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**Engineering Statement
Digital Flash Cut Application for K41KT
Channel 41 at Grays River, WA
April 2009**

This Engineering Statement has been prepared on behalf of Oregon Public Broadcasting, licensee of TV translator station K41KT at Grays River, Washington. (This facility is currently licensed as K65BU Grays River, but holds an analog displacement construction permit on Channel 41.) This material has been prepared in connection with an application for digital flash-cut on Channel 41.

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

1990 Census data selected
TV INTERFERENCE and SPACING ANALYSIS PROGRAM

Date: 04-20-2009 Time: 13:47:14

Record Selected for Analysis

K65BU USERRECORD-01 GRAYS RIVER WA US
Channel 41 ERP 0.5 kW HAAT 602. m RCAMSL 00881 m SIMPLE MASK
Latitude 046-27-40 Longitude 0123-32-58
Status APP Zone 2 Border
Dir Antenna Make usr Model USRPAT01 Beam tilt N Ref Azimuth 0.
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	0.249	722.9	43.5
45.0	0.008	588.6	21.5
90.0	0.003	409.5	14.1
135.0	0.182	496.6	37.4
180.0	0.439	712.6	46.9
225.0	0.054	730.8	34.4
270.0	0.026	623.3	28.4
315.0	0.397	533.9	43.3

Contour Overlap to Proposed Station

Station
K41IP 41 RAINIER OR BLTT20070209ABP causes

Contour overlap to Digital LPTV station
K65BU 41 GRAYS RIVER WA USERRECORD01
Required D/U ratio: 2.0

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 quite zone

Proposed facility OK toward Table Mountain

Proposed facility is within the Canadian coordination distance
Distance to border = 195.8km

Proposed facility is beyond the Mexican coordination distance

Proposed station is OK toward AM broadcast stations

Start of Interference Analysis

Channel	Proposed Station Call	City/State	ARN
41	K65BU	GRAYS RIVER WA	USERRECORD01

Stations Potentially Affected by Proposed Station

Chan	Call	City/State	Dist(km)	Status	Application	Ref. No.
26	K26DB	ASTORIA OR	33.0	LIC	BLTT	-19911016IG
26	K26GJ	PORTLAND OR	135.9	LIC	BLTTL	-20040419AAA
26	K26HS	TILLAMOOK OR	114.4	LIC	BLTTL	-20070625ADJ
34	K34DC	ASTORIA OR	33.0	LIC	BLTT	-19920505IJ
34	K34HK	LONGVIEW WA	55.5	LIC	BLTTL	-20080509AAL
34	K34HK	LONGVIEW WA	55.4	APP	BSTA	-20061109ADS
38	KKEI-CA	PORTLAND OR	121.4	LIC	BLTTA	-20070831ADB
38	K38GS	GRAYS RIVER, LEBAM WA	0.0	LIC	BLTT	-20040412ACX
40	K40AM	HOOD RIVER, ETC. OR	171.3	LIC	BLTT	-19940505JE
40	KOIN	PORTLAND OR	122.5	LIC	BLCDT	-20050613ABB
40	960920WH	PORTLAND OR	136.2	APP	BPCT	-19960920WH
40	960724LF	PORTLAND OR	122.5	APP	BPCT	-19960724LF
40	K40EG	TILLAMOOK OR	139.5	LIC	BLTT	-19960130JA
41	KBND-LP	BEND OR	316.6	LIC	BLTT	-20041025AEO
41	KBND-LP	BEND OR	316.6	CP	BPPTTL	-20060327AFE
41	KORY-CA	EUGENE OR	275.3	LIC	BLTTA	-20020722ABH
41	KORK-LD	PORTLAND OR	121.4	CP	BDCCDTL	-20061025ADW
41	KORK-LD	PORTLAND OR	83.4	APP	BSTA	-20090413AFO
41	K41IP	RAINIER OR	63.0	LIC	BLTT	-20070209ABP
41	K41GG	ROCKAWAY, ETC. OR	85.2	LIC	BLTT	-20010420AAU
41	K62DR	ROSEBURG OR	362.6	CP	BDISTTL	-20060331BFR
41	K41CL	WASCO/HEPPNER OR	242.8	LIC	BLTTL	-19980903JG
41	K41CK	ELLENSBURG WA	241.6	LIC	BLTT	-19890227IN
41	K21HL	PATEROS WA	320.4	APP	BDISTTL	-20081022ABU
41	KCTS-TV	SEATTLE WA	159.1	LIC	BLEDT	-19990415KH
41	KCYU-LP	YAKIMA WA	232.7	LIC	BLDTL	-20081219AAC
42	K42IR	ASTORIA OR	32.9	LIC	BLTTL	-20090327AIA
42	KSYS	JACKSONVILLE OR	111.1	APP	BDRTET	-20090108AGB
42	K42CZ	LINCOLN CITY, ETC. OR	193.4	LIC	BLTT	-19930608IF
42	KPXG-LP	PORTLAND OR	121.4	CP	BPPTTL	-20050901ABW
42	KPXG-LP	PORTLAND OR	121.4	CP	BDISDTL	-20060322ACZ
42	NEW	PORTLAND OR	122.5	ADD	BPRM	-20000717ABY
42	K42CM	CENTRALIA, ETC. WA	39.1	LIC	BLTT	-19910320IO
42	K42CM	CENTRALIA/CHEHALIS WA	39.1	CP	BDFCDTT	-20060227ADV
42	K42IO	ODELL WA	182.4	CP	BNPTTL	-20000831CLQ
42	KWDK	TACOMA WA	166.8	LIC	BLEDT	-20050421AAE
43	K43EJ	TILLAMOOK OR	139.5	LIC	BLTT	-19940610IK
44	K44HM	RAINIER OR	63.0	LIC	BLTT	-20070209ABN
44	K44AV	ROCKAWAY OR	85.2	LIC	BLTT	-20030610AAH
49	KPDX		121.1	APP	BSTA	-20090304ABA
49	K54GS	PUYALLUP WA	125.8	CP	BDISTTL	-20051221AJD
49	KPDX	VANCOUVER WA	121.1	LIC	BLCT	-19990909AAD

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Study of this proposal found the following interference problem(s):

NONE.

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 (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, based on the manufacturer's vertical plane pattern for the 3-level horizontally-polarized Kathrein K723147 panel antenna array proposed in this application. This relative field value yields a worst-case adjusted average effective radiated power of 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 $1.0 \mu\text{W}/\text{cm}^2$, which is 0.2% of $423 \mu\text{W}/\text{cm}^2$ (the FCC maximum for uncontrolled environments at the Channel 41 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.

April 20, 2009

Erik C. Swanson, P.E.