

## **ENGINEERING EXHIBIT**

### **Application for Minor Modification of FM Station Construction Permit**

prepared for

**Premier Broadcasters, Inc.**  
KVNW(FM) Napavine, WA  
Facility ID 189494  
Ch. 225C3 (92.9 MHz) 4 kW 256 m

*Premier Broadcasters, Inc.* (“*Premier*”) is the proposed assignee (file# 0000199941) of an authorization for unbuilt digital FM station KVNW, Channel 225C3, Facility ID 189494, Napavine, WA. KVNW is authorized by a Construction Permit (“CP” file# (BNPH-20110630AHJ) to operate at 2.65 kW effective radiated power (“ERP”) with a nondirectional antenna having a height above average terrain (“HAAT”) of 305 meters. *Premier* herein proposes a minor modification of the CP to employ a different transmitter location.

As specified herein, KVNW will be relocated 3.2 km and will operate with an ERP of 4.0 kW with a nondirectional antenna at 256 meters HAAT (using USGS 3 arc second digitized terrain data). This ERP/HAAT combination represents a maximum Class C3 facility.

The proposed site is that which is employed by *Premier’s* KITI-FM (Ch. 236A, Fac ID 53396, Winlock WA). *Premier* proposes to replace the existing KITI-FM antenna with a model that will be shared with the proposed KVNW.

The proposed antenna supporting structure is not registered as the overall structure height does not exceed 61 meters above ground and passes the FCC’s TOWAIR program for the location. The proposed shared antenna will side-mount to the tower and no change to the overall structure height will occur.

The principal community of Napavine is encompassed by the proposed KVNW 70 dBμ coverage contour. The attached Figure 1 supplies a coverage contour map for the proposed facility.

An allocation spacing summary table for the proposed transmitter site is provided in Table 1. The proposed KVNW site location meets the §73.207 minimum distance separation requirements with respect to all other stations, allotments, and proposals as contained within the FCC LMS database.

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

The proposed KVNW operation was evaluated for human exposure to RF energy using the procedures outlined in the FCC's OET Bulletin Number 65. The proposed transmitting antenna is an EPA Type 3 (opposed U dipole) consisting of two elements at 0.5 wavelength spacing. According to the FCC's "FMModel" software analysis,<sup>1</sup> the graph in Figure 2 depicts calculated power density levels attributable to the proposed facility at locations near the tower at a height of two meters above ground level. That analysis shows that the maximum calculated RF electromagnetic field attributable to KVNW is 33.1 μW/cm<sup>2</sup>, which is 16.6 percent of the general population / uncontrolled maximum permitted exposure limit.

The following table supplies a summary of RF signal density calculations for the proposed KVNW and other broadcast facilities near this site, for maximum exposure at 2 meters above ground.

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<sup>1</sup> "Office of Engineering and Technology Announces Updates to FMModel Software," Public Notice, DA 16-340, March 31, 2016. FMModel is available at <https://www.fcc.gov/oet/software/fmmodel>.

**Summary of Radiofrequency Electromagnetic Field Calculations  
 For Area in Vicinity of Proposed KVNW**

Facility	Channel	ERP (kW)	Polarization	Relative Field	Height (meters)	S - Calculated ( $\mu\text{W}/\text{cm}^2$ )	S - Limit ( $\mu\text{W}/\text{cm}^2$ )	Percent of Limit
KVNW(FM) Napavine, WA Proposed Facility	225	4	C	FMModel #3 2-bay $\lambda/2$	30.8	33.1	200	16.6%
KITI-FM Winlock, WA Lic BLH-20141126AOC	236	0.41	C	FMModel #3 2-bay $\lambda/2$	30.8	3.4	200	1.7%
New(FM) Winlock, WA APP File# 0000167294	209	0.285	C	FMModel #1 1-bay (worst-case)	31.5	13.2	200	6.6%
<b>Total Calculated Signal Density:</b>								<b>24.9%</b>

ERP: Effective Radiated Power  
 Polarization: H – Horizontal; V – Vertical; E – Elliptical; C – Circular  
 Field: Elevation Pattern Relative Field Value, or FMModel antenna configuration  
 Height: Height of radiation center above ground level  
 S-Calculated: OET Bulletin 65 calculated value of signal density at two meters above ground level  
 S-Limit: §1.1310 uncontrolled/general population limit for signal density

Individual station contributions were determined as a percentage of their respective exposure limit based on operating frequency and then all individual percentages were summed to determine the total RF exposure level. Based on this analysis and considering all broadcast facilities, the summary table shows that the total maximum calculated RF density at two meters above ground level is 24.9 percent of the FCC's uncontrolled / general population MPE limit. No other known emitters are near enough to the site to be a significant contributor at the proposed location.

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. This exhibit is limited to the evaluation of exposure to RF electromagnetic field.

*List of Attachments*

Figure 1	Proposed Coverage Contours
Figure 2	RF Electromagnetic Field – FCC FMModel Results
Table 1	§73.207 Allocation Spacing Study

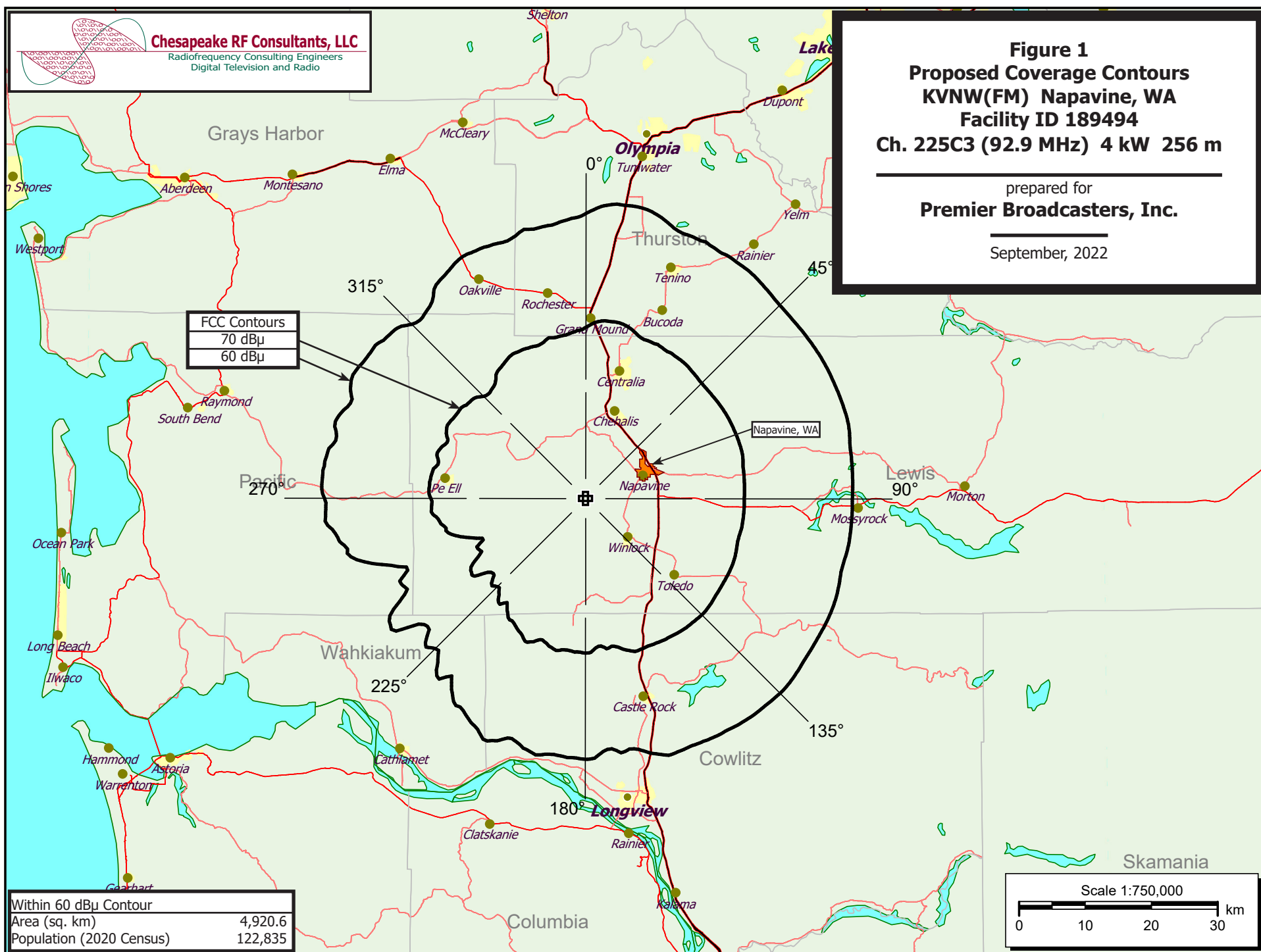
**Chesapeake RF Consultants, LLC**

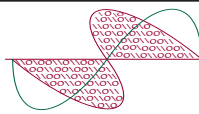
Joseph M. Davis, P.E.	September 28, 2022	
207 Old Dominion Road	Yorktown, VA 23692	703-650-9600



prepared for  
**Premier Broadcasters, Inc.**

September, 2022



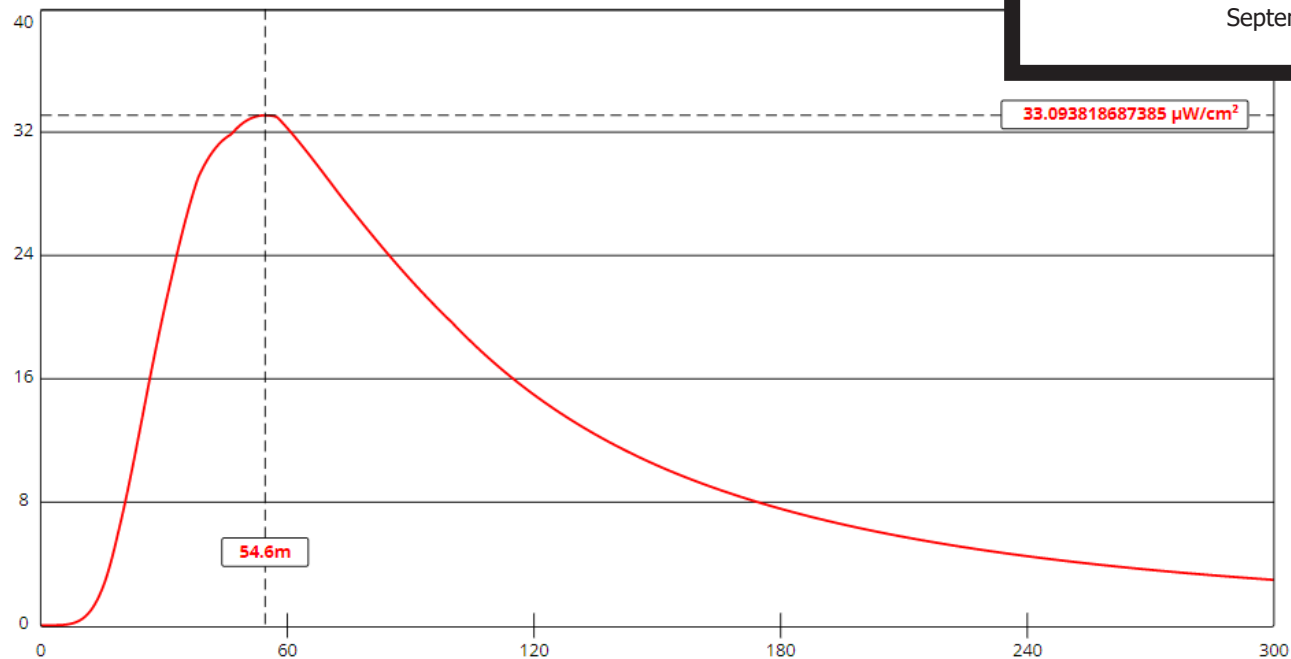


**Chesapeake RF Consultants, LLC**  
Radiofrequency Consulting Engineers  
Digital Television and Radio

**Figure 2**  
**RF Electromagnetic Field**  
**FCC FModel Results**  
**KVNW(FM) Napavine, WA**  
**Facility ID 189494**  
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[View Tabular Results +](#)

Channel Selection	Channel 225 (92.9 MHz) ▼		
<a href="#">Antenna Type +</a>	EPA Type 3: Opposed U Dipole ▼		
Height (m)	<input type="text" value="28.8"/>	Distance (m)	<input type="text" value="300"/>
ERP-H (W)	<input type="text" value="4000"/>	ERP-V (W)	<input type="text" value="4000"/>
Num of Elements	<input type="text" value="2"/>	$\lambda$	<input type="text" value="0.5"/>
Num of Points	<input type="text" value="500"/>	<input type="button" value="Apply"/>	

# Table 1

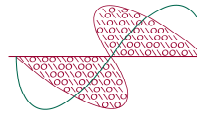
## Proposed Site

### \$73.207 Channel Spacing Study

prepared for

**Premier Broadcasters, Inc.**

KVNW(FM) Napavine, WA



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REFERENCE		CLASS = C3 Int = B1	DISPLAY DATES
46 32 36.30 N.			DATA 09-28-22
123 01 10.40 W.		Current Spacings to 3rd Adj.	SEARCH 09-28-22
----- Channel 225 - 92.9 MHz -----			

Call	Channel	Location		Azi	Dist	FCC	Margin
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KVNW	CP	225C3	Napavine	WA	292.1	3.21	153.0	-149.8
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**Proposed site is 3.21 km from authorized site**

KISM	LIC	225C	Bellingham	WA	3.2	237.90	237.0	0.9
KRYP	LIC	226C3	Gladstone	OR	167.8	119.88	99.0	20.9
KGON	LIC	222C	Portland	OR	167.8	119.88	96.0	23.9
KDBL	LIC	225C2	Toppenish	WA	90.3	201.53	177.0	24.5
KQMV	LIC	223C	Bellevue	WA	36.3	133.41	96.0	37.4
KJR-FM	LIC	227C0	Seattle	WA	31.5	131.05	87.0	44.1
KEUB	LIC	227C3	Gearhart	OR	227.4	96.59	43.0	53.6
KMSW	LIC	224C3	The Dalles	OR	125.8	167.57	99.0	68.6
KRXF	LIC	225C0	Bend	OR	156.7	301.01	226.0	75.0