-0.005	12.593	17.427	13.505	12.593	-2.723	-6.645	-7.557	-0.051	-
4.1	14.130	5.357	12.499	17.427	13.919	12.593	-2.723	-6.231	-7.557	-0.320	-
4.2	11.639	8.979	12.038	17.427	14.057	12.593	-2.723	-6.093	-7.557	-0.581	-
4.3	7.876	11.086	11.343	17.427	14.057	12.593	-2.723	-6.093	-7.557	-0.837	-
4.4	2.860	12.592	10.208	16.897	14.057	12.593	-3.253	-6.093	-7.557	-1.086	-
4.5	2.059	13.456	8.823	15.810	14.057	12.593	-4.340	-6.093	-7.557	-1.330	-
4.6	5.474	13.919	6.767	14.130	14.057	12.499	-6.020	-6.093	-7.651	-1.569	-
4.7	7.883	14.057	4.300	11.639	14.057	12.038	-8.511	-6.093	-8.112	-1.802	-
4.8	9.052	13.807	0.559	9.082	14.057	11.343	-11.068	-6.093	-8.807	-2.031	-
4.9	9.082	13.317	-3.362	9.082	14.057	10.208	-11.068	-6.093	-9.942	-2.255	-
5	8.032	12.411	-3.794	9.082	14.057	8.823	-11.068	-6.093	-11.327	-2.474	-
5.1	5.780	11.220	-0.400	9.082	14.057	7.102	-11.068	-6.093	-13.048	-2.689	-
5.2	1.479	9.602	2.644	10.147	14.057	7.150	-10.003	-6.093	-13.000	-2.900	-
5.3	-7.145	7.397	4.481	11.139	13.807	7.150	-9.011	-6.343	-13.000	-3.107	-
5.4	-0.608	4.715	5.880	11.362	13.317	7.150	-8.788	-6.833	-13.000	-3.310	-
5.5	5.193	1.043	6.612	11.362	12.411	7.150	-8.788	-7.739	-13.000	-3.509	-
5.6	8.303	-2.180	7.102	11.362	11.220	7.150	-8.788	-8.930	-13.000	-3.705	-
5.7	10.147	-2.326	7.150	11.362	9.602	7.150	-8.788	-10.548	-13.000	-3.897	-
5.8	11.139	0.163	6.996	11.362	7.397	7.150	-8.788	-12.753	-13.000	-4.086	-
5.9	11.362	1.896	6.481	11.362	4.715	7.150	-8.788	-15.435	-13.000	-4.271	-
6	10.893	2.998	5.756	11.362	3.368	7.150	-8.788	-16.782	-13.000	-4.454	-
6.1	9.761	3.368	4.671	11.362	3.368	7.150	-8.788	-16.782	-13.000	-4.633	-
6.2	7.774	3.125	3.335	11.362	3.368	7.150	-8.788	-16.782	-13.000	-4.810	-
6.3	4.303	2.348	1.575	11.362	3.368	6.996	-8.788	-16.782	-13.154	-4.984	-
6.4	-2.757	0.851	-0.528	11.362	3.368	6.481	-8.788	-16.782	-13.669	-5.154	-
6.5	-13.826	-1.240	-3.117	10.893	3.368	5.756	-9.257	-16.782	-14.394	-5.323	-
6.6	0.017	-4.541	-5.989	9.761	3.368	4.671	-10.389	-16.782	-15.479	-5.489	-
6.7	4.633	-8.340	-8.357	8.233	3.125	3.335	-11.917	-17.025	-16.815	-5.652	-
6.8	7.012	-9.657	-9.049	8.233	2.348	1.575	-11.917	-17.802	-18.575	-5.813	-
6.9	8.096	-6.432	-8.115	8.233	0.851	-0.528	-11.917	-19.299	-20.678	-5.971	-
7	8.233	-3.862	-7.205	8.233	-0.839	-3.117	-11.917	-20.989	-23.267	-6.000	-
7.1	7.590	-2.083	-6.653	8.233	-0.839	-5.989	-11.917	-20.989	-26.139	-6.000	-
7.2	6.045	-1.163	-6.659	8.233	-0.839	-6.653	-11.917	-20.989	-26.803	-6.000	-
7.3	3.037	-0.839	-7.201	8.233	-0.839	-6.653	-11.917	-20.989	-26.803	-6.000	-
7.4	-3.219	-0.977	-8.240	8.365	-0.839	-6.653	-11.785	-20.989	-26.803	-6.000	-
7.5	-15.081	-1.603	-9.932	9.052	-0.839	-6.653	-11.098	-20.989	-26.803	-6.000	-
7.6	-1.156	-2.556	-12.238	9.100	-0.839	-6.653	-11.050	-20.989	-26.803	-6.000	-
7.7	3.981	-3.913	-15.581	9.100	-0.839	-6.659	-11.050	-20.989	-26.809	-6.000	-
7.8	6.810	-5.403	-19.961	9.100	-0.839	-7.201	-11.050	-20.989	-27.351	-6.000	-
7.9	8.365	-6.947	-24.285	9.100	-0.977	-8.240	-11.050	-21.127	-28.390	-6.000	-

8	9.052	-8.197	-23.270	9.100	-1.603	-9.932	-11.050	-21.753	-30.082	-6.000	-
8.1	9.100	-9.094	-20.660	9.100	-2.556	-12.238	-11.050	-22.706	-32.388	-6.000	-
8.2	8.533	-9.796	-19.123	9.100	-3.913	-10.549	-11.050	-24.063	-30.699	-6.000	-
8.3	7.199	-10.754	-18.190	9.100	-5.403	-8.721	-11.050	-25.553	-28.871	-6.000	-
8.4	4.892	-12.172	-16.936	9.100	-6.947	-7.124	-11.050	-27.097	-27.274	-6.000	-
8.5	1.401	-14.562	-15.042	9.100	-8.197	-6.019	-11.050	-28.347	-26.169	-6.000	-
8.6	-3.046	-17.486	-12.815	9.100	-9.094	-5.164	-11.050	-29.244	-25.314	-6.000	-
8.7	-2.419	-18.027	-10.549	8.533	-9.420	-4.752	-11.617	-29.570	-24.902	-6.000	-
8.8	1.922	-15.285	-8.721	7.199	-9.420	-4.634	-12.951	-29.570	-24.784	-6.000	-
8.9	4.766	-12.484	-7.124	7.113	-9.420	-4.634	-13.037	-29.570	-24.784	-6.000	-
9	6.335	-10.529	-6.019	7.113	-9.420	-4.634	-13.037	-29.570	-24.784	-6.000	-
9.1	7.072	-9.671	-5.164	7.113	-9.420	-4.634	-13.037	-29.570	-24.784	-6.000	-
9.2	7.113	-9.420	-4.752	7.113	-9.420	-4.634	-13.037	-29.570	-24.784	-6.095	-
9.3	6.380	-10.173	-4.634	7.113	-9.420	-4.634	-13.037	-29.570	-24.784	-6.212	-
9.4	4.747	-11.847	-4.969	7.113	-9.420	-4.634	-13.037	-29.570	-24.784	-6.328	-
9.5	1.982	-14.844	-5.743	7.113	-7.730	-4.634	-13.037	-27.880	-24.784	-6.443	-
9.6	-2.890	-20.073	-7.153	7.113	-6.350	-4.634	-13.037	-26.500	-24.784	-6.557	-
9.7	-12.544	-19.033	-9.513	7.113	-5.799	-4.634	-13.037	-25.949	-24.784	-6.669	-
9.8	-4.705	-13.324	-13.627	6.380	-5.693	-4.258	-13.770	-25.843	-24.408	-6.781	-
9.9	0.710	-9.958	-23.110	5.484	-5.693	-2.469	-14.666	-25.843	-22.619	-6.891	-
10	3.431	-7.730	-18.895	5.484	-5.693	-1.102	-14.666	-25.843	-21.252	-7.000	-
15	-8.584	-15.343	-7.442	0.314	-10.132	-4.907	-19.836	-30.282	-25.057	-11.402	-
20	-16.024	-17.227	-6.300	-4.243	-11.884	-5.579	-24.393	-32.034	-25.729	-14.526	-
25	-12.409	-16.349	-15.319	-12.409	-5.508	-9.487	-32.559	-25.658	-29.637	-16.949	-
30	-8.385	-14.121	-8.141	-7.261	-9.016	-8.124	-27.411	-29.166	-28.274	-18.928	-
35	-27.397	-9.813	-12.728	-13.376	-9.733	-11.484	-33.526	-29.883	-31.634	-20.602	-
40	-8.852	-13.733	-13.034	-8.827	-12.388	-9.649	-28.977	-32.538	-29.799	-22.051	-
45	-12.381	-13.981	-17.099	-11.380	-11.895	-12.365	-31.530	-32.045	-32.515	-23.330	-
50	-10.011	-3.004	-6.437	-7.587	-1.778	-6.420	-27.737	-21.928	-26.570	-24.000	2.072
55	-10.764	-8.515	-13.981	-7.458	-8.464	-10.331	-27.608	-28.614	-30.481	-24.000	-
60	-8.961	-14.699	-5.078	-7.448	-7.799	-5.078	-27.598	-27.949	-25.228	-24.000	-
65	-9.571	-15.697	-11.959	-8.377	-10.817	-8.803	-28.527	-30.967	-28.953	-24.000	-
70	-11.281	-13.244	-5.404	-9.467	-11.405	-5.404	-29.617	-31.555	-25.554	-24.000	-
75	-5.701	-14.938	-10.018	-5.493	-14.488	-8.377	-25.643	-34.638	-28.527	-24.000	-
80	-15.578	-14.753	-5.546	-14.306	-14.449	-4.434	-34.456	-34.599	-24.584	-24.000	-
85	-11.970	-24.230	-13.331	-11.920	-23.347	-12.423	-32.070	-43.497	-32.573	-14.000	-
90	-13.471	-34.498	-14.545	-13.325	-34.156	-14.421	-33.475	-54.306	-34.571	-14.000	-
95	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
100	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
105	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
110	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
115	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
120	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
125	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
130	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
135	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
140	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
145	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
150	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
155	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
160	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
165	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
170	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
175	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
180	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-

14.25GHz H-Pol, Nominal Transmitted Co-Pol PSD with -20.15dBW/4KHz at Input



14.25GHz H-Pol Nominal Transmitted Co-Pol PSD with -20.15dBW/4kHz at Input



**Data in support of claim that proposed operation meets criteria of VMES Order July 2009**

**Applicant** RAS

**Date of Application**

**ID Heading**

<b>a1</b>	<b>Antenna Manufacture:</b>	RAS	<b>c</b>	<b>Main bore gain (dBi):</b>	36.0
<b>a2</b>	<b>Antenna Model:</b>	E7000	<b>d</b>	<b>Frequency at which gain was measured (GHz):</b>	14.25
<b>a3</b>	<b>Antenna ID:</b>	RAS	<b>e</b>	<b>Max input power density (dBW/4kHz):</b>	-20.15
<b>b</b>	<b>Transmit Band (b):</b>	14GHz	<b>Pattern ID</b>	Table A4	
	<b>Pattern Description:</b>	<b>14.25GHz V-polarization, co-polarized at tangent to the geosynchronous plane for 0°, 37.5°, and 50° skew angle</b>			

Offset Angles  (Degrees)	Nominal Co-Pol Gain Along Tangent to Geo Arc  (dBi)			Worst Case Co-Pol Gain Along Tangent to Geo Arc  (dBi)			Worst Case Co-Pol PSD Along Tangent to Geo Arc input PSD = -20.15dBW/4kHz  (dBW/4kHz)			FCC Mask (dBW/4kHz)	Mask Exceedence  (dB)
	0? Skew	37.5? Skew	50? Skew	0? Skew	37.5? Skew	50? Skew	0? Skew	37.5? Skew	50? Skew		
	-180	6	6	6	6	6	6	-14.150	-14.150		
-175	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-170	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-165	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-160	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-155	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-150	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-145	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-140	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-135	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-130	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-125	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-120	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-115	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-110	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-105	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-100	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-95	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-90	-4.570	-19.476	-23.027	-4.368	-18.791	-22.522	-24.518	-38.941	-42.672	-14.000	-
-85	-4.261	-19.409	-12.762	-3.961	-16.718	-11.707	-24.111	-36.868	-31.857	-14.000	-
-80	-11.063	-3.784	-10.519	-8.916	-3.604	-9.471	-29.066	-23.754	-29.621	-24.000	0.246
-75	-3.194	-10.845	-9.980	-2.580	-10.830	-9.632	-22.730	-30.980	-29.782	-24.000	1.270
-70	-8.614	-23.413	-22.673	-5.412	-20.946	-22.673	-25.562	-41.096	-42.823	-24.000	-
-65	-20.688	-9.472	-9.886	-11.522	-8.610	-9.297	-31.672	-28.760	-29.447	-24.000	-
-60	-19.638	-15.210	-10.510	-10.065	-9.806	-10.394	-30.215	-29.956	-30.544	-24.000	-
-55	-2.297	-10.659	-10.662	-2.230	-10.189	-6.017	-22.380	-30.339	-26.167	-24.000	1.620
-50	-9.448	-2.563	-11.533	-9.448	-1.662	-8.331	-29.598	-21.812	-28.481	-24.000	2.188
-45	-18.437	-6.514	-10.413	-15.511	-4.376	-10.374	-35.661	-24.526	-30.524	-23.330	-
-40	-8.815	-8.591	-23.868	-7.565	-8.423	-19.141	-27.715	-28.573	-39.291	-22.051	-
-35	-12.835	-11.274	-29.807	-11.618	-8.088	-11.094	-31.768	-28.238	-31.244	-20.602	-
-30	-21.139	-10.115	-13.725	-10.731	-10.049	-12.386	-30.881	-30.199	-32.536	-18.928	-
-25	-10.350	-24.576	-11.357	-4.484	-14.538	-11.245	-24.634	-34.688	-31.395	-16.949	-
-20	0.314	-14.303	-3.990	1.572	-7.280	-3.726	-18.578	-27.430	-23.876	-14.526	-
-15	-16.552	-16.450	-5.777	-1.792	-3.700	-4.151	-21.942	-23.850	-24.301	-11.402	-
-10	2.546	-14.804	-3.253	4.398	-7.988	-2.091	-15.752	-28.138	-22.241	-7.000	-

-9.9	-0.104	-13.357	-2.565	4.618	-6.988	-2.091	-15.532	-27.138	-22.241	-6.891	-
-9.8	-4.631	-11.847	-2.208	5.925	-6.280	-2.091	-14.225	-26.430	-22.241	-6.781	-
-9.7	-6.105	-10.325	-2.091	6.352	-5.644	-2.091	-13.798	-25.794	-22.241	-6.669	-
-9.6	-1.378	-9.113	-2.254	6.352	-5.340	-2.091	-13.798	-25.490	-22.241	-6.557	-
-9.5	2.272	-7.988	-2.778	6.352	-5.202	-2.091	-13.798	-25.352	-22.241	-6.443	-
-9.4	4.618	-6.988	-3.640	6.352	-5.183	-2.091	-13.798	-25.333	-22.241	-6.328	-
-9.3	5.925	-6.280	-5.108	6.352	-5.183	-2.091	-13.798	-25.333	-22.241	-6.212	-
-9.2	6.352	-5.644	-7.160	6.352	-5.183	-2.091	-13.798	-25.333	-22.241	-6.095	-
-9.1	6.060	-5.340	-10.741	6.352	-5.183	-2.254	-13.798	-25.333	-22.404	-6.000	-
-9	4.989	-5.202	-16.853	6.352	-5.183	-2.778	-13.798	-25.333	-22.928	-6.000	-
-8.9	2.728	-5.183	-31.573	6.352	-4.960	-3.640	-13.798	-25.110	-23.790	-6.000	-
-8.8	-1.850	-5.407	-15.259	7.209	-4.702	-3.489	-12.941	-24.852	-23.639	-6.000	-
-8.7	-15.328	-5.465	-9.866	8.367	-4.458	-3.107	-11.783	-24.608	-23.257	-6.000	-
-8.6	-6.091	-5.476	-7.086	8.858	-4.201	-2.987	-11.292	-24.351	-23.137	-6.000	-
-8.5	1.315	-5.368	-5.275	8.858	-4.156	-2.918	-11.292	-24.306	-23.068	-6.000	-
-8.4	5.062	-4.960	-4.150	8.858	-3.820	-2.918	-11.292	-23.970	-23.068	-6.000	-
-8.3	7.209	-4.702	-3.489	8.858	-3.173	-2.918	-11.292	-23.323	-23.068	-6.000	-
-8.2	8.367	-4.458	-3.107	8.858	-2.342	-2.918	-11.292	-22.492	-23.068	-6.000	-
-8.1	8.858	-4.201	-2.987	8.858	-1.199	-2.918	-11.292	-21.349	-23.068	-6.000	-
-8	8.767	-4.156	-2.918	8.858	-0.215	-2.918	-11.292	-20.365	-23.068	-6.000	-
-7.9	7.993	-3.820	-3.009	8.858	0.544	-2.918	-11.292	-19.606	-23.068	-6.000	-
-7.8	6.367	-3.173	-3.049	8.858	1.030	-2.918	-11.292	-19.120	-23.068	-6.000	-
-7.7	3.753	-2.342	-3.323	8.858	1.030	-2.918	-11.292	-19.120	-23.068	-6.000	-
-7.6	0.101	-1.199	-3.635	9.109	1.030	-2.918	-11.041	-19.120	-23.068	-6.000	-
-7.5	-1.543	-0.215	-4.362	9.807	1.030	-2.840	-10.343	-19.120	-22.990	-6.000	-
-7.4	2.127	0.544	-5.195	9.816	1.030	-0.712	-10.334	-19.120	-20.862	-6.000	-
-7.3	5.538	1.030	-6.226	9.816	1.030	1.266	-10.334	-19.120	-18.884	-6.000	-
-7.2	7.744	0.954	-6.341	9.816	1.030	2.653	-10.334	-19.120	-17.497	-6.000	-
-7.1	9.109	0.516	-5.165	9.816	1.030	3.750	-10.334	-19.120	-16.400	-6.000	-
-7	9.807	-0.720	-2.840	9.816	2.653	4.331	-10.334	-17.497	-15.819	-6.000	-
-6.9	9.816	-2.467	-0.712	9.816	5.101	4.588	-10.334	-15.049	-15.562	-5.971	-
-6.8	9.068	-4.202	1.266	9.816	6.815	4.588	-10.334	-13.335	-15.562	-5.813	-
-6.7	7.512	-3.426	2.653	9.816	8.154	4.588	-10.334	-11.996	-15.562	-5.652	-
-6.6	4.815	-0.387	3.750	9.816	8.918	4.588	-10.334	-11.232	-15.562	-5.489	-
-6.5	-0.187	2.653	4.331	9.816	9.325	4.588	-10.334	-10.825	-15.562	-5.323	-
-6.4	-8.053	5.101	4.588	10.232	9.325	4.588	-9.918	-10.825	-15.562	-5.154	-
-6.3	0.157	6.815	4.316	10.232	9.325	4.588	-9.918	-10.825	-15.562	-4.984	-
-6.2	5.156	8.154	3.613	10.232	9.325	4.588	-9.918	-10.825	-15.562	-4.810	-
-6.1	7.942	8.918	2.233	10.232	9.325	4.588	-9.918	-10.825	-15.562	-4.633	-
-6	9.551	9.325	0.068	10.232	9.325	5.213	-9.918	-10.825	-14.937	-4.454	-
-5.9	10.232	9.283	-2.583	10.232	9.325	7.279	-9.918	-10.825	-12.871	-4.271	-
-5.8	10.035	8.742	-3.854	10.232	9.325	8.567	-9.918	-10.825	-11.583	-4.086	-
-5.7	9.025	7.745	-0.879	10.232	9.325	9.553	-9.918	-10.825	-10.597	-3.897	-
-5.6	7.045	5.822	2.690	11.407	9.325	10.010	-8.743	-10.825	-10.140	-3.705	-
-5.5	3.704	2.981	5.213	13.167	9.325	10.156	-6.983	-10.825	-9.994	-3.509	-
-5.4	0.996	-1.679	7.279	14.173	9.998	10.156	-5.977	-10.152	-9.994	-3.310	-
-5.3	4.788	-4.268	8.567	14.424	11.195	10.156	-5.726	-8.955	-9.994	-3.107	-
-5.2	8.741	1.148	9.553	14.424	11.796	10.156	-5.726	-8.354	-9.994	-2.900	-
-5.1	11.407	5.545	10.010	14.424	12.033	10.156	-5.726	-8.117	-9.994	-2.689	-
-5	13.167	8.145	10.156	14.424	12.033	10.156	-5.726	-8.117	-9.994	-2.474	-
-4.9	14.173	9.998	9.826	14.424	12.033	10.156	-5.726	-8.117	-9.994	-2.255	-
-4.8	14.424	11.195	9.061	14.424	12.033	10.156	-5.726	-8.117	-9.994	-2.031	-
-4.7	13.987	11.796	7.726	14.424	12.033	10.156	-5.726	-8.117	-9.994	-1.802	-
-4.6	12.808	12.033	5.501	14.424	12.033	10.156	-5.726	-8.117	-9.994	-1.569	-
-4.5	10.532	11.651	2.499	14.424	12.033	11.553	-5.726	-8.117	-8.597	-1.330	-
-4.4	6.051	10.830	-0.745	15.038	12.033	13.172	-5.112	-8.117	-6.978	-1.086	-
-4.3	-3.065	9.241	1.658	16.059	12.033	14.408	-4.091	-8.117	-5.742	-0.837	-
-4.2	3.596	6.520	6.110	16.305	12.033	15.206	-3.845	-8.117	-4.944	-0.581	-
-4.1	9.649	2.349	9.114	16.305	13.673	15.627	-3.845	-6.477	-4.523	-0.320	-
-4	13.013	-1.504	11.553	16.305	15.204	15.704	-3.845	-4.946	-4.446	-0.051	-

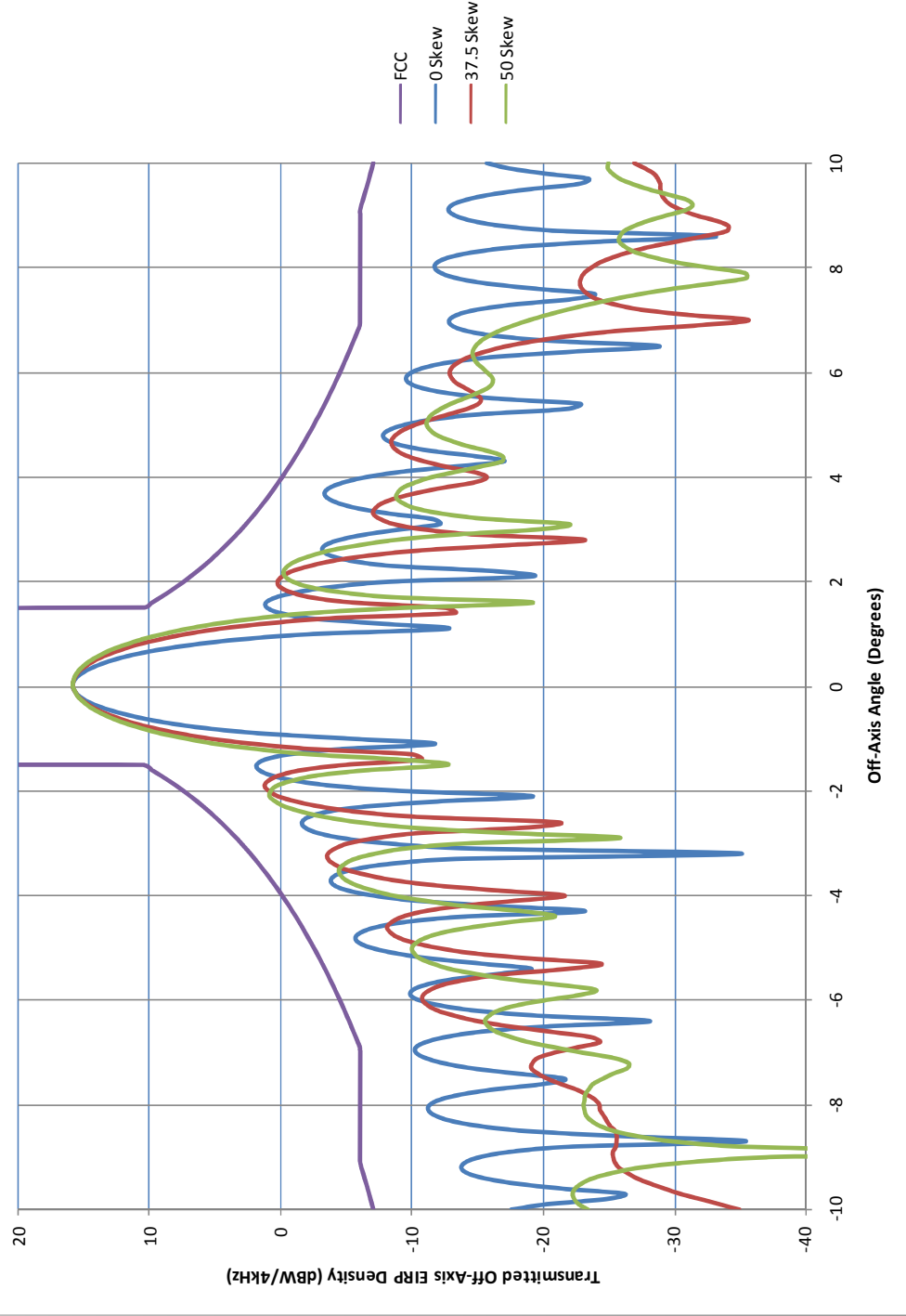


-3.9	15.038	3.700	13.172	16.305	16.071	15.704	-3.845	-4.079	-4.446	0.223	-
-3.8	16.059	8.495	14.408	16.305	16.538	15.704	-3.845	-3.612	-4.446	0.505	-
-3.7	16.305	11.652	15.206	16.305	16.552	15.704	-3.845	-3.598	-4.446	0.795	-
-3.6	15.864	13.673	15.627	16.305	16.552	15.704	-3.845	-3.598	-4.446	1.092	-
-3.5	14.604	15.204	15.704	16.305	16.552	15.704	-3.845	-3.598	-4.446	1.398	-
-3.4	12.023	16.071	15.323	16.305	16.552	15.704	-3.845	-3.598	-4.446	1.713	-
-3.3	6.779	16.538	14.555	17.330	16.552	15.704	-2.820	-3.598	-4.446	2.037	-
-3.2	-15.055	16.552	12.990	18.273	16.552	15.704	-1.877	-3.598	-4.446	2.371	-
-3.1	5.772	16.006	10.671	18.506	16.552	15.704	-1.644	-3.598	-4.446	2.716	-
-3	12.077	14.976	5.892	18.506	16.552	16.735	-1.644	-3.598	-3.415	3.072	-
-2.9	15.433	12.868	-5.696	18.506	16.552	18.502	-1.644	-3.598	-1.648	3.440	-
-2.8	17.330	9.396	3.197	18.506	17.082	19.820	-1.644	-3.068	-0.330	3.821	-
-2.7	18.273	1.459	10.147	18.506	18.999	20.568	-1.644	-1.151	0.418	4.216	-
-2.6	18.506	-1.037	14.110	18.506	20.354	21.008	-1.644	0.204	0.858	4.626	-
-2.5	18.038	9.325	16.735	18.506	21.050	21.008	-1.644	0.900	0.858	5.051	-
-2.4	16.637	14.238	18.502	18.506	21.368	21.008	-1.644	1.218	0.858	5.495	-
-2.3	13.782	17.082	19.820	19.154	21.368	21.008	-0.996	1.218	0.858	5.957	-
-2.2	8.196	18.999	20.568	20.880	21.368	21.008	0.730	1.218	0.858	6.439	-
-2.1	0.908	20.354	21.008	21.774	21.368	21.008	1.624	1.218	0.858	6.945	-
-2	10.878	21.050	20.909	21.966	21.368	21.008	1.816	1.218	0.858	7.474	-
-1.9	16.144	21.368	20.461	21.966	21.368	21.008	1.816	1.218	0.858	8.031	-
-1.8	19.154	21.074	19.229	21.966	21.368	21.008	1.816	1.218	0.858	8.618	-
-1.7	20.880	20.222	17.315	21.966	21.368	21.931	1.816	1.218	1.781	9.239	-
-1.6	21.774	18.530	13.450	21.966	22.153	25.104	1.816	2.003	4.954	9.897	-
-1.5	21.966	15.194	7.419	21.966	25.520	27.339	1.816	5.370	7.189	10.598	-
-1.4	21.337	9.428	11.090	21.966	27.882	29.302	1.816	7.732	9.152	-	-
-1.3	19.483	10.129	17.862	25.838	29.819	30.783	5.688	9.669	10.633	-	-
-1.2	15.622	17.681	21.931	28.738	31.413	32.070	8.588	11.263	11.920	-	-
-1.1	8.350	22.153	25.104	30.875	32.625	33.119	10.725	12.475	12.969	-	-
-1	14.854	25.520	27.339	32.529	33.688	33.956	12.379	13.538	13.806	-	-
-0.9	21.596	27.882	29.302	33.827	34.479	34.675	13.677	14.329	14.525	-	-
-0.8	25.838	29.819	30.783	34.799	35.090	35.177	14.649	14.940	15.027	-	-
-0.7	28.738	31.413	32.070	35.443	35.569	35.602	15.293	15.419	15.452	-	-
-0.6	30.875	32.625	33.119	35.827	35.827	35.827	15.677	15.677	15.677	-	-
-0.5	32.529	33.688	33.956	36.000	36.000	36.000	15.850	15.850	15.850	-	-
-0.4	33.827	34.479	34.675	36.000	36.000	36.000	15.850	15.850	15.850	-	-
-0.3	34.799	35.090	35.177	36.000	36.000	36.000	15.850	15.850	15.850	-	-
-0.2	35.443	35.569	35.602	36.000	36.000	36.000	15.850	15.850	15.850	-	-
-0.1	35.827	35.827	35.827	36.000	36.000	36.000	15.850	15.850	15.850	-	-
0	36.000	36.000	36.000	36.000	36.000	36.000	15.850	15.850	15.850	-	-
0.1	35.920	35.950	35.951	36.000	36.000	36.000	15.850	15.850	15.850	-	-
0.2	35.582	35.768	35.829	36.000	36.000	36.000	15.850	15.850	15.850	-	-
0.3	34.975	35.459	35.555	36.000	36.000	36.000	15.850	15.850	15.850	-	-
0.4	34.114	34.929	35.151	36.000	36.000	36.000	15.850	15.850	15.850	-	-
0.5	32.969	34.282	34.618	36.000	36.000	36.000	15.850	15.850	15.850	-	-
0.6	31.448	33.408	33.892	35.920	35.950	35.951	15.770	15.800	15.801	-	-
0.7	29.397	32.308	33.066	35.582	35.768	35.829	15.432	15.618	15.679	-	-
0.8	26.716	31.031	31.952	34.975	35.459	35.555	14.825	15.309	15.405	-	-
0.9	23.111	29.327	30.730	34.114	34.929	35.151	13.964	14.779	15.001	-	-
1	17.640	27.337	29.130	32.969	34.282	34.618	12.819	14.132	14.468	-	-
1.1	7.381	24.815	27.296	31.448	33.408	33.892	11.298	13.258	13.742	-	-
1.2	12.616	21.263	24.978	29.397	32.308	33.066	9.247	12.158	12.916	-	-
1.3	17.853	16.422	21.939	26.716	31.031	31.952	6.566	10.881	11.802	-	-
1.4	20.163	6.890	17.960	23.111	29.327	30.730	2.961	9.177	10.580	-	-
1.5	21.157	7.605	10.863	21.257	27.337	29.130	1.107	7.187	8.980	10.598	-
1.6	21.257	14.535	0.929	21.257	24.815	27.296	1.107	4.665	7.146	9.897	-
1.7	20.510	17.836	11.359	21.257	21.263	24.978	1.107	1.113	4.828	9.239	-
1.8	18.874	19.384	15.609	21.257	20.379	21.939	1.107	0.229	1.789	8.618	-
1.9	16.199	20.210	17.993	21.257	20.379	19.931	1.107	0.229	-0.219	8.031	-

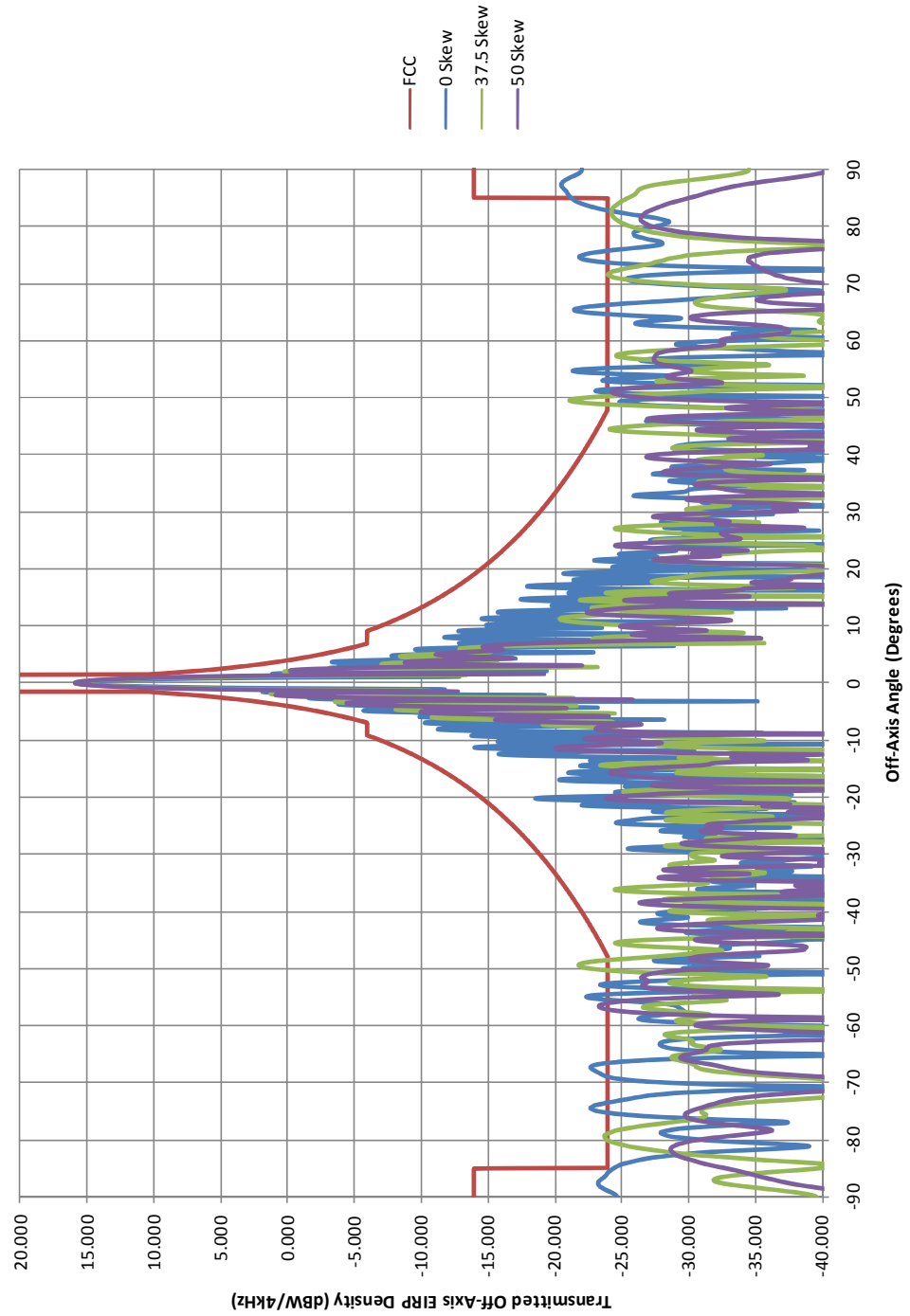
2	11.703	20.379	19.218	21.257	20.379	19.931	1.107	0.229	-0.219	7.474	-
2.1	0.973	20.041	19.827	21.257	20.379	19.931	1.107	0.229	-0.219	6.945	-
2.2	3.742	19.298	19.931	20.510	20.379	19.931	0.360	0.229	-0.219	6.439	-
2.3	11.579	17.940	19.615	18.874	20.379	19.931	-1.276	0.229	-0.219	5.957	-
2.4	14.763	16.143	18.936	16.955	20.379	19.931	-3.195	0.229	-0.219	5.495	-
2.5	16.343	13.424	17.809	16.955	20.379	19.931	-3.195	0.229	-0.219	5.051	-
2.6	16.955	9.396	16.336	16.955	20.041	19.931	-3.195	-0.109	-0.219	4.626	-
2.7	16.723	2.704	14.136	16.955	19.298	19.931	-3.195	-0.852	-0.219	4.216	-
2.8	15.639	-3.038	11.378	16.955	17.940	19.615	-3.195	-2.210	-0.535	3.821	-
2.9	13.740	5.259	6.957	16.955	16.143	18.936	-3.195	-4.007	-1.214	3.440	-
3	10.965	9.275	0.470	16.955	13.424	17.809	-3.195	-6.726	-2.341	3.072	-
3.1	7.983	11.498	-1.816	16.955	13.090	16.336	-3.195	-7.060	-3.814	2.716	-
3.2	8.583	12.575	4.470	16.786	13.090	14.136	-3.364	-7.060	-6.014	2.371	-
3.3	11.786	13.090	7.829	16.786	13.090	11.378	-3.364	-7.060	-8.772	2.037	-
3.4	14.207	12.955	9.843	16.786	13.090	11.339	-3.364	-7.060	-8.811	1.713	-
3.5	15.728	12.405	10.840	16.786	13.090	11.339	-3.364	-7.060	-8.811	1.398	-
3.6	16.567	11.308	11.339	16.786	13.090	11.339	-3.364	-7.060	-8.811	1.092	-
3.7	16.786	9.703	11.252	16.786	13.090	11.339	-3.364	-7.060	-8.811	0.795	-
3.8	16.353	7.686	10.824	16.786	13.090	11.339	-3.364	-7.060	-8.811	0.505	-
3.9	15.302	5.343	9.875	16.786	12.955	11.339	-3.364	-7.195	-8.811	0.223	-
4	13.586	4.418	8.633	16.786	12.405	11.339	-3.364	-7.745	-8.811	-0.051	-
4.1	10.957	5.483	6.825	16.786	11.641	11.339	-3.364	-8.509	-8.811	-0.320	-
4.2	6.961	7.564	4.966	16.786	11.703	11.252	-3.364	-8.447	-8.898	-0.581	-
4.3	3.087	9.197	3.306	16.353	11.703	10.824	-3.797	-8.447	-9.326	-0.837	-
4.4	5.300	10.484	3.259	15.302	11.703	9.875	-4.848	-8.447	-10.275	-1.086	-
4.5	8.646	11.259	4.413	13.586	11.703	9.044	-6.564	-8.447	-11.106	-1.330	-
4.6	10.819	11.641	6.035	12.327	11.703	9.044	-7.823	-8.447	-11.106	-1.569	-
4.7	12.011	11.703	7.269	12.327	11.703	9.044	-7.823	-8.447	-11.106	-1.802	-
4.8	12.327	11.386	8.256	12.327	11.703	9.044	-7.823	-8.447	-11.106	-2.031	-
4.9	11.861	10.816	8.778	12.327	11.703	9.044	-7.823	-8.447	-11.106	-2.255	-
5	10.665	9.865	9.044	12.327	11.703	9.044	-7.823	-8.447	-11.106	-2.474	-
5.1	8.557	8.718	8.947	12.327	11.703	9.044	-7.823	-8.447	-11.106	-2.689	-
5.2	4.923	7.339	8.624	12.327	11.703	9.044	-7.823	-8.447	-11.106	-2.900	-
5.3	-1.644	5.978	7.994	12.327	11.386	9.044	-7.823	-8.764	-11.106	-3.107	-
5.4	-2.690	5.077	7.204	11.861	10.816	9.044	-8.289	-9.334	-11.106	-3.310	-
5.5	3.683	4.886	6.197	10.665	9.865	9.044	-9.485	-10.285	-11.106	-3.509	-
5.6	7.282	5.398	5.236	10.561	8.718	8.947	-9.589	-11.432	-11.203	-3.705	-
5.7	9.335	6.081	4.402	10.561	7.339	8.624	-9.589	-12.811	-11.526	-3.897	-
5.8	10.343	6.768	4.013	10.561	7.267	7.994	-9.589	-12.883	-12.156	-4.086	-
5.9	10.561	7.136	4.041	10.561	7.267	7.204	-9.589	-12.883	-12.946	-4.271	-
6	10.146	7.267	4.438	10.561	7.267	6.197	-9.589	-12.883	-13.953	-4.454	-
6.1	9.063	7.073	4.872	10.561	7.267	5.526	-9.589	-12.883	-14.624	-4.633	-
6.2	7.062	6.564	5.287	10.561	7.267	5.526	-9.589	-12.883	-14.624	-4.810	-
6.3	3.621	5.743	5.491	10.561	7.267	5.526	-9.589	-12.883	-14.624	-4.984	-
6.4	-2.379	4.518	5.526	10.561	7.267	5.526	-9.589	-12.883	-14.624	-5.154	-
6.5	-8.770	2.955	5.319	10.146	7.267	5.526	-10.004	-12.883	-14.624	-5.323	-
6.6	-0.686	0.774	4.915	9.063	7.073	5.526	-11.087	-13.077	-14.624	-5.489	-
6.7	3.779	-2.016	4.275	7.272	6.564	5.526	-12.878	-13.586	-14.624	-5.652	-
6.8	6.073	-5.865	3.455	7.272	5.743	5.526	-12.878	-14.407	-14.624	-5.813	-
6.9	7.096	-11.670	2.416	7.272	4.518	5.526	-12.878	-15.632	-14.624	-5.971	-
7	7.272	-15.530	1.217	7.272	2.955	5.319	-12.878	-17.195	-14.831	-6.000	-
7.1	6.682	-10.865	-0.151	7.272	0.774	4.915	-12.878	-19.376	-15.235	-6.000	-
7.2	5.140	-7.316	-1.682	7.272	-2.016	4.275	-12.878	-22.166	-15.875	-6.000	-
7.3	2.270	-5.294	-3.332	7.272	-2.670	3.455	-12.878	-22.820	-16.695	-6.000	-
7.4	-2.060	-3.955	-5.201	7.905	-2.670	2.416	-12.245	-22.820	-17.734	-6.000	-
7.5	-3.792	-3.239	-7.273	8.376	-2.670	1.217	-11.774	-22.820	-18.933	-6.000	-
7.6	0.678	-2.817	-9.758	8.376	-2.670	-0.151	-11.774	-22.820	-20.301	-6.000	-
7.7	4.413	-2.670	-12.706	8.376	-2.670	-1.682	-11.774	-22.820	-21.832	-6.000	-
7.8	6.695	-2.752	-15.287	8.376	-2.670	-3.332	-11.774	-22.820	-23.482	-6.000	-
7.9	7.905	-3.003	-15.214	8.376	-2.670	-5.201	-11.774	-22.820	-25.351	-6.000	-

8	8.376	-3.515	-12.614	8.376	-2.670	-5.633	-11.774	-22.820	-25.783	-6.000	-
8.1	8.204	-4.184	-10.030	8.376	-2.670	-5.633	-11.774	-22.820	-25.783	-6.000	-
8.2	7.276	-5.183	-8.219	8.376	-2.670	-5.633	-11.774	-22.820	-25.783	-6.000	-
8.3	5.345	-6.432	-6.838	8.376	-2.752	-5.633	-11.774	-22.902	-25.783	-6.000	-
8.4	2.031	-7.998	-6.084	8.376	-3.003	-5.633	-11.774	-23.153	-25.783	-6.000	-
8.5	-4.273	-10.009	-5.633	8.376	-3.515	-5.633	-11.774	-23.665	-25.783	-6.000	-
8.6	-13.059	-12.065	-5.679	8.204	-4.184	-5.633	-11.946	-24.334	-25.783	-6.000	-
8.7	-1.409	-13.850	-6.002	7.330	-5.183	-5.633	-12.820	-25.333	-25.783	-6.000	-
8.8	3.220	-13.985	-6.783	7.330	-6.432	-5.633	-12.820	-26.582	-25.783	-6.000	-
8.9	5.585	-13.034	-7.862	7.330	-7.998	-5.633	-12.820	-28.148	-25.783	-6.000	-
9	6.845	-11.536	-9.233	7.330	-8.801	-5.633	-12.820	-28.951	-25.783	-6.000	-
9.1	7.330	-10.456	-10.661	7.330	-8.796	-5.679	-12.820	-28.946	-25.829	-6.000	-
9.2	7.055	-9.613	-11.233	7.330	-8.611	-5.677	-12.820	-28.761	-25.827	-6.095	-
9.3	5.979	-9.147	-10.770	7.330	-8.293	-5.121	-12.820	-28.443	-25.271	-6.212	-
9.4	4.096	-8.896	-9.364	7.330	-7.611	-4.772	-12.820	-27.761	-24.922	-6.328	-
9.5	1.226	-8.801	-7.863	7.330	-6.812	-4.772	-12.820	-26.962	-24.922	-6.443	-
9.6	-2.555	-8.796	-6.654	7.330	-5.790	-4.772	-12.820	-25.940	-24.922	-6.557	-
9.7	-3.369	-8.611	-5.677	7.055	-4.862	-4.772	-13.095	-25.012	-24.922	-6.669	-
9.8	-0.043	-8.293	-5.121	5.979	-3.958	-4.772	-14.171	-24.108	-24.922	-6.781	-
9.9	2.702	-7.611	-4.772	5.235	-3.114	-4.772	-14.915	-23.264	-24.922	-6.891	-
10	4.405	-6.812	-4.812	5.235	-2.477	-4.772	-14.915	-22.627	-24.922	-7.000	-
15	-0.855	-8.523	-12.147	2.653	-1.760	-5.062	-17.497	-21.910	-25.212	-11.402	-
20	-9.337	-22.889	-20.518	-3.510	-17.207	-19.630	-23.660	-37.357	-39.780	-14.526	-
25	-7.005	-7.527	-12.433	-7.005	-7.290	-6.396	-27.155	-27.440	-26.546	-16.949	-
30	-11.836	-10.606	-16.216	-10.824	-9.688	-8.722	-30.974	-29.838	-28.872	-18.928	-
35	-11.021	-11.081	-10.767	-8.451	-10.542	-10.314	-28.601	-30.692	-30.464	-20.602	-
40	-13.703	-15.383	-7.359	-13.088	-11.315	-6.722	-33.238	-31.465	-26.872	-22.051	-
45	-16.289	-5.866	-18.847	-8.312	-3.967	-10.854	-28.462	-24.117	-31.004	-23.330	-
50	-13.085	-2.268	-6.491	-5.303	-0.959	-4.702	-25.453	-21.109	-24.852	-24.000	2.891
55	-2.296	-10.270	-9.717	-1.229	-9.437	-8.440	-21.379	-29.587	-28.590	-24.000	2.621
60	-13.789	-20.788	-12.279	-9.146	-15.920	-12.279	-29.296	-36.070	-32.429	-24.000	-
65	-1.881	-17.204	-14.462	-1.330	-13.569	-11.080	-21.480	-33.719	-31.230	-24.000	2.520
70	-7.286	-8.554	-20.193	-5.495	-5.842	-18.246	-25.645	-25.992	-38.396	-24.000	-
75	-2.017	-10.180	-15.159	-1.719	-8.834	-14.390	-21.869	-28.984	-34.540	-24.000	2.131
80	-7.451	-5.491	-7.111	-6.495	-4.979	-6.646	-26.645	-25.129	-26.796	-24.000	-
85	-1.116	-5.373	-9.998	-0.902	-4.956	-9.176	-21.052	-25.106	-29.326	-14.000	-
90	-1.905	-14.384	-20.304	-1.810	-14.108	-20.054	-21.960	-34.258	-40.204	-14.000	-
95	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
100	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
105	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
110	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
115	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
120	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
125	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
130	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
135	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
140	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
145	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
150	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
155	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
160	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
165	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
170	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
175	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
180	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-

14.25GHz V-Pol, Nominal Transmitted Co-Pol PSD with -20.15dBW/4KHz at Input



### 14.25GHz V-Pol Nominal Transmitted Co-Pol PSD with -20.15dBW/4kHz at Input



**Data in support of claim that proposed operation meets criteria of VMES Order July 2009**

Applicant RAS Date of Application  
 ID Heading  
 a1 Antenna Manufacture: RAS c Main bore gain (dBi): 36.0  
 a2 Antenna Model: E7000 d Frequency at which gain was measured (GHz): 14.5  
 a3 Antenna ID: RAS e Max input power density (dBW/4kHz): -20.15  
 b Transmit Band (b): 14GHz Pattern ID Table A5  
 Pattern Description: 14.5GHz H-polarization, co-polarized at tangent to the geosynchronous plane for 0°, 37.5°, and 50° skew angle

Offset Angles  (Degrees)	Nominal Co-Pol Gain Along Tangent to Geo Arc			Worst Case Co-Pol Gain Along Tangent to Geo Arc			Worst Case Co-Pol PSD Along Tangent to Geo Arc input PSD = -20.15dBW/4kHz			FCC Mask (dBW/4kHz)	Mask Exceedence  (dB)
	(dBi)			(dBi)			(dBW/4kHz)				
	0? Skew	37.5? Skew	50? Skew	0? Skew	37.5? Skew	50? Skew	0? Skew	37.5? Skew	50? Skew		
-180	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-175	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-170	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-165	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-160	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-155	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-150	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-145	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-140	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-135	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-130	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-125	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-120	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-115	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-110	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-105	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-100	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-95	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-90	-16.876	-23.176	-20.301	-16.742	-22.593	-20.106	-36.892	-42.743	-40.256	-14.000	-
-85	-16.393	-13.335	-17.702	-15.929	-12.703	-16.205	-36.079	-32.853	-36.355	-14.000	-
-80	-10.566	-7.525	-14.804	-10.508	-7.524	-13.270	-30.658	-27.674	-33.420	-24.000	-
-75	-8.644	-24.120	-7.971	-7.358	-18.551	-7.422	-27.508	-38.701	-27.572	-24.000	-
-70	-17.115	-8.576	-17.392	-12.509	-7.803	-14.362	-32.659	-27.953	-34.512	-24.000	-
-65	-10.368	-15.680	-8.806	-10.368	-11.710	-8.296	-30.518	-31.860	-28.446	-24.000	-
-60	-9.619	-9.790	-8.659	-8.652	-7.407	-8.083	-28.802	-27.557	-28.233	-24.000	-
-55	-10.937	-15.820	-14.028	-9.977	-7.985	-13.997	-30.127	-28.135	-34.147	-24.000	-
-50	-10.639	-11.645	-8.631	-9.855	-6.760	-8.180	-30.005	-26.910	-28.330	-24.000	-
-45	-13.103	-16.032	-12.629	-9.428	-13.963	-11.297	-29.578	-34.113	-31.447	-23.330	-
-40	-21.915	-5.495	-14.884	-11.536	-3.865	-12.239	-31.686	-24.015	-32.389	-22.051	-
-35	-10.111	-7.569	-7.846	-9.997	-6.739	-6.964	-30.147	-26.889	-27.114	-20.602	-
-30	-13.668	-13.926	-16.299	-7.016	-6.357	-13.951	-27.166	-26.507	-34.101	-18.928	-
-25	-10.646	-16.619	-14.303	-6.158	-8.509	-10.901	-26.308	-28.659	-31.051	-16.949	-
-20	-2.454	-8.419	-9.736	-1.068	-4.315	-7.089	-21.218	-24.465	-27.239	-14.526	-
-15	-5.278	-5.362	-23.633	0.913	-4.083	-12.116	-19.237	-24.233	-32.266	-11.402	-
-10	4.492	-7.205	-16.951	4.492	-3.879	-5.631	-15.658	-24.029	-25.781	-7.000	-

-9.9	4.110	-9.258	-13.394	4.492	-3.879	-5.130	-15.658	-24.029	-25.280	-6.891	-
-9.8	2.818	-11.912	-10.113	4.492	-4.110	-5.020	-15.658	-24.260	-25.170	-6.781	-
-9.7	0.035	-15.352	-8.051	5.236	-4.728	-5.020	-14.914	-24.878	-25.170	-6.669	-
-9.6	-5.303	-19.136	-6.528	6.792	-5.757	-5.020	-13.358	-25.907	-25.170	-6.557	-
-9.5	-10.107	-20.349	-5.631	7.560	-7.205	-5.020	-12.590	-27.355	-25.170	-6.443	-
-9.4	-2.405	-19.004	-5.130	7.688	-9.258	-5.020	-12.462	-29.408	-25.170	-6.328	-
-9.3	2.427	-18.076	-5.020	7.688	-11.912	-5.020	-12.462	-32.062	-25.170	-6.212	-
-9.2	5.236	-18.018	-5.323	7.688	-13.405	-5.020	-12.462	-33.555	-25.170	-6.095	-
-9.1	6.792	-19.021	-5.921	7.688	-11.455	-5.020	-12.462	-31.605	-25.170	-6.000	-
-9	7.560	-19.903	-7.042	7.688	-10.093	-5.020	-12.462	-30.243	-25.170	-6.000	-
-8.9	7.688	-18.860	-8.432	7.688	-9.312	-5.020	-12.462	-29.462	-25.170	-6.000	-
-8.8	7.097	-16.068	-10.571	7.688	-8.930	-5.020	-12.462	-29.080	-25.170	-6.000	-
-8.7	5.567	-13.405	-12.978	7.688	-8.754	-5.323	-12.462	-28.904	-25.473	-6.000	-
-8.6	2.952	-11.455	-16.341	7.688	-8.562	-5.921	-12.462	-28.712	-26.071	-6.000	-
-8.5	-0.843	-10.093	-19.047	8.256	-7.930	-7.042	-11.894	-28.080	-27.192	-6.000	-
-8.4	-2.559	-9.312	-20.196	8.773	-6.986	-8.432	-11.377	-27.136	-28.582	-6.000	-
-8.3	1.398	-8.930	-19.776	8.773	-5.645	-10.571	-11.377	-25.795	-30.721	-6.000	-
-8.2	4.878	-8.754	-19.490	8.773	-4.511	-12.978	-11.377	-24.661	-33.128	-6.000	-
-8.1	7.018	-8.562	-20.819	8.773	-3.544	-13.119	-11.377	-23.694	-33.269	-6.000	-
-8	8.256	-7.930	-24.390	8.773	-2.962	-10.185	-11.377	-23.112	-30.335	-6.000	-
-7.9	8.773	-6.986	-40.017	8.773	-2.867	-7.862	-11.377	-23.017	-28.012	-6.000	-
-7.8	8.522	-5.645	-25.077	8.773	-2.867	-6.184	-11.377	-23.017	-26.334	-6.000	-
-7.7	7.378	-4.511	-17.508	8.773	-2.867	-4.732	-11.377	-23.017	-24.882	-6.000	-
-7.6	5.205	-3.544	-13.119	8.773	-2.867	-3.690	-11.377	-23.017	-23.840	-6.000	-
-7.5	1.305	-2.962	-10.185	8.773	-2.867	-2.765	-11.377	-23.017	-22.915	-6.000	-
-7.4	-8.047	-2.867	-7.862	8.773	-2.867	-2.150	-11.377	-23.017	-22.300	-6.000	-
-7.3	-6.614	-3.245	-6.184	8.937	-2.867	-1.624	-11.213	-23.017	-21.774	-6.000	-
-7.2	1.965	-4.553	-4.732	8.937	-2.867	-1.402	-11.213	-23.017	-21.552	-6.000	-
-7.1	5.647	-6.834	-3.690	8.937	0.228	-1.264	-11.213	-19.922	-21.414	-6.000	-
-7	7.680	-12.206	-2.765	8.937	3.014	-1.264	-11.213	-17.136	-21.414	-6.000	-
-6.9	8.738	-33.481	-2.150	8.937	5.071	-1.264	-11.213	-15.079	-21.414	-5.971	-
-6.8	8.937	-10.185	-1.624	8.937	6.560	-1.264	-11.213	-13.590	-21.414	-5.813	-
-6.7	8.248	-3.460	-1.402	8.937	7.776	-1.264	-11.213	-12.374	-21.414	-5.652	-
-6.6	6.633	0.228	-1.264	8.937	8.528	-1.264	-11.213	-11.622	-21.414	-5.489	-
-6.5	3.669	3.014	-1.472	8.937	9.031	-1.264	-11.213	-11.119	-21.414	-5.323	-
-6.4	-2.425	5.071	-1.759	9.770	9.202	-1.264	-10.380	-10.948	-21.414	-5.154	-
-6.3	-10.066	6.560	-2.438	10.356	9.202	-1.264	-9.794	-10.948	-21.414	-4.984	-
-6.2	1.117	7.776	-3.088	10.356	9.202	-1.264	-9.794	-10.948	-21.414	-4.810	-
-6.1	5.738	8.528	-4.012	10.356	9.202	-1.264	-9.794	-10.948	-21.414	-4.633	-
-6	8.299	9.031	-4.396	10.356	9.202	-1.472	-9.794	-10.948	-21.622	-4.454	-
-5.9	9.770	9.202	-4.519	10.356	9.202	-1.423	-9.794	-10.948	-21.573	-4.271	-
-5.8	10.356	9.007	-3.745	10.356	9.202	-1.423	-9.794	-10.948	-21.573	-4.086	-
-5.7	10.039	8.542	-2.973	10.356	9.202	-1.423	-9.794	-10.948	-21.573	-3.897	-
-5.6	8.810	7.510	-2.023	10.356	9.202	-1.423	-9.794	-10.948	-21.573	-3.705	-
-5.5	6.328	6.097	-1.625	11.550	9.202	-1.423	-8.600	-10.948	-21.573	-3.509	-
-5.4	1.080	4.004	-1.423	13.660	9.202	-1.423	-6.490	-10.948	-21.573	-3.310	-
-5.3	-17.175	1.177	-2.049	15.001	9.007	0.640	-5.149	-11.143	-19.510	-3.107	-
-5.2	2.594	-0.675	-3.044	15.639	8.542	4.080	-4.511	-11.608	-16.070	-2.900	-
-5.1	8.315	0.702	-4.867	15.720	8.548	6.519	-4.430	-11.602	-13.631	-2.689	-
-5	11.550	3.353	-5.530	15.720	8.548	8.727	-4.430	-11.602	-11.423	-2.474	-
-4.9	13.660	5.740	-2.804	15.720	8.548	10.275	-4.430	-11.602	-9.875	-2.255	-
-4.8	15.001	7.318	0.640	15.720	8.548	11.649	-4.430	-11.602	-8.501	-2.031	-
-4.7	15.639	8.178	4.080	15.720	8.548	12.538	-4.430	-11.602	-7.612	-1.802	-
-4.6	15.720	8.548	6.519	15.720	8.548	13.251	-4.430	-11.602	-6.899	-1.569	-
-4.5	15.331	8.083	8.727	15.720	8.548	13.546	-4.430	-11.602	-6.604	-1.330	-
-4.4	14.450	6.992	10.275	15.720	8.548	13.608	-4.430	-11.602	-6.542	-1.086	-
-4.3	12.967	4.563	11.649	15.720	10.214	13.608	-4.430	-9.936	-6.542	-0.837	-
-4.2	10.962	-0.475	12.538	15.720	12.749	13.608	-4.430	-7.401	-6.542	-0.581	-
-4.1	9.118	-15.337	13.251	15.720	14.374	13.608	-4.430	-5.776	-6.542	-0.320	-
-4	8.753	0.362	13.546	15.331	15.590	13.608	-4.819	-4.560	-6.542	-0.051	-

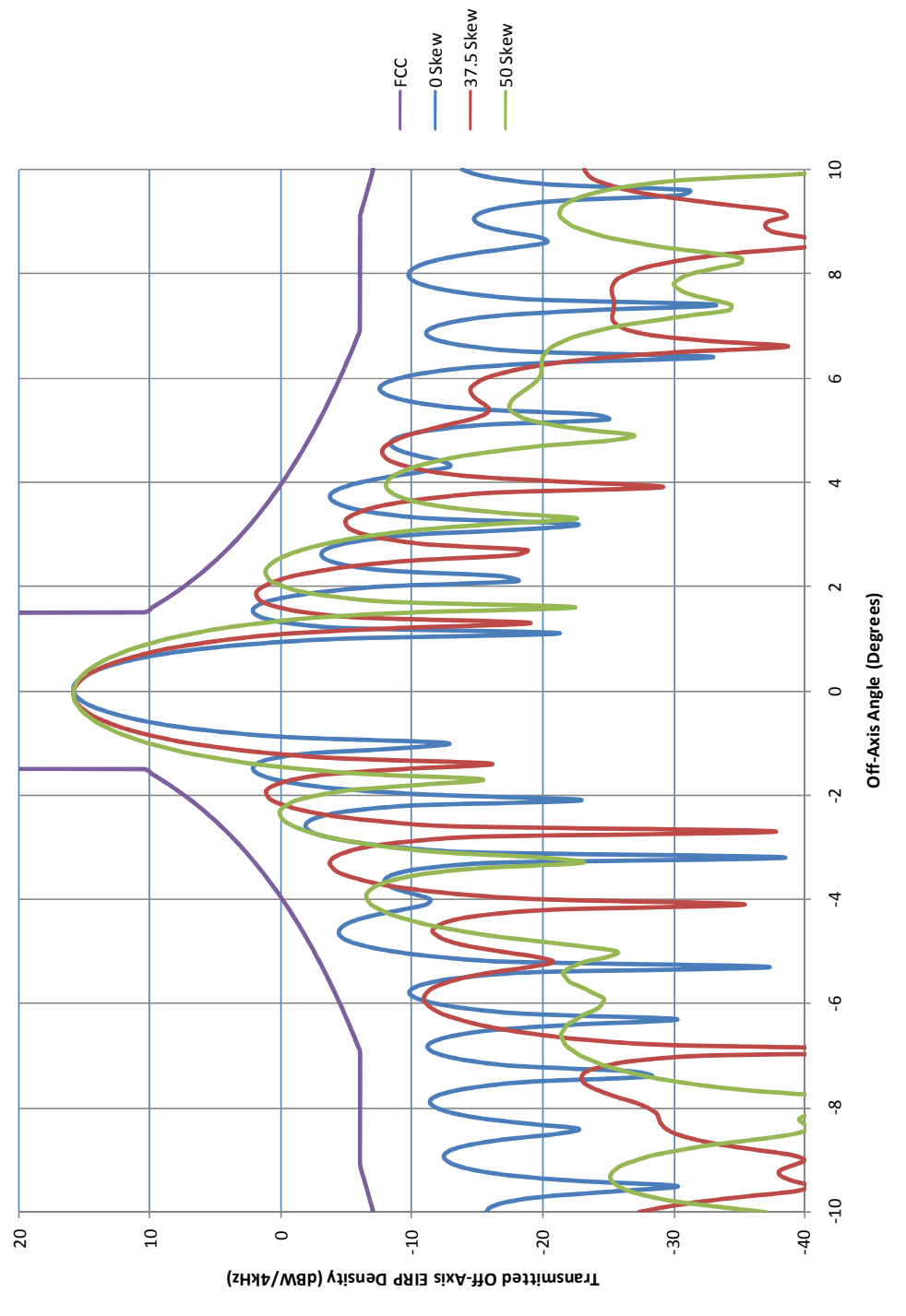
-3.9	9.979	6.487	13.608	14.450	16.187	13.608	-5.700	-3.963	-6.542	0.223	-
-3.8	11.392	10.214	13.233	12.967	16.401	13.608	-7.183	-3.749	-6.542	0.505	-
-3.7	12.156	12.749	12.479	12.156	16.401	13.608	-7.994	-3.749	-6.542	0.795	-
-3.6	12.151	14.374	11.086	12.156	16.401	13.608	-7.994	-3.749	-6.542	1.092	-
-3.5	11.276	15.590	8.852	12.156	16.401	13.608	-7.994	-3.749	-6.542	1.398	-
-3.4	9.076	16.187	4.870	14.586	16.401	14.613	-5.564	-3.749	-5.537	1.713	-
-3.3	3.827	16.401	-2.861	16.709	16.401	16.617	-3.441	-3.749	-3.533	2.037	-
-3.2	-18.369	16.115	0.194	17.878	16.401	18.111	-2.272	-3.749	-2.039	2.371	-
-3.1	5.364	15.212	7.672	18.280	16.401	19.148	-1.870	-3.749	-1.002	2.716	-
-3	11.233	13.694	11.796	18.280	16.401	19.867	-1.870	-3.749	-0.283	3.072	-
-2.9	14.586	10.663	14.613	18.280	16.401	20.178	-1.870	-3.749	0.028	3.440	-
-2.8	16.709	5.107	16.617	18.280	18.354	20.217	-1.870	-1.796	0.067	3.821	-
-2.7	17.878	-17.714	18.111	18.280	19.837	20.217	-1.870	-0.313	0.067	4.216	-
-2.6	18.280	7.016	19.148	18.280	20.836	20.217	-1.870	0.686	0.067	4.626	-
-2.5	18.020	12.626	19.867	18.280	21.211	20.217	-1.870	1.061	0.067	5.051	-
-2.4	16.987	16.179	20.178	18.280	21.211	20.217	-1.870	1.061	0.067	5.495	-
-2.3	14.723	18.354	20.217	18.451	21.211	20.217	-1.699	1.061	0.067	5.957	-
-2.2	10.017	19.837	19.749	20.650	21.211	20.217	0.500	1.061	0.067	6.439	-
-2.1	-2.803	20.836	18.928	21.840	21.211	20.217	1.690	1.061	0.067	6.945	-
-2	8.099	21.211	17.216	22.289	21.211	20.217	2.139	1.061	0.067	7.474	-
-1.9	14.786	21.211	14.642	22.289	21.211	22.317	2.139	1.061	2.167	8.031	-
-1.8	18.451	20.513	9.329	22.289	21.211	24.877	2.139	1.061	4.727	8.618	-
-1.7	20.650	19.111	4.767	22.289	21.211	27.154	2.139	1.061	7.004	9.239	-
-1.6	21.840	16.507	13.476	22.289	24.465	28.824	2.139	4.315	8.674	9.897	-
-1.5	22.289	10.774	18.487	22.289	27.295	30.382	2.139	7.145	10.232	10.598	-
-1.4	22.028	4.042	22.317	22.289	29.318	31.554	2.139	9.168	11.404	-	-
-1.3	20.814	15.356	24.877	24.190	31.021	32.661	4.040	10.871	12.511	-	-
-1.2	17.920	20.880	27.154	27.728	32.412	33.487	7.578	12.262	13.337	-	-
-1.1	10.993	24.465	28.824	30.205	33.466	34.261	10.055	13.316	14.111	-	-
-1	7.608	27.295	30.382	32.049	34.385	34.811	11.899	14.235	14.661	-	-
-0.9	18.824	29.318	31.554	33.473	35.035	35.313	13.323	14.885	15.163	-	-
-0.8	24.190	31.021	32.661	34.569	35.521	35.622	14.419	15.371	15.472	-	-
-0.7	27.728	32.412	33.487	35.346	35.862	35.882	15.196	15.712	15.732	-	-
-0.6	30.205	33.466	34.261	35.803	35.985	35.966	15.653	15.835	15.816	-	-
-0.5	32.049	34.385	34.811	36.000	36.000	36.000	15.850	15.850	15.850	-	-
-0.4	33.473	35.035	35.313	36.000	36.000	36.000	15.850	15.850	15.850	-	-
-0.3	34.569	35.521	35.622	36.000	36.000	36.000	15.850	15.850	15.850	-	-
-0.2	35.346	35.862	35.882	36.000	36.000	36.000	15.850	15.850	15.850	-	-
-0.1	35.803	35.985	35.966	36.000	36.000	36.000	15.850	15.850	15.850	-	-
0	36.000	36.000	36.000	36.000	36.000	36.000	15.850	15.850	15.850	-	-
0.1	35.966	35.806	35.860	36.000	36.000	36.000	15.850	15.850	15.850	-	-
0.2	35.680	35.460	35.669	36.000	36.000	36.000	15.850	15.850	15.850	-	-
0.3	35.087	34.963	35.293	36.000	36.000	36.000	15.850	15.850	15.850	-	-
0.4	34.187	34.208	34.867	36.000	36.000	36.000	15.850	15.850	15.850	-	-
0.5	32.983	33.323	34.229	36.000	36.000	36.000	15.850	15.850	15.850	-	-
0.6	31.407	32.136	33.538	35.966	35.806	35.860	15.816	15.656	15.710	-	-
0.7	29.293	30.668	32.589	35.680	35.460	35.669	15.530	15.310	15.519	-	-
0.8	26.342	28.928	31.579	35.087	34.963	35.293	14.937	14.813	15.143	-	-
0.9	22.159	26.531	30.226	34.187	34.208	34.867	14.037	14.058	14.717	-	-
1	15.191	23.590	28.777	32.983	33.323	34.229	12.833	13.173	14.079	-	-
1.1	-1.140	19.348	26.824	31.407	32.136	33.538	11.257	11.986	13.388	-	-
1.2	15.108	11.545	24.653	29.293	30.668	32.589	9.143	10.518	12.439	-	-
1.3	19.635	1.056	21.543	26.342	28.928	31.579	6.192	8.778	11.429	-	-
1.4	21.552	13.950	17.646	22.254	26.531	30.226	2.104	6.381	10.076	-	-
1.5	22.254	18.166	10.342	22.254	23.590	28.777	2.104	3.440	8.627	10.598	-
1.6	22.168	20.294	-2.346	22.254	21.986	26.824	2.104	1.836	6.674	9.897	-
1.7	21.359	21.531	11.516	22.254	21.986	24.653	2.104	1.836	4.503	9.239	-
1.8	19.670	21.959	15.892	22.254	21.986	21.543	2.104	1.836	1.393	8.618	-
1.9	16.866	21.986	18.565	22.254	21.986	21.331	2.104	1.836	1.181	8.031	-



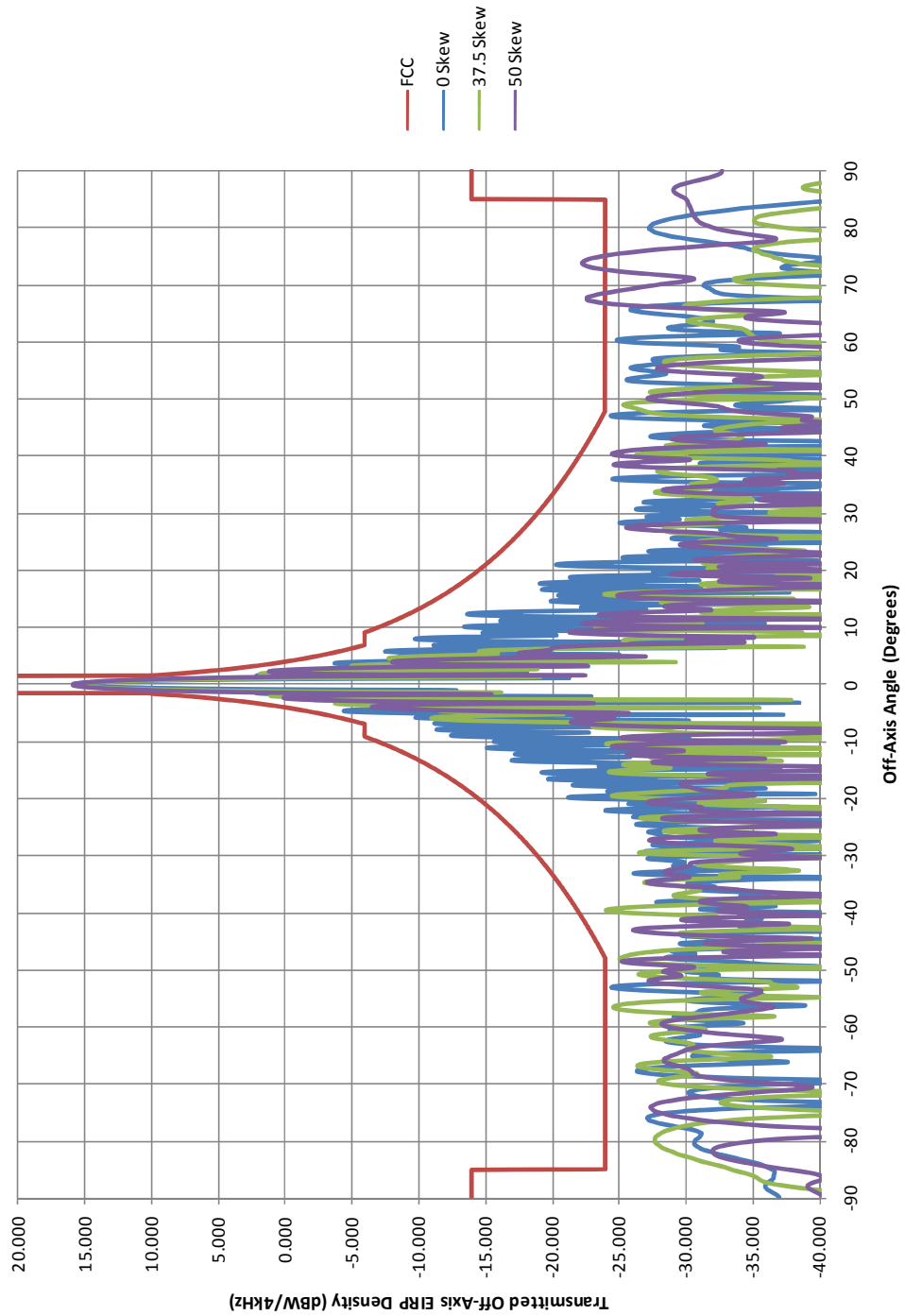
2	12.293	21.482	19.931	22.254	21.986	21.331	2.104	1.836	1.181	7.474	-
2.1	2.168	20.571	20.870	22.168	21.986	21.331	2.018	1.836	1.181	6.945	-
2.2	3.476	19.217	21.225	21.359	21.986	21.331	1.209	1.836	1.181	6.439	-
2.3	11.734	17.113	21.331	19.670	21.986	21.331	-0.480	1.836	1.181	5.957	-
2.4	15.011	14.371	21.050	17.066	21.986	21.331	-3.084	1.836	1.181	5.495	-
2.5	16.527	9.902	20.542	17.066	21.482	21.331	-3.084	1.332	1.181	5.051	-
2.6	17.066	2.384	19.697	17.066	20.571	21.331	-3.084	0.421	1.181	4.626	-
2.7	16.822	1.355	18.579	17.066	19.217	21.331	-3.084	-0.933	1.181	4.216	-
2.8	15.711	8.524	17.067	17.066	17.113	21.331	-3.084	-3.037	1.181	3.821	-
2.9	13.486	11.813	15.137	17.066	15.174	21.050	-3.084	-4.976	0.900	3.440	-
3	9.631	13.754	12.546	17.066	15.174	20.542	-3.084	-4.976	0.392	3.072	-
3.1	1.378	14.824	9.012	17.066	15.174	19.697	-3.084	-4.976	-0.453	2.716	-
3.2	-2.329	15.174	3.701	16.822	15.174	18.579	-3.328	-4.976	-1.571	2.371	-
3.3	8.435	15.099	-2.491	16.403	15.174	17.067	-3.747	-4.976	-3.083	2.037	-
3.4	12.587	14.395	2.678	16.403	15.174	15.137	-3.747	-4.976	-5.013	1.713	-
3.5	14.755	13.256	6.811	16.403	15.174	12.546	-3.747	-4.976	-7.604	1.398	-
3.6	15.925	11.350	9.384	16.403	15.174	12.091	-3.747	-4.976	-8.059	1.092	-
3.7	16.403	8.425	10.851	16.403	15.174	12.091	-3.747	-4.976	-8.059	0.795	-
3.8	16.245	3.788	11.715	16.403	15.099	12.091	-3.747	-5.051	-8.059	0.505	-
3.9	15.425	-8.962	12.091	16.403	14.395	12.091	-3.747	-5.755	-8.059	0.223	-
4	14.008	-2.279	12.047	16.403	13.256	12.091	-3.747	-6.894	-8.059	-0.051	-
4.1	11.986	4.998	11.697	16.403	12.397	12.091	-3.747	-7.753	-8.059	-0.320	-
4.2	9.402	8.547	10.920	16.403	12.397	12.091	-3.747	-7.753	-8.059	-0.581	-
4.3	7.265	10.463	9.883	16.245	12.397	12.091	-3.905	-7.753	-8.059	-0.837	-
4.4	7.806	11.709	8.293	15.425	12.397	12.091	-4.725	-7.753	-8.059	-1.086	-
4.5	9.615	12.260	6.376	14.008	12.397	12.047	-6.142	-7.753	-8.103	-1.330	-
4.6	11.005	12.397	3.536	11.986	12.397	11.697	-8.164	-7.753	-8.453	-1.569	-
4.7	11.715	12.116	0.058	11.715	12.397	10.920	-8.435	-7.753	-9.230	-1.802	-
4.8	11.669	11.430	-4.991	11.715	12.397	9.883	-8.435	-7.753	-10.267	-2.031	-
4.9	10.680	10.450	-6.847	11.715	12.397	8.293	-8.435	-7.753	-11.857	-2.255	-
5	8.554	9.004	-3.310	11.715	12.397	6.376	-8.435	-7.753	-13.774	-2.474	-
5.1	4.642	7.434	-0.619	11.715	12.397	3.536	-8.435	-7.753	-16.614	-2.689	-
5.2	-4.793	5.728	1.268	12.277	12.116	2.663	-7.873	-8.034	-17.487	-2.900	-
5.3	-3.622	4.549	2.155	12.628	11.430	2.663	-7.522	-8.720	-17.487	-3.107	-
5.4	5.379	4.217	2.663	12.628	10.450	2.663	-7.522	-9.700	-17.487	-3.310	-
5.5	9.131	4.648	2.638	12.628	9.004	2.663	-7.522	-11.146	-17.487	-3.509	-
5.6	11.177	5.216	2.392	12.628	7.434	2.663	-7.522	-12.716	-17.487	-3.705	-
5.7	12.277	5.560	1.891	12.628	5.728	2.663	-7.522	-14.422	-17.487	-3.897	-
5.8	12.628	5.629	1.323	12.628	5.629	2.663	-7.522	-14.521	-17.487	-4.086	-
5.9	12.210	5.215	0.794	12.628	5.629	2.663	-7.522	-14.521	-17.487	-4.271	-
6	11.040	4.441	0.417	12.628	5.629	2.638	-7.522	-14.521	-17.512	-4.454	-
6.1	9.019	3.112	0.241	12.628	5.629	2.392	-7.522	-14.521	-17.758	-4.633	-
6.2	5.633	1.279	0.212	12.628	5.629	1.891	-7.522	-14.521	-18.259	-4.810	-
6.3	-1.118	-1.321	0.200	12.628	5.629	1.323	-7.522	-14.521	-18.827	-4.984	-
6.4	-12.856	-5.108	0.133	12.210	5.215	0.794	-7.940	-14.935	-19.356	-5.154	-
6.5	1.111	-10.708	-0.140	11.040	4.441	0.417	-9.110	-15.709	-19.733	-5.323	-
6.6	5.585	-18.632	-0.591	9.019	3.112	0.241	-11.131	-17.038	-19.909	-5.489	-
6.7	7.858	-13.067	-1.390	9.002	1.279	0.212	-11.148	-18.871	-19.938	-5.652	-
6.8	8.927	-8.794	-2.425	9.002	-1.321	0.200	-11.148	-21.471	-19.950	-5.813	-
6.9	9.002	-6.651	-3.960	9.002	-5.108	0.133	-11.148	-25.258	-20.017	-5.971	-
7	8.199	-5.687	-5.786	9.002	-5.217	-0.140	-11.148	-25.367	-20.290	-6.000	-
7.1	6.468	-5.253	-8.381	9.002	-5.199	-0.591	-11.148	-25.349	-20.741	-6.000	-
7.2	3.282	-5.217	-11.155	9.002	-5.160	-1.390	-11.148	-25.310	-21.540	-6.000	-
7.3	-3.642	-5.305	-14.092	9.485	-5.160	-2.425	-10.665	-25.310	-22.575	-6.000	-
7.4	-13.036	-5.332	-14.257	10.257	-5.160	-3.960	-9.893	-25.310	-24.110	-6.000	-
7.5	0.558	-5.317	-12.800	10.401	-5.160	-5.786	-9.749	-25.310	-25.936	-6.000	-
7.6	5.249	-5.199	-11.154	10.401	-5.160	-8.381	-9.749	-25.310	-28.531	-6.000	-
7.7	7.902	-5.160	-10.255	10.401	-5.160	-9.889	-9.749	-25.310	-30.039	-6.000	-
7.8	9.485	-5.280	-9.889	10.401	-5.160	-9.889	-9.749	-25.310	-30.039	-6.000	-
7.9	10.257	-5.613	-10.303	10.401	-5.160	-9.889	-9.749	-25.310	-30.039	-6.000	-

8	10.401	-6.392	-11.227	10.401	-5.160	-9.216	-9.749	-25.310	-29.366	-6.000	-
8.1	10.034	-7.443	-13.031	10.401	-5.160	-6.866	-9.749	-25.310	-27.016	-6.000	-
8.2	9.129	-9.220	-14.952	10.401	-5.160	-4.759	-9.749	-25.310	-24.909	-6.000	-
8.3	7.540	-11.566	-14.985	10.401	-5.280	-3.402	-9.749	-25.430	-23.552	-6.000	-
8.4	5.188	-14.892	-12.571	10.401	-5.613	-2.248	-9.749	-25.763	-22.398	-6.000	-
8.5	2.259	-19.662	-9.216	10.401	-6.392	-1.613	-9.749	-26.542	-21.763	-6.000	-
8.6	-0.154	-22.385	-6.866	10.034	-7.443	-1.182	-10.116	-27.593	-21.332	-6.000	-
8.7	0.445	-19.876	-4.759	9.129	-9.220	-1.169	-11.021	-29.370	-21.319	-6.000	-
8.8	2.788	-17.531	-3.402	7.540	-11.566	-1.169	-12.610	-31.716	-21.319	-6.000	-
8.9	4.508	-16.918	-2.248	5.324	-11.426	-1.169	-14.826	-31.576	-21.319	-6.000	-
9	5.304	-17.126	-1.613	5.324	-8.533	-1.169	-14.826	-28.683	-21.319	-6.000	-
9.1	5.324	-18.540	-1.182	5.324	-6.436	-1.169	-14.826	-26.586	-21.319	-6.000	-
9.2	4.531	-18.075	-1.169	5.324	-4.978	-1.169	-14.826	-25.128	-21.319	-6.095	-
9.3	2.577	-14.657	-1.417	5.324	-3.858	-1.169	-14.826	-24.008	-21.319	-6.212	-
9.4	-1.262	-11.426	-2.069	5.324	-3.321	-1.169	-14.826	-23.471	-21.319	-6.328	-
9.5	-10.213	-8.533	-3.129	6.330	-3.050	-1.169	-13.820	-23.200	-21.319	-6.443	-
9.6	-10.990	-6.436	-4.722	6.722	-3.050	-1.169	-13.428	-23.200	-21.319	-6.557	-
9.7	-1.160	-4.978	-7.168	6.722	-3.050	-1.169	-13.428	-23.200	-21.319	-6.669	-
9.8	3.017	-3.858	-10.919	6.722	-3.050	-1.417	-13.428	-23.200	-21.567	-6.781	-
9.9	5.205	-3.321	-18.893	6.722	-3.050	-2.069	-13.428	-23.200	-22.219	-6.891	-
10	6.330	-3.050	-25.601	6.722	-3.050	-2.956	-13.428	-23.200	-23.106	-7.000	-
15	-5.820	-17.913	-8.631	0.238	-5.267	-4.794	-19.912	-25.417	-24.944	-11.402	-
20	-9.491	-12.074	-28.805	-6.072	-11.449	-9.373	-26.222	-31.599	-29.523	-14.526	-
25	-18.819	-10.797	-11.999	-8.941	-10.718	-9.429	-29.091	-30.868	-29.579	-16.949	-
30	-20.038	-16.596	-11.889	-7.160	-16.089	-11.884	-27.310	-36.239	-32.034	-18.928	-
35	-26.357	-10.347	-15.515	-9.100	-10.241	-9.758	-29.250	-30.391	-29.908	-20.602	-
40	-10.958	-6.700	-5.238	-10.153	-6.115	-4.347	-30.303	-26.265	-24.497	-22.051	-
45	-13.879	-12.734	-17.156	-11.242	-11.985	-17.013	-31.392	-32.135	-37.163	-23.330	-
50	-18.417	-15.662	-7.087	-16.342	-6.926	-7.010	-36.492	-27.076	-27.160	-24.000	-
55	-6.782	-15.976	-8.382	-5.756	-11.871	-7.726	-25.906	-32.021	-27.876	-24.000	-
60	-5.426	-18.294	-13.942	-4.712	-15.561	-13.836	-24.862	-35.711	-33.986	-24.000	-
65	-7.379	-16.317	-16.912	-5.849	-12.708	-14.499	-25.999	-32.858	-34.649	-24.000	-
70	-11.240	-16.275	-7.737	-11.190	-13.903	-6.269	-31.340	-34.053	-26.419	-24.000	-
75	-18.712	-16.288	-3.613	-16.483	-15.479	-2.601	-36.633	-35.629	-22.751	-24.000	1.249
80	-7.133	-17.216	-11.916	-7.123	-15.754	-11.317	-27.273	-35.904	-31.467	-24.000	-
85	-22.461	-41.544	-9.896	-19.441	-27.597	-9.540	-39.591	-47.747	-29.690	-14.000	-
90	-23.359	-25.219	-12.584	-23.255	-24.925	-12.450	-43.405	-45.075	-32.600	-14.000	-
95	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
100	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
105	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
110	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
115	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
120	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
125	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
130	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
135	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
140	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
145	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
150	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
155	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
160	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
165	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
170	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
175	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
180	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-

14.5GHz H-Pol, Nominal Transmitted Co-Pol PSD with -20.15dBW/4KHz at Input



14.5GHz H-Pol Nominal Transmitted Co-Pol PSD with -20.15dBW/4kHz at Input



**Data in support of claim that proposed operation meets criteria of VMES Order July 2009**

Applicant RAS Date of Application  
 ID Heading  
 a1 Antenna Manufacture: RAS c Main bore gain (dBi): 36.0  
 a2 Antenna Model: E7000 d Frequency at which gain was measured (GHz): 14.5  
 a3 Antenna ID: RAS e Max input power density (dBW/4kHz): -20.15  
 b Transmit Band (b): 14GHz Pattern ID Table A6  
 Pattern Description: 14.5GHz V-polarization, co-polarized at tangent to the geosynchronous plane for 0°, 37.5°, and 50° skew angle

Offset Angles  (Degrees)	Nominal Co-Pol Gain Along Tangent to Geo Arc  (dBi)			Worst Case Co-Pol Gain Along Tangent to Geo Arc  (dBi)			Worst Case Co-Pol PSD Along Tangent to Geo Arc input PSD = -20.15dBW/4kHz  (dBW/4kHz)			FCC Mask (dBW/4kHz)	Mask Exceedence  (dB)
	0° Skew	37.5° Skew	50° Skew	0° Skew	37.5° Skew	50° Skew	0° Skew	37.5° Skew	50° Skew		
-180	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-175	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-170	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-165	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-160	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-155	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-150	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-145	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-140	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-135	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-130	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-125	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-120	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-115	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-110	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-105	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-100	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-95	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
-90	-1.264	-16.136	-15.635	-1.264	-15.351	-15.036	-21.414	-35.501	-35.186	-14.000	-
-85	-0.919	-5.919	-11.033	-0.870	-5.546	-10.874	-21.020	-25.696	-31.024	-14.000	-
-80	-12.716	-11.334	-16.160	-12.444	-9.072	-15.416	-32.594	-29.222	-35.566	-24.000	-
-75	-3.835	-5.091	-6.170	-3.728	-5.038	-6.059	-23.878	-25.188	-26.209	-24.000	0.122
-70	-14.349	-10.484	-9.521	-11.691	-8.244	-8.597	-31.841	-28.394	-28.747	-24.000	-
-65	-17.723	-6.447	-8.711	-14.230	-6.407	-8.711	-34.380	-26.557	-28.861	-24.000	-
-60	-20.745	-8.749	-24.991	-8.864	-6.531	-15.174	-29.014	-26.681	-35.324	-24.000	-
-55	-15.335	-3.150	-2.942	-8.031	-2.662	-2.650	-28.181	-22.812	-22.800	-24.000	1.200
-50	-12.788	-22.998	-23.417	-9.684	-11.535	-9.231	-29.834	-31.685	-29.381	-24.000	-
-45	-3.787	-9.341	-7.480	-3.725	-6.433	-6.873	-23.875	-26.583	-27.023	-23.330	-
-40	-14.739	-14.161	-11.490	-8.302	-11.719	-7.572	-28.452	-31.869	-27.722	-22.051	-
-35	-11.435	-10.872	-16.086	-11.392	-6.477	-11.600	-31.542	-26.627	-31.750	-20.602	-
-30	-12.067	-8.821	-7.731	-6.759	-7.950	-5.532	-26.909	-28.100	-25.682	-18.928	-
-25	-20.178	-15.243	-20.409	-3.755	-14.393	-18.845	-23.905	-34.543	-38.995	-16.949	-
-20	-2.291	-7.558	-5.898	0.451	-7.535	-4.491	-19.699	-27.685	-24.641	-14.526	-
-15	-11.285	-7.837	-9.095	-1.408	-2.697	-4.950	-21.558	-22.847	-25.100	-11.402	-
-10	4.535	-10.520	0.107	4.535	-0.745	0.179	-15.615	-20.895	-19.971	-7.000	-

-9.9	3.595	-15.310	0.179	4.535	-1.434	0.179	-15.615	-21.584	-19.971	-6.891	-
-9.8	1.226	-17.719	-0.122	4.980	-2.673	0.179	-15.170	-22.823	-19.971	-6.781	-
-9.7	-3.505	-13.700	-0.947	6.787	-3.366	0.179	-13.363	-23.516	-19.971	-6.669	-
-9.6	-13.050	-10.143	-2.232	7.706	-2.671	0.179	-12.444	-22.821	-19.971	-6.557	-
-9.5	-4.413	-7.485	-4.224	7.933	-2.180	0.179	-12.217	-22.321	-19.971	-6.443	-
-9.4	1.680	-5.824	-7.276	7.933	-2.171	0.179	-12.217	-22.321	-19.971	-6.328	-
-9.3	4.980	-4.399	-12.280	7.933	-2.171	-0.122	-12.217	-22.321	-20.272	-6.212	-
-9.2	6.787	-3.366	-28.464	7.933	-2.171	-0.947	-12.217	-22.321	-21.097	-6.095	-
-9.1	7.706	-2.671	-15.963	7.933	-2.171	-0.074	-12.217	-22.321	-20.224	-6.000	-
-9	7.933	-2.180	-8.792	7.933	-2.171	0.830	-12.217	-22.321	-19.320	-6.000	-
-8.9	7.406	-2.171	-5.394	7.933	-2.171	1.475	-12.217	-22.321	-18.675	-6.000	-
-8.8	5.892	-2.435	-2.935	7.933	-2.171	1.927	-12.217	-22.321	-18.223	-6.000	-
-8.7	3.100	-3.279	-1.324	7.933	-2.171	2.158	-12.217	-22.321	-17.992	-6.000	-
-8.6	-2.225	-4.750	-0.074	7.933	-2.171	2.257	-12.217	-22.321	-17.893	-6.000	-
-8.5	-27.816	-6.906	0.830	8.581	-1.592	2.257	-11.569	-21.742	-17.893	-6.000	-
-8.4	-2.550	-10.231	1.475	8.581	0.547	2.257	-11.569	-19.603	-17.893	-6.000	-
-8.3	3.339	-11.580	1.927	8.581	1.985	2.257	-11.569	-18.165	-17.893	-6.000	-
-8.2	6.224	-7.973	2.158	8.581	3.094	2.257	-11.569	-17.056	-17.893	-6.000	-
-8.1	7.821	-4.334	2.257	8.581	3.810	2.257	-11.569	-16.340	-17.893	-6.000	-
-8	8.581	-1.592	2.144	8.581	4.211	2.257	-11.569	-15.939	-17.893	-6.000	-
-7.9	8.556	0.547	1.941	8.581	4.363	2.257	-11.569	-15.787	-17.893	-6.000	-
-7.8	7.646	1.985	1.525	8.581	4.363	2.257	-11.569	-15.787	-17.893	-6.000	-
-7.7	5.771	3.094	1.068	8.581	4.363	2.257	-11.569	-15.787	-17.893	-6.000	-
-7.6	2.490	3.810	0.441	8.581	4.363	2.257	-11.569	-15.787	-17.893	-6.000	-
-7.5	-3.500	4.211	-0.126	9.318	4.363	2.144	-10.832	-15.787	-18.006	-6.000	-
-7.4	-4.565	4.363	-0.672	9.731	4.363	1.941	-10.419	-15.787	-18.209	-6.000	-
-7.3	2.170	4.167	-0.921	9.731	4.363	2.182	-10.419	-15.787	-17.968	-6.000	-
-7.2	5.902	3.803	-0.853	9.731	4.363	2.941	-10.419	-15.787	-17.209	-6.000	-
-7.1	8.085	3.096	-0.319	9.731	4.363	3.394	-10.419	-15.787	-16.756	-6.000	-
-7	9.318	2.337	0.420	9.731	5.186	3.654	-10.419	-14.964	-16.496	-6.000	-
-6.9	9.731	1.648	1.368	9.731	6.583	3.654	-10.419	-13.567	-16.496	-5.971	-
-6.8	9.303	1.485	2.182	9.731	7.869	3.654	-10.419	-12.281	-16.496	-5.813	-
-6.7	8.047	2.205	2.941	9.731	8.751	3.654	-10.419	-11.399	-16.496	-5.652	-
-6.6	5.736	3.547	3.394	9.731	9.366	3.654	-10.419	-10.784	-16.496	-5.489	-
-6.5	1.601	5.186	3.654	10.312	9.648	3.654	-9.838	-10.502	-16.496	-5.323	-
-6.4	-4.145	6.583	3.468	11.131	9.648	3.654	-9.019	-10.502	-16.496	-5.154	-
-6.3	0.780	7.869	2.938	11.131	9.648	3.654	-9.019	-10.502	-16.496	-4.984	-
-6.2	5.668	8.751	1.690	11.131	9.648	3.654	-9.019	-10.502	-16.496	-4.810	-
-6.1	8.572	9.366	-0.441	11.131	9.648	3.654	-9.019	-10.502	-16.496	-4.633	-
-6	10.312	9.648	-4.435	11.131	9.648	6.474	-9.019	-10.502	-13.676	-4.454	-
-5.9	11.131	9.512	-16.496	11.131	9.648	8.413	-9.019	-10.502	-11.737	-4.271	-
-5.8	11.086	9.039	-9.432	11.131	9.648	9.936	-9.019	-10.502	-10.214	-4.086	-
-5.7	10.257	7.861	-0.622	11.131	9.648	10.933	-9.019	-10.502	-9.217	-3.897	-
-5.6	8.525	6.084	3.438	12.473	9.648	11.554	-7.677	-10.502	-8.596	-3.705	-
-5.5	5.520	2.852	6.474	14.492	9.648	11.807	-5.658	-10.502	-8.343	-3.509	-
-5.4	2.402	-3.481	8.413	15.789	10.950	11.807	-4.361	-9.200	-8.343	-3.310	-
-5.3	5.398	-9.580	9.936	16.385	12.165	11.807	-3.765	-7.985	-8.343	-3.107	-
-5.2	9.547	1.109	10.933	16.385	12.986	11.807	-3.765	-7.164	-8.343	-2.900	-
-5.1	12.473	5.895	11.554	16.385	13.203	11.807	-3.765	-6.947	-8.343	-2.689	-
-5	14.492	8.883	11.807	16.385	13.203	11.807	-3.765	-6.947	-8.343	-2.474	-
-4.9	15.789	10.950	11.632	16.385	13.203	11.807	-3.765	-6.947	-8.343	-2.255	-
-4.8	16.385	12.165	11.091	16.385	13.203	11.807	-3.765	-6.947	-8.343	-2.031	-
-4.7	16.384	12.986	9.917	16.385	13.203	11.807	-3.765	-6.947	-8.343	-1.802	-
-4.6	15.813	13.203	8.266	16.385	13.203	11.807	-3.765	-6.947	-8.343	-1.569	-
-4.5	14.532	12.989	5.460	16.385	13.203	12.290	-3.765	-6.947	-7.860	-1.330	-
-4.4	12.128	12.233	2.571	16.385	13.203	14.077	-3.765	-6.947	-6.073	-1.086	-
-4.3	7.888	10.691	3.012	16.385	13.203	15.335	-3.765	-6.947	-4.815	-0.837	-
-4.2	0.681	8.380	6.482	16.384	13.203	16.122	-3.766	-6.947	-4.028	-0.581	-
-4.1	4.066	4.306	9.946	16.452	14.785	16.574	-3.698	-5.365	-3.576	-0.320	-
-4	10.077	0.699	12.290	16.452	16.128	16.574	-3.698	-4.022	-3.576	-0.051	-

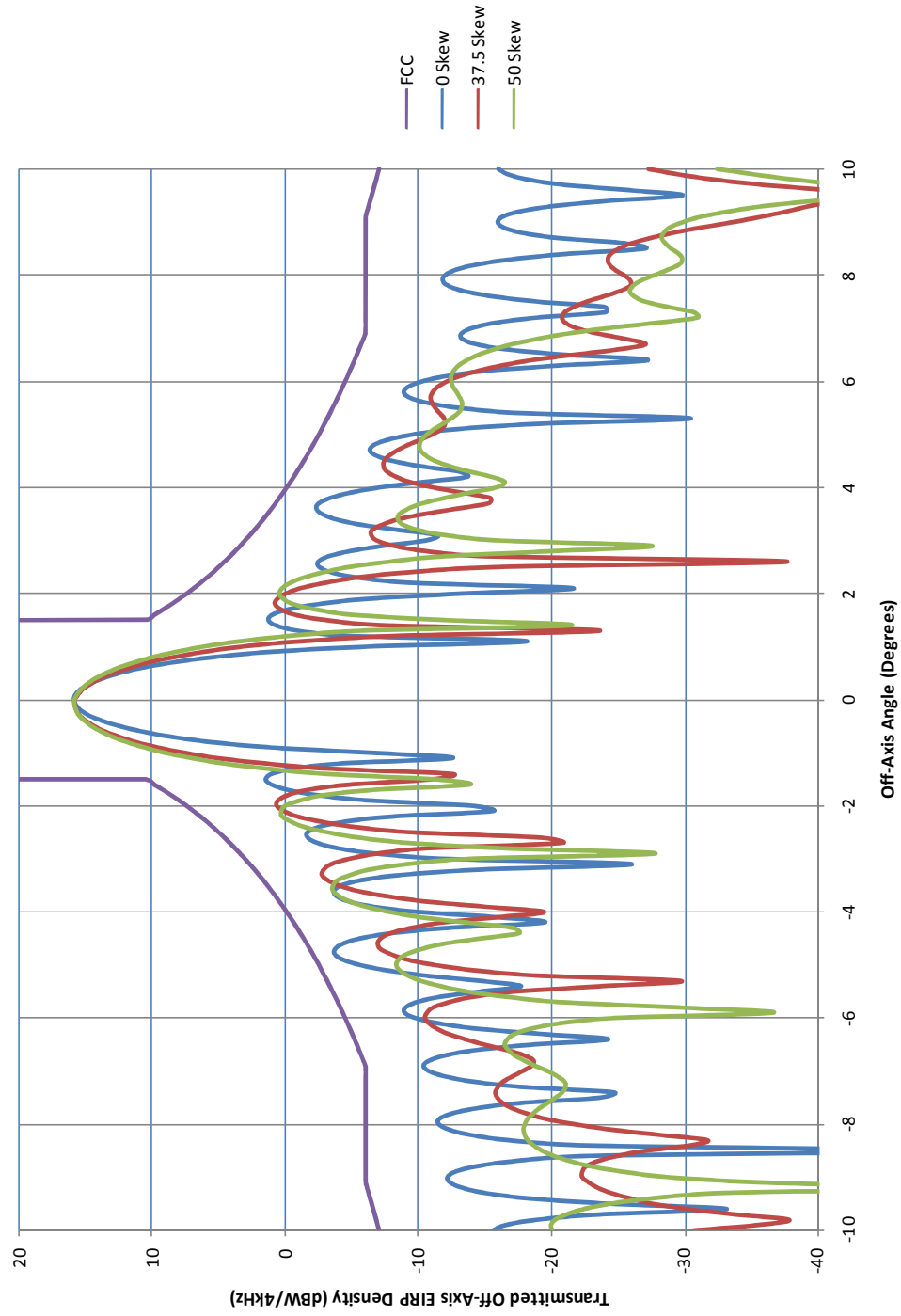
-3.9	13.490	5.105	14.077	16.452	16.986	16.574	-3.698	-3.164	-3.576	0.223	-
-3.8	15.376	9.691	15.335	16.452	17.401	16.574	-3.698	-2.749	-3.576	0.505	-
-3.7	16.277	12.599	16.122	16.452	17.401	16.574	-3.698	-2.749	-3.576	0.795	-
-3.6	16.452	14.785	16.574	16.452	17.401	16.574	-3.698	-2.749	-3.576	1.092	-
-3.5	15.901	16.128	16.554	16.452	17.401	16.574	-3.698	-2.749	-3.576	1.398	-
-3.4	14.371	16.986	16.218	16.452	17.401	16.574	-3.698	-2.749	-3.576	1.713	-
-3.3	11.341	17.401	15.238	16.452	17.401	16.574	-3.698	-2.749	-3.576	2.037	-
-3.2	5.266	17.256	13.794	17.699	17.401	16.574	-2.451	-2.749	-3.576	2.371	-
-3.1	-5.912	16.720	11.018	18.428	17.401	16.574	-1.722	-2.749	-3.576	2.716	-
-3	7.973	15.381	6.491	18.449	17.401	16.946	-1.701	-2.749	-3.204	3.072	-
-2.9	13.298	13.239	-7.659	18.449	17.401	18.691	-1.701	-2.749	-1.459	3.440	-
-2.8	16.145	9.394	3.761	18.449	17.444	19.705	-1.701	-2.706	-0.445	3.821	-
-2.7	17.699	-0.645	10.765	18.449	19.258	20.377	-1.701	-0.892	0.227	4.216	-
-2.6	18.428	0.915	14.580	18.449	20.243	20.447	-1.701	0.093	0.297	4.626	-
-2.5	18.449	10.637	16.946	18.449	20.793	20.447	-1.701	0.643	0.297	5.051	-
-2.4	17.640	14.849	18.691	18.449	20.793	20.447	-1.701	0.643	0.297	5.495	-
-2.3	15.685	17.444	19.705	18.449	20.793	20.447	-1.701	0.643	0.297	5.957	-
-2.2	12.016	19.258	20.377	19.923	20.793	20.447	-0.227	0.643	0.297	6.439	-
-2.1	4.524	20.243	20.447	21.144	20.793	20.447	0.994	0.643	0.297	6.945	-
-2	6.031	20.793	20.157	21.585	20.793	20.447	1.435	0.643	0.297	7.474	-
-1.9	13.706	20.695	19.072	21.585	20.793	20.447	1.435	0.643	0.297	8.031	-
-1.8	17.691	20.000	17.294	21.585	20.793	21.479	1.435	0.643	1.329	8.618	-
-1.7	19.923	18.481	13.559	21.585	21.713	24.834	1.435	1.563	4.684	9.239	-
-1.6	21.144	15.288	6.295	21.585	25.272	27.164	1.435	5.122	7.014	9.897	-
-1.5	21.585	9.149	8.983	21.585	27.734	29.202	1.435	7.584	9.052	10.598	-
-1.4	21.170	7.615	17.070	21.585	29.740	30.730	1.435	9.590	10.580	-	-
-1.3	19.517	16.849	21.479	25.645	31.385	32.055	5.495	11.235	11.905	-	-
-1.2	15.848	21.713	24.834	28.656	32.628	33.130	8.506	12.478	12.980	-	-
-1.1	7.528	25.272	27.164	30.856	33.715	33.984	10.706	13.565	13.834	-	-
-1	13.683	27.734	29.202	32.549	34.517	34.713	12.399	14.367	14.563	-	-
-0.9	21.166	29.740	30.730	33.870	35.132	35.217	13.720	14.982	15.067	-	-
-0.8	25.645	31.385	32.055	34.849	35.607	35.640	14.699	15.457	15.490	-	-
-0.7	28.656	32.628	33.130	35.487	35.853	35.853	15.337	15.703	15.703	-	-
-0.6	30.856	33.715	33.984	35.853	35.989	35.987	15.703	15.839	15.837	-	-
-0.5	32.549	34.517	34.713	36.000	36.000	36.000	15.850	15.850	15.850	-	-
-0.4	33.870	35.132	35.217	36.000	36.000	36.000	15.850	15.850	15.850	-	-
-0.3	34.849	35.607	35.640	36.000	36.000	36.000	15.850	15.850	15.850	-	-
-0.2	35.487	35.853	35.853	36.000	36.000	36.000	15.850	15.850	15.850	-	-
-0.1	35.853	35.989	35.987	36.000	36.000	36.000	15.850	15.850	15.850	-	-
0	36.000	36.000	36.000	36.000	36.000	36.000	15.850	15.850	15.850	-	-
0.1	35.880	35.714	35.788	36.000	36.000	36.000	15.850	15.850	15.850	-	-
0.2	35.486	35.362	35.474	36.000	36.000	36.000	15.850	15.850	15.850	-	-
0.3	34.807	34.775	35.026	36.000	36.000	36.000	15.850	15.850	15.850	-	-
0.4	33.858	34.065	34.437	36.000	36.000	36.000	15.850	15.850	15.850	-	-
0.5	32.598	33.104	33.643	36.000	36.000	36.000	15.850	15.850	15.850	-	-
0.6	30.919	31.899	32.737	35.880	35.714	35.788	15.730	15.564	15.638	-	-
0.7	28.633	30.490	31.514	35.486	35.362	35.474	15.336	15.212	15.324	-	-
0.8	25.587	28.590	30.167	34.807	34.775	35.026	14.657	14.625	14.876	-	-
0.9	21.306	26.340	28.378	33.858	34.065	34.437	13.708	13.915	14.287	-	-
1	13.906	23.392	26.305	32.598	33.104	33.643	12.448	12.954	13.493	-	-
1.1	1.950	18.990	23.596	30.919	31.899	32.737	10.769	11.749	12.587	-	-
1.2	15.261	11.995	19.881	28.633	30.490	31.514	8.483	10.340	11.364	-	-
1.3	19.170	-3.509	14.421	25.587	28.590	30.167	5.437	8.440	10.017	-	-
1.4	20.839	12.719	-1.312	21.393	26.340	28.378	1.243	6.190	8.228	-	-
1.5	21.393	17.098	8.227	21.393	23.392	26.305	1.243	3.242	6.155	10.598	-
1.6	21.102	19.432	15.079	21.393	20.923	23.596	1.243	0.773	3.446	9.897	-
1.7	19.911	20.466	17.864	21.393	20.923	20.582	1.243	0.773	0.432	9.239	-
1.8	17.669	20.923	19.524	21.393	20.923	20.582	1.243	0.773	0.432	8.618	-
1.9	13.969	20.768	20.302	21.393	20.923	20.582	1.243	0.773	0.432	8.031	-

2	6.827	20.123	20.582	21.393	20.923	20.582	1.243	0.773	0.432	7.474	-
2.1	-1.511	19.038	20.385	21.102	20.923	20.582	0.952	0.773	0.432	6.945	-
2.2	10.484	17.218	19.790	19.911	20.923	20.582	-0.239	0.773	0.432	6.439	-
2.3	14.666	14.808	18.797	17.669	20.923	20.582	-2.481	0.773	0.432	5.957	-
2.4	16.665	10.946	17.294	17.647	20.768	20.582	-2.503	0.618	0.432	5.495	-
2.5	17.564	4.098	15.344	17.647	20.123	20.582	-2.503	-0.027	0.432	5.051	-
2.6	17.647	-17.598	12.361	17.647	19.038	20.385	-2.503	-1.112	0.235	4.626	-
2.7	16.900	4.993	8.320	17.647	17.218	19.790	-2.503	-2.932	-0.360	4.216	-
2.8	15.247	9.586	-0.013	17.647	14.808	18.797	-2.503	-5.342	-1.353	3.821	-
2.9	12.705	12.010	-7.389	17.647	13.692	17.294	-2.503	-6.458	-2.856	3.440	-
3	9.566	13.267	4.113	17.647	13.692	15.344	-2.503	-6.458	-4.806	3.072	-
3.1	8.659	13.692	8.117	17.786	13.692	12.361	-2.364	-6.458	-7.789	2.716	-
3.2	11.630	13.608	10.205	17.786	13.692	11.684	-2.364	-6.458	-8.466	2.371	-
3.3	14.515	12.845	11.315	17.786	13.692	11.684	-2.364	-6.458	-8.466	2.037	-
3.4	16.333	11.646	11.684	17.786	13.692	11.684	-2.364	-6.458	-8.466	1.713	-
3.5	17.366	9.696	11.565	17.786	13.692	11.684	-2.364	-6.458	-8.466	1.398	-
3.6	17.786	7.231	10.902	17.786	13.692	11.684	-2.364	-6.458	-8.466	1.092	-
3.7	17.602	4.872	9.842	17.786	13.608	11.684	-2.364	-6.542	-8.466	0.795	-
3.8	16.754	4.741	8.197	17.786	12.845	11.684	-2.364	-7.305	-8.466	0.505	-
3.9	15.256	6.860	6.315	17.786	12.768	11.684	-2.364	-7.382	-8.466	0.223	-
4	13.022	9.047	4.288	17.786	12.768	11.565	-2.364	-7.382	-8.585	-0.051	-
4.1	9.845	10.768	3.640	17.786	12.768	10.902	-2.364	-7.382	-9.248	-0.320	-
4.2	6.436	11.827	4.637	17.602	12.768	9.995	-2.548	-7.382	-10.155	-0.581	-
4.3	7.091	12.523	6.317	16.754	12.768	10.056	-3.396	-7.382	-10.094	-0.837	-
4.4	9.958	12.768	7.779	15.256	12.768	10.056	-4.894	-7.382	-10.094	-1.086	-
4.5	12.055	12.714	8.908	13.762	12.768	10.056	-6.388	-7.382	-10.094	-1.330	-
4.6	13.288	12.354	9.593	13.762	12.768	10.056	-6.388	-7.382	-10.094	-1.569	-
4.7	13.762	11.732	9.995	13.762	12.768	10.056	-6.388	-7.382	-10.094	-1.802	-
4.8	13.455	10.944	10.056	13.762	12.768	10.056	-6.388	-7.382	-10.094	-2.031	-
4.9	12.380	9.972	9.900	13.762	12.768	10.056	-6.388	-7.382	-10.094	-2.255	-
5	10.457	9.105	9.498	13.762	12.714	10.056	-6.388	-7.436	-10.094	-2.474	-
5.1	7.212	8.405	8.971	13.762	12.354	10.056	-6.388	-7.796	-10.094	-2.689	-
5.2	0.862	8.131	8.307	13.762	11.732	10.056	-6.388	-8.418	-10.094	-2.900	-
5.3	-10.346	8.208	7.697	13.455	10.944	10.056	-6.695	-9.206	-10.094	-3.107	-
5.4	2.456	8.541	7.168	12.380	9.972	9.900	-7.770	-10.178	-10.250	-3.310	-
5.5	7.109	8.894	6.901	11.214	9.231	9.498	-8.936	-10.919	-10.652	-3.509	-
5.6	9.550	9.135	6.863	11.214	9.231	8.971	-8.936	-10.919	-11.179	-3.705	-
5.7	10.832	9.231	7.045	11.214	9.231	8.307	-8.936	-10.919	-11.843	-3.897	-
5.8	11.214	9.062	7.284	11.214	9.231	7.697	-8.936	-10.919	-12.453	-4.086	-
5.9	10.850	8.678	7.542	11.214	9.231	7.679	-8.936	-10.919	-12.471	-4.271	-
6	9.816	7.978	7.665	11.214	9.231	7.679	-8.936	-10.919	-12.471	-4.454	-
6.1	7.971	7.000	7.679	11.214	9.231	7.679	-8.936	-10.919	-12.471	-4.633	-
6.2	4.842	5.646	7.481	11.214	9.231	7.679	-8.936	-10.919	-12.471	-4.810	-
6.3	-0.649	3.837	7.114	11.214	9.062	7.679	-8.936	-11.088	-12.471	-4.984	-
6.4	-7.137	1.577	6.490	10.850	8.678	7.679	-9.300	-11.472	-12.471	-5.154	-
6.5	-0.955	-1.506	5.663	9.816	7.978	7.679	-10.334	-12.172	-12.471	-5.323	-
6.6	3.451	-4.866	4.501	7.971	7.000	7.679	-12.179	-13.150	-12.471	-5.489	-
6.7	5.802	-6.946	3.084	6.878	5.646	7.481	-13.272	-14.504	-12.669	-5.652	-
6.8	6.833	-5.384	1.201	6.878	3.837	7.114	-13.272	-16.313	-13.036	-5.813	-
6.9	6.878	-3.332	-1.097	6.878	1.577	6.490	-13.272	-18.573	-13.660	-5.971	-
7	6.106	-1.745	-4.061	6.878	-0.647	5.663	-13.272	-20.797	-14.487	-6.000	-
7.1	4.389	-0.915	-7.657	6.878	-0.647	4.501	-13.272	-20.797	-15.649	-6.000	-
7.2	1.202	-0.647	-10.840	6.878	-0.647	3.084	-13.272	-20.797	-17.066	-6.000	-
7.3	-3.920	-0.846	-10.554	7.878	-0.647	1.201	-12.272	-20.797	-18.949	-6.000	-
7.4	-3.883	-1.513	-8.616	8.291	-0.647	-1.097	-11.859	-20.797	-21.247	-6.000	-
7.5	1.134	-2.487	-6.913	8.291	-0.647	-4.061	-11.859	-20.797	-24.211	-6.000	-
7.6	4.556	-3.798	-6.064	8.291	-0.647	-5.744	-11.859	-20.797	-25.894	-6.000	-
7.7	6.705	-4.983	-5.744	8.291	-0.647	-5.744	-11.859	-20.797	-25.894	-6.000	-
7.8	7.878	-5.796	-5.993	8.291	-0.846	-5.744	-11.859	-20.996	-25.894	-6.000	-
7.9	8.291	-5.780	-6.595	8.291	-1.513	-5.744	-11.859	-21.663	-25.894	-6.000	-

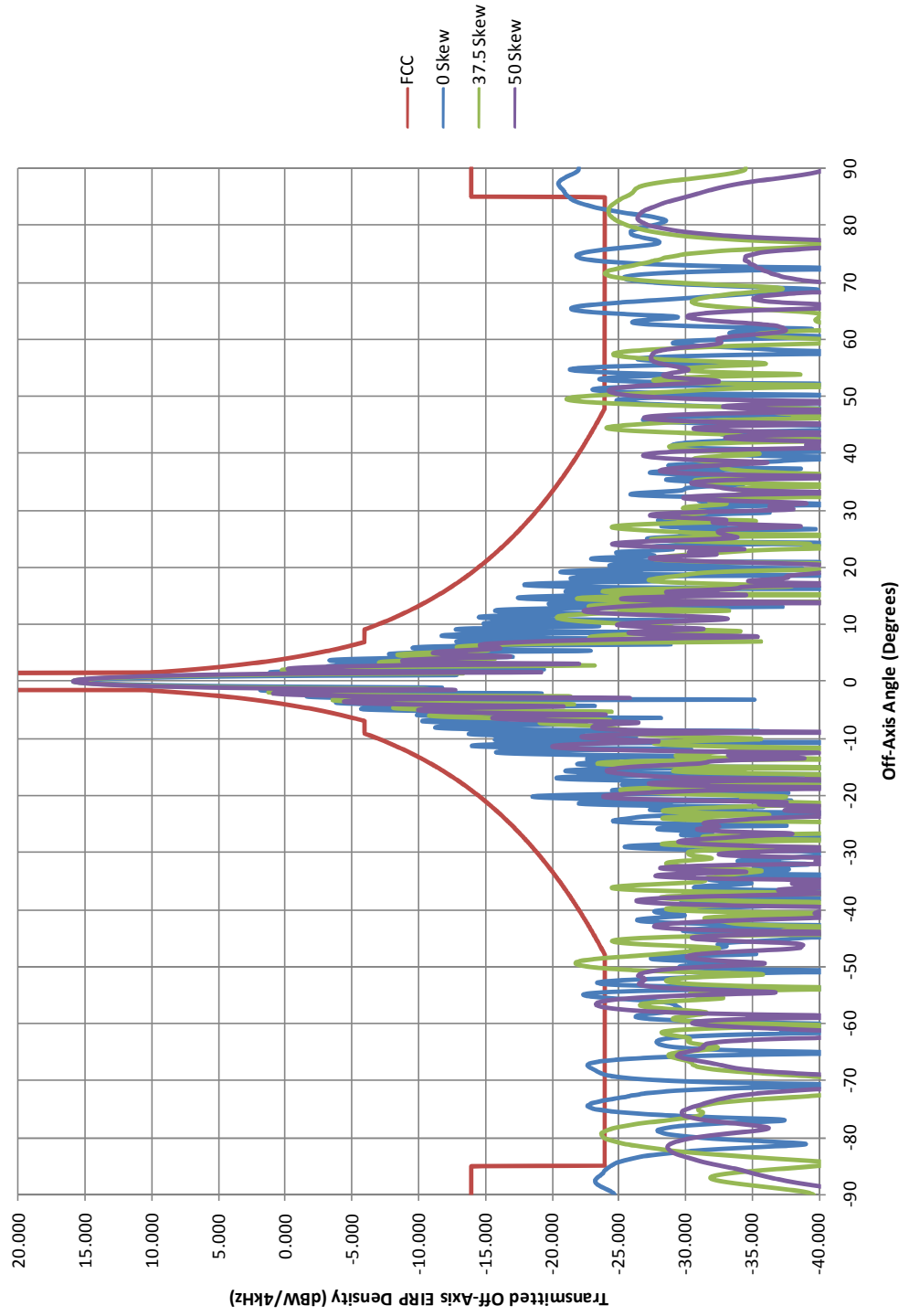


8	8.108	-5.298	-7.576	8.291	-2.487	-5.744	-11.859	-22.637	-25.894	-6.000	-
8.1	7.319	-4.635	-8.586	8.291	-3.798	-5.744	-11.859	-23.948	-25.894	-6.000	-
8.2	5.739	-4.217	-9.449	8.291	-4.094	-5.744	-11.859	-24.244	-25.894	-6.000	-
8.3	3.100	-4.094	-9.694	8.291	-4.094	-5.993	-11.859	-24.244	-26.143	-6.000	-
8.4	-0.991	-4.305	-9.435	8.291	-4.094	-6.595	-11.859	-24.244	-26.745	-6.000	-
8.5	-6.910	-4.928	-8.849	8.108	-4.094	-7.576	-12.042	-24.244	-27.726	-6.000	-
8.6	-5.473	-5.874	-8.412	7.319	-4.094	-8.141	-12.831	-24.244	-28.291	-6.000	-
8.7	-0.389	-7.295	-8.141	5.739	-4.094	-8.141	-14.411	-24.244	-28.291	-6.000	-
8.8	2.385	-9.025	-8.293	4.155	-4.094	-8.141	-15.995	-24.244	-28.291	-6.000	-
8.9	3.723	-11.155	-8.755	4.155	-4.305	-8.141	-15.995	-24.455	-28.291	-6.000	-
9	4.155	-13.529	-9.721	4.155	-4.928	-8.141	-15.995	-25.078	-28.291	-6.000	-
9.1	3.803	-15.614	-11.080	4.155	-5.874	-8.141	-15.995	-26.024	-28.291	-6.000	-
9.2	2.513	-17.515	-13.146	4.155	-7.295	-8.141	-15.995	-27.445	-28.291	-6.095	-
9.3	0.017	-19.217	-15.756	4.155	-9.025	-8.293	-15.995	-29.175	-28.443	-6.212	-
9.4	-4.190	-21.171	-19.628	4.155	-9.357	-8.755	-15.995	-29.507	-28.905	-6.328	-
9.5	-9.724	-22.941	-23.982	4.155	-7.160	-9.721	-15.995	-27.310	-29.871	-6.443	-
9.6	-5.745	-20.533	-25.217	4.107	-5.552	-9.769	-16.043	-25.702	-29.919	-6.557	-
9.7	-0.860	-15.800	-21.880	4.107	-4.300	-7.754	-16.043	-24.450	-27.904	-6.669	-
9.8	1.872	-12.125	-18.094	4.107	-3.338	-5.879	-16.043	-23.488	-26.029	-6.781	-
9.9	3.391	-9.357	-15.042	4.107	-2.632	-4.545	-16.043	-22.782	-24.695	-6.891	-
10	4.107	-7.160	-12.322	4.107	-2.043	-3.393	-16.043	-22.193	-23.543	-7.000	-
15	-13.686	-6.688	-15.419	0.426	-1.201	-13.098	-19.724	-21.351	-33.248	-11.402	-
20	-10.737	-21.399	-13.643	-3.292	-14.226	-9.523	-23.442	-34.376	-29.673	-14.526	-
25	-4.525	-5.736	-19.394	-2.741	-5.507	-8.285	-22.891	-25.657	-28.435	-16.949	-
30	-8.674	-11.482	-12.297	-5.232	-11.475	-5.715	-25.382	-31.625	-25.865	-18.928	-
35	-19.242	-15.650	-15.707	-11.640	-13.429	-10.659	-31.790	-33.579	-30.809	-20.602	-
40	-4.851	-6.092	-12.840	-4.330	-3.924	-7.601	-24.480	-24.074	-27.751	-22.051	-
45	-20.193	-9.045	-8.690	-12.257	-7.448	-4.419	-32.407	-27.598	-24.569	-23.330	-
50	-12.433	-8.043	-10.217	-10.235	-4.554	-7.261	-30.385	-24.704	-27.411	-24.000	-
55	-10.141	-3.315	-4.248	-8.685	-3.315	-4.110	-28.835	-23.465	-24.260	-24.000	0.535
60	-23.344	-10.738	-28.781	-7.677	-8.320	-11.938	-27.827	-28.470	-32.088	-24.000	-
65	-1.852	-4.378	-8.537	-1.289	-4.378	-8.529	-21.439	-24.528	-28.679	-24.000	2.561
70	-9.143	-16.140	-5.197	-6.325	-11.794	-4.647	-26.475	-31.944	-24.797	-24.000	-
75	-6.998	-16.732	-12.944	-6.087	-13.851	-12.033	-26.237	-34.001	-32.183	-24.000	-
80	-8.842	-6.848	-11.669	-6.699	-5.631	-11.240	-26.849	-25.781	-31.390	-24.000	-
85	-7.288	-15.871	-10.764	-6.624	-14.491	-10.397	-26.774	-34.641	-30.547	-14.000	-
90	-5.707	-20.165	-14.281	-5.619	-19.988	-14.167	-25.769	-40.138	-34.317	-14.000	-
95	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
100	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
105	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
110	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
115	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
120	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
125	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
130	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
135	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
140	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
145	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
150	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
155	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
160	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
165	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
170	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
175	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-
180	6	6	6	6	6	6	-14.150	-14.150	-14.150	-14.000	-

14.5GHz V-Pol, Nominal Transmitted Co-Pol PSD with -20.15dBW/4KHz at Input



### 14.25GHz V-Pol Nominal Transmitted Co-Pol PSD with -20.15dBW/4kHz at Input



**Data in support of claim that proposed operation meets criteria of VMES Order July 2009**

**Applicant** RAS

**Date of Application**

**ID Heading**

<b>a1</b>	<b>Antenna Manufacture:</b>	RAS	<b>c</b>	<b>Main bore gain (dBi):</b>	36.0
<b>a2</b>	<b>Antenna Model:</b>	E7000	<b>d</b>	<b>Frequency at which gain was measured (GHz):</b>	14.0
<b>a3</b>	<b>Antenna ID:</b>	RAS	<b>e</b>	<b>Max input power density (dBW/4kHz):</b>	-20.15
<b>b</b>	<b>Transmit Band (b):</b>	14GHz	<b>Pattern ID</b>	Table B1	
	<b>Pattern Description:</b>	<b>14.0GHz H-polarization, co-polarized perpendicular to the geosynchronous plane for 0°, 37.5°, and 50° skew angle</b>			

<b>Offset Angles</b>	<b>Nominal EI Gain Along At Normal to Geo Arc</b>	<b>Worst Case EI Gain Along At Normal to Geo Arc</b>	<b>Worst Case EI PSD Along At Normal to Geo Arc</b>	<b>FCC Mask (dBW/4kHz)</b>	<b>Mask Exceedence</b>
<b>(Degrees)</b>	<b>(dBi)</b>	<b>(dBi)</b>	<b>(dBW/4kHz)</b>		<b>(dB)</b>
	<b>0° Skew</b>	<b>0° Skew</b>	<b>0° Skew</b>		
-180	-2.750	-2.750	-22.900	-14	-
-175	-2.750	-2.750	-22.900	-14	-
-170	-2.750	-2.750	-22.900	-14	-
-165	-2.750	-2.750	-22.900	-14	-
-160	-2.750	-2.750	-22.900	-14	-
-155	-2.750	-2.750	-22.900	-14	-
-150	-2.750	-2.750	-22.900	-14	-
-145	-2.750	-2.750	-22.900	-14	-
-140	-2.750	-2.750	-22.900	-14	-
-135	-2.750	-2.750	-22.900	-14	-
-130	-2.750	-2.750	-22.900	-14	-
-125	-2.750	-2.750	-22.900	-14	-
-120	-2.750	-2.750	-22.900	-14	-
-115	-2.750	-2.750	-22.900	-14	-
-110	-2.750	-2.750	-22.900	-14	-
-105	-2.750	-2.750	-22.900	-14	-
-100	-2.750	-2.750	-22.900	-14	-
-95	-2.750	-2.750	-22.900	-14	-
-90	-8.217	-8.004	-28.154	-14	-
-85	-7.428	-7.405	-27.555	-24	-
-80	-7.315	-7.288	-27.438	-24	-
-75	-5.711	-5.174	-25.324	-24	-
-70	-1.698	-1.579	-21.729	-24	2.271
-65	-4.036	-1.910	-22.060	-24	1.940
-60	4.440	4.669	-15.481	-24	8.519
-55	-7.495	-2.339	-22.489	-24	1.511
-50	7.260	7.261	-12.889	-24	11.111
-45	4.178	6.964	-13.186	-23.330	10.144
-40	11.691	12.095	-8.055	-22.051	13.996
-35	4.712	6.629	-13.521	-20.602	7.081
-30	-4.367	2.957	-17.193	-18.928	1.735
-25	3.957	7.467	-12.683	-16.949	4.266
-20	12.400	13.165	-6.985	-14.526	7.541
-15	17.635	17.919	-2.231	-11.402	9.171
-10	19.845	21.401	1.251	-7.000	8.251

-9.9	20.213	21.635	1.485	-6.891	8.376
-9.8	20.552	21.846	1.696	-6.781	8.477
-9.7	20.862	22.032	1.882	-6.669	8.551
-9.6	21.144	22.197	2.047	-6.557	8.604
-9.5	21.401	22.340	2.190	-6.443	8.633
-9.4	21.635	22.462	2.312	-6.328	8.640
-9.3	21.846	22.561	2.411	-6.212	8.623
-9.2	22.032	22.638	2.488	-6.095	8.583
-9.1	22.197	22.694	2.544	-5.976	8.520
-9	22.340	22.727	2.577	-5.856	8.433
-8.9	22.462	22.738	2.588	-5.735	8.323
-8.8	22.561	22.738	2.588	-5.612	8.200
-8.7	22.638	22.738	2.588	-5.488	8.076
-8.6	22.694	22.738	2.588	-5.362	7.950
-8.5	22.727	22.738	2.588	-5.235	7.823
-8.4	22.738	22.738	2.588	-5.107	7.695
-8.3	22.724	22.738	2.588	-4.977	7.565
-8.2	22.686	22.738	2.588	-4.845	7.433
-8.1	22.622	22.738	2.588	-4.712	7.300
-8	22.533	22.738	2.588	-4.577	7.165
-7.9	22.414	22.738	2.588	-4.441	7.029
-7.8	22.265	22.724	2.574	-4.302	6.876
-7.7	22.085	22.686	2.536	-4.162	6.698
-7.6	21.871	22.622	2.472	-4.020	6.492
-7.5	21.620	22.533	2.383	-3.877	6.260
-7.4	21.326	22.414	2.264	-3.731	5.995
-7.3	20.988	22.265	2.115	-3.583	5.698
-7.2	20.600	22.085	1.935	-3.433	5.368
-7.1	20.156	21.871	1.721	-3.281	5.002
-7	19.647	21.620	1.470	-3.127	4.597
-6.9	19.060	21.326	1.176	-2.971	4.147
-6.8	18.385	20.988	0.838	-2.813	3.651
-6.7	17.604	20.600	0.450	-2.652	3.102
-6.6	16.693	20.156	0.006	-2.489	2.495
-6.5	15.613	19.647	-0.503	-2.323	1.820
-6.4	14.306	19.060	-1.090	-2.154	1.064
-6.3	12.691	18.385	-1.765	-1.984	0.219
-6.2	10.623	17.604	-2.546	-1.810	-
-6.1	7.808	16.693	-3.457	-1.633	-
-6	3.601	15.613	-4.537	-1.454	-
-5.9	-2.645	14.735	-5.415	-1.271	-
-5.8	0.166	16.499	-3.651	-1.086	-
-5.7	6.005	17.992	-2.158	-0.897	-
-5.6	9.822	19.290	-0.860	-0.705	-
-5.5	12.578	20.440	0.290	-0.509	0.799
-5.4	14.735	21.475	1.325	-0.310	1.635
-5.3	16.499	22.410	2.260	-0.107	2.367
-5.2	17.992	23.263	3.113	0.100	3.013
-5.1	19.290	24.048	3.898	0.311	3.587
-5	20.440	24.776	4.626	0.526	4.100
-4.9	21.475	25.456	5.306	0.745	4.561
-4.8	22.410	26.090	5.940	0.969	4.971
-4.7	23.263	26.682	6.532	1.198	5.334
-4.6	24.048	27.239	7.089	1.431	5.658
-4.5	24.776	27.766	7.616	1.670	5.946
-4.4	25.456	28.264	8.114	1.914	6.200
-4.3	26.090	28.736	8.586	2.163	6.423
-4.2	26.682	29.181	9.031	2.419	6.612
-4.1	27.239	29.605	9.455	2.680	6.775
-4	27.766	30.007	9.857	2.949	6.908

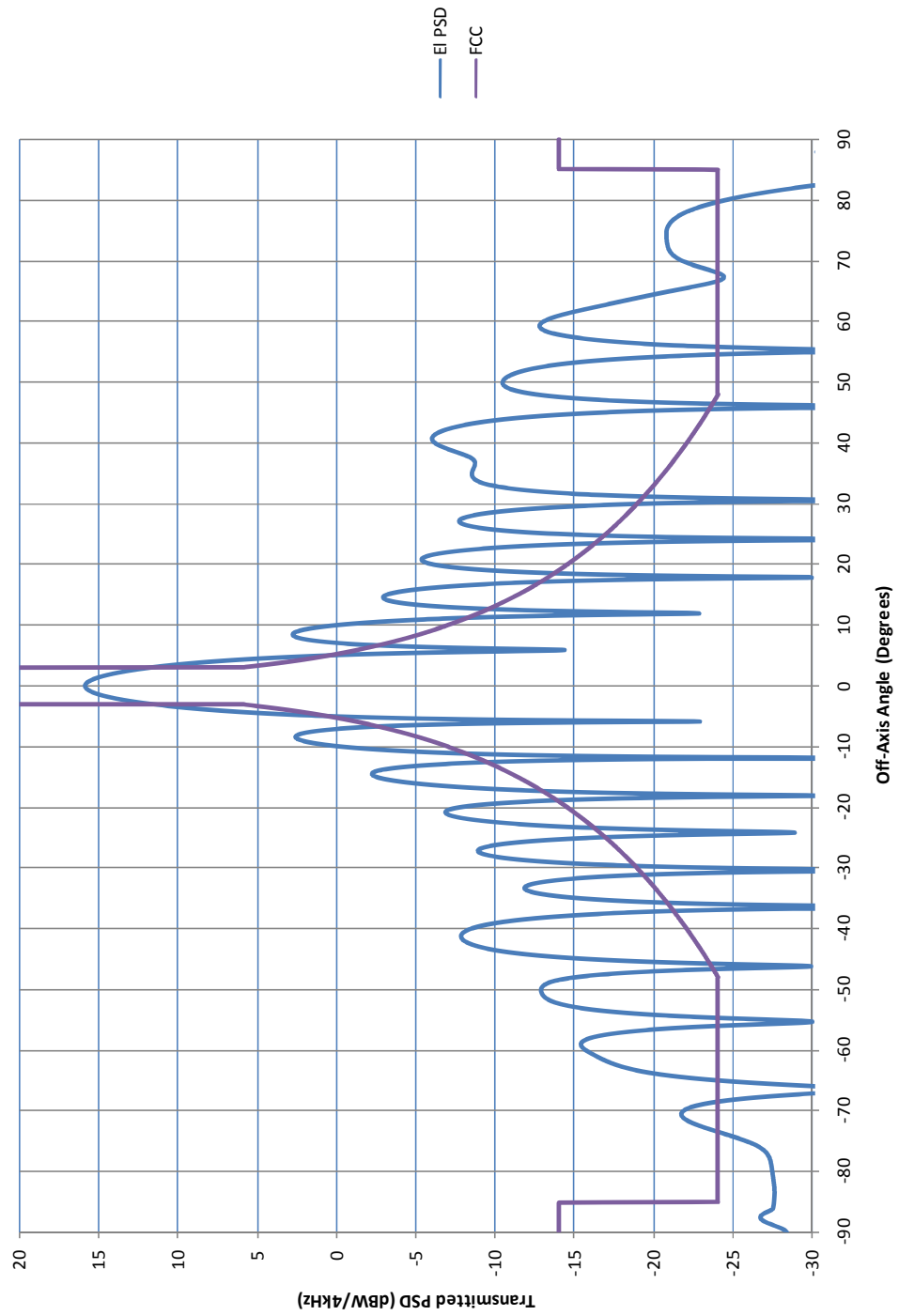
-3.9	28.264	30.392	10.242	3.223	7.019
-3.8	28.736	30.758	10.608	3.505	7.103
-3.7	29.181	31.106	10.956	3.795	7.161
-3.6	29.605	31.437	11.287	4.092	7.195
-3.5	30.007	31.753	11.603	4.398	7.205
-3.4	30.392	32.056	11.906	4.713	7.193
-3.3	30.758	32.344	12.194	5.037	7.157
-3.2	31.106	32.618	12.468	5.371	7.097
-3.1	31.437	32.879	12.729	5.716	7.013
-3	31.753	33.127	12.977	6.072	6.905
-2.9	32.056	33.365	13.215		-
-2.8	32.344	33.590	13.440		-
-2.7	32.618	33.804	13.654		-
-2.6	32.879	34.006	13.856		-
-2.5	33.127	34.198	14.048		-
-2.4	33.365	34.380	14.230		-
-2.3	33.590	34.551	14.401		-
-2.2	33.804	34.711	14.561		-
-2.1	34.006	34.862	14.712		-
-2	34.198	35.002	14.852		-
-1.9	34.380	35.134	14.984		-
-1.8	34.551	35.256	15.106		-
-1.7	34.711	35.367	15.217		-
-1.6	34.862	35.470	15.320		-
-1.5	35.002	35.563	15.413		-
-1.4	35.134	35.647	15.497		-
-1.3	35.256	35.722	15.572		-
-1.2	35.367	35.788	15.638		-
-1.1	35.470	35.845	15.695		-
-1	35.563	35.893	15.743		-
-0.9	35.647	35.932	15.782		-
-0.8	35.722	35.962	15.812		-
-0.7	35.788	35.984	15.834		-
-0.6	35.845	35.996	15.846		-
-0.5	35.893	36.000	15.850		-
-0.4	35.932	36.000	15.850		-
-0.3	35.962	36.000	15.850		-
-0.2	35.984	36.000	15.850		-
-0.1	35.996	36.000	15.850		-
0	36.000	36.000	15.850		-
0.1	35.996	36.000	15.850		-
0.2	35.983	36.000	15.850		-
0.3	35.961	36.000	15.850		-
0.4	35.931	36.000	15.850		-
0.5	35.892	36.000	15.850		-
0.6	35.844	35.996	15.846		-
0.7	35.788	35.983	15.833		-
0.8	35.723	35.961	15.811		-
0.9	35.650	35.931	15.781		-
1	35.568	35.892	15.742		-
1.1	35.478	35.844	15.694		-
1.2	35.378	35.788	15.638		-
1.3	35.269	35.723	15.573		-
1.4	35.152	35.650	15.500		-
1.5	35.026	35.568	15.418		-
1.6	34.890	35.478	15.328		-
1.7	34.745	35.378	15.228		-
1.8	34.590	35.269	15.119		-
1.9	34.426	35.152	15.002		-

2	34.252	35.026	14.876	-	
2.1	34.068	34.890	14.740	-	
2.2	33.873	34.745	14.595	-	
2.3	33.666	34.590	14.440	-	
2.4	33.450	34.426	14.276	-	
2.5	33.222	34.252	14.102	-	
2.6	32.982	34.068	13.918	-	
2.7	32.729	33.873	13.723	-	
2.8	32.462	33.666	13.516	-	
2.9	32.183	33.450	13.300	-	
3	31.891	33.222	13.072	6.072	7.000
3.1	31.583	32.982	12.832	5.716	7.116
3.2	31.259	32.729	12.579	5.371	7.208
3.3	30.918	32.462	12.312	5.037	7.275
3.4	30.560	32.183	12.033	4.713	7.320
3.5	30.185	31.891	11.741	4.398	7.343
3.6	29.790	31.583	11.433	4.092	7.341
3.7	29.372	31.259	11.109	3.795	7.314
3.8	28.931	30.918	10.768	3.505	7.263
3.9	28.467	30.560	10.410	3.223	7.187
4	27.977	30.185	10.035	2.949	7.086
4.1	27.458	29.790	9.640	2.680	6.960
4.2	26.907	29.372	9.222	2.419	6.803
4.3	26.319	28.931	8.781	2.163	6.618
4.4	25.694	28.467	8.317	1.914	6.403
4.5	25.028	27.977	7.827	1.670	6.157
4.6	24.312	27.458	7.308	1.431	5.877
4.7	23.540	26.907	6.757	1.198	5.559
4.8	22.702	26.319	6.169	0.969	5.200
4.9	21.792	25.694	5.544	0.745	4.799
5	20.796	25.028	4.878	0.526	4.352
5.1	19.696	24.312	4.162	0.311	3.851
5.2	18.464	23.540	3.390	0.100	3.290
5.3	17.070	22.702	2.552	-0.107	2.659
5.4	15.479	21.792	1.642	-0.310	1.952
5.5	13.636	20.796	0.646	-0.509	1.155
5.6	11.477	19.696	-0.454	-0.705	0.251
5.7	9.008	18.464	-1.686	-0.897	-
5.8	6.643	17.070	-3.080	-1.086	-
5.9	5.794	15.479	-4.671	-1.271	-
6	7.197	15.836	-4.314	-1.454	-
6.1	9.407	16.856	-3.294	-1.633	-
6.2	11.466	17.733	-2.417	-1.810	-
6.3	13.200	18.491	-1.659	-1.984	0.325
6.4	14.634	19.149	-1.001	-2.154	1.153
6.5	15.836	19.724	-0.426	-2.323	1.897
6.6	16.856	20.228	0.078	-2.489	2.567
6.7	17.733	20.672	0.522	-2.652	3.174
6.8	18.491	21.063	0.913	-2.813	3.726
6.9	19.149	21.403	1.253	-2.971	4.224
7	19.724	21.700	1.550	-3.127	4.677
7.1	20.228	21.959	1.809	-3.281	5.090
7.2	20.672	22.182	2.032	-3.433	5.465
7.3	21.063	22.372	2.222	-3.583	5.805
7.4	21.403	22.530	2.380	-3.731	6.111
7.5	21.700	22.658	2.508	-3.877	6.385

7.6	21.959	22.760	2.610	-4.020	6.630
7.7	22.182	22.836	2.686	-4.162	6.848
7.8	22.372	22.886	2.736	-4.302	7.038
7.9	22.530	22.912	2.762	-4.441	7.203
8	22.658	22.915	2.765	-4.577	7.342
8.1	22.760	22.915	2.765	-4.712	7.477
8.2	22.836	22.915	2.765	-4.845	7.610
8.3	22.886	22.915	2.765	-4.977	7.742
8.4	22.912	22.915	2.765	-5.107	7.872
8.5	22.915	22.915	2.765	-5.235	8.000
8.6	22.895	22.915	2.765	-5.362	8.127
8.7	22.852	22.915	2.765	-5.488	8.253
8.8	22.787	22.915	2.765	-5.612	8.377
8.9	22.700	22.915	2.765	-5.735	8.500
9	22.591	22.915	2.765	-5.856	8.621
9.1	22.459	22.895	2.745	-5.976	8.721
9.2	22.305	22.852	2.702	-6.095	8.797
9.3	22.127	22.787	2.637	-6.212	8.849
9.4	21.927	22.700	2.550	-6.328	8.878
9.5	21.703	22.591	2.441	-6.443	8.884
9.6	21.453	22.459	2.309	-6.557	8.866
9.7	21.177	22.305	2.155	-6.669	8.824
9.8	20.874	22.127	1.977	-6.781	8.758
9.9	20.544	21.927	1.777	-6.891	8.668
10	20.183	21.703	1.553	-7.000	8.553
15	17.001	17.211	-2.939	-11.402	8.463
20	14.060	14.696	-5.454	-14.526	9.072
25	6.020	9.224	-10.926	-16.949	6.023
30	0.573	5.711	-14.439	-18.928	4.489
35	11.616	11.618	-8.532	-20.602	12.070
40	13.948	14.116	-6.034	-22.051	16.017
45	3.580	6.984	-13.166	-23.330	10.164
50	9.686	9.687	-10.463	-24	13.537
55	-10.727	-3.019	-23.169	-24	0.831
60	7.109	7.331	-12.819	-24	11.181
65	-0.859	0.089	-20.061	-24	3.939
70	-1.640	-1.285	-21.435	-24	2.565
75	-0.657	-0.637	-20.787	-24	3.213
80	-4.344	-3.567	-23.717	-24	0.283
85	-15.723	-14.978	-35.128	-24	-
90	-11.143	-11.055	-31.205	-14	-
95	-2.750	-2.750	-22.900	-14	-
100	-2.750	-2.750	-22.900	-14	-
105	-2.750	-2.750	-22.900	-14	-
110	-2.750	-2.750	-22.900	-14	-
115	-2.750	-2.750	-22.900	-14	-
120	-2.750	-2.750	-22.900	-14	-
125	-2.750	-2.750	-22.900	-14	-
130	-2.750	-2.750	-22.900	-14	-
135	-2.750	-2.750	-22.900	-14	-
140	-2.750	-2.750	-22.900	-14	-
145	-2.750	-2.750	-22.900	-14	-
150	-2.750	-2.750	-22.900	-14	-
155	-2.750	-2.750	-22.900	-14	-
160	-2.750	-2.750	-22.900	-14	-
165	-2.750	-2.750	-22.900	-14	-
170	-2.750	-2.750	-22.900	-14	-
175	-2.750	-2.750	-22.900	-14	-
180	-2.750	-2.750	-22.900	-14	-



### 14.0GHz, H-Pol Co-Pol Elevation PSD with -20.15dBW/4kHz at Input



**Data in support of claim that proposed operation meets criteria of VMES Order July 2009**

**Applicant** RAS

**Date of Application**

**ID Heading**

<b>a1</b>	<b>Antenna Manufacture:</b>	RAS	<b>c</b>	<b>Main bore gain (dBi):</b>	36.0
<b>a2</b>	<b>Antenna Model:</b>	E7000	<b>d</b>	<b>Frequency at which gain was measured (GHz):</b>	14.0
<b>a3</b>	<b>Antenna ID:</b>	RAS	<b>e</b>	<b>Max input power density (dBW/4kHz):</b>	-20.15
<b>b</b>	<b>Transmit Band (b):</b>	14GHz	<b>Pattern ID</b>	Table B2	
	<b>Pattern Description:</b>	<b>14.0GHz V-polarization, co-polarized perpendicular to the geosynchronous plane for 0°, 37.5°, and 50° skew angle</b>			

<b>Offset Angles</b>	<b>Nominal EI Gain Along At Normal to Geo Arc</b>	<b>Worst Case EI Gain Along At Normal to Geo Arc</b>	<b>Worst Case EI PSD Along At Normal to Geo Arc</b>	<b>FCC Mask (dBW/4kHz)</b>	<b>Mask Exceedence</b>
<b>(Degrees)</b>	<b>(dBi)</b>	<b>(dBi)</b>	<b>(dBW/4kHz)</b>		<b>(dB)</b>
	<b>0° Skew</b>	<b>0° Skew</b>	<b>0° Skew</b>		
-180	-2.750	-2.750	-22.900	-14	-
-175	-2.750	-2.750	-22.900	-14	-
-170	-2.750	-2.750	-22.900	-14	-
-165	-2.750	-2.750	-22.900	-14	-
-160	-2.750	-2.750	-22.900	-14	-
-155	-2.750	-2.750	-22.900	-14	-
-150	-2.750	-2.750	-22.900	-14	-
-145	-2.750	-2.750	-22.900	-14	-
-140	-2.750	-2.750	-22.900	-14	-
-135	-2.750	-2.750	-22.900	-14	-
-130	-2.750	-2.750	-22.900	-14	-
-125	-2.750	-2.750	-22.900	-14	-
-120	-2.750	-2.750	-22.900	-14	-
-115	-2.750	-2.750	-22.900	-14	-
-110	-2.750	-2.750	-22.900	-14	-
-105	-2.750	-2.750	-22.900	-14	-
-100	-2.750	-2.750	-22.900	-14	-
-95	-2.750	-2.750	-22.900	-14	-
-90	-0.618	-0.518	-20.668	-14	-
-85	0.485	0.531	-19.619	-24	4.381
-80	-0.755	-0.699	-20.849	-24	3.151
-75	3.776	4.216	-15.934	-24	8.066
-70	3.698	4.081	-16.069	-24	7.931
-65	2.205	2.371	-17.779	-24	6.221
-60	4.591	5.190	-14.960	-24	9.040
-55	-1.965	0.379	-19.771	-24	4.229
-50	8.658	8.744	-11.406	-24	12.594
-45	0.664	4.115	-16.035	-23.330	7.295
-40	8.333	9.047	-11.103	-22.051	10.948
-35	12.994	13.540	-6.610	-20.602	13.992
-30	2.459	7.503	-12.647	-18.928	6.281
-25	9.913	11.717	-8.433	-16.949	8.516
-20	15.208	15.659	-4.491	-14.526	10.035
-15	17.664	18.119	-2.031	-11.402	9.371
-10	19.049	20.905	0.755	-7.000	7.755

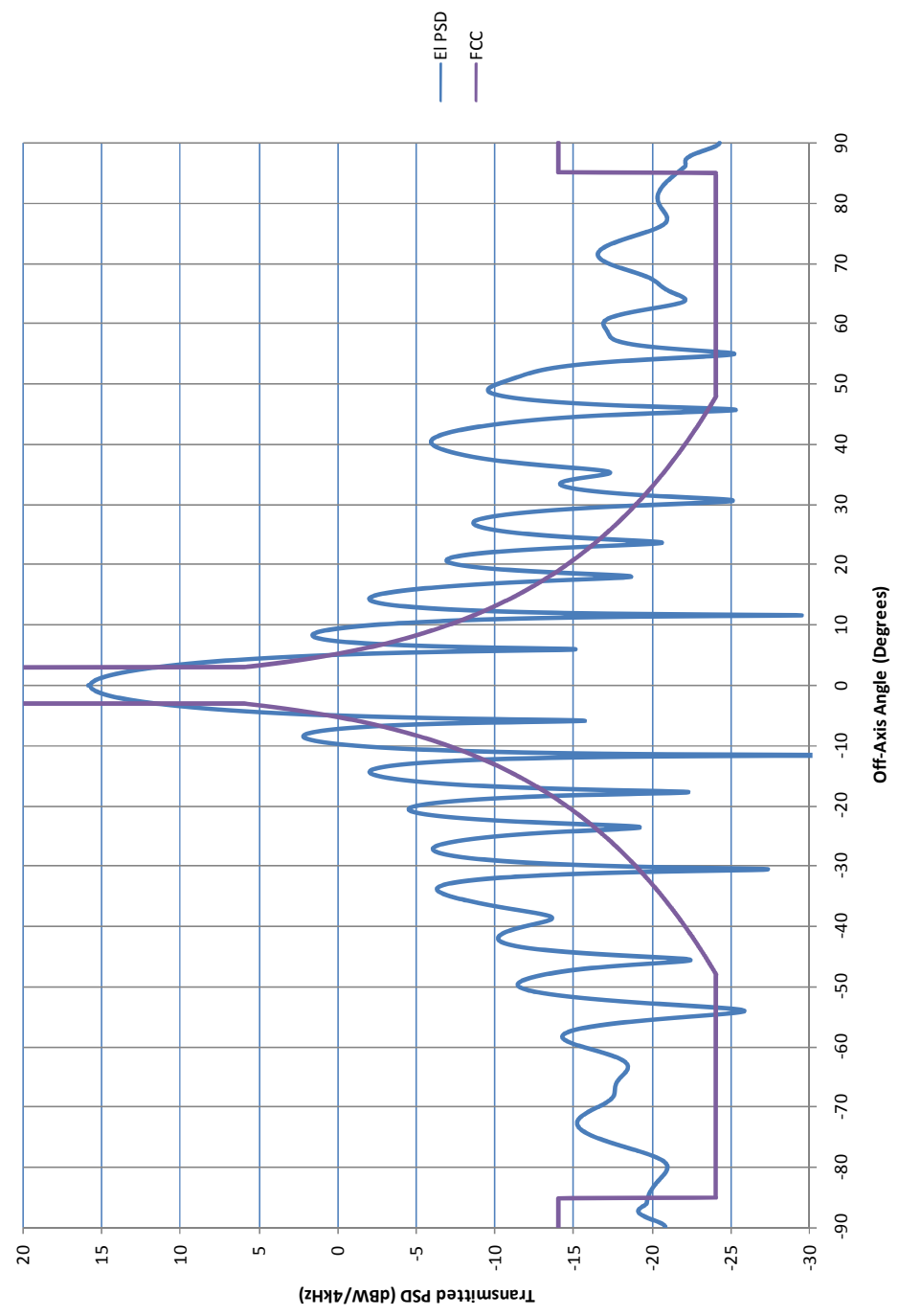
-9.9	19.495	21.173	1.023	-6.891	7.914
-9.8	19.901	21.412	1.262	-6.781	8.043
-9.7	20.271	21.622	1.472	-6.669	8.141
-9.6	20.605	21.804	1.654	-6.557	8.211
-9.5	20.905	21.959	1.809	-6.443	8.252
-9.4	21.173	22.086	1.936	-6.328	8.264
-9.3	21.412	22.189	2.039	-6.212	8.251
-9.2	21.622	22.266	2.116	-6.095	8.211
-9.1	21.804	22.318	2.168	-5.976	8.144
-9	21.959	22.343	2.193	-5.856	8.049
-8.9	22.086	22.344	2.194	-5.735	7.929
-8.8	22.189	22.344	2.194	-5.612	7.806
-8.7	22.266	22.344	2.194	-5.488	7.682
-8.6	22.318	22.344	2.194	-5.362	7.556
-8.5	22.343	22.344	2.194	-5.235	7.429
-8.4	22.344	22.344	2.194	-5.107	7.301
-8.3	22.320	22.344	2.194	-4.977	7.171
-8.2	22.269	22.344	2.194	-4.845	7.039
-8.1	22.191	22.344	2.194	-4.712	6.906
-8	22.086	22.344	2.194	-4.577	6.771
-7.9	21.952	22.344	2.194	-4.441	6.635
-7.8	21.790	22.320	2.170	-4.302	6.472
-7.7	21.594	22.269	2.119	-4.162	6.281
-7.6	21.365	22.191	2.041	-4.020	6.061
-7.5	21.101	22.086	1.936	-3.877	5.813
-7.4	20.798	21.952	1.802	-3.731	5.533
-7.3	20.452	21.790	1.640	-3.583	5.223
-7.2	20.057	21.594	1.444	-3.433	4.877
-7.1	19.608	21.365	1.215	-3.281	4.496
-7	19.099	21.101	0.951	-3.127	4.078
-6.9	18.522	20.798	0.648	-2.971	3.619
-6.8	17.862	20.452	0.302	-2.813	3.115
-6.7	17.101	20.057	-0.093	-2.652	2.559
-6.6	16.221	19.608	-0.542	-2.489	1.947
-6.5	15.197	19.099	-1.051	-2.323	1.272
-6.4	13.988	18.522	-1.628	-2.154	0.526
-6.3	12.537	17.862	-2.288	-1.984	-
-6.2	10.767	17.101	-3.049	-1.810	-
-6.1	8.617	16.221	-3.929	-1.633	-
-6	6.200	15.197	-4.953	-1.454	-
-5.9	4.503	14.814	-5.336	-1.271	-
-5.8	5.375	16.457	-3.693	-1.086	-
-5.7	7.990	17.894	-2.256	-0.897	-
-5.6	10.636	19.161	-0.989	-0.705	-
-5.5	12.900	20.293	0.143	-0.509	0.652
-5.4	14.814	21.318	1.168	-0.310	1.478
-5.3	16.457	22.255	2.105	-0.107	2.212
-5.2	17.894	23.120	2.970	0.100	2.870
-5.1	19.161	23.918	3.768	0.311	3.457
-5	20.293	24.658	4.508	0.526	3.982
-4.9	21.318	25.348	5.198	0.745	4.453
-4.8	22.255	25.995	5.845	0.969	4.876
-4.7	23.120	26.605	6.455	1.198	5.257
-4.6	23.918	27.179	7.029	1.431	5.598
-4.5	24.658	27.718	7.568	1.670	5.898
-4.4	25.348	28.227	8.077	1.914	6.163
-4.3	25.995	28.709	8.559	2.163	6.396
-4.2	26.605	29.168	9.018	2.419	6.599
-4.1	27.179	29.602	9.452	2.680	6.772
-4	27.718	30.013	9.863	2.949	6.914

-3.9	28.227	30.402	10.252	3.223	7.029
-3.8	28.709	30.773	10.623	3.505	7.118
-3.7	29.168	31.127	10.977	3.795	7.182
-3.6	29.602	31.462	11.312	4.092	7.220
-3.5	30.013	31.779	11.629	4.398	7.231
-3.4	30.402	32.080	11.930	4.713	7.217
-3.3	30.773	32.367	12.217	5.037	7.180
-3.2	31.127	32.640	12.490	5.371	7.119
-3.1	31.462	32.898	12.748	5.716	7.032
-3	31.779	33.143	12.993	6.072	6.921
-2.9	32.080	33.374	13.224		-
-2.8	32.367	33.593	13.443		-
-2.7	32.640	33.801	13.651		-
-2.6	32.898	33.997	13.847		-
-2.5	33.143	34.181	14.031		-
-2.4	33.374	34.355	14.205		-
-2.3	33.593	34.518	14.368		-
-2.2	33.801	34.671	14.521		-
-2.1	33.997	34.814	14.664		-
-2	34.181	34.946	14.796		-
-1.9	34.355	35.069	14.919		-
-1.8	34.518	35.183	15.033		-
-1.7	34.671	35.288	15.138		-
-1.6	34.814	35.384	15.234		-
-1.5	34.946	35.471	15.321		-
-1.4	35.069	35.549	15.399		-
-1.3	35.183	35.618	15.468		-
-1.2	35.288	35.679	15.529		-
-1.1	35.384	35.732	15.582		-
-1	35.471	35.775	15.625		-
-0.9	35.549	35.811	15.661		-
-0.8	35.618	35.838	15.688		-
-0.7	35.679	35.857	15.707		-
-0.6	35.732	35.867	15.717		-
-0.5	35.775	36.000	15.850		-
-0.4	35.811	36.000	15.850		-
-0.3	35.838	36.000	15.850		-
-0.2	35.857	36.000	15.850		-
-0.1	35.867	36.000	15.850		-
0	36.000	36.000	15.850		-
0.1	35.863	36.000	15.850		-
0.2	35.848	36.000	15.850		-
0.3	35.825	36.000	15.850		-
0.4	35.793	36.000	15.850		-
0.5	35.753	36.000	15.850		-
0.6	35.704	35.863	15.713		-
0.7	35.647	35.848	15.698		-
0.8	35.581	35.825	15.675		-
0.9	35.506	35.793	15.643		-
1	35.422	35.753	15.603		-
1.1	35.329	35.704	15.554		-
1.2	35.227	35.647	15.497		-
1.3	35.117	35.581	15.431		-
1.4	34.996	35.506	15.356		-
1.5	34.866	35.422	15.272		-
1.6	34.726	35.329	15.179		-
1.7	34.577	35.227	15.077		-
1.8	34.419	35.117	14.967		-
1.9	34.249	34.996	14.846		-

2	34.069	34.866	14.716	-
2.1	33.880	34.726	14.576	-
2.2	33.680	34.577	14.427	-
2.3	33.469	34.419	14.269	-
2.4	33.246	34.249	14.099	-
2.5	33.012	34.069	13.919	-
2.6	32.766	33.880	13.730	-
2.7	32.509	33.680	13.530	-
2.8	32.239	33.469	13.319	-
2.9	31.955	33.246	13.096	-
3	31.657	33.012	12.862	6.072 6.790
3.1	31.347	32.766	12.616	5.716 6.900
3.2	31.022	32.509	12.359	5.371 6.988
3.3	30.681	32.239	12.089	5.037 7.052
3.4	30.323	31.955	11.805	4.713 7.092
3.5	29.948	31.657	11.507	4.398 7.109
3.6	29.556	31.347	11.197	4.092 7.105
3.7	29.144	31.022	10.872	3.795 7.077
3.8	28.712	30.681	10.531	3.505 7.026
3.9	28.257	30.323	10.173	3.223 6.950
4	27.776	29.948	9.798	2.949 6.849
4.1	27.271	29.556	9.406	2.680 6.726
4.2	26.738	29.144	8.994	2.419 6.575
4.3	26.174	28.712	8.562	2.163 6.399
4.4	25.573	28.257	8.107	1.914 6.193
4.5	24.932	27.776	7.626	1.670 5.956
4.6	24.249	27.271	7.121	1.431 5.690
4.7	23.518	26.738	6.588	1.198 5.390
4.8	22.731	26.174	6.024	0.969 5.055
4.9	21.875	25.573	5.423	0.745 4.678
5	20.941	24.932	4.782	0.526 4.256
5.1	19.919	24.249	4.099	0.311 3.788
5.2	18.788	23.518	3.368	0.100 3.268
5.3	17.520	22.731	2.581	-0.107 2.688
5.4	16.079	21.875	1.725	-0.310 2.035
5.5	14.417	20.941	0.791	-0.509 1.300
5.6	12.482	19.919	-0.231	-0.705 0.474
5.7	10.211	18.788	-1.362	-0.897 -
5.8	7.640	17.520	-2.630	-1.086 -
5.9	5.379	16.079	-4.071	-1.271 -
6	5.111	14.417	-5.733	-1.454 -
6.1	6.965	15.468	-4.682	-1.633 -
6.2	9.249	16.445	-3.705	-1.810 -
6.3	11.259	17.281	-2.869	-1.984 -
6.4	12.929	18.004	-2.146	-2.154 0.008
6.5	14.314	18.630	-1.520	-2.323 0.803
6.6	15.468	19.171	-0.979	-2.489 1.510
6.7	16.445	19.641	-0.509	-2.652 2.143
6.8	17.281	20.050	-0.100	-2.813 2.713
6.9	18.004	20.405	0.255	-2.971 3.226
7	18.630	20.710	0.560	-3.127 3.687
7.1	19.171	20.969	0.819	-3.281 4.100
7.2	19.641	21.187	1.037	-3.433 4.470
7.3	20.050	21.367	1.217	-3.583 4.800
7.4	20.405	21.512	1.362	-3.731 5.093
7.5	20.710	21.623	1.473	-3.877 5.350

7.6	20.969	21.702	1.552	-4.020	5.572
7.7	21.187	21.751	1.601	-4.162	5.763
7.8	21.367	21.772	1.622	-4.302	5.924
7.9	21.512	21.772	1.622	-4.441	6.063
8	21.623	21.772	1.622	-4.577	6.199
8.1	21.702	21.772	1.622	-4.712	6.334
8.2	21.751	21.772	1.622	-4.845	6.467
8.3	21.772	21.772	1.622	-4.977	6.599
8.4	21.765	21.772	1.622	-5.107	6.729
8.5	21.730	21.772	1.622	-5.235	6.857
8.6	21.669	21.772	1.622	-5.362	6.984
8.7	21.583	21.772	1.622	-5.488	7.110
8.8	21.471	21.772	1.622	-5.612	7.234
8.9	21.333	21.765	1.615	-5.735	7.350
9	21.169	21.730	1.580	-5.856	7.436
9.1	20.980	21.669	1.519	-5.976	7.495
9.2	20.766	21.583	1.433	-6.095	7.528
9.3	20.524	21.471	1.321	-6.212	7.533
9.4	20.255	21.333	1.183	-6.328	7.511
9.5	19.957	21.169	1.019	-6.443	7.462
9.6	19.631	20.980	0.830	-6.557	7.387
9.7	19.274	20.766	0.616	-6.669	7.285
9.8	18.884	20.524	0.374	-6.781	7.155
9.9	18.457	20.255	0.105	-6.891	6.996
10	17.993	19.957	-0.193	-7.000	6.807
15	17.674	18.140	-2.010	-11.402	9.392
20	12.482	13.194	-6.956	-14.526	7.570
25	7.618	9.458	-10.692	-16.949	6.257
30	-0.262	3.839	-16.311	-18.928	2.617
35	3.205	4.495	-15.655	-20.602	4.947
40	14.171	14.247	-5.903	-22.051	16.148
45	1.574	5.303	-14.847	-23.330	8.483
50	10.030	10.459	-9.691	-24	14.309
55	-4.992	-2.673	-22.823	-24	1.177
60	3.312	3.312	-16.838	-24	7.162
65	-1.217	-0.793	-20.943	-24	3.057
70	3.001	3.368	-16.782	-24	7.218
75	0.819	1.423	-18.727	-24	5.273
80	-0.195	-0.138	-20.288	-24	3.712
85	-1.349	-1.116	-21.266	-24	2.734
90	-4.055	-3.832	-23.982	-14	-
95	-2.750	-2.750	-22.900	-14	-
100	-2.750	-2.750	-22.900	-14	-
105	-2.750	-2.750	-22.900	-14	-
110	-2.750	-2.750	-22.900	-14	-
115	-2.750	-2.750	-22.900	-14	-
120	-2.750	-2.750	-22.900	-14	-
125	-2.750	-2.750	-22.900	-14	-
130	-2.750	-2.750	-22.900	-14	-
135	-2.750	-2.750	-22.900	-14	-
140	-2.750	-2.750	-22.900	-14	-
145	-2.750	-2.750	-22.900	-14	-
150	-2.750	-2.750	-22.900	-14	-
155	-2.750	-2.750	-22.900	-14	-
160	-2.750	-2.750	-22.900	-14	-
165	-2.750	-2.750	-22.900	-14	-
170	-2.750	-2.750	-22.900	-14	-
175	-2.750	-2.750	-22.900	-14	-
180	-2.750	-2.750	-22.900	-14	-

### 14.0GHz, V-Pol Co-Pol Elevation PSD with -20.15dBW/4kHz at Input



**Data in support of claim that proposed operation meets criteria of VMES Order July 2009**

Applicant RAS

Date of Application

**ID Heading**

- a1 Antenna Manufacture: RAS
- a2 Antenna Model: E7000
- a3 Antenna ID: RAS
- b Transmit Band (b): 14GHz
- Pattern Description: 14.25GHz H-polarization, co-polarized perpendicular to the geosynchronous plane for 0°, 37.5°, and 50° skew angle
- c Main bore gain (dBi): 36.0
- d Frequency at which gain was measured (GHz): 14.25
- e Max input power density (dBW/4kHz): -20.15
- Pattern ID Table B3

Offset Angles (Degrees)	Nominal EI Gain Along At Normal to Geo Arc (dBi) 0° Skew	Worst Case EI Gain Along At Normal to Geo Arc (dBi) 0° Skew	Worst Case EI PSD Along At Normal to Geo Arc input PSD = -20.15dBW/4kHz (dBW/4kHz) 0° Skew	FCC Mask (dBW/4kHz)	Mask Exceedence (dB)
-180	-2.750	-2.750	-22.900	-14	-
-175	-2.750	-2.750	-22.900	-14	-
-170	-2.750	-2.750	-22.900	-14	-
-165	-2.750	-2.750	-22.900	-14	-
-160	-2.750	-2.750	-22.900	-14	-
-155	-2.750	-2.750	-22.900	-14	-
-150	-2.750	-2.750	-22.900	-14	-
-145	-2.750	-2.750	-22.900	-14	-
-140	-2.750	-2.750	-22.900	-14	-
-135	-2.750	-2.750	-22.900	-14	-
-130	-2.750	-2.750	-22.900	-14	-
-125	-2.750	-2.750	-22.900	-14	-
-120	-2.750	-2.750	-22.900	-14	-
-115	-2.750	-2.750	-22.900	-14	-
-110	-2.750	-2.750	-22.900	-14	-
-105	-2.750	-2.750	-22.900	-14	-
-100	-2.750	-2.750	-22.900	-14	-
-95	-2.750	-2.750	-22.900	-14	-
-90	0.334	0.599	-19.551	-14	-
-85	1.264	1.281	-18.869	-24	5.131
-80	-0.744	-0.254	-20.404	-24	3.596
-75	-4.940	-3.777	-23.927	-24	0.073
-70	-2.432	-1.687	-21.837	-24	2.163
-65	-0.581	0.221	-19.929	-24	4.071
-60	5.685	5.783	-14.367	-24	9.633
-55	3.886	5.651	-14.499	-24	9.501
-50	9.424	10.280	-9.870	-24	14.130
-45	-12.048	-1.109	-21.259	-23.330	2.071
-40	13.054	13.058	-7.092	-22.051	14.959
-35	-4.785	1.051	-19.099	-20.602	1.503
-30	-6.623	0.652	-19.498	-18.928	-
-25	8.475	10.270	-9.880	-16.949	7.069
-20	13.516	13.713	-6.437	-14.526	8.089
-15	16.955	17.257	-2.893	-11.402	8.509
-10	19.405	21.324	1.174	-7.000	8.174



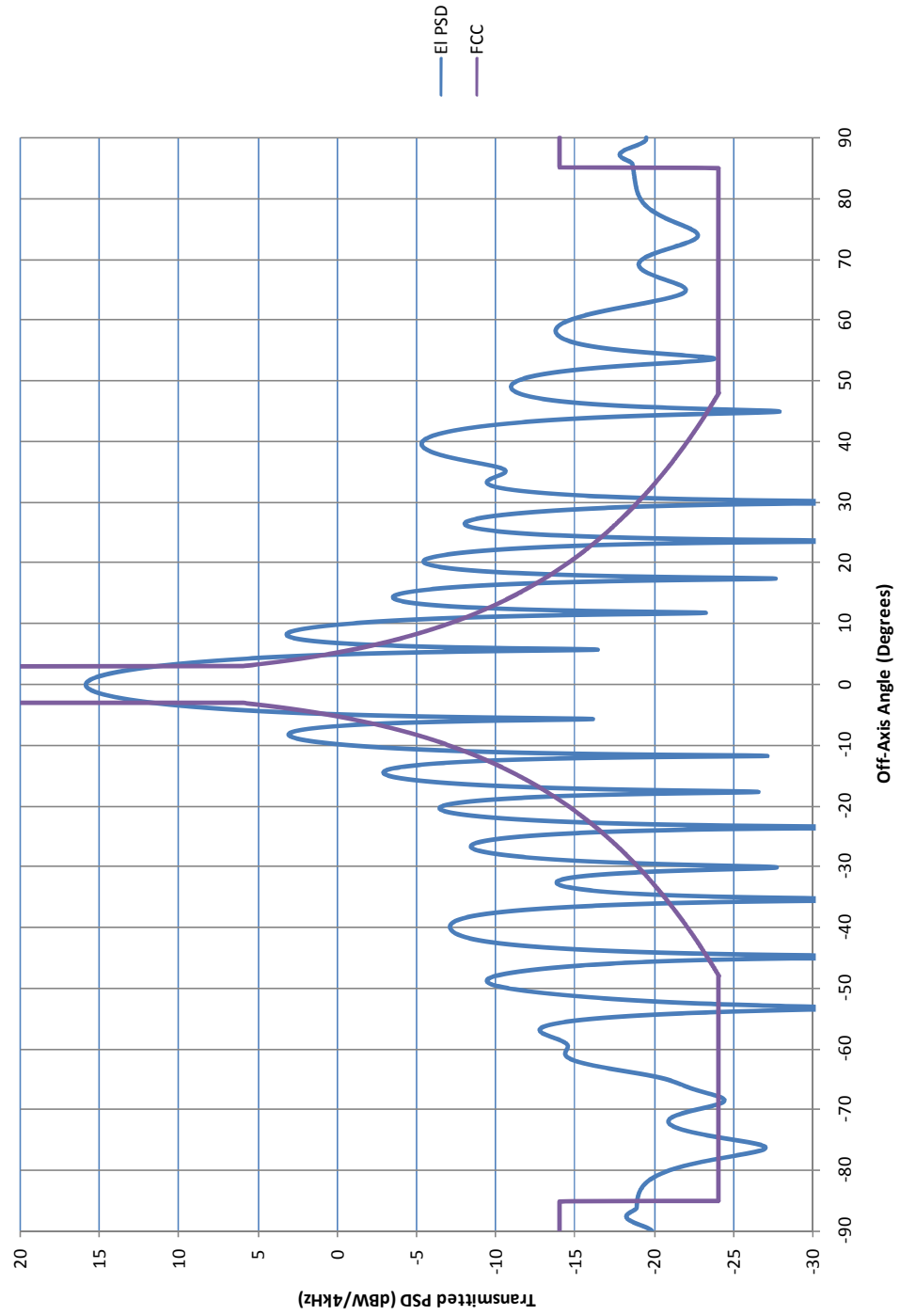
-9.9	19.855	21.620	1.470	-6.891	8.361
-9.8	20.269	21.887	1.737	-6.781	8.518
-9.7	20.650	22.129	1.979	-6.669	8.648
-9.6	21.001	22.346	2.196	-6.557	8.753
-9.5	21.324	22.539	2.389	-6.443	8.832
-9.4	21.620	22.708	2.558	-6.328	8.886
-9.3	21.887	22.852	2.702	-6.212	8.914
-9.2	22.129	22.972	2.822	-6.095	8.917
-9.1	22.346	23.069	2.919	-5.976	8.895
-9	22.539	23.143	2.993	-5.856	8.849
-8.9	22.708	23.193	3.043	-5.735	8.778
-8.8	22.852	23.217	3.067	-5.612	8.679
-8.7	22.972	23.218	3.068	-5.488	8.556
-8.6	23.069	23.218	3.068	-5.362	8.430
-8.5	23.143	23.218	3.068	-5.235	8.303
-8.4	23.193	23.218	3.068	-5.107	8.175
-8.3	23.217	23.218	3.068	-4.977	8.045
-8.2	23.218	23.218	3.068	-4.845	7.913
-8.1	23.194	23.218	3.068	-4.712	7.780
-8	23.144	23.218	3.068	-4.577	7.645
-7.9	23.066	23.218	3.068	-4.441	7.509
-7.8	22.961	23.218	3.068	-4.302	7.370
-7.7	22.827	23.218	3.068	-4.162	7.230
-7.6	22.662	23.194	3.044	-4.020	7.064
-7.5	22.463	23.144	2.994	-3.877	6.871
-7.4	22.229	23.066	2.916	-3.731	6.647
-7.3	21.958	22.961	2.811	-3.583	6.394
-7.2	21.646	22.827	2.677	-3.433	6.110
-7.1	21.288	22.662	2.512	-3.281	5.793
-7	20.877	22.463	2.313	-3.127	5.440
-6.9	20.409	22.229	2.079	-2.971	5.050
-6.8	19.876	21.958	1.808	-2.813	4.621
-6.7	19.268	21.646	1.496	-2.652	4.148
-6.6	18.570	21.288	1.138	-2.489	3.627
-6.5	17.759	20.877	0.727	-2.323	3.050
-6.4	16.816	20.409	0.259	-2.154	2.413
-6.3	15.709	19.876	-0.274	-1.984	1.710
-6.2	14.386	19.268	-0.882	-1.810	0.928
-6.1	12.771	18.570	-1.580	-1.633	0.053
-6	10.756	17.759	-2.391	-1.454	-
-5.9	8.236	16.816	-3.334	-1.271	-
-5.8	5.395	15.709	-4.441	-1.086	-
-5.7	4.068	16.172	-3.978	-0.897	-
-5.6	6.220	17.755	-2.395	-0.705	-
-5.5	9.374	19.137	-1.013	-0.509	-
-5.4	12.095	20.355	0.205	-0.310	0.515
-5.3	14.319	21.443	1.293	-0.107	1.400
-5.2	16.172	22.427	2.277	0.100	2.177
-5.1	17.755	23.327	3.177	0.311	2.866
-5	19.137	24.158	4.008	0.526	3.482
-4.9	20.355	24.924	4.774	0.745	4.029
-4.8	21.443	25.633	5.483	0.969	4.514
-4.7	22.427	26.294	6.144	1.198	4.946
-4.6	23.327	26.914	6.764	1.431	5.333
-4.5	24.158	27.498	7.348	1.670	5.678
-4.4	24.924	28.046	7.896	1.914	5.982
-4.3	25.633	28.560	8.410	2.163	6.247
-4.2	26.294	29.046	8.896	2.419	6.477
-4.1	26.914	29.505	9.355	2.680	6.675
-4	27.498	29.942	9.792	2.949	6.843

-3.9	28.046	30.354	10.204	3.223	6.981
-3.8	28.560	30.744	10.594	3.505	7.089
-3.7	29.046	31.113	10.963	3.795	7.168
-3.6	29.505	31.463	11.313	4.092	7.221
-3.5	29.942	31.797	11.647	4.398	7.249
-3.4	30.354	32.113	11.963	4.713	7.250
-3.3	30.744	32.411	12.261	5.037	7.224
-3.2	31.113	32.694	12.544	5.371	7.173
-3.1	31.463	32.962	12.812	5.716	7.096
-3	31.797	33.217	13.067	6.072	6.995
-2.9	32.113	33.458	13.308		-
-2.8	32.411	33.685	13.535		-
-2.7	32.694	33.899	13.749		-
-2.6	32.962	34.100	13.950		-
-2.5	33.217	34.291	14.141		-
-2.4	33.458	34.470	14.320		-
-2.3	33.685	34.637	14.487		-
-2.2	33.899	34.794	14.644		-
-2.1	34.100	34.940	14.790		-
-2	34.291	35.076	14.926		-
-1.9	34.470	35.202	15.052		-
-1.8	34.637	35.318	15.168		-
-1.7	34.794	35.424	15.274		-
-1.6	34.940	35.520	15.370		-
-1.5	35.076	35.608	15.458		-
-1.4	35.202	35.687	15.537		-
-1.3	35.318	35.756	15.606		-
-1.2	35.424	35.817	15.667		-
-1.1	35.520	35.869	15.719		-
-1	35.608	35.912	15.762		-
-0.9	35.687	35.947	15.797		-
-0.8	35.756	35.973	15.823		-
-0.7	35.817	35.990	15.840		-
-0.6	35.869	35.999	15.849		-
-0.5	35.912	36.000	15.850		-
-0.4	35.947	36.000	15.850		-
-0.3	35.973	36.000	15.850		-
-0.2	35.990	36.000	15.850		-
-0.1	35.999	36.000	15.850		-
0	36.000	36.000	15.850		-
0.1	35.992	36.000	15.850		-
0.2	35.975	36.000	15.850		-
0.3	35.949	36.000	15.850		-
0.4	35.916	36.000	15.850		-
0.5	35.874	36.000	15.850		-
0.6	35.822	35.992	15.842		-
0.7	35.762	35.975	15.825		-
0.8	35.693	35.949	15.799		-
0.9	35.616	35.916	15.766		-
1	35.529	35.874	15.724		-
1.1	35.433	35.822	15.672		-
1.2	35.327	35.762	15.612		-
1.3	35.212	35.693	15.543		-
1.4	35.088	35.616	15.466		-
1.5	34.954	35.529	15.379		-
1.6	34.809	35.433	15.283		-
1.7	34.654	35.327	15.177		-
1.8	34.489	35.212	15.062		-
1.9	34.314	35.088	14.938		-

2	34.128	34.954	14.804	-
2.1	33.930	34.809	14.659	-
2.2	33.720	34.654	14.504	-
2.3	33.499	34.489	14.339	-
2.4	33.267	34.314	14.164	-
2.5	33.021	34.128	13.978	-
2.6	32.762	33.930	13.780	-
2.7	32.489	33.720	13.570	-
2.8	32.203	33.499	13.349	-
2.9	31.902	33.267	13.117	-
3	31.586	33.021	12.871	6.072
3.1	31.253	32.762	12.612	5.716
3.2	30.903	32.489	12.339	5.371
3.3	30.535	32.203	12.053	5.037
3.4	30.149	31.902	11.752	4.713
3.5	29.743	31.586	11.436	4.398
3.6	29.314	31.253	11.103	4.092
3.7	28.860	30.903	10.753	3.795
3.8	28.382	30.535	10.385	3.505
3.9	27.878	30.149	9.999	3.223
4	27.343	29.743	9.593	2.949
4.1	26.774	29.314	9.164	2.680
4.2	26.166	28.860	8.710	2.419
4.3	25.519	28.382	8.232	2.163
4.4	24.827	27.878	7.728	1.914
4.5	24.081	27.343	7.193	1.670
4.6	23.272	26.774	6.624	1.431
4.7	22.390	26.166	6.016	1.198
4.8	21.426	25.519	5.369	0.969
4.9	20.362	24.827	4.677	0.745
5	19.172	24.081	3.931	0.526
5.1	17.821	23.272	3.122	0.311
5.2	16.262	22.390	2.240	0.100
5.3	14.434	21.426	1.276	-0.107
5.4	12.235	20.362	0.212	-0.310
5.5	9.525	19.172	-0.978	-0.509
5.6	6.284	17.821	-2.329	-0.705
5.7	3.785	16.262	-3.888	-0.897
5.8	4.984	15.754	-4.396	-1.086
5.9	7.974	16.891	-3.259	-1.271
6	10.614	17.856	-2.294	-1.454
6.1	12.711	18.685	-1.465	-1.633
6.2	14.388	19.403	-0.747	-1.810
6.3	15.754	20.024	-0.126	-1.984
6.4	16.891	20.567	0.417	-2.154
6.5	17.856	21.041	0.891	-2.323
6.6	18.685	21.458	1.308	-2.489
6.7	19.403	21.821	1.671	-2.652
6.8	20.024	22.135	1.985	-2.813
6.9	20.567	22.406	2.256	-2.971
7	21.041	22.639	2.489	-3.127
7.1	21.458	22.835	2.685	-3.281
7.2	21.821	22.996	2.846	-3.433
7.3	22.135	23.125	2.975	-3.583
7.4	22.406	23.224	3.074	-3.731
7.5	22.639	23.295	3.145	-3.877

7.6	22.835	23.338	3.188	-4.020	7.208
7.7	22.996	23.354	3.204	-4.162	7.366
7.8	23.125	23.354	3.204	-4.302	7.506
7.9	23.224	23.354	3.204	-4.441	7.645
8	23.295	23.354	3.204	-4.577	7.781
8.1	23.338	23.354	3.204	-4.712	7.916
8.2	23.354	23.354	3.204	-4.845	8.049
8.3	23.345	23.354	3.204	-4.977	8.181
8.4	23.311	23.354	3.204	-5.107	8.311
8.5	23.253	23.354	3.204	-5.235	8.439
8.6	23.170	23.354	3.204	-5.362	8.566
8.7	23.063	23.354	3.204	-5.488	8.692
8.8	22.933	23.345	3.195	-5.612	8.807
8.9	22.780	23.311	3.161	-5.735	8.896
9	22.604	23.253	3.103	-5.856	8.959
9.1	22.403	23.170	3.020	-5.976	8.996
9.2	22.178	23.063	2.913	-6.095	9.008
9.3	21.929	22.933	2.783	-6.212	8.995
9.4	21.655	22.780	2.630	-6.328	8.958
9.5	21.355	22.604	2.454	-6.443	8.897
9.6	21.028	22.403	2.253	-6.557	8.810
9.7	20.672	22.178	2.028	-6.669	8.697
9.8	20.289	21.929	1.779	-6.781	8.560
9.9	19.874	21.655	1.505	-6.891	8.396
10	19.425	21.355	1.205	-7.000	8.205
15	16.088	16.620	-3.530	-11.402	7.872
20	14.650	14.723	-5.427	-14.526	9.099
25	9.106	10.926	-9.224	-16.949	7.725
30	-20.528	-1.796	-21.946	-18.928	-
35	9.571	9.887	-10.263	-20.602	10.339
40	14.790	14.852	-5.298	-22.051	16.753
45	-7.454	-1.116	-21.266	-23.330	2.064
50	8.791	9.106	-11.044	-24	12.956
55	2.197	3.748	-16.402	-24	7.598
60	5.505	5.941	-14.209	-24	9.791
65	-1.792	-1.602	-21.752	-24	2.248
70	0.939	1.129	-19.021	-24	4.979
75	-2.078	-1.649	-21.799	-24	2.201
80	1.082	1.178	-18.972	-24	5.028
85	1.525	1.559	-18.591	-24	5.409
90	0.705	0.761	-19.389	-14	-
95	-2.750	-2.750	-22.900	-14	-
100	-2.750	-2.750	-22.900	-14	-
105	-2.750	-2.750	-22.900	-14	-
110	-2.750	-2.750	-22.900	-14	-
115	-2.750	-2.750	-22.900	-14	-
120	-2.750	-2.750	-22.900	-14	-
125	-2.750	-2.750	-22.900	-14	-
130	-2.750	-2.750	-22.900	-14	-
135	-2.750	-2.750	-22.900	-14	-
140	-2.750	-2.750	-22.900	-14	-
145	-2.750	-2.750	-22.900	-14	-
150	-2.750	-2.750	-22.900	-14	-
155	-2.750	-2.750	-22.900	-14	-
160	-2.750	-2.750	-22.900	-14	-
165	-2.750	-2.750	-22.900	-14	-
170	-2.750	-2.750	-22.900	-14	-
175	-2.750	-2.750	-22.900	-14	-
180	-2.750	-2.750	-22.900	-14	-

### 14.25GHz, H-Pol Co-Pol Elevation PSD with -20.15dBW/4kHz at Input



**Data in support of claim that proposed operation meets criteria of VMES Order July 2009**

**Applicant** RAS **Date of Application**

**ID Heading**

**a1 Antenna Manufacture:** RAS **c Main bore gain (dBi):** 36.0  
**a2 Antenna Model:** E7000 **d Frequency at which gain was measured (GHz):** 14.25  
**a3 Antenna ID:** RAS **e Max input power density (dBW/4kHz):** -20.15  
**b Transmit Band (b):** 14GHz **Pattern ID** Table B4  
**Pattern Description:** 14.25GHz V-polarization, co-polarized perpendicular to the geosynchronous plane for 0°, 37.5°, and 50° skew angle

Offset Angles  (Degrees)	Nominal EI Gain Along At Normal to Geo Arc  (dBi) 0° Skew	Worst Case EI Gain Along At Normal to Geo Arc  (dBi) 0° Skew	Worst Case EI PSD Along At Normal to Geo Arc input PSD = -20.15dBW/4kHz  (dBW/4kHz) 0° Skew	FCC Mask (dBW/4kHz)	Mask Exceedence  (dB)
-180	-2.750	-2.750	-22.900	-14	-
-175	-2.750	-2.750	-22.900	-14	-
-170	-2.750	-2.750	-22.900	-14	-
-165	-2.750	-2.750	-22.900	-14	-
-160	-2.750	-2.750	-22.900	-14	-
-155	-2.750	-2.750	-22.900	-14	-
-150	-2.750	-2.750	-22.900	-14	-
-145	-2.750	-2.750	-22.900	-14	-
-140	-2.750	-2.750	-22.900	-14	-
-135	-2.750	-2.750	-22.900	-14	-
-130	-2.750	-2.750	-22.900	-14	-
-125	-2.750	-2.750	-22.900	-14	-
-120	-2.750	-2.750	-22.900	-14	-
-115	-2.750	-2.750	-22.900	-14	-
-110	-2.750	-2.750	-22.900	-14	-
-105	-2.750	-2.750	-22.900	-14	-
-100	-2.750	-2.750	-22.900	-14	-
-95	-2.750	-2.750	-22.900	-14	-
-90	-3.148	-3.091	-23.241	-14	-
-85	-0.873	-0.641	-20.791	-24	3.209
-80	1.447	1.636	-18.514	-24	5.486
-75	3.506	3.805	-16.345	-24	7.655
-70	4.740	4.943	-15.207	-24	8.793
-65	3.882	3.994	-16.156	-24	7.844
-60	0.038	0.831	-19.319	-24	4.681
-55	6.271	6.741	-13.409	-24	10.591
-50	5.660	7.035	-13.115	-24	10.885
-45	-5.995	0.265	-19.885	-23.330	3.445
-40	11.965	12.078	-8.072	-22.051	13.979
-35	13.429	13.722	-6.428	-20.602	14.174
-30	-0.690	4.080	-16.070	-18.928	2.858
-25	12.688	13.951	-6.199	-16.949	10.750
-20	15.789	15.832	-4.318	-14.526	10.208
-15	16.337	17.141	-3.009	-11.402	8.393
-10	18.594	20.795	0.645	-7.000	7.645

-9.9	19.115	21.126	0.976	-6.891	7.867
-9.8	19.592	21.425	1.275	-6.781	8.056
-9.7	20.028	21.695	1.545	-6.669	8.214
-9.6	20.429	21.937	1.787	-6.557	8.344
-9.5	20.795	22.151	2.001	-6.443	8.444
-9.4	21.126	22.338	2.188	-6.328	8.516
-9.3	21.425	22.498	2.348	-6.212	8.560
-9.2	21.695	22.633	2.483	-6.095	8.578
-9.1	21.937	22.743	2.593	-5.976	8.569
-9	22.151	22.828	2.678	-5.856	8.534
-8.9	22.338	22.887	2.737	-5.735	8.472
-8.8	22.498	22.922	2.772	-5.612	8.384
-8.7	22.633	22.932	2.782	-5.488	8.270
-8.6	22.743	22.932	2.782	-5.362	8.144
-8.5	22.828	22.932	2.782	-5.235	8.017
-8.4	22.887	22.932	2.782	-5.107	7.889
-8.3	22.922	22.932	2.782	-4.977	7.759
-8.2	22.932	22.932	2.782	-4.845	7.627
-8.1	22.917	22.932	2.782	-4.712	7.494
-8	22.876	22.932	2.782	-4.577	7.359
-7.9	22.809	22.932	2.782	-4.441	7.223
-7.8	22.715	22.932	2.782	-4.302	7.084
-7.7	22.594	22.932	2.782	-4.162	6.944
-7.6	22.444	22.917	2.767	-4.020	6.787
-7.5	22.263	22.876	2.726	-3.877	6.603
-7.4	22.051	22.809	2.659	-3.731	6.390
-7.3	21.806	22.715	2.565	-3.583	6.148
-7.2	21.524	22.594	2.444	-3.433	5.877
-7.1	21.202	22.444	2.294	-3.281	5.575
-7	20.837	22.263	2.113	-3.127	5.240
-6.9	20.426	22.051	1.901	-2.971	4.872
-6.8	19.964	21.806	1.656	-2.813	4.469
-6.7	19.445	21.524	1.374	-2.652	4.026
-6.6	18.859	21.202	1.052	-2.489	3.541
-6.5	18.201	20.837	0.687	-2.323	3.010
-6.4	17.466	20.426	0.276	-2.154	2.430
-6.3	16.645	19.964	-0.186	-1.984	1.798
-6.2	15.732	19.445	-0.705	-1.810	1.105
-6.1	14.734	18.859	-1.291	-1.633	0.342
-6	13.688	18.201	-1.949	-1.454	-
-5.9	12.686	17.466	-2.684	-1.271	-
-5.8	11.910	16.645	-3.505	-1.086	-
-5.7	11.614	16.841	-3.309	-0.897	-
-5.6	11.974	18.107	-2.043	-0.705	-
-5.5	12.904	19.280	-0.870	-0.509	-
-5.4	14.153	20.360	0.210	-0.310	0.520
-5.3	15.506	21.357	1.207	-0.107	1.314
-5.2	16.841	22.281	2.131	0.100	2.031
-5.1	18.107	23.142	2.992	0.311	2.681
-5	19.280	23.940	3.790	0.526	3.264
-4.9	20.360	24.682	4.532	0.745	3.787
-4.8	21.357	25.377	5.227	0.969	4.258
-4.7	22.281	26.030	5.880	1.198	4.682
-4.6	23.142	26.645	6.495	1.431	5.064
-4.5	23.940	27.223	7.073	1.670	5.403
-4.4	24.682	27.766	7.616	1.914	5.702
-4.3	25.377	28.279	8.129	2.163	5.966
-4.2	26.030	28.765	8.615	2.419	6.196
-4.1	26.645	29.226	9.076	2.680	6.396
-4	27.223	29.661	9.511	2.949	6.562

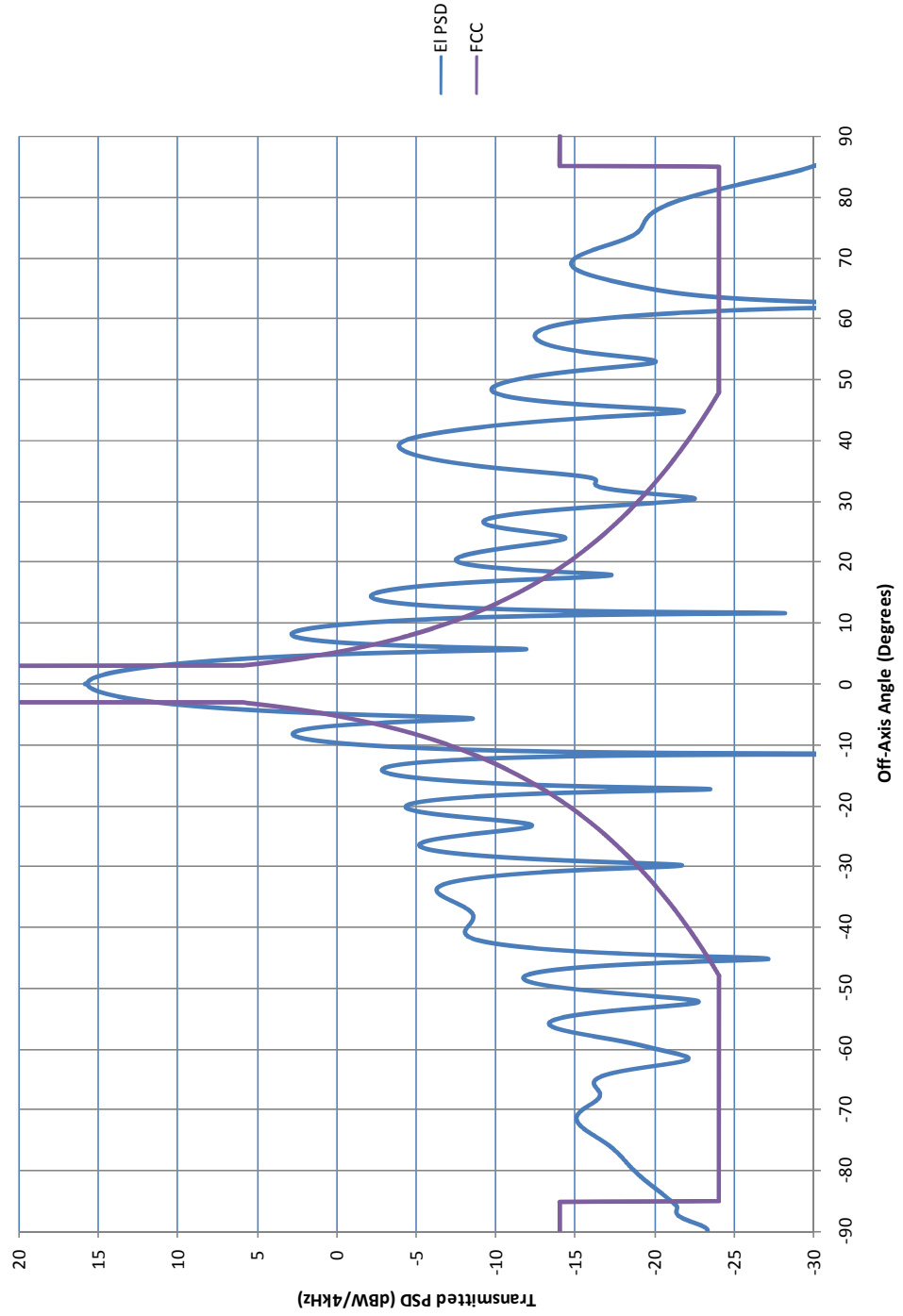
-3.9	27.766	30.073	9.923	3.223	6.700
-3.8	28.279	30.463	10.313	3.505	6.808
-3.7	28.765	30.833	10.683	3.795	6.888
-3.6	29.226	31.186	11.036	4.092	6.944
-3.5	29.661	31.519	11.369	4.398	6.971
-3.4	30.073	31.834	11.684	4.713	6.971
-3.3	30.463	32.133	11.983	5.037	6.946
-3.2	30.833	32.417	12.267	5.371	6.896
-3.1	31.186	32.687	12.537	5.716	6.821
-3	31.519	32.942	12.792	6.072	6.720
-2.9	31.834	33.182	13.032		-
-2.8	32.133	33.410	13.260		-
-2.7	32.417	33.625	13.475		-
-2.6	32.687	33.829	13.679		-
-2.5	32.942	34.021	13.871		-
-2.4	33.182	34.201	14.051		-
-2.3	33.410	34.370	14.220		-
-2.2	33.625	34.529	14.379		-
-2.1	33.829	34.678	14.528		-
-2	34.021	34.817	14.667		-
-1.9	34.201	34.946	14.796		-
-1.8	34.370	35.066	14.916		-
-1.7	34.529	35.177	15.027		-
-1.6	34.678	35.279	15.129		-
-1.5	34.817	35.373	15.223		-
-1.4	34.946	35.457	15.307		-
-1.3	35.066	35.532	15.382		-
-1.2	35.177	35.600	15.450		-
-1.1	35.279	35.659	15.509		-
-1	35.373	35.710	15.560		-
-0.9	35.457	35.752	15.602		-
-0.8	35.532	35.785	15.635		-
-0.7	35.600	35.811	15.661		-
-0.6	35.659	35.828	15.678		-
-0.5	35.710	36.000	15.850		-
-0.4	35.752	36.000	15.850		-
-0.3	35.785	36.000	15.850		-
-0.2	35.811	36.000	15.850		-
-0.1	35.828	36.000	15.850		-
0	36.000	36.000	15.850		-
0.1	35.836	36.000	15.850		-
0.2	35.827	36.000	15.850		-
0.3	35.810	36.000	15.850		-
0.4	35.784	36.000	15.850		-
0.5	35.748	36.000	15.850		-
0.6	35.703	35.836	15.686		-
0.7	35.649	35.827	15.677		-
0.8	35.586	35.810	15.660		-
0.9	35.513	35.784	15.634		-
1	35.430	35.748	15.598		-
1.1	35.337	35.703	15.553		-
1.2	35.235	35.649	15.499		-
1.3	35.122	35.586	15.436		-
1.4	34.998	35.513	15.363		-
1.5	34.863	35.430	15.280		-
1.6	34.717	35.337	15.187		-
1.7	34.561	35.235	15.085		-
1.8	34.393	35.122	14.972		-
1.9	34.214	34.998	14.848		-



2	34.021	34.863	14.713	-	
2.1	33.817	34.717	14.567	-	
2.2	33.601	34.561	14.411	-	
2.3	33.372	34.393	14.243	-	
2.4	33.130	34.214	14.064	-	
2.5	32.874	34.021	13.871	-	
2.6	32.604	33.817	13.667	-	
2.7	32.320	33.601	13.451	-	
2.8	32.021	33.372	13.222	-	
2.9	31.707	33.130	12.980	-	
3	31.376	32.874	12.724	6.072	6.652
3.1	31.028	32.604	12.454	5.716	6.738
3.2	30.664	32.320	12.170	5.371	6.799
3.3	30.282	32.021	11.871	5.037	6.834
3.4	29.880	31.707	11.557	4.713	6.844
3.5	29.456	31.376	11.226	4.398	6.828
3.6	29.009	31.028	10.878	4.092	6.786
3.7	28.541	30.664	10.514	3.795	6.719
3.8	28.048	30.282	10.132	3.505	6.627
3.9	27.527	29.880	9.730	3.223	6.507
4	26.975	29.456	9.306	2.949	6.357
4.1	26.389	29.009	8.859	2.680	6.179
4.2	25.768	28.541	8.391	2.419	5.972
4.3	25.109	28.048	7.898	2.163	5.735
4.4	24.404	27.527	7.377	1.914	5.463
4.5	23.645	26.975	6.825	1.670	5.155
4.6	22.827	26.389	6.239	1.431	4.808
4.7	21.943	25.768	5.618	1.198	4.420
4.8	20.982	25.109	4.959	0.969	3.990
4.9	19.927	24.404	4.254	0.745	3.509
5	18.758	23.645	3.495	0.526	2.969
5.1	17.454	22.827	2.677	0.311	2.366
5.2	15.995	21.943	1.793	0.100	1.693
5.3	14.354	20.982	0.832	-0.107	0.939
5.4	12.526	19.927	-0.223	-0.310	0.087
5.5	10.594	18.758	-1.392	-0.509	-
5.6	8.924	17.454	-2.696	-0.705	-
5.7	8.257	15.995	-4.155	-0.897	-
5.8	8.974	16.119	-4.031	-1.086	-
5.9	10.488	17.104	-3.046	-1.271	-
6	12.142	17.961	-2.189	-1.454	-
6.1	13.661	18.710	-1.440	-1.633	0.193
6.2	14.981	19.362	-0.788	-1.810	1.022
6.3	16.119	19.934	-0.216	-1.984	1.768
6.4	17.104	20.438	0.288	-2.154	2.442
6.5	17.961	20.882	0.732	-2.323	3.055
6.6	18.710	21.271	1.121	-2.489	3.610
6.7	19.362	21.610	1.460	-2.652	4.112
6.8	19.934	21.904	1.754	-2.813	4.567
6.9	20.438	22.158	2.008	-2.971	4.979
7	20.882	22.375	2.225	-3.127	5.352
7.1	21.271	22.557	2.407	-3.281	5.688
7.2	21.610	22.705	2.555	-3.433	5.988
7.3	21.904	22.821	2.671	-3.583	6.254
7.4	22.158	22.908	2.758	-3.731	6.489
7.5	22.375	22.967	2.817	-3.877	6.694

7.6	22.557	22.999	2.849	-4.020	6.869
7.7	22.705	23.003	2.853	-4.162	7.015
7.8	22.821	23.003	2.853	-4.302	7.155
7.9	22.908	23.003	2.853	-4.441	7.294
8	22.967	23.003	2.853	-4.577	7.430
8.1	22.999	23.003	2.853	-4.712	7.565
8.2	23.003	23.003	2.853	-4.845	7.698
8.3	22.983	23.003	2.853	-4.977	7.830
8.4	22.937	23.003	2.853	-5.107	7.960
8.5	22.866	23.003	2.853	-5.235	8.088
8.6	22.771	23.003	2.853	-5.362	8.215
8.7	22.651	23.003	2.853	-5.488	8.341
8.8	22.508	22.983	2.833	-5.612	8.445
8.9	22.341	22.937	2.787	-5.735	8.522
9	22.149	22.866	2.716	-5.856	8.572
9.1	21.932	22.771	2.621	-5.976	8.597
9.2	21.691	22.651	2.501	-6.095	8.596
9.3	21.424	22.508	2.358	-6.212	8.570
9.4	21.131	22.341	2.191	-6.328	8.519
9.5	20.809	22.149	1.999	-6.443	8.442
9.6	20.459	21.932	1.782	-6.557	8.339
9.7	20.080	21.691	1.541	-6.669	8.210
9.8	19.669	21.424	1.274	-6.781	8.055
9.9	19.224	21.131	0.981	-6.891	7.872
10	18.740	20.809	0.659	-7.000	7.659
15	17.638	18.003	-2.147	-11.402	9.255
20	12.471	12.668	-7.482	-14.526	7.044
25	8.028	9.477	-10.673	-16.949	6.276
30	-1.113	1.733	-18.417	-18.928	0.511
35	8.118	10.129	-10.021	-20.602	10.581
40	15.868	16.189	-3.961	-22.051	18.090
45	-1.120	2.140	-18.010	-23.330	5.320
50	8.907	9.682	-10.468	-24	13.532
55	5.688	6.571	-13.579	-24	10.421
60	3.671	5.199	-14.951	-24	9.049
65	0.590	1.565	-18.585	-24	5.415
70	5.159	5.363	-14.787	-24	9.213
75	0.997	1.139	-19.011	-24	4.989
80	-2.008	-1.404	-21.554	-24	2.446
85	-9.709	-9.076	-29.226	-24	-
90	-12.482	-12.209	-32.359	-14	-
95	-2.750	-2.750	-22.900	-14	-
100	-2.750	-2.750	-22.900	-14	-
105	-2.750	-2.750	-22.900	-14	-
110	-2.750	-2.750	-22.900	-14	-
115	-2.750	-2.750	-22.900	-14	-
120	-2.750	-2.750	-22.900	-14	-
125	-2.750	-2.750	-22.900	-14	-
130	-2.750	-2.750	-22.900	-14	-
135	-2.750	-2.750	-22.900	-14	-
140	-2.750	-2.750	-22.900	-14	-
145	-2.750	-2.750	-22.900	-14	-
150	-2.750	-2.750	-22.900	-14	-
155	-2.750	-2.750	-22.900	-14	-
160	-2.750	-2.750	-22.900	-14	-
165	-2.750	-2.750	-22.900	-14	-
170	-2.750	-2.750	-22.900	-14	-
175	-2.750	-2.750	-22.900	-14	-
180	-2.750	-2.750	-22.900	-14	-

### 14.25GHz, V-Pol Co-Pol Elevation PSD with -20.15dBW/4kHz at Input



**Data in support of claim that proposed operation meets criteria of VMES Order July 2009**

**Applicant** RAS

**Date of Application**

**ID Heading**

<b>a1</b>	<b>Antenna Manufacture:</b>	RAS	<b>c</b>	<b>Main bore gain (dBi):</b>	36.0
<b>a2</b>	<b>Antenna Model:</b>	E7000	<b>d</b>	<b>Frequency at which gain was measured (GHz):</b>	14.5
<b>a3</b>	<b>Antenna ID:</b>	RAS	<b>e</b>	<b>Max input power density (dBW/4kHz):</b>	-20.15
<b>b</b>	<b>Transmit Band (b):</b>	14GHz	<b>Pattern ID</b>	Table B5	
	<b>Pattern Description:</b>	<b>14.5GHz H-polarization, co-polarized perpendicular to the geosynchronous plane for 0°, 37.5°, and 50° skew angle</b>			

<b>Offset Angles</b>	<b>Nominal EI Gain Along At Normal to Geo Arc</b>	<b>Worst Case EI Gain Along At Normal to Geo Arc</b>	<b>Worst Case EI PSD Along At Normal to Geo Arc</b>	<b>FCC Mask (dBW/4kHz)</b>	<b>Mask Exceedence</b>
<b>(Degrees)</b>	<b>(dBi)</b>	<b>(dBi)</b>	<b>(dBW/4kHz)</b>		<b>(dB)</b>
	<b>0° Skew</b>	<b>0° Skew</b>	<b>0° Skew</b>		
-180	-2.750	-2.750	-22.900	-14	-
-175	-2.750	-2.750	-22.900	-14	-
-170	-2.750	-2.750	-22.900	-14	-
-165	-2.750	-2.750	-22.900	-14	-
-160	-2.750	-2.750	-22.900	-14	-
-155	-2.750	-2.750	-22.900	-14	-
-150	-2.750	-2.750	-22.900	-14	-
-145	-2.750	-2.750	-22.900	-14	-
-140	-2.750	-2.750	-22.900	-14	-
-135	-2.750	-2.750	-22.900	-14	-
-130	-2.750	-2.750	-22.900	-14	-
-125	-2.750	-2.750	-22.900	-14	-
-120	-2.750	-2.750	-22.900	-14	-
-115	-2.750	-2.750	-22.900	-14	-
-110	-2.750	-2.750	-22.900	-14	-
-105	-2.750	-2.750	-22.900	-14	-
-100	-2.750	-2.750	-22.900	-14	-
-95	-2.750	-2.750	-22.900	-14	-
-90	0.786	1.002	-19.148	-14	-
-85	2.747	2.912	-17.238	-24	6.762
-80	3.436	3.553	-16.597	-24	7.403
-75	-7.957	-4.642	-24.792	-24	-
-70	3.181	3.637	-16.513	-24	7.487
-65	2.280	2.713	-17.437	-24	6.563
-60	3.444	4.650	-15.500	-24	8.500
-55	9.027	9.378	-10.772	-24	13.228
-50	7.914	9.124	-11.026	-24	12.974
-45	3.710	6.325	-13.825	-23.330	9.505
-40	13.899	14.415	-5.735	-22.051	16.316
-35	7.109	8.852	-11.298	-20.602	9.304
-30	-1.937	3.043	-17.107	-18.928	1.821
-25	9.704	10.777	-9.373	-16.949	7.576
-20	13.965	13.977	-6.173	-14.526	8.353
-15	16.799	17.600	-2.550	-11.402	8.852
-10	17.988	20.324	0.174	-7.000	7.174

-9.9	18.540	20.681	0.531	-6.891	7.422
-9.8	19.047	21.007	0.857	-6.781	7.638
-9.7	19.510	21.302	1.152	-6.669	7.821
-9.6	19.934	21.568	1.418	-6.557	7.975
-9.5	20.324	21.807	1.657	-6.443	8.100
-9.4	20.681	22.021	1.871	-6.328	8.199
-9.3	21.007	22.208	2.058	-6.212	8.270
-9.2	21.302	22.368	2.218	-6.095	8.313
-9.1	21.568	22.504	2.354	-5.976	8.330
-9	21.807	22.615	2.465	-5.856	8.321
-8.9	22.021	22.702	2.552	-5.735	8.287
-8.8	22.208	22.763	2.613	-5.612	8.225
-8.7	22.368	22.799	2.649	-5.488	8.137
-8.6	22.504	22.809	2.659	-5.362	8.021
-8.5	22.615	22.809	2.659	-5.235	7.894
-8.4	22.702	22.809	2.659	-5.107	7.766
-8.3	22.763	22.809	2.659	-4.977	7.636
-8.2	22.799	22.809	2.659	-4.845	7.504
-8.1	22.809	22.809	2.659	-4.712	7.371
-8	22.793	22.809	2.659	-4.577	7.236
-7.9	22.750	22.809	2.659	-4.441	7.100
-7.8	22.678	22.809	2.659	-4.302	6.961
-7.7	22.577	22.809	2.659	-4.162	6.821
-7.6	22.446	22.809	2.659	-4.020	6.679
-7.5	22.283	22.793	2.643	-3.877	6.520
-7.4	22.084	22.750	2.600	-3.731	6.331
-7.3	21.848	22.678	2.528	-3.583	6.111
-7.2	21.572	22.577	2.427	-3.433	5.860
-7.1	21.252	22.446	2.296	-3.281	5.577
-7	20.884	22.283	2.133	-3.127	5.260
-6.9	20.460	22.084	1.934	-2.971	4.905
-6.8	19.973	21.848	1.698	-2.813	4.511
-6.7	19.419	21.572	1.422	-2.652	4.074
-6.6	18.784	21.252	1.102	-2.489	3.591
-6.5	18.052	20.884	0.734	-2.323	3.057
-6.4	17.203	20.460	0.310	-2.154	2.464
-6.3	16.215	19.973	-0.177	-1.984	1.807
-6.2	15.060	19.419	-0.731	-1.810	1.079
-6.1	13.695	18.784	-1.366	-1.633	0.267
-6	12.077	18.052	-2.098	-1.454	-
-5.9	10.194	17.203	-2.947	-1.271	-
-5.8	8.251	16.215	-3.935	-1.086	-
-5.7	7.048	15.815	-4.335	-0.897	-
-5.6	7.673	17.376	-2.774	-0.705	-
-5.5	9.686	18.751	-1.399	-0.509	-
-5.4	11.959	19.978	-0.172	-0.310	0.138
-5.3	14.023	21.076	0.926	-0.107	1.033
-5.2	15.815	22.068	1.918	0.100	1.818
-5.1	17.376	22.974	2.824	0.311	2.513
-5	18.751	23.808	3.658	0.526	3.132
-4.9	19.978	24.582	4.432	0.745	3.687
-4.8	21.076	25.299	5.149	0.969	4.180
-4.7	22.068	25.966	5.816	1.198	4.618
-4.6	22.974	26.589	6.439	1.431	5.008
-4.5	23.808	27.175	7.025	1.670	5.355
-4.4	24.582	27.728	7.578	1.914	5.664
-4.3	25.299	28.249	8.099	2.163	5.936
-4.2	25.966	28.739	8.589	2.419	6.170
-4.1	26.589	29.202	9.052	2.680	6.372
-4	27.175	29.642	9.492	2.949	6.543

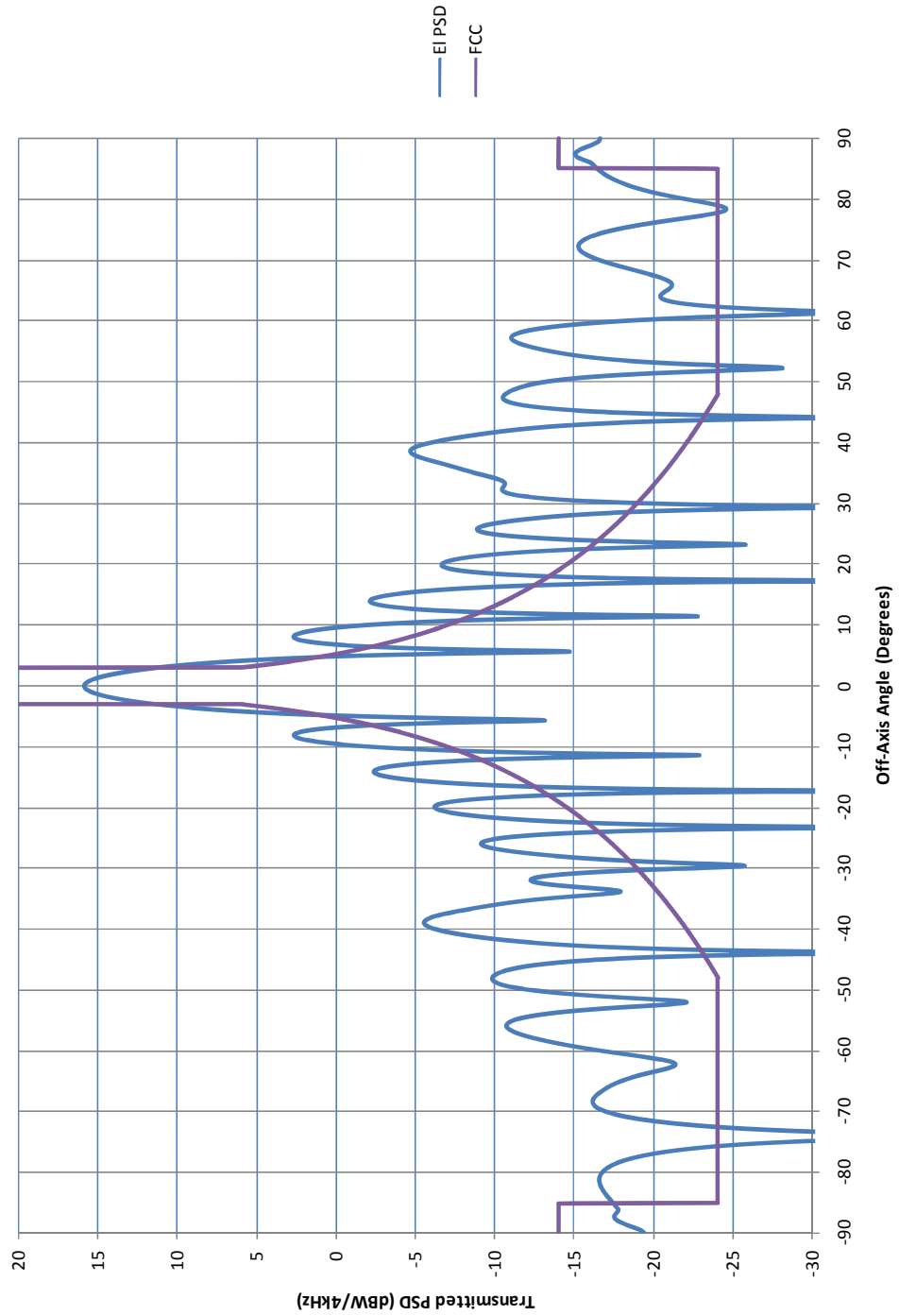
-3.9	27.728	30.060	9.910	3.223	6.687
-3.8	28.249	30.456	10.306	3.505	6.801
-3.7	28.739	30.832	10.682	3.795	6.887
-3.6	29.202	31.188	11.038	4.092	6.946
-3.5	29.642	31.528	11.378	4.398	6.980
-3.4	30.060	31.852	11.702	4.713	6.989
-3.3	30.456	32.159	12.009	5.037	6.972
-3.2	30.832	32.451	12.301	5.371	6.930
-3.1	31.188	32.728	12.578	5.716	6.862
-3	31.528	32.992	12.842	6.072	6.770
-2.9	31.852	33.243	13.093		-
-2.8	32.159	33.481	13.331		-
-2.7	32.451	33.706	13.556		-
-2.6	32.728	33.918	13.768		-
-2.5	32.992	34.120	13.970		-
-2.4	33.243	34.310	14.160		-
-2.3	33.481	34.490	14.340		-
-2.2	33.706	34.658	14.508		-
-2.1	33.918	34.815	14.665		-
-2	34.120	34.962	14.812		-
-1.9	34.310	35.100	14.950		-
-1.8	34.490	35.227	15.077		-
-1.7	34.658	35.344	15.194		-
-1.6	34.815	35.451	15.301		-
-1.5	34.962	35.548	15.398		-
-1.4	35.100	35.636	15.486		-
-1.3	35.227	35.714	15.564		-
-1.2	35.344	35.783	15.633		-
-1.1	35.451	35.842	15.692		-
-1	35.548	35.892	15.742		-
-0.9	35.636	35.932	15.782		-
-0.8	35.714	35.963	15.813		-
-0.7	35.783	35.985	15.835		-
-0.6	35.842	35.997	15.847		-
-0.5	35.892	36.000	15.850		-
-0.4	35.932	36.000	15.850		-
-0.3	35.963	36.000	15.850		-
-0.2	35.985	36.000	15.850		-
-0.1	35.997	36.000	15.850		-
0	36.000	36.000	15.850		-
0.1	35.995	36.000	15.850		-
0.2	35.979	36.000	15.850		-
0.3	35.954	36.000	15.850		-
0.4	35.920	36.000	15.850		-
0.5	35.877	36.000	15.850		-
0.6	35.824	35.995	15.845		-
0.7	35.761	35.979	15.829		-
0.8	35.689	35.954	15.804		-
0.9	35.608	35.920	15.770		-
1	35.517	35.877	15.727		-
1.1	35.417	35.824	15.674		-
1.2	35.306	35.761	15.611		-
1.3	35.186	35.689	15.539		-
1.4	35.056	35.608	15.458		-
1.5	34.916	35.517	15.367		-
1.6	34.766	35.417	15.267		-
1.7	34.604	35.306	15.156		-
1.8	34.432	35.186	15.036		-
1.9	34.250	35.056	14.906		-

2	34.056	34.916	14.766	-	
2.1	33.852	34.766	14.616	-	
2.2	33.634	34.604	14.454	-	
2.3	33.405	34.432	14.282	-	
2.4	33.164	34.250	14.100	-	
2.5	32.910	34.056	13.906	-	
2.6	32.643	33.852	13.702	-	
2.7	32.361	33.634	13.484	-	
2.8	32.063	33.405	13.255	-	
2.9	31.752	33.164	13.014	-	
3	31.425	32.910	12.760	6.072	6.688
3.1	31.080	32.643	12.493	5.716	6.777
3.2	30.717	32.361	12.211	5.371	6.840
3.3	30.333	32.063	11.913	5.037	6.876
3.4	29.930	31.752	11.602	4.713	6.889
3.5	29.506	31.425	11.275	4.398	6.877
3.6	29.059	31.080	10.930	4.092	6.838
3.7	28.584	30.717	10.567	3.795	6.772
3.8	28.080	30.333	10.183	3.505	6.678
3.9	27.547	29.930	9.780	3.223	6.557
4	26.982	29.506	9.356	2.949	6.407
4.1	26.379	29.059	8.909	2.680	6.229
4.2	25.734	28.584	8.434	2.419	6.015
4.3	25.040	28.080	7.930	2.163	5.767
4.4	24.295	27.547	7.397	1.914	5.483
4.5	23.491	26.982	6.832	1.670	5.162
4.6	22.617	26.379	6.229	1.431	4.798
4.7	21.657	25.734	5.584	1.198	4.386
4.8	20.596	25.040	4.890	0.969	3.921
4.9	19.419	24.295	4.145	0.745	3.400
5	18.095	23.491	3.341	0.526	2.815
5.1	16.581	22.617	2.467	0.311	2.156
5.2	14.818	21.657	1.507	0.100	1.407
5.3	12.733	20.596	0.446	-0.107	0.553
5.4	10.268	19.419	-0.731	-0.310	-
5.5	7.525	18.095	-2.055	-0.509	-
5.6	5.501	16.581	-3.569	-0.705	-
5.7	6.089	15.611	-4.539	-0.897	-
5.8	8.418	16.717	-3.433	-1.086	-
5.9	10.752	17.650	-2.500	-1.271	-
6	12.699	18.447	-1.703	-1.454	-
6.1	14.292	19.135	-1.015	-1.633	0.618
6.2	15.611	19.734	-0.416	-1.810	1.394
6.3	16.717	20.255	0.105	-1.984	2.089
6.4	17.650	20.706	0.556	-2.154	2.710
6.5	18.447	21.098	0.948	-2.323	3.271
6.6	19.135	21.439	1.289	-2.489	3.778
6.7	19.734	21.735	1.585	-2.652	4.237
6.8	20.255	21.988	1.838	-2.813	4.651
6.9	20.706	22.201	2.051	-2.971	5.022
7	21.098	22.380	2.230	-3.127	5.357
7.1	21.439	22.526	2.376	-3.281	5.657
7.2	21.735	22.642	2.492	-3.433	5.925
7.3	21.988	22.728	2.578	-3.583	6.161
7.4	22.201	22.787	2.637	-3.731	6.368
7.5	22.380	22.821	2.671	-3.877	6.548

7.6	22.526	22.829	2.679	-4.020	6.699
7.7	22.642	22.829	2.679	-4.162	6.841
7.8	22.728	22.829	2.679	-4.302	6.981
7.9	22.787	22.829	2.679	-4.441	7.120
8	22.821	22.829	2.679	-4.577	7.256
8.1	22.829	22.829	2.679	-4.712	7.391
8.2	22.814	22.829	2.679	-4.845	7.524
8.3	22.774	22.829	2.679	-4.977	7.656
8.4	22.711	22.829	2.679	-5.107	7.786
8.5	22.626	22.829	2.679	-5.235	7.914
8.6	22.519	22.829	2.679	-5.362	8.041
8.7	22.388	22.814	2.664	-5.488	8.152
8.8	22.234	22.774	2.624	-5.612	8.236
8.9	22.058	22.711	2.561	-5.735	8.296
9	21.858	22.626	2.476	-5.856	8.332
9.1	21.634	22.519	2.369	-5.976	8.345
9.2	21.383	22.388	2.238	-6.095	8.333
9.3	21.106	22.234	2.084	-6.212	8.296
9.4	20.803	22.058	1.908	-6.328	8.236
9.5	20.470	21.858	1.708	-6.443	8.151
9.6	20.105	21.634	1.484	-6.557	8.041
9.7	19.705	21.383	1.233	-6.669	7.902
9.8	19.268	21.106	0.956	-6.781	7.737
9.9	18.793	20.803	0.653	-6.891	7.544
10	18.274	20.470	0.320	-7.000	7.320
15	16.645	17.650	-2.500	-11.402	8.902
20	13.514	13.527	-6.623	-14.526	7.903
25	10.434	11.213	-8.937	-16.949	8.012
30	0.631	5.274	-14.876	-18.928	4.052
35	11.428	12.126	-8.024	-20.602	12.578
40	14.186	14.932	-5.218	-22.051	16.833
45	3.043	6.211	-13.939	-23.330	9.391
50	6.965	7.996	-12.154	-24	11.846
55	6.652	7.556	-12.594	-24	11.406
60	2.094	4.760	-15.390	-24	8.610
65	-0.625	-0.348	-20.498	-24	3.502
70	3.613	4.112	-16.038	-24	7.962
75	2.610	3.388	-16.762	-24	7.238
80	-1.881	-0.880	-21.030	-24	2.970
85	3.731	3.933	-16.217	-24	7.783
90	3.571	3.669	-16.481	-14	-
95	-2.750	-2.750	-22.900	-14	-
100	-2.750	-2.750	-22.900	-14	-
105	-2.750	-2.750	-22.900	-14	-
110	-2.750	-2.750	-22.900	-14	-
115	-2.750	-2.750	-22.900	-14	-
120	-2.750	-2.750	-22.900	-14	-
125	-2.750	-2.750	-22.900	-14	-
130	-2.750	-2.750	-22.900	-14	-
135	-2.750	-2.750	-22.900	-14	-
140	-2.750	-2.750	-22.900	-14	-
145	-2.750	-2.750	-22.900	-14	-
150	-2.750	-2.750	-22.900	-14	-
155	-2.750	-2.750	-22.900	-14	-
160	-2.750	-2.750	-22.900	-14	-
165	-2.750	-2.750	-22.900	-14	-
170	-2.750	-2.750	-22.900	-14	-
175	-2.750	-2.750	-22.900	-14	-
180	-2.750	-2.750	-22.900	-14	-



### 14.5GHz, H-Pol Co-Pol Elevation PSD with -20.15dBW/4kHz at Input



Data in support of claim that proposed operation meets criteria of VMES Order July 2009

Applicant RAS

Date of Application

ID Heading

- a1 Antenna Manufacture: RAS                                      c Main bore gain (dBi): 36.0
- a2 Antenna Model: E7000    d Frequency at which gain was measured (GHz): 14.5
- a3 Antenna ID: RAS    e Max input power density (dBW/4kHz): -20.15
- b Transmit Band (b): 14GHz                                      Pattern ID Table B6
- Pattern Description: 14.5GHz V-polarization, co-polarized perpendicular to the geosynchronous plane for 0°, 37.5°, and 50° skew angle

Offset Angles  (Degrees)	Nominal EI Gain Along At Normal to Geo Arc  (dBi) 0° Skew	Worst Case EI Gain Along At Normal to Geo Arc  (dBi) 0° Skew	Worst Case EI PSD Along At Normal to Geo Arc input PSD = -20.15dBW/4kHz  (dBW/4kHz) 0° Skew	FCC Mask (dBW/4kHz)	Mask Exceedence  (dB)
-180	-2.750	-2.750	-22.900	-14	-
-175	-2.750	-2.750	-22.900	-14	-
-170	-2.750	-2.750	-22.900	-14	-
-165	-2.750	-2.750	-22.900	-14	-
-160	-2.750	-2.750	-22.900	-14	-
-155	-2.750	-2.750	-22.900	-14	-
-150	-2.750	-2.750	-22.900	-14	-
-145	-2.750	-2.750	-22.900	-14	-
-140	-2.750	-2.750	-22.900	-14	-
-135	-2.750	-2.750	-22.900	-14	-
-130	-2.750	-2.750	-22.900	-14	-
-125	-2.750	-2.750	-22.900	-14	-
-120	-2.750	-2.750	-22.900	-14	-
-115	-2.750	-2.750	-22.900	-14	-
-110	-2.750	-2.750	-22.900	-14	-
-105	-2.750	-2.750	-22.900	-14	-
-100	-2.750	-2.750	-22.900	-14	-
-95	-2.750	-2.750	-22.900	-14	-
-90	-5.977	-5.877	-26.027	-14	-
-85	-3.848	-3.627	-23.777	-24	0.223
-80	-0.759	-0.361	-20.511	-24	3.489
-75	2.650	2.849	-17.301	-24	6.699
-70	5.416	5.830	-14.320	-24	9.680
-65	5.668	6.148	-14.002	-24	9.998
-60	-5.350	-2.675	-22.825	-24	1.175
-55	8.296	8.299	-11.851	-24	12.149
-50	2.455	5.209	-14.941	-24	9.059
-45	3.300	5.840	-14.310	-23.330	9.020
-40	13.155	13.629	-6.521	-22.051	15.530
-35	15.142	15.147	-5.003	-20.602	15.599
-30	7.359	9.798	-10.352	-18.928	8.576
-25	12.556	13.192	-6.958	-16.949	9.991
-20	15.795	15.798	-4.352	-14.526	10.174
-15	16.140	17.300	-2.850	-11.402	8.552
-10	18.726	20.765	0.615	-7.000	7.615

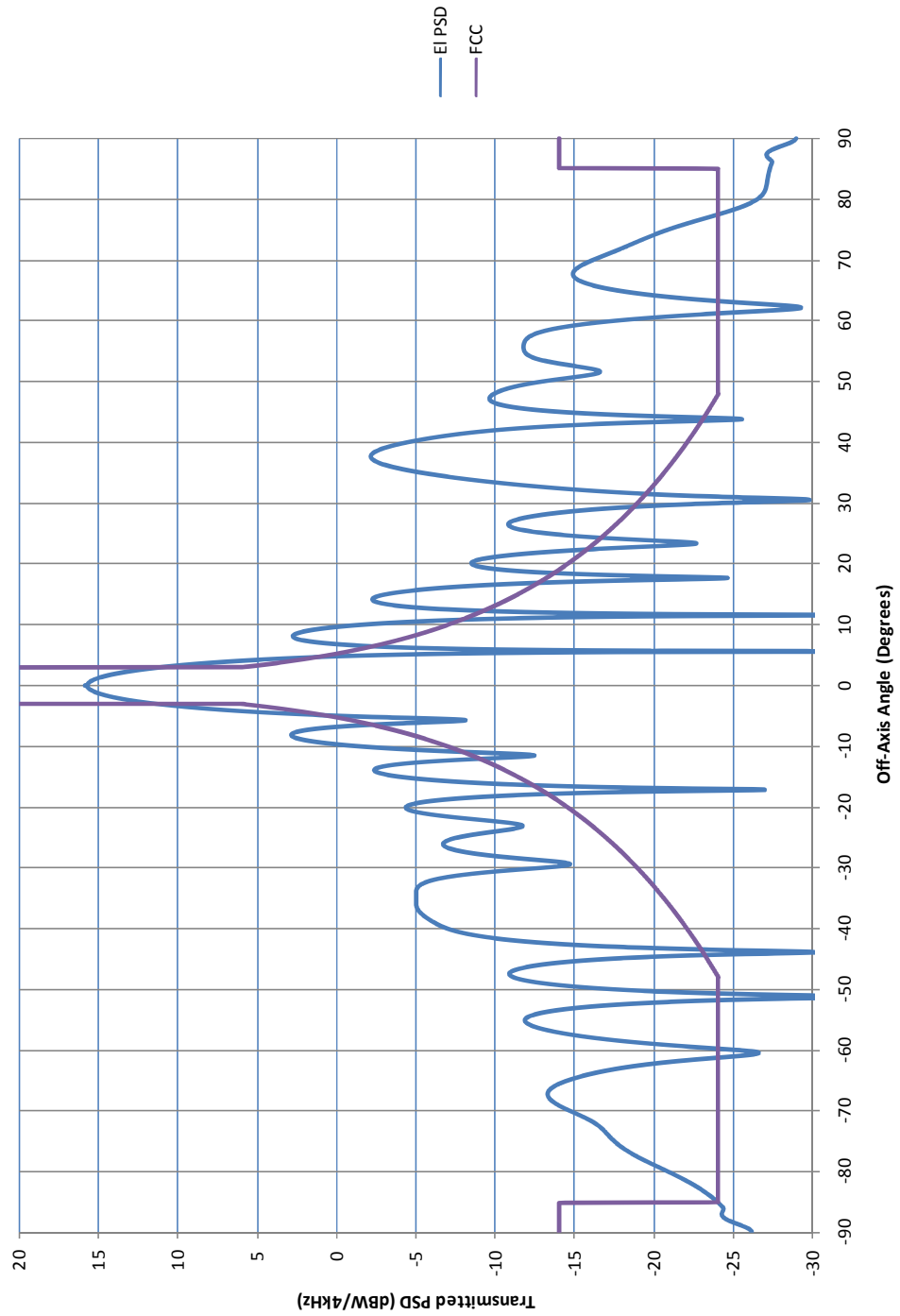
-9.9	19.198	21.083	0.933	-6.891	7.824
-9.8	19.635	21.376	1.226	-6.781	8.007
-9.7	20.042	21.643	1.493	-6.669	8.162
-9.6	20.419	21.886	1.736	-6.557	8.293
-9.5	20.765	22.104	1.954	-6.443	8.397
-9.4	21.083	22.297	2.147	-6.328	8.475
-9.3	21.376	22.468	2.318	-6.212	8.530
-9.2	21.643	22.617	2.467	-6.095	8.562
-9.1	21.886	22.741	2.591	-5.976	8.567
-9	22.104	22.842	2.692	-5.856	8.548
-8.9	22.297	22.920	2.770	-5.735	8.505
-8.8	22.468	22.975	2.825	-5.612	8.437
-8.7	22.617	23.005	2.855	-5.488	8.343
-8.6	22.741	23.011	2.861	-5.362	8.223
-8.5	22.842	23.011	2.861	-5.235	8.096
-8.4	22.920	23.011	2.861	-5.107	7.968
-8.3	22.975	23.011	2.861	-4.977	7.838
-8.2	23.005	23.011	2.861	-4.845	7.706
-8.1	23.011	23.011	2.861	-4.712	7.573
-8	22.991	23.011	2.861	-4.577	7.438
-7.9	22.945	23.011	2.861	-4.441	7.302
-7.8	22.872	23.011	2.861	-4.302	7.163
-7.7	22.771	23.011	2.861	-4.162	7.023
-7.6	22.640	23.011	2.861	-4.020	6.881
-7.5	22.477	22.991	2.841	-3.877	6.718
-7.4	22.282	22.945	2.795	-3.731	6.526
-7.3	22.051	22.872	2.722	-3.583	6.305
-7.2	21.781	22.771	2.621	-3.433	6.054
-7.1	21.469	22.640	2.490	-3.281	5.771
-7	21.113	22.477	2.327	-3.127	5.454
-6.9	20.709	22.282	2.132	-2.971	5.103
-6.8	20.250	22.051	1.901	-2.813	4.714
-6.7	19.729	21.781	1.631	-2.652	4.283
-6.6	19.140	21.469	1.319	-2.489	3.808
-6.5	18.479	21.113	0.963	-2.323	3.286
-6.4	17.737	20.709	0.559	-2.154	2.713
-6.3	16.906	20.250	0.100	-1.984	2.084
-6.2	15.981	19.729	-0.421	-1.810	1.389
-6.1	14.978	19.140	-1.010	-1.633	0.623
-6	13.940	18.479	-1.671	-1.454	-
-5.9	12.967	17.737	-2.413	-1.271	-
-5.8	12.251	16.906	-3.244	-1.086	-
-5.7	12.041	17.290	-2.860	-0.897	-
-5.6	12.471	18.511	-1.639	-0.705	-
-5.5	13.427	19.641	-0.509	-0.509	0.000
-5.4	14.666	20.684	0.534	-0.310	0.844
-5.3	15.990	21.649	1.499	-0.107	1.606
-5.2	17.290	22.545	2.395	0.100	2.295
-5.1	18.511	23.373	3.223	0.311	2.912
-5	19.641	24.142	3.992	0.526	3.466
-4.9	20.684	24.858	4.708	0.745	3.963
-4.8	21.649	25.530	5.380	0.969	4.411
-4.7	22.545	26.164	6.014	1.198	4.816
-4.6	23.373	26.757	6.607	1.431	5.176
-4.5	24.142	27.315	7.165	1.670	5.495
-4.4	24.858	27.842	7.692	1.914	5.778
-4.3	25.530	28.341	8.191	2.163	6.028
-4.2	26.164	28.816	8.666	2.419	6.247
-4.1	26.757	29.265	9.115	2.680	6.435
-4	27.315	29.689	9.539	2.949	6.590

-3.9	27.842	30.092	9.942	3.223	6.719
-3.8	28.341	30.476	10.326	3.505	6.821
-3.7	28.816	30.843	10.693	3.795	6.898
-3.6	29.265	31.190	11.040	4.092	6.948
-3.5	29.689	31.520	11.370	4.398	6.972
-3.4	30.092	31.834	11.684	4.713	6.971
-3.3	30.476	32.132	11.982	5.037	6.945
-3.2	30.843	32.417	12.267	5.371	6.896
-3.1	31.190	32.688	12.538	5.716	6.822
-3	31.520	32.944	12.794	6.072	6.722
-2.9	31.834	33.186	13.036		-
-2.8	32.132	33.417	13.267		-
-2.7	32.417	33.636	13.486		-
-2.6	32.688	33.843	13.693		-
-2.5	32.944	34.038	13.888		-
-2.4	33.186	34.222	14.072		-
-2.3	33.417	34.395	14.245		-
-2.2	33.636	34.558	14.408		-
-2.1	33.843	34.710	14.560		-
-2	34.038	34.852	14.702		-
-1.9	34.222	34.984	14.834		-
-1.8	34.395	35.106	14.956		-
-1.7	34.558	35.219	15.069		-
-1.6	34.710	35.322	15.172		-
-1.5	34.852	35.416	15.266		-
-1.4	34.984	35.500	15.350		-
-1.3	35.106	35.575	15.425		-
-1.2	35.219	35.642	15.492		-
-1.1	35.322	35.700	15.550		-
-1	35.416	35.748	15.598		-
-0.9	35.500	35.787	15.637		-
-0.8	35.575	35.818	15.668		-
-0.7	35.642	35.840	15.690		-
-0.6	35.700	35.854	15.704		-
-0.5	35.748	36.000	15.850		-
-0.4	35.787	36.000	15.850		-
-0.3	35.818	36.000	15.850		-
-0.2	35.840	36.000	15.850		-
-0.1	35.854	36.000	15.850		-
0	36.000	36.000	15.850		-
0.1	35.853	36.000	15.850		-
0.2	35.840	36.000	15.850		-
0.3	35.819	36.000	15.850		-
0.4	35.787	36.000	15.850		-
0.5	35.747	36.000	15.850		-
0.6	35.698	35.853	15.703		-
0.7	35.640	35.840	15.690		-
0.8	35.573	35.819	15.669		-
0.9	35.496	35.787	15.637		-
1	35.409	35.747	15.597		-
1.1	35.313	35.698	15.548		-
1.2	35.207	35.640	15.490		-
1.3	35.092	35.573	15.423		-
1.4	34.965	35.496	15.346		-
1.5	34.829	35.409	15.259		-
1.6	34.682	35.313	15.163		-
1.7	34.524	35.207	15.057		-
1.8	34.356	35.092	14.942		-
1.9	34.175	34.965	14.815		-

2	33.982	34.829	14.679	-	
2.1	33.778	34.682	14.532	-	
2.2	33.562	34.524	14.374	-	
2.3	33.333	34.356	14.206	-	
2.4	33.089	34.175	14.025	-	
2.5	32.832	33.982	13.832	-	
2.6	32.561	33.778	13.628	-	
2.7	32.276	33.562	13.412	-	
2.8	31.975	33.333	13.183	-	
2.9	31.656	33.089	12.939	-	
3	31.320	32.832	12.682	6.072	6.610
3.1	30.968	32.561	12.411	5.716	6.695
3.2	30.596	32.276	12.126	5.371	6.755
3.3	30.205	31.975	11.825	5.037	6.788
3.4	29.790	31.656	11.506	4.713	6.793
3.5	29.352	31.320	11.170	4.398	6.772
3.6	28.891	30.968	10.818	4.092	6.726
3.7	28.404	30.596	10.446	3.795	6.651
3.8	27.887	30.205	10.055	3.505	6.550
3.9	27.337	29.790	9.640	3.223	6.417
4	26.752	29.352	9.202	2.949	6.253
4.1	26.129	28.891	8.741	2.680	6.061
4.2	25.465	28.404	8.254	2.419	5.835
4.3	24.751	27.887	7.737	2.163	5.574
4.4	23.979	27.337	7.187	1.914	5.273
4.5	23.141	26.752	6.602	1.670	4.932
4.6	22.229	26.129	5.979	1.431	4.548
4.7	21.229	25.465	5.315	1.198	4.117
4.8	20.118	24.751	4.601	0.969	3.632
4.9	18.866	23.979	3.829	0.745	3.084
5	17.431	23.141	2.991	0.526	2.465
5.1	15.759	22.229	2.079	0.311	1.768
5.2	13.746	21.229	1.079	0.100	0.979
5.3	11.199	20.118	-0.032	-0.107	0.075
5.4	7.689	18.866	-1.284	-0.310	-
5.5	1.942	17.431	-2.719	-0.509	-
5.6	-18.449	15.759	-4.391	-0.705	-
5.7	-0.242	15.308	-4.842	-0.897	-
5.8	6.130	16.478	-3.672	-1.086	-
5.9	9.658	17.459	-2.691	-1.271	-
6	12.073	18.294	-1.856	-1.454	-
6.1	13.880	19.007	-1.143	-1.633	0.490
6.2	15.308	19.624	-0.526	-1.810	1.284
6.3	16.478	20.162	0.012	-1.984	1.996
6.4	17.459	20.631	0.481	-2.154	2.635
6.5	18.294	21.041	0.891	-2.323	3.214
6.6	19.007	21.397	1.247	-2.489	3.736
6.7	19.624	21.705	1.555	-2.652	4.207
6.8	20.162	21.971	1.821	-2.813	4.634
6.9	20.631	22.200	2.050	-2.971	5.021
7	21.041	22.392	2.242	-3.127	5.369
7.1	21.397	22.550	2.400	-3.281	5.681
7.2	21.705	22.678	2.528	-3.433	5.961
7.3	21.971	22.777	2.627	-3.583	6.210
7.4	22.200	22.848	2.698	-3.731	6.429
7.5	22.392	22.892	2.742	-3.877	6.619

7.6	22.550	22.911	2.761	-4.020	6.781
7.7	22.678	22.911	2.761	-4.162	6.923
7.8	22.777	22.911	2.761	-4.302	7.063
7.9	22.848	22.911	2.761	-4.441	7.202
8	22.892	22.911	2.761	-4.577	7.338
8.1	22.911	22.911	2.761	-4.712	7.473
8.2	22.906	22.911	2.761	-4.845	7.606
8.3	22.877	22.911	2.761	-4.977	7.738
8.4	22.824	22.911	2.761	-5.107	7.868
8.5	22.747	22.911	2.761	-5.235	7.996
8.6	22.648	22.911	2.761	-5.362	8.123
8.7	22.526	22.906	2.756	-5.488	8.244
8.8	22.381	22.877	2.727	-5.612	8.339
8.9	22.213	22.824	2.674	-5.735	8.409
9	22.021	22.747	2.597	-5.856	8.453
9.1	21.806	22.648	2.498	-5.976	8.474
9.2	21.566	22.526	2.376	-6.095	8.471
9.3	21.301	22.381	2.231	-6.212	8.443
9.4	21.008	22.213	2.063	-6.328	8.391
9.5	20.688	22.021	1.871	-6.443	8.314
9.6	20.339	21.806	1.656	-6.557	8.213
9.7	19.960	21.566	1.416	-6.669	8.085
9.8	19.547	21.301	1.151	-6.781	7.932
9.9	19.096	21.008	0.858	-6.891	7.749
10	18.606	20.688	0.538	-7.000	7.538
15	17.088	17.775	-2.375	-11.402	9.027
20	11.642	11.664	-8.486	-14.526	6.040
25	6.838	8.276	-11.874	-16.949	5.075
30	-3.824	0.851	-19.299	-18.928	-
35	14.801	15.851	-4.299	-20.602	16.303
40	15.712	16.559	-3.591	-22.051	18.460
45	6.015	8.199	-11.951	-23.330	11.379
50	7.228	8.340	-11.810	-24	12.190
55	8.337	8.382	-11.768	-24	12.232
60	2.653	4.419	-15.731	-24	8.269
65	2.490	3.498	-16.652	-24	7.348
70	4.025	4.452	-15.698	-24	8.302
75	-0.734	-0.197	-20.347	-24	3.653
80	-6.331	-6.006	-26.156	-24	-
85	-7.128	-7.076	-27.226	-24	-
90	-8.774	-8.558	-28.708	-14	-
95	-2.750	-2.750	-22.900	-14	-
100	-2.750	-2.750	-22.900	-14	-
105	-2.750	-2.750	-22.900	-14	-
110	-2.750	-2.750	-22.900	-14	-
115	-2.750	-2.750	-22.900	-14	-
120	-2.750	-2.750	-22.900	-14	-
125	-2.750	-2.750	-22.900	-14	-
130	-2.750	-2.750	-22.900	-14	-
135	-2.750	-2.750	-22.900	-14	-
140	-2.750	-2.750	-22.900	-14	-
145	-2.750	-2.750	-22.900	-14	-
150	-2.750	-2.750	-22.900	-14	-
155	-2.750	-2.750	-22.900	-14	-
160	-2.750	-2.750	-22.900	-14	-
165	-2.750	-2.750	-22.900	-14	-
170	-2.750	-2.750	-22.900	-14	-
175	-2.750	-2.750	-22.900	-14	-
180	-2.750	-2.750	-22.900	-14	-

### 14.5GHz, V-Pol Co-Pol Elevation PSD with -20.15dBW/4kHz at Input



Data in support of claim that proposed operation meets criteria of VMES Order July 2009

Applicant RAS Date of Application  
 ID Heading  
 a1 Antenna Manufacture: RAS c Main bore gain (dBi): 36.0  
 a2 Antenna Model: SR5000 d Frequency at which gain was measured (GHz): 14.0  
 a3 Antenna ID: RAS e Max input power density (dBW/4kHz): -20.15  
 b Transmit Band (b): 14GHz Pattern ID Table C1  
 Pattern Description: 14.0GHz H-polarization, X-polarized tangent to the geosynchronous plane for 0°, 37.5°, and 50° skew angle

Offset Angles  (Degrees)	Nominal X-Pol Gain Along Tangent to Geo Arc			Worst Case X-Pol Gain Along Tangent to Geo Arc			Worst Case X-Pol PSD Along Tangent to Geo Arc input PSD = -20.15dBW/4kHz			FCC Mask (dBW/4kHz)	Mask Exceedence  (dB)
	(dBi)			(dBi)			(dBW/4kHz)				
	0? Skew	37.5? Skew	50? Skew	0? Skew	37.5? Skew	50? Skew	0? Skew	37.5? Skew	50? Skew		
-9.2	-16.030	-10.863	-11.886	-10.292	-10.863	-8.165	-30.442	-31.013	-28.315	-16.000	-
-9.1	-12.776	-12.037	-11.646	-10.292	-10.863	-7.496	-30.442	-31.013	-27.646	-16.000	-
-9	-11.074	-13.294	-11.010	-10.292	-10.863	-7.193	-30.442	-31.013	-27.343	-16.000	-
-8.9	-10.292	-14.040	-10.092	-10.292	-10.863	-7.193	-30.442	-31.013	-27.343	-16.000	-
-8.8	-10.302	-14.065	-9.029	-10.292	-10.863	-7.193	-30.442	-31.013	-27.343	-16.000	-
-8.7	-11.123	-13.328	-8.165	-10.292	-10.863	-7.193	-30.442	-31.013	-27.343	-16.000	-
-8.6	-12.668	-12.697	-7.496	-10.292	-12.037	-7.193	-30.442	-32.187	-27.343	-16.000	-
-8.5	-14.932	-12.590	-7.193	-10.292	-12.590	-7.193	-30.442	-32.740	-27.343	-16.000	-
-8.4	-17.754	-12.863	-7.212	-10.292	-12.590	-7.193	-30.442	-32.740	-27.343	-16.000	-
-8.3	-19.212	-13.955	-7.623	-10.302	-12.590	-7.193	-30.452	-32.740	-27.343	-16.000	-
-8.2	-17.596	-15.464	-8.469	-11.123	-12.590	-7.193	-31.273	-32.740	-27.343	-16.000	-
-8.1	-15.796	-16.961	-9.769	-12.668	-12.590	-7.193	-32.818	-32.740	-27.343	-16.000	-
-8	-14.828	-17.675	-11.723	-14.755	-12.590	-7.193	-34.905	-32.740	-27.343	-16.000	-
-7.9	-14.755	-16.678	-14.435	-14.755	-12.863	-7.212	-34.905	-33.013	-27.362	-16.000	-
-7.8	-15.842	-15.202	-18.540	-14.219	-13.867	-7.623	-34.369	-34.017	-27.773	-16.000	-
-7.7	-18.745	-14.320	-25.244	-11.329	-13.867	-8.469	-31.479	-34.017	-28.619	-16.000	-
-7.6	-25.393	-13.867	-30.964	-9.562	-13.867	-9.769	-29.712	-34.017	-29.919	-16.000	-
-7.5	-30.254	-14.247	-23.940	-8.451	-13.867	-11.723	-28.601	-34.017	-31.873	-16.000	-
-7.4	-19.251	-15.307	-20.497	-7.820	-13.867	-14.435	-27.970	-34.017	-34.585	-16.000	-
-7.3	-14.219	-17.062	-18.764	-7.654	-13.867	-14.361	-27.804	-34.017	-34.511	-16.000	-
-7.2	-11.329	-19.719	-18.112	-7.654	-13.867	-12.900	-27.804	-34.017	-33.050	-16.000	-
-7.1	-9.562	-21.504	-17.571	-7.654	-13.867	-11.558	-27.804	-34.017	-31.708	-16.000	-
-7	-8.451	-20.540	-16.990	-7.654	-14.247	-10.544	-27.804	-34.397	-30.694	-16.000	-
-6.9	-7.820	-18.550	-15.829	-7.654	-15.307	-9.734	-27.804	-35.457	-29.884	-15.971	-
-6.8	-7.654	-16.830	-14.361	-7.654	-15.879	-9.249	-27.804	-36.029	-29.399	-15.813	-
-6.7	-7.957	-15.934	-12.900	-7.654	-15.879	-8.931	-27.804	-36.029	-29.081	-15.652	-
-6.6	-8.611	-15.879	-11.558	-7.654	-15.879	-8.896	-27.804	-36.029	-29.046	-15.489	-
-6.5	-9.545	-16.452	-10.544	-7.654	-15.879	-8.896	-27.804	-36.029	-29.046	-15.323	-
-6.4	-10.770	-18.064	-9.734	-7.654	-15.879	-8.896	-27.804	-36.029	-29.046	-15.154	-
-6.3	-12.364	-20.729	-9.249	-7.654	-15.879	-8.896	-27.804	-36.029	-29.046	-14.984	-
-6.2	-14.232	-25.700	-8.931	-7.957	-15.449	-8.896	-28.107	-35.599	-29.046	-14.810	-
-6.1	-16.192	-33.031	-8.896	-8.611	-13.969	-8.896	-28.761	-34.119	-29.046	-14.633	-
-6	-18.168	-26.063	-8.972	-9.545	-12.994	-8.896	-29.695	-33.144	-29.046	-14.454	-
-5.9	-20.158	-20.584	-9.302	-10.770	-12.251	-8.896	-30.920	-32.401	-29.046	-14.271	-
-5.8	-22.031	-17.510	-9.705	-12.364	-11.772	-8.896	-32.514	-31.922	-29.046	-14.086	-
-5.7	-22.964	-15.449	-10.356	-14.232	-11.462	-8.896	-34.382	-31.612	-29.046	-13.897	-
-5.6	-22.304	-13.969	-11.086	-15.666	-11.241	-8.896	-35.816	-31.391	-29.046	-13.705	-
-5.5	-20.668	-12.994	-12.129	-15.020	-11.153	-8.972	-35.170	-31.303	-29.122	-13.509	-

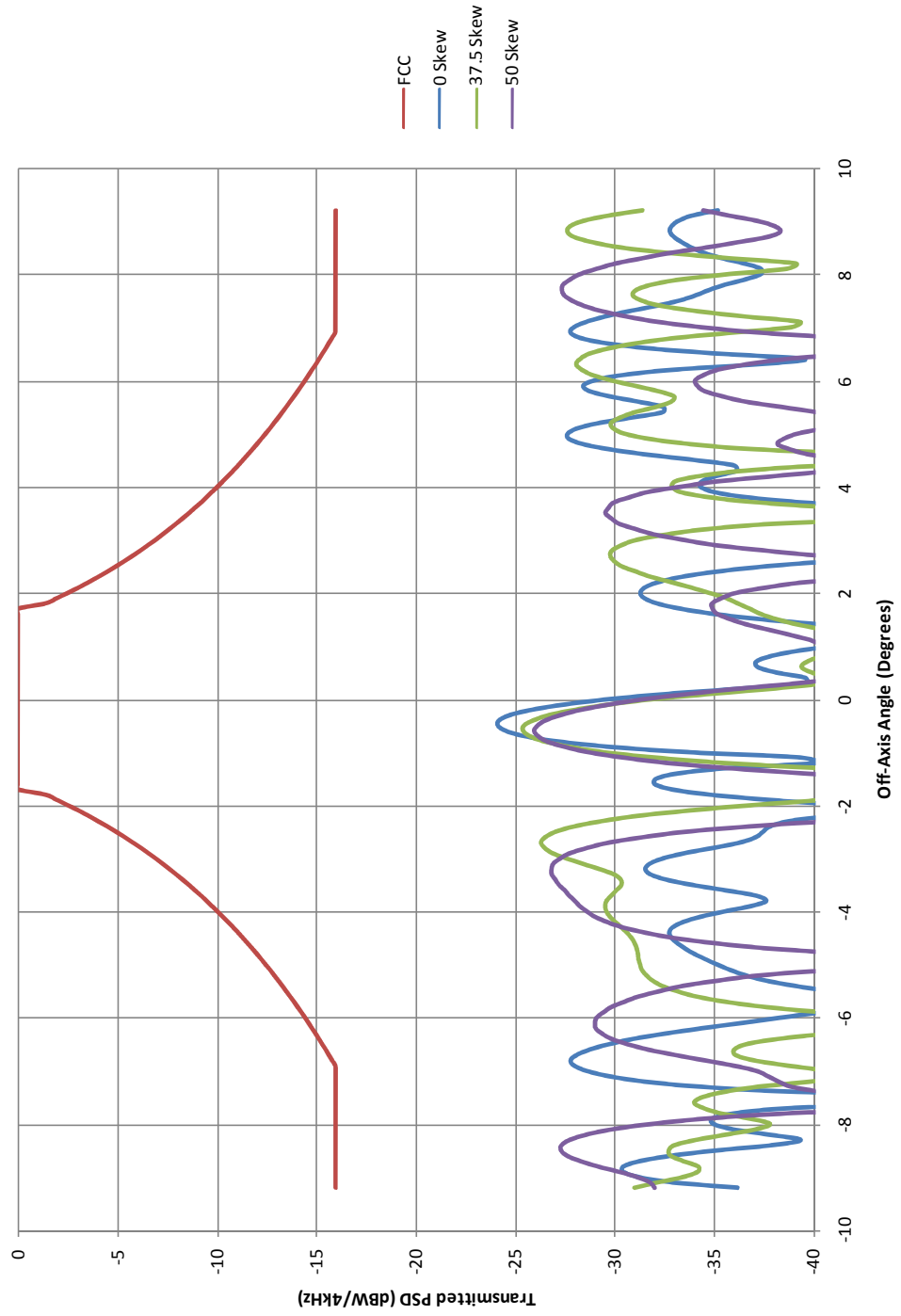


-5.4	-18.912	-12.251	-13.330	-14.420	-11.071	-9.302	-34.570	-31.221	-29.452	-13.310	-
-5.3	-17.454	-11.772	-15.083	-13.871	-11.043	-9.705	-34.021	-31.193	-29.855	-13.107	-
-5.2	-16.427	-11.462	-17.263	-13.414	-10.980	-10.356	-33.564	-31.130	-30.506	-12.900	-
-5.1	-15.666	-11.241	-20.843	-13.025	-10.878	-11.086	-33.175	-31.028	-31.236	-12.689	-
-5	-15.020	-11.153	-25.938	-12.730	-10.721	-12.129	-32.880	-30.871	-32.279	-12.474	-
-4.9	-14.420	-11.071	-28.495	-12.607	-10.490	-11.441	-32.757	-30.640	-31.591	-12.255	-
-4.8	-13.871	-11.043	-22.209	-12.607	-10.204	-10.294	-32.757	-30.354	-30.444	-12.031	-
-4.7	-13.414	-10.980	-17.775	-12.607	-9.913	-9.514	-32.757	-30.063	-29.664	-11.802	-
-4.6	-13.025	-10.878	-14.989	-12.607	-9.642	-8.895	-32.757	-29.792	-29.045	-11.569	-
-4.5	-12.730	-10.721	-12.885	-12.607	-9.461	-8.484	-32.757	-29.611	-28.634	-11.330	-
-4.4	-12.607	-10.490	-11.441	-12.607	-9.402	-8.133	-32.757	-29.552	-28.283	-11.086	-
-4.3	-12.767	-10.204	-10.294	-12.607	-9.402	-7.877	-32.757	-29.552	-28.027	-10.837	-
-4.2	-13.289	-9.913	-9.514	-12.607	-9.402	-7.598	-32.757	-29.552	-27.748	-10.581	-
-4.1	-14.164	-9.642	-8.895	-12.607	-9.402	-7.363	-32.757	-29.552	-27.513	-10.320	-
-4	-15.358	-9.461	-8.484	-12.607	-9.402	-7.087	-32.757	-29.552	-27.237	-10.051	-
-3.9	-16.681	-9.402	-8.133	-12.457	-9.402	-6.897	-32.607	-29.552	-27.047	-9.777	-
-3.8	-17.484	-9.467	-7.877	-11.654	-9.402	-6.718	-31.804	-29.552	-26.868	-9.495	-
-3.7	-16.948	-9.706	-7.598	-11.405	-9.104	-6.717	-31.555	-29.254	-26.867	-9.205	-
-3.6	-15.412	-9.959	-7.363	-11.405	-8.255	-6.717	-31.555	-28.405	-26.867	-8.908	-
-3.5	-13.766	-10.216	-7.087	-11.405	-7.452	-6.717	-31.555	-27.602	-26.867	-8.602	-
-3.4	-12.457	-10.178	-6.897	-11.405	-6.739	-6.717	-31.555	-26.889	-26.867	-8.287	-
-3.3	-11.654	-9.835	-6.718	-11.405	-6.358	-6.717	-31.555	-26.508	-26.867	-7.963	-
-3.2	-11.405	-9.104	-6.717	-11.405	-6.182	-6.717	-31.555	-26.332	-26.867	-7.629	-
-3.1	-11.630	-8.255	-6.796	-11.405	-6.182	-6.717	-31.555	-26.332	-26.867	-7.284	-
-3	-12.292	-7.452	-7.149	-11.405	-6.182	-6.717	-31.555	-26.332	-26.867	-6.928	-
-2.9	-13.397	-6.739	-7.645	-11.405	-6.182	-6.717	-31.555	-26.332	-26.867	-6.560	-
-2.8	-14.849	-6.358	-8.531	-11.405	-6.182	-6.717	-31.555	-26.332	-26.867	-6.179	-
-2.7	-16.173	-6.182	-9.632	-11.405	-6.182	-6.717	-31.555	-26.332	-26.867	-5.784	-
-2.6	-16.958	-6.386	-11.330	-11.630	-6.182	-6.796	-31.780	-26.332	-26.946	-5.374	-
-2.5	-17.311	-6.905	-13.414	-12.292	-6.182	-7.149	-32.442	-26.332	-27.299	-4.949	-
-2.4	-17.663	-7.817	-16.645	-13.397	-6.182	-7.645	-33.547	-26.332	-27.795	-4.505	-
-2.3	-18.602	-9.215	-21.089	-14.642	-6.182	-8.531	-34.792	-26.332	-28.681	-4.043	-
-2.2	-20.654	-11.022	-30.783	-12.719	-6.182	-9.632	-32.869	-26.332	-29.782	-3.561	-
-2.1	-22.862	-13.621	-35.491	-11.870	-6.386	-11.330	-32.020	-26.536	-31.480	-3.055	-
-2	-21.359	-16.684	-25.297	-11.870	-6.905	-13.414	-32.020	-27.055	-33.564	-2.526	-
-1.9	-17.664	-20.222	-22.507	-11.870	-7.817	-16.645	-32.020	-27.967	-36.795	-1.969	-
-1.8	-14.642	-22.680	-21.791	-11.870	-9.215	-15.527	-32.020	-29.365	-35.677	-1.382	-
-1.7	-12.719	-23.639	-22.581	-11.870	-11.022	-12.458	-32.020	-31.172	-32.608	-	-
-1.6	-11.870	-24.835	-24.491	-11.870	-11.864	-10.280	-32.020	-32.014	-30.430	-	-
-1.5	-11.953	-28.384	-23.526	-11.870	-9.327	-8.539	-32.020	-29.477	-28.689	-	-
-1.4	-13.042	-27.311	-19.362	-9.640	-7.613	-7.365	-29.790	-27.763	-27.515	-	-
-1.3	-15.593	-20.189	-15.527	-7.033	-6.362	-6.493	-27.183	-26.512	-26.643	-	-
-1.2	-20.105	-15.245	-12.458	-5.346	-5.618	-6.036	-25.496	-25.768	-26.186	-	-
-1.1	-19.162	-11.864	-10.280	-4.399	-5.286	-5.841	-24.549	-25.436	-25.991	-	-
-1	-13.525	-9.327	-8.539	-3.997	-5.286	-5.841	-24.147	-25.436	-25.991	-	-
-0.9	-9.640	-7.613	-7.365	-3.997	-5.286	-5.841	-24.147	-25.436	-25.991	-	-
-0.8	-7.033	-6.362	-6.493	-3.997	-5.286	-5.841	-24.147	-25.436	-25.991	-	-
-0.7	-5.346	-5.618	-6.036	-3.997	-5.286	-5.841	-24.147	-25.436	-25.991	-	-
-0.6	-4.399	-5.286	-5.841	-3.997	-5.286	-5.841	-24.147	-25.436	-25.991	-	-
-0.5	-3.997	-5.319	-5.999	-3.997	-5.286	-5.841	-24.147	-25.436	-25.991	-	-
-0.4	-4.060	-5.804	-6.417	-3.997	-5.286	-5.841	-24.147	-25.436	-25.991	-	-
-0.3	-4.609	-6.595	-7.181	-3.997	-5.286	-5.841	-24.147	-25.436	-25.991	-	-
-0.2	-5.722	-7.914	-8.226	-3.997	-5.286	-5.841	-24.147	-25.436	-25.991	-	-
-0.1	-7.389	-9.647	-9.665	-3.997	-5.286	-5.841	-24.147	-25.436	-25.991	-	-
0	-9.635	-11.847	-11.423	-3.997	-5.319	-5.999	-24.147	-25.469	-26.149	-	-
0.1	-12.588	-14.847	-13.683	-4.060	-5.804	-6.417	-24.210	-25.954	-26.567	-	-
0.2	-16.281	-17.946	-16.213	-4.609	-6.595	-7.181	-24.759	-26.745	-27.331	-	-
0.3	-19.491	-20.334	-19.140	-5.722	-7.914	-8.226	-25.872	-28.064	-28.376	-	-
0.4	-19.446	-20.698	-21.166	-7.389	-9.647	-9.665	-27.539	-29.797	-29.815	-	-
0.5	-17.980	-19.762	-22.059	-9.635	-11.847	-11.423	-29.785	-31.997	-31.573	-	-

0.6	-17.061	-19.262	-21.452	-12.588	-14.847	-13.683	-32.738	-34.997	-33.833	-
0.7	-16.964	-19.513	-21.078	-16.281	-17.946	-16.213	-36.431	-38.096	-36.363	-
0.8	-17.634	-20.269	-20.669	-16.964	-19.262	-17.673	-37.114	-39.412	-37.823	-
0.9	-18.940	-21.713	-20.644	-16.964	-19.100	-16.544	-37.114	-39.250	-36.694	-
1	-20.924	-22.999	-20.323	-16.964	-18.033	-15.707	-37.114	-38.183	-35.857	-
1.1	-23.689	-23.207	-19.787	-14.901	-17.204	-15.046	-35.051	-37.354	-35.196	-
1.2	-26.169	-22.168	-18.770	-13.175	-16.662	-14.799	-33.325	-36.812	-34.949	-
1.3	-24.382	-20.505	-17.673	-11.994	-16.047	-14.772	-32.144	-36.197	-34.922	-
1.4	-20.463	-19.100	-16.544	-11.344	-15.474	-14.772	-31.494	-35.624	-34.922	-
1.5	-17.267	-18.033	-15.707	-11.156	-14.605	-14.772	-31.306	-34.755	-34.922	-
1.6	-14.901	-17.204	-15.046	-11.156	-13.701	-14.772	-31.306	-33.851	-34.922	-
1.7	-13.175	-16.662	-14.799	-11.156	-12.717	-14.772	-31.306	-32.867	-34.922	-
1.8	-11.994	-16.047	-14.772	-11.156	-11.698	-14.772	-31.306	-31.848	-34.922	-1.382
1.9	-11.344	-15.474	-15.253	-11.156	-10.940	-14.772	-31.306	-31.090	-34.922	-1.969
2	-11.156	-14.605	-16.000	-11.156	-10.220	-14.772	-31.306	-30.370	-34.922	-2.526
2.1	-11.384	-13.701	-17.499	-11.156	-9.841	-14.772	-31.306	-29.991	-34.922	-3.055
2.2	-12.049	-12.717	-19.486	-11.156	-9.655	-14.772	-31.306	-29.805	-34.922	-3.561
2.3	-13.231	-11.698	-23.187	-11.156	-9.655	-14.772	-31.306	-29.805	-34.922	-4.043
2.4	-15.014	-10.940	-29.445	-11.156	-9.655	-14.876	-31.306	-29.805	-35.026	-4.505
2.5	-17.517	-10.220	-36.821	-11.156	-9.655	-13.274	-31.306	-29.805	-33.424	-4.949
2.6	-21.076	-9.841	-25.781	-11.384	-9.655	-11.853	-31.534	-29.805	-32.003	-5.374
2.7	-26.174	-9.655	-20.274	-12.049	-9.655	-10.925	-32.199	-29.805	-31.075	-5.784
2.8	-29.259	-9.753	-17.299	-13.231	-9.655	-10.108	-33.381	-29.805	-30.258	-6.179
2.9	-25.521	-10.243	-14.876	-15.014	-9.655	-9.713	-35.164	-29.805	-29.863	-6.560
3	-22.780	-11.012	-13.274	-17.517	-9.655	-9.419	-37.667	-29.805	-29.569	-6.928
3.1	-21.660	-12.496	-11.853	-21.076	-9.655	-9.419	-41.226	-29.805	-29.569	-7.284
3.2	-21.926	-14.547	-10.925	-19.419	-9.655	-9.419	-39.569	-29.805	-29.569	-7.629
3.3	-23.947	-17.935	-10.108	-16.474	-9.753	-9.419	-36.624	-29.903	-29.569	-7.963
3.4	-29.274	-24.519	-9.713	-14.824	-10.243	-9.419	-34.974	-30.393	-29.569	-8.287
3.5	-33.539	-32.976	-9.419	-14.160	-11.012	-9.419	-34.310	-31.162	-29.569	-8.602
3.6	-24.362	-21.677	-9.571	-14.160	-12.496	-9.419	-34.310	-32.646	-29.569	-8.908
3.7	-19.419	-17.113	-9.835	-14.160	-12.744	-9.419	-34.310	-32.894	-29.569	-9.205
3.8	-16.474	-14.612	-10.636	-14.160	-12.744	-9.419	-34.310	-32.894	-29.569	-9.495
3.9	-14.824	-13.152	-11.578	-14.160	-12.744	-9.419	-34.310	-32.894	-29.569	-9.777
4	-14.160	-12.744	-13.242	-13.861	-12.744	-9.419	-34.011	-32.894	-29.569	-10.051
4.1	-14.255	-12.927	-15.117	-11.532	-12.744	-9.571	-31.682	-32.894	-29.721	-10.320
4.2	-14.990	-14.172	-17.986	-9.616	-12.744	-9.835	-29.766	-32.894	-29.985	-10.581
4.3	-16.005	-16.439	-20.791	-8.261	-12.744	-10.636	-28.411	-32.894	-30.786	-10.837
4.4	-15.845	-20.968	-22.565	-7.559	-11.580	-11.578	-27.709	-31.730	-31.728	-11.086
4.5	-13.861	-34.115	-21.685	-7.508	-10.339	-13.242	-27.658	-30.489	-33.392	-11.330
4.6	-11.532	-24.143	-19.709	-7.508	-9.792	-15.117	-27.658	-29.942	-35.267	-11.569
4.7	-9.616	-17.021	-18.693	-7.508	-9.699	-17.986	-27.658	-29.849	-38.136	-11.802
4.8	-8.261	-13.679	-18.065	-7.508	-9.699	-18.065	-27.658	-29.849	-38.215	-12.031
4.9	-7.559	-11.580	-18.372	-7.508	-9.699	-18.065	-27.658	-29.849	-38.215	-12.255
5	-7.508	-10.339	-19.100	-7.508	-9.699	-18.065	-27.658	-29.849	-38.215	-12.474
5.1	-8.027	-9.792	-20.466	-7.508	-9.699	-16.435	-27.658	-29.849	-36.585	-12.689
5.2	-9.114	-9.699	-21.585	-7.508	-9.699	-15.281	-27.658	-29.849	-35.431	-12.900
5.3	-10.749	-10.161	-21.701	-7.508	-9.699	-14.377	-27.658	-29.849	-34.527	-13.107
5.4	-12.276	-10.891	-20.052	-7.508	-9.699	-14.029	-27.658	-29.849	-34.179	-13.310
5.5	-12.299	-11.951	-18.233	-7.508	-9.694	-13.927	-27.658	-29.844	-34.077	-13.509
5.6	-11.021	-12.714	-16.435	-8.027	-8.756	-13.927	-28.177	-28.906	-34.077	-13.705
5.7	-9.586	-12.846	-15.281	-8.282	-8.224	-13.927	-28.432	-28.374	-34.077	-13.897
5.8	-8.573	-12.012	-14.377	-8.282	-7.948	-13.927	-28.432	-28.098	-34.077	-14.086
5.9	-8.282	-10.851	-14.029	-8.282	-7.948	-13.927	-28.432	-28.098	-34.077	-14.271
6	-8.843	-9.694	-13.927	-8.282	-7.948	-13.927	-28.432	-28.098	-34.077	-14.454
6.1	-10.276	-8.756	-14.346	-8.282	-7.948	-13.927	-28.432	-28.098	-34.077	-14.633
6.2	-12.822	-8.224	-15.072	-8.282	-7.948	-13.927	-28.432	-28.098	-34.077	-14.810
6.3	-16.964	-7.948	-16.471	-8.116	-7.948	-13.927	-28.266	-28.098	-34.077	-14.984
6.4	-19.412	-8.123	-18.480	-7.641	-7.948	-13.927	-27.791	-28.098	-34.077	-15.154
6.5	-15.186	-8.594	-21.900	-7.641	-7.948	-13.927	-27.791	-28.098	-34.077	-15.323

6.6	-11.632	-9.563	-27.285	-7.641	-7.948	-12.059	-27.791	-28.098	-32.209	-15.489	-
6.7	-9.405	-10.991	-27.425	-7.641	-7.948	-10.485	-27.791	-28.098	-30.635	-15.652	-
6.8	-8.116	-12.986	-21.445	-7.641	-7.948	-9.248	-27.791	-28.098	-29.398	-15.813	-
6.9	-7.641	-15.890	-17.069	-7.641	-8.123	-8.357	-27.791	-28.273	-28.507	-15.971	-
7	-7.813	-18.721	-14.246	-7.641	-8.594	-7.737	-27.791	-28.744	-27.887	-16.000	-
7.1	-8.422	-19.181	-12.059	-7.641	-9.563	-7.349	-27.791	-29.713	-27.499	-16.000	-
7.2	-9.356	-16.468	-10.485	-7.641	-10.787	-7.231	-27.791	-30.937	-27.381	-16.000	-
7.3	-10.563	-14.067	-9.248	-7.641	-10.787	-7.231	-27.791	-30.937	-27.381	-16.000	-
7.4	-11.927	-12.230	-8.357	-7.641	-10.787	-7.231	-27.791	-30.937	-27.381	-16.000	-
7.5	-13.099	-11.243	-7.737	-7.813	-10.787	-7.231	-27.963	-30.937	-27.381	-16.000	-
7.6	-13.937	-10.787	-7.349	-8.422	-10.787	-7.231	-28.572	-30.937	-27.381	-16.000	-
7.7	-14.603	-10.951	-7.231	-9.356	-10.787	-7.231	-29.506	-30.937	-27.381	-16.000	-
7.8	-15.397	-11.718	-7.290	-10.563	-10.787	-7.231	-30.713	-30.937	-27.381	-16.000	-
7.9	-16.418	-13.190	-7.643	-11.927	-10.787	-7.231	-32.077	-30.937	-27.381	-16.000	-
8	-17.206	-15.640	-8.141	-13.099	-10.199	-7.231	-33.249	-30.349	-27.381	-16.000	-
8.1	-17.202	-18.496	-8.980	-13.230	-8.769	-7.231	-33.380	-28.919	-27.381	-16.000	-
8.2	-16.366	-18.962	-9.935	-12.840	-7.831	-7.231	-32.990	-27.981	-27.381	-16.000	-
8.3	-15.240	-15.622	-11.286	-12.637	-7.501	-7.290	-32.787	-27.651	-27.440	-16.000	-
8.4	-14.345	-12.549	-12.693	-12.637	-7.501	-7.643	-32.787	-27.651	-27.793	-16.000	-
8.5	-13.718	-10.199	-14.474	-12.637	-7.501	-8.141	-32.787	-27.651	-28.291	-16.000	-
8.6	-13.230	-8.769	-16.072	-12.637	-7.501	-8.980	-32.787	-27.651	-29.130	-16.000	-
8.7	-12.840	-7.831	-17.557	-12.637	-7.501	-9.935	-32.787	-27.651	-30.085	-16.000	-
8.8	-12.637	-7.501	-18.205	-12.637	-7.501	-11.286	-32.787	-27.651	-31.436	-16.000	-
8.9	-12.718	-7.641	-17.928	-12.637	-7.501	-12.693	-32.787	-27.651	-32.843	-16.000	-
9	-13.054	-8.282	-17.058	-12.637	-7.501	-14.322	-32.787	-27.651	-34.472	-16.000	-
9.1	-13.734	-9.544	-15.648	-12.637	-7.501	-14.322	-32.787	-27.651	-34.472	-16.000	-
9.2	-15.044	-11.264	-14.322	-12.637	-7.501	-14.322	-32.787	-27.651	-34.472	-16.000	-

### Nominal 14.0GHz, H-Polarized, X-pol PSD, with -20.15dBW/4kHz Input



Data in support of claim that proposed operation meets criteria of VMES Order July 2009

Applicant RAS Date of Application  
 ID Heading  
 a1 Antenna Manufacture: RAS c Main bore gain (dBi): 36.0  
 a2 Antenna Model: SR5000 d Frequency at which gain was measured (GHz): 14.0  
 a3 Antenna ID: RAS e Max input power density (dBW/4kHz): -20.15  
 b Transmit Band (b): 14GHz Pattern ID Table C2  
 Pattern Description: 14.0GHz V-polarization, X-polarized tangent to the geosynchronous plane for 0°, 37.5°, and 50° skew angle

Offset Angles  (Degrees)	Nominal X-Pol Gain Along Tangent to Geo Arc  (dBi)			Worst Case X-Pol Gain Along Tangent to Geo Arc  (dBi)			Worst Case X-Pol PSD Along Tangent to Geo Arc input PSD = -20.15dBW/4kHz  (dBW/4kHz)			FCC Mask (dBW/4kHz)	Mask Exceedence  (dB)
	0? Skew	37.5? Skew	50? Skew	0? Skew	37.5? Skew	50? Skew	0? Skew	37.5? Skew	50? Skew		
	-9.2	-22.031	-4.990	-8.862	-14.489	-4.623	-8.862	-34.639	-24.773		
-9.1	-19.945	-4.627	-10.261	-13.570	-4.623	-8.862	-33.720	-24.773	-29.012	-16.000	-
-9	-18.316	-4.623	-12.071	-12.711	-4.623	-8.862	-32.861	-24.773	-29.012	-16.000	-
-8.9	-16.922	-4.860	-14.029	-11.763	-4.623	-8.862	-31.913	-24.773	-29.012	-16.000	-
-8.8	-15.631	-5.338	-16.319	-10.751	-4.623	-8.862	-30.901	-24.773	-29.012	-16.000	-
-8.7	-14.489	-6.133	-18.094	-9.890	-4.623	-8.862	-30.040	-24.773	-29.012	-16.000	-
-8.6	-13.570	-7.091	-18.785	-9.302	-4.623	-10.261	-29.452	-24.773	-30.411	-16.000	-
-8.5	-12.711	-8.470	-18.109	-9.047	-4.623	-12.071	-29.197	-24.773	-32.221	-16.000	-
-8.4	-11.763	-10.085	-16.944	-9.047	-4.860	-14.029	-29.197	-25.010	-34.179	-16.000	-
-8.3	-10.751	-12.112	-15.829	-9.047	-5.338	-14.092	-29.197	-25.488	-34.242	-16.000	-
-8.2	-9.890	-14.735	-15.002	-9.047	-6.133	-14.092	-29.197	-26.283	-34.242	-16.000	-
-8.1	-9.302	-17.406	-14.440	-9.047	-7.091	-14.092	-29.197	-27.241	-34.242	-16.000	-
-8	-9.047	-19.261	-14.152	-9.047	-8.470	-14.092	-29.197	-28.620	-34.242	-16.000	-
-7.9	-9.266	-18.077	-14.092	-9.047	-10.085	-14.092	-29.197	-30.235	-34.242	-16.000	-
-7.8	-10.216	-15.922	-14.287	-9.047	-9.570	-14.092	-29.197	-29.720	-34.242	-16.000	-
-7.7	-12.054	-13.725	-14.661	-7.862	-9.188	-14.092	-28.012	-29.338	-34.242	-16.000	-
-7.6	-14.509	-12.195	-15.374	-6.457	-9.111	-14.092	-26.607	-29.261	-34.242	-16.000	-
-7.5	-15.772	-10.993	-16.261	-5.760	-9.111	-14.092	-25.910	-29.261	-34.242	-16.000	-
-7.4	-13.468	-10.109	-17.651	-5.704	-9.111	-14.092	-25.854	-29.261	-34.242	-16.000	-
-7.3	-10.206	-9.570	-19.348	-5.704	-9.111	-14.287	-25.854	-29.261	-34.437	-16.000	-
-7.2	-7.862	-9.188	-21.804	-5.704	-9.111	-14.661	-25.854	-29.261	-34.811	-16.000	-
-7.1	-6.457	-9.111	-24.867	-5.704	-9.111	-15.374	-25.854	-29.261	-35.524	-16.000	-
-7	-5.760	-9.180	-27.259	-5.704	-9.111	-16.261	-25.854	-29.261	-36.411	-16.000	-
-6.9	-5.704	-9.460	-26.207	-5.704	-9.111	-17.133	-25.854	-29.261	-37.283	-15.971	-
-6.8	-6.387	-9.965	-23.117	-5.704	-9.111	-16.863	-25.854	-29.261	-37.013	-15.813	-
-6.7	-7.920	-10.549	-20.630	-5.704	-9.111	-16.863	-25.854	-29.261	-37.013	-15.652	-
-6.6	-10.459	-11.384	-18.915	-5.704	-9.111	-16.863	-25.854	-29.261	-37.013	-15.489	-
-6.5	-14.687	-12.220	-17.724	-5.704	-9.180	-16.863	-25.854	-29.330	-37.013	-15.323	-
-6.4	-23.787	-12.970	-17.133	-5.704	-9.460	-16.863	-25.854	-29.610	-37.013	-15.154	-
-6.3	-26.084	-13.706	-16.863	-6.387	-9.965	-16.863	-26.537	-30.115	-37.013	-14.984	-
-6.2	-17.404	-14.019	-17.144	-7.920	-10.549	-16.863	-28.070	-30.699	-37.013	-14.810	-
-6.1	-14.362	-14.196	-17.605	-9.652	-11.384	-16.506	-29.802	-31.534	-36.656	-14.633	-
-6	-13.096	-14.335	-18.466	-7.782	-12.220	-14.936	-27.932	-32.370	-35.086	-14.454	-
-5.9	-12.737	-14.415	-18.988	-6.159	-12.970	-13.834	-26.309	-33.120	-33.984	-14.271	-
-5.8	-12.510	-14.924	-18.995	-4.902	-13.706	-12.937	-25.052	-33.856	-33.087	-14.086	-
-5.7	-11.440	-15.594	-17.900	-4.039	-14.019	-12.573	-24.189	-34.169	-32.723	-13.897	-
-5.6	-9.652	-16.632	-16.506	-3.483	-14.196	-12.504	-23.633	-34.346	-32.654	-13.705	-
-5.5	-7.782	-18.010	-14.936	-3.161	-14.335	-12.504	-23.311	-34.485	-32.654	-13.509	-

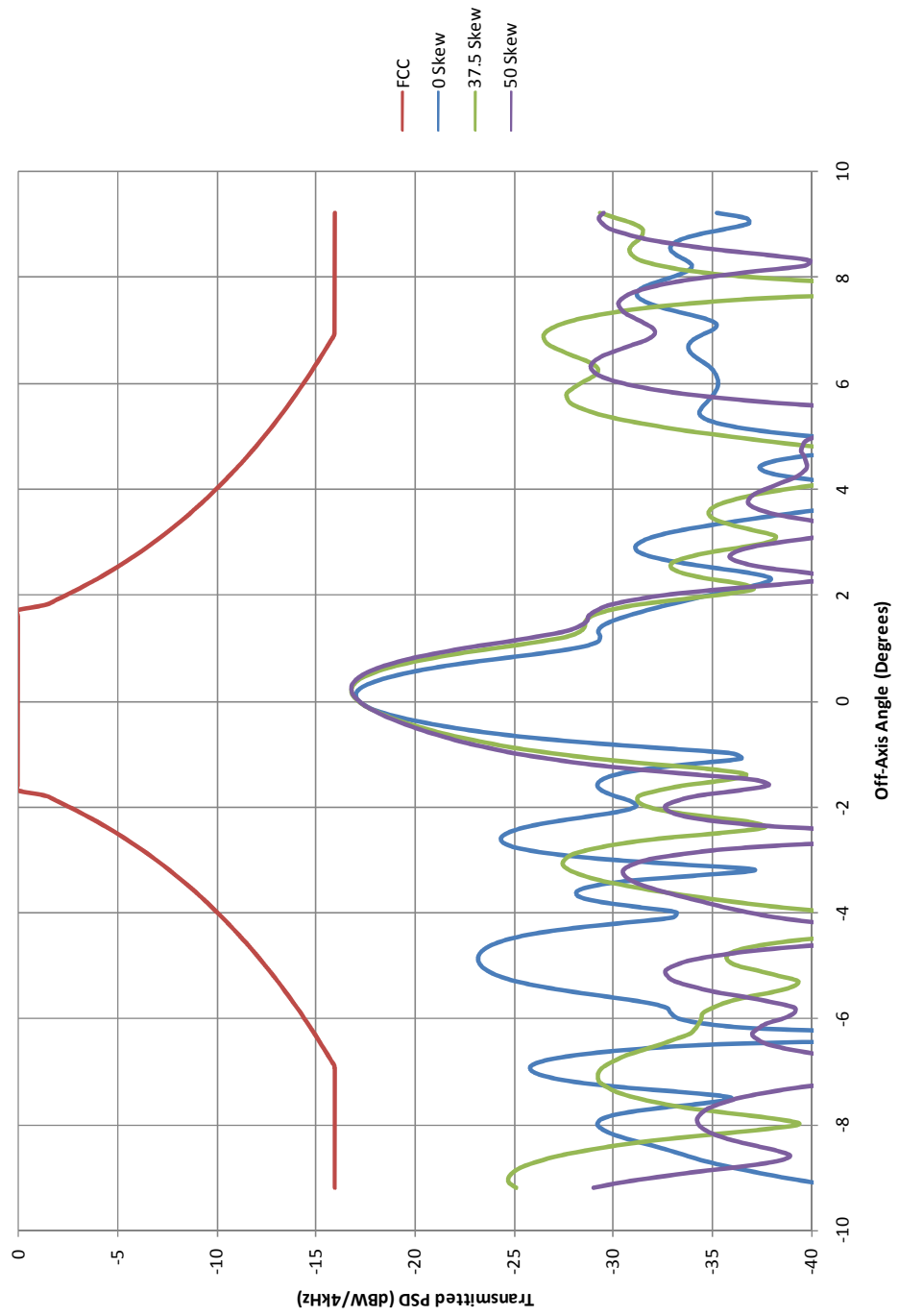
-5.4	-6.159	-18.951	-13.834	-3.036	-14.415	-12.504	-23.186	-34.565	-32.654	-13.310	-
-5.3	-4.902	-19.197	-12.937	-3.036	-14.924	-12.504	-23.186	-35.074	-32.654	-13.107	-
-5.2	-4.039	-18.216	-12.573	-3.036	-15.594	-12.504	-23.186	-35.744	-32.654	-12.900	-
-5.1	-3.483	-17.136	-12.504	-3.036	-15.645	-12.504	-23.186	-35.795	-32.654	-12.689	-
-5	-3.161	-16.074	-12.980	-3.036	-15.645	-12.504	-23.186	-35.795	-32.654	-12.474	-
-4.9	-3.036	-15.645	-13.836	-3.036	-15.645	-12.504	-23.186	-35.795	-32.654	-12.255	-
-4.8	-3.085	-15.675	-15.406	-3.036	-15.645	-12.504	-23.186	-35.795	-32.654	-12.031	-
-4.7	-3.330	-16.310	-17.611	-3.036	-15.645	-12.504	-23.186	-35.795	-32.654	-11.802	-
-4.6	-3.829	-17.709	-21.022	-3.036	-15.645	-12.504	-23.186	-35.795	-32.654	-11.569	-
-4.5	-4.654	-19.947	-25.791	-3.036	-15.645	-12.980	-23.186	-35.795	-33.130	-11.330	-
-4.4	-5.920	-23.955	-27.397	-3.036	-15.645	-13.836	-23.186	-35.795	-33.986	-11.086	-
-4.3	-7.820	-31.508	-23.519	-3.085	-15.675	-14.335	-23.235	-35.825	-34.485	-10.837	-
-4.2	-10.379	-34.808	-20.275	-3.330	-13.879	-13.254	-23.480	-34.029	-33.404	-10.581	-
-4.1	-12.820	-25.514	-18.107	-3.829	-12.058	-12.263	-23.979	-32.208	-32.413	-10.320	-
-4	-13.009	-21.153	-16.633	-4.654	-10.564	-11.392	-24.804	-30.714	-31.542	-10.051	-
-3.9	-11.050	-18.144	-15.408	-5.920	-9.245	-10.748	-26.070	-29.395	-30.898	-9.777	-
-3.8	-9.112	-15.880	-14.335	-7.820	-8.304	-10.404	-27.970	-28.454	-30.554	-9.495	-
-3.7	-8.091	-13.879	-13.254	-8.033	-7.656	-10.376	-28.183	-27.806	-30.526	-9.205	-
-3.6	-8.033	-12.058	-12.263	-8.033	-7.347	-10.376	-28.183	-27.497	-30.526	-8.908	-
-3.5	-8.889	-10.564	-11.392	-8.033	-7.347	-10.376	-28.183	-27.497	-30.526	-8.602	-
-3.4	-10.835	-9.245	-10.748	-6.817	-7.347	-10.376	-26.967	-27.497	-30.526	-8.287	-
-3.3	-14.273	-8.304	-10.404	-5.166	-7.347	-10.376	-25.316	-27.497	-30.526	-7.963	-
-3.2	-16.978	-7.656	-10.376	-4.352	-7.347	-10.376	-24.502	-27.497	-30.526	-7.629	-
-3.1	-13.356	-7.347	-10.838	-4.191	-7.347	-10.376	-24.341	-27.497	-30.526	-7.284	-
-3	-9.447	-7.456	-11.689	-4.191	-7.347	-10.376	-24.341	-27.497	-30.526	-6.928	-
-2.9	-6.817	-7.887	-13.407	-4.191	-7.347	-10.376	-24.341	-27.497	-30.526	-6.560	-
-2.8	-5.166	-8.907	-15.864	-4.191	-7.347	-10.376	-24.341	-27.497	-30.526	-6.179	-
-2.7	-4.352	-10.373	-20.563	-4.191	-7.347	-10.376	-24.341	-27.497	-30.526	-5.784	-
-2.6	-4.191	-12.474	-29.883	-4.191	-7.347	-10.838	-24.341	-27.497	-30.988	-5.374	-
-2.5	-4.539	-15.399	-25.411	-4.191	-7.456	-11.689	-24.341	-27.606	-31.839	-4.949	-
-2.4	-5.358	-17.518	-18.845	-4.191	-7.887	-12.475	-24.341	-28.037	-32.625	-4.505	-
-2.3	-6.687	-16.841	-15.474	-4.191	-8.907	-12.475	-24.341	-29.057	-32.625	-4.043	-
-2.2	-8.448	-14.680	-13.593	-4.191	-10.373	-12.475	-24.341	-30.523	-32.625	-3.561	-
-2.1	-10.140	-12.698	-12.695	-4.191	-11.120	-12.475	-24.341	-31.270	-32.625	-3.055	-
-2	-10.989	-11.545	-12.475	-4.539	-11.120	-12.475	-24.689	-31.270	-32.625	-2.526	-
-1.9	-10.680	-11.120	-13.047	-5.358	-11.120	-12.475	-25.508	-31.270	-32.625	-1.969	-
-1.8	-9.868	-11.208	-14.140	-6.687	-11.120	-10.945	-26.837	-31.270	-31.095	-1.382	-
-1.7	-9.257	-12.189	-16.209	-8.448	-11.120	-8.457	-28.598	-31.270	-28.607	-	-
-1.6	-9.047	-13.576	-17.706	-9.047	-8.993	-6.554	-29.197	-29.143	-26.704	-	-
-1.5	-9.266	-15.646	-16.984	-9.047	-6.842	-4.859	-29.197	-26.992	-25.009	-	-
-1.4	-10.000	-16.575	-13.925	-9.047	-4.932	-3.583	-29.197	-25.082	-23.733	-	-
-1.3	-11.452	-14.791	-10.945	-8.542	-3.477	-2.368	-28.692	-23.627	-22.518	-	-
-1.2	-13.801	-11.704	-8.457	-5.582	-2.177	-1.410	-25.732	-22.327	-21.560	-	-
-1.1	-16.286	-8.993	-6.554	-3.300	-1.035	-0.500	-23.450	-21.185	-20.650	-	-
-1	-15.787	-6.842	-4.859	-1.496	-0.096	0.296	-21.646	-20.246	-19.854	-	-
-0.9	-12.176	-4.932	-3.583	-0.034	0.796	1.001	-20.184	-19.354	-19.149	-	-
-0.8	-8.542	-3.477	-2.368	1.150	1.521	1.664	-19.000	-18.629	-18.486	-	-
-0.7	-5.582	-2.177	-1.410	2.056	2.139	2.193	-18.094	-18.011	-17.957	-	-
-0.6	-3.300	-1.035	-0.500	2.663	2.667	2.683	-17.487	-17.483	-17.467	-	-
-0.5	-1.496	-0.096	0.296	3.013	3.013	3.013	-17.137	-17.137	-17.137	-	-
-0.4	-0.034	0.796	1.001	3.127	3.256	3.270	-17.023	-16.894	-16.880	-	-
-0.3	1.150	1.521	1.664	3.127	3.306	3.351	-17.023	-16.844	-16.799	-	-
-0.2	2.056	2.139	2.193	3.127	3.306	3.351	-17.023	-16.844	-16.799	-	-
-0.1	2.663	2.667	2.683	3.127	3.306	3.351	-17.023	-16.844	-16.799	-	-
0	3.013	3.013	3.013	3.127	3.306	3.351	-17.023	-16.844	-16.799	-	-
0.1	3.127	3.256	3.270	3.127	3.306	3.351	-17.023	-16.844	-16.799	-	-
0.2	2.985	3.306	3.351	3.127	3.306	3.351	-17.023	-16.844	-16.799	-	-
0.3	2.537	3.185	3.317	3.127	3.306	3.351	-17.023	-16.844	-16.799	-	-
0.4	1.785	2.887	3.086	3.127	3.306	3.351	-17.023	-16.844	-16.799	-	-
0.5	0.746	2.318	2.691	3.127	3.306	3.351	-17.023	-16.844	-16.799	-	-

0.6	-0.606	1.575	2.091	3.127	3.306	3.351	-17.023	-16.844	-16.799	-
0.7	-2.327	0.507	1.253	2.985	3.306	3.351	-17.165	-16.844	-16.799	-
0.8	-4.397	-0.815	0.234	2.537	3.185	3.317	-17.613	-16.965	-16.833	-
0.9	-6.484	-2.370	-1.123	1.785	2.887	3.086	-18.365	-17.263	-17.064	-
1	-8.149	-4.254	-2.594	0.746	2.318	2.691	-19.404	-17.832	-17.459	-
1.1	-9.034	-6.020	-4.363	-0.606	1.575	2.091	-20.756	-18.575	-18.059	-
1.2	-9.184	-7.537	-5.983	-2.327	0.507	1.253	-22.477	-19.643	-18.897	-
1.3	-9.088	-8.219	-7.416	-4.397	-0.815	0.234	-24.547	-20.965	-19.916	-
1.4	-9.273	-8.463	-8.157	-6.484	-2.370	-1.123	-26.634	-22.520	-21.273	-
1.5	-9.821	-8.497	-8.541	-8.149	-4.254	-2.594	-28.299	-24.404	-22.744	-
1.6	-10.613	-8.854	-8.624	-9.034	-6.020	-4.363	-29.184	-26.170	-24.513	-
1.7	-11.539	-9.690	-9.036	-9.088	-7.537	-5.983	-29.238	-27.687	-26.133	-
1.8	-12.572	-11.045	-9.683	-9.088	-8.219	-7.416	-29.238	-28.369	-27.566	-1.382
1.9	-13.690	-13.145	-10.972	-9.273	-8.463	-8.157	-29.423	-28.613	-28.307	-1.969
2	-14.848	-15.441	-12.754	-9.821	-8.497	-8.541	-29.971	-28.647	-28.691	-2.526
2.1	-16.091	-16.959	-15.459	-10.613	-8.854	-8.624	-30.763	-29.004	-28.774	-3.055
2.2	-17.304	-16.299	-18.623	-11.539	-9.690	-9.036	-31.689	-29.840	-29.186	-3.561
2.3	-17.778	-14.585	-20.840	-11.117	-11.045	-9.683	-31.267	-31.195	-29.833	-4.043
2.4	-16.766	-13.391	-19.769	-10.960	-12.819	-10.972	-31.110	-32.969	-31.122	-4.505
2.5	-14.933	-12.819	-17.577	-10.960	-12.819	-12.754	-31.110	-32.969	-32.904	-4.949
2.6	-13.180	-12.881	-16.308	-10.960	-12.819	-15.459	-31.110	-32.969	-35.609	-5.374
2.7	-11.865	-13.642	-15.734	-10.960	-12.819	-15.734	-31.110	-32.969	-35.884	-5.784
2.8	-11.117	-14.840	-16.020	-10.960	-12.819	-15.734	-31.110	-32.969	-35.884	-6.179
2.9	-10.960	-16.559	-16.926	-10.960	-12.819	-15.734	-31.110	-32.969	-35.884	-6.560
3	-11.273	-17.843	-18.596	-10.960	-12.819	-15.734	-31.110	-32.969	-35.884	-6.928
3.1	-11.992	-18.066	-20.552	-10.960	-12.881	-15.734	-31.110	-33.031	-35.884	-7.284
3.2	-13.130	-17.057	-21.961	-10.960	-13.642	-15.734	-31.110	-33.792	-35.884	-7.629
3.3	-14.664	-15.954	-21.325	-10.960	-14.721	-16.020	-31.110	-34.871	-36.170	-7.963
3.4	-16.406	-15.098	-19.707	-10.960	-14.721	-16.707	-31.110	-34.871	-36.857	-8.287
3.5	-18.251	-14.721	-18.153	-11.273	-14.721	-16.707	-31.423	-34.871	-36.857	-8.602
3.6	-20.370	-14.778	-17.203	-11.992	-14.721	-16.707	-32.142	-34.871	-36.857	-8.908
3.7	-23.096	-15.242	-16.707	-13.130	-14.721	-16.707	-33.280	-34.871	-36.857	-9.205
3.8	-27.000	-16.098	-16.707	-14.664	-14.721	-16.707	-34.814	-34.871	-36.857	-9.495
3.9	-29.891	-17.291	-17.012	-16.406	-14.721	-16.707	-36.556	-34.871	-36.857	-9.777
4	-25.624	-18.896	-17.636	-17.208	-14.721	-16.707	-37.358	-34.871	-36.857	-10.051
4.1	-21.594	-20.899	-18.296	-17.208	-14.778	-16.707	-37.358	-34.928	-36.857	-10.320
4.2	-19.051	-23.387	-18.994	-17.208	-15.242	-16.707	-37.358	-35.392	-36.857	-10.581
4.3	-17.613	-26.550	-19.404	-17.208	-16.098	-16.707	-37.358	-36.248	-36.857	-10.837
4.4	-17.208	-29.403	-19.630	-17.208	-17.291	-17.012	-37.358	-37.441	-37.162	-11.086
4.5	-17.782	-28.660	-19.578	-17.208	-15.336	-17.636	-37.358	-35.486	-37.786	-11.330
4.6	-19.271	-25.535	-19.494	-16.994	-13.321	-18.296	-37.144	-33.471	-38.446	-11.569
4.7	-21.640	-22.591	-19.341	-15.440	-11.724	-18.994	-35.590	-31.874	-39.144	-11.802
4.8	-23.737	-19.734	-19.414	-14.527	-10.264	-19.341	-34.677	-30.414	-39.491	-12.031
4.9	-22.298	-17.451	-19.590	-14.194	-9.151	-19.341	-34.344	-29.301	-39.491	-12.255
5	-19.313	-15.336	-20.321	-14.194	-8.333	-19.341	-34.344	-28.483	-39.491	-12.474
5.1	-16.994	-13.321	-21.486	-14.194	-7.769	-18.530	-34.344	-27.919	-38.680	-12.689
5.2	-15.440	-11.724	-23.873	-14.194	-7.565	-15.470	-34.344	-27.715	-35.620	-12.900
5.3	-14.527	-10.264	-27.417	-14.194	-7.561	-13.082	-34.344	-27.711	-33.232	-13.107
5.4	-14.194	-9.151	-28.138	-14.194	-7.561	-11.384	-34.344	-27.711	-31.534	-13.310
5.5	-14.259	-8.333	-23.228	-14.194	-7.561	-10.158	-34.344	-27.711	-30.308	-13.509
5.6	-14.487	-7.769	-18.530	-14.194	-7.561	-9.316	-34.344	-27.711	-29.466	-13.705
5.7	-14.728	-7.565	-15.470	-14.194	-7.561	-8.866	-34.344	-27.711	-29.016	-13.897
5.8	-14.932	-7.561	-13.082	-14.194	-7.561	-8.719	-34.344	-27.711	-28.869	-14.086
5.9	-15.089	-7.896	-11.384	-14.194	-7.561	-8.719	-34.344	-27.711	-28.869	-14.271
6	-15.127	-8.320	-10.158	-13.906	-7.561	-8.719	-34.056	-27.711	-28.869	-14.454
6.1	-15.060	-8.810	-9.316	-13.666	-7.239	-8.719	-33.816	-27.389	-28.869	-14.633
6.2	-14.924	-9.115	-8.866	-13.635	-6.673	-8.719	-33.785	-26.823	-28.869	-14.810
6.3	-14.682	-9.024	-8.719	-13.635	-6.420	-8.719	-33.785	-26.570	-28.869	-14.984
6.4	-14.295	-8.570	-8.900	-13.635	-6.389	-8.719	-33.785	-26.539	-28.869	-15.154
6.5	-13.906	-7.869	-9.326	-13.635	-6.389	-8.719	-33.785	-26.539	-28.869	-15.323

6.6	-13.666	-7.239	-10.016	-13.635	-6.389	-8.719	-33.785	-26.539	-28.869	-15.489	-
6.7	-13.635	-6.673	-10.765	-13.635	-6.389	-8.719	-33.785	-26.539	-28.869	-15.652	-
6.8	-13.846	-6.420	-11.521	-13.452	-6.389	-8.719	-33.602	-26.539	-28.869	-15.813	-
6.9	-14.324	-6.389	-11.920	-12.391	-6.389	-8.900	-32.541	-26.539	-29.050	-15.971	-
7	-14.873	-6.670	-11.911	-11.591	-6.389	-9.326	-31.741	-26.539	-29.476	-16.000	-
7.1	-15.039	-7.265	-11.515	-11.123	-6.389	-10.016	-31.273	-26.539	-30.166	-16.000	-
7.2	-14.499	-8.187	-10.992	-11.038	-6.389	-10.121	-31.188	-26.539	-30.271	-16.000	-
7.3	-13.452	-9.572	-10.487	-11.038	-6.389	-10.121	-31.188	-26.539	-30.271	-16.000	-
7.4	-12.391	-11.398	-10.209	-11.038	-6.389	-10.121	-31.188	-26.539	-30.271	-16.000	-
7.5	-11.591	-14.112	-10.121	-11.038	-6.670	-10.121	-31.188	-26.820	-30.271	-16.000	-
7.6	-11.123	-18.124	-10.367	-11.038	-7.265	-10.121	-31.188	-27.415	-30.271	-16.000	-
7.7	-11.038	-25.754	-10.879	-11.038	-8.187	-10.121	-31.188	-28.337	-30.271	-16.000	-
7.8	-11.386	-31.788	-11.792	-11.038	-9.572	-10.121	-31.188	-29.722	-30.271	-16.000	-
7.9	-12.092	-20.934	-13.050	-11.038	-10.842	-10.121	-31.188	-30.992	-30.271	-16.000	-
8	-12.898	-16.421	-14.889	-11.038	-10.703	-10.121	-31.188	-30.853	-30.271	-16.000	-
8.1	-13.558	-13.857	-17.072	-11.038	-10.703	-10.367	-31.188	-30.853	-30.517	-16.000	-
8.2	-13.807	-12.308	-19.480	-11.038	-10.703	-10.879	-31.188	-30.853	-31.029	-16.000	-
8.3	-13.529	-11.289	-19.780	-11.386	-10.703	-10.495	-31.536	-30.853	-30.645	-16.000	-
8.4	-13.031	-10.842	-17.751	-12.092	-10.703	-9.677	-32.242	-30.853	-29.827	-16.000	-
8.5	-12.738	-10.703	-15.217	-12.738	-10.703	-9.309	-32.888	-30.853	-29.459	-16.000	-
8.6	-12.798	-10.852	-13.185	-12.738	-10.041	-9.134	-32.888	-30.191	-29.284	-16.000	-
8.7	-13.273	-11.187	-11.566	-12.738	-9.226	-9.134	-32.888	-29.376	-29.284	-16.000	-
8.8	-14.218	-11.365	-10.495	-12.738	-9.226	-9.134	-32.888	-29.376	-29.284	-16.000	-
8.9	-15.556	-11.344	-9.677	-12.738	-9.226	-9.134	-32.888	-29.376	-29.284	-16.000	-
9	-16.671	-10.877	-9.309	-12.738	-9.226	-9.134	-32.888	-29.376	-29.284	-16.000	-
9.1	-16.526	-10.041	-9.134	-12.798	-9.226	-9.134	-32.948	-29.376	-29.284	-16.000	-
9.2	-15.064	-9.226	-9.357	-13.273	-9.226	-9.134	-33.423	-29.376	-29.284	-16.000	-



Nominal 14.0GHz, V-Polarized, X-pol PSD, with -20.15dBW/4kHz Input



Data in support of claim that proposed operation meets criteria of VMES Order July 2009

Applicant RAS Date of Application  
 ID Heading  
 a1 Antenna Manufacture: RAS c Main bore gain (dBi): 36.0  
 a2 Antenna Model: SR5000 d Frequency at which gain was measured (GHz): 14.25  
 a3 Antenna ID: RAS e Max input power density (dBW/4kHz): -20.15  
 b Transmit Band (b): 14GHz Pattern ID Table C4  
 Pattern Description: 14.25GHz H-polarization, X-polarized tangent to the geosynchronous plane for 0°, 37.5°, and 50° skew angle

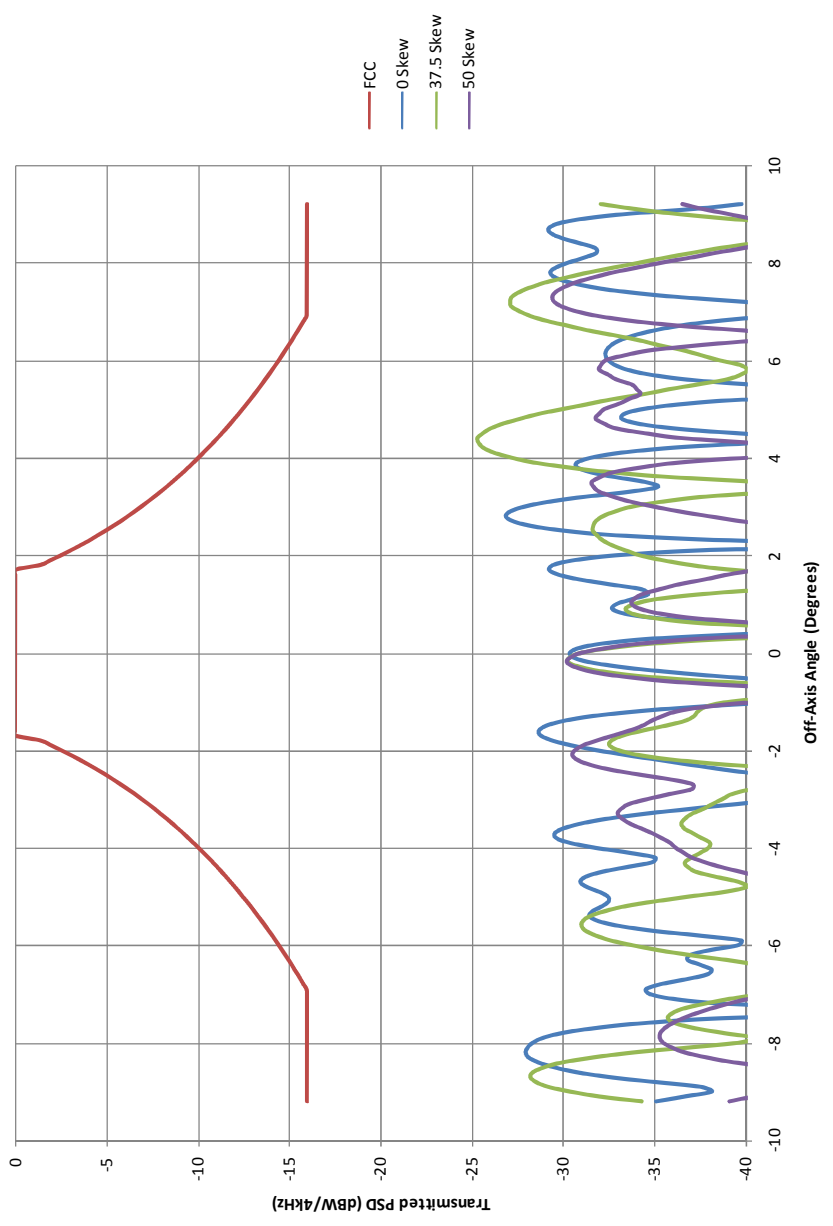
Offset Angles  (Degrees)	Nominal X-Pol Gain Along Tangent to Geo Arc  (dBi)			Worst Case X-Pol Gain Along Tangent to Geo Arc  (dBi)			Worst Case X-Pol PSD Along Tangent to Geo Arc input PSD = -20.15dBW/4kHz  (dBW/4kHz)			FCC Mask (dBW/4kHz)	Mask Exceedence  (dB)
	0? Skew	37.5? Skew	50? Skew	0? Skew	37.5? Skew	50? Skew	0? Skew	37.5? Skew	50? Skew		
	-9.2	-14.928	-14.150	-18.942	-12.301	-8.067	-18.942	-32.451	-28.217		
-9.1	-16.501	-11.829	-20.346	-10.550	-8.067	-18.942	-30.700	-28.217	-39.092	-16.000	-
-9	-17.988	-10.252	-22.651	-9.322	-8.067	-18.942	-29.472	-28.217	-39.092	-16.000	-
-8.9	-17.343	-9.014	-25.457	-8.463	-8.067	-18.942	-28.613	-28.217	-39.092	-16.000	-
-8.8	-14.761	-8.359	-28.354	-7.941	-8.067	-17.695	-28.091	-28.217	-37.845	-16.000	-
-8.7	-12.301	-8.067	-27.564	-7.784	-8.067	-16.536	-27.934	-28.217	-36.686	-16.000	-
-8.6	-10.550	-8.219	-24.123	-7.784	-8.067	-15.804	-27.934	-28.217	-35.954	-16.000	-
-8.5	-9.322	-8.829	-21.393	-7.784	-8.067	-15.325	-27.934	-28.217	-35.475	-16.000	-
-8.4	-8.463	-9.832	-19.189	-7.784	-8.067	-15.133	-27.934	-28.217	-35.283	-16.000	-
-8.3	-7.941	-11.516	-17.695	-7.784	-8.067	-15.133	-27.934	-28.217	-35.283	-16.000	-
-8.2	-7.784	-13.629	-16.536	-7.784	-8.067	-15.133	-27.934	-28.217	-35.283	-16.000	-
-8.1	-7.878	-16.575	-15.804	-7.784	-8.219	-15.133	-27.934	-28.369	-35.283	-16.000	-
-8	-8.156	-19.411	-15.325	-7.784	-8.829	-15.133	-27.934	-28.979	-35.283	-16.000	-
-7.9	-8.707	-20.344	-15.133	-7.784	-9.832	-15.133	-27.934	-29.982	-35.283	-16.000	-
-7.8	-9.766	-18.659	-15.161	-7.784	-11.516	-15.133	-27.934	-31.666	-35.283	-16.000	-
-7.7	-11.513	-17.069	-15.394	-7.784	-13.629	-15.133	-27.934	-33.779	-35.283	-16.000	-
-7.6	-14.120	-16.013	-15.811	-7.878	-15.593	-15.133	-28.028	-35.743	-35.283	-16.000	-
-7.5	-18.356	-15.593	-16.376	-8.156	-15.593	-15.133	-28.306	-35.743	-35.283	-16.000	-
-7.4	-27.370	-15.796	-17.080	-8.707	-15.593	-15.133	-28.857	-35.743	-35.283	-16.000	-
-7.3	-25.721	-16.418	-17.905	-9.766	-15.593	-15.161	-29.916	-35.743	-35.311	-16.000	-
-7.2	-18.757	-17.570	-18.858	-11.513	-15.593	-15.394	-31.663	-35.743	-35.544	-16.000	-
-7.1	-15.868	-18.956	-19.962	-14.120	-15.593	-15.811	-34.270	-35.743	-35.961	-16.000	-
-7	-14.582	-20.631	-21.268	-14.374	-15.593	-16.376	-34.524	-35.743	-36.526	-16.000	-
-6.9	-14.374	-22.079	-22.829	-14.374	-15.796	-17.080	-34.524	-35.946	-37.230	-15.971	-
-6.8	-15.150	-23.123	-24.674	-14.374	-16.418	-17.905	-34.524	-36.568	-38.055	-15.813	-
-6.7	-16.521	-23.410	-26.760	-14.374	-16.778	-18.858	-34.524	-36.928	-39.008	-15.652	-
-6.6	-17.705	-23.130	-28.331	-14.374	-15.085	-19.962	-34.524	-35.235	-40.112	-15.489	-
-6.5	-17.979	-22.170	-28.746	-14.374	-13.651	-21.268	-34.524	-33.801	-41.418	-15.323	-
-6.4	-17.348	-20.554	-27.384	-14.374	-12.447	-22.441	-34.524	-32.597	-42.591	-15.154	-
-6.3	-16.659	-18.770	-26.011	-15.150	-11.649	-21.955	-35.300	-31.799	-42.105	-14.984	-
-6.2	-16.783	-16.778	-24.523	-14.708	-11.078	-21.705	-34.858	-31.228	-41.855	-14.810	-
-6.1	-17.862	-15.085	-23.663	-12.860	-10.866	-21.277	-33.010	-31.016	-41.427	-14.633	-
-6	-19.408	-13.651	-22.832	-11.734	-10.866	-21.035	-31.884	-31.016	-41.185	-14.454	-
-5.9	-19.580	-12.447	-22.441	-11.280	-10.866	-20.686	-31.430	-31.016	-40.836	-14.271	-
-5.8	-17.275	-11.649	-21.955	-11.280	-10.866	-20.609	-31.430	-31.016	-40.759	-14.086	-
-5.7	-14.708	-11.078	-21.705	-11.280	-10.866	-20.560	-31.430	-31.016	-40.710	-13.897	-
-5.6	-12.860	-10.866	-21.277	-11.280	-10.866	-20.560	-31.430	-31.016	-40.710	-13.705	-
-5.5	-11.734	-10.944	-21.035	-11.280	-10.866	-20.560	-31.430	-31.016	-40.710	-13.509	-

-5.4	-11.280	-11.337	-20.686	-11.280	-10.866	-20.560	-31.430	-31.016	-40.710	-13.310	-
-5.3	-11.459	-12.138	-20.609	-11.107	-10.866	-20.560	-31.257	-31.016	-40.710	-13.107	-
-5.2	-11.957	-13.230	-20.560	-10.781	-10.866	-20.560	-30.931	-31.016	-40.710	-12.900	-
-5.1	-12.327	-14.875	-20.838	-10.781	-10.866	-20.560	-30.931	-31.016	-40.710	-12.689	-
-5	-12.284	-16.779	-21.147	-10.781	-10.944	-19.627	-30.931	-31.094	-39.777	-12.474	-
-4.9	-11.784	-18.777	-21.623	-10.781	-11.337	-18.520	-30.931	-31.487	-38.670	-12.255	-
-4.8	-11.107	-19.900	-21.770	-10.781	-12.138	-17.619	-30.931	-32.288	-37.769	-12.031	-
-4.7	-10.781	-19.453	-21.528	-10.781	-13.230	-16.882	-30.931	-33.380	-37.032	-11.802	-
-4.6	-11.043	-18.273	-20.701	-10.781	-14.875	-16.422	-30.931	-35.025	-36.572	-11.569	-
-4.5	-11.895	-17.189	-19.627	-10.781	-16.520	-16.000	-30.931	-36.670	-36.150	-11.330	-
-4.4	-13.260	-16.693	-18.520	-10.198	-16.520	-15.700	-30.348	-36.670	-35.850	-11.086	-
-4.3	-14.692	-16.520	-17.619	-9.449	-16.520	-15.229	-29.599	-36.670	-35.379	-10.837	-
-4.2	-14.872	-16.896	-16.882	-9.385	-16.520	-14.708	-29.535	-36.670	-34.858	-10.581	-
-4.1	-13.406	-17.383	-16.422	-9.385	-16.473	-14.074	-29.535	-36.623	-34.224	-10.320	-
-4	-11.592	-17.809	-16.000	-9.385	-16.327	-13.474	-29.535	-36.477	-33.624	-10.051	-
-3.9	-10.198	-17.895	-15.700	-9.385	-16.327	-13.056	-29.535	-36.477	-33.206	-9.777	-
-3.8	-9.449	-17.430	-15.229	-9.385	-16.327	-12.833	-29.535	-36.477	-32.983	-9.495	-
-3.7	-9.385	-16.932	-14.708	-9.385	-16.327	-12.833	-29.535	-36.477	-32.983	-9.205	-
-3.6	-9.879	-16.473	-14.074	-9.385	-16.327	-12.833	-29.535	-36.477	-32.983	-8.908	-
-3.5	-10.859	-16.327	-13.474	-9.385	-16.327	-12.833	-29.535	-36.477	-32.983	-8.602	-
-3.4	-12.347	-16.534	-13.056	-9.385	-16.327	-12.833	-29.535	-36.477	-32.983	-8.287	-
-3.3	-14.405	-16.920	-12.833	-9.385	-16.327	-12.833	-29.535	-36.477	-32.983	-7.963	-
-3.2	-16.872	-17.549	-13.018	-9.385	-16.327	-12.833	-29.535	-36.477	-32.983	-7.629	-
-3.1	-19.427	-18.039	-13.485	-9.879	-16.327	-12.833	-30.029	-36.477	-32.983	-7.284	-
-3	-21.980	-18.578	-14.488	-10.859	-16.327	-12.833	-31.009	-36.477	-32.983	-6.928	-
-2.9	-24.747	-19.089	-15.659	-12.347	-16.534	-12.448	-32.497	-36.684	-32.598	-6.560	-
-2.8	-27.306	-20.175	-16.879	-14.405	-16.920	-11.318	-34.555	-37.070	-31.468	-6.179	-
-2.7	-26.605	-22.077	-16.936	-15.065	-16.004	-10.632	-35.215	-36.154	-30.782	-5.784	-
-2.6	-23.663	-25.430	-15.737	-13.287	-14.002	-10.350	-33.437	-34.152	-30.500	-5.374	-
-2.5	-20.912	-28.250	-13.999	-11.662	-12.899	-10.350	-31.812	-33.049	-30.500	-4.949	-
-2.4	-18.695	-23.461	-12.448	-10.286	-12.395	-10.350	-30.436	-32.545	-30.500	-4.505	-
-2.3	-16.847	-18.949	-11.318	-9.226	-12.395	-10.350	-29.376	-32.545	-30.500	-4.043	-
-2.2	-15.065	-16.004	-10.632	-8.609	-12.395	-10.350	-28.759	-32.545	-30.500	-3.561	-
-2.1	-13.287	-14.002	-10.350	-8.508	-12.395	-10.350	-28.658	-32.545	-30.500	-3.055	-
-2	-11.662	-12.899	-10.492	-8.508	-12.395	-10.350	-28.658	-32.545	-30.500	-2.526	-
-1.9	-10.286	-12.395	-10.925	-8.508	-12.395	-10.350	-28.658	-32.545	-30.500	-1.969	-
-1.8	-9.226	-12.511	-11.700	-8.508	-12.395	-10.350	-28.658	-32.545	-30.500	-1.382	-
-1.7	-8.609	-13.111	-12.565	-8.508	-12.395	-10.350	-28.658	-32.545	-30.500	-	-
-1.6	-8.508	-14.176	-13.461	-8.508	-12.395	-10.350	-28.658	-32.545	-30.500	-	-
-1.5	-8.906	-15.419	-14.172	-8.508	-12.395	-10.492	-28.658	-32.545	-30.642	-	-
-1.4	-9.843	-16.506	-14.663	-8.508	-12.395	-10.925	-28.658	-32.545	-31.075	-	-
-1.3	-11.471	-17.013	-15.266	-8.508	-12.511	-11.700	-28.658	-32.661	-31.850	-	-
-1.2	-14.002	-17.248	-16.114	-8.508	-13.111	-12.565	-28.658	-33.261	-32.715	-	-
-1.1	-17.565	-17.742	-17.847	-8.508	-14.176	-13.461	-28.658	-34.326	-33.611	-	-
-1	-22.456	-19.093	-21.038	-8.906	-14.675	-13.339	-29.056	-34.825	-33.489	-	-
-0.9	-27.757	-22.282	-28.444	-9.843	-12.261	-11.517	-29.993	-32.411	-31.667	-	-
-0.8	-27.782	-28.655	-31.723	-11.471	-10.861	-10.531	-31.621	-31.011	-30.681	-	-
-0.7	-25.545	-25.348	-20.879	-11.355	-10.139	-10.057	-31.505	-30.289	-30.207	-	-
-0.6	-22.513	-18.660	-16.093	-10.407	-10.139	-10.057	-30.557	-30.289	-30.207	-	-
-0.5	-18.934	-14.675	-13.339	-10.209	-10.139	-10.057	-30.359	-30.289	-30.207	-	-
-0.4	-15.716	-12.261	-11.517	-10.209	-10.139	-10.057	-30.359	-30.289	-30.207	-	-
-0.3	-13.152	-10.861	-10.531	-10.209	-10.139	-10.057	-30.359	-30.289	-30.207	-	-
-0.2	-11.355	-10.139	-10.057	-10.209	-10.139	-10.057	-30.359	-30.289	-30.207	-	-
-0.1	-10.407	-10.211	-10.233	-10.209	-10.139	-10.057	-30.359	-30.289	-30.207	-	-
0	-10.209	-10.899	-10.880	-10.209	-10.139	-10.057	-30.359	-30.289	-30.207	-	-
0.1	-10.757	-12.548	-12.297	-10.209	-10.139	-10.057	-30.359	-30.289	-30.207	-	-
0.2	-12.261	-15.290	-14.407	-10.209	-10.139	-10.057	-30.359	-30.289	-30.207	-	-
0.3	-15.281	-20.271	-17.992	-10.209	-10.139	-10.057	-30.359	-30.289	-30.207	-	-
0.4	-20.929	-32.940	-23.402	-10.209	-10.211	-10.233	-30.359	-30.361	-30.383	-	-
0.5	-27.319	-23.861	-26.796	-10.209	-10.899	-10.880	-30.359	-31.049	-31.030	-	-

0.6	-19.656	-17.664	-20.928	-10.757	-12.548	-12.297	-30.907	-32.698	-32.447	-
0.7	-15.288	-14.989	-17.241	-12.261	-13.275	-13.591	-32.411	-33.425	-33.741	-
0.8	-13.194	-13.631	-15.157	-12.522	-13.275	-13.591	-32.672	-33.425	-33.741	-
0.9	-12.522	-13.275	-14.055	-12.425	-13.275	-13.591	-32.575	-33.425	-33.741	-
1	-12.773	-13.787	-13.591	-10.736	-13.275	-13.591	-30.886	-33.425	-33.741	-
1.1	-13.628	-14.997	-13.721	-9.581	-13.275	-13.591	-29.731	-33.425	-33.741	-
1.2	-14.503	-17.502	-14.180	-9.062	-13.275	-13.591	-29.212	-33.425	-33.741	-
1.3	-14.126	-21.344	-15.118	-9.062	-13.275	-13.591	-29.212	-33.425	-33.741	-
1.4	-12.425	-29.682	-16.167	-9.062	-13.275	-13.591	-29.212	-33.425	-33.741	-
1.5	-10.736	-32.876	-17.570	-9.062	-13.787	-13.591	-29.212	-33.937	-33.741	-
1.6	-9.581	-23.466	-18.842	-9.062	-13.252	-13.721	-29.212	-33.402	-33.871	-
1.7	-9.062	-19.063	-20.380	-9.062	-12.539	-14.180	-29.212	-32.689	-34.330	-
1.8	-9.306	-16.808	-21.814	-9.062	-12.043	-15.118	-29.212	-32.193	-35.268	-1.382
1.9	-10.507	-15.240	-23.818	-9.062	-11.721	-16.167	-29.212	-31.871	-36.317	-1.969
2	-12.928	-14.023	-26.350	-9.062	-11.485	-17.570	-29.212	-31.635	-37.720	-2.526
2.1	-17.534	-13.252	-30.382	-8.070	-11.485	-18.842	-28.220	-31.635	-38.992	-3.055
2.2	-27.538	-12.539	-35.562	-7.051	-11.485	-19.511	-27.201	-31.635	-39.661	-3.561
2.3	-18.990	-12.043	-32.004	-6.693	-11.485	-17.775	-26.843	-31.635	-37.925	-4.043
2.4	-13.009	-11.721	-27.494	-6.693	-11.485	-16.137	-26.843	-31.635	-36.287	-4.505
2.5	-9.896	-11.485	-23.969	-6.693	-11.485	-14.746	-26.843	-31.635	-34.896	-4.949
2.6	-8.070	-11.511	-21.583	-6.693	-11.485	-13.490	-26.843	-31.635	-33.640	-5.374
2.7	-7.051	-11.651	-19.511	-6.693	-11.485	-12.563	-26.843	-31.635	-32.713	-5.784
2.8	-6.693	-12.045	-17.775	-6.693	-11.485	-11.826	-26.843	-31.635	-31.976	-6.179
2.9	-6.958	-12.725	-16.137	-6.693	-11.485	-11.510	-26.843	-31.635	-31.660	-6.560
3	-7.775	-13.685	-14.746	-6.693	-11.485	-11.411	-26.843	-31.635	-31.561	-6.928
3.1	-9.140	-15.350	-13.490	-6.693	-11.511	-11.411	-26.843	-31.661	-31.561	-7.284
3.2	-11.102	-17.682	-12.563	-6.693	-11.651	-11.411	-26.843	-31.801	-31.561	-7.629
3.3	-13.502	-21.480	-11.826	-6.693	-10.104	-11.411	-26.843	-30.254	-31.561	-7.963
3.4	-15.025	-24.807	-11.510	-6.958	-8.238	-11.411	-27.108	-28.388	-31.561	-8.287
3.5	-14.323	-20.617	-11.411	-7.775	-7.020	-11.411	-27.925	-27.170	-31.561	-8.602
3.6	-12.693	-15.742	-11.865	-9.140	-6.079	-11.411	-29.290	-26.229	-31.561	-8.908
3.7	-11.342	-12.436	-12.584	-10.598	-5.498	-11.411	-30.748	-25.648	-31.561	-9.205
3.8	-10.598	-10.104	-14.153	-10.598	-5.240	-11.411	-30.748	-25.390	-31.561	-9.495
3.9	-10.602	-8.238	-16.216	-10.598	-5.173	-11.411	-30.748	-25.323	-31.561	-9.777
4	-11.394	-7.020	-20.117	-10.598	-5.173	-11.411	-30.748	-25.323	-31.561	-10.051
4.1	-13.025	-6.079	-25.610	-10.598	-5.173	-11.865	-30.748	-25.323	-32.015	-10.320
4.2	-15.776	-5.498	-25.704	-10.598	-5.173	-12.065	-30.748	-25.323	-32.215	-10.581
4.3	-20.185	-5.240	-20.358	-10.598	-5.173	-11.623	-30.748	-25.323	-31.773	-10.837
4.4	-23.312	-5.173	-16.333	-10.602	-5.173	-11.623	-30.752	-25.323	-31.773	-11.086
4.5	-19.288	-5.463	-14.313	-11.394	-5.173	-11.623	-31.544	-25.323	-31.773	-11.330
4.6	-15.849	-5.897	-12.716	-13.025	-5.173	-11.623	-33.175	-25.323	-31.773	-11.569
4.7	-13.887	-6.606	-12.065	-13.040	-5.173	-11.623	-33.190	-25.323	-31.773	-11.802
4.8	-13.040	-7.549	-11.623	-13.040	-5.173	-11.623	-33.190	-25.323	-31.773	-12.031
4.9	-13.199	-8.557	-11.817	-13.040	-5.173	-11.623	-33.190	-25.323	-31.773	-12.255
5	-14.290	-9.907	-12.128	-13.040	-5.463	-11.623	-33.190	-25.613	-31.773	-12.474
5.1	-16.438	-11.236	-12.881	-13.040	-5.897	-11.623	-33.190	-26.047	-31.773	-12.689
5.2	-20.335	-12.615	-13.439	-13.040	-6.606	-11.623	-33.190	-26.756	-31.773	-12.900
5.3	-28.537	-14.263	-14.058	-13.040	-7.549	-11.623	-33.190	-27.699	-31.773	-13.107
5.4	-27.156	-15.645	-13.876	-12.659	-8.557	-11.817	-32.809	-28.707	-31.967	-13.310
5.5	-20.147	-17.214	-13.589	-12.290	-9.907	-11.822	-32.440	-30.057	-31.972	-13.509
5.6	-16.664	-18.773	-12.762	-12.155	-11.236	-11.822	-32.305	-31.386	-31.972	-13.705
5.7	-14.610	-19.571	-12.303	-12.155	-12.615	-11.822	-32.305	-32.765	-31.972	-13.897
5.8	-13.368	-19.931	-11.822	-12.155	-14.263	-11.822	-32.305	-34.413	-31.972	-14.086
5.9	-12.659	-19.527	-11.921	-12.155	-14.084	-11.822	-32.305	-34.234	-31.972	-14.271
6	-12.290	-18.344	-12.210	-12.155	-12.768	-11.822	-32.305	-32.918	-31.972	-14.454
6.1	-12.155	-17.399	-13.231	-12.155	-11.315	-11.822	-32.305	-31.465	-31.972	-14.633
6.2	-12.211	-16.421	-14.630	-12.155	-10.150	-11.822	-32.305	-30.300	-31.972	-14.810
6.3	-12.447	-15.151	-17.173	-12.155	-8.973	-11.822	-32.305	-29.123	-31.972	-14.984
6.4	-12.915	-14.084	-20.278	-12.155	-8.083	-11.790	-32.305	-28.233	-31.940	-15.154
6.5	-13.669	-12.768	-22.783	-12.155	-7.470	-10.552	-32.305	-27.620	-30.702	-15.323

6.6	-14.729	-11.315	-19.885	-12.155	-7.026	-9.753	-32.305	-27.176	-29.903	-15.489	-
6.7	-16.168	-10.150	-16.278	-12.211	-6.965	-9.338	-32.361	-27.115	-29.488	-15.652	-
6.8	-18.228	-8.973	-13.655	-12.447	-6.965	-9.255	-32.597	-27.115	-29.405	-15.813	-
6.9	-21.243	-8.083	-11.790	-12.915	-6.965	-9.255	-33.065	-27.115	-29.405	-15.971	-
7	-24.486	-7.470	-10.552	-11.340	-6.965	-9.255	-31.490	-27.115	-29.405	-16.000	-
7.1	-23.688	-7.026	-9.753	-10.105	-6.965	-9.255	-30.255	-27.115	-29.405	-16.000	-
7.2	-19.568	-6.965	-9.338	-9.363	-6.965	-9.255	-29.513	-27.115	-29.405	-16.000	-
7.3	-15.892	-7.066	-9.255	-9.136	-6.965	-9.255	-29.286	-27.115	-29.405	-16.000	-
7.4	-13.182	-7.492	-9.441	-9.136	-6.965	-9.255	-29.286	-27.115	-29.405	-16.000	-
7.5	-11.340	-8.146	-9.922	-9.136	-6.965	-9.255	-29.286	-27.115	-29.405	-16.000	-
7.6	-10.105	-8.979	-10.596	-9.136	-6.965	-9.255	-29.286	-27.115	-29.405	-16.000	-
7.7	-9.363	-10.126	-11.549	-9.136	-6.965	-9.255	-29.286	-27.115	-29.405	-16.000	-
7.8	-9.136	-11.307	-12.615	-9.136	-7.066	-9.255	-29.286	-27.216	-29.405	-16.000	-
7.9	-9.451	-12.681	-13.941	-9.136	-7.492	-9.441	-29.286	-27.642	-29.591	-16.000	-
8	-10.143	-14.076	-15.271	-9.136	-8.146	-9.922	-29.286	-28.296	-30.072	-16.000	-
8.1	-10.996	-15.463	-16.820	-9.136	-8.979	-10.596	-29.286	-29.129	-30.746	-16.000	-
8.2	-11.664	-16.945	-18.213	-9.045	-10.126	-11.549	-29.195	-30.276	-31.699	-16.000	-
8.3	-11.579	-18.506	-19.770	-9.045	-11.307	-12.615	-29.195	-31.457	-32.765	-16.000	-
8.4	-10.694	-20.363	-20.913	-9.045	-12.681	-13.941	-29.195	-32.831	-34.091	-16.000	-
8.5	-9.758	-22.699	-22.042	-9.045	-14.076	-15.271	-29.195	-34.226	-35.421	-16.000	-
8.6	-9.167	-25.026	-22.351	-9.045	-13.708	-16.820	-29.195	-33.858	-36.970	-16.000	-
8.7	-9.045	-25.279	-22.212	-9.045	-11.911	-16.362	-29.195	-32.061	-36.512	-16.000	-
8.8	-9.569	-22.156	-21.332	-9.045	-11.911	-16.362	-29.195	-32.061	-36.512	-16.000	-
8.9	-10.991	-18.878	-20.096	-9.045	-11.911	-16.362	-29.195	-32.061	-36.512	-16.000	-
9	-13.452	-15.959	-18.814	-9.045	-11.911	-16.362	-29.195	-32.061	-36.512	-16.000	-
9.1	-17.066	-13.708	-17.446	-9.045	-11.911	-16.362	-29.195	-32.061	-36.512	-16.000	-
9.2	-19.609	-11.911	-16.362	-9.045	-11.911	-16.362	-29.195	-32.061	-36.512	-16.000	-

Nominal 14.25GHz, H-Polarized, X-pol PSD, with -20.15dBW/4kHz Input



Data in support of claim that proposed operation meets criteria of VMES Order July 2009

Applicant RAS Date of Application  
 ID Heading  
 a1 Antenna Manufacture: RAS c Main bore gain (dBi): 36.0  
 a2 Antenna Model: SR5000 d Frequency at which gain was measured (GHz): 14.25  
 a3 Antenna ID: RAS e Max input power density (dBW/4kHz): -20.15  
 b Transmit Band (b): 14GHz Pattern ID Table C4  
 Pattern Description: 14.25GHz V-polarization, X-polarized tangent to the geosynchronous plane for 0°, 37.5°, and 50° skew angle

Offset Angles  (Degrees)	Nominal X-Pol Gain Along Tangent to Geo Arc  (dBi)			Worst Case X-Pol Gain Along Tangent to Geo Arc  (dBi)			Worst Case X-Pol PSD Along Tangent to Geo Arc input PSD = -20.15dBW/4kHz  (dBW/4kHz)			FCC Mask (dBW/4kHz)	Mask Exceedence  (dB)
	0? Skew	37.5? Skew	50? Skew	0? Skew	37.5? Skew	50? Skew	0? Skew	37.5? Skew	50? Skew		
	-9.2	-6.418	-15.552	-16.883	-6.418	-12.654	-14.403	-26.568	-32.804		
-9.1	-7.306	-21.016	-21.880	-6.418	-11.247	-12.262	-26.568	-31.397	-32.412	-16.000	-
-9	-8.847	-24.296	-41.524	-6.418	-10.434	-11.121	-26.568	-30.584	-31.271	-16.000	-
-8.9	-11.152	-19.035	-24.314	-6.418	-10.168	-10.486	-26.568	-30.318	-30.636	-16.000	-
-8.8	-14.213	-14.906	-17.508	-6.418	-10.145	-10.393	-26.568	-30.295	-30.543	-16.000	-
-8.7	-16.268	-12.654	-14.403	-6.418	-10.145	-10.393	-26.568	-30.295	-30.543	-16.000	-
-8.6	-14.741	-11.247	-12.262	-7.306	-10.145	-10.393	-27.456	-30.295	-30.543	-16.000	-
-8.5	-12.301	-10.434	-11.121	-8.847	-10.145	-10.393	-28.997	-30.295	-30.543	-16.000	-
-8.4	-10.545	-10.168	-10.486	-9.355	-10.145	-10.393	-29.505	-30.295	-30.543	-16.000	-
-8.3	-9.587	-10.145	-10.393	-9.355	-10.145	-10.393	-29.505	-30.295	-30.543	-16.000	-
-8.2	-9.355	-10.562	-10.780	-9.355	-10.145	-10.393	-29.505	-30.295	-30.543	-16.000	-
-8.1	-9.695	-11.071	-11.625	-9.355	-10.145	-10.393	-29.505	-30.295	-30.543	-16.000	-
-8	-10.481	-11.816	-13.021	-8.295	-10.145	-10.393	-28.445	-30.295	-30.543	-16.000	-
-7.9	-11.512	-12.674	-14.849	-6.550	-10.145	-10.393	-26.700	-30.295	-30.543	-16.000	-
-7.8	-12.229	-13.413	-17.210	-5.172	-10.145	-10.393	-25.322	-30.295	-30.543	-16.000	-
-7.7	-11.796	-14.290	-18.940	-4.271	-10.562	-10.780	-24.421	-30.712	-30.930	-16.000	-
-7.6	-10.217	-14.830	-19.038	-3.826	-11.071	-11.625	-23.976	-31.221	-31.775	-16.000	-
-7.5	-8.295	-15.267	-17.491	-3.794	-11.816	-13.021	-23.944	-31.966	-33.171	-16.000	-
-7.4	-6.550	-15.465	-15.764	-3.794	-12.674	-13.057	-23.944	-32.824	-33.207	-16.000	-
-7.3	-5.172	-15.296	-14.530	-3.794	-12.263	-13.057	-23.944	-32.413	-33.207	-16.000	-
-7.2	-4.271	-14.927	-13.627	-3.794	-11.960	-13.057	-23.944	-32.110	-33.207	-16.000	-
-7.1	-3.826	-14.217	-13.217	-3.794	-11.958	-13.057	-23.944	-32.108	-33.207	-16.000	-
-7	-3.794	-13.538	-13.057	-3.794	-11.958	-13.057	-23.944	-32.108	-33.207	-16.000	-
-6.9	-4.193	-12.772	-13.314	-3.794	-11.958	-13.057	-23.944	-32.108	-33.207	-15.971	-
-6.8	-5.118	-12.263	-13.807	-3.794	-11.958	-13.057	-23.944	-32.108	-33.207	-15.813	-
-6.7	-6.603	-11.960	-14.750	-3.794	-11.958	-13.057	-23.944	-32.108	-33.207	-15.652	-
-6.6	-8.521	-11.958	-16.051	-3.794	-11.958	-13.057	-23.944	-32.108	-33.207	-15.489	-
-6.5	-10.465	-12.392	-17.979	-3.794	-11.958	-13.057	-23.944	-32.108	-33.207	-15.323	-
-6.4	-11.458	-13.228	-20.737	-4.193	-11.958	-13.314	-24.343	-32.108	-33.464	-15.154	-
-6.3	-10.956	-14.827	-24.812	-5.118	-11.958	-13.807	-25.268	-32.108	-33.957	-14.984	-
-6.2	-9.874	-17.183	-31.338	-6.603	-11.958	-14.750	-26.753	-32.108	-34.900	-14.810	-
-6.1	-8.978	-21.396	-31.013	-7.745	-11.958	-16.051	-27.895	-32.108	-36.201	-14.633	-
-6	-8.467	-28.934	-25.907	-7.322	-12.392	-17.979	-27.472	-32.542	-38.129	-14.454	-
-5.9	-8.316	-27.650	-23.024	-7.023	-13.228	-20.737	-27.173	-33.378	-40.887	-14.271	-
-5.8	-8.315	-20.607	-21.536	-7.023	-13.739	-21.131	-27.173	-33.889	-41.281	-14.086	-
-5.7	-8.130	-17.253	-21.131	-7.023	-13.739	-21.131	-27.173	-33.889	-41.281	-13.897	-
-5.6	-7.745	-15.184	-21.473	-7.023	-13.739	-21.131	-27.173	-33.889	-41.281	-13.705	-
-5.5	-7.322	-14.103	-22.910	-7.023	-13.739	-21.131	-27.173	-33.889	-41.281	-13.509	-

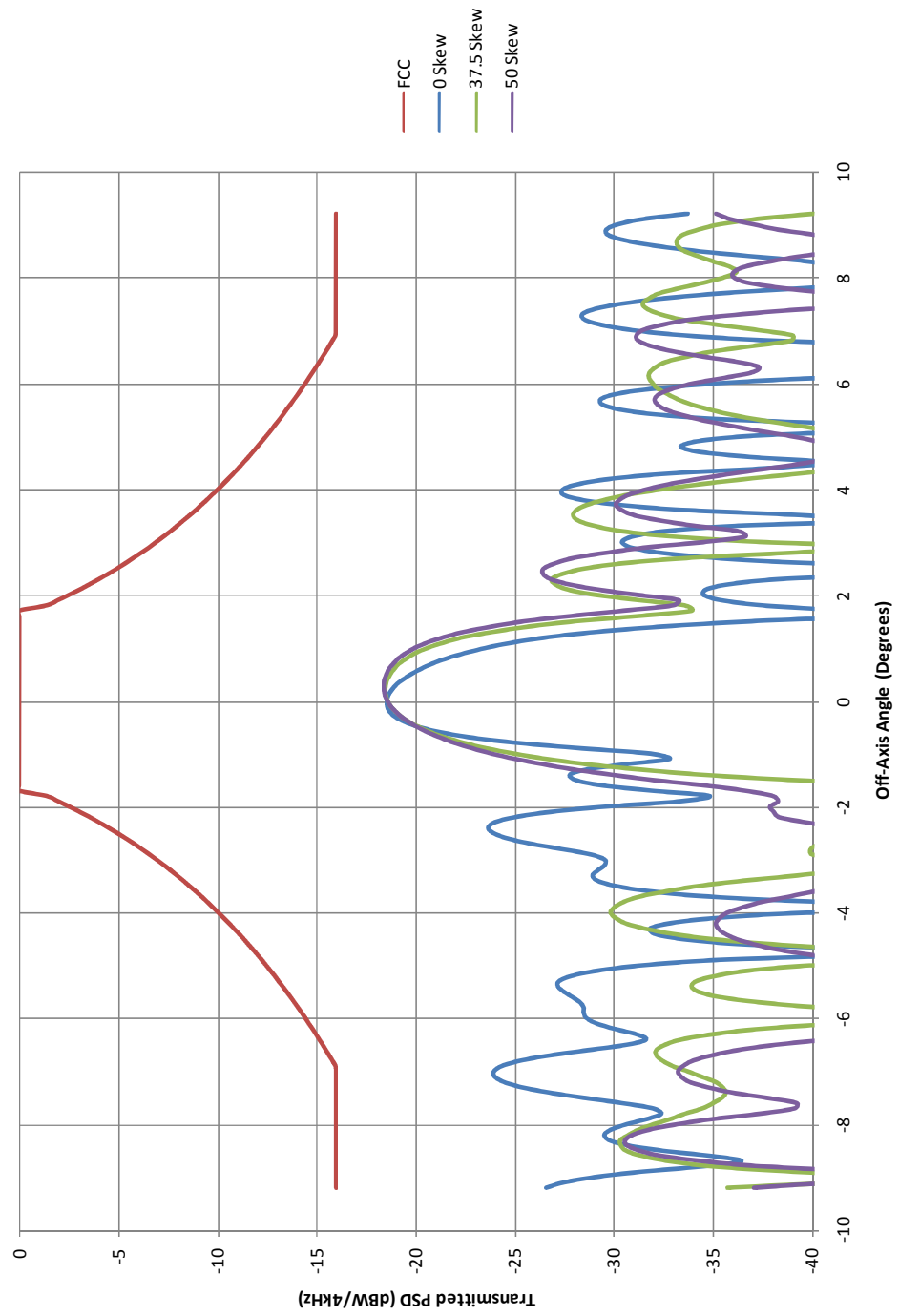
-5.4	-7.023	-13.739	-25.359	-7.023	-13.739	-21.131	-27.173	-33.889	-41.281	-13.310	-
-5.3	-7.065	-13.952	-30.629	-7.023	-13.739	-19.747	-27.173	-33.889	-39.897	-13.107	-
-5.2	-7.689	-14.943	-48.471	-7.023	-13.739	-18.039	-27.173	-33.889	-38.189	-12.900	-
-5.1	-9.006	-16.595	-32.017	-7.023	-13.739	-16.880	-27.173	-33.889	-37.030	-12.689	-
-5	-11.222	-19.693	-25.659	-7.023	-13.739	-15.988	-27.173	-33.889	-36.138	-12.474	-
-4.9	-14.988	-25.079	-22.002	-7.023	-12.705	-15.402	-27.173	-32.855	-35.552	-12.255	-
-4.8	-21.878	-30.311	-19.747	-7.065	-11.324	-15.075	-27.215	-31.474	-35.225	-12.031	-
-4.7	-21.964	-22.518	-18.039	-7.689	-10.372	-14.971	-27.839	-30.522	-35.121	-11.802	-
-4.6	-16.226	-17.805	-16.880	-9.006	-9.889	-14.971	-29.156	-30.039	-35.121	-11.569	-
-4.5	-13.269	-14.694	-15.988	-11.222	-9.651	-14.971	-31.372	-29.801	-35.121	-11.330	-
-4.4	-11.861	-12.705	-15.402	-11.669	-9.651	-14.971	-31.819	-29.801	-35.121	-11.086	-
-4.3	-11.669	-11.324	-15.075	-11.669	-9.651	-14.971	-31.819	-29.801	-35.121	-10.837	-
-4.2	-12.723	-10.372	-14.971	-11.669	-9.651	-14.971	-31.819	-29.801	-35.121	-10.581	-
-4.1	-15.162	-9.889	-15.166	-11.660	-9.651	-14.971	-31.810	-29.801	-35.121	-10.320	-
-4	-20.019	-9.651	-15.576	-9.937	-9.651	-14.971	-30.087	-29.801	-35.121	-10.051	-
-3.9	-31.764	-9.850	-16.344	-9.004	-9.651	-14.971	-29.154	-29.801	-35.121	-9.777	-
-3.8	-20.355	-10.314	-17.306	-8.761	-9.651	-14.971	-28.911	-29.801	-35.121	-9.495	-
-3.7	-14.608	-11.121	-18.656	-8.761	-9.651	-14.971	-28.911	-29.801	-35.121	-9.205	-
-3.6	-11.660	-12.461	-19.929	-8.761	-9.651	-15.166	-28.911	-29.801	-35.316	-8.908	-
-3.5	-9.937	-14.072	-21.304	-8.761	-9.651	-15.576	-28.911	-29.801	-35.726	-8.602	-
-3.4	-9.004	-16.356	-21.843	-8.609	-9.850	-16.344	-28.759	-30.000	-36.494	-8.287	-
-3.3	-8.761	-19.091	-22.208	-7.168	-10.314	-17.306	-27.318	-30.464	-37.456	-7.963	-
-3.2	-9.032	-21.154	-22.072	-5.625	-11.121	-18.656	-25.775	-31.271	-38.806	-7.629	-
-3.1	-9.386	-21.927	-22.556	-4.463	-12.461	-19.929	-24.613	-32.611	-40.079	-7.284	-
-3	-9.364	-20.958	-23.340	-3.754	-14.072	-21.304	-23.904	-34.222	-41.454	-6.928	-
-2.9	-8.609	-19.803	-25.743	-3.503	-16.356	-21.460	-23.653	-36.506	-41.610	-6.560	-
-2.8	-7.168	-19.759	-29.726	-3.503	-19.091	-19.543	-23.653	-39.241	-39.693	-6.179	-
-2.7	-5.625	-20.268	-39.813	-3.503	-19.759	-18.160	-23.653	-39.909	-38.310	-5.784	-
-2.6	-4.463	-21.774	-31.626	-3.503	-19.759	-17.881	-23.653	-39.909	-38.031	-5.374	-
-2.5	-3.754	-25.140	-25.019	-3.503	-19.759	-17.695	-23.653	-39.909	-37.845	-4.949	-
-2.4	-3.503	-28.988	-21.460	-3.503	-19.759	-17.695	-23.653	-39.909	-37.845	-4.505	-
-2.3	-3.806	-28.595	-19.543	-3.503	-19.759	-17.695	-23.653	-39.909	-37.845	-4.043	-
-2.2	-4.830	-24.964	-18.160	-3.503	-20.268	-16.418	-23.653	-40.418	-36.568	-3.561	-
-2.1	-6.660	-22.245	-17.881	-3.503	-20.899	-14.373	-23.653	-41.049	-34.523	-3.055	-
-2	-9.454	-20.899	-17.695	-3.503	-18.924	-11.822	-23.653	-39.074	-31.972	-2.526	-
-1.9	-13.183	-21.287	-18.102	-3.503	-14.343	-9.753	-23.653	-34.493	-29.903	-1.969	-
-1.8	-14.650	-22.699	-17.837	-3.806	-11.123	-7.797	-23.956	-31.273	-27.947	-1.382	-
-1.7	-11.734	-25.803	-16.418	-4.830	-8.428	-6.210	-24.980	-28.578	-26.360	-	-
-1.6	-9.226	-24.989	-14.373	-6.660	-6.424	-4.847	-26.810	-26.574	-24.997	-	-
-1.5	-7.897	-18.924	-11.822	-7.609	-4.775	-3.659	-27.759	-24.925	-23.809	-	-
-1.4	-7.609	-14.343	-9.753	-7.609	-3.376	-2.686	-27.759	-23.526	-22.836	-	-
-1.3	-8.429	-11.123	-7.797	-5.065	-2.290	-1.807	-25.215	-22.440	-21.957	-	-
-1.2	-10.453	-8.428	-6.210	-2.736	-1.350	-1.093	-22.886	-21.500	-21.243	-	-
-1.1	-12.643	-6.424	-4.847	-1.139	-0.593	-0.451	-21.289	-20.743	-20.601	-	-
-1	-11.682	-4.775	-3.659	-0.036	0.020	0.078	-20.186	-20.130	-20.072	-	-
-0.9	-8.214	-3.376	-2.686	0.720	0.533	0.530	-19.430	-19.617	-19.620	-	-
-0.8	-5.065	-2.290	-1.807	1.206	0.923	0.909	-18.944	-19.227	-19.241	-	-
-0.7	-2.736	-1.350	-1.093	1.480	1.230	1.203	-18.670	-18.920	-18.947	-	-
-0.6	-1.139	-0.593	-0.451	1.598	1.462	1.445	-18.552	-18.688	-18.705	-	-
-0.5	-0.036	0.020	0.078	1.606	1.606	1.606	-18.544	-18.544	-18.544	-	-
-0.4	0.720	0.533	0.530	1.606	1.697	1.723	-18.544	-18.453	-18.427	-	-
-0.3	1.206	0.923	0.909	1.606	1.726	1.777	-18.544	-18.424	-18.373	-	-
-0.2	1.480	1.230	1.203	1.606	1.726	1.781	-18.544	-18.424	-18.369	-	-
-0.1	1.598	1.462	1.445	1.606	1.726	1.781	-18.544	-18.424	-18.369	-	-
0	1.606	1.606	1.606	1.606	1.726	1.781	-18.544	-18.424	-18.369	-	-
0.1	1.527	1.697	1.723	1.606	1.726	1.781	-18.544	-18.424	-18.369	-	-
0.2	1.375	1.726	1.777	1.606	1.726	1.781	-18.544	-18.424	-18.369	-	-
0.3	1.140	1.688	1.781	1.606	1.726	1.781	-18.544	-18.424	-18.369	-	-
0.4	0.806	1.618	1.747	1.606	1.726	1.781	-18.544	-18.424	-18.369	-	-
0.5	0.387	1.470	1.644	1.606	1.726	1.781	-18.544	-18.424	-18.369	-	-



0.6	-0.101	1.274	1.520	1.527	1.726	1.781	-18.623	-18.424	-18.369	-
0.7	-0.679	1.022	1.297	1.375	1.726	1.781	-18.775	-18.424	-18.369	-
0.8	-1.412	0.643	1.048	1.140	1.688	1.781	-19.010	-18.462	-18.369	-
0.9	-2.320	0.205	0.662	0.806	1.618	1.747	-19.344	-18.532	-18.403	-
1	-3.414	-0.429	0.201	0.387	1.470	1.644	-19.763	-18.680	-18.506	-
1.1	-4.771	-1.244	-0.430	-0.101	1.274	1.520	-20.251	-18.876	-18.630	-
1.2	-6.542	-2.256	-1.246	-0.679	1.022	1.297	-20.829	-19.128	-18.853	-
1.3	-8.965	-3.722	-2.257	-1.412	0.643	1.048	-21.562	-19.507	-19.102	-
1.4	-12.237	-5.504	-3.667	-2.320	0.205	0.662	-22.470	-19.945	-19.488	-
1.5	-16.775	-7.902	-5.315	-3.414	-0.429	0.201	-23.564	-20.579	-19.949	-
1.6	-22.407	-11.082	-7.662	-4.771	-1.244	-0.430	-24.921	-21.394	-20.580	-
1.7	-21.236	-13.738	-10.281	-6.542	-2.256	-1.246	-26.692	-22.406	-21.396	-
1.8	-17.334	-13.388	-12.809	-8.965	-3.722	-2.257	-29.115	-23.872	-22.407	-1.382
1.9	-15.207	-11.051	-13.091	-12.237	-5.504	-3.667	-32.387	-25.654	-23.817	-1.969
2	-14.351	-8.873	-10.980	-14.351	-6.684	-5.315	-34.501	-26.834	-25.465	-2.526
2.1	-14.478	-7.488	-9.005	-14.351	-6.684	-6.245	-34.501	-26.834	-26.395	-3.055
2.2	-15.650	-6.845	-7.518	-14.351	-6.684	-6.245	-34.501	-26.834	-26.395	-3.561
2.3	-18.398	-6.684	-6.601	-12.066	-6.684	-6.245	-32.216	-26.834	-26.395	-4.043
2.4	-24.478	-7.277	-6.245	-10.645	-6.684	-6.245	-30.795	-26.834	-26.395	-4.505
2.5	-28.978	-8.383	-6.290	-10.243	-6.684	-6.245	-30.393	-26.834	-26.395	-4.949
2.6	-19.509	-10.404	-6.896	-10.243	-6.684	-6.245	-30.393	-26.834	-26.395	-5.374
2.7	-14.790	-13.742	-7.851	-10.243	-6.684	-6.245	-30.393	-26.834	-26.395	-5.784
2.8	-12.066	-19.050	-9.544	-10.243	-6.684	-6.245	-30.393	-26.834	-26.395	-6.179
2.9	-10.645	-23.713	-11.595	-10.243	-7.277	-6.245	-30.393	-27.427	-26.395	-6.560
3	-10.243	-16.980	-14.476	-10.243	-7.764	-6.290	-30.393	-27.914	-26.440	-6.928
3.1	-10.752	-12.827	-16.447	-10.243	-7.764	-6.896	-30.393	-27.914	-27.046	-7.284
3.2	-12.374	-10.239	-16.130	-10.089	-7.764	-7.851	-30.239	-27.914	-28.001	-7.629
3.3	-15.919	-8.862	-13.959	-8.120	-7.764	-9.544	-28.270	-27.914	-29.694	-7.963
3.4	-22.800	-8.013	-12.205	-7.247	-7.764	-9.921	-27.397	-27.914	-30.071	-8.287
3.5	-19.431	-7.764	-10.859	-7.247	-7.764	-9.921	-27.397	-27.914	-30.071	-8.602
3.6	-13.472	-7.924	-10.216	-7.247	-7.764	-9.921	-27.397	-27.914	-30.071	-8.908
3.7	-10.089	-8.462	-9.921	-7.247	-7.764	-9.921	-27.397	-27.914	-30.071	-9.205
3.8	-8.120	-9.424	-10.133	-7.247	-7.764	-9.921	-27.397	-27.914	-30.071	-9.495
3.9	-7.247	-10.672	-10.641	-7.247	-7.764	-9.921	-27.397	-27.914	-30.071	-9.777
4	-7.297	-12.414	-11.555	-7.247	-7.764	-9.921	-27.397	-27.914	-30.071	-10.051
4.1	-8.148	-14.435	-12.733	-7.247	-7.924	-9.921	-27.397	-28.074	-30.071	-10.320
4.2	-9.906	-16.817	-14.270	-7.247	-8.462	-9.921	-27.397	-28.612	-30.071	-10.581
4.3	-12.991	-19.447	-15.988	-7.247	-9.424	-10.133	-27.397	-29.574	-30.283	-10.837
4.4	-17.930	-21.599	-17.881	-7.247	-10.672	-10.641	-27.397	-30.822	-30.791	-11.086
4.5	-20.547	-22.980	-19.626	-7.297	-12.414	-11.555	-27.447	-32.564	-31.705	-11.330
4.6	-16.798	-23.347	-20.944	-8.148	-14.435	-12.733	-28.298	-34.585	-32.883	-11.569
4.7	-14.114	-23.591	-21.428	-9.906	-16.817	-14.270	-30.056	-36.967	-34.420	-11.802
4.8	-13.199	-23.652	-21.146	-12.991	-17.227	-14.259	-33.141	-37.377	-34.409	-12.031
4.9	-14.018	-23.471	-20.045	-12.156	-15.761	-13.221	-32.306	-35.911	-33.371	-12.255
5	-16.722	-22.548	-18.703	-10.127	-14.633	-12.429	-30.277	-34.783	-32.579	-12.474
5.1	-22.342	-20.791	-17.064	-9.232	-13.699	-11.999	-29.382	-33.849	-32.149	-12.689
5.2	-23.493	-18.964	-15.617	-9.190	-12.995	-11.882	-29.340	-33.145	-32.032	-12.900
5.3	-16.166	-17.227	-14.259	-9.190	-12.476	-11.882	-29.340	-32.626	-32.032	-13.107
5.4	-12.156	-15.761	-13.221	-9.190	-12.010	-11.882	-29.340	-32.160	-32.032	-13.310
5.5	-10.127	-14.633	-12.429	-9.190	-11.760	-11.882	-29.340	-31.910	-32.032	-13.509
5.6	-9.232	-13.699	-11.999	-9.190	-11.586	-11.882	-29.340	-31.736	-32.032	-13.705
5.7	-9.190	-12.995	-11.882	-9.190	-11.586	-11.882	-29.340	-31.736	-32.032	-13.897
5.8	-10.043	-12.476	-12.152	-9.190	-11.586	-11.882	-29.340	-31.736	-32.032	-14.086
5.9	-12.011	-12.010	-12.847	-9.190	-11.586	-11.882	-29.340	-31.736	-32.032	-14.271
6	-15.295	-11.760	-13.902	-9.190	-11.586	-11.882	-29.340	-31.736	-32.032	-14.454
6.1	-20.798	-11.586	-15.425	-9.190	-11.586	-11.882	-29.340	-31.736	-32.032	-14.633
6.2	-34.261	-11.621	-16.779	-9.190	-11.586	-11.693	-29.340	-31.736	-31.843	-14.810
6.3	-27.885	-11.922	-17.147	-10.043	-11.586	-11.051	-30.193	-31.736	-31.201	-14.984
6.4	-23.576	-12.455	-16.060	-12.011	-11.586	-10.957	-32.161	-31.736	-31.107	-15.154
6.5	-24.476	-13.518	-14.302	-10.756	-11.586	-10.957	-30.906	-31.736	-31.107	-15.323

6.6	-29.916	-14.888	-12.770	-9.182	-11.586	-10.957	-29.332	-31.736	-31.107	-15.489	-
6.7	-25.805	-16.831	-11.693	-8.360	-11.621	-10.957	-28.510	-31.771	-31.107	-15.652	-
6.8	-17.929	-18.750	-11.051	-8.237	-11.922	-10.957	-28.387	-32.072	-31.107	-15.813	-
6.9	-13.406	-18.831	-10.957	-8.237	-11.493	-10.957	-28.387	-31.643	-31.107	-15.971	-
7	-10.756	-17.105	-11.283	-8.237	-11.278	-10.957	-28.387	-31.428	-31.107	-16.000	-
7.1	-9.182	-15.068	-12.261	-8.237	-11.278	-10.957	-28.387	-31.428	-31.107	-16.000	-
7.2	-8.360	-13.236	-13.705	-8.237	-11.278	-10.957	-28.387	-31.428	-31.107	-16.000	-
7.3	-8.237	-12.158	-16.295	-8.237	-11.278	-10.957	-28.387	-31.428	-31.107	-16.000	-
7.4	-8.886	-11.493	-19.676	-8.237	-11.278	-10.957	-28.387	-31.428	-31.107	-16.000	-
7.5	-10.262	-11.278	-25.097	-8.237	-11.278	-11.283	-28.387	-31.428	-31.433	-16.000	-
7.6	-12.378	-11.593	-25.546	-8.237	-11.278	-12.261	-28.387	-31.428	-32.411	-16.000	-
7.7	-15.435	-12.150	-20.809	-8.237	-11.278	-13.705	-28.387	-31.428	-33.855	-16.000	-
7.8	-19.634	-13.219	-18.218	-8.237	-11.278	-15.858	-28.387	-31.428	-36.008	-16.000	-
7.9	-23.392	-14.401	-16.517	-8.886	-11.278	-15.858	-29.036	-31.428	-36.008	-16.000	-
8	-23.281	-15.402	-15.858	-10.262	-11.278	-15.858	-30.412	-31.428	-36.008	-16.000	-
8.1	-22.007	-16.012	-15.876	-11.786	-11.593	-15.858	-31.936	-31.743	-36.008	-16.000	-
8.2	-21.147	-15.644	-16.445	-10.345	-12.150	-15.858	-30.495	-32.300	-36.008	-16.000	-
8.3	-19.536	-14.808	-17.733	-9.532	-13.014	-15.858	-29.682	-33.164	-36.008	-16.000	-
8.4	-16.598	-14.036	-19.322	-9.457	-13.014	-15.858	-29.607	-33.164	-36.008	-16.000	-
8.5	-13.849	-13.331	-21.391	-9.457	-13.014	-15.858	-29.607	-33.164	-36.008	-16.000	-
8.6	-11.786	-13.023	-22.352	-9.457	-13.014	-15.662	-29.607	-33.164	-35.812	-16.000	-
8.7	-10.345	-13.014	-21.591	-9.457	-13.014	-14.966	-29.607	-33.164	-35.116	-16.000	-
8.8	-9.532	-13.292	-19.957	-9.457	-13.014	-14.966	-29.607	-33.164	-35.116	-16.000	-
8.9	-9.457	-14.099	-18.079	-9.457	-13.014	-14.966	-29.607	-33.164	-35.116	-16.000	-
9	-10.064	-15.193	-16.824	-9.457	-13.014	-14.966	-29.607	-33.164	-35.116	-16.000	-
9.1	-11.346	-17.064	-15.662	-9.457	-13.014	-14.966	-29.607	-33.164	-35.116	-16.000	-
9.2	-13.552	-19.922	-14.966	-9.457	-13.014	-14.966	-29.607	-33.164	-35.116	-16.000	-

### Nominal 14.25GHz, V-Polarized, X-pol PSD, with -20.15dBW/4kHz Input



Data in support of claim that proposed operation meets criteria of VMES Order July 2009

Applicant RAS Date of Application  
 ID Heading  
 a1 Antenna Manufacture: RAS c Main bore gain (dBi): 36.0  
 a2 Antenna Model: SR5000 d Frequency at which gain was measured (GHz): 14.5  
 a3 Antenna ID: RAS e Max input power density (dBW/4kHz): -20.15  
 b Transmit Band (b): 14GHz Pattern ID Table C5  
 Pattern Description: 14.5GHz H-polarization, X-polarized tangent to the geosynchronous plane for 0°, 37.5°, and 50° skew angle

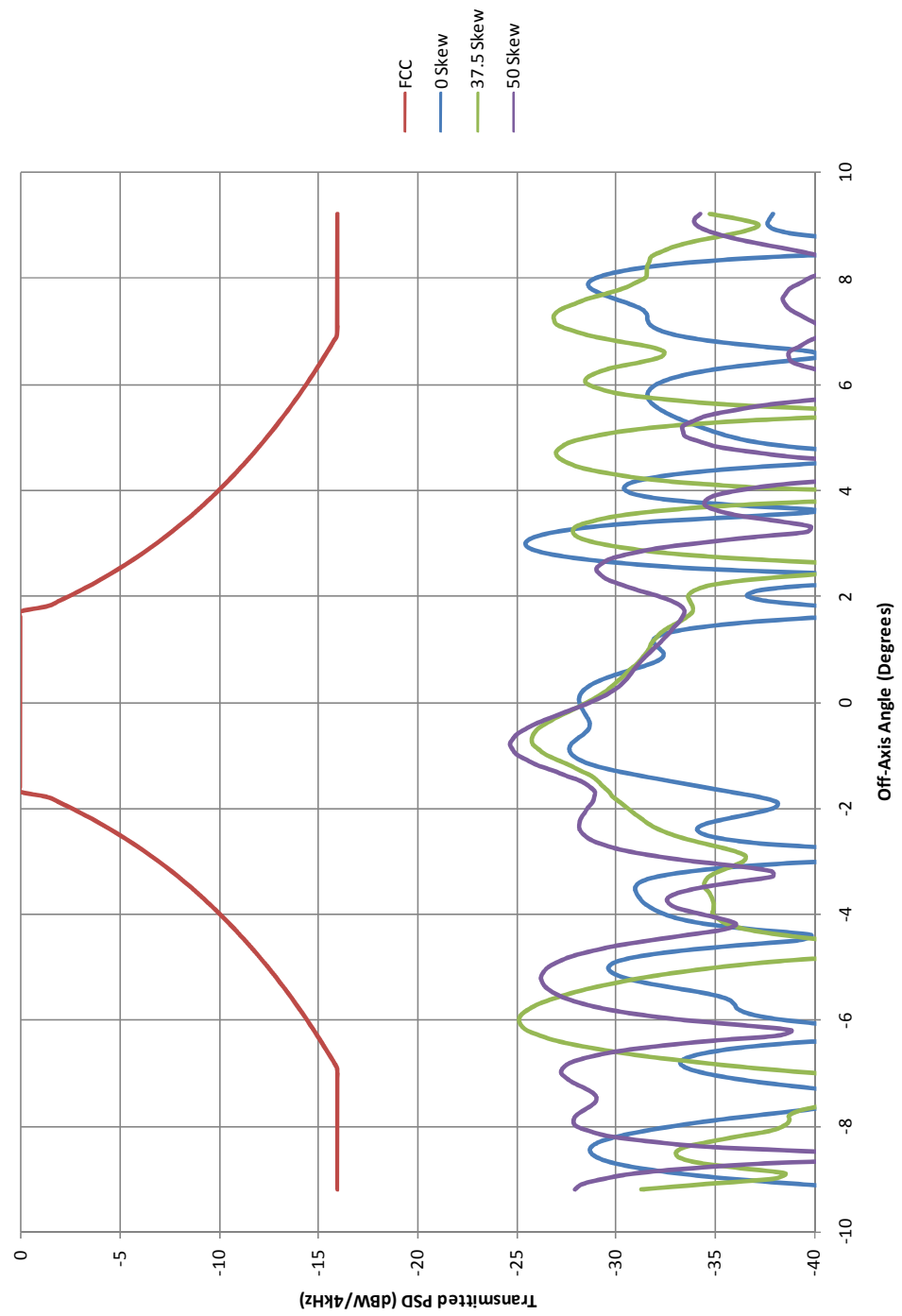
Offset Angles  (Degrees)	Nominal X-Pol Gain Along Tangent to Geo Arc  (dBi)			Worst Case X-Pol Gain Along Tangent to Geo Arc  (dBi)			Worst Case X-Pol PSD Along Tangent to Geo Arc input PSD = -20.15dBW/4kHz  (dBW/4kHz)			FCC Mask (dBW/4kHz)	Mask Exceedence  (dB)
	0? Skew	37.5? Skew	50? Skew	0? Skew	37.5? Skew	50? Skew	0? Skew	37.5? Skew	50? Skew		
-9.2	-23.368	-11.162	-7.819	-9.680	-11.162	-7.819	-29.830	-31.312	-27.969	-16.000	-
-9.1	-19.058	-14.405	-8.198	-8.899	-11.162	-7.819	-29.049	-31.312	-27.969	-16.000	-
-9	-15.595	-17.792	-9.281	-8.556	-11.162	-7.819	-28.706	-31.312	-27.969	-16.000	-
-8.9	-12.995	-18.404	-10.821	-8.556	-11.162	-7.819	-28.706	-31.312	-27.969	-16.000	-
-8.8	-11.033	-16.158	-13.758	-8.556	-11.162	-7.819	-28.706	-31.312	-27.969	-16.000	-
-8.7	-9.680	-14.066	-18.095	-8.556	-11.162	-7.819	-28.706	-31.312	-27.969	-16.000	-
-8.6	-8.899	-13.068	-26.536	-8.556	-12.909	-8.198	-28.706	-33.059	-28.348	-16.000	-
-8.5	-8.556	-12.909	-20.736	-8.556	-12.909	-7.859	-28.706	-33.059	-28.009	-16.000	-
-8.4	-8.592	-13.376	-14.619	-8.556	-12.909	-7.747	-28.706	-33.059	-27.897	-16.000	-
-8.3	-9.040	-14.628	-11.681	-8.556	-12.909	-7.747	-28.706	-33.059	-27.897	-16.000	-
-8.2	-9.951	-16.027	-9.587	-8.556	-12.909	-7.747	-28.706	-33.059	-27.897	-16.000	-
-8.1	-11.245	-17.607	-8.529	-8.556	-12.909	-7.747	-28.706	-33.059	-27.897	-16.000	-
-8	-12.855	-18.340	-7.859	-8.556	-12.909	-7.747	-28.706	-33.059	-27.897	-16.000	-
-7.9	-14.765	-18.614	-7.747	-8.592	-13.376	-7.747	-28.742	-33.526	-27.897	-16.000	-
-7.8	-17.009	-18.620	-7.898	-9.040	-14.628	-7.747	-29.190	-34.778	-27.897	-16.000	-
-7.7	-19.421	-19.270	-8.290	-9.951	-16.027	-7.747	-30.101	-36.177	-27.897	-16.000	-
-7.6	-21.585	-20.723	-8.708	-11.245	-17.607	-7.375	-31.395	-37.757	-27.525	-16.000	-
-7.5	-22.842	-23.391	-8.906	-12.855	-18.340	-7.126	-33.005	-38.490	-27.276	-16.000	-
-7.4	-22.184	-28.734	-8.778	-13.331	-16.496	-7.126	-33.481	-36.646	-27.276	-16.000	-
-7.3	-19.911	-48.290	-8.351	-13.081	-13.950	-7.126	-33.231	-34.100	-27.276	-16.000	-
-7.2	-17.535	-30.354	-7.793	-13.081	-11.582	-7.126	-33.231	-31.732	-27.276	-16.000	-
-7.1	-15.623	-23.632	-7.375	-13.081	-9.735	-7.126	-33.231	-29.885	-27.276	-16.000	-
-7	-14.214	-19.685	-7.126	-13.081	-8.175	-7.126	-33.231	-28.325	-27.276	-16.000	-
-6.9	-13.331	-16.496	-7.244	-13.081	-6.917	-7.126	-33.231	-27.067	-27.276	-15.971	-
-6.8	-13.081	-13.950	-7.659	-13.081	-6.069	-7.126	-33.231	-26.219	-27.276	-15.813	-
-6.7	-13.559	-11.582	-8.569	-13.081	-5.404	-7.126	-33.231	-25.554	-27.276	-15.652	-
-6.6	-14.752	-9.735	-9.889	-13.081	-5.101	-7.126	-33.231	-25.251	-27.276	-15.489	-
-6.5	-16.810	-8.175	-11.951	-13.081	-5.009	-7.126	-33.231	-25.159	-27.276	-15.323	-
-6.4	-20.211	-6.917	-14.598	-13.081	-5.009	-7.244	-33.231	-25.159	-27.394	-15.154	-
-6.3	-25.389	-6.069	-18.009	-13.081	-5.009	-7.659	-33.231	-25.159	-27.809	-14.984	-
-6.2	-25.297	-5.404	-18.680	-13.559	-5.009	-8.221	-33.709	-25.159	-28.371	-14.810	-
-6.1	-20.936	-5.101	-16.127	-14.752	-5.009	-7.372	-34.902	-25.159	-27.522	-14.633	-
-6	-18.189	-5.009	-13.148	-14.327	-5.009	-6.786	-34.477	-25.159	-26.936	-14.454	-
-5.9	-16.672	-5.134	-10.990	-12.768	-5.009	-6.385	-32.918	-25.159	-26.535	-14.271	-
-5.8	-15.990	-5.504	-9.375	-11.256	-5.009	-6.179	-31.406	-25.159	-26.329	-14.086	-
-5.7	-15.792	-6.016	-8.221	-10.186	-5.009	-6.110	-30.336	-25.159	-26.260	-13.897	-
-5.6	-15.397	-6.754	-7.372	-9.592	-5.009	-6.110	-29.742	-25.159	-26.260	-13.705	-
-5.5	-14.327	-7.629	-6.786	-9.469	-5.009	-6.110	-29.619	-25.159	-26.260	-13.509	-

-5.4	-12.768	-8.672	-6.385	-9.469	-5.134	-6.110	-29.619	-25.284	-26.260	-13.310	-
-5.3	-11.256	-9.939	-6.179	-9.469	-5.504	-6.110	-29.619	-25.654	-26.260	-13.107	-
-5.2	-10.186	-11.359	-6.110	-9.469	-6.016	-6.110	-29.619	-26.166	-26.260	-12.900	-
-5.1	-9.592	-13.140	-6.238	-9.469	-6.754	-6.110	-29.619	-26.904	-26.260	-12.689	-
-5	-9.469	-15.298	-6.502	-9.469	-7.629	-6.110	-29.619	-27.779	-26.260	-12.474	-
-4.9	-9.903	-17.956	-7.013	-9.469	-8.672	-6.110	-29.619	-28.822	-26.260	-12.255	-
-4.8	-11.088	-21.636	-7.694	-9.469	-9.939	-6.110	-29.619	-30.089	-26.260	-12.031	-
-4.7	-13.096	-24.696	-8.721	-9.469	-11.359	-6.110	-29.619	-31.509	-26.260	-11.802	-
-4.6	-15.902	-23.905	-9.964	-9.469	-13.140	-6.238	-29.619	-33.290	-26.388	-11.569	-
-4.5	-19.081	-20.569	-11.666	-9.469	-14.747	-6.502	-29.619	-34.897	-26.652	-11.330	-
-4.4	-19.660	-18.224	-13.475	-9.903	-14.747	-7.013	-30.053	-34.897	-27.163	-11.086	-
-4.3	-16.866	-16.498	-15.269	-11.088	-14.747	-7.694	-31.238	-34.897	-27.844	-10.837	-
-4.2	-14.478	-15.503	-15.921	-11.010	-14.706	-8.721	-31.160	-34.856	-28.871	-10.581	-
-4.1	-13.060	-15.031	-15.199	-10.850	-14.567	-9.964	-31.000	-34.717	-30.114	-10.320	-
-4	-12.212	-14.747	-14.065	-10.815	-14.350	-11.666	-30.965	-34.500	-31.816	-10.051	-
-3.9	-11.651	-14.811	-13.007	-10.815	-14.350	-12.495	-30.965	-34.500	-32.645	-9.777	-
-3.8	-11.254	-14.794	-12.527	-10.815	-14.350	-12.495	-30.965	-34.500	-32.645	-9.495	-
-3.7	-11.010	-14.706	-12.495	-10.815	-14.350	-12.495	-30.965	-34.500	-32.645	-9.205	-
-3.6	-10.850	-14.567	-13.082	-10.815	-14.350	-12.495	-30.965	-34.500	-32.645	-8.908	-
-3.5	-10.815	-14.350	-14.259	-10.815	-14.350	-12.495	-30.965	-34.500	-32.645	-8.602	-
-3.4	-11.082	-14.359	-15.935	-10.815	-14.350	-11.642	-30.965	-34.500	-31.792	-8.287	-
-3.3	-11.941	-14.571	-17.732	-10.815	-14.350	-10.206	-30.965	-34.500	-30.356	-7.963	-
-3.2	-13.645	-15.084	-17.688	-10.815	-14.350	-9.243	-30.965	-34.500	-29.393	-7.629	-
-3.1	-16.464	-15.786	-15.882	-10.815	-13.502	-8.584	-30.965	-33.652	-28.734	-7.284	-
-3	-21.488	-16.329	-13.498	-10.815	-12.632	-8.227	-30.965	-32.782	-28.377	-6.928	-
-2.9	-33.918	-16.372	-11.642	-11.082	-11.981	-8.043	-31.232	-32.131	-28.193	-6.560	-
-2.8	-23.603	-15.661	-10.206	-11.941	-11.498	-8.043	-32.091	-31.648	-28.193	-6.179	-
-2.7	-17.969	-14.585	-9.243	-13.645	-11.142	-8.043	-33.795	-31.292	-28.193	-5.784	-
-2.6	-15.436	-13.502	-8.584	-13.926	-10.764	-8.043	-34.076	-30.914	-28.193	-5.374	-
-2.5	-14.240	-12.632	-8.227	-13.926	-10.428	-8.043	-34.076	-30.578	-28.193	-4.949	-
-2.4	-13.926	-11.981	-8.043	-13.926	-10.098	-8.043	-34.076	-30.248	-28.193	-4.505	-
-2.3	-14.404	-11.498	-8.044	-13.926	-9.739	-8.043	-34.076	-29.889	-28.193	-4.043	-
-2.2	-15.531	-11.142	-8.115	-13.926	-9.529	-8.043	-34.076	-29.679	-28.193	-3.561	-
-2.1	-16.848	-10.764	-8.296	-13.926	-9.235	-8.043	-34.076	-29.385	-28.193	-3.055	-
-2	-17.836	-10.428	-8.469	-12.563	-8.980	-8.043	-32.713	-29.130	-28.193	-2.526	-
-1.9	-17.974	-10.098	-8.693	-11.096	-8.644	-7.387	-31.246	-28.794	-27.537	-1.969	-
-1.8	-17.058	-9.739	-8.789	-9.746	-8.080	-6.711	-29.896	-28.230	-26.861	-1.382	-
-1.7	-15.567	-9.529	-8.819	-8.689	-7.555	-5.937	-28.839	-27.705	-26.087	-	-
-1.6	-14.054	-9.235	-8.533	-8.005	-6.931	-5.392	-28.155	-27.081	-25.542	-	-
-1.5	-12.563	-8.980	-8.115	-7.621	-6.360	-4.895	-27.771	-26.510	-25.045	-	-
-1.4	-11.096	-8.644	-7.387	-7.484	-5.994	-4.677	-27.634	-26.144	-24.827	-	-
-1.3	-9.746	-8.080	-6.711	-7.484	-5.696	-4.557	-27.634	-25.846	-24.707	-	-
-1.2	-8.689	-7.555	-5.937	-7.484	-5.652	-4.557	-27.634	-25.802	-24.707	-	-
-1.1	-8.005	-6.931	-5.392	-7.484	-5.652	-4.557	-27.634	-25.802	-24.707	-	-
-1	-7.621	-6.360	-4.895	-7.484	-5.652	-4.557	-27.634	-25.802	-24.707	-	-
-0.9	-7.484	-5.994	-4.677	-7.484	-5.652	-4.557	-27.634	-25.802	-24.707	-	-
-0.8	-7.580	-5.696	-4.557	-7.484	-5.652	-4.557	-27.634	-25.802	-24.707	-	-
-0.7	-7.885	-5.652	-4.703	-7.484	-5.652	-4.557	-27.634	-25.802	-24.707	-	-
-0.6	-8.245	-5.759	-4.950	-7.484	-5.652	-4.557	-27.634	-25.802	-24.707	-	-
-0.5	-8.478	-5.997	-5.410	-7.484	-5.652	-4.557	-27.634	-25.802	-24.707	-	-
-0.4	-8.508	-6.425	-5.947	-7.484	-5.652	-4.557	-27.634	-25.802	-24.707	-	-
-0.3	-8.387	-6.889	-6.616	-7.580	-5.652	-4.557	-27.730	-25.802	-24.707	-	-
-0.2	-8.225	-7.439	-7.300	-7.885	-5.652	-4.703	-28.035	-25.802	-24.853	-	-
-0.1	-8.075	-7.998	-8.017	-7.983	-5.759	-4.950	-28.133	-25.909	-25.100	-	-
0	-7.983	-8.506	-8.657	-7.983	-5.997	-5.410	-28.133	-26.147	-25.560	-	-
0.1	-8.002	-8.978	-9.247	-7.983	-6.425	-5.947	-28.133	-26.575	-26.097	-	-
0.2	-8.163	-9.384	-9.703	-7.983	-6.889	-6.616	-28.133	-27.039	-26.766	-	-
0.3	-8.494	-9.709	-10.073	-7.983	-7.439	-7.300	-28.133	-27.589	-27.450	-	-
0.4	-9.025	-10.016	-10.345	-7.983	-7.998	-8.017	-28.133	-28.148	-28.167	-	-
0.5	-9.757	-10.320	-10.566	-7.983	-8.506	-8.657	-28.133	-28.656	-28.807	-	-

0.6	-10.625	-10.572	-10.769	-8.002	-8.978	-9.247	-28.152	-29.128	-29.397	-
0.7	-11.473	-10.900	-10.985	-8.163	-9.384	-9.703	-28.313	-29.534	-29.853	-
0.8	-12.079	-11.146	-11.221	-8.494	-9.709	-10.073	-28.644	-29.859	-30.223	-
0.9	-12.245	-11.357	-11.500	-9.025	-10.016	-10.345	-29.175	-30.166	-30.495	-
1	-12.031	-11.562	-11.774	-9.757	-10.320	-10.566	-29.907	-30.470	-30.716	-
1.1	-11.760	-11.665	-12.067	-10.625	-10.572	-10.769	-30.775	-30.722	-30.919	-
1.2	-11.798	-11.892	-12.311	-11.473	-10.900	-10.985	-31.623	-31.050	-31.135	-
1.3	-12.492	-12.154	-12.571	-11.760	-11.146	-11.221	-31.910	-31.296	-31.371	-
1.4	-14.035	-12.539	-12.784	-11.760	-11.357	-11.500	-31.910	-31.507	-31.650	-
1.5	-16.581	-13.046	-13.045	-11.760	-11.562	-11.774	-31.910	-31.712	-31.924	-
1.6	-20.408	-13.459	-13.218	-11.760	-11.665	-10.992	-31.910	-31.815	-31.142	-
1.7	-23.333	-13.745	-13.328	-11.798	-11.892	-10.195	-31.948	-32.042	-30.345	-
1.8	-20.221	-13.736	-13.154	-12.492	-12.154	-9.465	-32.642	-32.304	-29.615	-1.382
1.9	-17.403	-13.600	-12.661	-14.035	-12.539	-9.086	-34.185	-32.689	-29.236	-1.969
2	-16.438	-13.529	-11.924	-14.492	-13.046	-8.894	-34.642	-33.196	-29.044	-2.526
2.1	-17.098	-13.861	-10.992	-10.514	-13.459	-8.894	-30.664	-33.609	-29.044	-3.055
2.2	-19.999	-14.698	-10.195	-7.945	-13.529	-8.894	-28.095	-33.679	-29.044	-3.561
2.3	-28.346	-16.655	-9.465	-6.290	-12.465	-8.894	-26.440	-32.615	-29.044	-4.043
2.4	-21.665	-19.922	-9.086	-5.443	-10.326	-8.894	-25.593	-30.476	-29.044	-4.505
2.5	-14.492	-24.257	-8.894	-5.278	-8.836	-8.894	-25.428	-28.986	-29.044	-4.949
2.6	-10.514	-21.126	-9.145	-5.278	-7.991	-8.894	-25.428	-28.141	-29.044	-5.374
2.7	-7.945	-16.051	-9.648	-5.278	-7.723	-8.894	-25.428	-27.873	-29.044	-5.784
2.8	-6.290	-12.465	-10.702	-5.278	-7.723	-8.894	-25.428	-27.873	-29.044	-6.179
2.9	-5.443	-10.326	-12.088	-5.278	-7.723	-8.894	-25.428	-27.873	-29.044	-6.560
3	-5.278	-8.836	-14.243	-5.278	-7.723	-8.894	-25.428	-27.873	-29.044	-6.928
3.1	-5.704	-7.991	-16.682	-5.278	-7.723	-9.145	-25.428	-27.873	-29.295	-7.284
3.2	-6.770	-7.723	-19.456	-5.278	-7.723	-9.648	-25.428	-27.873	-29.798	-7.629
3.3	-8.710	-7.864	-19.667	-5.278	-7.723	-10.702	-25.428	-27.873	-30.852	-7.963
3.4	-11.905	-8.670	-18.110	-5.278	-7.723	-12.088	-25.428	-27.873	-32.238	-8.287
3.5	-16.696	-9.934	-16.201	-5.278	-7.723	-14.243	-25.428	-27.873	-34.393	-8.602
3.6	-20.064	-12.146	-15.000	-5.704	-7.723	-14.373	-25.854	-27.873	-34.523	-8.908
3.7	-16.078	-15.676	-14.373	-6.770	-7.723	-14.373	-26.920	-27.873	-34.523	-9.205
3.8	-12.664	-22.114	-14.411	-8.710	-7.864	-14.373	-28.860	-28.014	-34.523	-9.495
3.9	-10.895	-34.644	-14.959	-10.261	-8.250	-14.373	-30.411	-28.400	-34.523	-9.777
4	-10.261	-19.551	-16.296	-10.261	-7.487	-14.373	-30.411	-27.637	-34.523	-10.051
4.1	-10.427	-14.406	-18.308	-10.261	-7.012	-14.373	-30.411	-27.162	-34.523	-10.320
4.2	-11.327	-11.415	-21.888	-10.261	-6.874	-14.373	-30.411	-27.024	-34.523	-10.581
4.3	-13.102	-9.613	-27.560	-10.261	-6.874	-14.411	-30.411	-27.024	-34.561	-10.837
4.4	-16.005	-8.250	-29.728	-10.261	-6.874	-14.133	-30.411	-27.024	-34.283	-11.086
4.5	-20.070	-7.487	-23.662	-10.261	-6.874	-13.384	-30.411	-27.024	-33.534	-11.330
4.6	-23.660	-7.012	-19.241	-10.427	-6.874	-13.252	-30.577	-27.024	-33.402	-11.569
4.7	-21.917	-6.874	-16.910	-11.327	-6.874	-13.250	-31.477	-27.024	-33.400	-11.802
4.8	-18.828	-7.125	-15.070	-13.102	-6.874	-13.250	-33.252	-27.024	-33.400	-12.031
4.9	-16.810	-7.623	-14.133	-12.616	-6.874	-13.250	-32.766	-27.024	-33.400	-12.255
5	-15.590	-8.720	-13.384	-12.107	-6.874	-13.250	-32.257	-27.024	-33.400	-12.474
5.1	-14.712	-10.230	-13.252	-11.715	-6.874	-13.250	-31.865	-27.024	-33.400	-12.689
5.2	-13.943	-12.596	-13.250	-11.478	-6.874	-13.250	-31.628	-27.024	-33.400	-12.900
5.3	-13.230	-16.473	-13.812	-11.426	-7.125	-13.250	-31.576	-27.275	-33.400	-13.107
5.4	-12.616	-21.649	-14.529	-11.426	-7.623	-13.250	-31.576	-27.773	-33.400	-13.310
5.5	-12.107	-20.878	-15.886	-11.426	-8.412	-13.250	-31.576	-28.562	-33.400	-13.509
5.6	-11.715	-15.621	-17.508	-11.426	-8.406	-13.250	-31.576	-28.556	-33.400	-13.705
5.7	-11.478	-12.404	-20.001	-11.426	-8.406	-13.250	-31.576	-28.556	-33.400	-13.897
5.8	-11.426	-10.172	-22.773	-11.426	-8.406	-13.812	-31.576	-28.556	-33.962	-14.086
5.9	-11.575	-9.067	-25.695	-11.426	-8.406	-14.529	-31.576	-28.556	-34.679	-14.271
6	-11.962	-8.412	-25.034	-11.426	-8.406	-15.886	-31.576	-28.556	-36.036	-14.454
6.1	-12.661	-8.406	-23.000	-11.426	-8.406	-17.508	-31.576	-28.556	-37.658	-14.633
6.2	-13.771	-8.901	-20.830	-11.426	-8.406	-18.566	-31.576	-28.556	-38.716	-14.810
6.3	-15.440	-9.737	-19.589	-11.426	-8.406	-18.566	-31.576	-28.556	-38.716	-14.984
6.4	-17.785	-11.100	-18.753	-11.575	-8.406	-18.566	-31.725	-28.556	-38.716	-15.154
6.5	-20.051	-12.136	-18.566	-11.962	-7.687	-18.566	-32.112	-27.837	-38.716	-15.323

6.6	-19.713	-12.305	-18.603	-11.585	-6.956	-18.566	-31.735	-27.106	-38.716	-15.489	-
6.7	-17.118	-11.501	-19.104	-11.427	-6.768	-18.566	-31.577	-26.918	-38.716	-15.652	-
6.8	-14.681	-9.959	-19.550	-11.397	-6.768	-18.566	-31.547	-26.918	-38.716	-15.813	-
6.9	-13.032	-8.610	-20.114	-11.141	-6.768	-18.566	-31.291	-26.918	-38.716	-15.971	-
7	-12.069	-7.687	-20.213	-10.526	-6.768	-18.372	-30.676	-26.918	-38.522	-16.000	-
7.1	-11.585	-6.956	-20.073	-9.755	-6.768	-18.263	-29.905	-26.918	-38.413	-16.000	-
7.2	-11.427	-6.768	-19.574	-9.036	-6.768	-18.263	-29.186	-26.918	-38.413	-16.000	-
7.3	-11.397	-6.792	-19.076	-8.538	-6.768	-18.263	-28.688	-26.918	-38.413	-16.000	-
7.4	-11.141	-7.114	-18.618	-8.458	-6.768	-18.263	-28.608	-26.918	-38.413	-16.000	-
7.5	-10.526	-7.783	-18.372	-8.458	-6.768	-18.263	-28.608	-26.918	-38.413	-16.000	-
7.6	-9.755	-8.473	-18.263	-8.458	-6.768	-18.263	-28.608	-26.918	-38.413	-16.000	-
7.7	-9.036	-9.440	-18.420	-8.458	-6.768	-18.263	-28.608	-26.918	-38.413	-16.000	-
7.8	-8.538	-10.296	-18.650	-8.458	-6.792	-18.263	-28.608	-26.942	-38.413	-16.000	-
7.9	-8.458	-10.873	-19.169	-8.458	-7.114	-18.263	-28.608	-27.264	-38.413	-16.000	-
8	-8.892	-11.380	-19.650	-8.458	-7.783	-18.263	-28.608	-27.933	-38.413	-16.000	-
8.1	-9.860	-11.444	-20.354	-8.458	-8.473	-17.616	-28.608	-28.623	-37.766	-16.000	-
8.2	-11.489	-11.451	-20.739	-8.458	-9.440	-16.254	-28.608	-29.590	-36.404	-16.000	-
8.3	-14.139	-11.568	-20.863	-8.458	-10.296	-15.162	-28.608	-30.446	-35.312	-16.000	-
8.4	-18.458	-11.686	-20.198	-8.458	-10.873	-14.351	-28.608	-31.023	-34.501	-16.000	-
8.5	-26.518	-12.252	-19.020	-8.892	-11.380	-13.889	-29.042	-31.530	-34.039	-16.000	-
8.6	-33.659	-12.969	-17.616	-9.860	-11.444	-13.832	-30.010	-31.594	-33.982	-16.000	-
8.7	-22.971	-14.058	-16.254	-11.489	-11.451	-13.832	-31.639	-31.601	-33.982	-16.000	-
8.8	-19.297	-15.463	-15.162	-14.139	-11.568	-13.832	-34.289	-31.718	-33.982	-16.000	-
8.9	-17.864	-16.587	-14.351	-17.491	-11.686	-13.832	-37.641	-31.836	-33.982	-16.000	-
9	-17.491	-17.055	-13.889	-17.491	-12.252	-13.832	-37.641	-32.402	-33.982	-16.000	-
9.1	-17.574	-16.082	-13.832	-17.491	-12.969	-13.832	-37.641	-33.119	-33.982	-16.000	-
9.2	-17.757	-14.606	-14.114	-17.491	-14.058	-13.832	-37.641	-34.208	-33.982	-16.000	-

### Nominal 14.5GHz, H-Polarized, X-pol PSD, with -20.15dBW/4kHz Input





Data in support of claim that proposed operation meets criteria of VMES Order July 2009

Applicant RAS Date of Application  
 ID Heading  
 a1 Antenna Manufacture: RAS c Main bore gain (dBi): 36.0  
 a2 Antenna Model: SR5000 d Frequency at which gain was measured (GHz): 14.5  
 a3 Antenna ID: RAS e Max input power density (dBW/4kHz): -20.15  
 b Transmit Band (b): 14GHz Pattern ID Table C6  
 Pattern Description: 14.5GHz V-polarization, X-polarized tangent to the geosynchronous plane for 0°, 37.5°, and 50° skew angle

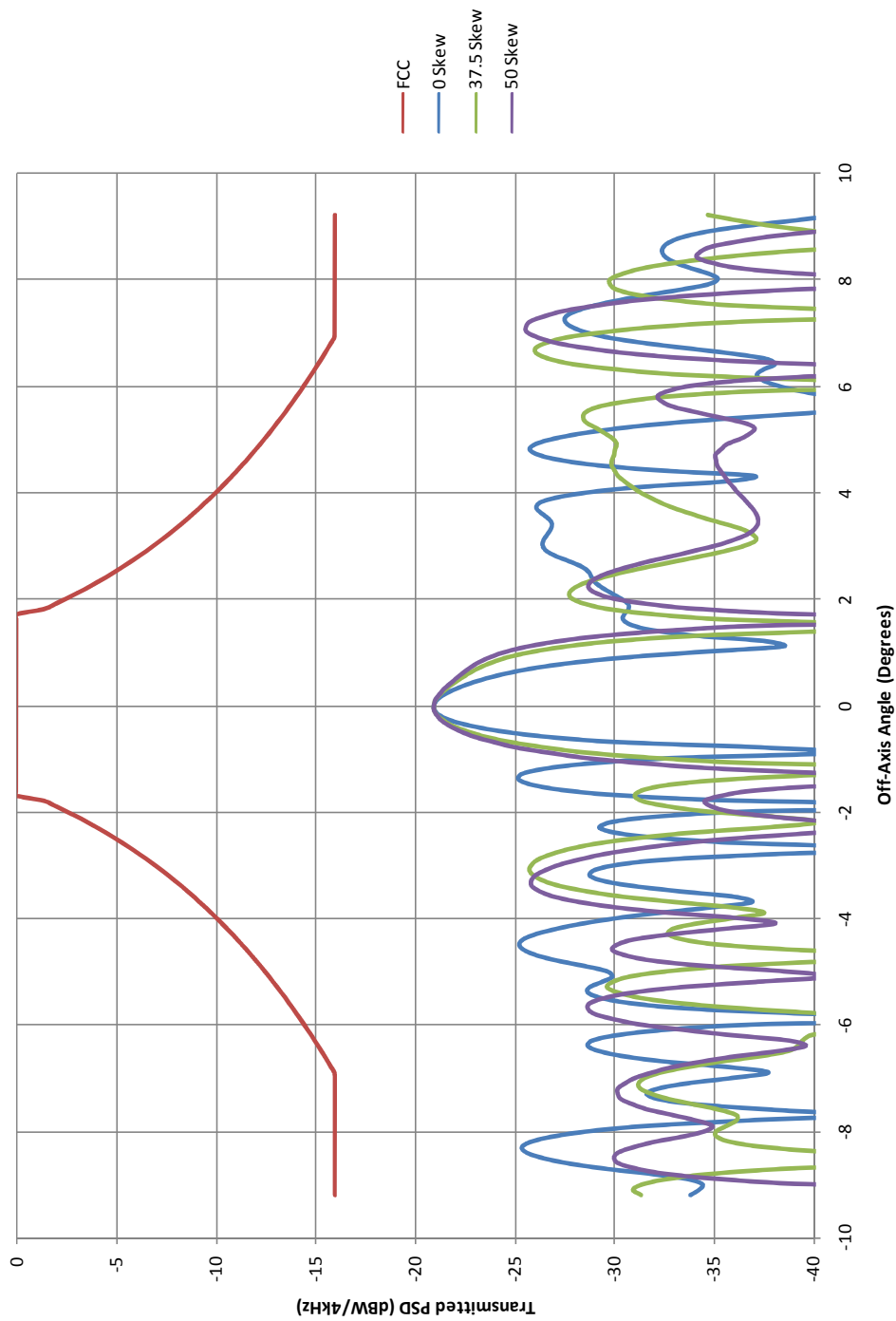
Offset Angles  (Degrees)	Nominal X-Pol Gain Along Tangent to Geo Arc  (dBi)			Worst Case X-Pol Gain Along Tangent to Geo Arc  (dBi)			Worst Case X-Pol PSD Along Tangent to Geo Arc input PSD = -20.15dBW/4kHz  (dBW/4kHz)			FCC Mask (dBW/4kHz)	Mask Exceedence  (dB)
	0? Skew	37.5? Skew	50? Skew	0? Skew	37.5? Skew	50? Skew	0? Skew	37.5? Skew	50? Skew		
	-9.2	-13.649	-11.166	-23.893	-9.230	-10.769	-10.858	-29.380	-30.919		
-9.1	-14.088	-10.769	-31.971	-7.415	-10.769	-9.996	-27.565	-30.919	-30.146	-16.000	-
-9	-14.247	-11.261	-19.680	-6.165	-10.769	-9.805	-26.315	-30.919	-29.955	-16.000	-
-8.9	-13.499	-12.517	-15.071	-5.407	-10.769	-9.805	-25.557	-30.919	-29.955	-16.000	-
-8.8	-11.549	-14.816	-12.338	-5.190	-10.769	-9.805	-25.340	-30.919	-29.955	-16.000	-
-8.7	-9.230	-18.883	-10.858	-5.190	-10.769	-9.805	-25.340	-30.919	-29.955	-16.000	-
-8.6	-7.415	-26.568	-9.996	-5.190	-10.769	-9.805	-25.340	-30.919	-29.955	-16.000	-
-8.5	-6.165	-29.320	-9.805	-5.190	-11.261	-9.805	-25.340	-31.411	-29.955	-16.000	-
-8.4	-5.407	-21.033	-10.025	-5.190	-12.517	-9.805	-25.340	-32.667	-29.955	-16.000	-
-8.3	-5.190	-17.378	-10.805	-5.190	-14.816	-9.805	-25.340	-34.966	-29.955	-16.000	-
-8.2	-5.653	-15.623	-11.861	-5.190	-14.958	-9.805	-25.340	-35.108	-29.955	-16.000	-
-8.1	-6.783	-14.958	-13.302	-5.190	-14.958	-9.805	-25.340	-35.108	-29.955	-16.000	-
-8	-8.644	-14.969	-14.385	-5.190	-13.844	-9.805	-25.340	-33.994	-29.955	-16.000	-
-7.9	-11.597	-15.482	-14.730	-5.190	-12.576	-10.025	-25.340	-32.726	-30.175	-16.000	-
-7.8	-16.543	-15.965	-13.908	-5.190	-11.689	-9.989	-25.340	-31.839	-30.139	-16.000	-
-7.7	-21.870	-15.965	-12.753	-5.653	-11.137	-9.989	-25.803	-31.287	-30.139	-16.000	-
-7.6	-17.735	-15.097	-11.542	-6.783	-11.054	-9.989	-26.933	-31.204	-30.139	-16.000	-
-7.5	-13.973	-13.844	-10.749	-8.644	-11.054	-9.989	-28.794	-31.204	-30.139	-16.000	-
-7.4	-12.023	-12.576	-10.155	-11.444	-11.054	-9.989	-31.594	-31.204	-30.139	-16.000	-
-7.3	-11.444	-11.689	-9.989	-11.444	-11.054	-9.989	-31.594	-31.204	-30.139	-16.000	-
-7.2	-12.043	-11.137	-10.001	-11.444	-11.054	-9.989	-31.594	-31.204	-30.139	-16.000	-
-7.1	-13.557	-11.054	-10.369	-10.360	-11.054	-9.989	-30.510	-31.204	-30.139	-16.000	-
-7	-15.824	-11.390	-10.874	-9.075	-11.054	-9.989	-29.225	-31.204	-30.139	-16.000	-
-6.9	-17.562	-12.182	-11.722	-8.491	-11.054	-9.989	-28.641	-31.204	-30.139	-15.971	-
-6.8	-15.586	-13.481	-12.712	-8.491	-11.054	-9.989	-28.641	-31.204	-30.139	-15.813	-
-6.7	-12.485	-15.102	-14.147	-8.491	-11.054	-10.001	-28.641	-31.204	-30.151	-15.652	-
-6.6	-10.360	-17.072	-15.842	-8.491	-11.054	-10.369	-28.641	-31.204	-30.519	-15.489	-
-6.5	-9.075	-18.547	-17.993	-8.491	-11.390	-10.874	-28.641	-31.540	-31.024	-15.323	-
-6.4	-8.491	-19.042	-19.426	-8.491	-12.182	-9.785	-28.641	-32.332	-29.935	-15.154	-
-6.3	-8.724	-19.290	-18.575	-8.491	-13.481	-8.826	-28.641	-33.631	-28.976	-14.984	-
-6.2	-9.963	-19.714	-15.716	-8.491	-15.102	-8.486	-28.641	-35.252	-28.636	-14.810	-
-6.1	-12.383	-21.424	-13.271	-8.491	-13.165	-8.486	-28.641	-33.315	-28.636	-14.633	-
-6	-16.877	-25.379	-11.132	-8.491	-11.144	-8.486	-28.641	-31.294	-28.636	-14.454	-
-5.9	-27.924	-27.389	-9.785	-8.491	-10.028	-8.486	-28.641	-30.178	-28.636	-14.271	-
-5.8	-19.732	-20.828	-8.826	-8.503	-9.467	-8.486	-28.653	-29.617	-28.636	-14.086	-
-5.7	-13.564	-16.318	-8.486	-8.503	-9.467	-8.486	-28.653	-29.617	-28.636	-13.897	-
-5.6	-10.671	-13.165	-8.587	-8.503	-9.467	-8.486	-28.653	-29.617	-28.636	-13.705	-
-5.5	-9.154	-11.144	-9.345	-8.503	-9.467	-8.486	-28.653	-29.617	-28.636	-13.509	-

-5.4	-8.503	-10.028	-10.744	-8.312	-9.467	-8.486	-28.462	-29.617	-28.636	-13.310	-
-5.3	-8.584	-9.467	-13.131	-6.960	-9.467	-8.486	-27.110	-29.617	-28.636	-13.107	-
-5.2	-9.202	-9.745	-16.905	-5.926	-9.467	-8.486	-26.076	-29.617	-28.636	-12.900	-
-5.1	-9.732	-10.606	-20.625	-5.292	-9.467	-8.587	-25.442	-29.617	-28.737	-12.689	-
-5	-9.454	-12.504	-18.315	-5.059	-9.467	-9.345	-25.209	-29.617	-29.495	-12.474	-
-4.9	-8.312	-15.724	-14.379	-5.059	-9.467	-9.714	-25.209	-29.617	-29.864	-12.255	-
-4.8	-6.960	-21.045	-11.726	-5.059	-9.467	-9.714	-25.209	-29.617	-29.864	-12.031	-
-4.7	-5.926	-25.094	-10.366	-5.059	-9.745	-9.714	-25.209	-29.895	-29.864	-11.802	-
-4.6	-5.292	-19.043	-9.714	-5.059	-10.606	-9.714	-25.209	-30.756	-29.864	-11.569	-
-4.5	-5.059	-15.087	-9.958	-5.059	-12.504	-9.714	-25.209	-32.654	-29.864	-11.330	-
-4.4	-5.259	-13.241	-10.834	-5.059	-12.528	-9.714	-25.209	-32.678	-29.864	-11.086	-
-4.3	-5.919	-12.528	-12.786	-5.059	-12.528	-9.714	-25.209	-32.678	-29.864	-10.837	-
-4.2	-6.950	-12.790	-15.417	-5.059	-12.528	-8.061	-25.209	-32.678	-28.211	-10.581	-
-4.1	-8.292	-14.020	-17.905	-5.059	-10.263	-6.801	-25.209	-30.413	-26.951	-10.320	-
-4	-10.002	-15.841	-15.975	-5.059	-8.466	-6.071	-25.209	-28.616	-26.221	-10.051	-
-3.9	-12.157	-17.360	-12.536	-5.259	-7.110	-5.677	-25.409	-27.260	-25.827	-9.777	-
-3.8	-14.731	-15.735	-9.890	-5.919	-6.266	-5.649	-26.069	-26.416	-25.799	-9.495	-
-3.7	-16.748	-12.882	-8.061	-6.950	-5.773	-5.649	-27.100	-25.923	-25.799	-9.205	-
-3.6	-15.833	-10.263	-6.801	-8.292	-5.566	-5.649	-28.442	-25.716	-25.799	-8.908	-
-3.5	-13.146	-8.466	-6.071	-8.590	-5.566	-5.649	-28.740	-25.716	-25.799	-8.602	-
-3.4	-10.785	-7.110	-5.677	-8.590	-5.566	-5.649	-28.740	-25.716	-25.799	-8.287	-
-3.3	-9.226	-6.266	-5.649	-8.590	-5.566	-5.649	-28.740	-25.716	-25.799	-7.963	-
-3.2	-8.590	-5.773	-5.856	-8.590	-5.566	-5.649	-28.740	-25.716	-25.799	-7.629	-
-3.1	-8.833	-5.566	-6.366	-8.590	-5.566	-5.649	-28.740	-25.716	-25.799	-7.284	-
-3	-10.004	-5.676	-7.057	-8.590	-5.566	-5.649	-28.740	-25.716	-25.799	-6.928	-
-2.9	-12.532	-6.004	-8.077	-8.590	-5.566	-5.649	-28.740	-25.716	-25.799	-6.560	-
-2.8	-17.927	-6.671	-9.306	-8.590	-5.566	-5.649	-28.740	-25.716	-25.799	-6.179	-
-2.7	-25.472	-7.622	-10.998	-8.590	-5.566	-5.856	-28.740	-25.716	-26.006	-5.784	-
-2.6	-16.663	-8.989	-13.121	-8.833	-5.566	-6.366	-28.983	-25.716	-26.516	-5.374	-
-2.5	-12.161	-10.984	-16.040	-9.073	-5.676	-7.057	-29.223	-25.826	-27.207	-4.949	-
-2.4	-9.897	-13.625	-19.878	-9.073	-6.004	-8.077	-29.223	-26.154	-28.227	-4.505	-
-2.3	-9.073	-17.463	-23.032	-9.073	-6.671	-9.306	-29.223	-26.821	-29.456	-4.043	-
-2.2	-9.666	-20.079	-20.766	-9.073	-7.622	-10.998	-29.223	-27.772	-31.148	-3.561	-
-2.1	-11.824	-17.926	-17.797	-7.292	-8.989	-13.121	-27.442	-29.139	-33.271	-3.055	-
-2	-16.612	-14.504	-15.624	-5.718	-10.857	-14.360	-25.868	-31.007	-34.510	-2.526	-
-1.9	-30.526	-12.467	-14.653	-5.026	-10.857	-14.360	-25.176	-31.007	-34.510	-1.969	-
-1.8	-16.193	-11.197	-14.360	-5.026	-10.857	-14.360	-25.176	-31.007	-34.510	-1.382	-
-1.7	-10.225	-10.857	-15.239	-5.026	-10.857	-14.360	-25.176	-31.007	-34.510	-	-
-1.6	-7.292	-11.255	-17.029	-5.026	-10.857	-11.413	-25.176	-31.007	-31.563	-	-
-1.5	-5.718	-12.561	-21.711	-5.026	-10.857	-8.491	-25.176	-31.007	-28.641	-	-
-1.4	-5.026	-15.515	-34.618	-5.026	-8.568	-6.584	-25.176	-28.718	-26.734	-	-
-1.3	-5.161	-21.151	-22.419	-5.026	-6.393	-4.916	-25.176	-26.543	-25.066	-	-
-1.2	-6.283	-31.944	-15.294	-5.026	-4.668	-3.798	-25.176	-24.818	-23.948	-	-
-1.1	-8.541	-17.429	-11.413	-5.026	-3.392	-2.816	-25.176	-23.542	-22.966	-	-
-1	-12.572	-12.103	-8.491	-4.258	-2.493	-2.121	-24.408	-22.643	-22.271	-	-
-0.9	-21.085	-8.568	-6.584	-2.728	-1.742	-1.571	-22.878	-21.892	-21.721	-	-
-0.8	-17.379	-6.393	-4.916	-1.689	-1.284	-1.169	-21.839	-21.434	-21.319	-	-
-0.7	-10.150	-4.668	-3.798	-1.077	-0.949	-0.924	-21.227	-21.099	-21.074	-	-
-0.6	-6.509	-3.392	-2.816	-0.809	-0.780	-0.771	-20.959	-20.930	-20.921	-	-
-0.5	-4.258	-2.493	-2.121	-0.775	-0.775	-0.771	-20.925	-20.925	-20.921	-	-
-0.4	-2.728	-1.742	-1.571	-0.775	-0.775	-0.771	-20.925	-20.925	-20.921	-	-
-0.3	-1.689	-1.284	-1.169	-0.775	-0.775	-0.771	-20.925	-20.925	-20.921	-	-
-0.2	-1.077	-0.949	-0.924	-0.775	-0.775	-0.771	-20.925	-20.925	-20.921	-	-
-0.1	-0.809	-0.780	-0.771	-0.775	-0.775	-0.771	-20.925	-20.925	-20.921	-	-
0	-0.775	-0.775	-0.775	-0.775	-0.775	-0.771	-20.925	-20.925	-20.921	-	-
0.1	-0.940	-0.854	-0.836	-0.775	-0.775	-0.771	-20.925	-20.925	-20.921	-	-
0.2	-1.303	-1.094	-1.039	-0.775	-0.775	-0.771	-20.925	-20.925	-20.921	-	-
0.3	-1.855	-1.375	-1.261	-0.775	-0.775	-0.771	-20.925	-20.925	-20.921	-	-
0.4	-2.552	-1.728	-1.570	-0.775	-0.775	-0.771	-20.925	-20.925	-20.921	-	-
0.5	-3.413	-2.129	-1.871	-0.775	-0.775	-0.775	-20.925	-20.925	-20.925	-	-

0.6	-4.504	-2.551	-2.206	-0.940	-0.854	-0.836	-21.090	-21.004	-20.986	-
0.7	-5.931	-3.053	-2.577	-1.303	-1.094	-1.039	-21.453	-21.244	-21.189	-
0.8	-7.899	-3.696	-3.006	-1.855	-1.375	-1.261	-22.005	-21.525	-21.411	-
0.9	-10.621	-4.521	-3.604	-2.552	-1.728	-1.570	-22.702	-21.878	-21.720	-
1	-14.342	-5.745	-4.380	-3.413	-2.129	-1.871	-23.563	-22.279	-22.021	-
1.1	-18.318	-7.435	-5.516	-4.504	-2.551	-2.206	-24.654	-22.701	-22.356	-
1.2	-17.374	-9.883	-7.074	-5.931	-3.053	-2.577	-26.081	-23.203	-22.727	-
1.3	-13.944	-13.977	-9.293	-7.899	-3.696	-3.006	-28.049	-23.846	-23.156	-
1.4	-11.783	-21.206	-12.755	-10.277	-4.521	-3.604	-30.427	-24.671	-23.754	-
1.5	-10.692	-24.510	-18.462	-10.145	-5.745	-4.380	-30.295	-25.895	-24.530	-
1.6	-10.277	-15.761	-45.459	-9.669	-7.435	-5.516	-29.819	-27.585	-25.666	-
1.7	-10.317	-11.889	-20.027	-9.222	-7.573	-7.074	-29.372	-27.723	-27.224	-
1.8	-10.542	-9.549	-14.135	-8.865	-7.573	-8.531	-29.015	-27.723	-28.681	-1.382
1.9	-10.510	-8.346	-11.428	-8.682	-7.573	-8.531	-28.832	-27.723	-28.681	-1.969
2	-10.145	-7.690	-9.747	-8.533	-7.573	-8.531	-28.683	-27.723	-28.681	-2.526
2.1	-9.669	-7.573	-8.899	-8.173	-7.573	-8.531	-28.323	-27.723	-28.681	-3.055
2.2	-9.222	-7.837	-8.531	-7.550	-7.573	-8.531	-27.700	-27.723	-28.681	-3.561
2.3	-8.865	-8.407	-8.603	-6.857	-7.573	-8.531	-27.007	-27.723	-28.681	-4.043
2.4	-8.682	-9.314	-8.998	-6.392	-7.573	-8.531	-26.542	-27.723	-28.681	-4.505
2.5	-8.533	-10.357	-9.668	-6.226	-7.573	-8.531	-26.376	-27.723	-28.681	-4.949
2.6	-8.173	-11.631	-10.580	-6.226	-7.573	-8.531	-26.376	-27.723	-28.681	-5.374
2.7	-7.550	-12.940	-11.601	-6.226	-7.837	-8.531	-26.376	-27.987	-28.681	-5.784
2.8	-6.857	-14.280	-12.790	-6.226	-8.407	-8.603	-26.376	-28.557	-28.753	-6.179
2.9	-6.392	-15.503	-13.885	-6.226	-9.314	-8.998	-26.376	-29.464	-29.148	-6.560
3	-6.226	-16.449	-14.983	-6.226	-10.357	-9.668	-26.376	-30.507	-29.818	-6.928
3.1	-6.281	-16.958	-15.810	-6.164	-11.631	-10.580	-26.314	-31.781	-30.730	-7.284
3.2	-6.453	-16.787	-16.471	-5.915	-12.788	-11.601	-26.065	-32.938	-31.751	-7.629
3.3	-6.631	-16.253	-16.838	-5.915	-12.147	-12.790	-26.065	-32.297	-32.940	-7.963
3.4	-6.695	-15.372	-17.024	-5.915	-11.604	-13.885	-26.065	-31.754	-34.035	-8.287
3.5	-6.512	-14.427	-17.021	-5.915	-11.084	-14.983	-26.065	-31.234	-35.133	-8.602
3.6	-6.164	-13.605	-16.916	-5.915	-10.697	-15.760	-26.065	-30.847	-35.910	-8.908
3.7	-5.915	-12.788	-16.727	-5.915	-10.336	-15.523	-26.065	-30.486	-35.673	-9.205
3.8	-6.101	-12.147	-16.489	-5.915	-10.015	-15.330	-26.065	-30.165	-35.480	-9.495
3.9	-7.003	-11.604	-16.247	-5.915	-9.845	-15.136	-26.065	-29.995	-35.286	-9.777
4	-8.685	-11.084	-15.981	-5.915	-9.697	-14.972	-26.065	-29.847	-35.122	-10.051
4.1	-11.393	-10.697	-15.760	-5.915	-9.697	-14.918	-26.065	-29.847	-35.068	-10.320
4.2	-15.506	-10.336	-15.523	-5.915	-9.697	-14.894	-26.065	-29.847	-35.044	-10.581
4.3	-16.849	-10.015	-15.330	-5.578	-9.697	-14.894	-25.728	-29.847	-35.044	-10.837
4.4	-12.257	-9.845	-15.136	-5.578	-9.697	-14.894	-25.728	-29.847	-35.044	-11.086
4.5	-9.004	-9.697	-14.972	-5.578	-9.697	-14.894	-25.728	-29.847	-35.044	-11.330
4.6	-7.080	-9.711	-14.918	-5.578	-9.352	-14.894	-25.728	-29.502	-35.044	-11.569
4.7	-5.988	-9.827	-14.894	-5.578	-8.920	-14.894	-25.728	-29.070	-35.044	-11.802
4.8	-5.578	-9.867	-15.171	-5.578	-8.428	-14.894	-25.728	-28.578	-35.044	-12.031
4.9	-5.879	-9.952	-15.490	-5.578	-8.260	-14.894	-25.728	-28.410	-35.044	-12.255
5	-6.796	-9.753	-16.164	-5.578	-8.260	-13.895	-25.728	-28.410	-34.045	-12.474
5.1	-8.216	-9.352	-16.627	-5.578	-8.260	-12.753	-25.728	-28.410	-32.903	-12.689
5.2	-10.175	-8.920	-16.855	-5.578	-8.260	-12.200	-25.728	-28.410	-32.350	-12.900
5.3	-12.856	-8.428	-16.289	-5.578	-8.260	-11.996	-25.728	-28.410	-32.146	-13.107
5.4	-16.404	-8.260	-15.081	-5.879	-8.260	-11.996	-26.029	-28.410	-32.146	-13.310
5.5	-20.244	-8.402	-13.895	-6.796	-8.260	-11.996	-26.946	-28.410	-32.146	-13.509
5.6	-22.725	-9.036	-12.753	-8.216	-8.260	-11.996	-28.366	-28.410	-32.146	-13.705
5.7	-22.286	-10.476	-12.200	-10.175	-8.260	-11.996	-30.325	-28.410	-32.146	-13.897
5.8	-20.568	-12.818	-11.996	-12.856	-8.260	-11.996	-33.006	-28.410	-32.146	-14.086
5.9	-19.053	-17.799	-12.564	-16.404	-7.743	-11.996	-36.554	-27.893	-32.146	-14.271
6	-17.974	-32.120	-13.793	-16.983	-6.547	-11.996	-37.133	-26.697	-32.146	-14.454
6.1	-17.251	-20.333	-16.486	-15.673	-5.935	-10.567	-35.823	-26.085	-30.717	-14.633
6.2	-16.983	-13.315	-21.540	-13.420	-5.879	-8.409	-33.570	-26.029	-28.559	-14.810
6.3	-17.324	-9.958	-29.564	-11.243	-5.879	-6.877	-31.393	-26.029	-27.027	-14.984
6.4	-17.897	-7.743	-19.531	-9.507	-5.879	-5.988	-29.657	-26.029	-26.138	-15.154
6.5	-17.430	-6.547	-13.884	-8.368	-5.879	-5.435	-28.518	-26.029	-25.585	-15.323

6.6	-15.673	-5.935	-10.567	-7.682	-5.879	-5.386	-27.832	-26.029	-25.536	-15.489	-
6.7	-13.420	-5.879	-8.409	-7.357	-5.879	-5.386	-27.507	-26.029	-25.536	-15.652	-
6.8	-11.243	-6.420	-6.877	-7.357	-5.879	-5.386	-27.507	-26.029	-25.536	-15.813	-
6.9	-9.507	-7.423	-5.988	-7.357	-5.879	-5.386	-27.507	-26.029	-25.536	-15.971	-
7	-8.368	-9.319	-5.435	-7.357	-5.879	-5.386	-27.507	-26.029	-25.536	-16.000	-
7.1	-7.682	-11.994	-5.386	-7.357	-5.879	-5.386	-27.507	-26.029	-25.536	-16.000	-
7.2	-7.357	-16.457	-5.599	-7.357	-5.879	-5.386	-27.507	-26.029	-25.536	-16.000	-
7.3	-7.414	-24.910	-6.321	-7.357	-6.420	-5.386	-27.507	-26.570	-25.536	-16.000	-
7.4	-7.931	-22.377	-7.311	-7.357	-7.423	-5.386	-27.507	-27.573	-25.536	-16.000	-
7.5	-8.841	-15.867	-8.955	-7.357	-9.319	-5.386	-27.507	-29.469	-25.536	-16.000	-
7.6	-10.057	-12.840	-11.040	-7.357	-9.609	-5.386	-27.507	-29.759	-25.536	-16.000	-
7.7	-11.537	-10.973	-14.219	-7.357	-9.609	-5.599	-27.507	-29.759	-25.749	-16.000	-
7.8	-13.186	-9.946	-18.886	-7.414	-9.609	-6.321	-27.564	-29.759	-26.471	-16.000	-
7.9	-14.573	-9.609	-26.165	-7.931	-9.609	-7.311	-28.081	-29.759	-27.461	-16.000	-
8	-15.022	-9.644	-24.582	-8.841	-9.609	-8.955	-28.991	-29.759	-29.105	-16.000	-
8.1	-14.533	-10.278	-19.142	-10.057	-9.609	-11.040	-30.207	-29.759	-31.190	-16.000	-
8.2	-13.673	-11.264	-16.115	-11.537	-9.609	-13.970	-31.687	-29.759	-34.120	-16.000	-
8.3	-12.909	-12.845	-14.723	-12.228	-9.609	-13.970	-32.378	-29.759	-34.120	-16.000	-
8.4	-12.431	-15.058	-13.970	-12.228	-9.609	-13.970	-32.378	-29.759	-34.120	-16.000	-
8.5	-12.228	-17.930	-14.104	-12.228	-9.644	-13.970	-32.378	-29.794	-34.120	-16.000	-
8.6	-12.291	-21.846	-14.640	-12.228	-10.278	-13.970	-32.378	-30.428	-34.120	-16.000	-
8.7	-12.652	-24.383	-15.998	-12.228	-11.264	-13.970	-32.378	-31.414	-34.120	-16.000	-
8.8	-13.404	-22.602	-17.724	-12.228	-12.845	-13.970	-32.378	-32.995	-34.120	-16.000	-
8.9	-14.672	-19.848	-20.180	-12.228	-14.530	-13.970	-32.378	-34.680	-34.120	-16.000	-
9	-16.529	-17.668	-22.015	-12.228	-14.530	-14.104	-32.378	-34.680	-34.254	-16.000	-
9.1	-18.957	-15.987	-21.731	-12.291	-14.530	-14.640	-32.441	-34.680	-34.790	-16.000	-
9.2	-20.964	-14.530	-20.156	-12.652	-14.530	-15.998	-32.802	-34.680	-36.148	-16.000	-

### Nominal 14.5GHz, V-Polarized, X-pol PSD, with -20.15dBW/4kHz Input



**Table D1**

**Remote to Hub Emission Designator 7M04G7W**

Data Parameters		Satellite Parameters	
Data Rate	4976.6 kbps	Sat Name	TestSat
FEC	21/44 Turbo	Sat Long.	79 deg
Modulation	qpsk BPSK / QPSK	Sat Rx, G/T	4.5 dB/K
Threshold Eb/No	3.00 dB	Sat Tx, EIRP	48 dBW
Occ BW	1.35	SFD	-90 dBW/m <sup>2</sup>
Spread Spectrum	n (Y / N)	IP / OP ratio	5 dB
Chip Rate	5.21 Mchips/s	U/L Freq	14.25 GHz
Total # of spread Links	1	D/L Freq.	11.95 GHz
Beta Factor	1.00		
Rx Site Parameters		Tx Site Parameters	
Rx Site Name	Hub	Tx Site Name	Remote
Rx Lat	39 deg	Tx Lat	39 deg
Rx Long	77 deg	Tx Long	77 deg
Rx G/T	33 dB/K	Tx Ant Gain	36 dBi
Ant Gain	55 dBi	Tx Loss	0.5 dB
System Temp	150 K	Radome loss	0.25 dB
		Pointing Loss	0.35 dB
		Tx HPA	16.80 W
Interference Parameters		DownLink Fade	6.1 dB
ASI U/L EIRP in our direction	-3.9 dBW/4KHz		
DL interference, dBW/4KHz	-30.6 dBW/4KHz		

Threshold C/N 2.80 dB  
 C/lo Uplink WRT Saturation 61.0 dB/Hz  
 C/lo Downlink WRT Saturation 114.6 dB/Hz

Tx Slant Range	37536418.2 m	Rx Slant Range	37536418.2 m
Tx FSL	207.0 dB	Rx FSL	205.5 dB
Uplink EIRP	47.2 dBW	OPBO	21.0 dB
Uplink C/No	72.5 dB-Hz	D/L EIRP	27.0 dBW
U/L C/N	5.4 dB	D/L C/No	82.6 dB/Hz
G(1m <sup>2</sup> ) Tx	44.5 dBi	D/L C/N	15.4 dB
U/L flux density @ satellite	-116.0 dBW/m <sup>2</sup>	Spread Factor	1
IPBO	26.0 dB		

C/l up 19.9 dB  
 C/l dn 26.4 dB

**Clear Sky C/(N + I) 4.80 dB**  
**CS Eb/No 5.00 dB**  
**Clear Sky (CS)Margin 2.00 dB**

**D/L Faded C/(N+I) 2.80 dB**  
**D/L faded Eb/No 3.00 dB**  
**D/L Faded Margin 0.00 dB**

**PSD @ ant Flange -20.7 dBW / 4KHz**  
 Occupied BW 7038.3 KHz  
 D/L PSD/4KHz -5.5 dBW/4KHz

	Tx Site	Rx Site	
Az Angle	183.18	183.18	deg
EI Angle	44.80	44.80	deg
Pol Angle	2.47	2.47	deg

**Table D2**

**Remote to Hub Emission Designator 9M72G7W**

Data Parameters		Satellite Parameters	
Data Rate	3600.0 kbps	Sat Name	TestSat
FEC	0.500 Turbo	Sat Long.	79 deg
Modulation	bpsk BPSK / QPSK	Sat Rx, G/T	4.5 dB/K
Threshold Eb/No	4.20 dB	Sat Tx, EIRP	48 dBW
Occ BW	1.35	SFD	-90 dBW/m <sup>2</sup>
Spread Spectrum	n (Y / N)	IP / OP ratio	5 dB
Chip Rate	7.20 Mchips/s	U/L Freq	14.25 GHz
Total # of spread Links	1	D/L Freq.	11.95 GHz
Beta Factor	1.00		
Rx Site Parameters		Tx Site Parameters	
Rx Site Name	Hub	Tx Site Name	Remote
Rx Lat	39 deg	Tx Lat	39 deg
Rx Long	77 deg	Tx Long	77 deg
Rx G/T	33 dB/K	Tx Ant Gain	36 dBi
Ant Gain	55 dBi	Tx Loss	0.5 dB
System Temp	150 K	Radome loss	0.25 dB
		Pointing Loss	0.35 dB
		Tx HPA	16.02 W
Interference Parameters		DownLink Fade	6.1 dB
ASI U/L EIRP in our direction	-3.9 dBW/4KHz		
DL interference, dBW/4KHz	-30.6 dBW/4KHz		



Threshold C/N                      1.19 dB  
 C/lo Uplink WRT Saturation      60.6 dB/Hz  
 C/lo Downlink WRT Saturation    114.6 dB/Hz

Tx Slant Range                      37536418.2 m  
 Tx FSL                                  207.0 dB  
 Uplink EIRP                          46.9 dBW  
 Uplink C/No                        72.3 dB-Hz  
 U/L C/N                                3.8 dB  
 G(1m<sup>2</sup>) Tx                          44.5 dBi  
 U/L flux density @ satellite      -116.2 dBW/m<sup>2</sup>  
 IPBO                                    26.2 dB

Rx Slant Range                      37536418.2 m  
 Rx FSL                                  205.5 dB  
 OPBO                                  21.2 dB  
 D/L EIRP                              26.8 dBW  
 D/L C/No                              82.4 dB/Hz  
 D/L C/N                                13.8 dB

Spread Factor	1
---------------	---

C/I up                                  18.3 dB  
 C/I dn                                  24.8 dB

**Clear Sky C/(N + I)                      3.19 dB**  
**CS Eb/No                                    6.20 dB**  
**Clear Sky (CS)Margin                    2.00 dB**

**D/L Faded C/(N+I)                      1.19 dB**  
**D/L faded Eb/No                        4.20 dB**  
**D/L Faded Margin                        0.00 dB**

**PSD @ ant Flange                      -22.3 dBW / 4KHz**  
 Occupied BW                        9720.0 KHz  
 D/L PSD/4KHz                        -7.1 dBW/4KHz

	Tx Site	Rx Site	
Az Angle	183.18	183.18	deg
EI Angle	44.80	44.80	deg
Pol Angle	2.47	2.47	deg

**Table D3**

**Remote to Hub Emission Designator 21M57G7W**

Data Parameters		Satellite Parameters	
Data Rate	15980.6 kbps	Sat Name	TestSat
FEC	0.500 Turbo	Sat Long.	79 deg
Modulation	qpsk BPSK / QPSK	Sat Rx, G/T	4.5 dB/K
Threshold Eb/No	1.70 dB	Sat Tx, EIRP	48 dBW
Occ BW	1.35	SFD	-90 dBW/m <sup>2</sup>
Spread Spectrum	n (Y / N)	IP / OP ratio	5 dB
Chip Rate	15.98 Mchips/s	U/L Freq	14.25 GHz
Total # of spread Links	1	D/L Freq.	11.95 GHz
Beta Factor	1.00		
Rx Site Parameters		Tx Site Parameters	
Rx Site Name	Hub	Tx Site Name	Remote
Rx Lat	39 deg	Tx Lat	39 deg
Rx Long	77 deg	Tx Long	77 deg
Rx G/T	33 dB/K	Tx Ant Gain	36 dBi
Ant Gain	55 dBi	Tx Loss	0.5 dB
System Temp	150 K	Radome loss	0.25 dB
		Pointing Loss	0.35 dB
		Tx HPA	40.00 W
Interference Parameters		DownLink Fade	
ASI U/L EIRP in our direction	-3.9 dBW/4KHz		6.1 dB
DL interference, dBW/4KHz	-30.6 dBW/4KHz		



Threshold C/N	1.70 dB		
C/lo Uplink WRT Saturation	68.6 dB/Hz		
C/lo Downlink WRT Saturation	114.6 dB/Hz		
Tx Slant Range	37536418.2 m	Rx Slant Range	37536418.2 m
Tx FSL	207.0 dB	Rx FSL	205.5 dB
Uplink EIRP	50.9 dBW	OPBO	17.3 dB
Uplink C/No	76.3 dB-HZ	D/L EIRP	30.7 dBW
U/L C/N	4.3 dB	D/L C/No	86.4 dB/Hz
G(1m <sup>2</sup> ) Tx	44.5 dBi	D/L C/N	14.3 dB
U/L flux density @ satellite	-112.3 dBW/m <sup>2</sup>		
IPBO	22.3 dB	Spread Factor	1
C/I up	18.8 dB		
C/I dn	25.3 dB		
<b>Clear Sky C/(N + I)</b>	<b>3.70 dB</b>		
<b>CS Eb/No</b>	<b>3.70 dB</b>		
<b>Clear Sky (CS)Margin</b>	<b>2.00 dB</b>		
<b>D/L Faded C/(N+I)</b>	<b>1.70 dB</b>		
<b>D/L faded Eb/No</b>	<b>1.70 dB</b>		
<b>D/L Faded Margin</b>	<b>0.00 dB</b>		
<b>PSD @ ant Flange</b>	<b>-21.8 dBW / 4KHz</b>		
Occupied BW	21573.8 KHz		
D/L PSD/4KHz	-6.6 dBW/4KHz		

	Tx Site	Rx Site	
Az Angle	183.18	183.18	deg
EI Angle	44.80	44.80	deg
Pol Angle	2.47	2.47	deg



**Table D4**

**Hub to Remote Emission Designator 724K1G7W**

Data Parameters		Satellite Parameters	
Data Rate	512.0 kbps	Sat Name	TestSat
FEC	21/44 Turbo	Sat Long.	79 deg
Modulation	qpsk BPSK / QPSK	Sat Rx, G/T	4.5 dB/K
Threshold Eb/No	3.00 dB	Sat Tx, EIRP	48 dBW
Occ BW	1.35	SFD	-90 dBW/m <sup>2</sup>
Spread Spectrum	n (Y / N)	IP / OP ratio	5 dB
Chip Rate	0.54 Mchips/s	U/L Freq	14.25 GHz
Total # of spread Links	1	D/L Freq.	11.95 GHz
Beta Factor	1.00		
Rx Site Parameters		Tx Site Parameters	
Rx Site Name	Hub	Tx Site Name	Remote
Rx Lat	39 deg	Tx Lat	39 deg
Rx Long	77 deg	Tx Long	77 deg
Rx G/T	13 dB/K	Tx Ant Gain	60.3 dBi
Ant Gain	34.9 dBi	Tx Loss	4.5 dB
System Temp	150 K	Radome loss	0 dB
		Pointing Loss	0.1 dB
		Tx HPA	0.32 W
Interference Parameters		DownLink Fade	
ASI U/L EIRP in our direction	-3.9 dBW/4KHz		2.2 dB
DL interference, dBW/4KHz	2 dBW/4KHz		



Threshold C/N	2.80 dB		
C/Io Uplink WRT Saturation	68.2 dB/Hz		
C/Io Downlink WRT Saturation	82.0 dB/Hz		
Tx Slant Range	37536418.2 m	Rx Slant Range	37536418.2 m
Tx FSL	207.0 dB	Rx FSL	205.5 dB
Uplink EIRP	50.7 dBW	OPBO	17.5 dB
Uplink C/No	76.1 dB-HZ	D/L EIRP	30.5 dBW
U/L C/N	18.8 dB	D/L C/No	66.2 dB/Hz
G(1m <sup>2</sup> ) Tx	44.5 dBi	D/L C/N	8.9 dB
U/L flux density @ satellite	-112.5 dBW/m <sup>2</sup>		
IPBO	22.5 dB	Spread Factor	1
C/I up	33.3 dB		
C/I dn	7.3 dB		
<b>Clear Sky C/(N + I)</b>	<b>4.80 dB</b>		
<b>CS Eb/No</b>	<b>5.00 dB</b>		
<b>Clear Sky (CS)Margin</b>	<b>2.00 dB</b>		
<b>D/L Faded C/(N+I)</b>	<b>2.80 dB</b>		
<b>D/L faded Eb/No</b>	<b>3.00 dB</b>		
<b>D/L Faded Margin</b>	<b>0.00 dB</b>		
<b>PSD @ ant Flange</b>	<b>-32.0 dBW / 4KHz</b>		
Occupied BW	724.1 KHz		
D/L PSD/4KHz	8.0 dBW/4KHz		

	Tx Site	Rx Site	
Az Angle	183.18	183.18	deg
EI Angle	44.80	44.80	deg
Pol Angle	2.47	2.47	deg

**Table D5**

**Hub to Remote Emission Designator 54M0G7W**

Data Parameters		Satellite Parameters	
Data Rate	33200.0 kbps	Sat Name	TestSat
FEC	22/53 1/2 DVB-S2	Sat Long.	79 deg
Modulation	qpsk BPSK / QPSK	Sat Rx, G/T	4.5 dB/K
Threshold Eb/No	1.70 dB	Sat Tx, EIRP	48 dBW
Occ BW	1.35	SFD	-90 dBW/m <sup>2</sup>
Spread Spectrum	n (Y / N)	IP / OP ratio	5 dB
Chip Rate	40.00 Mchips/s	U/L Freq	14.25 GHz
Total # of spread Links	1	D/L Freq.	11.95 GHz
Beta Factor	1.00		
Rx Site Parameters		Tx Site Parameters	
Rx Site Name	Hub	Tx Site Name	Remote
Rx Lat	39 deg	Tx Lat	39 deg
Rx Long	77 deg	Tx Long	77 deg
Rx G/T	13 dB/K	Tx Ant Gain	60.3 dBi
Ant Gain	34.9 dBi	Tx Loss	4.5 dB
System Temp	150 K	Radome loss	0 dB
		Pointing Loss	0.1 dB
		Tx HPA	15.31 W
Interference Parameters		<b>DownLink Fade</b>	
ASI U/L EIRP in our direction	-3.9 dBW/4KHz		2.2 dB
DL interference, dBW/4KHz	2 dBW/4KHz		



Threshold C/N	0.89 dB	Rx Slant Range	37536418.2 m
C/lo Uplink WRT Saturation	101.8 dB/Hz	Rx FSL	205.5 dB
C/lo Downlink WRT Saturation	82.0 dB/Hz	OPBO	0.6 dB
Tx Slant Range	37536418.2 m	D/L EIRP	47.4 dBW
Tx FSL	207.0 dB	D/L C/No	83.0 dB/Hz
Uplink EIRP	67.5 dBW	D/L C/N	7.0 dB
Uplink C/No	92.9 dB-Hz		
U/L C/N	16.9 dB	<b>Spread Factor</b>	<b>1</b>
G(1m <sup>2</sup> ) Tx	44.5 dBi		
U/L flux density @ satellite	-95.6 dBW/m <sup>2</sup>		
IPBO	5.6 dB		
C/I up	31.4 dB		
C/I dn	5.3 dB		
<b>Clear Sky C/(N + I)</b>	<b>2.89 dB</b>		
<b>CS Eb/No</b>	<b>3.70 dB</b>		
<b>Clear Sky (CS)Margin</b>	<b>2.00 dB</b>		
<b>D/L Faded C/(N+I)</b>	<b>0.89 dB</b>		
<b>D/L faded Eb/No</b>	<b>1.70 dB</b>		
<b>D/L Faded Margin</b>	<b>0.00 dB</b>		
<b>PSD @ ant Flange</b>	<b>-34.0 dBW / 4KHz</b>		
Occupied BW	54000.0 KHz		
D/L PSD/4KHz	6.1 dBW/4KHz		

	Tx Site	Rx Site	
Az Angle	183.18	183.18	deg
EI Angle	44.80	44.80	deg
Pol Angle	2.47	2.47	deg

## Radiation Hazard Analysis

### E-7000

This analysis predicts the radiation levels around a proposed earth station complex, comprised of a single panel type antenna. This report is developed in accordance with the prediction methods contained in OET Bulletin No. 65, Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields, Edition 97-01, pp 26-30. The maximum level of non-ionizing radiation to which employees may be exposed is limited to a power density level of 5 milliwatts per square centimeter ( $5 \text{ mW/cm}^2$ ) averaged over any 6 minute period in a controlled environment and the maximum level of non-ionizing radiation to which the general public is exposed is limited to a power density level of 1 milliwatt per square centimeter ( $1 \text{ mW/cm}^2$ ) averaged over any 30 minute period in a uncontrolled environment. Note that the worse-case radiation hazards exist along the beam axis. Under normal circumstances, it is highly unlikely that the antenna axis will be aligned with any occupied area since that would represent a blockage to the desired signals, thus rendering the link unusable.

#### **Earth Station Technical Parameter Table**

Antenna Aperture Size	1.2m x 0.212m
Antenna Effective Diameter	0.569 meters
Antenna Surface Area	0.254 sq. meters
Antenna Isotropic Gain	36.0 dBi
Number of Identical Adjacent Antennas	1
Nominal Antenna Efficiency ( $\epsilon$ )	55%
Nominal Frequency	14.25 GHz
Nominal Wavelength ( $\lambda$ )	0.0211 meters
Maximum Transmit Power / Carrier	40.0 Watts
Number of Carriers	1
Total Transmit Power	40.0 Watts
W/G Loss from Transmitter to Feed	1.0 dB
Total Feed Input Power	31.8 Watts
Radome Losses	0.25 dB
Effective RF Power at radome	30.0 Watts
Near Field Limit	$R_{nf} = D^2/4\lambda = 3.85 \text{ meters}$
Far Field Limit	$R_{ff} = 0.6 D^2/\lambda = 9.23 \text{ meters}$

Transition Region

$R_{nf}$  to  $R_{ff}$  = 3.85 meters to 9.23 meters

In the following sections, the power density in the above regions, as well as other critically important areas will be calculated and evaluated. The calculations are done in the order discussed in OET Bulletin 65.

### 1.0 At the Antenna Surface

The power density at the reflector surface can be calculated from the expression:

$$PD_{as} = 4P/A = \mathbf{49.96 \text{ mW/cm}^2} \text{ (1)}$$

Where: P = total power at feed, milliwatts

A = Total area of reflector, sq. cm

In the normal range of transmit powers for satellite antennas, the power densities at or around the reflector surface is expected to exceed safe levels. This area will not be accessible to the general public.

This antenna will incorporate a radome which has 0.25 dB of loss. The worst case power density at the surface of the radome is shown below:

$$PD_{radome} = 4P_{rad}/A = \mathbf{47.16 \text{ mW/cm}^2} \text{ (2)}$$

Where: Prad = total power at feed less radome losses, milliwatts

A = Total area of reflector, sq. cm (this would represent worst case)

Operators and technicians should receive training specifying this area as a high exposure area. Procedures must be established that will assure that all transmitters are rerouted or turned off before access by maintenance personnel to this area is possible.

### 2.0 On-Axis Near Field Region

The geometrical limits of the radiated power in the near field approximate a cylindrical volume with a diameter equal to that of the antenna. In the near field, the power density is neither uniform nor does its value vary uniformly with distance from the antenna. For the purpose of considering radiation hazard it is assumed that the on-axis flux density is at its maximum value throughout the length of this region. The length of this region, i.e., the distance from the antenna to the end of the near field, is computed as  $R_{nf}$  above.

The maximum power density in the near field is given by:

$$PD_{nf} = (16\epsilon P)/(\pi D^2) = \mathbf{26.03 \text{ mW/cm}^2} \text{ (3)}$$

from 0 to 3.85 meters

Evaluation

Uncontrolled Environment: **Does Not Meet Controlled Limits**

Controlled Environment: **Does Not Meet Uncontrolled Limits**

### 3.0 On-Axis Transition Region

The transition region is located between the near and far field regions. As stated in Bulletin 65, the power density begins to vary inversely with distance in the transition region. The maximum power density in the transition region will not exceed that calculated for the near field region, and the transition region begins at that value. The maximum value for a given distance within the transition region may be computed for the point of interest according to:

$$PD_{tr} = (PD_{nf})(R_{nf})/R = \text{dependent on } R \quad (4)$$

where:  $PD_{nf}$  = near field power density

$R_{nf}$  = near field distance

$R$  = distance to point of interest

$$PD_{tr} = \mathbf{26.03} \text{ mW/cm}^2$$

For:  $3.85 < R < 9.23$  meters

We use Eq (4) to determine the safe on-axis distances required for the two occupancy conditions:

#### Evaluation

Uncontrolled Environment Safe Operating Distance, (meters),  $R_{safeu}$ : 100.1

Controlled Environment Safe Operating Distance, (meters),  $R_{safec}$ : 20.03

### 4.0 On-Axis Far-Field Region

The on-axis power density in the far field region ( $PD_{ff}$ ) varies inversely with the square of the distance as follows:

$$PD_{ff} = PG/(4\pi R^2) = \text{dependent on } R \quad (5)$$

where:  $P$  = total power at feed

$G$  = Numeric Antenna gain in the direction of interest relative to isotropic radiator

$R$  = distance to the point of interest

For:  $R > R_{ff} = 9.23$  meters

$$PD_{ff} = 11.15 \text{ mW/cm}^2 \text{ at } R_{ff}$$

We use Eq (5) to determine the safe on-axis distances required for the two occupancy conditions:

Evaluation

Uncontrolled Environment Safe Operating Distance,(meters),  $R_{safeu}$  : See Section 3

Controlled Environment Safe Operating Distance,(meters),  $R_{safec}$  : See Section 3

### 5.0 Off-Axis Levels at the Far Field Limit and Beyond

In the far field region, the power is distributed in a pattern of maxima and minima (sidelobes) as a function of the off-axis angle between the antenna center line and the point of interest. Off-axis power density in the far field can be estimated using the antenna radiation patterns prescribed for the antenna in use. Usually this will correspond to the antenna gain pattern envelope defined by the FCC or the ITU, which takes the form of:

$$G_{off} = 32 - 25\log(\Theta)$$

for  $\Theta$  from 1 to 48 degrees; -10 dBi from 48 to 180 degrees

(Applicable for commonly used satellite transmit antennas)

Considering that satellite antenna beams are aimed skyward, power density in the far field will usually not be a problem except at low look angles. In these cases, the off axis gain reduction may be used to further reduce the power density levels.

*For example:* At two (2) degrees off axis At the far-field limit, we can calculate the power density as:

$$G_{off} = 32 - 25\log(2) = 32 - 7.52 \text{ dBi} = 280.2 \text{ numeric}$$

$$PD_{2 \text{ deg off-axis}} = PD_{ff} \times 280.2/G = 0.78 \text{ mW/cm}^2 \text{ (6)}$$

## 6.0 Off-Axis power density in the Near Field and Transitional Regions

According to Bulletin 65, off-axis calculations in the near field may be performed as follows: assuming that the point of interest is at least one antenna diameter removed from the center of the main beam, the power density at that point is at least a factor of 100 (20 dB) less than the value calculated for the equivalent on-axis power density in the main beam. Therefore, for regions at least D meters away from the center line of the dish, whether behind, below, or in front under of the antenna's main beam, the power density exposure is at least 20 dB below the main beam level as follows:

$$PD_{\text{nf(off-axis)}} = PD_{\text{nf}} / 100 = \mathbf{0.260} \text{ mW/cm}^2 \text{ at D off axis (7)}$$

See Section 7 for the calculation of the distance vs. elevation angle required to achieve this rule for a given object height.

## 7.0 Evaluation of Safe Occupancy Area in Front of Antenna

The distance (S) from a vertical axis passing through the dish center to a safe off axis location in front of the antenna can be determined based on the dish diameter rule (Item 6.0). Assuming a flat terrain in front of the antenna, the relationship is:

$$S = (D / \sin \alpha) + (2h - D - 2) / (2 \tan \alpha) \text{ (8)}$$

Where:  $\alpha$  = minimum elevation angle of antenna

D = dish diameter in meters

h = maximum height of object to be cleared, meters

For distances equal or greater than determined by equation (8), the radiation hazard will be below safe levels for all but the most powerful stations (> 4 kilowatts RF at the feed).

For	D =	0.569 meters
	h =	2.0 meters, delta between antenna and object >1 m

Then:

$\alpha$	S
10	1.7 meters
15	1.1 meters
20	0.9 meters
25	0.7 meters
30	0.6 meters

## 8.0 Summary of Results

The earth station site will be protected from uncontrolled access by virtue of the fact that it will be mounted on the roof of a vehicle. There will also be proper emission warning signs placed and all operating personnel will be aware of the human exposure levels at and around the earth station. The applicant agrees to abide by the conditions specified in Condition 18 provided below:

*(18) - The Raysat Antenna Systems LLC shall take all reasonable and customary measures to ensure that the MET does not create potential for harmful non-ionizing radiation to persons who may be in the vicinity of the MET when it is in operation. At a minimum, permanent warning label(s) shall be affixed to the MET warning of the radiation hazard and including a diagram showing the regions around the MET where the radiation levels could exceed 1.0mW/cm<sup>2</sup>. The operator of the MET shall be responsible for assuring that individuals do not stray into the region around the MET where there is a potential for exceeding the maximum permissible exposure limits required by Section 1.1310 of the Commission ' s rules 47 C.F.R § 1.1310. This shall be accomplished by means of signs, caution tape, verbal warnings, placement of the MET so as to minimize access to the hazardous region and/or any other appropriate means*

The table below summarizes all of the above calculations.



Parameter	Abbr.		Units	Formula
Antenna Effective Diameter	Df	0.569	meters	$(\pi * D_f^2) / 4$
Antenna Centerline	h	2	meters	
Antenna Surface Area	Sa	0.254	meter <sup>2</sup>	
Antenna Ground Elevation	GE	2	meters	
Frequency of Operation	f	14.25	GHz	
Wavelength	$\lambda$	0.0211	meters	
HPA Output Power	P <sub>HPA</sub>	40	watts	
HPA to Antenna Loss	L <sub>TX</sub>	1	dB	
Radome Loss	L <sub>Rad</sub>	0.25	dB	
Transmit Power at Flange	P	31.77	watts	
Effective Power after Radome		30.00	watts	$P / 10 \text{Log}^{-1}(\text{Radome Loss} / 10)$
Antenna Gain	G <sub>es</sub>	36	dBi	does not include radome loss
Antenna Aperature Efficiency	$\eta$	55%	n/a	
<b>1. Reflector Surface Region Calculations</b>				
Antenna Surface Power Density	P <sub>das</sub>	499.6	W/m <sup>2</sup>	$(16 * P) / (\pi * D^2)$
		49.96	mW/cm <sup>2</sup>	
Power at Radome Surface	P <sub>drad</sub>	471.6	W/m <sup>2</sup>	$(16 * P) / (\pi * D^2)$
(outside radome)		47.16	mW/cm <sup>2</sup>	<b>Does not meet controlled limits</b> <b>Does not meet uncontrolled limits</b>
<b>2. On Axis Near Field Calculations</b>				
Extent of Near Field	R <sub>n</sub>	3.846	meters	$D^2 / (4 * \lambda)$
		12.620	feet	
Near Field Power Density	P <sub>Dnf</sub>	260.3	w/m <sup>2</sup>	$(16 * \eta * P) / (\pi * D^2)$
		26.03	mW/cm <sup>2</sup>	<b>Does not meet controlled limits</b> <b>Does not meet uncontrolled limits</b>
<b>3. On Axis Transition Region Calculations</b>				
Extent of Transition Region (min)	R <sub>Tr</sub>	3.846	meters	$D^2 / (4 * \lambda)$
Extent of Transition Region (min)		12.620	feet	
Extent of Transition Region (max)	R <sub>Tr</sub>	9.231	meters	$0.6 * D^2 / \lambda$
Extent of Transition Region (max)		30.287	feet	
Worst Case Transition Region Power Density	P <sub>DTr</sub>	260.3	w/m <sup>2</sup>	
		26.03	mW/cm <sup>2</sup>	<b>Does not meet controlled limits</b> <b>Does not meet uncontrolled limits</b>
Uncontrolled enviornment safe operating distance	R <sub>su</sub>	100.1	meters	$(P_{Dnf}) / R_{nf} / R_{su}$
Controlled enviornment safe operating distance	R <sub>sc</sub>	20.0	meters	$(P_{Dnf}) / R_{nf} / R_{sc}$
<b>4. On Axis Far Field Calculations</b>				
Distance to Far Field Region	R <sub>f</sub>	9.23	meters	$0.6 * D^2 / \lambda$
		30.29	feet	
On Axis Power Density in the Far Field	P <sub>Dff</sub>	111.5	W/m <sup>2</sup>	$(G_{es} * P) / (4 * \pi * R_f^2)$
		11.15	mW/cm <sup>2</sup>	<b>Does not meet controlled limits</b> <b>Does not meet uncontrolled limits</b>
<b>5. Off-axis Power Density in the Far Field Limit and Beyond</b>				
Antenna Surface Power Density	P <sub>Ds</sub>	7.8	W/m <sup>2</sup>	$(G_{es} * P) / (4 * \pi * R_f^2) * (Goa / Ges)$
Goa/Ges at a sample angle of $\theta=2$ degrees		0.070		$Goa = 32 - 25 * \log(\theta)$
		0.78	mW/cm <sup>2</sup>	
<b>6. Off Axis Power Density in the Near Field and Transitional Region Calculations</b>				
Power Density of Wn/100 for 1 diameter removed	P <sub>Ds</sub>	2.60	W/m <sup>2</sup>	$[(16 * \eta * P) / (\pi * D^2)] / 100$
		0.260	mW/cm <sup>2</sup>	<b>Meets controlled limits</b> <b>Meets Uncontrolled limits</b>
<b>7.0 Off-axis Safe Distances from Earth Station</b>				
minimum elevation angle of antenna	$\alpha$	10	degree	$S = (D / \sin \alpha) + (2h - D - 2) / (2 \tan \alpha)$
hieght of object to be cleared	h	2	meter	
Groun elevation delta antenna-obstacle elevation ang	GD	S		
	10	1.7	meter	
	15	1.1	meter	
	20	0.9	meter	
	25	0.7	meter	
	30	0.6	meter	

Note: Maximum FCC power density limits for 6GHz is 1mW/cm2 for general population exposure as per FCC OS&T