

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
Denali 20020, LLC
BREWSTER, WA
(E910548)
Satellite Earth Station

Prepared By:
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, VA 20147
May 9, 2011

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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

Time Warner Cable LLC
QWEST CORPORATION

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 04/26/2011.

Company

ACCEL NET, INC.
Avista Utilities
BENTON COUNTY EMERGENCY SERVICES
BNSF Railway Company
Benton Rural Electric Association
Boeing Company
Boingo Wireless, Inc.
CITY OF TACOMA
Cellco Partnership - Oregon
Cellco Partnership - Washington
CenturyTel of Washington, Inc.
City of Seattle
City of Tacoma / Tacoma Public Utilities
Clearwire Spectrum Holdings II, LLC
Clearwire Spectrum Holdings III, LLC
Clearwire Spectrum Holdings LLC
Columbia Rural Electric Association, Inc
Cyberdyne Networks, Inc.
Desert Winds Wireless LLC
Eastern Sub-RSA Limited Partnership
Eastside Public Safety Com Agency
Ellensburg Telephone Company
Energy Northwest
Everett Clinic
Fisher Broadcasting, Inc.
Franklin County Sheriff
Frontier Communications of the Northwest
Hermiston, City of
Idaho RSA #1 Limited Partnership
Inland Telephone Company
J & R Electronics Inc
KGY, Inc.
KING COUNTY DEPT OF TRANSPORTATION
KITSAP, COUNTY OF
King, County of
Lake Washington Vascular
METROPOLITAN AREA NETWORKS, INC.
MTS Allstream Inc
McDaniel Cellular Telephone Company
New Cingular Wireless PCS -AK,WA,OR, NID

New Cingular Wireless PCS LLC -OR Region
Noel Communications, Inc
North East Washington Microwave
PACIFICORP
PIERCE COUNTY COMMUNICATIONS DIVISION
PIERCE TRANSIT
PIERCE, COUNTY OF
Pass Word, Inc.
PocketiNet Communications Inc.
Post Falls Police Department
Providence Toppenish Community Hospital
Ptera Wireless, Inc.
Public Util Dist. #1 of Snohomish County
Puget Sound Energy
QWEST CORPORATION
RCC Minnesota, Inc - Washington/Oregon
Rivercom 911
SADDLE MOUNTAIN WIRELESS INC
SNOHOMISH COUNTY EMERGENCY RADIO SYSTEM
SPOKANE COUNTY
Seattle City Light
Seattle SMSA Limited Partnership
Skotdal Brothers LLC (c/o CSI)
Snohomish County Pub.Trans.Benefit Area
Spectrum Networks Inc.
Spokane MSA Limited Partnership
St. Anthony Hospital
Startouch, Inc.
Stat Network Solutions
Stevens County Fire District #2
T-Mobile License LLC
THURSTON, COUNTY OF
Time Warner Cable LLC
USCOC of Richland, Inc.
United Telephone Co. of the Northwest
Verizon Wireless (VAW) LLC - (WA)
Verizon Wireless (VAW) LLC - ID,MT, N WY
Verizon Wireless VAW LLC (OR, HI)
WASHINGTON STATE DOT
WHIDBEY TELEPHONE COMPANY
WIRED OR WIRELESS, INC.
Washington RSA No. 8 Limited Partnership
Washington State Patrol
Western Sub-RSA LTD Partnership
Whitman County Fire District #7
Yakima MSA Limited Partnership

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: 04/29/2011
Job Number: 110426COMSGE02

Administrative Information

Status ENGINEER PROPOSAL
Call Sign E910548
Licensee Code DENALI
Licensee Name Denali 20020, LLC

Site Information BREWSTER, WA

Venue Name
Latitude (NAD 83) 48° 8' 47.0" N
Longitude (NAD 83) 119° 41' 29.0" W
Climate Zone A
Rain Zone 5
Ground Elevation (AMSL) 380.0 m / 1246.7 ft

Link Information

Satellite Type Geostationary
Mode TR - Transmit-Receive
Modulation Digital
Satellite Arc 53° W to 186° West Longitude
Azimuth Range 107.8° to 251.9°
Corresponding Elevation Angles 6.7° / 6.9°
Antenna Centerline (AGL) 3.66 m / 12.0 ft

Antenna Information

		Receive - FCC32		Transmit - FCC32	
Manufacturer		Vertex		Vertex	
Model		6.1 Meter		6.1 Meter	
Gain / Diameter		55.5 dBi / 6.1 m		56.9 dBi / 6.1 m	
3-dB / 15-dB Beamwidth		0.28° / 0.57°		0.24° / 0.48°	
Max Available RF Power	(dBW/4 kHz) (dBW/MHz)			-14.0 10.0	
Maximum EIRP	(dBW/4 kHz) (dBW/MHz)			42.9 66.9	
Interference Objectives:	Long Term Short Term	-156.0 dBW/MHz -146.0 dBW/MHz	20% 0.01%	-151.0 dBW/4 kHz -128.0 dBW/4 kHz	20% 0.0025%

Frequency Information

	Receive 11.0 GHz	Transmit 14.0 GHz
Emission / Frequency Range (MHz)	1M00G7D - 72M0G7W / 10950.0 - 11200.0 1M00G7D - 72M0G7W / 11450.0 - 11700.0	1M00G7D - 72M0G7W / 14000.0 - 14500.0

Max Great Circle Coordination Distance 442.1 km / 274.6 mi 196.1 km / 121.9 mi
Precipitation Scatter Contour Radius 403.4 km / 250.6 mi 100.0 km / 62.1 mi

COMSEARCH

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19700 Janelia Farm Boulevard, Ashburn, VA 20147
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Coordination Values

BREWSTER, WA

Licensee Name Denali 20020, LLC
Latitude (NAD 83) 48° 8' 47.0" N
Longitude (NAD 83) 119° 41' 29.0" W
Ground Elevation (AMSL) 380.0 m / 1246.7 ft
Antenna Centerline (AGL) 3.66 m / 12.0 ft
Antenna Model Vertex 6.1 Meter
Antenna Mode Receive 11.0 GHz Transmit 14.0 GHz
Interference Objectives: Long Term -156.0 dBW/MHz 20% -151.0 dBW/4 kHz 20%
Short Term -146.0 dBW/MHz 0.01% -128.0 dBW/4 kHz 0.0025%
Max Available RF Power -14.0 (dBW/4 kHz)

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 11.0 GHz		Transmit 14.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
0	0.79	107.70	-10.00	192.53	-10.00	100.00
5	0.98	102.73	-10.00	182.58	-10.00	100.00
10	0.70	97.75	-10.00	196.88	-10.00	100.00
15	1.32	92.78	-10.00	170.89	-10.00	100.00
20	1.63	87.80	-10.00	157.83	-10.00	100.00
25	0.62	82.84	-10.00	201.04	-10.00	100.00
30	0.57	77.87	-10.00	203.71	-10.00	100.00
35	0.76	72.89	-10.00	194.03	-10.00	100.00
40	1.26	67.90	-10.00	173.13	-10.00	100.00
45	1.65	62.91	-10.00	157.13	-10.00	100.00
50	1.46	57.94	-10.00	163.52	-10.00	100.00
55	1.87	52.95	-10.00	150.43	-10.00	100.00
60	1.75	47.99	-10.00	154.11	-10.00	100.00
65	2.21	42.98	-8.83	146.89	-8.83	100.00
70	2.21	38.02	-7.50	153.34	-7.50	100.00
75	2.43	33.04	-5.98	155.44	-5.98	100.00
80	2.64	28.06	-4.20	159.48	-4.20	100.00
85	2.59	23.14	-2.11	175.14	-2.11	100.00
90	2.79	18.20	0.50	183.74	0.50	100.00
95	2.89	13.33	3.88	198.19	3.88	100.00
100	2.70	8.74	8.46	222.04	8.46	100.00
105	2.37	5.12	14.26	264.87	14.26	107.02
110	2.24	4.95	14.64	399.19	14.64	165.90
115	2.24	7.95	9.49	238.34	9.49	100.00
120	2.57	10.72	6.24	213.40	6.24	100.00
125	2.69	13.56	3.69	201.47	3.69	100.00
130	1.85	17.07	1.20	205.77	1.20	100.00
135	1.09	20.38	-0.73	217.46	-0.73	100.00
140	0.44	23.46	-2.26	244.91	-2.26	117.19
145	0.28	25.93	-3.35	254.55	-3.35	126.21
150	0.00	28.31	-4.30	258.30	-4.30	130.29
155	0.00	30.17	-4.99	254.84	-4.99	128.49
160	0.00	31.76	-5.55	252.11	-5.55	127.06
165	0.00	33.03	-5.97	250.04	-5.97	125.97
170	0.00	33.96	-6.27	248.59	-6.27	125.19
175	0.00	34.52	-6.45	247.73	-6.45	124.74
180	0.00	34.71	-6.51	247.44	-6.51	124.58
185	0.00	34.52	-6.45	247.73	-6.45	124.73

COMSEARCH

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Coordination Values

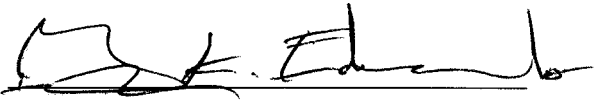
BREWSTER, WA

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Antenna Centerline (AGL)	3.66 m / 12.0 ft		
Antenna Model	Vertex 6.1 Meter		
Antenna Mode	Receive 11.0 GHz		Transmit 14.0 GHz
Interference Objectives: Long Term	-156.0 dBW/MHz	20%	-151.0 dBW/4 kHz 20%
Short Term	-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz 0.0025%
Max Available RF Power			-14.0 (dBW/4 kHz)

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 11.0 GHz		Transmit 14.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	33.96	-6.27	248.59	-6.27	125.19
195	0.00	33.03	-5.97	250.04	-5.97	125.96
200	0.00	31.76	-5.55	252.11	-5.55	127.06
205	0.00	30.18	-4.99	254.84	-4.99	128.49
210	0.00	28.31	-4.30	258.30	-4.30	130.29
215	0.00	26.18	-3.45	262.59	-3.45	131.27
220	0.00	23.84	-2.43	267.86	-2.43	134.06
225	0.00	21.29	-1.20	274.35	-1.20	137.59
230	0.00	18.59	0.27	282.38	0.27	142.07
235	0.00	15.73	2.08	292.55	2.08	147.92
240	0.00	12.76	4.35	303.12	4.35	155.82
245	0.25	9.51	7.55	318.78	7.55	164.07
250	0.43	6.75	11.26	442.06	11.26	196.13
255	1.84	5.95	12.64	268.75	12.64	112.47
260	1.67	9.64	7.40	241.66	7.40	100.28
265	2.38	13.85	3.46	204.29	3.46	100.00
270	2.98	18.51	0.31	178.42	0.31	100.00
275	3.29	23.37	-2.22	154.40	-2.22	100.00
280	3.42	28.30	-4.29	141.12	-4.29	100.00
285	3.32	33.27	-6.05	135.43	-6.05	100.00
290	3.00	38.27	-7.57	135.26	-7.57	100.00
295	1.88	43.34	-8.92	155.26	-8.92	100.00
300	1.69	48.31	-10.00	155.93	-10.00	100.00
305	2.07	53.26	-10.00	145.02	-10.00	100.00
310	1.77	58.25	-10.00	153.35	-10.00	100.00
315	1.88	63.21	-10.00	150.09	-10.00	100.00
320	2.21	68.18	-10.00	141.73	-10.00	100.00
325	1.87	73.17	-10.00	150.54	-10.00	100.00
330	2.24	78.14	-10.00	141.06	-10.00	100.00
335	1.65	83.13	-10.00	157.17	-10.00	100.00
340	1.13	88.11	-10.00	177.49	-10.00	100.00
345	0.62	93.08	-10.00	200.94	-10.00	100.00
350	0.00	98.04	-10.00	231.37	-10.00	115.80
355	0.00	103.00	-10.00	231.37	-10.00	115.80

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: May 9, 2011