

Engineering Statement

prepared for

Gray Television Licensee, LLC

New(DT) Yuma, AZ

Facility ID 776268

Ch. 27 100 kW 452 m

This engineering statement has been prepared on behalf of *Gray Television Licensee, LLC* (“*Gray*”), permittee of a new full power digital television (DT) station at Yuma, AZ (Facility ID 776268) in support of a *Petition for Rulemaking* to amend §73.622(j) by changing the facility’s channel assignment. The New(DT) facility is authorized to operate on Channel 11 (file number 0000195675). As described herein, *Gray* requests substitution of Channel 27 in lieu of Channel 11 for Yuma, AZ.

The New(DT) Channel 11 assignment is in the VHF spectrum and which has proven to be ineffective for satisfactory viewer reception as discussed herein and elsewhere in the petition. The use of Channel 27 would place the New(DT) facility in the UHF spectrum which is known to provide robust signal levels for home reception.

Gray’s experience in other markets is that many viewers experience significant difficulty in receiving VHF television signals. Problems with digital VHF reception by stations in many markets have been widely publicized since the 2009 digital transition date. It has been established that indoor reception is difficult for digital VHF stations due to the longer wavelength signal’s inability to readily pass through building construction materials, the ineffectiveness of many indoor antennas many of which were designed to emphasize the shorter wavelengths for UHF reception, and high levels of manmade and environmental noise.

No change in transmitting location is proposed. The authorized New(DT) facility tower structure corresponds to FCC Antenna Structure Registration (“ASR”) number 1225054. As with the authorized Channel 11 facility, *Gray* proposes to implement the Channel 27 substitution with a side-mounted transmitting antenna on the existing tower structure.

The New(DT) Channel 11 facility is authorized to operate with 5 kW effective radiated power (“ERP”) directional at 452 meters antenna height above average terrain (“HAAT”). Gray proposes herein to utilize 100 kW ERP directional on Channel 27 at 452 meters antenna HAAT.

A summary of the authorized Channel 11 and proposed Channel 27 technical parameters is provided in the following.

Authorized Channel 11 Parameters (file# 0000195675)

FacID	Call	Ch	City	St	Lat	Lon	RCAMSL	HAAT	ERP	DA
776268	(New)	11	YUMA	AZ	330319.1	1144946.9	730.7	451.6	5	DA

Proposed Channel 27 Parameters

FacID	Call	Ch	City	St	Lat	Lon	RCAMSL	HAAT	ERP	DA
776268	(New)	27	YUMA	AZ	330319.1	1144946.9	730.7	451.6	100	DA

The proposed directional antenna azimuthal pattern, a wide cardioid oriented at 200°T, is plotted in Figure 1. A map is supplied as Figure 2 which depicts the standard predicted coverage contours. As demonstrated thereon, the proposed facility complies with §73.625(a)(1) as the entire community of Yuma will be encompassed by the 48 dBμ contour.

Interference study per FCC OET Bulletin 69¹ shows that the proposal complies with the 0.5 percent limit of new interference caused to pertinent nearby full service and Class A television stations as required by §73.616. The interference study output report is provided as Table 1.

The site location is 38.2 km to the U.S. – Mexico border, within the international coordination zone. The “TVStudy” analysis of Table 1 includes non-US records from current FCC

¹FCC Office of Engineering and Technology Bulletin number 69, *Longley-Rice Methodology for Evaluating TV Coverage and Interference*, February 6, 2004 (“OET-69”). This analysis employed the FCC’s current “TVStudy” software with the default application processing template settings, 2 km cell size, and 1 km terrain increment. Comparisons of various results of this computer program (run on a Mac processor) to the FCC’s implementation of TVStudy show excellent correlation.

LMS data and shows that no Mexican station would receive any new interference from the proposed Channel 27 substitution.

Conclusion

The proposed channel substitution complies with the FCC's principal community coverage requirements of §73.625 and the interference protection requirements of §73.616.

List of Attachments

Figure 1 Antenna Azimuthal Pattern
Figure 2 Proposed Coverage Contours
Table 1 TVStudy Analysis of Proposal

Chesapeake RF Consultants, LLC

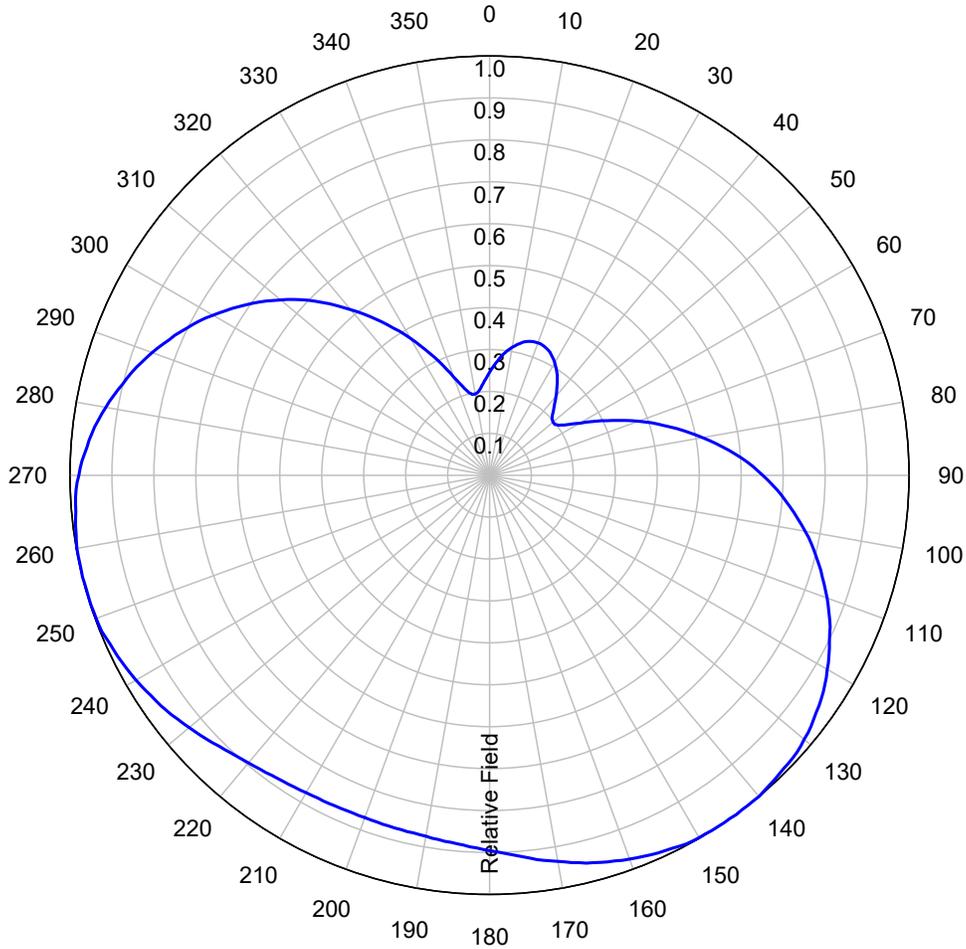
Joseph M. Davis, P.E. October 24, 2022
207 Old Dominion Road Yorktown, VA 23692 703-650-9600

AZIMUTH PATTERN

Type: ATW-C2
 Directivity: Numeric 1.80 dBd 2.55
 Peak(s) at: _____

Channel: 27
 Location: Yuma, AZ
 Polarization: Horizontal

Note: Pattern shape and directivity may vary with channel and mouting configuration.



Preliminary, subject to final design and review.

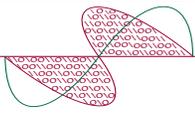
ELECTRONICS RESEARCH, INC. **ERI**



Figure 1
Antenna Azimuthal Pattern
New(DT) Yuma, AZ
Facility ID 776268
Ch. 27 100 kW 452 m

prepared for
Gray Television Licensee, LLC

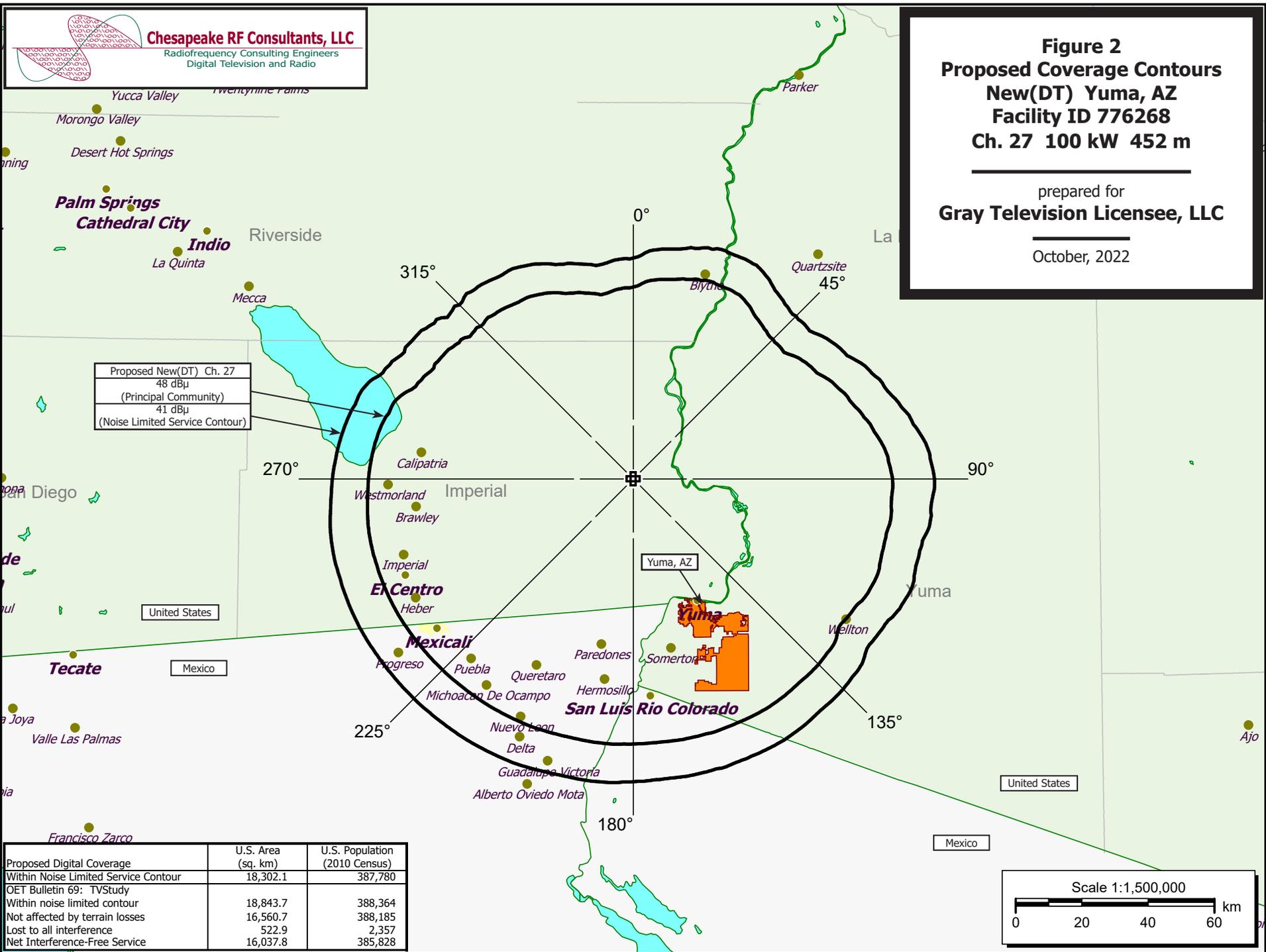
October, 2022



Chesapeake RF Consultants, LLC
 Radiofrequency Consulting Engineers
 Digital Television and Radio

Figure 2
Proposed Coverage Contours
New(DT) Yuma, AZ
Facility ID 776268
Ch. 27 100 kW 452 m

prepared for
Gray Television Licensee, LLC
 October, 2022



Proposed New(DT) Ch. 27
 48 dBµ
 (Principal Community)
 41 dBµ
 (Noise Limited Service Contour)

Proposed Digital Coverage	U.S. Area (sq. km)	U.S. Population (2010 Census)
Within Noise Limited Service Contour	18,302.1	387,780
OET Bulletin 69: TVStudy		
Within noise limited contour	18,843.7	388,364
Not affected by terrain losses	16,560.7	388,185
Lost to all interference	522.9	2,357
Net Interference-Free Service	16,037.8	385,828

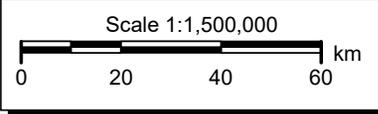


Table 1 New Ch. 27 TVStudy Analysis of Proposal
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tvstudy v2.2.5 (4uoc83)
Database: localhost, Study: New-27 1225054 ERI-C2 100kW, Model: Longley-Rice
Start: 2022.10.24 11:32:47

Study created: 2022.10.24 11:32:46

Study build station data: LMS TV 2022-10-20

Proposal: NEW-27 D27 DT APP YUMA, AZ
File number: New-27 1225054 ERI-C2 100kW
Facility ID: 776268
Station data: User record
Record ID: 4723
Country: U.S.
Zone: II

Build options:
Protect pre-transition records not on baseline channel

Search options:
Non-U.S. records included
Baseline record excluded if station has CP

Stations potentially affected by proposal:

IX	Call	Chan	Svc	Status	City, State	File Number	Distance
No	KUTP	D26	DT	LIC	PHOENIX, AZ	BLCDT20130625AAK	259.3 km
Yes	KMIR-TV	D26	DT	LIC	PALM SPRINGS, CA	BLANK0000075143	174.0
No	KSWB-TV	D26	DT	LIC	SAN DIEGO, CA	BLANK0000068712	200.6
No	KTVW-CD	D27	DC	LIC	FLAGSTAFF/DONEY PARK, AZ	BLDTA20140421ACI	372.5
Yes	KASW	D27	DD	CP	PHOENIX, AZ	BLANK0000116045	259.2
Yes	KVER-CD	D27	DC	LIC	INDIO, CA	BLANK0000074955	173.9
No	KPOM-CD	D27	DC	LIC	ONTARIO, CA	BLANK0000189414	325.6
No	KESQ-TV	D28	DT	LIC	PALM SPRINGS, CA	BLANK0000078362	174.0
No	XHEBC	D26	DT	BL	ENSENADA, BN	DTVBL704628	214.0
No	XHSFB	D26	DT	BL	SAN FELIPE, BN	DTVBL704644	225.9
No	XHBJ	D27	DT	BL	TIJUANA, BN	DTVBL704655	215.5
No	XHAQ	D28	DT	LIC	MEXICALI, BN	BLANKBPFS20050721AFZ	78.7
No	XHJK	D28	DT	LIC	TIJUANA, BN	BLANKBPFS20091104ADT	215.4

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied:

Channel: D27
Latitude: 33 3 19.10 N (NAD83)
Longitude: 114 49 46.90 W
Height AMSL: 730.7 m
HAAT: 451.6 m
Peak ERP: 100 kW
Antenna: ERI ATW-C2 200.0 deg
Elev Pattn: Generic
Elec Tilt: 0.75

40.0 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	6.05 kW	365.4 m	68.0 km
45.0	4.91	432.0	70.7
90.0	42.4	560.5	92.5
135.0	97.8	444.4	91.1
180.0	80.1	494.9	93.0
225.0	83.7	521.4	95.4
270.0	95.8	468.0	92.5
315.0	34.0	326.3	75.6

Distance to Canadian border: 1772.3 km

**Proposal is within coordination distance of Mexican border
Distance to Mexican border: 38.2 km

Conditions at FCC monitoring station: Douglas AZ

Table 1 New Ch. 27 TVStudy Analysis of Proposal
(page 2 of 3)



Bearing: 108.2 degrees Distance: 516.1 km

Proposal is not within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:
Bearing: 44.7 degrees Distance: 1159.2 km

Study cell size: 2.00 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 BLANK0000075143 LIC scenario 1

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	KMIR-TV	D26	DT	LIC	PALM SPRINGS, CA	BLANK0000075143	
Undesireds:	NEW-27	D27	DT	APP	YUMA, AZ	New-27 1225054 ERI-C2	174.0 km
	KVEA	D25	DT	LIC	CORONA, CA	BLANK0000136469	155.4
	KUVI-DT	D26	DT	LIC	BAKERSFIELD, CA	BLANK0000081232	273.8
	KSWB-TV	D26	DT	LIC	SAN DIEGO, CA	BLANK0000068712	138.2
	KSKJ-CD	D26	DC	LIC	VAN NUYS, CA	BLANK0000071612	154.8
	KTNV-TV	D26	DT	APP	LAS VEGAS, NV	BLANK0000145120	263.5
	KPOM-CD	D27	DC	LIC	ONTARIO, CA	BLANK0000189414	154.9
	XHEXT	D25	DT	BL	MEXICALI, BN	DTVBL704637	164.8

Service area	Terrain-limited	IX-free, before	IX-free, after	Percent New IX
24915.7	2,760,914	12602.4	717,156	0.39

Undesired	Total IX	Unique IX, before	Unique IX, after
NEW-27 D27 DT APP	48.0	0	0
KVEA D25 DT LIC	40.1	8,838	335
KUVI-DT D26 DT LIC	12.0	0	0
KSWB-TV D26 DT LIC	104.2	12,535	4,037
KSKJ-CD D26 DC LIC	20.0	31	0
KTNV-TV D26 DT APP	100.0	499	463
KPOM-CD D27 DC LIC	16.0	490	234
XHEXT D25 DT BL	4.0	0	0

Interference to BLANK0000116045 CP scenario 1

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	KASW	D27	DD	CP	PHOENIX, AZ	BLANK0000116045	
Undesireds:	NEW-27	D27	DT	APP	YUMA, AZ	New-27 1225054 ERI-C2	259.2 km
	KUTP	D26	DT	LIC	PHOENIX, AZ	BLCDT20130625AAK	0.1
	KTVW-CD	D27	DC	LIC	FLAGSTAFF/DONEY PARK, AZ	BLDTA20140421ACI	188.7
	KUAS-TV	D28	DT	LIC	TUCSON, AZ	BLEDT20030115ABS	158.8

Service area	Terrain-limited	IX-free, before	IX-free, after	Percent New IX
35441.3	4,174,437	28722.6	4,161,631	0.17

Undesired	Total IX	Unique IX, before	Unique IX, after
NEW-27 D27 DT APP	48.1	0	0
KUTP D26 DT LIC	100.1	7	7
KTVW-CD D27 DC LIC	24.0	13	13
KUAS-TV D28 DT LIC	4.0	0	0

Interference to BLANK0000074955 LIC scenario 1

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	KVER-CD	D27	DC	LIC	INDIO, CA	BLANK0000074955	
Undesireds:	NEW-27	D27	DT	APP	YUMA, AZ	New-27 1225054 ERI-C2	173.9 km
	KMIR-TV	D26	DT	LIC	PALM SPRINGS, CA	BLANK0000075143	0.1
	KPOM-CD	D27	DC	LIC	ONTARIO, CA	BLANK0000189414	154.9
	KESQ-TV	D28	DT	LIC	PALM SPRINGS, CA	BLANK0000078362	0.1

Table 1 New Ch. 27 TVStudy Analysis of Proposal
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Service area	Terrain-limited	IX-free, before	IX-free, after	Percent New IX
7485.4 625,728	5161.3 446,703	5085.1 435,369	5021.2 434,420	1.26 0.22
Undesired	Total IX	Unique IX, before	Unique IX, after	
NEW-27 D27 DT APP	79.9 1,340		63.9 949	
KMIR-TV D26 DT LIC	60.1 7,010	16.1 418	8.0 27	
KPOM-CD D27 DC LIC	8.0 4,324	8.0 4,324	8.0 4,324	
KESQ-TV D28 DT LIC	52.1 6,592	8.0 0	4.0 0	

Interference to proposal scenario 1
0.61% interference received

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	NEW-27	D27	DT	APP	YUMA, AZ	New-27 1225054 ERI-C2	
Undesireds:	KMIR-TV	D26	DT	LIC	PALM SPRINGS, CA	BLANK0000075143	174.0 km
	KASW	D27	DD	CP	PHOENIX, AZ	BLANK0000116045	259.2
	KVER-CD	D27	DC	LIC	INDIO, CA	BLANK0000074955	173.9
	XHAQ	D28	DT	LIC	MEXICALI, BN	BLANKBPFS20050721AFZ	78.7

Service area	Terrain-limited	IX-free	Percent IX
18843.7 388,364	16560.7 388,185	16037.8 385,828	3.16 0.61
4211.0 1,061,221	4211.0 1,061,221	4134.6 1,024,532	1.81 3.46 (in Mexico)
Undesired	Total IX	Unique IX	Prcnt Unique IX
KMIR-TV D26 DT LIC	12.0 2	0.0 0	0.00 0.00
KASW D27 DD CP	40.1 852	36.1 7	0.22 0.00
KVER-CD D27 DC LIC	431.0 2,350	375.1 1,503	2.27 0.39
XHAQ D28 DT LIC	95.7 0	55.8 0	0.34 0.00
XHAQ D28 DT LIC	76.4 36,689	76.4 36,689	1.81 3.46 (in Mexico)