

**October 2007
New FM Channel 204C3
Manson, Washington
NIER Analysis**

Facilities Proposed

The proposed operation will be on Channel 204C3 (88.7 MHz) with an effective radiated power of 9 kilowatts. Operation is proposed with a 5-element circularly-polarized omni-directional half-wave-spaced antenna. The antenna will be side-mounted on a wooden pole located atop Bear Mountain.

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

Study of the area within 1000 meters of the proposed site reveals no likely sources of non-ionizing radiation apart from this proposal and KZAL 234C3 Manson.

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.

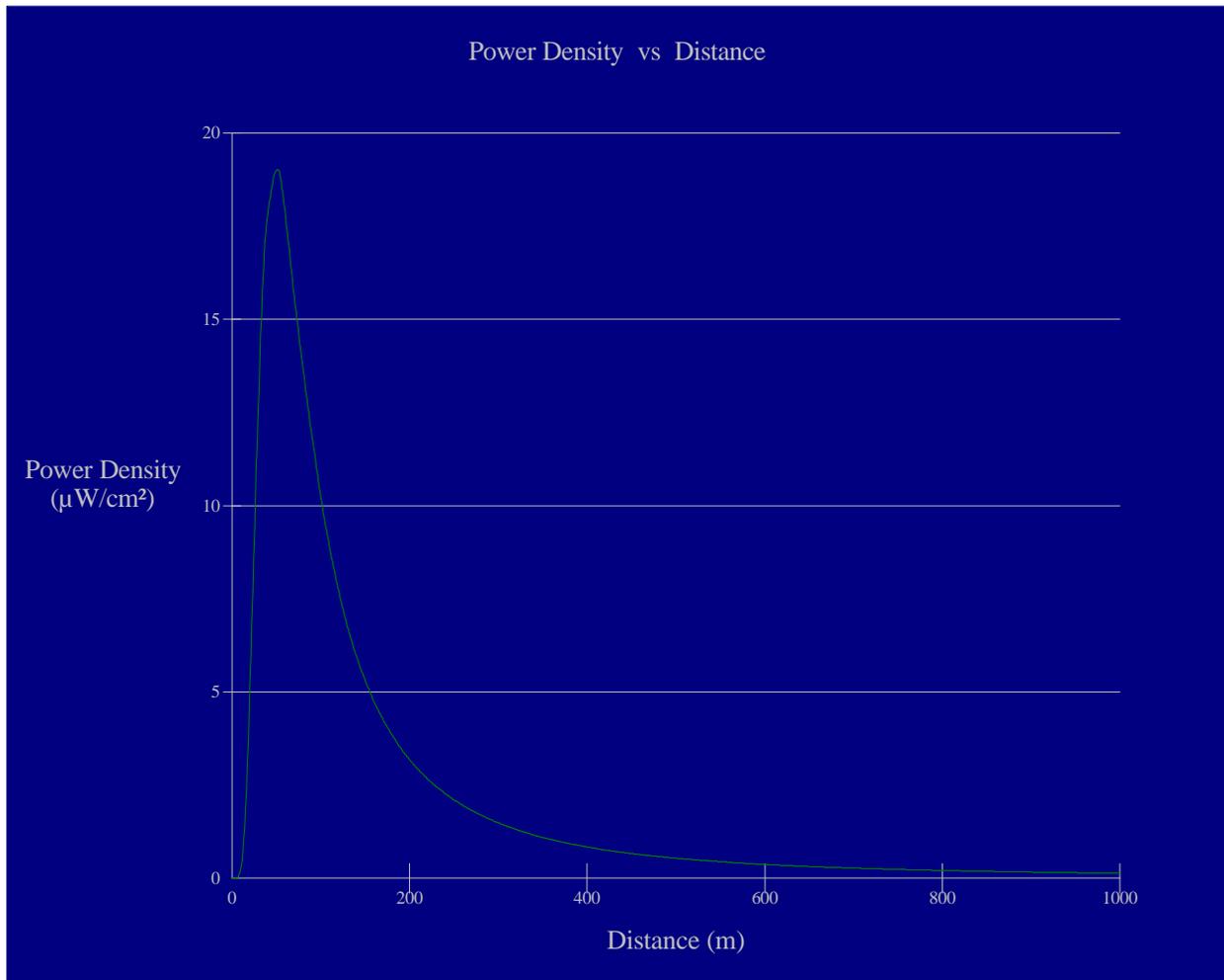
Calculations of the power density produced by the proposed Manson 204C3 and the other stations at this transmitter site are summarized in the following table:

Call	Avg or Peak ERP Antenna Model	Relative Field	Height AGL	Calculated Exposure	Gen Pub FCC Limit	% of Limit
Manson 204C3	9 kW avg SHI 6810-5-SS	FMMModel	12 m	93.8 $\mu\text{W}/\text{cm}^2$	200 $\mu\text{W}/\text{cm}^2$	46.9%
KZAL 234C3	10.3 kW avg ERI rototiller half-wave	FMMModel	12 m	111.0 $\mu\text{W}/\text{cm}^2$	200 $\mu\text{W}/\text{cm}^2$	55.5%

Nearby FM translator K223AZ operates with an ERP of less than 100 Watts and is therefore excluded from this study.

These calculations show that the maximum calculated power density produced at two meters above ground level by the proposed operation of Manson 204C3 and the present operation of KZAL (were their maxima to coincide, which they do not) is 102.4% of 200 $\mu\text{W}/\text{cm}^2$ (the FCC standard for uncontrolled environments). Accordingly, the applicant will make on-site post-construction power density measurements if the Commission so requires.

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

Manson 204C3
 Antenna Type: Shively 6810-5-SS
 No. of Elements: 5
 Element Spacing: 0.5 wavelength

Distance: 1000 meters
 Horizontal ERP: 9 kW
 Vertical ERP: 9 kW

Antenna Height: 12 meters AGL

Maximum Power Density is 93.8 : W/cm² at 50 meters from the antenna structure.