

TECHNICAL SUMMARY  
APPLICATION FOR CONSTRUCTION PERMIT  
LOW POWER DIGITAL STATION K24NG-D  
LAKE HAVASU CITY, ARIZONA  
CHANNEL 24 15 KW (DA)

1. Application Purpose: The instant application proposes to change the licensed K24NG-D directional antenna system from a Scala model 4DR-16S to a Kathrein model 4x1 750 0000049 E-pol panel array, increase the ERP from 2.34 kW (horizontal polarization) to 15 kW (elliptical polarization), decrease the antenna height by 6 meters and change the emission mask from stringent to full service. No other changes are proposed.

2. Interference Compliance: As indicated in the attached *TVStudy* analysis summary, K24NG-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 0.13 is presumed for the antenna's downward radiation ( $-60^{\circ}$  to  $-90^{\circ}$  elevation, see attached vertical plane relative field pattern). The calculated power density at a point 2 meters above ground level is  $189 \text{ uW/cm}^2$  which is 53.2% of the FCC's recommended limit of  $355.3 \text{ uW/cm}^2$  for channel 24 for an uncontrolled environment. Thus, it is believed that the proposed K24NG-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.

## K24NG-D TVSTUDY INTERFERENCE ANALYSIS

tvstudy v2.2.5 (4uoc83)  
Database: localhost, Study: k24ng030, Model: Longley-Rice  
Start: 2023.07.06 12:16:56

Study created: 2023.07.06 12:16:56

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

Proposal: K24NG030 D24 LD APP LAKE HAVASU CITY, AZ  
File number: k24ng030  
Facility ID: 43402  
Station data: User record  
Record ID: 450  
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	K22DR-D	N22	TX	LIC	LAUGHLIN, NV	BLTT19911118JJ	79.5 km
No	K23FV-D	D23	LD	LIC	KINGMAN, AZ	BLD TT20130308ABD	68.1
No	K23BJ-D	D23	LD	LIC	LAKE HAVASU CITY, AZ	BLANK0000177714	0.0
No	K23BJ-D	N23	TX	LIC	LAKE HAVASU CITY, AZ	BLTTL19891127JR	0.1
No	K23DK-D	D23	LD	LIC	MEADVIEW, AZ	BLD TT20130308ABX	142.3
No	K23NJ-D	D23	LD	LIC	PRESCOTT, ETC., AZ	BLANK0000058780	168.7
No	KVMD	D23	DD	LIC	TWENTYNINE PALMS, CA	BLANK0000145096	251.1
No	KLVD-LD	D23	LD	CP	LAS VEGAS, NV	BLANK0000216405	166.7
No	KLVD-LD	D23	LD	LIC	LAS VEGAS, NV	BLD TL20110728ADN	166.7
Yes	K24DK-D	D24	LD	LIC	BULLHEAD CITY, AZ	BLD TT20110328ABJ	48.2
No	K24KS-D	D24	LD	LIC	FLAGSTAFF, AZ	BLD TT20111201MML	262.5
Yes	KTVK	D24	DT	LIC	PHOENIX, AZ	BLANK0000150263	255.2
No	K24NI-D	D24	LD	LIC	YUMA, AZ	BLANK0000064203	218.6
No	K24LS-D	D24+	LD	LIC	LUCERNE VALLEY, CA	BLANK0000115882	266.8
No	K24ON-D	D24	LD	LIC	RIDGECREST, CA	BLANK0000214555	316.8
No	KPXN-TV	D24	DT	LIC	SAN BERNARDINO, CA	BLANK0000068510	341.5
No	KBNT-CD	D24	DC	LIC	SAN DIEGO, CA	BLANK0000068521	330.5
Yes	KVVU-TV	D24	DT	CP	HENDERSON, NV	BLANK0000185177	166.4
No	KEGS-LD	D24	LD	LIC	LAS VEGAS, NV	BLD TL20100104ABL	161.3
No	K24NE-D	D24	LD	LIC	OVERTON, NV	BLANK0000137688	231.9
No	K24BY-D	D24	LD	LIC	PAHRUMP, NV	BLD TT20120502ABQ	230.3
No	K24MY-D	D24	LD	LIC	KANARRAVILLE, UT	BLANK0000091241	337.4
No	K47MF-D	D24	LD	LIC	ORDERVILLE, UT	BLANK0000059976	335.8
No	K24CY-D	D24	LD	LIC	ST. GEORGE, UT	BLANK0000146926	282.9
No	K24CY-D	N24	TX	LIC	ST. GEORGE, UT	BLTT19930730JE	282.9
No	K25PJ-D	D25	LD	LIC	CHLORIDE, AZ	BLANK0000071721	90.1
No	K25DH-D	D25	LD	LIC	MEADVIEW, AZ	BLD TT20130308ABY	142.3
No	K25OM-D	D25	LD	LIC	PRESCOTT, AZ	BLANK0000058628	168.3
No	KJPO-LD	D25	LD	LIC	TONOPAH, AZ	BLANK0000151024	166.3
No	K25QN-D	D25	LD	CP	DESERT CENTER, CA	BNPDTL20100514ACT	130.2
No	DK25GK	N25+	TX	APP	JOSHUA TREE, CA	BLTT20000605AOK	156.8
No	KPVM-LD	D25	LD	LIC	LAS VEGAS, NV	BLANK0000112505	161.3
No	KYPO-LD	N27	TX	LIC	TACNA, AZ	BLTTL20080818AAL	114.1
No	CADENATRES	D24	DT	LIC	ENSENADA, BN	BLANKBPFS20160524AAT	368.7
No	XHEXT	D25	DT	LIC	MEXICALI, BN	BLANKBPFS20050721BFG	244.1

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied:

Channel: D24  
Mask: Full Service  
Latitude: 34 36 9.00 N (NAD83)  
Longitude: 114 22 16.00 W  
Height AMSL: 402.0 m  
HAAT: 48.0 m  
Peak ERP: 15.0 kW  
Antenna: Kat\_4x1\_750\_0000049\_E 350.0 deg  
Elev Pattnr: Generic

49.8 dBu contour:  
Azimuth ERP HAAT Distance

# K24NG-D TVSTUDY INTERFERENCE ANALYSIS

0.0 deg	0.049 kW	29.8 m	8.5 km
45.0	0.042	-13.4	8.2
90.0	0.394	-304.1	14.2
135.0	8.80	-11.2	28.2
180.0	10.7	249.9	52.3
225.0	0.633	167.6	33.0
270.0	0.033	107.4	14.4
315.0	0.052	161.8	20.1

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 BLDTT20110328ABJ LIC scenario 1

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance		
	K24DK-D	D24	LD	LIC	BULLHEAD CITY, AZ	BLDTT20110328ABJ			
Undesireds:	K24NG030	D24	LD	APP	LAKE HAVASU CITY, AZ	k24ng030	48.2 km		
	K23BJ-D	D23	LD	LIC	LAKE HAVASU CITY, AZ	BLANK0000177714	48.2		
	KLVD-LD	D23	LD	CP	LAS VEGAS, NV	BLANK0000216405	122.6		
	KVVU-TV	D24	DT	CP	HENDERSON, NV	BLANK0000185177	122.3		
	K24CY-D	D24	LD	LIC	ST. GEORGE, UT	BLANK0000146926	236.6		
Service area		Terrain-limited		IX-free, before		IX-free, after	Percent New IX		
2781.3		76,295		2399.6		74,312	2365.6		
						74,299	2357.6		
						74,299	0.34		
						74,299	0.00		
Undesired				Total IX	Unique IX, before	Unique IX, after			
K24NG030 D24 LD APP				8.0	0	8.0	0		
KVVU-TV D24 DT CP				33.9	13	33.9	13		

## ----- Interference to BLANK0000150263 LIC scenario 1

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance		
	KTVK	D24	DT	LIC	PHOENIX, AZ	BLANK0000150263			
Undesireds:	K24NG030	D24	LD	APP	LAKE HAVASU CITY, AZ	k24ng030	255.2 km		
	KVOA	D23	DT	LIC	TUCSON, AZ	BLCDT20071113AJK	162.1		
	KVVU-TV	D24	DT	CP	HENDERSON, NV	BLANK0000185177	400.8		
	KMSB	D25	DT	LIC	TUCSON, AZ	BLCDT20050623ABE	162.1		
	XHNOA	D24	DT	LIC	NOGALES, SO	BLANKBPFS20111108ADH	249.2		
Service area		Terrain-limited		IX-free, before		IX-free, after	Percent New IX		
39127.7		4,184,336		32182.7		4,173,012	32137.6		
						4,172,368	32136.6		
						4,172,368	0.00		
						4,172,368	0.00		
Undesired				Total IX	Unique IX, before	Unique IX, after			
K24NG030 D24 LD APP				1.0	0	1.0	0		
KVOA D23 DT LIC				15.0	4	0.0	0		
KMSB D25 DT LIC				25.0	49	10.0	45		
XHNOA D24 DT LIC				21.0	595	20.0	595		

## ----- Interference to BLANK0000185177 CP scenario 1

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	KVVU-TV	D24	DT	CP	HENDERSON, NV	BLANK0000185177	

# K24NG-D TVSTUDY INTERFERENCE ANALYSIS

Undesireds: K24NG030 D24 LD APP LAKE HAVASU CITY, AZ k24ng030 166.4 km

Service area	Terrain-limited	IX-free, before	IX-free, after	Percent New IX
35861.1 1,982,766	23403.0 1,924,810	23403.0 1,924,810	23385.0 1,924,810	0.08 0.00

Undesired	Total IX	Unique IX, before	Unique IX, after
K24NG030 D24 LD APP 17.9	0		17.9 0

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Interference to proposal scenario 1

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	K24NG030	D24	LD	APP	LAKE HAVASU CITY, AZ	k24ng030	

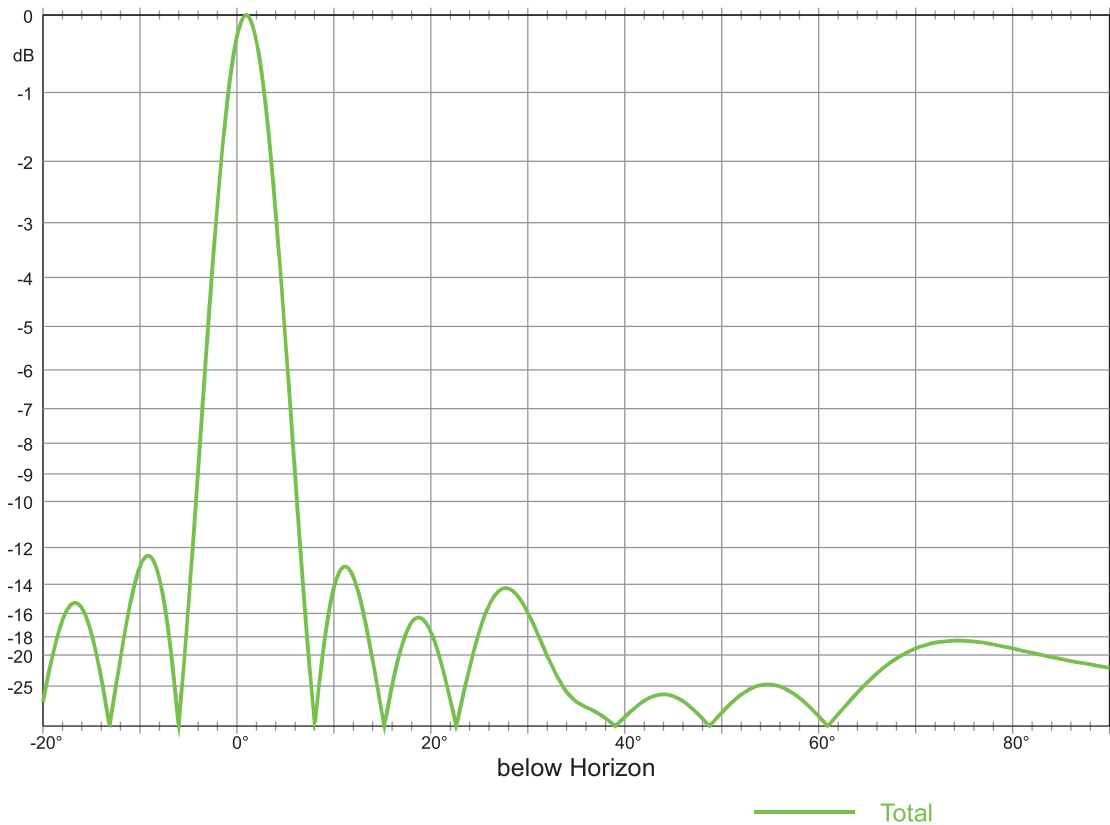
Undesireds:	K23BJ-D	D23	LD	LIC	LAKE HAVASU CITY, AZ	BLANK0000177714	0.0 km
	K24DK-D	D24	LD	LIC	BULLHEAD CITY, AZ	BLD TT20110328ABJ	48.2
	KVVU-TV	D24	DT	CP	HENDERSON, NV	BLANK0000185177	166.4
	K24CY-D	D24	LD	LIC	ST. GEORGE, UT	BLANK0000146926	282.9

Service area	Terrain-limited	IX-free	Percent IX
2209.8 63,479	1590.8 56,345	1563.6 56,343	1.71 0.00

Undesired	Total IX	Unique IX	Prcnt Unique IX
K24DK-D D24 LD LIC 12.1	0	11.1	0.70 0.00
KVVU-TV D24 DT CP 16.1	2	15.1	0.95 0.00

Subject to alternation

Elevation Pattern (cartesian-linear)



Antenna, Order No. 7500000049

Number of Bays: 4

Frequency: 533 MHz

Elevation Directivity: 9.56 dBd

Directivity: 17.14 dBd

Downtilt: 1°

Compensation: 12.13 %

No.	Vert. Distance [mm]	Power	Phase [°]
4	3450	1	38.5
3	2300	1	25.7
2	1150	1	12.8
1	0	1	0