

**ENGINEERING STATEMENT RE:
RICHLAND - ATLANTA TOWER
WQXI(AM) BEFORE AND AFTER CONSTRUCTION
DIRECTIONAL ANTENNA MEASUREMENTS**

INTRODUCTION

This engineering statement is prepared on behalf of Richland Towers (Richland), presently operating a multi-user tower facility in Atlanta, Georgia. The several FCC Permittees, who will be using this tower, all are required to deal with the impact the construction of this tower may have on nearby AM radio stations. This requirement is specified in Section 73.1692 of the FCC Rules. The measurements and analysis, required in Section 73.1692(c) and (d) are presented herein. Since no FCC permittee was the builder of the tower, and Richland is not an FCC permittee, there was no traditional method by which this condition could be met. Therefore, Richland has undertaken the effort to show no impact on WQXI(AM) by these measurements. They are provided by Richland for the use of the tenant permittees as needed.

AFFECTED STATIONS

All AM non-directional stations within 0.8km and all Directional stations within 3.2km must be addressed to determine any adverse effect of the tower construction. Typically measurements made before and after tower construction are made in order to illustrate that the AM station has not been adversely affected.

There is one AM station requiring attention as per Section 73.1692 of the FCC Rules. Station WQXI(AM), 790kHz, Atlanta, Georgia, has a nighttime directional antenna and is located 1.4km away. All other AM stations within 3.2km, are all further than 0.8km, and are authorized only with non-directional antennas and hence not subject to this condition.

BEFORE AND AFTER PARTIAL PROOF MEASUREMENTS

The FCC Rules require proof that the new construction does not have an adverse effect on WQXI(AM). Such proof is presented by partial proofs of performance, with measurements made before and after the construction, to illustrate no significant relative change in AM station operation. Current FCC Rules define a partial proof as

measurements on ten or more points, along the monitor point radials (or at least 4 radials) from two to 10 miles around the AM pattern.

Measurements for this proof were made along the five proof radials for WQXI(AM). Measurements made by Russell C. Harbaugh, Jr., P.E., as the after measurements on behalf of another tower builder, have been adopted as the Richland Before measurements. That measurement data is presented in the tables in Figure 1, attached to this report. The measurements were made at the locations, time and dates as shown in that tabulation.

The WQXI(AM) operating parameters at the time of the measurements are tabulated below.

WQXI(AM) - Atlanta, Georgia
Antenna operating parameters

Date	10/19/2000		6/24/2002
Time	7:45PM		9:00PM
Plate Voltage	5,000 V		55.0 V
Plate Current	0.25 A		19.5 A
Efficiency	85%		98.6%
Output Power	1058 Watts		1058 Watts
Common Point	50 Ohms		50 Ohms
	4.6 Amperes		4.6 Amperes
Antenna Monitor	Ratio Phase		Ratio Phase
	.930 146		.925 147.5
	1.00 0		1.00 0
	.620 -50		.620 -50
	.60 162		.590 162
Base Current	Current Ratio		Current Ratio
	6.5 Amp. 0.956		6.6 Amp. 0.943
	6.8 1.00		7.0 1.00
	4.3 0.632		4.4 0.629
	4.2 0.618		4.2 0.600

The field intensity meter used for the measurements were Potomac Instruments Model FIM-41. The Before measurements were made with meter S.N. 1401, calibrated in

February 1999. The after measurements were made using meter S.N. 534 last calibrated in May 1995.

PARTIAL PROOF MEASUREMENTS, VARIATIONS

The “before and after” measurements presented in this report show a clear and uniformly downward shift in values along each of the five proof radials. The before measurements for each radial, made in the winter months, are all relatively high. The after measurements, made in hot and humid summer conditions, are all relatively low. All radials are effected by nearly equal shifts, in the range of 10% to 20%. Several things may cause differences in measured values and they were all investigated and reported below.

- 1) Field Intensity Meter calibration was checked by comparing measured values with the meter used by station WQXI(AM). Both meters were found to be in close agreement. Both meters have been maintained and regularly calibrated.
- 2) The WQXI(AM) nighttime antenna parameters were carefully checked and found to be within tolerance of the FCC authorized values, with only minor variation from nominal values.
- 3) The Field Intensity historical values were inspected to discover any seasonal variations. The antenna monitor values, and measured field intensity at the monitor points, covering many seasons over several years, are tabulated on Table 2 attached to this report. Analysis of that data indicates a relatively stable antenna operation with a long term (6 year) variation of antenna monitor values that does not exceed 5% of Loop Current and 3 degrees of Phase.

However, the average seasonal monitor point Field Intensity variation is as much as 68% to as little as 6% among the five proof radials in any one year. The average variation of any radial over that full six year span is in the range of 44% to 15%. The individual radial variations in these before and after measurements, as reported above, is from 10% to 20%. The historical variation trends to be abruptly high in the winter and trending low in the summer. The seasonal variation is illustrated on the graph attached as Figure 2.

CONCLUSION

The before and after measurements show a uniform downward change, from winter to summer season, for each of the five proof radials. This change is consistent with the seasonal variations seen over the last several years. All radials are affected the same, the average field

intensity along a radial is reduced. No radial has a net increase in field and most individual points along a radial are also individually reduced in value.

The net effect seen in the before and after measurements are attributed to the historic seasonal variation seen at WQXI(AM). There is no evidence of any one radial being seriously affected and hence no evidence of a disruption of the WQXI(AM) directional pattern by re-radiation from the Richland Atlanta tower.

Respectfully Submitted
Lohnes & Culver

by _____
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July, 2002

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WQXI(AM) ANTENNA SYSTEM HISTORICAL VALUES	TABLE 1
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July, 2002

FIELD STRENGTH MEASUREMENTS
N 10° E

POINT NO.	DISTANCE (MILES)	(BEFORE) DA PARTIAL PROOF (MV/M)	DATE TIME (EDT) 10/16/2000	(AFTER) DA PARTIAL PROOF (MV/M)	DATE TIME (EDT) 06/24/02
9	2.18	36.0	1135	34.5	1413
10	2.98	17.5	1123	14.5	1434
11	3.17	24.8	1116	23.0	1438
12MP	3.41	21.5	1105	20.0	1442
13	3.77	14.5	1056	12.5	1445
14	4.06	19.1	1049	17.5	1449
15	4.92	9.5	1040	7.4	1458
16	5.71	11.2	1026	8.0	1901
17	6.27	7.2	1020	5.0	1907
18	6.88	7.4	1014	5.3	1913
19	7.14	6.2	1002	4.4	1917
20	7.60	4.8	0956	3.25	1921

After/Before Arithmetic Ratio 0.812

FIELD STRENGTH MEASUREMENTS
N 63.5° E

POINT NO.	DISTANCE (MILES)	(BEFORE) DA PARTIAL PROOF (MV/M)	DATE TIME (EDT) 10/16/2000	(AFTER) DA PARTIAL PROOF (MV/M)	DATE TIME (EDT) 06/25/02
7MP	2.07	8.90	1326	11.7	1106
8	2.46	8.40	1332	6.5	1050
9	3.03	4.40	1337	4.0	1042
11	3.78	4.20	1344	3.9	1035
12	4.09	3.10	1351	2.95	1030
13	5.04	1.65	1359	1.2	1022
14	5.56	1.09	1404	0.76	1018
15	6.10	1.32	1409	1.0	1012
16	7.29	1.26	1425	1.22	1008
17	7.80	1.20	1430	0.84	1001

After/Before Arithmetic Ratio 0.827

FIELD STRENGTH MEASUREMENTS
N 170° E

POINT NO.	DISTANCE (MILES)	(BEFORE) DA PARTIAL PROOF (MV/M)	DATE TIME (EDT) 10/17/2000	(AFTER) DA PARTIAL PROOF (MV/M)	DATE TIME (EDT) 06/25/02
6	2.27	20.6	1309	19.0	1401
7MP	2.62	23.2	1315	19.2	1356
8	2.73	22.1	1319	18.8	1352
11	3.38	13.1	1328	11.8	1347
12	3.55	13.2	1335	12.6	1343
13	4.10	12.7	1339	11.8	1335
14	4.76	6.2	1348	5.6	1327
17	5.45	8.4	1354	6.3	1319
20	6.36	5.2	1404	4.15	1316
21	6.63	4.6	1407	3.7	1312

After/Before Arithmetic Ratio 0.864

FIELD STRENGTH MEASUREMENTS
N 286° E

POINT NO.	DISTANCE (MILES)	(BEFORE) DA PARTIAL PROOF (MV/M)	DATE TIME (EDT) 10/18/2000	(AFTER) DA PARTIAL PROOF (MV/M)	DATE TIME (EDT) 06/25/02
11MP	2.25	3.75	1413	4.4	1135
12	2.51	3.60	1408	4.7	1142
13	2.87	2.30	1400	3.2	1146
15	3.74	1.60	1356	1.1	1152
16	4.27	2.05	1348	1.5	1157
17	4.88	1.10	1342	1.08	1202
18	5.64	0.60	1337	0.67	1209
20	7.52	1.10	1320	0.65	1226
21	7.90	1.33	1312	0.82	1235
22	8.33	1.31	1306	0.7	1242

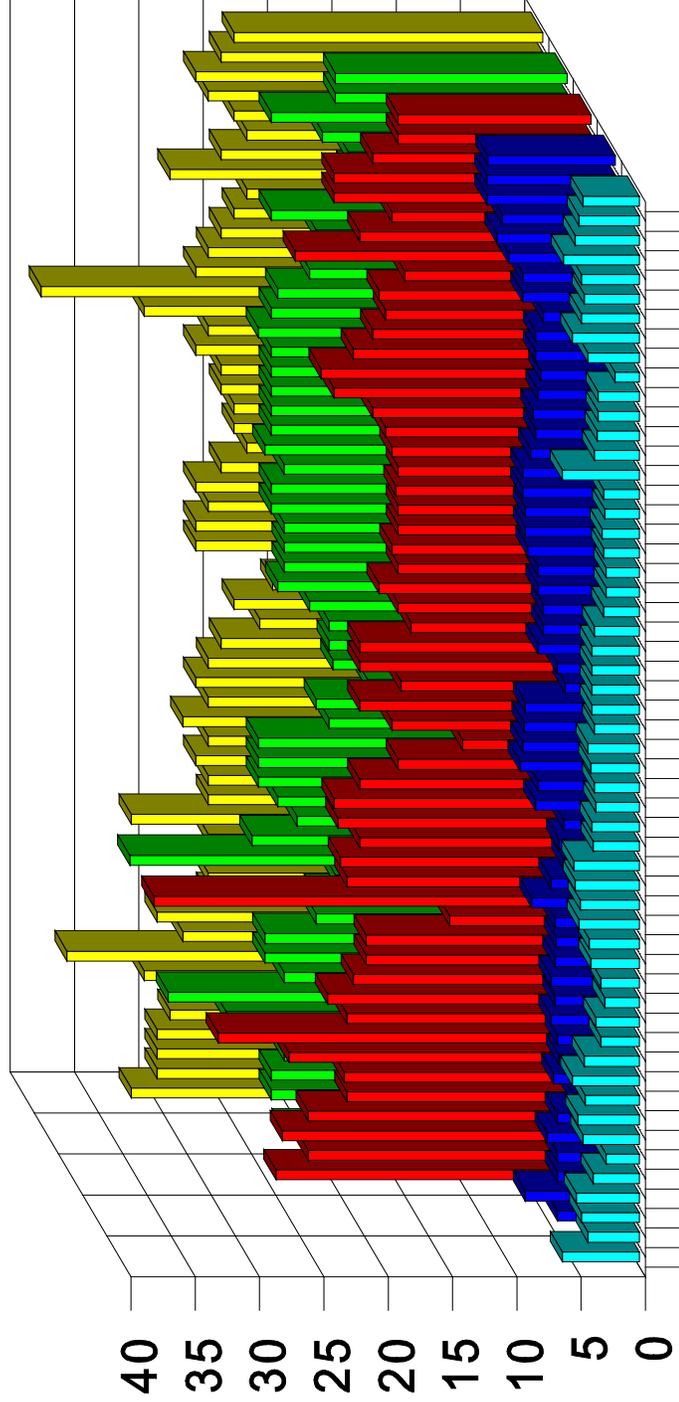
After/Before Arithmetic Ratio 0.903

FIELD STRENGTH MEASUREMENTS
N 345° E

POINT NO.	DISTANCE (MILES)	(BEFORE) DA PARTIAL PROOF (MV/M)	DATE TIME (EDT) 10/18/2000	(AFTER) DA PARTIAL PROOF (MV/M)	DATE TIME (EDT) 06/24/02
13MP	2.33	21.00	1100	20.8	2025
16	3.22	10.10	1050	8.8	2016
17	3.64	6.90	1045	5.8	2010
18	3.97	5.40	1041	5.1	2006
19	4.67	4.20	1032	2.9	1959
20	5.13	3.80	1025	3.25	1952
21	5.79	3.60	1016	3.7	1946
22	6.11	1.53	1009	1.35	1941
23	6.43	2.51	1005	2.05	1930
24	6.97	2.05	1001	1.65	1933

After/Before Arithmetic Ratio 0.872

WQXI(AM) Monitor Point Readings



JAN '96 '97 '98 '99 '00 '01 '02

170 Deg.
345 Deg.
286 Deg.

10 Deg.
63.5 Deg.

MPs for WQXI

DATE	LOOP1	PHASE1	LOOP2	LOOP3	PHASE3	LOOP4	PHASE4	COM_PT	10 Deg	63.5	170	286	345
3/26/96	93.7	146.1	100.0	62.1	-50.0	62.0	164.0	4.6	22	4.5	32	6	24.5
4/4/96	92.7	146.1	100.0	61.5	-50.0	60.0	163.0	4.6	18	7	30	4	22
4/9/96	93.7	146.1	100.0	62.0	-50.0	61.5	163.0	4.6	23	4.5	30	4.5	24
5/13/96	92.0	146.1	100.0	61.0	-50.0	59.5	163.0	4.6	23	4.5	30	4.9	22
6/30/96	93.0	146.1	100.0	60.5	-52.0	58.0	162.0	4.6	22	5.3	29	3.6	19
8/14/96	92.5	146.1	100.0	61.5	-51.9	57.5	162.0	4.6	22.5	4.5	18	2.6	19.2
10/9/96	93.1	146.1	100.0	62.5	-50.0	63.0	163.0	4.6	26.5	3.3	31	4.4	23.5
11/14/96	94.0	145.0	100.0	62.9	-50.0	61.5	163.0	4.6	31	4.8	37	4.8	29
12/11/96	94.0	145.0	100.0	63.0	-50.0	61.5	163.0	4.6	22	4.4	28	4.2	19
1/15/97	94.5	146.1	100.0	63.0	-50.0	62.5	163.0	4.6	23.5	4.5	30	5.2	20.5
2/26/97	93.0	145.5	100.0	60.0	-50.0	60.0	162.0	4.6	23.5	5	26	4.3	18.5
3/10/97	92.0	146.1	100.0	60.0	-50.1	59.5	163.0	4.6	19.5	4.7	26	3	17.5
4/3/97	92.0	146.1	100.0	60.0	-50.1	63.0	158.0	4.6	19.5	5	25	3.4	17.5
5/9/97	92.5	146.1	100.0	60.5	-51.0	58.5	163.0	4.6	18	4.7	26	2.7	11
7/2/97	91.0	146.1	100.0	59.0	-51.0	57.0	162.0	4.6	34	4.6	32	3	34
8/12/97	91.9	146.1	100.0	60.6	-50.0	59.8	163.0	4.6	24.5	4.7	26	3.8	19
9/23/97	93.0	146.1	100.0	62.1	-50.0	61.0	160.0	4.6	21	6.5	26	3.9	19.5
10/27/97	93.7	146.1	100.0	63.0	-50.0	62.5	163.0	4.6	22.5	5	27	4.7	18
11/26/97	93.7	146.1	100.0	63.0	-50.0	62.0	164.0	4.6	24	4	26	4.6	19.7
12/31/97	94.0	146.0	100.0	64.0	-49.0	63.0	163.0	4.6	24	4.4	28	5	20
1/31/98	93.7	146.1	100.0	63.0	-50.0	62.0	163.0	4.6	24	4	26	5.1	18

Thursday, June 27, 2002

DATE	LOOP1	PHASE1	LOOP2	LOOP3	PHASE3	LOOP4	PHASE4	COM_PT	10 Deg	63.5	170	286	345
3/30/98	92.5	146.1	100.0	62.0	-50.0	60.0	164.0	4.6	18.5	6.2	27	3.6	15
4/28/98	92.5	146.1	100.0	62.0	-50.0	60.5	162.0	4.6	19.5	6	26	3.7	10
5/28/98	91.0	146.1	100.0	60.0	-50.0	58.0	160.0	4.6	15.5	7.4	25	3.4	15.5
6/30/98	91.9	146.1	100.0	59.0	-50.0	58.0	160.0	4.6	18.2	7.2	22	3.5	18
7/29/98	91.5	144.5	100.0	60.1	-50.1	59.0	162.0	4.6	18.5	7.1	24	3.8	14.8
7/30/98	91.5	144.5	100.0	60.1	-50.1	59.5	162.0	4.6					
10/1/98	93.0	146.1	100.0	62.0	-50.0	61.0	161.5	4.6	18.5	7	21	4	18
11/11/98	94.0	146.1	100.0	63.0	-49.9	62.2	162.0	4.6	20	3.9	20	3.5	18
12/9/98	94.0	146.0	100.0	62.9	-49.8	62.0	163.9	4.6	22.5	4.5	27	3.7	14
1/20/99	93.8	146.0	100.0	62.9	-49.8	64.0	163.9	4.6	22	6	27	3.7	15
2/9/99	93.0	146.0	100.0	62.5	-50.0	62.0	163.9	4.6	22	5.6	26	3.7	16.5
3/17/99	93.0	146.0	100.0	62.5	-50.0	61.5	164.0	4.6	22	5.6	27	3.7	15
4/20/99	93.0	146.0	100.0	62.0	-50.0	60.0	163.0	4.6	23	6	25	3.5	15.5
5/20/99	93.0	146.0	100.0	62.0	-50.0	60.0	163.0	4.6	23	6	23	2.8	15
6/22/99	93.0	146.0	100.0	62.0	-50.0	59.5	162.0	4.6	22	6.8	24	2.6	15
7/22/99	92.0	146.0	100.0	61.0	-50.2	59.5	164.0	4.7	23.5	7	24	2.6	15.2
8/25/99	92.0	147.0	100.0	60.0	-50.0	59.5	163.0	4.6	23	7	25	2.8	15
9/27/99	93.0	146.0	100.0	62.0	-50.0	59.0	162.5	4.6	23	7.2	25	2.9	15.5
10/27/99	93.5	146.0	100.0	62.5	-50.0	60.5	163.0	4.6	23	7.2	27	2.7	16
11/23/99	94.0	146.0	100.0	62.5	-50.0	60.5	162.0	4.6	23	6.6	26	2.8	17
12/22/99	95.0	146.0	100.0	63.0	-49.9	62.5	162.0	4.6	23	6.2	31	6	20
1/19/00	93.5	146.0	100.0	62.0	-50.0	62.0	161.0	4.6	24	6.4	39	3.5	21
2/23/00	93.5	146.0	100.0	62.5	-50.0	62.5	162.0	4.6	23	6	27	3.3	18.5

Thursday, June 27, 2002

DATE	LOOP1	PHASE1	LOOP2	LOOP3	PHASE3	LOOP4	PHASE4	COM_PT	10 Deg	63.5	170	286	345
3/22/00	93.0	146.0	100.0	62.0	-50.0	60.5	162.0	4.6	22.5	5.8	26	3.2	17
4/20/00	92.8	146.0	100.0	61.8	-50.0	59.5	161.7	4.6	20	6.2	25	3.2	16
7/27/00	93.0	146.0	100.0	61.8	-50.0	59.0	161.0	4.6	18	6.2	24	1.9	16.5
10/19/00	93.0	146.0	100.0	62.0	-50.0	60.0	162.0	4.6	19.5	5.6	23	4	14.5
1/24/01	95.0	146.0	100.0	63.5	-50.0	62.0	162.0	4.6	23	7.2	29	5.2	23
4/16/01	93.0	146.0	100.0	61.0	-50.0	60.0	162.0	4.6	17	7.2	25	4.5	18
7/23/01	93.0	146.0	100.0	60.0	-51.0	59.0	162.0	4.6	17	8.3	23	4.3	15.5
8/29/01	92.0	146.0	100.0	60.0	-50.0	58.5	161.5	4.6	17	9.2	24	4.5	20
11/7/01	95.0	146.0	100.0	63.0	-51.0	61.5	162.0	4.6	19	8.8	26	5.9	20
1/15/02	96.0	146.0	100.0	64.0	-50.0	62.0	162.0	4.6	23	10	27	5	17
4/18/02	92.5	146.0	100.0	60.0	-50.0	60.0	162.0	4.6	18	10	25	4.7	15
6/20/02	92.5	146.0	100.0	61.0	-50.0	59.0	162.0	4.6	18	9.9	24	4.4	15
6/24/02	92.5	147.5	100.0	62.0	-50.0	59.0	162.0	4.6					

Thursday, June 27, 2002