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Engineering Statement Minor Modification Application for K46KG-D Channel 46 at Madras & Culver, OR June 2009

This Engineering Statement has been prepared on behalf of Rural Oregon Wireless Television, licensee of digital TV translator station K46KG-D at Madras & Culver, Oregon. This material has been prepared in connection with a minor modification application.

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: 06-01-2009 Time: 11:46:45

Record Selected for Analysis

K46KG-DUSERRECORD-01MADRAS & CULVEROR USChannel 46 ERP 12.7kWHAAT 522. mRCAMSL 01851 mSTRINGENT MASKLatitude 045-19-57Longitude 0121-42-46Status APPZone 2BorderDir Antenna Make usrModel USRPAT01Beam tilt NRef Azimuth 150.Last updateCutoff dateDocketCommentsApplicant

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	ERP	HAAT	51.0 dBu F(50,90)
(Deg)	(kW)	(m)	(km)
0.0	0.005	90.8	7.8
45.0	0.026	278.5	20.6
90.0	0.926	382.1	43.9
135.0	10.517	618.5	65.5
180.0	6.223	691.1	63.8
225.0	0.103	618.2	36.4
270.0	0.032	783.2	31.9
315.0	0.081	715.0	36.6

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 quite zone Proposed facility OK toward Table Mountian Proposed facility is within the Canadian coordination distance Distance to border = 347.6km Proposed facility is beyond the Mexican coordination distance Proposed station is OK toward AM broadcast stations

	Propo	sed Station	
Channel	Call	City/State	ARN
46	K46KG-D	MADRAS & CULVER OR	USERRECORD01

Stations Potentially Affected by Proposed Station

Chan	Call	City/State		Dist(km)	Status	Applicatio	on Ref. No.
31	КЗІНК	RAINIER OR		127.7	LIC	BLTT	-20070502ABR
31	K31HZ	THE DALLES, ETC.	OR	62.8	LIC	BLTT	-20070813ADC
32	KRCW-TV	SALEM OR		60.7	LIC	BLCT	-19990816KE
38	K53EI	HOOD RIVER OR		46.7	CP	BDISTT	-20070822ABB
38	KKEI-CA	PORTLAND OR		83.3	LIC	BLTTA	-20070831ADB
39	KFXO-LP	BEND OR		138.9	LIC	BLTTL	-19931014JH
39	K39ES	HEPPNER, ETC. OR		103.0	LIC	BLTT	-19980803JH
39	K59EK	THE DALLES OR		62.8	CP	BDISTT	-20071120AET
42	NEW	PORTLAND OR		82.2	ADD	BPRM	-20000717ABY
42	KPXG-LP	PORTLAND OR		83.3	CP	BPTTL	-20050901ABW
42	K42BR	TERREBONNE-BEND,	ETC OR	112.6	LIC	BLTTL	-19880729IU
42	К42ІО	ODELL WA		43.8	CP	BNPTTL	-20000831CLQ
43	KUBN-LP	BEND OR		138.9	CP	BDISTTL	-20060822AIL
43	K43FH	HEPPNER, ETC. OR		103.0	LIC	BLTT	-19980803JJ
44	K44AH	PRINEVILLE, ETC.	OR	116.0	LIC	BLTT	-19970724JE
44	K44HM	RAINIER OR		127.7	LIC	BLTT	-20070209ABN
45	K45KM-D	BEND OR		142.7	LIC	BLDTL	-20080908ABQ
45	K45CV	CORVALLIS OR		134.5	LIC	BLTT	-19930604IG
45	KNMT	PORTLAND OR		82.2	LIC	BLCDT	-20060619AAM
45	K45KM-D	TERREBONNE OR		142.7	CP MOD	BMPTT	-20070430AWR
45	KDHW-LP	YAKIMA WA		164.9	LIC	BLTTA	-20010709ADB
45	KDHW-LP	YAKIMA WA		163.4	CP	BPTTA	-20040525ADF
46	К46АМ	BAKER, ETC. OR		319.8	LIC	BLTT	-19810121LB
46	K46AS	COOS BAY OR		288.7	LIC	BLTT	-19980911JB
46	K46IP-D	COTTAGE GROVE OR		202.3	LIC	BLDTT	-20090330AAN
46	K46IP-D	COTTAGE GROVE OR		202.4	CP	BDISTT	-20051122AGB
46	К46СН	GOLD HILL OR		338.9	LIC	BLTT	-19890525II
46	K46CU	HEPPNER, ETC. OR		103.0	LIC	BLTT	-19980803JI
46	KGW	PORTLAND OR		83.3	LIC	BLCDT	-20000314ABB
46	К46АК	PRINEVILLE, ETC.	OR	116.0	LIC	BLTT	-19931105JI
46	KTCW	ROSEBURG OR		270.5	LIC	BLCT	-19920501KG
46	K53CU	ROSEBURG OR		270.5	APP	BDISTT	-20090501APM
46	KUMN-LD	MOSES LAKE, ETC.	WA	233.4	CP	BDCCDTL	-20061030AGL
46	KPMT-LP	PULLMAN WA		382.6	LIC	BLTTL	-20070220ABL
46	KUSE-LD	SEATTLE WA		242.2	CP	BDCCDTL	-20061011ADL
46	KUSE-LD	SEATTLE WA		242.2	APP	BMPDTL	-20090428AAA
46	K46FL	WALLA WALLA WA		274.2	LIC	BLTT	-20020211AAA
47	NEW	BEND OR		142.7	APP	BNPTTL	-20000810AAY
47	NEW	BEND OR		153.1	APP	BNP'I"I'L	-20000830A1W
47	NEW	BEND OR		142.6	APP	BNP'I"I'L	-20000807AEH
4/	NEW	BEND OR		153.1	APP	BNP.1.1.T	-20000830ASA
4/	K4/LE-D	COLLEGE HILL, ETC	C. OR	184.2	CP	BDCCD.II.	-2006102/AHF
4/	K4/AV	COTTAGE GROVE OR		202.4	LIC	BP.I.I.	-198601131E
47	K4/AV	COTTAGE GROVE OR		202.3	CP	BDFCDTT	-20081003AE1
47	KUNP-LP	PORTLAND OR		83.1	LIC	BPICE	-20060809ABC
47	K5ZAK V 47 T T	PRINEVILLE OR		107.7	CP CP MOD	BDISII	-20061212AB1
47	K4700	RAINIER OR		170 2	CP MOD	BMPII	-20070227AEF
4/	K47CD	RUCKAWAY OR		162 6	LIC	BLII	-20030610AAF
4/	KIVE VAODI	IARIMA WA		112.0	LIC		-20001213AHK
40	K40BL VDV	IERREBONNE-BEND,	EIC OR	. 112.0	ADD	BLIIA	200002047BF
49 10	NEW	WADM CODINCO OD		03.0 E0 E	APP	אוסט זיייייתאס	-20090304ABA
49 10	NEW	WARM SPRINGS UR		5.5C	AFF		100000031BPV
49 50	KEDA	VANCOUVER WA		03.0			-19990909AAD
50	KEOCE	HOOD RIVER OR		40./ 17 1			-20070022AAV
50	KIIBN-TD	DEINEVILLE-DEDMON		4/.1 120 0	LIC	BUTT	-19951010TC
50		SATEM OB		112 5	LIC	BI.TTI.	-20020916APF
50	10000			TT0.0			

53	K53EI	HOOD RIVER OR	47.1	LIC	BLTT	-19920504IG
54	K54BK	MAUPIN OR	54.1	LIC	BLTT	-19980427JC
54	KPXG-LP	PORTLAND OR	83.3	LIC	BLTTL	-20040901ACK
54	K54AP	PRINEVILLE OR	116.0	LIC	BLTT	-19920518IL

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

NONE.

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.

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

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 (8 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 0.12 at these angles, based on the manufacturer's vertical plane pattern for the horizontally-polarized 2X1 Kathrein K723417 panel antenna array proposed in this application. This relative field value yields a worst-case adjusted average effective radiated power of 182.88 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 95.5 μ W/cm², which is 21.6% of 443 μ W/cm² (the FCC maximum for uncontrolled environments at the Channel 46 frequency).

The proposed K46KG-D operation will be located approximately 50 meters from the licensed operation of KPFR 208C1 Pine Grove and the authorized operation of KZME 216C3 Brightwood.

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Using FMModel, the maximum calculated power density from KPFR is 179.7 μ W/cm², which is 89.9% of 200 μ W/cm² (the FCC maximum for uncontrolled environments at FM frequencies). The KZME construction permit does not specify the use of a particular antenna model, and requires that the KZME permittee conduct post-construction RFR measurements in order to demonstrate compliance. Under a worst-case assumption of a "ring stub" antenna for KZME, the maximum calculated power density from that station would be 90.2 μ W/cm², which is 45.1% of 200 μ W/cm² (the FCC maximum for uncontrolled environments at FM frequencies).

Simple summation of the maxima from K46KG-D, KPFR, and (unbuilt) KZME would produce a result which exceeds the FCC standard for uncontrolled environments. These calculations, however, are conservative and it is not believed that the FCC maximum for uncontrolled environments will be exceeded. If required by the FCC, the K46KG-D licensee will conduct post-construction measurements as a condition of licensing.

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.

June 1, 2009

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