

January 2016
FM Translator K285EQ
Reno, Nevada Channel 285D
Allocation Study

Purpose of Application

The instant application proposes to modify the licensed FM translator facility, to operate with a circularly polarized antenna rather than a vertically-polarized antenna. There is no change in the translator's protected or interfering contours as a result of this modification.

Allocation Study

The attached spacing study shows the spacing between the proposed translator site and the location of cochannel and adjacent channel stations and proposals. This study was made with the Commission's Class A spacing requirements, and individual situations were examined to determine the lack of prohibited contour overlap per the requirements of §74.1204 of the Rules. The attached allocation study map demonstrates compliance with the Commission's Rules for protection of FM broadcast stations and FM translators as outlined in §74.1204.

The attached spacing study demonstrates compliance with §73.207 of the Commission's Rules regarding spacing restrictions to stations which are 53 or 54 channels removed from the proposed operation.

KDOT 283C Reno

The proposed translator transmitter site is located within the 60 dBu protected contour of second-adjacent channel station KDOT 283C Reno. The proposed site is 30.9 km from the KDOT transmitter site at a bearing of 14 degrees True. Given the KDOT antenna's 947 meter HAAT and 25 kW ERP along this radial, KDOT places an 84.9 dBu contour at the translator transmitter site. The corresponding interfering contour from the translator is $84.9 + 40 = 124.9$ dBu. The attached map of the proposed transmitter site depicts the 124.9 dBu contour from the proposed facility, extending 62 meters from the antenna per a Free Space calculation. There is no population within this contour. Therefore, the proposed facility is believed to satisfy the requirements of §74.1204(d) with respect to KDOT.

KZTI 287C Fallon Station

The proposed translator transmitter site is located within the 60 dBu protected contour of second-adjacent channel station KZTI 287C Fallon Station. The proposed site is 83.56 km from the KZTI transmitter site at a bearing of 244 degrees True. Given the KZTI antenna's 589 meter HAAT and 100 kW ERP along this radial, KZTI places a 63.3 dBu contour at the translator transmitter site. The corresponding interfering contour from the translator is $63.3 + 40 = 103.3$ dBu.

The nearest occupied structure is located 696 meters WNW of the proposed transmitter site, at an elevation of 5160 feet (1573 meters). This is 122 meters below the proposed radiation center. (The extent of development in this area has been double-checked against recent aerial photography.) Given that the transmitting antenna will be installed at a height of 122 meters above the nearest structure, and taking into consideration the vertical plane pattern of the Shively 6832-2 antenna array to be used, the attached calculations demonstrate that the interference area will not reach

ground level at or beyond the nearest structure. An interference zone will exist from 22 to 126 meters, and also from 275 to 621 meters from the transmitter site, but this area is unpopulated.

Therefore, the proposed facility is believed to satisfy the requirements of §74.1204(d) with respect to KZTI.

KZTI-FM1 287D Reno

The proposed translator transmitter site is located within the 60 dBu protected contour of second-adjacent channel booster station KZTI-FM1 287D Reno.

The licensed K285EQ facility was authorized more than two months prior to the original authorization for KZTI-FM1 at this site. As such, the initial KZTI-FM1 authorization, as well as the subsequent modification of that facility, were voluntarily subject to overlap from the already-authorized K285EQ 100 dBu F(50,10) contour.

Since the instant application proposes no change in ERP, antenna height, or tower location, there is therefore no change in the distance to the 100 dBu F(50,10) contour in any direction, and there will be no additional impact on KZTI-FM1.

Therefore, the proposed facility is believed to satisfy the requirements of §74.1204(d) with respect to KZTI-FM1.

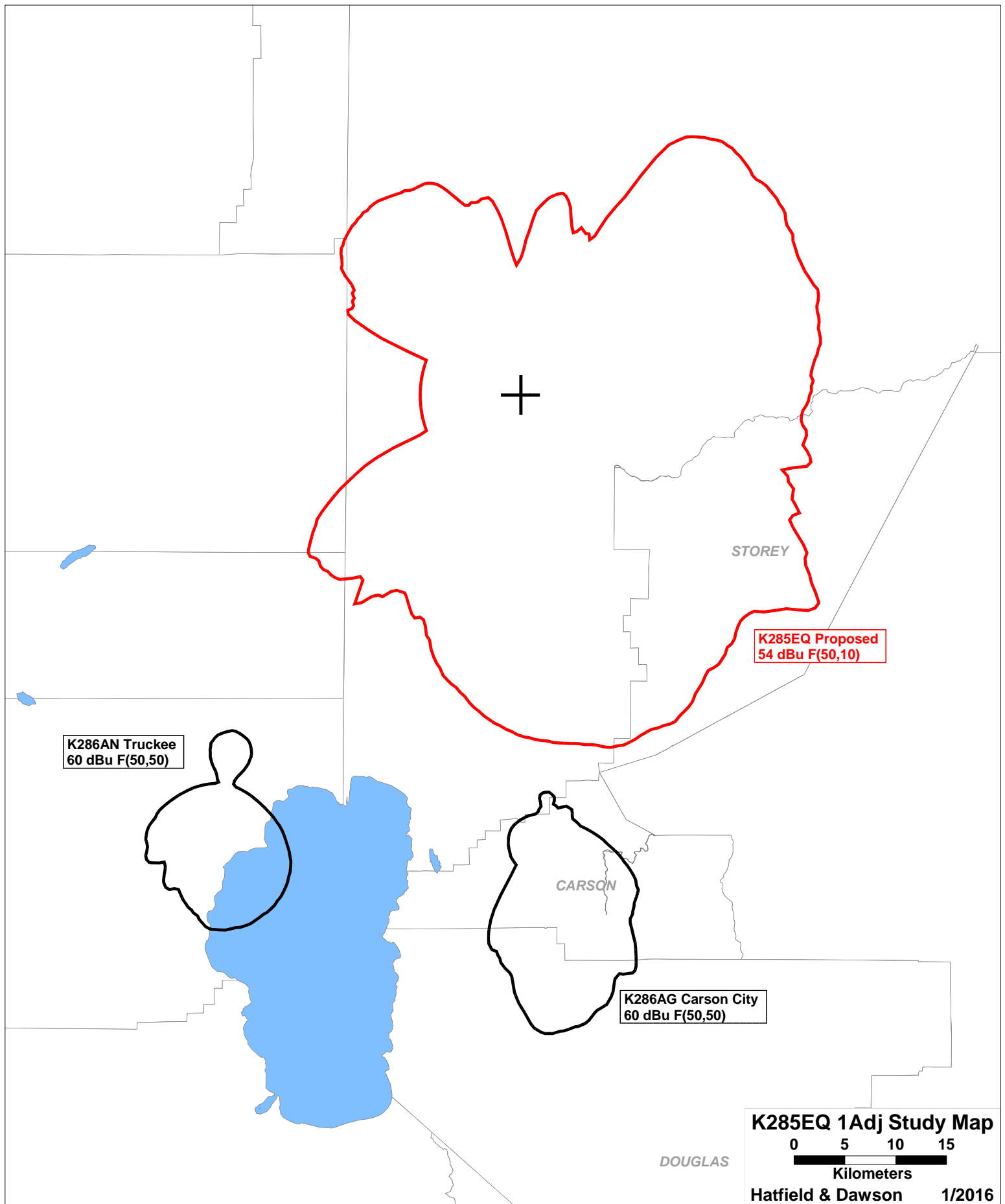
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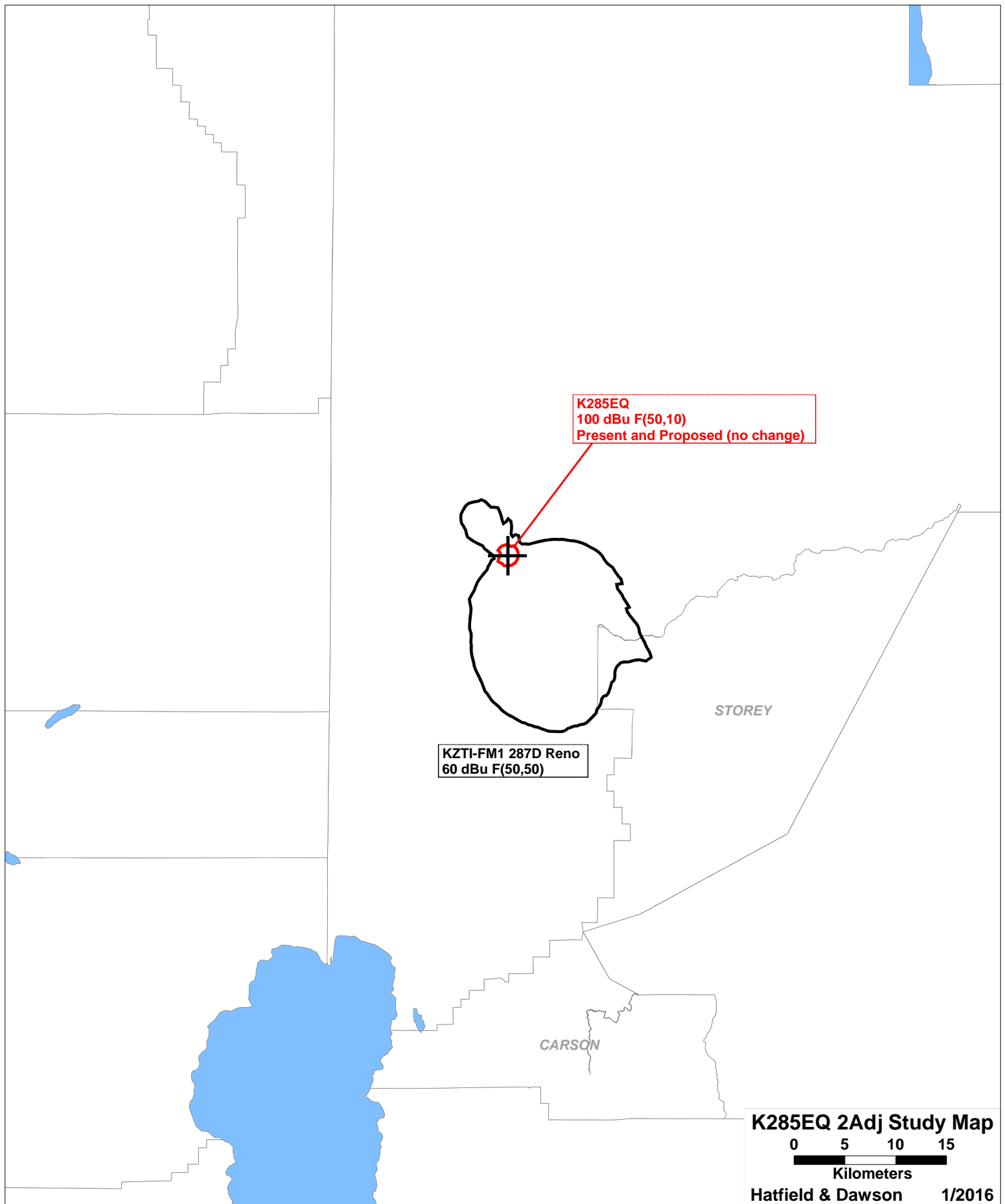
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SEARCH PARAMETERS                               FM Database Date: 160115
Channel: 285A    104.9 MHz                      Page 1
Latitude: 39 35 2
Longitude: 119 47 55
Safety Zone: 50 km
Job Title: K285EQ RENO

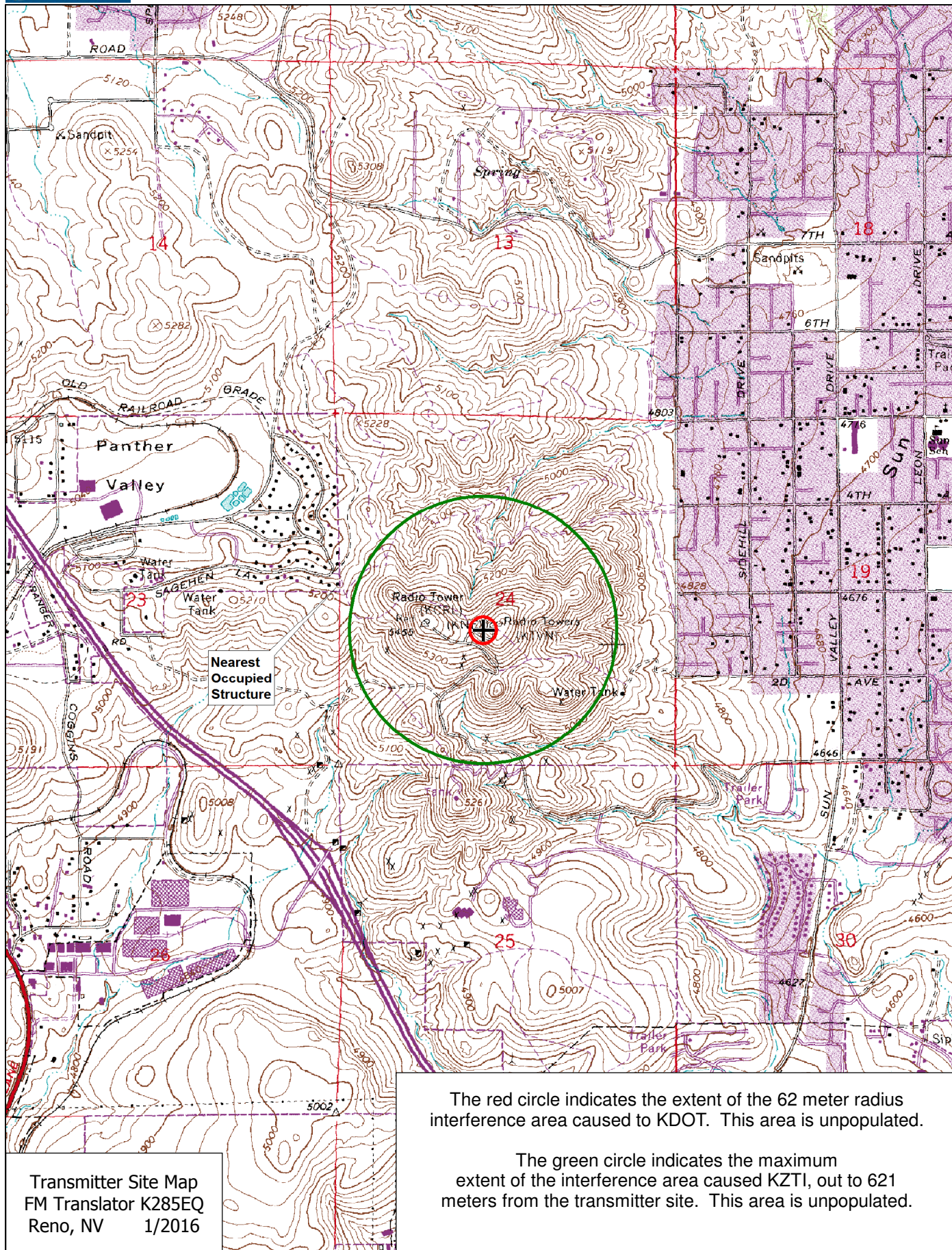
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Call Status	City St	FCC File No.	Channel Freq.	ERP(kW) HAAT(m)	Latitude Longitude	Bearing deg-True	Dist (km)	Req (km)
K231CC CP	PORTOLA CA	BNPFT-30912ACQ	231D 94.1	0.001 734.0	39-46-09 120-26-08	290.9	58.39 0.00	0 TRANS
K285EQ APP	RENO NV	BPFT-51230AVO	231D 94.1	0.095 DA 0.0	39-35-02 119-47-55	0.0	0.00 0.00	0 TRANS
K232EA LIC	CARSON CITY NV	BLFT-61108AAH	232D 94.3	0.099 370.0	39-12-50 119-46-10	176.5	41.15 0.00	0 TRANS
KDOT LIC	RENO NV	BMLH-950831KA	283C 104.5	25.000 893.0	39-18-48 119-52-59	193.6	30.90 -64.10	95 SHORT
KYIX LIC	SOUTH OROVILLE CA	BLH-940204KM	285A 104.9	0.260 472.0	39-39-04 121-27-43	273.5	143.03 28.03	115 CLEAR
K285EQ LIC	RENO NV	BLFT-20808ABH	285D 104.9	0.240 337.0	39-35-02 119-47-55	0.0	0.00 0.00	0 TRANS
KNCI LIC	SACRAMENTO CA	BLH-840815CB	286B 105.1	50.000 152.0	38-38-31 121-05-25	227.2	153.02 40.02	113 CLEAR
K286BX CP	SUSANVILLE CA	BNPFT-30328AUP	286D 105.1	0.010 130.0	40-26-37 120-38-34	323.3	119.61 0.00	0 TRANS
K286AN LIC	TRUCKEE CA	BLFT-40929AFG	286D 105.1	0.010 DA 825.0	39-14-29 120-08-20	217.6	48.01 0.00	0 TRANS
K286AG LIC	CARSON CITY NV	BLFT-981013TN	286D 105.1	0.150 DA 355.0	39-12-50 119-46-10	176.5	41.15 0.00	0 TRANS
KZTI LIC	FALLON STATION NV	BLH-21119AOL	287C 105.3	100.000 600.0	39-54-46 118-55-18	63.7 SS	83.56 -11.44	95 SHORT
KZTI-FM1 LIC	RENO NV	BLFTB-30314ABU	287D 105.3	0.099 DA 0.0	39-35-04 119-48-06	283.3	0.27 0.00	0 BOOST
K287BK CP	VERDI NV	BNPFT-30805ABB	287D 105.3	0.003 DA 943.0	39-34-43 119-56-42	267.4	12.59 0.00	0 TRANS

===== END OF FM SPACING STUDY FOR CHANNEL 285 =====



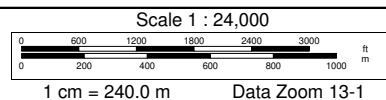




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K285EQ Free Space Interference Area Calculator

Interference Area to KZTI

Antenna Height: 122 meters AGL
 Contour Level: 103.3 dBu equals 0.1 V/m
 ERP in Watts: 240 Watts

Maximum distance
 to interfering contour is: 2436.9 feet equals 742.8 meters

Antenna: 6832-2 Ch285

Depression Angle (degrees)	Shively 6832-2 Ch285 Relative Field	Adjusted ERP (Watts)	Free Space Distance To 103.3 dBu Contour Along the depression angle	Horizontal Distance (meters)	Contour AGL (m)
-90	0.000	0.0	0.0 meters	0	122.0
-89	0.019	0.1	14.1	0.2	107.9
-88	0.037	0.3	27.5	1.0	94.5
-87	0.054	0.7	40.1	2.1	81.9
-86	0.071	1.2	52.7	3.7	69.4
-85	0.088	1.9	65.4	5.7	56.9
-84	0.104	2.6	77.2	8.1	45.2
-83	0.121	3.5	89.9	11.0	32.8
-82	0.137	4.5	101.8	14.2	21.2
-81	0.153	5.6	113.6	17.8	9.8
-80	0.168	6.8	124.8	21.7	-0.9 FAIL
-79	0.183	8.0	135.9	25.9	-11.4 FAIL
-78	0.198	9.4	147.1	30.6	-21.9 FAIL
-77	0.212	10.8	157.5	35.4	-31.4 FAIL
-76	0.226	12.3	167.9	40.6	-40.9 FAIL
-75	0.240	13.8	178.3	46.1	-50.2 FAIL
-74	0.253	15.4	187.9	51.8	-58.6 FAIL
-73	0.266	17.0	197.6	57.8	-66.9 FAIL
-72	0.278	18.5	206.5	63.8	-74.4 FAIL
-71	0.290	20.2	215.4	70.1	-81.7 FAIL
-70	0.301	21.7	223.6	76.5	-88.1 FAIL
-69	0.311	23.2	231.0	82.8	-93.7 FAIL
-68	0.321	24.7	238.4	89.3	-99.1 FAIL
-67	0.330	26.1	245.1	95.8	-103.6 FAIL
-66	0.338	27.4	251.1	102.1	-107.3 FAIL
-65	0.345	28.6	256.3	108.3	-110.2 FAIL
-64	0.352	29.7	261.5	114.6	-113.0 FAIL
-63	0.357	30.6	265.2	120.4	-114.3 FAIL
-62	0.362	31.5	268.9	126.2	-115.4 FAIL
-61	0.366	32.1	271.9	131.8	-115.8 FAIL
-60	0.368	32.5	273.3	136.7	-114.7 FAIL
-59	0.370	32.9	274.8	141.5	-113.6 FAIL
-58	0.370	32.9	274.8	145.6	-111.1 FAIL
-57	0.370	32.9	274.8	149.7	-108.5 FAIL
-56	0.368	32.5	273.3	152.8	-104.6 FAIL
-55	0.364	31.8	270.4	155.1	-99.5 FAIL
-54	0.360	31.1	267.4	157.2	-94.3 FAIL
-53	0.354	30.1	262.9	158.2	-88.0 FAIL
-52	0.347	28.9	257.7	158.7	-81.1 FAIL
-51	0.338	27.4	251.1	158.0	-73.1 FAIL
-50	0.328	25.8	243.6	156.6	-64.6 FAIL
-49	0.317	24.1	235.5	154.5	-55.7 FAIL

-48	0.304	22.2	225.8	151.1	-45.8	FAIL
-47	0.289	20.0	214.7	146.4	-35.0	FAIL
-46	0.273	17.9	202.8	140.9	-23.9	FAIL
-45	0.255	15.6	189.4	133.9	-11.9	FAIL
-44	0.236	13.4	175.3	126.1	0.2	FAIL
-43	0.216	11.2	160.4	117.3	12.6	
-42	0.193	8.9	143.4	106.5	26.1	
-41	0.170	6.9	126.3	95.3	39.2	
-40	0.145	5.0	107.7	82.5	52.8	
-39	0.118	3.3	87.6	68.1	66.8	
-38	0.090	1.9	66.8	52.7	80.8	
-37	0.061	0.9	45.3	36.2	94.7	
-36	0.031	0.2	23.0	18.6	108.5	
-35	0.001	0.0	0.7	0.6	121.6	
-34	0.034	0.3	25.3	20.9	107.9	
-33	0.068	1.1	50.5	42.4	94.5	
-32	0.103	2.5	76.5	64.9	81.5	
-31	0.139	4.6	103.2	88.5	68.8	
-30	0.175	7.3	130.0	112.6	57.0	
-29	0.213	10.9	158.2	138.4	45.3	
-28	0.250	15.0	185.7	164.0	34.8	
-27	0.289	20.0	214.7	191.3	24.5	
-26	0.327	25.7	242.9	218.3	15.5	
-25	0.366	32.1	271.9	246.4	7.1	
-24	0.405	39.4	300.8	274.8	-0.4	FAIL
-23	0.444	47.3	329.8	303.6	-6.9	FAIL
-22	0.483	56.0	358.8	332.6	-12.4	FAIL
-21	0.521	65.1	387.0	361.3	-16.7	FAIL
-20	0.559	75.0	415.2	390.2	-20.0	FAIL
-19	0.596	85.3	442.7	418.6	-22.1	FAIL
-18	0.632	95.9	469.4	446.5	-23.1	FAIL
-17	0.667	106.8	495.4	473.8	-22.8	FAIL
-16	0.702	118.3	521.4	501.2	-21.7	FAIL
-15	0.735	129.7	545.9	527.3	-19.3	FAIL
-14	0.766	140.8	569.0	552.1	-15.6	FAIL
-13	0.796	152.1	591.2	576.1	-11.0	FAIL
-12	0.825	163.4	612.8	599.4	-5.4	FAIL
-11	0.851	173.8	632.1	620.5	1.4	FAIL
-10	0.876	184.2	650.7	640.8	9.0	
-9	0.899	194.0	667.7	659.5	17.5	
-8	0.920	203.1	683.3	676.7	26.9	
-7	0.938	211.2	696.7	691.5	37.1	
-6	0.954	218.4	708.6	704.7	47.9	
-5	0.968	224.9	719.0	716.3	59.3	
-4	0.980	230.5	727.9	726.1	71.2	
-3	0.988	234.3	733.8	732.8	83.6	
-2	0.995	237.6	739.0	738.6	96.2	
-1	0.999	239.5	742.0	741.9	109.0	
0	1.000	240.0	742.8	742.8	122.0	

Antenna Mfg.: Shively Labs
Antenna Type: 6832-2SS(98")

Date: 1/20/2016

Station: 0
Frequency: 104.9
Channel #: 285

Beam Tilt 0
Gain (Max) 1.009
Gain (Horizon) 1.009

0.037 dB
0.037 dB

Figure: Note: dB is ref dipole. Hpol

Angle of Depression (Deg)	Relative Field	Angle of Depression (Deg)	Relative Field	Angle of Depression (Deg)	Relative Field	Angle of Depression (Deg)	Relative Field
-90	0.000	-44	0.236	0	1.000	46	0.273
-89	0.019	-43	0.216	1	0.999	47	0.289
-88	0.037	-42	0.193	2	0.995	48	0.304
-87	0.054	-41	0.170	3	0.988	49	0.317
-86	0.071	-40	0.145	4	0.980	50	0.328
-85	0.088	-39	0.118	5	0.968	51	0.338
-84	0.104	-38	0.090	6	0.954	52	0.347
-83	0.121	-37	0.061	7	0.938	53	0.354
-82	0.137	-36	0.031	8	0.920	54	0.360
-81	0.153	-35	0.001	9	0.899	55	0.364
-80	0.168	-34	0.034	10	0.876	56	0.368
-79	0.183	-33	0.068	11	0.851	57	0.370
-78	0.198	-32	0.103	12	0.825	58	0.370
-77	0.212	-31	0.139	13	0.796	59	0.370
-76	0.226	-30	0.175	14	0.766	60	0.368
-75	0.240	-29	0.213	15	0.735	61	0.366
-74	0.253	-28	0.250	16	0.702	62	0.362
-73	0.266	-27	0.289	17	0.667	63	0.357
-72	0.278	-26	0.327	18	0.632	64	0.352
-71	0.290	-25	0.366	19	0.596	65	0.345
-70	0.301	-24	0.405	20	0.559	66	0.338
-69	0.311	-23	0.444	21	0.521	67	0.330
-68	0.321	-22	0.483	22	0.483	68	0.321
-67	0.330	-21	0.521	23	0.444	69	0.311
-66	0.338	-20	0.559	24	0.405	70	0.301
-65	0.345	-19	0.596	25	0.366	71	0.290
-64	0.352	-18	0.632	26	0.327	72	0.278
-63	0.357	-17	0.667	27	0.289	73	0.266
-62	0.362	-16	0.702	28	0.250	74	0.253
-61	0.366	-15	0.735	29	0.213	75	0.240
-60	0.368	-14	0.766	30	0.175	76	0.226
-59	0.370	-13	0.796	31	0.139	77	0.212
-58	0.370	-12	0.825	32	0.103	78	0.198
-57	0.370	-11	0.851	33	0.068	79	0.183
-56	0.368	-10	0.876	34	0.034	80	0.168
-55	0.364	-9	0.899	35	0.001	81	0.153
-54	0.360	-8	0.920	36	0.031	82	0.137
-53	0.354	-7	0.938	37	0.061	83	0.121
-52	0.347	-6	0.954	38	0.090	84	0.104
-51	0.338	-5	0.968	39	0.118	85	0.088
-50	0.328	-4	0.980	40	0.145	86	0.071
-49	0.317	-3	0.988	41	0.170	87	0.054
-48	0.304	-2	0.995	42	0.193	88	0.037
-47	0.289	-1	0.999	43	0.216	89	0.019
-46	0.273	0	1.000	44	0.236	90	0.000
-45	0.255			45	0.255		

January 2016
FM Translator K285EQ
Reno, Nevada Channel 285D
RF Exposure Study

Facilities Proposed

The proposed operation will be on Channel 285D (104.9 MHz) with an effective radiated power of 240 watts. Operation is proposed with a two-element antenna (98 inch interbay spacing) to be mounted on an existing tower on Red Peak. The antenna system will be shared by FM translators K223AL, K241AK, K245BV, and K285EQ.

The antenna support structure does not exceed 60.96 meters (200 feet) above ground and does not require notification to the Federal Aviation Administration. Therefore, this structure does not require an Antenna Structure Registration Number.

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.

$$S(\mu W / cm^2) = \frac{33.40981 \times AdjERP(Watts)}{D^2}$$

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.

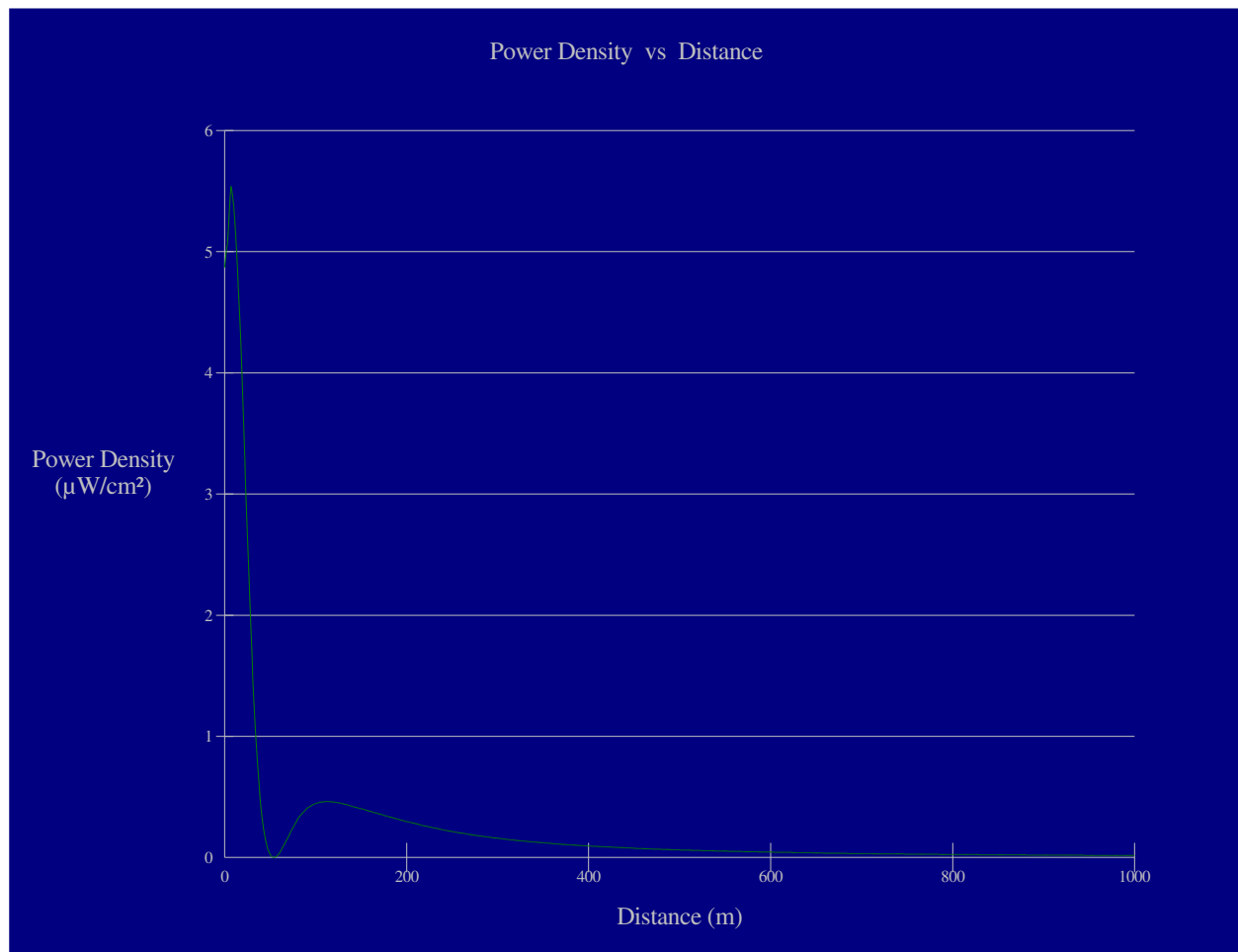
Ground level power densities have been calculated for locations extending from the base of the tower to a distance of 1000 meters. Values past this point are increasingly negligible.

Calculations of the power density produced by the proposed K285EQ antenna system assume a Type 1 element pattern, which is the "worst case" element pattern. The highest calculated ground level power density occurs at a distance of 7 meters from the base of the antenna support structure. At this point the power density is calculated to be 5.3 $\mu W/cm^2$, which is 2.7% of 200 $\mu W/cm^2$ (the FCC standard for uncontrolled environments).

These calculations show that the maximum calculated power density produced at two meters above ground level by the proposed operation of K285EQ alone is less than 5% of the applicable FCC exposure limit at all locations between 1 and 1000 meters from the base of the antenna support structure. Section 1.1307(b)(3) of the Commission's Rules excludes applications for new facilities or modifications to existing facilities from the requirement of preparing an environmental assessment when the calculated emissions from the applicant's 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.

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 radiation in excess of FCC guidelines.



Ground-Level RF Exposure

OET FMModel

K285EQ Reno

Antenna Type: Shively 6832-2

No. of Elements: 2

Element Spacing: 0.87 wavelength (2.49 meter spacing between bays)

Distance: 1000 meters

Horizontal ERP: 0.240 kW

Vertical ERP: 0.240 kW

Antenna Height: 40 meters AGL

Maximum Calculated Power Density is $5.3 \mu\text{W}/\text{cm}^2$ at 7 meters from the antenna structure.

Hatfield & Dawson Consulting Engineers