

February 24, 2023
HDR Project #10355449
Town of Newburgh Task Order 2022-11

Town of Newburgh Planning Board
21 Hudson Valley Professional Plaza
Newburgh, NY 12550

Re: **Verizon Wireless**
Proposed New Wireless Telecommunications Facility – “Fostertown Road”
Pressler Road. Town of Newburgh, Orange County, NY

Dear Chairman Ewasutyn and the Town of Newburgh Planning Board:

This technical memorandum (Tech Memo) was prepared to summarize HDR’s review of the application materials prepared by Young/Sommer (attorney for applicant) and submitted on behalf of the applicant, Verizon Wireless of the East LP d/b/a Verizon Wireless (Verizon, “applicant”) to construct a new wireless telecommunication facility at the above-referenced ±25.7-acre property (the site) located in “AR” (Agricultural Residence) and “RR” (Reservoir Residence) zoning districts in the Town of Newburgh (Town). Verizon has reported a need to supplement its local network’s capacity and coverage to provide enhanced and reliable wireless services to the site area. The applicant is seeking Planning Board approvals of a Special Use Permit and Site Plan, along with six waivers to the Town’s Wireless Telecommunication Facilities Code (Chapter 168). The need for set-back variances has not been identified by the applicant, based on the Bulk Table developed in the drawing set.

The proposed facility includes construction of a new 120-foot tall “conventional” (galvanized grey) monopole and associated ground-based equipment compound in the southwest corner of a small field on the subject parcel ±650-ft west of Pressler Road and roughly behind the parcel located at 138 Pressler Road. It should be noted that the subject parcel fronts Pressler Road north of the parcel at 138 Pressler Road. A Central Hudson Gas & Electric (CHG&E) easement crosses the northern portion of the subject parcel. The nearby land use is predominantly suburban residential or woodlands and open space.

The Verizon facility is proposed to consist of a monopole structure, a 2,500 square foot (50-ft by 50-ft) fenced equipment compound at the base of the structure accessed via a 12-ft wide gravel access road leading to the compound from Pressler Road. A 15-ft wide gravel parking and turn around area is proposed to wrap around the north and west sides of the compound with the main access gate being located on the west side of the compound. Utilities (electric and fiber) are proposed to be routed underground with utility boards/connections to be placed near the northeast corner of the compound. A backup generator is not proposed by Verizon. A total of approximately 0.4 acres is proposed to be disturbed.

Verizon proposes to install a three-sector antenna frame with three panel antennas and two remote radio head units (RRHs) per sector for a total of nine panel antennas and six RRH units. One small over-voltage protection (OVP) unit is proposed to be mounted near the pole structure on the antenna frame. At grade, Verizon is proposing a small equipment platform consisting of two equipment cabinets and an H-frame rack for smaller equipment in the northeastern corner of the equipment compound. The monopole structure and equipment compound as proposed are designed to accommodate up to three additional wireless carriers in the future.

This technical review includes a general assessment of the application (including technical information from Verizon), focusing on issues related to facility operation, capacity/coverage needs, and conformance with electromagnetic radiation hazard criteria. In addition, potential aesthetic impacts and other aspects of the proposed installation are discussed. This review consists of an analysis of the initial and supplemental materials provided by the applicant as of the date of this Tech Memo.

This Tech Memo is written for the review and comment of the Town of Newburgh Planning Board. A summary of Findings and Recommendations is included at the end of this report.

The Tech Memo is divided into the following sections:

1. Application Overview
2. Summary of Application Filings
3. Coverage / Capacity Needs for the Proposed Verizon Facility
4. Conformance with NIER and Other Radiation Hazard Criteria
5. Alternate Site Analysis
6. Visual Impact Analysis / Aesthetics
7. Co-location Potential
8. Cultural / Ecological Resources
9. Structural Assessment
10. Findings and Recommendations

1. Application Overview

Verizon has proposed the installation of a 120-ft conventional monopole (124-ft with lightning rod) to accommodate the proposed Verizon wireless telecommunications facility. Space for up to three additional carrier antenna arrays at lower heights on the monopole (and room for other ground-based equipment) that could be proposed in the future has been included in the Site Plan and the facility design. As of the date of this memorandum, HDR is not aware of whether any other carriers have expressed interest in co-locating at the proposed facility; however, it is likely that other carriers will be interested in co-location if the monopole site is approved and constructed.

The antenna array is divided into three sectors with a subset of the total number of antennas and RRHs divided among each sector. The sectors are known as alpha, beta, and gamma and face approximately east-northeast, south southwest, and north northwest, respectively. A total of 9

panel antennas (3 per sector) will accommodate FCC-licensed frequencies that allow Verizon to provide voice and data exchange services to the site area, both for areas that are currently not sufficiently covered and as a supplement to existing cell sites in Verizon's network. The proposed installation will accommodate Verizon's enhanced "4G" or long-term evolution (LTE) operations, including various voice and data services to consumers. Verizon is licensed to operate at several frequency bands, including 700, 850, 1900, 2100, and 3700 MHz to provide different classes of wireless services (LTE, PCS, and cellular). HDR notes that 5G operations are proposed as part of this application however, high-frequency 5G [mmWave technology] is not proposed.

The tops of the Verizon antennas will reach a height of ± 120 ft above grade (even with the monopole structure height). The centerline height of the panel antennas is proposed at 116 ft. The proposed antennas include two models with the following approximate dimensions and weights:

- 96 inches in height, 11.9 inches in width and 7.1 inches in depth (Commscope NHH-65C-R2B; 51.6 lbs)
- 35.1 inches in height, 16.1 inches in width and 5.5 inches in depth (Samsung MT6047-77A; 87.1 lbs)

A total of 6 small RRH units (2 per sector) are proposed to be situated behind the panel antennas and mounted on the boom struts (part of the antenna mounting system). This equipment is used increasingly by wireless carriers to boost antenna signals and process "call traffic". Two RRH models (1 of each type per sector) are proposed to accommodate the various Verizon frequency bands.

One small overvoltage protector (OVP) will also be mounted behind the panel antennas on the equipment frame. One small GPS antenna will be mounted to the top of the H-frame supports located on the concrete pad within the ground-based equipment compound.

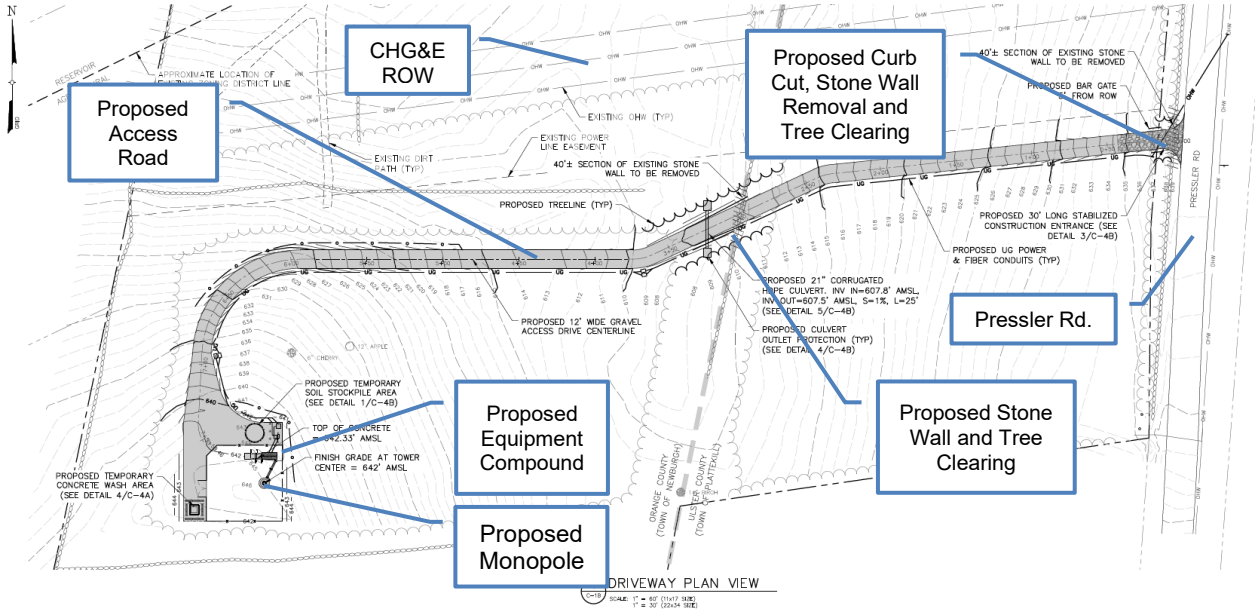
A 50 ft by 50 ft fenced compound (2,500 square feet total), underlain with $\frac{3}{4}$ " crushed stone (6" thick) and stabilization fabric, is proposed at the monopole base to provide dedicated room for the monopole, Verizon's ground-based equipment, and equipment of potential future co-locators. Access to the equipment compound will be from an approximately 760-ft long by 12-ft wide gravel access road that leads to the compound from a curb cut on the west side of Pressler Road (located in the Town of Plattekill, Ulster County). Existing soil will be removed as necessary at the equipment compound and along the access road. Installation of a 6 ft high chain link topped with 3 strands of galvanized steel barbed wire is currently proposed around the monopole and equipment compound area, encompassing the monopole structure and Verizon's equipment cabinets. It is noted here and expanded on in the Recommendations section at the end of this Tech Memo, that final colors, textures, materials of fencing will be at the Planning Board's discretion. Some ancillary equipment (i.e., electric meter and transformer) will be located outside of the fenced compound, as is typical at cell sites. A 12-foot wide double-gate is proposed for access at the west side of the fenced area. Small (maximum dimensions 18" x 12") RF notification and emergency contact signs (Verizon) are proposed on the compound fencing.

The proposed Verizon equipment and battery cabinets (1 each) will be installed on a new 4 ft wide by 11.5 ft long concrete pad. The electric panel, telco panel, and an OVP will be mounted on a 10 ft wide by 10 ft tall H-frame along with a 25W flood light. A single GPS antenna will be mounted just above the top of the H-frame. No tower lighting is required or proposed, and at-grade lighting will only be functional if required for night-time service visits. Cables connecting the antennas and other equipment located on the monopole with Verizon's ground-based equipment will be routed within the monopole structure. A 10-ft tall cable bridge that guides and connects cabling between the monopole and the ground-based equipment is also proposed within the fenced area.

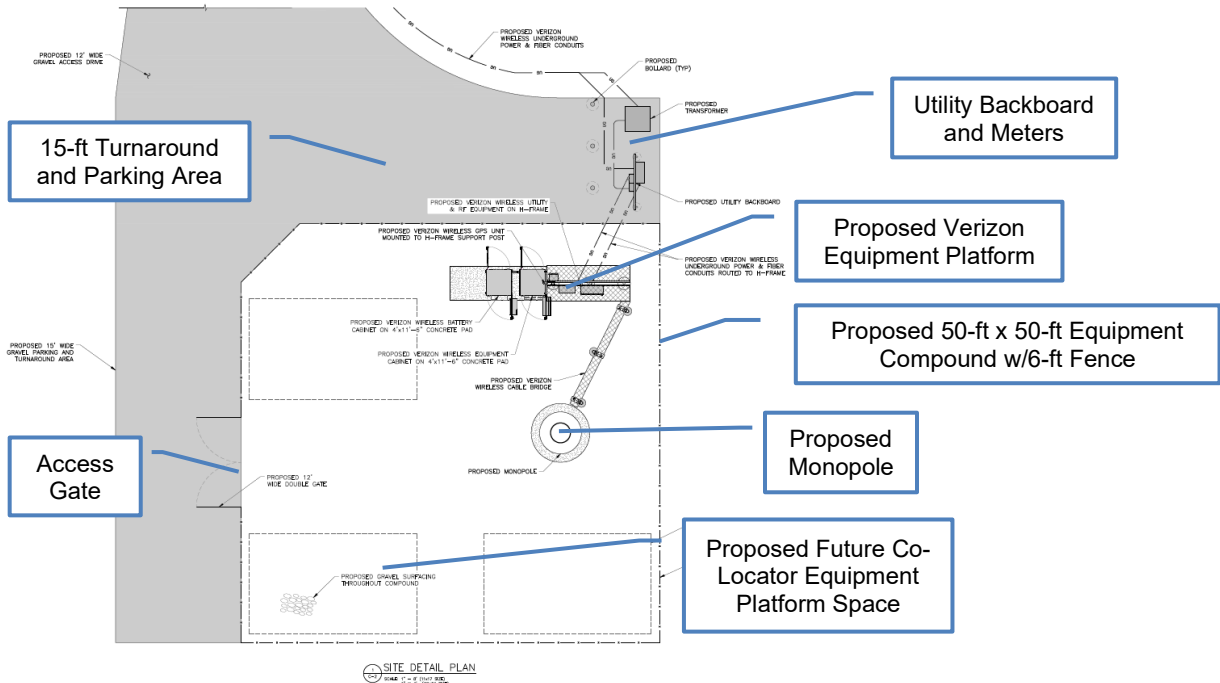
New utility lines (electric and telco; 4" conduit) are proposed to support the wireless facility; all electric, telco, and Verizon utility conduits will be routed underground along the new access road in a common trench and connect with a proposed utility pole to be located on the west side of Pressler Road just south of the proposed curb cut for the access road. A transformer and electrical multimeter center are proposed exterior to the north side of the monopole's fenced compound. Three bollards are proposed adjacent to the multimeter center to protect the equipment from vehicle movements at the property.

The proposed 12-ft wide gravel access road will require site grading and the removal of an approximately 40-ft portion of two separate existing stone walls and the clearing of an approximately 20-ft wide swath of vegetation located between two fields. The applicant did not include details on the number of trees or total area of clearing required to accommodate the access road. Verizon is proposing to install a 25-ft long 21-inch diameter corrugated HDPE culvert where the proposed access road crosses a topographic low spot, which is approximately co-located with the tree line that is proposed to be cleared. Overall, the topography is not expected to be altered significantly based on the access road profile and review of the survey map for the proposed tower/compound area. No changes to the existing stormwater flow regime at the site are anticipated, given the gravel surfaces and limited cut/fill proposed. No landscaping (e.g., vegetation to screen the ground-based compound) is proposed. No significant changes to the existing use of the land other than those already described are proposed. The total area of disturbance is listed as approximately 0.38 acres (inclusive of the equipment compound and the approximately 760-ft long access road).

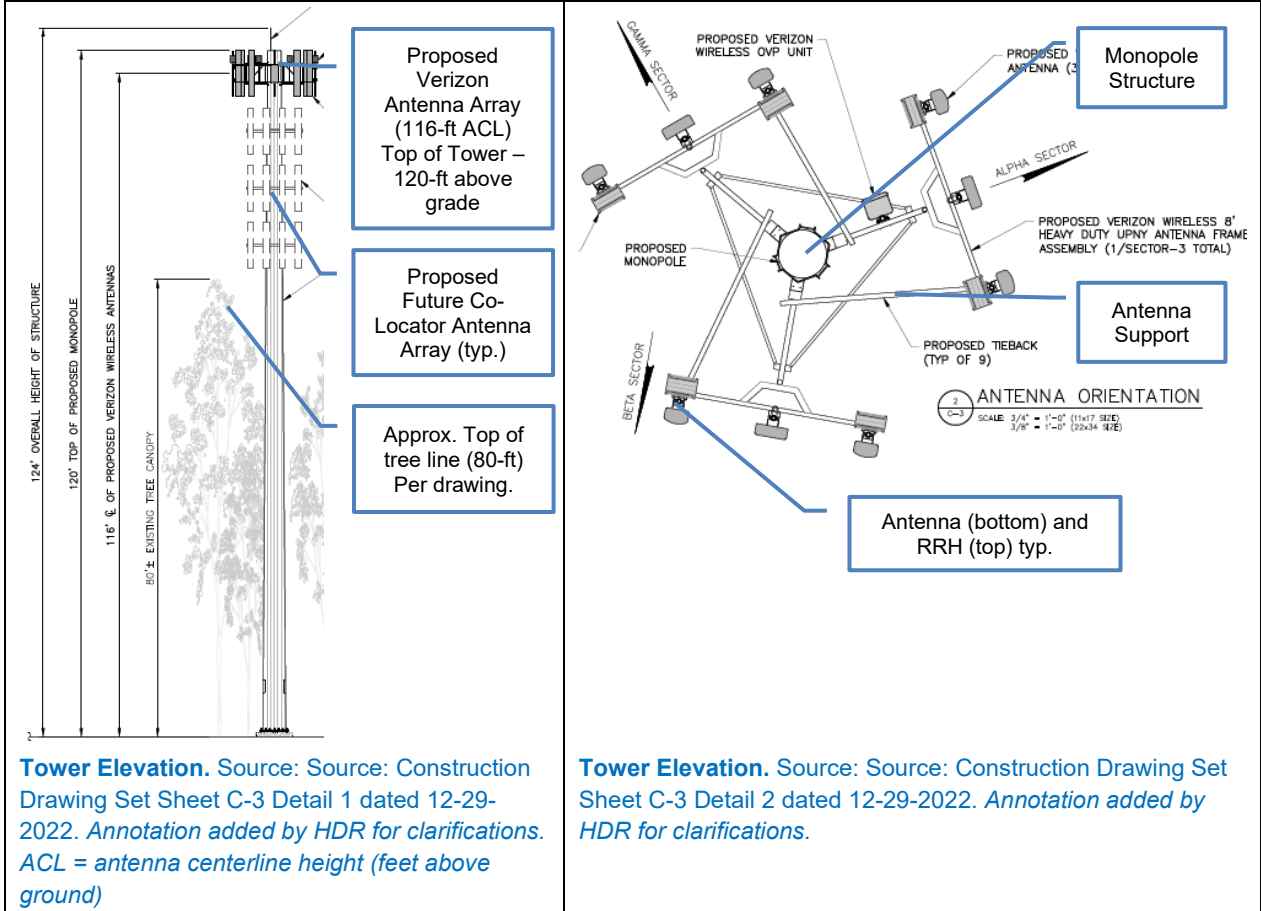
The following images are reproduced from the current (12-29-2022) construction drawings submitted by the applicant and include a plan view of the proposed equipment compound and a cross-section of the proposed monopole.



Driveway Plan View. Source: Construction Drawing Set Sheet C-1B Detail 1 dated 12-29-2022. Annotation added by HDR for clarifications.



Site Detail Plan View. Source: Source: Construction Drawing Set Sheet C-2 Detail 1 dated 12-29-2022. Annotation added by HDR for clarifications.



WAIVER REQUESTS

The applicant is seeking waivers to six of items from the Town’s Wireless Telecommunication Facilities (WTF Law) Code (Town of Newburgh Code, Chapter 168). These waiver requests, along with HDR’s recommendations on whether to grant the requested waivers, are provided in the Recommendations section at the end of this Tech Memo.

2. Summary of Application Filings

Application Submittals

The application submittals received, including supplemental information provided by Verizon during the review process, include the following listed below.

Summary of Application Filings

An initial application package dated June 17, 2022 containing the following components was filed under the title *Statement of Intent and Application for Special User Permit and Site Plan Review*. The package is 98 pages in PDF format. The submittals in this filing which were reviewed for this Completeness Review Memo are outlined below:

1. Statement of Intent and Application for Special Use Permit and Site Plan Review, prepared by Young/Sommer (June 17, 2022; 14 pp.) – *includes the following components:*
 - a. Town of Newburgh Application form for Site Plan Review
 - b. Fee Acknowledgement form
 - c. Planning Board Disclaimer Statement to Applicants (form)
 - d. Disclosure Addendum Statement to Application Petition and Request (form)
 - e. Town of Newburgh Planning Board Checklist
 - f. Statement of Intent (5 pp.)
2. Construction Drawing prepared by Tectonic Engineering Consultants, Geologists, and Land Surveyors, DPC (“Tectonic”); signed by a NYS P.E. (Rev. 0; 6-6-2022; 8 sheets)
3. Documentation of Public Utility Status and Overview of Rosenberg Decision (2 pp.)
4. Reproduction of a portion of the Telecommunications Act of 1996 (7 pp.)
5. Copies of Verizon Wireless’ FCC Licenses (16 pp.)
6. RF Justification prepared by Verizon (June 1, 2022; 19 pp.) – includes coverage and capacity information as related to existing Verizon cell sites in the area.
7. Equipment Specification Sheets [1 antenna model; 1 mounting unit] (6 pp. total)
8. Site Selection Analysis prepared by Verizon Wireless (June 10, 2022; 8 pp.) – includes the applicant’s search ring and analysis of other potentially viable locations for a new Verizon facility.
9. Verizon Wireless Non-Interference Letter prepared by Verizon (June 8, 2022; 1 pp.)
10. SEQR Full Environmental Assessment Form (FEAF) Part 1 (June 3, 2022; 13 pp.)
11. EAF Mapper Summary Report (June 1, 2022; 2 pp.)
12. Structural Analysis and Grounding Letter, prepared by Tectonic, signed by a NYS P.E. (June 3, 2022; 1pp.)
13. Viewshed Map prepared by Tectonic (undated; 1 pp.) *Note: This map appears to be a “bare earth” representation (e.g., areas from where the proposed tower will be visible appear to be modeled considering ground topography ‘only’, without consideration of trees and structures).*
14. Certificate of AM Regulatory Compliance prepared by Site Safe (June 14, 2022, 1 pp.)
15. Property Owner’s Proxy (June 16, 2022, 1 pp.) Authorizes Verizon Wireless and its agents to represent property owner on the matter of the application.
16. Federal Airways & Airspace Summary Report (June 14, 2022; text file output)

HDR reviewed the above listed application filings and submitted a Completeness Memo dated September 20, 2022. The Completeness Memo inventoried the above materials and provided supplemental information requests based on HDR’s initial review.

The following materials were received as part of an interim supplemental filing and in part to support the coordination and execution of the required balloon test (detailed later in this Tech Memo) in support of the required Visual Resources Evaluation. The filing was dated September 9, 2022 and contained the following:

1. Cover Letter prepared by Young/Sommer dated September 9, 2022 (2 pp.)
2. Tectonic Letter – Foliage Conditions for Visual Study dated September 7, 2022 (1 pp.) *HDR notes that at the time, the applicant was seeking to conduct the balloon test during “leaf on” conditions and submitted this letter to justify this action. Ultimately the balloon test was conducted in the early part of December 2022 during “leaf off” conditions. Details are discussed in the VRE section of this Tech Memo.*
 - a. Updated Viewshed Map (for Balloon Test)
 - b. Proposed Viewpoint Locations Map (for Balloon Test)
3. FEAF Appendix B – Visual EAF Addendum. Undated (2 pp.)

Supplemental information submitted in response to requested information was provided by Verizon in a filing dated January 16, 2023, which consisted of the following items:

1. Cover Letter prepared by Young/Sommer, LLC dated January 16, 2023 (9 pp.) *The cover letter includes narrative responses to supplemental information requests in a comment/response format and includes several supplemental Exhibits, under which the remainder of this list are included.*
2. Visual Resource Evaluation prepared by Tectonic, dated December 30, 2022 (48 pp.).
3. Letter Response to Information Request by Verizon, dated February 15, 2022 (2 pp.) *This provides additional commentary supplemental to Young/Sommer response listed as item #1 above.*
4. Verizon Engineering Necessity Case, revision dated November 1, 2022 (43 pp.) *This revision includes responses to supplemental information requests.*
5. Letter Response to Information Request by Tectonic, dated January 4, 2023 (5 pp.) *This provides additional commentary supplemental to Young/Sommer response listed as item #1 above.*
6. Radio Frequency Emission Compliance Report prepared by GCB Services dated June 9, 2022 (7 pp.)
7. Site Selection Analysis prepared by Verizon Wireless, revision dated January 4, 2023 (9 pp.) – *This provides responses to supplemental information requests.*
8. Verizon Wireless Tower Maintenance and Inspection Plan. Undated (2 pp.)
9. FAA Determination. June 14, 2022 (4 pp.)
10. SHPO No Effect Concurrence Email dated August 10, 2022 (1 pp.)
11. Construction Drawing prepared by Tectonic Engineering Consultants, Geologists, and Land Surveyors, DPC (“Tectonic”); signed by a NYS P.E. (Issue 2; 12-29-2022; 12 sheets) ***This Drawing set is considered to be the latest for the Planning Board review.***

The applicant responses and additional information provided (outlined above) appear to be generally responsive, and the combined application materials / filings appear to be comprehensive and in accordance with the requirements of the Town’s Wireless Code [Town Code Chapter §168].

We note that this Tech Memo does not include comments that have been submitted by or are forthcoming from the Planning Board Engineer, Planning Board Attorney, or other Town representatives.. The need for other Town permits and/or variances additional to those identified

by the applicant will need to be confirmed by the Code Compliance Department prior to approving any permits.

3. Coverage / Capacity Needs for the Proposed Verizon Facility

The frequencies involved in Verizon’s wireless network operation require line-of-sight signal propagation paths for its performance with some enhancement gained from reflections off solid structures or surfaces. When considering a regional wireless network plan (inclusive of different types of mobile users) it is necessary that adjacent wireless telecommunications facilities exist in order to provide uninterrupted service and so that capacity (call traffic and data use) can be managed in a given area of a provider’s network.

When evaluating the need for a new wireless telecommunications facility a number of factors are considered. The network *coverage* and/or *capacity* directly impact the quality of service provided by the network. *Coverage* is the geographic area of service provided by a given cell site at a given operating frequency and signal strength. *Capacity* is the ability of the network equipment to connect callers or data users through a given cell site at one time. The proliferation of mobile devices such as cell/smart phones, tablets, connected vehicles, and other devices has increased the need for network capacity even within areas that were once considered “covered” during the early roll-out of wireless technology. Industry focus has shifted from large geographic coverage (several square miles) to “capacity coverage” (increase of capacity through network densification) in order to meet subscriber demand for bandwidth intensive services. An inability to meet the demand results in overloaded networks, degraded call quality, and slow or interrupted services (e.g., dropped calls).

Existing cell sites can be and are routinely upgraded over time by adding newer antenna models and equipment to meet changing demands on the network. Capacity relief via construction of new cell sites (“cell splitting”) is ultimately required in many instances to fully remedy local network problems. The industry trend is to “split” geographic areas served by older towers and antenna sites by adding “in-fill” sites (network densification) to relieve capacity issues. These sites must maintain sufficient separation from surrounding sites to avoid impeding or interfering with service of the neighboring cell site.

For this application, Verizon identified a Search Ring area (designated as “Fostertown” or “Fostertown Rd”) within where a new wireless facility is needed to remedy existing service gaps and capacity issues in the local network. Verizon has provided two documents that in conjunction describe Verizon’s stated need for the proposed new facility – Site Selection Analysis Report (Verizon, January 4, 2023) and the RF Engineering Necessity Case (Verizon, updated November 1, 2022).



EXISTING VERIZON CELL SITES

There are two existing “on-air” Verizon cell sites in the vicinity of the proposed Fostertown Road site off Pressler Road that were evaluated by the applicant to justify the need for a new site:

- Balmville
- Chadwick Lake

After reviewing the initial application submittal, HDR requested that the applicant also assess another exiting tower at the Cronomer Valley Fire Department (CVFD) located approximately 2.25 miles south of the proposed site on NY State Route 32. AT&T is currently the only commercial carrier utilizing that structure. The applicant provided rationale for why the CVFD site is not a viable alternative in its revised RF Necessity Case dated November 1, 2022, which is discussed in more detail in the *Alternate Site Analysis* section of this Tech Memo.

The following list of macro facilities¹ was provided by Verizon and listed as being within 3-miles of the proposed site.

Tower	Address	Town	ACL	Distance (miles from proposed Site)	Direction	Status
1. Chadwick Lake	400 Quaker St.	Newburgh	112 ft	1.7 mi	W	On-Air
2. Newburgh HD	Valley View Dr.	Newburgh	146	2.5	SW	On-Air
3. Balmville	21 Bannerman View Dr.	Newburgh	77	2.8	SE	On-Air
4. Cronomer Hill	Not Provided	Newburgh	NP	±2.4	-	Planned
5. Marlboro HS	50 Cross Rd.	Marlborough	86	4	E	Approved

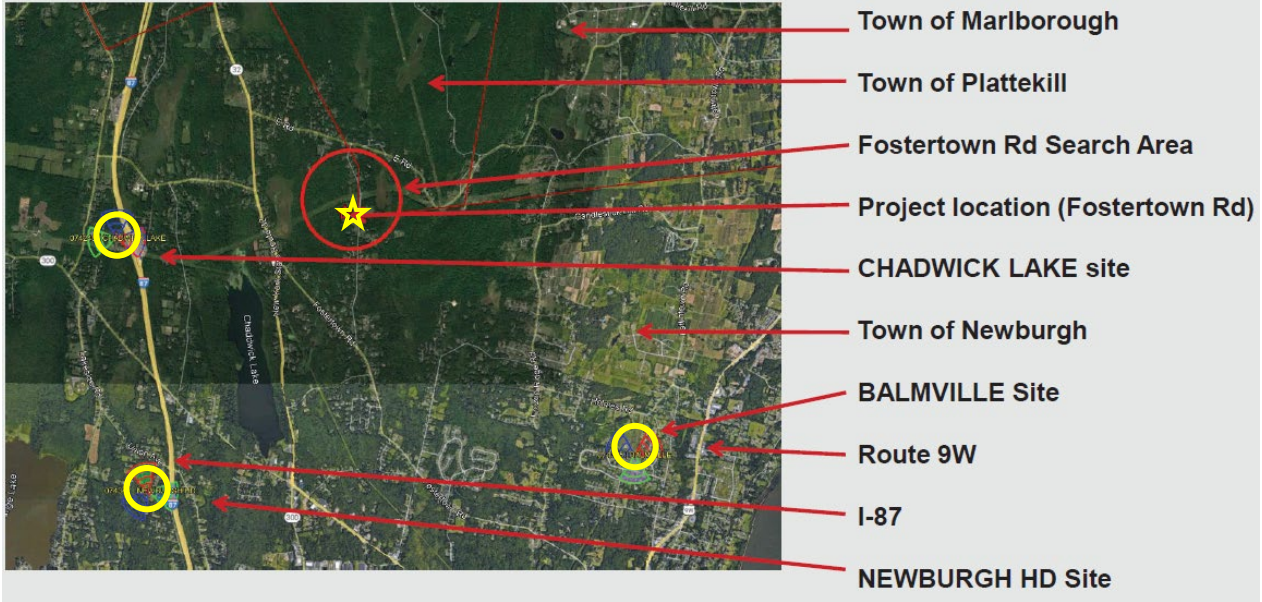
ACL – antenna centerline height above ground in feet

NP – Not Provided. Verizon indicated that this project is still in the development stage with little progress made and therefore data is not yet available. “Cronomer Hill” is a Verizon-designated search ring name and may not imply a specific location or address.

Source: Applicant Filing.

The following image is reproduced from the revised Engineering Necessity Case provided by Verizon and depicts existing nearby on-air sites listed in the table above. Additional annotation in yellow added by HDR for emphasis/clarification to indicate on-air sites (yellow circles) and the project location (yellow star).

¹ A macro facility is a traditional cell tower structure that serves a large area of users. In contrast, small cell sites have comparatively small footprints and can be used to infill gaps between macro sites or offload capacity in limited geographies (e.g., a string of small sites along a highway or a cluster used to serve a densely populated area such as a stadium or urban environment). Verizon does have small cells along a portion of Route 9W in the Town of Plattekill; however, they are well outside the targeted search area and were not listed by Verizon in the table provided.



Existing Nearby On-Air Sites Source: Applicant Filing (Engineering Necessity Case).

APPLICANT’S OBJECTIVE

The applicant’s RF engineer stated in their Engineering Necessity Case that the objectives for the proposed project are to:

- Improve **coverage** in this portion of Newburgh and southern Plattekill along Fostertown Road, NY State Route 32, Pressler Road, East Road, and Huckleberry Turnpike, and adjacent residential areas.
- Offload **capacity** from the Chadwick Lake (Quaker Street) and Balmville (Bannerman View Drive) towers, which Verizon states are above or near system capacity limitations at which point end user service quality degrades.

CAPACITY

To justify the need for capacity relief, Verizon furnished trend charts that plot key performance indicators (KPIs) over time that were accompanied by narrative descriptions of the need. The charts focus on the two nearby sites (the Quaker Street tower [Verizon “Chadwick Lake”], located west of the proposed facility along the west side of Route 87 and the Bannerman View Drive [Verizon “Balmville”] tower, located southeast of the proposed facility) that serve the subject area and from which Verizon is seeking to offload capacity. HDR reviewed the technical information provided by the applicant to justify the proposed cell site. The initial Engineering Necessity Case document was dated June 1, 2022 but later updated on November 1, 2022 with supplemental information requested by HDR in its Completeness Memo #1.

Verizon’s documentation attests to the need for network coverage improvement as well as capacity relief of two existing towers that have already or will soon become overburdened and thus increasing the potential for dropped calls, denied access to the network, a reduction in data

transmission speeds, and/or an inability to successfully transmit data. **The data appear to justify that two ‘on-air’ facilities surrounding the proposed site are (and will increasingly be) in need of capacity relief, justifying a need for a new site in the area.**

CAPACITY ASSESSMENT

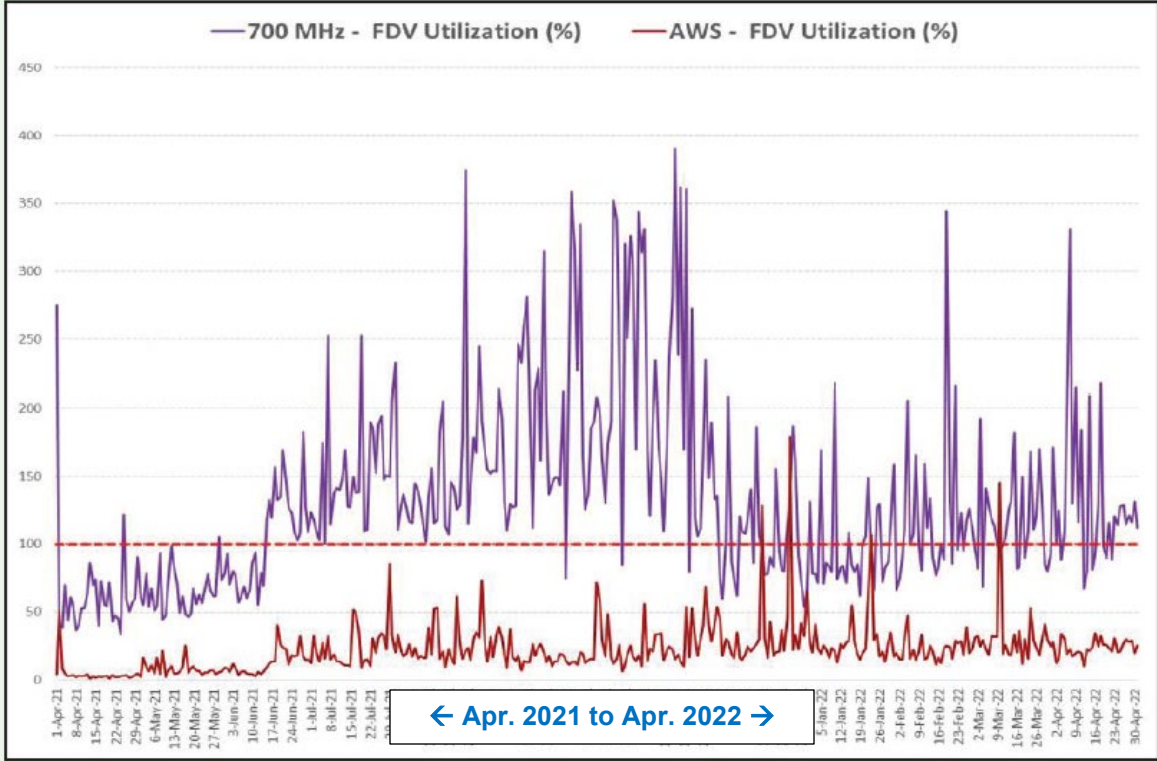
KPIs considered when evaluating an existing wireless network’s capacity/usage include Forward Data Volume (FDV), Average Schedule Eligible User (ASEU), and Average Active Connections (AvgAC). FDV is a measure of usage on a particular cell site over time and is indicative of the amount of data a cell site can provide before users begin to experience degraded quality of service. ASEU is a measurement of the loading of control channels and system at a given site and determines users within smaller geographies within a “cell” that can send data and when it can be sent. If the ASEU is too high (too many users) and the FDV (capacity) is also exceeded, users experience dropped calls and the inability to send/receive data. AvgAC is a measurement of how many devices/users can connect to a cell site at a given time. If the AvgAC is exceeded, users experience dropped calls and connection failures.

Verizon provided the following KPI charts:

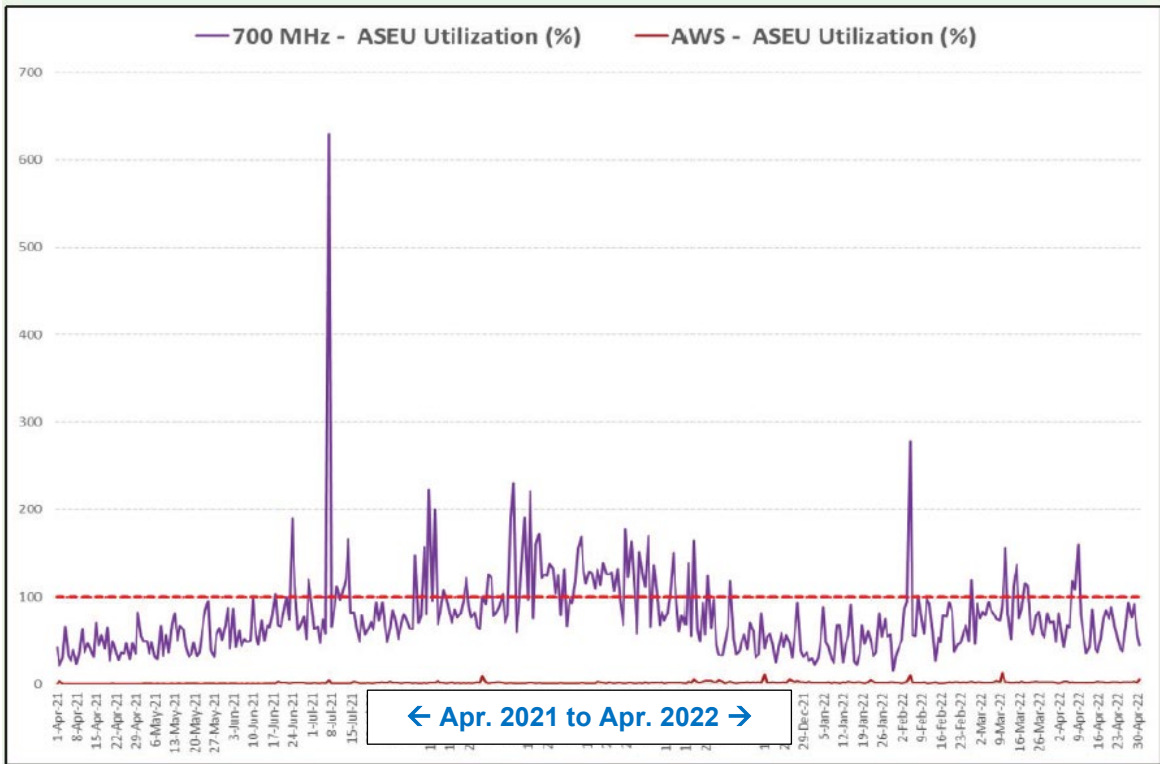
- FDV and ASEU for the gamma sector of the Bannerman View Drive tower (Note the northwest-facing Verizon antenna sector at this existing tower site is of interest as it faces into the proposed site and search ring area. The sector is shown as blue in the above image.)
- FDV for the alpha sector of the Quaker Street tower (East-facing Verizon antenna sector at this existing tower site, noted as red in the above image. This sector is also of interest as it faces into the proposed site and search ring area.)

The graphics that follow are reproduced from the applicant’s filings. The descriptions accompanying the charts in the source document explain that the horizontal dashed red line represents the limit where the sector reaches exhaustion. The time-series lines present “daily max busy hour” utilization for the “low band” 700 MHz (purple) and “mid band” 2100 MHz [AWS] (red) frequencies expressed as the indicated KPI (e.g., FDV, ASEU). Where those values exceed the threshold service degradation is likely to occur. The charts present utilization expressed in the stated KPI for the 700 MHz and 2100 MHz (AWS) frequency bands over an approximately 1-year period starting in April 2021 and running through April 2022. HDR notes that ASEU data for Quaker Street and AvgAC data for both sites were not provided in the RF Engineer’s submittal.

The following two charts present FDV and ASEU data for the Bannerman View Drive gamma sector. Verizon notes that this sector has exceeded its ability to support both FDV and ASEU requirements in the 700 MHz frequency band and that the 2100 MHz frequency band is unable to offload demand from the 700 MHz due to the properties of radiofrequency signal propagation functions. Frequencies with longer wavelengths (e.g., 700 MHz) tend to propagate further and have a larger service footprint than frequencies with shorter wavelengths (e.g., 2100 MHz). Carriers often use 700 MHz and 2100 MHz as analogs for the lower and upper end of propagation given that 700 MHz will have a smaller footprint than 2100 MHz.

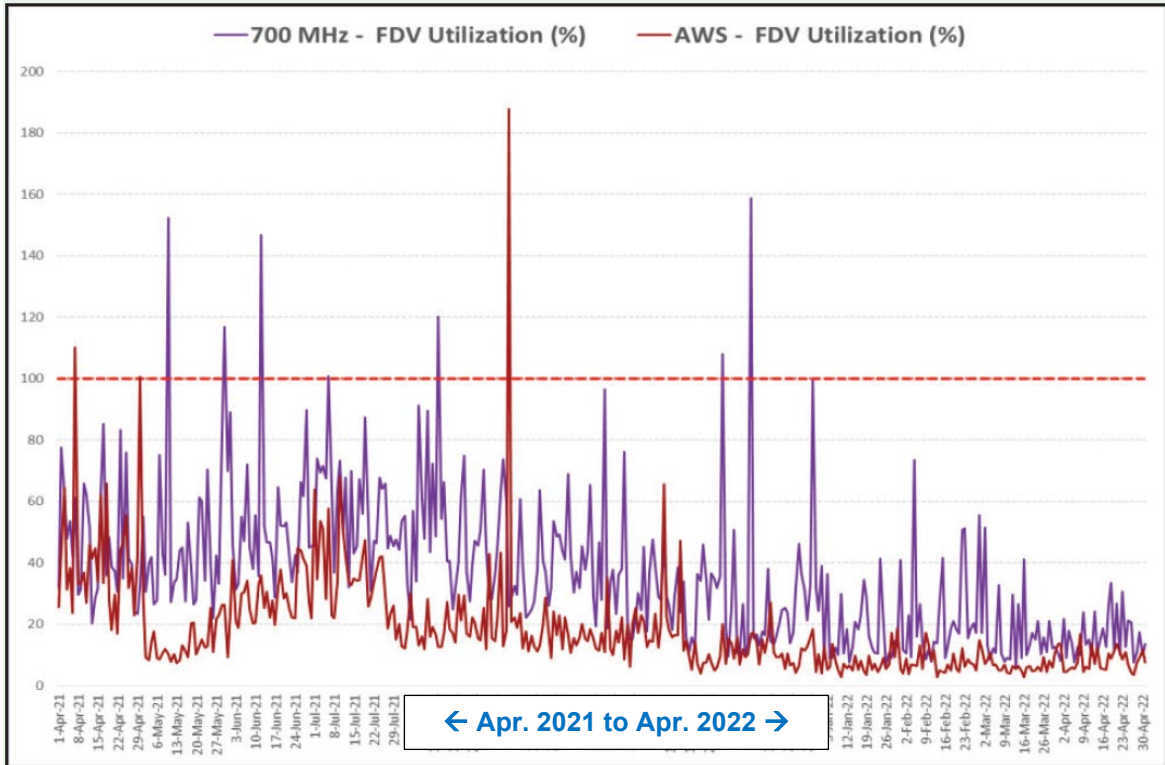


FDV (Balmville Gamma Sector). Source: Applicant Filing.



ASEU (Balmville Gamma Sector). Source: Applicant Filing.

The following chart presents FDV data for the Quaker Street alpha sector. Verizon reports in the application materials that this sector has exceeded its ability to support FDV requirements.



FDV (Chadwick Lake Alpha Sector). Source: Applicant Filing.

The capacity charts furnished by Verizon provide evidence that both the Bannerman View Drive and Quaker Street co-location sites are unable to consistently meet Verizon’s operational requirements with regard to FDV (both towers) and ASEU (Bannerman View Drive). The need for capacity relief appears most prominently in the charts for the Balmville gamma sector.

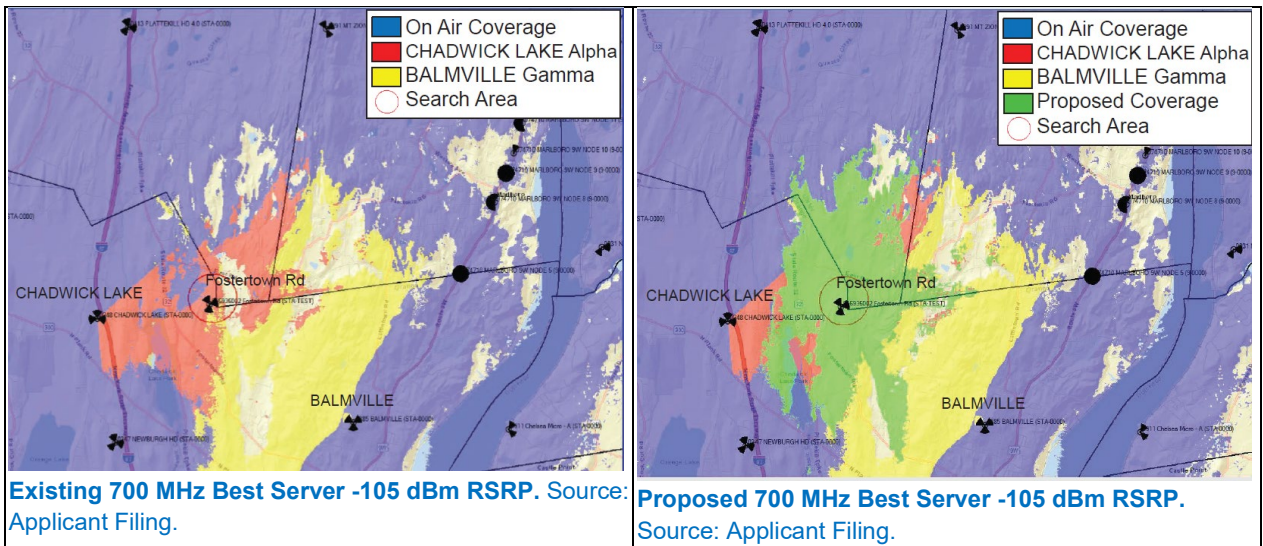
COVERAGE

HDR reviewed “best server” and coverage plots provided in Verizon’s Engineering Necessity Case. These maps present the footprints of existing on-air towers as well as the proposed coverage either in terms of signal quality or which tower serves a given area (i.e., best server). Signal quality is represented in dBm reference signal received power (RSRP). The RSRP values are presented as negative numbers. The closer the value is to zero the better the signal strength is. Carriers have different ways of dividing up signal strengths into classes of quality; however, in the plots provided by Verizon signal strengths are broken into four groups: ≥ -85 dBm (strongest signal strength), between -85 and -95 dBm; between -95 and -105 dBm and less than -105 dBm (no reliable service).

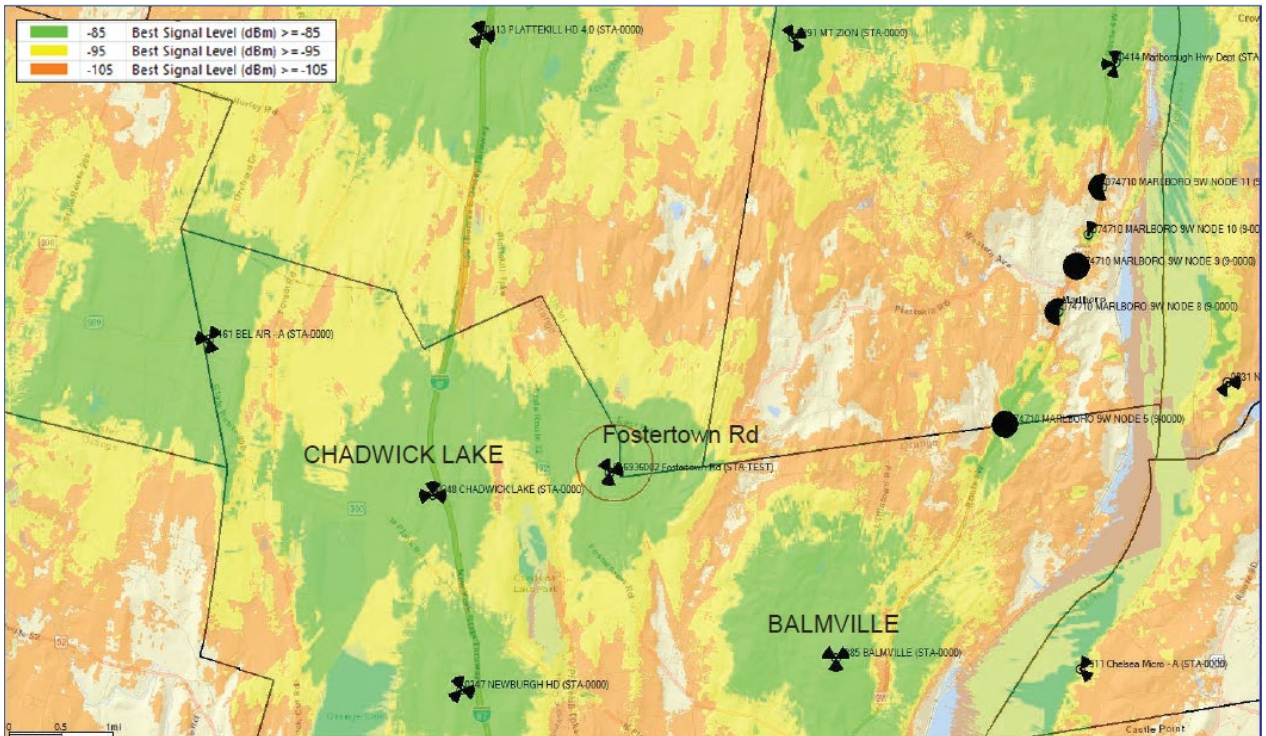
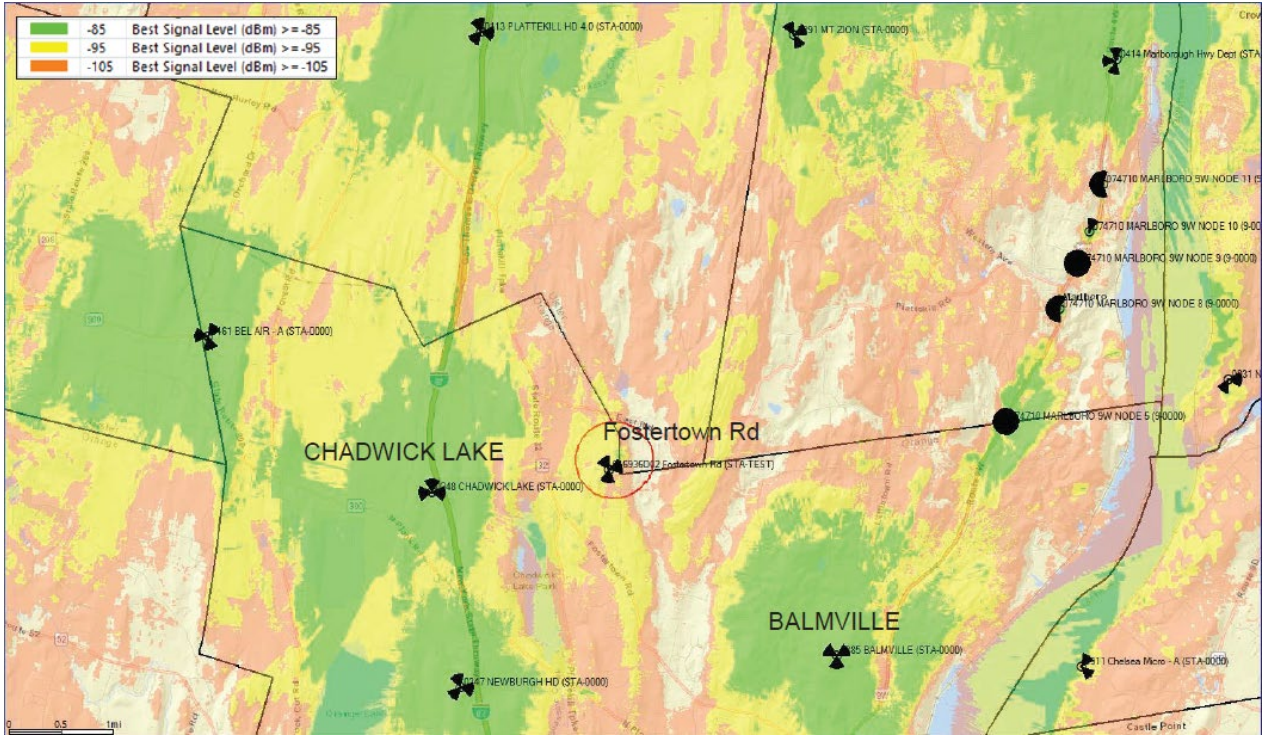
Best server plots for the 700 MHz and 2100 MHz frequency bands under existing and proposed conditions were provided and are reproduced below. The “best server” is the tower and sector that

would provide service to a user accessing the network at any given location. Verizon shows the coverage at -105 dBm or better signal strength coverage.

The following two figures depict the “best server” at the “open space” signal strength of -105 dBm RSRP (i.e., does not effectively penetrate buildings or obstructions) for the project area as it exists currently and with the proposed tower online. To support their justification, Verizon presented the existing service from the towers they are seeking capacity relief for in unique colors (Balmville gamma sector in yellow shading; Chadwick Lake alpha sector in red shading) while the proposed tower is presented with green shading. Other nearby on-air sites are grouped together and represented as blue shading.

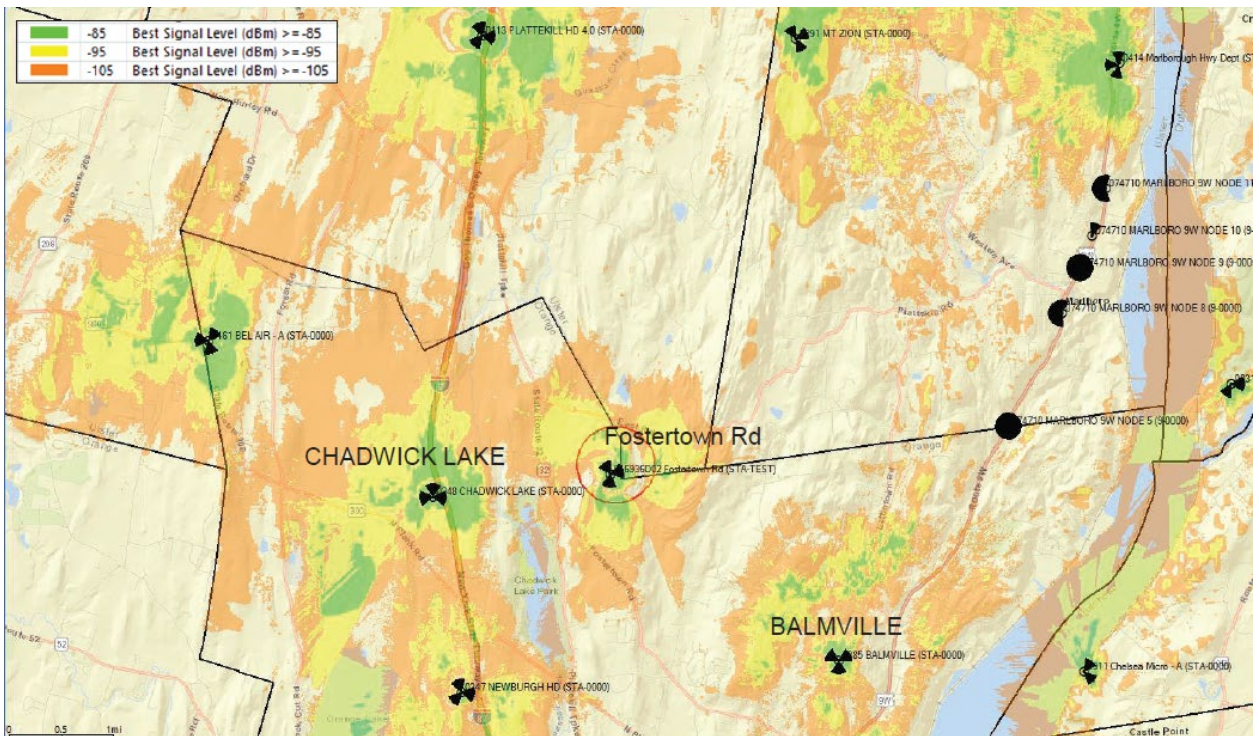
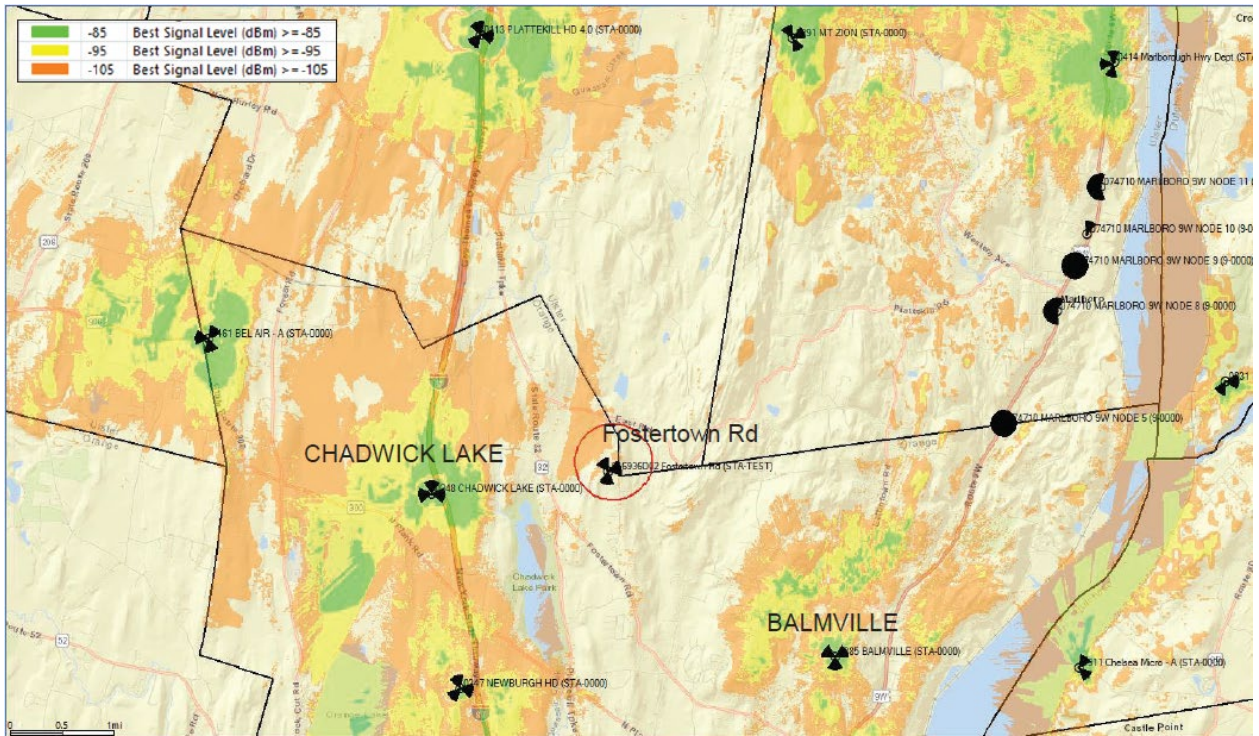


In the top-to-bottom comparison of coverage plots below, signal strengths are depicted for the low band (700 MHz; first set of images) and high band (2100 MHz; second set of images) frequencies as -85 dBm (in-building) in green; -95 dBm (in-vehicle) as yellow; and -105 dBm (open space) as orange. The top image shows current Verizon coverage footprints at the depicted signal strengths provided by the existing on-air network while the bottom image shows the proposed coverage footprints/signal strengths if the Fostertown Road monopole is constructed and operational.



Low Band (700 MHz): current on-air signal strength (TOP) and proposed signal strength (BOTTOM).

Source: Applicant Filings



High Band (2100 MHz): current on-air signal strength (TOP) and proposed signal strength (BOTTOM).

Source: Applicant Filings

ADDITIONAL REQUESTED INFORMATION

HDR requested supplemental information, which was provided by the applicant's RF engineer in the supplemental filing. Requested information included the following items and HDR's assessment of the responsiveness to the question are provided as sub-bullets.

- Coverage plots that include the recently approved Verizon tower at the Marlborough High School in the Town of Plattekill.
 - Revised plots were provided, some of which are reproduced above.
- Coverage plots for 700 MHz and 2100 MHz focused on the proposed site with and without neighboring sites “turned on” and at both the proposed antenna centerline height of 116-ft and at an alternative height of 96-ft to confirm tower height and potential for future co-locators.
 - A total of eight additional plots were provided. These plots show a similar, albeit smaller coverage footprint for both frequencies as would be expected from antennas mounted at a lower elevation. Though the coverage plots appear to be very similar, and potentially justify a shorter tower/lower antenna centerline, there would be deficiencies along Fostertown Road and East Road that would not satisfy Verizon's stated network improvement goals. Therefore, the proposed tower height appears to be reasonable and justified based on the coverage footprints shown.
- Information on the software used to develop the coverage plots:
 - Verizon's RF engineers use calibrated Atoll v3.41 software. The software accounts for terrain, vegetation, buildings, and other site-specific inputs to model signal propagation, and is a recognized modeling tool in the industry.
- Explanation of whether the CVFD location is a suitable existing tower.
 - Provided – see Alternate Site Analysis section of this Tech Memo for discussion.

SUMMARY OF RF JUSTIFICATION REVIEW

The applicant's RF engineer has provided technical information that attests to the need for capacity relief, noting that existing Verizon cell sites in the area (specifically two that are co-located at the Quaker Street and Bannerman View Drive cell towers) have or will soon become overburdened with call and data traffic, resulting in dropped calls, denied access to the network, a reduction in data transmission speed, or an inability to successfully transmit data. Additionally, a combination of distance and terrain is documented to inhibit service provided by the other nearby towers. Given the location, distance, and antenna heights of the existing Verizon sites in the area and the capacity data reviewed by HDR; increasing trends in mobile device use; and the frequency bands and services which Verizon is licensed to utilize, the needs for **capacity relief and supplemental coverage for the local Verizon network appear to be justified. The proposed Verizon facility appears to be well-situated and designed to provide necessary supplemental coverage and capacity to the existing wireless network in this portion of the Town.**

4. Conformance with NIER and Other Radiation Hazard Criteria

In order to comply with the Non-Ionizing Electromagnetic Radiation (NIER) hazard criteria, GCB Services (on behalf of the applicant) prepared a “Radio Frequency Emission Compliance Report” dated June 9, 2022. The analysis considered the following FCC-licensed frequencies proposed to be used by Verizon: 700, 850, 1900, 2100, and 3700 MHz (C-Band). **It is noted that high-frequency 5G (“mm-Wave”) technology is not proposed as part of this application.** HDR notes that effective radiated power (ERP), transmitting frequencies, input power, gain, azimuth, downtilt, and other assumptions about the operation and installation of the Verizon antenna array are included in the report. GCB concludes that Verizon will be compliant with FCC radio frequency exposure regulations at publicly accessible areas around the tower. They further recommend installation of guideline signs and information signs at the site access gate and installation of a guideline sign at the base of the monopole.

The GCB report does not include calculations or exhibits depicting the modeled RF emissions from the proposed Verizon facility. Based on HDR’s experience on other similar tower projects, it is understood that RF emissions would be compliant with applicable criteria in public areas; however, it is recommended that a revised report be provided (see recommendation section at the end of this Tech Memo).

5. Alternate Site Analysis

Town of Newburgh Wireless Code (§168-7) stipulates that applicants seeking to construct a new wireless facility locate their proposed facility in accordance with a prioritized list of site types. Existing telecommunication towers or other tall structures are the highest priority site type while residentially zoned parcels are the lowest priority. Applicants seeking to locate on any class of property other than the highest priority must demonstrate why sites of higher priority were not selected. The subject parcel spans two zoning districts: RR (Reservoir Residence) and AR (Agricultural Residence) although the proposed tower and access road are on the AR zoned portion of the parcel.

Verizon’s Site Selection Analysis dated June 10, 2022 and revised January 4, 2023 based on supplemental information requested in HDR’s Completeness Memo, was reviewed for this Tech Memo. This report details Verizon’s site selection process including alternative sites considered within the search area (“search ring”) targeted to resolve the applicant’s stated network objectives. Verizon attests that no sites of higher priority pursuant to Town of Newburgh Code were identified in the search ring that would achieve the stated goal of increasing network coverage and capacity relief. The tallest structures in the search area are the ±70-ft tall CHG&E transmission line support towers north of the proposed site, as confirmed by HDR during site reconnaissance and the balloon test. The applicant notes that these transmission towers are too short to provide the necessary coverage and that CHG&E regulations along with restrictions on the easement make locating on these structures impractical. The applicant also attests that there are no other existing wireless telecommunications structures or industrially or commercially zoned parcels within or near the search area.

Other parcels considered in the site selection include:

- 64 Pressler Road in Town of Newburgh
- 131 Pressler Road in Town of Plattekill
- 32 Pressler Road in Town of Newburgh

The applicant ruled out each of the above listed potential alternate sites based on lower topography (75-ft to 120-ft lower than the proposed site) that would result in a significantly taller tower being required to achieve the stated network goals and/or presence of sensitive ecological resources (e.g., wetlands).

The initial Site Selection Analysis report did not include discussion of potential co-location on a nearby (but outside the search ring) existing monopole located at the CVFD on Planck Road (NY Route 32), south of the proposed site. HDR requested that the applicant discuss the viability of this location as an alternative to the proposed site, as co-location is preferred to construction of new tower sites. The applicant included discussion in the Engineering Necessity Case and in the Site Selection Analysis. Verizon notes that the tower at the CVFD property is located outside of its search ring and too far away (about 2.25 miles south of the proposed site) to provide the coverage and capacity relief that they are seeking to achieve. Furthermore, the terrain between the search area and the CVFD site limits the effectiveness of the alternate site to satisfy Verizon's network goals. HDR reviewed the documentation provided, which includes a terrain profile, and agrees that a topographic high point located between the Fostertown search ring and the CVFD tower would likely inhibit the ability for a Verizon co-location at the CVFD tower to reach the targeted zone.

In summary, HDR reviewed the Site Selection Analysis in conjunction with Town of Newburgh Wireless Code and Zoning Maps and radiofrequency coverage plots supplied by the applicant. HDR also used its own site reconnaissance including desktop reviews, in-field "dashboard" surveys, and general knowledge of the area including the existing network of tower sites. The information and conclusions presented by Verizon are reasonable in justifying that potential alternative sites are not viable to provide the identified coverage and capacity relief needs. **As such, the location off Pressler Road (as proposed) appears reasonable and appropriate based on a lack of viable alternatives or higher priority sites in the area to meet the applicant's current service needs.**

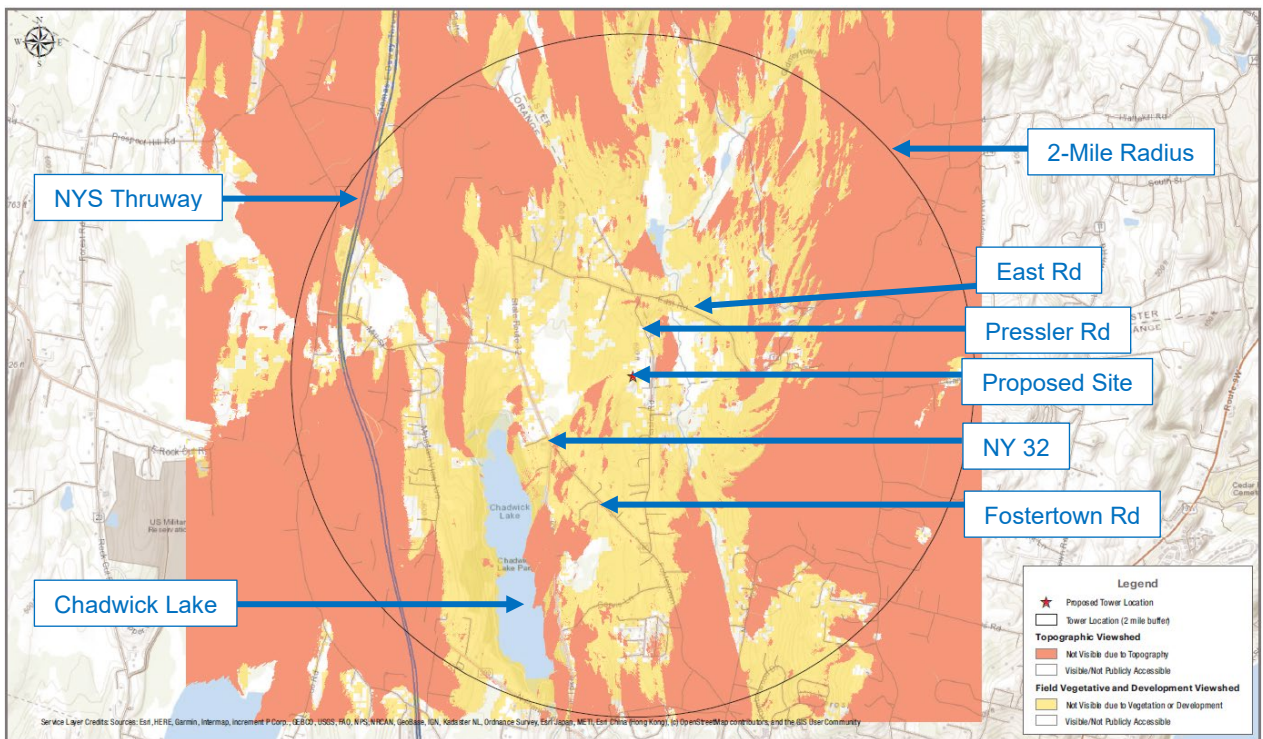
6. Visual Impact Analysis / Aesthetics

Verizon submitted a Visual Resource Evaluation (VRE) dated December 30, 2022 with its January 2023 supplemental filing. A VRE was not submitted in the initial application filing due to the requisite balloon test (described below) having not been completed at that time. The report, prepared by Tectonic Engineering, includes a short narrative of the site setting and the process/methodology used to develop the VRE; a viewshed analysis; maps depicting photo locations; and photographic simulations of the proposed tower from various locations. Photographs were collected using a camera with specific settings capable of simulating the human eye's view.

The applicant submitted an Appendix B – Visual EAF addendum to the Full EAF in a supplemental filing dated September 9, 2022.

VIEWSHED

Verizon developed a viewshed map using Esri ArcGIS Desktop (geographic information system (GIS) software) Spatial Analyst “Viewshed” tool. The process utilized digital elevation model and land use/land cover data obtained from public sources to simulate areas possibly blocked by terrain and/or land use. The viewshed analysis map is reproduced from the VRE and depicts the viewshed analysis performed by Tectonic. Areas that are blocked by topography are indicated by red shading and areas blocked by vegetation or development are shown with yellow shading. Areas within the analysis with potential visibility of the proposed tower are indicated with no shading.



Viewshed Map. Source: Tectonic VRE Report (dated December 30, 2022)

Note: RED = not visible due to topography; YELLOW = concealed due to vegetation or structures; NO COLOR = potential visibility. NOTE – COLOR SCHEME IS INDEPENDENT AND UNRELATED TO RF COVERAGE MAPS DISCUSSED EARLIER IN THIS TECH MEMO.

BALLOON TESTS and VRE

A “balloon test” was conducted by Tectonic to facilitate the development of photographic simulations of the proposed 120-ft tall (124-ft tall w/lightning rod) telecommunications structure. To conduct a balloon test in the Town of Newburgh [Code §168-6(Z)], an applicant must float a brightly colored, minimum 3-foot diameter, balloon at the maximum height of the proposed tower for a minimum of eight consecutive hours between 7am and 4pm. It must also be initially scheduled for a weekend day but may be conducted during the week if weather delays the initial date. The

balloon test must be publicly advertised in one of the Town's official newspapers 7 and 14 days prior to the primary date. The balloon test was originally publicly noticed and scheduled to be conducted November 5, 2022; however, poor weather conditions required that the balloon test be rescheduled a number of times. At the request of the Town Planning Board, the applicant re-noticed the balloon test for the re-scheduled date of Saturday December 10, 2022.

A total of 21 viewpoints from within a 2-mile radius of the proposed site were proposed by Tectonic in the applicant's September 2022 filing. HDR reviewed the proposed viewpoints and, in coordination with the Town, deemed that they were reasonable based on the accompanying viewshed map and its own knowledge of the area. HDR noted that during the balloon test additional locations may be requested based on observations in the field or input from members of the Town Planning Board.

The noticed balloon test was successfully completed by Tectonic on behalf of Verizon on the rescheduled date of Saturday December 10, 2022. HDR was present for the duration of the test to collect independent observations of visibility, to confirm the balloon test was successfully completed, and to coordinate any additional viewpoints with the representatives from Tectonic conducting the test. Tectonic provided two personnel to conduct the test – one to monitor the balloon and one to assess visibility and collect photographs from the field. The person monitoring the balloon would alert the photographer if the balloon was down or if winds pushed the balloon off its mark. Weather conditions were generally clear and cool with temperatures starting in the 20s°F and topping out around 40°F. Early morning winds were marginal and resulted in the balloon being deflected too much; however, winds calmed as the day progressed. A red 3-ft diameter balloon was filled with helium and floated at the proposed tower height of 120-ft above ground level. The balloon was tethered to the ground at the proposed tower site via an inelastic plastic line and stake. The balloon was launched at approximately 7:00am; however, due to the winds deflecting the balloon Tectonic did not start collecting photo until sometime later. The balloon floated for the required 8-hours in total with a brief period (approximately 20 minutes) of downtime in the mid-morning to reset the balloon. HDR followed Tectonic's photographer to the predetermined viewpoints but also independently went to other locations to assess visibility such as Teakettle St., Old Mill Rd., Marino Dr., and the neighborhood north of Fostertown Elementary School.

Tectonic visited and collected photographs from publicly accessible locations (e.g., roads) at or close to the originally proposed 21 viewpoints during the December 10, 2022 balloon test. While conducting the balloon test, HDR requested additional near-field photos to better characterize the views adjacent to the proposed site as well as the addition of the Rossville Church and Cemetery located on NY Route 32, which is less than 1-mile west of the proposed site. In addition, a portion of the trail on the southwest side of Chadwick Lake most likely to have visibility was visited. Tectonic collected photographs using a Nikon D3200 digital camera with a 55mm focal length lens and photo locations recorded on a paper map.

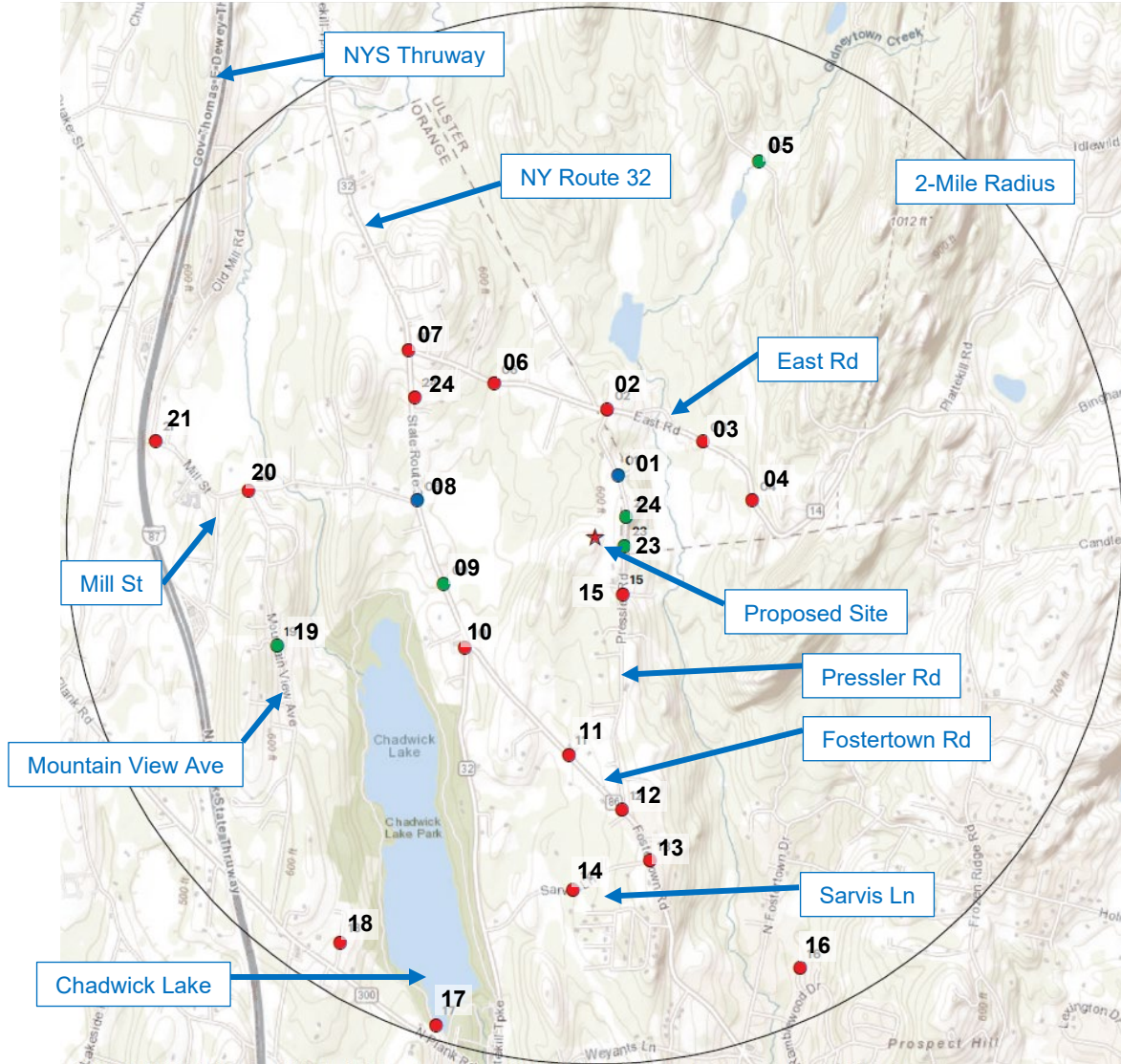
After completion of the balloon test, Tectonic provided HDR with its photographic log and map of the locations photographed on December 10, 2022. Based on the limited number of locations at

which visibility was confirmed, the applicant recommended and HDR concurred that all photos in which the balloon was visible would be used for photosimulations. HDR also reviewed the photos and in conjunction with the Town, its own knowledge of the area, and observations made in the field, provided the applicant a list of suggested photosimulations based on the photos via email. These recommendations included various possibly configurations of the proposed monopole including galvanized gray and matte brown finishes with and without co-locators, and a stealth tree design. The applicant declined to provide a stealth tree simulation with the supplemental materials. HDR notes that a stealth tree is not proposed by the applicant; however, HDR requested the simulation to provide a potential visual impact mitigation measure for the Town Planning Board to consider.



Illustrative depiction of a series of simulations depicting different color and antenna configurations including the equipment compound at the base of the tower. The above is from simulation “S-23” in the VRE. The photo is taken from the road in front of 138 Pressler Road. From left to right: photo from balloon float; gray monopole (Verizon only); brown monopole (Verizon only); gray monopole (with co-locators); brown monopole (with co-locators).

The following image is reproduced from the Tectonic VRE and presents the locations of photographs collected during the December 10, 2022 balloon test including the original 21 viewpoints (#1 through #21) and additional viewpoints. The color of the dot represents the visibility of the balloon from that location. Annotation added by HDR for clarity.



Viewshed Map. Source: Tectonic VRE Report (dated December 30, 2022)

Note: RED = not visible; BLUE = Seasonally visible through vegetation; GREEN = visible.

#	Location	Dist.	Dir.	#	Location	Dist.	Dir.
01	Pressler Rd & Gidney Creek Way	0.24	SW	13	Fostertown Rd & Sarvis Ln	1.25	NNW
02	Pressler Rd & East Rd	0.48	SSW	14	Near 60 Sarvis Ln	1.34	N
03	Near 241 East Rd	0.54	SW	15	Pressler Rd & Countryman Ln	0.25	NW
04	Near 306 East Rd	0.61	WSW	16	Near 10 Shadowbrook Ln	1.81	NW
05	Near 319 & 345 Huckleberry Tpke	1.55	SW	17	Chadwick Lake Park	1.95	NNE
06	Near 48 East Rd	0.69	SE	18	Near 14 Gunsch Estate Dr	1.82	NE
07	NY Route 32 & East Rd	0.99	SE	19	Near 155 Mountain View Ave	1.27	NE
08	NY Route 32 & Mill St	0.69	ESE	20	Near Mountain View Ave & Mill St	1.32	ESE
09	Near 637 NY Route 32	0.60	ESE	21	Mill St & Old Mill Rd	1.70	ESE
10	NY Route 32 & Fostertown Rd	0.65	NE	22	CHG&E Utility ROW on Pressler Rd	0.14	SW
11	NY Route 32 & Russet Ct	0.83	NNE	23	Near 138 Pressler Rd	0.12	WNE
12	Fostertown Rd & Pressler Rd	1.04	N	24	Rossville Church & Cemetery NY32	0.86	SE

Dist. = Distance. Approximate distance from photo location to proposed tower given in miles.

Dir. = Direction. Approximate direction from photo location to proposed tower.

Information Source: Tectonic VRE (December 30, 2022)

A selection of photosimulations from the VRE report are reproduced below. Refer to the applicant's revised VRE for the full set of details and photographic simulations.



Photograph P-22; Balloon Float. Pressler Road from under CHG&E utility corridor.



Photosimulation S-22; Gray Monopole Verizon only. Pressler Road from under CHG&E utility corridor.



Photosimulation S-22; Gray Monopole w/Co-location. Pressler Road from under CHG&E utility corridor.



Photograph P-23; Balloon Float. From road near 138 Pressler Road.



Photosimulation S-23; Gray Monopole Verizon Only. From road near 138 Pressler Road.



Photosimulation S-23; Gray Monopole w/Co-Location. From road near 138 Pressler Road.



Photograph P-19; Balloon Float. Looking northeast road near 155 Mountain View Ave.



Photosimulation S-19; Gray Monopole Verizon Only . Looking northeast road near 155 Mountain View Ave.

The following image is provided as a reference photograph for the Planning Board of a stealth tree monopole design, as stealth tree simulations were not provided by the applicant. HDR notes that the example below is not a Verizon design.



Example of a 120-ft tall Homeland Tower stealth tree monopole design.

SEQRA and STATE HISTORIC PRESERVATION OFFICE

The initial application filing contained a Full SEQRA EAF (“FEAF”) and supporting attachments. A “No Effect Concurrence Letter” [via email] dated August 10, 2022, was submitted by the applicant and documents the concurrence of the NY State Historic Preservation Office (SHPO) that no Direct or Visual effects or historic properties exist within the Area of Potential Effect (APE) for the project.

7. Co-Location Potential

The application materials note that co-location by other commercial wireless carriers will be permitted, and the foundation and structural design of the monopole will provide capacity for three (3) additional antenna arrays (four total carriers). The ground-based equipment area at the base of the monopole has also been designed to support up to three additional wireless carriers. It is HDR’s understanding that there has been no commitment to, or formal notification of, interest in co-location by other commercial carriers. However, given the location and design of the proposed

monopole and siting priorities established in the Town’s wireless code, it is likely that co-location at the site would be sought in the future.

8. Cultural / Ecological Resources

A Full EAF was submitted with the initial application material; however, the proposed access road has since been re-aligned. The submitted FEAF may therefore require revision as total areas disturbed and other potential impacts may be different.

The above notwithstanding, the original FEAF indicated that there are no threatened or endangered species on the site. The FEAF indicates a freshwater pond of approximately 0.01 acres within or adjoining the project.

The proposed facility is located within 5 miles of the following officially designated and publicly accessible federal, state or local scenic or aesthetic resources:

- Chadwick Lake Park
- Cronomer Hill Park
- Algonquin Park
- James Olley Park
- Kimball Park
- Popp Mountain Memorial Park
- State Recreation, Designated Greenway Trails

In HDR’s Completeness Memo, the applicant was requested to provide a narrative (with backup calculations if needed) to confirm that no permanent stormwater controls are required. The applicant’s response stated that the total proposed disturbed area is below the 1-acre trigger for a SWPPP. HDR notes that the proposed access road includes a culvert where the road crosses a low point in the existing tree line. **The final determination on the need for a SWPPP should be confirmed by the Town’s Planning Board Engineer.**

TREE CLEARING

Both the originally proposed access road alignment and revised alignment required tree removal. HDR requested further clarification on the proposed clearing including the number, diameter, and types of trees to be removed and/or protected as well as more detail on removal of clearing of other existing or anthropogenic features. The applicant’s revised drawings that depict the currently proposed alignment (i.e., not on the CHG&E ROW) do not include the requested information.

9. Structural Assessment

A full structural and foundation analysis was not provided as part of the application filings received and reviewed for this Tech Memo; however, a letter dated June 3, 2022 prepared and stamped by a NYS P.E. (Tectonic) states that the tower will be “designed to accommodate antenna arrays for three (3) additional carriers in addition to the proposed Verizon Wireless installation.” The letter further states that the design of the monopole, foundation, and antenna supports will follow “the

most stringent criteria of the 2020 Building Code of New York State and ANSI/TIA-222-H-2017” criteria.

The applicant also noted that a geotechnical investigation would be conducted in the future to obtain data to inform the design of the foundation and structure of the tower. Two potential foundation designs were offered in general terms by the applicant’s engineer: either a 24-ft square, 6-ft thick pad and pier or a caisson drilled into bedrock. Sample cut sheets of tower designs were requested by HDR; however, the applicant declined to provide citing that source documents from prior projects for these designs are proprietary to Verizon.

The final configuration of the monopole, if approved, will be based on Planning Board decisions (e.g., monopole design; additional room and structural/foundation capacity for local government or emergency service antennas) and conditions that can possibly influence the cell site’s appearance and structural design. ***Thus, a final analysis should be required as a condition of approval, during the Building Permit phase of the project. It is understood that the Applicant maintains full responsibility for the accuracy and adequacy of all aspects of the proposed installation’s design and construction.*** It is also understood that the Town’s Building Department may conduct a detailed review of the structural analysis, including all design assumptions and calculations, if the Site Plan and Special Use Permit application are approved.

10. Summary of Technical Review Findings and Recommendations

Findings

- The responses to comments and additional information provided by the applicant appear to be responsive, and the combined application materials / filings appear to be comprehensive and in accordance with the requirements of the Town’s Wireless Code (Chapter 168 of Town of Newburgh Code).
- As depicted in the application materials and described in this Tech Memo, a need for Verizon to provide capacity relief to the local wireless network and new coverage has been documented. HDR concurs with the applicant’s alternate site analysis in that there appear to be no other tall structures or towers in the area that could be utilized in lieu of a new facility/tower structure that would meet the priority siting requirements of the Wireless Code and achieve the applicant’s stated objectives. A telecommunications facility consisting of a new monopole located at the site, as proposed, will provide enhanced services to the site area and capacity relief to the existing Verizon network.
- The location of the proposed monopole off Pressler Road appears reasonable based on (a) the areas of documented service needs (i.e., around the site area, Fostertown Road, NY State Route 32, East Road and nearby neighborhoods) (b) achieved setbacks; (c) the findings of the alternate site analysis conducted; and (d) the predicted coverage and interaction with existing “on air” Verizon cell sites in the area. The proposed monopole off

Pressler Road is well-positioned to interact with nearby existing Verizon sites (notably, the Balmville and Chadwick Lake cell sites) and is at appropriate distances from those facilities and at a focused height to serve the site area and provide the necessary capacity relief to Verizon's local wireless network.

- The height of the proposed monopole (120 ft above grade) appears to be reasonable based on (a) the heights of existing tree lines (approximately 80-ft) and structures nearby (which can impede signal) and the varying topography that exists in the area; (b) the possibility of future co-location by other wireless carriers or the Town/EMS should the monopole be approved and constructed; and (c) the fact that FAA markings or lighting will not be required at the proposed height. The 120 ft height (124 ft with lightning rod) appears to balance the needs of the applicant while providing space at lower heights for co-location in the future.
- At the current time, none of the other wireless carriers that service the Town of Newburgh area have reportedly expressed interest in co-locating at the proposed facility. However, it is likely that one or more wireless carriers would be interested in co-locating at the site at lower heights in the future if the monopole is approved and constructed.
- In order to comply with the applicable FCC general public MPE criteria, RF levels were calculated for the proposed Verizon installation (without future co-location considered – see RF recommendation below). The anticipated RF levels were modeled and stated to be below and compliant with the general public MPE criterion at locations at and in proximity to the site.
- No tower lighting or marking is required for the proposed monopole as indicated by a Federal Airways & Airspace search result provided by the applicant (dated June 14, 2022).

Recommendations

The following recommendations were identified based on HDR's technical review of the application materials. Some of the below recommendations may be considered as conditions if the Site Plan and Special Use Permit application is approved. **It is expected that supplemental information for some of the below items will be provided by the applicant for discussion at a future Planning Board meeting.**

Monopole and Equipment Compound Configuration: It is understood that final monopole design, colors, textures, and other aesthetic aspects of all proposed equipment including but not limited to the monopole structure, ground-based equipment compound and fencing, and landscaping are subject to Town Planning Board review and approval. The structural and foundation analysis, which has not yet been provided, will need to be finalized based on any granted approval and conditions.

It is recommended that the final industrial-grade finish / color selected for the pole be applied with a matte finish to the extent feasible, as opposed to a high-gloss or shiny finish, to reduce reflectivity. If an alternate color for the monopole and painting is requested by the Planning Board, the final color that is selected should be prepared and applied in accordance with the specifications of the paint and pole vendors, including the use of protective coatings to eliminate corrosion of the structure. Measures should be included in the pole installation specifications for protection of steel and paint/coatings. If damage to paint or coating occurs during shipping or installation, remedial measures should be included.

Verizon panel antennas, RRH units, main distribution boxes, brackets and mounts, the antenna frame, and visible sections of cables should be color-matched with the monopole. It is understood that cables (for Verizon and any future co-locators) connecting equipment mounted on the monopole with ground-based equipment will be routed within the monopole structure.

A conventional, galvanized gray monopole is proposed. **Supplemental photosimulations were requested that consider a matte brown color option and a stealth tree option.** The following notes are offered for Planning Board review, in terms of what is proposed and alternate options to consider:

- **Type of structure:** The conventional monopole is the option proposed by the applicant for this site. A stealth tree has not been proposed, nor has it been recommended to the applicant. The photosimulations with the stealth tree design were requested by HDR to present an additional option for the consideration of the Planning Board. The surrounding terrain is generally wooded, open fields, or wetlands. HDR notes that a stealth tree option may reduce visual impacts in a setting like this; however, verticality is established by the existence of the high-voltage transmission cable supports within the CHG&E utility corridor on the north end of the subject parcel. **HDR recommends that a subset of the photosimulations be developed for the stealth tree option and submitted to the Planning Board to supplement the conventional monopole simulations.**
- **Monopole color:** **Grey (conventional monopole) with matte finish (non-specular) is recommended for Planning Board consideration.** Photosimulations of a brown monopole were provided by the applicant at the request of HDR. Color examples / swatches may be reviewed by the Planning Board or during the Building Permit phase of the project (if approvals are granted). Color specs/swatches (grey, as proposed, and brown option) should be provided prior to and at a future Planning Board meeting.
- **Ancillary equipment on the monopole (antennas, RRH units, cables, etc.):** A matte finish (color to match monopole) is recommended.
- **Equipment compound fencing and landscaping (screening):** A 6-ft high chain link fence topped with three strands of barbed wire is proposed. The Planning Board should review fence options and opine on fence style, color, and landscaping that may be useful for at-grade screening purposes pursuant to Town Code requirements (§168-6 P). The applicant



has stated that no vegetative screening is proposed as the tower base and ground-based equipment compound is screened naturally by vegetation.

- It is requested that the applicant provide examples of alternate fence styles (e.g., vinyl privacy slats or no-climb mesh) to the Town Planning Board for consideration.
 - **Equipment compound lighting:** A small floodlamp is proposed at the ground-based equipment compound. This lighting should be confirmed by the applicant to be utilized only if needed during night-time service visits. It should also be confirmed by the applicant that the light is attached to a manually controlled timer switch that will turn off after a fixed time (e.g., 4-hours).
- **Visual Resources Evaluation:** HDR notes that photosimulations depicting a stealth monopole were requested but not received. A photo of a similar type of design is provided in the Tech Memo (see VRE Section); however, HDR feels it is important for the Planning Board to at least consider this design option. **Photosimulations depicting a stealth monopole / stealth tree design are requested to be submitted to the Planning Board for viewpoints P-1, P-19, P-22, and P-23.**
- **Waivers to Town Wireless Code:** The applicant has requested six waivers to the Wireless Code provisions. The following table presents the requested waivers (as included in the applicant’s initial filings; in the first column) and HDR’s recommendations (second column). It is understood that decisions to grant or deny the requested waivers is at the Planning Board’s discretion and HDR’s recommendations do not constitute a disposition on any waiver requests.

#	Applicant’s Waiver Request	HDR Recommendation
1	§168-6(F) - A waiver is requested from the requirement to provide one certified report containing the requested information. Instead, such information is provided in separate reports and analyses.	<p>This waiver may be granted at the Town’s discretion. It is noted that the applicant has thus far provided two major filings (the initial and supplemental).</p> <p>HDR recommends that if the waiver is granted that the applicant agree to limit the number of submittals to the extent practical in order to reduce the burden on the Town to track all components separately.</p>
2	§168-6(F)(22) - A waiver is requested from the requirement to provide a topographic and geomorphic analysis with the Special Use Permit application. In the event the permit is granted, Verizon Wireless agrees to perform such analysis as a condition of such approval.	<p>This waiver may be granted at the Town’s discretion provided that the applicant agrees to perform the analysis as a condition of the permit approval (i.e., at the Building Permit phase of the project).</p>
3	§168-21 - A waiver is requested from the requirement for the property owner to co-sign the performance security. Standard industry practice requires the tower owner to be wholly responsible for such security.	<p>This waiver may be granted at the Town’s discretion after review by the Planning Board attorney. The applicant is indicating that they will take full responsibility for obtaining and maintaining the required performance securities.</p>



# Applicant's Waiver Request	HDR Recommendation
<p>4 §168-23 - A waiver is requested from the requirement to provide an annual NIER report concerning the emissions. The FCC is the federal agency with sole and exclusive jurisdiction to regulate wireless signals. Additionally, due to the height of the proposed antennas (being more than 10 meters above the ground), the signal strength will always be in compliance with FCC mandates. In fact, it is anticipated that the proposed facility will be categorically exempt from routine FCC monitoring.</p>	<p>In light of emerging technologies in the wireless industry and alternate frequencies/operations that may be put into future use, HDR recommends to not grant this waiver request.</p>
<p>5 §168-24 - A waiver is requested from the requirements of this section concerning insurance. We believe that many of the requirements contained in such section exceed the jurisdiction of the Town's authority. For instance, the Town is NOT legally entitled to be a "named" insured on the policy. A named insured would give the Town the same rights and obligations as Verizon Wireless under the policy, including the obligation of the Town to be liable for the insurance premium. Additionally, Verizon Wireless is not authorized to provide the Town with a copy of its insurance policy. Such policy is considered confidential and proprietary. Nevertheless, Verizon Wireless maintains acceptable levels of insurance coverage for all of its sites and will do so for the proposed site.</p>	<p>This waiver should be reviewed by the Planning Board attorney.</p> <p>In any event, the Building Department should review the applicant's contractor's licenses, insurance, and worker's compensation submittals at the building permit phase.</p>
<p>6 §168-25 - A waiver is requested from the requirement to indemnify the Town relative to the land use and permitting process. This is generally not considered a zoning issue. Moreover, as part of the lease with the school district, Verizon Wireless has agreed to indemnify the school.</p>	<p>It appears that this waiver request may be a carry-over from a previous application. The subject parcel on Pressler Road is not owned by the Town and therefore this condition in the code is not applicable.</p> <p>The applicant should confirm in writing whether they intend to retain this waiver request.</p>

- **SEQRA and Cultural Resources:** Based on the final monopole configuration and Site Plan conditions, the Full EAF (Part 2) should be finalized by the Planning Board. Based on the review of applicant submittals and proposed disturbance for construction, there do not appear to be constraints associated with wetlands or ecological resources. **The applicant should confirm that there are no anticipated impacts to cultural resources.**

It is noted that the original FEAF was completed prior to the re-alignment of the access road. **The applicant should confirm that the acreage for disturbance and other elements of the FEAF remain unchanged after the realignment of the access road.**

- **Town / EMS antenna co-location:** The applicant should confirm whether the wireless telecommunications facility (tower structure and ground-based equipment compound) will be

designed to accommodate municipal or emergency services (e.g., Fire, Police, EMS) equipment. HDR notes that the applicant has provided a letter documenting that the facility will be designed to accommodate four total wireless carriers. HDR understands that plans for co-locating on the monopole can be resolved during the Building Permit phase of the project. Details on antenna(s) and equipment proposed will need to be provided to the applicant.

- **Structural and Foundation Analysis:** If approved, the monopole will be designed to accommodate up to three additional commercial co-locators below the proposed Verizon antennas. [See above comment on Town/EMS antennas.] It is recommended that a final structural and foundation design analysis be developed as a condition of approval to include the final monopole configuration and the co-location scenarios, including design for co-location by three other commercial carriers, Town-owned / EMS antennas, and a foundation design that provides for the possibility of an EFR height increase (i.e., “hypothetical”; addition of an additional 20 ft to accommodate antennas of a wireless carrier in the future that could require extra height to meet service needs). These analyses can be performed at the Building Permit phase of the project. All data that supports the final structural and foundation analyses, such as soil borings, shall be provided to the Code Compliance Department. **It is understood that the Applicant and the Applicant’s engineer maintain full responsibility for the accuracy and adequacy of all aspects of the design and structural analyses, and for the construction and maintenance/operation of the Verizon facility.**
 - It is understood that if any height extension above 120 ft (exclusive of the 4-ft lightning rod) is proposed for the monopole in the future, appropriate Town of Newburgh Code provisions must be adhered to. A height extension proposal may also require a new / separate FAA notification and request for determination. Any modification to a proposed facility in the Town must first be approved by the Building Department (in the case of modifications, upgrades, and co-locations that do not constitute FCC substantial changes) and/or the Planning Board (if a substantial change is proposed).
- **Construction:** If the monopole is approved, a proposed construction schedule should be provided by the applicant at the Building Permit stage of the project. A description of site preparation/clearing activities, construction staging areas, soil/material stockpiles, work hours and duration of work, soil erosion/sediment controls, and proposed construction equipment (e.g., crane) should be submitted to the Town’s Code Compliance Department, including the final construction drawing set and any other details requested.

With regards to scheduling of construction activities: the applicant should to the extent practical ensure that the construction of the monopole and ground-based equipment compound, if approved, be conducted at times that will not interfere with neighboring residential parcels.

Only physical means to control grass, weeds, or nuisance vegetation shall be used. The use of herbicides, pesticides, or other chemical means to control vegetation shall not be permitted at any part of the Verizon lease over the life of the facility. A note to this effect

should be added to the final Site Plan. This requirement shall be transferred to the new owner should Verizon divest its ownership of the tower in the future.

Construction may only occur after approvals of the Site Plan, Special Use Permit, and any requested waivers are granted by the Planning Board and after a Building Permit is issued by the Town. The Code Compliance Department may require third party inspections during construction (e.g., concrete, electrical) and other items which will be scoped during the Building Permit phase of the project.

“As Built” drawings should include the following information – along with any additional items required by the Town Code Compliance Department:

- Documentation/survey of actual monopole height. Final Drawings should include a survey of the property (including lot lines) conducted by a licensed professional surveyor.
- Actual centerline height of the antenna array.
- Map of all trenches, utility runs, sub-grade infrastructure, and utility connections associated with the facility.
- Documentation that antennas, transformers and all other equipment is properly grounded and in compliance with all applicable electrical and fire codes.

It is assumed that excess soil removed from construction / grading operations will be maintained on-site. Should any soil need to be transported off-site, it is the applicant’s responsibility to comply with all local, State, and Federal regulations pertaining to soil characterization, transportation, disposal, and reuse. Groundwater (if encountered during foundation work) should be handled in accordance with all appropriate rules and regulations.

The applicant should confirm whether any imported fill material will be required (other than gravel). The applicant should also confirm whether any temporary stormwater management will be required during construction.

- **Operations (future):** Operations shall be maintained in accordance with the Town’s Wireless Code and all other relevant Town codes and State/Federal requirements (including non-interference compliance). Any proposed modifications in Verizon’s number of antennas, antenna sizes, operating frequencies (i.e., high-frequency 5G services), or number/sizes of other equipment from the information as provided in the application materials and as noted on the final Planning Board Drawing Set shall first be approved by the Town prior to any modifications. All necessary Town approvals must be obtained before any modifications are conducted. Co-location that may be contemplated at the site must first be approved by the Town of Newburgh. *See above notes under Structural and Foundation Analysis as related to co-location scenarios, FCC substantial change criteria, and Town Code Compliance Department or Planning Board involvement.*
- **Maintenance:** If the application is approved, a site-specific maintenance checklist should be provided by the applicant at the Building Permit stage of the project. HDR notes that a tower maintenance and inspection plan has been submitted by the applicant with its

January 2023 filing. Periodic inspection and maintenance should target upkeep of the visible aspects of the wireless facility in accordance with the approved Site Plan and/or “as-built” that are developed. Integrity of the monopole exterior surface and the appearance of all ancillary equipment should be adequately maintained in accordance with the approved Site Plan. Industrial coatings are recommended for painting of the monopole, antennas, and all exterior equipment that is visible to the public. **It is noted that an updated site-specific maintenance plan will be needed for the stealth tree design, if selected by the Planning Board.**

- **Tree Removal & Landscaping:**

It is noted by the applicant’s consultant, Tectonic, in its responsive filing letter dated January 4, 2023 that individual tree information was not picked up during their site survey; however, based on their site walk and aerial imagery review it is anticipated that there are five deciduous trees with a caliper of 8-inch or greater that would need to be removed.

- **The applicant provide better detail about the proposed tree removal at both locations where tree removal is proposed – at the curb cut on Pressler Road and at the stand of trees that borders the field where the tower is proposed.**
 - **It is additionally noted that no landscaping or plantings are proposed by the applicant at this time. Based on the proposed tree removal and a review of the photosimulations, the Planning Board may choose to require landscaping.**
 - **The applicant should also confirm the need for a tree survey. If a tree survey is required, a tree protection plan should also be developed and submitted.**
- **RF Emissions / Safety:** HDR notes that the RF Emissions Compliance report prepared by the applicant’s RF professional consultant – GPC Services attests that the facility will be compliant with FCC general population maximum exposure limits (MPE). HDR agrees based on the frequencies, antennas, and tower configuration provided. **For the Town’s files, a supplemental RF emissions report is requested that accounts for the proposed Verizon equipment plus two additional hypothetical co-located carriers so that a cumulative (conservative) assessment of proposed and future RF emissions can be documented.** Levels at general public areas around the proposed towers, expressed as percent of general public MPE, should be provided. The supplemental report should include assumptions made about the other hypothetical co-located carriers.

The proposed FCC-type and notification signage should be installed and routinely inspected and maintained at all times in accordance with all FCC rules, regulations, and guidance. It is the applicant’s sole responsibility to comply with all FCC rules and regulations that are applicable to the site and operations, including but not limited to compliance with RF emission levels and non-interference parameters. Signage with facility contact information (Verizon) shall also be installed and maintained at the site at all times.

- Contact information for representatives of Verizon (and others co-located on the tower in the future) should be kept up to date and on file at all times with the Town and property owner(s).
- All FCC-compliance signage shall be maintained and updated as needed.
- In the event that the cell site is built, and ownership is divested to a tower or infrastructure company, signage and contact information shall be updated.
- Per Town Wireless Code §168-12, signage “shall be no larger than four square feet and provide adequate notification to person in the immediate area of the presence of an antenna that has transmission capabilities.” The signage must contain the names(s) of the owner(s) and operator(s) of the antenna(s) as well as emergency phone number(s) and must be visible from the access point of the site. The sign must be approved by the Board prior to installation and no other signage is permitted unless required by law. The sign shall not be lighted unless authorized by the Town Planning Board.
- Per Wireless Code Section 168-23, annual certification that NIER levels at the site are within the threshold levels adopted by the FCC. The certifying engineering must be licensed to practice engineering in the State of New York. HDR recommends that the certification include documentation that the operations (power levels, frequencies) follow FCC regulations and that signage is maintained. The annual certification should also confirm - with citations – what the current and applicable FCC MPE levels (general population) and guidelines.
- **Other:**
 - If the Special Use Permit and Site Plan are approved for this Verizon application, construction shall not be initiated until all approval conditions are met to the satisfaction of the Planning Board, Building Inspector, Planning Board attorney, and Planning Board consultants. It is anticipated that a “Check Set” version of final Construction Drawings – and any other supplemental materials to document final Planning Board decisions and the Site Plan and Special Use Permit conditions - will be submitted for Planning Board Chairman signature prior to the Building Permit phase of the project.
 - The applicant should provide a letter pursuant to the requirements of Town Code §168-6 W. It is noted that the applicant has committed to the tower being designed to accommodate three additional co-located commercial wireless carriers.
 - All applicable Town Code sections (including but not limited to Wireless Code, Chapter 168) and other state/federal requirements relating to operations, periodic compliance reporting, certifications, permit renewals, and other items shall be adhered to by the applicant (or tower owner if ownership is transferred in the future) for the life of the facility.
 - The ground-based equipment compound shall be maintained to ensure the equipment and monopole are secure at all times.
 - The applicant should provide periodic updates, both in writing and at Planning Board meetings for which the applicant is on the agenda, with regard to ongoing coordination and communication with other regulatory/governing bodies having


jurisdiction. HDR notes that a portion of the project as currently proposed falls within the Town of Plattekill / Ulster County. Prior to construction, the applicant should provide the Town of Newburgh with proof that all other permits from Plattekill and/or other governing bodies have been secured.

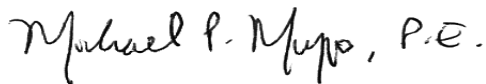
- Orange County Planning Board (OCPB) & Ulster County Planning Board (UCPB). It is suggested that the revised VRE and any other relevant Drawing revisions be submitted to the respective boards. This can be coordinated by the applicant and the Town.
- Performance/Removal Bond. Performance bond or other security will be furnished by the applicant, in accordance with Town Wireless Code §168-21. The need for a construction / completion bond should be reviewed by the Town.
- Fees and Escrows. The Planning Board should review the applicant's fees and escrows to verify they are adequate before full approvals are granted.

Please feel free to contact us should you have any questions on this memorandum.

Sincerely,

Henningson, Durham & Richardson
Architecture and Engineering, P.C.
in association with HDR Engineering Inc.


Colin Mills
Project Scientist



Michael P. Musso, P.E.
Senior Project Manager