

# ENGINEERING EXHIBIT

## Application for Modification of Construction Permit

prepared for

**PRC Tacoma -- I LLC**  
KXOT(FM) Tacoma, Washington  
Facility ID 62470  
Ch. 219C2 23 kW 223 m

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FCC Form 340, Section VII - FM Engineering on Channels 200-220

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Statement B	Environmental Considerations
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*This material supplies a "hard copy" of the engineering portions of this application as entered November 30, 2005 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 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 ROBERT J. CLINTON		Relationship to Applicant (e.g., Consulting Engineer) CONSULTANT	
Signature		Date 11/30/2005	
Mailing Address CAVELL, MERTZ & DAVIS, INC. 7839 ASHTON AVENUE			
City MANASSAS		State or Country (if foreign address) VA	Zip Code 20109-2883
Telephone Number (include area code) 7033929090		E-Mail Address (if available) BCLINTON@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).

<b>Section VII - FM Engineering on Channels 200-220</b>												
<b>TECHNICAL SPECIFICATIONS</b>												
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.												
<b>TECH BOX</b>												
1.	Channel Number: 219											
2.	Class (select one): <input type="radio"/> D <input type="radio"/> A <input type="radio"/> B1 <input type="radio"/> B <input type="radio"/> C3 <input checked="" type="radio"/> C2 <input type="radio"/> C1 <input type="radio"/> C0 <input type="radio"/> C											
3.	Antenna Location Coordinates: (NAD 27) Latitude: Degrees 47 Minutes 18 Seconds 14 <input checked="" type="radio"/> North <input type="radio"/> South Longitude: Degrees 122 Minutes 23 Seconds 43 <input checked="" type="radio"/> West <input type="radio"/> East											
4.	Antenna Structure Registration Number: 1037820 <input type="checkbox"/> Not Applicable <input type="checkbox"/> Notification filed with FAA											
5.	Antenna Location Site Elevation Above Mean Sea Level: 150 meters											
6.	Overall Tower Height Above Ground Level: 141.1 meters											
7.	Height of Radiation Center Above Ground Level: 130.1 meters(H) 130.1 meters(V)											
8.	Height of Radiation Center Above Average Terrain: 223 meters(H) 223 meters(V)											
9.	Effective Radiated Power: 23 kW(H) 23 kW(V)											
10.	Maximum Effective Radiated Power: <input checked="" type="checkbox"/> Not Applicable kW(H) kW(V) (Beam-Tilt Antenna ONLY)											
11.	Directional Antenna Relative Field Values: <input type="checkbox"/> Not applicable (Nondirectional) Rotation (Degrees): <input checked="" type="checkbox"/> No Rotation											
	Degrees	Value	Degrees	Value	Degrees	Value	Degrees	Value	Degrees	Value	Degrees	Value
	0	0.397	10	0.375	20	0.339	30	0.285	40	0.354	50	0.441
	60	0.548	70	0.683	80	0.849	90	1	100	1	110	1
	120	1	130	1	140	1	150	1	160	1	170	1

180	1	190	1	200	1	210	1	220	1	230	1
240	1	250	1	260	1	270	1	280	1	290	1
300	1	310	1	320	0.953	330	0.766	340	0.615	350	0.494
Additional Azimuths		27	0.291	315	1.000						

## 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****AUXILIARY ANTENNA APPLICANTS ARE NOT REQUIRED TO RESPOND TO ITEMS 12-15.**

12.	<b>Main Studio Location.</b> The proposed main studio location complies with 47 C.F.R. Section 73.1125.	<input checked="" type="radio"/> Yes <input type="radio"/> No  See Explanation in [Exhibit 13]
13.	<b>Interference.</b> The proposed facility complies with all of the following applicable rule sections. Check all that apply:	<input checked="" type="radio"/> Yes <input type="radio"/> No  See Explanation in [Exhibit 14]
<b>Contour Overlap Requirements.</b>		
a. <input checked="" type="checkbox"/> 47 C.F.R. Section 73.509 <b>Exhibit Required.</b> [Exhibit 15]		
<b>Spacing Requirements.</b>		
b. <input checked="" 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 16]		
<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 17]		
<b>Television Channel 6 Protection.</b>		
e. <input checked="" type="checkbox"/> 47 C.F.R. Section 73.525 with respect to station(s) <b>Exhibit Required.</b> [Exhibit 18]		
14.	<b>Reserved Channels Above 220.</b>	
a. <b>Allotment.</b> The proposed facility complies with the allotment requirements of 47 C.F.R. Section 73.203.		<input type="radio"/> Yes <input type="radio"/> No See Explanation in [Exhibit 19]
b. <b>Community Coverage.</b> The proposed facility complies with 47 C.F.R. Section 73.315.		<input type="radio"/> Yes <input type="radio"/> No See Explanation in [Exhibit 20]
15.	<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 checked="" type="radio"/> No <input checked="" type="radio"/> Canada <input type="radio"/> Mexico [Exhibit 21]

16. **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 compliance through the use of the RF worksheets in Worksheet #7, an **Exhibit is required.** ☒ Yes ☐ No See Explanation in [Exhibit 22]
- 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.

**PREPARER'S CERTIFICATION ON PAGE 8 MUST BE COMPLETED AND SIGNED.**

## Exhibits

### Exhibit 14

**Description:** EXHIBIT 14 - STATEMENT A

EXHIBIT 14 - STATEMENT A - ALLOCATION CONSIDERATIONS

### Attachment 14

Description
EXHIBIT 14 - STATEMENT A

### Exhibit 15

**Description:** EXHIBIT 15 - CONTOUR OVERLAP

SEE EXPLANATION IN EXHIBIT 14 - STATEMENT A

### Attachment 15

### Exhibit 18

**Description:** EXHIBIT 18 - TELEVISION CHANNEL 6 PROTECTION

SEE EXPLANATION IN EXHIBIT 14 - STATEMENT A

### Attachment 18

### Exhibit 21

**Description:** EXHIBIT 21 - INTERNATIONAL BORDERS

SEE EXPLANATION IN EXHIBIT 14 - STATEMENT A

### Attachment 21

### Exhibit 22

**Description:** EXHIBIT 22 - STATEMENT B

EXHIBIT 22 - STATEMENT B - ENVIRONMENTAL CONSIDERATIONS

### Attachment 22

Description
EXHIBIT 22 - STATEMENT B

Exhibit 22 - Statement B  
**ENVIRONMENTAL CONSIDERATIONS**  
prepared for  
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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.

**Nature of The Proposal**

The instant application seeks a Construction Permit to modify the KXOT facility. The instant proposal involves replacement of the existing KXOT antenna with a different directional antenna system, side-mounted at a higher elevation on the existing tower structure (ASR number 1037820).

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. No change in overall structure height is proposed, thus no change in current structure marking and lighting requirements is anticipated. 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 energy 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.

Exhibit 22 - Statement B  
**ENVIRONMENTAL CONSIDERATIONS**  
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It is proposed to install the KXOT antenna such that its center of radiation is 130.1 meters above ground level. A maximum ERP of 23 kilowatts, circularly polarized, will be employed. The “uncontrolled/general population” limit specified in §1.1310 for the FM radio band is 200  $\mu\text{W}/\text{cm}^2$ .

Calculations were made per OET 65 to predict power density attributable to the proposed facility at points two meters above ground level locations in the immediate vicinity of the tower. For purposes of this study, a “worst case” relative field of 100 percent is assumed for the KXOT antenna.

The formula used for calculating FM signal density in this analysis is essentially the same as equation (9) in OET-65.

$$S = (33.4098) (F^2) (ERP) / D^2$$

Where:

<i>S</i>	=	power density in microwatts/cm <sup>2</sup>
<i>ERP</i>	=	total (average) ERP in Watts
<i>F</i>	=	relative field factor
<i>D</i>	=	distance in meters

Using this formula and the assumptions above, the proposed facility would contribute a power density of 93.7  $\mu\text{W}/\text{cm}^2$  at two meters above ground level near antenna support structure, or 46.8 percent of the general population/uncontrolled limit. At ground level locations away from the base of the tower, the calculated RF power density is even lower, due to the increasing distance from the transmitting antenna. If the antenna’s vertical plane pattern is used, the calculated density would be lower.

According to the Commission’s database, the only other non-excluded emitter authorized at or near this site is auxiliary facility KBSG-FM (BXLH-19990714KF, Ch. 247C, Tacoma, WA). According to information provided by the applicant, the KBSG-FM auxiliary antenna has been permanently dismantled and removed from the support structure, and the transmitting equipment has been removed from the equipment building. The applicant will be the structure owner and does not

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**ENVIRONMENTAL CONSIDERATIONS**  
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anticipate that the KBSG-FM auxiliary facility will be restored. Therefore, the KBSG-FM auxiliary antenna's contribution to the total RF electromagnetic field does not require consideration.

Thus, based on this analysis, the Commission's limit regarding general population / uncontrolled exposure to RF electromagnetic field is not exceeded at ground level locations near the KXOT tower site.

**Safety of Tower Workers and the General Public**

As demonstrated herein, excessive levels of RF energy 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 continue to be restricted and controlled through the use of a locked fence. Additionally, appropriate RF exposure warning signs will continue to 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 continue to be employed protecting maintenance workers from excessive exposure when work must be performed on the tower 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 any 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.