

Exhibit B

This Exhibit B presents the power flux-density (“PFD”) contour analysis and associated assessments prepared by Northwood Space Corporation (“Northwood”) pursuant to Section 25.136(a)(4) of the Federal Communications Commission’s (“FCC”) rules¹ for Northwood’s gateway earth station facility located at or near Bismarck in Burleigh County, North Dakota (the “Site”) relative to the Upper Microwave Flexible Use Service (“UMFUS”) deployments in the 27.5–28.35 GHz band in the county.

1. PFD Contour Generation

a. Earth Station Parameters

Table 1 below sets forth the earth station parameters used by Northwood to generate the PFD contour for the Site. The latitude and longitude values reflect the Site’s confirmed coordinates.

Table 1. Northwood Earth Station Parameters

Field	Value	Units
County / Municipality	Burleigh County	
Latitude	46.882251	° N
Longitude	–100.804839	° W
Simulation Frequency	28	GHz
Maximum Number of Simultaneously Active Antennas ²	6	antennas
Antenna Centerline Height (Above Ground Level)	1.52	meters
Worst-case Antenna Gain toward the Horizon	–10	dBi
Average Antenna Gain toward the Horizon	–20	dBi
RF Transmit Power Density (antenna input)	24.0	dBW/MHz
Per-Antenna EIRP Density toward the Horizon	4.0	dBW/MHz
Aggregate EIRP Density toward the Horizon (6 antennas)	11.8	dBW/MHz

The RF transmit power in Table 1 represents the power required to communicate with GSO satellites. Power levels for communications with much lower altitude NGSO satellites will be several orders of magnitude lower.

The gain toward the horizon in Table 1 reflects the off-axis characteristics of Northwood’s 2.4-meter Ka-band antennas together with the Site’s operational pointing geometry. Each antenna is highly directive, with an on-axis gain of 55.2 dBi and a half-power beamwidth of approximately

¹ 47 C.F.R. § 25.136(a)(4).

² A single antenna is the typical number of antennas transmitting at any one time. All six antennas were used for modelling the worst-case aggregate interference.

0.3 degrees, and its gain declines steeply with off-axis angle. The reference radiation pattern in Recommendation ITU-R S.465-6 declines to -10 dBi for off-axis angles at and beyond approximately 48 degrees. In reality, the measured off-axis gain of Northwood's antennas is substantially better than this reference envelope. For purposes of this Section 25.136 analysis, we use a mean off-axis antenna gain of -20 dBi to represent the earth station's antenna gain toward the horizon. The actual off-axis gain toward the horizon varies between approximately -10 dBi and -30 dBi across large portions of the angular range (and drops as low as -50 dBi at certain angles). A mean off-axis gain of -20 dBi is a reasonable, statistically representative simplification that accounts for the full range of sidelobe variation across all operational beam positions. This approach is consistent with industry practice of evaluating earth station emissions against emission envelopes rather than requiring exhaustive enumeration of every antenna pattern variation. The aggregate input value in Table 1 conservatively applies the full $10 \cdot \log_{10}(6)$ combination of all six antennas, without any reduction for the varying and independent pointing of the antennas.

b. PFD Contour Methodology

To demonstrate compliance with the criteria in Section 25.136(a)(4) of the Commission's rules allowing fixed-satellite service ("FSS") earth station transmissions in the 27.5–28.35 GHz band without providing additional interference protection to co-frequency UMFUS licensees, Northwood generated the Site's -77.6 dBm/m²/MHz PFD contour using the earth station parameters set forth in Table 1. The contour was generated by creating a raster grid of measurement points located 10 meters above ground level and surrounding the earth station, and by calculating the path attenuation, received power, and power flux-density to each point.

Northwood used bare-Earth digital terrain elevation data obtained from the U.S. Geological Survey to characterize the terrain surrounding the Site. Northwood applied Recommendation ITU-R P.452 to estimate the basic transmission loss not exceeded for 10% of time between the Site and each point on the PFD measurement grid. To account for clutter losses at the UMFUS base station receive point, Northwood applied Recommendation ITU-R P.2108 and assumed that 80% of UMFUS base station deployments are located below rooftop level and therefore experience clutter losses consistent with that recommendation. No clutter loss was assumed at the Northwood earth station. Northwood designed the Site to ensure that the PFD produced by the earth station does not exceed -77.6 dBm/m²/MHz at 10 meters above ground level anywhere outside of the contour depicted in Figure 1 below.

c. Gateway PFD Contour Figure

Figure 1 below depicts the Site's -77.6 dBm/m²/MHz PFD contour together with the boundaries of the U.S. Census tabulation blocks that intersect the contour. The green dot in Figure 1 marks the location of the Site. The map plots each intersecting census block by its block identifier against the Site's latitude and longitude, and identifies the total population determined to be covered by the contour. This figure and the population coverage tables in Section 2.b below are derived from the population-block intersection analysis performed for the Site.

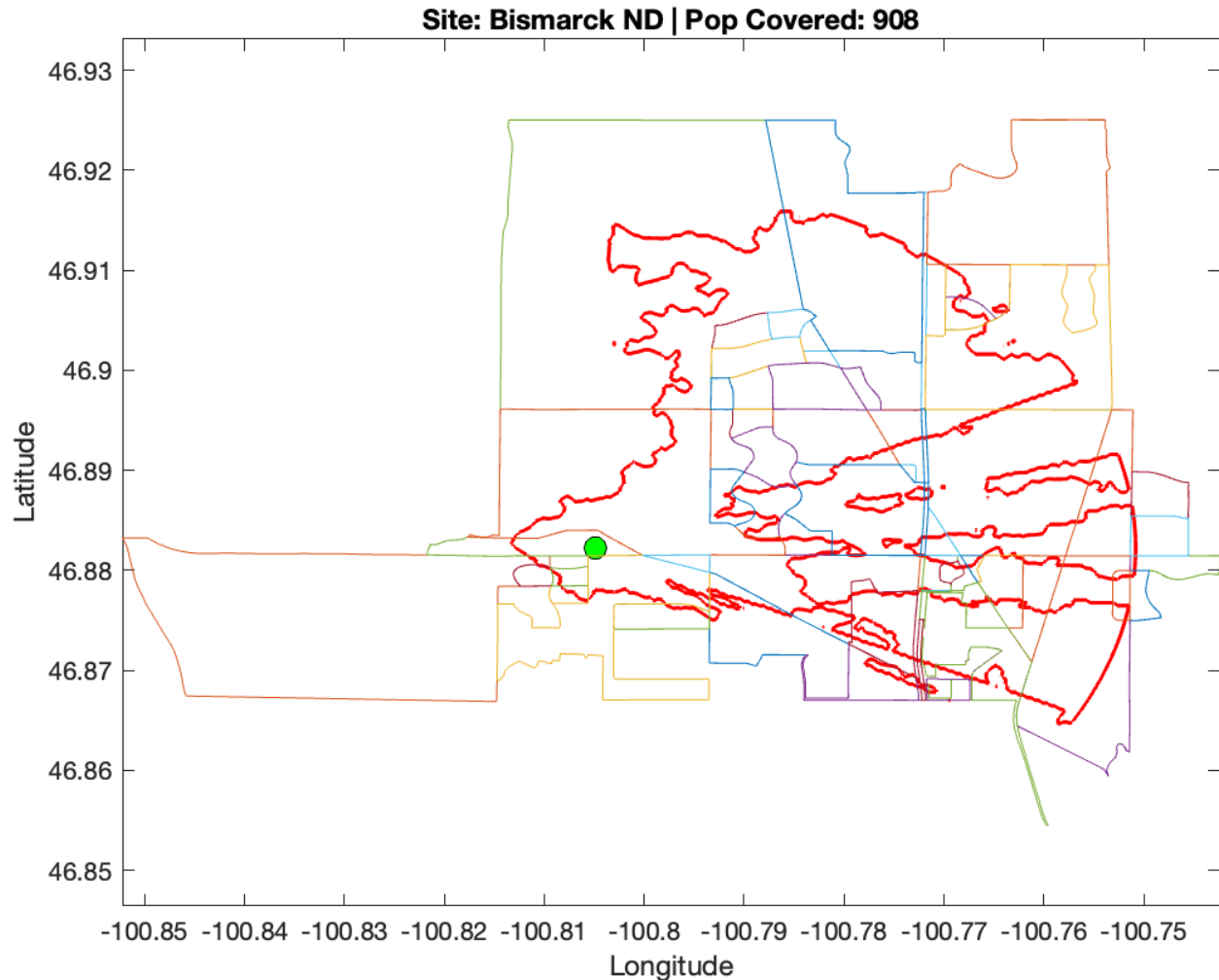


Figure 1. Bismarck, ND Gateway PFD Contour ($-77.6 \text{ dBm/m}^2/\text{MHz}$)

2. Section 25.136(a)(4) Protection Criteria Analysis

a. Other Earth Stations Located in the County (47 C.F.R. § 25.136(a)(4)(i))

Section 25.136(a)(4)(i) of the Commission’s rules requires the applicant to demonstrate that there are no more than two other authorized earth stations operating in the 27.5–28.35 GHz band pursuant to Section 25.136(a) in the same county.³

Northwood has reviewed the Commission’s licensing database and identified, as of the date of this submission, two other FSS earth stations within Burleigh County.⁴ None of these earth stations is

³ 47 C.F.R. § 25.136(a)(4).

⁴ See Application of HNS License Sub, LLC, ICFS File No. SES-LIC-20150604-00338 (granted Dec. 8, 2015) (later amended by SES-MOD-20170418-00409) (“Hughes 2015 Application”); Application of HNS License Sub, LLC, ICFS File No. SES-MOD-20201204-01310 (granted Dec. 26, 2023) (“Hughes 2020 Application”).

collocated with the Site, and none of their respective $-77.6 \text{ dBm/m}^2/\text{MHz}$ PFD contours is known to overlap with the Site's contour depicted in Figure 1 above.

b. Population Covered by Census Block (47 C.F.R. § 25.136(a)(4)(ii))

Section 25.136(a)(4)(ii) requires the applicant to demonstrate that the area covered by the earth station's PFD contour, "together with the similar area of any other earth station" authorized under Section 25.136(a), does not cover, in the aggregate, a population exceeding certain prescribed limits.⁵ These limits are: (1) 0.1% of the county population if that population exceeds 450,000; (2) 450 people if the county population is between 6,000 and 450,000; or (iii) 7.5% of the county population if that population is fewer than 6,000.⁶ Under FCC guidance implementing Section 25.136(a)(4)(ii), where the PFD contours of two earth stations overlap within the same licensing area, the population covered by the overlap is counted only once against the aggregate population limit for that licensing area, and where a contour covers multiple licensing areas, the covered population in each licensing area is counted against the limit applicable to that specific area.⁷

The total population of Burleigh County, according to 2020 U.S. Census Bureau data, is 98,458 and therefore the applicable population limit pursuant to Section 25.136(a)(4)(ii) is 450 persons.⁸

Table 2 below sets forth, on a census-block basis, the total population, total block area, the percentage of each block's area falling within the Site's PFD contour, and the resulting covered population which is calculated to be proportional to the covered area of each block.

Table 2. Population Covered by Census Block

County Name	Block ID	Total Population	Total Area	Partial Area	% Area	Covered Population
Burleigh County	2020	0	33453.42856	5299.400602	15.84112849	0
Burleigh County	2026	0	35571.01872	25105.46377	70.57842218	0
Burleigh County	4050	21	105057.3781	63900.19425	60.82409003	12.77305891
Burleigh County	1033	9	1919637.547	464272.8505	24.1854433	2.176689897
Burleigh County	3040	72	224397.0701	74055.82517	33.00213552	23.76153758
Burleigh County	2001	6	829176.1198	352361.8177	42.49541314	2.549724788
Burleigh County	3042	27	75294.71837	75294.71837	100	27
Burleigh County	3049	17	46869.68381	46869.68381	100	17
Burleigh County	2050	0	39738.58766	1191.909794	2.999376336	0
Burleigh County	3017	42	6292142.024	1339108.798	21.2822405	8.93854101
Burleigh County	3057	0	192369.3593	124427.2767	64.68144258	0
Burleigh County	3033	43	147149.2677	147149.2678	100	43.00000002
Burleigh County	2029	0	750512.8375	90202.0251	12.01871848	0
Burleigh County	2000	0	12458.00818	484.9768045	3.892892006	0
Burleigh County	2023	0	3000.080162	2712.371307	90.40996107	0
Burleigh County	4051	43	219222.7948	49858.8676	22.74346865	9.779691518

⁵ 47 C.F.R. § 25.136(a)(4)(ii).

⁶ 47 C.F.R. § 25.136(a)(4)(ii), Table 1.

⁷ *Space Bureau Updates its Guidance on Siting Methodologies for Earth Stations Seeking to Operate in the 24.75-25.25 GHz, 27.5-28.35 GHz, 37.5-40 GHz, 47.2-48.2 GHz, and 50.4-51.4 GHz Bands to Demonstrate Compliance with Section 25.136*, 40 FCC Rcd 1547, 1556 (rel. Mar. 10, 2025) ("2025 UMFUS Guidance").

⁸ See *Burleigh County, North Dakota*, U.S. Census Bureau, <https://www.census.gov/quickfacts/fact/table/burleighcountynorthdakota/PST045225> (last visited Aug. 22, 2026).

Burleigh County	2001	32	142287.6605	5895.431847	4.143319122	1.325862119
Burleigh County	2006	11	39288.2233	39288.2233	100	11
Burleigh County	3052	33	290115.5423	290115.5423	100	33
Burleigh County	2021	0	24821.55674	11447.39594	46.11876708	0
Burleigh County	2016	18	4269096.748	13482.83495	0.315824066	0.056848332
Burleigh County	4052	23	113991.9869	113847.3517	99.87311813	22.97081717
Burleigh County	3053	20	64368.54956	64368.54956	100	20
Burleigh County	2085	0	69165.09232	16525.5288	23.89287463	0
Burleigh County	3054	8	32259.10155	32259.10155	100	8
Burleigh County	3019	51	124084.6345	124084.6345	100	51
Burleigh County	2003	14	85473.56033	1867.57841	2.184977908	0.305896907
Burleigh County	3056	74	468722.7782	425945.0141	90.873547	67.24642478
Burleigh County	3044	75	214496.5382	214496.5382	100	75
Burleigh County	2010	47	1460723.642	730699.1303	50.02309192	23.5108532
Burleigh County	2052	0	37186.8803	2752.039728	7.400566289	0
Burleigh County	3050	0	75867.12141	54234.47007	71.48613137	0
Burleigh County	2084	0	32149.69669	3623.509375	11.27074202	0
Burleigh County	3051	0	26019.20748	10083.86747	38.75547507	0
Burleigh County	4031	40	1784440.76	6363.71069	0.356622132	0.142648853
Burleigh County	2022	0	212599.6923	57160.27406	26.88633903	0
Burleigh County	3058	21	128277.1414	61813.86252	48.18774556	10.11942657
Burleigh County	3070	23	321121.3272	198469.6826	61.80520127	14.21519629
Burleigh County	1034	3	73780.95788	45951.54172	62.28103164	1.868430949
Burleigh County	2025	10	62322.03849	407.169139	0.653330907	0.065333091
Burleigh County	3061	0	25276.59745	9646.639146	38.16431055	0
Burleigh County	1032	0	530410.1669	307799.4199	58.03045248	0
Burleigh County	3043	41	127313.2249	127313.2249	100	41
Burleigh County	3055	113	307481.7365	307481.7365	100	113
Burleigh County	2014	19	194715.6103	13469.16771	6.917353818	1.314297225
Burleigh County	3045	42	83623.95511	83623.95511	100	42
Burleigh County	1036	66	195954.0457	1470.588772	0.750476351	0.495314392
Burleigh County	3059	47	877984.5194	161143.8961	18.35384252	8.626305986
Burleigh County	3032	22	2529219.991	1247401.991	49.31963197	10.85031903
Burleigh County	2008	18	56210.07124	20324.51084	36.15813036	6.508463465
Burleigh County	2028	0	241164.7985	32656.51385	13.54116109	0
Burleigh County	2010	8	54020.03616	46248.14803	85.61295275	6.84903622
Burleigh County	1035	32	192076.0311	14637.75642	7.620813662	2.438660372
Burleigh County	2015	0	1298.511338	1298.511338	99.99999999	0
Burleigh County	3018	20	56253.37105	56253.37098	99.99999988	19.99999998
Burleigh County	2012	0	240248.3244	106067.3541	44.14905052	0
Burleigh County	4048	84	1665360.745	677436.5038	40.67806364	34.16957346
Burleigh County	2051	3	95121.92058	64277.37341	67.57367073	2.027210122
Burleigh County	2014	14	579510.3565	440056.4662	75.93591059	10.63102748
Burleigh County	2019	0	2573.75886	769.6299976	29.90295671	0
Burleigh County	2027	0	395457.4994	253271.487	64.04518498	0
Burleigh County	3046	33	2103160.005	1243056.54	59.10423066	19.50439612
Burleigh County	2011	0	71736.0853	27272.24065	38.01746434	0
Burleigh County	2003	76	1157452.108	375753.1109	32.46381499	24.67249939
Burleigh County	3041	46	197237.4256	195859.0265	99.3011473	45.67852776
Burleigh County	2018	0	122670.698	84886.45766	69.19864241	0
Burleigh County	2002	0	49948.88603	49948.88603	100	0
Burleigh County	2024	0	25278.59085	13742.18264	54.36292995	0
Burleigh County	3034	39	149348.7408	116685.0973	78.12928091	30.47041956

Table 3 below sets forth the total population covered by the Site’s PFD contour in the county.

Table 3. Population Covered by County

County Name	Population Covered
Burleigh County	908

Note: Covered population figures in Table 2 are summed and the result has been rounded up to the next whole number of persons

As mentioned above, at the time of this filing, there are two other FSS earth stations in the 27.5–28.35 GHz band in Burleigh County, both operated by HNS License Sub, LLC. The two stations are collocated in the 27.85-28.35 GHz segment, with one station operating under grandfathered status in this segment only, and the other station operating in the broader 27.5-28.35 GHz band.⁹ HNS License Sub, LLC has estimated the two stations’ aggregated population coverage to be 79 in the 27.5-27.85 GHz band, and 61 in the 27.85-28.35 GHz band.¹⁰ The aggregate population coverage for the Site is therefore 908 plus the aggregate PFD population coverage of HNS License Sub, LLC’s stations in the relevant frequency segments, which in each case exceeds the 450 population limit.

Because the population covered exceeds the limit, Northwood has concurrently sought a waiver of the population limit set forth in Section 25.136(a)(4)(ii) of the Commission’s rules.

c. Infrastructure-Crossing Analysis (47 C.F.R. § 25.136(a)(4)(iii))

Section 25.136(a)(4)(iii) of the Commission’s rules provides that an earth station’s PFD contour shall not cross any roads classified as Interstate, Other Freeways and Expressways, or Other Principal Arterials, as defined in the functional classification guidelines issued by the Federal Highway Administration. The Space Bureau’s Revised Siting Guidance¹¹ clarifies that applicants should consult the Federal Highway Administration Office of Planning, Environment, and Realty’s Executive Geographic Information System (“HEPGIS”) map to determine the classification of roads in the vicinity of the proposed earth station, and specifically the 2022 Highway Performance Monitoring System Functional Class on National Highway System (“NHS”) layer.

Northwood has reviewed the HEPGIS map and the 2022 NHS functional classification data for the area surrounding the Site. Based on this review, the Site’s –77.6 dBm/m²/MHz PFD contour depicted in Figure 1 above intersects with one segment of road, approximately 3 kilometers in length, classified as Other Principal Arterials on the HEPGIS NHS map.

⁹ See Hughes 2020 Application, Attachment B at 1; Radio Station Authorization, HNS License Sub, LLC, ICFS No. SES-LIC-20150604-00338 (Dec. 8, 2015). HNS License Sub, LLC also provided a supplemental analysis in response to objections from Verizon showing that its stations’ aggregate PFD population coverage under the worst-case scenario would be 114 for the 27.5-27.85 GHz band, and 27 for the 27.85-28.35 GHz band. HNS License Sub, LLC, *Written Ex Parte Presentation and Supplemental UMFUS Showing*, ICFS File Nos. SES-MOD-20201204-01305, et al., at 1-5 (Apr. 14, 2022).

¹⁰ Hughes 2020 Application, Attachment B at 2-7.

¹¹ 2025 UMFUS Guidance, 40 FCC Rcd at 1557.

Because the Site's PFD contour crosses a road identified for additional interference protection in the Space Bureau's guidelines, Northwood has concurrently sought a waiver of the road-crossing restriction set forth in Section 25.136(a)(4)(iii) of the Commission's rules in connection with its application for the Site.

Section 25.136(a)(4)(iii) also provides that an earth station's PFD contour shall not encompass any major event venue, urban mass transit route, passenger railroad, or cruise ship port. Northwood's analysis of the Site confirms that the PFD contour depicted in Figure 1 does not encompass any such infrastructure, and this requirement is therefore satisfied.

d. UMFUS Coordination (47 C.F.R. § 25.136(a)(4)(iv))

Section 25.136(a)(4)(iv) requires that the applicant complete coordination with UMFUS licensees within the earth station's PFD contour. Northwood has completed such coordination and has attached the coordination report as Exhibit A to the application.¹²

¹² 47 C.F.R. § 25.136(a)(4)(iv).