

## **Engineering Statement**

### **Purpose**

The instant Form 349 has been prepared on behalf of California Lutheran University (“CLU”), licensee of FM translator station K209CE, San Luis Obispo, CA, Facility ID 81483.

The instant application is being filed as a minor change application to modify existing construction permit BPFT-20130214ADA. Specifically, CLU is proposing to change the transmitter location, increase the ERP and change the antenna from a single-bay to a two-bay model. Figure 1 shows the overlapping 60 dBu contours of the authorized CP and the proposed facilities.

### **Background**

The FCC granted the assignment of K209CE to CLU on March 14, 2013. On May 6, 2013, notice of consummation was filed with the FCC that the acquisition was complete. An STA request was also filed for K209CE to remain silent while the primary station to be rebroadcast, co-owned KCLM, Santa Maria, CA (channel 209B), upgraded its facilities and to allow time for K209CE to modify its facilities, which includes a frequency change from 89.7 MHz to 92.1 MHz (see BLSTA-20130506ADJ). The change in frequency was necessary because of the predicted co-channel interference that would be caused to KCLM by the existing K209CE facility; a new channel in the reserved (non-commercial) band could not be found.

Because CLU specified a new frequency in the non-reserved band for K209CE, 74.1231(b) specifies that the programming to be rebroadcast by the translator must be received via direct off-air pickup. KCLM completed its upgrade and resumed broadcasting on June 18, 2013. Since that time, unsuccessful efforts have been made to receive KCLM at the existing/ approved K209CE (K221FV <sup>1</sup>) transmitting site on Cuesta Peak. The elevated RF noise floor and spurious emissions caused by the close proximity of high power FM stations at the site have made it impossible to receive a good quality signal from KCLM.

The existing K209CE (K221FV) transmitter site is located on Cuesta Peak in the mountains north of San Luis Obispo. The proposed new transmitter site is located 10.7 km south of the existing transmitter site on the south end of San Luis Obispo, and while significantly lower in elevation, initial tests have shown it will allow K209CE (K221FV) to receive a good quality off-air signal from KCLM while covering the majority of the population that would have been served by the higher elevation transmitter site on Cuesta Peak.

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<sup>1</sup> Callsign K221FV has been reserved for (assigned to) K209CE due to the channel change from 89.7 MHz (channel 209) to 92.1 MHz (channel 221).

## **Interference Analysis**

A spacing study was performed to identify stations requiring contour protection (see Table 1). Though FM translator stations (Class D) use contour protection methodology, for purposes of identifying potentially affected stations, the spacing study was run as a proposed Class A facility. As is shown in Table 1, the proposed facility protects all licensed and proposed stations on co-channel and 3<sup>rd</sup> adjacent channels. It is short-spaced as a full Class A station to 1<sup>st</sup> adjacent, non-commercial Class B station KCSB-FM, Santa Barbara on channel 220 by only 8.6 km; however, as a Class D station, there is no prohibited contour overlap (see Figure 2). Additionally, the proposed facility is fully spaced to stations on I.F. channels 274 (102.7 MHz) and 275 (102.9 MHz).

With respect to 2<sup>nd</sup> adjacent stations, the proposed facility is short-spaced to Class B station KKAL, Paso Robles on channel 223. K209CE (K221FV) is currently co-located with KKAL on Cuesta Peak, and since the proposed transmitter site is only 10.7 km away, the new site is fully within KKAL's protected 54 dBu contour.

Section 74.1204(d) states:

... In addition, an application otherwise precluded by this section will be accepted if it can be demonstrated that no actual interference will occur due to intervening terrain, lack of population or such other factors as may be applicable.

Using the Desired-to-Undesired protection ratios in 74.1204(a)(1), interference will be caused to a station operating on a 2<sup>nd</sup> or 3<sup>rd</sup> adjacent channel if the D/U ratio is less than -40 dB (i.e., the undesired signal has to be 40 dB or more stronger than the desired signal to cause interference).

KKAL operates with a non-directional ERP of 4.8 kW at an HAAT of 453m. The proposed K209CE (K221FV) facility will operate with a non-directional ERP of 0.25 kW at an HAAT of -102m. KKAL has a predicted F(50,50) signal strength of 90.4 dBu at the proposed K209CE (K221FV) transmitter site (see Figure 3a). The interfering K209CE (K221FV) signal strength is therefore the 130.4 dBu F(50,10) contour. The K209CE (K221FV) 130.4 dBu contour extends only 34 meters from the antenna.<sup>2</sup> As can be seen in Figure 3b, there are no homes or other occupied structures within the immediate vicinity of the transmitter site; therefore, no interference is predicted to be caused to KKAL.

## **Environmental Considerations**

The proposed antenna is an Electronics Research, Inc. ("ERI") model 100A-2F, a two-bay, full-wave spaced, circularly polarized antenna. The antenna will be mounted atop a wooden monopole with the center of radiation 7 meters above the ground. Access to the site is restricted by means of locked gates.

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<sup>2</sup> Due to the small distance involved, the F(50,10) and F(50,50) contour graphs could not be used; the FCC's free-space formula was used to compute the distance.

Following the procedures outlined in OET-65 using an ERP of 0.25 kW in both the horizontal and vertical polarities (0.5 kW total) and using the downward relative field value of 0.53 (see Figure 4), a calculated maximum RF exposure level of 0.111 mW/cm<sup>2</sup> at 2 meters above ground level is obtained at a distance approximately 4 meters from the base of the wooden monopole. This represents 11.1% for a Controlled/Worker environment or 55.5% for an Uncontrolled/General Population environment.

There are two other FM translator stations located at this site atop an adjacent 46m tower: K293AW, San Luis Obispo and KPYG-FM1, San Luis Obispo. K293AW operates with an ERP of 0.25 kW using an ERI model 100A-2F, a two-bay, full-wave spaced, circularly polarized antenna, while KPYG-FM1 operates with an ERP of 0.90 kW using a Scala model FMVMP-3, a three-bay, full-wave spaced, vertically polarized antenna. Together, these two stations contribute no more than 1% to the Controlled/Worker exposure level or less than 5% to the Uncontrolled/General Population exposure level. Therefore, in aggregate, the site is determined to be in compliance with the RFR standards.

As this is a multi-user site, CLU agrees to reduce power or cease transmission as may be necessary to protect persons needing access to the monopole or adjacent tower structure.

#### AFFIDAVIT

I, Timothy P. Schultz, do hereby certify that this Engineering Statement, the accompanying figures and tables, and all technical portions of this application were prepared by me personally. All facts herein are known to be true based on fact, belief and personal experience.

I have been gainfully employed in the broadcast engineering field since 1977, working in all phases of AM, FM and Television engineering. I have prepared several engineering applications for the Commission and have a working knowledge of current FCC Rules and Regulations. I hold valid FCC License PG-11-27583 and am Professionally Certified by the Society of Broadcast Engineers.

Signed: Timothy P. Schultz

Dated: 7-21-13

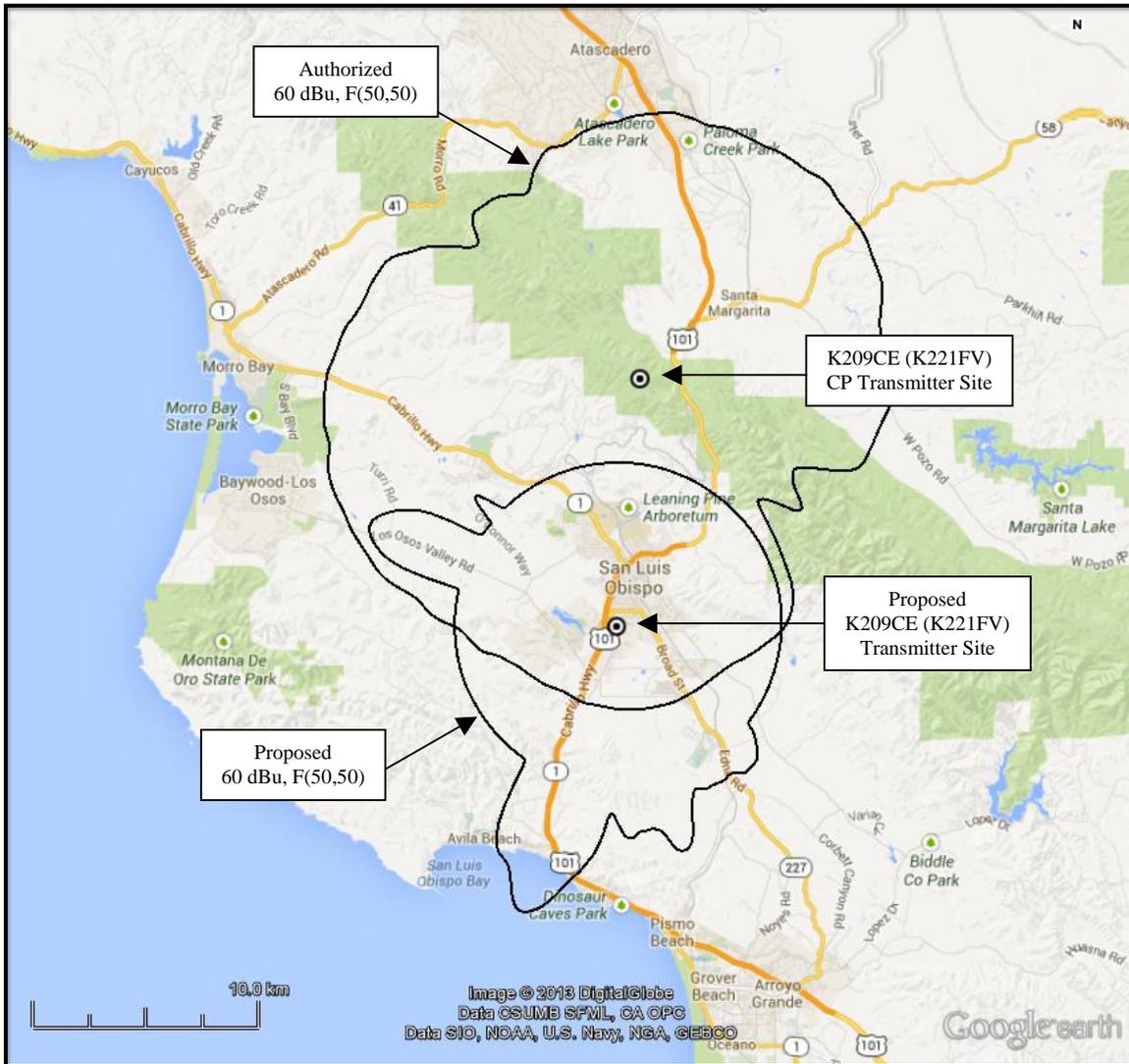
Timothy P. Schultz, CPBE  
7007 Arizona Avenue  
Los Angeles, CA 90045

**Table 1**

California Lutheran University - K209CE, San Luis Obispo, CA  
Channel 221A (92.1 MHz)  
35-15-50 / 120-39-59  
FCC Database: 7/17/13

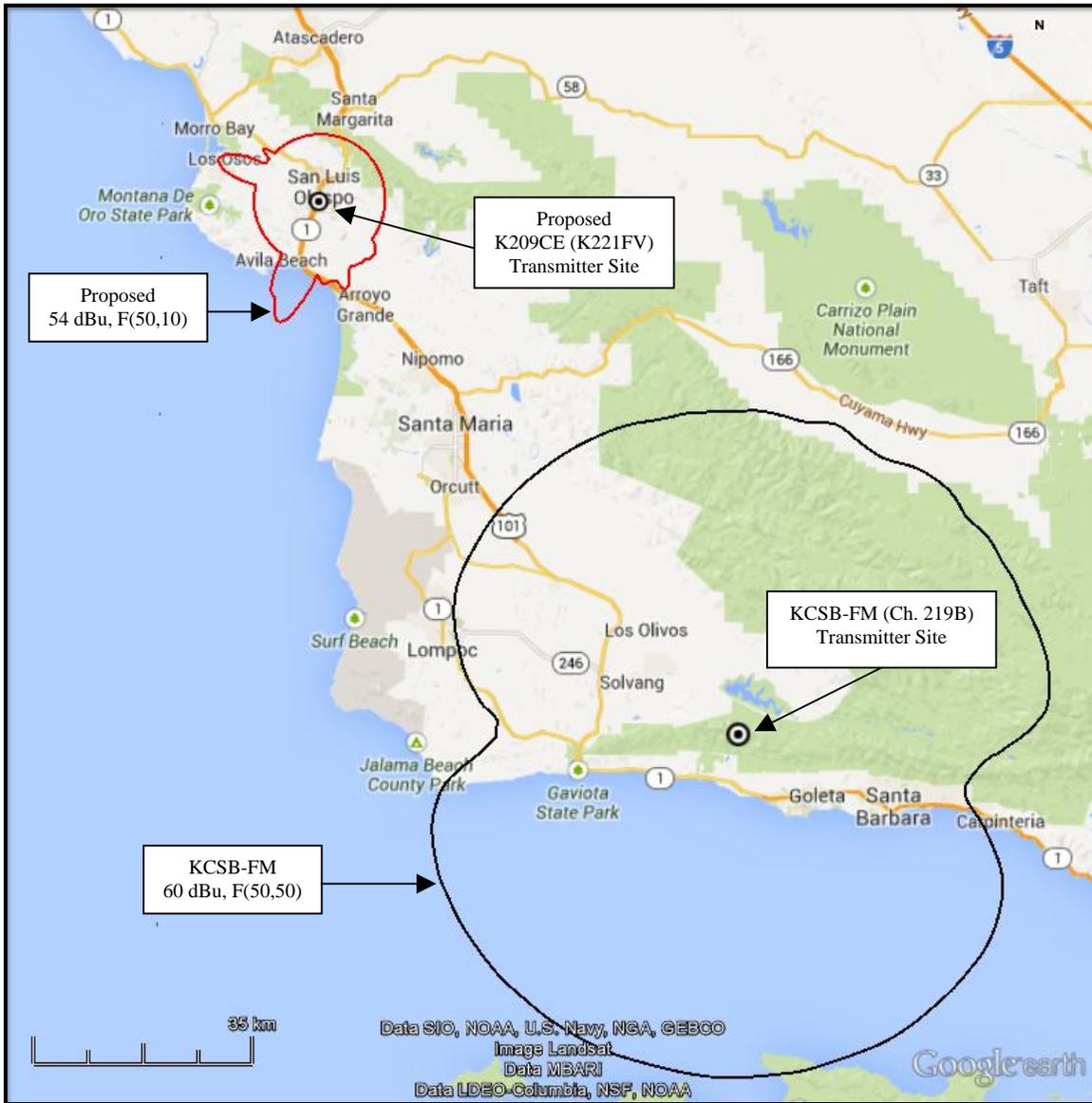
Callsign City of License	Auth License	Licensee Name St FCC File No.	Chan Freq	HAAT HAMSL	ERP (kW)	Latitude Longitude	Bear (deg)	Dist (km)	Req (km)
K218CP SANTA BARBARA	LIC	CALVARY CHAPEL OF TWIN FALLS, INC. CA BLFT-20090202AAE	218 D 91.5	268 660	0 H 0.01 V	34-27-57 119-40-38	134.2	126.6	31 CLEAR
KRQZ LOMPOC	LIC	SPIRIT COMMUNICATIONS, INC. CA BLED-20080821AAI	218 B1 91.5	238 410	4 H 4 V	34-50-08 120-24-06	153.1	53.3	48 CLOSE
K219AO FAIRMONT, ETC.	LIC	FAMILY STATIONS, INC. CA BLFT-19841207TH	219 D 91.7	974 2453	0.089 H 0 V	35-01-31 118-30-55	97.1	197.8	31 CLEAR
KNBX SAN ARDO	LIC	KCBX, INC. CA BLED-20010110AAB	219 B 91.7	543 889	2.7 H 2.7 V	35-57-06 121-00-03	338.5	82.1	69 CLEAR
KFHL WASCO	LIC	MARY V. HARRIS FOUNDATION CA BLED-20050815ADD	219 A 91.7	73 180	6 H 6 V	35-24-55 119-14-01	82.2	131.3	31 CLEAR
K219LL CHUALAR	LIC	ONE MINISTRIES, INC. CA BLFT-20110506ABG	219 D 91.7	656 946	0.003 H 0.008 V	36-45-23 121-30-05	335.9	181.9	31 CLEAR
K219LN KERNVILLE	LIC	CALVARY CHAPEL OF TWIN FALLS, INC. CA BLFT-20110516ABZ	219 D 91.7	816 2182	0 H 0.01 V	35-42-21 118-33-31	74.9	197.5	31 CLEAR
KCSB-FM SANTA BARBARA	LIC	UNIVERSITY OF CALIFORNIA CA BLED-19840928DF	220 B 91.9	879 1239	0.62 H 0.62 V	34-31-31 119-57-29	141.6	104.4	113 SHORT
K220GR LOS BANOS	LIC	PAULINO BERNAL EVANGELISM CA BLFT-19990511UE	220 D 91.9	-27 96	0.055 H 0.055 V	36-59-32 120-54-17	353.7	193.0	72 CLEAR
KSPB PEBBLE BEACH	LIC	ROBERT LOUIS STEVENSON SCHOOL CA BMLD-19881216KF	220 A 91.9	148 245	1 H 1 V	36-35-11 121-55-21	322.8	185.4	72 CLEAR
KPSV-FM TULARE	CP	SOUTH VALLEY PEACE CENTER CA BNPED-20071022ANE	220 B1 91.9	54 107	25 H 25 V	36-01-31 119-32-06	50.0	139.8	96 CLEAR
KVMX BAKERSFIELD	LIC	LOTUS BAKERSFIELD CORP. CA BLH-20101028ABN	221 A 92.1	121 493	4.2 H 4.2 V	35-29-11 118-53-21	80.8	163.4	115 CLEAR
K209CE SAN LUIS OBISPO	CP	CALIFORNIA LUTHERAN UNIVERSITY CA BPFT-20130214ADA	221 A 92.1	0 772	4.2 H 4.2 V	35-29-11 118-53-21	5.1	10.7	115 SHORT
NEW SOLEIDAD	APP	BROADCAST TOWERS, INC. CA BNPFT-20030317CVI	222 D 92.3	0 59	0.019 H 0.019 V	36-30-45 121-26-59	333.3	155.5	72 CLEAR
KKAL PASO ROBLES	LIC	AGM CALIFORNIA, INC. CA BLH-19961226KA	223 B 92.5	453 790	4.8 H 4.8 V	35-21-40 120-39-21	5.1	10.8	69 SHORT
NEW HANFORD	APP	ROBERT J. CONNELLY, JR. CA BNPFT-20030317FHX	223 D 92.5	34 96	0.25 H 0.25 V	36-19-16 119-40-03	39.5	139.1	31 CLEAR
KMYX-FM ARVIN	LIC	FARMWORKER EDUCATIONAL RADIO NETWORK CA BLH-20120105ABB	223 A 92.5	312 1042	0.62 H 0.62 V	35-11-41 118-42-16	91.9	178.8	31 CLEAR
KTOM-FM MARINA	LIC	CC LICENSES, LLC CA BMLH-19950908KF	224 B1 92.7	189 421	6.9 H 6.9 V	36-33-09 121-47-17	325.1	175.2	48 CLEAR
- KERMAN	VAC	LINDA A. DAVIDSON CA RM-10969	224 A 92.7	-	H V	36-40-37 120-12-08	14.7	162.3	31 CLEAR

Callsign City of License	Auth License	Licensee Name St FCC File No.	Chan Freq	HAAT HAMSL	ERP (kW)	Latitude Longitude	Bear (deg)	Dist (km)	Req (km)
- WASCO	VAC	LINDA A. DAVIDSON CA RM-11014	224 A 92.7	-	H V	35-35-37 119-20-35	72.6	125.6	31 CLEAR
KTOM-FM MARINA	LIC	CC LICENSES, LLC CA BXLH-20060515ABT	224 B1 92.7	171 403	1 H 1 V	36-33-09 121-47-17	325.1	175.2	48 CLEAR
KWVP-LP WASCO	LIC	ROSECORP TRUST CA BLL-20080303AJA	224 L1 92.7	38 0	0.061 H 0.061 V	35-35-33 119-20-01	72.8	126.4	31 CLEAR
NEW KERMAN	APP	HISPANIC TARGET MEDIA INC. CA BSFH-20110202ADE	224 A 92.7	0 0	0 H 0 V	36-40-37 120-12-08	14.7	162.3	31 CLEAR
NEW KERMAN	APP	HISPANIC TARGET MEDIA INC. CA BNPB-20110630AGU	224 A 92.7	105 704	5.4 H 5.4 V	36-21-21 120-27-41	8.6	122.6	31 CLEAR
NEW WASCO	APP	HISPANIC TARGET MEDIA INC. CA BSFH-20130206AEC	224 A 92.7	0 0	0 H 0 V	35-35-37 119-20-35	72.6	125.6	31 CLEAR
KIWI MCFARLAND	LIC	LOTUS BAKERSFIELD CORP. CA BLH-20020919AAY	275 B1 102.9	98 628	25 H 25 V	35-19-16 119-42-26	85.5	87.5	12 CLEAR



**60 dBu Contour Overlap Map**  
**K209CE (Proposed), San Luis Obispo, CA**  
**Channel 221D (92.1 MHz)**  
**0.250 kW – ND, -102m HAAT**

**Figure 1**



**1<sup>st</sup> Adjacent Channel Protection Map**

**K209CE (Proposed), San Luis Obispo, CA**  
**Channel 221D (92.1 MHz)**  
**0.250 kW – ND, -102m HAAT**

**Figure 2**



**2<sup>nd</sup> Adjacent Contour Overlap Map**

**K209CE (Proposed), San Luis Obispo, CA**  
**Channel 221D (92.1 MHz)**  
**0.250 kW – ND, -102m HAAT**

**Figure 3a**



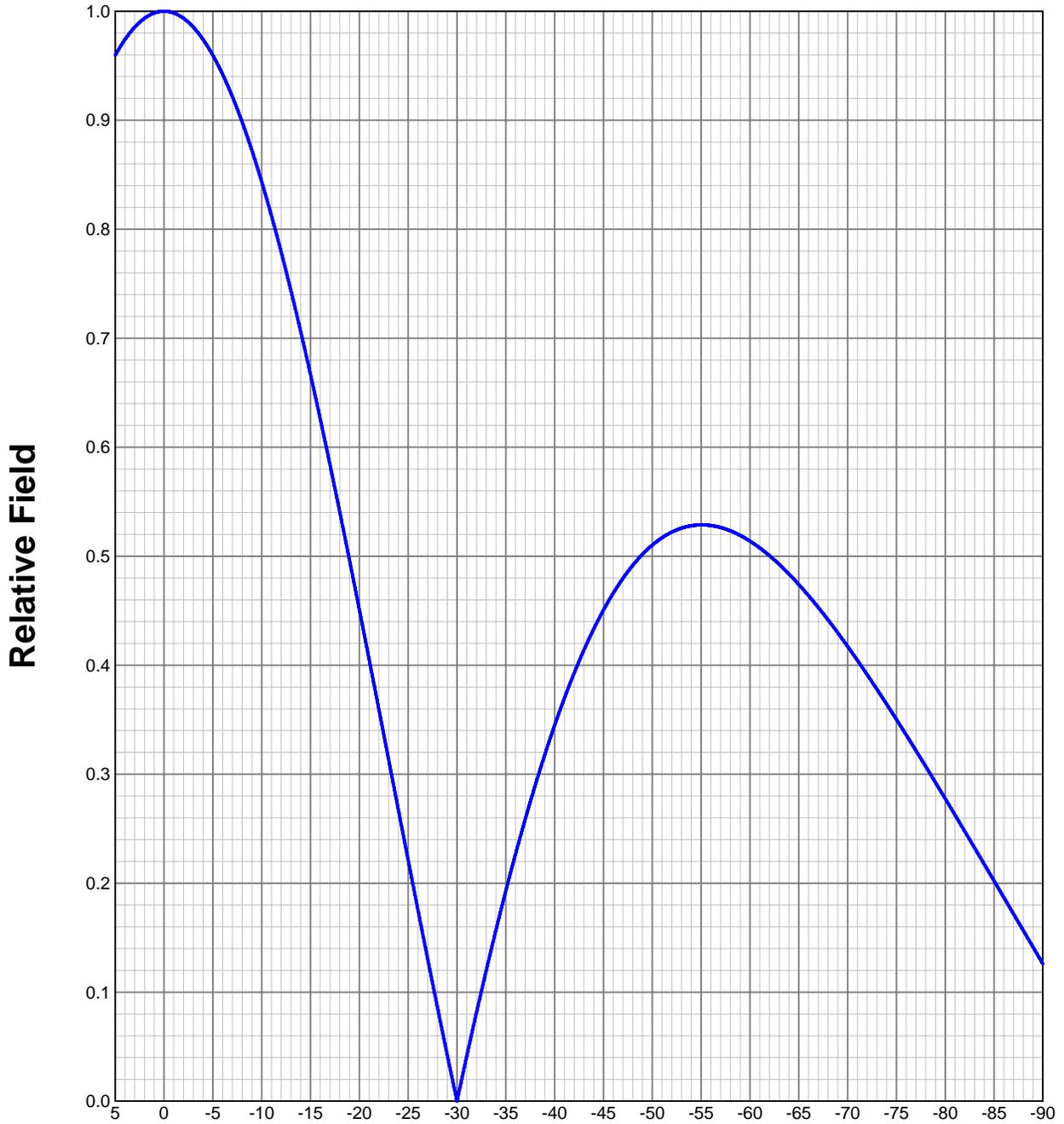
**2<sup>nd</sup> Adjacent Contour Overlap Map (Close-up)**

**K209CE (Proposed), San Luis Obispo, CA  
Channel 221D (92.1 MHz)  
0.250 kW – ND, -102m HAAT**

**Figure 3b**

### ELEVATION PATTERN

Type:	100A2		Channel:	_____
Directivity:	Numeric	dBd	Location:	_____
Main Lobe:	0.90	-0.47	Beam Tilt:	0.00
Horizontal:	0.90	-0.47	Polarization:	Circular



- Figure 4 -