Statement of Certified Engineer
Site Selection and Performance Standards

Site Name:	Verizon Wireless - Casanova
Parcel Number:	7902-23-8746-000
Site Address:	5348 Casanova Road, Warrenton, VA

The location was selected by Verizon Wireless to provide and improve wireless 4G LTE coverage along State Route 643 (Meetze Road) to Warrenton, Virginia, including providing coverage to the community of Casanova. The site will also enhance in-building coverage in the surrounding area.

Verizon identified no existing structures of sufficient height in the area to support the facility and provide the desired coverage objectives.

The proposed facility will help Verizon resolve the need for adequate coverage in the area around the proposed site and also ensure adequate overlapping coverage between and among existing Verizon sites. Ultimately, the proposed site will allow residents and commuters to experience better quality and diminished dropped calls. The propagation maps attached to the application and prepared by a RF engineer illustrate the improved coverage that will result with the addition of the new telecommunications site.

The proposed use will meet all performance standards for the Agricultural Zoning District (RA) related to Noise, Vibration, and Glare, as specified in Article 9 of the Fauquier County Zoning Ordinance.

Naod Desta
Radio Frequency Engineer WB/VA
Verizon Wireless
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2nd Floor - Network
Laurel, MD 20723

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September 15, 2016

Attn: Barb Pivec - Partner
Calvert Crossland, LLC
904 S Broadway
Baltimore, MD 21231

Re: RF Design Considerations for Proposed Calvert Crossland "Casanova" Communications Facility
Site Name: Casanova, Proposed 140' Monopole
5348 Casanova Road, Warrenton, VA 20187 (Fauquier County)

Dear Ms. Pivec,

I previously provided extensive radiofrequency analysis for the prior application for a proposed communications facility in the "Casanova" area. A new application is being filed in Fauquier County for a proposed 140' monopole on the Pohzehl property which will afford Verizon Wireless an antenna centerline height of 136' above ground level. Attached are current propagation exhibits which demonstrate the additional coverage afforded by the proposed facility. The proposed facility will fill a large coverage gap that exists in the Casanova area.

The objective of the proposed communications facility is to provide an effective wireless communication coverage solution to a section of Fauquier County southeast of Warrenton in a community known as Casanova. The community of Casanova is relatively rural with scattered homes, farms, churches, a ballfield, a post office, and an Inn (Poplar Springs) with spa and restaurant (The Manor House Restaurant). All of these areas currently suffer from a lack of reliable wireless communications services simply due to not having a facility in the area. The proposed facility will improve service and provide better handoff between the existing sites primarily those identified on the attached propagation plots as *Leesview, Calverton, Litchfield, and Warrenton South*. The facility will provide 1-2 miles of substantial new service to the entire Casanova community including large sections of Casanova Road, SR-643 and SR-616, Rogues Road, Weston Road, Country View Drive and other secondary routes in the vicinity of Casanova. The facility will also provide reliable coverage to the Poplar Springs Inn and Spa, along with the Manor House Restaurant on the southeast side of Casanova. There are no other existing tall structures suitable for collocation in this target area which I have identified during multiple site visits. The proposed facility location is particularly suited to fulfill the objectives of providing new reliable coverage to the area in which it will serve.

The proposed facility will also need to be close enough to the heart of Casanova (within half of a mile where the junction of Casanova Road, Rogues Road, and Weston Road is located) to reach the largest number of subscribers in the area, and also to extend coverage most effectively in the northwest direction towards other existing sites on the south side of the town of Warrenton (such as Leesview). The closer proximity to Casanova is a primary consideration due to the limited reach of the AWS band (higher frequency band with more limited range which enhances capacity, also known as XLTE). To accomplish this from a RF perspective only, the site is most particularly suited at the Pohzehl property location to meet this criteria.

The existing Verizon Wireless facilities in the area are identified on the propagation plots as follows:

Leesview – 320' guyed tower at 6546 Lovers Lane, Warrenton (VZW at 160')

Warrenton South – 140' monopine at 9337 James Madison Highway, Warrenton (VZW at 131')
Calverton – 265' lattice tower at 4202 Old Calverton Road, Calverton (VZW at 218')
Litchfield – 199' monopole at intersection of Opal Road and Route 29, Opal (VZW at 178')

The objectives of the proposed facility are primarily based on the need for coverage, which is delivering sufficient signal to the area in which the proposed site will serve. As discussed, the proposed site will meet that objective at 140 feet in height at the proposed location. Although the objectives of the facility are primarily based on coverage, the facility will also provide additional capacity to other existing sites in the area. More specifically, the proposed facility will provide some needed offloading of usage from all other adjacent sites, such as those identified on the propagation plots as Warrenton South, Calverton, Litchfield, and Leesview. Any reduction in antenna height from 140 feet will further reduce the amount of traffic off-loading to the adjacent sites currently serving the area, and would consequently require addition facilities to the east and west of the proposed facility location.

Proper placement of new facilities is critical to maintaining and expanding service where it is needed, and minimizing signal propagation (RF interference) where it is not needed. New facilities must be properly placed within the existing cellular network grid to provide proper handoff to other existing adjacent facilities. Verizon Wireless takes steps to only build new facilities where absolutely necessary, and considerable planning goes into the development of a new facility to minimize visual impact.

In summary, upon consideration of the many factors discussed herein, it is my opinion that the proposed communications facility is particularly suited (both in location and minimum height required for Verizon Wireless) to provide reliable service to subscribers in a section of Fauquier County that currently suffer from a significant gap in reliable wireless service. I am not aware of any other more feasible alternatives of providing reliable wireless service is this area. The proposed communications facility in this location is necessary for the efficient operation and provision of wireless services to the area for which it is proposed.

Please let me know if I can provide any further assistance.

Respectfully,

Paul Dugan, P.E.
Registered Professional Engineer
Virginia License Number 036239

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EDUCATION:

Widener University, Chester, Pennsylvania
Master of Business Administration, July 1991
Master of Electrical Engineering, December 1988
Bachelor of Science, Electrical Engineering, May 1984

PROFESSIONAL ASSOCIATIONS:

Registered Professional Engineer in the following jurisdictions:

Pennsylvania, License Number PE-045711-E
New Jersey, License Number GE41731
Maryland, License Number 24211
Delaware, License Number 11797
Virginia, License Number 36239
West Virginia, License Number 20258
Connecticut, License Number 22566
New York, License Number 079144
District of Columbia, License Number PE-900355
Puerto Rico, License Number 18946

Full member of **The Association of Federal Communications Consulting Engineers** (www.afcce.org) January 1999 to Present
Elected and served on the Board of Directors for five year term 2006-2011

Full member of **The National Society of Professional Engineers** (www.nspe.org) and the **Pennsylvania Society of Professional Engineers** (www.pspe.org) June 2003 to Present
Currently serving as PSPE State Director and Past President on the Board of Directors of the Valley Forge Chapter and the South East Region Vice-Chair for the "Professional Engineers in Private Practice" Executive Committee. Actively participated in NSPE Annual Conferences 7/2005 to Present.

Actively participate in **Chester County ARES/RACES Amateur Radio** (CCAR www.w3eoc.org) which prepares and provides emergency backup communications for Chester County Department of Emergency Services, March 2005 to Present

Full member of **The National Council of Examiners for Engineering** (www.ncees.org) May 2001 to Present

Full Member of **The Radio Club of America** (www.radio-club-of-america.org) December 2003 to Present

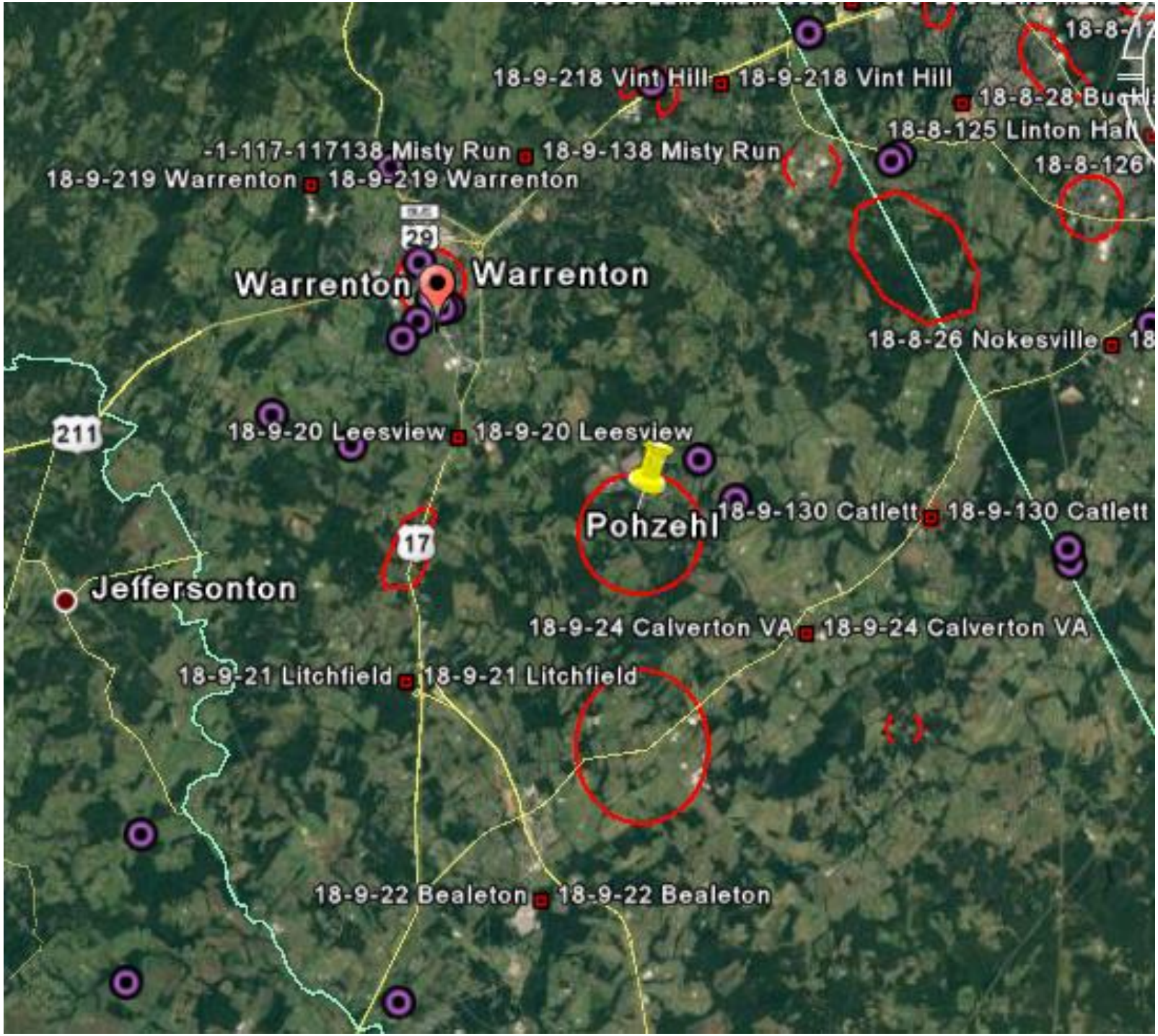
PROFESSIONAL EXPERIENCE:

Millennium Engineering, P.C., Malvern, Pennsylvania
Position: **President**, August 1999 to Present (www.millenniumengineering.net)

Verizon Wireless, Plymouth Meeting, Pennsylvania
Position: **Cellular RF System Design/Performance Engineer**, April 1990 to August 1999

Communications Test Design, Inc., West Chester, Pennsylvania
Position: **Electrical Engineer,** May 1984 to April 1990

PERSONAL:

Date/place of birth: November 21, 1961, West Chester, Pennsylvania; United States Citizen

Antenna Support Structures in the Vicinity of Calvert Crossland Site Casanova