

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
DIRECTV Enterprises, LLC
BAKERSFIELD, CA
Satellite Earth Station

Prepared By:
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, VA 20147
August 29, 2017

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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.

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 07/20/2017.

Company

AT&T Corp.
AT&T Mobility Spectrum LLC - Southern CA
Aera Energy LLC
Antelecom, Inc.
Antelope Valley College
Bakersfield, City of
Bel Air Internet, LLC
California Internet, L.P.
Cardiology Associates Medical Group, Inc
Care Community Ambulance Services Inc.
Castaic Lake Water Agency
Chevron USA Inc.
City of Los Angeles Dept Water & Power
City of San Buenaventura Police Dept
City of Santa Barbara Fire Department
Clearwire Spectrum Holdings III, LLC
Community Memorial Health System
Conterra Ultra Broadband, LLC
Fixed Wireless Holdings, LLC
Frontier California Inc.
Gilcomm LLC
Iberdrola Renewables, LLC
Kern County Superintendent of Schools
Kern Ed Telecom Consortium
Kern Schools Federal Credit Union
Kern Schools Federal Credit Union
Kern Valley Dispatch
Kern, County of
Kings County Office of Education
LT-WR, LLC
Los Angeles County FCC Licensing Section
Los Angeles Regional Interoperable Comm
Los Angeles SMSA Ltd. Partnership
Macpherson Oil Company
Metropolitan Water Dist of So California
NBC Telemundo License LLC
New Cingular Wireless PCS - Los Angeles
New Cingular Wireless PCS LLC - N CAL
Nextweb Inc
Oacys.Com Incorporated

Pacific Bell Tel Com dba AT&T California
Paramount Farms
Pueblo Radiology
Regents of the University of California
Santa Barbara Cellular Systems, Ltd.
Santa Barbara, County of
Skyriver Communications
SmartSky Networks
Southern California Gas Company
Sprint Spectrum L.P.
Sprint Telephony PCS, L.P.
T-Mobile License LLC
Tejon Ranch Co
Tulare, City of
Tulare, County of
Turn Wireless, LLC
UbiquiTel Leasing Company
Ventura County Office of Education
Ventura, County of
Verizon Wireless (VAW) LLC (Southern CA)
Verizon Wireless (VAW) LLC-N CA/NV
unWired Broadband, Inc

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: 07/20/2017
Job Number: 170720COMSGE06

Administrative Information

Status ENGINEER PROPOSAL
Call Sign E170103
Licensee Code ZDIRTV
Licensee Name DIRECTV Enterprises, LLC

Site Information

BAKERSFIELD, CA

Venue Name
Latitude (NAD 83) 35° 18' 33.9" N
Longitude (NAD 83) 119° 4' 35.5" W
Climate Zone A
Rain Zone 4
Ground Elevation (AMSL) 112.01 m / 367.5 ft

Link Information

Satellite Type Geostationary
Mode TR - Transmit-Receive
Modulation Digital
Satellite Arc 82° W to 125° West Longitude
Azimuth Range 127.4° to 190.2°
Corresponding Elevation Angles 33.4° / 48.5°
Antenna Centerline (AGL) 8.38 m / 27.5 ft

Antenna Information

Receive - FCC32

Transmit - FCC32

Manufacturer	General Dynamics	General Dynamics		
Model	GD 13.2m	GD 13.2m		
Gain / Diameter	62.5 dBi / 13.2 m	65.2 dBi / 13.2 m		
3-dB / 15-dB Beamwidth	0.13° / 0.25°	0.09° / 0.17°		
Max Available RF Power (dBW/4 kHz)		-11.4		
(dBW/MHz)		12.6		
Maximum EIRP (dBW/4 kHz)		53.8		
(dBW/MHz)		77.8		
Interference Objectives:	Long Term	-156.0 dBW/MHz	20%	-151.0 dBW/4 kHz 20%
	Short Term	-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz 0.0025%

Frequency Information

Receive 12.2 GHz

Transmit 17.3 GHz

Emission / Frequency Range (MHz) 82K0F3N - 24M0G7W / 12200.0 - 12700.0 82K0F3N - 24M0G7W / 17300.0 - 17800.0

Max Great Circle Coordination Distance 245.6 km / 152.6 mi 131.1 km / 81.5 mi
Precipitation Scatter Contour Radius 350.1 km / 217.5 mi 100.0 km / 62.1 mi

COMSEARCH

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Coordination Values		BAKERSFIELD, CA			
Licensee Name		DIRECTV Enterprises, LLC			
Latitude (NAD 83)		35° 18' 33.9" N			
Longitude (NAD 83)		119° 4' 35.5" W			
Ground Elevation (AMSL)		112.01 m / 367.5 ft			
Antenna Centerline (AGL)		8.38 m / 27.5 ft			
Antenna Model		GD 13.2m			
Antenna Mode		Receive 12.2 GHz		Transmit 17.3 GHz	
Interference Objectives: Long Term		-156.0 dBW/MHz	20%	-151.0 dBW/4 kHz	20%
Short Term		-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz	0.0025%
Max Available RF Power		-11.4 (dBW/4 kHz)			

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 12.2 GHz		Transmit 17.3 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
0	0.00	120.49	-10.00	227.19	-10.00	122.33
5	0.00	116.60	-10.00	227.19	-10.00	122.33
10	0.00	112.61	-10.00	227.19	-10.00	122.33
15	0.00	108.57	-10.00	227.19	-10.00	122.33
20	0.00	104.47	-10.00	227.19	-10.00	122.33
25	0.00	100.34	-10.00	227.19	-10.00	122.33
30	0.00	96.19	-10.00	227.19	-10.00	122.33
35	0.00	92.02	-10.00	227.19	-10.00	122.33
40	0.00	87.84	-10.00	227.19	-10.00	122.33
45	0.00	83.67	-10.00	227.19	-10.00	122.33
50	0.00	79.51	-10.00	227.19	-10.00	122.33
55	0.00	75.38	-10.00	227.19	-10.00	122.33
60	0.00	71.29	-10.00	227.19	-10.00	122.33
65	0.00	67.25	-10.00	227.19	-10.00	122.33
70	0.00	63.27	-10.00	227.19	-10.00	122.33
75	0.00	59.38	-10.00	227.19	-10.00	122.33
80	0.00	55.59	-10.00	227.19	-10.00	122.33
85	0.00	51.93	-10.00	227.19	-10.00	122.33
90	0.00	48.44	-10.00	227.19	-10.00	122.33
95	0.00	45.17	-9.37	229.94	-9.37	123.93
100	0.00	42.15	-8.62	233.30	-8.62	125.84
105	0.00	39.46	-7.90	236.57	-7.90	127.68
110	0.00	37.17	-7.25	239.60	-7.25	129.36
115	0.00	35.35	-6.71	242.17	-6.71	129.52
120	0.00	34.09	-6.31	244.56	-6.31	130.56
125	0.00	33.44	-6.11	245.56	-6.11	131.11
130	0.00	33.45	-6.11	245.54	-6.11	131.10
135	0.00	34.12	-6.33	244.51	-6.33	130.53
140	0.00	35.40	-6.73	242.09	-6.73	130.73
145	0.00	37.24	-7.27	239.50	-7.27	129.31
150	0.00	39.55	-7.93	236.46	-7.93	127.62
155	0.00	42.15	-8.62	233.30	-8.62	125.84
160	0.00	44.48	-9.20	230.68	-9.20	124.35
165	0.00	46.39	-9.66	228.67	-9.66	123.19
170	0.00	47.82	-9.99	227.23	-9.99	122.35
175	0.00	48.70	-10.00	227.19	-10.00	122.33
180	0.00	49.00	-10.00	227.19	-10.00	122.33
185	0.00	48.72	-10.00	227.19	-10.00	122.33

COMSEARCH

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Coordination Values

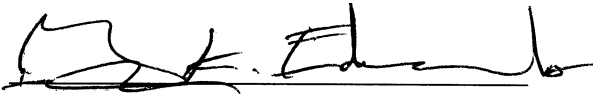
BAKERSFIELD, CA

Licensee Name DIRECTV Enterprises, LLC
Latitude (NAD 83) 35° 18' 33.9" N
Longitude (NAD 83) 119° 4' 35.5" W
Ground Elevation (AMSL) 112.01 m / 367.5 ft
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Antenna Model GD 13.2m
Antenna Mode Receive 12.2 GHz Transmit 17.3 GHz
Interference Objectives: Long Term -156.0 dBW/MHz 20% -151.0 dBW/4 kHz 20%
Short Term -146.0 dBW/MHz 0.01% -128.0 dBW/4 kHz 0.0025%
Max Available RF Power -11.4 (dBW/4 kHz)

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 12.2 GHz		Transmit 17.3 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	48.51	-10.00	227.19	-10.00	122.33
195	0.00	48.69	-10.00	227.19	-10.00	122.33
200	0.00	49.25	-10.00	227.19	-10.00	122.33
205	0.00	50.18	-10.00	227.19	-10.00	122.33
210	0.00	51.45	-10.00	227.19	-10.00	122.33
215	0.00	53.04	-10.00	227.19	-10.00	122.33
220	0.00	54.92	-10.00	227.19	-10.00	122.33
225	0.00	57.06	-10.00	227.19	-10.00	122.33
230	0.00	59.42	-10.00	227.19	-10.00	122.33
235	0.00	61.98	-10.00	227.19	-10.00	122.33
240	0.00	64.70	-10.00	227.19	-10.00	122.33
245	0.00	67.57	-10.00	227.19	-10.00	122.33
250	0.00	70.55	-10.00	227.19	-10.00	122.33
255	0.00	73.63	-10.00	227.19	-10.00	122.33
260	0.00	76.79	-10.00	227.19	-10.00	122.33
265	0.00	80.01	-10.00	227.19	-10.00	122.33
270	0.00	83.28	-10.00	227.19	-10.00	122.33
275	0.00	86.58	-10.00	227.19	-10.00	122.33
280	0.00	89.88	-10.00	227.19	-10.00	122.33
285	0.00	93.20	-10.00	227.19	-10.00	122.33
290	0.00	96.49	-10.00	227.19	-10.00	122.33
295	0.00	99.76	-10.00	227.19	-10.00	122.33
300	0.00	102.98	-10.00	227.19	-10.00	122.33
305	0.00	106.15	-10.00	227.19	-10.00	122.33
310	0.00	109.24	-10.00	227.19	-10.00	122.33
315	0.00	112.23	-10.00	227.19	-10.00	122.33
320	0.00	115.11	-10.00	227.19	-10.00	122.33
325	0.00	117.84	-10.00	227.19	-10.00	122.33
330	0.00	120.41	-10.00	227.19	-10.00	122.33
335	0.00	122.79	-10.00	227.19	-10.00	122.33
340	0.00	124.94	-10.00	227.19	-10.00	122.33
345	0.00	126.84	-10.00	227.19	-10.00	122.33
350	0.00	127.95	-10.00	227.19	-10.00	122.33
355	0.00	124.29	-10.00	227.19	-10.00	122.33

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: August 29, 2017