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**VIA ELECTRONIC FILING**

November 14, 2018

Marlene H. Dortch  
Office of the Secretary  
Federal Communications Commission  
445 12th Street, SW  
Washington, DC 20554

Re: AT&T Corp. Application for Modification of Call Sign KA273 to Add New Antennas, IBFS  
File No. SES-MOD-INTR2018-09342

Dear Ms. Dortch:

AT&T Corp., by its undersigned counsel, respectfully notifies the Federal Communications Commission that the coordination process for the above-captioned earth station modification application has been completed. Attached are the final Frequency Coordination and Interference Analysis Reports for inclusion in the FCC's files for the above-referenced earth station application.

Should you have any questions regarding this filing, please do not hesitate to contact me.

Respectfully Submitted,

*/s/ Jennifer D. Hindin*

Jennifer D. Hindin  
*Counsel for AT&T Corp.*

**Attachment 1**

**Coordination Report for 11.1-meter Antenna**

# FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for  
**AT&T Corp -  
MALIBU, CA**  
**Satellite Earth Station**

Prepared By:  
COMSEARCH  
19700 Janelia Farm Boulevard  
Ashburn, VA 20147  
October 31, 2018

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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 10/15/2018.

Company

ABC Holding Company Inc.  
AT&T Mobility Spectrum LLC - Southern CA  
Air Sites 2000 LLC  
Anaheim City, of  
BNS Electronics, Inc.  
California Internet Solutions, Inc.  
California Internet, L.P.  
California State University, Northridge  
California, State of  
City of Los Angeles Dept Water & Power  
City of Montebello  
Coast Community College District  
Communication Services, Inc.  
DM Ventures, Inc. dba Warp2Biz  
Fresno MSA Limited Partnership  
Frontier California Inc.  
Glendale City California  
Go Creative Wireless  
ION Media Los Angeles License, Inc.  
KTLA, LLC  
Kern, County of  
LDM Engineering  
Los Angeles City Info Technology Agency  
Los Angeles County Dept of Public Works  
Los Angeles County FCC Licensing Section  
Los Angeles County Metro Transit Auth  
Los Angeles Regional Interoperable Comm  
Los Angeles SMSA Ltd. Partnership  
Los Angeles Unified School District  
MHO Networks  
Metropolitan Water Dist of So California  
New Cingular Wireless PCS - Los Angeles  
Nextel of California Inc.  
Nextweb Inc  
Northrop Grumman Systems Corp.  
Nrx TV La License Co, LLC  
Olympic Wireless, LLC  
Orange, County of, CA  
Pacific Bell Tel Com dba AT&T California  
Regents of the University of California  
Santa Barbara, County of

Skyriver Communications  
Southern California Edison Company  
Southern California Gas Company  
Southern California Regional Rail Auth.  
Spectrum Link, Inc.  
TV Microwaves Company  
Turn Wireless, LLC  
Union Pacific Railroad Company  
Vectus, Inc  
Ventura, County of  
Verizon Wireless (VAW) LLC (Southern CA)  
Verizon Wireless (VAW) LLC-N CA/NV



## **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: 10/31/2018  
Job Number: 181015COMSGE16

---

### Administrative Information

Status ENGINEER PROPOSAL  
Call Sign KA273  
Licensee Code P1175P  
Licensee Name AT&T Corp -

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### Site Information MALIBU, CA

Venue Name  
Latitude (NAD 83) 34° 4' 50.3" N  
Longitude (NAD 83) 118° 53' 49.7" W  
Climate Zone A  
Rain Zone 4  
Ground Elevation (AMSL) 330.71 m / 1085.0 ft

---

### Link Information

Satellite Type Geostationary  
Mode TR - Transmit-Receive  
Modulation Digital  
Satellite Arc 70° W to 187° West Longitude  
Azimuth Range 116.1° to 257.3°  
Corresponding Elevation Angles 25.1° / 9.4°  
Antenna Centerline (AGL) 5.49 m / 18.0 ft

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### Antenna Information

		<b>Receive - FCC32</b>		<b>Transmit - FCC32</b>	
Manufacturer		Gen Dynamics		Gen Dynamics	
Model		Satcom		Satcom	
Gain / Diameter		51.9 dBi / 11.1 m		55.6 dBi / 11.1 m	
3-dB / 15-dB Beamwidth		0.40° / 0.90°		0.30° / 0.60°	
Max Available RF Power	(dBW/4 kHz) (dBW/MHz)			-2.7 21.3	
Maximum EIRP	(dBW/4 kHz) (dBW/MHz)			52.9 76.9	
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

	<b>Receive 4.0 GHz</b>	<b>Transmit 6.1 GHz</b>
Emission / Frequency Range (MHz)	54K6G7W - 72M0G7W / 3625.0 - 4200.0	54K6G7W - 72M0G7W / 5850.0 - 6425.0
Max Great Circle Coordination Distance	286.4 km / 177.9 mi	127.9 km / 79.5 mi
Precipitation Scatter Contour Radius	392.6 km / 243.9 mi	100.0 km / 62.1 mi

# COMSEARCH

## Earth Station Data Sheet

19700 Janelia Farm Boulevard, Ashburn, VA 20147  
(703)726-5500 <http://www.comsearch.com>

### Coordination Values

### MALIBU, CA

Licensee Name AT&T Corp -  
Latitude (NAD 83) 34° 4' 50.3" N  
Longitude (NAD 83) 118° 53' 49.7" W  
Ground Elevation (AMSL) 330.71 m / 1085.0 ft  
Antenna Centerline (AGL) 5.49 m / 18.0 ft  
Antenna Model Gen Dynamics 11.1 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 -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	5.76	102.67	-10.00	127.52	-10.00	100.00
5	6.21	107.67	-10.00	122.90	-10.00	100.00
10	7.24	105.26	-10.00	111.72	-10.00	100.00
15	7.25	100.52	-10.00	111.62	-10.00	100.00
20	7.50	95.77	-10.00	108.98	-10.00	100.00
25	8.10	91.01	-10.00	102.91	-10.00	100.00
30	7.62	86.24	-10.00	107.76	-10.00	100.00
35	7.42	81.48	-10.00	109.82	-10.00	100.00
40	7.30	76.74	-10.00	111.09	-10.00	100.00
45	6.76	72.05	-10.00	116.92	-10.00	100.00
50	5.78	67.48	-10.00	127.32	-10.00	100.00
55	6.01	62.79	-10.00	125.15	-10.00	100.00
60	4.40	58.52	-10.00	141.84	-10.00	100.00
65	5.16	53.78	-10.00	133.26	-10.00	100.00
70	5.80	49.09	-10.00	127.13	-10.00	100.00
75	6.46	44.40	-9.19	123.39	-9.19	100.00
80	5.89	40.24	-8.12	133.72	-8.12	100.00
85	6.12	35.90	-6.88	135.12	-6.88	100.00
90	5.39	32.26	-5.72	148.07	-5.72	100.00
95	6.11	28.08	-4.21	147.29	-4.21	100.00
100	7.77	23.47	-2.26	136.94	-2.26	100.00
105	9.33	19.19	-0.08	133.87	-0.08	100.00
110	10.96	15.37	2.33	132.86	2.33	100.00
115	12.55	12.61	4.48	132.64	4.48	100.00
120	13.09	12.65	4.44	128.94	4.44	100.00
125	14.50	13.86	3.46	115.05	3.46	100.00
130	15.78	16.35	1.66	100.00	1.66	100.00
135	16.41	19.13	-0.04	100.00	-0.04	100.00
140	17.31	21.43	-1.27	100.00	-1.27	100.00
145	18.02	23.54	-2.30	100.00	-2.30	100.00
150	17.39	26.46	-3.56	100.00	-3.56	100.00
155	13.58	31.92	-5.60	100.00	-5.60	100.00
160	14.76	32.61	-5.83	100.00	-5.83	100.00
165	14.18	34.50	-6.44	100.00	-6.44	100.00
170	12.80	36.81	-7.15	100.00	-7.15	100.00
175	12.95	37.25	-7.28	100.00	-7.28	100.00
180	15.36	35.03	-6.61	100.00	-6.61	100.00
185	15.28	34.92	-6.58	100.00	-6.58	100.00

# COMSEARCH

## Earth Station Data Sheet

19700 Janelia Farm Boulevard, Ashburn, VA 20147  
(703)726-5500 <http://www.comsearch.com>

### Coordination Values

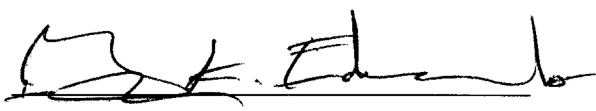
### MALIBU, CA

Licensee Name AT&T Corp -  
Latitude (NAD 83) 34° 4' 50.3" N  
Longitude (NAD 83) 118° 53' 49.7" W  
Ground Elevation (AMSL) 330.71 m / 1085.0 ft  
Antenna Centerline (AGL) 5.49 m / 18.0 ft  
Antenna Model Gen Dynamics 11.1 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 -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	14.45	35.19	-6.66	100.00	-6.66	100.00
195	12.15	36.45	-7.04	100.00	-7.04	100.00
200	11.40	35.72	-6.82	100.00	-6.82	100.00
205	10.37	34.75	-6.52	100.00	-6.52	100.00
210	10.06	32.69	-5.86	102.79	-5.86	100.00
215	10.29	29.84	-4.87	105.33	-4.87	100.00
220	12.75	25.00	-2.95	100.00	-2.95	100.00
225	14.03	20.92	-1.02	100.00	-1.02	100.00
230	12.21	18.90	0.09	113.91	0.09	100.00
235	9.45	17.22	1.10	137.11	1.10	100.00
240	8.27	14.26	3.15	160.15	3.15	100.00
245	8.22	10.46	6.51	183.79	6.51	100.00
250	7.46	7.00	10.87	216.47	10.87	100.00
255	7.36	3.09	19.77	286.36	19.77	127.88
260	6.62	3.88	17.28	277.58	17.28	125.61
265	5.57	8.60	8.64	227.78	8.64	102.18
270	3.48	13.99	3.35	229.28	3.35	110.39
275	2.59	18.93	0.07	230.23	0.07	114.41
280	2.73	23.61	-2.33	213.20	-2.33	102.97
285	3.01	28.37	-4.32	199.77	-4.32	100.00
290	3.58	33.15	-6.01	178.91	-6.01	100.00
295	2.95	38.16	-7.54	185.03	-7.54	100.00
300	4.42	42.93	-8.82	146.79	-8.82	100.00
305	4.96	47.85	-10.00	134.12	-10.00	100.00
310	5.41	52.80	-10.00	130.89	-10.00	100.00
315	5.23	57.79	-10.00	132.65	-10.00	100.00
320	6.51	62.73	-10.00	119.63	-10.00	100.00
325	7.28	67.71	-10.00	111.38	-10.00	100.00
330	7.89	72.70	-10.00	104.91	-10.00	100.00
335	6.67	77.71	-10.00	117.85	-10.00	100.00
340	6.19	82.71	-10.00	123.17	-10.00	100.00
345	6.99	87.70	-10.00	114.45	-10.00	100.00
350	7.39	92.69	-10.00	110.18	-10.00	100.00
355	7.13	97.69	-10.00	112.91	-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: October 31, 2018

**Attachment 2**

**Coordination Report for 13.1-meter Antenna**

# FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for  
**AT&T Corp**  
**MALIBU, CA**  
**Satellite Earth Station**

Prepared By:  
COMSEARCH  
19700 Janelia Farm Boulevard  
Ashburn, VA 20147  
October 31, 2018

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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.

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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.

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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 10/15/2018.

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AT&T Mobility Spectrum LLC - Southern CA  
Air Sites 2000 LLC  
Anaheim City, of  
BNS Electronics, Inc.  
California Internet Solutions, Inc.  
California Internet, L.P.  
California State University, Northridge  
California, State of  
City of Los Angeles Dept Water & Power  
City of Montebello  
Coast Community College District  
Communication Services, Inc.  
DM Ventures, Inc. dba Warp2Biz  
Fresno MSA Limited Partnership  
Frontier California Inc.  
Glendale City California  
Go Creative Wireless  
ION Media Los Angeles License, Inc.  
KTLA, LLC  
Kern, County of  
LDM Engineering  
Los Angeles City Info Technology Agency  
Los Angeles County Dept of Public Works  
Los Angeles County FCC Licensing Section  
Los Angeles County Metro Transit Auth  
Los Angeles Regional Interoperable Comm  
Los Angeles SMSA Ltd. Partnership  
Los Angeles Unified School District  
MHO Networks  
Metropolitan Water Dist of So California  
New Cingular Wireless PCS - Los Angeles  
Nextel of California Inc.  
Nextweb Inc  
Northrop Grumman Systems Corp.  
Nrj TV La License Co, LLC  
Olympic Wireless, LLC  
Orange, County of, CA  
Pacific Bell Tel Com dba AT&T California  
Regents of the University of California  
Santa Barbara, County of

Skyriver Communications  
Southern California Edison Company  
Southern California Gas Company  
Southern California Regional Rail Auth.  
Spectrum Link, Inc.  
TV Microwaves Company  
Turn Wireless, LLC  
Union Pacific Railroad Company  
Vectus, Inc  
Ventura, County of  
Verizon Wireless (VAW) LLC (Southern CA)  
Verizon Wireless (VAW) LLC-N CA/NV

## **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: 10/31/2018  
Job Number: 181015COMSGE17

---

### Administrative Information

Status ENGINEER PROPOSAL  
Call Sign KA273  
Licensee Code P1175P  
Licensee Name AT&T Corp -

---

### Site Information MALIBU, CA

Venue Name  
Latitude (NAD 83) 34° 4' 50.3" N  
Longitude (NAD 83) 118° 53' 49.7" W  
Climate Zone A  
Rain Zone 4  
Ground Elevation (AMSL) 330.71 m / 1085.0 ft

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### Link Information

Satellite Type Geostationary  
Mode TR - Transmit-Receive  
Modulation Digital  
Satellite Arc 70° W to 187° West Longitude  
Azimuth Range 116.1° to 257.3°  
Corresponding Elevation Angles 25.1° / 9.4°  
Antenna Centerline (AGL) 5.49 m / 18.0 ft

---

### Antenna Information

		<b>Receive - FCC32</b>		<b>Transmit - FCC32</b>	
Manufacturer		Gen Dynamics		Gen Dynamics	
Model		Satcom		Satcom	
Gain / Diameter		53.5 dBi / 13.1 m		57.3 dBi / 13.1 m	
3-dB / 15-dB Beamwidth		0.38° / 0.76°		0.26° / 0.52°	
Max Available RF Power	(dBW/4 kHz) (dBW/MHz)			-2.7 21.3	
Maximum EIRP	(dBW/4 kHz) (dBW/MHz)			54.6 78.6	
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

	<b>Receive 4.0 GHz</b>	<b>Transmit 6.1 GHz</b>
Emission / Frequency Range (MHz)	54K6G7W - 72M0G7W / 3625.0 - 4200.0	54K6G7W - 72M0G7W / 5850.0 - 6425.0
Max Great Circle Coordination Distance	286.4 km / 177.9 mi	127.9 km / 79.5 mi
Precipitation Scatter Contour Radius	392.6 km / 243.9 mi	100.0 km / 62.1 mi

# COMSEARCH

## Earth Station Data Sheet

19700 Janelia Farm Boulevard, Ashburn, VA 20147  
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### Coordination Values

### MALIBU, CA

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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	5.76	102.67	-10.00	127.52	-10.00	100.00
5	6.21	107.67	-10.00	122.90	-10.00	100.00
10	7.24	105.26	-10.00	111.72	-10.00	100.00
15	7.25	100.52	-10.00	111.62	-10.00	100.00
20	7.50	95.77	-10.00	108.98	-10.00	100.00
25	8.10	91.01	-10.00	102.91	-10.00	100.00
30	7.62	86.24	-10.00	107.76	-10.00	100.00
35	7.42	81.48	-10.00	109.82	-10.00	100.00
40	7.30	76.74	-10.00	111.09	-10.00	100.00
45	6.76	72.05	-10.00	116.92	-10.00	100.00
50	5.78	67.48	-10.00	127.32	-10.00	100.00
55	6.01	62.79	-10.00	125.15	-10.00	100.00
60	4.40	58.52	-10.00	141.84	-10.00	100.00
65	5.16	53.78	-10.00	133.26	-10.00	100.00
70	5.80	49.09	-10.00	127.13	-10.00	100.00
75	6.46	44.40	-9.19	123.39	-9.19	100.00
80	5.89	40.24	-8.12	133.72	-8.12	100.00
85	6.12	35.90	-6.88	135.12	-6.88	100.00
90	5.39	32.26	-5.72	148.07	-5.72	100.00
95	6.11	28.08	-4.21	147.29	-4.21	100.00
100	7.77	23.47	-2.26	136.94	-2.26	100.00
105	9.33	19.19	-0.08	133.87	-0.08	100.00
110	10.96	15.37	2.33	132.86	2.33	100.00
115	12.55	12.61	4.48	132.64	4.48	100.00
120	13.09	12.65	4.44	128.94	4.44	100.00
125	14.50	13.86	3.46	115.05	3.46	100.00
130	15.78	16.35	1.66	100.00	1.66	100.00
135	16.41	19.13	-0.04	100.00	-0.04	100.00
140	17.31	21.43	-1.27	100.00	-1.27	100.00
145	18.02	23.54	-2.30	100.00	-2.30	100.00
150	17.39	26.46	-3.56	100.00	-3.56	100.00
155	13.58	31.92	-5.60	100.00	-5.60	100.00
160	14.76	32.61	-5.83	100.00	-5.83	100.00
165	14.18	34.50	-6.44	100.00	-6.44	100.00
170	12.80	36.81	-7.15	100.00	-7.15	100.00
175	12.95	37.25	-7.28	100.00	-7.28	100.00
180	15.36	35.03	-6.61	100.00	-6.61	100.00
185	15.28	34.92	-6.58	100.00	-6.58	100.00

# COMSEARCH

## Earth Station Data Sheet

19700 Janelia Farm Boulevard, Ashburn, VA 20147  
(703)726-5500 <http://www.comsearch.com>

### Coordination Values

### MALIBU, CA

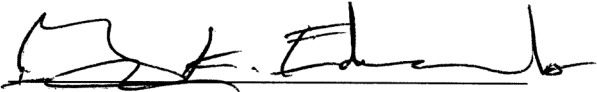
Licensee Name	AT&T Corp			
Latitude (NAD 83)	34° 4' 50.3" N			
Longitude (NAD 83)	118° 53' 49.7" W			
Ground Elevation (AMSL)	330.71 m / 1085.0 ft			
Antenna Centerline (AGL)	5.49 m / 18.0 ft			
Antenna Model	Gen Dynamics 13.1 meter			
Antenna Mode	Receive 4.0 GHz		Transmit 6.1 GHz	
Interference Objectives: 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			-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	14.45	35.19	-6.66	100.00	-6.66	100.00
195	12.15	36.45	-7.04	100.00	-7.04	100.00
200	11.40	35.72	-6.82	100.00	-6.82	100.00
205	10.37	34.75	-6.52	100.00	-6.52	100.00
210	10.06	32.69	-5.86	102.79	-5.86	100.00
215	10.29	29.84	-4.87	105.33	-4.87	100.00
220	12.75	25.00	-2.95	100.00	-2.95	100.00
225	14.03	20.92	-1.02	100.00	-1.02	100.00
230	12.21	18.90	0.09	113.91	0.09	100.00
235	9.45	17.22	1.10	137.11	1.10	100.00
240	8.27	14.26	3.15	160.15	3.15	100.00
245	8.22	10.46	6.51	183.79	6.51	100.00
250	7.46	7.00	10.87	216.47	10.87	100.00
255	7.36	3.09	19.77	286.36	19.77	127.88
260	6.62	3.88	17.28	277.58	17.28	125.61
265	5.57	8.60	8.64	227.78	8.64	102.18
270	3.48	13.99	3.35	229.28	3.35	110.39
275	2.59	18.93	0.07	230.23	0.07	114.41
280	2.73	23.61	-2.33	213.20	-2.33	102.97
285	3.01	28.37	-4.32	199.77	-4.32	100.00
290	3.58	33.15	-6.01	178.91	-6.01	100.00
295	2.95	38.16	-7.54	185.03	-7.54	100.00
300	4.42	42.93	-8.82	146.79	-8.82	100.00
305	4.96	47.85	-10.00	134.12	-10.00	100.00
310	5.41	52.80	-10.00	130.89	-10.00	100.00
315	5.23	57.79	-10.00	132.65	-10.00	100.00
320	6.51	62.73	-10.00	119.63	-10.00	100.00
325	7.28	67.71	-10.00	111.38	-10.00	100.00
330	7.89	72.70	-10.00	104.91	-10.00	100.00
335	6.67	77.71	-10.00	117.85	-10.00	100.00
340	6.19	82.71	-10.00	123.17	-10.00	100.00
345	6.99	87.70	-10.00	114.45	-10.00	100.00
350	7.39	92.69	-10.00	110.18	-10.00	100.00
355	7.13	97.69	-10.00	112.91	-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: October 31, 2018