

# FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for  
**Denali 20020, LLC**  
**BREWSTER, WA**  
**(E990066)**  
**Satellite Earth Station**

Prepared By:  
COMSEARCH  
19700 Janelia Farm Boulevard  
Ashburn, VA 20147  
June 27, 2014

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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 04/09/2014.

Company

3G Wireless, LLC  
AERIAL VIDEO SYSTEMS  
AT&T California  
Alascom Inc  
Apple Valley Broadcasting Inc.  
Ascent Media Network Services, LLC  
Bellsouth Telecommunications, Inc.  
Borgeson, Tom R.  
Broadcast Sports Inc.  
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  
Cowboys Stadium LP  
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  
Illinois Bell Telephone Company  
Indiana Bell Telephone Company  
Information & Display Systems, Inc.  
Information Super Station, LLC  
International Communications Group, Inc.  
KIRO-TV, Inc  
Kentucky RSA #3 Cellular General Partner  
Kentucky RSA #4 Cellular General Partner  
King Broadcasting Company  
MERCURY COMMUNICATIONS  
Metro Networks Communications, Inc.  
Michigan Bell Telephone Company  
Moreen, Steven K  
NEW ENGLAND DIGITAL DISTRIBUTION, INC.

NEW ENGLAND SATELLITE SYSTEMS INC  
NSM Surveillance  
Navajo Communications Company  
NorthWest Suburbs Community Access Corp  
Ohio Bell Telephone Company  
On Scene Video Production  
Onboard Images  
Penn Service Microwave Co., Inc.  
Plateau Telecommunications, Inc.  
Plum TV, LLC  
Production & Satellite Services, Inc.  
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  
Radiofone, Inc.  
Randy Hermes Production  
Regulus Media Services, Inc.  
Remote Broadcasts, Inc.  
SBE Coordinator  
SPOKANE TELEVISION INC  
Sinclair Yakima Licensee, LLC ( WA)  
Southwestern Bell Telephone L.P.  
Speedshotz, Inc  
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.  
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: 06/27/2014  
Job Number: 140409COMSGE03

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### Administrative Information

Status ENGINEER PROPOSAL  
Call Sign E990066  
Licensee Code DENALI  
Licensee Name Denali 20020, LLC

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### Site Information BREWSTER, WA

Venue Name  
Latitude (NAD 83) 48° 8' 44.0" N  
Longitude (NAD 83) 119° 42' 9.2" W  
Climate Zone A  
Rain Zone 5  
Ground Elevation (AMSL) 382.8 m / 1255.9 ft

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### Link Information

Satellite Type Low Earth Orbit  
Mode TO - Transmit-Only  
Modulation Digital  
Minimum Elevation Angle 5.0°  
Azimuth Range 0.0° to 360°  
Antenna Centerline (AGL) 4.88 m / 16.0 ft

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### Antenna Information Transmit - FCC32

Manufacturer NEC  
Model G2573C  
Gain / Diameter 41.5 dBi / 7.6 m  
3-dB / 15-dB Beamwidth 1.6° / 3.4°

Max Available RF Power (dBW/4 kHz) -17.6  
(dBW/MHz) 6.36

Maximum EIRP (dBW/4 kHz) 23.90  
(dBW/MHz) 47.90

Interference Objectives: Long Term -154.0 dBW/4 kHz 20%  
Short Term -131.0 dBW/4 kHz 0.0025%

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### Frequency Information Transmit 2.0 GHz

Emission / Frequency Range (MHz) 1M31F1D / 2055.345 - 2056.655

Max Great Circle Coordination Distance 183.2 km / 113.8 mi  
Precipitation Scatter Contour Radius 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>

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<b>Coordination Values</b>	<b>BREWSTER, WA</b>
Licensee Name	Denali 20020, LLC
Latitude (NAD 83)	48° 8' 44.0" N
Longitude (NAD 83)	119° 42' 9.2" W
Ground Elevation (AMSL)	382.8 m / 1255.9 ft
Antenna Centerline (AGL)	4.88 m / 16.0 ft
Antenna Model	NEC 7.6 Meter
Antenna Mode	Transmit 2.0 GHz
Interference Objectives: Long Term	-154.0 dBW/4 kHz 20%
Short Term	-131.0 dBW/4 kHz 0.0025%
Max Available RF Power	-17.6 (dBW/4 kHz)

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Transmit 2.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)
0	0.00	69.62	5.00	183.20
5	0.00	65.27	5.00	183.20
10	0.00	60.97	5.00	183.20
15	0.00	56.73	5.00	183.20
20	0.00	52.58	5.00	183.20
25	0.00	48.54	5.00	183.20
30	0.00	44.65	5.00	183.20
35	0.00	40.94	5.00	183.20
40	0.00	37.47	5.00	183.20
45	0.00	34.32	5.00	183.20
50	0.00	31.59	5.00	183.20
55	0.00	29.40	5.00	183.20
60	0.00	27.87	5.00	183.20
65	0.00	27.12	5.00	183.20
70	0.00	27.20	5.00	183.20
75	0.00	28.13	5.00	183.20
80	0.00	29.80	5.00	183.20
85	0.00	32.12	5.00	183.20
90	0.00	34.94	5.00	183.20
95	0.00	38.16	5.00	183.20
100	0.00	41.69	5.00	183.20
105	0.00	45.44	5.00	183.20
110	0.00	49.37	5.00	183.20
115	0.00	53.43	5.00	183.20
120	0.00	57.60	5.00	183.20
125	0.00	61.85	5.00	183.20
130	0.00	66.17	5.00	183.20
135	0.00	70.53	5.00	183.20
140	0.00	74.92	5.00	183.20
145	0.00	79.34	5.00	183.20
150	0.00	83.78	5.00	183.20
155	0.00	88.23	5.00	183.20
160	0.00	92.69	5.00	183.20
165	0.00	97.14	5.00	183.20
170	0.00	101.57	5.00	183.20
175	0.00	105.99	5.00	183.20
180	0.00	110.38	5.00	183.20
185	0.00	114.73	5.00	183.20

# COMSEARCH

## Earth Station Data Sheet

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

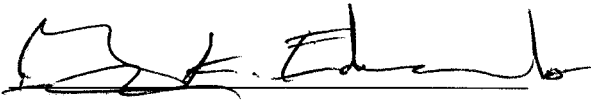
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Short Term	-131.0 dBW/4 kHz 0.0025%
Max Available RF Power	-17.6 (dBW/4 kHz)

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Transmit 2.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	119.03	5.00	183.20
195	0.00	123.27	5.00	183.20
200	0.00	127.42	5.00	183.20
205	0.00	131.46	5.00	183.20
210	0.00	135.35	5.00	183.20
215	0.00	139.06	5.00	183.20
220	0.00	142.53	5.00	183.20
225	0.00	145.68	5.00	183.20
230	0.00	148.41	5.00	183.20
235	0.00	150.60	5.00	183.20
240	0.00	152.13	5.00	183.20
245	0.00	152.88	5.00	183.20
250	0.00	152.80	5.00	183.20
255	0.00	151.87	5.00	183.20
260	0.00	150.20	5.00	183.20
265	0.00	147.88	5.00	183.20
270	0.00	145.06	5.00	183.20
275	0.00	141.84	5.00	183.20
280	0.00	138.31	5.00	183.20
285	0.00	134.56	5.00	183.20
290	0.00	130.63	5.00	183.20
295	0.00	126.57	5.00	183.20
300	0.00	122.40	5.00	183.20
305	0.00	118.15	5.00	183.20
310	0.00	113.83	5.00	183.20
315	0.00	109.47	5.00	183.20
320	0.00	105.08	5.00	183.20
325	0.00	100.66	5.00	183.20
330	0.00	96.22	5.00	183.20
335	0.00	91.77	5.00	183.20
340	0.00	87.31	5.00	183.20
345	0.00	82.86	5.00	183.20
350	0.00	78.43	5.00	183.20
355	0.00	74.01	5.00	183.20

## 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: June 27, 2014