

## **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 dBμ 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 dBμ 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 02-244<sup>1</sup> 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 dBμ based on standard FCC F(50,50) propagation curves. The corresponding undesired interfering signal level is 151 dBμ.

At the proposed ERP of 0.05 kW, the translator's worst-case (free space) 151 dBμ 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.

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<sup>1</sup>*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,<sup>2</sup> 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

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<sup>2</sup>"Office of Engineering and Technology Announces Updates to FMModel Software," Public Notice,

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

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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**

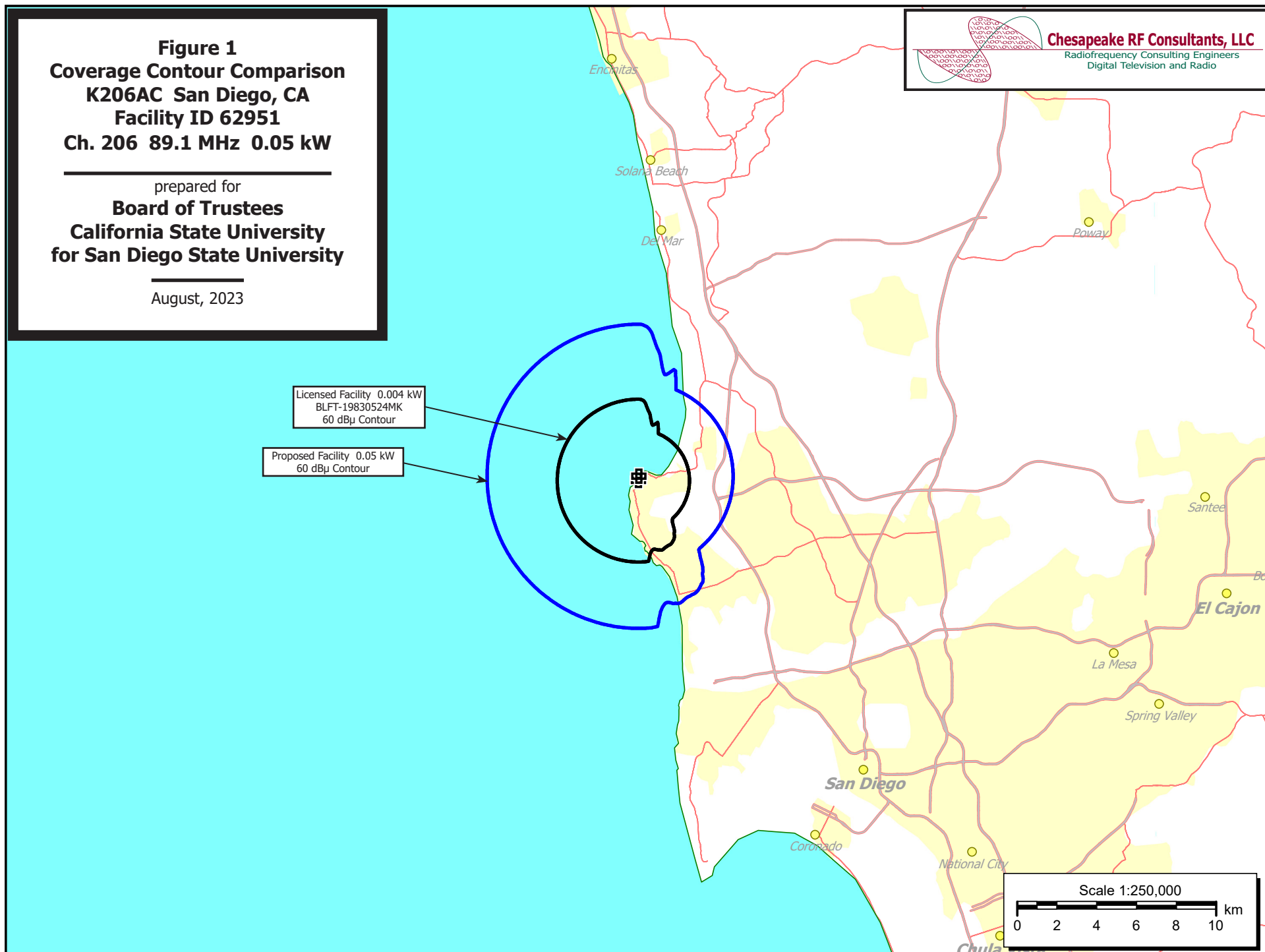
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**Board of Trustees**  
**California State University**  
**for San Diego State University**

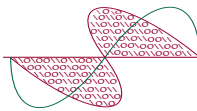
August, 2023



Licensed Facility 0.004 kW  
BLFT-19830524MK  
60 dBμ Contour

Proposed Facility 0.05 kW  
60 dBμ Contour



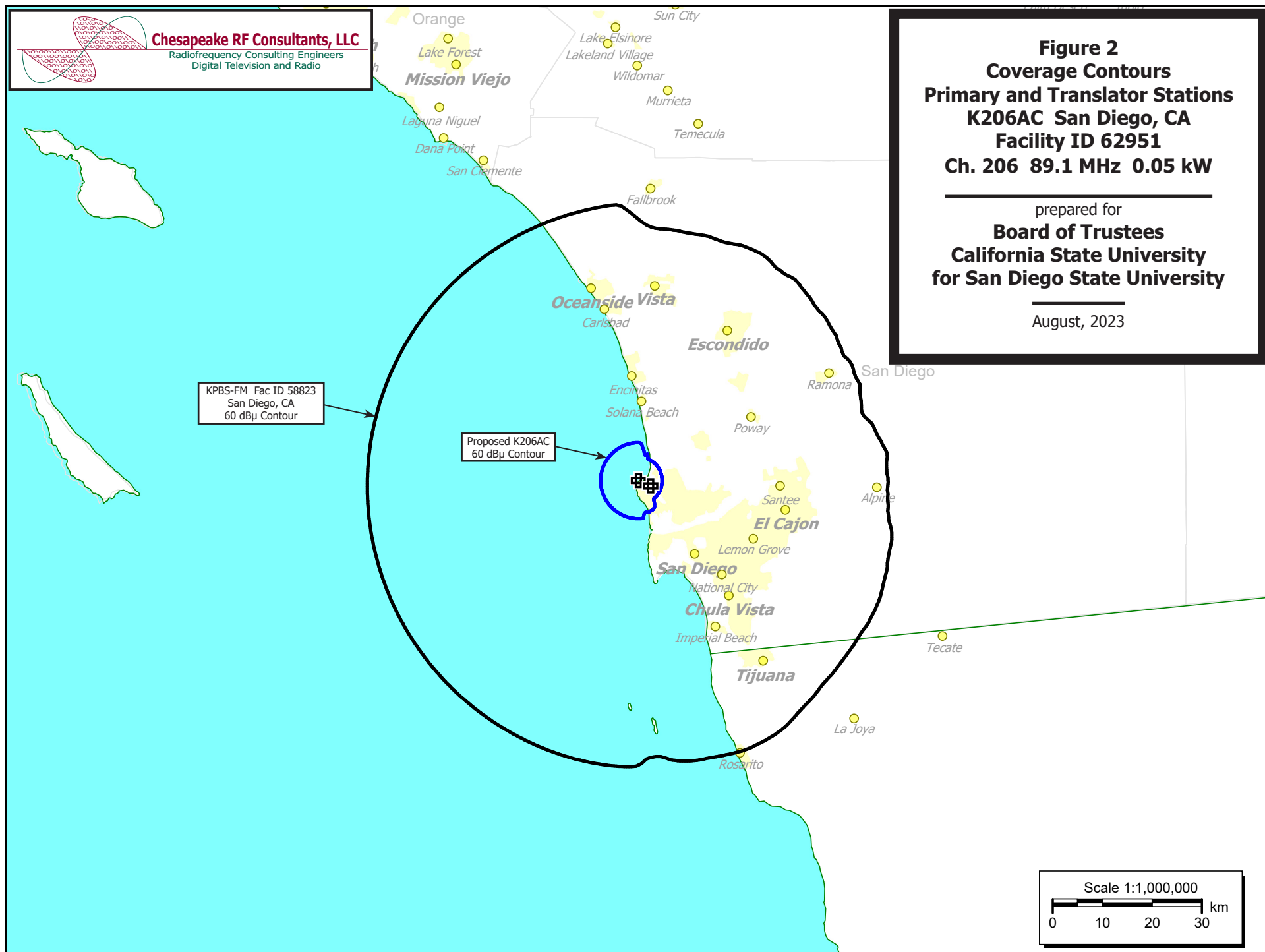


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**Figure 2**  
**Coverage Contours**  
**Primary and Translator Stations**  
**K206AC San Diego, CA**  
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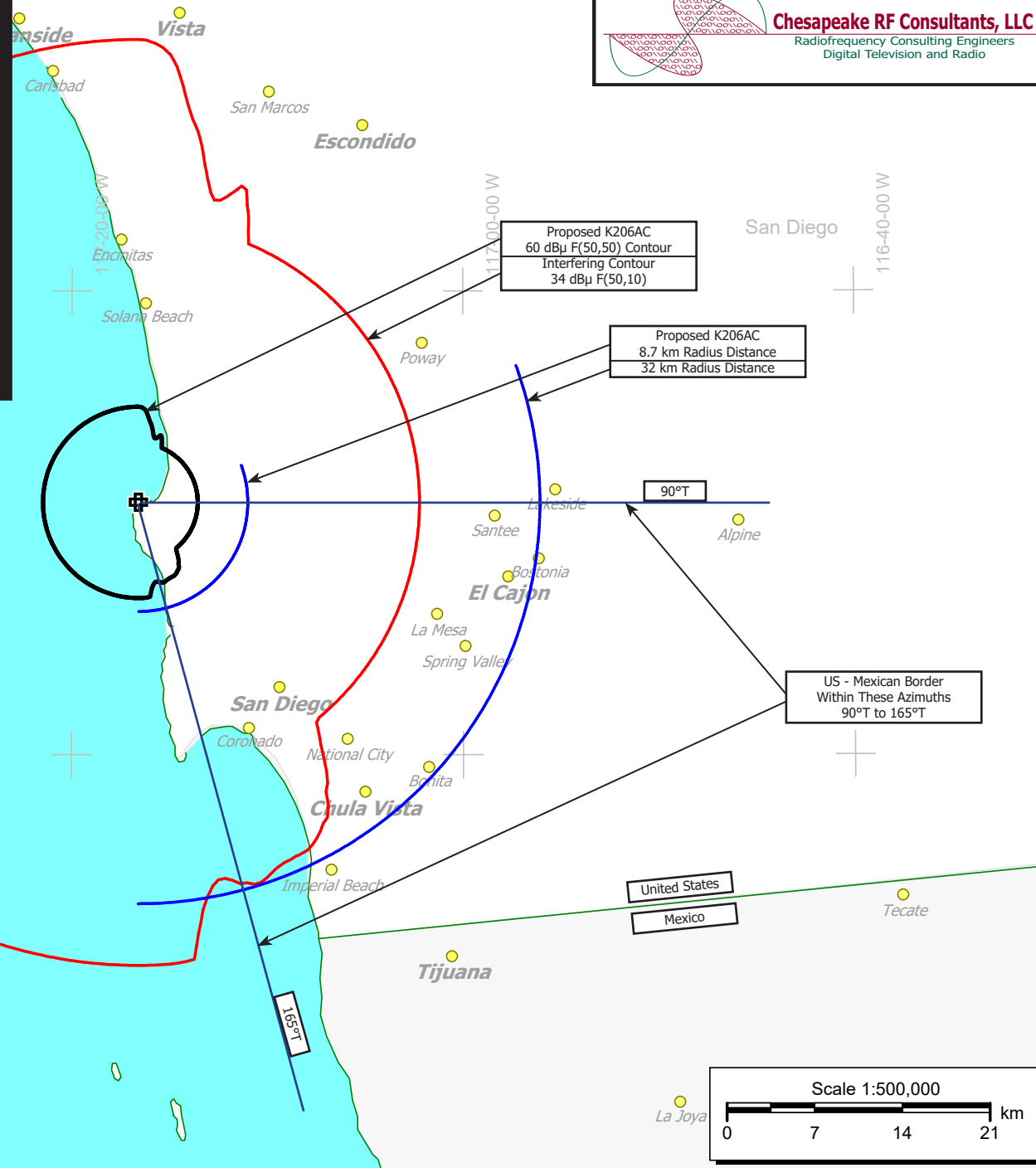
**Figure 3**  
**Compliance with §74.1235(d)(1)**  
**K206AC San Diego, CA**  
**Facility ID 62951**  
**Ch. 206 89.1 MHz 0.05 kW**

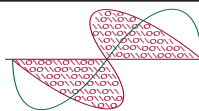
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Distance to Contours		
Toward US-Mexico Border		
Terrain Data: 3-Second USGS		
Azimuth	60 dBμ	34 dBμ
(deg T)	F(50,50)	F(50,10)
(km)	(km)	(km)
90	4.7	22.4
95	4.7	22.4
100	4.7	22.4
105	4.7	22.4
110	4.7	22.4
115	4.7	22.4
120	4.7	22.4
125	4.7	22.4
130	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



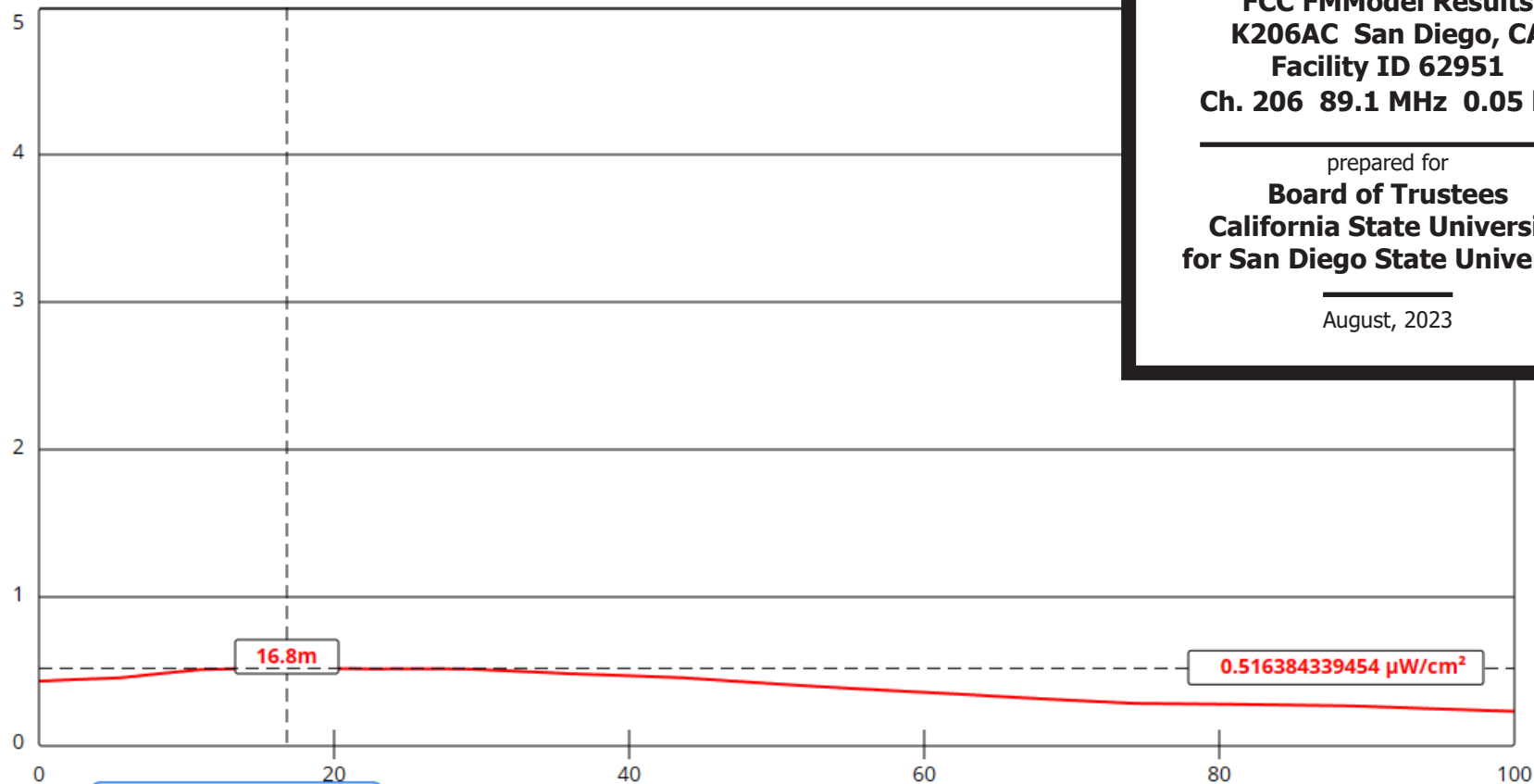


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**Figure 4**  
**RF Electromagnetic Field**  
**FCC FMModel Results**  
**K206AC San Diego, CA**  
**Facility ID 62951**  
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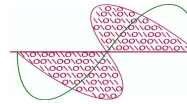


[View Tabular Results +](#)

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	$\lambda$	1
Num of Points	500	Apply	



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



**Chesapeake RF Consultants, LLC**

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Digital Television and Radio

CH	CALL	TYPE	ANT	AZI.	DIST	LAT.	Pwr(kw)	INT(km)	PRO(km)	*OUT*
CITY		STATE		<--	FILE #	LNG.	HAAT(M)	COR(M)	LICENSEE	(Overlap in km)
208B	KPBS-FM	LIC	CN	114.3	2.71	32 50 17.00	26.000	6.6	56.9	-54.7*
San Diego			CA	294.3	0000151340	117 15 00.00	209	271	Board Of Trustees, Califor	
205B	KSDW	LIC	DCN	28.6	65.97	33 22 10.10	0.270	71.2	47.4	9.7
Temecula			CA	208.8	BLEDD20110210AAS	116 56 10.00	924	1757	Calvary Chapel of Costa Me	
206A	768226	CP	DCN	100.5	54.93	32 45 24.00	0.300	46.1	12.8	26.6
Dulzura			CA	280.8	0000167832	116 42 00.00	109	846	Activist San Diego	
206B1	KNSJ	LIC	DEN	86.3	80.32	32 53 31.10	0.330	80.8	24.9	34.2
Descanso			CA	266.7	BLEDD20130520ADY	116 25 11.00	729	1905	Activist San Diego	
203B1	KSBR	LIC	DCN	337.4	78.76	33 30 10.60	1.800	2.4	30.6	44.5
Mission Viejo			CA	157.2	0000206319	117 36 11.50	198	361	South Orange County Commun	
206D	K206AA	LIC	DHN	330.4	89.76	33 33 01.10	0.040	27.9	7.6	52.4
Laguna Beach			CA	150.2	BLFT19820702KG	117 45 18.20	246	316	South Orange County Commun	
206B1	KNSJ	STA	DHN	86.3	80.32	32 53 31.10	0.330	8.7	1.3	53.4
Descanso			CA	266.7	0000216720	116 25 11.00	729	1905	Activist San Diego	
205A	KUCI	LIC	DCN	329.4	102.98	33 38 41.10	0.200	9.6	6.7	85.4
Irvine			CA	149.0	BLEDD19930305KA	117 50 39.20	-3	67	Regents Of The University	

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