PierCon Solutions L.L.C.
Specialists in Wireless Systems

63 Beaver Brook Rd., Suite 201
Lincoln Park, NJ 07035
(973) 628-9330 phone
(973) 628-9321 fax

February 5, 2018

William Rice, Chairman
Village of Nelsonville Zoning Board of Appeals
258 Main Street
Nelsonville, NY 10516

Re: Homeland Towers/AT&T/Verizon Wireless application for a proposed cell tower at 15 Rockledge Road, Nelsonville, NY

On behalf of Verizon Wireless, the following provides details in regard to information such as a flagpole design, an outdoor distributed antenna system (DAS), and the 850 MHz frequency band for Verizon Wireless.

Flagpole Design

The flagpole design will be discussed as this was brought up in the AFRK report. An alternate type of wireless facility is a flagpole type design which houses most of the equipment (antennas, remote radios heads, and cables) inside a flagpole-like pole. This type of design places a large amount of equipment in an extremely tight space. Since the amount of extra space is limited, it is very difficult to modify the equipment after it has been installed (azimuths cannot be adjusted, mechanical down tilt cannot be added). This causes the site to not function as optimally as it should. Due to space limitations, the azimuths which are available in a flagpole design are limited to 120 degree differences and could not be adjusted.

If a flagpole design was to be used in this area, certain criteria would need to be met to accomplish the goals of remedying the significant gap in coverage. Verizon Wireless would need to stack antennas on top of each other within the pole (taking two slots instead of one). Since AT&T was also proposed on this monopine, a separate flagpole would be designed for them. PierCon did not review AT&T radio frequency plots or submissions in regard to minimum height requirements, but it is our understanding that AT&T height requirements are similar to Verizon Wireless' since both flagpoles would be 110' tall.

In summary, in order for a flagpole design to work, two flagpoles at 110' would be needed instead of 1 monopine at this location.

Outdoor DAS

An outdoor DAS is not a feasible alternative to remedy Verizon Wireless' significant gap in service in in this area. If a DAS were to be implemented in this area, the location of antennas would likely be on new or existing utility poles (if they were available). The Village of Nelsonville contains a high amount of trees that are taller than all of the existing poles. A typical DAS node in this environment with trees taller than the antennas can be expected to cover approximately 800' – 1200' along the street on which it is located with the existing utility poles. If a DAS was in place, over 20 DAS nodes would need to be installed to have comparable coverage to the proposed facility at 15 Rockledge Road. Given utility company limitations, it is expected that most utility poles will not be available. Even with 20 DAS nodes, in-building coverage would not be present in many residences (which the proposed site provides coverage to) due to their distance off of the road and the presence of the numerous dense surrounding trees.

It should be noted that nodes along Route 301 would be within the State right-of-way, and thus the Village would not have any permitting control, and nodes in the Village right-of-way would require an agreement with the Village. I would also like to note that the examples of DAS nodes included in Exhibit O of the opposition memorandum are not relevant to the Nelsonville area. Specifically the

examples shown were only 25 feet in height and located in a park or college campus, or 30 feet in a downtown urban area. These areas do not have the foliage or topography similar to Nelsonville. Given the tree line in this area, much taller facilities would be necessary given the foliage and topography. Such height would result in far different visual appearance than the examples set forth in Exhibit O. Obviously the numerous indoor or in-stadium examples shown in Exhibit O are also not applicable in the Nelsonville area.

Utility poles which are relevant to the Nelsonville area are attached to this letter. Attached are four pictures (taken on January 31st by Homeland Towers). In the attached photos, existing utility poles are shown in the areas of nearby schools and homes. It is clear that existing vegetation is much taller than the existing utility poles from these pictures. As discussed earlier, tall vegetation severely limits the ability of a DAS to provide coverage.

The other factor in determining in a DAS solution is feasible pertains to the reliability of the system. Since a DAS design utilizes multiple nodes distributed across a wide area, a power outage can effectively bring down the DAS system. At a Verizon Wireless macro facility, such as the proposed, a generator will automatically turn on and allow the site to continue providing service to the area. During prolonged outages, Verizon Wireless dispatches technicians to refuel these generators so that service will continue to be provided. This cannot be done in a DAS system, as there are too many locations to be able to provide backup power (instead of one location). Limitations on utility poles can prevent additional cabinets being located on them which eliminate a backup battery option. Simply put, if the power goes out on the utility poles, the DAS system also loses power. Emergency situations like ice storms, falling trees, car crashes, or other disasters could all cause the DAS system to lose power when service is needed most.

In addition to the infeasibility of DAS, it should be noted that collocating multiple carriers (whether wireless service providers or public safety) on a DAS system is very difficult. For a macro wireless facility, additional carriers and public safety agencies can simply place additional equipment cabinets on the ground and additional antennas on the structure. Collocation on a DAS gets quite complicated due to power, frequency, and antenna restraints.

A DAS is not a viable solution in Nelsonville due to the infeasibilities described above and the limitation related to collocation. Simply put, a DAS is not a feasible engineering solution to provide reliable wireless service in this area of Nelsonville given the vegetation, overall size of the gap, difficult topography and reliability.

850 MHz Frequency Band

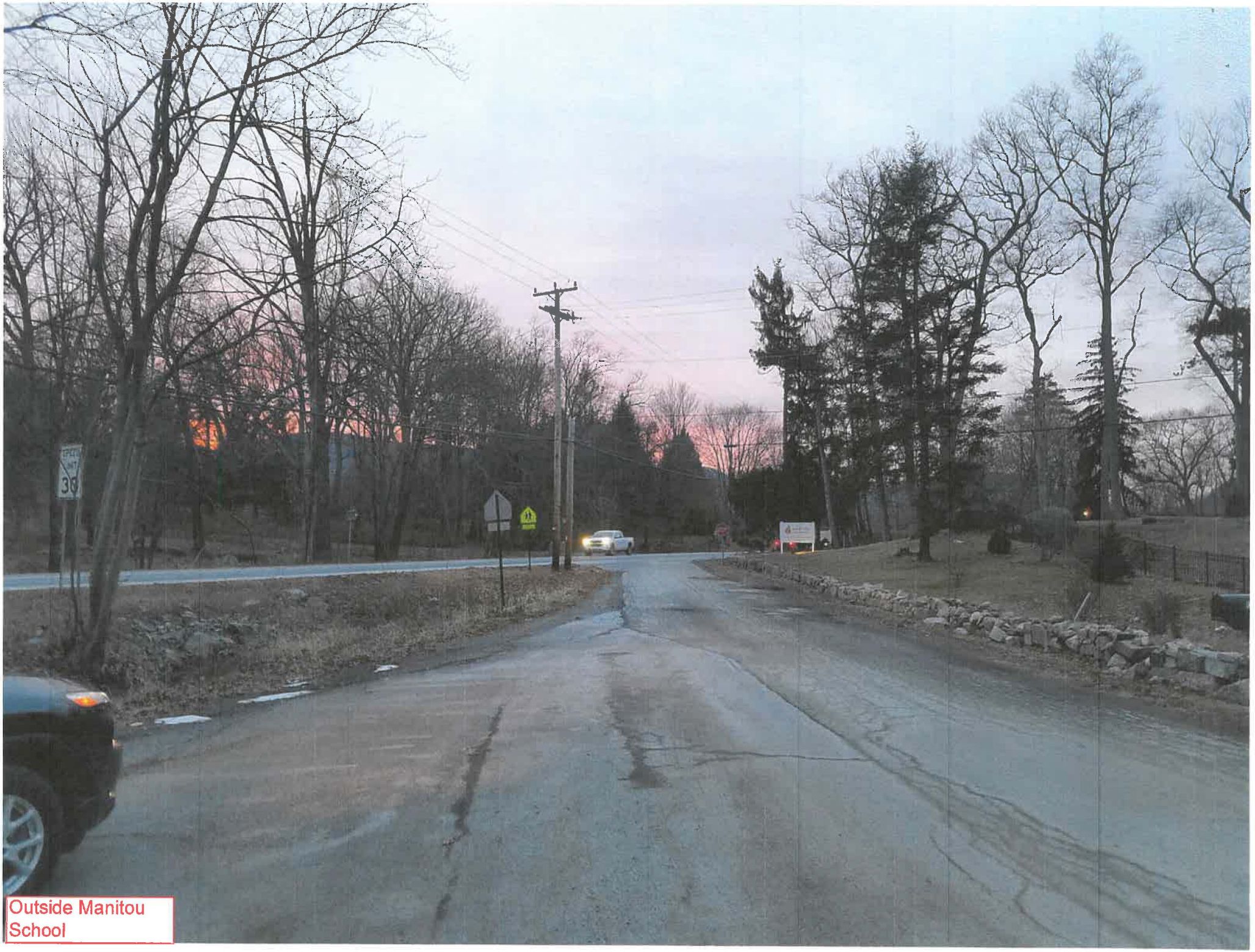
Questions have been asked about the 850 MHz band from Verizon Wireless. An incorrect assumption has been made that the 850 MHz frequency band is the only band in which Verizon Wireless provides personal wireless service. This is simply not true. The 850 MHz frequency band, as described in previous reports, currently deploys 3G CDMA which can be used for voice and data (just like 4G LTE can). VoLTE service is a personal wireless service, irrespective of the frequency band. 3G is an older technology which is approximately 10 times as slow and efficient as 4G. While this technology will remain active on existing facilities to service those without 4G capabilities, including existing facilities in this area, Verizon Wireless is not installing 3G technology on new facilities anymore (including the proposed facility at 15 Rockledge Road). The 850 MHz band is currently being transitioned to becoming a 100% LTE channel, and installing 3G in additional locations would make this transition take longer.

As stated by the RF expert Ron Graiff retained by the Village of Nelsonville, and I agree, radio frequency propagation gets worse or poorer as the frequency gets higher. To be more specific, 700 MHz coverage is the best coverage which can be expected from Verizon Wireless' currently licensed frequencies of 700, 850, 1900, and 2100 MHz.

Sincerely,

Adam Feehan, Sr. RF Engineer
PierCon Solutions, LLC


Outside Haldane
High School


Outside Manitou School


Route 301 near
Wood Ave


Wood Ave