November 2017
KQFO(FM)   Channel 261C2
Pasco, WA
Revised RF Exposure Study

Facilities Constructed

Construction permit BPH-20170427AAR includes a condition requiring a revised RF field showing if the KQFO facility is constructed with anything other than a 6-bay, EPA Type 2 antenna with 0.5 wavelength bay spacing.

The KQFO facility was constructed with a 4-bay, EPA Type 2 antenna with 0.5 wavelength bay spacing. The following revised calculations are therefore submitted in conjunction with the license application.

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 500 meters. Values past this point are increasingly negligible.
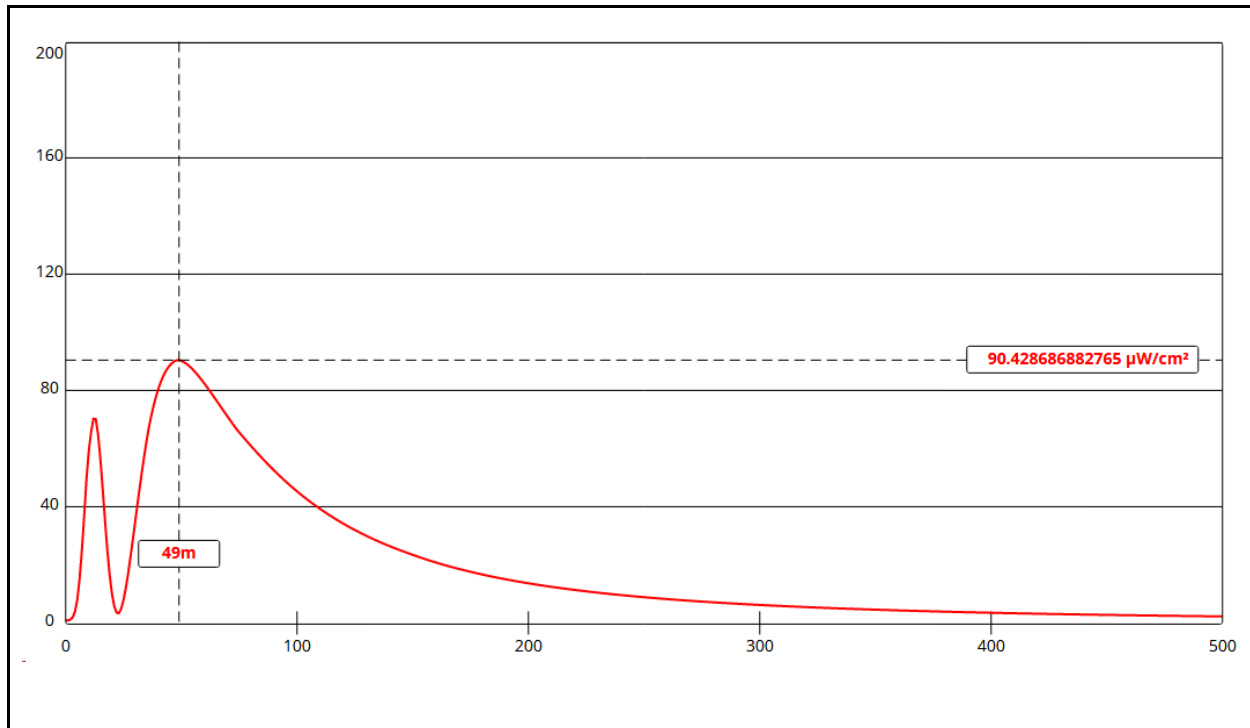
Calculations of the power density produced by the proposed "double V" antenna system assume Type 2 element pattern. The highest calculated ground level power density occurs at a distance of 49 meters from the base of the antenna support structure. At this point the power density is

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calculated to be 90.4 µW/cm², which is 45.2% of 200 µW/cm² (the FCC standard for uncontrolled environments).

Calculations of the power density produced by KQFO and the other FM authorizations at this transmitter site are summarized in the following table:

Callsign	Avg or Peak ERP Antenna Model	Relative Field	Height AGL	Calculated Max Exposure	Gen Pop FCC Limit	% of Limit
KQFO 261C1	8.4 kW H 8.4 kW V PSIFM-4C-50WS-H 4-bay half-wave	FMModel Type 2	15 m	90.4 µW/cm²	200 µW/cm²	45.2%
K204CZ	0.011 kW V ANT90DIR	FMModel Type 1	19 m	1.2 µW/cm²	200 µW/cm²	0.6%
K258CN	0.250 kW V SCA CLFMV	Manf Pattern	10 m	13.7 µW/cm²	200 µW/cm²	6.9%
K282AA	0.274 kW H 0.274 kW V ring stub assumed	FMModel Type 1	24 m	22.8 µW/cm²	200 µW/cm²	11.4%
K285FN	0.250 kW H 0.250 kW V NIC BKG77-1	FMModel Type 2	19 m	15.9 µW/cm²	200 µW/cm²	8.0%
Total						72%

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 exposure in excess of FCC guidelines.

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Ground-Level RF Exposure   **OET FMModel**

KQFO 261C2 Pasco
Antenna Type: PSIFM-4C-50WS-H (Type 2)
No. of Elements: 4
Element Spacing: 0.5 wavelength

Distance: 500 meters
Horizontal ERP: 8.4 kW
Vertical ERP: 8.4 kW

Antenna Height: 15 meters AGL

Maximum Calculated Power Density is 90.4 µW/cm^2 at 49 meters from the antenna structure.

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