

STEPHEN S. LOCKWOOD, PE, PMP

THOMAS M. ECKELS, PE  
ERIK C. SWANSON, PE, PMP  
THOMAS S. GORTON, PE

JAMES B. HATFIELD, PE  
BENJAMIN F. DAWSON III, PE  
STEPHEN PUMPLE, M.Eng, MBA, PMP  
CONSULTANTS

HATFIELD & DAWSON  
CONSULTING ELECTRICAL ENGINEERS  
9500 GREENWOOD AVE. N.  
SEATTLE, WASHINGTON 98103

TELEPHONE (206) 783-9151

E-MAIL hatdaw@hatdaw.com

MAURY L. HATFIELD, PE  
(1942-2009)  
PAUL W. LEONARD, PE  
(1925-2011)

**Engineering Statement  
Minor Modification of KFSF-DT  
Channel 34 at Vallejo, CA  
October 2023**

**I. Background**

This Engineering Statement has been prepared on behalf of Unimas San Francisco LLC, licensee of digital television station KFSF-DT at Vallejo, California. This application specifies a minor modification of the licensed KFSF-DT facility, to increase main lobe ERP.

**II. Interference Study**

Study has been made of all cochannel and adjacent-channel facilities in the vicinity of the proposed operation, including a detailed Longley-Rice interference study to demonstrate that the proposed operation will not cause interference to any authorized or pending proposed facilities. This study was performed using the Commission's *TVStudy* software.

This study was conducted using the standard study cell size of 2.0 km and terrain extraction increment of 1.0 km.

The results of this study indicate that the proposed facility is predicted to cause zero additional interference to any of the listed stations, beyond the allowed value of 0.5% to full-power and Class A stations. Based on this interference study, it is believed that the proposed facility can operate without risk of interference to other stations.

Study created: 2023.10.19 14:06:04

Study build station data: LMS TV 2023-10-16

Proposal: KFSF-DT D34 DT APP VALLEJO, CA  
 File number: KFSF-MOD  
 Facility ID: 51429  
 Station data: User record  
 Record ID: 1539  
 Country: U.S.  
 Zone: II

Stations potentially affected by proposal:

IX	Call	Chan	Svc	Status	City, State	File Number	Distance
Yes	KKPX-TV	D33	DT	LIC	SAN JOSE, CA	BLANK0000108766	7.7 km
Yes	KGPE	D34	DT	LIC	FRESNO, CA	BLANK0000191060	277.8
Yes	KEZT-CD	D34	DC	LIC	SACRAMENTO, CA	BLANK0000115780	123.9
Yes	KTAS	D34	DT	LIC	SAN LUIS OBISPO, CA	BLCDT20070222AAX	310.7
Yes	KCRA-TV	D35	DT	LIC	SACRAMENTO, CA	BLANK0000143770	101.5

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied:

Channel: D34  
 Latitude: 37 45 19.00 N (NAD83)  
 Longitude: 122 27 10.00 W  
 Height AMSL: 523.7 m  
 HAAT: 499.0 m  
 Peak ERP: 850 kW  
 Antenna: DIE-TFU-26DSC/VP-R P190 (ID 96898) 135.0 deg  
 Elev Pattn: Generic  
 Elec Tilt: 0.75

40.7 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	396 kW	497.5 m	106.1 km
45.0	156	516.8	99.2
90.0	396	517.5	107.7
135.0	850	506.5	114.1
180.0	396	406.2	98.7
225.0	156	516.7	99.2
270.0	396	517.6	107.7
315.0	850	516.1	114.8

ERP exceeds maximum

ERP: 850 kW ERP maximum: 515 kW

Distance to Canadian border: 1167.0 km

Distance to Mexican border: 731.2 km

\*\*Proposal is within coordination distance of FCC monitoring station  
 Conditions at FCC monitoring station: Livermore CA  
 Bearing: 92.9 degrees Distance: 61.5 km  
 ERP: 433 kW HAAT: 518.2 m Field strength: 68.0 dBu, 2.5 mV/m

Proposal is not within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:  
 Bearing: 74.6 degrees Distance: 1507.5 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%

---- Below is IX received by proposal KFSF-MOD ----

Proposal receives 3.60% interference from scenario 1  
 No IX check failures found.

### III. Facilities Proposed

The proposed operation will be on Channel 34 with a maximum lobe effective radiated power of 850 kilowatts. Operation is proposed with the existing Dielectric TFU-26DSC/VP-R P190 antenna, which is installed on an existing tower at Mount Sutro, with FCC Antenna Structure Registration Number 1001289.

The attached antenna data was provided by the manufacturer.

### IV. Compliance with §73.622(f) *DTV maximum power and antenna heights*

Processing is requested pursuant to the provisions of §73.622(f)(5), which allows for technical facilities up to those needed to provide the same geographic coverage as the largest station within the market.

The table below demonstrates that the geographic coverage of the proposed noise limited contour will not exceed that of the largest station within the San Francisco market.

Station	Service Area (sq km)
KFSF-DT Ch34 Vallejo - Proposed 850 kW at 499m HAAT	35,304.9
KPIX-TV Ch29 San Francisco - Licensed 1000 kW at 490.3m HAAT	39,367.1

## V. RF Exposure Calculations

The power density calculations shown below were made using the techniques outlined in OET Bulletin No. 65. "Ground level" calculations in this report have been made at a reference height of 2 meters above ground to provide a worst-case estimate of exposure for persons standing on the ground in the vicinity of the tower. The equation shown below was used to calculate the ground level power density figures from each antenna.

$$S(\mu W / cm^2) = \frac{33.4 \times AdjERP(Watts)}{D^2}$$

Where: *AdjERP(Watts)* is the maximum lobe effective radiated power times the element pattern factor times the array pattern factor.

*D* is the distance in meters from the center of radiation to the calculation point.

Ground level power density levels produced by the proposed facility were calculated for an elevation of 2 meters above ground, using the manufacturer's elevation patterns for the elliptically-polarized Dielectric TFU-26DSC/VP-R P190 antenna proposed in this application. This antenna is configured for vertically-polarized power at 16% of the horizontally-polarized power (or 850 kW horizontal and 136 kW vertical.) Based on this analysis, the maximum ground-level power density from the proposed facility is calculated to be 3.5  $\mu W/cm^2$ , which is 0.9% of 393  $\mu W/cm^2$  (the FCC maximum for uncontrolled environments at the Channel 34 frequency).

These calculations show that the maximum calculated power density produced at two meters above ground level by the proposed operation alone is less than 5% of the applicable FCC exposure limit at all locations between 1 and 500 meters from the base of the antenna support structure. Section 1.1307 of the Commission's Rules exempts applications for new facilities or modifications to existing facilities from the requirement of preparing an environmental assessment when the calculated emissions from the applicants proposed facility are predicted to be less than 5% of the applicable FCC exposure limit. Therefore, the proposed facility is in compliance with Section 1.1301 *et seq* and no further analysis of RF exposure at this site is required in this application.

Pursuant to OET Bulletin No. 65, all station personnel and contractors are required to follow appropriate safety procedures before any work is commenced on the antenna tower or rooftop, including reduction in power or discontinuance of operation before any maintenance work is undertaken. The permittee/licensee in coordination with other users of the site must reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency exposure in excess of FCC guidelines.

October 19, 2023

Erik C. Swanson, P.E.

Consulting Engineer

# KFSF-DT Ch34 Los Angeles

## Ground-Level Power Density Calculations

Using Manufacturer's Vertical Plane Pattern

Antenna	TFU-26DSC/VP-R P190		
ERP	850,000	Watts H (avg)	
	136,000	Watts V (avg)	
Antenna AGL	269.5	meters less 2m is	267.5 meters above the reference plane
MBT	0	degrees	

Calculated  
Maximum is 3.5  $\mu\text{W}/\text{cm}^2$  at 201 meters from the tower

### Power Density vs Distance

