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**FM Translator K229DI
Channel 229D at Corvallis, OR
To Rebroadcast KEJO(AM) 1240 kHz Corvallis, OR
October 2021**

Background & Allocation Study

The instant application is being filed in order to facilitate buildout of this FM translator facility prior to expiration of the underlying original construction permit. Operation is proposed from the current CP site, which is on the KLOO/KEJO AM tower, with NAD83 coordinates adjusted to better match the actual tower location.

The attached spacing study shows the spacing between the proposed translator site and the location of cochannel and adjacent channel stations and proposals. This study was made with the Commission's Class A spacing requirements, and individual situations were examined to determine the lack of prohibited contour overlap per the requirements of §74.1204 of the Rules. The attached allocation study maps demonstrate compliance with the Commission's Rules for protection of FM broadcast stations and FM translators as outlined in §74.1204.

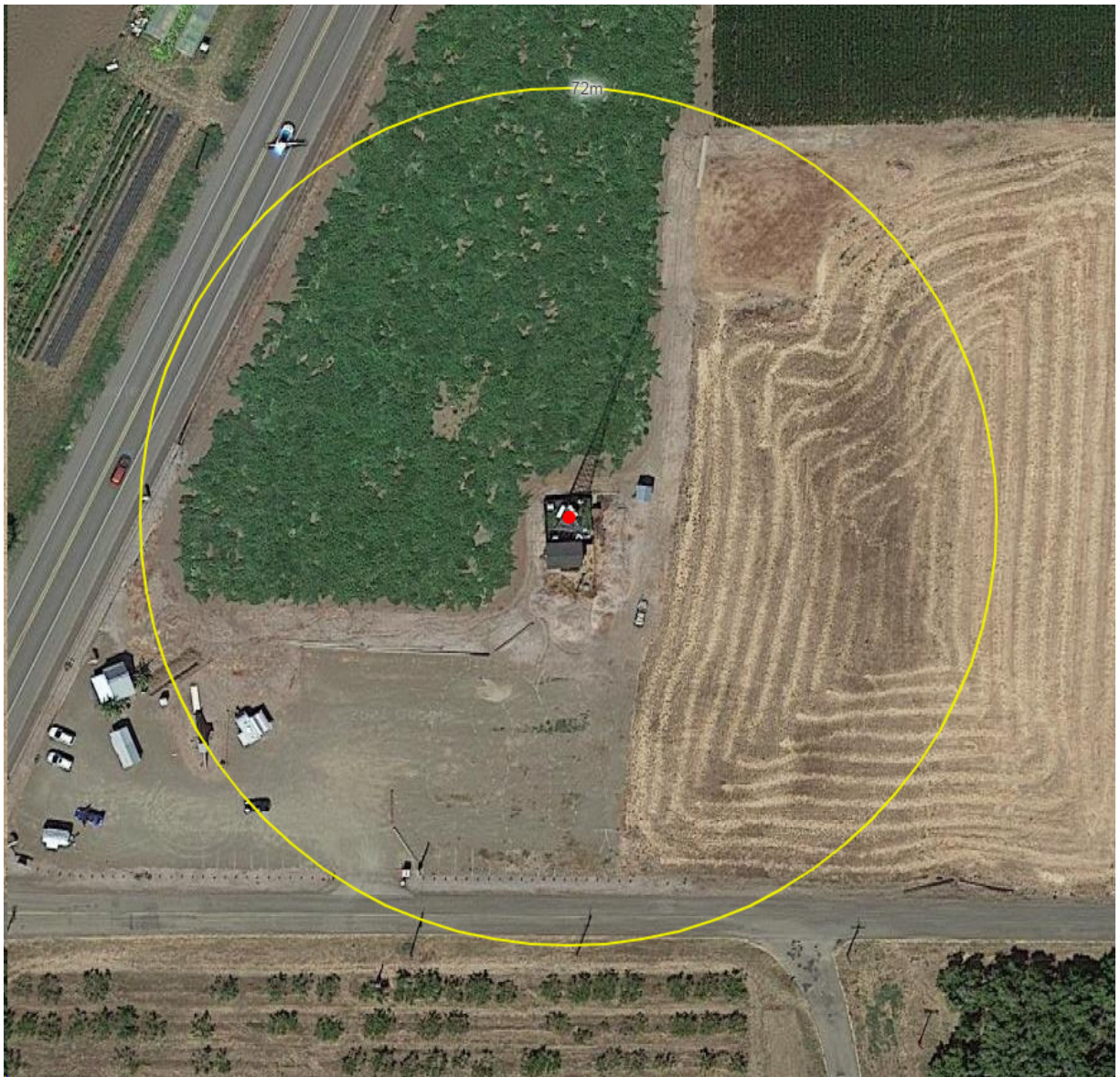
The attached spacing study demonstrates compliance with §73.207 of the Commission's Rules regarding spacing restrictions to stations which are 53 or 54 channels removed from the proposed operation.

KKNU 227C0 Springfield-Eugene

The proposed translator transmitter site is located within the 60 dBu protected contour of second-adjacent channel station KKNU 227C0 Springfield-Eugene. The following calculation, performed using the *Living Way* methodology, demonstrates interference protection to that station.

Protected Station	Distance & Bearing to Proposal	Station ERP and HAAT on that azimuth	Station Field Strength at Proposal	Corresponding Translator Interfering Contour	Distance to Translator Interfering Contour
KKNU 227C0	66.48 km 352 deg True	100 kW 460 meters	67.1 dBu F(50,50)	107.1 dBu	116 meters Free Space

The 107.1 dBu contour from the proposed facility would extend 116 meters from the antenna per a Free Space calculation. However, taking into account the elevation pattern of the Nicom BKG77-1 antenna, the attached calculations demonstrate that the 107.1 dBu contour will not reach ground level in the vicinity of the tower except out to a distance of 72 meters from the tower. There is no population within this contour. (In the aerial view on the following page, the only structures within this radius are the transmitter building, and a temporarily parked trailer in the southwest quadrant.) Therefore, the proposed facility is believed to satisfy the requirements of §74.1204(d) with respect to KKNU.



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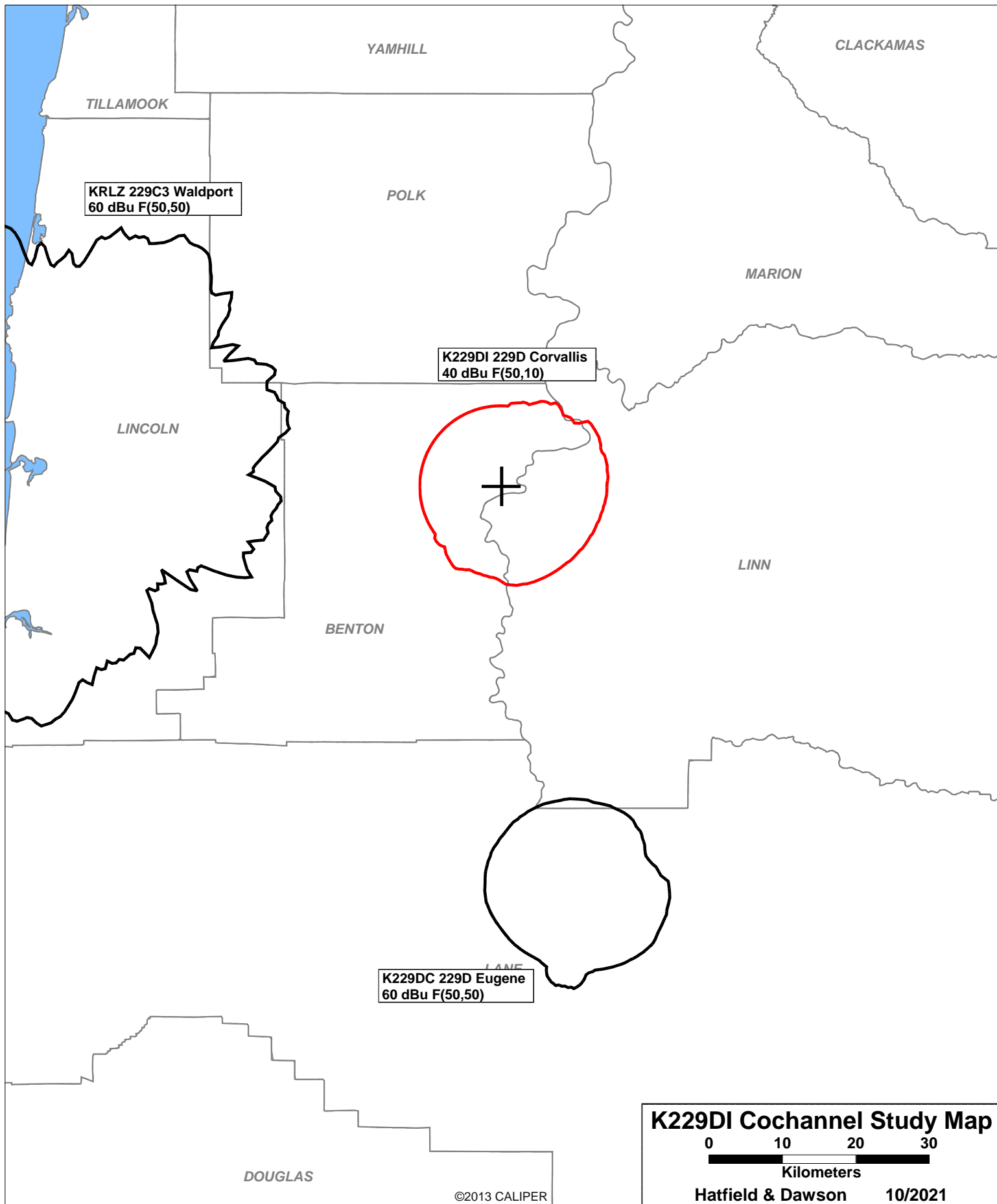
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SEARCH PARAMETERS                               FM Database Date: 20211005
Channel: 229A      93.7 MHz                      Page 1
Latitude: 44 35 37.6 (NAD83)
Longitude: 123 13 34.1
Safety Zone: 50 km
Job Title: K229DI CORVALLIS

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Call Status	City St	FCC File No.	Channel Freq.	ERP(kW) HAAT(m)	Latitude Longitude	Bearing deg-True	Dist (km)	Req (km)
KKNU LIC	SPRINGFIELD-EUGENE OR BLH-20060202ABA	227C0 93.3	100.000 395.0	44 0 3.4 123 6 49.3	172.2	66.48 -19.52	86 SHORT	
K227DU LIC	SALEM OR 0000151907	227D 93.3	0.250 0.0	DA 44 51 17.0 123 7 19.0	15.8	30.15 0.00	0 TRANS	
K228DT LIC	HAPPY HOLLOW OR BLFT-20000414ACQ	228D 93.5	0.010 0.0	DA 45 12 47.3 123 45 18.4	329.0	80.52 0.00	0 TRANS	
K228EU LIC	PORTLAND OR BLFT-20110118ABC	228D 93.5	0.099 0.0	DA 45 31 20.4 122 44 49.4	19.9	109.88 0.00	0 TRANS	
K229DC LIC	EUGENE OR BLFT-20170316AAY	229D 93.7	0.250 0.0	DA 44 0 6.4 123 6 51.3	172.3	66.38 0.00	0 TRANS	
KRLZ LIC	WALDPORT OR BLH-20160202ABJ	229C3 93.7	9.000 132.0	44 38 39.4 124 0 54.4	275.4 SS	62.87 -79.13	142 SHORT	
KURT LIC	PRINEVILLE OR BLH-20180620ABA	229C2 93.7	1.000 689.0	44 26 16.5 120 57 16.1	94.7	181.45 15.45	166 CLEAR	
K229DI CP	CORVALLIS OR BNPFT-20180420AB	229D 93.7	0.150 0.0	44 35 37.4 123 13 34.3	215.5	0.01 0.00	0 TRANS	
K230AD LIC	COTTAGE GROVE OR BLFT-20070207ABB	230D 93.9	0.250 0.0	43 46 40.4 123 2 36.3	170.8	91.83 0.00	0 TRANS	
KPDQ-FM LIC	PORTLAND OR BLH-20060208AMF	230C1 93.9	52.000 387.0	45 29 19.4 122 41 44.3	22.5 SS	107.88 -25.12	133 SHORT	
K231CY LIC	LEBANON OR BLFT-20171024AAW	231D 94.1	0.250 0.0	DA 44 30 18.4 122 57 47.3	115.2	23.11 0.00	0 TRANS	
KMCQ-LP LIC	SALEM OR BLL-20170123FKV	232L1 94.3	0.007 109.6	44 53 48.1 123 5 6.2	18.3	35.47 6.47	29 CLOSE	
K282BH LIC	PHILOMATH OR BLFT-20141103AAF	282D 104.3	0.015 0.0	44 38 24.4 123 16 29.3	323.2	6.44 0.00	0 TRANS	
K282BY LIC	SALEM OR BLFT-20180404AAS	282D 104.3	0.180 0.0	DA 44 59 49.4 123 9 16.4	7.2	45.17 0.00	0 TRANS	

===== END OF FM SPACING STUDY FOR CHANNEL 229 =====



KPDQ-FM 230C1 Portland
60 dBu F(50,50)

YAMHILL

CLACKAMAS

POLK

MARION

LINCOLN

K229DI 229D Corvallis
54 dBu F(50,10)

LINN

BENTON

LANE
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K229DI 1Adj Study Map

0 5 10 15

Kilometers

Hatfield & Dawson

10/2021

YAMHILL

CLACKAMAS

POLK

MARION

K227DU 227D Salem
60 dBu F(50,50)

K229DI 229D Corvallis
100 dBu F(50,10)



K231CY 231D Lebanon
60 dBu F(50,50)

BENTON

LINN

LANE

K229DI 2Adj Study Map

0 5 10 15

Kilometers

Hatfield & Dawson

10/2021

K229DI Free Space Interference Area Calculator Interference Area to KGNU

Antenna Height: 52 meters AGL
 Contour Level: 107.1 dBu equals 0.2 V/m
 ERP in Watts: 14 Watts

Maximum distance
 to interfering contour is: 380.0 feet equals 115.8 meters

Antenna: BKG77-1

Depression Angle (degrees)	Nicom BKG77-1 Relative Field	Adjusted ERP (Watts)	Free Space Distance To 107.1 dBu Contour Along the depression angle	Horizontal Distance (meters)	Contour AGL (meters)
-90	0.105	0.2	12.2 meters	0	39.8
-89	0.104	0.2	12.0	0.2	40.0
-88	0.102	0.1	11.8	0.4	40.2
-87	0.100	0.1	11.6	0.6	40.4
-86	0.102	0.1	11.8	0.8	40.2
-85	0.103	0.1	11.9	1.0	40.1
-84	0.105	0.2	12.2	1.3	39.9
-83	0.110	0.2	12.7	1.6	39.4
-82	0.115	0.2	13.3	1.9	38.8
-81	0.120	0.2	13.9	2.2	38.3
-80	0.129	0.2	14.9	2.6	37.3
-79	0.137	0.3	15.9	3.0	36.4
-78	0.145	0.3	16.8	3.5	35.6
-77	0.155	0.3	18.0	4.0	34.5
-76	0.166	0.4	19.2	4.7	33.3
-75	0.176	0.4	20.4	5.3	32.3
-74	0.188	0.5	21.8	6.0	31.1
-73	0.199	0.6	23.0	6.7	30.0
-72	0.211	0.6	24.4	7.6	28.8
-71	0.225	0.7	26.1	8.5	27.4
-70	0.239	0.8	27.7	9.5	26.0
-69	0.253	0.9	29.3	10.5	24.6
-68	0.268	1.0	31.0	11.6	23.2
-67	0.282	1.1	32.7	12.8	21.9
-66	0.297	1.2	34.4	14.0	20.6
-65	0.313	1.4	36.3	15.3	19.1
-64	0.329	1.5	38.1	16.7	17.7
-63	0.345	1.7	40.0	18.1	16.4
-62	0.361	1.8	41.8	19.6	15.1
-61	0.376	2.0	43.6	21.1	13.9
-60	0.391	2.1	45.3	22.6	12.8
-59	0.406	2.3	47.0	24.2	11.7
-58	0.421	2.5	48.8	25.8	10.6
-57	0.436	2.7	50.5	27.5	9.6
-56	0.450	2.8	52.1	29.1	8.8
-55	0.465	3.0	53.9	30.9	7.9
-54	0.479	3.2	55.5	32.6	7.1
-53	0.494	3.4	57.2	34.4	6.3
-52	0.508	3.6	58.8	36.2	5.6
-51	0.523	3.8	60.6	38.1	4.9
-50	0.539	4.1	62.4	40.1	4.2
-49	0.553	4.3	64.1	42.0	3.7

-48	0.568	4.5	65.8	44.0	3.1
-47	0.584	4.8	67.6	46.1	2.5
-46	0.600	5.0	69.5	48.3	2.0
-45	0.616	5.3	71.3	50.5	1.5 X
-44	0.631	5.6	73.1	52.6	1.2 X
-43	0.646	5.8	74.8	54.7	1.0 X
-42	0.661	6.1	76.6	56.9	0.8 X
-41	0.676	6.4	78.3	59.1	0.6 X
-40	0.691	6.7	80.0	61.3	0.6 X
-39	0.706	7.0	81.8	63.5	0.5 X
-38	0.719	7.2	83.3	65.6	0.7 X
-37	0.732	7.5	84.8	67.7	1.0 X
-36	0.745	7.8	86.3	69.8	1.3 X
-35	0.758	8.0	87.8	71.9	1.6 X
-34	0.771	8.3	89.3	74.0	2.1
-33	0.783	8.6	90.7	76.1	2.6
-32	0.795	8.8	92.1	78.1	3.2
-31	0.806	9.1	93.4	80.0	3.9
-30	0.818	9.4	94.7	82.1	4.6
-29	0.829	9.6	96.0	84.0	5.4
-28	0.840	9.9	97.3	85.9	6.3
-27	0.852	10.2	98.7	87.9	7.2
-26	0.862	10.4	99.8	89.7	8.2
-25	0.872	10.6	101.0	91.5	9.3
-24	0.881	10.9	102.0	93.2	10.5
-23	0.891	11.1	103.2	95.0	11.7
-22	0.900	11.3	104.2	96.7	12.9
-21	0.910	11.6	105.4	98.4	14.2
-20	0.918	11.8	106.3	99.9	15.6
-19	0.926	12.0	107.3	101.4	17.1
-18	0.934	12.2	108.2	102.9	18.6
-17	0.941	12.4	109.0	104.2	20.1
-16	0.947	12.6	109.7	105.4	21.8
-15	0.954	12.7	110.5	106.7	23.4
-14	0.960	12.9	111.2	107.9	25.1
-13	0.966	13.1	111.9	109.0	26.8
-12	0.972	13.2	112.6	110.1	28.6
-11	0.977	13.4	113.2	111.1	30.4
-10	0.982	13.5	113.7	112.0	32.2
-9	0.987	13.6	114.3	112.9	34.1
-8	0.991	13.7	114.8	113.7	36.0
-7	0.995	13.9	115.2	114.4	38.0
-6	0.999	14.0	115.7	115.1	39.9
-5	0.999	14.0	115.7	115.3	41.9
-4	0.999	14.0	115.7	115.4	43.9
-3	0.999	14.0	115.7	115.6	45.9
-2	1.000	14.0	115.8	115.8	48.0
-1	1.000	14.0	115.8	115.8	50.0
0	1.000	14.0	115.8	115.8	52.0

Facilities Proposed

The proposed operation will be on Channel 229D (93.7 MHz) with an effective radiated power of 14 watts. Operation is proposed with a 1-element circularly-polarized omni-directional antenna. The antenna will be side-mounted on the existing tower used by KEJO(AM) and KLOO(AM).

The proposed antenna support structure does not exceed 60.96 meters (200 feet) above ground and does not require notification to the Federal Aviation Administration. Therefore, this structure does not require an Antenna Structure Registration Number.

RF Exposure Calculations

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.

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

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.

Ground level power densities have been calculated for locations extending from the base of the tower to a distance of 500 meters. Values past this point are increasingly negligible.

Calculations of the power density produced by the proposed antenna system assume a Type 2 element pattern, which is the element pattern used in the Commission's FMModel software for the Nicom BKG77-1 antenna proposed for use. The highest calculated ground level power density occurs at a distance of 51 meters from the base of the antenna support structure. At this point the power density is calculated to be 0.1 $\mu W/cm^2$, which is 0.05% of 200 $\mu W/cm^2$ (the FCC standard for uncontrolled environments).

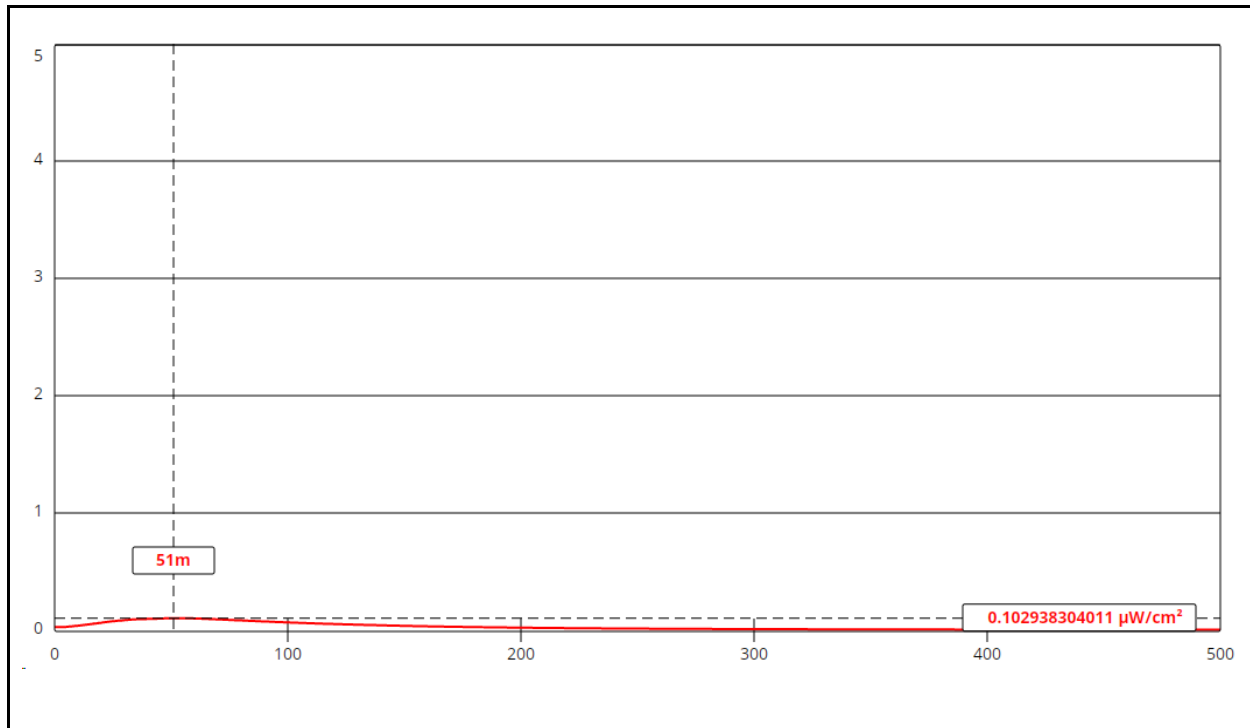
The permittee/licensee in coordination with other users of the site must reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency exposure in excess of FCC guidelines.

AM Station KEJO

The translator antenna will be installed on the tower used by AM station KEJO 1240 kHz. KEJO operates with 1 kilowatt nondirectional full time. The radiator is 88.4 electrical degrees tall, or 24.6% of the station wavelength. Using Tables 1-4 in OET Bulletin No. 65, the fencing distance requirement for this station is 1 meter from the tower base. The tower is fenced to at least this distance.

AM Station KLOO

The translator antenna will be installed on the tower used by AM station KLOO 1340 kHz. KLOO operates with 1 kilowatt nondirectional full time. The radiator is 95.6 electrical degrees tall, or 26.6% of the station wavelength. Using Tables 1-4 in OET Bulletin No. 65, the fencing distance requirement for this station is 1 meter from the tower base. The tower is fenced to at least this distance.



Ground-Level RF Exposure

OET FMModel

K229DI Corvallis

Antenna Type: Nicom BKG77-1 (Type 2)

No. of Elements: 1

Element Spacing: 1 wavelength

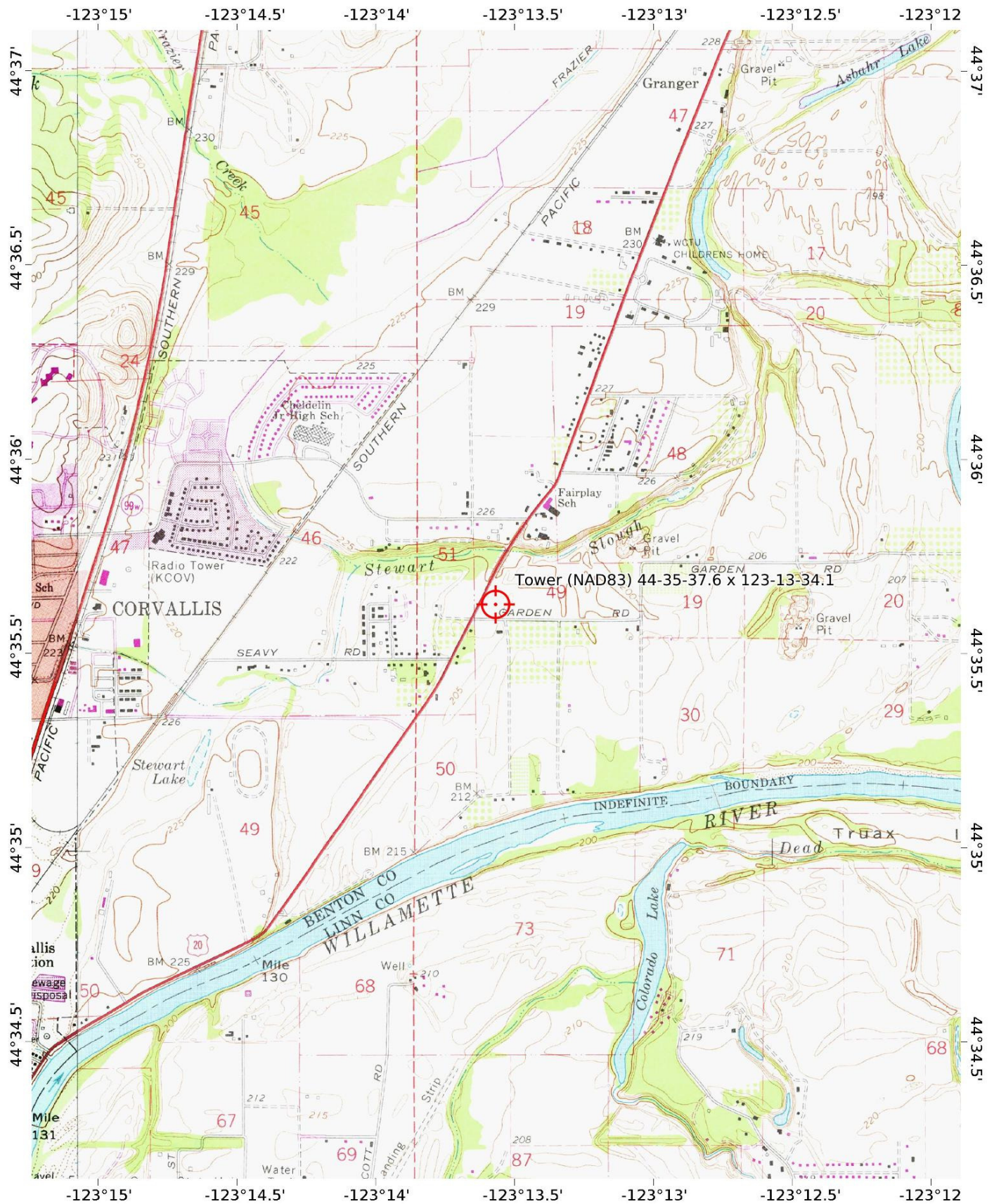
Distance: 500 meters

Horizontal ERP: 14 W

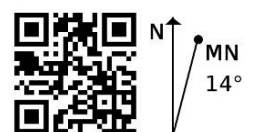
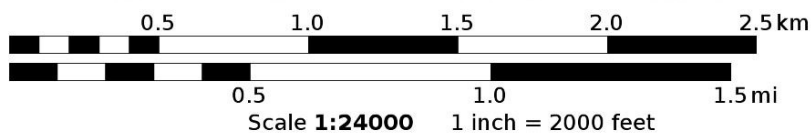
Vertical ERP: 14 W

Antenna Height: 52 meters AGL

Maximum Calculated Power Density is 0.1 $\mu\text{W}/\text{cm}^2$ at 51 meters from the antenna structure.



Mercator Projection
WGS84
USNG Zone 10TDQ
 CALTOPO



Hatfield & Dawson Consulting Engineers

