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General Counsel & Vice President Regulatory Affairs

October 30, 2014

Via Electronic Filing

Marlene H. Dortch, Secretary
Federal Communications Commission
445 Twelfth Street, SW
Washington, DC 20554

Re: *Ex Parte* Notice: *Terrestrial Use of the 2473-2495 MHz Band for Low-Power Mobile Broadband Networks* – IB Docket No. 13-213, RM-11685

Dear Ms. Dortch:

On October 10 and 22, 2014, Kerrisdale Capital Management, LLC (“Kerrisdale”) filed *ex parte* letters regarding the Commission’s proposal to allow Globalstar to provide low-power terrestrial mobile broadband service (Terrestrial Low Power Service or “TLPS”) in its licensed spectrum at 2483.5-2495 MHz and adjacent, unlicensed spectrum at 2473-2483.5 MHz.¹ The Commission should give no weight to Kerrisdale’s flawed submissions.

Kerrisdale’s assertions regarding Globalstar and TLPS are, at best, misinformed and lack credibility. Kerrisdale is an investment firm with no legitimate stake in telecommunications or satellite policies. It is not a carrier, manufacturer, technology vendor, consumer, or end user organization. It is a short seller and it profits if Globalstar’s stock price declines.² Kerrisdale is attempting to use the Commission’s proceeding to make a quick buck.

Kerrisdale was silent throughout the 2013 pleading cycle on Globalstar’s petition for rulemaking. Kerrisdale remained silent throughout the 2014 pleading cycle on the

¹ *Terrestrial Use of the 2473-2495 MHz Band for Low-Power Mobile Broadband Networks; Amendments to Rules for the Ancillary Terrestrial Component of Mobile Satellite Service Systems*, Notice of Proposed Rulemaking, 28 FCC Rcd 15351 (2013).

² Letter from Sahn Adrangi, Kerrisdale Capital Management, LLC, to Marlene Dortch, Secretary, FCC, IB Docket No. 13-213, at 2 (Oct. 10, 2014) (“Kerrisdale I”); *see also* Letter from Sahn Adrangi, Kerrisdale Capital Management, LLC, to Marlene Dortch, Secretary, FCC, IB Docket No. 13-213 (Oct. 22, 2014) (“Kerrisdale II”).

Commission's proposed TLPS rules. While interested parties met the May 2014 deadline for comments and the June 2014 deadline for reply comments, Kerrisdale had no interest yet in Globalstar stock and was indifferent to this proceeding.³ Then months after the close of the pleading cycle, after admitting that its interest was driven by "financial positions that would increase in value if the price of Globalstar's stock declines,"⁴ Kerrisdale lodged pseudoscience *ex parte* filings transparently designed to depress Globalstar's stock price. The Commission should reject Kerrisdale's self-serving effort to advance its own private interest over the public interest.

Kerrisdale's financially motivated filings are severely flawed and do not contain any material relevant to the Commission's decisions in this proceeding. Its supposed criticisms of the TLPS field study conducted by Globalstar and Jarvinian in 2013 are meritless and irrelevant. Kerrisdale claims that Jarvinian conducted a computer simulation of TLPS coverage rather than actual field tests, and argues that Globalstar overstated the coverage and capacity advantages of TLPS over public Wi-Fi. In fact, Jarvinian's conclusions regarding signal propagation and capacity were based on real-world measurements of access point transmissions on Channel 14 (TLPS) and Channel 6 (public Wi-Fi). Jarvinian collected more than 3,000 such data points to demonstrate substantial differences in coverage between a TLPS access point and an access point using conventional Wi-Fi channels, and Globalstar's assessment of coverage and capacity was well founded and based on real-world testing.⁵ In fact, in order to be conservative, these tests compared coverage and capacity at a time when public Wi-Fi usage was well below peak levels, which made the performance disparity between TLPS and Wi-Fi Channel 6 comparatively moderate and anything but overstated.

Kerrisdale's claims are based on computer simulations and a survey purporting to project the range of a 2.4 GHz Wi-Fi signal. These simulated results from a source unwilling to go on the record should be given no weight. Kerrisdale fails to account for the distinction between physical propagation range and effective range due to interference limitation, and makes no attempt to compare the performance of TLPS with public Wi-Fi in an environment that already includes substantial Wi-Fi operations. Such a comparison – showing the superior characteristics of TLPS transmissions on unencumbered 802.11 Channel 14 – was the very purpose of the Jarvinian field testing, and the conclusions of that testing remain uncontested. While the physical propagation

³ See 47 C.F.R. § 1.415 (providing that the FCC will establish comment deadlines and stating that "[n]o additional comments may be filed unless specifically requested or authorized by the Commission.").

⁴ Kerrisdale I at 2.

⁵ Letter to Mignon Clyburn, Acting Chairwoman, FCC, from L. Barbee Ponder IV, Globalstar, Inc., RM-11685 (June 10, 2013).

ranges of TLPS and public 2.4 GHz 802.11 channels are identical in a vacuum, the lack of significant interference on Channel 14 means that the usable range for equivalent throughput is much greater in TLPS spectrum. Significantly, the more interference-limited the environment is (*e.g.*, a dense urban area), the greater the effective differential in performance between TLPS and unlicensed 2.4 GHz spectrum.

Kerrisdale's analysis also ignores the carrier-controlled nature of TLPS. For both regulatory and market-based reasons, a TLPS operator will manage operations on Channel 14 through a network operating system. Centralized coordination of TLPS coverage boundaries and frequency re-use through control of power and radiation patterns will limit interference and enable a high, carrier-grade quality of service that is unobtainable on public Wi-Fi channels.⁶ In contrast, uncoordinated co-channel usage constrains the use of these network management techniques in public Wi-Fi spectrum.

Like its simulated coverage from a single access point, Kerrisdale's anonymous simulation of a Wi-Fi network architecture using a large number of 5 GHz and dual-mode (5 GHz/2.4 GHz) access points is irrelevant to the Jarvinian test results comparing TLPS and public Wi-Fi propagation and capacity.⁷ Globalstar actively supported the Commission's proceeding to free up additional Wi-Fi channels at 5 GHz, and it believes that the Commission should put the 5 GHz band and other bands to greater use to meet the public's accelerating demand for wireless broadband. At the same time, Kerrisdale's network design merely highlights the inferior propagation characteristics of the 5 GHz band and the need for a large number of access points for this deployment. Kerrisdale continues to treat the 5 GHz band as a direct alternative to 2.4 GHz, but 5 GHz transmissions decay at roughly 4.5 times the rate of 2.4 GHz signals in free space and meaningfully faster when transiting common building materials. Thus, while it is an important complement, the 5 GHz band because of its limited propagation will never achieve the same functionality as the 2.4 GHz band, regardless of future technological developments.⁸

⁶ Comments of Globalstar, Inc., IB Docket No. 13-213, at 14-15 (May 5, 2014) ("Globalstar Comments").

⁷ Kerrisdale II at 3-4.

⁸ Kerrisdale misleadingly portrays 2.4 GHz as a dead band that is soon to be abandoned for the 5 GHz band and the 802.11ac standard, which was developed to accommodate the larger channel widths at 5 GHz. Development of the 2.4 GHz band continues at a robust pace and will likely accelerate after the Commission adopts TLPS rules. The industry remains focused on dual-band devices where 2.4 GHz will continue to be essential to device operations.

The Commission should also disregard Kerrisdale's grossly manipulated test of the effect of TLPS operations on 802.11 Channel 14 at 2473-2495 MHz on nearby public Wi-Fi networks operating on Channel 11 at 2451-2473 MHz.⁹ Kerrisdale's test parameters bear no resemblance to real-world operating conditions. In a sealed, anechoic test chamber, Kerrisdale's contractor placed a single access point operating on Channel 11 directly next to access points and client devices operating on Channel 14. This diversity of transmitting sources and the density and close physical proximity of this equipment are entirely unrealistic and would never exist in practice. In addition, for the Wi-Fi traffic on Channel 11, four "parallel" traffic streams were utilized, implying that the access point was transmitting four parallel spatial streams. This mode of operation appears purposely selected since it is known to be particularly vulnerable to interference. Also, the traffic generator for all four of the tightly spaced Channel 14 transmissions was set on bi-directional mode. As a result, both the Channel 14 access points and client devices were transmitting and therefore presumably interfering with one another. This mode further increases the probability of interference to adjacent-channel operations.

Finally, the Channel 14 access points and client devices in the Kerrisdale tests were set to operate in the now fifteen-year old and virtually obsolete 802.11b mode, a mode that would never be deployed in TLPS, while the Channel 11 devices were set to operate in 802.11n mode (the most widely deployed version of the technology today). It is well known that the operation of Wi-Fi devices using 802.11n is severely degraded by nearby devices using 802.11b.¹⁰ This detrimental impact on throughput occurs not only if the proximate 802.11b and 802.11n operations are on the same channel, but also if these operations occur on adjacent channels (such as Channels 6 and 11 or Channels 11 and 14), since the longer packet transmission times for 802.11b disproportionately defer 802.11n carrier sensing. In the future, TLPS operations on Channel 14 will be in the

⁹ Kerrisdale II at 5-7.

¹⁰ See, e.g., Alfred Chan, Trapeze Networks, "IEEE 802.11n WLAN Enterprise Deployment," at 39 (Nov. 8, 2010) ("802.11 and 802.11b clients seriously degrade 802.11n performance as they have no OFDM capabilities and do not recognize an OFDM signal. If possible legacy 802.11 and 802.11b devices should be taken out of service when deploying 802.11n."), <https://www.bicsi.org/uploadedfiles/PDFs/Conferences/singapore2010/day2/2.8%20802.11n%20Deployment%20-%20Alfred%20Chan,%20Trapeze.pdf>; see also Meru Networks, "Wireless Without Compromise: Delivering the Promise of IEEE 802.11n," at 11-12 (viewed Oct. 29, 2014) ("A single legacy client can have a huge performance impact for all users . . . If all clients are allowed to send the same number of packets, an 802.11n network could spend nearly all its time listening to slow 802.11b transmissions. The worst client will dominate the airwaves and the performance of the entire network will suffer due to the slower clients."), http://me.westcon.com/documents/36967/Delivering_the_promise_of_11n_White_Paper.pdf.

more interference compatible 802.11n mode. With its choice of test parameters, Kerrisdale attempts to cause controversy for its own financial benefit.

In any case, mutual effects among Wi-Fi channels were obviously understood and anticipated by IEEE when it designed the 802.11 standard. The standard provides for the use of Channel 14 at 2473-2495 MHz and thirteen other 22 megahertz channels across the 2.4 GHz ISM band. Any party is free today to deploy Wi-Fi systems on Channels 2, 5, 7, or 10, despite the effects on non-overlapping Channels 1, 6, and 11. With respect to Channel 14, IEEE itself urged the Commission in 2003 to permit 802.11 operations above 2483.5 MHz without any concern about the effect of those operations on preexisting Wi-Fi or other unlicensed systems at 2.4 GHz.¹¹

Compliance with Part 15 of the Commission's rules is all that should be required for unlicensed operations below 2483.5 MHz, including TLPS in the 2473-2483.5 MHz band segment. As it has described in this proceeding, Globalstar's TLPS operations will comply not only with already existing Part 15 rules, but also with the Commission's proposal in the *NPRM* to limit out-of-band emissions below 2473 MHz.¹²

While Kerrisdale claims concern over the possibility of increased interference to Wi-Fi from Channel 14, it incongruously calls for the Commission to open up Channel 13 in the United States. It even suggests a nationwide shift to a "Channel 1/5/9/13 template" for Wi-Fi operations.¹³ It is elemental that this Channel 1/5/9/13 structure would result in greater Wi-Fi interference than Channel 1/6/11/14 usage. A more tightly packed Channel 1/5/9/13 configuration would spread Wi-Fi transmissions over only 83 megahertz of spectrum, compared to 95 megahertz for the Channel 1/6/11/14 arrangement. Because of the greater potential for interference – plus the need to comply with emissions limits at the 2483.5 MHz band edge – the Channel 1/5/9/13 alignment is almost never used. Network engineers in the United States use the Channel 1/6/11 Wi-Fi configuration primarily, and engineers in other countries typically follow this protocol.

* * *

The record in this proceeding demonstrates the public interest benefits of the Commission's proposed rules, including the ability of TLPS to ease the worsening Wi-Fi

¹¹ Comments of IEEE 802, IB Docket No. 02-364 (July 7, 2003). *See also* Comments of the License-Exempt Alliance, IB Docket No. 02-364 (July 11, 2003).

¹² Globalstar Comments at 29-30.

¹³ Kerrisdale I at 8-9.

traffic jam,¹⁴ the availability of additional spectrum for wireless broadband,¹⁵ improved service quality at 2.4 GHz,¹⁶ increased capacity for wireless carriers,¹⁷ the rapid delivery of TLPS capability to consumers' existing devices,¹⁸ and significant benefits for public safety and educational and other institutions.¹⁹ Among other things, Kerrisdale ignores the fact that the Commission's proposal would increase the use of largely fallow unlicensed spectrum at 2473-2483.5 MHz,²⁰ in keeping with the Commission's ongoing efforts to open up the 5 GHz band and other bands to greater use and efficiency. Most recently, Steve Pociask, President of the American Consumer Institute, estimated that the Commission's new rules and Globalstar's launch of TLPS will yield additional public interest benefits by creating nearly 90,000 jobs and \$11 billion of GDP annually.²¹

The Commission's innovative rules for low power wireless broadband in the Big LEO band, proposed almost a year ago, represent the logical next step as the Commission advances the nation's spectrum policy goals. For more than a decade, the Commission has worked toward more flexible terrestrial use of MSS spectrum. In 2003, the Commission adopted rules for MSS ATC operations in the Big LEO band and other MSS bands.²² In 2010, the National Broadband Plan noted that the restrictive nature of these MSS ATC rules had "made it difficult for MSS providers to deploy ancillary terrestrial networks, as well as to establish partnerships with wireless providers or other well-

¹⁴ Reply Comments of Samsung Electronics America, Inc. and Samsung Telecommunications America, LLC, IB Docket No. 13-213, at 1 (June 4, 2014) ("Samsung Reply"); Reply Comments of Oceus Networks, IB Docket No. 13-213, at 2-3 (June 4, 2014) ("Oceus Reply").

¹⁵ Samsung Reply at 1; Comments of DISH Network Corporation, IB Docket No. 13-213, at 2 (May 5, 2014); Comments of NTCH, Inc., IB Docket No. 13-213, at 2 (May 5, 2014) ("NTCH Comments").

¹⁶ Comments of Oceus Networks, IB Docket No. 13-213, at 4 (May 5, 2014) ("Oceus Comments").

¹⁷ NTCH Comments at 2; Samsung Reply at 1.

¹⁸ Oceus Comments at 4; NTCH Comments at 2-3.

¹⁹ NTCH Comments at 2; Oceus Reply at 2.

²⁰ Samsung Reply at 1.

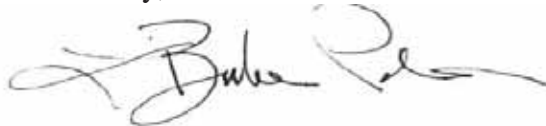
²¹ Steve Pociask, The American Consumer Institute Center for Citizen Research, "Benefits of Expanding Wi-Fi," at 6 (Oct. 2014), <http://www.theamericanconsumer.org/wp-content/uploads/2014/10/Final-Wi-Fi.pdf>.

²² See *Flexibility for Delivery of Communications by Mobile Satellite Service Providers in the 2 GHz Band, the L-Band, and the 1.6/2.4 GHz Bands*, Report and Order and Notice of Proposed Rulemaking, 18 FCC Rcd 1962 (2003) ("ATC Order").

capitalized potential entrants,”²³ and urged the Commission to take “actions that will optimize license flexibility sufficient to increase terrestrial broadband use of MSS spectrum” while preserving the MSS industry’s unique services.²⁴ In response, the Commission issued a Notice of Inquiry on the regulatory barriers to terrestrial use of existing MSS spectrum and specifically asked how it “can best increase the value, utilization, innovation and investment in the spectrum for terrestrial services throughout the 2 GHz, Big LEO and L-bands.”²⁵ In December 2012, the Commission reformed the 2 GHz MSS-terrestrial framework by eliminating the ATC requirements in that band and establishing flexible technical rules for future terrestrial operations.²⁶ The Commission’s proposed rules for low-power terrestrial mobile broadband service in the Big LEO band would accelerate this shift toward efficient and innovative use of MSS spectrum. Globalstar urges the Commission to adopt its proposed rules for TLPS as expeditiously as possible.

Pursuant to section 1.1206(b)(2) of the Commission’s rules, 47 C.F.R. § 1.1206(b)(2), this *ex parte* letter is being filed electronically for inclusion in the public record of the above-referenced proceeding.

Sincerely,



L. Barbee Ponder IV, General Counsel
and Vice President Regulatory Affairs

²³ FCC, “Connecting America: The National Broadband Plan,” at 88 (rel. March 16, 2010), <http://download.broadband.gov/plan/national-broadband-plan.pdf> (“National Broadband Plan”).

²⁴ *Id.* at 87.

²⁵ *Fixed and Mobile Services in the Mobile Satellite Service Bands at 1525-1559 MHz and 1626.5-1660.5 MHz, 1610-1626.5 MHz and 2483.5-2500 MHz, and 2000-2020 MHz and 2180-2200 MHz*, Notice of Proposed Rulemaking and Notice of Inquiry, 25 FCC Rcd 9481, ¶ 26 (2010).

²⁶ *Service Rules for Advanced Wireless Services in the 2000-2020 MHz and 2180-2200 MHz Bands; Fixed and Mobile Services in the Mobile Satellite Service Bands at 1525-1559 MHz and 1626.5-1660.5 MHz, 1610-1626.5 MHz and 2483.5-2500 MHz, and 2000-2020 MHz and 2180-2200 MHz; Service Rules for Advanced Wireless Services in the 1915-1920 MHz, 1995-2000 MHz, 2020-2025 MHz and 2175-2180 MHz Bands*, Report and Order and Order of Proposed Modification, 27 FCC Rcd 16102 (2012).

Declaration

I hereby certify under penalty of perjury that the engineering statements made in the foregoing written *ex parte* of Globalstar, Inc. are true and correct to the best of my knowledge.

Dated: October 30, 2014

A handwritten signature in black ink that reads "Dennis A. Roberson". The signature is written in a cursive style with a horizontal line underneath it.

Dennis Roberson
President and Chief Executive Officer
Roberson and Associates, LLC