

ENGINEERING EXHIBIT  
IN SUPPORT OF AN  
APPLICATION FOR CONSTRUCTION PERMIT  
WWDJ(AM) - HACKENSACK, NEW JERSEY  
970 kHz - 6.0 kW DAY/5.0 kW NIGHT - DA-2

FACILITY ID: 58635

Applicant: Salem Media of New York, LLC

June, 2005

***CARL T. JONES***  
CORPORATION

## TABLE OF CONTENTS

FCC Form 301 - Section III

ENGINEERING STATEMENT OF CYNTHIA M. JACOBSON, P.E.

### FIGURE NUMBER

Daytime Horizontal Standard Radiation Pattern .....	1
Tabulation of Daytime Horizontal Fields .....	2
Present and Proposed Daytime 1000 mV/m Contours .....	3
Present and Proposed Daytime 5 mV/m & 2 mV/m Contours .....	4
Present and Proposed Daytime 0.5 mV/m Contours .....	5
Daytime Allocation Study .....	6

### APPENDIX A

Summary of Measurement Data





STATEMENT OF CYNTHIA M. JACOBSON  
IN SUPPORT OF AN  
APPLICATION FOR CONSTRUCTION PERMIT  
WWDJ - HACKENSACK, NEW JERSEY  
970 kHz - 6.0 kW DAY/5.0 kW NIGHT - DA-2  
FACILITY ID: 58635

Applicant: Salem Media of New York, LLC

I am a Radio Engineer, an employee in the firm of Carl T. Jones Corporation, with offices located in Springfield, Virginia.

My education and experience are a matter of record with the Federal Communications Commission. I am a Registered Professional Engineer in the Commonwealth of Virginia, Registration No. 027914.

GENERAL

This office has been authorized by Salem Media of New York, LLC ("Salem"), licensee of Standard Broadcast Station WWDJ, Hackensack, New Jersey, to prepare this statement, FCC Form 301 (Section III), and the attached engineering exhibits in support of an Application for Construction Permit to increase the daytime operating power.

WWDJ is licensed to operate on 970 kHz with a power of 5.0 kW daytime and 5.0 kW nighttime, employing a directional antenna system for both modes. WWDJ is co-located with WWRV - 1330 kHz, New York, New York.

STATEMENT OF CYNTHIA M. JACOBSON  
WWDJ - HACKENSACK, NEW JERSEY  
PAGE 2

WWDJ proposes to operate with a power of 6.0 kW during the day utilizing a directional array. No changes are proposed to the nighttime array.

SITE AND SURROUNDING TERRAIN

The coordinates (NAD-27) are:

North Latitude: 40-54-40

West Longitude: 74-01-42

The WWDJ antenna/transmitter location and surrounding terrain characteristics and the site elevation remain unchanged. Detailed information describing the site is currently on file with the FCC and FAA. Site photographs are also contained in the WWDJ/WWRV files at the FCC.

ANTENNA SYSTEM AND GROUND SYSTEM

The existing antenna system consists of three series-excited structures of equal heights. All the structures are uniform cross-section, guyed structures. At the frequency of 970 kHz, the electrical height is 89.0 degrees.

The ground system consists of 120 evenly spaced, buried, copper wire radials per tower. The radials are between 61 and 77 meters long, except where shortened and bonded to the transverse copper strap between towers. A 14.6 meter square ground screen exists at the base around each tower. A tower sketch and property plat are contained in the FCC files.

Figure 1 is a polar plot of the proposed daytime standard radiation pattern in the horizontal plane. Figure 2 is a tabulation of the horizontal inverse distance fields (mV/m at 1 kilometer).

#### FAA NOTIFICATION AND TOWER REGISTRATION

Since WWDJ is proposing to utilize the existing towers without physical alteration, it is believed that no further notification to the Federal Aviation Administration (FAA) is necessary.

The proposed transmitting antennas are existing, registered tower structures. The Tower Registration Numbers are #1039504, #1039505, and #1039506 for Towers 1 - 3 respectively.

#### BLANKETING AND STATION INTERACTION

The present and proposed 1000 mV/m is depicted in Figure 3. The population within the proposed daytime 1000 mV/m contour is greater than 300 persons but less than 1.0 percent of the population within the proposed 25 mV/m contour.

In response to all complaints of blanketing interference, the applicant will undertake steps to mitigate the blanketing effects in accordance with the requirements of Section 73.88.

With the exception of co-located WWRV, there are no AM stations located within 3.2 kilometers of the existing WWDJ antenna site. There are two FM translator stations located

within 10 kilometers of the proposed site. There are no TV stations within 10 kilometers. It is expected that no detrimental interaction will occur with any station.

### COVERAGE CONTOURS

The present and proposed 5.0 mV/m and 2.0 mV/m daytime contours are shown in Figure 4. The proposed 5.0 mV/m daytime service contour will encompass 100% of the city of license, Hackensack, New Jersey. Figure 5 depicts the present and proposed 0.5 mV/m daytime contour.

### DAYTIME ALLOCATION STUDY

The results of the daytime study are shown in Figure 6. Eight stations were considered in detail regarding the daytime allocation. These stations are:

WELI	960 kHz	New Haven, Connecticut;
WPLY	960 kHz	Mount Pocono, Pennsylvania;
WCHN	970 kHz	Norwich, New York;
WESO	970 kHz	Southbridge, Massachusetts;
WAMD	970 kHz	Aberdeen, Maryland;
WILK	980 kHz	Wilkes-Barre, Pennsylvania;
WOFX	980 kHz	Troy, New York; and
WSUB	980 kHz	Groton, Connecticut.

The distances to all groundwave contours were calculated using the equivalent distance method. Contours were calculated at 5 degree intervals using ground conductivity values shown on the M-3 soil map with the exception of WWDJ where measurement data was employed. Appendix A is a breakdown of the measured conductivities and sources for WWDJ. Tabulations of distances to groundwave contours and conductivity profiles are not included herein but can be provided upon request.

As depicted in Figure 6, overlap presently exists with WSUB and WELI. Both of these areas of overlap can be attributed to the unusual saltwater, resulting in the majority of the overlap falling in water. Should the Commission deem it necessary, a waiver of Section 73.37(a) is respectfully requested.

#### ENVIRONMENTAL IMPACT

The proposal described herein does not involve high intensity lighting as specified in Section 1.1307(a)(8) of the Rules, nor will it result in human exposure to radiofrequency radiation in excess of the standards specified in Section 1.1307(b). The applicant has determined that under the provisions of Section 1.1306, the proposal is excluded from environmental processing. No new tower construction is necessary.

### RADIOFREQUENCY IMPACT

On January 1, 1986, the FCC amended its Rules to implement the National Environmental Policy Act of 1969 (NEPA). This amendment established RF radiation protection guidelines to be used to determine if potentially harmful RF exposure is possible from an FCC-regulated transmission facility. Effective October 15, 1997, the FCC adopted revised guidelines and procedures for evaluating environmental effects of RF emissions. These revised guidelines incorporate two tiers of exposure limits based on whether exposure occurs in a “controlled” (occupational) situation or an “uncontrolled” (general population) situation. The FCC has also revised OET Bulletin No. 65 entitled, “Evaluating Compliance With FCC Guidelines For Human Exposure to Radiofrequency Electromagnetic Fields,” to aid the radiation exposure analysis. This bulletin, as well as other current literature, provides detailed information for conducting an analysis including mathematical equations that can be used to determine compliance with the Commission’s guidelines.

The proposed WWDJ facility will be co-located with the WWRV(AM) facility, thus the proposed site is considered a multiple-use site.

### CALCULATION METHODS

Verification of compliance with FCC-specified guidelines for human exposure to RF radiation was obtained from OET Bulletin No. 65. To obtain distance to compliance with the guidelines, Table 2, Section 1 of Supplement A was used. The proposed WWDJ facility will



operate on 970 kHz with a daytime power of 6.0 kW and a nighttime power of 5.0 kW. Assuming a worst case scenario of 6.0 kW power, a fence of at least 2 meters from the base of each tower is required.

The WWRV facility operates on 1330 kHz with a daytime power of 10 kW and a nighttime power of 5.0 kW. Using Tables 2 and 3, Section 1 of Supplement A, and a worst case scenario of 10.0 kW, a fence of at least 2.0 meters from the base of the tower is required.

A 4.0 meter fence will satisfy both the occupational/controlled and the general population/uncontrolled MPE limits. The entire perimeter of the property which the WWDJ/WWRV transmitters and antenna systems are located is adequately fenced to deny access to the site, thus meeting the 4.0 meter minimum fencing. The fences will be locked to preclude public access to the towers and appropriate warning signs will also be posted.

#### OCCUPATIONAL SAFETY

Access to the WWDJ/WWRV supporting tower base will be restricted to authorized maintenance personnel only. WWDJ insures protection to station personnel or tower contractors working in the vicinity of the antenna. WWDJ will initiate joint procedures with WWRV to be followed during times of service or maintenance of the transmission systems when necessary to avoid potentially harmful exposure to personnel.

STATEMENT OF CYNTHIA M. JACOBSON  
WWDJ - HACKENSACK, NEW JERSEY  
PAGE 8

CONCLUSION

This statement, Section III of FCC Form 301, and the attached exhibits were prepared by me or under my direct supervision and are believed to be true and correct.

It is submitted that the proposed operation described herein complies with the technical standards of the Rules and Regulations of the Commission.

DATED: June 23, 2005

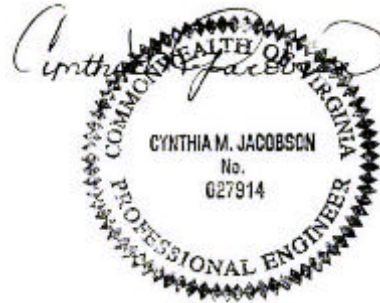
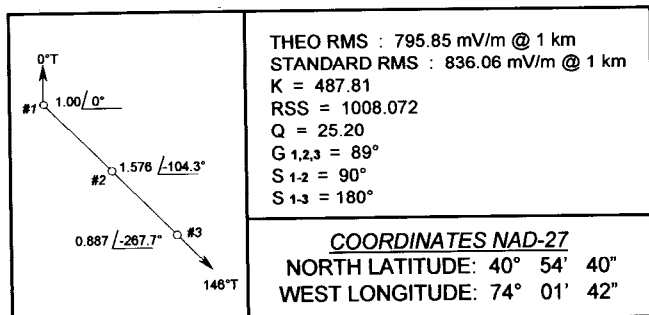
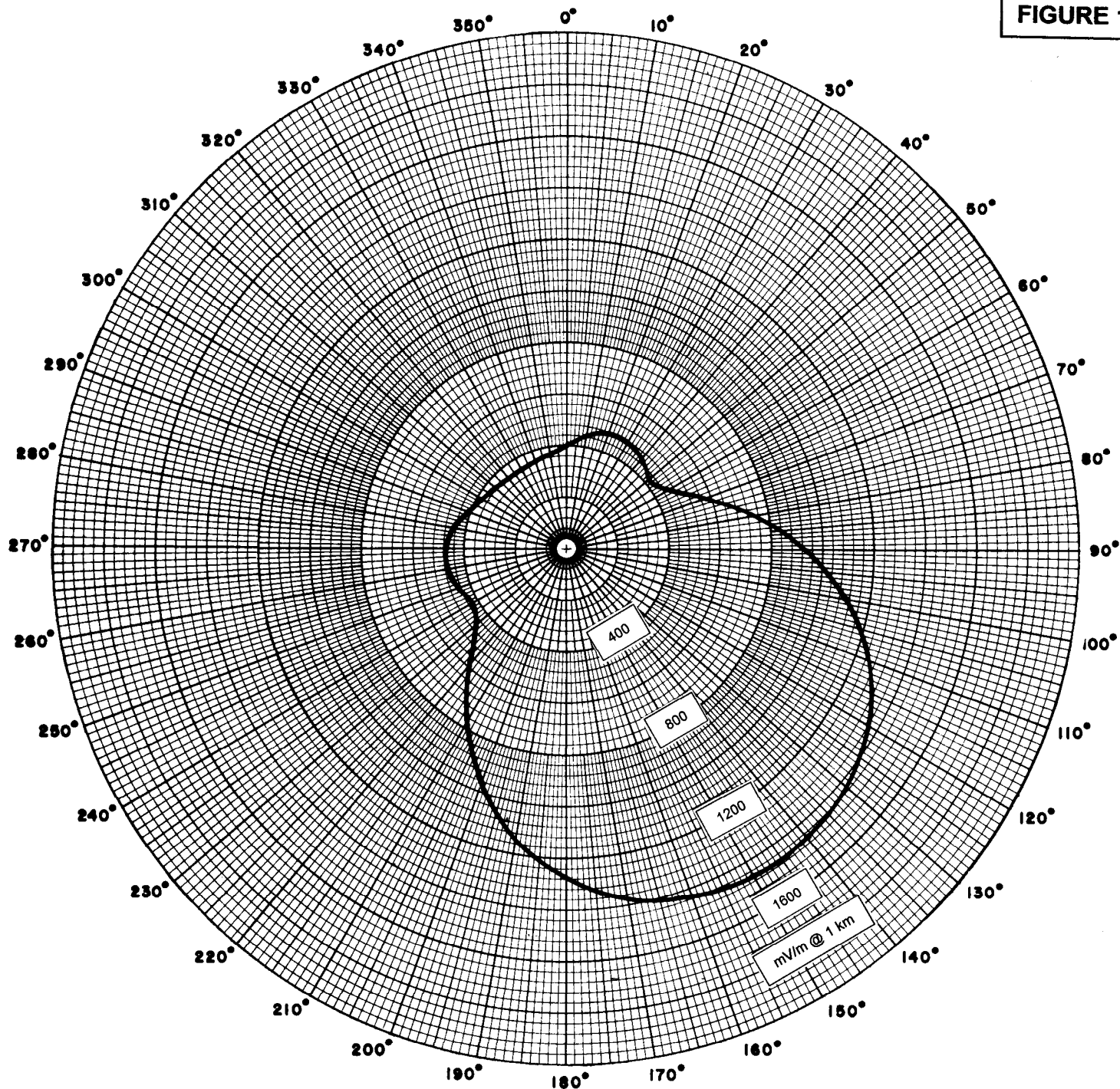


FIGURE 1



**PROPOSED DAYTIME HORIZONTAL PLANE  
STANDARD RADIATION PATTERN**  
WWDJ - HACKENSACK, NEW JERSEY  
970 kHz - 6.0 kW DAY / 5.0 kW NIGHT - DA-2  
JUNE, 2005

**CARL T. JONES**  
CORPORATION

FIGURE 2

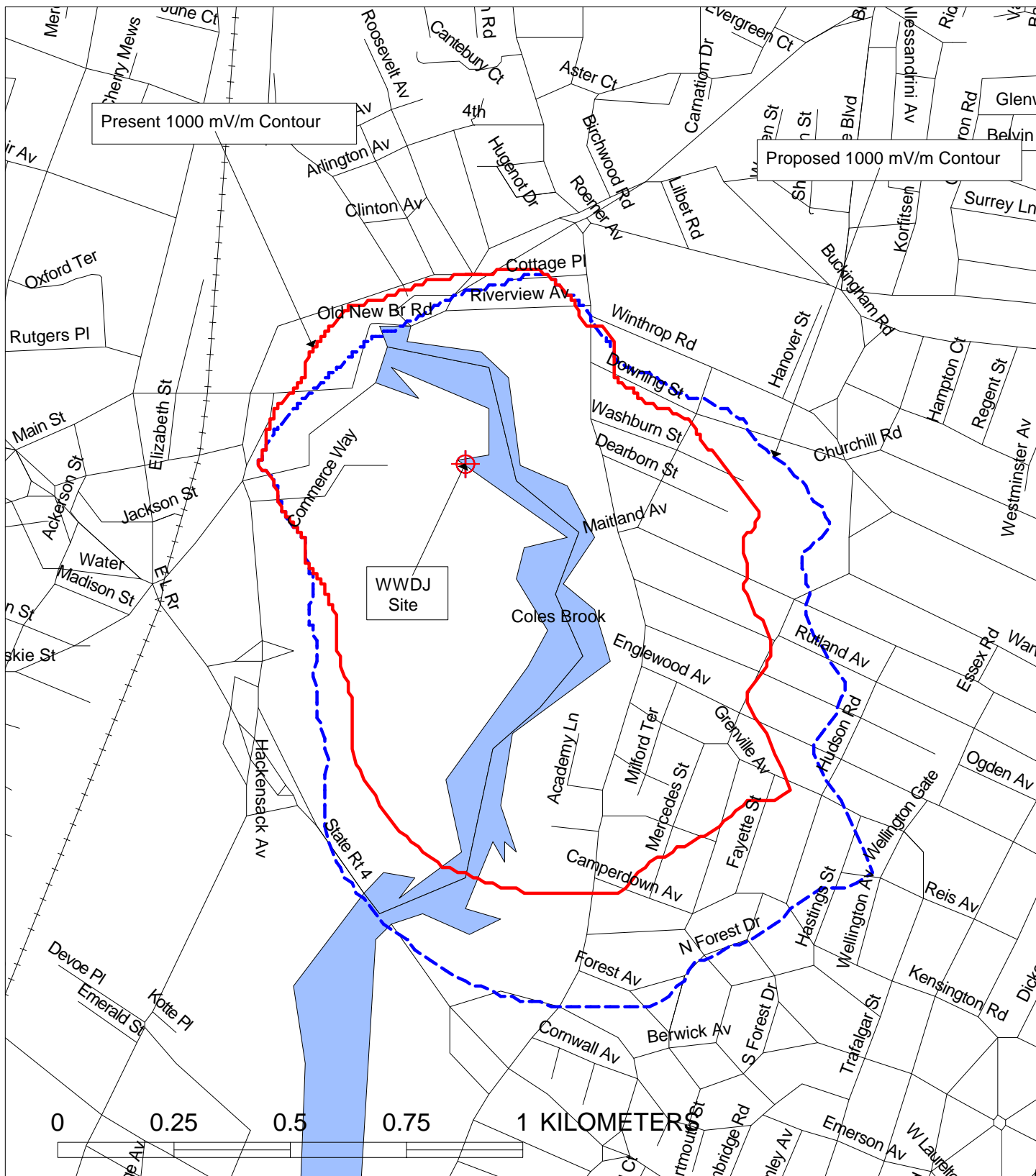
## DAYTIME HORIZONTAL FIELDS

WWDJ - HACKENSACK, NEW JERSEY  
 970 KHZ - 6.0 KW DAY/5.0 KW NIGHT - DA-2

AZIMUTH (DEGREES)	E THEO. (mV/m)	E STD. (mV/m)	AZIMUTH (DEGREES)	E THEO. (mV/m)	E STD. (mV/m)
0	379.3	399.2	180	1217.6	1278.7
5	396.4	417.0	185	1156.8	1214.9
10	414.5	436.0	190	1086.8	1141.5
15	431.7	454.0	195	1008.3	1059.0
20	445.6	468.6	200	922.6	969.1
25	454.3	477.8	205	832.1	874.1
30	456.4	479.9	210	739.7	777.2
35	451.5	474.8	215	649.8	682.8
40	440.8	463.6	220	567.5	596.5
45	427.4	449.6	225	498.9	524.5
50	417.2	438.8	230	449.5	472.7
55	417.5	439.2	235	422.4	444.3
60	436.0	458.6	240	415.6	437.2
65	476.6	501.1	245	422.6	444.5
70	538.1	565.6	250	435.5	458.0
75	615.6	646.9	255	447.8	470.9
80	703.2	738.8	260	455.2	478.7
85	795.1	835.3	265	456.0	479.5
90	886.8	931.6	270	449.8	473.0
95	974.8	1023.9	275	437.7	460.4
100	1056.4	1109.5	280	421.6	443.5
105	1129.9	1186.7	285	403.6	424.6
110	1194.4	1254.4	290	385.9	406.0
115	1249.5	1312.2	295	370.3	389.7
120	1295.1	1360.1	300	358.1	376.9
125	1331.7	1398.6	305	349.6	368.0
130	1359.7	1427.9	310	344.5	362.7
135	1379.6	1448.9	315	341.8	359.9
140	1391.9	1461.8	320	340.8	358.8
145	1397.0	1467.0	325	340.5	358.5
150	1394.8	1464.8	330	340.6	358.6
155	1385.5	1455.0	335	341.3	359.3
160	1368.6	1437.3	340	343.2	361.3
165	1343.9	1411.4	345	347.2	365.5
170	1310.8	1376.6	350	354.3	372.9
175	1268.8	1332.6	355	365.0	384.2

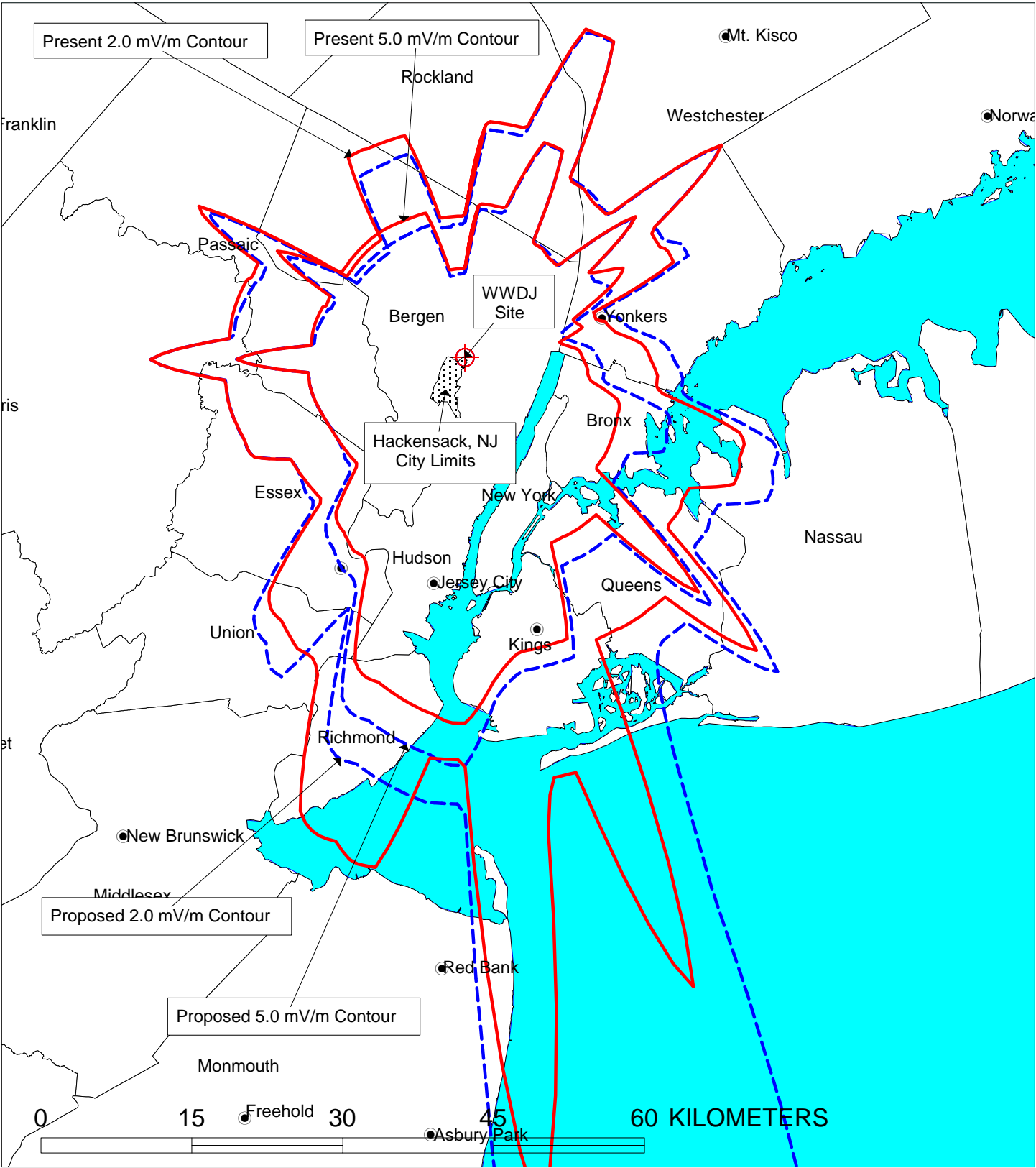
Fields in mV/m @ 1 Kilometer

FIGURE 3



PRESENT AND PROPOSED DAYTIME 1000 mV/m CONTOURS  
WWDJ (AM) - HACKENSACK, NEW JERSEY  
970 kHz - 6.0 kW D/5.0 kW N - DA-2  
JUNE, 2005

FIGURE 4



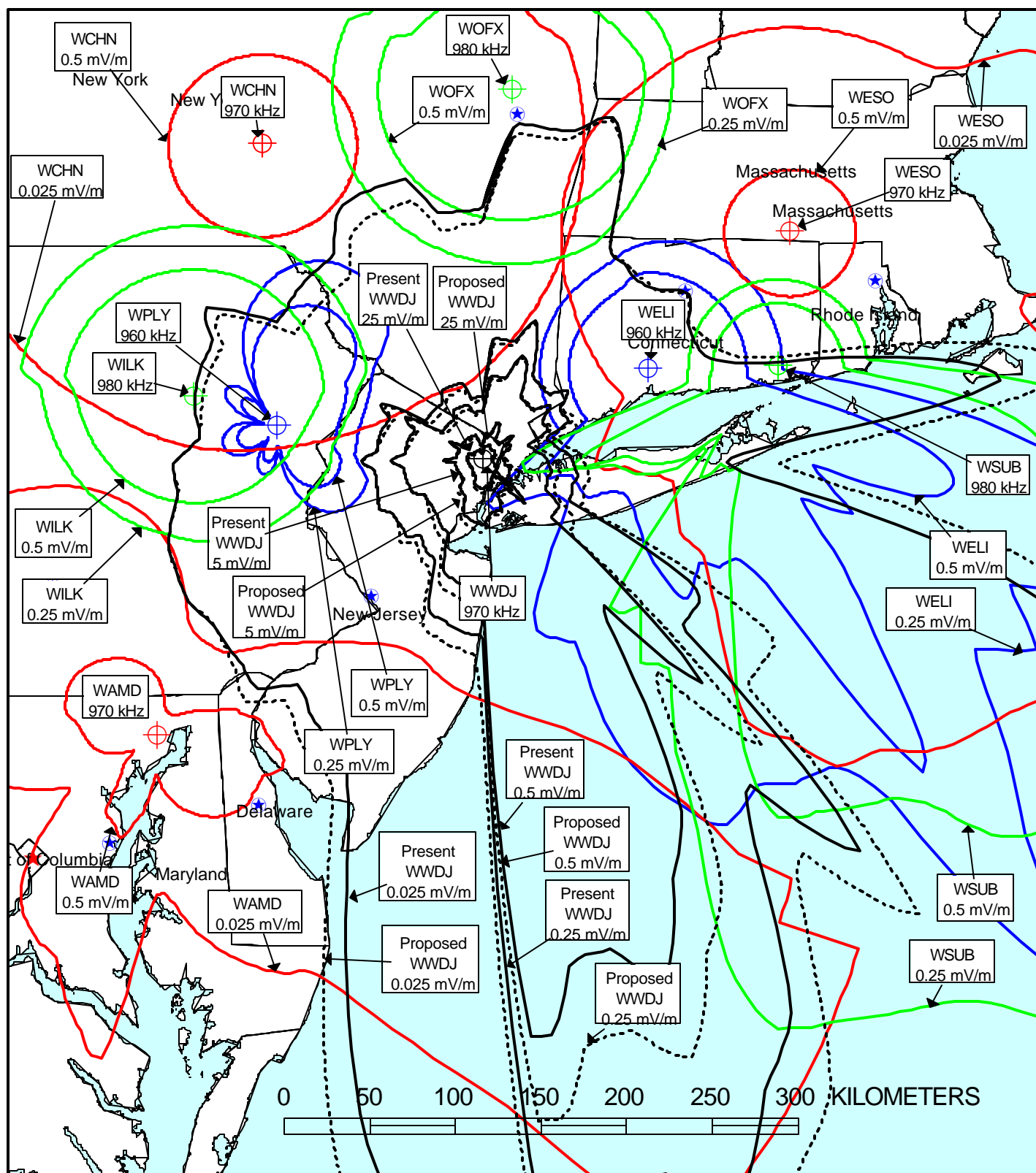
PRESENT AND PROPOSED DAYTIME 5.0 mV/m & 2.0 mV/m CONTOURS  
WWDJ (AM) - HACKENSACK, NEW JERSEY  
970 kHz - 6.0 kW D/5.0 kW N - DA-2  
JUNE, 2005

**FIGURE 5**



PRESENT AND PROPOSED DAYTIME 0.5 mV/m CONTOURS  
WWDJ (AM) - HACKENSACK, NEW JERSEY  
970 kHz - 6.0.0 kW D/5.0 kW N - DA-2  
JUNE, 2005

FIGURE 6



DAYTIME ALLOCATION STUDY  
 USING MEASUREMENTS FROM NEARBY STATIONS  
 WWDJ(AM) - 970 KHZ - HACKENSACK, NEW JERSEY  
 6 KW DAY/5 KW NIGHT - DA-2  
 JUNE, 2005



## APPENDIX A

### Summary of Measurement Data

SUMMARY OF MEASUREMENT DATA  
FOR  
WWDJ - 970 kHz, HACKENSACK, NEW JERSEY

<u>Radial</u>	<u>Conductivity, Distance</u>	<u>Source of Data</u>
7	3.0 mS/m for 12.0 km 2.0 mS/m for 32.1 km	WWRV BL-19910624AC
37	3.0 mS/m for 16.0 km 1.5 mS/m for 31.9 km	WWRV BL-19910624AC
60.5	3.0 mS/m for 2.8 km 4.0 mS/m for 6.5 km 3.0 mS/m for 18.0 km 2.0 mS/m for 31.5 km	WWRV BL-19910624AC
70	2.0 mS/m for 5.4 km 1.0 mS/m for 12.6 km 0.1 mS/m for 57.0 km 1.0 mS/m for 83.2 km	WWRV BP-20001214AJK
90	1.5 mS/m for 5.1 km 0.5 mS/m for 71.2 km 0.1 mS/m for 82.0 km	WWRV BP-20001214AJK
110	1.0 mS/m for 16.9 km 1.5 mS/m for 45.9 km 0.1 mS/m for 54.0 km	WWRV BP-20001214AJK
120	1.5 mS/m for 9.9 km 1.0 mS/m for 54.9 km	WWRV BP-20001214AJK
146	3.0 mS/m for 6.2 km 4.0 mS/m for 8.5 km 2.0 mS/m for 16.0 km 3.0 mS/m for 20.0 km 1.5 mS/m for 32.1 km	WWRV BL-19910624AC

<u>Radial</u>	<u>Conductivity, Distance</u>	<u>Source of Data</u>
190	4.0 mS/m for 5.6 km 5.0 mS/m for 51.5 km 3.0 mS/m for 99.5 km	WWRV BP-20001214AJK
210	2.0 mS/m for 3.1 km 3.0 mS/m for 36.9 km 1.5 mS/m for 95.3 km	WWRV BP-20001214AJK
231.5	3.0 mS/m for 2.7 km 2.0 mS/m for 4.0 km 3.0 mS/m for 12.0 km 2.0 mS/m for 21.0 km 1.5 mS/m for 36.5 km	WWRV BL-19910624AC
255	2.0 mS/m for 1.7 km 3.0 mS/m for 14.0 km 2.0 mS/m for 35.2 km	WWRV BL-19910624AC
285	4.0 mS/m for 11.5 km 2.0 mS/m for 30.7 km	WWRV BL-19910624AC
315	4.0 mS/m for 5.2 km 2.0 mS/m for 15.7 km 0.5 mS/m for 53.5 km	WWRV BP-20001214AJK
335	3.0 mS/m for 2.3 km 2.0 mS/m for 23.7 km 1.0 mS/m for 44.7 km	WWRV BP-20001214AJK
355	4.0 mS/m for 2.5 km 2.0 mS/m for 2.8 km 0.5 mS/m for 35.6 km 0.1 mS/m for 50.2 km	WWRV BP-20001214AJK