December 2016
New LPFM Channel 289L1
Kennewick, Washington
Allocation Study

Facilities Proposed

The instant application proposes a minor modification of the original construction permit for New LPFM on Channel 289L1 at Kennewick, Washington.

The antenna support structure does not exceed 60.96 meters (200 feet) above ground and does not require notification to the Federal Aviation Administration, as there are no airports within 8 kilometers of the site. Therefore, this structure does not require an Antenna Structure Registration Number.

Spacing Study

The attached spacing study shows that the proposed LPFM operation meets the co-channel and adjacent channel spacing requirements for Class L1 stations as prescribed in §73.807 of the Commission's Rules, with the exception of short-spacings to KONA-FM Kennewick and K291BS Richland. A second-adjacent channel waiver is requested with respect to these stations.

KONA-FM 287C Kennewick

The proposed LPFM transmitter site is located within the 60 dBu protected contour of second-adjacent channel station KONA-FM 287C Kennewick. The following calculation, performed using the *Living Way* methodology, addresses 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**
KONA-FM 287C	7.77 km 23 deg True	100 kW 488 meters	106.4 dBu F(50,50)	146.4 dBu	0.9 meters Free Space

The 146.4 dBu interfering contour from the proposed facility would extend only 0.9 meters[1] from the antenna and would not reach ground level (which is 10 meters below the antenna). There is no population within this contour. Therefore, the proposed facility is believed to satisfy the requirements of §73.807(e)(1) with respect to KONA-FM.

K291BS Richland

The proposed LPFM transmitter site is located within the 60 dBu protected contour of second-adjacent channel station K291BS Richland. The following calculation, performed using the *Living Way* methodology, addresses 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**
K291BS	15.23 km 123 deg True	0.205 kW 262 meters	64.6 dBu F(50,50)	104.6 dBu	109.2 meters Free Space

The 104.6 dBu interfering contour from the proposed facility would extend only 109.2 meters from the antenna and would not overlap any populated areas, as depicted on the attached transmitter site map. Therefore, the proposed facility is believed to satisfy the requirements of §73.807(e)(1) with respect to K291BS.

[1] This study assumes a maximum ERP of 7 watts at 105 meters HAAT.

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SEARCH PARAMETERS FM Database Date: 161227

Channel: 289L1 105.7 MHz
Latitude: 46 9 44
Longitude: 119 9 13
Safety Zone: 32 km
Job Title: KENNEWICK 289L1 MOD

Call Status	City St	FCC File No.	Channel Freq.	ERP(kW) HAAT(m)	Latitude Longitude	Bearing deg-True	Dist (km)	Req (km)
KONA-FM	KENNEWICK		287C	100.000	46-05-51	202.2	7.77	93
LIC	WA	BLH-940525KA	105.3	347.0	119-11-30		-85.23	SHORT
K289BJ	ARLINGTON		289D	0.115	45-42-27	239.0	97.20	0
LIC	OR	BLFT-71001ACR	105.7	153.0	120-13-27		0.00	TRANS
NEW	KENNEWICK		289L1	0.065	46-11-13	351.6	2.78	24
CP MOD	WA	BMPL-61116AAS	105.7	-43.0	119-09-32		-21.22	SHORT
KRSE	YAKIMA		289C1	100.000	46-42-42	299.0	128.37	111
LIC	WA	BMLH-30327AIS	105.7	172.3	120-37-22		17.37	CLEAR
KOLH-LP	HERMISTON		290L1	0.100	45-50-07	191.7	37.11	14
LIC	OR	BLL-50701AFI	105.9	23.3	119-15-02		23.11	CLEAR
K291BS	RICHLAND		291D	0.250 DA	46-14-08	302.5	15.23	21
LIC	WA	BLFT-60422AAE	106.1	0.0	119-19-13		-5.77	SHORT

==== END OF FM SPACING STUDY FOR CHANNEL 289 ====

December 2016
New LPFM Channel 289L1
Kennewick, Washington
RF Exposure Study

Power Density 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.

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

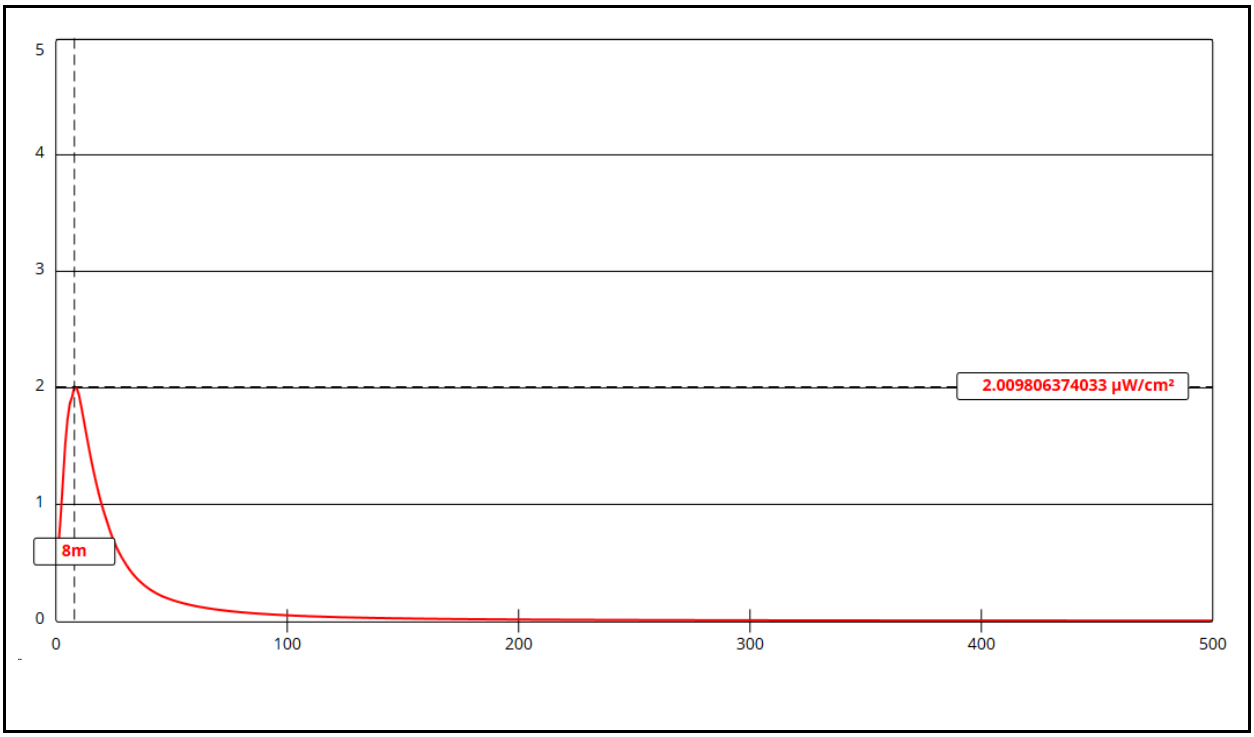
Where: *AdjERP(Watts)* is the maximum lobe effective radiated power times the element pattern factor times the array pattern factor.

D is the distance in meters from the center of radiation to the calculation point.

Calculations of the power density produced by the proposed antenna system have been made using the appropriate element pattern for the Nicom BKG77-1 antenna to be used. The highest calculated ground level power density from the proposed LPFM station occurs at a distance of 8 meters from the base of the antenna support structure. At this point the power density is calculated to be 2.0 μW/cm², which is 1% of 200 μW/cm² (the FCC standard for uncontrolled environments).[2]

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.

[2] This study assumes a maximum ERP of 7 watts at 105 meters HAAT.

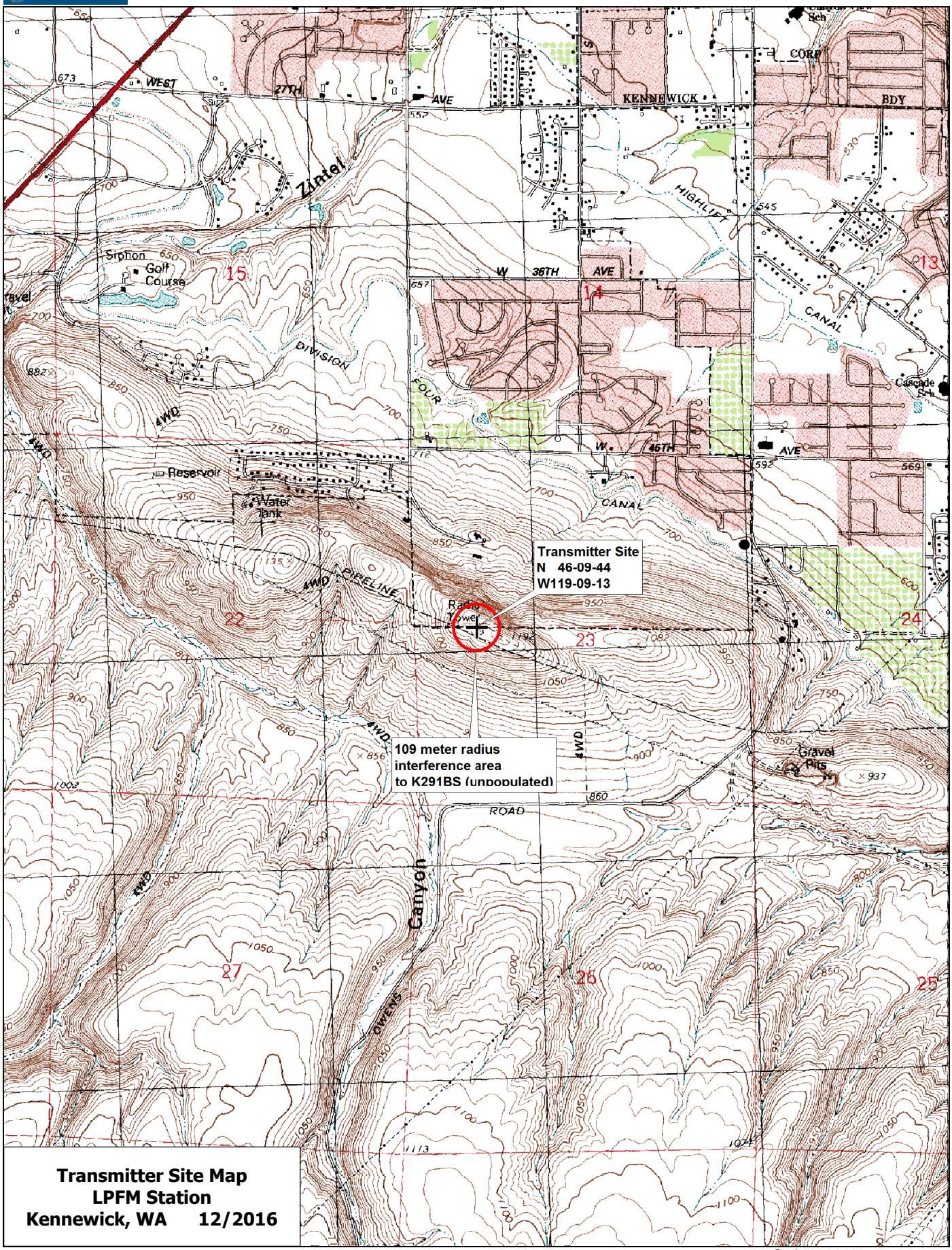


Ground-Level RF Exposure **OET FMModel**

Kennewick 289L1

Antenna Type:	Nicom BKG77-1 (Type 2)
No. of Elements:	1
Element Spacing:	1.0 wavelength
Distance:	100 meters
Horizontal ERP:	7 W assumed
Vertical ERP:	7 W assumed
Antenna Height:	10 meters AGL

Maximum Calculated Power Density is 2.0 µW/cm^2 at 8 meters from the antenna structure.



Transmitter Site Map
LPFM Station
Kennewick, WA 12/2016

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TN
MN (14.7°E)

Scale 1 : 24,000
1 cm = 240.0 m
Data Zoom 13-1