

**June 2009**  
**KGSG(FM) Channel 229A**  
**Pasco, WA**  
**NIER Analysis**

**Facilities Proposed**

The proposed operation will be on Channel 229A (93.7 MHz) with an effective radiated power of 0.45 kilowatts. Operation is proposed with a 2-element circularly-polarized omni-directional antenna. The proposed antenna support structure will 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.

**NIER 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.

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

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.

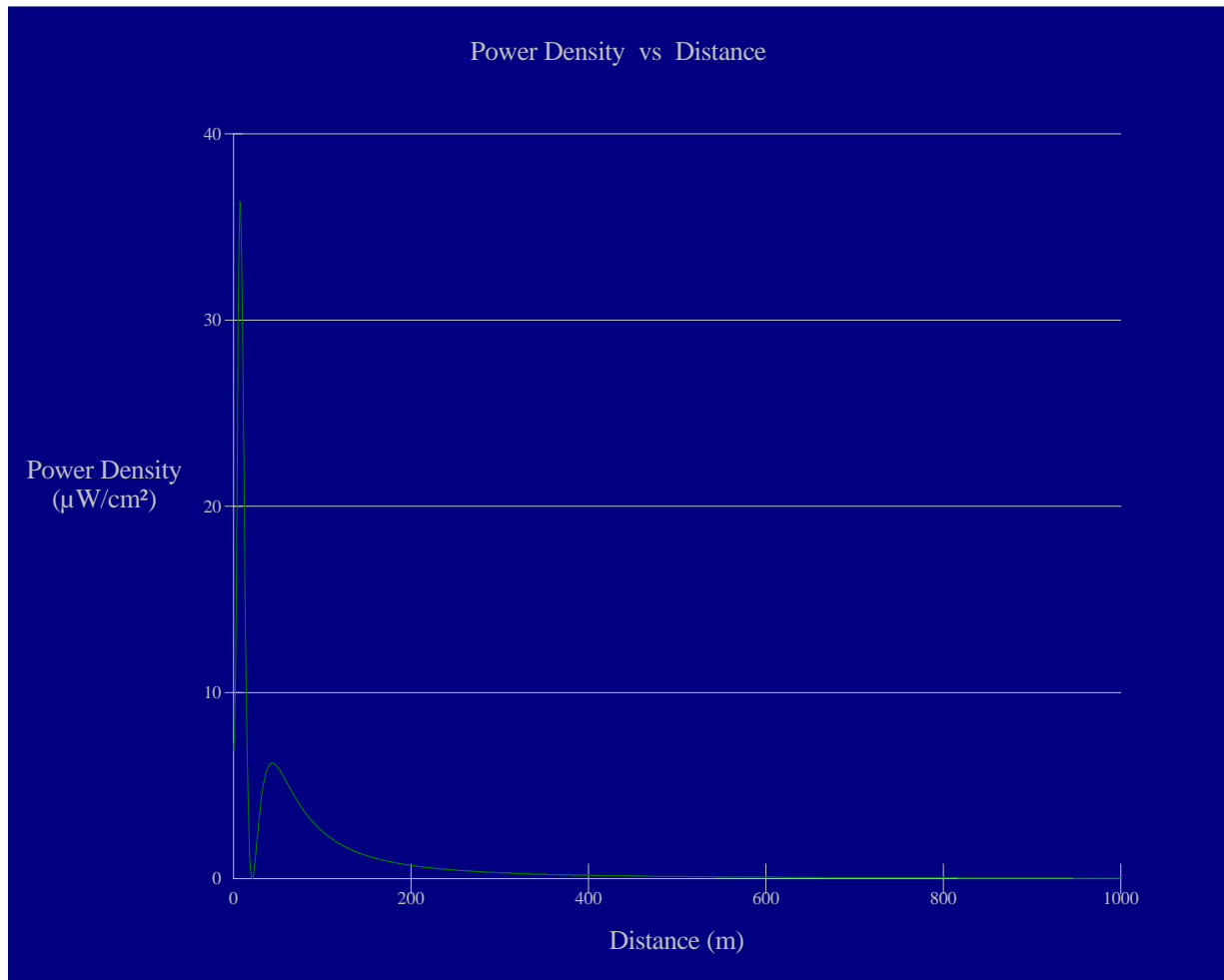
Calculations of the power density produced by the proposed KGSG antenna system assume the appropriate element pattern for the Dielectric DCRM-2 antenna proposed for use. The highest calculated ground level power density occurs at a distance of 7 meters from the base of the antenna support structure. At this point the power density is calculated to be 36.4  $\mu\text{W}/\text{cm}^2$ .

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

Call	Avg or Peak ERP Antenna Model	Relative Field	Height AGL	Calculated Max Exposure	Gen Pub FCC Limit	% of Limit
KGSG(FM) 229A	0.45 kW avg DIE DCRM-2	FMMModel	14 m	36.4 $\mu\text{W}/\text{cm}^2$	200 $\mu\text{W}/\text{cm}^2$	18.2%
K282AA 282D	0.274 kW avg ring stub assumed	FMMModel	24 m	22.8 $\mu\text{W}/\text{cm}^2$	200 $\mu\text{W}/\text{cm}^2$	11.4%
KCWK-DT Ch9 CP	45 kW avg ERI ATW6V2-ETO-9	0.130	50 m	11.0 $\mu\text{W}/\text{cm}^2$	200 $\mu\text{W}/\text{cm}^2$	5.5%
K23FU Ch23	7.75 kW peak SCA 4DR-4S	Scala pattern	7 m	187.7 $\mu\text{W}/\text{cm}^2$	351 $\mu\text{W}/\text{cm}^2$	53.5%
KNDU-DT Ch26	150 kW avg ERI ALP24M5-HSO-26	0.234	58 m	87.5 $\mu\text{W}/\text{cm}^2$	363 $\mu\text{W}/\text{cm}^2$	24.1%
K29FF Ch29	12.3 kW peak SCA 4DR-4S	Scala pattern	7 m	297.8 $\mu\text{W}/\text{cm}^2$	374 $\mu\text{W}/\text{cm}^2$	79.6%
KBWU-LD Ch36	13.3 kW avg SCA 4DR-16S	Scala pattern	12 m	83.9 $\mu\text{W}/\text{cm}^2$	403 $\mu\text{W}/\text{cm}^2$	20.8%
KTNW-DT Ch38	47.6 kW avg DIE TLP-8L F	0.230	10 m	1314.5 $\mu\text{W}/\text{cm}^2$	411 $\mu\text{W}/\text{cm}^2$	319.8%
KVEW-DT Ch44	160 kW avg DIE TFU-30GTH-R O4	0.054	74 m	3.0 $\mu\text{W}/\text{cm}^2$	435 $\mu\text{W}/\text{cm}^2$	0.7%

Simple summation of the calculated maxima from all stations at this transmitter site would produce a result which exceeds the applicable FCC standard. These stations, however, operate from several different tower sites on the butte, and as a result their maxima do not coincide. Individual tower sites are fenced to prevent casual access to areas which may exceed the general public exposure standard. Furthermore, the above worst-case calculations from the digital TV stations presume that the indicated relative field value (the maximum below 45 degrees from the horizontal) is radiated straight down. It is expected that the actual exposure levels at the site comply with the applicable standard. Post-construction measurements will be performed if so required by the Commission.

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 NIER

#### OET FMModel

##### KGSG 229A Pasco

Antenna Type: Dielectric DCRM-2  
No. of Elements: 2  
Element Spacing: 1.0 wavelength

Distance: 1000 meters  
Horizontal ERP: 0.45 kW  
Vertical ERP: 0.45 kW

Antenna Height: 14 meters AGL

Maximum Power Density is 36.4 :  $\text{W}/\text{cm}^2$  at 7 meters from the antenna structure.