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Engineering Statement Displacement Application for K59BX For Operation on Channel 31z February 2006

This Engineering Statement has been prepared on behalf of Oregon Public Broadcasting ("OPB"), licensee of TV translator station K59BX at Grays River, Washington. This material has been prepared in connection with a displacement application to modify K59BX to Ch. 31z.

I. Allocation Study

Cochannel

Study has been made of all cochannel operations within 400 km of the proposed Ch. 31z operation. That study shows that there will be no prohibited contour overlap with any authorized cochannel facilities close enough to require detailed study, with the exception of:

K31FB Grays River Ch. 31z: K31FB has been granted a construction permit to modify to Channel 35 (FCC File No. BMJPTT-20000829AQW). The licensee of K31FB, KING Broadcasting Company, has provided OPB with a letter consenting to grant of the instant application.

K31HK Longview Ch. 31-: There is both contour overlap and predicted Longley-Rice interference to a portion of the K31HK service area. That interference is only predicted to occur, however, in outlying areas which are not a part of the core K31HK service area.

The permittee of K31HK, Rural Oregon Wireless Television, has provided OPB with a letter consenting to grant of the instant application.

With regard to digital stations KONG-DT Ch. 31 Everett and KLSR-DT Ch. 31 Eugene, a detailed Longley-Rice interference study has been conducted to demonstrate that the proposed operation will not cause interference to those facilities.

The time-shared "HDTV" computer program offered by the National Telecommunications and Information Administration's *TA Services* in Boulder, Colorado was employed as the method for coverage and interference protection. The HDTV computer program has been developed in close coordination with the Commission's OET staff, and utilizes similar methodology as the computer program used by the Commission to develop the DTV Table of Allotments. Predictions included "clipping" the extent of protected coverage as specified under §73.623(c)(2) at the Grade B contour distance for analog stations, at the 74 dBu contour distance for UHF translators, and at the DTV coverage contour distance for DTV assignments per §73.625(b). It is believed that the HDTV program offered by *TA Services* is compliant with the FCC's OET Bulletin 69 Longley-Rice Methodology for Evaluating TV Coverage and Interference ("OET-69").

Study was made using the Grays River Ch. 31 technical facility described herein, including the proposed horizontal pattern. The vertical pattern used comports with the Commission's Report and Order in MB Docket No. 03-185, released on September 30, 2004.

The results indicate that the proposed Grays River Ch. 31 facility is predicted to cause only de minimus interference to the digital television stations. Specifically, interference is predicted to zero of the population served by KLSR-DT, and to only 483 people served by KONG-DT. Each of these interference figures is less than 0.5% of the population served by the affected facility and is therefore considered to round to zero per Commission policy.

First-Adjacent

There will be no prohibited contour overlap with any authorized first-adjacent-channel facilities close enough to require detailed study.

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N+7

There are no analog television stations on Channel 38 within 100 km of the proposed translator.

N-14 and N-15

There are no authorized operations on Channels 16 and 17 close enough to require detailed study.

Based on the foregoing allocation and interference study, it is believed that the proposed Grays River Ch. 31 facility can operate without risk of interference to other stations.

II. NIER Study

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.

Where: VERP = total peak visual ERP in Watts AERP = aural ERP in Watts F = relative field factor in the downward direction Distance = 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 Grays River Ch. 31 antenna system have been performed using the manufacturer's vertical plane pattern for the 2-level Kathrein

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K723417 panel antenna array proposed for use. Power density levels were calculated for an elevation of 2 meters above ground level (13 meters below the antenna radiation center). The worst-case power density levels occur at depression angles between 45 and 90 degrees below the horizontal. The calculations in this report assume a "worst case" relative field value of 0.1 at these angles. This value is slightly higher than the value at a depression angle of 58 degrees below the horizontal, according to the manufacturer's vertical plane pattern. This relative field value yields a worst-case adjusted peak effective radiated power of 19 Watts at depression angles between 40 and 90 degrees below the horizontal. Assuming a worst-case average effective radiated power of 8 Watts, and the shortest distance between the antenna radiation center and 2 meters above ground (i.e. straight down), the highest calculated ground level power density from the proposed antenna alone occurs at the base of the antenna support structure. At this point the power density is calculated to be $1.6 \,\mu$ W/cm², which is 0.4% of $382 \,\mu$ W/cm² (the FCC standard for uncontrolled environments at the Channel 31 visual carrier frequency).

These calculations show that the maximum calculated power density produced at two meters above ground level by the proposed operation 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.

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Public access to the site is restricted and the antenna tower is 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.

February 13, 2006

Erik C. Swanson