

# FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for  
**INTELSAT, LLC**  
**HAGERSTOWN, MD - IMT-07X**  
**Satellite Earth Station**

Prepared By:  
COMSEARCH  
19700 Janelia Farm Boulevard  
Ashburn, VA 20147  
December 29, 2004

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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

AT&T COMMUNICATIONS OF MARYLAND INC  
Cellco Partnership - Newark-Dallas-Route  
Cellco Partnership - Virginia  
Cellco Partnership- PA Region  
Dobson Cellular Systems, Inc.  
Hardy Cellular Telephone Company  
Intermedia Services, LLC.  
Local Communications Network, Inc.  
MCI Worldcom Network Services, Inc.  
USCOC of Cumberland, Inc.  
Vanguard Cellular Pennsylvania, LLC  
Washington D.C. SMSA L.P.  
West Virginia Ems Tsn, 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 10/07/2004.

#### Company

ALLTEL Communications of VA No. 1, Inc.  
ALLTEL Communications of Virginia, Inc.  
AT&T COMMUNICATIONS OF MARYLAND INC  
AT&T COMMUNICATIONS OF VIRGINIA INC  
AT&T COMMUNICATIONS OF WEST VIRGINIA  
AT&T CORP  
American Cellular Corporation  
Atlantic Broadband (Delmar), LLC  
Atlantic Broadband (Penn), LLC  
Atlantic City Electric Company  
BAY BROADBAND COMMUNICATIONS LLC  
CNG Transmission Corporation  
COLLEGE OF SOUTHERN MARYLAND  
CROWN COMMUNICATION, INC.  
Cellco Partnership - Newark-Dallas-Route  
Cellco Partnership - Virginia  
Cellco Partnership- PA Region  
Charles County  
Cingular Pennsylvania, LLC  
Corban Networks, Inc.  
DELAWARE STATE  
Delmarva Power & Light Company  
Dobson Cellular Systems, Inc.  
EASTERBROOKE CELLULAR CORPORATION  
Exelon Generation Company, L.L.C  
FAYETTE COUNTY EMERGENCY MANAGEMENT  
FIRST TELEVISION CORP.(MID-ATLANTIC)  
Frederick County Em. Comm. Center  
Hardy Cellular Telephone Company  
Intermedia Services, LLC.  
LB Tower Company LLC  
LOUDOUN COUNTY GOVERNMENT  
Lenfest MNC, Inc.  
Local Communications Network, Inc.  
MARYLAND PUBLIC BROADCASTING COMMISSION  
MCI Worldcom Network Services, Inc.  
Maryland RSA 2, LLC  
Maryland State Highway Administration  
Maryland, State of - DBM  
NATIONAL RADIO ASTRONOMY OBSERVATORY

NTELOS Telephone, Inc.  
Nera Networks Inc.  
PENN SERVICE MICROWAVE CO. INC.  
PENNSYLVANIA TURNPIKE COMMISSION  
PITTSBURGH CELLULAR TELEPHONE COMPANY  
PRINCE WILLIAM COUNTY  
PSEG Services Corporation  
Peco Energy Company  
STATE OF MARYLAND, MIEMSS  
Southern & Central Wireless, LLC  
Southwestern Bell Mobile Sys LLC - DC  
Susquehanna Electric Company  
Time Warner Cable  
USCOC of Cumberland, Inc.  
Vanguard Cellular Pennsylvania, LLC  
Verizon Maryland, Inc.  
Virginia Cellular Inc./Cellular One  
Virginia Electric & Power Company  
Virginia PCS Alliance, L.C.  
WEST VIRGINIA HEALTH & HUMAN RESOURCES  
Washington D.C. SMSA L.P.  
West Virginia Ems Tsn, 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: 12/29/2004  
Job Number: 041007COMSTC01

### Administrative Information

Licensee Name IntelSat, LLC

### Site Information

#### HAGERSTOWN, MD

Venue Name IMT-07X  
Latitude (NAD 83) 39° 35' 59.6" N  
Longitude (NAD 83) 77° 45' 27.5" W  
Climate Zone A  
Rain Zone 2  
Ground Elevation (AMSL) 169.47 m / 556.0 ft

### Link Information

Satellite Type Geostationary  
Mode TR - Transmit-Receive  
Modulation Digital  
Satellite Arc 6° W to 143° West Longitude  
Azimuth Range 101.9° to 253.6°  
Corresponding Elevation Angles 5.3° / 10.3°  
Antenna Centerline (AGL) 6.1 m / 20.0 ft

### Antenna Information

#### Receive

#### Transmit

Manufacturer	Vertex KPCC	Vertex KPCC
Gain / Diameter	50.2 dBi / 9.3 m	53.9 dBi / 9.3 m
3-dB / 15-dB Beamwidth	0.53° / 1.11°	0.35° / 0.71°

		<u>36M0F8W</u>	<u>43K0G7W</u>	<u>- 72M0G7W</u>	
Max Available RF Power	(dBW/4 kHz)	-2.7	-2.7	-12.6	
	(dBW/MHz)	21.3	7.7	11.4	
Maximum EIRP	(dBW/4 kHz)	51.2	51.2	41.3	
	(dBW/MHz)	75.2	61.6	65.5	
	(dBW)	78.2	61.6	83.9	
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)	36M0F8W / 3700.0 - 4200.0	36M0F8W / 5925.0 - 6425.0
	43K0G7W - 72M0G7W / 3700.0 - 4200.0	43K0G7W - 72K0G7W / 5925.0 - 6425.0

Max Great Circle Coordination Distance	663.7 km / 412.4 mi	398.5 km / 247.6 mi
Precipitation Scatter Contour Radius	613.5 km / 381.2 mi	101.4 km / 63.0 mi

# COMSEARCH

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### Coordination Values

### HAGERSTOWN, MD

Licensee Name IntelSat, LLC  
Latitude (NAD 83) 39° 35' 59.6" N  
Longitude (NAD 83) 77° 45' 27.5" W  
Ground Elevation (AMSL) 169.47 m / 556.0 ft  
Antenna Centerline (AGL) 6.1 m / 20.0 ft  
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 -2.7 (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	0.26	101.82	-10.00	277.19	-10.00	161.95
5	0.23	96.84	-10.00	281.74	-10.00	165.94
10	0.21	91.86	-10.00	284.33	-10.00	169.83
15	0.00	86.88	-10.00	285.28	-10.00	170.66
20	0.00	81.90	-10.00	285.28	-10.00	170.66
25	0.00	76.92	-10.00	285.28	-10.00	170.66
30	0.00	71.95	-10.00	285.28	-10.00	170.66
35	0.00	66.97	-10.00	285.28	-10.00	170.66
40	0.00	62.00	-10.00	285.28	-10.00	170.66
45	0.00	57.03	-10.00	285.28	-10.00	170.66
50	0.00	52.06	-10.00	285.28	-10.00	170.66
55	0.00	47.10	-9.82	286.40	-9.82	171.34
60	0.00	42.14	-8.62	294.23	-8.62	176.03
65	0.00	37.19	-7.26	303.30	-7.26	181.28
70	0.00	32.26	-5.72	314.62	-5.72	187.24
75	0.00	27.35	-3.92	327.41	-3.92	194.13
80	0.00	22.47	-1.79	343.07	-1.79	202.28
85	0.00	17.66	0.83	362.98	0.83	210.76
90	0.00	12.98	4.17	388.86	4.17	224.76
95	0.00	8.66	8.56	426.07	8.56	245.20
100	0.00	5.61	13.27	663.74	13.27	398.52
105	0.00	6.15	12.28	511.01	12.28	292.45
110	0.00	9.60	7.45	416.38	7.45	239.82
115	0.00	13.27	3.93	387.54	3.93	223.71
120	0.00	16.89	1.31	366.72	1.31	212.69
125	0.00	20.41	-0.75	350.91	-0.75	204.62
130	0.00	23.83	-2.43	338.34	-2.43	199.84
135	0.00	27.11	-3.83	328.09	-3.83	194.49
140	0.00	30.23	-5.01	319.61	-5.01	189.96
145	0.00	33.14	-6.01	311.94	-6.01	186.11
150	0.00	35.81	-6.85	306.10	-6.85	182.86
155	0.00	38.20	-7.55	301.33	-7.55	180.16
160	0.00	40.26	-8.12	297.51	-8.12	177.95
165	0.00	41.92	-8.56	294.59	-8.56	176.24
170	0.00	43.16	-8.88	292.52	-8.88	175.02
175	0.00	43.92	-9.07	291.29	-9.07	174.29
180	0.00	44.17	-9.13	290.88	-9.13	174.04
185	0.00	43.92	-9.07	291.29	-9.07	174.29

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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 -2.7 (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	175.02
195	0.00	41.92	-8.56	294.59	-8.56	176.24
200	0.00	40.26	-8.12	297.52	-8.12	177.95
205	0.00	38.20	-7.55	301.33	-7.55	180.15
210	0.00	35.81	-6.85	306.10	-6.85	182.86
215	0.00	33.14	-6.01	311.94	-6.01	186.11
220	0.00	30.22	-5.01	319.62	-5.01	189.96
225	0.21	26.96	-3.77	327.66	-3.77	194.06
230	0.22	23.67	-2.36	336.27	-2.36	198.20
235	0.22	20.26	-0.67	348.91	-0.67	204.67
240	0.23	16.72	1.42	362.89	1.42	209.70
245	0.26	13.18	4.01	380.16	4.01	217.99
250	0.26	10.64	6.33	399.45	6.33	228.82
255	0.24	10.13	6.87	446.59	6.87	253.84
260	0.21	11.89	5.12	395.17	5.12	227.84
265	0.26	15.11	2.52	368.51	2.52	211.95
270	0.31	19.10	-0.02	341.29	-0.02	198.12
275	0.24	23.52	-2.28	333.94	-2.28	196.35
280	0.00	28.18	-4.25	325.06	-4.25	192.88
285	0.00	32.86	-5.92	313.22	-5.92	186.47
290	0.00	37.61	-7.38	302.47	-7.38	180.81
295	0.00	42.41	-8.69	293.76	-8.69	175.76
300	0.00	47.25	-9.86	286.17	-9.86	171.20
305	0.28	52.07	-10.00	275.29	-10.00	160.31
310	0.24	56.96	-10.00	280.06	-10.00	164.46
315	0.00	61.88	-10.00	285.28	-10.00	170.66
320	0.00	66.78	-10.00	285.28	-10.00	170.66
325	0.00	71.69	-10.00	285.28	-10.00	170.66
330	0.00	76.61	-10.00	285.28	-10.00	170.66
335	0.00	81.52	-10.00	285.28	-10.00	170.66
340	0.32	86.44	-10.00	270.80	-10.00	156.46
345	0.29	91.36	-10.00	274.59	-10.00	159.71
350	0.23	96.29	-10.00	281.42	-10.00	165.66
355	0.00	101.20	-10.00	285.28	-10.00	170.66

## 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. I AM FAMILIAR WITH PARTS 101 AND 25 OF THE FCC RULES AND REGULATIONS. 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.



Timothy O. Crutcher  
Frequency Planner  
COMSEARCH  
19700 Janelia Farm Boulevard  
Ashburn, VA 20147

DATED: December 29, 2004