

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
Denali 20020, LLC
BREWSTER, WA
Satellite Earth Station

Prepared By:
COMSEARCH
21515 Ridgetop Circle, Suite 300
Sterling, VA 20166
October 26, 2022

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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. Resolution data was reviewed and accepted by each of these companies for those cases reported and there are no unresolved interference objections.

Company

Washington State of Dept of Transportation
Cellco Partnership - Washington

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 09/21/2022.

Company

AT&T Mobility Spectrum LLC - Washington
Accel Net, Inc.
BNSF Railway Company
Bearclaw, LLC
Bookbinder, LLC
Brigadier, LLC
Cascade Natural Gas Corporation
Cellco Partnership - Idaho
Cellco Partnership - Washington
CenturyTel of Washington, Inc.
Chelan County PUD #1
City of Tacoma / Tacoma Public Utilities
Computer 5, Inc.
Confluence Health
Eastside Public Safety Com Agency
EcliptixNet Broadband, Inc.
Inland Cellular LLC
King County DOT Metro Transit Division
King, County of
Kittcom
Kootenai, County of
Multi Agency Communications Center
NCI Data.com, LLC
New Cingular Wireless PCS - ID, WY
New Cingular Wireless PCS LLC-Washington
New Cingular Wireless PCS, LLC (NY)
Northwest Pipeline GP
Olympic Wireless, LLC
Pick Two LLC
Pierce County
Puget Sound Energy, Inc
Qwest Corporation
Seattle City Light
Seattle SMSA Limited Partnership
Seattle, City of
Snohomish County 911
Spokane Regional Emergency Communication
Startouch, Inc.
Symplified Technologies, LLC
The Boeing Company

USCOC of Richland, Inc.
Union Pacific Railroad Company
Washington State of Dept of Transportat
Washington, State of
Western Sub-RSA LTD Partnership
Yakima MSA Limited Partnership
Ziply Fiber Northwest, LLC
iHM Licenses, 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: 10/26/2022
Job Number: 220921COMSGE03

Administrative Information

Status: ENGINEER PROPOSAL
Call Sign: E100078
Licensee Code: DENALI
Licensee Name: Denali 20020, LLC

Site Information BREWSTER, WA

Venue Name
Latitude (NAD 83): 48° 8' 50.0" N
Longitude (NAD 83): 119° 41' 32.2" W
Climate Zone: A
Rain Zone: 5
Ground Elevation (AMSL): 379.78 m / 1246.0 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): 6.4 m / 21.0 ft

Antenna Information

Manufacturer: Vertex-RSI
Model: 16.4 meter
Gain / Diameter: 55.5 dBi / 16.4 m
3-dB / 15-dB Beamwidth: 0.40° / 0.90°

Receive - FCC32

Vertex-RSI
16.4 meter
55.5 dBi / 16.4 m
0.40° / 0.90°

Transmit - FCC32

Vertex-RSI
16.4 meter
58.9 dBi / 16.4 m
0.20° / 0.50°

Max Available RF Power (dBW/4 kHz)
(dBW/MHz)

-9.2
14.8

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

49.7
73.7

Interference Objectives: Long Term -156.0 dBW/MHz 20%
Short Term -146.0 dBW/MHz 0.01%

-154.0 dBW/4 kHz 20%
-131.0 dBW/4 kHz 0.0025%

Frequency Information

Emission / Frequency Range (MHz): 2M20G1D - 36M0G7W / 4000.0 - 4200.0

Receive 4.0 GHz

2M20G1D - 36M0G7W / 4000.0 - 4200.0

Transmit 6.1 GHz

2M20G1D - 36M0G7W / 5925.0 - 6425.0

Max Great Circle Coordination Distance: 555.9 km / 345.4 mi
Precipitation Scatter Contour Radius: 448.7 km / 278.8 mi

267.9 km / 166.4 mi
100.0 km / 62.1 mi

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Coordination Values

BREWSTER, WA

Licensee Name Denali 20020, LLC
Latitude (NAD 83) 48° 8' 50.0" N
Longitude (NAD 83) 119° 41' 32.2" W
Ground Elevation (AMSL) 379.78 m / 1246.0 ft
Antenna Centerline (AGL) 6.4 m / 21.0 ft
Antenna Model Vertex-RSI 16.4 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 -9.2 (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	1.09	107.71	-10.00	217.65	-10.00	100.00
5	0.93	102.73	-10.00	224.29	-10.00	102.18
10	0.68	97.75	-10.00	238.15	-10.00	113.05
15	1.11	92.78	-10.00	216.85	-10.00	100.00
20	1.89	87.80	-10.00	197.44	-10.00	100.00
25	0.51	82.84	-10.00	249.16	-10.00	121.21
30	0.46	77.87	-10.00	254.19	-10.00	124.74
35	0.71	72.89	-10.00	236.92	-10.00	112.11
40	1.21	67.90	-10.00	213.74	-10.00	100.00
45	1.37	62.92	-10.00	209.30	-10.00	100.00
50	1.51	57.94	-10.00	205.29	-10.00	100.00
55	1.82	52.95	-10.00	199.28	-10.00	100.00
60	1.75	47.99	-10.00	201.41	-10.00	100.00
65	2.06	42.99	-8.84	198.66	-8.84	100.00
70	2.10	38.03	-7.50	203.94	-7.50	100.00
75	2.37	33.04	-5.98	205.16	-5.98	100.00
80	2.57	28.07	-4.21	207.10	-4.21	100.00
85	2.57	23.14	-2.11	218.06	-2.11	100.00
90	2.67	18.22	0.48	230.80	0.48	100.00
95	2.85	13.34	3.87	248.71	3.87	100.00
100	2.72	8.73	8.47	288.35	8.47	119.10
105	2.35	5.14	14.22	350.42	14.22	147.28
110	2.22	4.96	14.61	514.12	14.61	236.69
115	2.19	7.99	9.43	313.43	9.43	132.86
120	2.48	10.80	6.16	276.55	6.16	115.07
125	2.63	13.61	3.65	253.09	3.65	102.89
130	1.68	17.21	1.11	264.17	1.11	114.42
135	0.93	20.51	-0.80	280.81	-0.80	128.94
140	0.40	23.49	-2.27	312.71	-2.27	152.20
145	0.27	25.94	-3.35	322.02	-3.35	161.74
150	0.00	28.30	-4.30	324.71	-4.30	165.93
155	0.00	30.17	-4.99	319.75	-4.99	163.25
160	0.00	31.76	-5.55	315.81	-5.55	161.15
165	0.00	33.03	-5.97	312.82	-5.97	159.57
170	0.00	33.96	-6.27	310.10	-6.27	158.46
175	0.00	34.52	-6.45	308.85	-6.45	157.80
180	0.00	34.71	-6.51	308.43	-6.51	157.59
185	0.00	34.52	-6.45	308.85	-6.45	157.80

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Short Term -146.0 dBW/MHz 0.01% -131.0 dBW/4 kHz 0.0025%
Max Available RF Power -9.2 (dBW/4 kHz)

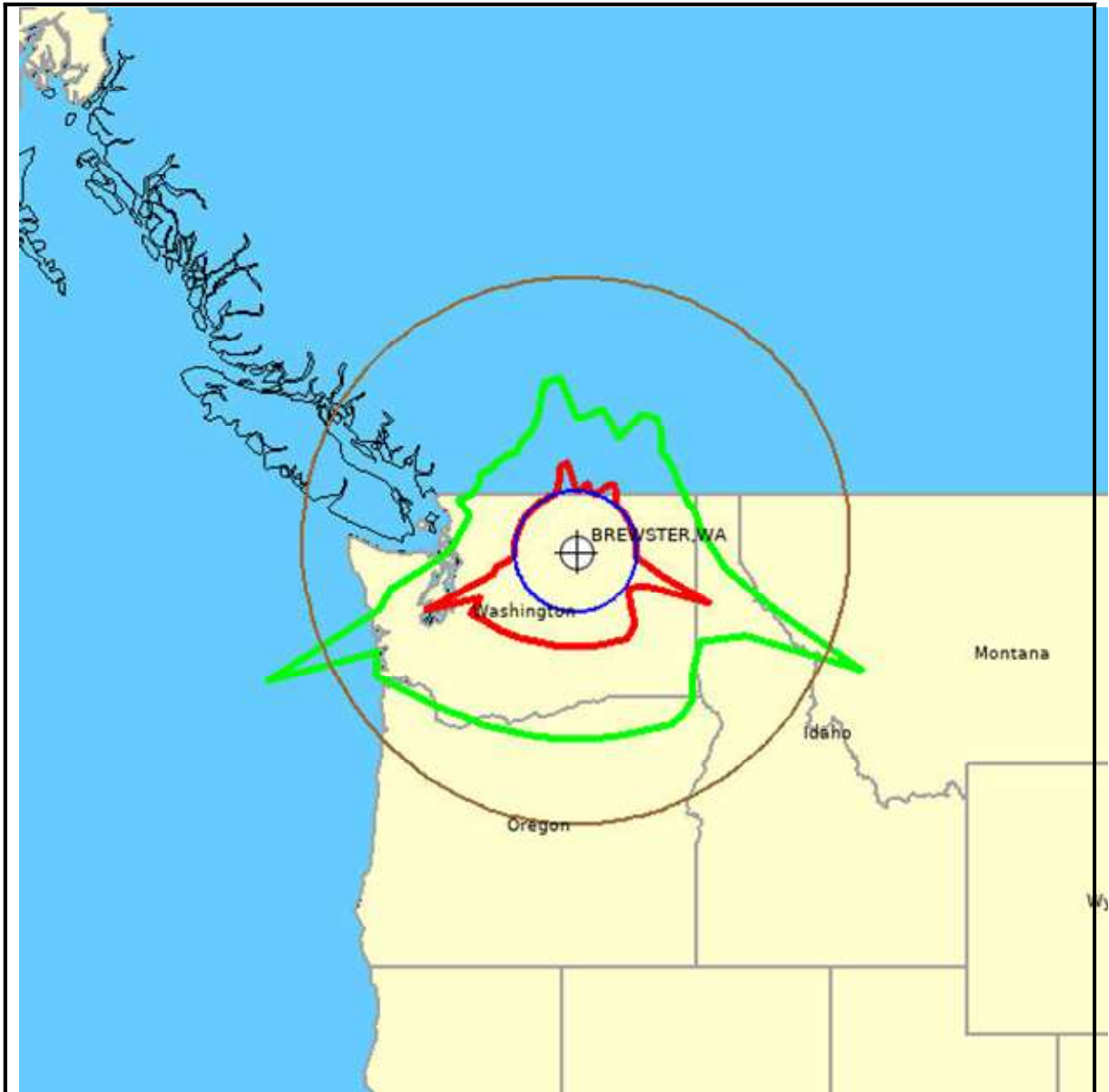
Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 4.0 GHz		Transmit 6.1 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	33.96	-6.27	310.09	-6.27	158.46
195	0.00	33.03	-5.97	312.82	-5.97	159.56
200	0.00	31.76	-5.55	315.81	-5.55	161.15
205	0.00	30.18	-4.99	319.74	-4.99	163.25
210	0.00	28.30	-4.30	324.71	-4.30	165.93
215	0.00	26.18	-3.45	330.84	-3.45	170.85
220	0.00	23.84	-2.43	338.31	-2.43	174.81
225	0.00	21.29	-1.20	347.46	-1.20	179.57
230	0.00	18.59	0.27	358.68	0.27	185.26
235	0.00	15.73	2.08	372.78	2.08	192.22
240	0.00	12.76	4.35	390.35	4.35	200.90
245	0.67	9.19	7.92	369.79	7.92	176.79
250	0.72	6.48	11.71	555.90	11.71	267.86
255	2.49	5.41	13.68	341.03	13.68	142.03
260	1.80	9.57	7.47	309.51	7.47	133.92
265	2.63	13.77	3.52	252.32	3.52	102.54
270	3.35	18.44	0.36	214.09	0.36	100.00
275	3.59	23.33	-2.20	198.41	-2.20	100.00
280	3.40	28.30	-4.30	191.70	-4.30	100.00
285	3.22	33.29	-6.06	186.58	-6.06	100.00
290	2.95	38.28	-7.57	184.93	-7.57	100.00
295	1.55	43.37	-8.93	209.10	-8.93	100.00
300	1.97	48.29	-10.00	195.32	-10.00	100.00
305	2.07	53.26	-10.00	192.83	-10.00	100.00
310	1.76	58.25	-10.00	200.88	-10.00	100.00
315	2.06	63.21	-10.00	193.05	-10.00	100.00
320	2.07	68.19	-10.00	193.01	-10.00	100.00
325	2.02	73.17	-10.00	194.09	-10.00	100.00
330	2.34	78.14	-10.00	186.79	-10.00	100.00
335	1.83	83.13	-10.00	199.05	-10.00	100.00
340	1.36	88.11	-10.00	209.62	-10.00	100.00
345	0.77	93.08	-10.00	232.85	-10.00	108.98
350	0.24	98.05	-10.00	280.00	-10.00	141.70
355	0.00	103.01	-10.00	285.28	-10.00	145.65

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Denali 20020, LLC



Legend:

Scale: 1:11,000,000

Great Circle: 6.1 GHz

4.0 GHz

Precipitation Scatter: 6.1 GHz

4.0 GHz

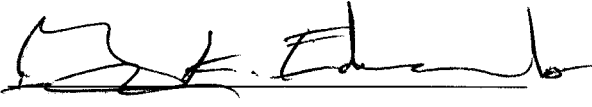
Earth Station Site: 



COMSEARCH®
21515 Ridgetop Circle, Suite 300
Sterling, VA 20166

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
21515 Ridgetop Circle, Suite 300
Sterling, VA 20166

DATED: October 26, 2022