

# FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for  
**KVH Industries, Inc.**  
**NUEVO, CA**  
**(2.4 meter)**  
**Satellite Earth Station**

Prepared By:  
COMSEARCH  
19700 Janelia Farm Boulevard  
Ashburn, VA 20147  
May 10, 2012

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## 1. CONCLUSIONS

An interference study considering all existing, proposed and prior coordinated microwave facilities within the coordination contours of the proposed earth station demonstrates that this site will operate satisfactorily with the common carrier microwave environment. Further, there will be no restrictions of its operation due to interference considerations.

## 2. SUMMARY OF RESULTS

A number of great circle interference cases were identified during the interference study of the proposed earth station. Each of the cases, which exceeded the interference objective on a line-of-sight basis, was profiled and the propagation losses estimated using NBS TN101 (Revised) techniques. The losses were found to be sufficient to reduce the signal levels to acceptable magnitudes in every case.

The following companies reported potential great circle interference conflicts that did not meet the objectives on a line-of-sight basis. When over-the-horizon losses are considered on the interfering paths, sufficient blockage exists to negate harmful interference from occurring with the proposed transmit-receive earth station.

### Company

Southern California Edison Company

No other carriers reported potential interference cases.

### 3. SUPPLEMENTAL SHOWING

Pursuant to Part 25.203(c) of the FCC Rules and Regulations, the satellite earth station proposed in this application was coordinated by Comsearch using computer techniques and in accordance with Part 25 of the FCC Rules and Regulations.

Coordination data for this earth station was sent to the below listed carriers with a letter dated 05/02/2012.

Company

ANAHEIM CITY, COMMUNICATIONS DIVISION  
AT&T California  
AirSites2000, LLC  
CCO SoCal I, LLC  
CNG Communications, Inc.  
COAST COMMUNITY COLLEGE DISTRICT  
California, State of  
Calvary Chapel of Costa Mesa  
Cellco Partnership - California  
Coachella Valley Water District  
DRS Technical Services  
ENTRAVISION HOLDINGS, LLC  
KTLA INC  
LOS ANGELES CITY WATER & POWER  
Los Angeles County FCC Licensing Section  
Los Angeles SMSA Ltd. Partnership  
MOBILE RELAY ASSOCIATES INC  
MONTEBELLO CITY CALIFORNIA  
Metropolitan Water Dist of So California  
New Cingular Wireless PCS - Los Angeles  
New Cingular Wireless PCS LLC -San Diego  
ORANGE, COUNTY OF, CA  
QUALCOMM INC.  
Regional 3Cs  
Riverside, County of  
SAN DIEGO, CITY OF  
SOUTHERN CALIFORNIA REGIONAL RAIL AUTH.  
San Bernardino County of California  
San Diego County  
San Diego Gas & Electric Company  
Skyriver Communications  
Southern California Edison Company  
Southern California Gas Company  
T-Mobile License LLC  
TV MICROWAVES CO  
Turn Wireless, LLC  
University of California,HPWREN  
Verizon California Inc.  
Verizon Wireless (VAW) LLC (CA)  
Western Pacific Mobile Microwave  
Western Technical Services

## **4. EARTH STATION COORDINATION DATA**

This section presents the data pertinent to frequency coordination of the proposed earth station that was circulated to all carriers within its coordination contours.

# COMSEARCH

## Earth Station Data Sheet

19700 Janelia Farm Boulevard, Ashburn, VA 20147  
(703)726-5500 <http://www.comsearch.com>

Date: 05/09/2012  
Job Number: 120502COMSGE06

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### Administrative Information

Status ENGINEER PROPOSAL  
Call Sign  
Licensee Code KVHIND  
Licensee Name KVH Industries, Inc.

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### Site Information

**NUEVO, CA**  
Venue Name  
Latitude (NAD 83) 33° 47' 46.3" N  
Longitude (NAD 83) 117° 5' 20.7" W  
Climate Zone A  
Rain Zone 4  
Ground Elevation (AMSL) 562.97 m / 1847.0 ft

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### Link Information

Satellite Type Geostationary  
Mode TR - Transmit-Receive  
Modulation Digital  
Satellite Arc 53° W to 180° West Longitude  
Azimuth Range 105.1° to 254.1°  
Corresponding Elevation Angles 12.8° / 13.8°  
Antenna Centerline (AGL) 2.74 m / 9.0 ft

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### Antenna Information

		<b>Receive - FCC32</b>		<b>Transmit - FCC32</b>	
Manufacturer		SeaTel		SeaTel	
Model		9797		9797	
Gain / Diameter		38.5 dBi / 2.4 m		41.7 dBi / 2.4 m	
3-dB / 15-dB Beamwidth		2.30° / 4.60°		2.70° / 5.40°	
Max Available RF Power	(dBW/4 kHz) (dBW/MHz)			-28.0 -4.0	
Maximum EIRP	(dBW/4 kHz) (dBW/MHz)			13.7 37.7	
Interference Objectives:	Long Term	-156.0 dBW/MHz	20%	-154.0 dBW/4 kHz	20%
	Short Term	-146.0 dBW/MHz	0.01%	-131.0 dBW/4 kHz	0.0025%

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### Frequency Information

	<b>Receive 4.0 GHz</b>	<b>Transmit 6.1 GHz</b>
Emission / Frequency Range (MHz)	10M0G7D - 30M0G7D / 3700.0 - 4200.0	10M0G7D - 30M0G7D / 5925.0 - 6425.0
Max Great Circle Coordination Distance	285.9 km / 177.6 mi	100.0 km / 62.1 mi
Precipitation Scatter Contour Radius	381.8 km / 237.2 mi	100.0 km / 62.1 mi

# COMSEARCH

## Earth Station Data Sheet

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### Coordination Values

### NUEVO, CA

Licensee Name KVH Industries, Inc.  
Latitude (NAD 83) 33° 47' 46.3" N  
Longitude (NAD 83) 117° 5' 20.7" W  
Ground Elevation (AMSL) 562.97 m / 1847.0 ft  
Antenna Centerline (AGL) 2.74 m / 9.0 ft  
Antenna Model SeaTel 9797  
Antenna Mode Receive 4.0 GHz Transmit 6.1 GHz  
Interference Objectives: Long Term -156.0 dBW/MHz 20% -154.0 dBW/4 kHz 20%  
Short Term -146.0 dBW/MHz 0.01% -131.0 dBW/4 kHz 0.0025%  
Max Available RF Power -28.0 (dBW/4 kHz)

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 4.0 GHz		Transmit 6.1 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
0	1.31	104.81	-10.00	210.97	-10.00	100.00
5	2.69	99.96	-10.00	178.61	-10.00	100.00
10	2.03	95.03	-10.00	193.91	-10.00	100.00
15	2.83	90.12	-10.00	175.46	-10.00	100.00
20	3.24	85.19	-10.00	164.00	-10.00	100.00
25	3.16	80.27	-10.00	165.93	-10.00	100.00
30	3.93	75.31	-10.00	149.25	-10.00	100.00
35	3.44	70.40	-10.00	159.55	-10.00	100.00
40	3.54	65.47	-10.00	157.49	-10.00	100.00
45	3.57	60.55	-10.00	156.81	-10.00	100.00
50	3.28	55.67	-10.00	163.19	-10.00	100.00
55	2.74	50.86	-10.00	177.59	-10.00	100.00
60	2.69	46.01	-9.57	180.85	-9.57	100.00
65	3.40	41.03	-8.33	170.91	-8.33	100.00
70	3.63	36.15	-6.95	172.73	-6.95	100.00
75	3.19	31.49	-5.45	190.30	-5.45	100.00
80	3.73	26.61	-3.63	188.01	-3.63	100.00
85	3.74	22.00	-1.56	198.51	-1.56	100.00
90	3.64	17.63	0.84	210.72	0.84	100.00
95	2.83	14.18	3.21	244.49	3.21	100.00
100	3.01	11.05	5.92	259.48	5.92	100.00
105	3.35	9.46	7.60	263.33	7.60	100.00
110	3.84	10.20	6.78	244.31	6.78	100.00
115	3.88	13.29	3.91	223.87	3.91	100.00
120	4.12	17.02	1.23	206.17	1.23	100.00
125	3.80	21.04	-1.08	199.80	-1.08	100.00
130	4.02	24.63	-2.78	186.57	-2.78	100.00
135	3.84	28.33	-4.31	182.30	-4.31	100.00
140	3.89	31.71	-5.53	174.70	-5.53	100.00
145	4.14	34.73	-6.52	162.64	-6.52	100.00
150	3.24	38.35	-7.59	178.24	-7.59	100.00
155	3.62	40.69	-8.24	164.57	-8.24	100.00
160	4.88	41.85	-8.54	141.18	-8.54	100.00
165	4.95	43.53	-8.97	138.49	-8.97	100.00
170	5.18	44.55	-9.22	134.94	-9.22	100.00
175	5.68	44.79	-9.28	131.15	-9.28	100.00
180	5.90	44.81	-9.28	129.00	-9.28	100.00
185	6.47	44.01	-9.09	123.67	-9.09	100.00



# COMSEARCH

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### Coordination Values

### NUEVO, CA

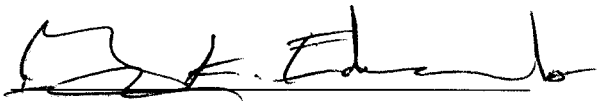
Licensee Name	KVH Industries, Inc.			
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Interference Objectives: Long Term	-156.0 dBW/MHz	20%	-154.0 dBW/4 kHz	20%
Short Term	-146.0 dBW/MHz	0.01%	-131.0 dBW/4 kHz	0.0025%
Max Available RF Power			-28.0 (dBW/4 kHz)	

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 4.0 GHz		Transmit 6.1 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
190	6.53	43.24	-8.90	123.72	-8.90	100.00
195	5.93	42.62	-8.74	130.85	-8.74	100.00
200	5.37	41.43	-8.43	136.24	-8.43	100.00
205	5.61	39.07	-7.80	136.45	-7.80	100.00
210	5.82	36.37	-7.02	137.67	-7.02	100.00
215	6.42	33.05	-5.98	135.52	-5.98	100.00
220	6.23	30.07	-4.95	142.22	-4.95	100.00
225	6.15	26.77	-3.69	149.33	-3.69	100.00
230	6.11	23.26	-2.16	157.73	-2.16	100.00
235	5.83	19.75	-0.39	173.26	-0.39	100.00
240	5.88	15.93	1.95	186.34	1.95	100.00
245	5.64	12.21	4.83	205.53	4.83	100.00
250	5.10	9.60	7.44	225.43	7.44	100.00
255	4.59	9.25	7.85	237.08	7.85	100.00
260	4.94	10.61	6.36	220.54	6.36	100.00
265	4.83	14.06	3.30	206.52	3.30	100.00
270	4.77	18.21	0.49	192.01	0.49	100.00
275	4.82	22.65	-1.88	178.07	-1.88	100.00
280	3.39	27.76	-4.09	192.95	-4.09	100.00
285	2.85	32.58	-5.82	195.75	-5.82	100.00
290	1.18	37.75	-7.42	228.01	-7.42	100.00
295	1.19	42.45	-8.70	220.86	-8.70	100.00
300	0.00	47.46	-9.91	285.86	-9.91	100.00
305	0.00	52.21	-10.00	285.28	-10.00	100.00
310	0.27	56.95	-10.00	275.93	-10.00	100.00
315	0.00	61.80	-10.00	285.28	-10.00	100.00
320	0.00	66.62	-10.00	285.28	-10.00	100.00
325	0.00	71.46	-10.00	285.28	-10.00	100.00
330	0.00	76.30	-10.00	285.28	-10.00	100.00
335	0.00	81.15	-10.00	285.28	-10.00	100.00
340	0.00	86.00	-10.00	285.28	-10.00	100.00
345	0.00	90.86	-10.00	285.28	-10.00	100.00
350	0.00	95.71	-10.00	285.28	-10.00	100.00
355	0.44	100.59	-10.00	256.00	-10.00	100.00

## 5. CERTIFICATION

I HEREBY CERTIFY THAT I AM THE TECHNICALLY QUALIFIED PERSON RESPONSIBLE FOR THE PREPARATION OF THE FREQUENCY COORDINATION DATA CONTAINED IN THIS APPLICATION, THAT I AM FAMILIAR WITH PARTS 101 AND 25 OF THE FCC RULES AND REGULATIONS, THAT I HAVE EITHER PREPARED OR REVIEWED THE FREQUENCY COORDINATION DATA SUBMITTED WITH THIS APPLICATION, AND THAT IT IS COMPLETE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

BY: \_



Gary K. Edwards  
Senior Manager  
COMSEARCH  
19700 Janelia Farm Boulevard  
Ashburn, VA 20147

DATED: May 10, 2012