

ENGINEERING EXHIBIT

FM Translator Minor Modification of a Licensed Facility

prepared for

Board of Trustees California State University for San Diego State University

K206AC San Diego, CA

Facility ID 62951

Ch. 206 89.1 MHz 0.05 kW

Board of Trustees California State University for San Diego State University (“SDSU”) is the licensee of FM translator station K206AC, Channel 206, Facility ID 62951, San Diego CA. K206AC is licensed (BLFT-19830524MK) to operate with 0.004 kW (4 Watts) effective radiated power (“ERP”) with a nondirectional antenna. *SDSU* seeks a minor modification of K206AC to specify an increase in ERP to 0.05 kW (50 Watts) and to correct the facility’s geographic coordinates. No change in actual antenna location is sought.

The existing non-directional antenna will not be changed and is currently side-mounted on a rooftop antenna support structure having FCC Antenna Structure Registration (“ASR”) number 1015342. No change to overall structure height is proposed. Revised site coordinates are provided as follows to correspond to the ASR.

		<u>N-Latitude</u>	<u>W-Longitude</u>
Licensed K206AC	(NAD-83)	32° 50’ 46.1”	117° 16’ 36.1”
Corrected K206AC	(NAD-83)	32° 50’ 53.1”	117° 16’ 35.1”

The K206AC antenna is a single bay, circularly polarized Shively model 6812-1. Figure 1 depicts the 60 dB μ contours of the licensed and the proposed K206AC facilities. The service area overlap shows compliance with the minor change requirements of §74.1233.

Fill-In Compliance

K206AC will be a fill-in translator for the HD-2 program of *SDSU*’s primary station KPBS-FM (Ch. 208B, Facility ID 58823, San Diego CA). The 60 dB μ contour of the proposed

translator is encompassed by that of KPBS-FM, as depicted in Figure 2. As a fill-in translator, the proposed 0.05 kW ERP complies with §74.1235(a). Final signal delivery of the audio programming material to the translator will be accomplished via a direct off-air feed.

§74.1204 Interference Protection (FM and FM Translator stations)

Table 1 supplies a summary of the proposal's compliance with the interference protection requirements of §74.1204(a) and (g). The proposed facility complies with the prohibited contour overlap requirements of §74.1204(a) regarding all FM full power, low power, and translator stations except with respect to KPBS-FM. The proposal complies with §74.1204(d) with respect to KPBS-FM.

As described in FCC 02-244¹ the "ratio" undesired-to-desired signal method of interference determination may be used by an FM translator applicant to demonstrate compliance with §74.1204(d). KPBS-FM is on a second adjacent channel and is located 2.7 km from the K206AC translator site. The KPBS-FM signal level at the K206AC site is 111 dB μ based on standard FCC F(50,50) propagation curves. The corresponding undesired interfering signal level is 151 dB μ .

At the proposed ERP of 0.05 kW, the translator's worst-case (free space) 151 dB μ interfering signal extends 1.5 meters. Since this region is immediately adjacent to the antenna and inaccessible, no populated areas will be affected. Thus, the proposal complies with §74.1204(d) with respect to KPBS-FM.

§74.1205 Interference Protection (TV Ch. 6)

There are no full-power or Class A television stations authorized to operate on TV Channel 6 within 137 km of the K206AC site.

¹*Living Way Ministries, Inc.* Memorandum Opinion and Order, Released September 9, 2002, FCC 02-244, 17 FCC Red 17054-60.

§74.1235 Interference Protection (Mexico)

The K206AC site is located 37.6 km from the US-Mexico border. As demonstrated in Figure 3, the proposal complies with §74.1235(d)(1) for FM translator stations located within 125 km of the US-Mexican border. The proposed ERP does not exceed 0.05 kW in the direction of the Mexican border, does not produce an interfering contour in excess of 32 km from the transmitter site in the direction of the Mexican border, nor does the 60 dBu service contour exceed 8.7 km from the transmitter site in the direction of the Mexican border.

Human Exposure to Radiofrequency Electromagnetic Field (Environmental)

The proposed operation was evaluated for human exposure to RF energy using the procedures outlined in the FCC's OET Bulletin Number 65. The rooftop mounted transmitting antenna is a Shively model 6812-1 consisting of one element. According to the FCC's "FMModel" software analysis,² the graph in Figure 4 depicts calculated power density levels attributable to the proposed facility at locations near the building at a height of two meters above ground level. That analysis shows that the maximum calculated RF electromagnetic field attributable to the proposed K206AC is 0.5 $\mu\text{W}/\text{cm}^2$, which is 0.3 percent of the general population/uncontrolled maximum permitted exposure limit. This is well below the five percent threshold limit described in §1.1307(b) regarding sites with multiple emitters, categorically excluding the applicant from responsibility for taking any corrective action in the areas where the proposal's contribution is less than five percent.

The transmitting antenna is centered 9.8 meters above the main building rooftop. At two meters above the main rooftop level, FMModel shows that the maximum calculated RF electromagnetic field attributable to the proposed K206AC is 59.7 $\mu\text{W}/\text{cm}^2$, which is 29.9 percent of the general population/uncontrolled maximum permitted exposure limit. Since there are other emitters on the building's rooftop, upon construction of the proposed facility *SDSU* will conduct RF exposure measurements to evaluate the level of RF exposure resulting from the proposed facility. Measurements will be taken on the roof and at any appropriate locations within the building to determine if there are any areas that exceed FCC guidelines for human exposure to RF electromagnetic field. Based on these results appropriate exposure abatement procedures will be

²"Office of Engineering and Technology Announces Updates to FMModel Software," Public Notice,

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established and followed in order to comply with the FCC's exposure limits. Such abatement procedures may involve the restriction of access to certain areas and/or facility modifications to reduce RF levels. RF exposure warning signs will be posted near the antenna.

Environmental matters covered by this exhibit are limited to the evaluation of exposure to RF electromagnetic field. The proposal involves use of an existing rooftop-mounted transmitting antenna. No change in structure height is proposed.

List of Attachments

Figure 1	Coverage Contour Comparison
Figure 2	Coverage Contours – Primary and Translator Stations
Figure 3	Compliance with §74.1235(d)(1)
Figure 4	RF Electromagnetic Field – FCC FMModel Results
Table 1	Channel Allocation Summary

Chesapeake RF Consultants, LLC

Joseph M. Davis, P.E. August 29, 2023
207 Old Dominion Road Yorktown, VA 23692 703-650-9600

Figure 1
Coverage Contour Comparison
K206AC San Diego, CA
Facility ID 62951
Ch. 206 89.1 MHz 0.05 kW

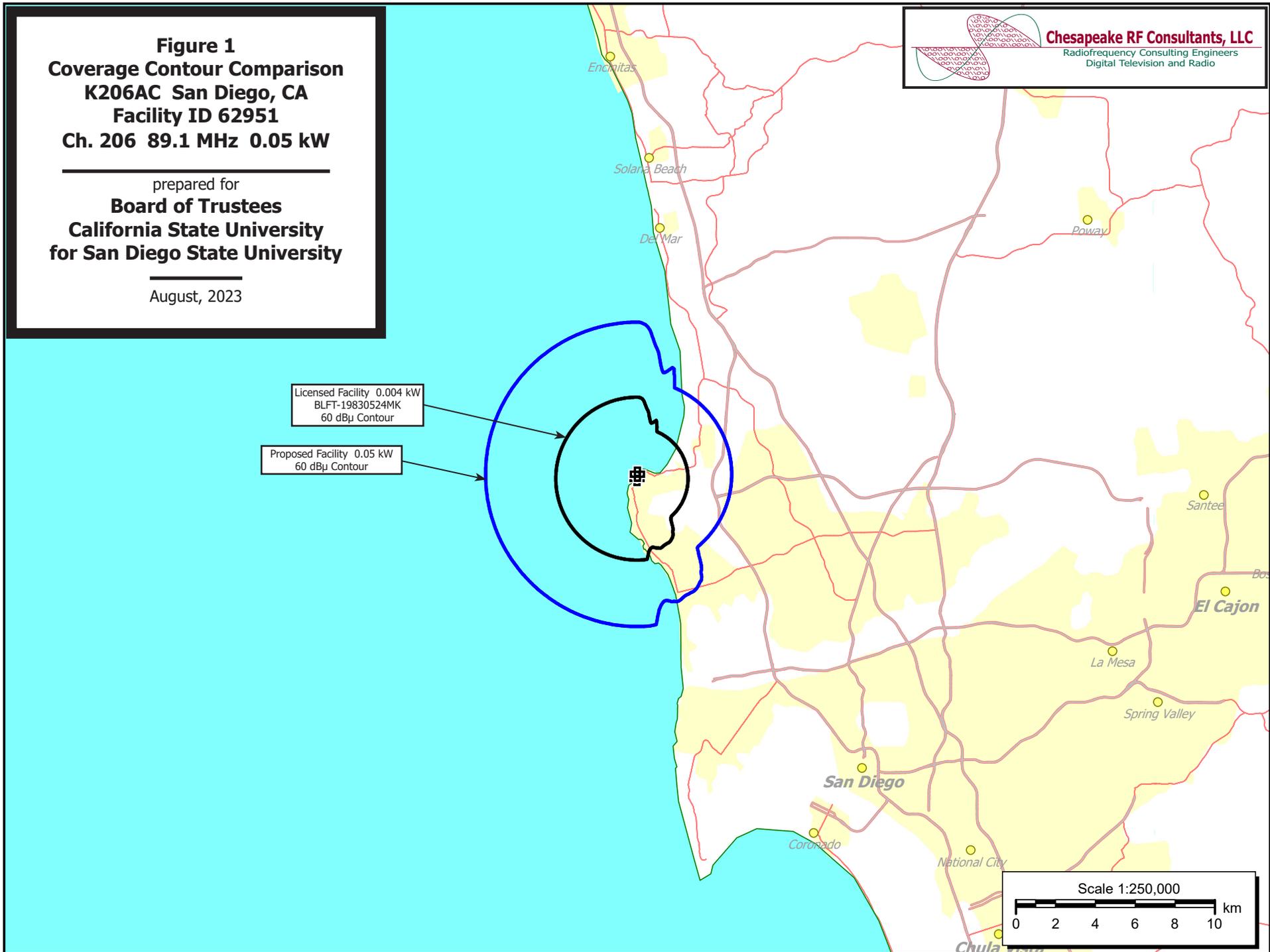
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California State University
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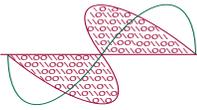
August, 2023



Licensed Facility 0.004 kW
BLFT-19830524MK
60 dB μ Contour

Proposed Facility 0.05 kW
60 dB μ Contour



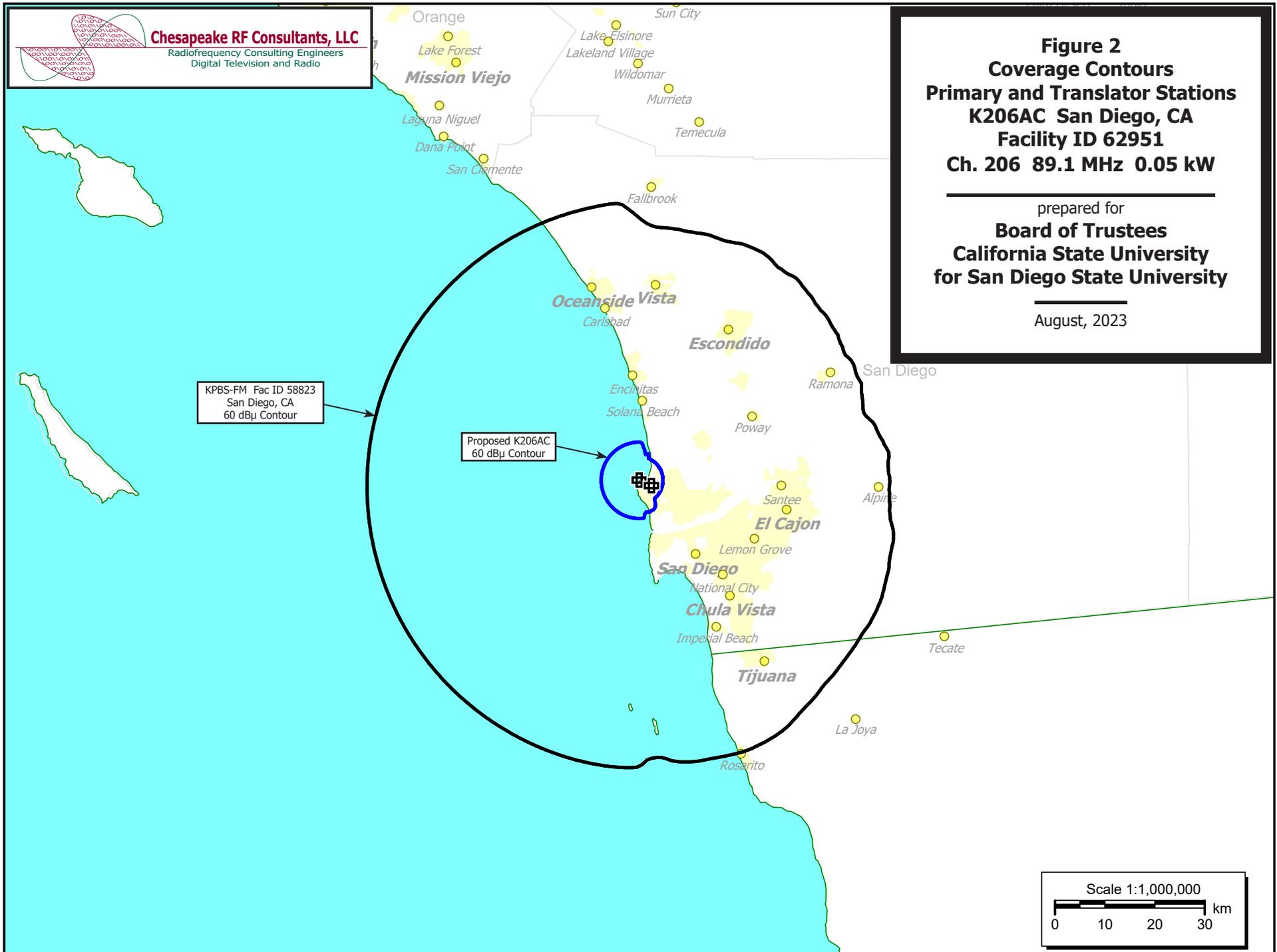


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Figure 2
Coverage Contours
Primary and Translator Stations
K206AC San Diego, CA
Facility ID 62951
Ch. 206 89.1 MHz 0.05 kW

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KPBS-FM Fac ID 58823
San Diego, CA
60 dBu Contour

Proposed K206AC
60 dBu Contour

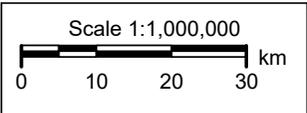
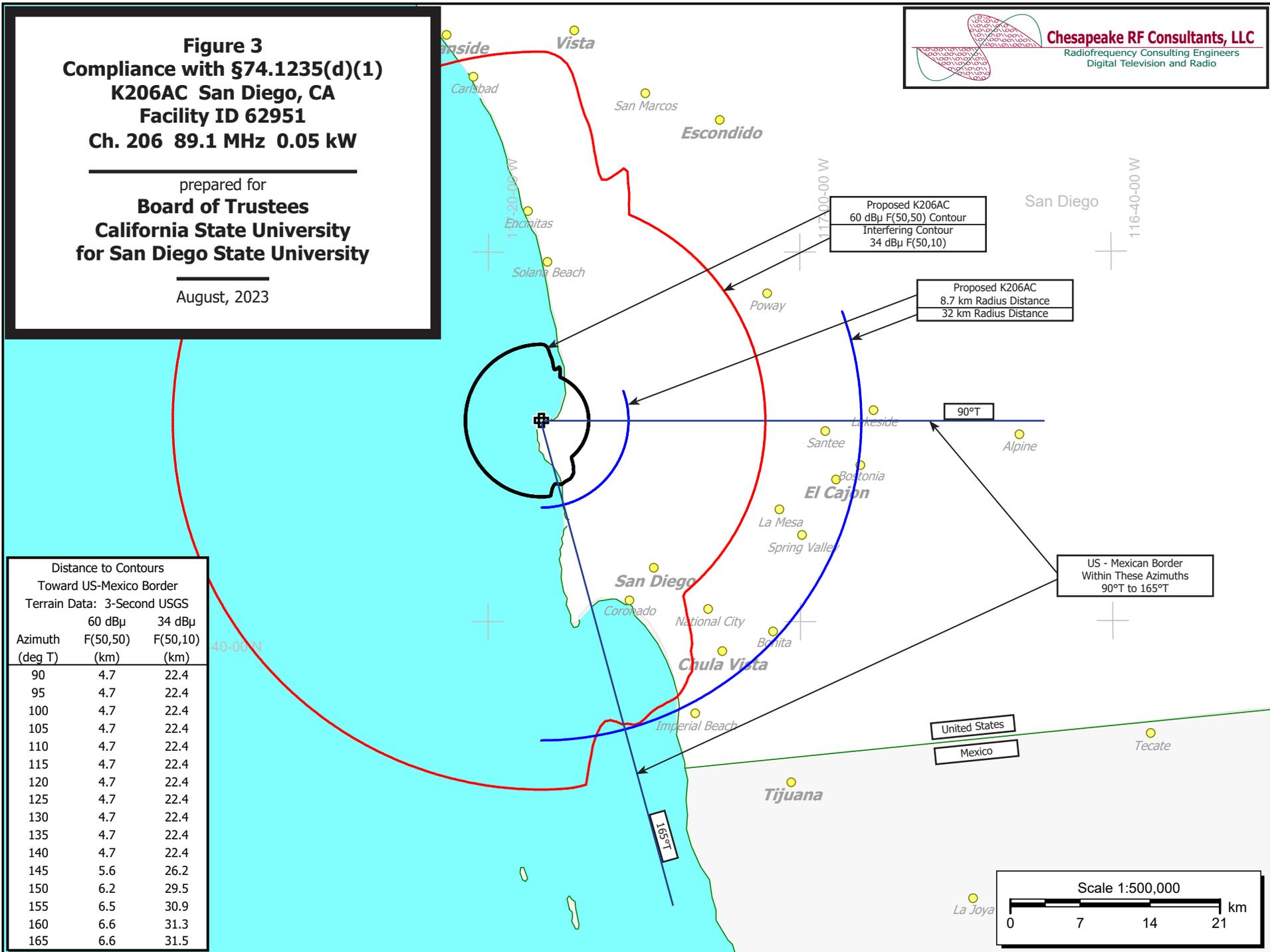


Figure 3
Compliance with §74.1235(d)(1)
K206AC San Diego, CA
Facility ID 62951
Ch. 206 89.1 MHz 0.05 kW

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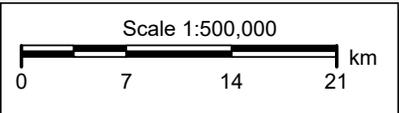
Proposed K206AC
 60 dBµ F(50,50) Contour
 Interfering Contour
 34 dBµ F(50,10)

Proposed K206AC
 8.7 km Radius Distance
 32 km Radius Distance

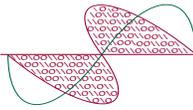
90°T

US - Mexican Border
 Within These Azimuths
 90°T to 165°T

United States
 Mexico



Distance to Contours		
Toward US-Mexico Border		
Terrain Data: 3-Second USGS		
Azimuth (deg T)	60 dBµ F(50,50)	34 dBµ F(50,10)
	(km)	(km)
90	4.7	22.4
95	4.7	22.4
100	4.7	22.4
105	4.7	22.4
110	4.7	22.4
115	4.7	22.4
120	4.7	22.4
125	4.7	22.4
130	4.7	22.4
135	4.7	22.4
140	4.7	22.4
145	5.6	26.2
150	6.2	29.5
155	6.5	30.9
160	6.6	31.3
165	6.6	31.5

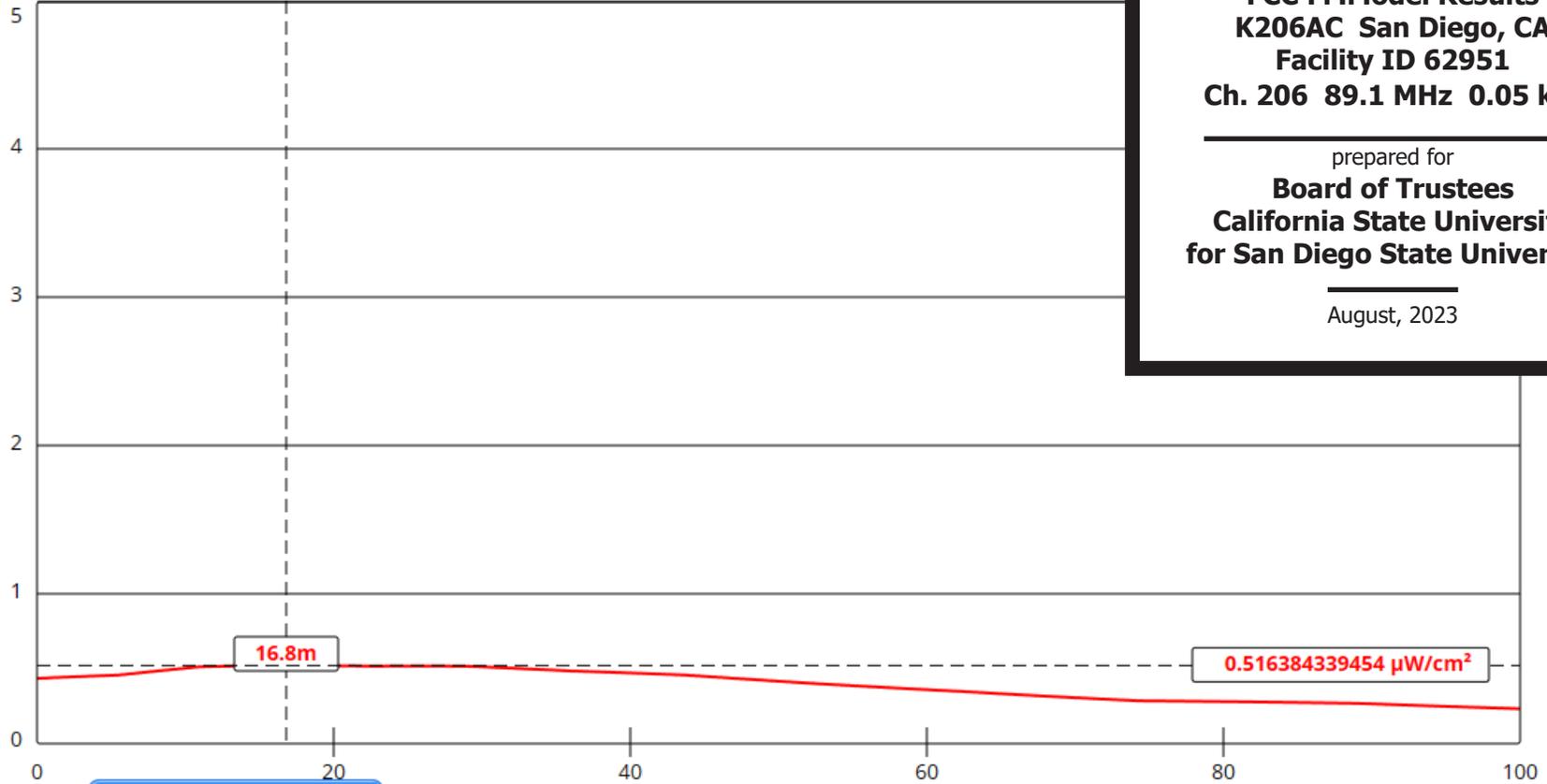


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Figure 4
RF Electromagnetic Field
FCC FMModel Results
K206AC San Diego, CA
Facility ID 62951
Ch. 206 89.1 MHz 0.05 kW

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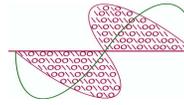


[View Tabular Results +](#)

Channel Selection	Channel 206 (89.1 MHz) ▾		
Antenna Type +	EPA Type 1: Ring-and-Stub or "Other" ▾		
Height (m)	64.4	Distance (m)	100
ERP-H (W)	50	ERP-V (W)	50
Num of Elements	1	λ	1
Num of Points	500	Apply	

Table 1

**Channel Allocation Study Summary
Board of Trustees, California State University
for San Diego State University
K206AC San Diego, CA**



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

REFERENCE CH# 206D - 89.1 MHz, Pwr= 0.05 kw, HAAT= 48.3 M, COR= 78.6 M DISPLAY DATES
32 50 53.1 N. Average Protected F(50-50)= 6.0 km DATA 08-28-23
117 16 35.1 W. Omni-directional SEARCH 08-28-23

CH CITY	CALL	TYPE	ANT STATE	AZI. <--	DIST FILE #	LAT. LNG.	Pwr(kw) HAAT(M)	INT(km) COR(M)	PRO(km) LICENSEE	*OUT* (Overlap in km)
208B San Diego	KPBS-FM	LIC	CN CA	114.3 294.3	2.71 0000151340	32 50 17.00 117 15 00.00	26.000 209	6.6 271	56.9 Board Of Trustees, Califor	-54.7*
205B Temecula	KSDW	LIC	DCN CA	28.6 208.8	65.97 BLED20110210AAS	33 22 10.10 116 56 10.00	0.270 924	71.2 1757	47.4 Calvary Chapel Of Costa Me	9.7
206A Dulzura	768226	CP	DCN CA	100.5 280.8	54.93 0000167832	32 45 24.00 116 42 00.00	0.300 109	46.1 846	12.8 Activist San Diego	26.6
206B1 Descanso	KNSJ	LIC	DEN CA	86.3 266.7	80.32 BLED20130520ADY	32 53 31.10 116 25 11.00	0.330 729	80.8 1905	24.9 Activist San Diego	34.2
203B1 Mission Viejo	KSBR	LIC	DCN CA	337.4 157.2	78.76 0000206319	33 30 10.60 117 36 11.50	1.800 198	2.4 361	30.6 South Orange County Commun	44.5
206D Laguna Beach	K206AA	LIC	DHN CA	330.4 150.2	89.76 BLFT19820702KG	33 33 01.10 117 45 18.20	0.040 246	27.9 316	7.6 South Orange County Commun	52.4
206B1 Descanso	KNSJ	STA	DHN CA	86.3 266.7	80.32 0000216720	32 53 31.10 116 25 11.00	0.330 729	8.7 1905	1.3 Activist San Diego	53.4
205A Irvine	KUCI	LIC	DCN CA	329.4 149.0	102.98 BLED19930305KA	33 38 41.10 117 50 39.20	0.200 -3	9.6 67	6.7 Regents Of The University	85.4

Terrain database is USGS 03 SEC, R= 73.215 qualifying spacings or FCC minimum spacings in KM, M= Margin in KM In & Out distances between contours are shown at closest points. Reference Zone= East Zone 2A, Co to 3rd adjacent.

Call signs with exclamation marks need not be protected.

Ant Column: (D= DA Standard, Z= DA 73.215, N= Not DA 73.215, _= Omni), Polarization (C,H,V,E), Beamtilt(Y,N,X) Incoming contour overlap is ignored.

"*"affixed to 'IN' or 'OUT' values = site inside restricted contour.

Reference station has protected zone issue: Mexico