ENGINEERING EXHIBIT

Application for Construction Permit

prepared for

Gray Television Licensee, Inc.

W64AO Charlottesville, Virginia
Facility ID 4687
Ch. 16 150 kW

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This material supplies a "hard copy" of the engineering portions of this application as entered April 13, 2004 for filing electronically. Since the FCC's electronic filing system may be accessed by anyone with the applicant's name and password, and electronic data may otherwise be altered in an unauthorized fashion, we cannot be responsible for changes made subsequent to our entry of this data and related attachments.

SECTION III - ENGINEERING DATA

TECHNICAL SPECIFICATIONS
Ensure that the specifications below are accurate. Contradicting data found elsewhere in this application will be disregarded. All items must be completed. The response "on file" is not acceptable.

TECH BOX

1. Channel Number:
16

2. Frequency Offset: ○ No offset ◉ Zero offset ○ Plus offset ○ Minus offset

3. Translator Input Channel No. :

4. Primary station proposed to be rebroadcast:

Call Sign	City	State	Channel

5. Antenna Location Coordinates: (NAD 27)
Latitude:
Degrees 37 Minutes 59 Seconds 3 ◉ North ○ South

Longitude:
Degrees 78 Minutes 28 Seconds 52 ◉ West ○ East

6. Antenna Structure Registration Number:
☑ Not Applicable ☐ Notification filed with FAA

7. Antenna Location Site Elevation Above Mean Sea Level: 443.5 meters

8. Overall Tower Height Above Ground Level: 57.9 meters

9. Height of Radiation Center Above Ground Level: 41.1 meters

10. Maximum Effective Radiated Power (ERP) Towards Radio Horizon: 150 kW

11. Maximum ERP in any Horizontal and Vertical Angle: 150 kW

12. Transmitting Antenna:
Before selecting Directional "Off-the-Shelf", refer to "Search for Antenna Information" under CDBS Public Access (http://svartifoss2.fcc.gov/prod/cdbs/pubacc/prod/cdbs_pa.htm). Make sure that the Standard Pattern is marked Yes and that the relative field values shown match your values. Enter the Manufacturer (Make) and Model exactly as displayed in the Antenna Search.
○ Nondirectional ○ Directional "Off-the-shelf" ◉ Directional composite

Manufacturer ERI Model AL12N-16-PL

Directional Antenna Relative Field Values: ☐ N/A (Nondirectional or Directional "Off-the-shelf")

Rotation (Degrees): 335 ☐ No Rotation

Degrees	Value	Degrees	Value	Degrees	Value	Degrees	Value	Degrees	Value	Degrees	Value
0	1	10	.972	20	.906	30	.815	40	.713	50	.611
60	.517	70	.435	80	.368	90	.316	100	.269	110	.221
120	.168	130	.12	140	.094	150	.104	160	.147	170	.202
180	.236	190	.202	200	.147	210	.104	220	.094	230	.12
240	.168	250	.221	260	.269	270	.316	280	.368	290	.435
300	.517	310	.611	320	.713	330	.815	340	.906	350	.972
Additional Azimuths		143	.093	217	.093						

Relative Field Polar Plot

NOTE: In addition to the information called for in this section, an explanatory exhibit providing full particulars must be submitted for each question for which a "No" response is provided.

CERTIFICATION

13. **Interference** : The proposed facility complies with all of the following applicable rule sections. Check all those that apply. ○ Yes ◉ No

See Explanation in [Exhibit 6]

TV broadcast analog system protection.
a. ☑ 47 C.F.R. Section 74.705

	Digital TV station protection. b. ☑ 47 C.F.R. Section 74.706 **Low Power TV and TV translator station protection.** c. ☑ 47 C.F.R. Section 74.707	
14.	**Environmental Protection Act.** The proposed facility is excluded from environmental processing under 47. C.F.R. Section 1.1306 (i.e., The facility will not have a significant environmental impact and complies with the maximum permissible radiofrequency electromagnetic exposure limits for controlled and uncontrolled environments). Unless the applicant can determine RF compliance, an **Exhibit is required.** By checking "Yes" above, the applicant also certifies that it, in coordination with other users of the site, will reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency electromagnetic exposure in excess of FCC guidelines.	◉ Yes ○ No See Explanation in [Exhibit 7]

PREPARERS CERTIFICATION ON PAGE 3 MUST BE COMPLETED AND SIGNED.

SECTION III PREPARER'S CERTIFICATION

I certify that I have prepared Section III (Engineering Data) on behalf of the applicant, and that after such preparation, I have examined and found it to be accurate and true to the best of my knowledge and belief.

Name JOSEPH M.DAVIS, P.E.	Relationship to Applicant (e.g., Consulting Engineer) CONSULTING ENGINEER	
Signature	Date 4/13/2004	
Mailing Address CAVELL MERTZ & DAVIS, INC. 7839 ASHTON AVENUE		
City MANASSAS	State or Country (if foreign address) VA	Zip Code 20109 -
Telephone Number (include area code) 7033929090	E-Mail Address (if available) JDAVIS@CMDCONSULTING.COM	

WILLFUL FALSE STATEMENTS ON THIS FORM ARE PUNISHABLE BY FINE AND/OR IMPRISONMENT (U.S. CODE, TITLE 18, SECTION 1001), AND/OR REVOCATION OF ANY STATION LICENSE OR CONSTRUCTION PERMIT (U.S. CODE, TITLE 47, SECTION 312(a)(1)), AND/OR FORFEITURE (U.S. CODE, TITLE 47, SECTION 503).

Exhibits

Exhibit 6
Description: EXHIBIT 6 - STATEMENT A

EXHIBIT 6 - STATEMENT A - ATTACHED AS A PDF FILE

Attachment 6

Description
Exhibit 6 - Statement A

Exhibit 7
Description: EXHIBIT 7 - STATEMENT B

EXHIBIT 7 - STATEMENT B - ATTACHED AS A PDF FILE

Attachment 7

Description
Exhibit 7 - Statement B

Exhibit 7 - Statement B

ENVIRONMENTAL CONSIDERATIONS

prepared for

W64AO Charlottesville, Virginia

Facility ID 4687

Ch. 16 150 kW

The instant proposal is not believed to have a significant environmental impact as defined under Section 1.1306 of the Commission's Rules. Consequently, preparation of an Environmental Assessment is not required.

Gray Television Licensee, Inc. ("Gray"), licensee of Low Power Television ("LPTV") station W64AO, Channel 64, Charlottesville, Virginia, Facility ID 4687 (BLTT-19801015IC), proposes herein to change W64AO's channel of operation to Channel 16 and make other facility modifications. No change in transmitter site location is proposed.

The transmitting location is along the top of Carter's Mountain, a *de facto* "antenna farm" serving Charlottesville and the surrounding area. The proposed W64AO Channel 16 facility will employ a replacement antenna structure at the same site as that currently employed by the Channel 64 licensed facility. The existing W64AO tower structure (60.4 meters overall height above ground level) will be removed.

A replacement tower structure having a slightly lower overall height (57.9 meters above ground level) is proposed. Due to the structure height and location, FAA notification and corresponding structure marking/lighting are not required (based on the Commission's TOWAIR computer program).

The use of existing transmitting locations has been characterized as being environmentally preferable by the Commission, according to Note 1 of §1.1306 of the Commission's Rules. Additionally, Note 3 of §1.1306 indicates that construction of a support structure in an established "antenna farm" may be excluded from environmental processing (see below for RF exposure analysis). Therefore, it is believed that this application may be categorically excluded from environmental processing pursuant to §1.1306 of the Commission's rules.

Human Exposure to Radiofrequency Electromagnetic Field

The proposed operation was evaluated for human exposure to radiofrequency electromagnetic field using the procedures outlined in the Commission's OET Bulletin No. 65 ("OET 65"). OET 65 describes a means of determining whether a proposed facility exceeds the radiofrequency exposure guidelines adopted in §1.1310. Under present Commission policy, a facility may be presumed to comply with the limits specified in §1.1310 if it satisfies the exposure criteria set forth in OET 65. Based upon that methodology, and as demonstrated in the following, the proposed transmitting system will comply with the cited adopted guidelines.

The proposed transmitting antenna will be installed such that its center of radiation is 41.1 meters above ground level. An ERP of 150 kilowatts (10% aural), horizontally polarized, will be employed. The "uncontrolled/general population" maximum permissible exposure ("MPE") limit specified in §1.1310 for Channel 16 (frequency band 482 - 488 MHZ) is 323.3 $\mu W/cm^2$.

OET-65's formula for NTSC television transmitting antennas as used for calculating signal density in this analysis is:

$$S = (33.4098)\ (F^2)\ (0.4 \times ERP_{Visual} + ERP_{Aural})\ /\ D^2$$

Where:

S	=	Plane Wave Power Density ($\mu W/cm^2$) at specified point
F	=	Relative Field Factor
ERP_{Visual}	=	total visual ERP in Watts
ERP_{Aural}	=	total aural ERP in Watts
D	=	distance in meters from center of radiation to the specified point.

Using this formula, calculations were made to predict power density attributable to the proposed W64AO facility at points two meters above ground level near the transmitting site. The calculations consider the theoretical elevation pattern of the proposed antenna system (see **Exhibit 7 - Figure 3**).

The W64AO transmitter site is near the top of a peak along the ridge of Carter's Mountain. Since the terrain rises slightly in one direction within 200 meters of the base of the site, detailed calculations were performed to predict power density attributable to the facility considering these higher elevations. According to W64AO license data, the ground elevation at the existing tower base is 443.5 meters AMSL. The nearby WVIR-TV tower (Ch. 29, Charlottesville, VA) is located 0.1 km distant at the crest of the terrain peak, to the south of the proposed site. The WVIR-TV tower's FCC Antenna Structure Registration data (number 1018769) indicates a ground elevation of 445 meters AMSL, which corresponds to that as indicated on a U.S.G.S. topographic map for the area.

For study purposes, detailed calculations were performed assuming that the ground is actually flat in all directions from the existing tower base and has an elevation corresponding to that of the terrain peak at the nearby WVIR-TV tower. Considering the theoretical elevation pattern of the proposed W64AO antenna system along various depression angles and the "slant" distance from the antenna to the "flat earth," the highest RF electromagnetic field level attributable to the proposed W64AO facility is 12.98 $\mu W/cm^2$, which is 4.01 percent of the uncontrolled / general public MPE limit at any location two meters above the "flat earth" maximum ground level. This occurs at a distance of 16 meters horizontal away from the base of the tower structure.

The attached **Exhibit 7 - Figure 4** provides a graph of calculated RF electromagnetic field attributable to the proposed W64AO facility at locations two meters above the "flat earth" maximum ground level near the transmitter site, to a distance of 500 meters horizontally from the W64AO tower location. When the actual terrain elevations are considered (which are below the "flat earth" maximum along most azimuths), the calculated RF electromagnetic field will be even lower.

At a distance of 500 meters from the proposed W64AO, assuming a worst-case relative field factor of 100 percent, the calculated contribution to RF exposure attributable to the proposed W64AO facility is 10.0 $\mu W/cm^2$, which is 3.1 percent of the uncontrolled / general public MPE limit. At more distant locations, the W64AO contribution is lower than 3.1 percent.

As described above, the proposed W64AO facility is predicted to cause RF electromagnetic field levels of less than five percent at any publically accessible location. §1.1307(b)(3) states that facilities at locations with multiple transmitters (such as the case at hand) are categorically excluded from responsibility for taking any corrective action in the areas where its contribution is less than five percent. Since the instant situation meets the five percent exclusion test at all ground level areas, the impact of any other facilities near this site may be considered independently from this proposal. Accordingly, it is believed that the impact of the proposed operation should not be considered to be a factor at or near ground level as defined under §1.1307(b).

Safety of Tower Workers and the General Public

As demonstrated herein, excessive levels of RF energy attributable to the proposal will not be caused at publicly accessible areas at ground level near the antenna supporting structure. Consequently, members of the general public will not be exposed to RF levels in excess of the Commission's guidelines. Nevertheless, tower access will be restricted and controlled through the use of a locked fence. Additionally, appropriate RF exposure warning signs will be posted.

With respect to worker safety, it is believed that based on the preceding analysis, excessive exposure would not occur in areas at ground level. A site exposure policy will be employed protecting maintenance workers from excessive exposure when work must be performed on the tower or nearby towers in areas where high RF levels may be present. Such protective measures may include, but will not be limited to, restriction of access to areas where levels in excess of the guidelines may be expected, power reduction, or the complete shutdown of facilities when work or inspections must be performed in areas where the exposure guidelines will be exceeded. On-site RF exposure measurements may also be undertaken to establish the bounds of safe working areas. The applicant will coordinate exposure procedures with all pertinent stations.

Conclusion

Based on the preceding, it is believed that the instant proposal may be categorically excluded from environmental processing under Section 1.1306 of the Rules, hence preparation of an Environmental Assessment is not required.

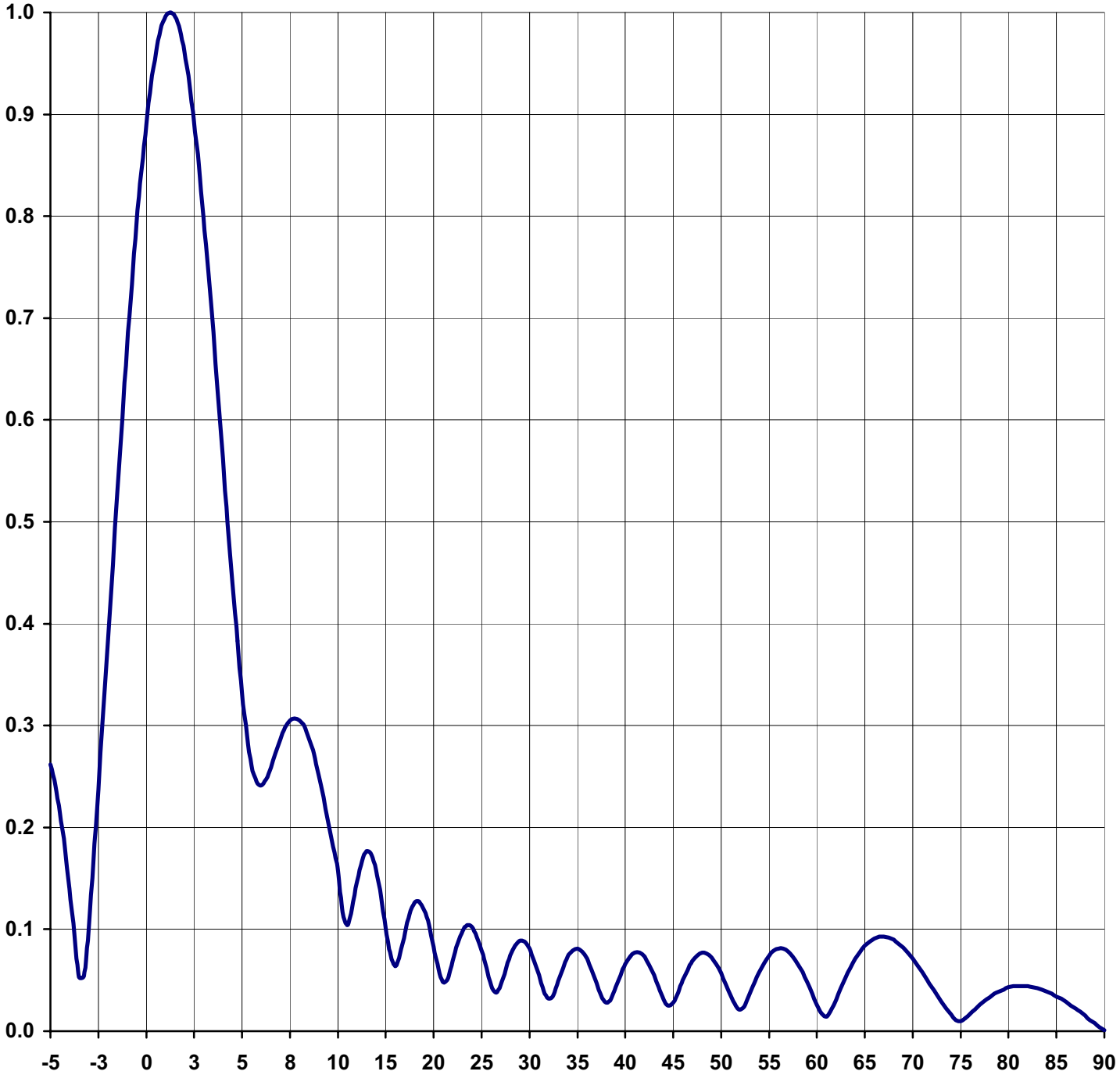
EXHIBIT 7 - FIGURE 3
ANTENNA VERTICAL PLANE (ELEVATION) PATTERN

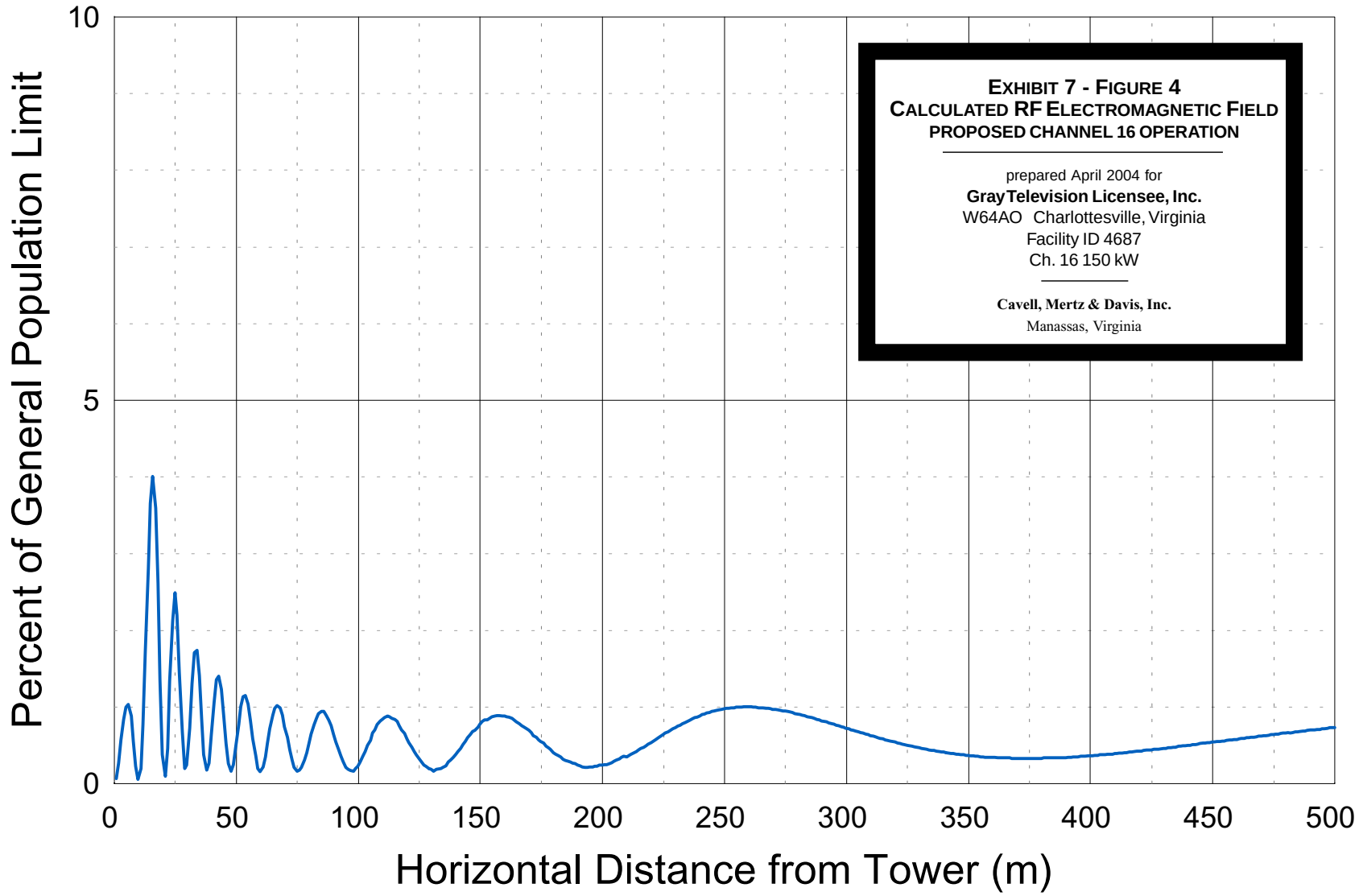
prepared April 2004 for
Gray Television Licensee, Inc.
W64AO Charlottesville, Virginia
Facility ID 4687
Ch. 16 150 kW

Cavell, Mertz & Davis, Inc.
Manassas, Virginia

ELEVATION PATTERN

TYPE:	***AL12PLUS5***	
Directivity:	***Numeric***	***dBd***
Main Lobe:	***12.00***	***(15.05)***
Horizontal:	***9.53***	***(8.99)***
Beam Tilt:	***1.25***	
Polarization:	***Horizontal***	
Channel:	***16***	
Location:	***Charlottesville, VA***	





Graph depicts calculated percentage of General Population/Uncontrolled Maximum Permissible Exposure Limit at locations 2 meters above ground level attributable to the proposed Ch. 16 operation. Flat terrain assumed corresponding to elevation of nearby peak of mountaintop. Calculations are based on methodology outlined in FCC's OET Bulletin Number 65.