

MULLANEY ENGINEERING, INC.

9049 SHADY GROVE COURT
GAITHERSBURG, MD 20877

ENGINEERING EXHIBIT EE-3:

**LPTV STATION WARZ-LP (CA)
WATERS & BROCK COMMUNICATIONS, INC.
SMITHFIELD-SELMA, NORTH CAROLINA**

Ch. 34- 70 KW-DA Increase ERP

NOVEMBER 4, 2003

**ENGINEERING STATEMENT IN SUPPORT OF A
MODIFICATION OF FACILITIES
INCREASE IN ERP
USING OET BULLETIN NO. 69**

File No. BLTTA-20021118AAC - Facility ID: 71089

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TABLE OF CONTENTS:

1. F.C.C. Form 346.
2. Declaration of Engineer
3. Narrative Statement
4. Figure 1, Existing vs: Proposed Coverage Map.
5. Figure 2, Proposed Antenna Pattern.
6. Figure 3, Longley Rice - Population Interference Analysis.

Declaration

I, John J. Mullaney, declare and state that I am a graduate electrical engineer with a B.E.E. and my qualifications are known to the Federal Communications Commission, and that I am an principal engineer in the firm of Mullaney Engineering, Inc., and that I have provided engineering services in the area of telecommunications since 1977. My qualifications as an expert in radio engineering are a matter of record with the Federal Communications Commission.

The firm of Mullaney Engineering, Inc., has been requested by Waters & Brock Communications, Inc., to prepare the instant engineering exhibit in support of an request for grant of a modification application which proposes an increase in ERP for LPTV station WARZ-LP (CA) at Smithfield-Selma, North Carolina (FCC Facility ID Number: 71089).

All facts contained herein are true of my own knowledge except where stated to be on information or belief, and as to those facts, I believe them to be true. I declare under penalty of perjury that the foregoing is true and correct.

/s/ John J. Mullaney
John J. Mullaney, Consulting Engineer

Executed on the 4th day of November 2003

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WATERS & BROCK COMMUNICATIONS, INC.
SMITHFIELD-SELMA, NORTH CAROLINA**

Ch. 34- 70 KW-DA Increase ERP

NARRATIVE STATEMENT:

I. General:

This engineering statement has been prepared on behalf of Waters & Brock Communications, Inc., licensee of LPTV Station WARZ-LP (CA) at Smithfield-Selma, North Carolina. The purpose of this statement is to request a grant of a modification application which proposes an increase in ERP. This application requests to operate a directional antenna yielding an ERP of 70 kW on Channel 34- from its existing site. The existing Shively directional antenna will simply be re-oriented. This application requests a waiver to use the techniques described in OET Bulletin No. 69 regarding the use of Longley Rice to compute interference caused.

WARZ-LP has filed a petition for reconsideration of the grant of the recent CP to WACN-LP at Apex / Raleigh, NC. In order to avoid a delay in processing of its application, WARZ-LP has provided **full protection** to that CP despite the fact that it was granted erroneously.

The application is not a major environmental action, as defined by Section 1.1307 of the Commission's Rules. The proposed facility is in full compliance with both the "controlled" & "un-controlled" FCC Radiation Guidelines. Since the proposed LPTV

facility contributes less than 1% of the “controlled” standard at ground level it is **categorically excluded** from further consideration.

Compliance with the FCC's interference criteria was determined through the use of a computerized implementation of OET Bulletin No. 69 by V-Soft Communications (the program is know as “Probe II”). WARZ-LP (CA) **requests a waiver of the rules** to permit it to use these additional techniques to demonstrate a lack of interference.

Answers to questions contained in F.C.C. Form 346 are incorporated in the following paragraphs and figures.

II. Engineering Discussion:

A. Proposed Location:

WARZ-LP (CA) proposes to re-orient its existing antenna on its existing tower and the same identical antenna height. No change in overall tip height is proposed. The Antenna Structure Registration (ASR) number is **1205989**.

Figure 1 is a map showing the general area and the protected contours of the existing and proposed facilities on Ch. 34.

B. Antenna System and Tower:

The antenna will be a Shively model 2050-16. **Figure 2** is a tabulation and plot of the antenna pattern with an orientation of N-120-E.

C. Transmitter:

WARZ-LP (CA) will use a transmitter rated at 10,000 watt. The transmitter complies with the frequency tolerance as specified part 74.761 of the Commission's Rules.

The transmitters operating frequency will be checked with a calibrated frequency counter which will use WWV as a reference.

D. Proposed Coverage:

The existing site has a direct line of sight view of the city of license and the surrounding built up area.

E. Proposed Operation:

WARZ-LP (CA) will fully comply with section 74.734 of the rules concerning "Attended and unattended operation". The existing equipment is so designed that it can be controlled to shut down in the absence of base band video and/or audio signals at the transmitter input. The equipment will be secured in a locked enclosure or structure to prevent access to unauthorized persons.

Based on past performance of the existing equipment the probability of spurious radiations is highly unlikely. The system, however, will be checked on a regular basis to determine full compliance with the Commission Rules.

F. Other Services in Area:

Based on the type of transmitter proposed, no intermodulation problems with existing transmitting facilities would be expected. In the unlikely event some

problems would occur, WARZ-LP (CA) will correct such cases in accordance with the Commission's rules.

There is one known AM Broadcast Stations within 3.2 kilometers of the proposed site. WMPM AM-1270 kHz (N-DA) is located 2.9 km away. Given that this is a non-directional facility it is beyond the 0.8 km criteria specified in the rules. Thus, no partial proof is required.

G. Interference Analysis:

Compliance with the FCC interference rules is based upon a detailed analysis using the techniques described in **OET Bulletin No. 69 - Longley Rice Analysis.**

Use of the FCC's LPONE computer program predicts interference to twelve facilities or proposals. They are: WUNM-TV NTSC-19 LIC, WCIV-TV DTV-34 Alloc, WCIV DTV-34 CP, WPXU-TV NTSC-34 LIC, WSOC-TV DTV-34 LIC, WSOC-TV DTV-34 CP, WSET-TV DTV-34 Alloc, WSET-TV DTV-34 CP, WACN-LP NTSV-34 LIC, WACN-LP NTSC-34 CP, W34AX NTSC-34 LIC, W63CW NTSC-35 App. However, LPONE does not consider terrain shielding nor does it consider the interference already being received by a given station from other authorized stations - known as Masking interference. Nor does it utilize the more sophisticated analysis techniques permitted by OET-69.

Figure 3 is a tabulation of the populations which are predicted by OET-69 to receive interference within the noise limited contour. The L-R analysis look at 43 stations and these include all of the stations identified by LPONE. The predicted interference to WACN's license & CP **will be reduced** by grant of this proposal.

The predicted interference to the other 11 records (6 stations) involves populations where are well less than 0.5% of their service areas. Where the population predicted to receive interference is less than 0.5% of the base line the interference is considered **insignificant** and is not counted as interference against the application. It was **not necessary** to use “masking” by other facilities to make the predicted interference small enough not to be objectionable.

Based upon this analysis, WARZ-LP (CA) has established that its proposal to operate with an ERP of 70 kW-DA **does not cause any “objectionable” interference** to any existing or proposed Full Service or LPTV/Translator facility.

H. Environmental Assessment Statement:

WARZ-LP (CA) believes its proposal will not significantly affect the environment since it does not meet any of the criteria specified in Section 1.1307 of the rules. Since an existing tower will be used with no change in overall height the only remaining environmental issue is R.F. Exposure. As will be shown, the proposed LPTV contributes less than 5% of the “controlled” standard at ground level and, therefore, it is **categorically excluded** from further consideration. Specifically the proposed facility:

- 1) Will NOT involve the exposure of workers or the general public to levels of Radio Frequency radiation in excess of the guidelines recommended by the FCC - OET Bulletin 65 (August 25, 1997).

The following is a more detailed discussion of this protection standard:

A. National Environmental Policy Act of 1969:

In 1969, Congress enacted the National Environmental Policy Act (NEPA), which requires the FCC to evaluate the potential environmental significance of the facilities it regulates and authorizes. Human exposure to Radio Frequency (RF) radiation had been identified as an issue that the FCC must consider.

Beginning with the filing of applications after January 1, 1986, broadcast stations were required to “certify compliance” with FCC prescribed guidelines on human exposure to RF radiation. The FCC standard was based upon the American National Standards Institute’s (ANSI) RF radiation protection guides (ANSI C95.1-1982). These exposure limits are expressed in terms of milli-watts per square centimeter.

In October 1997, the FCC implemented a two tier evaluation criteria utilizing recommendations of the National Council on Radiation Protection and Measurement (NCRP). The “controlled” tier involves areas which have restricted access while the “un-controlled” tier involves areas which have unrestricted access. The Maximum Permissible Exposure (MPE) limits for “controlled” areas are the same as adopted in 1985, while the “un-controlled” limits for FM and TV frequencies are one-fifth or 20% of the limits for “controlled” areas.

These exposure limits are time-averaged over any six minute period and vary depending upon the frequency involved. The following are the Maximum Permissible Exposure (MPE) limits for “controlled” areas:

Frequency Range (MHz)	Power Density (mW/sq.cm)
*****	*****
0.3 to 3	100 AM
3 to 30	900/(Freq ²)
30 to 300	1.0 VHF TV & FM
300 to 1,500	Freq/300 UHF TV
1500 to 100,000	5.0

WARZ-LP (CA) recognizes that compliance with the above criteria at sites involving multiple AM, FM and/or TV facilities is based upon the contributions of all such facilities. At the site discussed in this application, the only significant facility that will exist is the operation of WARZ-LP.

Although other transmission facilities operate from this same site the proposed LPTV facility is not required to conduct a complete analysis since it contributes less than 1% of the “controlled” standard at ground level and therefore, it is **categorically excluded** from further consideration.

Exposure from TV signals is determined by the following formula:

$$D = \frac{\text{SQRT}(F^2 * [0.4 * \text{VERP} + \text{AERP}])}{1.667 * \text{SQRT}(\text{PD}) * 3.2808}$$

Where:

- D = the closest distance in feet that a human should come to an operating antenna (to obtain feet multiply by 3.2808)
- F = typical relative field factor in downward direction
 (F = 1 is worst case main lobe)

VERP = peak Visual ERP in watts (above a dipole)
AERP = Aural ERP in watts (above a dipole)
PD = highest Power Density in milli-watts/cm²
SQRT = Square Root
Freq = Frequency in mega-cycles

The vertical radiation pattern of the TV antenna specified in this application is very narrow and, therefore, the power density as seen by an observer on the ground near the base of the tower will be less than 20 percent of the total field.

The application of the above equation (assuming the maximum field strength), in our case, for a frequency of 590 to 596 MHz results in a minimum distance of 54.5 meters (179 feet) from the antenna based upon an “un-controlled” power density of 0.39 mW/cm.sq. Inasmuch as the lowest element on the proposed antenna will be approximately 105 meters (344 feet) above ground level, it is obvious that no hazard will exist at ground level. At 2 meters above ground and using the maximum downward radiation the contribution is 4.7% of the controlled standard. However, using a form factor of $F=0.4$ the contribution at ground level is 0.75%. Based upon this the facility qualifies for **Categorical Exclusion**.

Access to the site is or will be controlled by a locked gate to insure safety. WARZ-LP (CA) understands that persons expected to be in the area must not be exposed to excessive levels of R.F. radiation. The power will be reduced or turned completely off as necessary to avoid an over exposure. Prior to commencing operation WARZ-LP (CA) will see to it that the site access plan is developed to include the effect of its facility. This information will be clearly documented and all persons having access will be advised of hazardous areas.

III. SUMMARY:

Waters & Brock Communications, Inc., Licensee herein requests a grant of a modification application which proposes an increase in ERP for WARZ-LP (CA) at Smithfield-Selma, NC. This applications requests to operate a directional antenna yielding an ERP of 70 kW on Channel 34- from the existing site. This application requests a waiver to use the techniques described in OET Bulletin No. 69 regarding the use of Longley Rice to compute interference caused. When “**masking**” is applied it can be established that no “objectionable” interference is caused. This engineering proposal is in full compliance with the Commission’s Rules.

/s/ John J. Mullaney
John J. Mullaney, Consulting Engineer

November 4, 2003.