

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
HUGHES NETWORK SYSTEMS LIMITED
GILBERT, AZ
Satellite Earth Station

Prepared By:
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, VA 20147
March 03, 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.

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

Alltel Comm Southwest Holdings Inc.

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 02/15/2017.

Company

AT&T Corp.
AT&T Mobility Spectrum LLC - Arizona
Affiniti LLC
Agua Fria Unified School District
Alltel Comm Southwest Holdings Inc.
American Medical Response, Inc.
Arizona Board of Regents Arizona St Univ
Arizona State University - Tempe
Avondale Police Department
BNCCORP INC.
Banner Health
Bluewire LLC
Camp Verde Fire District
Casa Grande Union HS Distrist
Central Yavapai Fire District
City of Avondale
City of Casa Grande
City of Glendale Water Services Wireless
City of Surprise
City of Tucson IT Department
Clearwire Spectrum Holdings III, LLC
Commnet Four Corners, LLC
Conterra Ultra Broadband, LLC
Coppernet Systems, Inc.
Creative Airtime Services
DW Tower, LLC
Deer Valley Unified School District
Dysart Unified School District
El Paso Natural Gas Company, LLC
FibAire Communications, LLC
GTT America LLC
Gila River Cellular General Partnership
Global Telecom & Technology Americas
Global Telecom & Technology Americas, In
Golder Ranch Fire District
GovNET Licenses LLC
Gutierrez-Palmenberg, Inc.
J.O. Combs Elementary School District
Littleton Unified School District
Maricopa County Wireless Systems

Mesa, City of
Multimedia Holdings Corporation
NW Communications of Phoenix, Inc.
New Cingular Wireless PCS LLC - AZ
Next Level Solutions
Nextel License Holdings 4 Inc.
Nextlink Wireless, LLC
North West Fire District
Paradise Valley Unified School District
Pendergast School District #92
Peoria, City of
Phoenix, City of
Qwest Corporation
Rio Verde Wireless, LLC
SWWG, LLC
Saddleback Communications
Scottsdale Medical Imaging
Scottsdale, City of
Shamrock Foods Company
Silver Bell Mining LLC
Simply Bits, LLC
Skyview Networks
Spanish Independent Broadcast Network
Sparkplug Southwest, LLC
SpeedConnect, LLC
Sprint PCS
Sprint Spectrum L.P.
Sprint Spectrum LP DBA Sprint PCS
Sun City West Fire District
Sun Health Corporation
T-Mobile License LLC
Telink Networks SW, LLC
Tempe Union High School District #213
Tempe, City of
Town of Florence
Town of Gilbert, AZ
Treach, James E
Union Pacific Railroad Company
Univision Radio License Corporation
Verizon Wireless(VAW) LLC-AZ/CO/NM/NV/UT
Western Broadband, LLC
Western WiMax, LLC
XO Communications, LLC

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: 03/03/2017
Job Number: 170215COMSGE10

Administrative Information

Status ENGINEER PROPOSAL
Call Sign E150076
Licensee Code HUNESY
Licensee Name HUGHES NETWORK SYSTEMS LIMITED

Site Information GILBERT, AZ

Venue Name
Latitude (NAD 83) 33° 21' 56.1" N
Longitude (NAD 83) 111° 48' 49.1" W
Climate Zone A
Rain Zone 5
Ground Elevation (AMSL) 372.21 m / 1221.2 ft

Link Information

Satellite Type Geostationary
Mode TR - Transmit-Receive
Modulation Digital
Satellite Arc 97.1° W to 97.1° West Longitude
Azimuth Range 154.5° to 154.5°
Corresponding Elevation Angles 48.1° / 48.1°
Antenna Centerline (AGL) 5.49 m / 18.0 ft

Antenna Information

		Receive - FCC32		Transmit - FCC32	
Manufacturer		GD Satcom		GD Satcom	
Model		9.2 meter		9.2 meter	
Gain / Diameter		62.7 dBi / 9.2 m		66.1 dBi / 9.2 m	
3-dB / 15-dB Beamwidth		1.00° / 2.00°		0.09° / 0.18°	
Max Available RF Power	(dBW/4 kHz) (dBW/MHz)			-38.0 -14.0	
Maximum EIRP	(dBW/4 kHz) (dBW/MHz)			28.1 52.1	
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 18.0 GHz	Transmit 28.0 GHz
Emission / Frequency Range (MHz)	100KG7W - 250MG7W / 18300.0 - 19300.0 100KG7W - 250MG7W / 19700.0 - 20200.0	100KG7W - 250MG7W / 27850.0 - 30000.0
Max Great Circle Coordination Distance	136.2 km / 84.6 mi	100.0 km / 62.1 mi
Precipitation Scatter Contour Radius	100.0 km / 62.1 mi	100.0 km / 62.1 mi

COMSEARCH

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Coordination Values

GILBERT, AZ

Licensee Name HUGHES NETWORK SYSTEMS LIMITED
Latitude (NAD 83) 33° 21' 56.1" N
Longitude (NAD 83) 111° 48' 49.1" W
Ground Elevation (AMSL) 372.21 m / 1221.2 ft
Antenna Centerline (AGL) 5.49 m / 18.0 ft
Antenna Model GD Satcom 9.2 meter
Antenna Mode Receive 18.0 GHz Transmit 28.0 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 -38.0 (dBW/4 kHz)

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 18.0 GHz		Transmit 28.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
0	0.00	127.08	-10.00	136.18	-10.00	100.00
5	0.00	125.13	-10.00	136.18	-10.00	100.00
10	0.00	122.94	-10.00	136.18	-10.00	100.00
15	0.00	120.52	-10.00	136.18	-10.00	100.00
20	0.00	117.91	-10.00	136.18	-10.00	100.00
25	0.00	115.13	-10.00	136.18	-10.00	100.00
30	0.00	112.22	-10.00	136.18	-10.00	100.00
35	0.00	109.19	-10.00	136.18	-10.00	100.00
40	0.00	106.07	-10.00	136.18	-10.00	100.00
45	0.00	102.87	-10.00	136.18	-10.00	100.00
50	0.00	99.62	-10.00	136.18	-10.00	100.00
55	0.00	96.32	-10.00	136.18	-10.00	100.00
60	0.00	92.99	-10.00	136.18	-10.00	100.00
65	0.00	89.65	-10.00	136.18	-10.00	100.00
70	0.00	86.32	-10.00	136.18	-10.00	100.00
75	0.00	82.99	-10.00	136.18	-10.00	100.00
80	0.00	79.70	-10.00	136.18	-10.00	100.00
85	0.00	76.46	-10.00	136.18	-10.00	100.00
90	0.00	73.27	-10.00	136.18	-10.00	100.00
95	0.00	70.17	-10.00	136.18	-10.00	100.00
100	0.00	67.16	-10.00	136.18	-10.00	100.00
105	0.00	64.28	-10.00	136.18	-10.00	100.00
110	0.00	61.53	-10.00	136.18	-10.00	100.00
115	0.00	58.96	-10.00	136.18	-10.00	100.00
120	0.00	56.59	-10.00	136.18	-10.00	100.00
125	0.00	54.44	-10.00	136.18	-10.00	100.00
130	0.00	52.55	-10.00	136.18	-10.00	100.00
135	0.00	50.96	-10.00	136.18	-10.00	100.00
140	0.00	49.70	-10.00	136.18	-10.00	100.00
145	0.00	48.78	-10.00	136.18	-10.00	100.00
150	0.00	48.24	-10.00	136.18	-10.00	100.00
155	0.00	48.09	-10.00	136.18	-10.00	100.00
160	0.00	48.32	-10.00	136.18	-10.00	100.00
165	0.00	48.94	-10.00	136.18	-10.00	100.00
170	0.00	49.93	-10.00	136.18	-10.00	100.00
175	0.00	51.27	-10.00	136.18	-10.00	100.00
180	0.00	52.92	-10.00	136.18	-10.00	100.00
185	0.00	54.87	-10.00	136.18	-10.00	100.00

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Coordination Values

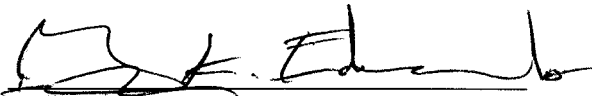
GILBERT, AZ

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Short Term -146.0 dBW/MHz 0.01% -128.0 dBW/4 kHz 0.0025%
Max Available RF Power -38.0 (dBW/4 kHz)

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 18.0 GHz		Transmit 28.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	57.06	-10.00	136.18	-10.00	100.00
195	0.00	59.48	-10.00	136.18	-10.00	100.00
200	0.00	62.09	-10.00	136.18	-10.00	100.00
205	0.00	64.87	-10.00	136.18	-10.00	100.00
210	0.00	67.78	-10.00	136.18	-10.00	100.00
215	0.00	70.81	-10.00	136.18	-10.00	100.00
220	0.00	73.93	-10.00	136.18	-10.00	100.00
225	0.00	77.13	-10.00	136.18	-10.00	100.00
230	0.00	80.38	-10.00	136.18	-10.00	100.00
235	0.00	83.68	-10.00	136.18	-10.00	100.00
240	0.00	87.01	-10.00	136.18	-10.00	100.00
245	0.00	90.35	-10.00	136.18	-10.00	100.00
250	0.00	93.68	-10.00	136.18	-10.00	100.00
255	0.00	97.01	-10.00	136.18	-10.00	100.00
260	0.00	100.30	-10.00	136.18	-10.00	100.00
265	0.00	103.54	-10.00	136.18	-10.00	100.00
270	0.00	106.73	-10.00	136.18	-10.00	100.00
275	0.00	109.83	-10.00	136.18	-10.00	100.00
280	0.00	112.84	-10.00	136.18	-10.00	100.00
285	0.00	115.72	-10.00	136.18	-10.00	100.00
290	0.00	118.47	-10.00	136.18	-10.00	100.00
295	0.00	121.04	-10.00	136.18	-10.00	100.00
300	0.00	123.41	-10.00	136.18	-10.00	100.00
305	0.00	125.56	-10.00	136.18	-10.00	100.00
310	0.00	127.45	-10.00	136.18	-10.00	100.00
315	0.00	129.04	-10.00	136.18	-10.00	100.00
320	0.00	130.30	-10.00	136.18	-10.00	100.00
325	0.00	131.22	-10.00	136.18	-10.00	100.00
330	0.00	131.76	-10.00	136.18	-10.00	100.00
335	0.00	131.91	-10.00	136.18	-10.00	100.00
340	0.00	131.68	-10.00	136.18	-10.00	100.00
345	0.00	131.06	-10.00	136.18	-10.00	100.00
350	0.00	130.07	-10.00	136.18	-10.00	100.00
355	0.00	128.73	-10.00	136.18	-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: March 03, 2017