



November 23, 2022
HDR Project #10346973
Town of Cortlandt

Town of Cortlandt Planning Board
1 Heady Street
Cortlandt Manor, New York 10567

**Re: Homeland Towers / New York SMSA Limited Partnership d/b/a Verizon Wireless
Proposed Installation of a Wireless Telecommunications Facility
52 Montrose Station Road, Town of Cortlandt, Westchester County, NY
HDR Memo #3**

Dear Honorable Chairwoman Taylor and Members of the Town of Cortlandt Planning Board:

This memorandum was prepared by HDR to summarize additional information received as it relates to the application to construct a new wireless telecommunications tower filed by Snyder & Snyder, LLP on behalf of the co-applicants (collectively the “applicant”), Verizon Wireless (Verizon) and Homeland Towers, LLC (Homeland). The applicants are proposing to construct a new 140-ft tall monopole on the rear portion of a ±6-acre parcel of land located at 52 Montrose Station Road (zoned R-40; residential). Verizon is proposing to install a three-sector antenna array consisting of 12 panel antennas (four per sector) mounted to the monopole structure with an antenna centerline height of 137-ft above ground level (agl). A second carrier has expressed interest in co-locating on the tower if approved and constructed. Several designs have been put before the Planning Board for consideration including a traditional monopole (gray and brown colors) and a stealth-tree monopole.

HDR attended a work session with members of Planning Board on October 27, 2022 to review HDR’s prior filings as well as to discuss and provide context to questions brought up by the Board and members of the public at the two prior public hearing sessions. Slide decks used at the work session and the Planning Board meeting of November 1, 2022 were submitted and further discussed at the meeting.

The discussion at both the work session and the Planning Board meeting included a general overview of the proposed site location and HDR’s work on behalf of the Planning Board to-date such as: review of initial application materials (circa 2019); site visits; supplemental information requests based on reviews of application submittals with the context of Town Wireless Code §277 (HDR Inventory and Completeness Memo; July 7, 2022); scope development, noticing, and observation of balloon test (July 23, 2022) and visual assessment, technical review of application filings (HDR Tech Memo; September 23, 2022); and review of various supplemental filings made by the applicant and members of the public made in response to comments and inquiries made during the Planning Board Meetings on October 11, 2022.

A significant part of the discussion focused on signal propagation (coverage) maps provided by the applicant in response to a request by the Planning Board and members of the public to provide supplemental detail on the process of selecting the proposed site and whether alternate sites may be viable options. Coverage of ten alternate sites was provided by the applicant in its October 20, 2022 responsive filing. These map exhibits provide coverage from other possible sites; however, not all of the sites are feasible or practical (for example – alternate sites at Croton Solar and Furnace Dock Road would not provide coverage to portions of the Verizon gap area, are too close to an existing Verizon facility wherein interference becomes a concern).

To provide additional context and a visual depiction of the differences between each of the ten alternatives compared to the proposed site's coverage, HDR digitally georeferenced the applicant's coverage maps into a geographic information system (GIS) map and developed a series of comparative images. During the October 27, 2022 work session it was requested that this also include a comparison of total coverage areas, between the proposed site at 52 Montrose Station Road and each of the alternates. More details on this process as well as the comparison of approximate total area covered follows in Section 3 of this memo. HDR also developed several topographic cross sections depicting elevations along a transect that would bisect the proposed site and one or more of the alternative sites to give context to the terrain (terrain can block the line-of-sight signal propagation needed for wireless service).

HDR's presentation also included several photographs collected during a site visit conducted on October 25, 2022 to Dickerson Mountain¹, a discussion on FCC nationwide mapping resources and HDR's outreach to FCC, a discussion on alternate technologies (e.g., satellite), a series of photosimulations included in the applicant's visual resource evaluation and additional simulations depicting a stealth tree. HDR requested as part of its September 2022 Tech Memo that photosimulations and elevation details showing a stealth tree design be provided for the Planning Board to consider as an alternative to the proposed monopole design.

This memo provides additional discussion on the search for alternative towers and existing antenna sites via publicly available internet-based resources, outreach to neighboring municipalities, and the comparison of signal coverage areas requested by the board. HDR notes that the public hearing was closed at the November 1, 2022 and that a 20-day written comment period was opened with final submissions by the applicant and any members of the public due November 22, 2022.

1. Search for Existing Towers

Town Code Chapter 277 (Wireless) stipulates a hierarchy of priorities for siting a new wireless telecommunications facility. The site proposed by the applicant at 52 Montrose Station Road falls into the lowest priority category and as such requires that potential sites of a higher priority are not overlooked. HDR has independently reviewed publicly available information as described below

¹ Note: "Dickerson Mountain" as referred to by the applicant in RF exhibits is an existing Verizon facility at 260 Croton Avenue (Lake Mohegan Fire District Station 3 monopole). The term in this memo is intended to refer to the actual topographic feature unless the address or the context indicates reference to this existing wireless facility.

and in Section 2 of this memo as well as the attestations made by the applicant in its filings to assess whether any existing towers or other tall structures exist that might be able to provide coverage for the gap in service area identified by Verizon.

There are several publicly accessible websites on which one can freely search for antennas and/or tower information. These websites can provide a general idea of what might be present in the real world; however, they may not provide a complete or up to date inventory. For example, antennasearch.com provides existing antennas and towers within a 3-mile radius of an address; however, the site does not clearly indicate information about its sources of data. Another site, cellmapper.net shows user-generated data from handheld mobile devices with their companion application installed and running. This service appears to estimate tower locations based on user-provided data and signal strength with registered users being able to “verify” tower locations. A Federal government website also allows visitors to look up the locations of towers; however, it appears to only reliably provide those that have FAA-required tower lighting; however, many cell towers do not require this and therefore the results may not be comprehensive of existing towers within a given area. Towermaps.com provides a map of tower locations for free but details about the tower require site registration. The free map appears to cover some but not all of the known towers (for example, an existing tower at 451 Yorktown Road in the Town does not appear on the map) and indicates its last update was in 2020. Rooftop or other non-tower-based antenna equipment may not show up in search results from these sites either. Nevertheless, these websites are useful tools to review for general information.

In a 2019 RF Report (C-Squared, February 20, 2019) the applicant supplied a listing of 17 towers identified by using antennasearch.com. This list is noted to exclude towers upon which Verizon was already located or those which had pending or proposed sites at the time. In a November 21, 2022 filing submitted in opposition to the application, the same website is referenced noting that there are “19 towers and 196 antennae” within a 3-mile radius of the proposed 52 Montrose Station Road site. HDR performed an independent search on the same website and noted the same results (search conducted most recently on November 22, 2022). A screenshot of the search results from antennasearch.com is included as **Attachment 1**. Many of the towers shown are towers upon which Verizon has indicated it is *already* co-located on. Other towers are farther away and would not likely provide the coverage required due to distance and/or terrain or would interfere with an existing cell site that may in fact be closer to the proposed site and Verizon service gap.

In addition to the above-referenced websites, HDR also worked with the Town’s Planning Department to reach out to neighboring municipalities to request information on existing tower sites within surrounding communities. These findings are discussed below in Section 2.

Based on HDR’s review of search results from antennasearch.com, other websites listed above, documentation provided by the applicant, information supplied by neighboring municipalities and an outside firm conducting a Northern Westchester wireless siting plan (CityScape), and HDR’s own knowledge of the area, it appears that there are no existing towers within the search area that can be utilized to serve the gap in coverage identified and targeted by the applicant.

2. Municipal Outreach

HDR worked with the Town of Cortlandt’s Director of Planning to reach out to five neighboring municipalities for information on towers that may be located along the boundary of, but not necessarily within, the Town of Cortlandt to assess whether towers / existing cell sites might exist in proximity to the proposed site location. A summary of the information provided by the neighboring municipalities is below.

Municipality	Summary of Response
Town of Yorktown	<p>Provided a map of sites within Yorktown and approximately within 1-mile buffer (Attachment 2) of the Town boundary (part of CityScape study). Three towers along the western edge of Yorktown were identified including:</p> <ul style="list-style-type: none"> • 3105 E. Main Street (northeast of proposed site at Town Centre; Verizon is co-located here and refers to site as “Roe Park”) • 451 Yorktown Rd (south of proposed site; Verizon is co-located on this tower) • Intersection of Maple Ave and Croton Ave southeast of the proposed site (Hemlock Hill Farm and Market) – note, based on review of aerial photographs and results from antennasearch.com it does not appear that there is currently a tower site at this location. Yorktown’s map (CityScape study) indicates there is an “inquiry” at this location which could mean interest expressed for a tower site.
City of Peekskill	Listing of current or proposed wireless facilities is not available.
Town of New Castle	<p>Provided a GIS layer depicting towers within the Town of New Castle, which includes the tower at 1065 Quaker Bridge Road within Cortlandt (well south of targeted coverage area). Other towers are south and/or also well outside of the search area.</p>
Village of Croton-on-Hudson	<ul style="list-style-type: none"> • 20 Veterans Plaza (Train Station) Monopole – includes Verizon • 1 Van Wyck St (Muni. Bldg. Rooftop) – includes Verizon
Village of Buchanan	No cell sites reported within Village proper. (note - contact noted routine inquiries are received from residents with regard to lack of cell service)

Yorktown is also a participant in the Northern Westchester County Wireless Telecommunications Infrastructure Master Plan study along with the towns of Bedford, Lewisboro, Mount Kisco (town and village), North Salem, Somers, and Pound Ridge. This study is being conducted by CityScape Consults, Inc. (CityScape), part of which provides table and map inventories of existing cell sites in each of those communities and adjacent (1 mile) to the borders. The Town of Cortlandt is not part of this study; however, outreach to Yorktown and New Castle staff had noted the study and provided exhibits for cell site mapping for areas adjacent to Cortlandt (e.g., western portion of Yorktown). No new information on eligible structures or existing tower sites that may be viable alternatives was revealed.

HDR also placed an inquiry with to the Town of Cortlandt Department of Technical Services (DoTS). DoTS provided a list of tower sites within the Town that have current or prior applications or permits as logged into this tracking system (note – this list is not comprehensive of all tower sites – for example, it does not include several towers on which Verizon is co-located). This Town inventory did not identify cell site locations that were not discussed / reviewed prior.

3. Alternative Site Coverage Area Comparisons

At the request of the Planning Board, HDR conducted an analysis comparing the coverage area provided by the proposed site against each of the ten (10) alternate sites that the applicant provided modeled signal propagation maps for in their responsive filing submitted on October 20, 2022. These alternate sites represent places identified by members of the Planning Board and/or members of the public during the prior public hearings. The signal propagation maps present modeled signal strengths from each alternate site on its own (e.g., all other sites in the area are “turned off”) and color coded to depict level of service as defined by Verizon’s RF engineers. On these figures the applicant shows what it deems as reliable in-building (≥ -85 dBm signal strength) and reliable in-vehicle coverage (< -85 dBm and ≥ -95 dBm) in reference signal received power (RSRP) using green and blue shading, respectively. RSRP values are given in negative numbers with signal strength increasing as the value approaches zero.

To perform the analysis, HDR georeferenced the provided figures into geographic information system (GIS) software (Esri ArcGIS Pro). The georeferencing process works by selecting points from the image lacking a spatial reference and locating them to a known point on the underlying base map which represents the real world (for example: an intersection or other distinct feature that is visible in both the original propagation map and an underlying base map image). This process was repeated for each alternate site propagation map. The approximate areas covered by both the in-vehicle and in-building coverage were extracted from the coverage map figures into a single shape.

Verizon has indicated that it is seeking to fill a particular gap in coverage in the area around the proposed site at 52 Montrose Station Road. In order to provide a consistent comparison between the proposed site (52 Montrose Station Road) and each alternative site within the underlying context of the gap area, each coverage area was clipped at a 2-mile radius from the proposed site. This allows a direct comparison of coverage to an approximation of the area targeted by Verizon.

The following table presents a comparison of the approximate coverage areas for the proposed site at 52 Montrose Station Road and each of the ten alternative sites provided by the applicant. For reference, the approximate coverage areas for the alternative and the proposed site (with no other sites “on”) are presented in the first two columns. For comparative analysis, the area serviced by only the alternate site, area serviced by both the alternate site and proposed site (areas where both sites cover / overlap), and area serviced by only the proposed site are provided in the last three columns. Larger numbers in the “Alt. Site and Proposed Site Overlap” column indicate that there is more similarity between the proposed site and the corresponding alternate site’s coverage footprints.

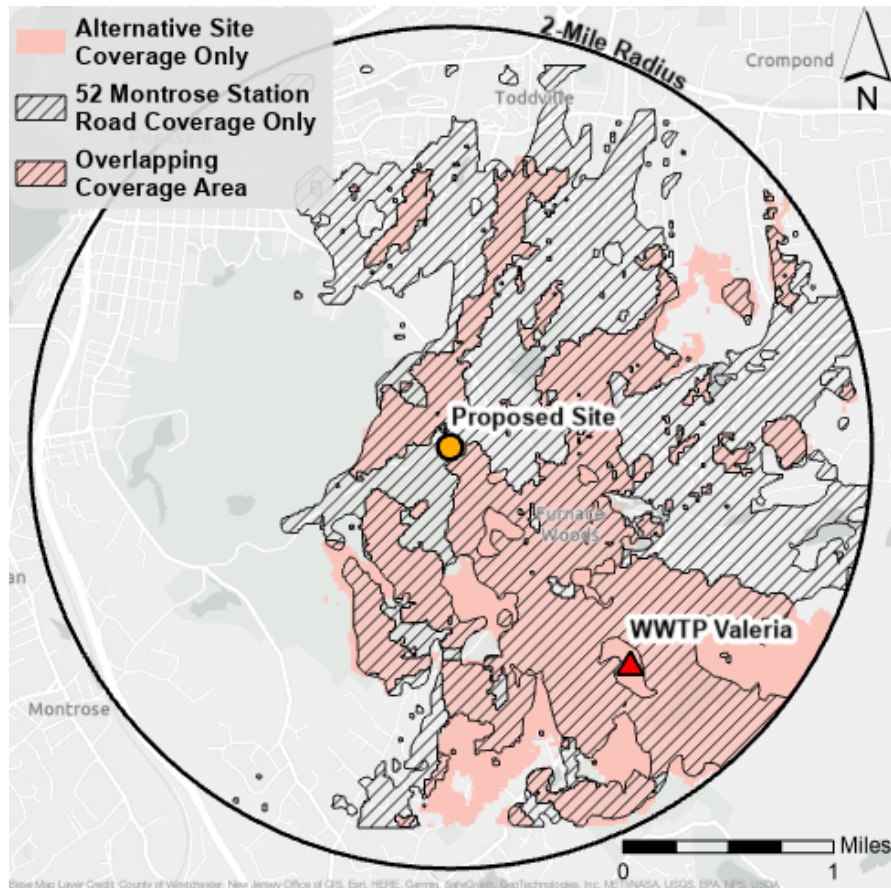
When interpreting coverage areas shown in the table below one should also consider that these are purely approximate total areas. The values do not account for the presence (or absence) of major roadways that see many users traveling through an area, commercial and institutional locations that see many temporary visitors, parks, density of housing, schools, or other uses that might drive the need for cell service. The values also do not take into consideration overlap (or interference) with existing coverage provided by other currently on-air sites (e.g., Croton Solar alternative is in close proximity to existing 260 Croton Ave; Spitzenberg Mountain alternative providing coverage to areas already served in west/southwest portion of the Town).

Comparison of Coverage Areas

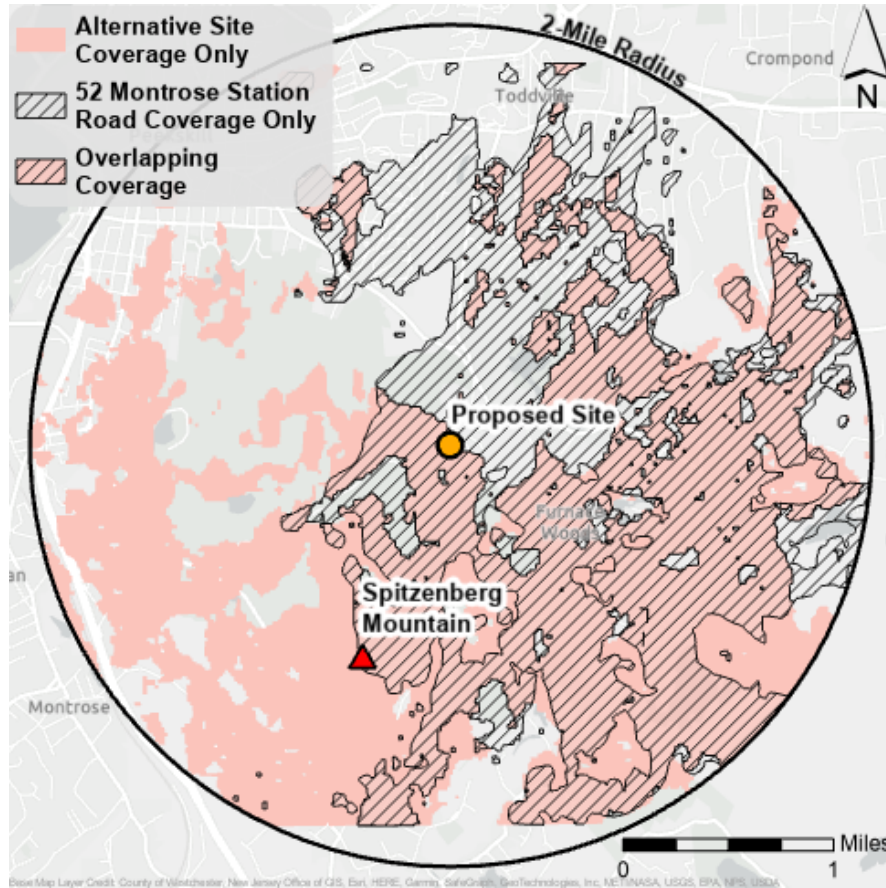
Alternate Site Name	Alternate Site Total Coverage Area*	Proposed Site Coverage Area*	Alternate Site Coverage Only*	Alt. Site and Proposed Site Overlap*	Proposed Site Coverage Only*
Spitzenberg Mountain	6.3	5.3	2.9	3.4	1.9
Valeria WWTP	3.3	5.3	0.8	2.5	2.8
Croton Solar	3.1	5.3	0.8	2.3	3.0
534 Furnace Dock Rd	2.5	5.3	0.5	2.0	3.3
KP Lounge	3.9	5.3	0.7	3.2	2.1
Ohr Hameir	4.3	5.3	0.3	4.0	1.3
Sportsman Club	4.8	5.3	1.1	3.7	1.6
Chapel Hill Neighborhood	4.1	5.3	2.1	2.0	3.3
Cook Pool	2.6	5.3	0.9	1.7	3.6
Flanders Lane	4.4	5.3	1.5	2.9	2.4

All areas shown are in square miles. *Alternative site and propose site coverage areas are clipped to a 2-mile radius around the proposed site. Coverage areas depicted on the source figures may extend beyond this area. Please refer to the discussion above this table for further details on the source of these values and guidance on interpretation.

The below image provides a graphical representation of the generation of the values in the table above for the Valeria Wastewater Treatment Plant (WWTP) alternative site.



The below image provides a graphical representation of the generation of the values in the table above for the Spitzenberg Mountain alternative site. It is noted that within the 2-mile radius that Spitzenberg Mountain provides more net area coverage than the proposed site at 52 Montrose Station Road; however, coverage from this alternative does not reach into the northern gap area that would be serviced by the proposed site.



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

Sincerely,

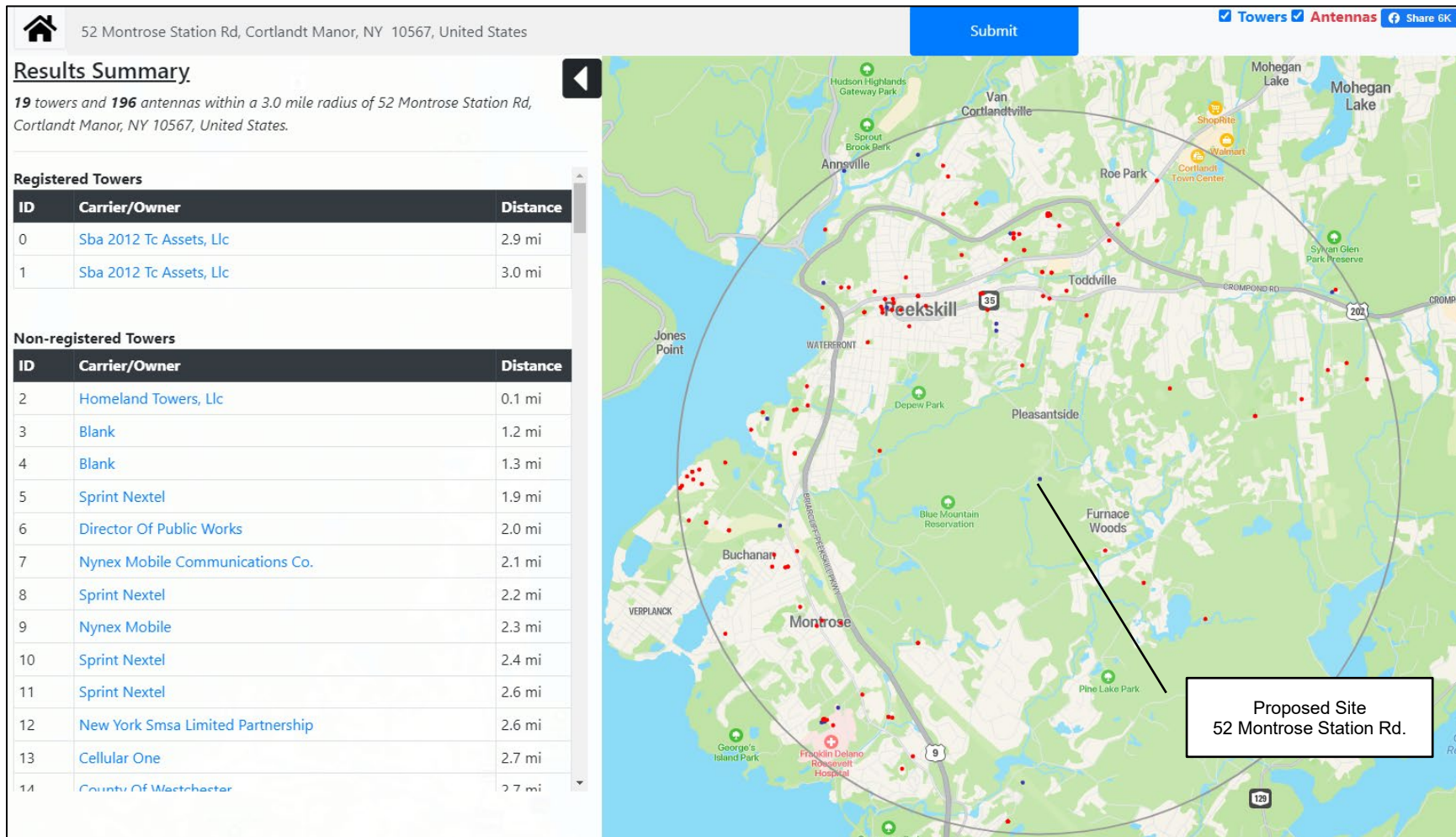
Henningson, Durham & Richardson
 Architecture and Engineering, P.C.
 in association with HDR Engineering Inc.

Colin J. Mills
 Colin Mills
 Project Scientist

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



ATTACHMENT 1
Antennasearch.com Search Results – November 22, 2022

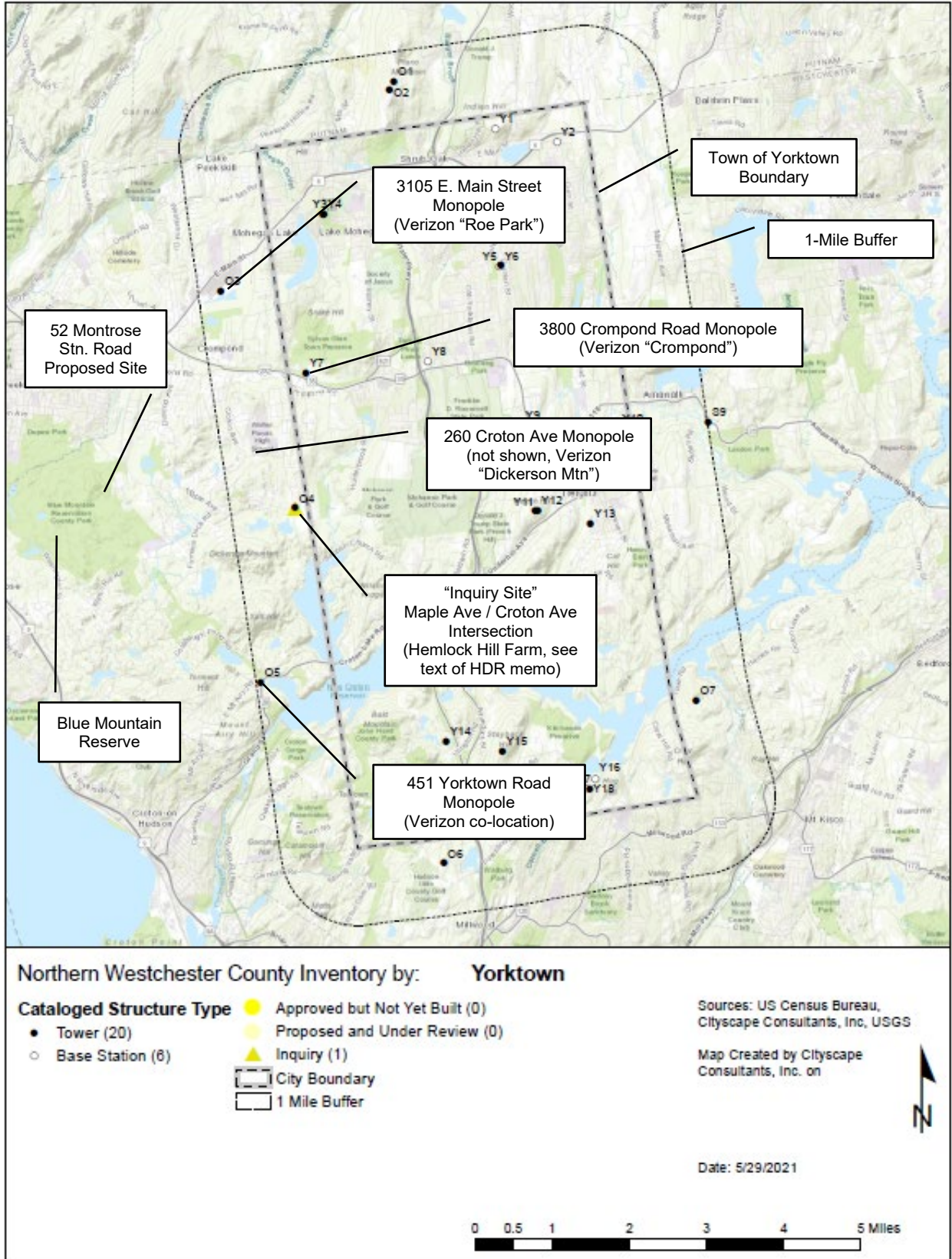


Source: antennasearch.com search results; November 22, 2022. Additional notation added by HDR for clarity.

Blue Dots = Existing Towers
 Red Dots = Existing Antenna (may not be tower mounted)



ATTACHMENT 2
Yorktown Map of Existing Cell Sites within Town Boundary and 1-mile Buffer (CityScape Study)



Source: Town of Yorktown (received November 9, 2022; part of CityScope study). Additional notation added by HDR for clarity.