Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	SAT-PDR-20200526-00054
Mangata Networks LLC	)	Call Sign S3068
	)	
Petition for a Declaratory Ruling	)	
Granting Access to the U.S. Market	)	
For the Mangata Networks System	)	

CONSOLIDATED REPLY COMMENTS

Mangata Networks LLC ("Mangata") hereby submits this Consolidated Reply Comments in response to comments filed by Telesat Canada ("Telesat"), O3B Limited ("O3b"), The Boeing Company ("Boeing"), Kuiper Systems LLC ("Kuiper"), and Iridium Constellation LLC ("Iridium"), (collectively, such filings will be referred to as the "Comments")[1] with respect to Mangata's Petition for Declaratory Ruling (PDR) for U.S. market access[2].

Mangata Networks was founded in 2020 with a mission to deliver the lowest cost and highest performance capacity to anyone, anywhere by skillfully and cost-effectively combining terrestrial and satellite technologies to create a socially responsible, global network service provider. Mangata whole-heartedly believes in universal capacity to the underserved, and the necessity to

[1] *See* Comments of Telesat Canada, Call Sign S3068, IBFS File No. SAT-PDR-20200526-00054 (filed Sep. 8, 2020) ("Telesat Comments"); Petition to Deny or Condition of O3B Limited, Call Sign S3068, IBFS File No. SAT-PDR-20200526-00054 (filed Sep. 8, 2020) ("O3b Petition"); Comments of the Boeing Company, Call Sign S3068, IBFS File No. SAT-PDR-20200526-00054 (filed Sep. 8, 2020) ("Boeing Comments"); Comments of Kuiper System LLC, Call Sign S3068, IBFS File No. SAT-PDR-20200526-00054 (filed Sep. 8, 2020) ("Kuiper Comments"); Petition to Deny In Part, Call Sign S3068, IBFS File No. SAT-PDR-20200526-00054 (filed Sep. 8, 2020) ("Iridium Petition").

[2] *See* Mangata Networks LLC Petition for Declaratory Ruling for U.S. market access for its NGSO constellation, Call Sign S3068, IBFS File No. SAT-PDR-20200526-00054, Call Sign S3068 (filed May 26, 2020) (the "Application").

bring more schools and healthcare centers online, a need that has become ever more apparent during the COVID pandemic.

In Mangata's PDR for U.S. market access, Mangata seeks authority to the 17.7 - 18.6 GHz, 18.8 - 20.2 GHz, and 37.5 - 42.5 GHz bands (space-to-Earth) and to the 27.5 - 30.0 GHz, 47.2 - 50.2 GHz, and 50.4 - 51.4 GHz bands (Earth-to-space) to provide Fixed-Satellite Service from 791 satellites distributed in 27 MEO planes with inclination between 45 degrees and 52 degrees, and 32 HEO places with inclinations of 63.4 degrees.

I. Waiver Request for FCC Requirement 25.261(c): Band Segmentation

In the Application, Mangata requested a waiver of Section 25.261(c), which outlines the default procedures for band splitting absent coordination between two or more satellite systems. As stated in the Application, Mangata will coordinate in good faith with operators of co-frequency systems consistent with the Commission's spectrum sharing rule, Section 25.261(b). Mangata notes that good faith coordination includes detailed compatibility studies for incumbent systems, and that attempting detailed compatibility studies before coordination based solely off Schedule S inputs and publicly available technical information can lead to inaccurate assessments. Therefore, Mangata did not furnish individual detailed compatibility assessments for every co-frequency system in its application. However, Mangata is prepared to collaborate and (pre-)coordinate with other co-frequency systems to mutually provide such analysis.

Today, Part 25.261(c) of the Commission's Rules establishes a default procedure for sharing among NGSO FSS space stations absent coordination. As stated in Part 25.261(c), if coordination is not reached, the default procedure is to split the commonly authorized frequency band among the co-frequency satellite networks, "whenever the increase in system noise temperature of an earth station receiver, or a space station receiver for a satellite with on-board processing, of either system, $\Delta T/T$, exceeds 6 percent due to interference from emissions originating in the other system…".

In addition to traditional spectrum sharing technologies (small spot beams, satellite diversity, flexible network control and dynamic channel reassignment, which Kuiper states are also deployed

in their system)[3], Mangata's system incorporates additional technical safeguards (such as nulling, beam hopping, and power control) to accommodate spectrum sharing. The incorporation of these technical safeguards enable the operation of multiple NGSO systems in the same spectrum absent interference, without band segmentation. As such, waiving the two-step default procedure (good-faith coordination followed by band segmentation) stated in Part 25.261(c) of the Commission's Rules, and instead enabling Mangata to implement a three-step procedure (good-faith coordination, new spectrum sharing technology that prevents an increase in system noise temperature of greater than 6 percent, and lastly band segmentation, if necessary) is aligned with the FCC policy objectives as set forth in the NGSO FSS Order and serves the public interest.

II. Waiver Request for U.S. Table of Allocations: MSS Feeder Links

O3b and Iridium have requested the Commission deny the portion of Mangata's Application that seeks rule waivers to allow Mangata to use of 19.4 - 19.6 GHz and 29.1 - 29.5 GHz on a non-conforming basis. The 19.3-19.7 GHz band is allocated to Fixed Satellite Service (space-to-earth) while footnote NG166 stipulates that the use of 19.4 – 19.6 GHz and 29.1 – 29.25 GHz by FSS is limited to feeder links for NGSO systems in the MSS. Footnote NG535A limits use of the band 29.25 - 29.5 GHz by the FSS to GSO networks or feeder links from NGSO MSS systems. Mangata's application seeks authorization to use these frequencies for both MSS feeder links, FSS feeder links and FSS service links, which it intends to use to connect underserved communities heavily focusing on schools, healthcare centers, and government centers and clinics.

A primary reason Iridium and O3b are requesting the Commission deny Mangata's application for access to 19.3 - 19.7 GHz and 29.1 - 29.5 GHz is due to a perceived lack of Mangata's commitment to coordinate with co-frequency systems (Iridium and O3b in particular), and that there are currently three systems licensed in this band already.

Mangata would like to reiterate its commitment to coordinating with all co-frequency licensed operators, and that it will specifically coordinate with Iridium. In doing so, Mangata will ensure that it will not cause harmful interference into Iridium's system, which supports DoD, commercial,

[3] *See* Comments of Kuiper System LLC, Call Sign S3068, IBFS File No. SAT-PDR-20200526-00054 (filed Sep. 8, 2020)("Kuiper")

military and civilian government users, public safety including first responders to its gateways and TT&C links in 19.4 - 19.6 GHz and 29.1 - 29.3 GHz.

Similar to Kuiper, Mangata will specifically ensure that it will not cause harmful interference into Iridium's system by deploying directional antennas[4]. Furthermore, Mangata will not co-locate its feeder link earth stations or user terminals with existing or planned Iridium gateway earth stations. If Mangata's earth stations are close enough to generate harmful interference, it will implement technical measures to avoid co-frequency, co-polarization operation during predicted events.

Secondly, Iridium states that the Commission never intended for more than three NGSO MSS systems to share the feeder link spectrum, and that currently Iridium, O3b, and Kuiper are licensed to operate in this band[5]. Mangata does not dispute the validity of the claim, but strongly believes that there are operational and technological methods that enable more than three satellite systems to share this band. Additionally, denying a fourth system on the basis that the bands were only intended for three systems does not promote spectrum sharing, or benefit public interest. In this day and age, operators should work together to fully utilize spectrum and connect our underserved communities.

Mangata also believes that from a purely technological standpoint, the distinction between MSS and FSS systems has become challenging to define, and recommends that the FCC consider whether treating these two services differently, in particular the feeder links supporting these services, continues to be appropriate given the technological and market evolution of the satellite industry.

Mangata respectfully requests that the FCC authorize Mangata access to these bands for both FSS service link, FSS feeder link and MSS feeder link (19.4 - 19.6 GHz (space-to-Earth) and 29.1 - 29.5 GHz (Earth-to-space)) use, which will serve the public interest and encourage innovation as well as efficient and effective spectrum sharing.

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[4] *See* Page C-8 and C-9, Order and Authorization, Call Sign S3051, IBFS File No. SAT-LOA-20190704-00057 (July 29th 2020)

[5] *See* Page 4, Petition to Deny In Part, Call Sign S3068, IBFS File No. SAT-PDR-20200526-00054 (filed Sep. 8, 2020) ("Iridium Petition")

III. V-band Processing Round

Mangata acknowledges Boeing's and Kuiper's suggestion that Mangata's Application initiate a new processing round for NGSO systems that operate in part of V-band. In so far as this processing round does not address the V-band, please treat this application as an application for Ka-band and Mangata Networks will resubmit an application for V-bands in the appropriate round.

IV. Conclusion

Mangata is committed to its mission of creating a socially responsible, global network service provider, and collaborating with other co-frequency GSO and NGSO systems to minimize uncertainty in the coordination process and to maximize efficient use of spectrum resources. This commitment will be accomplished through good faith coordination and the mutual use of mitigation techniques in order to eliminate harmful interference into currently authorized systems and future entrants. Mangata will also gladly engage with any co-frequency system for pre-coordination to provide additional technical information and address concerns not covered in this response.

Mangata firmly believes that innovation, collaboration and entrepreneurial spirit will be required to bring more of the U.S. population, and the world, online, and looks forward to working together with incumbents and future entrants to deploy high-performance, cost-efficient network solutions. Simply put, limiting the use of portions of Ka-band to three systems, which deploy directional antennas and sophisticated resource management capabilities, undermines the Commission's efforts to curb spectrum warehousing and risks underutilizing spectrum, a valuable resource needed to advance our nation's education and healthcare systems. Mangata would like to change that paradigm. As such, Mangata respectfully requests that the Commission deny petitions of Telesat, O3b, Boeing, Kuiper, and Iridium, and that the Commission act timely to authorize Mangata's network.