

WMKT – Charlevoix, MI

Measurement Information

* Nighttime Radial measurements were taken from Nighttime Full Proof of Performance Application circa 1977 currently on file with the FCC

* All measurements taken in October of 2001 were taken by Mr. Justin Asher, an engineer in the employ of Munn-Reese, Inc. using Potomac Instruments FIM-41 field meter #1474 last calibrated Oct 26, 2000.

* All measurements taken in August of 2004 were taken by Mr. Justin Asher, an engineer in the employ of Munn-Reese, Inc. using Potomac Instruments FIM-41 field meter #1149 last calibrated Nov. 13, 2002.

Exhibit 15.4a – Summary of measured Conductivities for WMKT – Charlevoix, MI

Exhibit 15.4b – Family of Curves for Current Measurements (2001 & 2004)

Exhibit 15.4c – Tabulation & Graph of Measurement for WMKT – 66.0° (night)

Exhibit 15.4d – Tabulation & Graph of Measurement for WMKT – 85.0° (day)

Exhibit 15.4e – Tabulation & Graph of Measurement for WMKT – 102.0° (night)

Exhibit 15.4f – Tabulation & Graph of Measurement for WMKT – 105.0° (day)

Exhibit 15.4g – Tabulation & Graph of Measurement for WMKT – 125.0° (day)

Exhibit 15.4h – Tabulation & Graph of Measurement for WMKT – 145.0° (day)

Exhibit 15.4i – Tabulation & Graph of Measurement for WMKT – 165.0° (day)

Exhibit 15.4j – Tabulation & Graph of Measurement for WMKT – 174.0° (night)

Exhibit 15.4k – Tabulation & Graph of Measurement for WMKT – 228.0° (night)

Exhibit 15.4l – Tabulation & Graph of Measurement for WMKT – 230.0° (day)

Exhibit 15.4m – Tabulation & Graph of Measurement for WMKT – 245.5° (night)

Exhibit 15.4n – Tabulation & Graph of Measurement for WMKT – 250.0° (day)

Exhibit 15.4o – Tabulation & Graph of Measurement for WMKT – 270.0° (day)

Exhibit 15.4p – Tabulation & Graph of Measurement for WMKT – 282.0° (night)

Exhibit 15.4q – Tabulation & Graph of Measurement for WMKT – 290.0° (day)

Exhibit 15.4a**Summary of Measured Conductivities for WMKT – Charlevoix, MI**

<u>Azimuth</u> <u>(° True)</u>	<u>Meas</u> <u>Cond</u>	<u>Distance</u>	<u>Azimuth</u> <u>(° True)</u>	<u>Meas</u> <u>Cond</u>	<u>Distance</u>
66.0°	2.0:	0.00 km to 1.61 km	228.0°	3.0:	0.00 km to 13.0 km
	3.0:	1.61 km to 8.85 km			
	2.0:	8.85 km to 35.4 km			
85.0°	3.0:	0.00 km to 30.0 km	230.0°	3.0:	0.00 km to 50.0 km
	0.5:	30.0 km to 67.0 km		1.0:	50.0 km to 99.6 km
	1.5:	67.0 km to 109.0 km			
102.0°	2.0:	0.00 km to 2.41 km	245.5°	2.0:	0.00 km to 3.22 km
	3.0:	2.41 km to 6.92 km		3.0:	3.30 km to 8.21 km
	2.0:	6.92 km to 20.9 km			
	1.5:	20.9 km to 35.7 km			
105.0°	3.0:	0.00 km to 20.0 km	250.0°	2.0:	0.00 km to 31.9 km
	1.0:	20.0 km to 146.0 km			
125.0°	4.0:	0.00 km to 6.75 km	270.0°	2.0:	0.00 km to 8.93 km
	3.0:	6.75 km to 15.0 km			
	2.0:	15.0 km to 41.0 km			
	1.5:	41.0 km to 142.0 km			
145.0°	3.0:	0.00 km to 12.0 km	282.0°	2.0:	0.00 km to 3.22 km
	4.0:	12.0 km to 20.0 km		3.0:	3.30 km to 7.27 km
	2.0:	20.0 km to 35.0 km			
	1.0:	35.0 km to 129.0 km			
165.0°	2.0:	0.00 km to 13.0 km	290.0°	3.0:	0.00 km to 6.85 km
	1.5:	13.0 km to 161.0 km			
174.0°	3.0:	0.00 km to 2.41 km			
	1.5:	2.41 km to 32.2 km			

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Exhibit 15.4b Family of Curves 2001 & 2004 Measurements

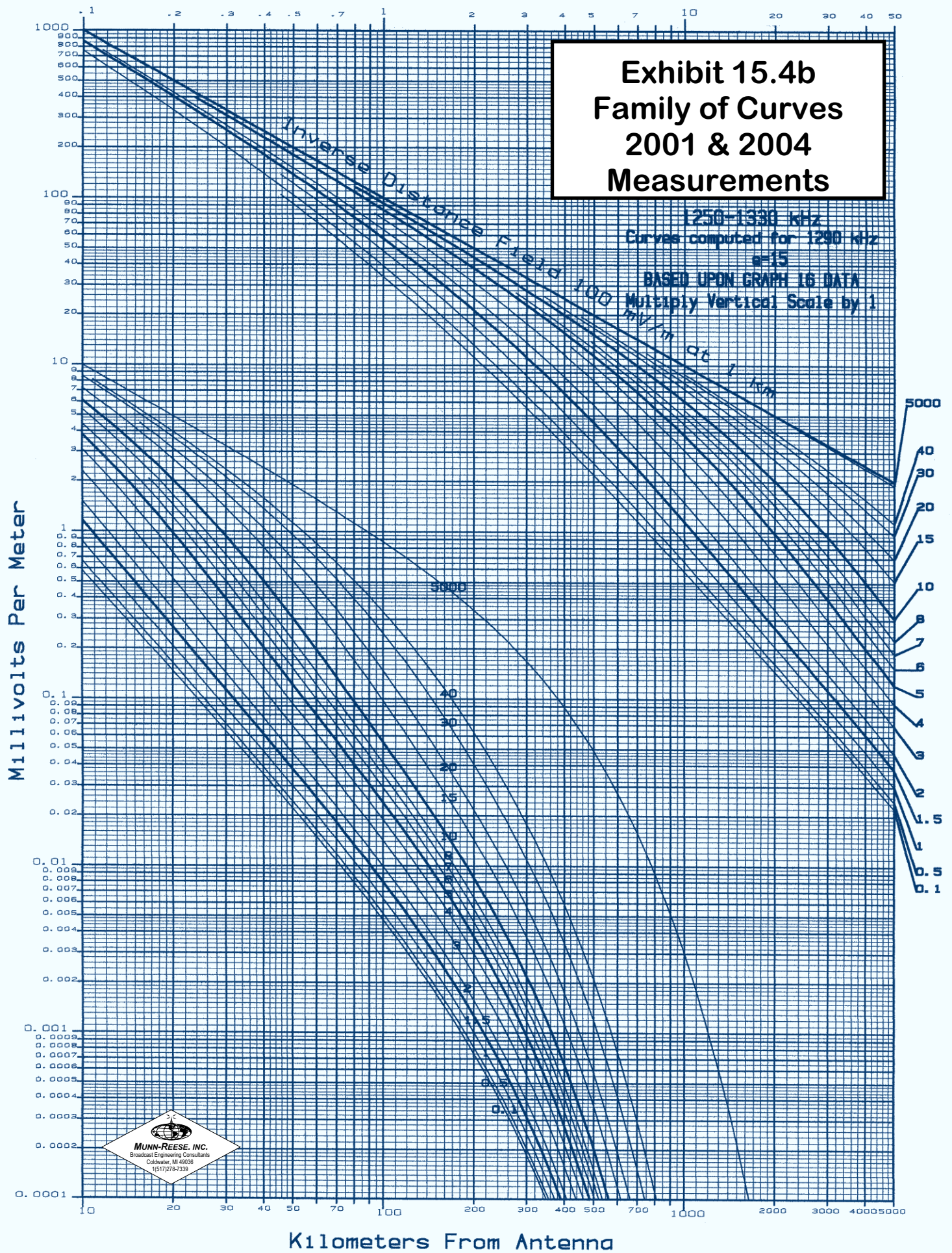


Exhibit 15.4c

WMKT - 66.0° (night)

TABULATION OF FIELD INTENSITY MEASUREMENTS

66° T. RADIAL - WVOY

POINT	NON-DIRECTIONAL		DIRECTIONAL		RATIO	MILES
	mV/m	TIME (EST)	mV/m	TIME (EST)		
1	2780	11:04 a	--	--	---	0.13
2	1610	11:08	--	--	---	0.23
3	980	11:15	--	--	---	0.33
4	275	11:44	184	3:10 p	.6691	0.88
5	287	11:41	183	3:07	.6376	0.94
6	285	11:37	178	3:04	.6246	1.02
7	210	12:00 n	138	7:33 a	.6571	1.13
8	185	12:08 p	118	2:55 p	.6378	1.35
9	170	1:22	93	2:48	(.5471)	1.46
10	182	12:19	93	2:41	(.5110)	1.57
11	130	12:29	80	2:06	.6154	1.69
12	128	12:34	72	2:10	(.5625)	1.80
13	98	12:54	54	2:24	(.5510)	2.04
14	35	2:30	21	6:54 a	.6000	4.13
15	25.5	2:36	15.8	6:50	.6196	5.00
16	12.8	2:43	8.4	6:43	.6563	6.10
17	4.4	3:01	2.85	6:30	.6477	7.75
18	4.38	3:05	2.70	6:26	.6164	8.33
19	5.20	3:10	3.30	6:23	.6346	9.37
20	2.5	3:17	1.45	6:18	.5800	10.35
21	2.92	3:27	1.75	6:11	.5993	11.46
22	2.75	3:32	1.62	6:07	.5891	12.01
23	2.40	3:40	1.45	6:02	.6042	13.65
24	2.15	3:52	1.30	5:55	.6047	14.73
25	1.96	3:59	1.15	5:47	.5867	15.79
26	1.23	4:21	.80	5:27	.6504	17.30
27	1.51	4:32	.90	5:22	.5960	18.55
28	0.92	4:38	.56	5:14	.6087	20.17
29	0.75	4:45	.475	5:10	.6333	22.00

Avg. = .6213

Ratios in () are not included in average.



Exhibit 15.4c WMKT - 66.0° (night)

GROUND WAVE FIELD INTENSITY

STATION WVOY
FREQUENCY 1270 kHz
POWER 5 kW
DIRECTION 66° T.
EXHIBIT FIGURE 10A

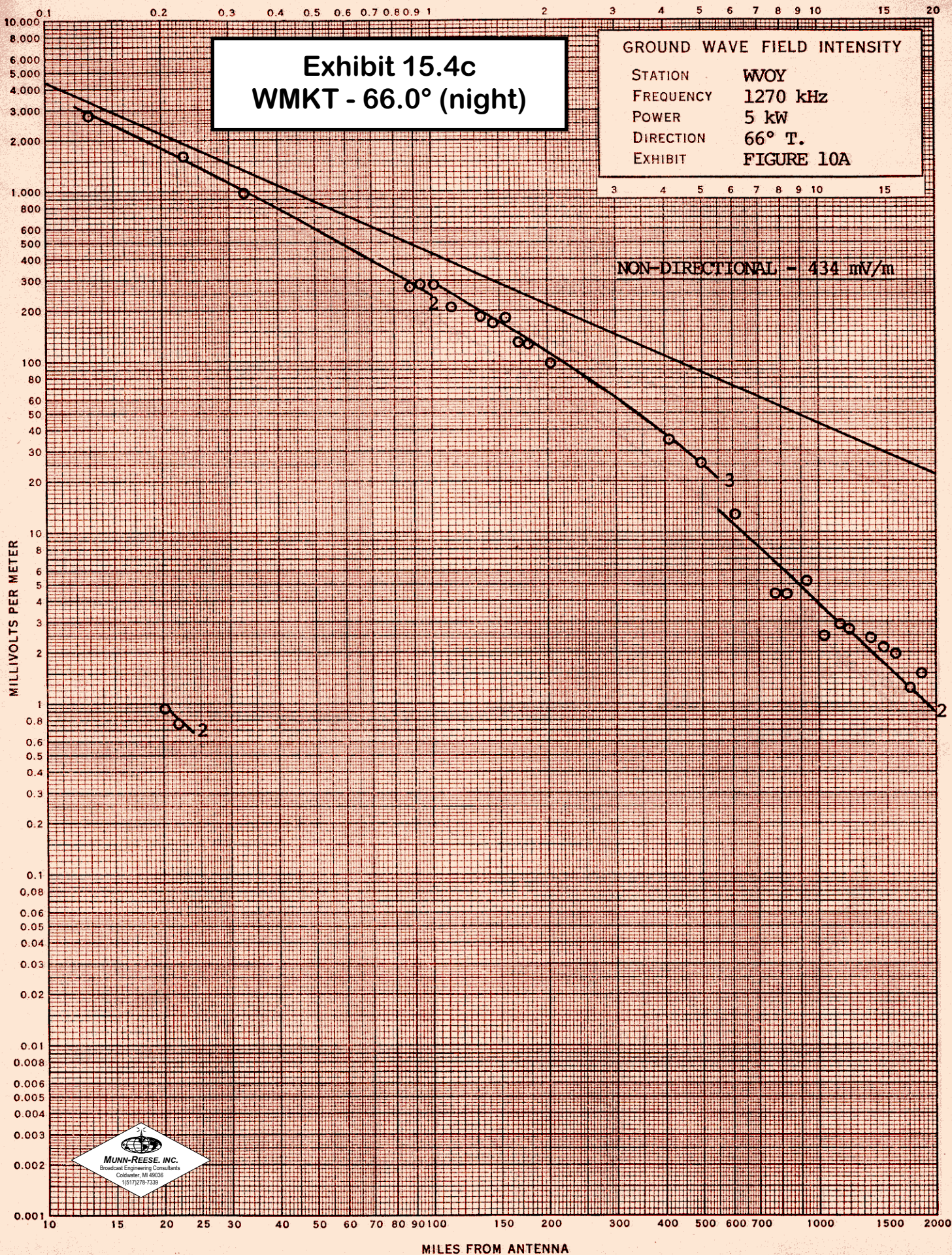


Exhibit 15.4d

WMKT - 85.0° (day)

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Figure
Page 1 of 1

Tabulation of Field Strength Measurements									
Call: WMKT Frequency(kHz): 1270 Bearing: 85.0° Power(kW): 5.0 NDA									
Point ###	mV/m	Meas Time	Con Date	mV/m	Time	Date	Distance km	Ratio	MP *
1	198.000	1622	08/24/04				1.63		
2	140.000	1627	08/24/04				2.54		
3	8.250	0820	08/25/04				12.50		
4	6.000	0825	08/25/04				14.00		
5	5.600	0830	08/25/04				15.30		
6	2.100	0836	08/25/04				17.50		
7	3.300	0907	08/25/04				18.90		
8	1.000	0917	08/25/04				22.00		
9	1.400	0934	08/25/04				24.20		
10	1.250	0943	08/25/04				29.00		
11	0.350	0951	08/25/04				33.50		
12	0.200	1020	08/25/04				40.00		
13	0.210	1034	08/25/04				45.60		
14	0.130	1054	08/25/04				49.40		
15	0.150	1115	08/25/04				53.60		
16	0.110	1124	08/25/04				58.60		
17	0.103	1207	08/25/04				66.90		
18	0.105	1233	08/25/04				73.80		
19	0.092	1244	08/25/04				77.10		
20	0.090	1255	08/25/04				83.10		
21	0.100	1305	08/25/04				86.20		
22	0.058	1340	08/25/04				96.70		
23	0.040	1419	08/25/04				103.00		
24	0.045	1434	08/25/04				109.00		
Average Arithmetic Ratio =							0.0000		
Average Logarithmic Ratio =							0.0000		

Exhibit 15.4d WMKT - 85.0° (day)

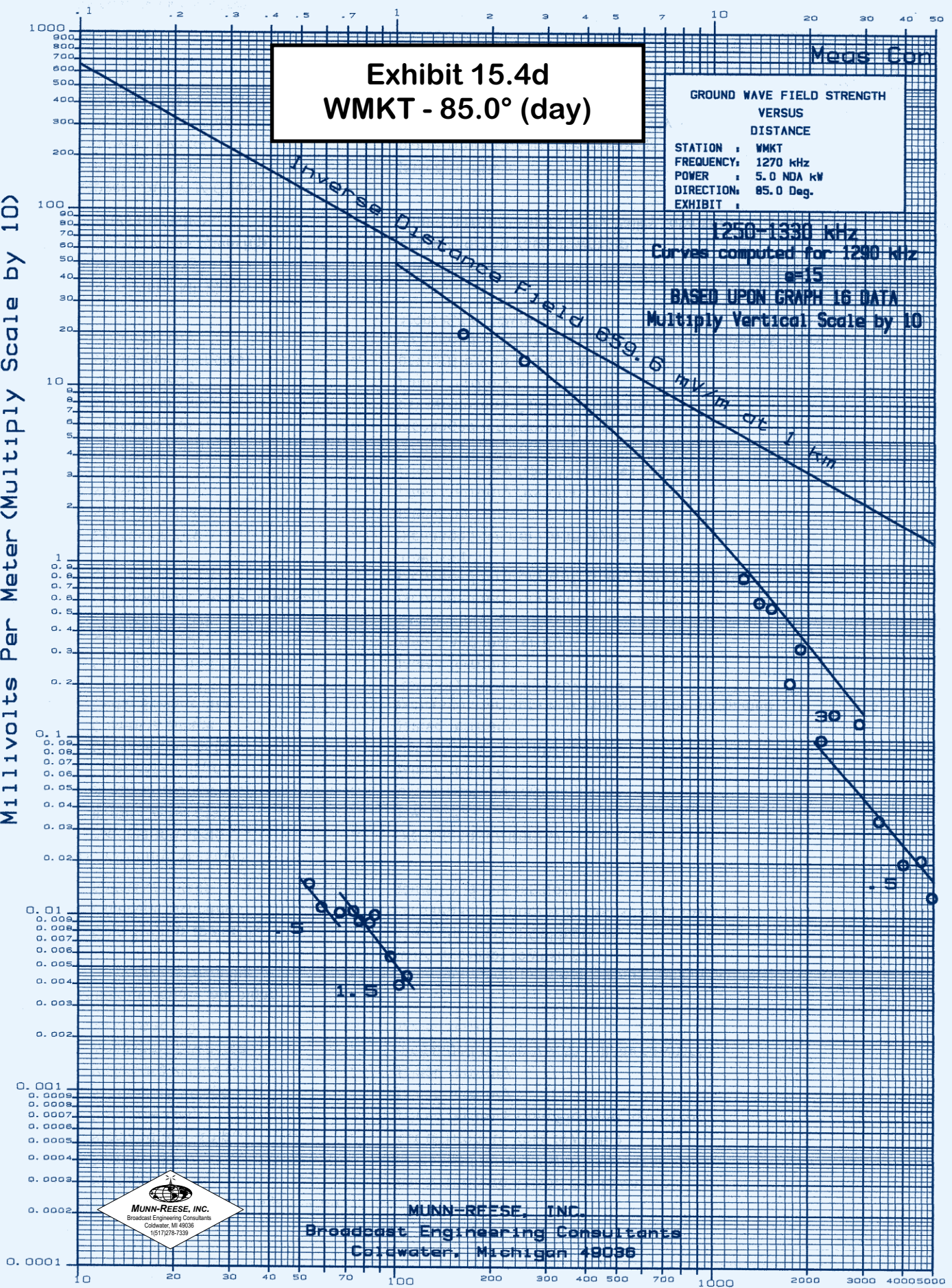
Meas Con

GROUND WAVE FIELD STRENGTH
VERSUS
DISTANCE
STATION : WMKT
FREQUENCY: 1270 kHz
POWER : 5.0 NDA kW
DIRECTION: 85.0 Deg.
EXHIBIT :

1250-1330 kHz
Curves computed for 1290 kHz
 $m=15$
BASED UPON GRAPH 16 DATA
Multiply Vertical Scale by 10

Millivolts Per Meter (Multiply Scale by 10)

Inverse Distance Field 059.0 mV/m at 1 km



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Kilometers From Antenna

Exhibit 15.4e

WMKT - 102.0° (night)

TABULATION OF FIELD INTENSITY MEASUREMENTS

102° T. RADIAL - WVOY

POINT	NON-DIRECTIONAL		DIRECTIONAL		RATIO	MILES
	mV/m	TIME (EST)	mV/m	TIME (EST)		
1	1840	6:57 P	--	--	--	0.19
2	1500	7:02	--	--	--	0.27
3	1120	7:06	--	--	--	0.35
4	330	6:40	13.5	6:22 P	.0409	0.72
5	300	6:37	11.1	6:18	.0370	0.82
6	280	6:46	13.2	6:14	.0471	0.92
7	240	5:56	6.7	5:39	.0279	1.04
8	225	6:02	5.1	5:42	.0226	1.10
9	192	6:04	4.3	5:45	.0223	1.18
10	177	6:08	3.7	5:49	.0209	1.28
11	165	6:14	1.4	5:52	(.0084)	1.39
12	146	5:39	3.2	7:08	.0219	1.62
13	148	5:36	3.1	7:05	.0209	1.68
14	138	5:14	3.7	6:49	.0268	1.78
15	110	5:23	2.6	6:53	.0236	1.88
16	114	5:27	3.1	6:57	.0271	1.98
17	78	1:14	.48	4:52	(.0061)	2.53
18	25.2	1:20	.50	4:47	.0198	3.08
19	38.5	1:25	.86	12:34	.0223	4.12
20	17.8	1:43	.44	12:39	.0247	4.77
21	13.8	1:49	.475	12:45	.0344	5.50
22	8.8	1:55	.45	12:49	.0511	6.80
23	5.3	2:39	.27	1:13	.0509	10.22
24	3.12	2:48	.152	1:29	.0487	11.32
25	2.6	2:58	.15	1:22	.0576	12.70
26	1.5	3:10	.112	1:40	.0746	13.66
27	0.84	3:19	.076	1:55	.0904	14.49
28	0.88	3:23	.075	2:00	.0852	15.72
29	1.15	3:33	.085	2:04	.0739	16.50
30	0.73	3:54	.059	2:16	.0808	18.81
31	0.51	4:12	.038	2:49	.0745	22.15

Avg. = .0434

Ratios in () are not included in average.



