ENGINEERING REPORT
EVALUATION OF ELECTROMAGNETIC EFFECTS OF RICHLAND TOWERS STRUCTURES ON AM BROADCAST STATION KCCV
PREPARED FOR
RICHLAND TOWERS
KANSAS CITY, MISSOURI

November 6, 2002

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Engineering Statement

This Engineering Report was prepared to present the results of an analysis of the re-radiation electromagnetic effects of the Richland Towers structures located near Kansas City, Missouri on the KCCV(AM), Overland Park, Kansas, antenna array.

Background

AM broadcast station KCCV is licensed for operation on 760 kHz with a power of 6 kW using a directional antenna pattern during daytime hours only. KCCV utilizes three 102-m towers in an "in-line" arrangement to produce its daytime pattern. KCCV was originally constructed at its present site in 1989.

Richland Towers is the owner of an existing tower located approximately 2.1-km south-southwest of the KCCV antenna array. This tower has an overall height of 353 m AGL (1158-ft) and it was constructed in 1977. Richland Towers is constructing a new tower structure of the same overall height to replace the old tower. The new tower will be located 12.5 m (41 ft) north of the old tower. The old Richland tower is expected to be dismantled in early 2003. Figure 1 herein is a map showing the locations of the KCCV antenna array and the Richland towers.

Construction of MININEC Model

Experience indicates that the presence of a tall tower, such as the old or new Richland tower, in proximity to the KCCV antenna array could result in re-radiation and directional antenna pattern distortion. In order to estimate the effects of the Richland towers on the KCCV antenna pattern, the method of moments modeling technique was employed using the MININEC software tool. A wire model of the Richland towers and the KCCV directional antenna array were developed using the MININEC software. The Appendix to this report includes a summary of the model construct.

Physical and electrical data for the KCCV antenna array were obtained from the FCC files for KCCV. The mechanical information for both the old and new Richland towers was obtain from the Richland Towers company. A wire model was developed using cylindrical elements of varying radius to approximate the structures. The top-mounted antennas and candelabras were modeled in addition to all guy wires with the exception of the dual guy wires off the candelabra arms of the new tower. In that case, a single guy wire with a lumped load adjustment was modeled to approximate the dual guy wires.

Perspective views of the wire model construct, as output from the software tool are included herein as Figure 2. Array synthesis functions in the MININEC software were employed to formulate the KCCV daytime patterns.

Results

It is important to recognize that the KCCV antenna system was built many years after the old Richland tower was constructed. The KCCV array was adjusted within FCC requirements in 1989 notwithstanding the re-radiation from the old Richland tower. The net change in the KCCV pattern is the key parameter to be examined. And

this parameter is most relevant on the KCCV measured radials.* The absolute effects on the KCCV pattern are not particularly important to the determination of whether the KCCV pattern will be adversely affected by the replacement tower. Further it should be recognized that the MININEC model assumes a perfect loss-less ground plane. In reality, the losses due to propagation attenuation will lessen the magnitude of the re-radiation effects. Therefore, the effects predicted herein can be considered as the worst-case or outer limit of the likely effects on KCCV.

Figure 3 is the calculated KCCV pattern as modeled without the presence of any re-radiating structures. Figures 4 and 5 are the calculated patterns for the KCCV antenna system with the old and new Richland towers included in the model.

Figure 6 is a tabulation and analysis of the KCCV patterns as predicted using the MININEC model. The magnitude change in the KCCV pattern for the case with the new Richland tower relative to the case with the old Richland tower is calculated with the percentage change given. The case where both the old and the new towers are present was not evaluated.

The predicted net effect on the KCCV measured inverse distance field levels resulting from the replacement of the old Richland tower with the new Richland tower is summarized in Figure 7. This is based on the use of the MININEC analysis results for those radials appearing in the latest KCCV full antenna proof-of-performance.† Also shown in Figure 7 is the predicted net effect on the KCCV monitoring points.

The results of this analysis indicate that both of the KCCV monitoring points will increase in magnitude after the Richland tower replacement has been

* From the last full proof-of-performance on KCCV, these are the azimuths of: 25°, 71.5°, 118°, 164.5°, 211°, 254.5°, 298° and 341.5° relative to true north.

completed. However, as indicated in Figure 7, both monitoring points will be within the FCC licensed maximums.

Also, although there will be some effect on the analyzed inverse distance field of the KCCV measured radials, all but two of the radials are predicted to stay within the FCC standard pattern limits. The radials predicted to be out of standard pattern limits are the 71.5 and 164.5 degrees. However, these radials are predicted to be outside of the maximum by a relatively small amount. Therefore, there is a strong possibility that actual measurements on these radials would demonstrate these radials to be within limits. At worst, it may be necessary to make some minor adjustments on the KCCV antenna system to meet the FCC requirements.

Conclusion

Based on the MININEC model analysis of the old and new Richland towers, we conclude that there will be minimal net effect on the KCCV antenna system. Monitoring points are expected to stay within FCC limits. And, all but two measured radials are expected to stay within limits. Notwithstanding this finding, actual measurements taken as part of a partial proof-of-performance on KCCV may be all that

† See FCC File No. BL-19891204AA.

is necessary to demonstrate compliance with the FCC limits. At worst, some minor adjustments on the KCCV array may be required.

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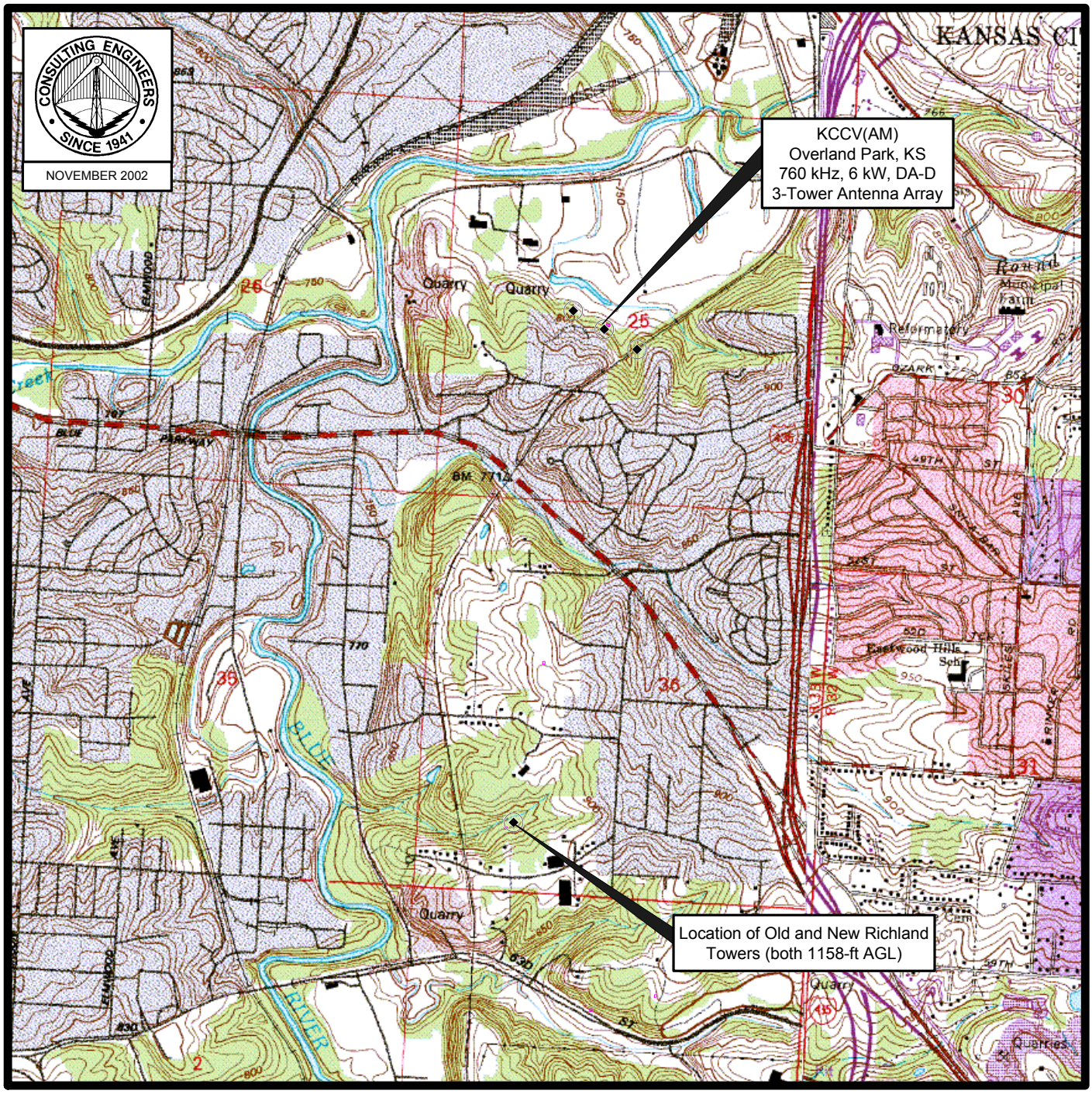
November 6, 2002



MAP OF KCCV AND RICHLAND TOWERS

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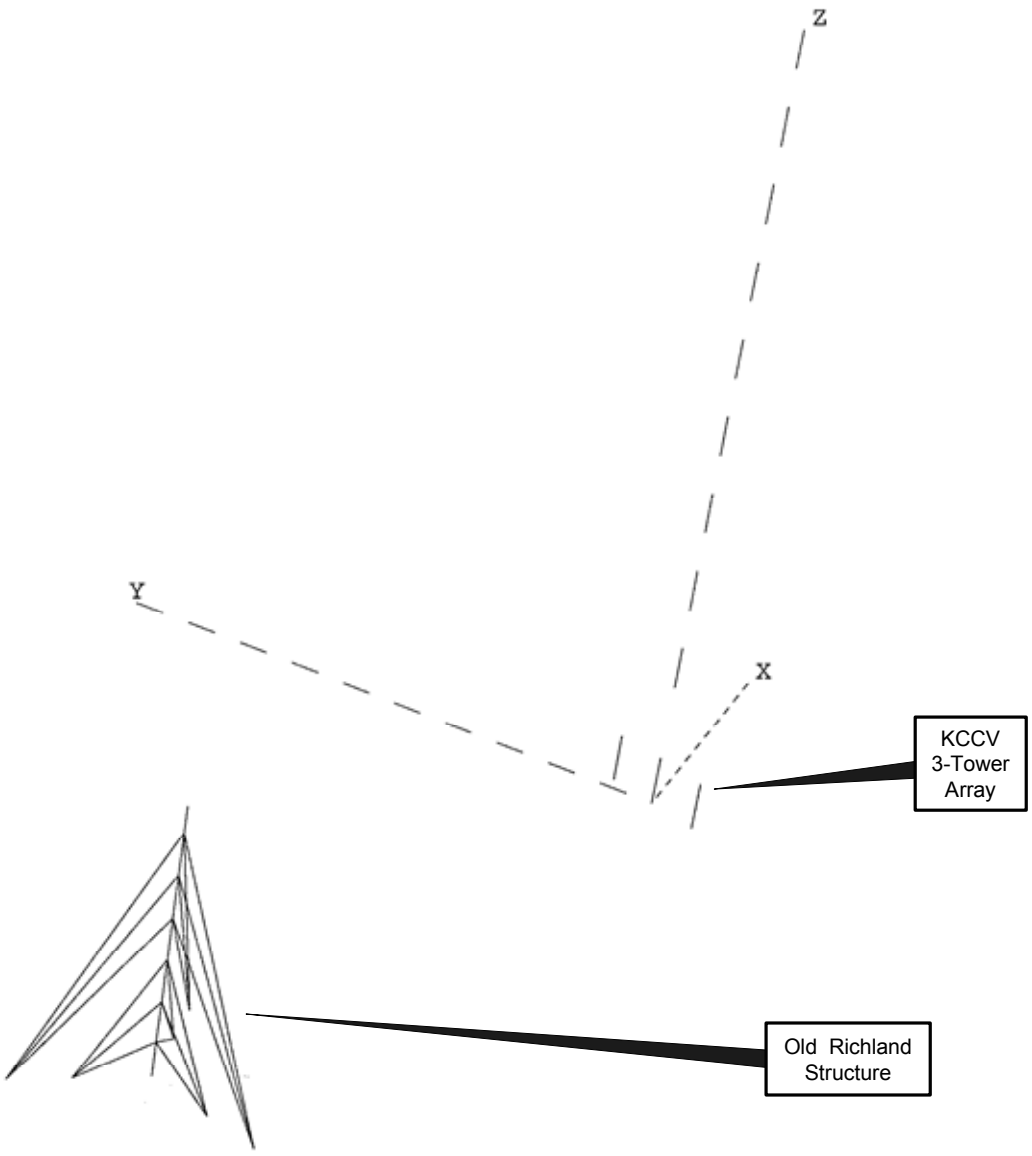

PERSPECTIVE VIEWS OF MININEC WIRE MODELS (OLD RICHLAND TOWER WITH KCCV ARRAY)

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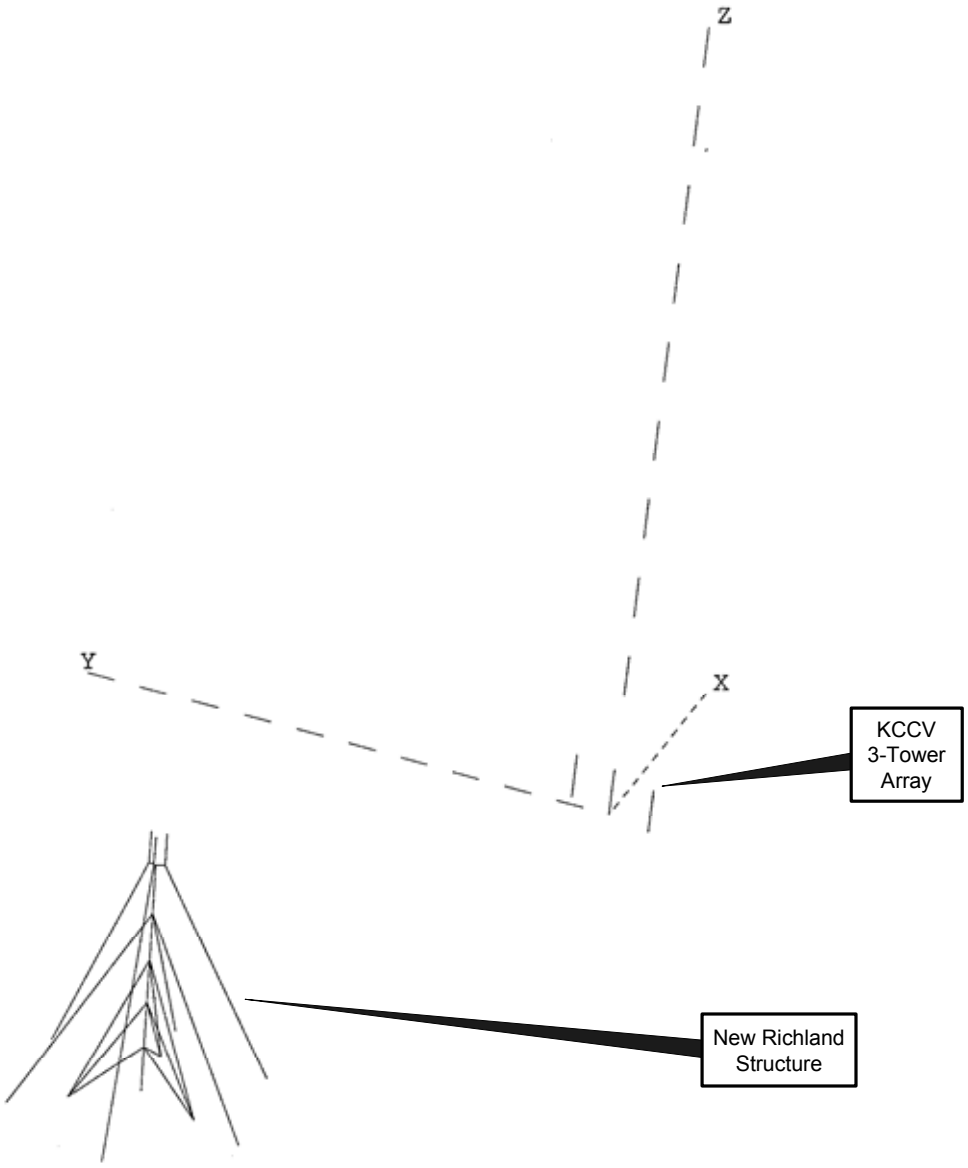

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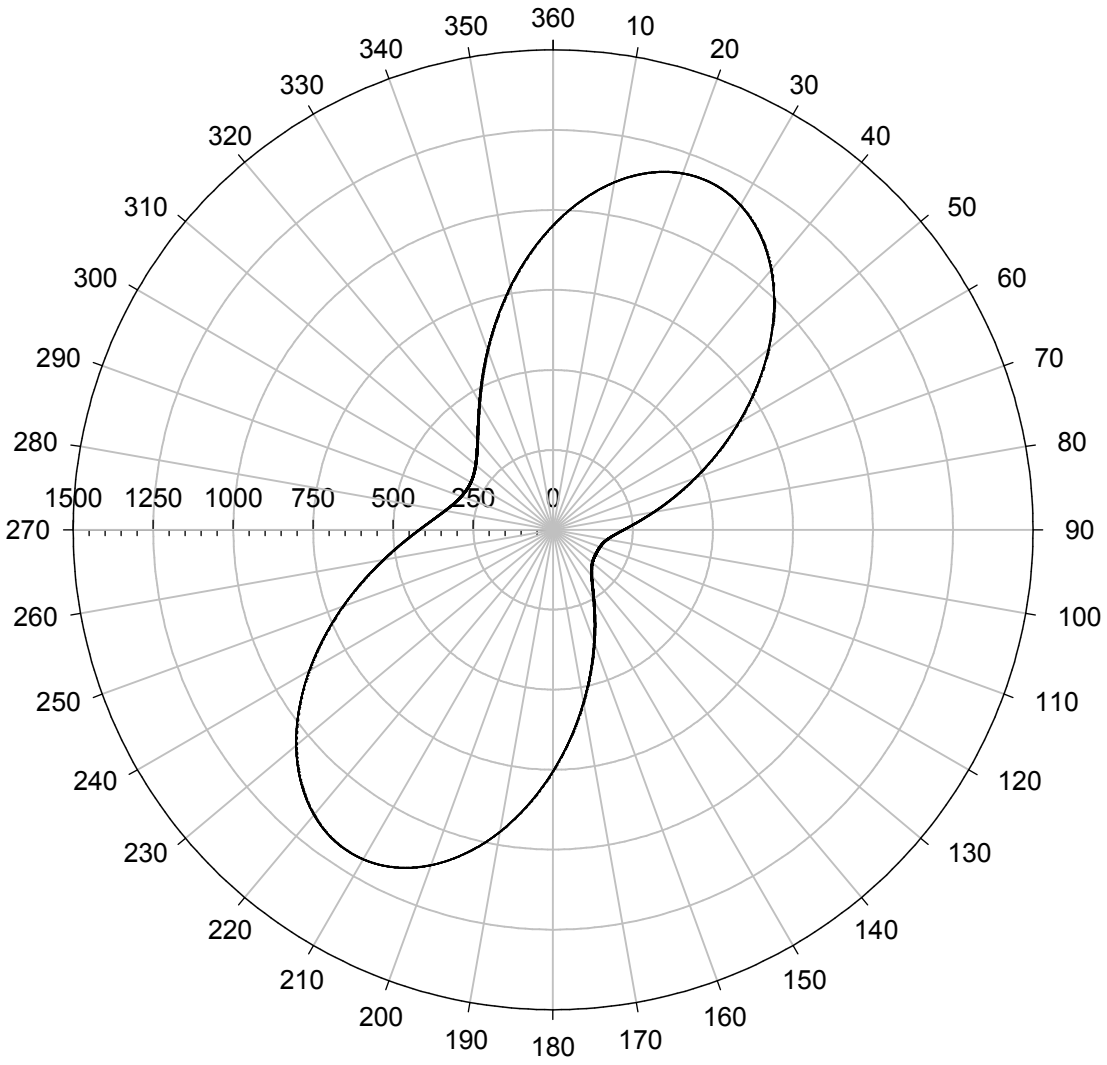

KCCV THEORETICAL HORIZONTAL PLANE PATTERN BASED ON MININEC MODEL OF ARRAY ALONE (GRAPH - mV/m at 1 km)

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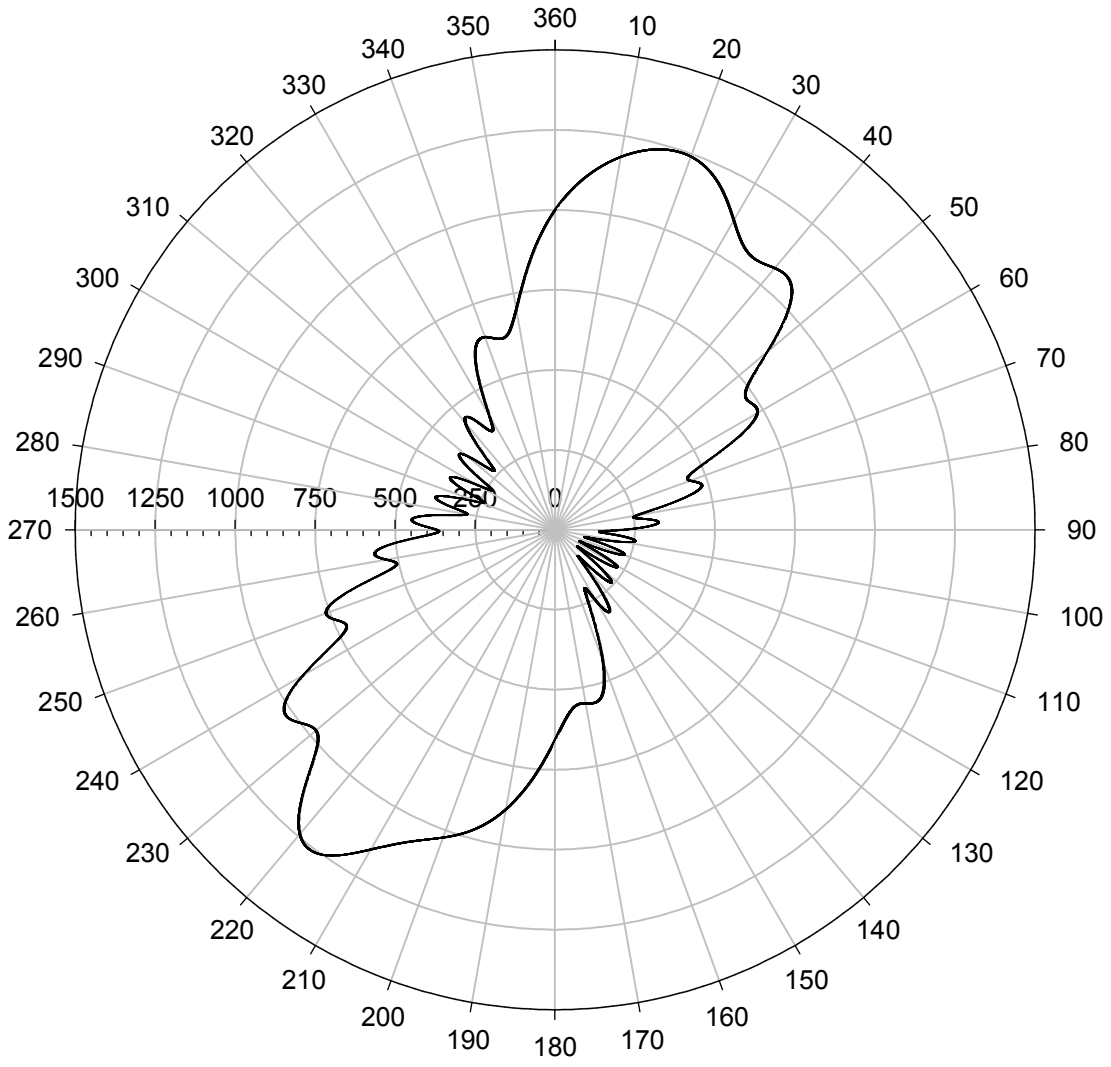

KCCV THEORETICAL HORIZONTAL PLANE PATTERN BASED ON MININEC MODEL OF ARRAY WITH OLD TOWER (GRAPH - mV/m at 1 km)

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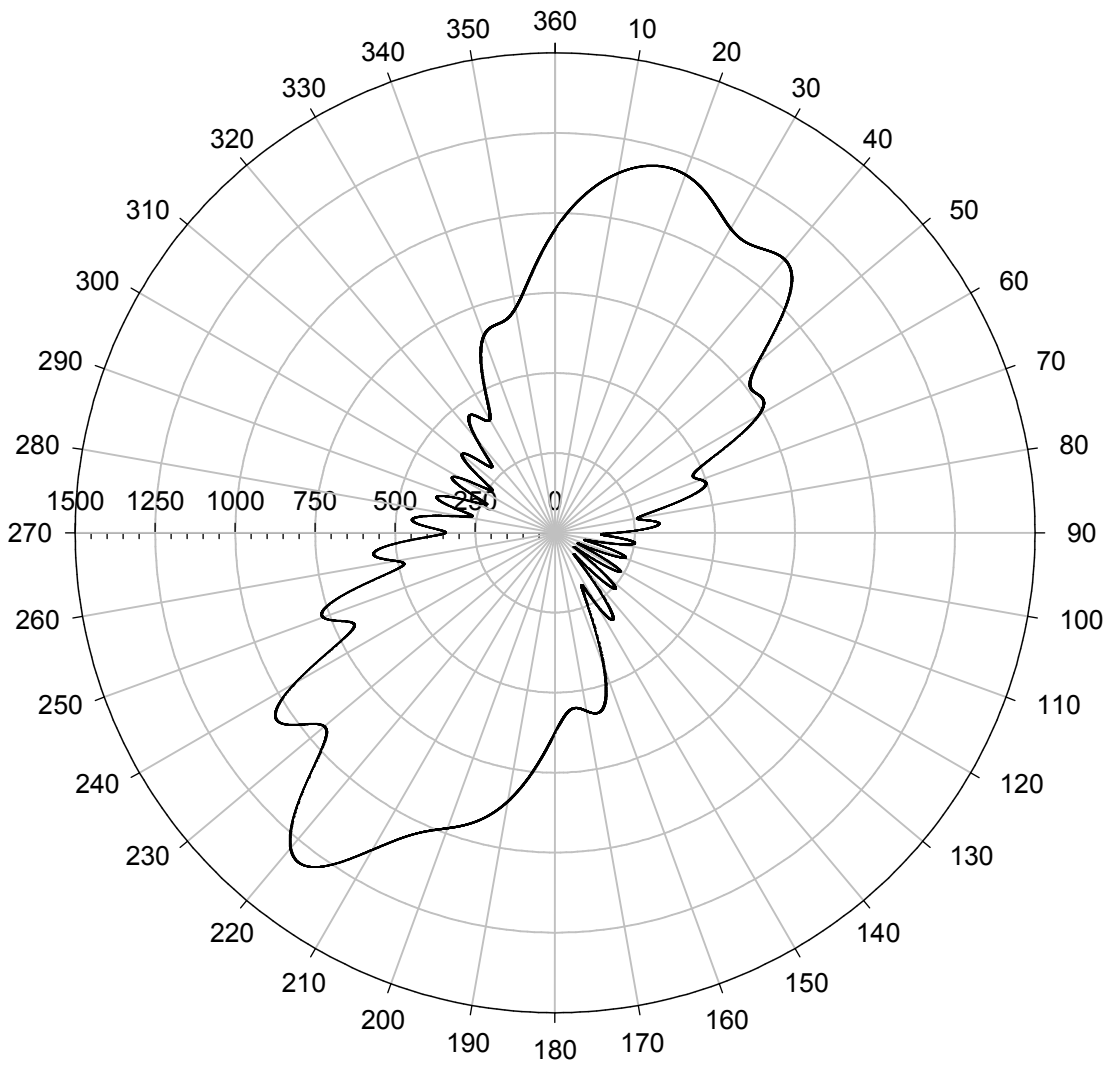

KCCV THEORETICAL HORIZONTAL PLANE PATTERN BASED ON MININEC MODEL OF ARRAY WITH NEW TOWER (GRAPH - mV/m at 1 km)

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Tabulation and Analysis of KCCV MININEC Calculated Patterns

Azimuth (deg. true)	KCCV Undisturbed Pattern (mV/m at 1 km)	KCCV Pattern with Old Richland Tower (mV/m at 1 km)	KCCV Pattern with Old Richland Tower (mV/m at 1 km)	KCCV Pattern Change Relative to KCCVwith Old Richland Tower (mV/m at 1 km)	Percent Change Relative to KCCVwith Old Richland Tower
0.0	951.4	1000.9	949.2	-51.7	-5.2
1.0	977.0	1025.2	973.7	-51.6	-5.0
1.5	985.4	1036.8	985.5	-51.3	-4.9
2.0	993.7	1048.1	997.2	-50.9	-4.9
2.5	1001.9	1059.0	1008.6	-50.4	-4.8
3.0	1010.0	1069.5	1019.6	-49.8	-4.7
3.5	1017.9	1079.6	1030.4	-49.2	-4.6
4.0	1025.8	1089.5	1041.0	-48.5	-4.5
4.5	1033.5	1099.0	1051.2	-47.8	-4.4
5.0	1041.1	1108.2	1061.1	-47.1	-4.3
5.5	1048.6	1117.0	1070.6	-46.4	-4.2
6.0	1056.0	1125.6	1079.9	-45.7	-4.1
6.5	1063.2	1133.9	1088.9	-45.0	-4.0
7.0	1070.2	1141.9	1097.5	-44.4	-3.9
7.5	1077.1	1149.6	1105.8	-43.8	-3.8
8.0	1083.8	1157.0	1113.8	-43.2	-3.7
8.5	1090.4	1164.2	1121.4	-42.8	-3.7
9.0	1096.8	1171.1	1128.7	-42.3	-3.6
9.5	1103.1	1177.7	1135.7	-42.0	-3.6
10.0	1109.1	1184.0	1142.3	-41.7	-3.5
10.5	1115.0	1190.0	1148.5	-41.5	-3.5
11.0	1120.7	1195.8	1154.4	-41.4	-3.5
11.5	1126.2	1201.3	1160.0	-41.4	-3.4
12.0	1131.5	1206.5	1165.1	-41.4	-3.4
12.5	1136.6	1211.4	1169.9	-41.5	-3.4
13.0	1141.6	1216.0	1174.3	-41.7	-3.4

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Tabulation and Analysis of KCCV MININEC Calculated Patterns

Azimuth (deg. true)	KCCV Undisturbed Pattern (mV/m at 1 km)	KCCV Pattern with Old Richland Tower (mV/m at 1 km)	KCCV Pattern with Old Richland Tower (mV/m at 1 km)	KCCV Pattern Change Relative to KCCVwith Old Richland Tower (mV/m at 1 km)	Percent Change Relative to KCCVwith Old Richland Tower
13.5	1146.3	1220.3	1178.3	-42.0	-3.4
14.0	1150.7	1224.3	1181.9	-42.4	-3.5
14.5	1155.0	1227.9	1185.1	-42.8	-3.5
15.0	1159.1	1231.2	1187.9	-43.3	-3.5
15.5	1162.9	1234.1	1190.2	-43.9	-3.6
16.0	1166.5	1236.6	1192.1	-44.5	-3.6
16.5	1169.9	1238.7	1193.5	-45.1	-3.6
17.0	1173.1	1240.4	1194.5	-45.8	-3.7
17.5	1176.0	1241.7	1195.1	-46.6	-3.8
18.0	1178.7	1242.5	1195.2	-47.3	-3.8
18.5	1181.1	1242.9	1194.8	-48.1	-3.9
19.0	1183.3	1242.7	1193.9	-48.8	-3.9
19.5	1185.3	1242.1	1192.6	-49.6	-4.0
20.0	1187.0	1241.0	1190.8	-50.2	-4.0
20.5	1188.4	1239.3	1188.5	-50.8	-4.1
21.0	1189.6	1237.1	1185.8	-51.4	-4.2
21.5	1190.6	1234.4	1182.6	-51.8	-4.2
22.0	1191.3	1231.1	1179.0	-52.1	-4.2
22.5	1191.8	1227.3	1175.0	-52.2	-4.3
23.0	1192.0	1222.9	1170.7	-52.2	-4.3
23.5	1191.9	1217.9	1166.0	-52.0	-4.3
24.0	1191.6	1212.4	1160.9	-51.5	-4.2
24.5	1191.1	1206.4	1155.6	-50.8	-4.2
25.0	1190.2	1199.9	1150.1	-49.7	-4.1
25.5	1189.2	1192.8	1144.4	-48.4	-4.1
26.0	1187.8	1185.4	1138.6	-46.7	-3.9
26.5	1186.3	1177.5	1132.8	-44.7	-3.8
27.0	1184.4	1169.3	1127.0	-42.3	-3.6

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27.5	1182.3	1160.7	1121.3	-39.4	-3.4
28.0	1180.0	1151.9	1115.8	-36.2	-3.1
28.5	1177.4	1143.0	1110.5	-32.5	-2.8
29.0	1174.5	1134.0	1105.5	-28.4	-2.5
29.5	1171.4	1124.9	1101.0	-23.9	-2.1
30.0	1168.1	1116.0	1096.9	-19.0	-1.7
30.5	1164.5	1107.3	1093.4	-13.8	-1.2
31.0	1160.6	1098.8	1090.5	-8.3	-0.8
31.5	1156.5	1090.8	1088.3	-2.5	-0.2
32.0	1152.2	1083.3	1086.8	3.5	0.3
32.5	1147.7	1076.4	1085.9	9.5	0.9
33.0	1142.9	1070.2	1085.8	15.6	1.5
33.5	1137.8	1064.8	1086.4	21.6	2.0
34.0	1132.6	1060.2	1087.7	27.4	2.6
34.5	1127.1	1056.6	1089.5	32.9	3.1
35.0	1121.4	1053.9	1091.9	38.0	3.6
35.5	1115.5	1052.1	1094.8	42.6	4.1
36.0	1109.4	1051.3	1097.9	46.6	4.4
36.5	1103.0	1051.4	1101.2	49.8	4.7
37.0	1096.5	1052.3	1104.5	52.2	5.0
37.5	1089.8	1053.9	1107.7	53.8	5.1
38.0	1082.8	1056.1	1110.5	54.5	5.2
38.5	1075.7	1058.7	1112.9	54.2	5.1
39.0	1068.3	1061.6	1114.6	52.9	5.0
39.5	1060.8	1064.6	1115.4	50.7	4.8
40.0	1053.1	1067.5	1115.1	47.6	4.5
40.5	1045.3	1070.0	1113.7	43.6	4.1
41.0	1037.2	1072.0	1110.8	38.8	3.6

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41.5	1029.0	1073.3	1106.5	33.2	3.1
42.0	1020.7	1073.5	1100.5	27.0	2.5
42.5	1012.1	1072.6	1092.9	20.3	1.9
43.0	1003.5	1070.3	1083.4	13.1	1.2
43.5	994.7	1066.5	1072.2	5.7	0.5
44.0	985.7	1061.1	1059.2	-1.9	-0.2
44.5	976.6	1053.8	1044.4	-9.4	-0.9
45.0	967.4	1044.7	1028.0	-16.7	-1.6
45.5	958.1	1033.8	1010.1	-23.6	-2.3
46.0	948.6	1020.9	990.9	-30.0	-2.9
46.5	939.0	1006.2	970.5	-35.6	-3.5
47.0	929.4	989.7	949.3	-40.4	-4.1
47.5	919.6	971.6	927.7	-44.0	-4.5
48.0	909.7	952.2	905.8	-46.3	-4.9
48.5	899.8	931.5	884.2	-47.3	-5.1
49.0	889.7	910.0	863.3	-46.7	-5.1
49.5	879.6	887.9	843.4	-44.6	-5.0
50.0	869.4	865.8	825.0	-40.8	-4.7
50.5	859.2	843.9	808.4	-35.5	-4.2
51.0	848.9	822.7	794.1	-28.7	-3.5
51.5	838.5	802.8	782.1	-20.6	-2.6
52.0	828.1	784.5	772.8	-11.7	-1.5
52.5	817.6	768.2	766.0	-2.2	-0.3
53.0	807.1	754.2	761.7	7.5	1.0
53.5	796.6	742.9	759.6	16.8	2.3
54.0	786.1	734.2	759.5	25.3	3.4
54.5	775.5	728.2	760.8	32.6	4.5
55.0	764.9	724.8	763.1	38.4	5.3

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55.5	754.3	723.5	765.9	42.4	5.9
56.0	743.7	724.1	768.5	44.4	6.1
56.5	733.1	725.9	770.5	44.6	6.1
57.0	722.5	728.5	771.4	42.9	5.9
57.5	711.9	731.2	770.6	39.5	5.4
58.0	701.3	733.5	768.0	34.5	4.7
58.5	690.8	734.8	763.0	28.2	3.8
59.0	680.3	734.7	755.6	20.9	2.8
59.5	669.8	732.6	745.5	12.9	1.8
60.0	659.3	728.3	732.8	4.5	0.6
60.5	648.9	721.4	717.4	-4.0	-0.6
61.0	638.5	711.9	699.6	-12.3	-1.7
61.5	628.2	699.7	679.7	-20.0	-2.9
62.0	617.9	684.7	657.8	-26.9	-3.9
62.5	607.7	667.2	634.6	-32.6	-4.9
63.0	597.6	647.4	610.5	-36.9	-5.7
63.5	587.5	625.7	586.2	-39.5	-6.3
64.0	577.5	602.5	562.3	-40.1	-6.7
64.5	567.5	578.4	539.7	-38.7	-6.7
65.0	557.7	554.2	519.1	-35.1	-6.3
65.5	547.9	530.5	501.2	-29.4	-5.5
66.0	538.2	508.3	486.5	-21.8	-4.3
66.5	528.6	488.4	475.6	-12.7	-2.6
67.0	519.1	471.4	468.6	-2.8	-0.6
67.5	509.7	458.1	465.3	7.2	1.6
68.0	500.3	448.8	465.3	16.5	3.7
68.5	491.1	443.7	468.1	24.4	5.5
69.0	482.0	442.4	472.7	30.3	6.9

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69.5	473.0	444.5	478.4	34.0	7.6
70.0	464.1	449.0	484.3	35.3	7.9
70.5	455.3	455.2	489.5	34.3	7.5
71.0	446.6	461.9	493.3	31.4	6.8
71.5	438.1	468.4	495.2	26.8	5.7
72.0	429.7	473.6	494.7	21.0	4.4
72.5	421.3	477.0	491.3	14.3	3.0
73.0	413.1	477.9	485.0	7.1	1.5
73.5	405.1	475.9	475.6	-0.3	-0.1
74.0	397.1	470.8	463.2	-7.6	-1.6
74.5	389.3	462.3	448.0	-14.3	-3.1
75.0	381.7	450.6	430.2	-20.4	-4.5
75.5	374.1	435.6	410.2	-25.4	-5.8
76.0	366.7	417.9	388.6	-29.2	-7.0
76.5	359.4	397.6	366.2	-31.5	-7.9
77.0	352.3	375.5	343.6	-32.0	-8.5
77.5	345.3	352.3	321.8	-30.6	-8.7
78.0	338.4	328.9	301.9	-27.0	-8.2
78.5	331.7	306.3	284.9	-21.4	-7.0
79.0	325.1	285.8	271.9	-13.9	-4.9
79.5	318.7	268.7	263.6	-5.1	-1.9
80.0	312.4	256.1	260.3	4.2	1.6
80.5	306.2	248.9	261.8	12.8	5.2
81.0	300.2	247.4	267.2	19.8	8.0
81.5	294.3	251.1	275.5	24.4	9.7
82.0	288.6	258.9	285.5	26.6	10.3
82.5	283.0	269.5	295.9	26.4	9.8
83.0	277.6	281.4	305.8	24.4	8.7

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Azimuth (deg. true)	KCCV Undisturbed Pattern (mV/m at 1 km)	KCCV Pattern with Old Richland Tower (mV/m at 1 km)	KCCV Pattern with Old Richland Tower (mV/m at 1 km)	KCCV Pattern Change Relative to KCCVwith Old Richland Tower (mV/m at 1 km)	Percent Change Relative to KCCVwith Old Richland Tower
83.5	272.3	293.3	314.2	20.9	7.1
84.0	267.1	304.1	320.6	16.4	5.4
84.5	262.1	313.0	324.3	11.4	3.6
85.0	257.2	319.2	325.2	5.9	1.9
85.5	252.5	322.4	322.8	0.5	0.1
86.0	247.9	322.1	317.3	-4.8	-1.5
86.5	243.4	318.3	308.5	-9.8	-3.1
87.0	239.1	310.9	296.7	-14.2	-4.6
87.5	234.9	300.1	282.2	-18.0	-6.0
88.0	230.9	286.1	265.2	-20.9	-7.3
88.5	227.0	269.2	246.3	-22.9	-8.5
89.0	223.2	250.0	226.3	-23.7	-9.5
89.5	219.5	229.1	205.8	-23.3	-10.2
90.0	216.0	207.4	186.1	-21.3	-10.3
90.5	212.6	186.0	168.5	-17.5	-9.4
91.0	209.4	166.4	154.6	-11.8	-7.1
91.5	206.3	150.5	146.1	-4.4	-2.9
92.0	203.2	140.2	144.0	3.8	2.7
92.5	200.4	137.1	148.4	11.3	8.2
93.0	197.6	141.3	158.0	16.6	11.8
93.5	194.9	151.6	171.0	19.4	12.8
94.0	192.4	165.9	185.8	19.9	12.0
94.5	190.0	182.1	200.9	18.8	10.3
95.0	187.6	198.4	215.0	16.6	8.4
95.5	185.4	213.7	227.4	13.7	6.4
96.0	183.3	227.1	237.5	10.4	4.6
96.5	181.3	237.8	244.7	6.9	2.9
97.0	179.4	245.5	248.8	3.3	1.3

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Azimuth (deg. true)	KCCV Undisturbed Pattern (mV/m at 1 km)	KCCV Pattern with Old Richland Tower (mV/m at 1 km)	KCCV Pattern with Old Richland Tower (mV/m at 1 km)	KCCV Pattern Change Relative to KCCVwith Old Richland Tower (mV/m at 1 km)	Percent Change Relative to KCCVwith Old Richland Tower
97.5	177.6	249.8	249.6	-0.2	-0.1
98.0	175.8	250.6	247.0	-3.6	-1.4
98.5	174.2	247.7	241.0	-6.8	-2.7
99.0	172.6	241.3	231.7	-9.6	-4.0
99.5	171.2	231.5	219.4	-12.1	-5.2
100.0	169.8	218.5	204.3	-14.2	-6.5
100.5	168.5	202.6	186.9	-15.7	-7.8
101.0	167.2	184.5	167.9	-16.6	-9.0
101.5	166.1	164.8	148.1	-16.7	-10.1
102.0	165.0	144.5	128.7	-15.7	-10.9
102.5	163.9	124.8	111.6	-13.2	-10.6
103.0	162.9	108.0	99.4	-8.6	-8.0
103.5	162.0	96.6	94.6	-2.0	-2.1
104.0	161.2	93.5	98.7	5.3	5.6
104.5	160.4	99.4	110.4	11.0	11.0
105.0	159.6	112.5	126.7	14.3	12.7
105.5	158.9	129.6	145.2	15.6	12.1
106.0	158.3	148.3	163.9	15.7	10.6
106.5	157.7	166.8	181.6	14.9	8.9
107.0	157.1	183.9	197.4	13.5	7.4
107.5	156.6	198.9	210.7	11.8	5.9
108.0	156.1	211.2	221.0	9.8	4.6
108.5	155.6	220.3	227.9	7.6	3.4
109.0	155.2	226.0	231.2	5.2	2.3
109.5	154.8	228.0	230.8	2.8	1.2
110.0	154.5	226.5	226.7	0.3	0.1
110.5	154.1	221.3	219.0	-2.2	-1.0
111.0	153.8	212.6	207.9	-4.7	-2.2

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111.5	153.6	200.7	193.6	-7.1	-3.5
112.0	153.3	185.9	176.5	-9.4	-5.1
112.5	153.1	168.7	157.2	-11.5	-6.8
113.0	152.9	149.9	136.6	-13.2	-8.8
113.5	152.8	130.3	115.9	-14.4	-11.0
114.0	152.6	111.4	96.9	-14.4	-13.0
114.5	152.5	95.3	82.9	-12.4	-13.1
115.0	152.4	85.3	77.8	-7.5	-8.7
115.5	152.3	84.1	83.8	-0.3	-0.4
116.0	152.2	92.2	98.4	6.2	6.8
116.5	152.2	107.0	117.9	10.9	10.2
117.0	152.2	125.2	139.0	13.8	11.0
117.5	152.1	144.5	160.0	15.5	10.7
118.0	152.2	163.3	179.5	16.2	9.9
118.5	152.2	180.5	196.9	16.4	9.1
119.0	152.2	195.6	211.5	15.9	8.1
119.5	152.3	207.8	222.9	15.0	7.2
120.0	152.4	217.0	230.7	13.7	6.3
120.5	152.5	222.8	234.8	12.1	5.4
121.0	152.6	225.1	235.1	10.0	4.5
121.5	152.8	223.8	231.6	7.7	3.5
122.0	152.9	219.1	224.3	5.2	2.4
122.5	153.1	211.0	213.3	2.4	1.1
123.0	153.3	199.8	199.1	-0.7	-0.3
123.5	153.6	185.7	181.9	-3.8	-2.1
124.0	153.8	169.4	162.3	-7.1	-4.2
124.5	154.1	151.4	141.0	-10.5	-6.9
125.0	154.5	132.7	119.0	-13.7	-10.3

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125.5	154.8	114.5	98.1	-16.4	-14.3
126.0	155.2	98.8	81.3	-17.6	-17.8
126.5	155.6	88.4	72.9	-15.5	-17.5
127.0	156.1	86.1	76.8	-9.4	-10.9
127.5	156.6	92.8	91.2	-1.6	-1.7
128.0	157.1	106.4	111.5	5.2	4.9
128.5	157.7	124.0	134.2	10.2	8.3
129.0	158.3	143.2	157.1	13.9	9.7
129.5	158.9	162.5	179.0	16.5	10.1
130.0	159.6	180.8	199.0	18.2	10.1
130.5	160.4	197.3	216.5	19.2	9.7
131.0	161.2	211.6	231.1	19.5	9.2
131.5	162.0	223.1	242.5	19.4	8.7
132.0	162.9	231.8	250.4	18.6	8.0
132.5	163.9	237.3	254.7	17.5	7.4
133.0	165.0	239.5	255.4	15.8	6.6
133.5	166.1	238.5	252.3	13.8	5.8
134.0	167.2	234.3	245.7	11.4	4.8
134.5	168.5	227.0	235.6	8.5	3.8
135.0	169.8	216.9	222.3	5.4	2.5
135.5	171.2	204.3	206.2	1.9	0.9
136.0	172.6	189.5	187.6	-1.9	-1.0
136.5	174.2	173.2	167.2	-5.9	-3.4
137.0	175.8	156.1	145.9	-10.2	-6.5
137.5	177.6	139.3	124.8	-14.5	-10.4
138.0	179.4	124.4	106.1	-18.3	-14.7
138.5	181.3	113.2	92.7	-20.5	-18.1
139.0	183.3	108.1	88.4	-19.6	-18.2

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139.5	185.4	110.3	95.1	-15.2	-13.8
140.0	187.6	119.7	110.8	-8.9	-7.4
140.5	190.0	134.6	132.0	-2.6	-2.0
141.0	192.4	153.0	155.8	2.8	1.8
141.5	194.9	173.1	180.4	7.3	4.2
142.0	197.6	193.6	204.6	10.9	5.6
142.5	200.4	213.8	227.6	13.8	6.5
143.0	203.2	232.8	249.0	16.1	6.9
143.5	206.3	250.3	268.1	17.9	7.1
144.0	209.4	265.7	284.9	19.1	7.2
144.5	212.6	279.0	298.9	19.9	7.1
145.0	216.0	289.7	310.0	20.3	7.0
145.5	219.5	297.9	318.1	20.2	6.8
146.0	223.2	303.4	323.1	19.8	6.5
146.5	227.0	306.1	325.1	18.9	6.2
147.0	230.9	306.2	323.9	17.7	5.8
147.5	234.9	303.8	319.9	16.1	5.3
148.0	239.1	298.8	313.0	14.2	4.7
148.5	243.4	291.7	303.6	11.9	4.1
149.0	247.9	282.6	291.9	9.2	3.3
149.5	252.5	272.0	278.2	6.2	2.3
150.0	257.2	260.2	263.0	2.8	1.1
150.5	262.1	247.8	246.9	-0.9	-0.4
151.0	267.1	235.5	230.6	-4.9	-2.1
151.5	272.3	224.0	215.0	-9.1	-4.0
152.0	277.6	214.3	201.0	-13.2	-6.2
152.5	283.0	207.2	190.1	-17.1	-8.2
153.0	288.6	203.7	183.6	-20.2	-9.9

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Azimuth (deg. true)	KCCV Undisturbed Pattern (mV/m at 1 km)	KCCV Pattern with Old Richland Tower (mV/m at 1 km)	KCCV Pattern with Old Richland Tower (mV/m at 1 km)	KCCV Pattern Change Relative to KCCVwith Old Richland Tower (mV/m at 1 km)	Percent Change Relative to KCCVwith Old Richland Tower
153.5	294.3	204.4	182.4	-22.0	-10.8
154.0	300.2	209.5	187.0	-22.5	-10.7
154.5	306.2	219.0	197.4	-21.5	-9.8
155.0	312.4	232.2	212.7	-19.5	-8.4
155.5	318.7	248.6	231.8	-16.7	-6.7
156.0	325.1	267.3	253.7	-13.6	-5.1
156.5	331.7	287.6	277.3	-10.3	-3.6
157.0	338.4	308.9	301.9	-6.9	-2.2
157.5	345.3	330.6	327.0	-3.7	-1.1
158.0	352.3	352.4	351.9	-0.5	-0.1
158.5	359.4	373.8	376.3	2.5	0.7
159.0	366.7	394.5	399.9	5.3	1.4
159.5	374.1	414.4	422.4	8.0	1.9
160.0	381.7	433.2	443.7	10.5	2.4
160.5	389.3	450.7	463.6	12.9	2.9
161.0	397.1	466.9	481.9	15.0	3.2
161.5	405.1	481.7	498.7	17.0	3.5
162.0	413.1	495.0	513.8	18.8	3.8
162.5	421.3	506.9	527.2	20.3	4.0
163.0	429.7	517.3	539.0	21.7	4.2
163.5	438.1	526.2	549.0	22.9	4.3
164.0	446.6	533.7	557.5	23.8	4.5
164.5	455.3	539.9	564.4	24.5	4.5
165.0	464.1	544.8	569.7	25.0	4.6
165.5	473.0	548.5	573.7	25.2	4.6
166.0	482.0	551.2	576.4	25.2	4.6
166.5	491.1	552.9	577.8	24.9	4.5
167.0	500.3	553.8	578.2	24.4	4.4

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Azimuth (deg. true)	KCCV Undisturbed Pattern (mV/m at 1 km)	KCCV Pattern with Old Richland Tower (mV/m at 1 km)	KCCV Pattern with Old Richland Tower (mV/m at 1 km)	KCCV Pattern Change Relative to KCCVwith Old Richland Tower (mV/m at 1 km)	Percent Change Relative to KCCVwith Old Richland Tower
167.5	509.7	554.0	577.6	23.6	4.3
168.0	519.1	553.7	576.2	22.5	4.1
168.5	528.6	553.0	574.2	21.2	3.8
169.0	538.2	552.0	571.7	19.7	3.6
169.5	547.9	550.9	568.8	17.9	3.2
170.0	557.7	549.9	565.7	15.8	2.9
170.5	567.5	549.0	562.5	13.5	2.5
171.0	577.5	548.4	559.5	11.1	2.0
171.5	587.5	548.3	556.7	8.4	1.5
172.0	597.6	548.6	554.3	5.7	1.0
172.5	607.7	549.6	552.4	2.8	0.5
173.0	617.9	551.3	551.1	-0.2	0.0
173.5	628.2	553.8	550.6	-3.2	-0.6
174.0	638.5	557.0	550.8	-6.2	-1.1
174.5	648.9	561.1	551.9	-9.1	-1.6
175.0	659.3	566.0	554.0	-12.0	-2.1
175.5	669.8	571.7	556.9	-14.8	-2.6
176.0	680.3	578.3	560.8	-17.4	-3.0
176.5	690.8	585.6	565.7	-19.9	-3.4
177.0	701.3	593.7	571.5	-22.2	-3.7
177.5	711.9	602.4	578.1	-24.3	-4.0
178.0	722.5	611.8	585.6	-26.2	-4.3
178.5	733.1	621.7	593.8	-27.9	-4.5
179.0	754.3	632.2	602.8	-29.4	-4.7
180.0	754.3	654.4	622.5	-31.9	-4.9
181.0	786.1	677.8	644.2	-33.6	-5.0
181.5	796.6	689.9	655.6	-34.2	-5.0
182.0	807.1	702.1	667.3	-34.7	-4.9

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182.5	817.6	714.3	679.3	-35.1	-4.9
183.0	828.1	726.7	691.3	-35.3	-4.9
183.5	838.5	739.0	703.5	-35.5	-4.8
184.0	848.9	751.3	715.7	-35.6	-4.7
184.5	859.2	763.5	727.9	-35.6	-4.7
185.0	869.4	775.6	740.0	-35.6	-4.6
185.5	879.6	787.6	752.1	-35.5	-4.5
186.0	889.7	799.4	764.0	-35.4	-4.4
186.5	899.8	811.0	775.7	-35.3	-4.4
187.0	909.7	822.5	787.3	-35.2	-4.3
187.5	919.6	833.6	798.6	-35.1	-4.2
188.0	929.4	844.6	809.6	-35.0	-4.1
188.5	939.0	855.3	820.4	-34.9	-4.1
189.0	948.6	865.7	830.9	-34.8	-4.0
189.5	958.1	875.8	841.1	-34.7	-4.0
190.0	967.4	885.7	851.0	-34.7	-3.9
190.5	976.6	895.2	860.5	-34.7	-3.9
191.0	985.7	904.4	869.7	-34.7	-3.8
191.5	994.7	913.4	878.5	-34.8	-3.8
192.0	1003.5	922.0	887.0	-35.0	-3.8
192.5	1012.1	930.3	895.2	-35.2	-3.8
193.0	1020.7	938.3	903.0	-35.4	-3.8
193.5	1029.0	946.0	910.4	-35.6	-3.8
194.0	1037.2	953.4	917.5	-36.0	-3.8
194.5	1045.3	960.5	924.2	-36.3	-3.8
195.0	1053.1	967.3	930.6	-36.7	-3.8
195.5	1060.8	973.9	936.7	-37.1	-3.8
196.0	1068.3	980.1	942.6	-37.6	-3.8

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Azimuth (deg. true)	KCCV Undisturbed Pattern (mV/m at 1 km)	KCCV Pattern with Old Richland Tower (mV/m at 1 km)	KCCV Pattern with Old Richland Tower (mV/m at 1 km)	KCCV Pattern Change Relative to KCCVwith Old Richland Tower (mV/m at 1 km)	Percent Change Relative to KCCVwith Old Richland Tower
196.5	1075.7	986.1	948.1	-38.0	-3.9
197.0	1082.8	991.9	953.4	-38.5	-3.9
197.5	1089.8	997.5	958.5	-39.0	-3.9
198.0	1096.5	1002.9	963.4	-39.5	-3.9
198.5	1103.0	1008.1	968.1	-40.0	-4.0
199.0	1109.4	1013.1	972.7	-40.4	-4.0
199.5	1115.5	1018.1	977.2	-40.9	-4.0
200.0	1121.4	1023.0	981.8	-41.2	-4.0
200.5	1127.1	1027.8	986.3	-41.5	-4.0
201.0	1132.6	1032.6	990.9	-41.6	-4.0
201.5	1137.8	1037.4	995.7	-41.7	-4.0
202.0	1142.9	1042.2	1000.6	-41.6	-4.0
202.5	1147.7	1047.2	1005.8	-41.4	-4.0
203.0	1152.2	1052.3	1011.3	-41.0	-3.9
203.5	1156.5	1057.6	1017.2	-40.4	-3.8
204.0	1160.6	1063.1	1023.5	-39.6	-3.7
204.5	1164.5	1068.9	1030.2	-38.6	-3.6
205.0	1168.1	1074.9	1037.5	-37.3	-3.5
205.5	1171.4	1081.2	1045.4	-35.8	-3.3
206.0	1174.5	1087.9	1053.9	-34.0	-3.1
206.5	1177.4	1094.9	1063.0	-31.9	-2.9
207.0	1180.0	1102.3	1072.7	-29.6	-2.7
207.5	1182.3	1110.1	1083.1	-26.9	-2.4
208.0	1184.4	1118.2	1094.1	-24.0	-2.1
208.5	1186.3	1126.7	1105.8	-20.9	-1.9
209.0	1187.8	1135.5	1118.0	-17.4	-1.5
209.5	1189.2	1144.5	1130.7	-13.8	-1.2
210.0	1190.2	1153.9	1143.9	-9.9	-0.9

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Tabulation and Analysis of KCCV MININEC Calculated Patterns

Azimuth (deg. true)	KCCV Undisturbed Pattern (mV/m at 1 km)	KCCV Pattern with Old Richland Tower (mV/m at 1 km)	KCCV Pattern with Old Richland Tower (mV/m at 1 km)	KCCV Pattern Change Relative to KCCVwith Old Richland Tower (mV/m at 1 km)	Percent Change Relative to KCCVwith Old Richland Tower
210.5	1191.1	1163.4	1157.5	-5.9	-0.5
211.0	1191.6	1173.0	1171.3	-1.7	-0.1
211.5	1191.9	1182.6	1185.2	2.6	0.2
212.0	1192.0	1192.2	1199.1	6.9	0.6
212.5	1191.8	1201.7	1212.9	11.3	0.9
213.0	1191.3	1210.8	1226.4	15.6	1.3
213.5	1190.6	1219.6	1239.4	19.8	1.6
214.0	1189.6	1227.9	1251.8	23.9	1.9
214.5	1188.4	1235.5	1263.4	27.9	2.3
215.0	1187.0	1242.4	1274.0	31.6	2.5
215.5	1185.3	1248.4	1283.3	35.0	2.8
216.0	1183.3	1253.3	1291.4	38.1	3.0
216.5	1181.1	1257.1	1297.8	40.8	3.2
217.0	1178.7	1259.6	1302.6	43.0	3.4
217.5	1176.0	1260.7	1305.5	44.8	3.6
218.0	1173.1	1260.4	1306.4	46.1	3.7
218.5	1169.9	1258.4	1305.2	46.8	3.7
219.0	1166.5	1254.8	1301.7	46.9	3.7
219.5	1162.9	1249.6	1296.0	46.4	3.7
220.0	1159.1	1242.6	1287.9	45.3	3.6
220.5	1155.0	1233.9	1277.4	43.5	3.5
221.0	1150.7	1223.5	1264.6	41.0	3.4
221.5	1146.3	1211.5	1249.5	37.9	3.1
222.0	1141.6	1198.0	1232.2	34.2	2.9
222.5	1136.6	1183.1	1213.0	29.9	2.5
223.0	1131.5	1167.0	1191.9	25.0	2.1
223.5	1126.2	1149.8	1169.4	19.6	1.7
224.0	1120.7	1131.9	1145.6	13.7	1.2

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224.5	1115.0	1113.5	1121.1	7.6	0.7
225.0	1109.1	1095.0	1096.2	1.2	0.1
225.5	1103.1	1076.6	1071.5	-5.2	-0.5
226.0	1096.8	1058.9	1047.4	-11.5	-1.1
226.5	1090.4	1042.0	1024.5	-17.5	-1.7
227.0	1083.8	1026.5	1003.5	-22.9	-2.2
227.5	1077.1	1012.6	984.9	-27.7	-2.7
228.0	1070.2	1000.7	969.2	-31.5	-3.1
228.5	1063.2	991.0	956.8	-34.2	-3.5
229.0	1056.0	983.8	948.1	-35.7	-3.6
229.5	1048.6	979.0	943.2	-35.8	-3.7
230.0	1041.1	976.7	942.1	-34.6	-3.5
230.5	1033.5	976.8	944.7	-32.1	-3.3
231.0	1025.8	979.0	950.5	-28.4	-2.9
231.5	1017.9	982.9	959.2	-23.8	-2.4
232.0	1010.0	988.3	970.0	-18.3	-1.9
232.5	1001.9	994.6	982.3	-12.3	-1.2
233.0	993.7	1001.3	995.4	-5.9	-0.6
233.5	985.4	1007.9	1008.4	0.5	0.1
234.0	977.0	1013.8	1020.7	6.8	0.7
234.5	968.6	1018.6	1031.5	12.8	1.3
235.0	960.0	1021.8	1040.2	18.4	1.8
235.5	951.4	1023.0	1046.3	23.3	2.3
236.0	942.7	1021.8	1049.2	27.4	2.7
236.5	933.9	1017.9	1048.7	30.7	3.0
237.0	925.1	1011.2	1044.4	33.1	3.3
237.5	916.2	1001.5	1036.1	34.6	3.5
238.0	907.2	988.9	1023.9	35.0	3.5

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238.5	898.2	973.3	1007.8	34.5	3.5
239.0	889.2	955.1	988.0	32.9	3.4
239.5	880.2	934.4	964.8	30.3	3.2
240.0	871.1	911.8	938.6	26.8	2.9
240.5	861.9	887.7	910.1	22.4	2.5
241.0	852.8	862.7	880.0	17.3	2.0
241.5	843.7	837.6	849.1	11.5	1.4
242.0	834.5	813.1	818.4	5.2	0.6
242.5	825.3	790.1	788.8	-1.3	-0.2
243.0	816.2	769.2	761.6	-7.7	-1.0
243.5	807.0	751.4	737.7	-13.7	-1.8
244.0	797.8	737.1	718.2	-18.9	-2.6
244.5	788.7	726.8	703.7	-23.1	-3.2
245.0	779.6	720.6	694.7	-25.9	-3.6
245.5	770.5	718.4	691.2	-27.2	-3.8
246.0	761.4	719.8	692.9	-26.9	-3.7
246.5	752.3	724.1	699.0	-25.1	-3.5
247.0	743.3	730.6	708.6	-22.1	-3.0
247.5	734.3	738.3	720.4	-17.9	-2.4
248.0	725.4	746.3	733.3	-13.0	-1.7
248.5	716.5	753.6	745.9	-7.6	-1.0
249.0	707.7	759.3	757.3	-2.0	-0.3
249.5	698.9	762.8	766.4	3.7	0.5
250.0	690.2	763.4	772.5	9.2	1.2
250.5	681.5	760.6	774.9	14.3	1.9
251.0	672.9	754.2	773.1	18.9	2.5
251.5	664.4	744.1	766.9	22.8	3.1
252.0	655.9	730.2	756.2	26.0	3.6

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252.5	647.5	712.9	741.0	28.2	4.0
253.0	639.2	692.4	721.8	29.3	4.2
253.5	630.9	669.5	698.9	29.4	4.4
254.0	622.8	644.8	672.9	28.1	4.4
254.5	614.7	619.3	644.8	25.5	4.1
255.0	606.7	594.0	615.5	21.5	3.6
255.5	598.8	570.1	586.2	16.1	2.8
256.0	591.0	548.8	558.2	9.4	1.7
256.5	583.3	531.2	533.0	1.8	0.3
257.0	575.7	518.2	512.0	-6.2	-1.2
257.5	568.1	510.4	496.3	-14.1	-2.8
258.0	560.7	507.8	486.7	-21.1	-4.2
258.5	553.4	510.1	483.5	-26.6	-5.2
259.0	546.2	516.4	486.3	-30.1	-5.8
259.5	539.0	525.5	494.2	-31.3	-6.0
260.0	532.0	536.1	505.7	-30.4	-5.7
260.5	525.1	546.9	519.4	-27.5	-5.0
261.0	518.3	556.7	533.7	-23.0	-4.1
261.5	511.6	564.4	547.3	-17.1	-3.0
262.0	505.0	569.2	558.8	-10.4	-1.8
262.5	498.6	570.4	567.4	-3.0	-0.5
263.0	492.2	567.7	572.2	4.6	0.8
263.5	485.9	560.7	572.8	12.1	2.2
264.0	479.8	549.6	568.9	19.3	3.5
264.5	473.8	534.6	560.3	25.7	4.8
265.0	467.8	516.1	547.2	31.1	6.0
265.5	462.0	494.9	529.9	35.0	7.1
266.0	456.3	471.8	509.0	37.2	7.9

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266.5	450.8	448.0	485.3	37.3	8.3
267.0	445.3	424.8	459.6	34.8	8.2
267.5	440.0	403.7	433.3	29.6	7.3
268.0	434.7	386.1	407.7	21.6	5.6
268.5	429.6	373.5	384.6	11.1	3.0
269.0	424.6	366.7	365.5	-1.2	-0.3
269.5	419.7	366.0	352.0	-14.0	-3.8
270.0	414.9	370.9	345.1	-25.8	-6.9
270.5	410.2	380.3	345.2	-35.1	-9.2
271.0	405.7	392.7	351.6	-41.1	-10.5
271.5	401.2	406.5	363.1	-43.4	-10.7
272.0	396.9	420.2	377.9	-42.3	-10.1
272.5	392.6	432.3	394.2	-38.1	-8.8
273.0	388.5	441.9	410.4	-31.5	-7.1
273.5	384.5	448.1	425.0	-23.1	-5.1
274.0	380.6	450.3	437.0	-13.3	-3.0
274.5	376.8	448.2	445.5	-2.8	-0.6
275.0	373.1	441.7	449.8	8.1	1.8
275.5	369.5	431.0	449.6	18.6	4.3
276.0	366.0	416.4	444.8	28.5	6.8
276.5	362.6	398.5	435.5	37.0	9.3
277.0	359.3	378.1	421.9	43.7	11.6
277.5	356.1	356.5	404.5	48.0	13.5
278.0	353.0	334.9	384.0	49.1	14.7
278.5	350.0	314.9	361.5	46.6	14.8
279.0	347.1	298.4	338.1	39.7	13.3
279.5	344.3	286.9	315.4	28.5	9.9
280.0	341.6	281.6	295.0	13.4	4.8

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280.5	339.0	283.0	279.0	-4.0	-1.4
281.0	336.5	290.5	268.9	-21.6	-7.4
281.5	334.1	302.8	265.9	-36.9	-12.2
282.0	331.7	318.0	270.0	-48.0	-15.1
282.5	329.5	334.5	280.3	-54.1	-16.2
283.0	327.3	350.5	295.2	-55.3	-15.8
283.5	325.2	364.8	312.6	-52.2	-14.3
284.0	323.2	376.2	330.7	-45.6	-12.1
284.5	321.3	384.1	347.9	-36.2	-9.4
285.0	319.5	387.9	363.0	-24.9	-6.4
285.5	317.7	387.3	375.1	-12.2	-3.2
286.0	316.1	382.3	383.4	1.1	0.3
286.5	314.5	373.1	387.4	14.4	3.9
287.0	313.0	359.9	387.1	27.1	7.5
287.5	311.5	343.5	382.2	38.7	11.3
288.0	310.2	324.7	373.1	48.4	14.9
288.5	308.9	304.6	360.0	55.4	18.2
289.0	307.7	284.7	343.6	59.0	20.7
289.5	306.6	266.5	324.7	58.2	21.8
290.0	305.5	252.0	304.2	52.3	20.7
290.5	304.5	242.9	283.6	40.8	16.8
291.0	303.6	240.4	264.5	24.1	10.0
291.5	302.7	244.8	248.6	3.8	1.6
292.0	302.0	255.2	237.8	-17.4	-6.8
292.5	301.3	270.1	233.5	-36.6	-13.6
293.0	300.6	287.6	236.2	-51.4	-17.9
293.5	300.1	305.9	245.3	-60.6	-19.8
294.0	299.6	323.5	259.4	-64.1	-19.8

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294.5	299.1	339.2	276.6	-62.5	-18.4
295.0	298.8	352.0	295.2	-56.8	-16.1
295.5	298.5	361.3	313.5	-47.7	-13.2
296.0	298.2	366.5	330.3	-36.2	-9.9
296.5	298.1	367.6	344.7	-23.0	-6.2
297.0	298.0	364.4	355.8	-8.7	-2.4
297.5	297.9	357.2	363.2	6.0	1.7
298.0	298.0	346.1	366.6	20.5	5.9
298.5	298.1	331.9	366.0	34.1	10.3
299.0	298.2	315.1	361.3	46.2	14.6
299.5	298.5	296.9	352.8	55.9	18.8
300.0	298.8	278.5	341.0	62.6	22.5
300.5	299.1	261.3	326.5	65.2	24.9
301.0	299.6	247.1	310.0	62.9	25.4
301.5	300.1	237.5	292.5	55.0	23.1
302.0	300.6	234.0	275.3	41.4	17.7
302.5	301.3	236.9	259.9	23.0	9.7
303.0	302.0	246.1	247.8	1.7	0.7
303.5	302.7	260.1	240.3	-19.8	-7.6
304.0	303.6	277.4	238.6	-38.8	-14.0
304.5	304.5	296.4	242.8	-53.6	-18.1
305.0	305.5	315.5	252.3	-63.2	-20.0
305.5	306.6	333.6	266.1	-67.5	-20.2
306.0	307.7	349.7	282.7	-67.0	-19.2
306.5	308.9	363.1	300.6	-62.5	-17.2
307.0	310.2	373.2	318.5	-54.8	-14.7
307.5	311.5	379.8	335.3	-44.5	-11.7
308.0	313.0	382.6	350.3	-32.3	-8.4

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308.5	314.5	381.6	362.9	-18.8	-4.9
309.0	316.1	377.0	372.4	-4.6	-1.2
309.5	317.7	369.0	378.7	9.7	2.6
310.0	319.5	358.1	381.7	23.7	6.6
310.5	321.3	344.7	381.3	36.6	10.6
311.0	323.2	329.8	377.7	48.0	14.5
311.5	325.2	314.1	371.2	57.0	18.2
312.0	327.3	298.9	362.1	63.2	21.1
312.5	329.5	285.3	351.0	65.7	23.0
313.0	331.7	274.7	338.6	63.9	23.3
313.5	334.1	268.3	325.7	57.4	21.4
314.0	336.5	266.9	313.2	46.4	17.4
314.5	339.0	270.9	302.2	31.3	11.6
315.0	341.6	279.9	293.5	13.6	4.8
315.5	344.3	293.4	288.2	-5.1	-1.7
316.0	347.1	310.0	287.0	-23.0	-7.4
316.5	350.0	328.6	290.0	-38.6	-11.7
317.0	353.0	348.1	297.2	-50.9	-14.6
317.5	356.1	367.5	308.0	-59.5	-16.2
318.0	359.3	386.0	321.7	-64.3	-16.6
318.5	362.6	402.8	337.4	-65.5	-16.3
319.0	366.0	417.6	354.1	-63.5	-15.2
319.5	369.5	429.9	371.1	-58.8	-13.7
320.0	373.1	439.4	387.5	-51.8	-11.8
320.5	376.8	446.0	403.0	-43.0	-9.6
321.0	380.6	449.6	416.8	-32.8	-7.3
321.5	384.5	450.3	428.8	-21.5	-4.8
322.0	388.5	448.3	438.6	-9.7	-2.2

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Tabulation and Analysis of KCCV MININEC Calculated Patterns

Azimuth (deg. true)	KCCV Undisturbed Pattern (mV/m at 1 km)	KCCV Pattern with Old Richland Tower (mV/m at 1 km)	KCCV Pattern with Old Richland Tower (mV/m at 1 km)	KCCV Pattern Change Relative to KCCVwith Old Richland Tower (mV/m at 1 km)	Percent Change Relative to KCCVwith Old Richland Tower
322.5	392.6	443.7	446.1	2.4	0.6
323.0	396.9	436.9	451.3	14.4	3.3
323.5	401.2	428.3	454.1	25.8	6.0
324.0	405.7	418.3	454.6	36.3	8.7
324.5	410.2	407.6	453.1	45.5	11.2
325.0	414.9	396.9	449.8	53.0	13.3
325.5	419.7	386.8	445.1	58.3	15.1
326.0	424.6	378.0	439.2	61.2	16.2
326.5	429.6	371.4	432.7	61.3	16.5
327.0	434.7	367.6	426.1	58.5	15.9
327.5	440.0	367.0	419.8	52.9	14.4
328.0	445.3	369.9	414.4	44.5	12.0
328.5	450.8	376.5	410.5	34.0	9.0
329.0	456.3	386.5	408.3	21.8	5.6
329.5	462.0	399.6	408.4	8.8	2.2
330.0	467.8	415.1	410.9	-4.3	-1.0
330.5	473.8	432.7	415.9	-16.8	-3.9
331.0	479.8	451.5	423.4	-28.1	-6.2
331.5	485.9	471.2	433.3	-37.9	-8.0
332.0	492.2	491.1	445.2	-45.9	-9.3
332.5	498.6	510.7	458.8	-51.9	-10.2
333.0	505.0	529.7	473.7	-56.0	-10.6
333.5	511.6	547.8	489.6	-58.2	-10.6
334.0	518.3	564.6	506.0	-58.6	-10.4
334.5	525.1	580.1	522.7	-57.4	-9.9
335.0	532.0	593.9	539.2	-54.7	-9.2
335.5	539.0	606.0	555.2	-50.7	-8.4
336.0	546.2	616.3	570.7	-45.6	-7.4

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336.5	553.4	624.9	585.3	-39.6	-6.3
337.0	560.7	631.7	598.9	-32.8	-5.2
337.5	568.1	636.9	611.4	-25.5	-4.0
338.0	575.7	640.4	622.7	-17.7	-2.8
338.5	583.3	642.4	632.8	-9.6	-1.5
339.0	591.0	643.1	641.6	-1.5	-0.2
339.5	598.8	642.6	649.3	6.6	1.0
340.0	606.7	641.2	655.7	14.5	2.3
340.5	614.7	638.9	661.0	22.1	3.5
341.0	622.8	636.2	665.4	29.2	4.6
341.5	630.9	633.1	668.7	35.7	5.6
342.0	639.2	629.9	671.4	41.5	6.6
342.5	647.5	626.9	673.3	46.4	7.4
343.0	655.9	624.2	674.7	50.5	8.1
343.5	664.4	622.2	675.8	53.5	8.6
344.0	672.9	621.0	676.6	55.6	9.0
344.5	681.5	620.7	677.3	56.6	9.1
345.0	690.2	621.6	678.1	56.5	9.1
345.5	698.9	623.7	679.2	55.4	8.9
346.0	707.7	627.2	680.5	53.3	8.5
346.5	716.5	632.0	682.3	50.3	8.0
347.0	725.4	638.2	684.7	46.5	7.3
347.5	734.3	645.8	687.7	41.9	6.5
348.0	743.3	654.7	691.5	36.8	5.6
348.5	752.3	664.8	696.0	31.2	4.7
349.0	761.4	676.0	701.3	25.3	3.7
349.5	770.5	688.3	707.4	19.1	2.8
350.0	779.6	701.5	714.4	12.9	1.8

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Azimuth (deg. true)	KCCV Undisturbed Pattern (mV/m at 1 km)	KCCV Pattern with Old Richland Tower (mV/m at 1 km)	KCCV Pattern with Old Richland Tower (mV/m at 1 km)	KCCV Pattern Change Relative to KCCVwith Old Richland Tower (mV/m at 1 km)	Percent Change Relative to KCCVwith Old Richland Tower
350.5	788.7	715.5	722.1	6.6	0.9
351.0	797.8	730.1	730.6	0.5	0.1
351.5	807.0	745.2	739.8	-5.4	-0.7
352.0	816.2	760.8	749.7	-11.1	-1.5
352.5	825.3	776.6	760.2	-16.4	-2.1
353.0	834.5	792.7	771.3	-21.4	-2.7
353.5	843.7	808.8	782.8	-26.0	-3.2
354.0	852.8	825.0	794.8	-30.2	-3.7
354.5	861.9	841.1	807.1	-33.9	-4.0
355.0	871.1	857.0	819.7	-37.3	-4.4
355.5	880.2	872.8	832.6	-40.3	-4.6
356.0	889.2	888.4	845.5	-42.8	-4.8
356.5	898.2	903.6	858.6	-45.0	-5.0
357.0	907.2	918.6	871.7	-46.9	-5.1
357.5	916.2	933.2	884.9	-48.4	-5.2
358.0	925.1	947.5	898.0	-49.6	-5.2
358.5	933.9	961.4	911.0	-50.5	-5.2
359.0	942.7	975.0	923.9	-51.1	-5.2
359.5	951.4	988.1	936.6	-51.5	-5.2

Figure 7

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Summary of Results Relative to KCCV Measured Radials

Azimuth (deg. True)	Percent Change Relative to KCCVwith Old Richland Tower	Analyzed Field from 1997 Partial Proof (mV/m)	Estimated New Analyzed Field with New Tower (mV/m)	Maximum Permissible based on Standard Pattern (mV/m)
25.0	-4.1	1197.3	1147.7	1233.0
71.5	5.7	460.3	**486.7**	462.9
118.0	9.9	129.6	142.5	159.5
164.5	4.5	459.0	**479.8**	462.9
211.0	-0.1	1192.7	1191.0	1233.0
254.5	4.1	569.0	592.4	645.0
298.0	5.9	274.2	290.4	309.4
341.5	5.6	563.6	595.4	645.0

Monitoring Points				
Azimuth (deg. True)	Percent Change Relative to KCCVwith Old Richland Tower	1997 MP Measured Field (mV/m)	Estimated New Analyzed Field with New Tower (mV/m)	FCC Licensed Maximum (mV/m)
118.0	9.9	16.8	18.5	20.69
298.0	5.9	54.0	57.2	63.00