

## **ENGINEERING EXHIBIT**

### **Application for Auxiliary Antenna Construction Permit**

prepared for

#### **Hampton Roads Educational Telecommunications Association, Inc.**

WHRO-FM Norfolk, VA

Facility ID 25940

Ch. 212B (90.3 MHz) 26.5 kW 182 m

*Hampton Roads Educational Telecommunications Association, Inc. (“HRETA”)* is the licensee of WHRO-FM, Channel 212B, Norfolk, VA (BLED-20030506AAW). *HRETA* herein proposes to construct a new auxiliary antenna facility.

WHRO-FM’s main facility is presently licensed to operate at 7.3 kW effective radiated power (“ERP”) using a non-directional antenna at a height above average terrain (“HAAT”) of 350 meters. The proposed auxiliary antenna will be situated on a separate tower structure located adjacent to the main WHRO-FM facility. The proposed tower structure is associated with FCC Antenna Structure Registration number 1027474 and was employed by the analog WHRO-TV television facility (Channel 15, Hampton-Norfolk, VA), under common ownership with WHRO-FM.<sup>1</sup>

The top-mounted Channel 15 television antenna has been removed, and the tower’s overall height will be reduced further. The final overall height above ground will be 193.6 meters, which is 112.7 meters reduced from its original overall height. Notification to the FAA of the reduction in tower height will be made by the structure owner and the corresponding FCC ASR #1027474 will be modified upon approval from the FAA. The proposed WHRO-FM auxiliary antenna will be side-mounted on the upper portion of the tower structure, following the height reduction.

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<sup>1</sup>WHRO-FM was previously licensed to operate on this tower (BLED-19901002KC), at 23 kW ERP and 192 m HAAT.

The antenna will be shared with WHRV(FM) (Ch. 208B Norfolk, VA) which is proposing to use the subject antenna as its main facility. WHRV is also licensed to *HRETA*, and a separate application for construction permit regarding WHRV is being filed contemporaneously. WHRO-FM and WHRV presently utilize a shared antenna, and the existing combining equipment will be employed during the condition where WHRO-FM (auxiliary) and WHRV (main) must simultaneously use the new antenna.

**Figure 1** shows that the 60 dB $\mu$  (1 mV/m) contour of the proposed auxiliary facility does not extend beyond the 60 dB $\mu$  contour of the main facility, in compliance with §73.1675(a)(1).

### **Human Exposure to Radiofrequency Electromagnetic Field (Environmental)**

The proposed transmitting antenna will be side-mounted on an existing antenna support structure. 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 FCC Rules. Therefore, it is believed that this application may be categorically excluded from environmental processing pursuant to §1.1306 of the Commission's rules.

The proposed WHRO-FM operation was evaluated for human exposure to RF energy using the procedures outlined in the Commission's OET Bulletin Number 65. The WHRO-FM auxiliary facility will employ a shared six element Shively 6814 series antenna, with approximately one wavelength element spacing. **Figure 2** supplies manufacturer's elevation pattern data for this series antenna on WHRO-FM's frequency, which shows that the relative field at downward elevations is less than 35 percent. Based on OET-65 equation (10), and considering 35 percent antenna relative field, the calculated signal density near the tower at two meters above ground level attributable to the proposed facility is 6.4  $\mu\text{W}/\text{cm}^2$ , which is 3.2 percent of the general population/uncontrolled maximum permitted exposure limit. This is below the five percent threshold limit described in §1.1307(b) regarding sites with multiple emitters, categorically excluding the applicant from responsibility for taking any corrective action in the areas where the proposal's contribution is less than five percent.

The general public will not be exposed to RF levels attributable to the proposal in excess of the FCC's guidelines. RF exposure warning signs will continue to be posted. With respect to worker safety, the applicant will coordinate exposure procedures with all pertinent stations and will reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from RF electromagnetic field exposure in excess of FCC guidelines.

### **Certification**

The undersigned hereby certifies that the foregoing statement and associated attachments were prepared by him or under his direction, and that they are true and correct to the best of his knowledge and belief.



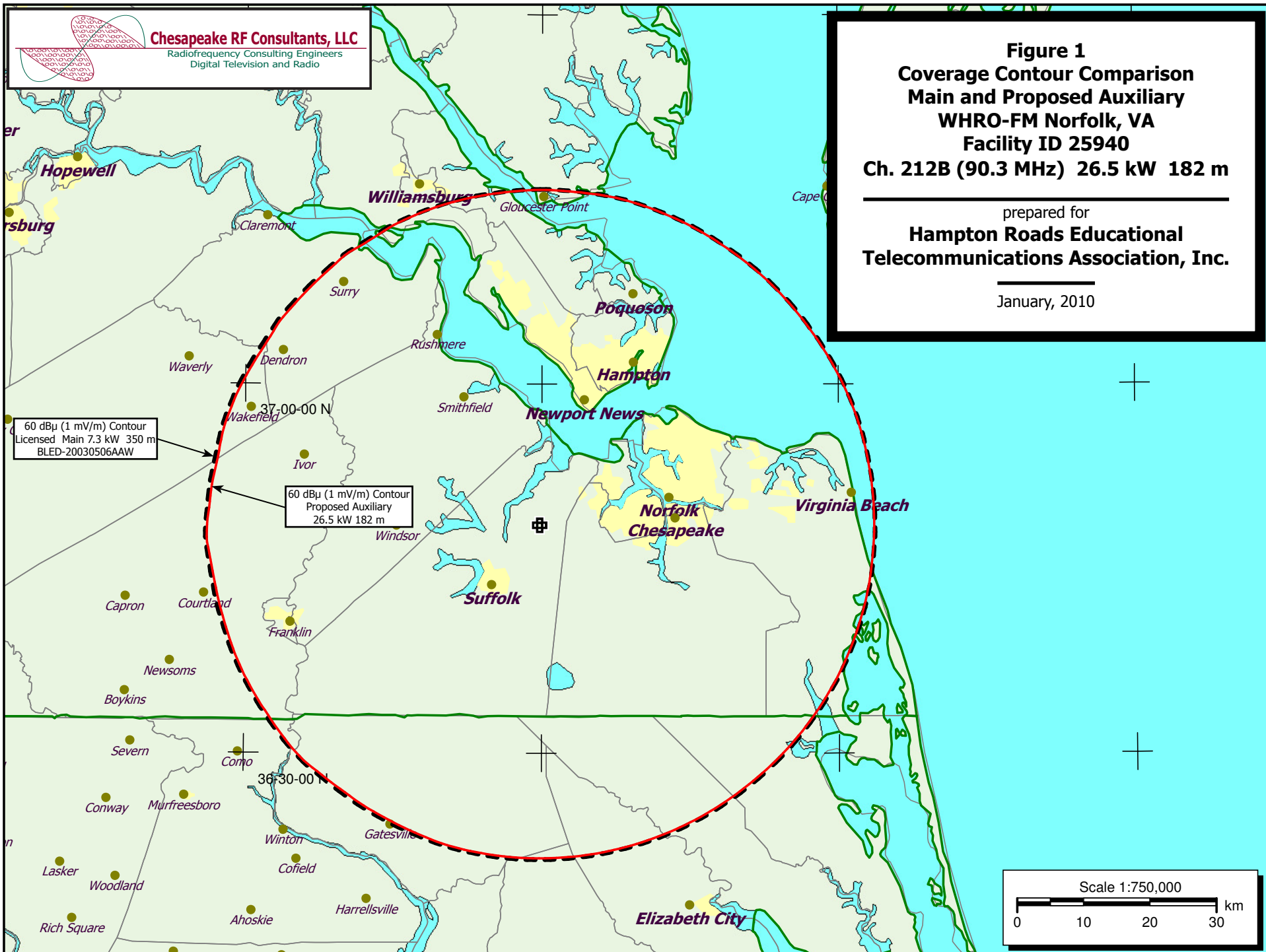
Joseph M. Davis, P.E.  
January 28, 2010

**Chesapeake RF Consultants, LLC**  
11993 Kahns Road  
Manassas, VA 20112  
703-650-9600

### List of Attachments

Figure 1	Coverage Contour Comparison
Figure 2	Antenna Vertical Plane (Elevation) Pattern
Form 340	Saved Version of Engineering Sections from FCC Form at Time of Upload

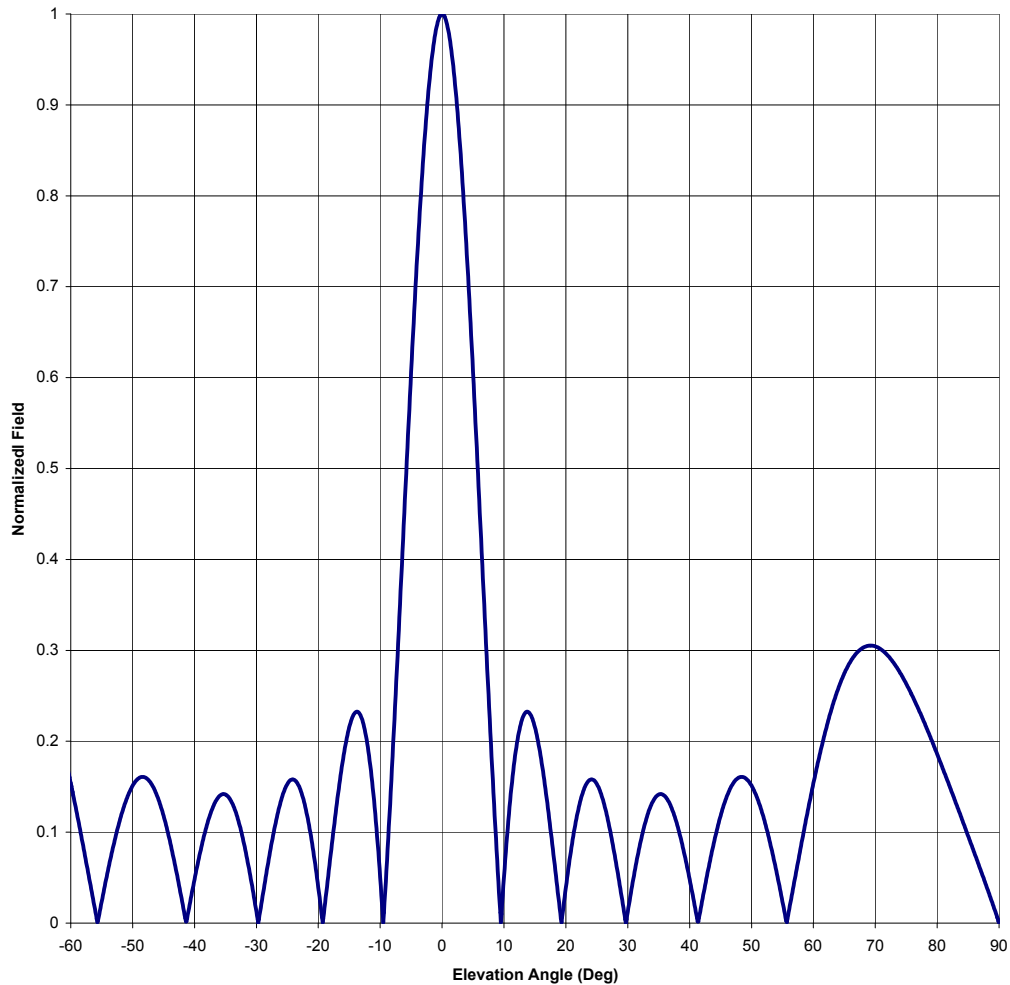
*This material was entered January 28, 2010 for filing electronically. Since the FCC's electronic filing system may be accessed by anyone with the applicant's account number and password, and electronic data may otherwise be altered in an unauthorized fashion, we cannot be responsible for changes made subsequent to our entry of this data and related attachments.*



Antenna Mfg.: Shively Labs  
Antenna Type: 6814  
Station: WHRO-FM  
Frequency: 90.3  
Channel #: 212  
Figure: 0

Date: 1/27/2010

Beam Tilt	0	
Gain (Max)	3.296	5.180 dB
Gain (Horizon)	3.296	5.180 dB



**Figure 2**  
**Auxiliary Antenna Elevation Pattern**  
**WHRO-FM Norfolk, VA**  
**Facility ID 25940**  
**Ch. 212B (90.3 MHz) 26.5 kW 182 m**

prepared for  
**Hampton Roads Educational**  
**Telecommunications Association, Inc.**

January, 2010

**Section VII Preparer's Certification**

I certify that I have prepared Section VII (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 1/28/2010	
Mailing Address CHESAPEAKE RF CONSULTANTS LLC 11993 KAHNS ROAD		
City MANASSAS	State or Country (if foreign address) VA	Zip Code 20112-
Telephone Number (include area code) 7036509600	E-Mail Address (if available) JOSEPH.DAVIS@RF-CONSULTANTS.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).

**Section VII - FM Engineering****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: 212																																																																																																
2.	Class (select one): <input type="radio"/> D <input type="radio"/> A <input type="radio"/> B1 <input checked="" type="radio"/> B <input type="radio"/> C3 <input type="radio"/> C2 <input type="radio"/> C1 <input type="radio"/> C0 <input type="radio"/> C																																																																																																
3.	Antenna Location Coordinates: (NAD 27) Latitude: Degrees 36 Minutes 48 Seconds 32 <input checked="" type="radio"/> North <input type="radio"/> South  Longitude: Degrees 76 Minutes 30 Seconds 13 <input checked="" type="radio"/> West <input type="radio"/> East																																																																																																
4.	Proposed Assignment Coordinates: (NAD 27) - RESERVED CHANNELS ABOVE 220 ONLY <input checked="" type="checkbox"/> Not Applicable Latitude: Degrees Minutes Seconds <input type="radio"/> North <input type="radio"/> South  Longitude: Degrees Minutes Seconds <input type="radio"/> West <input type="radio"/> East																																																																																																
5.	Antenna Structure Registration Number: 1027474 <input type="checkbox"/> Not Applicable <input type="checkbox"/> Notification filed with FAA																																																																																																
6.	Overall Tower Height Above Ground Level: 193.6 meters																																																																																																
7.	Height of Radiation Center Above Mean Sea Level: 187.3 meters(H) 187.3 meters(V)																																																																																																
8.	Height of Radiation Center Above Ground Level: 180.3 meters(H) 180.3 meters(V)																																																																																																
9.	Height of Radiation Center Above Average Terrain: 181.7 meters(H) 181.7 meters(V)																																																																																																
10.	Effective Radiated Power: 26.5 kW(H) 26.5 kW(V)																																																																																																
11.	Maximum Effective Radiated Power: (Beam-Tilt Antenna ONLY) <input checked="" type="checkbox"/> Not Applicable kW(H) kW(V)																																																																																																
12.	Directional Antenna Relative Field Values: <input checked="" type="checkbox"/> Not applicable (Nondirectional) Rotation (Degrees): <input type="checkbox"/> No Rotation <table><thead><tr><th>Degrees</th><th>Value</th><th>Degrees</th><th>Value</th><th>Degrees</th><th>Value</th><th>Degrees</th><th>Value</th><th>Degrees</th><th>Value</th><th>Degrees</th><th>Value</th></tr></thead><tbody><tr><td>0</td><td></td><td>10</td><td></td><td>20</td><td></td><td>30</td><td></td><td>40</td><td></td><td>50</td><td></td></tr><tr><td>60</td><td></td><td>70</td><td></td><td>80</td><td></td><td>90</td><td></td><td>100</td><td></td><td>110</td><td></td></tr><tr><td>120</td><td></td><td>130</td><td></td><td>140</td><td></td><td>150</td><td></td><td>160</td><td></td><td>170</td><td></td></tr><tr><td>180</td><td></td><td>190</td><td></td><td>200</td><td></td><td>210</td><td></td><td>220</td><td></td><td>230</td><td></td></tr><tr><td>240</td><td></td><td>250</td><td></td><td>260</td><td></td><td>270</td><td></td><td>280</td><td></td><td>290</td><td></td></tr><tr><td>300</td><td></td><td>310</td><td></td><td>320</td><td></td><td>330</td><td></td><td>340</td><td></td><td>350</td><td></td></tr><tr><td>Additional Azimuths</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></tbody></table>	Degrees	Value	Degrees	Value	Degrees	Value	Degrees	Value	Degrees	Value	Degrees	Value	0		10		20		30		40		50		60		70		80		90		100		110		120		130		140		150		160		170		180		190		200		210		220		230		240		250		260		270		280		290		300		310		320		330		340		350		Additional Azimuths											
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**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**

<b>AUXILIARY ANTENNA APPLICANTS ARE NOT REQUIRED TO RESPOND TO ITEMS 13-17. PROCEED TO ITEM 18.</b>		
13.	<b>Main Studio Location.</b> The proposed main studio location complies with 47 C.F.R. Section 73.1125.	<input type="radio"/> Yes <input type="radio"/> No See Explanation in [Exhibit 13]
14.	<b>Community Coverage.</b> The proposed facility complies with 47 C.F.R. Section 73.315. (Channels 221 and above) or 47 C.F.R. Section 73.515 (Channels 220 and below).	<input type="radio"/> Yes <input type="radio"/> No See Explanation in [Exhibit 14]
15.	<b>Interference.</b> The proposed facility complies with all of the following applicable rule sections. Check all that apply:  <b>Contour Overlap Requirements.</b> a. <input type="checkbox"/> 47 C.F.R. Section 73.509 <b>Exhibit Required.</b> [Exhibit 16] <b>Spacing Requirements.</b> b. <input type="checkbox"/> 47 C.F.R. Section 73.207 with respect to station(s) <b>Grandfathered Short-Spaced.</b> c. <input type="checkbox"/> 47 C.F.R. Section 73.213(a) with respect to station(s) <b>Exhibit Required.</b> [Exhibit 17] <b>Contour Protection.</b> d. <input type="checkbox"/> 47 C.F.R. Section 73.215(a) with respect to station(s) <b>Exhibit Required.</b> [Exhibit 18] <b>Television Channel 6 Protection.</b> e. <input type="checkbox"/> 47 C.F.R. Section 73.525 with respect to station(s) <b>Exhibit Required.</b> [Exhibit 19]	<input type="radio"/> Yes <input type="radio"/> No See Explanation in [Exhibit 15]
16.	<b>Reserved Channels Above 220.</b> a. <b>Availability of Channels.</b> The proposed facility complies with the assignment requirements of 47 C.F.R. Section 73.203.	<input type="radio"/> Yes <input type="radio"/> No See Explanation in [Exhibit 20]
17.	<b>International Borders.</b> The proposed antenna location is not within 320 kilometers of the common border between the United States and Canada or Mexico.  If "No," specify the country and provide an exhibit of compliance with all provisions of the relevant International Agreement.	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Canada <input type="radio"/> Mexico [Exhibit 21]
18.	<b>Environmental Protection Act.</b> 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 compliance through the use of the RF worksheets in Worksheet #7, an <b>Exhibit is required.</b>  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.	<input checked="" type="radio"/> Yes <input type="radio"/> No See Explanation in [Exhibit 22]
19.	<b>Community of License Change - Section 307(b).</b> If the application is being submitted to change the facility's community of license, then the applicant certifies that it has attached an exhibit containing information demonstrating that the proposed community of license change comports with the fair distribution of service policies underlying Section 307(b) of the Communications Act of 1934, as amended (47 U.S.C. Section 307(b)).  <b>An exhibit is required</b> unless this question is not applicable.	<input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> N/A [Exhibit 23]