March 2024
KXAO(FM) Channel 204A
Joshua Tree, California
Allocation Study

Background

The instant application proposed modification of the original construction permit 0000167282 for KXAO on Channel 204A at Joshua Tree. KXAO was granted as a singleton out of the 2021 NCE FM filing window.

Allocation Study

The attached spacing study shows the co-channel and adjacent channel spacing between stations and demonstrates that the proposed operation meets the IF channel spacing requirements as prescribed in §73.207 of the Commission's Rules.

Individual stations were examined to confirm the lack of prohibited contour overlap as prescribed in §73.509 of the Commission's Rules. The attached allocation study map exhibits demonstrate requisite contour protection for the following domestic stations:

Cochannel	KFHM	204A	Big Bear City
	KSPC	204A	Claremont
	KUBO CP	204B	Calexico
First-adjacent	0000165829 CP	203A	Ludlow
	KPSC	203A	Palm Springs
	KSDW	205B	Temecula
Third-adjacent	KRTM	201B1	Banning
	KCRI	207B1	Indio

TV Channel 6

Section 73.525 of the Commission's Rules specifies a threshold distance of 235 kilometers for FM stations operating on Channel 204. There is no domestic TV Channel 6 station located within this threshold distance.

FMSTUDY.EXE Copyright 2021, Hatfield & Dawson, LLC Version 5.10

SEARCH PARAMETERS FM Database Date: 20240325

Channel: 204A 88.7 MHz

Latitude: 34 9 10.9 (NAD83)

Longitude: 116 23 23.3

Safety Zone: 50 km

Job Title: KXAO 204A JOSHUA TREE

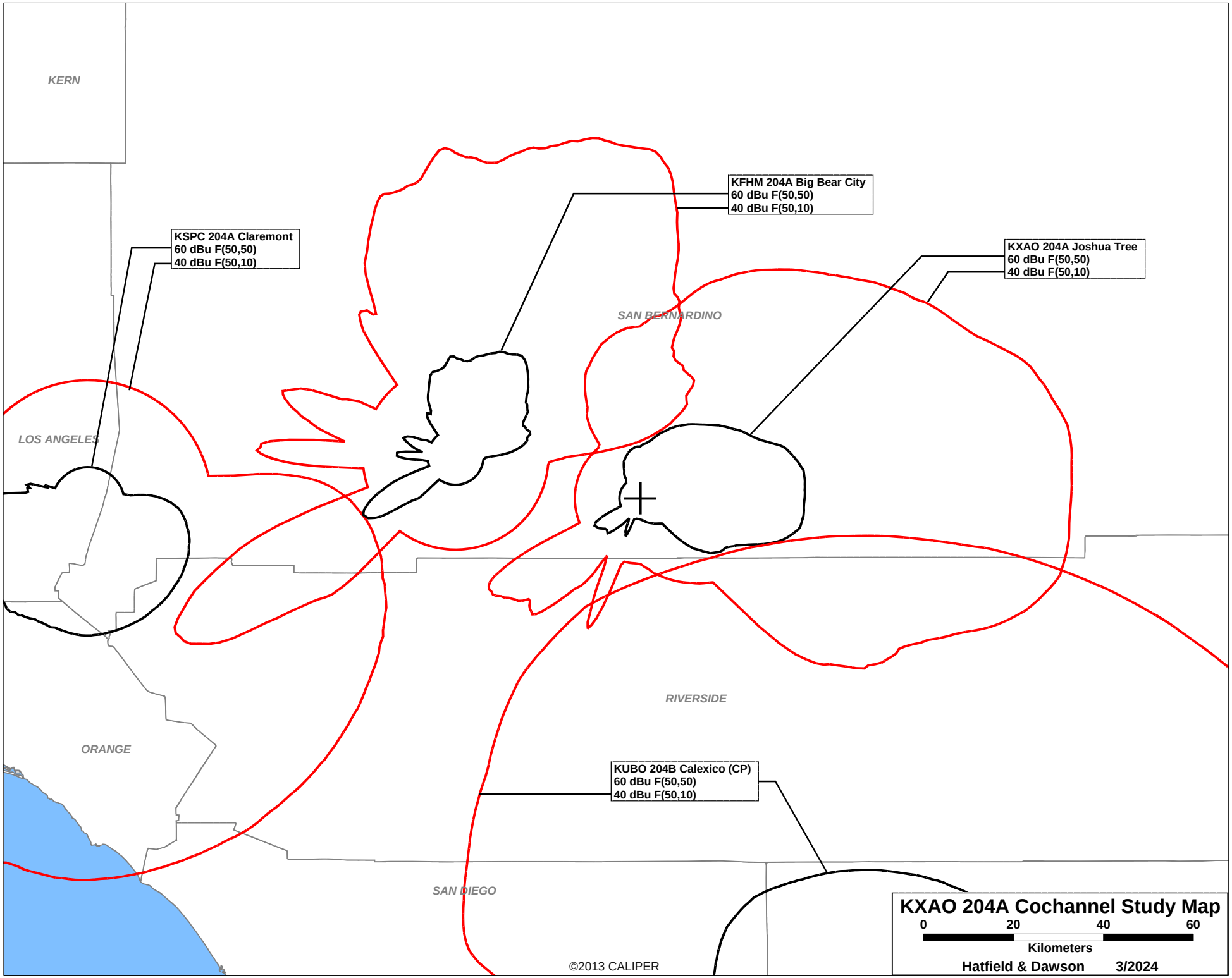
Call	City	Channel	ERP(kW)	Latitude	Bearing	Dist	Req
Status	St FCC File No.	Freq.	HAAT(m)	Longitude	deg-True	(km)	(km)
KRTM	BANNING	201B1	0.150	DA 34 2 16.0	252.0	41.20	48
LIC	CA BLED-20150527ABD	88.1	774.0	116 48 51.1		-6.80	SHORT
KLHM	LUCERNE VALLEY	201A	0.750	34 24 11.9	298.0	59.64	31
CP	CA 0000206545	88.1	-216.0	116 57 47.0		28.64	CLEAR
	LUDLOW	203A	1.000	34 42 34.0	19.4	65.50	72
CP	CA 0000165829	88.5	76.0	116 9 5.0		-6.50	SHORT
KPSC	PALM SPRINGS	203A	1.600	33 51 56.1	187.5	32.16	72
LIC	CA BLED-20131119AOY	88.5	180.0	116 26 7.0		-39.84	SHORT
KHMS	VICTORVILLE	203A	0.200	34 36 39.9	301.9	97.12	72
LIC	CA BLED-19961016KA	88.5	461.0	117 17 23.1		25.12	CLEAR
KSBR	MISSION VIEJO	203B1	1.800	DA 33 30 10.6	237.5	133.48	96
LIC	CA 0000206319	88.5	198.0	117 36 11.5		37.48	CLEAR
KSBR-FM1	MISSION VIEJO	203B1	0.200	DA 33 33 1.5	242.4	142.96	0
CP	CA 0000220343	88.5	0.0	117 45 19.0	SS	0.00	BOOST
KFHM	BIG BEAR CITY	204A	0.145	34 14 9.0	282.8	42.08	115
LIC	CA BLED-20130131AGT	88.7	63.0	116 50 7.1		-72.92	SHORT
KXAO	JOSHUA TREE	204A	0.045	DA 34 4 54.0	151.5	9.01	115
CP	CA 0000167282	88.7	405.0	116 20 35.0		-105.99	SHORT
K204GG	BANNING	204D	0.014	DA 34 2 13.0	256.6	55.02	0
LIC	CA BLFT-20190415ABD	88.7	0.0	116 58 10.1		0.00	TRANS
KSPC	CLAREMONT	204A	0.400	34 8 33.0	269.8	122.89	115
LIC	CA BLED-20120709AEN	88.7	21.0	117 43 20.2		7.89	CLOSE
KUBO	CALEXICO	204B	17.000	DA 32 57 29.0	158.9	142.05	178
CP	CA 0000217323	88.7	217.0	115 50 22.0		-35.95	SHORT
K205DK	YUCCA VALLEY	205D	0.010	DA 34 4 55.0	151.4	8.99	0
LIC	CA BLFT-20140625AKM	88.9	0.0	116 20 35.0		0.00	TRANS
KSDW	TEMECULA	205B	0.270	DA 33 22 10.1	210.3	100.57	113
LIC	CA BLED-20110210AAS	88.9	924.0	116 56 10.0		-12.43	SHORT

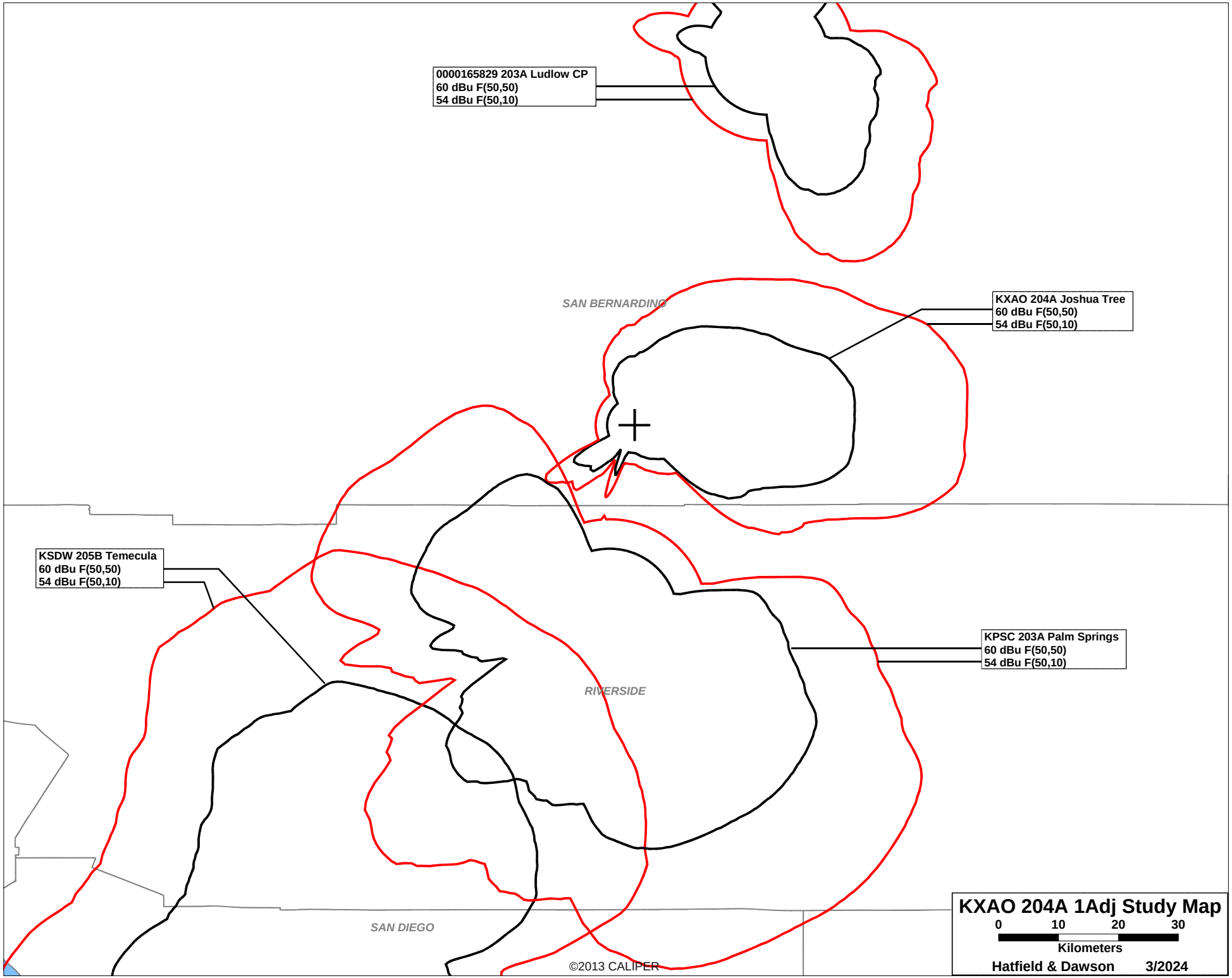
SEARCH PARAMETERS FM Database Date: 20240325

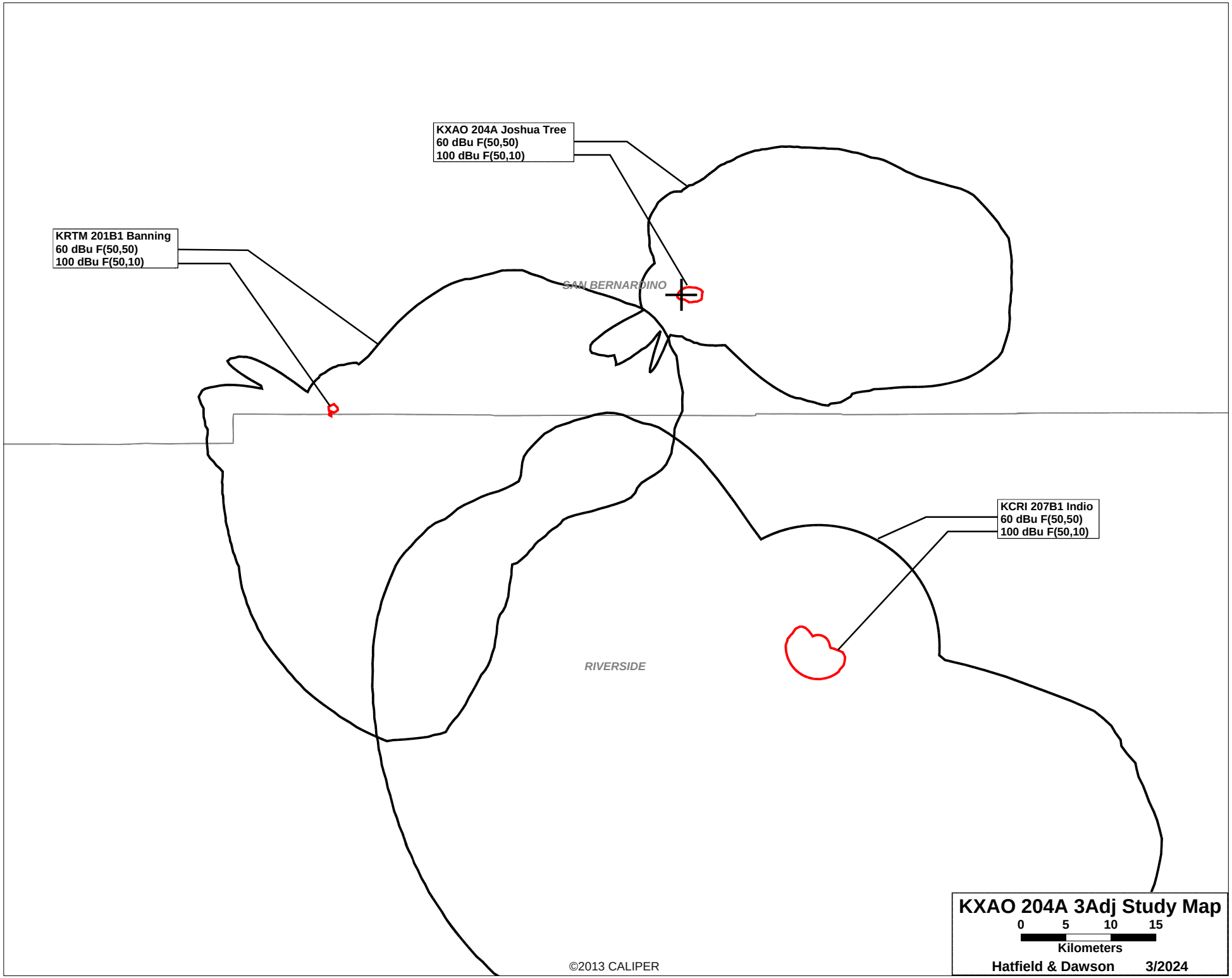
Channel: 204A 88.7 MHz
Latitude: 34 9 10.9 (NAD83)
Longitude: 116 23 23.3
Safety Zone: 50 km
Job Title: KXAO 204A JOSHUA TREE

Call Status	City St	FCC File No.	Channel Freq.	ERP(kW) HAAT(m)	Latitude Longitude	Bearing deg-True	Dist (km)	Req (km)
K205GJ CP	VICTORVILLE CA	0000219101	205D 88.9	0.010 DA 0.0	34 36 36.9 117 17 18.1	301.9	96.96 0.00	0 TRANS
K205DT CP	INDIO CA	0000215092	205D 88.9	0.010 DA 0.0	33 48 6.1 116 13 33.0	158.8	41.81 0.00	0 TRANS
K205DT LIC	INDIO CA	BLFT-20180228AAM	205D 88.9	0.006 0.0	33 48 6.1 116 13 33.0	158.8	41.81 0.00	0 TRANS
KODV LIC	BARSTOW CA	BLED-20111201FJR	206B 89.1	5.800 DA 234.0	34 58 15.0 117 2 24.6	327.0	108.59 39.59	69 CLEAR
KUOR-FM LIC	REDLANDS CA	0000218108	206A 89.1	0.035 815.0	34 11 47.0 117 2 56.0	274.7	60.96 29.96	31 CLEAR
KCRI LIC	INDIO CA	BLED-20101123AGU	207B1 89.3	3.200 174.0	33 48 5.8 116 13 29.9	158.7	41.85 -6.15	48 SHORT
K207FA LIC	TWENTYNINE PALMS CA	0000216194	207D 89.3	0.010 0.0	34 9 15.1 116 11 52.7	89.5	17.69 0.00	0 TRANS
K257DV CP	TWENTY-NINE PALMS CA	0000219942	257D 99.3	0.250 0.0	34 9 15.0 116 11 53.0	89.5	17.68 0.00	0 TRANS
K257DV LIC	TWENTY-NINE PALMS CA	0000210987	257D 99.3	0.010 0.0	34 4 44.6 115 57 22.9	101.5	40.82 0.00	0 TRANS
KMRJ LIC	RANCHO MIRAGE CA	BLH-19980724KA	258A 99.5	3.000 100.0	33 52 15.1 116 13 40.0	154.5	34.69 24.69	10 CLEAR

==== END OF FM SPACING STUDY FOR CHANNEL 204 ====


KERN
KFHM 204A Big Bear City
60 dBu F(50,50)
40 dBu F(50,10)
KSPC 204A Claremont
60 dBu F(50,50)
40 dBu F(50,10)
KXAO 204A Joshua Tree
60 dBu F(50,50)
40 dBu F(50,10)
SAN BERNARDINO
LOS ANGELES
RIVERSIDE
ORANGE
KUBO 204B Calexico (CP)
60 dBu F(50,50)
40 dBu F(50,10)
SAN DIEGO
©2013 CALIPER
KXAO 204A Cochannel Study Map
0
20
40
60
Kilometers
Hatfield & Dawson 3/2024


0000165829 203A Ludlow CP
60 dBu F(50,50)
54 dBu F(50,10)
SAN BERNARDINO
KXAO 204A Joshua Tree
60 dBu F(50,50)
54 dBu F(50,10)
KSDW 205B Temecula
60 dBu F(50,50)
54 dBu F(50,10)
KPSC 203A Palm Springs
60 dBu F(50,50)
54 dBu F(50,10)
RIVERSIDE
SAN DIEGO
©2013 CALIPER
KXAO 204A 1Adj Study Map
0 10 20 30
Kilometers
Hatfield & Dawson 3/2024



March 2024
KXAO(FM) Channel 204A
Joshua Tree, California
RF Exposure Study

Facilities Proposed

The proposed operation will be on Channel 204A (88.7 MHz) with a maximum lobe effective radiated power of 1.35 kilowatts. Operation is proposed with a 2-level circularly-polarized directional antenna. The antenna will be side-mounted on an existing tower on Paxton Peak, with FCC Antenna Structure Registration Number 1243832.

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.

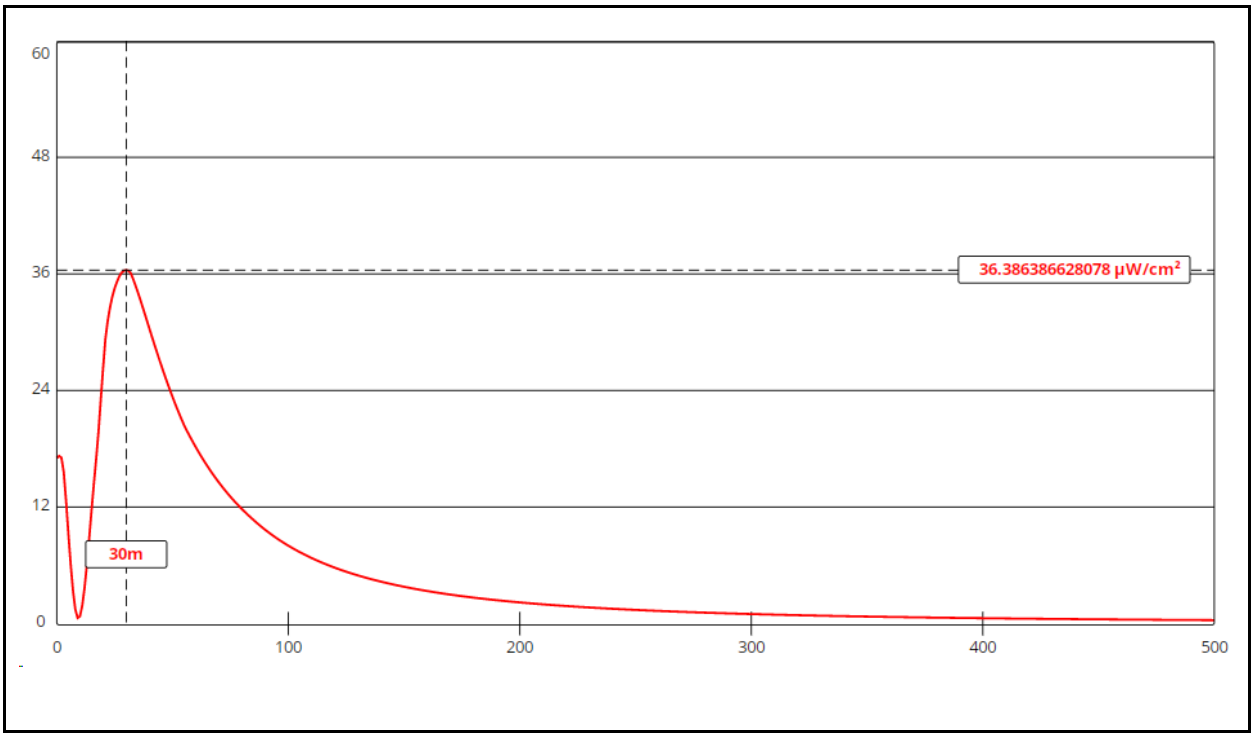
Ground level power densities have been calculated for locations extending from the base of the tower to a distance of 500 meters. Values past this point are increasingly negligible.

The log periodic antenna model to be used is not specifically listed in the Commission's FMModel software. Therefore, calculations of the power density produced by the proposed KXAO antenna system assume a Type 1 element pattern, which is the "worst case" element pattern in FMModel. The highest calculated ground level power density occurs at a distance of 30 meters from the base of the antenna support structure. At this point the power density is calculated to be 36.4 μW/cm².

Calculations of the power density produced by the collocated K210EN antenna system assume a Type 1 element pattern, which is the “worst case” element pattern in FMModel. The highest calculated ground level power density occurs at a distance of 2 meters from the base of the antenna support structure. At this point the power density is calculated to be 3.2 $\mu W/cm^2$.

These calculations show that the maximum calculated power density produced at two meters above ground level by the proposed operation of KXAO and the present operation of K210EN (were their maxima to coincide, which they do not) is 39.6 $\mu W/cm^2$, which is 19.8% of 200 $\mu W/cm^2$ (the FCC standard for uncontrolled environments).

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.

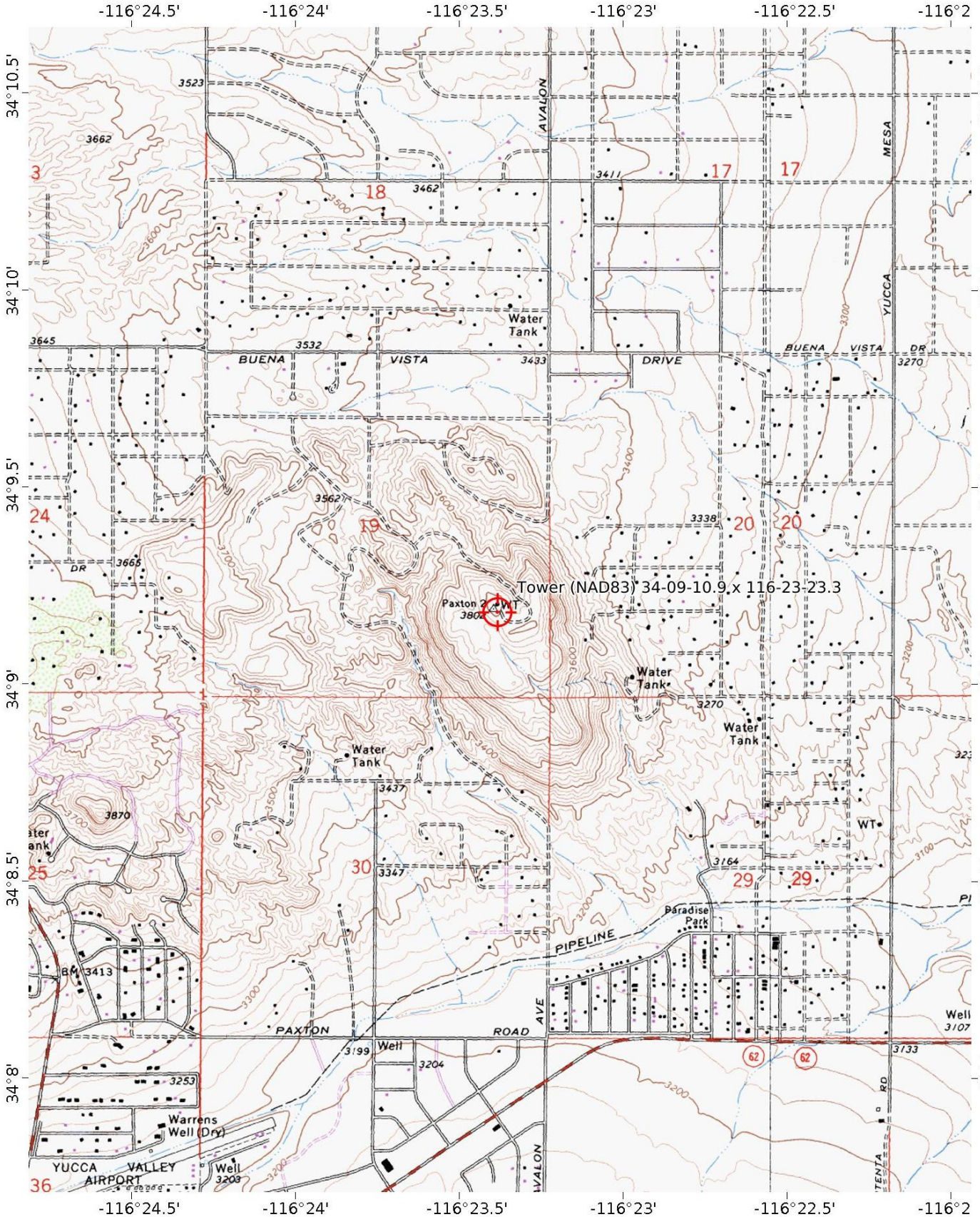


Ground-Level RF Exposure **OET FMModel**

KXAO 204A Joshua Tree

Antenna Type:	PSI log periodic (Type 1)
No. of Elements:	2
Element Spacing:	0.59 wavelength
Distance:	500 meters
Horizontal ERP:	1.35 kW
Vertical ERP:	1.35 kW
Antenna Height:	16.8 meters AGL

Maximum Calculated Power Density is 36.4 µW/cm^2 at 30 meters from the antenna structure.



Mercator Projection
WGS84
UTM Zone 11S

CALTOPO

0.5 1.0 1.5 2.0 2.5 km

0.5 1.0 1.5 mi

Scale **1:24000** 1 inch = 2000 feet

MN
11.1º

Hatfield & Dawson Consulting Engineers