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5 July 2018

Innovation, Science and Economic Development Canada  
c/o Senior Director, Spectrum Licensing and Auction Operations  
235 Queen Street, 6<sup>th</sup> Floor  
Ottawa, ON K1A 0H5

Dear Sir or Madam:

**Re: Comments of Ciel Satellite Limited Partnership, SES S.A., and O3b Limited - Addendum to the Consultation on Releasing Millimetre Wave Spectrum to Support 5G, Canada Gazette, Part I, June 6, 2018, Notice No. SLPB-005-18**

## **I. Introduction**

1. Ciel Satellite Limited Partnership and its affiliates SES S.A. and O3b Limited (collectively, "SES") hereby submit these comments in response to Innovation, Science and Economic Development Canada's ("ISED") *Addendum to the Consultation on Releasing Millimetre Wave Spectrum to Support 5G, Canada Gazette, Part I, June 6, 2018, Notice No. SLPB-005-18* (the "Addendum").
2. SES, one of the world's largest commercial communications satellite operators, with both geostationary orbit ("GSO") and non-geostationary orbit ("NGSO") satellites providing telecommunications services, is uniquely positioned to address the matters raised in the *Consultation on Releasing Millimetre Wave Spectrum to Support 5G* (the "Consultation") and in the Addendum. The SES fleet of more than 50 GSO satellites supplies C-, Ku-, and Ka-band video and data services to customers in Canada and around the globe. O3b uses its Ka-band NGSO system to provide low-latency, high throughput capacity to enterprise customers including mobile network operators, ISPs and governments. Many SES GSO satellites and the O3b satellite constellation have

- been approved by ISED to provide Fixed-Satellite Service (“FSS”) in Canada and the capacity on these systems is available for use by Canadian service providers.
3. SES commends ISED for initiating a proceeding to facilitate the development of innovative uses of millimeter wave (“mmWave”) spectrum, including the deployment of 5G services. As a GSO and NGSO operator that provides a wide range of services to mobile network operators around the world, SES will play a central role in the deployment of 5G. To fulfill its stated policy goals, ISED should carefully consider the critical contribution of satellite networks to the larger telecommunications ecosystem and recognize the need for flexibility and shared use of mmWave spectrum as it strives to create policies beneficial to Canada and its citizens.

## II. ISED’s Proposed Spectrum Policy in the 26 and 28 GHz Band

***Question A2: ISED is seeking comments on the changes proposed above to introduce flexible use licensing in the 26 GHz band, including the ensuing changes to the CTFA Canadian footnotes and the policy on this band contained in SP 3-30 GHz, Revisions to Spectrum Utilization Policies in the 3-30 GHz Frequency Range and Further Consultation.***

4. SES supported ISED’s proposal in the Consultation to continue soft partitioning of the 28 GHz band between terrestrial and FSS services, and SES supports the present proposal for the same reasons. ISED is wisely seeking to develop policies that will facilitate terrestrial deployment in the 26.5-27.5 GHz band (the “26 GHz band”) while still allowing FSS operators meaningful access to the band. This effort to strike a balance between the two services appropriately reflects the physical properties of the 26 GHz band, as well as the varying needs of users over Canada’s vast geography.

## III. Coexistence Between Flexible Use Terrestrial Stations and FSS Earth Stations in the 27.0-28.35 GHz Band

***Question A8A: ISED is seeking comments on the proposal to require site-by-site coordination between proposed flexible use terrestrial stations and FSS earth stations in the 27.0–28.35 GHz band when a pre-determined trigger threshold is exceeded.***

***Question A9A: ISED is seeking comments on whether there should be restrictions on the geographic areas in which new FSS earth stations can be deployed in the 27.0–28.35 GHz band.***

5. SES agrees with ISED that coordination triggers such as a Power Flux Density (“PFD”) limit or a separation distance may be useful for assessing circumstances in which coordination will be necessary for deployment. Metrics such as these can be used to create regulatory certainty and give potential operators clear guidance on how and where they can deploy in shared bands.
6. However, SES also believes that it is critical that ISED maintain its discretionary authority to approve applications for FSS earth stations operating in the 27.0-28.35 GHz band. As ISED points out in the Consultation, many Canadian teleport facilities are already deployed close to urban boundaries, near to existing fiber links. Establishing feeder links at these existing teleports is by far the most cost-effective method to support new FSS earth station facilities in the 27.0-28.35 GHz band. SES currently intends to deploy several gateways at such locations in Canada to support operations of the SES-17 satellite, which is currently under construction and expected to be launched in early 2021. The adoption by ISED of overly-prescriptive restrictions on the geographic areas in which new FSS earth stations can be deployed in the 27.0-28.35 GHz band runs the risk of inadvertently and unnecessarily ruling out the use of existing teleport facilities in suburban areas. While coordination triggers can provide useful guidance on how ISED can enable terrestrial deployment, the continuing evolution of mmWave communications technologies demands a more flexible regulatory system in order to efficiently utilize the 27.0-28.35GHz band. Given the fact that many mmWave systems and use cases for both terrestrial and FSS operations in the 27.0-28.35 GHz band are still under development, an overly-rigid regulatory scheme could have unanticipated and detrimental effects on deployment in the band. ISED has the authority and expertise to determine whether a proposed earth station will in fact impose minimal constraints on a case-by-case basis and should reserve the right to use its discretion where called for, so that it does not unnecessarily deprive the Canadian market of the benefits of FSS in the 27.0-28.35 GHz band.

7. Technical and economic limitations may restrict viable 5G terrestrial deployments, so ISED must be able to exercise its discretion to approve FSS earth stations in order to efficiently utilize the 27.0-28.35 GHz band. Terrestrial operators' 5G trials have shown technical limitations such as the short transmit distance and difficulty penetrating obstructions like foliage and windows.<sup>1</sup> These technical limitations also mean that a large scale deployment of 5G services would require a significant amount of costly fiber and small cell deployment, leading terrestrial service providers to doubt the economic efficiency of some 5G fixed wireless services.<sup>2</sup> Some terrestrial operators have even stated that laying fiber directly to homes may be more economically viable than implementing direct-to-residence 5G fixed wireless service.<sup>3</sup> The limited propagation properties of these high frequency waves and the high cost of widespread terrestrial deployment in this band suggests that FSS earth stations may be able to operate in the vicinity of urban areas and within other geographic regions where 5G terrestrial deployment seems likely. ISED should retain and exercise its discretion to review FSS earth station applications without overly prescriptive geographic restrictions to ensure the efficient use of the 27.0-28.35 GHz band.

#### **IV. Limits on Aggregate Emissions of Terrestrial Services in the 27.0-28.35 GHz Band.**

***Question A10A: ISED is seeking comments on whether it should impose any limits on the aggregate emissions of the terrestrial services in the 27.0–28.35 GHz band to ensure coexistence with FSS space stations.***

8. SES believes that ISED should implement measures to limit aggregate emissions of terrestrial services in the 27.0-28.35 GHz band towards the sky, which could interfere with FSS satellite operations. Terrestrial base stations pointing towards

<sup>1</sup> See Sue Marek, *AT&T, Shaw, and China Mobile Outline 5G Trial Successes and Failures*, SDxCentral, May 17, 2018. <https://www.sdxcentral.com/articles/news/aatt-shaw-and-china-mobile-outline-5g-trial-successes-and-failures/2018/05/>.

<sup>2</sup> See Sue Marek, *AT&T's Mixed Messages on 5G Fixed Wireless*, SDxCentral, May 30, 2018. <https://www.sdxcentral.com/articles/editorial/atts-mixed-messages-on-5g-fixed-wireless/2018/05/>.

<sup>3</sup> See Karl Bode, *AT&T Thinks Fiber Makes More Sense than 5G*, DSL Reports, Apr. 27, 2018. <http://www.dslreports.com/shownews/ATT-Thinks-Fiber-Makes-More-Sense-Than-Fixed-5G-141708>; See also Phillip Dampier, *AT&T Reiterates 5G Fixed Wireless is a Waste of Resources: Pushes Fiber to Home Instead*, Stop the Cap, May 30, 2018. <http://stopthecap.com/2018/05/30/att-reiterates-5g-fixed-wireless-is-a-waste-of-resources-pushes-fiber-to-home-instead/>.

- the sky may cause interference with satellite operations, and equipment manufacturers are already developing applications that require skyward transmissions. Base stations may have to transmit upwards to serve end users located at the top of buildings. Other applications are developing around drones, which will also require base stations to transmit towards the sky.<sup>4</sup>
9. In the U.S., Globalstar has petitioned the Federal Communications Commission to investigate aggregate emissions interference into its satellites in the 5091 to 5250 MHz (“5.1 GHz band”) band. Globalstar’s petition demonstrates the growing interference into Globalstar’s licensed feeder link spectrum from unlicensed terrestrial devices.<sup>5</sup> Globalstar’s findings are relevant for all bands shared between satellite uplink operations and terrestrial services, including the 27.0-28.35 GHz band.
10. Applications for 5G systems are still in development, so the extent of aggregate interference caused by terrestrial use in 5G systems is not yet fully known. What is known is that FSS systems operating in the 26 and 28 GHz bands will play a critical role in the deployment of 5G services throughout Canada. In order to facilitate the sharing of the 27.0-28.35 GHz band between terrestrial and satellite uses, ISED must evaluate how it can effectively prevent or address unacceptable aggregate interference, including how it will identify responsible parties and how it will ensure that interference is immediately dealt with once it occurs.

## V. Conclusion

11. SES appreciates the opportunity to provide comments to the Addendum. By adopting balanced proposals that enable FSS operators to have meaningful access to the 26 GHz band without unduly constraining terrestrial deployment, ISED can ensure that Canadian users, including governments, enterprises and

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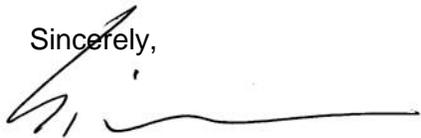
<sup>4</sup> Dawn Bushaus, *Attack of the 5G-enabled drones: Getting them off the ground*, TM Forum, April 11, 2017, <https://inform.tmforum.org/features-and-analysis/2017/04/attack-5g-enabled-drones-getting-off-ground/>; The QnQ Team, *Drones + 5G: The sky’s the limit*, Qualcomm.com, Nov. 14, 2016, <https://www.qualcomm.com/news/onq/2016/11/14/drones-5g-skys-limit>; Joanna Crews, *Report: Samsung Aims to Help US Military Build 5G Wireless Network*, ExecutiveBiz.com, Nov. 03, 2017, <http://blog.executivebiz.com/2017/11/report-samsung-aims-to-help-us-military-build-5g-wireless-network/>.

<sup>5</sup> See Petition for Notice of Inquiry of Globalstar, RM-11808 (May 21, 2018) (“Petition”); Public Notice, *Consumer & Governmental Affairs Bureau Reference Information Center Petition for Notice of Inquiry*, Report No. 3092 (rel. June 6, 2018).

consumers, continue to receive the benefits of new telecommunications technologies in the mmWave bands and the proliferation of 5G services.

12. All of which is respectfully submitted.

Sincerely,

A handwritten signature in black ink, appearing to read "S. Gibson", with a long horizontal flourish extending to the right.

Scott Gibson  
Vice President & General Counsel  
Ciel Satellite Limited Partnership