

APPLICATION FOR MINOR MODIFICATION  
OF A DIGITAL TELEVISION BROADCAST  
STATION CONSTRUCTION PERMIT FCC  
FILE NO.: BPEDT-20000501AGN WHMC-DT  
CHANNEL 9 WITH AN ERP OF 20 KW, AND  
A NON-DA ANTENNA HAAT OF 229.6 M  
SOUTH CAROLINA EDUCATIONAL  
TELEVISION COMMISSION  
CONWAY, SOUTH CAROLINA

KESSLER & GEHMAN ASSOCIATES, INC.  
TELECOMMUNICATIONS CONSULTING ENGINEERS

20030918

*Prepared by Ryan Wilhour*

*KG&A*

507 N.W. 60th Street, Suite C  
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ENGINEERING STATEMENT OF RYAN C. WILLOUR OF THE FIRM OF KESSLER AND GEHMAN ASSOCIATES, INC., CONSULTING ENGINEERS IN CONNECTION WITH AN APPLICATION FOR A MINOR MODIFICATION OF A CONSTRUCTION PERMIT FOR WHMC-DT WHICH IS PROPOSED TO OPERATE ON DTV CHANNEL 9 WITH A MAXIMUM EFFECTIVE RADIATED POWER OF 20 KILOWATTS HORIZONTALLY POLARIZED AT AN EFFECTIVE ANTENNA HEIGHT OF 229.6 METERS ABOVE AVERAGE TERRAIN IN THE VICINITY OF CONWAY, SOUTH CAROLINA

PROCLAMATION OF ENGINEER

I, Ryan C. Wilhour, am an associate of Kessler and Gehman Associates, Inc. with offices in Gainesville, Florida. I am a graduate of the University of Florida with a Bachelor of Science Degree in electrical engineering.

This firm has been employed by South Carolina Educational Television Commission ("SCETC") to make engineering studies and to prepare the engineering portion for an application for a minor modification to a construction permit for a digital television broadcast station WHMC-DT to operate on DTV channel 9 with a maximum effective radiated power of 20 kilowatts horizontally polarized at an effective antenna height of 229.6 meters above average terrain in the vicinity of Conway, SC. This application was prepared in response to FCC DA 03-2709, MB Docket No. 03-110 RM-10700 Titled: "In the Matter of Amendment of Section 73.622(b), Table of Allotments, Digital Television Broadcast Stations. (Conway, South Carolina)", which is a Report and Order that amended the DTV table of allotments to specify channel 9 lieu of channel 58. The instant application has been prepared in response to paragraph 4 which orders SCETV to submit to the Commission a minor change application for a construction permit specifying the ordered technical parameters.

### ATTACHED FIGURES

In carrying out the engineering studies the following attached figures were prepared:

1. Proposed engineering specifications (Exhibit E1)
2. Elevation drawing of the antenna system (Exhibit E2)
3. USGS 7.5 minute topographic quadrangle showing the proposed transmitter location and coordinate lines (Exhibit E3)
4. Antenna elevation pattern (Exhibit E4)
5. Map showing the predicted DTV coverage contour (Exhibit E5)
6. Environmental Impact / RFR Hazard Analysis (Exhibit E6)

### TRANSMITTER TOWER

SCETC proposes to operate the DTV facilities of WHMC-DT on the existing WHMC-TV tower, FCC tower registration number 1059179. It is proposed to employ a side mounted panel antenna for the WHMC-DT broadcast facility; hence the proposed construction will not change the overall height of the tower. The FAA has not been notified of the proposed construction since the overall tower height is not being modified.

### INTERFERENCE ANALYSIS

The applicant accepts full responsibility for the elimination of any objectionable interference including that caused by intermodulation to facilities in existence or authorized prior to the grant of this application. The instant application does not include interference studies since the table of allotments has been amended; thus all 5 questions in Section VII of FCC form

340dtv are answered as “yes”. The instant application is considered a “checklist application”.

### **ENVIRONMENTAL IMPACT/RFR HAZARD ANALYSIS**

An analysis has been made of the human exposure to RFR using the calculation methodology described in OET Bulletin 65, Edition, 97-01. Exhibit E6 is a RFR study demonstrating compliance within 5% of the most restrictive permissible exposure at any location 2 meters above the ground assuming worse case terrain (See Methodology). Exhibit E6 calculations were made using a frequency of 186 MHz, which is the lower edge of the proposed channel. To account for ground reflections, a coefficient of 1.6 was included in the calculations.

Pursuant to OET Bulletin 65 concerning multiple-user transmitter sites only those licensees whose transmitters produce power density levels greater than 5.0% of the exposure limit are considered significant contributors to RFR. Since the proposed operation is well within 5% of the most permissible exposure at any location 2 meters above the ground, it is not considered a significant contributor to RFR exposure. Thus, contributions to exposure from other RF sources in the vicinity of WHMC-DT were not taken into account. The instant proposal complies with the FCC limits for human exposure to RF radiation and thus is excluded from further environmental processing.

A chain link fence shall encompass the WHMC-DT support structure if it is not already. The applicant will cooperate with any other users of the tower by reducing the power to the antenna or if necessary completely cutting it off in order to protect maintenance workers on the tower.

DECLARATION OF ENGINEER

The foregoing statement and the report regarding the aforementioned engineering work are true and correct to the best of my knowledge. Executed on September 19, 2003.

The logo consists of the letters 'KGA' in a stylized, outlined serif font. A thick, solid horizontal bar passes behind the letters, extending slightly beyond them on both sides.

Ryan Wilhour

A handwritten signature in blue ink, appearing to read 'Ryan Wilhour', with a stylized flourish at the end.

Consulting Engineer

**WHMC-DT**  
**CONWAY, SOUTH CAROLINA**  
**ENGINEERING SPECIFICATIONS**

**A. Transmitter Site (NAD 27):**

N. Latitude: 33° 56' 58"

W. Longitude: 79° 06' 31"

FCC Tower Registration Number:

1059179

FAA Study Number:

98-ASO-3348-OE

Street Address or Location:

6.5 Miles NNW of Conway, SC

**B. Proposed Facility:**

Channel: 9

Frequency: 186-192 MHz

**C. Antenna and Other Elevations:**

Height of Site Above Mean Sea Level (AMSL) 24.3 m

Overall Height of Structure Above Ground 256.4 m

(including all appurtenances)

Overall Height of Structure Above Mean Sea Level 280.7 m

(including all appurtenances)

Height of Sight Above Average Terrain 4.5 m

Effective Height of Antenna Above Ground 225.1 m

Effective Height of Antenna Above Average Terrain 229.6 m

Effective Height of Antenna Above Mean Sea Level 249.4 m

**D. Antenna Parameters - Horizontal Polarization:**

Antenna Make Dielectric

Antenna Model THB-O3-3H/9HD-1-R

Maximum Antenna Gain in Beam Maximum 9.13 dB

Maximum Antenna Gain in Horizontal Plane 9.06 dB

Maximum Effective Radiated Power 13.01 dBk

In Beam Maximum 20.0 kW

Maximum Effective Radiated Power 12.94 dBk

In Horizontal Plane 19.68 kW

**KESSLER & GEHMAN**

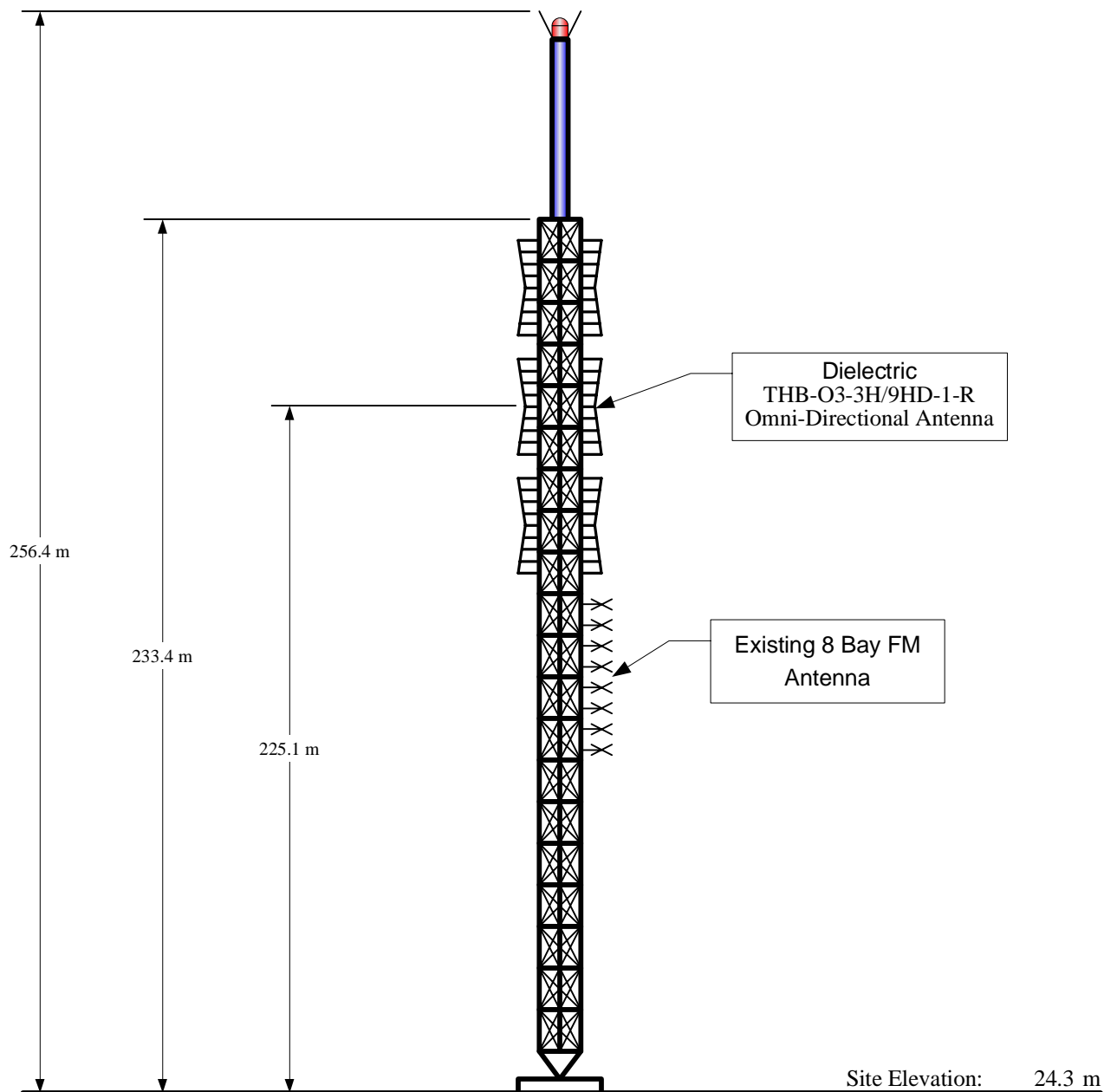
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**CONWAY, SOUTH CAROLINA**

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EXHIBIT E1



Overall Height AGL:	256.4 m
Overall Height AMSL:	280.7 m
Radiation Center AGL:	225.1 m
Radiation Center AMSL:	249.4 m
Radiation Center HAAT:	229.6 m
Average Terrain:	19.8 m

NAD 27 Coordinates:	
N. Latitude:	33° 56' 58"
W. Longitude:	79° 06' 31"

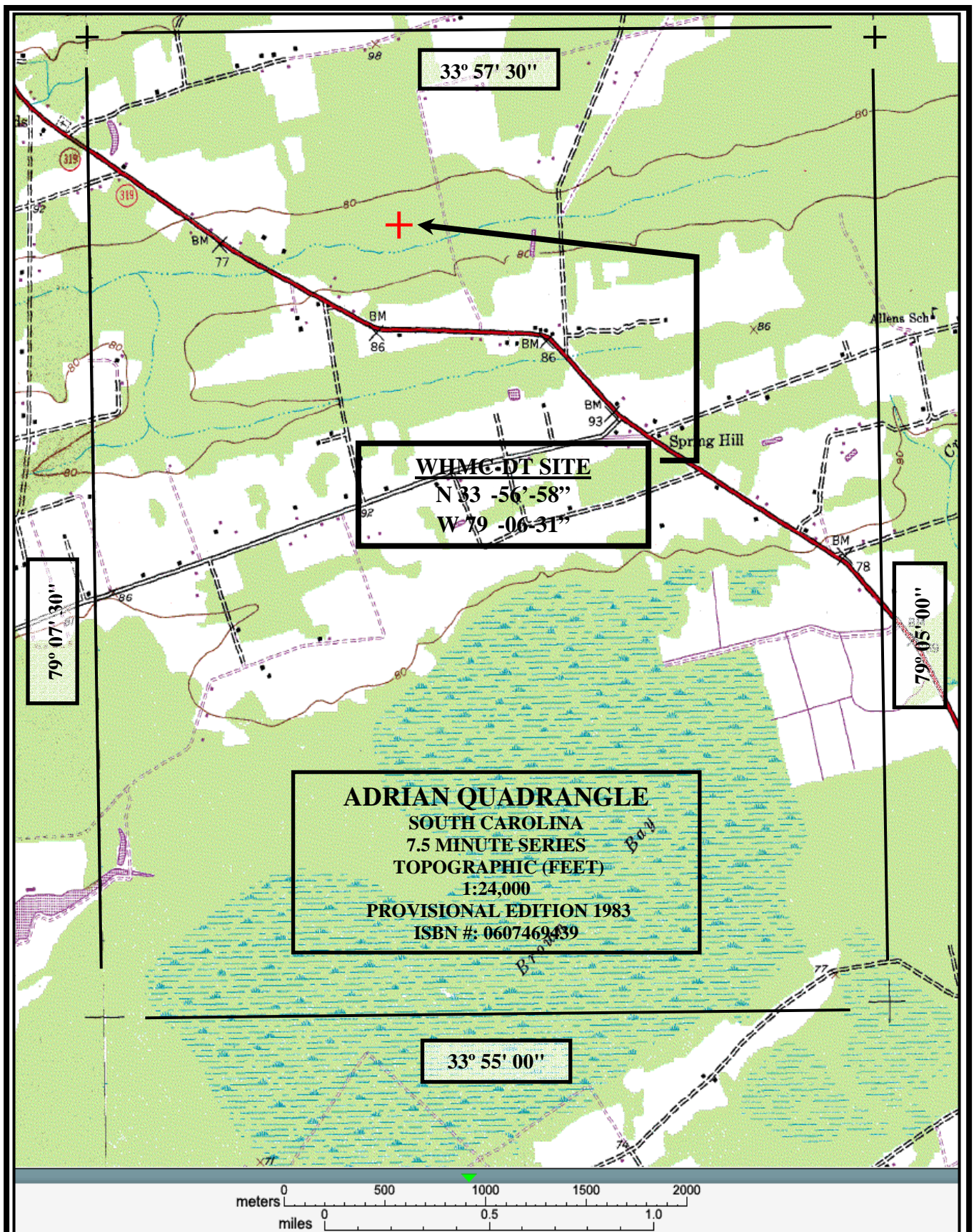
FCC Tower Registration Number:	1059179
FAA Aeronautical Study Number:	98-ASO-3348-OE

NOTE: NOT TO SCALE

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**EXHIBIT E3**

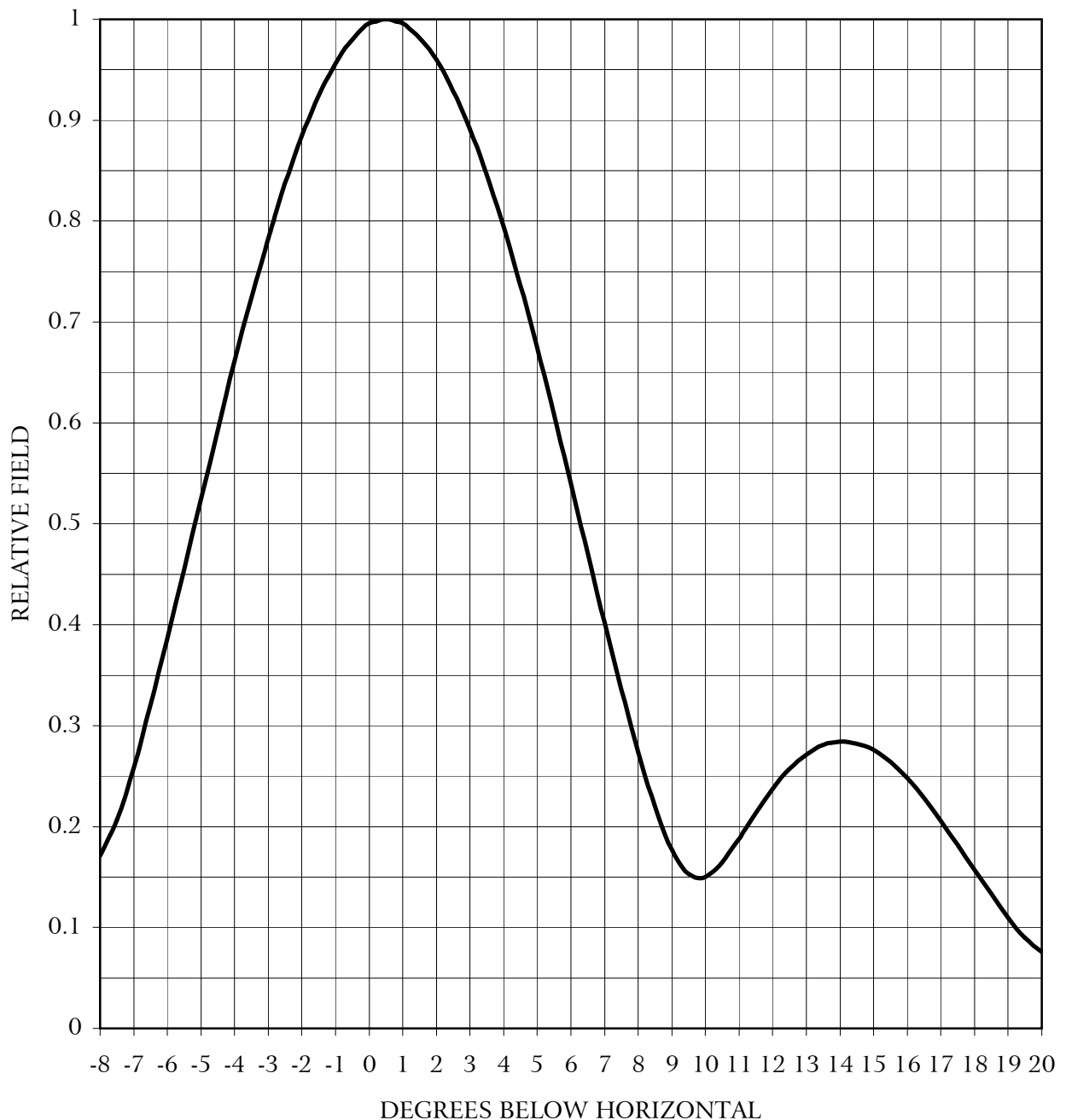


# ELEVATION PATTERN

DIELECTRIC - THB-O3-3H/9HD-1-R

RMS Gain at Main Lobe 6.4 (8.06 dB)  
RMS Gain at Horizontal 6.3 (7.99 dB)

Beam Tilt 0.5 deg  
Frequency 189.0 MHz

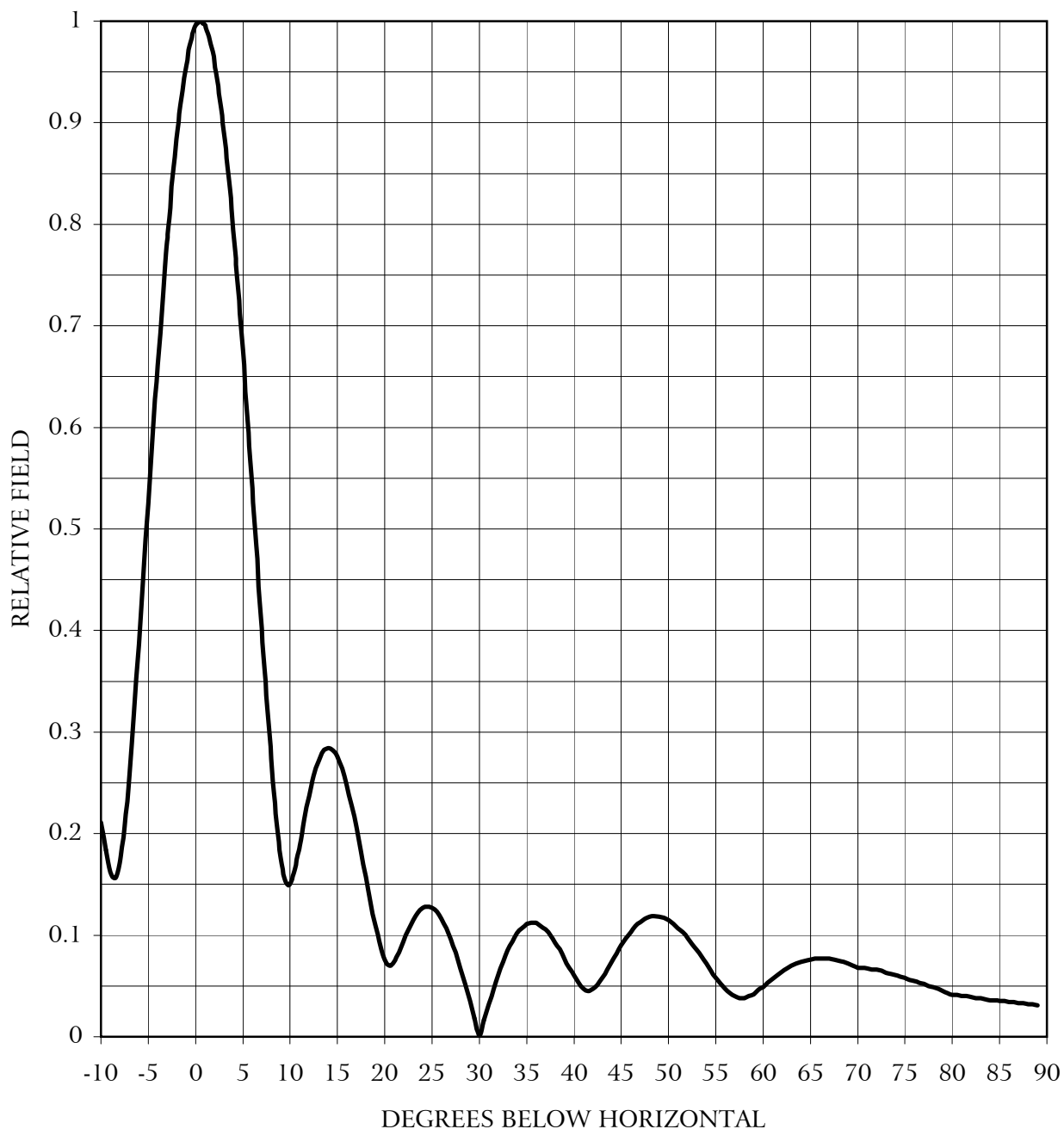


# ELEVATION PATTERN

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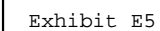


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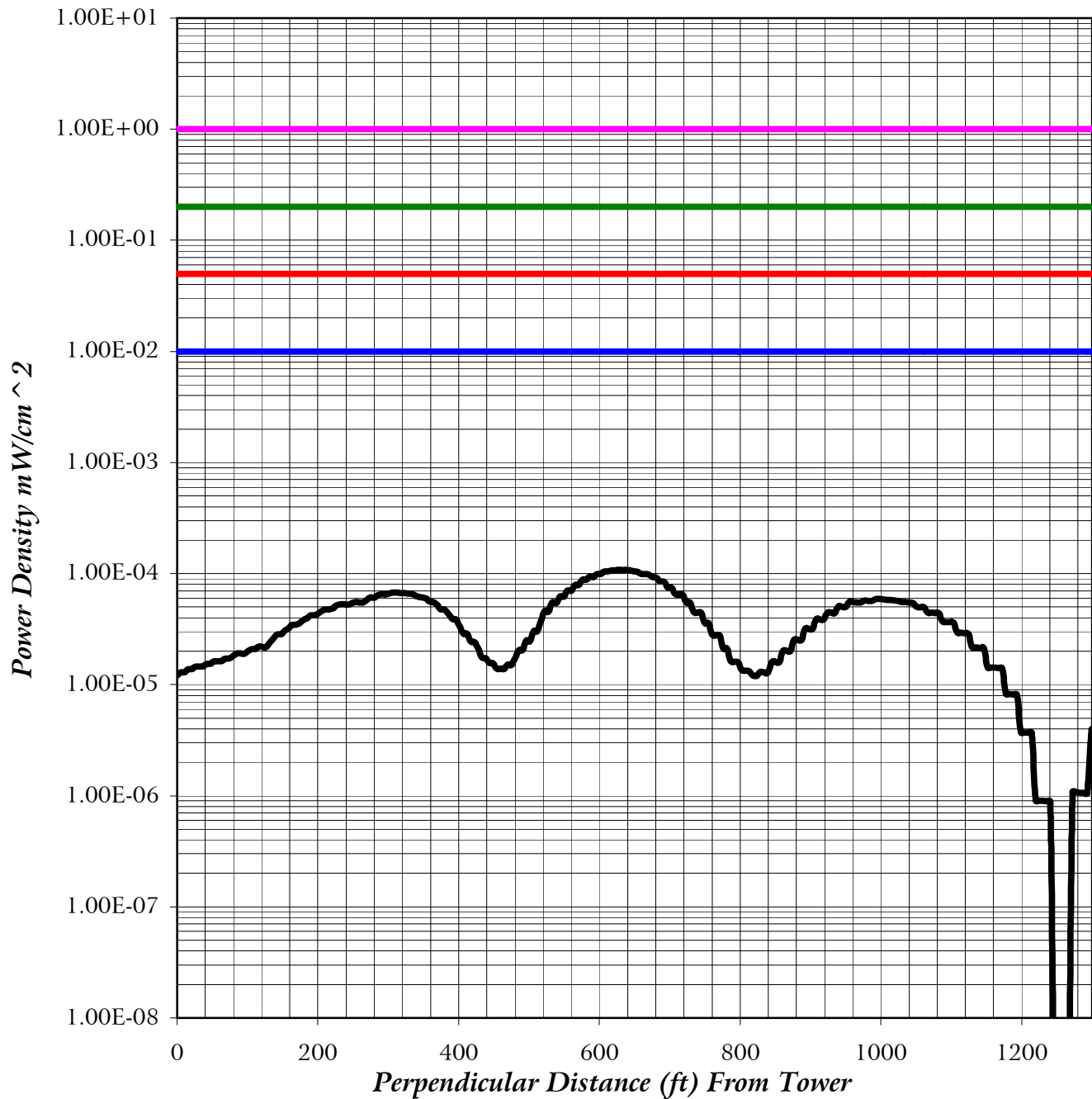
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EXHIBIT E4B



# FAR FIELD EXPOSURE TO RF EMISSIONS



- Maximum Occupational Controlled Exposure
- Maximum General Population or Uncontrolled Exposure
- 5% of Maximum Occupational Controlled Exposure
- 5% of Maximum General Population or Uncontrolled Exposure
- Proposed Power Density 2 Meters Above Ground Level

METHODOLOGY AND EXPLANATION OF  
ENVIRONMENTAL IMPACT / RADIO FREQUENCY RADIATION  
HAZARD ANALYSIS

An analysis has been made of the human exposure to radio frequency radiation ("RFR") using the calculation methodology described in *OET Bulletin 65, Edition, 97-01*. The resulting chart is conducted using the following methodology.

Methodology

Terrain<sup>1</sup> extraction is compiled from the proposed tower site through 0.25 miles in 0.001 mile increments for 360 radials. The power density is calculated for each terrain point at 6 feet above ground level using the elevation pattern of the proposed broadcast antenna. The power density calculations were conducted using the lower edge of the proposed channel frequency. To account for ground reflections, a coefficient of 1.6 was included in the calculation.

RFR Chart

For simplicity of display the following method was chosen to display the RFR values: Of the 360 radials the power density was analyzed and the maximum values were chosen for display for each 0.001 mile increment from the tower. The resulting maximum values were then charted as the black line.

The purple line represents the maximum occupational controlled exposure level for the given frequency.

The green line represents the maximum general population or uncontrolled exposure level for the given frequency.

The red line represents 5% of the maximum occupational controlled exposure level for the given frequency.

The blue line represents 5% of the maximum general population or uncontrolled exposure level for the given frequency.

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<sup>1</sup> Terrain extraction is based upon a 3 arc second point spacing terrain database