

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for

**SES Americom, Inc.
Bristow, Virginia
(Call Sign: E000152)**

Satellite Earth Station

Prepared By:
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, Virginia 20147
August 1, 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 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 transmit-receive earth station.

Company

Norfolk Southern Railway
Transcontinental Gas Pipeline Corp.
Virginia Electric & Power 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 June 26, 2013.

Company

ADAMS COUNTY EMERGENCY MANAGEMENT AGENCY
AT&T COMMUNICATIONS OF MARYLAND INC
AT&T Communications of Virginia, LLC
AT&T Corp.
Alltel Communications LLC-Southern VA
Alltel Communications of Petersburg Inc
Appalachia Engineering Services
Atlantic Broadband (Delmar), LLC
Atlantic Broadband (Penn), LLC
B20 LLC
BAY BROADBAND COMMUNICATIONS LLC
Baltimore County of Maryland
Baltimore Gas and Electric Company
Bedford, County of
Believe Wireless, LLC
Blue Ridge Carriers
Capital Communications of America
Cellco Partnership - Bridgeville, PA/WV
Cellco Partnership - Southern Virginia
Cellco Partnership- PA Region
Cellco Partnership-Newark-Dallas Verizon
Cellco Partnership-WDC/Baltimore
Cellco Prtnrshp - Phil. Tri-State Rgn
Charles City County Sheriffs Office
Charles, County of
Chesterfield, County of
Comprehensive Wireless LLC
Conterra Ultra Broadband, LLC
County of Frederick
Delaware Division of Communications
ECW Wireless, LLC
Eastern MLG LLC
Enoch Pratt Free Library
Exelon Generation Company, L.L.C

Company (Continued)

FELHC, Inc.
Frederick County
Fundamental Broadcasting LLC
Garden State Transmissions
Goochland County
HENRICO COUNTY
Hanover, County of
Hardy Cellular Telephone Company
Harrisonburg-Rockingham ECC
King and Queen County
Last Mile Inc.
Loudoun, County of
MCI Communications Services Inc.
MVC Research. LLC
Maryland Public Broadcasting Commission
Maryland State Highway Administration
Maryland, State of - Dept.of Info & Tech
National Radio Astronomy Observatory
New Cingular Wireless PCS - Maryland
New Cingular Wireless PCS LLC - DC
New Cingular Wireless PCS LLC - VA
New Cingular Wireless PCS LLC- WV/NC/SC
New Cingular Wireless PCS LLC-DE/NH/RI
New Cingular Wireless PCS, LLC - PA
New Kent County
Norfolk Southern Railway
Old Dominion LLC
PA Communications
PEG Bandwidth
PENNSYLVANIA TURNPIKE COMMISSION
Petersburg Cellular Partnership
Prince George's County
Prince William, County of
RAPPAHANNOCK ELECTRIC COOPERATIVE
RCTC Wholesale Corporation
RICHMOND, CITY OF
Rural Broadband Network Services LLC
SCTF NET
SHENANDOAH VALLEY ELECTRIC COOPERATIVE
Southern Maryland Electric Cooperative I
Sprint Spectrum, LP
St. Mary's County of (MD)
Stafford, County of
State of Maryland, MIEMSS
State of WV DHHR/BPH STECS
Texas Eastern Communications, Inc.
Thought Transmissions, LLC
US Cellular Operating Company, LLC (WI)
USCOC of Cumberland, Inc.
USCOC of Virginia RSA #2, Inc.
USCOC of Virginia RSA #3, Inc.

Company (Continued)

Verizon Maryland, Inc.
Verizon Wireless (VAW) LLC - Delaware
Verizon Wireless (VAW) LLC - Maryland
Verizon Wireless VAW LLC-Southern VA
Verizon Wireless(VAW) LLC-AZ/CO/NM/NV/UT
Virginia RSA 5 Limited Partnership
Virginia Broadband, LLC
Virginia Cellular LLC
Virginia Department of State Police
Virginia Electric & Power Company
Virginia PCS Alliance, L.C.
Washington D.C. SMSA L.P.
Washington Gas Light Company
Washington Suburban Sanitary Commission
World Class Wireless LLC
York County Dept of Emergency Services
iSignal
ANNE ARUNDEL, COUNTY OF
Albermarle, County of, Virginia
American Electric Power Service Corp.
Appalachia Engineering Services
CARROLL COUNTY
CBS Communications Services Inc.
CTAB Holdings LLC
Calvert Cliffs Nuclear Power Plant
Calvert County Government
City of Richmond
Columbia Gas Transmission Corporation
Commonwealth of Pennsylvania
Commonwealth of Pennsylvania-Radio Proj.
Conectiv Communications, Inc.
County of Culpeper
County of Louisa, VA
Egan LLC
Franklin County Dept. of Emergency Servi
George Washington University
HENRICO COUNTY
Howard, County of
Lancaster County of
Last Mile Inc.
M&T Bank
MARYLAND EMERG MANAGEMENT AGENCY COMM
MARYLAND STATE DEPT OF GENERAL SERVICES
Maryland, State Of - MDOT - MTA
Maryland, State of - DNR
Montgomery, County of
Morgan, County of
Nelson, County of
PENNSYLVANIA MICROWAVE NETWORK INC.
Pennsylvania Commonwealth State Police

Company (Continued)

Potomac Electric Power Company
Powhatan, County of
Prince George's, County of
RCYM Holdings LLC
Redi-Call Communications Company
SPOTSYLVANIA COUNTY
Southside Electric Cooperative
Transcontinental Gas Pipeline Corp.
Virginia RSA #7, Inc.
Warrenton Fauquier Joint Communications
York County Dept of Emergency Services
3G Wireless, LLC
ABC, Inc. - WPVI-TV
AERIAL VIDEO SYSTEMS
AT&T California
Alascom Inc
Ascent Media Network Services, LLC
Bellsouth Telecommunications, Inc.
BFI Licenses, LLC
Borgeson, Tom R.
Broadcast Sports Inc.
C-SPAN
CBS Broadcasting Inc
CBS TELEVISION LICENSES LLC
CNG Communications, Inc.
Carolina Telephone and Telegraph Co
Casper, John
CenturyTel of the Southwest, Inc.
Chicago Comnet Corp
Cincinnati Bell Wireless LLC
Citywide News Network, Inc.
Cohen, Elana
County of Fairfax, Virginia
Cowboys Stadium LP
CP Communications PA, LLC
DCI II, INC.
Direct Broadcast Services, Inc.
GOODYEAR TIRE AND RUBBER COMPANY
GSN New, Inc
Global Microwave Systems Inc
HF Enterprises, Inc
Hallco Unlimited, Inc.
Hawaiian Telcom, Inc.
Heiden, William
Henrico County Police
Illinois Bell Telephone Company
Indiana Bell Telephone Company
Information & Display Systems, Inc.
Information Super Station, LLC
International Communications Group, Inc.

Company (Continued)

Kentucky RSA #3 Cellular General Partner
Kentucky RSA #4 Cellular General Partner
MERCURY COMMUNICATIONS
Metro Networks Communications, Inc.
Metrosat Communications Inc.
Michigan Bell Telephone Company
Moreen, Steven K
NBC TELEMUNDO LICENSE LLC
NEW ENGLAND DIGITAL DISTRIBUTION, INC.
NEW ENGLAND SATELLITE SYSTEMS INC
NSM Surveillance
National Cable Satellite Corporation
Navajo Communications Company
NorthWest Suburbs Community Access Corp
Ohio Bell Telephone Company
On Scene Video Production
Onboard Images
Pacific Television Center
Penn Service Microwave Co., Inc.
Plateau Telecommunications, Inc.
Plum TV, LLC
Production & Satellite Services, Inc.
Proxy Aviation
Public Television Communications Center
QUICK LINK CONNECTIONS INC
QWEST CORPORATION
RCC Minnesota Inc. - MN NE ND SD
REMOTE FACILITIES CONSULTING SERVICES
RF Central, LLC
RF Film, Inc
RF Technology, LLC
Radiofone, Inc.
Randy Hermes Production
Regulus Media Services, Inc.
Remote Broadcasts, Inc.
Southwestern Bell Telephone L.P.
Speedshotz, Inc
The City of Baltimore, Police Department
Total RF Marketing Inc
Unisat, Inc.
United Telephone - Southeast
VERIZON SOUTH INC.
Verizon California Inc.
Verizon Maryland, Inc.
Verizon New England Inc.
Verizon New Jersey, Inc.
Verizon New York, Inc.
Verizon North Inc.
Verizon Northwest Inc.
Verizon Pennsylvania, Inc.
Verizon Virginia, Inc.
Verizon Washington DC, Inc.

Company (Continued)

Village Video Productions Inc
Vyvx, LLC
Westar Satellite Services LP
Western Technical Services
Wexler Video, Inc.
Winged Vision Inc
Wisconsin Bell, Inc.
Wolfe Air Aviation

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: 08/01/2013
Job Number: 130626COMSJC02

Administrative Information

Status ENGINEER PROPOSAL
Call Sign E000152
Licensee Code P3210
Licensee Name SES Americom, Inc.

Site Information BRISTOW, VIRGINIA

Venue Name
Latitude (NAD 83) 38° 47' 1.6" N
Longitude (NAD 83) 77° 34' 24.3" W
Climate Zone A
Rain Zone 2
Ground Elevation (AMSL) 86.47 m / 283.7 ft

Link Information

Satellite Type Geostationary
Mode TR - Transmit-Receive
Modulation Analog and Digital
Satellite Arc 10° W to 139° West Longitude
Azimuth Range 104.5° to 251.2°
Corresponding Elevation Angles 8.7° / 13.4°
Antenna Centerline (AGL) 6.71 m / 22.0 ft

Antenna Information

Manufacturer Vertex Corporation
Model 9 Meter KPC
Gain / Diameter 50.1 dBi / 9.0 m
3-dB / 15-dB Beamwidth 0.53° / 1.00°

Receive

Transmit

Vertex Corporation
9 Meter KPC
53.2 dBi / 9.0 m
0.38° / 0.72°

Max Available RF Power (dBW/4 kHz)
(dBW/MHz)

SEE ATTACHMENT 1
SEE ATTACHMENT 1

Maximum EIRP (dBW/4 kHz)
(dBW/MHz)
(dBW)

SEE ATTACHMENT 1
SEE ATTACHMENT 1
SEE ATTACHMENT 1

Interference Objectives: Long Term -156.0 dBW/MHz 20%
Short Term -146.0 dBW/MHz 0.01%

-154.0 dBW/4 kHz 20%
-131.0 dBW/4 kHz 0.0025%

Frequency Information

Receive 4.0 GHz

Transmit 6.1 GHz

Emission / Frequency Range (MHz) SEE ATTACHMENT 1

SEE ATTACHMENT 1

Max Great Circle Coordination Distance 471.4 km / 292.9 mi
Precipitation Scatter Contour Radius 555.5 km / 345.1 mi

279.7 km / 173.8 mi
153.6 km / 95.5 mi

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ATTACHMENT 1

Page 1 of 2

Vertex Corporation:
Model: 9 Meter KPC
Call Sign: E000152

4 GHz Gain: 50.1 dBi
6 GHz Gain: 53.2 dBi

Satellite Arc: 10.0 to 60.0 West Longitude

Receive Band: 3625.0 to 3700.0 MHz

Emissions

N0N
500KG7D
20M0G7W – 72M0G7W

Satellite Arc: 10.0 to 139.0 West Longitude

Receive Band: 3700.0 to 4200.0 MHz

Emissions

N0N
500KG7D
20M0G7W – 72M0G7W

Satellite Arc: 10.0 to 60.0 West Longitude

Transmit Band: 5850.0 to 5925.0 MHz

<u>Emission</u>	<u>RF Power Density (dBW/4 kHz)</u>	<u>EIRP/Carrier (dBW)</u>	<u>EIRP Density (dBW/ 4 kHz)</u>
N0N	-0.5	52.7	52.7
900KF1D	-2.7	74.0	50.5
20M0G7W to	-24.0	66.2	29.2
72M0G7W	-24.0	71.8	29.2

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ATTACHMENT 1

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Satellite Arc: 10.0 to 139.0 West Longitude

Transmit Band: 5925.0 to 6425.0 MHz

<u>Emission</u>	<u>RF Power Density (dBW/4 kHz)</u>	<u>EIRP/Carrier (dBW)</u>	<u>EIRP Density (dBW/ 4 kHz)</u>
N0N	-0.5	52.7	52.7
900KF1D	-2.7	74.0	50.5
20M0G7W to 72M0G7W	-24.0	66.2	29.2
	-24.0	71.8	29.2

Satellite Arc: 10.0 to 60.0 West Longitude

Transmit Band: 6491.0 to 6650.0 MHz

<u>Emission</u>	<u>RF Power Density (dBW/4 kHz)</u>	<u>EIRP/Carrier (dBW)</u>	<u>EIRP Density (dBW/ 4 kHz)</u>
N0N	-0.5	52.7	52.7
900KF1D	-2.7	74.0	50.5
20M0G7W to 72M0G7W	-24.0	66.2	29.2
	-24.0	71.8	29.2

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Earth Station Data Sheet

19700 Janelia Farm Boulevard, Ashburn, VA 20147
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Coordination Values

BRISTOW, VA

Licensee Name SES Americom, Inc.
Latitude (NAD 83) 38° 47' 1.6" N
Longitude (NAD 83) 77° 34' 24.3" W
Ground Elevation (AMSL) 86.47 m / 283.7 ft
Antenna Centerline (AGL) 6.71 m / 22.0 ft
Antenna Model Vertex Corporation 9 Meter KPC
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 -0.5 (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	0.66	104.35	-10.00	239.54	-10.00	138.38
5	0.77	99.41	-10.00	232.97	-10.00	133.19
10	0.65	94.45	-10.00	240.25	-10.00	138.94
15	0.73	89.50	-10.00	235.27	-10.00	134.98
20	0.66	84.55	-10.00	239.86	-10.00	138.63
25	0.61	79.60	-10.00	242.72	-10.00	140.94
30	0.44	74.66	-10.00	255.95	-10.00	151.90
35	0.32	69.73	-10.00	270.82	-10.00	164.94
40	0.33	64.79	-10.00	269.50	-10.00	163.75
45	0.38	59.85	-10.00	263.66	-10.00	158.59
50	0.40	54.92	-10.00	260.54	-10.00	155.86
55	0.00	50.06	-10.00	285.28	-10.00	179.20
60	0.00	45.16	-9.37	289.32	-9.37	181.63
65	0.00	40.29	-8.13	297.45	-8.13	186.41
70	0.00	35.45	-6.74	306.87	-6.74	191.76
75	0.00	30.64	-5.16	318.56	-5.16	197.82
80	0.00	25.91	-3.34	331.67	-3.34	204.77
85	0.00	21.28	-1.20	347.49	-1.20	211.45
90	0.00	16.86	1.33	366.88	1.33	221.98
95	0.00	12.85	4.27	389.72	4.27	235.21
100	0.21	9.60	7.45	414.35	7.45	248.37
105	0.32	8.39	8.90	471.41	8.90	279.71
110	0.56	9.82	7.20	371.79	7.20	215.93
115	0.66	13.16	4.02	337.41	4.02	198.27
120	0.69	16.81	1.36	314.25	1.36	185.30
125	0.73	20.34	-0.71	294.97	-0.71	173.64
130	0.81	23.74	-2.39	277.43	-2.39	159.73
135	0.89	27.00	-3.79	262.71	-3.79	149.44
140	0.88	30.16	-4.99	255.85	-4.99	145.35
145	0.85	33.13	-6.01	251.20	-6.01	142.81
150	0.81	35.87	-6.87	248.37	-6.87	141.63
155	0.64	38.42	-7.61	254.98	-7.61	147.79
160	0.52	40.61	-8.22	259.33	-8.22	152.23
165	0.23	42.56	-8.73	289.21	-8.73	180.57
170	0.34	43.72	-9.02	274.53	-9.02	168.36
175	0.35	44.48	-9.20	271.74	-9.20	164.53
180	0.25	44.84	-9.29	283.63	-9.29	176.72

COMSEARCH

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Coordination Values

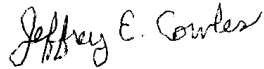
BRISTOW, VA

Licensee Name SES Americom, Inc.
Latitude (NAD 83) 38° 47' 1.6" N
Longitude (NAD 83) 77° 34' 24.3" W
Ground Elevation (AMSL) 86.47 m / 283.7 ft
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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 -0.5 (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)
185	0.00	44.83	-9.29	289.85	-9.29	181.95
190	0.00	44.04	-9.10	291.09	-9.10	182.69
195	0.00	42.77	-8.78	293.16	-8.78	183.91
200	0.00	41.06	-8.34	296.08	-8.34	185.62
205	0.00	38.96	-7.77	299.89	-7.77	187.82
210	0.00	36.52	-7.06	304.65	-7.06	190.52
215	0.00	33.79	-6.22	310.47	-6.22	193.76
220	0.00	30.82	-5.22	318.12	-5.22	197.58
225	0.00	27.65	-4.04	326.54	-4.04	202.08
230	0.00	24.31	-2.65	336.72	-2.65	205.77
235	0.23	20.69	-0.89	346.24	-0.89	210.07
240	0.32	17.15	1.14	349.44	1.14	209.39
245	0.34	14.44	3.01	361.21	3.01	215.09
250	0.27	13.21	3.97	378.84	3.97	226.75
255	0.30	13.67	3.61	371.30	3.61	221.63
260	0.38	15.72	2.09	349.52	2.09	208.08
265	0.46	18.88	0.10	323.70	0.10	194.08
270	0.47	22.73	-1.92	306.90	-1.92	184.75
275	0.49	26.95	-3.76	291.43	-3.76	175.02
280	0.44	31.40	-5.42	285.02	-5.42	172.06
285	0.48	35.95	-6.89	270.98	-6.89	160.39
290	0.47	40.62	-8.22	264.30	-8.22	156.49
295	0.49	45.33	-9.41	254.38	-9.41	149.73
300	0.49	50.10	-10.00	251.01	-10.00	147.70
305	0.47	54.90	-10.00	253.51	-10.00	149.81
310	0.51	59.71	-10.00	249.41	-10.00	146.47
315	0.43	64.56	-10.00	257.70	-10.00	153.40
320	0.47	69.40	-10.00	253.70	-10.00	149.97
325	0.49	74.26	-10.00	251.17	-10.00	147.84
330	0.50	79.13	-10.00	250.20	-10.00	147.02
335	0.53	83.99	-10.00	247.78	-10.00	145.11
340	0.47	88.87	-10.00	253.14	-10.00	149.50
345	0.53	93.74	-10.00	247.88	-10.00	145.19
350	0.60	98.62	-10.00	243.29	-10.00	141.41
355	0.60	103.49	-10.00	243.64	-10.00	141.69

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.



Jeffrey E. Cowles
Engineer III, Telecommunications
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, Va. 20147

DATED: August 1, 2013