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September 4, 2023

Mr. Bruce Flower, Chair
Town of Wappinger Planning Board
20 Middlebush Rd
Wappingers Falls Wappingers Falls 12590-4004

RE: Telecommunications Facility RF Site Review
Verizon Wireless "Kent Road" and "Spook Hill Park" Small-cell sites

Dear Mr. Flower,

We have been retained by the Town of Wappinger to provide a review of the subject small-cell[1] wireless facilities. This preliminary report discusses the radio-frequency (RF) aspects of the proposed Verizon Wireless (Applicant) small-cell projects in the Town of Wappinger. The "Diddell Road" macro facility is also under review by the town and was addressed in a separate report dated August 31, 2023. Subsequent reports for these sites, if needed, will address any remaining questions or issues that arise during public hearings at the request of the town. We will limit discussion here to the essential information regarding the two small-cell sites since background information applicable to the proposed small-cells and the proposed "Diddell Rd" macro site was included in the August 31, 2023, "Diddell Road" preliminary report.

The following materials form the basis for this report:

1. Exhibit 5 of Zoning Application for "Kent Road" and "Spook Hill Park" small cells (5/10/23) (Engineering Necessity Case – dated April 3, 2023)
2. Related materials posted online at town web site under planning board agenda for June 19, 2023 (https://townofwappingerny.gov/planning-board-meetings-minutes/)
3. Town of Wappinger – Town Code § 240-81 "Telecommunications towers, antennas and personal wireless service facilities"

[1] In order to qualify as a "small-cell", a site must meet the definition requirements of 47 U.S.C. §1.6002.

Summary of Findings

1. The RF coverage levels upon which the proposed site is designed are reasonable values and are consistent with threshold levels used by Applicant in similar sites in this region.
2. Based on the RF coverage thresholds for in-building and in-vehicle coverage and the need to off-load traffic from certain neighbor sites, applicant has demonstrated need[2] for RF coverage and additional traffic capacity from a base station facility in the general area of the proposed project site.
3. Applicant has restricted the proposed small-cells to 46.2' height to comport with existing utility poles in the area (such sites can be up to 55' tall and still qualify as a small-cell). A height increase to 55' would improve coverage and a reduction to 30' would reduce coverage from the proposed 45' ACL.
4. The proposed small-cell sites have antennas more than 10 m above ground. Therefore, the site is categorically excluded under FCC regulations from mandatory human exposure analysis.
5. Although the proposed small-cell sites are categorically excluded from mandatory human exposure analysis, Applicant provided an NIER analysis by SiteSafe which states that an analysis was performed and the proposed site will be operating below 1% of general population exposure limits.
6. If the proposed site is ultimately approved it, like the existing neighbor sites currently in operation, will serve as a fixed area of coverage to which future neighbor sites must connect.
7. Wireless networks consist of individual cells that function as a whole. Approval of any one particular site should consider the future need for additional neighbor sites and the locations of those sites. A new tower in a more controversial area may be required to address the remaining coverage gaps, extend the coverage area, off-load traffic from future saturated sectors, and properly connect the proposed site into the larger network.
8. The proposed RF coverage shows that several coverage gap areas will remain in the area. Those gaps that remain after a proposed site is active imply the possibility that Applicant may decide to address those areas as part of their overall wireless network. At this time, the board should understand the potential need to serve remaining gap areas and how approval of the proposed site will influence the placement and height of future sites.

[2] There are several ways by which a wireless telecommunications service provider can establish site need for a "covered service." A "covered service" is "a telecommunications service or a personal wireless service". See "Accelerating Wireless Broadband Deployment by Removing Barriers to Infrastructure Investment," FCC 18-133, 85 FR 51867, at ¶ 37 and footnote 85 (October 15, 2018) (the FCC regulatory test for establishing an effective prohibition is whether "a state or local legal requirement materially inhibits a provider's ability to engage in any of a variety of activities related to its provision of a covered service," and this test is met "not only when filling a coverage gap but also when densifying a wireless network, introducing new services or otherwise improving service capabilities")

The information in this report concerns the RF engineering issues related to the proposed project to assist the board in weighing the alternatives and planning for the future of the community. Engineering design choices may also implicate aesthetic and legal issues. However, this report must not be relied upon for any legal advice or direction. Legal advice about action on these issues must be obtained from the board's counsel. The remainder of this report addresses the details that support the findings.

Site Details

Applicant proposes two new 46.2'+/- utility pole and antenna array (43' pole height plus approximately 3' cylindrical antenna array) with an antenna centerline (ACL) approximately 45' with an ancillary pole-mounted equipment cabinet. The site is intended to provide wireless signals to the nearby area to enhance reliable service in the area as well as draw wireless traffic away from existing neighbor sites to relieve congestion at those sites, and utilize the mid-band frequencies for wireless traffic in the local area.

RF and Capacity Discussion

The RF engineering preliminary report for Applicant's macro facility (the "Diddell Road" site) contains background information regarding wireless site deployment and methodology for evaluating service gaps, aesthetic impact, and additional technology applications. We refer the reader to that report for such background information and focus on the two small-cell subject sites. Those sites are independent from the Diddell Road macro site.

Applicant has the burden to show proposed sites are necessary and that the proposed sites are the least intrusive to provide service. The proposed sites are intended to provide new RF coverage to the area where existing sites provide some service and thereby off-load traffic from existing sites. Applicant's "Engineering Necessity Case" exhibit shows the two neighbor sites that serve the general area near the proposed small-cell sites. Metrics[3] for the neighbor sites indicate they are often saturated and cannot provide service at mid-band where the bulk of licensed wireless bandwidth is offered to subscribers.

The "Wappingers Falls" beta sector to the west and the "Swartoutville" gamma sector to the east provide service at low-band (700 MHz) to the project areas. Forward Data Volume (FDV) plots for those sites show that each site is frequently over capacity. Overcapacity causes poor service for all users in a sector resulting in slow data transfer and intermittent dropped or blocked calls similar to what might happen at the edge of a cell with weak coverage – sometimes called a service "gap" area. Neither neighbor site can provide mid-band services where the bulk of available bandwidth is offered to

[3] Relevant metrics are the RF signal levels, Forward Data Volume (FDV), and Average Scheduled Eligible Users (ASEU). Each provides insights into cell site service capabilities and limitations.

subscribers[4]. Mid-band services, although available, show very low FDV utilization for each neighbor sector. Further, the Average Scheduled Eligible User (ASEU) plots show values that exceed capacity indicating these sites are saturated at low-band likely due to distant subscribers with multiple sessions due intermittent service. To the extent that the proposed small-cells can overlap areas with mid-band coverage where current subscribers are attempting to use the overcrowded low-band for services, traffic can be drawn away from the saturated neighbor sites and handled with mid-band coverage to improve services in those areas and provide new service in the vicinity of the proposed small-cell poles. We conclude that, based on the propagation plots provided by Applicant, that some traffic will be drawn away from the existing saturated cells and mid-band service will be provided in the vicinity of each of the proposed small-cell sites.

Site Relocation

Last week Applicant submitted an updated site plan that shows relocation of the Spook Hill Park small-cell approximately 160' north on the east side of Spook Hill Road. The "Kent Rd" site remains as originally proposed. The original location was at the intersection of Nancy Aleen Drive. We understand that the request for relocation came as a result of safety concerns about that location. Verizon's RF engineer was able to verify during a phone conversation earlier today that the move will provide the necessary service as originally planned since ground elevation and terrain issues are essentially the same as the original site.

Alternate Locations and Pole Height

Applicant considered six (6) existing poles as potential alternate sites for the "Kent Rd" site and four (4) existing poles for the "Spook Hill Park" site, but other than the new replacement poles as proposed cannot mount antennas at the 45' ACL level. In both locations Applicant estimates the height of existing utility poles at 40' – 45' therefore has limited their proposed sites to similar heights, 43' pole and 46.2' total height including the antenna array. A series of propagation plots for the proposed cells at ACLs of 55', 45' (proposed), and 30'. At 45' the combination of small-cell sites provides nearly complete RF coverage at low-band to draw off traffic from the existing neighbor site, and each small-cell provides some mid-band coverage near each site to allow subscribers who are within range to utilize mid-band service. The analysis is more qualitative and related to trying to match the proposed height to the nearby exiting utility poles.

[4] Approximately 7% of user bandwidth is available at low-band compared to about 93% in mid-band because of the wider range of operating frequencies allocated by the FCC and licensed to Applicant.

Conclusion

The information in this report concerns the RF engineering issues related to the proposed project to assist the board in weighing the alternatives and planning for the future of the community. Engineering design choices implicate aesthetic and legal issues as well. However, this report must not be relied upon for any legal advice or direction. Legal advice about action on these issues must be obtained from the board's counsel.

Thank you for the opportunity to assist the Town of Wappinger. Please feel free to call if there are additional questions or other concerns at this time.

Sincerely,

William P Johnson
Consultant