

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
Intelsat License LLC
HAGERSTOWN, MD
E000296
Satellite Earth Station

Prepared By:
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, VA 20147
July 31, 2019

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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 07/01/2019.

Company

AQ2AT LLC
AT&T Corp.
AT&T Wireless Services 3 LLC - PA
Access MLP Operating LLC
Adams County Department of Emergency Svc
Affiniti PA, LLC
Albemarle, County of
Allentown SMSA Limited Partnership
Alltel Communications LLC - Western PA
Alltel Communications LLC-E OH WV
American Electric Power Service Corp
Anne Arundel, County of
Appalachia Engineering Services
Appalachian Power Company
Argos Engineering, LLC
Atlantic Broadband (Penn), LLC
Atlantic City Electric Company
Atlantic Coast Pipeline, LLC
Atlantic, County of
Baltimore County of Maryland
Baltimore Gas and Electric Company
Beaver Springs Faith Baptist Church, Inc
Bedford County of
Believe Wireless, LLC
Berks County Department of Emergency Ser
Blair County 911
Blue Ridge Carriers
Blueline Communications
CNX Midstream, LLC
Calvert, County of
Cambria, County of
Capital Communications of America
Caroline County, VA
Carroll, County of
Cellco Partnership - Bridgeville, PA/WV
Cellco Partnership - Southern Virginia
Cellco Partnership- PA Region
Cellco Partnership-WDC/Baltimore
Cellco Prtnrshp - Phil. Tri-State Rgn
Charles, County of
Chester, County of

City of Fredericksburg
Citynet, LLC
Clearfield, County of
Clinton, County of
Columbia, County
Commonwealth of Pennsylvania
Commonwealth of Pennsylvania-Radio Proj.
Comprehensive Wireless LLC
Conterra Ultra Broadband, LLC
County of Augusta
County of Burlington, Public Safety Cntr
County of Camden
County of Centre
County of Culpeper
County of Fayette
County of Frederick
County of Orange, VA
County of York
DC2A LLC
DSRC Networks
Dauphin County Emergency Management
Delaware County (PA) Emergency Services
Delaware Division of Communications
Delmarva Power and Light Company
Dominion Energy Transmission, Inc.
ECW Wireless, LLC
Eastern MLG LLC
Electric Railroad, LLC
Enoch Pratt Free Library
Entercom License, LLC
Essex, County of
Exelon Generation Company, LLC
FELHC, Inc.
FM Radio License, LLC
Fulton County PA
Fundamental Broadcasting LLC
GTT America LLC
Garden State Transmissions
Getwireless.Net
Gloucester, County of
Greene, County of (PA)
Hanover, County of
Hardy Cellular Telephone Company
Hardy County OEM/E911
Harrisonburg-Rockingham ECC
Henrico County
High Voltage Communications LLC (CFN)
Huntingdon, County of
Indiana, County of
Jefferson County of Pennsylvania
Jefferson Microwave, LLC
Juniata County Emergency Services
Kentucky Power Company
King and Queen County
Kryptick Technologies
Lancaster County-Wide Communications

Limitless Mobile, LLC
Loudoun, County of
MCI Communications Services Inc.
MGW Networks, LLC
Maryland Public Broadcasting Commission
Maryland State Highway Administration
Maryland, State of - Dept.of Info & Tech
Mifflin County
Montgomery County Of
Montgomery, County of
Mountain State Communications, llc
New Cingular Wireless PCS LLC - NJ
New Cingular Wireless PCS - Maryland
New Cingular Wireless PCS LLC - DC
New Cingular Wireless PCS LLC - Ohio
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 Jersey Turnpike Authority-Pkwy Div
New Jersey, State of -NJ Transit
New Line Networks, LLC
Norfolk Southern Railway
Northumberland County DPS/911
Ohio Valley Electric Company
PSEG Services Corporation
Peco Energy Company
Pennsylvania Turnpike Commission
Perry, County of
Pittsburgh SMSA Limited Partnership
Preston County Office of Emergency Manag
Prince George's County
Prince William, County of
Radio License Holding CBC, LLC
Radio One Inc
Rappahannock Electric Cooperative
Rockbridge Reg. Pub Safety Comm Ctr
Rural Broadband Network Services LLC
Rural Broadband, LLC
SW Networks
Shenandoah Personal Communications, LLC
Shenandoah Valley Electric Cooperative
Snyder, County of
Somerset County, Maryland
Somerset, County of
South Central Task Force (SCTFNET)
Southern Maryland Electric Cooperative I
Spotsylvania, County of
Sprintcom, Inc
St. Mary's County of (MD)
Stafford, County of
State of Maryland, MIEMSS
T-Mobile License LLC
Texas Eastern Communications, LLC
Thought Transmissions, LLC
Torellco LLC

Transcontinental Gas Pipeline Corp.
US Cellular Operating Company, LLC (WI)
USCOC of Cumberland, Inc.
USCOC of Virginia RSA #3, Inc.
USOC of Pennsylvania RSA No 10 B2 Inc.
Uniti Fiber PEG, LLC
Ursa Navigation Solutions, Inc.
Verizon Maryland, Inc.
Verizon Wireless (VAW) LLC - Maryland
Verizon Wireless (VAW) LLC - W/B/V Mkts
Verizon Wireless (VAW) LLC-Pennsylvania
Verizon Wireless VAW LLC - West Virginia
Verizon Wireless VAW LLC-Southern VA
Virginia RSA 5 Limited Partnership
Virginia Broadband, LLC
Virginia Department of State Police
Virginia Electric & Power Company
WV DHSEM, SIRN System
Warrenton Fauquier Joint Communications
Washington Gas Light Company
Washington Suburban Sanitary Commission
Washington, County of
Weblin Holdings LLC
West Virginia Radio Corporation
Westmoreland, County of
Wheeling Power Company
Wicomico County
Williamson Enterprise LLC
Wireless Internetwork LLC
World Class Wireless, LLC
iSignal
xWave Engineering 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: 07/31/2019
Job Number: 190701COMSGE04

Administrative Information

Status: ENGINEER PROPOSAL
Call Sign: E000296
Licensee Code: INTELS
Licensee Name: Intelsat License LLC

Site Information HAGERSTOWN, MD

Venue Name
Latitude (NAD 83): 39° 35' 54.0" N
Longitude (NAD 83): 77° 45' 35.0" W
Climate Zone: A
Rain Zone: 2
Ground Elevation (AMSL): 173.74 m / 570.0 ft

Link Information

Satellite Type: Geostationary
Mode: TR - Transmit-Receive
Modulation: Digital
Satellite Arc: 6° W to 149° West Longitude
Azimuth Range: 101.9° to 257.8°
Corresponding Elevation Angles: 5.3° / 5.7°
Antenna Centerline (AGL): 5.79 m / 19.0 ft

Antenna Information

	Receive - FCC32	Transmit - FCC32
Manufacturer	Vertex	Vertex
Model	9 KPC	9 KPC
Gain / Diameter	50.1 dBi / 9.0 m	53.5 dBi / 9.0 m
3-dB / 15-dB Beamwidth	0.65° / 1.00°	0.36° / 0.67°
Max Available RF Power (dBW/4 kHz)		7.2
(dBW/MHz)		31.2
Maximum EIRP (dBW/4 kHz)		60.7
(dBW/MHz)		84.7
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)	300KG7D / 3698.0 300KG7D / 3944.5 300KG7D / 3955.5 300KG7D / 4199.8	850KF7D / 5924.0 850KF7D / 5927.5 850KF7D / 6170.0 850KF7D / 6180.0
Max Great Circle Coordination Distance	662.2 km / 411.4 mi	507.1 km / 315.0 mi
Precipitation Scatter Contour Radius	613.5 km / 381.2 mi	431.6 km / 268.1 mi

COMSEARCH

Earth Station Data Sheet

19700 Janelia Farm Boulevard, Ashburn, VA 20147
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Coordination Values

HAGERSTOWN, MD

Licensee Name Intelsat License LLC
Latitude (NAD 83) 39° 35' 54.0" N
Longitude (NAD 83) 77° 45' 35.0" W
Ground Elevation (AMSL) 173.74 m / 570.0 ft
Antenna Centerline (AGL) 5.79 m / 19.0 ft
Antenna Model Vertex 9 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 7.2 (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	0.00	101.81	-10.00	285.28	-10.00	207.10
5	0.00	96.84	-10.00	285.28	-10.00	207.10
10	0.00	91.86	-10.00	285.28	-10.00	207.10
15	0.00	86.88	-10.00	285.28	-10.00	207.10
20	0.00	81.90	-10.00	285.28	-10.00	207.10
25	0.00	76.92	-10.00	285.28	-10.00	207.10
30	0.00	71.95	-10.00	285.28	-10.00	207.10
35	0.00	66.97	-10.00	285.28	-10.00	207.10
40	0.00	62.00	-10.00	285.28	-10.00	207.10
45	0.00	57.03	-10.00	285.28	-10.00	207.10
50	0.00	52.06	-10.00	285.28	-10.00	207.10
55	0.00	47.09	-9.82	286.40	-9.82	207.79
60	0.00	42.14	-8.62	294.23	-8.62	212.59
65	0.00	37.19	-7.26	303.30	-7.26	218.19
70	0.00	32.26	-5.72	314.62	-5.72	224.84
75	0.00	27.34	-3.92	327.41	-3.92	232.91
80	0.00	22.47	-1.79	343.08	-1.79	243.02
85	0.00	17.65	0.83	362.99	0.83	255.60
90	0.00	12.98	4.17	388.88	4.17	274.11
95	0.00	8.66	8.56	426.09	8.56	301.31
100	0.00	5.61	13.27	662.20	13.27	507.05
105	0.00	6.15	12.28	510.47	12.28	371.03
110	0.00	9.60	7.45	416.37	7.45	294.11
115	0.00	13.27	3.93	387.53	3.93	272.70
120	0.00	16.89	1.31	366.72	1.31	258.14
125	0.00	20.41	-0.75	350.91	-0.75	248.15
130	0.00	23.83	-2.43	338.33	-2.43	239.94
135	0.00	27.11	-3.83	328.09	-3.83	233.34
140	0.00	30.23	-5.01	319.61	-5.01	227.97
145	0.00	33.14	-6.01	311.94	-6.01	223.55
150	0.00	35.82	-6.85	306.09	-6.85	219.92
155	0.00	38.20	-7.55	301.33	-7.55	216.96
160	0.00	40.26	-8.12	297.51	-8.12	214.61
165	0.00	41.93	-8.56	294.59	-8.56	212.81
170	0.00	43.16	-8.88	292.52	-8.88	211.54
175	0.00	43.92	-9.07	291.29	-9.07	210.78
180	0.00	44.18	-9.13	290.88	-9.13	210.53
185	0.00	43.92	-9.07	291.28	-9.07	210.78

COMSEARCH

Earth Station Data Sheet

19700 Janelia Farm Boulevard, Ashburn, VA 20147
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Coordination Values

HAGERSTOWN, MD

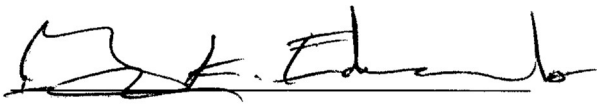
Licensee Name: Intelsat License LLC
Latitude (NAD 83): 39° 35' 54.0" N
Longitude (NAD 83): 77° 45' 35.0" W
Ground Elevation (AMSL): 173.74 m / 570.0 ft
Antenna Centerline (AGL): 5.79 m / 19.0 ft
Antenna Model: Vertex 9 meter
Antenna Mode: Receive 4.0 GHz Transmit 6.1 GHz
Interference Objectives: Long 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: 7.2 (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)
190	0.00	43.16	-8.88	292.52	-8.88	211.54
195	0.00	41.93	-8.56	294.59	-8.56	212.81
200	0.00	40.26	-8.12	297.51	-8.12	214.61
205	0.00	38.20	-7.55	301.32	-7.55	216.96
210	0.00	35.81	-6.85	306.10	-6.85	219.92
215	0.00	33.14	-6.01	311.94	-6.01	223.55
220	0.00	30.22	-5.01	319.62	-5.01	227.97
225	0.00	27.11	-3.83	328.08	-3.83	233.34
230	0.00	23.83	-2.43	338.32	-2.43	239.93
235	0.00	20.42	-0.75	350.90	-0.75	248.14
240	0.00	16.89	1.31	366.75	1.31	258.16
245	0.00	13.28	3.92	387.51	3.92	272.68
250	0.00	9.59	7.46	416.47	7.46	294.19
255	0.00	6.33	11.96	518.47	11.96	378.50
260	0.00	6.11	12.35	641.44	12.35	489.18
265	0.00	9.18	7.93	420.53	7.93	297.19
270	0.00	13.46	3.77	386.29	3.77	271.82
275	0.00	18.11	0.55	360.86	0.55	254.16
280	0.00	22.90	-2.00	341.54	-2.00	242.02
285	0.00	27.76	-4.09	326.22	-4.09	232.16
290	0.00	32.66	-5.85	313.67	-5.85	224.24
295	0.00	37.59	-7.38	302.52	-7.38	217.70
300	0.00	42.53	-8.72	293.57	-8.72	212.18
305	0.00	47.48	-9.91	285.84	-9.91	207.44
310	0.00	52.44	-10.00	285.28	-10.00	207.10
315	0.00	57.40	-10.00	285.28	-10.00	207.10
320	0.00	62.37	-10.00	285.28	-10.00	207.10
325	0.00	67.34	-10.00	285.28	-10.00	207.10
330	0.00	72.31	-10.00	285.28	-10.00	207.10
335	0.00	77.28	-10.00	285.28	-10.00	207.10
340	0.00	82.26	-10.00	285.28	-10.00	207.10
345	0.00	87.23	-10.00	285.28	-10.00	207.10
350	0.00	92.21	-10.00	285.28	-10.00	207.10
355	0.00	97.18	-10.00	285.28	-10.00	207.10

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: July 31, 2019