

TECHNICAL SUMMARY
APPLICATION FOR CONSTRUCTION PERMIT
LOW POWER DIGITAL STATION K29FD-D
LAKE HAVASU CITY, ARIZONA
CHANNEL 29 15 KW (DA)

1. Application Purpose: The instant application proposes to change the licensed K29FD-D directional antenna system from a Scala model 4DR-16S to a Kathrein model 4x1 750 0000049 E-pol panel array and increase the ERP from 2.37 kW (horizontal polarization) to 15 kW (elliptical polarization). No other changes are proposed.

2. Interference Compliance: As indicated in the attached *TVStudy* analysis summary, K29FD-D's proposed 15 kW operation meets the FCC's interference protection requirements with respect to all protected facilities. A cell size of 1.0 km and a profile resolution of 1.0 km points/km were utilized for the *TVStudy* analysis.

3. RFR Compliance: The proposed facilities were evaluated in terms of potential radiofrequency radiation (RFR) exposure at ground level to workers and the general public. The radiation center for the proposed DTV antenna will be located 16 meters above ground level. The total DTV ERP is 21.43 kW (15 kW H-pol, 6.43 kW V-pol). A greater than expected vertical plane relative field value of 0.15 is presumed for the antenna's downward radiation (-60° to -90° elevation, see attached vertical plane relative field pattern). The calculated power density at a point 2 meters above ground level is 82.2 uW/cm² which is 21.9% of the FCC's recommended limit of 375.3 uW/cm² for channel 29 for an uncontrolled environment. Thus, it is believed that the proposed K29FD-D facility is in compliance with the FCC's requirements with regard to RF radiation exposure. However, if necessary, measurements will be made to substantiate compliance with the FCC's RF radiation exposure requirements.

Access to the transmitting site will be restricted and appropriately marked with RFR warning signs. Furthermore, as this is a multi-user site, a protocol shall be in effect in the event that workers or other authorized personnel enter the restricted area or climb the supporting structure to ensure that appropriate measures will be taken to assure worker safety with respect to RF energy exposure.

K29FD-D TVSTUDY INTERFERENCE ANALYSIS

tvstudy v2.2.5 (4uoc83)
Database: localhost, Study: k29fd030, Model: Longley-Rice
Start: 2023.07.06 12:15:01

Study created: 2023.07.06 12:15:01

Study build station data: LMS TV 2023-07-03

Proposal: K29FD030 D29 LD APP LAKE HAVASU CITY, AZ
File number: k29fd030
Facility ID: 43400
Station data: User record
Record ID: 449
Country: U.S.

Search options:
Non-U.S. records included

Stations potentially affected by proposal:

IX	Call	Chan	Svc	Status	City, State	File Number	Distance
No	DK14JT	N14	TX	APP	JOSHUA TREE, ETC., CA	BLTVL19980330JH	156.8 km
No	K22DR-D	N22	TX	LIC	LAUGHLIN, NV	BLTT19911118JJ	79.5
No	KYPO-LD	N27	TX	LIC	TACNA, AZ	BLTTL20080818AAL	114.1
No	K280A-D	D28	LD	LIC	COTTONWOOD, AZ	BLANK0000062884	206.3
Yes	K28PO-D	D28	LD	LIC	LAKE HAVASU CITY, AZ	BLANK0000071726	0.0
No	K28QP-D	D28	LD	CP	SALOME, AZ	BNPDTL20100514AEQ	139.7
No	KESQ-TV	D28	DT	LIC	PALM SPRINGS, CA	BLANK0000078362	206.5
No	KVPX-LD	D28	LD	LIC	LAS VEGAS, NV	BLDTL20111006ACC	161.3
No	K28EU-D	D28	LD	LIC	LAUGHLIN, ETC., NV	BLDTT20120319ADY	79.3
No	K29LM-D	D29	LD	LIC	COTTONWOOD, ETC., AZ	BLANK0000062886	206.3
Yes	K29LO-D	D29	LD	LIC	KINGMAN, AZ	BLANK0000071727	68.1
No	KTAZ	D29	DT	LIC	PHOENIX, AZ	BLANK0000190913	255.4
No	KPCE-LD	D29-	LD	LIC	TUCSON, AZ	BLANK0000163431	398.2
No	KBFX-CD	D29	DC	LIC	BAKERSFIELD, CA	BLTTA20101018ACF	395.5
No	K29LS-D	D29	LD	LIC	CALEXICO, CA	BLANK0000165443	233.6
No	K29NN-D	D29z	LD	LIC	LUCERNE VALLEY, CA	BLANK0000082013	230.2
No	KFTR-DT	D29	DT	LIC	ONTARIO, CA	BLCDT20100401AFY	341.5
No	KFTR-DT	D29	DT	CP	ONTARIO, CA	BLANK0000035667	341.5
No	KPSE-LD	D29	LD	LIC	PALM SPRINGS, CA	BLDTL20140903AFX	206.4
No	K29GK-D	D29	LD	LIC	TWENTYNINE PALMS,ETC, CA	BLANK0000136621	156.8
No	K29GK-D	N29-	TX	LIC	TWENTYNINE PALMS,ETC, CA	BLTT20060119ADC	156.8
No	K29NQ-D	D29	LD	CP	WINTERHAVEN, CA	BNPDTL20100510AAX	208.9
Yes	KVCW	D29	DD	LIC	LAS VEGAS, NV	BLANK0000159469	166.5
No	DDDKWWB-LPD29		LD	APP	MESQUITE, ETC., NV	BLANK0000052515	287.1
No	K29JA-D	D29	LD	LIC	ALTON, UT	BLDTT20091211AGI	349.4
No	K29FA-D	D29	LD	LIC	BERYL, MODENA ETC., UT	BLDTT20090728ADI	349.3
No	K24II-D	D29	LD	LIC	KANAB, UT	BLANK0000060007	320.0
No	K29ML-D	D29	LD	LIC	KANARRAVILLE/NEW HAR, UT	BLANK0000091040	337.4
No	K29MJ-D	D29	LD	LIC	ROCKVILLE, UT	BLANK0000132302	308.0
No	K32MH-D	D29	LD	APP	WASHINGTON, ETC., UT	BLANK0000215077	287.1
No	K30GG-D	D30	LD	LIC	CHLORIDE, AZ	BLDTT20130308AAS	90.1
No	K30LL-D	D30	LD	LIC	KINGMAN, AZ	BLDTT20111207AFE	68.3
No	K30JD-D	D30	LD	LIC	PRESCOTT, AZ	BLDTT20130130AIN	168.7
No	K30QU-D	D30	LD	CP	DESERT CENTER, CA	BNPDTL20100514ACU	130.2
No	DK30BQ	D30	LD	APP	NEEDLES, CA	BDFCDTT20100519ADJ	48.2
No	KDNU-LD	D30	LD	LIC	LAS VEGAS, NV	BLANK0000165183	161.3
No	XHAQ	D28	DT	LIC	MEXICALI, BN	BLANKBPFS20050721AFZ	244.1
No	XHENB	D29	DT	LIC	ENSENADA, BN	BLANKBPFS20160301ABR	369.2
No	XHTIT	D29	DT	LIC	TIJUANA, BN	BLANKBPFS20091109AAC	339.9

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied:

Channel: D29
Mask: Stringent
Latitude: 34 36 9.00 N (NAD83)
Longitude: 114 22 16.00 W
Height AMSL: 408.0 m
HAAT: 54.0 m
Peak ERP: 15.0 kW
Antenna: Kat_4x1_750_0000049_E 350.0 deg
Elev Pattn: Generic

K29FD-D TVSTUDY INTERFERENCE ANALYSIS

50.2 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	0.039 kW	35.8 m	8.5 km
45.0	0.035	-7.4	7.6
90.0	0.286	-298.1	12.7
135.0	8.33	-5.2	27.4
180.0	10.3	255.9	51.9
225.0	0.475	173.6	31.4
270.0	0.028	113.4	13.8
315.0	0.045	167.8	19.2

Distance to Canadian border: 1600.3 km

**Proposal is within coordination distance of Mexican border

Distance to Mexican border: 211.8 km

Conditions at FCC monitoring station: Douglas AZ

Bearing: 126.8 degrees Distance: 558.4 km

Proposal is not within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:

Bearing: 50.0 degrees Distance: 1011.3 km

Study cell size: 1.00 km

Profile point spacing: 1.00 km

Maximum new IX to full-service and Class A: 0.50%

Maximum new IX to LPTV: 2.00%

Interference to BLANK0000071726 LIC scenario 1

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	K28PO-D	D28	LD	LIC	LAKE HAVASU CITY, AZ	BLANK0000071726	
Undesireds:	K29FD030	D29	LD	APP	LAKE HAVASU CITY, AZ	k29fd030	0.0 km
	KYPO-LD	D27	LD	LIC	TACNA, AZ	BLANK0000179279	114.1
	K27NR-D	D27	LD	LIC	TOPOCK, AZ	BLANK0000071723	48.2
	K28EU-D	D28	LD	LIC	LAUGHLIN, ETC., NV	BLDTT20120319ADY	79.3
Service area		Terrain-limited		IX-free, before		IX-free, after	Percent New IX
1389.2		55,923		1109.0		55,923	1.00 0.00
Undesired			Total IX		Unique IX, before		Unique IX, after
K29FD030 D29 LD APP			13.1		0		11.0 0
K27NR-D D27 LD LIC			4.0		3.0 0		3.0 0
K28EU-D D28 LD LIC			74.5		73.5 0		71.5 0

Interference to BLANK0000071727 LIC scenario 1

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	K29LO-D	D29	LD	LIC	KINGMAN, AZ	BLANK0000071727	
Undesireds:	K29FD030	D29	LD	APP	LAKE HAVASU CITY, AZ	k29fd030	68.1 km
	K29LM-D	D29	LD	LIC	COTTONWOOD, ETC., AZ	BLANK0000062886	168.8
	KTAZ	D29	DT	LIC	PHOENIX, AZ	BLANK0000190913	257.7
	K29GK-D	D29	LD	LIC	TWENTYNINE PALMS, ETC, CA	BLANK0000136621	218.4
	KVCW	D29	DD	LIC	LAS VEGAS, NV	BLANK0000159469	143.3
	K30LL-D	D30	LD	LIC	KINGMAN, AZ	BLDTT20111207AFE	0.1
Service area		Terrain-limited		IX-free, before		IX-free, after	Percent New IX
8917.0		80,743		6986.4		61,977	0.14 0.00
Undesired			Total IX		Unique IX, before		Unique IX, after
K29FD030 D29 LD APP			31.0		23		10.0 0
K29LM-D D29 LD LIC			3.0		3.0 0		3.0 0
KTAZ D29 DT LIC			1.0		1.0 0		1.0 0
KVCW D29 DD LIC			36.9		30.9 2		29.9 2
K30LL-D D30 LD LIC			175.1		395		169.1 352

K29FD-D TVSTUDY INTERFERENCE ANALYSIS

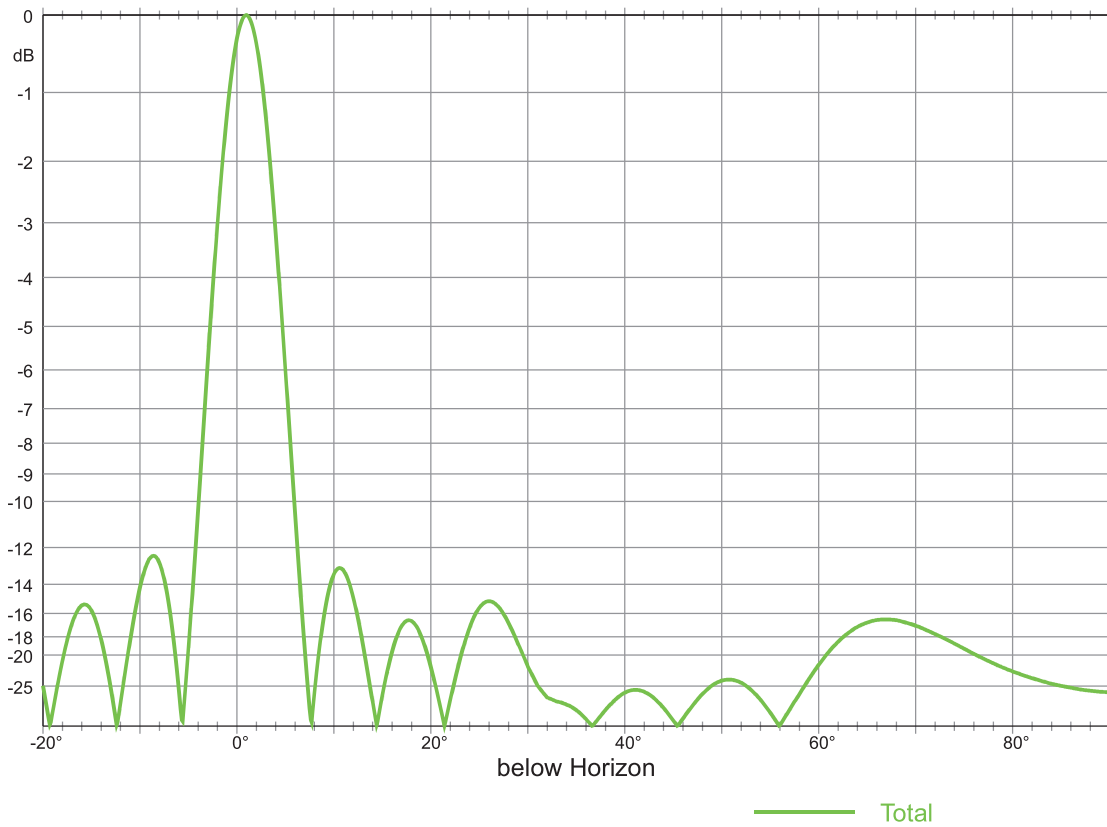
Interference to BLANK0000159469 LIC scenario 1

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	KVCW	D29	DD	LIC	LAS VEGAS, NV	BLANK0000159469	
Undesireds:	K29FD030	D29	LD	APP	LAKE HAVASU CITY, AZ	k29fd030	166.5 km
	KFTR-DT	D29	DT	LIC	ONTARIO, CA	BLCDT20100401AFY	341.4
	Service area		Terrain-limited		IX-free, before	IX-free, after	Percent New IX
	31427.0	1,967,558	19682.8	1,918,488	19682.8	1,918,488	19680.8 1,918,488 0.01 0.00
Undesired				Total IX	Unique IX, before	Unique IX, after	
K29FD030 D29 LD APP		2.0		0		2.0 0	

Interference to proposal scenario 1

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	K29FD030	D29	LD	APP	LAKE HAVASU CITY, AZ	k29fd030	
Undesireds:	K29LO-D	D29	LD	LIC	KINGMAN, AZ	BLANK0000071727	68.1 km
	K29GK-D	D29	LD	LIC	TWENTYNINE PALMS,ETC, CA	BLANK0000136621	156.8
	KVCW	D29	DD	LIC	LAS VEGAS, NV	BLANK0000159469	166.5
	K30LL-D	D30	LD	LIC	KINGMAN, AZ	BLDTT20111207AFE	68.3
	Service area		Terrain-limited		IX-free	Percent IX	
	2110.2	61,923	1537.4	56,344	1491.1	56,344	3.01 0.00
Undesired				Total IX	Unique IX	Prcnt Unique IX	
K29LO-D D29 LD LIC		45.3		0	26.2	0	1.70 0.00
KVCW D29 DD LIC		1.0		0	1.0	0	0.07 0.00
K30LL-D D30 LD LIC		19.1		0	0.0	0	0.00 0.00

Elevation Pattern (cartesian-linear)



Antenna, Order No. 7500000049
Number of Bays: 4

Frequency: 563 MHz
Elevation Directivity: 9.77 dBd
Directivity: 17.57 dBd
Downtilt: 1°
Compensation: 13.52 %

No.	Vert. Distance [mm]	Power	Phase [°]
4	3450	1	40.7
3	2300	1	27.2
2	1150	1	13.5
1	0	1	0