

May 2005
KAYO-FM Channel 257C Elma, WA
NIER Analysis

Facilities Proposed

The proposed operation will be on Channel 257C (99.3 MHz) with a maximum lobe effective radiated power of 64 kilowatts. Operation is proposed with a 10-element circularly-polarized half-wave-spaced directional antenna. The antenna will be side-mounted on a new tower to be constructed at South Mountain. The FCC Antenna Structure Registration Number for the tower is 1247912.

NIER Calculations

Study of the area within 1000 meters of the proposed site reveals no other likely sources of non-ionizing radiation other than this proposal and a pending application to locate KFMV 249C Oakville on this tower. Precise calculations are made only with regard to the levels from this proposal.

OET Bulletin 65 Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields (Edition 97-01) states in part that:

When performing an evaluation for compliance with the FCC's RF guidelines all significant contributors to the ambient RF environment should be considered. . .For purposes of such consideration, significance can be taken to mean any transmitter producing more than 5% of the applicable exposure limit (in terms of power density or the square of the electric or magnetic field strength) at accessible locations.

As will be demonstrated below, the proposed operation of KAYO-FM will produce less than 5% of the applicable exposure limit for both controlled and uncontrolled environments. Thus, the proposed facility is categorically excluded from the requirement of further study. Therefore, pursuant to §1.1307(b)(3) of the Commission's Rules no calculations are required for the other FM

facilities in the vicinity, and precise calculations are made only with regard to the levels from this proposal.

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.

Calculations of the power density produced by the KAYO-FM antenna system assume a Type 3 element pattern, which is the appropriate element pattern for the ERI "rototiller" antenna to be used by KAYO-FM. 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.

The highest calculated ground level power density from KAYO-FM occurs at a distance of 1114 meters from the base of the antenna support structure. At this point the power density is calculated to be 1.4 $\mu\text{W}/\text{cm}^2$, which is 0.14% of 1000 $\mu\text{W}/\text{cm}^2$ (the FCC standard for controlled environments) and 0.7% of 200 $\mu\text{W}/\text{cm}^2$ (the FCC standard for uncontrolled environments).

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These calculations show that the maximum calculated power density produced at two meters above ground level by the proposed operation of KAYO-FM alone is less than 5% of the applicable FCC exposure limit at all locations between 1 and 1000 meters from the base of the antenna support structure. Section 1.1307(b)(3) of the Commission's Rules excludes applications for new facilities or modifications to existing facilities from the requirement of preparing an environmental assessment when the calculated emissions from the applicants proposed facility are predicted to be less than 5% of the applicable FCC exposure limit. Therefore, the proposed facility is in compliance with Section 1.1301 et seq and no further analysis of non-ionizing radiation at this site is required in this application.

Public access to the site is restricted by a locked gate and the antenna tower is posted with warning signs. Pursuant to OST Bulletin No. 65, all station personnel and contractors are required to follow appropriate safety procedures before any work is commenced on the antenna tower, including reduction in power or discontinuance of operation before any maintenance work is undertaken.

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.

Power Density vs Distance

