

# FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

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

Prepared By:  
COMSEARCH  
19700 Janelia Farm Boulevard  
Ashburn, VA 20147  
June 13, 2019

## TABLE OF CONTENTS

1. CONCLUSIONS .....	3
2. SUMMARY OF RESULTS .....	4
3. SUPPLEMENTAL SHOWING .....	5
4. EARTH STATION COORDINATION DATA.....	6
5. CERTIFICATION.....	10

## 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 05/08/2019.

Company

Apple Valley Broadcasting Inc. (KVEW-TV)  
Cascade Public Media  
Christian Broadcasting of Yakima  
Falcon Video Communications, L.P.  
Friends of KSPS  
KHQ, Incorporated  
KIRO-TV, Inc  
KSKN Television, Inc.  
King Broadcasting Company  
King Broadcasting Company - KREM TV  
King, County of  
Kootenai Cablevision  
Mountain Broadcasting L.L.C.  
Mountain Licenses, L.P.  
Puget Sound Educational TV, Inc.  
SBE Coordinator  
Sinclair Seattle Licensee, LLC  
Sinclair Yakima Licensee, LLC ( WA)  
Spokane Television Inc.  
State Board of Education State of Idaho  
Tribune Broadcasting Seattle, LLC  
Washington State University

## **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: 05/08/2019  
Job Number: 190508COMSGE02

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### Administrative Information

Status ENGINEER PROPOSAL  
Call Sign E120043  
Licensee Code DENALI  
Licensee Name Denali 20020, LLC

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### 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

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### Link Information

Satellite Type Geostationary  
Mode TR - Transmit-Receive  
Modulation Digital  
Satellite Arc 53° W to 188° West Longitude  
Azimuth Range 107.8° to 253.5°  
Corresponding Elevation Angles 6.7° / 5.6°  
Antenna Centerline (AGL) 5.49 m / 18.0 ft

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### Antenna Information

		Receive - FCC32		Transmit - FCC32
Manufacturer		Vertex		Vertex
Model		9 KPK		9 KPK
Gain / Diameter		59.2 dBi / 9.0 m		60.4 dBi / 9.0 m
3-dB / 15-dB Beamwidth		0.20° / 0.38°		0.16° / 0.32°
Max Available RF Power	(dBW/4 kHz) (dBW/MHz)			-14.0 10.0
Maximum EIRP	(dBW/4 kHz) (dBW/MHz)			46.4 70.4
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%

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### Frequency Information

	Receive 12.0 GHz	Transmit 14.0 GHz
Emission / Frequency Range (MHz)	1M00G7D - 72M0G7W / 12250.0 - 12750.0	1M00G7D - 72M0G7W / 14000.0 - 14500.0
Max Great Circle Coordination Distance	606.4 km / 376.8 mi	273.4 km / 169.9 mi
Precipitation Scatter Contour Radius	410.9 km / 255.3 mi	100.0 km / 62.1 mi

# COMSEARCH

## Earth Station Data Sheet

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<b>Coordination Values</b>	<b>BREWSTER, WA</b>		
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)	5.49 m / 18.0 ft		
Antenna Model	Vertex 9 meter		
Antenna Mode	Receive 12.0 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 (°)	Receive 12.0 GHz		Transmit 14.0 GHz		Coordination Distance (km)
	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)	
0	0.83	106.45	-10.00	186.23	100.00
5	0.93	102.73	-10.00	180.79	100.00
10	0.69	97.75	-10.00	193.34	100.00
15	1.31	92.78	-10.00	166.83	100.00
20	1.66	87.80	-10.00	153.23	100.00
25	0.58	82.84	-10.00	198.96	100.00
30	0.55	77.87	-10.00	200.58	100.00
35	0.74	72.89	-10.00	190.80	100.00
40	1.23	67.90	-10.00	169.69	100.00
45	1.62	62.91	-10.00	154.36	100.00
50	1.44	57.94	-10.00	159.95	100.00
55	1.86	52.95	-10.00	147.31	100.00
60	1.73	47.99	-10.00	150.96	100.00
65	2.19	42.98	-8.83	143.99	100.00
70	2.20	38.02	-7.50	149.75	100.00
75	2.42	33.04	-5.98	151.85	100.00
80	2.63	28.06	-4.20	155.56	100.00
85	2.57	23.14	-2.11	170.77	100.00
90	2.79	18.20	0.50	179.09	100.00
95	2.88	13.34	3.87	193.83	100.00
100	2.68	8.75	8.45	217.43	100.00
105	2.36	5.14	14.24	260.08	107.21
110	2.22	4.97	14.60	415.26	176.92
115	2.23	7.96	9.48	233.36	100.00
120	2.58	10.72	6.24	208.56	100.00
125	2.68	13.58	3.68	197.10	100.00
130	1.85	17.06	1.20	203.57	100.00
135	1.04	20.42	-0.75	214.13	100.00
140	0.42	23.47	-2.26	241.83	118.38
145	0.27	25.94	-3.35	251.96	127.23
150	0.00	28.31	-4.30	254.46	130.29
155	0.00	30.17	-4.99	251.01	128.49
160	0.00	31.76	-5.55	248.28	127.06
165	0.00	33.03	-5.97	246.22	125.97
170	0.00	33.96	-6.27	244.76	125.19
175	0.00	34.52	-6.45	243.90	124.74
180	0.00	34.71	-6.51	243.11	124.58
185	0.00	34.52	-6.45	243.90	124.73



# COMSEARCH

## Earth Station Data Sheet

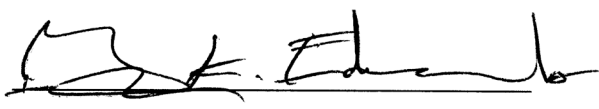
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Interference Objectives: Long Term	-156.0 dBW/MHz	20%	-151.0 dBW/4 kHz 20%
Short Term	-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz 0.0025%
Max Available RF Power		-14.0 (dBW/4 kHz)	

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 12.0 GHz		Transmit 14.0 GHz		Coordination Distance (km)
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)		
190	0.00	33.96	-6.27	244.76	-6.27	125.19	
195	0.00	33.03	-5.97	246.21	-5.97	125.96	
200	0.00	31.76	-5.55	248.29	-5.55	127.06	
205	0.00	30.18	-4.99	251.01	-4.99	128.49	
210	0.00	28.31	-4.30	254.46	-4.30	130.29	
215	0.00	26.18	-3.45	258.72	-3.45	131.27	
220	0.00	23.84	-2.43	263.93	-2.43	134.06	
225	0.00	21.29	-1.20	270.33	-1.20	137.59	
230	0.00	18.59	0.27	278.21	0.27	142.07	
235	0.00	15.73	2.08	288.13	2.08	147.92	
240	0.00	12.76	4.35	298.21	4.35	155.82	
245	0.22	9.53	7.52	316.03	7.52	166.92	
250	0.45	6.24	12.13	461.74	12.13	209.15	
255	1.75	4.15	16.55	606.43	16.55	273.40	
260	1.66	7.61	9.96	252.57	9.96	108.04	
265	2.30	11.97	5.05	208.54	5.05	100.00	
270	2.95	16.71	1.42	180.02	1.42	100.00	
275	3.28	21.63	-1.37	154.92	-1.37	100.00	
280	3.45	26.59	-3.62	140.26	-3.62	100.00	
285	3.30	31.58	-5.49	135.02	-5.49	100.00	
290	3.07	36.58	-7.08	133.07	-7.08	100.00	
295	1.87	41.64	-8.49	153.84	-8.49	100.00	
300	1.58	46.64	-9.72	156.94	-9.72	100.00	
305	2.06	51.59	-10.00	141.81	-10.00	100.00	
310	1.81	56.59	-10.00	148.75	-10.00	100.00	
315	1.83	61.57	-10.00	148.08	-10.00	100.00	
320	2.08	66.55	-10.00	141.42	-10.00	100.00	
325	1.85	71.55	-10.00	147.58	-10.00	100.00	
330	2.25	76.53	-10.00	137.84	-10.00	100.00	
335	1.60	81.53	-10.00	154.98	-10.00	100.00	
340	1.14	86.52	-10.00	172.54	-10.00	100.00	
345	0.62	91.50	-10.00	196.79	-10.00	100.00	
350	0.00	96.47	-10.00	227.19	-10.00	115.80	
355	0.00	101.45	-10.00	227.19	-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: June 13, 2019