FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
DIRECTV Enterprises, LLC
LONG BEACH, CA
(9.2 Meter, C-band)
Satellite Earth Station

Prepared By:
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, VA 20147
July 13, 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

California, State of
Los Angeles County FCC Licensing Section
Los Angeles SMSA Ltd. Partnership
New Cingular Wireless PCS - Los Angeles
San Bernardino County of California
Southern California Edison Company
Southern California Gas Company
Southern California Regional Rail Auth.

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 05/31/2012.

Company
ANAHEIM CITY, COMMUNICATIONS DIVISION
AT&T California
AirSites2000, LLC
American Tower, LLC
BNSF Railway Company
CCO SoCal I, LLC
CNG Communications, Inc.
COAST COMMUNITY COLLEGE DISTRICT
California, State of
Calvary Chapel of Costa Mesa
Cellco Partnership - California
ENTRAVISION HOLDINGS, LLC
Fresno MSA Limited Partnership
KTLA INC
LOS ANGELES CITY WATER & POWER
LOS ANGELES UNIFIED SCHOOL DISTRICT
Los Angeles City Info Technology Agency
Los Angeles County Dept of Public Works
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
Nextel of California Inc.
ORANGE, COUNTY OF, CA
QUALCOMM INC.
QWEST CORPORATION
Riverside, County of
San Bernardino County of California
San Diego County
San Diego Gas & Electric Company
Skyriver Communications
Southern California Edison Company
Southern California Gas Company
Southern California Regional Rail Auth.
T-Mobile License LLC
TV MICROWAVES CO
Turn Wireless, LLC

University of California,HPWREN
Ventura, County of
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:	07/02/2012
Job Number:	120531COMSGE01

Administrative Information

Status	ENGINEER PROPOSAL
Call Sign	
Licensee Code	ZDIRTV
Licensee Name	DIRECTV Enterprises, LLC

Site Information — LONG BEACH, CA

Venue Name	
Latitude (NAD 83)	33° 49' 45.5" N
Longitude (NAD 83)	118° 12' 39.1" W
Climate Zone	B
Rain Zone	4
Ground Elevation (AMSL)	13.7 m / 45.0 ft

Link Information

Satellite Type	Geostationary
Mode	TR - Transmit-Receive
Modulation	Digital
Satellite Arc	58° W to 143° West Longitude
Azimuth Range	107.7° to 219.7°
Corresponding Elevation Angles	16.0° / 42.6°
Antenna Centerline (AGL)	5.49 m / 18.0 ft

Antenna Information		Receive - FCC32		Transmit - FCC32	
Manufacturer		General Dynamics		General Dynamics	
Model		9.2 Meter		9.2 Meter	
Gain / Diameter		50.1 dBi / 9.2 m		53.6 dBi / 9.2 m	
3-dB / 15-dB Beamwidth		0.55° / 1.20°		0.40° / 0.80°	
Max Available RF Power	(dBW/4 kHz)			-19.9	
	(dBW/MHz)			4.1	
Maximum EIRP	(dBW/4 kHz)			33.7	
	(dBW/MHz)			57.7	
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%

Frequency Information	Receive 4.0 GHz	Transmit 6.1 GHz
Emission / Frequency Range (MHz)	24M0G7W - 36M0G7W / 3700.0 - 4200.0	24M0G7W - 36M0G7W / 5925.0 - 6425.0
Max Great Circle Coordination Distance	518.3 km / 322.0 mi	151.0 km / 93.8 mi
Precipitation Scatter Contour Radius	375.1 km / 233.1 mi	100.0 km / 62.1 mi

COMSEARCH

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Coordination Values	**LONG BEACH, CA**			
Licensee Name	DIRECTV Enterprises, LLC			
Latitude (NAD 83)	33° 49' 45.5" N			
Longitude (NAD 83)	118° 12' 39.1" W			
Ground Elevation (AMSL)	13.7 m / 45.0 ft			
Antenna Centerline (AGL)	5.49 m / 18.0 ft			
Antenna Model	General Dynamics 9.2 meter			
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			-19.9 (dBW/4 kHz)	

			Receive 4.0 GHz		Transmit 6.1 GHz	
Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
0	0.00	106.97	-10.00	412.20	-10.00	125.53
5	0.00	102.18	-10.00	412.20	-10.00	125.53
10	0.00	97.38	-10.00	412.20	-10.00	125.53
15	0.00	92.58	-10.00	412.20	-10.00	125.53
20	0.00	87.77	-10.00	412.20	-10.00	125.53
25	0.00	82.96	-10.00	412.20	-10.00	125.53
30	0.00	78.16	-10.00	412.20	-10.00	125.53
35	0.00	73.37	-10.00	412.20	-10.00	125.53
40	0.00	68.59	-10.00	412.20	-10.00	125.53
45	0.00	63.82	-10.00	412.20	-10.00	125.53
50	0.00	59.08	-10.00	412.20	-10.00	125.53
55	0.34	54.29	-10.00	365.20	-10.00	114.97
60	0.47	49.56	-10.00	329.62	-10.00	104.57
65	0.55	44.88	-9.30	320.97	-9.30	101.69
70	0.67	40.25	-8.12	312.58	-8.12	100.00
75	0.69	35.73	-6.83	322.45	-6.83	101.20
80	0.72	31.33	-5.40	331.52	-5.40	103.40
85	0.68	27.15	-3.84	352.67	-3.84	109.33
90	0.61	23.29	-2.18	383.88	-2.18	116.88
95	0.62	19.85	-0.44	402.47	-0.44	119.00
100	0.61	17.17	1.13	424.89	1.13	124.21
105	0.52	15.72	2.09	457.59	2.09	132.72
110	0.47	15.71	2.10	471.34	2.10	136.77
115	0.32	17.28	1.06	518.32	1.06	150.96
120	0.33	19.85	-0.44	492.08	-0.44	144.11
125	0.84	22.87	-1.98	346.00	-1.98	106.31
130	0.48	26.86	-3.73	391.73	-3.73	117.56
135	0.00	30.81	-5.22	475.46	-5.22	141.77
140	0.00	34.32	-6.39	459.60	-6.39	137.48
145	0.00	37.63	-7.39	445.94	-7.39	133.97
150	0.00	40.71	-8.24	434.61	-8.24	131.10
155	0.00	43.50	-8.96	425.30	-8.96	128.77
160	0.00	45.93	-9.55	417.80	-9.55	126.91
165	0.00	47.93	-10.00	412.20	-10.00	125.53
170	0.00	49.42	-10.00	412.20	-10.00	125.53
175	0.00	50.36	-10.00	412.20	-10.00	125.53
180	0.00	50.67	-10.00	412.20	-10.00	125.53
185	0.00	50.36	-10.00	412.20	-10.00	125.53

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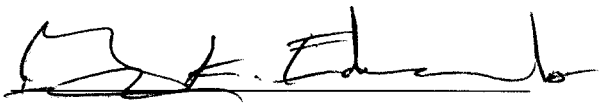
Antenna Mode	Receive 4.0 GHz		Transmit 6.1 GHz	
Interference Objectives: Long Term	-156.0 dBW/MHz	20%	-154.0 dBW/4 kHz	20%
Short Term	-146.0 dBW/MHz	0.01%	-131.0 dBW/4 kHz	0.0025%
Max Available RF Power			-19.9 (dBW/4 kHz)	

			Receive 4.0 GHz		Transmit 6.1 GHz	
Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	49.43	-10.00	412.20	-10.00	125.53
195	0.00	47.93	-10.00	412.20	-10.00	125.53
200	0.00	46.08	-9.59	417.33	-9.59	126.79
205	0.00	44.55	-9.22	421.96	-9.22	127.94
210	0.00	43.44	-8.95	425.49	-8.95	128.81
215	0.00	42.76	-8.78	427.67	-8.78	129.36
220	0.00	42.56	-8.72	428.34	-8.72	129.53
225	0.00	42.83	-8.79	427.46	-8.79	129.31
230	0.00	43.56	-8.98	425.10	-8.98	128.72
235	0.00	44.73	-9.27	421.42	-9.27	127.80
240	0.00	46.31	-9.64	416.66	-9.64	126.63
245	0.00	48.25	-10.00	412.20	-10.00	125.53
250	0.00	50.52	-10.00	412.20	-10.00	125.53
255	0.00	53.06	-10.00	412.20	-10.00	125.53
260	0.00	55.83	-10.00	412.20	-10.00	125.53
265	0.00	58.81	-10.00	412.20	-10.00	125.53
270	0.00	61.95	-10.00	412.20	-10.00	125.53
275	0.00	65.22	-10.00	412.20	-10.00	125.53
280	0.00	68.61	-10.00	412.20	-10.00	125.53
285	0.00	72.09	-10.00	412.20	-10.00	125.53
290	0.00	75.64	-10.00	412.20	-10.00	125.53
295	0.00	79.24	-10.00	412.20	-10.00	125.53
300	0.00	82.89	-10.00	412.20	-10.00	125.53
305	0.00	86.56	-10.00	412.20	-10.00	125.53
310	0.00	90.24	-10.00	412.20	-10.00	125.53
315	0.24	93.93	-10.00	398.30	-10.00	121.73
320	0.43	97.64	-10.00	340.69	-10.00	107.81
325	0.52	101.32	-10.00	318.38	-10.00	101.17
330	0.58	104.96	-10.00	309.75	-10.00	100.00
335	0.59	108.54	-10.00	308.11	-10.00	100.00
340	0.62	112.06	-10.00	303.65	-10.00	100.00
345	0.00	115.21	-10.00	412.20	-10.00	125.53
350	0.00	116.52	-10.00	412.20	-10.00	125.53
355	0.00	111.75	-10.00	412.20	-10.00	125.53

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
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19700 Janelia Farm Boulevard
Ashburn, VA 20147

DATED: July 13, 2012