CENTURYLINK\textsuperscript{1} REPLY IN OPPOSITION TO APPLICATION

Pursuant to 47 C.F.R. § 25.154(d), CenturyLink submits this reply in continued opposition to Higher Ground LLC’s application for a blanket license to operate up to 50,000 mobile earth terminals for C-band operations.\textsuperscript{2} CenturyLink remains concerned that the planned use of frequencies in the 5925-6425 MHz band for mobile earth station transmission purposes will cause harmful interference to CenturyLink’s fixed microwave facilities located throughout the nation that use frequencies in this band. Because Higher Ground’s interference protection regime is wholly untested, Higher Ground has failed to demonstrate special circumstances that would warrant granting the waivers requested as part of its application. Further, the convenience of communication that the SatPaq devices would afford to some individuals does not outweigh the potential for harmful interference that could bring down communication links impacting hundreds of individuals, and thus is not in the public interest. As such, CenturyLink continues to urge the Commission to deny the application.

\textsuperscript{1}This filing is made on behalf of CenturyLink, Inc. and its subsidiary entities that provide communication services using fixed microwave facilities.

I. HIGHER GROUND’S APPLICATION TRIGGERS ADDITIONAL SCRUTINY.

Under the Commission’s rules, radio station applications will be granted where after examination of the application, any pleadings, any objections and any other pertinent materials, “the Commission finds that the applicant is legally, technically, and otherwise qualified, that the proposed facilities and operations comply with all applicable rules, regulations, and policies, and that grant of the application will serve the public interest, convenience and necessity.”\(^3\) In this case, absent several waivers of the Commission’s rules, Higher Ground’s application would immediately fail because its proposed devices and operations are not in accord with several existing Commission rules. Thus, in order to grant Higher Ground’s application, the Commission must take the additional step of evaluating whether waiver of several of its rules is appropriate to permit the application to be granted. This further evaluation should reveal that waiver is not appropriate and the application must be denied.

II. HIGHER GROUND’S UNTESTED AND INCOMPLETE INTERFERENCE PROTECTION REGIME CANNOT SUSTAIN A WAIVER OF THE COMMISSION’S FREQUENCY COORDINATION PROCEDURES RULES OR THE COMMISSION’S RULES THAT CATEGORICALLY EXCLUDE MOBILE DEVICES FROM THE C-BAND.

CenturyLink’s greatest concern with Higher Ground’s application and its assertions as to how its novel self-coordination regime will detect and avoid harmful interference with fixed point-to-point microwave facilities is that the regime is completely untested.\(^4\) The proposed methods (including exact procedures for location database query), the assumptions and estimates they are based on, and their practicalities of implementation have simply not been tested. As a result, there is no direct experience on which to gauge the accuracy of Higher Ground’s

\(^3\) 47 C.F.R. § 25.156(a).

\(^4\) Higher Ground has acknowledged this (see CTL Comments at 4) and does not address this concern of CTL’s in its Response ( Consolidated Opposition of Higher Ground LLC, filed herein Sept. 23, 2015, or “Higher Ground Response”).
expectations regarding its interference protection strategy. Yet, Higher Ground seeks a waiver of the Commission’s existing frequency coordination requirements for avoiding harmful interference, based on its novel, untested, alternative approach. A speculative methodology should not be sufficient to trigger waiver of the Commission’s established requirements.

Further, Higher Ground’s response raises several additional concerns regarding its application. Higher Ground reiterates that the devices will operate as attachments to smartphones and that initial target markets includes tourists and those engaging in outdoor recreational activities such as hiking, camping and fishing outside of cellular areas. Yet, it is just this type of use that can trigger interference that is the hardest to find, locate, and troubleshoot given its transient and intermittent nature.

Higher Ground also states that it will be able to locate any device causing interference through the use of transmission logs and terminate that interference through remote shutdown of the device. Yet, it remains questionable – and untested – that transmission logs will be sufficient to identify a device that may be causing intermittent interference. If a fixed link operator is experiencing interference, how is it to know that there are SatPaq devices in the area that might be causing the interference? Will SatPaq locations be made public in real time? How does the fixed link operator know how to quickly identify if a SatPaq device is the cause of the interference and where does it go to address that? What is the process for communicating with Higher Ground that a SatPaq device is causing interference and what happens if Higher Ground does not agree? If there is more than one SatPaq device in the vicinity of a fixed link operator experiencing interference – which seems quite plausible if the devices are to be targeted to consumers engaging in recreational outdoor activities – how will it be determined which device

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5 Higher Ground Response at 10-11.
is or was causing the interference? What if the interference is caused by more than one device? Will Higher Ground remotely shut down all SatPaq devices in the area?

Higher Ground also states that it has specific signal bandwidths that could aid fixed microwave operators in determining if a SatPaq device might be the cause of an interference event. This approach is impractical. It presumes a high level of training on SatPaq devices and it presumes an ability to quickly perform measurements to characterize the interference that simply do not exist. In many rural microwave links, the level of alarming is limited to a “major alarm” or “link down alarm”. A detailed report on the signal signature of the interfering signal requires a highly trained individual with specific test equipment to go on site, which is costly and time consuming.

Meanwhile, as the fixed link operator is taking all the steps it can to determine the cause of the interference, a major outage could be occurring. Higher Ground’s approach for remedying any interference is not sufficient to prevent harmful interference to CenturyLink’s fixed microwave facilities.

Higher Ground also states that its approach will effectively prevent harmful interference by SatPaq devices because a number of databases as well as its network controller will insure that certain transmission levels will never be exceeded and thus not cause harmful interference. Even if this is the case, this makes the successful operation of critical CenturyLink communication facilities dependent on another entity’s operations without any defined relationship with that entity or understanding of what standards apply and what procedures will be followed in the event of emergency. What guarantee does CenturyLink have of proper operation of Higher Ground’s network controller, including in case of emergency or natural

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6 Higher Ground Response at 10-11.
7 Id. at 13.
disaster? CenturyLink’s network has very strict reliability and operations requirements, including conformance to Telcordia Equipment Building System (NEBS) level 3 for all network elements in its central offices, including microwave radios. This conformance ensures high network reliability and good network performance including during catastrophic conditions such as extreme temperatures, smoke, humidity, or earthquakes. It is not clear what standards the Higher Ground network controller would follow.

III. HIGHER GROUND’S APPLICATION IS NOT IN THE PUBLIC INTEREST.

Higher Ground has not established that its novel, untested interference protection regime is sufficient to protect fixed microwave facilities from harmful interference. The proposed alternative approach, especially because it is untested, leaves too many questions unanswered for it to justify a waiver of the Commission’s established frequency coordination procedures or a waiver of the categorical ban on mobile device use in the C-band. The self-coordination approach leaves fixed microwave providers with no ability to coordinate with Higher Ground to avoid interference and an ill-defined, impractical ability to coordinate with Higher Ground in addressing and remedying actual interference. The approach might be more aptly termed the “non-coordination” approach. Permitting Higher Ground to launch these SatPaq devices nationwide without a tested, well-defined approach for avoiding and remedying interference with fixed microwave facilities that are providing critical communication links throughout the country is not in the public interest. For these reasons and the reasons stated in CenturyLink’s prior
opposition comments, CenturyLink respectfully requests that the Commission deny this application.

Respectfully submitted,

CENTURYLINK

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Its Attorney

September 28, 2015
DECLARATION OF THOMAS SCHWENGLER

I am employed by CenturyLink as a principle architect and in that role my responsibilities include architecting microwave links in CenturyLink’s network. Through this role I am familiar with CenturyLink’s fixed microwave facilities. I have reviewed the foregoing CenturyLink Reply in Opposition to Application and I declare, under penalty of perjury, that the facts stated therein are true to the best of my knowledge, information, and belief.

[Signature]
Thomas Schwengler, Ph.D.

Executed on September 28, 2015
CERTIFICATE OF SERVICE

I, Ross Dino, do hereby certify that I have caused the foregoing CENTURYLINK REPLY IN OPPOSITION TO APPLICATION to be:

1) Filed with the FCC via the International Bureau Electronic Filing System; and

2) With a copy served, via electronic mail and first-class U.S. Mail, postage pre-paid, on each of the parties as referenced on the attached service list.

/s/ Ross Dino

September 28, 2015
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