

**February 2012
KHNW(FM) Channel 202A
Manson, Washington
RF Exposure Study**

Facilities Proposed

The proposed operation will be on Channel 202A (88.3 MHz) with a maximum lobe effective radiated power of 0.340 kilowatts. Operation is proposed with an antenna to be side-mounted on a pipe extension to an existing wooden pole located atop Bear Mountain.

The proposed antenna support structure does not exceed 60.96 meters (200 feet) above ground and does not require notification to the Federal Aviation Administration. Therefore, this structure does not require an Antenna Structure Registration Number.

RF Exposure Calculations

Study of the area within 1000 meters of the proposed site reveals no likely sources of RF exposure apart from this proposal and KZAL 234C3 Manson.¹

The power density calculations shown below were made using the techniques outlined in OET Bulletin No. 65. "Ground level" calculations in this report have been made at a reference height of 2 meters above ground to provide a worst-case estimate of exposure for persons standing on the ground in the vicinity of the tower. The equation shown below was used to calculate the ground level power density figures from each antenna.

$$S(\mu W / cm^2) = \frac{33.40981 \times AdjERP(Watts)}{D^2}$$

Where: *AdjERP(Watts)* is the maximum lobe effective radiated power times the element pattern factor times the array pattern factor.

D is the distance in meters from the center of radiation to the calculation point.

Ground level power densities have been calculated for locations extending from the base of the tower to a distance of 1000 meters. Values past this point are increasingly negligible.

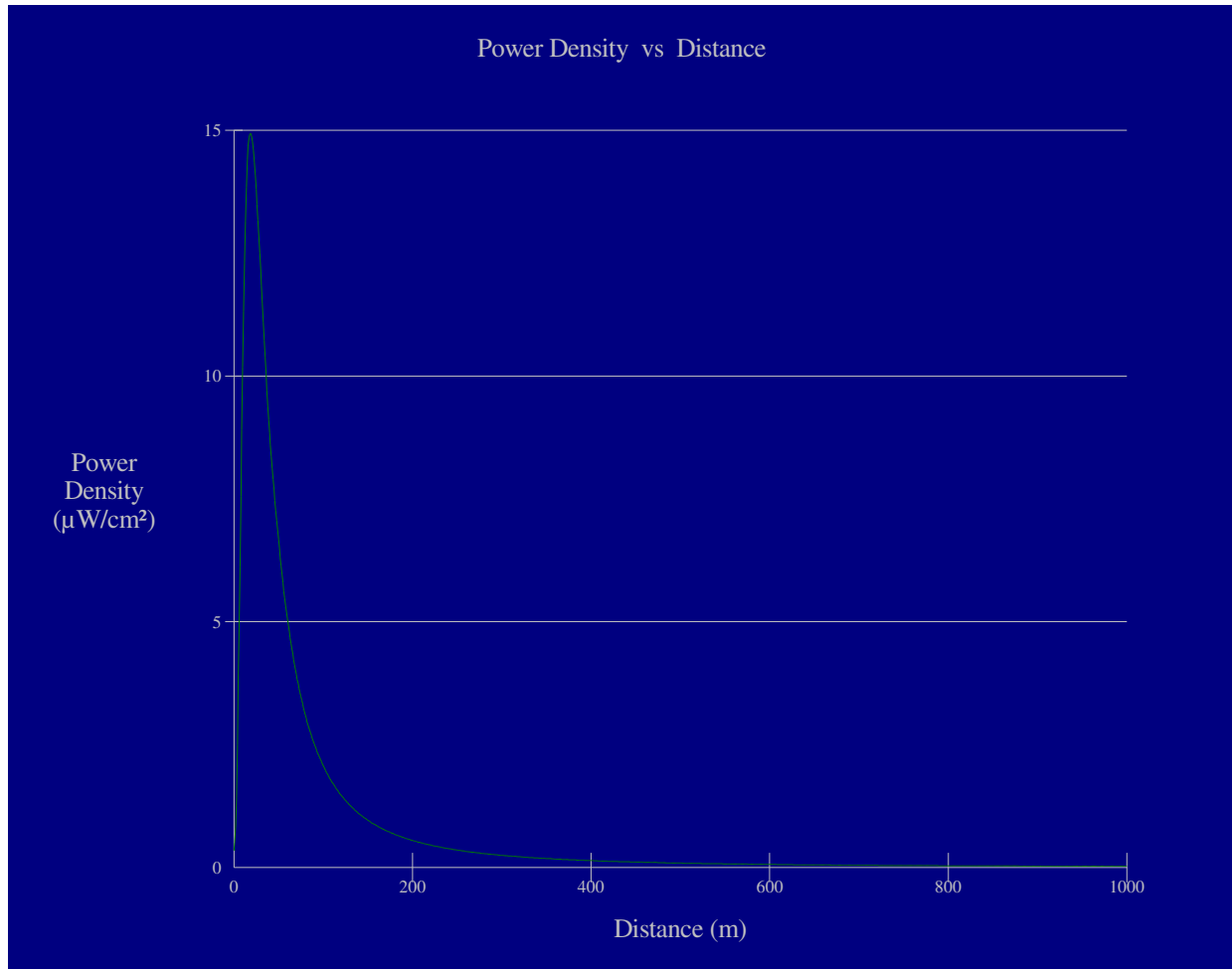
¹ While there is a license at this location for an FM translator with callsign K223AZ, no transmitting equipment for that facility was visible during this engineer's visit to the transmitter site in October 2011.

Calculations of the power density produced by the proposed KHNW facility and the other stations at this transmitter site are summarized in the following table:

Callsign	Avg or Peak ERP Antenna Model	Relative Field	Height AGL	Calculated Max Exposure
KHNW 202A	0.340 kW avg Shively 6810-1-DA	FMModel	20 m	14.9 $\mu\text{W}/\text{cm}^2$
KZAL 234C3	10.3 kW avg ERI LPX-5E-HW rototiller half-wave spacing	FMModel	12 m	111.0 $\mu\text{W}/\text{cm}^2$

These calculations show that the maximum calculated power density produced at two meters above ground level by the proposed operation of KHNW and the present operation of KZAL (were their maxima to coincide, which they do not) is 125.9 $\mu\text{W}/\text{cm}^2$, which is 63% of 200 $\mu\text{W}/\text{cm}^2$ (the FCC standard for uncontrolled environments).

The permittee/licensee in coordination with other users of the site must reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency radiation in excess of FCC guidelines.



Ground-Level RF Exposure

OET FMModel

KHNW 202A Manson

Antenna Type: Shively 6810-1-DA

No. of Elements: 1

Element Spacing: dna

Distance: 1000 meters

Horizontal ERP: 0.340 kW

Vertical ERP: 0.340 kW

Antenna Height: 20 meters AGL

Maximum Calculated Power Density is 14.9 $\mu\text{W}/\text{cm}^2$ at 19 meters from the antenna structure.

Hatfield & Dawson Consulting Engineers