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**Engineering Statement
Digital Replacement Translator Application for KIRO-TV
Channel 51 at Issaquah, WA
September 2009**

This Engineering Statement has been prepared on behalf of KIRO-TV, Inc., licensee of television station KIRO-TV at Seattle, Washington. This material has been prepared in connection with an application for a digital replacement translator to provide continued digital service to KIRO-TV viewers in the vicinity of Issaquah, Washington.

KIRO-TV has historically operated on high-VHF Channel 7. The station's move to post-transition operations on UHF Channel 39 has been demonstrated to result in a loss of service to viewers in the vicinity of Issaquah, Washington.

I. Allocation Study

Study has been made of all cochannel and adjacent-channel facilities in the vicinity of the proposed operation, including a detailed Longley-Rice interference study to demonstrate that the proposed operation will not cause interference to any facilities with which contour overlap exists. This study was performed using the SunDTV program from V-Soft Communications and a 1 km grid spacing. The SunDTV program identically duplicates the FCC's OET-69 processing program.

The results of this study indicate that the proposed facility is predicted to cause zero additional interference to any of the listed stations.

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

Summary Study

Census data selected: 2000

Post DTV Transition Database Selected

TV INTERFERENCE and SPACING ANALYSIS PROGRAM

Date: 09-03-2009 Time: 14:35:44

Record Selected for Analysis

ISS USERRECORD-01 ISSAQUAH WA US
 Channel 51 ERP 0.95 kW HAAT 703. m RCAMSL 00935 m STRINGENT MASK
 Latitude 047-30-17 Longitude 0121-58-06
 Status APP Zone 2 Border
 Dir Antenna Make usr Model USRPAT01 Beam tilt N Ref Azimuth 270.
 Last update Cutoff date Docket
 Comments
 Applicant

Cell Size for Service Analysis 1.0 km/side

Distance Increments for Longley-Rice Analysis 1.00 km

Not full service station

Facility meets maximum power limit

Azimuth (Deg)	ERP (kW)	HAAT (m)	51.0 dBu F(50,90) (km)
0.0	0.802	795.4	52.1
45.0	0.142	754.7	40.6
90.0	0.088	679.8	36.5
135.0	0.142	380.7	32.5
180.0	0.802	668.8	49.9
225.0	0.816	777.2	51.9
270.0	0.505	713.1	47.7
315.0	0.816	855.1	53.2

Contour Overlap to Proposed Station

Contour Overlap Evaluation to Proposed Station Complete

LANDMOBILE SPACING VIOLATIONS FOUND

NONE

Proposed facility OK to FCC Monitoring Stations

Proposed facility OK toward West Virginia quiet zone

Proposed facility OK toward Table Mountain

Proposed facility is within the Canadian coordination distance
Distance to border = 128.4km

Proposed facility is beyond the Mexican coordination distance

Proposed station is OK toward AM broadcast stations

Canada

There are two cochannel (Ch 51) Canadian digital television allotments in the vicinity of the proposed operation, at Oliver BC and Wilson Creek BC. These are Canadian "Class B" allotments, which are protected out to a radius of 45 km. As is demonstrated by the attached map exhibit, the 19.5 dBu F(50,10) contour from the proposed facility does not overlap the protected service area of either of these Canadian digital Ch 51 allotments.

II. NIER Study

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 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 and TV 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.

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

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.

Power density levels produced by the proposed facility were calculated for an elevation of 2 meters above ground (68 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 0.300 at these angles, based on the manufacturer's vertical plane pattern for the horizontally-polarized ERI ALP4L1-HSP-51 antenna proposed in this application. This relative field value yields a worst-case adjusted average effective radiated power of 85.5 Watts at depression angles between 45 and 90 degrees below the horizontal. Assuming this power and the shortest distance between the antenna radiation center and 2 meters above ground level (i.e. straight down), the highest calculated 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 $0.6 \mu\text{W}/\text{cm}^2$, which is 0.1% of $463 \mu\text{W}/\text{cm}^2$ (the FCC maximum for uncontrolled environments at the Channel 51 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.

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.

September 4, 2009

Erik C. Swanson, P.E.

