March 2005
New FM – Channel 248C3 – Winthrop, WA
NIER Analysis

Facilities Proposed

The proposed operation will be on Channel 248C3 (97.5 MHz) with an effective radiated power of 0.33 kilowatts. Operation is proposed with a circularly-polarized omni-directional antenna which will be mounted on an existing wooden pole atop McClure 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

There are a number of existing FM and TV translator stations operating at McClure Mountain, along with KVLR 292A Twisp. Each of the FM translators operates with less than 100 Watts ERP, and therefore they are excluded from further consideration. Detailed study has been made only of the proposed Winthrop FM, KVLR, and the three television translators.

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.

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

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 Winthrop 248C3 antenna system assume a Type 1 element pattern, which is the “worst case” element pattern for a “ring stub” antenna. The highest calculated ground level power density occurs at a distance of 2 meters from the base of the antenna support structure. At this point the power density is calculated to be 270.2 $\mu W/cm^2$. The actual maximum ground level from the antenna to be used will likely be lower.

Calculations of the power density produced by the KVLR antenna system assume a Type 1 element pattern, which is the “worst case” element pattern for a “ring stub” antenna. The highest calculated ground level power density occurs at a distance of 2 meters from the base of the antenna support structure. At this point the power density is calculated to be 244.6 $\mu W/cm^2$.

The three television translators at this site (K08AY, K10BD, and K12BA) each operate with a peak ERP of 98 Watts, from antennas located about 10 meters above ground. Using a worst-case assumption of 20% aural power, the three TV translators have a combined worst-case power density of 92.1 $\mu W/cm^2$ at the base of the tower.

These calculations show that the maximum calculated power density produced at two meters above ground level by the proposed operation of Winthrop 248C3 and the present operations at this site is 606.9 $\mu W/cm^2$, which is 61% of 1000 $\mu W/cm^{2,}$ the FCC standard for controlled environments such as this one.

The McClure Mountain transmitter site is located on an elevated peak in a mountainous area of north-central Washington. Only a single unimproved access road with numerous switchbacks leads to the site. The road is steep, the peak of McClure Mountain rising 3000 feet above the adjacent valley floor. There are two locked gates on this road, which crosses private property. The first locked gate is located about 4 miles from the transmitter site, not far from the intersection with the Twisp-Carlton Road. There are no other roads approaching the site from other directions. This is a controlled access site.

Public access to the site is restricted by two locked gates, and the antenna tower is or will be posted with warning signs. Pursuant to OET 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.