FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
Towerstream Corp
MIAMI, FL
(KA412)
Satellite Earth Station

Prepared By:
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, VA 20147
August 27, 2013

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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 almost every case, those cases that were not cleared with pathloss were resolved by frequency offset.

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 08/14/2013.

Company
Alltel Communications LLC - S Florida
Embarq Florida, Inc.
FLORIDA POWER AND LIGHT COMPANY
Florida RSA No. 2B (Indian River) LP
Florida Rural Broadband Alliance, LLC
Miami-Dade County
New Cingular Wireless PCS LLC - N FL
New Cingular Wireless PCS LLC - S FL
PALM BEACH, COUNTY OF
Palm Beach, County Facilities Dev & Ops
South Florida Water Management District
T-MOBILE USA, INC.
T-Mobile License LLC
Verizon Wireless (VAW) LLC - S Florida
Verizon Wireless Personal Comm, LP(S FL)

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:	08/27/2013
Job Number:	130814COMSGE03

Administrative Information

Status	ENGINEER PROPOSAL
Call Sign	KA412
Licensee Code	TOWSTR
Licensee Name	Towerstream Corp

Site Information — MIAMI, FL

Venue Name	
Latitude (NAD 83)	25° 48' 35.0" N
Longitude (NAD 83)	80° 21' 11.0" W
Climate Zone	B
Rain Zone	1
Ground Elevation (AMSL)	1.83 m / 6.0 ft

Link Information

Satellite Type	Geostationary
Mode	TR - Transmit-Receive
Modulation	Analog
Satellite Arc	6° W to 60° West Longitude
Azimuth Range	97.0° to 139.6°
Corresponding Elevation Angles	5.4° / 52.3°
Antenna Centerline (AGL)	11.89 m / 39.0 ft

Antenna Information		Receive - FCC32		Transmit - FCC32	
Manufacturer		Prodelin		Prodelin	
Model		1244		1244	
Gain / Diameter		38.0 dBi / 2.4 m		42.0 dBi / 2.4 m	
3-dB / 15-dB Beamwidth		0.01° / 0.02°		0.02° / 0.03°	
Max Available RF Power	(dBW/4 kHz)			-13.6	
	(dBW/MHz)			10.4	
Maximum EIRP	(dBW/4 kHz)			28.4	
	(dBW/MHz)			52.4	
Interference Objectives:	Long Term	-158.0 dBW/MHz	20%	-154.0 dBW/4 kHz	20%
	Short Term	-148.0 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)	3M17G7D / 3625.0 - 4200.0	3M17G7D / 5850.0 - 6018.0 3M17G7D / 6109.0 - 6126.0 3M17G7D / 6178.0 - 6240.0 3M17G7D / 6272.0 - 6425.0
Max Great Circle Coordination Distance	863.3 km / 536.4 mi	278.5 km / 173.0 mi
Precipitation Scatter Contour Radius	720.3 km / 447.5 mi	100.0 km / 62.1 mi

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Coordination Values	**MIAMI, FL**			
Licensee Name	Towerstream Corp			
Latitude (NAD 83)	25° 48' 35.0" N			
Longitude (NAD 83)	80° 21' 11.0" W			
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Antenna Centerline (AGL)	11.89 m / 39.0 ft			
Antenna Model	Prodelin 2.4 Meter			
Antenna Mode	Receive 4.0 GHz		Transmit 6.1 GHz	
Interference Objectives: Long Term	-158.0 dBW/MHz	20%	-154.0 dBW/4 kHz	20%
Short Term	-148.0 dBW/MHz	0.01%	-131.0 dBW/4 kHz	0.0025%
Max Available RF Power			-13.6 (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	96.92	-10.00	437.80	-10.00	147.64
5	0.00	91.95	-10.00	437.80	-10.00	147.64
10	0.00	86.97	-10.00	437.80	-10.00	147.64
15	0.00	81.99	-10.00	437.80	-10.00	147.64
20	0.00	77.01	-10.00	437.80	-10.00	147.64
25	0.00	72.04	-10.00	437.80	-10.00	147.64
30	0.00	67.06	-10.00	437.80	-10.00	147.64
35	0.00	62.09	-10.00	437.80	-10.00	147.64
40	0.00	57.12	-10.00	437.80	-10.00	147.64
45	0.00	52.15	-10.00	437.80	-10.00	147.64
50	0.00	47.19	-9.85	439.83	-9.85	148.13
55	0.00	42.24	-8.64	456.09	-8.64	153.07
60	0.00	37.29	-7.29	474.43	-7.29	158.89
65	0.00	32.36	-5.75	497.02	-5.75	165.88
70	0.00	27.45	-3.96	524.56	-3.96	174.46
75	0.00	22.58	-1.84	559.14	-1.84	185.32
80	0.00	17.77	0.76	604.27	0.76	199.97
85	0.00	13.10	4.07	665.61	4.07	219.49
90	0.00	8.79	8.40	754.84	8.40	247.17
95	0.00	5.73	13.04	863.29	13.04	278.47
100	0.00	6.19	12.21	843.62	12.21	272.20
105	0.00	9.68	7.36	732.56	7.36	240.30
110	0.00	14.05	3.31	650.92	3.31	214.89
115	0.00	18.45	0.35	596.91	0.35	197.64
120	0.00	22.82	-1.96	557.19	-1.96	184.70
125	0.00	27.13	-3.84	526.58	-3.84	175.09
130	0.00	31.37	-5.41	502.11	-5.41	167.46
135	0.00	35.52	-6.76	482.06	-6.76	161.24
140	0.00	39.55	-7.93	465.38	-7.93	156.11
145	0.00	43.42	-8.94	451.97	-8.94	151.81
150	0.00	47.09	-9.82	440.12	-9.82	148.22
155	0.00	50.50	-10.00	437.80	-10.00	147.64
160	0.00	53.55	-10.00	437.80	-10.00	147.64
165	0.00	56.14	-10.00	437.80	-10.00	147.64
170	0.00	58.14	-10.00	437.80	-10.00	147.64
175	0.00	60.08	-10.00	437.80	-10.00	147.64
180	0.00	62.23	-10.00	437.80	-10.00	147.64
185	0.00	64.56	-10.00	437.80	-10.00	147.64

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Antenna Mode	Receive 4.0 GHz		Transmit 6.1 GHz	
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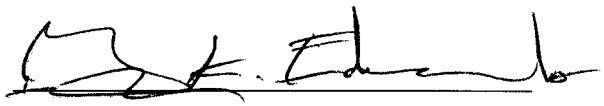
Max Available RF Power			-13.6 (dBW/4 kHz)	

			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	67.05	-10.00	437.80	-10.00	147.64
195	0.00	69.68	-10.00	437.80	-10.00	147.64
200	0.00	72.42	-10.00	437.80	-10.00	147.64
205	0.00	75.26	-10.00	437.80	-10.00	147.64
210	0.00	78.17	-10.00	437.80	-10.00	147.64
215	0.00	81.14	-10.00	437.80	-10.00	147.64
220	0.00	84.16	-10.00	437.80	-10.00	147.64
225	0.00	87.20	-10.00	437.80	-10.00	147.64
230	0.00	90.26	-10.00	437.80	-10.00	147.64
235	0.00	93.32	-10.00	437.80	-10.00	147.64
240	0.00	96.36	-10.00	437.80	-10.00	147.64
245	0.00	99.37	-10.00	437.80	-10.00	147.64
250	0.00	102.34	-10.00	437.80	-10.00	147.64
255	0.00	105.24	-10.00	437.80	-10.00	147.64
260	0.00	108.06	-10.00	437.80	-10.00	147.64
265	0.00	110.78	-10.00	437.80	-10.00	147.64
270	0.00	113.39	-10.00	437.80	-10.00	147.64
275	0.00	115.85	-10.00	437.80	-10.00	147.64
280	0.00	118.15	-10.00	437.80	-10.00	147.64
285	0.00	120.27	-10.00	437.80	-10.00	147.64
290	0.00	122.17	-10.00	437.80	-10.00	147.64
295	0.00	123.83	-10.00	437.80	-10.00	147.64
300	0.00	125.22	-10.00	437.80	-10.00	147.64
305	0.00	126.33	-10.00	437.80	-10.00	147.64
310	0.00	127.13	-10.00	437.80	-10.00	147.64
315	0.00	127.60	-10.00	437.80	-10.00	147.64
320	0.00	127.74	-10.00	437.80	-10.00	147.64
325	0.00	127.54	-10.00	437.80	-10.00	147.64
330	0.00	126.76	-10.00	437.80	-10.00	147.64
335	0.00	121.80	-10.00	437.80	-10.00	147.64
340	0.00	116.83	-10.00	437.80	-10.00	147.64
345	0.00	111.85	-10.00	437.80	-10.00	147.64
350	0.00	106.88	-10.00	437.80	-10.00	147.64
355	0.00	101.90	-10.00	437.80	-10.00	147.64

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
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DATED: August 27, 2013