

BENJAMIN F. DAWSON III, PE  
THOMAS M. ECKELS, PE  
STEPHEN S. LOCKWOOD, PE  
DAVID J. PINION, PE

PAUL W. LEONARD, PE  
ERIK C. SWANSON, PE  
THOMAS S. GORTON, PE  
MICHAEL H. MEHIGAN, EIT

HATFIELD & DAWSON  
CONSULTING ELECTRICAL ENGINEERS  
9500 GREENWOOD AVE. N.  
SEATTLE, WASHINGTON 98103

TELEPHONE (206) 783-9151  
FACSIMILE (206) 789-9834  
E-MAIL [hatdaw@hatdaw.com](mailto:hatdaw@hatdaw.com)

JAMES B. HATFIELD, PE  
CONSULTANT

MAURY L. HATFIELD, PE  
CONSULTANT  
OAKHURST, NSW  
AUSTRALIA

**Engineering Statement  
Digital Displacement Application for K56BV  
Channel 46 at Madras & Culver, OR  
July 2008**

This Engineering Statement has been prepared on behalf of Rural Oregon Wireless Television, licensee of TV translator station K56BV at Madras & Culver, Oregon. This material has been prepared in connection with a digital displacement 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

2000 Census data selected  
TV INTERFERENCE and SPACING ANALYSIS PROGRAM

Date: 07-22-2008 Time: 12:53:02

Record Selected for Analysis

K56BV USERRECORD-01 MADRAS & CULVER OR US  
Channel 46 ERP 1.2 kW HAAT 67. m RCAMSL 00842 m SIMPLE MASK  
Latitude 044-34-45 Longitude 0121-09-09  
Status APP Zone 2 Border  
Dir Antenna Make usr Model USRPAT01 Beam tilt N Ref Azimuth 350.  
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	1.152	111.7	31.0
45.0	0.232	57.4	16.0
90.0	0.001	33.0	3.2
135.0	0.001	33.0	3.5
180.0	0.012	33.0	5.9
225.0	0.001	33.0	2.9
270.0	0.016	94.5	10.5
315.0	0.666	146.7	30.5

Contour Overlap to Proposed Station

Station  
K46AK 46 PRINEVILLE, ETC. OR BLTT19931105JI causes

Contour overlap to Digital LPTV station

K56BV 46 MADRAS & CULVER OR USERRECORD01  
Required D/U ratio: 2.0

Station  
NEW 47 WARM SPRINGS OR BNPTTL20000831CBS causes

Contour overlap to Digital LPTV station

K56BV 46 MADRAS & CULVER OR USERRECORD01  
Required D/U ratio: -49.0

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 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	ARN
46	Call City/State K56BV MADRAS & CULVER OR	USERRECORD01

Stations Potentially Affected by Proposed Station

Chan	Call	City/State	Dist(km)	Status	Application	Ref. No.
31	K31CR	PRINEVILLE, ETC. OR	44.7	LIC	BLTT	-19920505IK
31	K31HZ	THE DALLES, ETC. OR	125.9	LIC	BLTT	-20070813ADC
32	K32CC	MONTGOMERY RANCH, ETC OR	83.2	LIC	BLTT	-19881013IC
32	KRCW-TV	SALEM OR	105.0	LIC	BLCT	-19990816KE
32	K32CC	SUNRIVER OR	83.2	CP	BPTT	-20050606AIB
38	K53EI	HOOD RIVER OR	133.5	CP	BDISTT	-20070822ABB
38	K38DT	NORTH LAPINE OR	83.2	LIC	BLTT	-19930401JG
38	K38DT	SUNRIVER OR	83.2	CP	BPTT	-20050606AHY
39	KFXO-LP	BEND OR	44.7	LIC	BLTTL	-19931014JH
39	K39ES	HEPPNER, ETC. OR	141.6	LIC	BLTT	-19980803JH
39	K59EK	THE DALLES OR	125.9	CP	BDISTT	-20071120AET
42	K42IO	ODELL WA	125.4	CP	BNPTTL	-20000831CLQ
43	KUBN-LP	BEND OR	44.7	CP	BDISTTL	-20060822AIL
43	K43FH	HEPPNER, ETC. OR	141.6	LIC	BLTT	-19980803JJ
44	K44AH	PRINEVILLE, ETC. OR	22.2	LIC	BLTT	-19970724JE
45	K60BQ	BEND OR	57.5	CP	BDFCDTL	-20080114AAA
45	K45KF-D	BURNS OR	196.4	CP	BDCCDTT	-20061030ABH
45	K45CV	CORVALLIS OR	143.4	LIC	BLTT	-19930604IG
45	KNMT	PORTLAND OR	162.0	LIC	BLCDDT	-20060619AAM
45	K60BQ	TERREBONNE OR	57.5	CP MOD	BMPTT	-20070430AWR
46	K46HX	GRANGEVILLE ID	401.9	LIC	BLTT	-20070103ACZ
46	K46HX	GRANGEVILLE ID	401.9	CP	BDFCDTT	-20071221ADE
46	K46AM	BAKER, ETC. OR	267.3	LIC	BLTT	-19810121LB
46	K46AS	COOS BAY OR	272.2	LIC	BLTT	-19980911JB
46	K58CT	COTTAGE GROVE OR	175.0	CP	BDISTT	-20051122AGB
46	K46CH	GOLD HILL OR	281.7	LIC	BLTT	-19890525II
46	K46CU	HEPPNER, ETC. OR	141.6	LIC	BLTT	-19980803JI
46	KGW	PORTLAND OR	163.3	LIC	BLCDDT	-20000314ABB
46	K46AK	PRINEVILLE, ETC. OR	22.2	LIC	BLTT	-19931105JI
46	KTCW	ROSEBURG OR	233.9	LIC	BLCT	-19920501KG
46	KUMN-LD	MOSES LAKE, ETC. WA	276.8	CP	BDCCDTL	-20061030AGL
46	KPMT-LP	PULLMAN WA	389.8	LIC	BLTTL	-20070220ABL
46	NEW	SEATTLE WA	331.2	APP	BDCCDTL	-20061011ADL
46	K46FL	WALLA WALLA WA	265.9	LIC	BLTT	-20020211AAA
47	NEW	BEND OR	67.9	APP	BNPTTL	-20000830AIW
47	NEW	BEND OR	57.6	APP	BNPTTL	-20000807AEH
47	NEW	BEND OR	57.5	APP	BNPTTL	-20000810AAY
47	NEW	BEND OR	67.9	APP	BNPTTL	-20000830ASA
47	K47LE-D	COLLEGE HILL, ETC. OR	167.8	CP	BDCCDTT	-20061027AHF
47	K47AV	COTTAGE GROVE OR	175.0	LIC	BLTT	-19860113IE
47	KUNP-LP	PORTLAND OR	163.0	LIC	BLTTL	-20060809ABC

47	K52AK	PRINEVILLE OR	22.2	CP	BDISTT	-20061212ABI
47	NEW	WARM SPRINGS OR	35.2	APP	BNPTTL	-20000831CBS
49	NEW	WARM SPRINGS OR	35.2	APP	BNPTTL	-20000831BPV
50	K50CE	HOOD RIVER OR	133.5	CP	BPTT	-20070822AAV
50	K50CE	HOOD RIVER OR	133.9	LIC	BLTT	-19880603IK
50	KUBN-LP	PRINEVILLE-REDMOND OR	44.7	LIC	BLTT	-19951019IC
53	K53JV	BEND OR	57.5	LIC	BLTT	-20071024ABG
53	K53EI	HOOD RIVER OR	133.9	LIC	BLTT	-19920504IG
54	K54BK	MAUPIN OR	67.4	LIC	BLTT	-19980427JC
54	K54AP	PRINEVILLE OR	22.2	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.

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

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.

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 levels produced by the proposed facility were calculated using the manufacturer's vertical plane pattern for the horizontally-polarized Scala 4DR-8S antenna proposed in this application. The highest calculated power density from the proposed antenna alone occurs at 19 meters from the base of the antenna support structure. At this point the power density is calculated to be 3.5  $\mu\text{W}/\text{cm}^2$ , which is 0.8% of 443  $\mu\text{W}/\text{cm}^2$  (the FCC maximum for uncontrolled environments at the Channel 46 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.

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.

July 22, 2008

Erik C. Swanson, P.E.

# Madras & Culver Digital Ch46 - Scala 4DR-8S

ERP                    1200 Watts H (avg)  
                          0 Watts V (avg)  
AGL                    19 less 2m is                    17 meters  
Maximum is            3.52  $\mu\text{W}/\text{cm}^2$  at                    19 meters

Power Density vs Distance

