

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554**

In the Matter of

Northwood Space Corp.

Modification for Baseline Earth
Station Authorization

Call Sign E260328

File No. SES-MOD-20260901-02466

MODIFICATION APPLICATION

Northwood Space Corp. (“Northwood”) requests modification of its baseline earth station license¹ pursuant to Section 25.117 of the Commission’s rules to add Ka-band frequencies and update other operating parameters.² As modified, the fixed earth station will support space-to-Earth reception in the 17.2–21.4 GHz band and Earth-to-space transmission in the 27.5–31.0 GHz band, in addition to the S- and X-band frequencies already authorized. Northwood certifies that, unless otherwise indicated in this modification application, the information previously provided to the Commission as part of the granted baseline license application has not changed.³

Granting this application will serve the public interest. It will allow Northwood to complete antenna construction, finalize service agreements with spacecraft operators, and, once Northwood designates a point of communication, promptly commence operations under the Commission’s streamlined procedures for baseline earth station licensees.⁴

¹ See *Northwood Space Corp.*, Earth Station Authorization, Call Sign E260328, File No. SES-LIC-20260426-01142 (granted Jul. 28, 2026) (“Northwood Baseline License”).

² See generally 47 C.F.R. § 25.117.

³ See 47 C.F.R. § 25.117(c).

⁴ See 47 C.F.R. § 25.115(a)(5)(i) (permitting earth station applications to “identify either the specific satellite(s) with which it plans to operate, or the eastern and western boundaries of the arc it plans to

I. INTRODUCTION AND BACKGROUND

Northwood operates as a multi-purpose ground-station-as-a-service (“GSaaS”) provider. Rather than dedicating a facility to a single mission or a single radiocommunication service, Northwood makes its ground infrastructure available to multiple spacecraft operators and supports whatever space services a given customer’s mission requires, including the fixed-satellite service (“FSS”), the mobile-satellite service (“MSS”), the broadcasting-satellite service (“BSS”), the Earth exploration-satellite service (“EESS”), the space research service (“SRS”), and space operation (telemetry, tracking, and command (“TT&C”) functions. The service Northwood supports at any given time depends on the spacecraft with which it is then communicating.

Founded in 2022, Northwood is a next-generation space infrastructure company focused on delivering high-performance, distributed satellite ground capacity for government and commercial missions. As the space economy continues to grow at an exponential pace, so too does the need for reliable ground infrastructure to move space-based data quickly and securely back to Earth. Northwood’s novel antenna systems are manufactured at its 180,000-square-foot facility in Torrance, California, are designed to communicate with multiple spacecraft simultaneously, and can be configured into different frequency and power combinations to rapidly scale connectivity and resilience for space.

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coordinate”); *id.* § 25.118(g) (establishing streamlined notification procedure for adding a point of communication to a baseline license); 47 C.F.R. § 25.117(i) (providing for deemed granted status 35 days following public notice of an application to add one or more space station point of communication, subject to certain conditions); *see also Expediting Initial Processing of Satellite and Earth Station Applications*, Second Report and Order, 40 FCC Rcd 6443, 6444 ¶ 3 (2025) (“*Baseline License Order*”). Northwood acknowledges that it is required to designate a point of communication prior to commencing operations. *Baseline License Order* at 6446–48, ¶¶ 7–10.

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Earlier this year, the Commission granted Northwood authority to operate a six-antenna fixed earth station in the 2025–2110 MHz, 2200–2290 MHz, 8025–8400 MHz, and 8450–8500 MHz bands.⁵ With this application, Northwood seeks to modify the aforementioned authorization to add Ka-band frequency support. As described below, Northwood’s earth station will be equipped with up to six additional parabolic dish antennas to communicate with geostationary orbit (“GSO”) and non-geostationary orbit (“NGSO”) satellites using Ka-band spectrum in addition to the previously authorized S- and X-band frequencies.

II. PUBLIC INTEREST BENEFITS

Northwood is developing an innovative, software-defined, global ground station network to support the exponential growth of the new space economy. Northwood’s ground stations will provide communications for third-party satellite systems across several different types of allocations, including the associated TT&C functions, and will help ensure reliable, low-latency connectivity for those systems. Northwood’s GSaaS will, in turn, promote the Commission’s goals of furthering space safety and sustainability by supporting the communications and command functions needed for satellite operations and maneuverability in orbit. And the uniquely lightweight footprint of Northwood’s ground stations mitigates the cost, risks, and delays associated with typical earth station construction processes, thus allowing for efficient deployments that can quickly expand access to Earth-to-space communications for emergencies and disaster relief. Expedient grant of this application will allow Northwood to extend its GSaaS offerings to support Ka-band transmissions and deploy critical ground station infrastructure quickly and cost effectively.

⁵ Northwood Baseline License.

III. ANTENNA LOCATION AND CHARACTERISTICS

The earth station site is fixed and located at or near Talkeetna in Matanuska-Susitna Borough, Alaska at 62° 20' 00.7" North, 150° 02' 15.8" West (NAD83), with an altitude of 146 meters above mean sea level. Each antenna will use two-line element tracking via servo motor with 0.05-degree accuracy and will be enclosed by a radome. Table 1, below, summarizes the antenna characteristics of the earth station.

Table 1. Antenna Characteristics

Model Number	NW24-Ka
Diameter	2.4 meters
Maximum effective isotropic radiated power ("EIRP")	85.2 dBW
Gain	55.2 dBi
Beamwidth (half-power)	0.30 degrees
Minimum Elevation Angle	5 degrees

Northwood's earth station will operate well within the technical parameters of the Commission's Part 25 rules. The antennas' high gain, narrow beamwidth, and high pointing accuracy ensure adequate gain-to-noise performance for Earth-to-space communications.⁶ Northwood can maintain the required carrier-to-noise levels across the full elevation range. The station's operating parameters are fully compatible with the rules applicable to the requested frequency bands and will not exceed the power, spectrum, or out-of-band emission ("OOBE") limits that apply to these frequencies under Part 25 of the Commission's rules.

IV. POINTS OF COMMUNICATION

The Commission's innovative baseline license framework is particularly well-suited to Northwood's GSaaS business model. Consistent with the Commission's baseline-application

⁶ Notwithstanding the maximum EIRP and EIRP density levels specified here, each earth station transmission will occur at the lowest power level needed to provide the required signal quality as indicated in the application and further amended by coordination agreements. *See* 47 C.F.R. § 25.204(d).

rules, Northwood does not identify a point of communication in this application but instead commits to adding points of communication as it enters service agreements with individual spacecraft operators. Where an operation conforms to the allocation for the relevant band and needs no frequency or other change beyond those authorized here, Northwood will add the point of communication by notification under Section 25.118(g); where the additional point of communication requires a waiver or a mandatory additional showing, Northwood will instead seek prior authorization by modification under Section 25.117.⁷ For each added point of communication, Northwood will identify the applicable service, allocation status, and basis of operation at the time of notification.

V. SPECTRUM USE AND SHARING

As a multi-purpose GSaaS provider, Northwood's precise service offering will vary by customer and mission, and may include FSS, MSS, BSS, EESS, SRS, or TT&C services. For each supported service type, Northwood will either conform to the allocation in effect for the relevant band or, where necessary, seek a waiver to operate on a secondary, non-interference basis, as determined when the point of communication is added. For purposes of the modification of this earth station license, Northwood's Ka-band uplink operations will support transmissions consistent with the International Telecommunication Union ("ITU") frequency allocations and the U.S. Table of Frequency Allocations. The specific modulation, coding, and duty-cycle parameters

⁷ See, e.g., 47 C.F.R. § 25.118(g) (identifying the conditions under which an earth station operator may add a point of communication without prior authorization); 47 C.F.R. § 25.117(i) (identifying exceptions to notifications eligible for deemed-granted status 35 days after public notice, such as modifications causing earth station transmissions to exceed the highest EIRP, EIRP density, and bandwidth prescribed for any already authorized emission). Compare *Baseline License Order* at 6446, ¶ 8 (explaining that baseline licensees "who do not include a point of communication with their initial application" may "add a point of communication prior to communicating with any satellite, following the process we establish"), with *Baseline License Order* at 6446, ¶ 10 n.24 (providing that earth station operations that require a "waiver of the Commission's rules are not eligible for th[e] notification process due to the prior requirement for a Commission decision on the waiver request").

will depend on the mission profile of each supported spacecraft, but all emissions will remain within the authorized bandwidth and comply with the applicable spectrum and OOB in Part 25, and consistent with the Part 5 or Part 25 authority held by each supported spacecraft operator.⁸

Each antenna will support a transmit beam operating at an EIRP not exceeding this earth station's authorized EIRP, with the associated EIRP spectral density maintained within the limits applicable to the selected channel bandwidth and service configuration. Northwood will meet standard availability targets for the supported service allocation and will adjust carrier bandwidths, coding rates, and modulation formats as required by mission partners while remaining fully compliant with the Commission's technical rules and parameters authorized for this earth station.⁹

Northwood will adhere to ITU standards applicable to earth stations operating in the FSS, MSS, BSS, EESS, SRS, or TT&C service in the 17.2–21.4 GHz and 27.5–31.0 GHz bands, as warranted. While not an exhaustive restatement of applicable standards, the operations will conform to the allocations and technical provisions set forth in ITU Radio Regulations Article 21, the relevant footnotes associated with these bands, and the reference antenna performance standards in Recommendation ITU-R S.465-6.¹⁰ Where applicable, Northwood will also comply

⁸ 47 C.F.R. §§ 25.204 (earth station transmit power and OOB limits), 25.209 (earth station antenna gain performance standards); *see also* 47 C.F.R. § 25.271 (establishing rules for control of earth station facilities).

⁹ *See, e.g.*, 47 C.F.R. § 25.202(g) (prohibiting band-edge TT&C and requiring interior-band TT&C transmissions to avoid causing more interference or demanding more interference protection than ordinary traffic unless coordinated with nearby co-frequency satellites, and to use frequencies, polarization, and coding chosen to minimize interference into other networks).

¹⁰ *See* Int'l Telecomm. Union, Rec. ITU-R S.465-6, *Reference Radiation Pattern for Earth Station Antennas in the Fixed-Satellite Service for Use in Coordination and Interference Assessment in the Frequency Range from 2 to 31 GHz* (Jan. 2010).

with the earth station power limits in Article 21.¹¹ When sharing spectrum, Northwood will operate pursuant to applicable Commission rules, as discussed below.

A. Northwood Transmit Frequencies

The earth station will transmit to satellite systems using Ka-band spectrum with the technical operating parameters detailed in Table 2 below. These parameters define the station's transmission characteristics, including power limits, and operational constraints necessary to ensure compatibility with other spectrum users.

Table 2. Northwood System Transmit Operating Parameters

Parameter	Ka-band (27.5–28.35 GHz)	Ka-band (28.35–31.0 GHz)
Max EIRP per Carrier	82.2 dBW	85.2 dBW
Typical Bandwidth	2 MHz–480 MHz	2 MHz–480 MHz
Max EIRP Density	79.2 dBW/MHz (2 MHz carrier)	82.2 dBW/MHz (2 MHz carrier)
Typical EIRP Density	58.2 dBW/MHz (250 MHz carrier)	61.2 dBW/MHz (250 MHz carrier)
Transmit Power	≤ 27 dBW	≤ 30 dBW
Power Control Range	0.5 dB steps	
Polarization	RHCP/LHCP simultaneous	
Min. Elevation	5°	
Typical Duty Cycle	Up to 100%	

Because Northwood is applying for a baseline license that encompasses a large range of potential customers and operational variation across the entire 3.5 GHz of Ka-band spectrum, Northwood has provided different operational parameters inside and outside the UMFUS bands. The specifications inside the UMFUS band are consistent with the coordination report in Exhibit A and the 24.0 dBW/MHz maximum available radio-frequency power density during coordination.¹² In both cases, the worst-case maximum EIRP density would be realized only for a specific satellite

¹¹ See 47 C.F.R. § 25.204(b); see also International Telecommunication Union, *Radio Regulations*: Articles, Edition of 2024, Art. 21, Table 21-2 (2024), available at <https://www.itu.int/pub/R-REG-RR-2024> (limiting earth stations operating above 15 GHz in bands shared coequally with terrestrial services to a horizon EIRP of +64 dBW/MHz for elevation angles at or below 0°, increasing to +79 dBW/MHz at 5° (+64 + 3θ dBW/MHz), with no restriction above 5° and an exceedance of up to 10 dB permitted subject to agreement with any affected administration).

¹² See 47 C.F.R. § 25.136(a)(4)(iv); 47 C.F.R. § 25.203(c); 47 C.F.R. § 101.103(d).

point of communication operating a narrow, full-power transmission. The typical EIRP densities shown are more representative of expected operation; the worst case is provided for completeness.

Northwood will transmit in the Earth-to-space direction in the Ka-band frequencies shown in Table 3, which also summarizes the allocation status of each band. Northwood will transmit consistent with the allocations described and, in the 27.5–28.35 GHz portion, consistent with Section 25.136 of the Commission’s rules.

Table 3. Northwood System Transmit Frequencies

Transmit Frequencies	Status ¹³
27.5–30.0 GHz	There are no Federal services allocated in this band in the United States. The 27.5–28.35 GHz and 29.1–29.25 GHz bands are allocated to non-Federal FSS and non-Federal MSS in the Earth-to-space direction on a co-primary basis with the Fixed Service and Mobile Service. The 28.35–29.1 GHz and 29.25–29.5 GHz bands each have a primary allocation for non-Federal FSS in the Earth-to-space direction, and the 29.5–30.0 GHz band is allocated to non-Federal FSS and non-Federal MSS in the Earth-to-space direction on a co-primary basis. In the 27.5–28.35 GHz portion, FSS (Earth-to-space) is generally co-primary with fixed and mobile services but is secondary to Upper Microwave Flexible Use Service (“UMFUS”). However, FSS may operate without providing interference protection to UMFUS stations pursuant to 47 C.F.R. § 25.136(a)(4), as addressed in Section V.A below.
30.0–31.0 GHz	The 30.0–31.0 GHz band is allocated to Federal FSS and MSS in the Earth-to-space direction limited to military systems under footnote G117 and is not generally available to non-Federal satellite use in the Earth-to-space direction. To the extent that Northwood seeks to transmit to non-Federal satellite points of communication in this band, Northwood will seek a waiver of the U.S. Table of Frequency Allocations to do so on a secondary, unprotected basis.

¹³ See generally 47 C.F.R. § 2.106.

Northwood will comply with Part 25 and the Commission's frequency coordination framework. Northwood has completed coordination with commercial fixed service links in the Ka-band and has attached a coordination report, compliant with Section 25.203(c) of the Commission's rules, as Exhibit A.¹⁴ Northwood's certification regarding its antenna off-axis gain required under Section 25.132(a)(1) is provided in Section VI.¹⁵ Northwood's transmissions will remain within the authorized bandwidth, observe the relevant out-of-band emission limits,¹⁶ and maintain off-axis EIRP density levels that are equal to or below the applicable limits in Section 25.218 for transmissions to GSO networks.¹⁷ For transmissions to NGSO networks, Northwood will comply with the applicable Part 25 NGSO provisions, including relevant standards under Section 25.208.¹⁸ To the extent any GSO transmit emission exceeds the routine off-axis EIRP density envelope in Section 25.218 of the Commission's rules, Northwood will make the non-routine showing required by Section 25.220, including coordination with, or consent from, any affected co-frequency GSO operators.¹⁹

Northwood's Ka-band uplink includes the 27.5–28.35 GHz band that is shared with UMFUS. FSS earth stations that meet the protection criteria in Section 25.136(a)(4) may transmit in the 27.5–28.35 GHz band without providing interference protection to those shared UMFUS operations.²⁰ These protection criteria require that: (1) there are no more than two other authorized FSS earth stations in the same county operating pursuant to Section 25.136(a)(1)–(4) in the band;

¹⁴ See 47 C.F.R. § 25.203(c).

¹⁵ See 47 C.F.R. § 25.132.

¹⁶ See 47 C.F.R. § 25.202(f).

¹⁷ See 47 C.F.R. § 25.218.

¹⁸ See 47 C.F.R. §§ 25.146(d), 25.208(c)–(d).

¹⁹ See 47 C.F.R. §§ 25.218, 25.220.

²⁰ See 47 C.F.R. § 25.136(a)(4).

(2) the applicant completes coordination with affected UMFUS licensees; (3) the aggregate population covered by the power flux-density (“PFD”) contours of the applicant’s earth station and other 47 C.F.R. § 25.136(a) earth stations in the county does not exceed prescribed limits; and, (4) the earth station’s PFD contour does not encompass any major event venue, urban mass transit route, passenger railroad, or cruise ship port, or cross certain major roads (i.e., Interstate, Other Freeways and Expressways, or Other Principal Arterial).²¹

Northwood requests authority to conduct FSS uplink transmission in the 27.5–28.35 GHz band without providing additional interference protection to UMFUS operations in the band in accordance with Section 25.136(a)(4).²² Northwood is submitting as Exhibit B a detailed analysis consistent with Section 25.136(a)(4).

(1) **Station Limit.** As of the date of this submission, the Commission’s International Communications Filing System shows one other authorized earth station operating in the 27.5–28.35 GHz band in Matanuska-Susitna Borough.²³

(2) **UMFUS Coordination.** Northwood has completed coordination with the UMFUS licensees within the protection zone using the process specified in 47 C.F.R. § 101.103(d) and has attached the coordination report, consistent with 47 C.F.R. §§ 25.136(a)(4)(iv), 25.203(c), as Exhibit A.²⁴

²¹ See 47 C.F.R. § 25.136(a)(4)(i)–(iv).

²² See 47 C.F.R. § 25.136(a)(4).

²³ See Application of WorldVu Satellites Limited, ICFS File No. SES-LIC-20180604-01082 (granted Nov. 8, 2019).

²⁴ 47 C.F.R. § 25.203(c); 47 C.F.R. § 101.103(d).

(3) **Population Coverage Limit.** As demonstrated in Exhibit B, the PFD contours for this and other 28 GHz FSS earth stations in the county do not cover a population that exceeds the relevant aggregate population limit.

(4) **Infrastructure Coverage Limit.** As demonstrated in Exhibit B, the PFD contour for this earth station does not contain any major event venue, urban mass transit route, passenger railroad, or cruise ship port. The PFD contour also does not cross any Interstate, Other Freeways and Expressways, or Other Principal Arterial, as defined by the Federal Highway Administration Office of Planning, Environment, and Realty Executive Geographic Information System.

B. Northwood Receive Frequencies

The earth station's receive system employs high-sensitivity Ka-band configurations optimized for satellite telecommunications reception. The earth station's receive performance characteristics, including gain-to-temperature ratios ("G/T") and system noise specifications, are detailed in Table 4. These parameters ensure reliable reception of spacecraft telemetry across varying elevation angles and atmospheric conditions typical of the site's location.

Table 4. Northwood System Receive Operating Parameters

Parameter	Ka-band (17.2–21.4 GHz)
G/T	26 dB/K
System Noise Temp	272 K
Polarization	LHCP/RHCP simultaneous
Min.-Max Bandwidth	1 MHz–40 MHz
Min. Elevation	5°

The earth station will receive satellite downlink transmissions in the 17.2–21.4 GHz band. Allocations for satellite services vary within the band and are summarized in Table 5.

Table 5. Northwood System Receive Frequencies

Receive Frequencies	Status ²⁵
17.2–21.4 GHz	The 17.3–17.8 GHz, 18.142–18.3 GHz, and 18.3–20.2 GHz bands have primary non-Federal FSS (space-to-Earth) allocations, which is co-primary in various portions with, as applicable, BSS, MSS, passive EESS, passive SRS, and the fixed and mobile services. Federal FSS and MSS are primary in much of these ranges, but they are limited to military systems under footnote G117. Non-Federal FSS is secondary to fixed service in the 17.8–18.142 GHz portion of the band. The 17.2–17.3 GHz band has non-Federal secondary allocations for active ESS, active SRS, and radiolocation and Federal primary allocations for the same services. The 20.2–21.2 GHz band is allocated on a co-primary basis to Federal FSS and MSS in the space-to-Earth direction that are limited to military systems under footnote G117. The band is not generally available to non-Federal satellite use in the space-to-Earth direction, except for standard frequency and time signal-satellite service on a secondary basis. To the extent that Northwood seeks to receive from other types of non-Federal satellite points of communication in this band, Northwood will seek a waiver of the U.S. Table of Frequency Allocations to do so on a secondary, unprotected basis. The 21.2–21.4 GHz band has co-primary Federal and non-Federal allocations for passive EESS, passive SRS, and fixed and mobile services. Northwood will receive in these bands on a secondary basis as applicable consistent with the relevant satellite service allocations.

The earth station will receive in the 17.2–21.4 GHz band in accordance with the service and allocation that the relevant satellite point of communication uses: where the operation conforms to the allocation for that point of communication’s service type, Northwood will receive on that basis; where it does not, Northwood will receive on an unprotected, non-interference basis subject to, as needed, a request for waiver of the Table of Frequency Allocations.

²⁵ See generally 47 C.F.R. § 2.106.

VI. ANTENNA PATTERN

For transmissions in the Ka-band to GSO networks, Northwood certifies that its earth station will comply with the applicable antenna gain performance standards in 47 C.F.R. § 25.209 as required under 47 C.F.R. § 25.132, and the off-axis EIRP density envelopes in 47 C.F.R. § 25.218.²⁶

VII. RADIATION HAZARD ANALYSIS

Exhibit C, the Radiation Hazard Analysis, confirms that Northwood complies with relevant Commission standards and demonstrates there is no risk of radiation exposure beyond the acceptable limits.²⁷ To further protect the public, Northwood will limit site access through physical controls. Trained technicians responsible for operating the earth station will turn off and secure the transmitters before performing maintenance.

VIII. FAA NOTIFICATION

The Commission addressed antenna structure notification when it licensed this earth station.²⁸ This modification adds frequencies only while maintaining the same previously licensed antenna form factor and site location. Therefore, no Federal Aviation Administration notification is required.

²⁶ The Commission has not established similar standards for transmissions in the Ka-band to NGSO networks.

²⁷ See FCC OET Bulletin No. 65, *Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields* (Aug. 1997), <https://www.fcc.gov/general/oet-bulletins-line>; 47 C.F.R. § 1.1310; Exhibit C.

²⁸ Northwood Baseline License at B (“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.”).

IX. OTHER MATTERS

The Commission addressed environmental and historic preservation considerations when it licensed this earth station.²⁹ This modification only adds frequencies. Radiofrequency exposure associated with the added Ka-band operations is addressed separately in the Radiation Hazard Analysis discussed in Section VII and attached as Exhibit C. The application has no other environmental effect requiring further review, and no new tribal or historic-preservation review is required.

X. CONCLUSION

Prompt grant of this modification application will accelerate the deployment of Northwood's shared ground infrastructure and its ability to improve the security, resiliency, and reliability of space-based communications globally. Grant will allow Northwood to complete site construction while finalizing service agreements, and once a point of communication is designated, to begin operations without delay. Expanding Northwood's earth station site to support Ka-band operations will strengthen the resilience of America's space communications architecture by adding critically needed satellite telecommunications capacity. The Commission should act swiftly to authorize this vital addition to the nation's space infrastructure.

Respectfully submitted,

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²⁹ Northwood Baseline License at B ("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.").

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