



UNITED STATES OF AMERICA
FEDERAL COMMUNICATIONS COMMISSION
RADIO STATION AUTHORIZATION

Denali 20020, LLC

Call Sign: E990065

Authorization Type: Modification of License

File Number: SES-MOD-20181221-03581

Non Common Carrier

Grant date:

Expiration Date: 06/24/2024

Nature of Service: Earth Exploration Satellite Service

Class of Station: Fixed Earth Stations

A) Site Location(s)

#	Site ID	Address	Latitude	Longitude	Elevation (Meters)	Special Provisions NAD (Refer to Section H)
1)	1	P.O. BOX 430, 66C USEI DRIVE (BREW-1) BREWSTER, OKANOGAN, WA 98812	48°8'45.6"N	119°42'0.4"W	382.8	27
Licensee certifies antenna(s) comply with gain patterns specified in Section 25.209						
2)	Antenna 1 (S/X-BAND)	P.O. BOX 430, 66C USEI DRIVE (BREW-1) BREWSTER, OKANOGAN, WA 98812	48°8'45.1"N	119°42'4.6"W	382.8	83
Licensee certifies antenna(s) comply with gain patterns specified in Section 25.209						
3)	Antenna 2 (UHF)	P.O. BOX 430, 66C USEI DRIVE (UHF-YAGI) BREWSTER, OKANOGAN, WA 98812	48°8'45.1"N	119°42'4.6"W	382.8	83
Licensee certifies antenna(s) comply with gain patterns specified in Section 25.209						

Subject to the provisions of the Communications Act of 1934, The Communications Satellite Act of 1962, subsequent acts and treaties, and all present and future regulations made by this Commission, and further subject to the conditions and requirements set forth in this license, the grantee is authorized to construct, use and operate the radio facilities described below for radio communications for the term beginning June 24, 2009 (3 AM Eastern Standard Time) and ending June 24, 2024 (3 AM Eastern Standard Time) . The required date of completion of construction and commencement of operation is 00/00/0000. Grantee must file with the Commission a certification upon completion of construction and commencement of operation.

B) Particulars of Operations

The General Provision 1010 applies to all receiving frequency bands.

The General Provision 1900 applies to all transmitting frequency bands.

For the text of these provisions, refer to Section H.

#	Frequency (MHz)	Polarization Code	Emission	Tx/Rx Mode	Max EIRP /Carrier (dBW)	Max EIRP Density /Carrier (dBW/4kHz)	Associated Antenna	Special Provisions (Refer to Section H)	Modulation/ Services
1)	8166.5850-8233.4150	H, V, L, R	66M8G1D	Rx			BREW-1		DIGITAL: PAYLOAD (DATA), TT&C. QPSK AND 8-PSK



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2)	8099.5850-8166.4150	H, V, L, R	66M8G1D	Rx			BREW-1		DIGITAL: PAYLOAD (DATA), TT&C. QPSK AND 8-PSK
3)	7071.9000-7073.9000	L, R	250KG2D	Rx			BREW-1		TT&C
4)	7071.9000-7073.9000	L, R	250KG9D	Rx			BREW-1		TT&C
5)	7071.2000-7071.2000	R	NON	Rx			BREW-1		AFC
6)	7068.3000-7068.5000	L, R	75K0G1D	Rx			BREW-1		SRMS TELEMETRY
7)	7068.3000-7068.5000	L, R	75K0G1W	Rx			BREW-1		SRMS TELEMETRY
8)	7068.3000-7068.5000	L, R	75K0G7D	Rx			BREW-1		SRMS TELEMETRY
9)	7068.3000-7068.5000	L, R	75K0G7W	Rx			BREW-1		SRMS TELEMETRY
10)	7017.3000-7017.5000	L, R	75K0G1D	Rx			BREW-1		SRMS TELEMETRY
11)	7017.3000-7017.5000	L, R	75K0G1W	Rx			BREW-1		SRMS TELEMETRY
12)	7017.3000-7017.5000	L, R	75K0G7D	Rx			BREW-1		SRMS TELEMETRY
13)	7017.3000-7017.5000	L, R	75K0G7W	Rx			BREW-1		SRMS TELEMETRY
14)	7015.1000-7015.1000	L	NON	Rx			BREW-1		AFC
15)	7011.0000-7013.0000	L, R	250KG2D	Rx			BREW-1		TT&C
16)	7011.0000-7013.0000	L, R	250KG9D	Rx			BREW-1		TT&C
17)	5242.5000-5244.5000	L, R	1M00F2D	Tx	81.00	70.20	BREW-1		TT&C-EMERGENCY ONLY
18)	5242.5000-5244.5000	L, R	1M00F9D	Tx	81.00	70.20	BREW-1		TT&C-EMERGENCY ONLY
19)	5242.5000-5244.5000	L, R	1M00F2D	Tx	66.00	55.20	BREW-1		TT&C-NORMAL OPERATION
20)	5242.5000-5244.5000	L, R	1M00F9D	Tx	66.00	55.20	BREW-1		TT&C-NORMAL OPERATION
21)	5241.2000-5241.2000	R	NON	Tx	42.00	42.00	BREW-1		AFC
22)	5237.3000-5238.2000	L, R	100KG1D	Tx	58.30	44.30	BREW-1		HPN COMMAND-DIGITAL
23)	5237.3000-5238.2000	L, R	100KG1W	Tx	58.30	44.30	BREW-1		HPN COMMAND-DIGITAL
24)	5237.3000-5238.2000	L, R	100KG7D	Tx	58.30	44.30	BREW-1		HPN COMMAND-DIGITAL



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The General Provision 1010 applies to all receiving frequency bands.

The General Provision 1900 applies to all transmitting frequency bands.

For the text of these provisions, refer to Section H.

#	Frequency (MHz)	Polarization Code	Emission	Tx/Rx Mode	Max EIRP /Carrier (dBW)	Max EIRP Density /Carrier (dBW/4kHz)	Associated Antenna	Special Provisions (Refer to Section H)	Modulation/ Services
25)	5237.3000-5238.2000	L,R	100KG7W	Tx	58.30	44.30	BREW-1		HPN COMMAND-DIGITAL
26)	5236.9000-5237.3000	L,R	100KG1D	Tx	58.30	44.30	BREW-1		SRMS COMMAND-DIGITAL
27)	5236.9000-5237.3000	L,R	100KG1W	Tx	58.30	44.30	BREW-1		SRMS COMMAND-DIGITAL
28)	5236.9000-5237.3000	L,R	100KG7D	Tx	58.30	44.30	BREW-1		SRMS COMMAND-DIGITAL
29)	5236.9000-5237.3000	L,R	100KG7W	Tx	58.30	44.30	BREW-1		SRMS COMMAND-DIGITAL
30)	5186.7000-5187.1000	L,R	100KG1D	Tx	58.30	44.30	BREW-1		SRMS COMMAND-DIGITAL
31)	5186.7000-5187.1000	L,R	100KG1W	Tx	58.30	44.30	BREW-1		SRMS COMMAND-DIGITAL
32)	5186.7000-5187.1000	L,R	100KG7D	Tx	58.30	44.30	BREW-1		SRMS COMMAND-DIGITAL
33)	5186.7000-5187.1000	L,R	100KG7W	Tx	58.30	44.30	BREW-1		SRMS COMMAND-DIGITAL
34)	5185.8000-5186.7000	L,R	100KG1D	Tx	58.30	44.30	BREW-1		HPN COMMAND-DIGITAL
35)	5185.8000-5186.7000	L,R	100KG1W	Tx	58.30	44.30	BREW-1		HPN COMMAND-DIGITAL
36)	5185.8000-5186.7000	L,R	100KG7D	Tx	58.30	44.30	BREW-1		HPN COMMAND-DIGITAL
37)	5185.8000-5186.7000	L,R	100KG7W	Tx	58.30	44.30	BREW-1		HPN COMMAND-DIGITAL
38)	5185.1000-5185.1000	L	NON	Tx	42.00	42.00	BREW-1		AFC
39)	5179.5000-5181.5000	L,R	1M00F2D	Tx	81.00	70.20	BREW-1		TT&C-EMERGENCY ONLY
40)	5179.5000-5181.5000	L,R	1M00F9D	Tx	81.00	70.20	BREW-1		TT&C-EMERGENCY ONLY
41)	5179.5000-5181.5000	L,R	1M00F2D	Tx	66.00	55.20	BREW-1		TT&C-NORMAL OPERATION
42)	5179.5000-5181.5000	L,R	1M00F9D	Tx	66.00	55.20	BREW-1		TT&C-NORMAL OPERATION
43)	2055.3450-2056.6550	H,V,L,R	1M31F1D	Tx	49.01	23.90	BREW-1		DIGITAL DATA CARRIER: TT&C. MSK
44)	449.9700-450.0300	L,R	60K0F1D	Tx	36.50	24.74	UHF-YAGI		DIGITAL: TT&C. GFSK
45)	449.9700-450.0300	L,R	60K0F1D	Tx	36.50	24.74	UHF-YAGI		DIGITAL: TT&C. GFSK
46)	401.2700-401.3300	L,R	60K0F1D	Rx			UHF-YAGI		DIGITAL: TT&C. GFSK



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C) Frequency Coordination Limits

#	Frequency Limits (MHz)	Satellite Arc (Deg. Long.)		Elevation (Degrees)		Azimuth (Degrees)		Max EIRP Density toward Horizon (dBW/4kHz)	Associated Antenna(s)
		East Limit	West Limit	East Limit	West Limit	East Limit	West Limit		
1)	5179.5000-5181.5000	NGSO		05.0-05.0		000.0-360.0		21.4	BREW-1
2)	5242.5000-5244.5000	NGSO		05.0-05.0		000.0-360.0		21.4	BREW-1
3)	7011.0000-7013.0000	NGSO		05.0-05.0		000.0-360.0			BREW-1
4)	7071.9000-7073.9000	NGSO		05.0-05.0		000.0-360.0			BREW-1
5)	5185.1000	NGSO		05.0-05.0		000.0-360.0		11.3	BREW-1
6)	5241.2000	NGSO		05.0-05.0		000.0-360.0			BREW-1
7)	5185.8000-5186.7000	NGSO		05.0-05.0		000.0-360.0			BREW-1
8)	5186.7000-5187.1000	NGSO		05.0-05.0		000.0-360.0			BREW-1
9)	5236.9000-5237.3000	NGSO		05.0-05.0		000.0-360.0			BREW-1
10)	5237.3000-5238.2000	NGSO		05.0-05.0		000.0-360.0			BREW-1
11)	7017.3000-7017.5000	NGSO		05.0-05.0		000.0-360.0			BREW-1
12)	7068.3000-7068.5000	NGSO		05.0-05.0		000.0-360.0			BREW-1
13)	7015.1000	NGSO		05.0-05.0		000.0-360.0			BREW-1
14)	7071.2000	NGSO		05.0-05.0		000.0-360.0			BREW-1
15)	2055.3450-2056.6550	NGSO		05.0-05.0		000.0-360.0		-17.6	BREW-1
16)	8166.5850-8233.4150	NGSO		05.0-05.0		-360.0			BREW-1
17)	8099.5850-8166.4150	NGSO		05.0-05.0		-360.0			BREW-1
18)	449.9700-450.0300	NGSO		05.0-05.0		000.0-360.0		13.72	UHF-YAGI
19)	401.2700-401.3300	NGSO		05.0-05.0		-360.0			UHF-YAGI
20)	449.9700-450.0300	NGSO		05.0-05.0		000.0-000.0		19.72	UHF-YAGI

D) Points of Communications

The following stations located in the Satellite orbits consistent with Sections B and C of this Entry:

- 1) 1 to ICO MEO constellation of the United Kingdom satellite system. (Non-U.S.-licensed)
- 2) Antenna 2 (UHF) to Planet Labs (S2912) (SKYSAT 16-21) NGSO EESS (U.S.-licensed) [between 400 and 630 km circular at 97.0 to 97.9 degrees inclined orbit]
- 3) Antenna 1 (S/X-BAND) to Planet Labs (S2912) (SKYSAT 16-21) NGSO EESS (U.S.-licensed) [between 400 and 630 km circular at 97.0 to 97.9 degrees inclined orbit]



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E) Antenna Facilities

Site ID	Antenna ID	Units	Diameter (meters)	Manufacturer	Model number	Site Elevation (Meters)	Max Antenna Height (Meters)	Special Provisions (Refer to Section H)
Antenna 1 (S/X-BAND)	BREW-1	1	7.6	NEC	G2573C	382.8	11.9 AGL/ 394.7 AMSL	
Max Gains(s):								
Maximum total input power at antenna flange (Watts) =					1,175.00			
Maximum aggregate output EIRP for all carriers (dBW) =					81.00			
1	BREW-1	1	7.6	NEC	G2573C	382.8	11.9 AGL/ 394.7 AMSL	
Max Gains(s):								
8.1000 GHz 50.3 dBi @ 5.2000 GHz 52.7 dBi @ 7.0250 GHz 53.4 dBi @								
41.5 dBi @ 2.0560 GHz								
Maximum total input power at antenna flange (Watts) =					1,175.00			
Maximum aggregate output EIRP for all carriers (dBW) =					81.00			
Antenna 2 (UHF)	UHF-YAGI	1	2.7	M2 INC	450CP34/400	382.8	386.6 AGL/ 0 AMSL	
Max Gains(s):								
16.5 dBi @ 0.4010 GHz 16.5 dBi @ 0.4500 GHz								
Maximum total input power at antenna flange (Watts) =					100.00			
Maximum aggregate output EIRP for all carriers (dBW) =					36.50			

G) Antenna Structure marking and lighting requirements:

None unless otherwise specified under Special and General Provisions

H) Special and General Provisions

A) This RADIO STATION AUTHORIZATION is granted subject to the following special provisions and general conditions:

- 4 --- Licensee must ensure that a current listing of the name, title, mailing address, email address, and telephone number of the responsible point of contact are on file at the FCC. Any changes must be filed electronically in the International Communications Filing System (ICFS) using the "Pleadings and Comments" link on the ICFS homepage within 10 days of the change.
- 5 --- Licensee must notify the Commission when this earth station is no longer operational or when it has not been used to provide any service during any 6-month operation.
- 6 --- Licensee must comply with the license modification application and notification requirements of 47 CFR §§ 25.117 and 25.118, as applicable, to change the coordinates of its authorized earth station.
- 8 --- Licensee must notify the Commission when all earth stations under this authorization are no longer operational or when they have not been used to provide service during any continuous six-month period.



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H) Special and General Provisions

A) This RADIO STATION AUTHORIZATION is granted subject to the following special provisions and general conditions:

- 90397 --- Telemetry, tracking and command (TT&C) operations identified in part B, Particulars of Operation in this authorization may be transmitted within the assigned bands that are not at a band edge only if the transmissions cause no greater interference and require no greater protection from harmful interference than the communications traffic on the satellite network or have been coordinated with operators of authorized co-frequency space stations at orbital locations within six degrees of the assigned orbital location. Frequencies, polarization, and coding of telemetry, tracking, and command transmissions must be selected to minimize interference into other satellite networks.
- 90398 --- Changes to previously authorized transmitting facilities, operations and devices regulated by the Commission that may have significant environmental impact, and are not excluded by section 1.1306, require the preparation of an Environmental Assessment (EA) by the licensee. (See 47 CFR §§ 1.1307, 1.1308 and 1.1311)
- 90399 --- The licensee shall, at all times, take all necessary measures to ensure that operation of this (these) authorized earth station(s) do(es) not create potential exposure of humans to radiofrequency radiation in excess of the FCC exposure limits defined in 47 CFR §§ 1.1307(b), 1.1310. Measures must be taken to ensure compliance with limits for both occupational/controlled exposure and for general population/uncontrolled exposure, as defined in these rule sections. Compliance can be accomplished in most cases by appropriate restrictions, such as fencing. Requirements for restrictions can be determined by predictions based on calculations, modeling, or by field measurements. The FCC's updated OET Bulletin 65 (available on-line at www.fcc.gov/oet/rfsafety) provides information on predicting exposure levels and on methods for ensuring compliance, including the use of warning and alerting signs and protective equipment for workers.
- 90470 --- The application for this authorization was filed within the 194-day filing window for FSS earth stations operating in the 3700-4200 MHz frequency band as of April 19, 2018, as established by Public Notice DA 18-398 (rel. Apr. 19, 2018) and Public Notice DA-18-639 (rel. Jun. 21, 2018), and Public Notice DA 18-1061 (rel. Oct. 17, 2018).



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B) This RADIO STATION AUTHORIZATION is granted subject to the additional conditions specified below:

This authorization is issued on the grantee's representation that the statements contained in the application are true and that the undertakings described will be carried out in good faith.

This authorization shall not be construed in any manner as a finding by the Commission on the question of marking or lighting of the antenna system should future conditions require. The grantee expressly agrees to install such marking or lighting as the Commission may require under the provisions of Section 303(q) of the Communications Act. 47 U.S.C. § 303(q).

Neither this authorization nor the right granted by this authorization shall be assigned or otherwise transferred to any person, firm, company or corporation without the written consent of the Commission. This authorization is subject to the right of use or control by the government of the United States conferred by Section 706 of the Communications Act. 47 U.S.C. § 706. Operation of this station is governed by Part 25 of the Commission's Rules. 47 C.F.R. Part 25.

This authorization shall not vest in the licensee any right to operate this station nor any right in the use of the designated frequencies beyond the term of this license, nor in any other manner than authorized herein.

This authorization is issued on the grantee's representation that the station is in compliance with environmental requirements set forth in Section 1.1307 of the Commission's Rules. 47 C.F.R. § 1.1307.

This authorization is issued on the grantee's representation that the station is in compliance with the Federal Aviation Administration (FAA) requirements as set forth in Section 17.4 of the Commission's Rules. 47 C.F.R. § 17.4.

The following condition applies when this authorization permits construction of or modifies the construction permit of a radio station.

This authorization shall be automatically forfeited if the station does not meet each required construction deadline by the required date of completion unless, before such date(s), a specific application is timely filed to request an extension of the construction deadline(s), supported with good cause why that failure to construct by the required date was due to factors not under control of the grantee.

Licensees are required to pay annual regulatory fees related to this authorization. The requirement to collect annual regulatory fees from regulatees is contained in Public Law 103-66, "The Omnibus Budget Reconciliation Act of 1993." These regulatory fees, which are likely to change each fiscal year, are used to offset costs associated with the Commission's enforcement, public service, international and policy and rulemaking activities. The Commission issues a Report and Order each year, setting the new regulatory fee rates. Receive only earth stations are exempt from payment of regulatory fees.