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**Engineering Statement
Digital Displacement Application for K38AH
Channel 49 at Pendleton, OR
October 2011**

This Engineering Statement has been prepared on behalf of Umatilla Electric Cooperative, licensee of TV translator station K38AH at Pendleton, Oregon. This material has been prepared in connection with an application for digital displacement. Displacement is necessary due to the nearby operations of cochannel DTV station KTNW Richland.

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, apart from the station's analog license. 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

Percent allowed new interference: 0.500
Percent allowed new interference to non Class A LPTV: 2.000
Census data selected 2000
Data Base Selected
./data_files/pt_tvdb.sff
TV INTERFERENCE and SPACING ANALYSIS PROGRAM

Date: 10-28-2011 Time: 16:36:21

Record Selected for Analysis

K38AH USERRECORD-01 PENDLETON, ETC. OR US
Channel 49 ERP 2. kW HAAT 488. m RCAMSL 01825 m SIMPLE MASK
Latitude 045-12-47 Longitude 0119-17-41
Status APP Zone 2 Border Site number: 01
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
Service Class = LD
Maximum height/power limits not checked

Site number	1			
Azimuth	ERP	HAAT	51.0 dBu F(50,90)	
(Deg)	(kW)	(m)	(km)	
0.0	2.000	680.6	56.0	
45.0	0.442	591.0	44.9	
90.0	0.002	386.8	11.8	
135.0	0.002	265.3	10.7	
180.0	0.020	293.1	19.8	
225.0	0.002	354.9	12.3	
270.0	0.001	595.2	13.5	
315.0	0.442	733.5	47.2	

Contour Overlap to Proposed Station

Contour Overlap Evaluation to Proposed Station Complete

NO LANDMOBILE SPACING VIOLATIONS FOUND

Checks to Site Number 01

Proposed facility OK to FCC Monitoring Stations

Proposed facility OK toward West Virginia quiet zone

Proposed facility OK toward Table Mountain

Proposed facility is beyond the Canadian coordination distance

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
49	K38AH	PENDLETON, ETC. OR	USERRECORD01

Stations Potentially Affected by Proposed Station

Chan	Call	City/State	Dist(km)	Status	Application	Ref. No.
34	K34DI	LA GRANDE OR	0.0	LIC	BLTT	-19920304II
35	K35GA	LA GRANDE OR	122.7	LIC	BLTT	-20011212AAE
35	K35FO	MILTON-FREEWATER OR	105.0	LIC	BLTT	-20020724AAD
42	K42AI	BAKER OR	137.1	LIC	BLTT	-19820511IC
46	K46AM	BAKER, ETC. OR	137.1	LIC	BLTT	-19810121LB
46	K46FL	WALLA WALLA WA	105.9	LIC	BLTT	-20020211AAA
48	K48DC	BAKER CITY, ETC. OR	137.2	LIC	BLTT	-20081202AGT
48	K48DZ-D	HERMISTON OR	85.3	LIC	BLDTL	-20110817AAL
48	K48BL	TERREBONNE-BEND, ETC OR	167.6	LIC	BLTTA	-20010711ABF
48	NEW	YAKIMA WA	199.8	APP	BNPDTL	-20090825BIN
49	KZAK-LD	BOISE ID	299.2	LIC	BLDTL	-20110706AAP
49	K49EB-D	GARDEN VALLEY ID	304.2	LIC	BLDTL	-20100823AAF
49	K49JD-D	KELLOGG ID	350.2	LIC	BLDTT	-20110720ABP
49	K24DW	SANDPOINT ID	399.2	CP	BDISDTT	-20110103AAO
49	K49KT-D	BEND OR	174.3	LIC	BLDTL	-20101004AAQ
49	KAMK-LP	EUGENE OR	330.7	CP	BDISTTL	-20051230AAL
49	KAMK-LP	EUGENE OR	330.7	CP	BDFCDTL	-20091028ACQ
49	KAMK-LP	EUGENE OR	330.7	CP	BDISDTL	-20110817ADL
49	K49FV	ROSEBURG OR	388.8	LIC	BLTT	-20020726ABG
49	KWVT-LD	SALEM OR	272.1	LIC	BLDTL	-20110208ADU
49	K56BK	BREWSTER & PATEROS WA	316.3	CP	BDISDTT	-20101021ADG
49	NEW	CENTERVILLE WA	136.4	APP	BNPDTL	-20100513ADZ
49	K49EV	CLARKSTON WA	221.9	LIC	BLTTL	-20010501AAG
49	K49EV	CLARKSTON WA	221.9	CP	BDFCDTL	-20090825BVD
49	KCST-LD	HOQUIAM WA	355.1	CP	BDCCDTL	-20061026AEB
49	K49IX-D	PUYALLUP WA	315.7	LIC	BLDTT	-20090610ACB
49	KRLB-LD	RICHLAND, ETC WA	113.7	LIC	BLDTL	-20090615ADK
49	K49LI-D	ROYAL CITY WA	203.8	CP	BNPDTL	-20090825AED
49	K67CD	STEMILT, ECT WA	244.5	CP	BDISDTT	-20090716ADD
49	K67CD	STEMILT, ETC. WA	244.5	APP	BSTA	-20090717AAL
49	K49GF	YAKIMA, ETC. WA	173.6	LIC	BLTTL	-20040616AAK
50	K50FD	BAKER OR	137.1	LIC	BLTT	-19970421JE
50	K50FD	BAKER VALLEY OR	137.2	CP	BDFCDTT	-20090921ABM
50	KUBN-LP	BEND OR	174.3	APP	BDFCDTL	-20060331BDR
50	K50CE	HOOD RIVER OR	187.4	LIC	BLTT	-20100322ADH
50	K50CE	HOOD RIVER OR	187.4	APP	BDFCDTT	-20100429AAL
50	K50CE	HOOD RIVER OR	187.4	CP	BDFCDTT	-20110729ABO
50	K50CI	LA GRANDE OR	112.0	CP	BDFCDTT	-20090806AAE
50	K50CI	LA GRANDE OR	111.9	LIC	BLTT	-19891120JI
50	K50FX	MILTON-FREEWATER OR	105.9	CP	BDFCDTT	-20090512AAE
50	K50FX	MILTON-FREEWATER OR	105.9	LIC	BLTT	-20010621AAM
50	KUBN-LP	PRINEVILLE-REDMOND OR	174.3	LIC	BLTT	-19951019IC
50	K50KK-D	ELLENSBURG WA	206.1	LIC	BLDTT	-20090506ACL
50	K50LM-D	SUNNYSIDE WA	136.5	CP	BNPDTL	-20090825BIC
51	K51DF	MILTON, ETC. OR	105.0	LIC	BLTT	-19891114JR
52	K52DT	LA GRANDE OR	111.9	LIC	BLTT	-19920304IJ
52	K52CH	MAUPIN OR	137.9	LIC	BLTT	-19980427JD
53	K53EJ	BAKER OR	137.1	LIC	BLTTL	-19920729IB
53	K53EK	MILTON-FREEWATER OR	105.9	LIC	BLTT	-19931101IE
56	K56BE	LA GRANDE OR	111.9	LIC	BLTT	-19810427JA

56 K56CD MAUPIN OR 137.9 LIC BLTT -19980427JB

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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 (15 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 0.125 at these angles, based on the manufacturer's vertical plane pattern for the horizontally-polarized Kathrein/Scala 2X1KBBU antenna proposed in this application. This relative field value yields a worst-case adjusted average effective radiated power of 31.25 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 $4.6 \mu\text{W}/\text{cm}^2$, which is 1% of $453 \mu\text{W}/\text{cm}^2$ (the FCC maximum for uncontrolled environments at the Channel 49 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 RF exposure 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 exposure in excess of FCC guidelines.

October 31, 2011

Erik C. Swanson, P.E.