

**MULLANEY ENGINEERING, INC.**

9049 SHADY GROVE COURT  
GAITHERSBURG, MD 20877

**ENGINEERING EXHIBIT EE:**

**RADIO ONE LICENSES, LLC  
AM BROADCAST STATION WYCB  
1340 KHZ, WASHINGTON, DC**

**LICENSED: 1.0 KW      ND      U  
PROPOSED: 0.27 KW    ND      U**

**9 January 2004**

**FCC FACILITY NUMBER 7038**

**ENGINEERING EXHIBIT  
IN SUPPORT OF  
AN APPLICATION FOR CONSTRUCTION PERMIT  
TO CHANGE TRANSMITTER/ANTENNA LOCATION,  
CHANGE ANTENNA HEIGHT, AND CHANGE OPERATING POWER  
OF EXISTING CLASS C AM STATION**

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# To be supplied

**DECLARATION**

I, Alan E. Gearing, declare and state that I am a graduate electrical engineer with a Bachelor of Science degree in Electrical Engineering from SUNY University at Buffalo, that I am a registered professional engineer in the District of Columbia (since 1979), and that I have provided engineering services in the areas of broadcasting and radio communications since 1973. My qualifications as an expert in radio engineering are a matter of record with the Federal Communications Commission. I am a senior engineer with the firm of Mullaney Engineering, Inc., consulting broadcast and radio communications engineers with offices in Gaithersburg, Maryland.

The firm of Mullaney Engineering, Inc., has been retained by RADIO ONE LICENSES, LLC to prepare the instant engineering exhibit and Section III-A of FCC Form 301 in support of *an Application for Construction Permit to: change transmitter/antenna location, change antenna height, and change operating power* for existing Class C AM broadcast station WYCB, licensed to serve Washington, DC [FCC FACILITY ID NUMBER 7038]

All facts contained herein are true of my own knowledge except those stated to be on information and 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.



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Alan E. Gearing, P.E.  
District of Columbia Number 7406

Executed on the 9<sup>th</sup> day of January 2004

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**NARRATIVE STATEMENT:**

**I. GENERAL:**

This engineering statement and the instant engineering exhibit of which it is part have been prepared on behalf of RADIO ONE LICENSES, LLC (hereinafter "Radio One"), licensee of AM Broadcast Station WYCB, Washington, DC [FCC FACILITY ID NUMBER 7038]. WYCB is a Class C station licensed to operate on the frequency of 1340 kHz with fulltime power of 1,000 watts, employing a non-directional antenna.

Radio One now **proposes to move the WYCB transmitter/antenna site to a new location, install a new nondirectional radiator, and reduce the WYCB operating power to 270 watts, fulltime.** Plans are to eventually diplex co-owned station WOL at the new WYCB transmitter/antenna site. An application for construction permit to move station WOL is being filed concurrently with the instant application.

The changes proposed herein fall within the definition of a minor change as given in the current version of §73.3571 of the FCC Rules. Except with respect to

principal community coverage requirements [§73.24(i)] and allocation contour overlap requirements [§73.37], **for which waivers are requested**, the proposed operation of WYCB is believed to be completely in compliance with all pertinent FCC rules and policies, as well as all international treaty requirements. Full discussion and justifications for the waivers requested are contained in the paragraphs below.

The proposed WYCB facilities will be built to comply with the *FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields* and the instant proposal is categorically excluded from environmental processing pursuant to the provisions of Section 1.1306 of the Commission's Rules. A more detailed discussion of environmental factors is included under the heading Environmental Considerations below.

Information requested by exhibits in response to questions on Section III-A of FCC Form 301 [June 2002 version] are incorporated in the following paragraphs, figures, and tables.

## **II. ENGINEERING DISCUSSION:**

### **A. WYCB Transmitter/Antenna Location:**

The proposed WYCB transmitter/antenna site is located within the area known as Blue Plains/DC Village in Washington, DC. The proposed site is 10.5 km (6.5 mi.) at a bearing of 238.8 degrees True from the licensed WYCB site. Figure 1 is a full-scale reproduction of a portion of a USGS 7.5 minute series topographic quadrangle map showing the location of the proposed WYCB site. The geographic coordinates [NAD 27 reference - rounded to the nearest second] of the proposed antenna location are:

Latitude: 38° 48' 53"  
Longitude: 77° 00' 52"

Figure 2 herein is an aerial photograph showing the proposed WYCB site and the surrounding area.

There are no known radio facilities located within the general vicinity of the proposed site. Table 1 (to be supplied) is a list of places, airfields, other broadcast stations, and towers within ten kilometers of the proposed site. The list shows that there are no other stations within a distance of 3.2 kilometers from the proposed antenna location.

A computerized analysis of the population contained within the proposed blanketing area indicates that there are no persons living within the proposed 1000 mV/m contour. Figure 5-A (to be supplied) is a map showing the location of the proposed blanketing contour. The nearby buildings shown on the topographic site map of Figure 1 and the aerial photo of Figure 2 are abandoned and the blanketing contour does not encompass any currently populated areas. The instant proposal is therefore in compliance with the requirements of §73.24(g). Radio One will fully comply with the provisions of §73.88 concerning responding to reports of blanketing interference.

**B. Proposed Antenna:**

Radio One proposes to employ a new type of radiating structure for the WYCB non-directional antenna. In particular, the antenna element will consist of a coil-loaded, self-supporting, whip antenna manufactured by Valcom LTD (model V-3370-CL2). This antenna has been analyzed by the

Commission and it is the undersigned's understanding that the Commission will routinely approve use of this antenna for fulltime nondirectional operation by AM broadcast stations.

The Valcom whip antenna is only 22.8 meters (74.8') in height, which would be only 36.7 electrical degrees at WYCB's operating frequency of 1340 kHz. (The top-loading capacitive sphere would increase the effective electrical length to 40.1° at 1340 kHz.) As a result of the center loading, the radiation efficiency of the Valcom antenna is equivalent to that for a much longer antenna. With the ground system proposed (see below), the efficiency of the Valcom antenna is expected to be approximately 282 mV/m/kW @ km, in compliance with the requirements of §73.189 of the FCC Rules. If the Commission so requires, Radio One will conduct a nondirectional proof of performance on the installed antenna system to verify the radiation efficiency.

Figure 3 is a vertical sketch of the proposed antenna structure. Since the overall height of the proposed antenna structure is less than 61 meters (200') notification to the FAA is not required, unless the structure penetrates the imaginary surfaces extending outward from nearby airports. The proposed structure was checked using the Commission's online TOWAIR program which determined that antenna structure registration, and hence FAA notification, is not required.

The antenna ground system will consist of 120 buried copper wire radials evenly spaced about the tower. Each radial will extend to the plat boundary or to a line approximately 76.2 meters (250') from the northern boundary. The total area of the ground system will be 62,500 square feet, which is

equivalent to a circle of radius 43.0 meters (141'). At WYCB's operating frequency of 1340 kHz, the proposed ground system will have an effective electrical length of 69.1 degrees. As noted above, with the proposed ground system the proposed antenna system is expected to meet minimum efficiency requirements. Figure 4 is a site plat showing the proposed ground system layout and the proposed tower location relative to the site boundaries.

**C. Principal Community Coverage:**

Figure 5-B, herein, is a map showing the location of the licensed and proposed WYCB 5.0 mV/m contours. Figure 5-C (to be supplied) is a map showing the location of the licensed and proposed WYCB 2.0 mV/m and 0.5 mV/m contours. Figure 5-D, herein, shows the licensed and proposed WYCB 25.6 mV/m 50% RSS night limit contours.

From Figure 5-B it is evident that the principal community to be served (Washington, DC) is not provided with the level of daytime coverage required by a strict reading of §73.24(i). In fact, the licensed WYCB facility does not provide 100% coverage to Washington. Radio One has expended great effort to find a site from which WYCB would cover as much of Washington as possible. In order to provide the coverage specified by the Rules, a centrally located site would be required. Despite its best efforts, Radio One has not been able to find such a site. It is expected that once the facility specified herein is put in operation, that field strength measurements will allow Radio One to propose increased power for WYCB, which will increase the percentage of Washington eventually served by a 5 mV/m signal, but 100% coverage will not be feasible. Radio One therefore respectfully requests a

waiver of the provisions of §73.24(i) with respect to daytime coverage of Washington.

As to coverage of Washington, DC, during nighttime hours, Figure 5-D shows that even WYCB's licensed operation does not provide the specified 80% coverage of Washington with its 50% RSS night limit contour. It is also readily evident from the map of Figure 5-D that 80% coverage of Washington would not be possible from any transmitter/antenna location. As noted above, the site proposed herein is the best that Radio One has been able to locate. Therefore, Radio One respectfully requests waiver of the provisions of §73.24(i) relative to principal community coverage by the proposed WYCB 50% RSS nighttime interference free contour.

**D. Daytime Allocation Study:**

Table 2 is a tabulation of stations pertinent to the operation of Station WYCB on 1340 kHz at Washington. Figures 6-A through 6-C (to be supplied) are appropriately scaled maps showing applicable allocation contours for WYCB and the more critical stations from Table 2. Figure 6-A shows the cochannel allocation situation, Figure 6-B shows the first adjacent channel allocation situation, and Figure 6-C shows the second and third adjacent channel allocation situation.

Daytime allocation studies involving Class C stations are typically carried out based on the assumption of 250-watt, non-directional operation by all Class C stations for interference received, while for interference caused other Class C stations are assumed to operating at full licensed power (see §73.37(b)). The analysis shown in Table 2 employs this assumption. The last two columns of

Table 2 show the clearance (black, positive numbers) or the amount of contour overlap (red, negative numbers). Comparison of the licensed and proposed analysis shows that the amount of both caused and received overlap has been either reduced or eliminated entirely with respect to all pertinent stations except cochannel station WVCV, Orange Virginia. However, if the amount of overlap resulting from the licensed WYCB 1000-watt operation is compared with the amount of overlap resulting from the proposed 270-watt operation the total amount of overlap with WVCV is actually reduced. Radio One believes the proposed operation meets the intent of the Commission's allocation rules. If considered necessary, Radio One respectfully requests waiver of the provisions of §73.37 with respect to the remaining normally prohibited contour overlap since the total amount of overlap with respect to each affected station has been decreased.

**E. Conductivities and Unattenuated Field Strengths:**

The FCC Conductivity Map, Figure M-3, was used to establish the effective conductivities for all stations in the absence of measurement data. There was no measurement data readily available for any stations pertinent to the WYCB allocation situation.

Where applicable, the equivalent distance method was used to establish the distances to contours.

The FCC's AM station database has been used to obtain parameters of all stations considered in the allocation study except for the proposed WYCB operation which is specified herein.

As the latest version of FCC Form 301 [June 2002] no longer specifically refers to a tabulation of supporting data employed in generating groundwave contour locations depicted in coverage and allocation showings, such data are not being submitted herein, but will be supplied to the Commission upon request.

**F. Nighttime Allocation Study:**

Section 73.182(a)(3) of the FCC Rules states: "On local channels the separation required for the daytime protection shall also determine the nighttime separation." Hence, no separate nighttime allocation analysis has been conducted.

The proposed WYCB 50% RSS night limit was determined to be 25.6 mV/m and its 25% RSS night limit was determined to be 40.1 mV/m. Table 3 (to be supplied) provides calculation details of the WYCB RSS limits.

**G. Environmental Considerations:**

The applicant believes its proposal will not significantly affect the environment for the following reasons.

The proposal does not meet any of the criteria specified in Section 1.1307 of the FCC Rules. More specifically, the proposed facilities are not known to fall within any of the categories enumerated in Sections 1.1307(a)(1)-(7) and will not involve the use of high intensity white lights. Furthermore, operation of the proposed facility will not involve the exposure of workers or the general public to levels of radio frequency electromagnetic fields exceeding guidelines adopted by the Federal Communications Commission. [The

current FCC guidelines are based upon criteria contained in the National Council of Radiation Protection and Measurements (NCRP) Report No. 86 (1986) and ANSI/IEEE C95.1-1992.]

With regard to the last item, the proposed tower will be surrounded by a gated fence, at least seven feet tall. The fence will not be less than three meters from any point on the tower or feed line. This is the "worst case" distance from Section 1 of Supplement A to OET Bulletin No. 65 (Edition 97-01) assuming: a 0.27 kW, 1340 kHz, AM station plus a 0.39 kW, 1450 kHz AM station, both with an antenna tower approximately 0.1 wavelength in height. The fence gate will be kept locked and appropriate warning signs posted on each face of the fence. Procedures will be adopted to protect workers requiring access to the tower inside the fenced area, including reduction of power or cessation of operation, to comply with germane exposure guidelines.

### **III. SUMMARY:**

Radio One proposes to continue operating Class C AM station WYCB at Washington, DC, but employing a new antenna structure at a new site approximately 10.5 km (6.5 mi.) from its licensed antenna tower. Operation of WYCB will continue to be on 1340 kHz, but with nondirectional fulltime power reduced to 270 watts.

The proposed changes and would not have any significant impact on the environment. Except with respect to principal community coverage requirements [§73.24(i)] and allocation contour overlap requirements [§73.37], **for which waivers have been requested and for which supporting documentation has**

**been provided**, the proposed operation of WYCB is believed to be completely in compliance with all pertinent FCC rules and policies, as well as all international treaty requirements.



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Alan E. Gearing, P.E.