

April 2013
KPLK(FM) Channel 205A
Sedro-Woolley, WA
RF Exposure Study

Facilities Proposed

The proposed operation will be on Channel 205A (88.9 MHz) with a maximum lobe effective radiated power of 4.2 kilowatts. Operation is proposed with the existing 2-element circularly-polarized half-wavelength-spaced directional antenna. The antenna is side-mounted on an existing tower on Butler Hill. The FCC Antenna Structure Registration number for this tower is #1003133

RF Exposure Calculations

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.

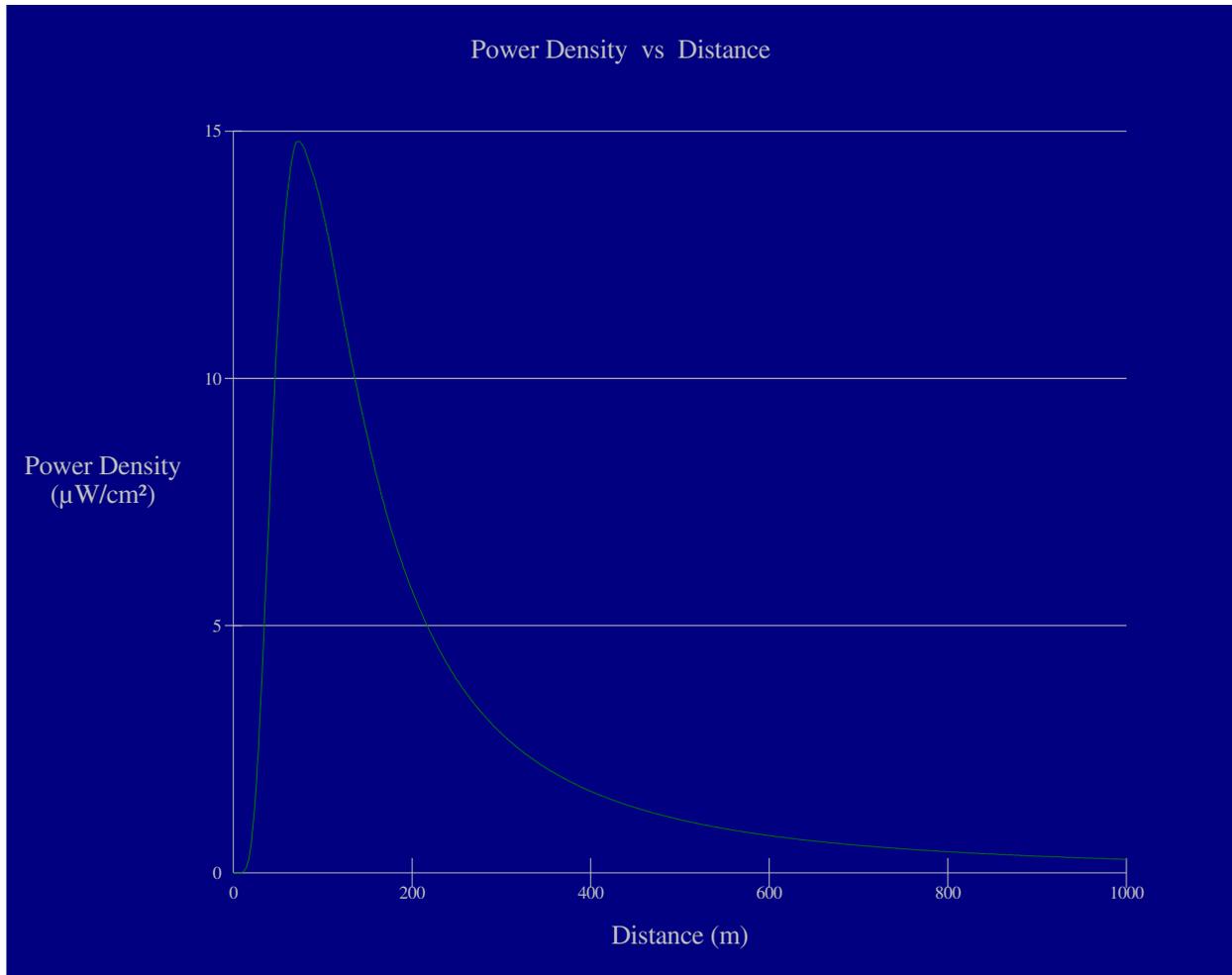
Ground level power densities have been calculated for locations extending from the base of the tower to a distance of 1000 meters. Values past this point are increasingly negligible.

Calculations of the power density produced by the proposed KPLK antenna system assume a Type 6 element pattern, which is the element pattern for the Shively 6810-2R-SS-DA antenna proposed for use. The highest calculated ground level power density occurs at a distance of 73 meters from the base of the antenna support structure. At this point the power density is calculated to be 14.8 $\mu W/cm^2$, which is 3.1% of 200 $\mu W/cm^2$ (the FCC standard for uncontrolled environments).

Calculations of the power density produced by the KMWS antenna system assume a Type 6 element pattern, which is the element pattern for the Shively 6810-1R-DA antenna used by that station. The highest calculated ground level power density occurs at a distance of 29 meters from the base of the antenna support structure. At this point the power density is calculated to be 27.2 $\mu\text{W}/\text{cm}^2$, which is 13.6% of 200 $\mu\text{W}/\text{cm}^2$ (the FCC standard for uncontrolled environments).

These calculations show that the maximum calculated power density produced at two meters above ground level by the proposed operation of KPLK and the present operation of KMWS (were their maxima to coincide, which they do not) is 16.7% of 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

KPLK 205A Sedro-Woolley

Antenna Type: Shively 6810-2R-SS-DA

No. of Elements: 2

Element Spacing: 0.5 wavelength

Distance: 1000 meters

Horizontal ERP: 4.2 kW

Vertical ERP: 4.2 kW

Antenna Height: 42 meters AGL

Maximum Calculated Power Density is $14.8 \mu\text{W}/\text{cm}^2$ at 73 meters from the antenna structure.