

Eco-Site/T-Mobile Information submitted to date

- Original Application: November 16, 2016
 - ATC Concurs
- Supplemental Information: April 10, 2017
 - ATC Concurs
 - Eco-Site/T-Mobile Cell Splitting Presentation
 - Eco-Site/T-Mobile Site Selection Summary
 - Eco-Site/T-Mobile Planning Commission Responses
 - Eco-Site/T-Mobile Propagation Maps

Radio Frequency Propagation Evaluation for Eco-Site /T-Mobile SUP-16-0011

ATC Report Support Data: December 6, 2016

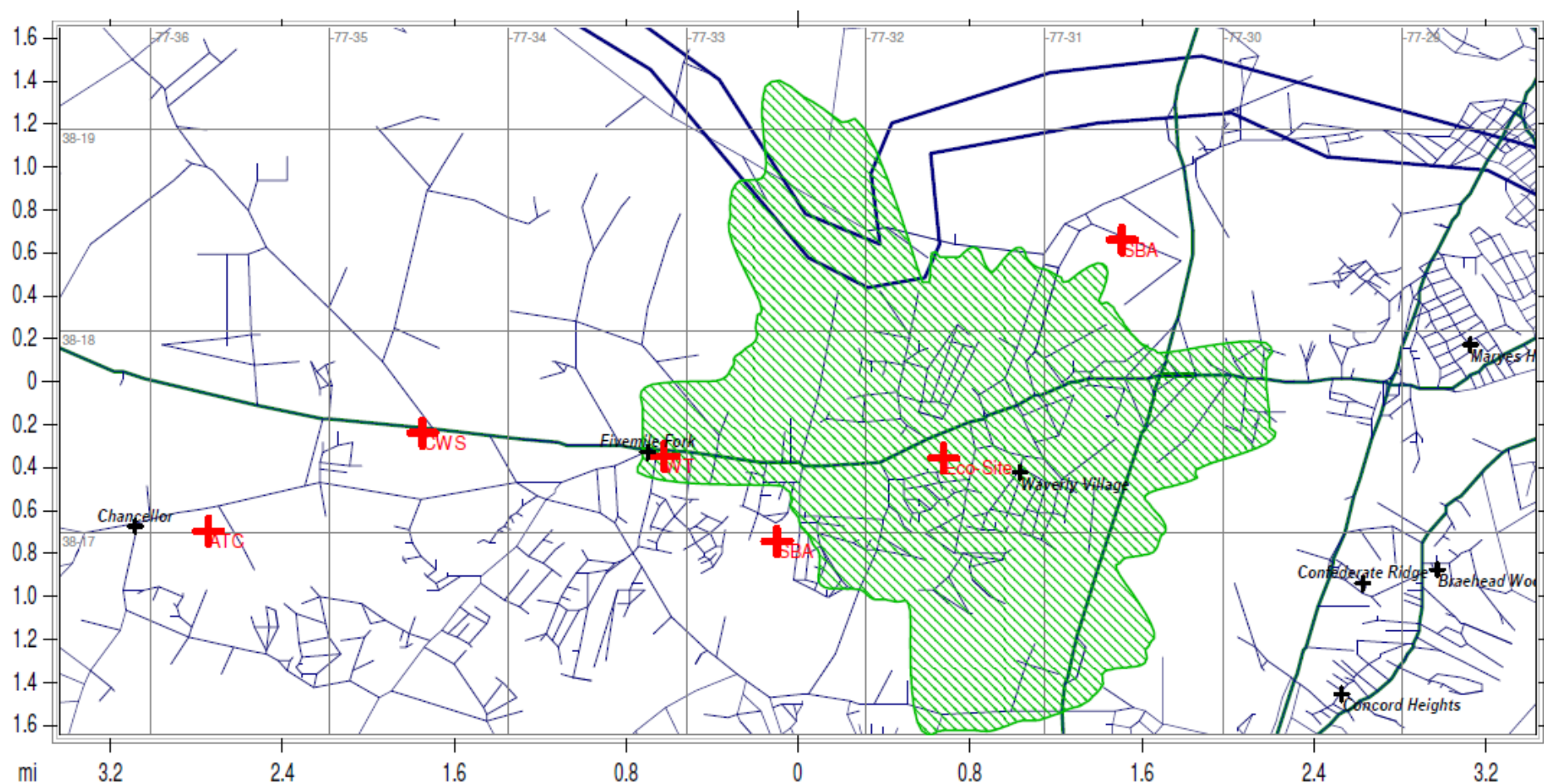
T-Mobile has FCC Licenses for Three Blocks

- 763 MHZ – D Block
- 1755 MHZ – F Block
- 1865 MHZ –PCS Block

A-Block @ 700 MHZ

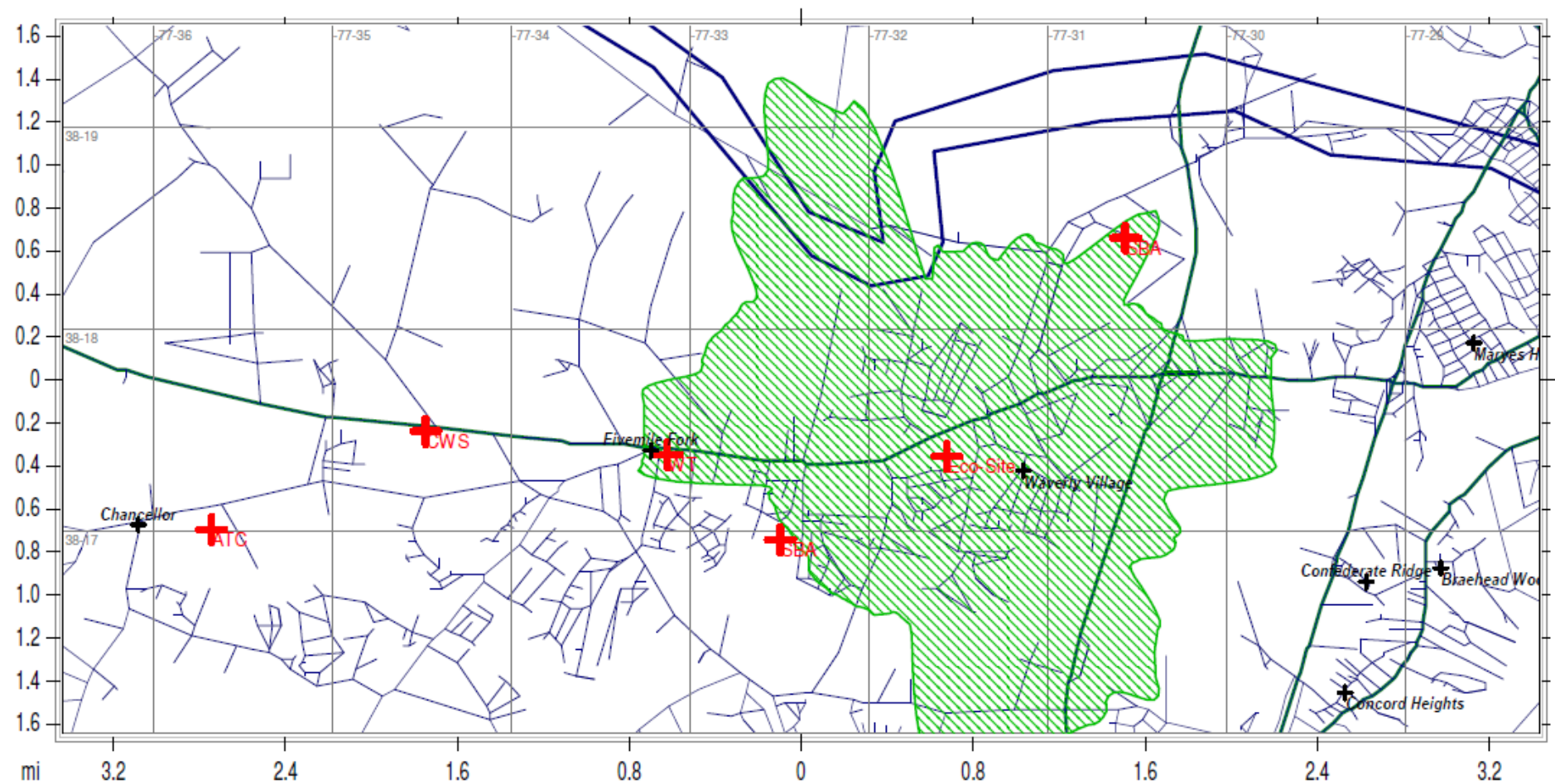
- General Principles
 - Minimum Base Line @ 700 MHZ
 - Lower Frequency @ Same Effective Radiated Power covers greater geography
 - High Frequency @ Same Effective Radiated Power covers less geography
 - Mobile Data with In-building Penetration
 - RadioSoft-ComStudy Software (r.10)
 - 23 different inputs for the calculations
 - System Technology
 - Tower Tx/Rx Frequency
 - ERP
 - Line Loss
 - Antenna Gain
 - Antenna Orientation & Tilt
 - Topography
 - Sound Attenuation
 - Antenna Pattern
 - Center Line of antenna
 - Foliage
 - Location of Rx/Tx Device
 - Device Rx/Tx, ERP, Antenna Gain, etc.
 - Knife Edge Diffraction
 - Reflective Power

Spotsylvania County, Virginia



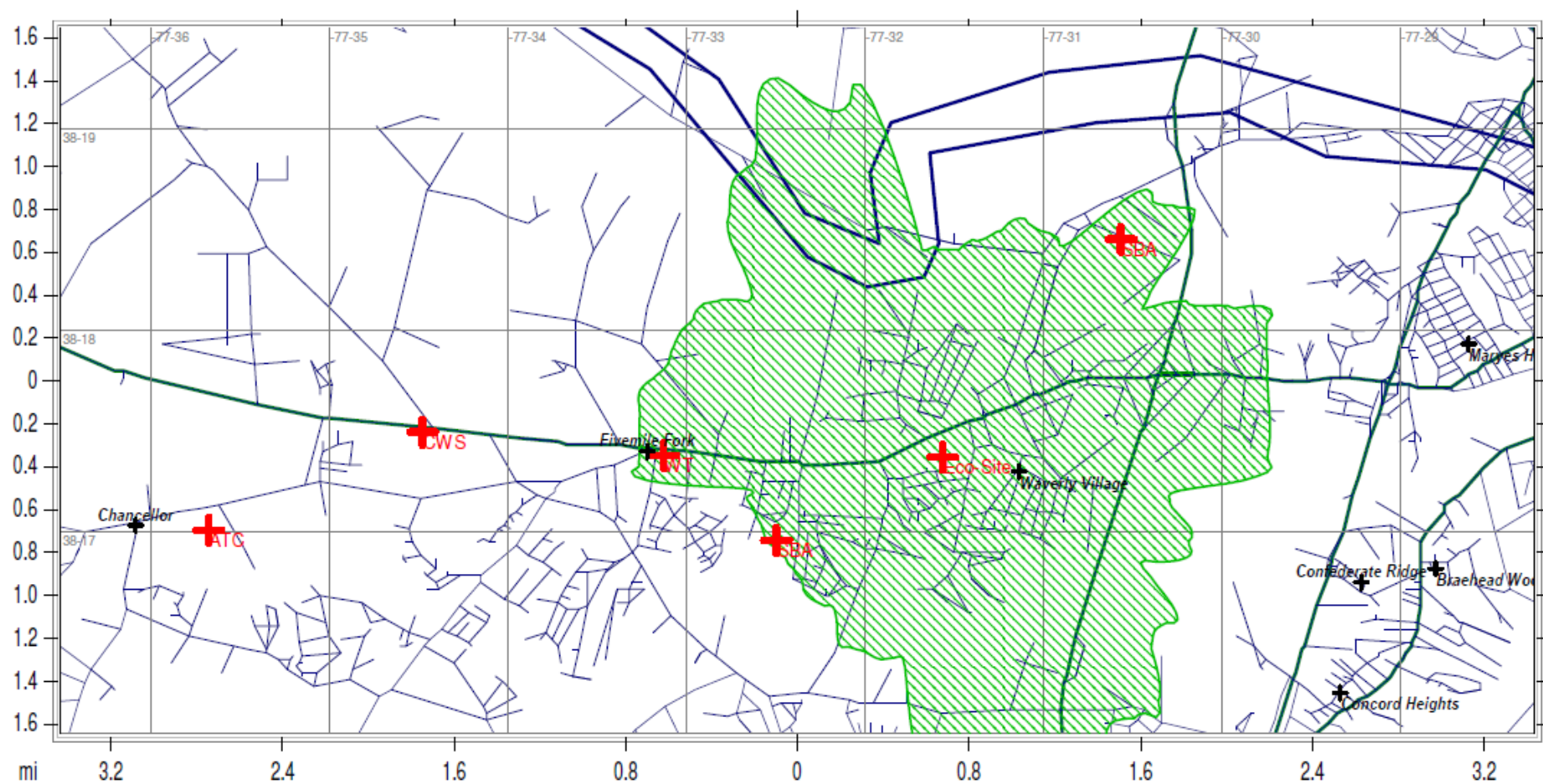
A-Block -700 @ 80' AGL.pdf

Spotsylvania County, Virginia



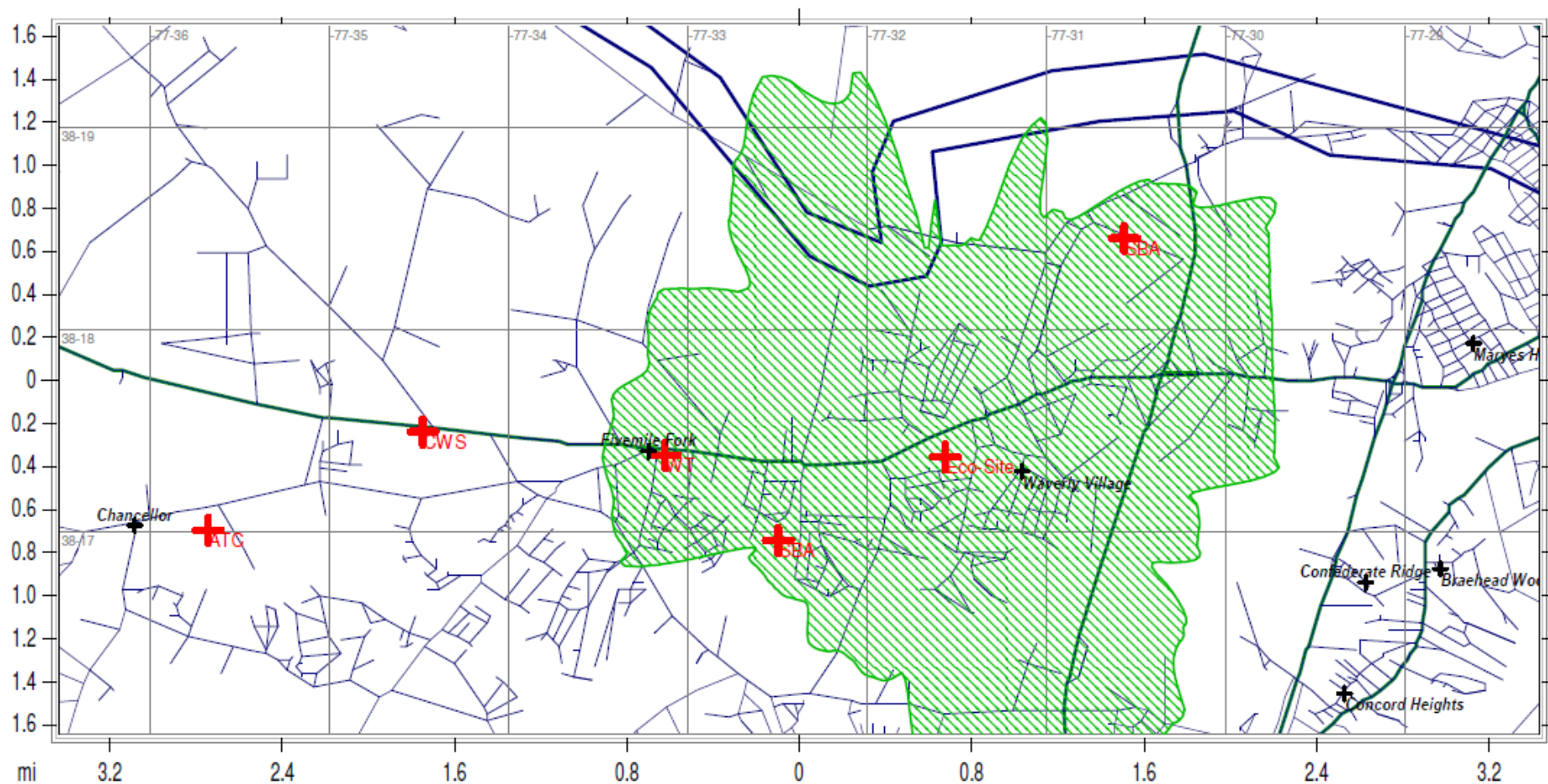
A-Block -700 - @ 100' AGL.pdf

Spotsylvania County, Virginia



A Block - 700 @ 120' AGL

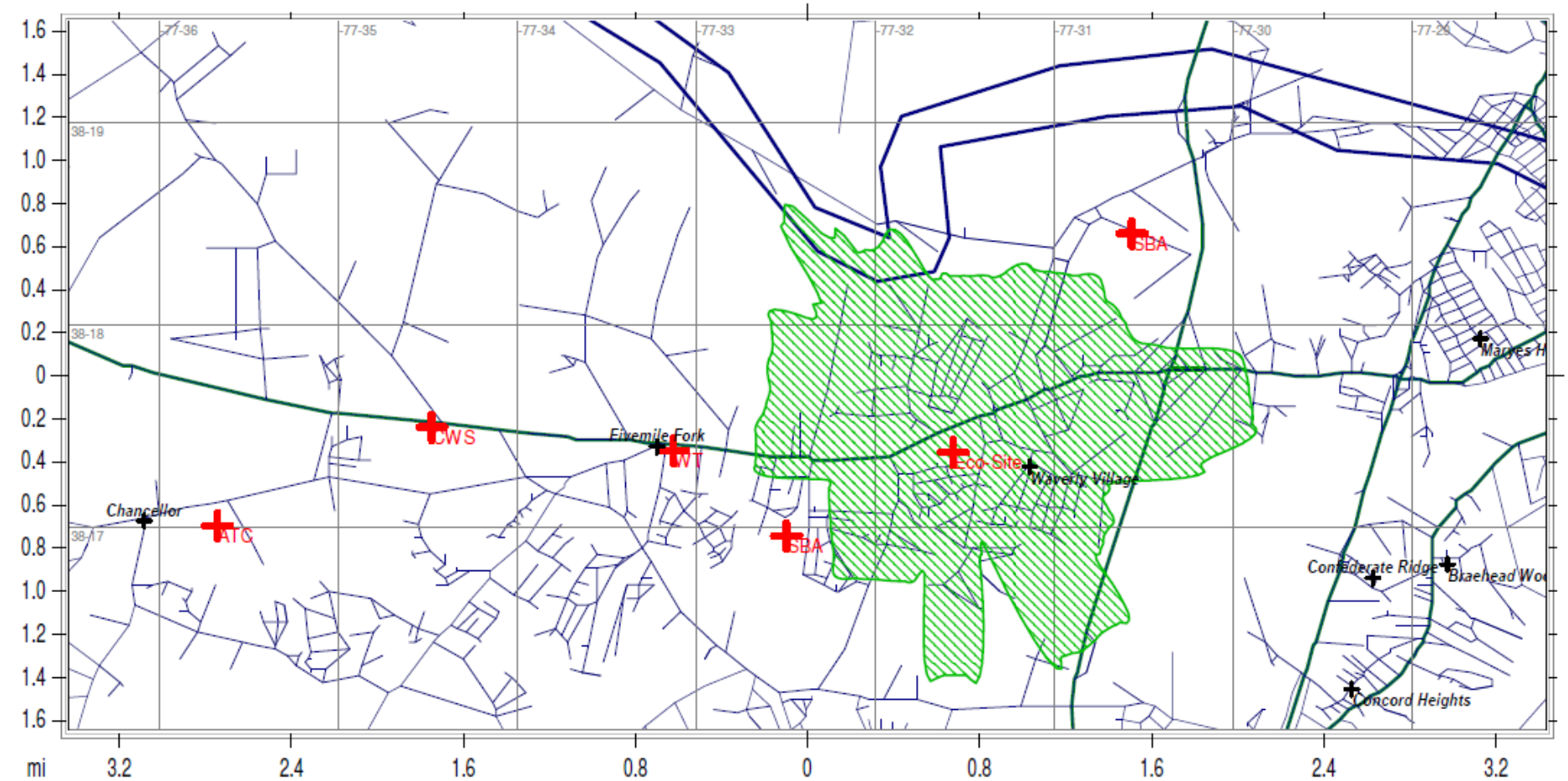
Spotsylvania County, Virginia



A-Block 700 @150' AGL

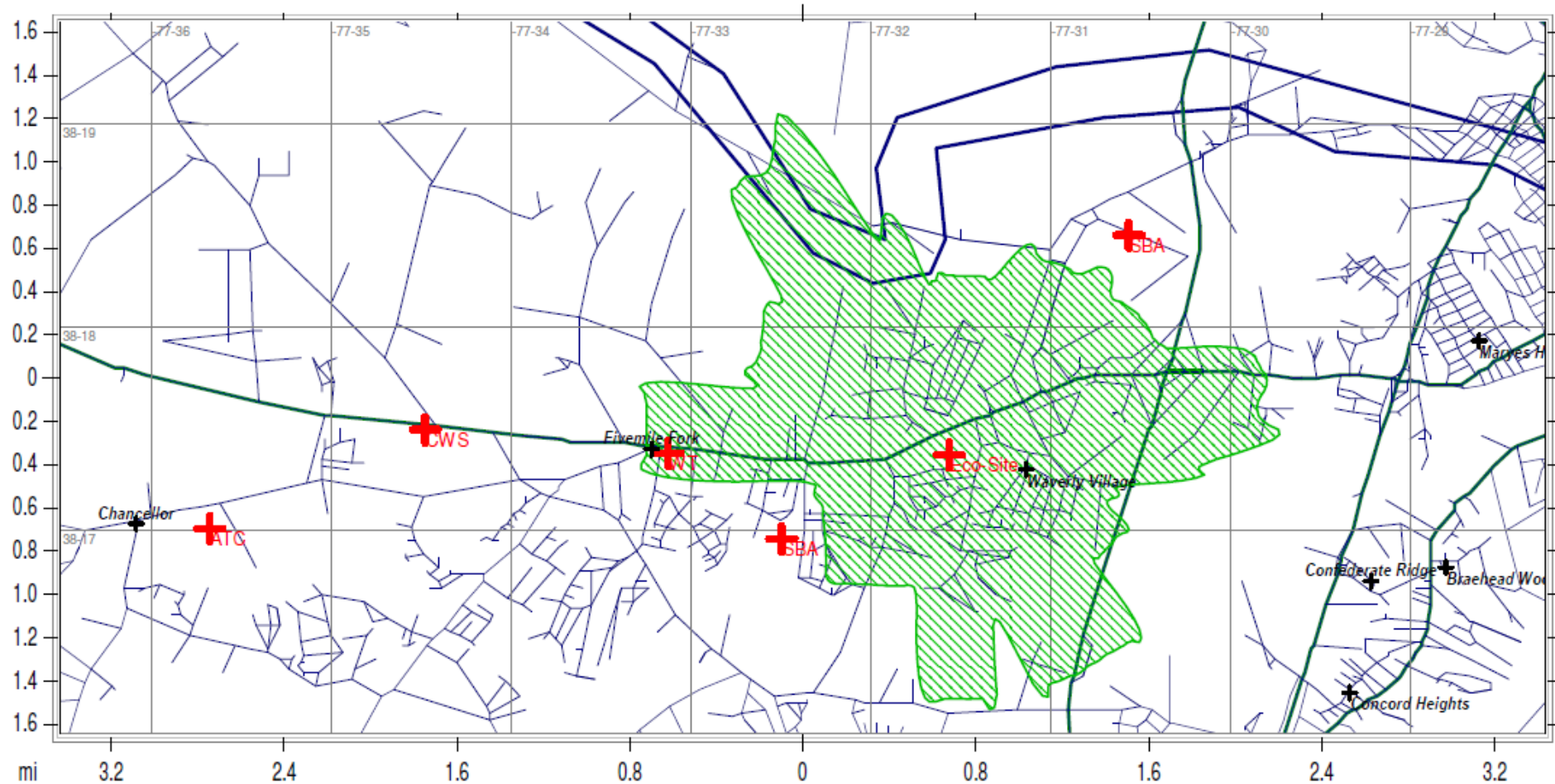
D Block – 763 MHZ

Spotsylvania County, Virginia



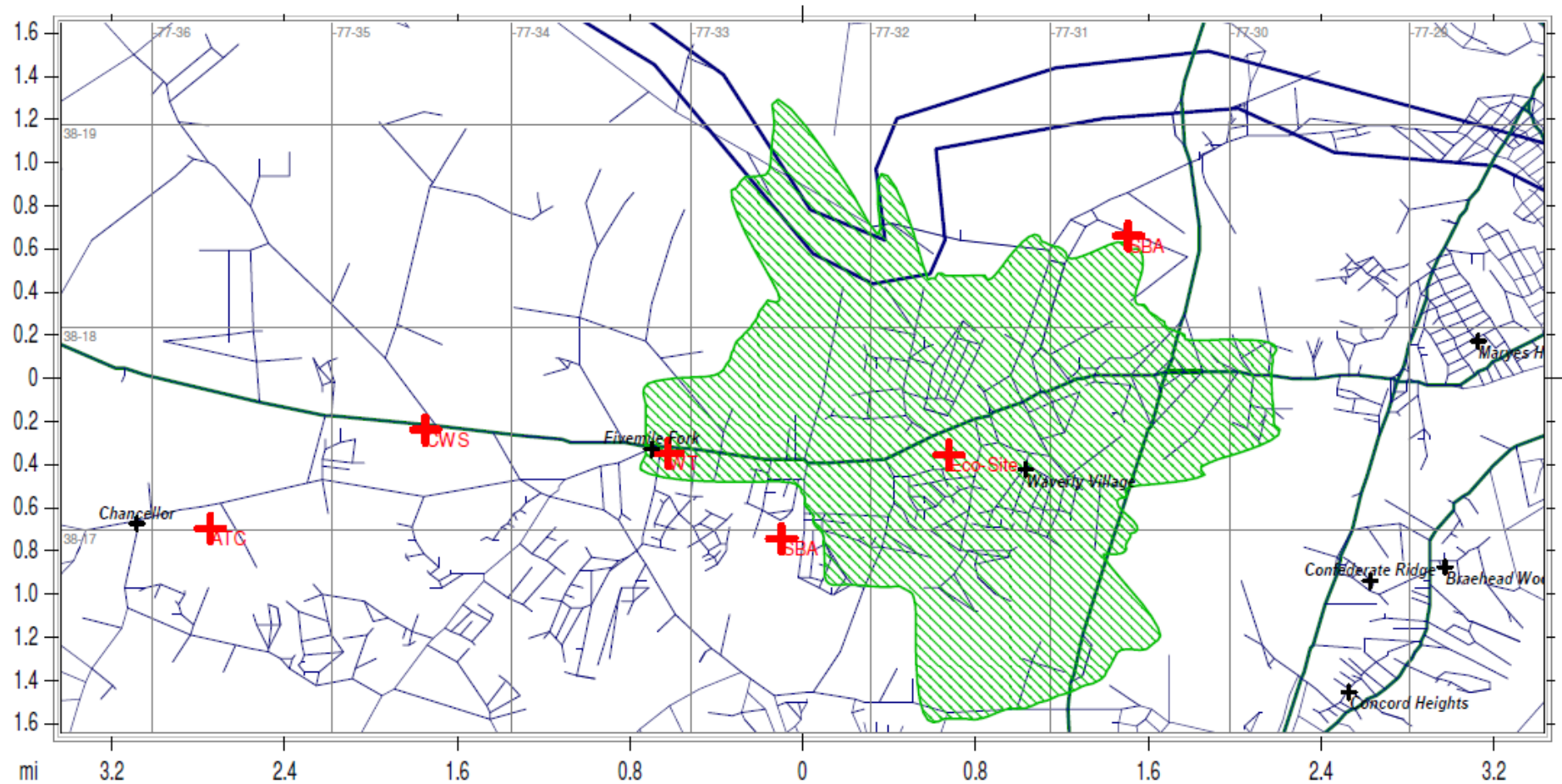
D Block -763 @ 80' AGL.pdf

Spotsylvania County, Virginia



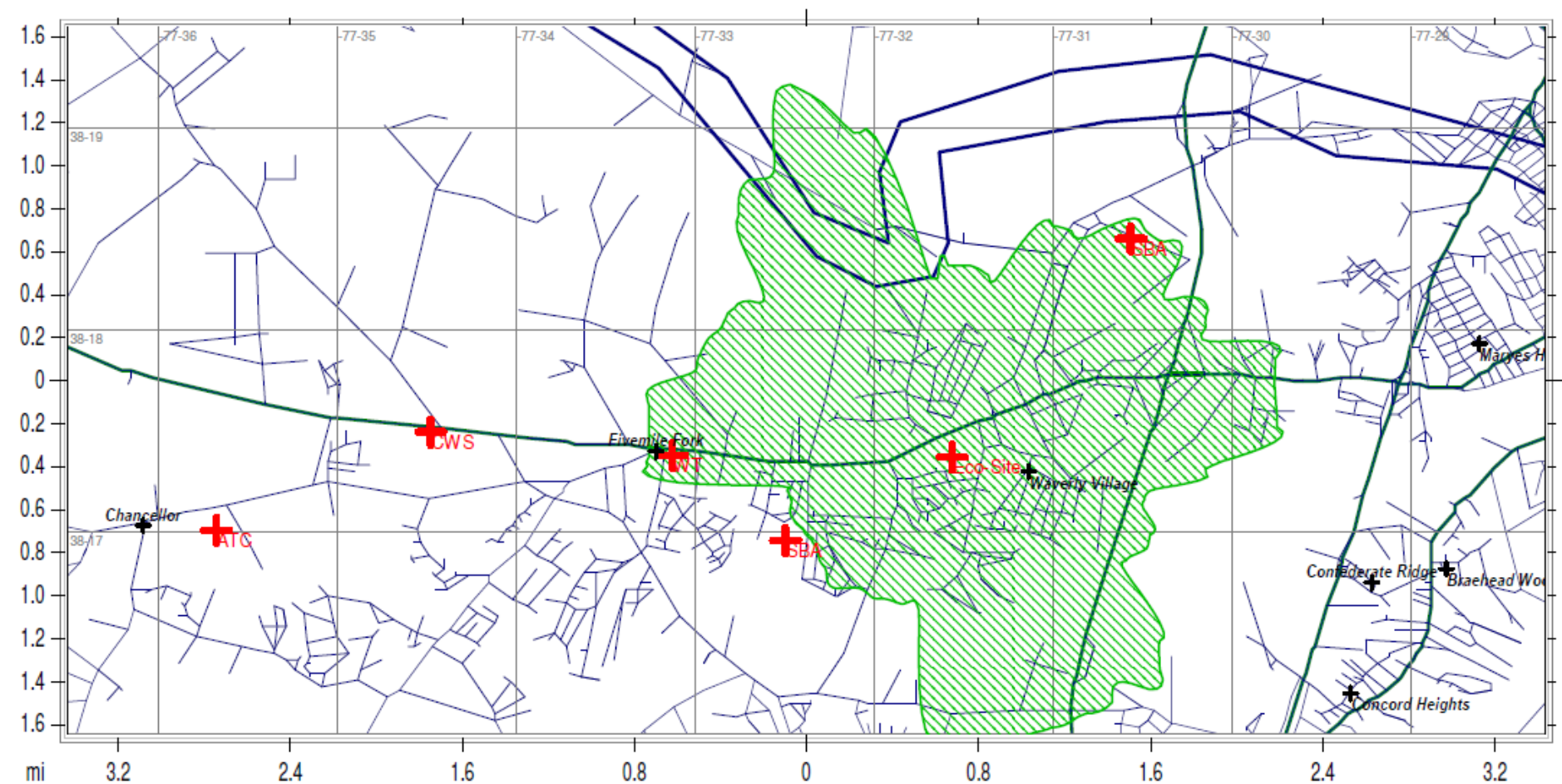
D Block -763 @ 100' AGL.pdf

Spotsylvania County, Virginia



D-Block 763 @ 120' AGL

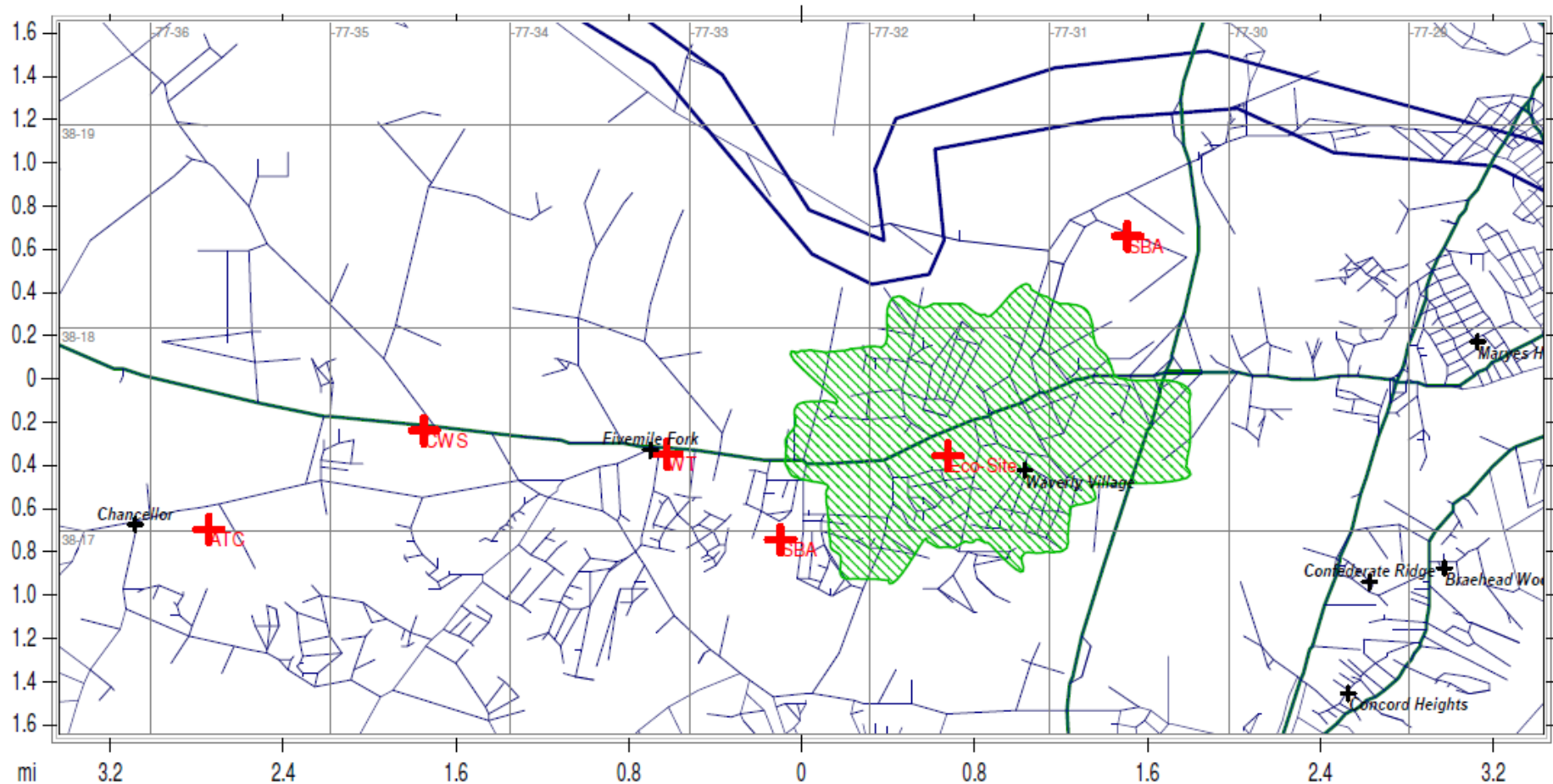
Spotsylvania County, Virginia



D-Block - 763 - @ 150' AGL.pdf

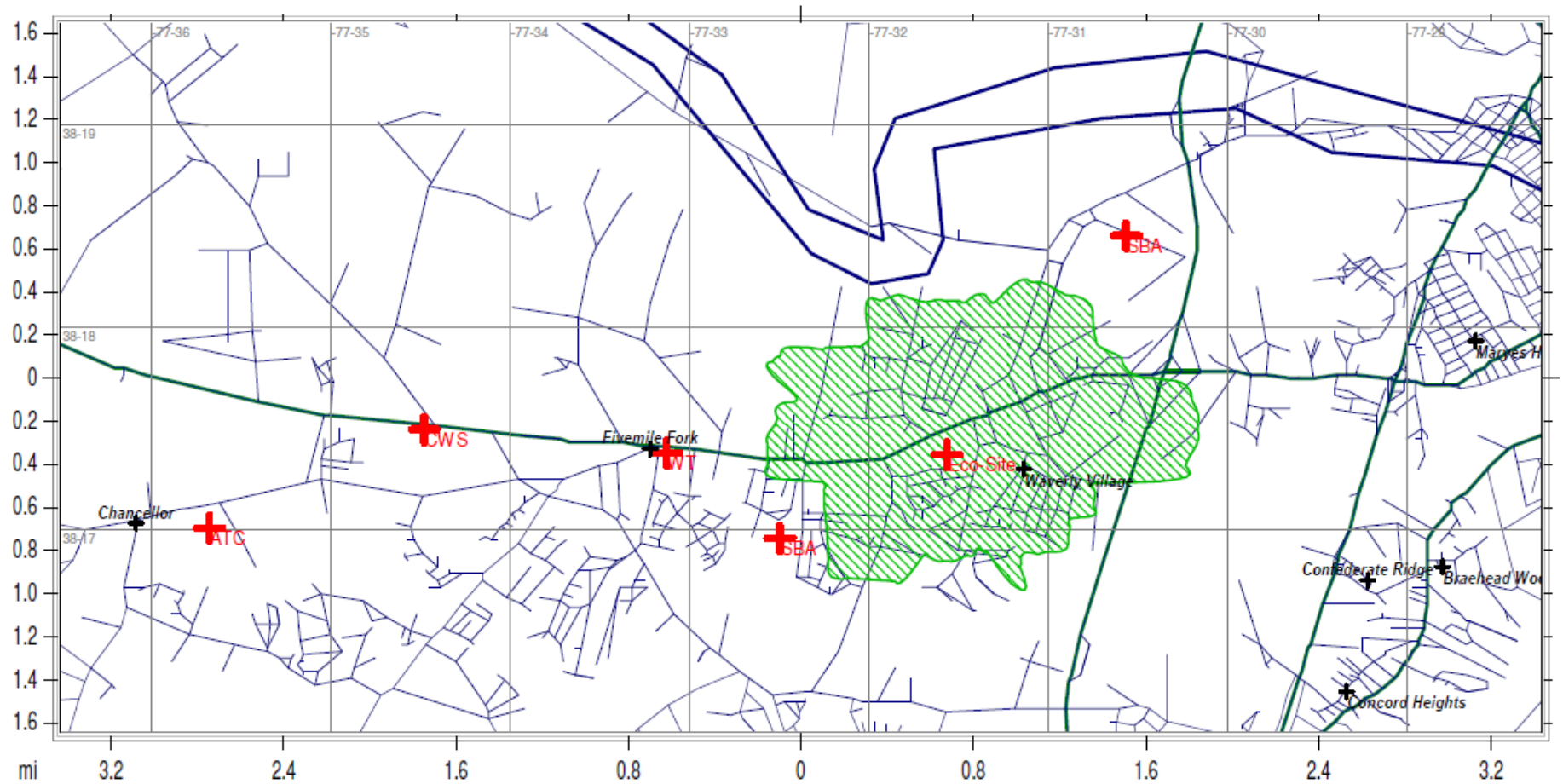
F- Block – 1755 MHZ

Spotsylvania County, Virginia



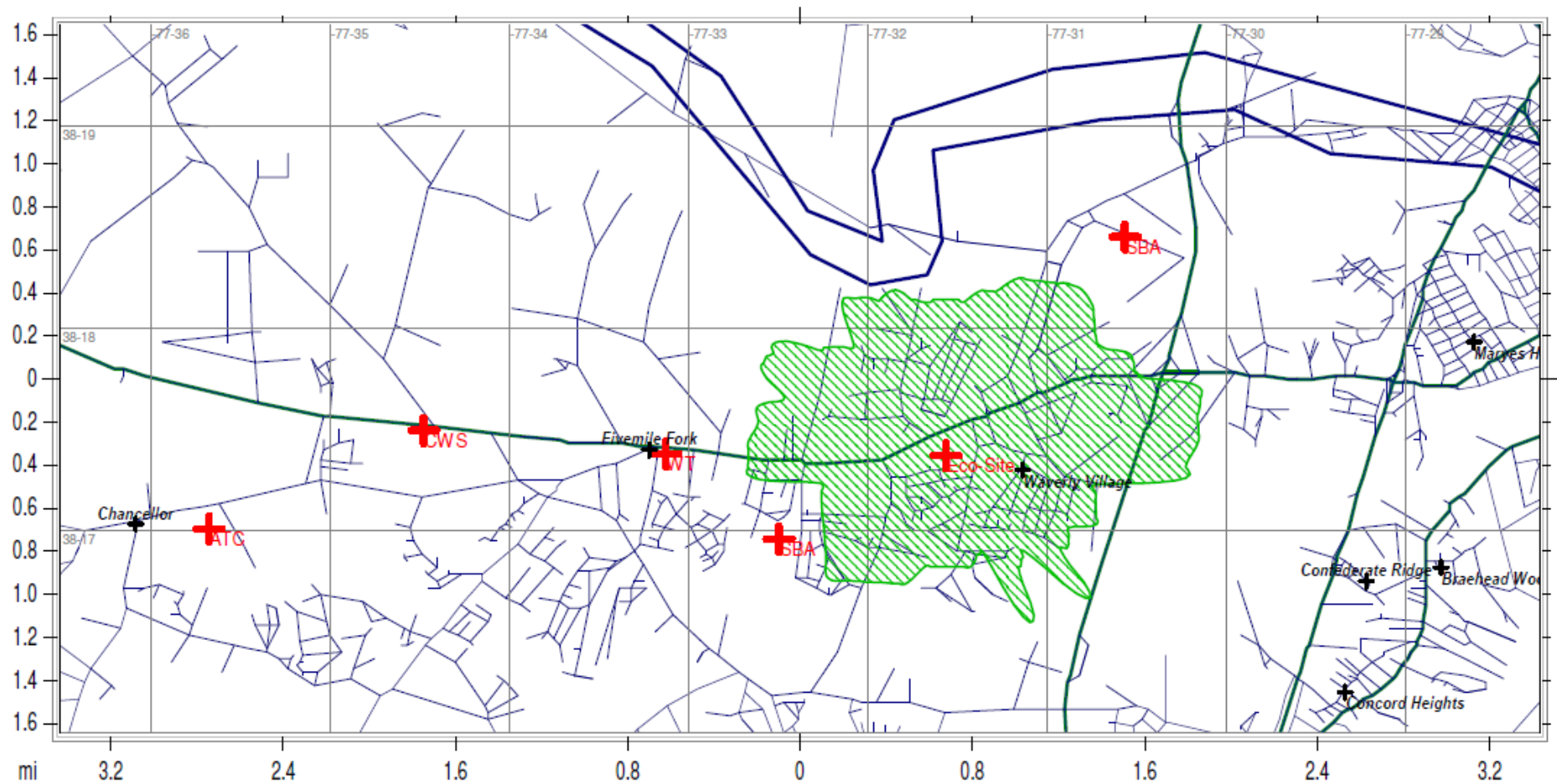
F- Block -1755 @ 80' AGL

Spotsylvania County, Virginia



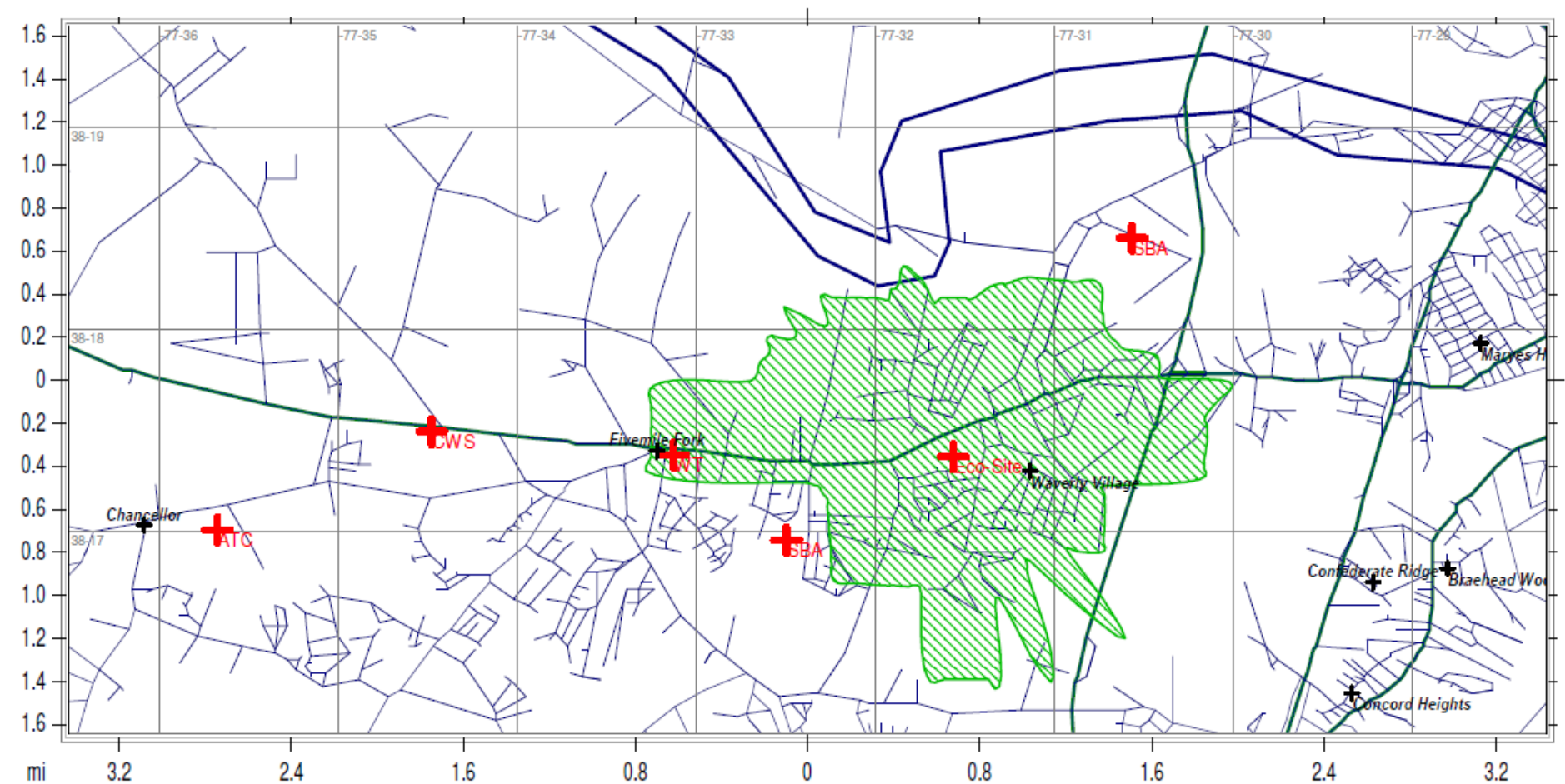
F Block -1755 @ 100' AGL

Spotsylvania County, Virginia



Block F - 1755 @ 120' AGL

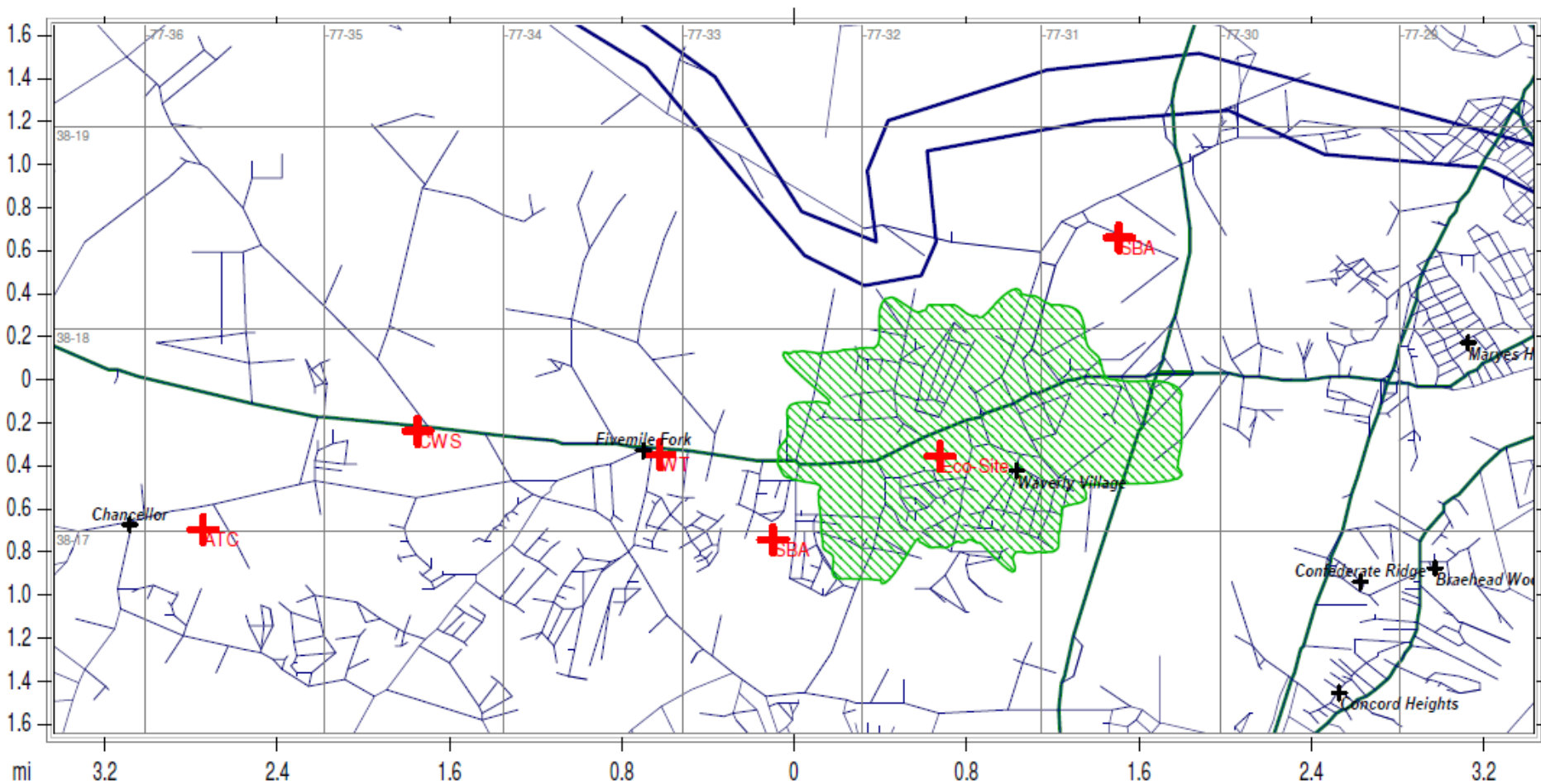
Spotsylvania County, Virginia



F Block 1755 @ 150' AGL.pdf

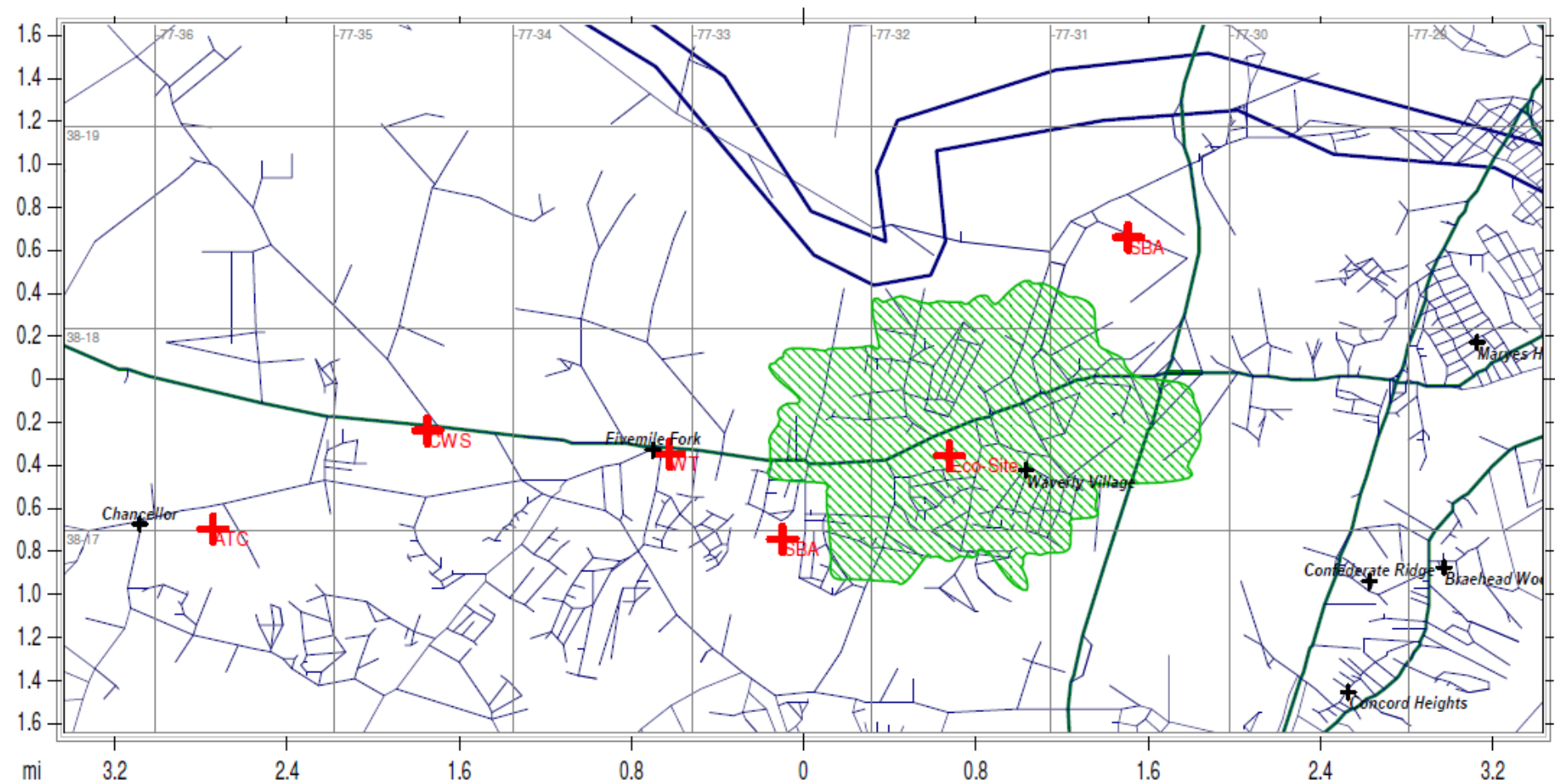
PCS Block -1865 MHZ

Spotsylvania County, Virginia



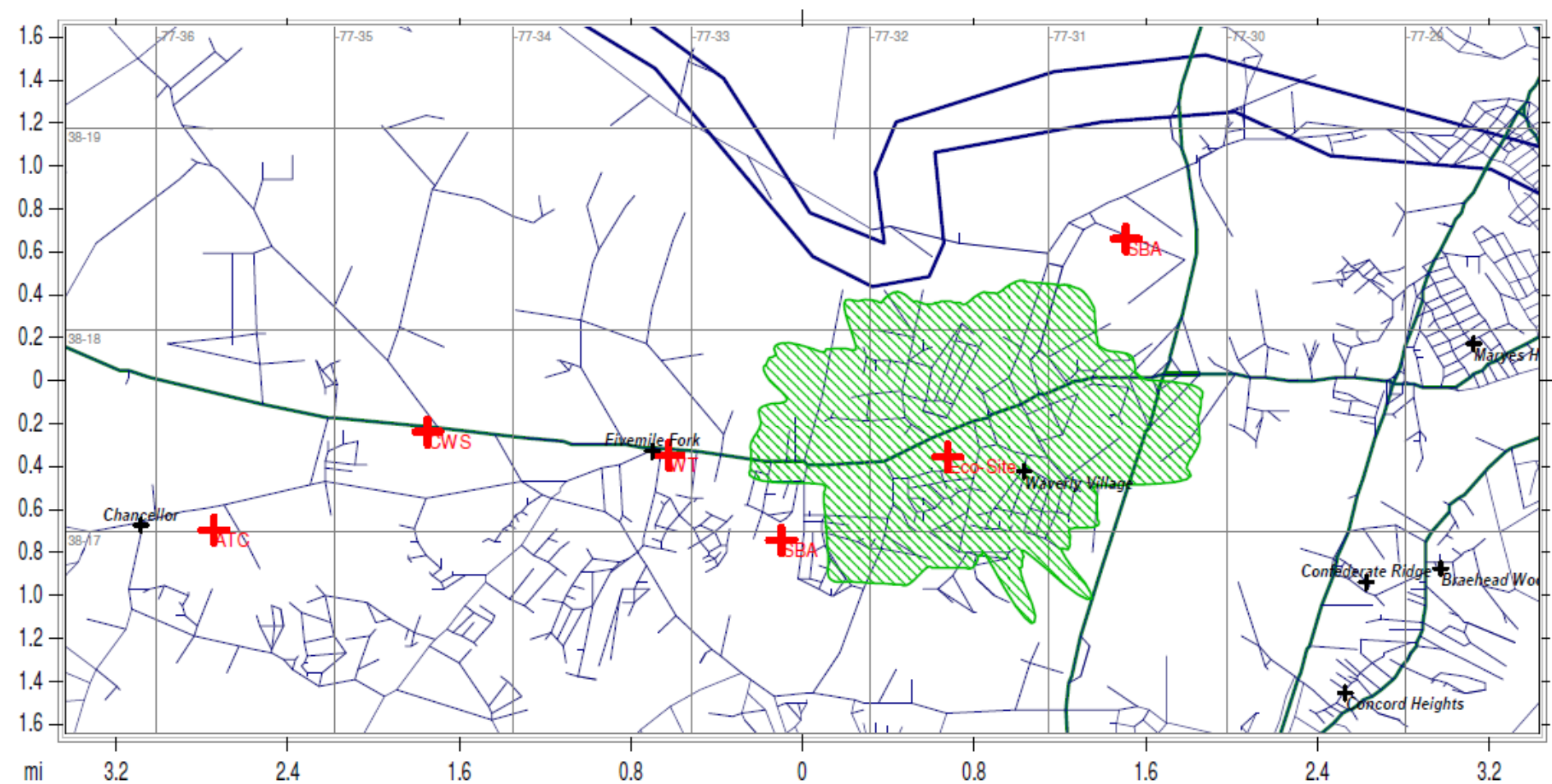
PCS Block 1865 @ 80' AGL

Spotsylvania County, Virginia



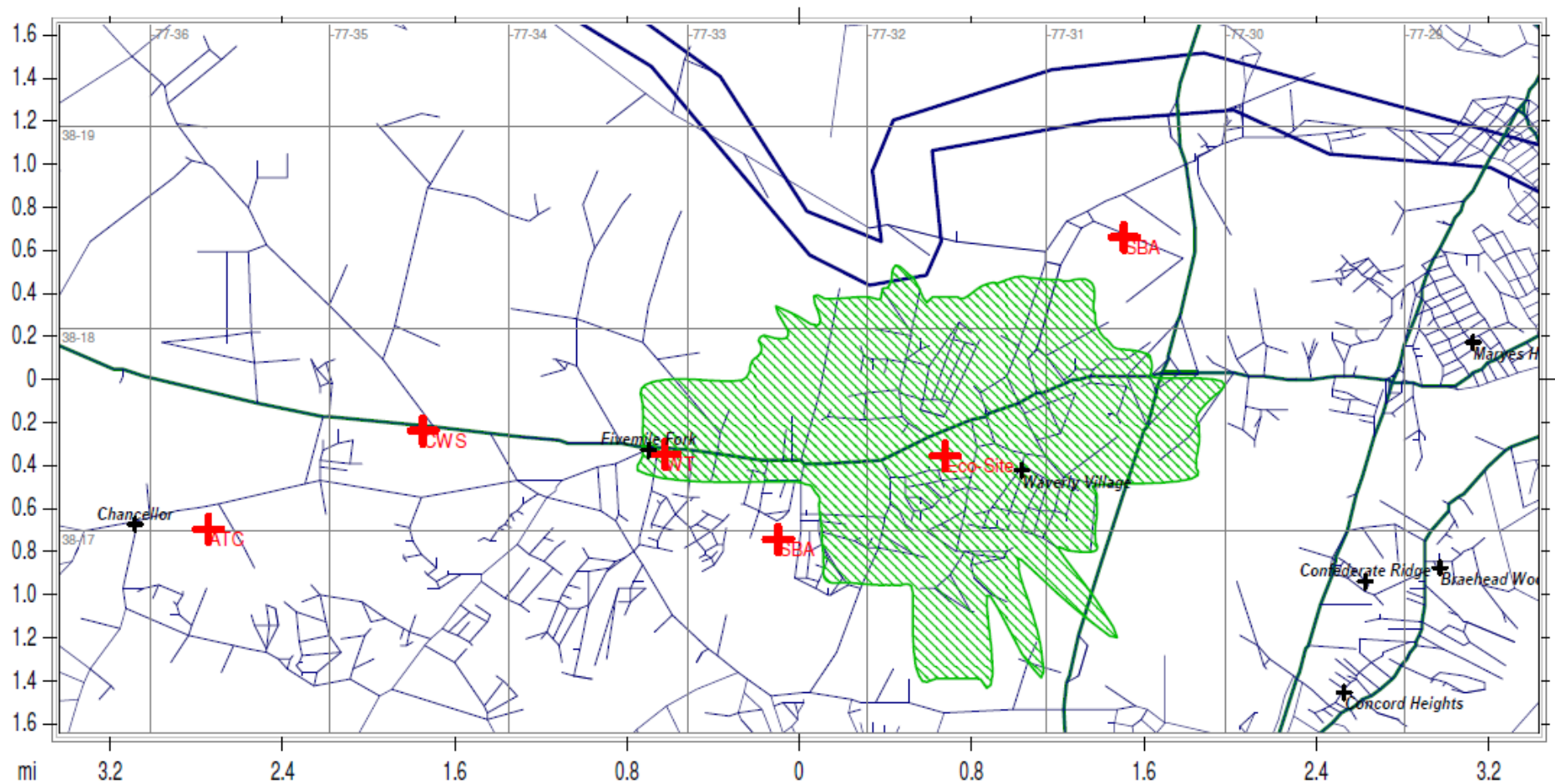
PCS Block - 1865 @ 100' AGL

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PCS Block 1865 @ 120' AGL

Spotsylvania County, Virginia

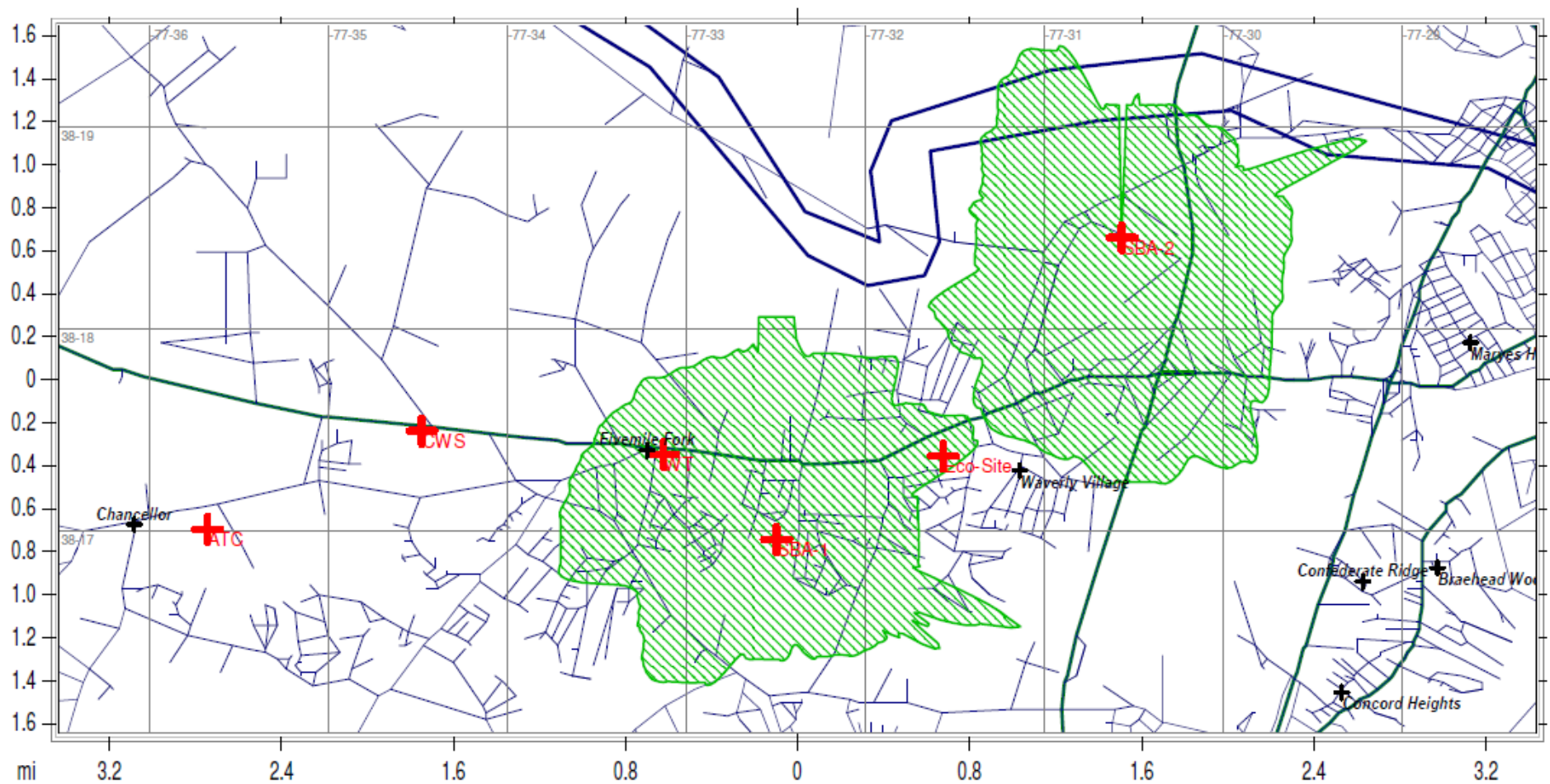


PCS Block - 1865 @ 150' AGL

Evaluation Summary

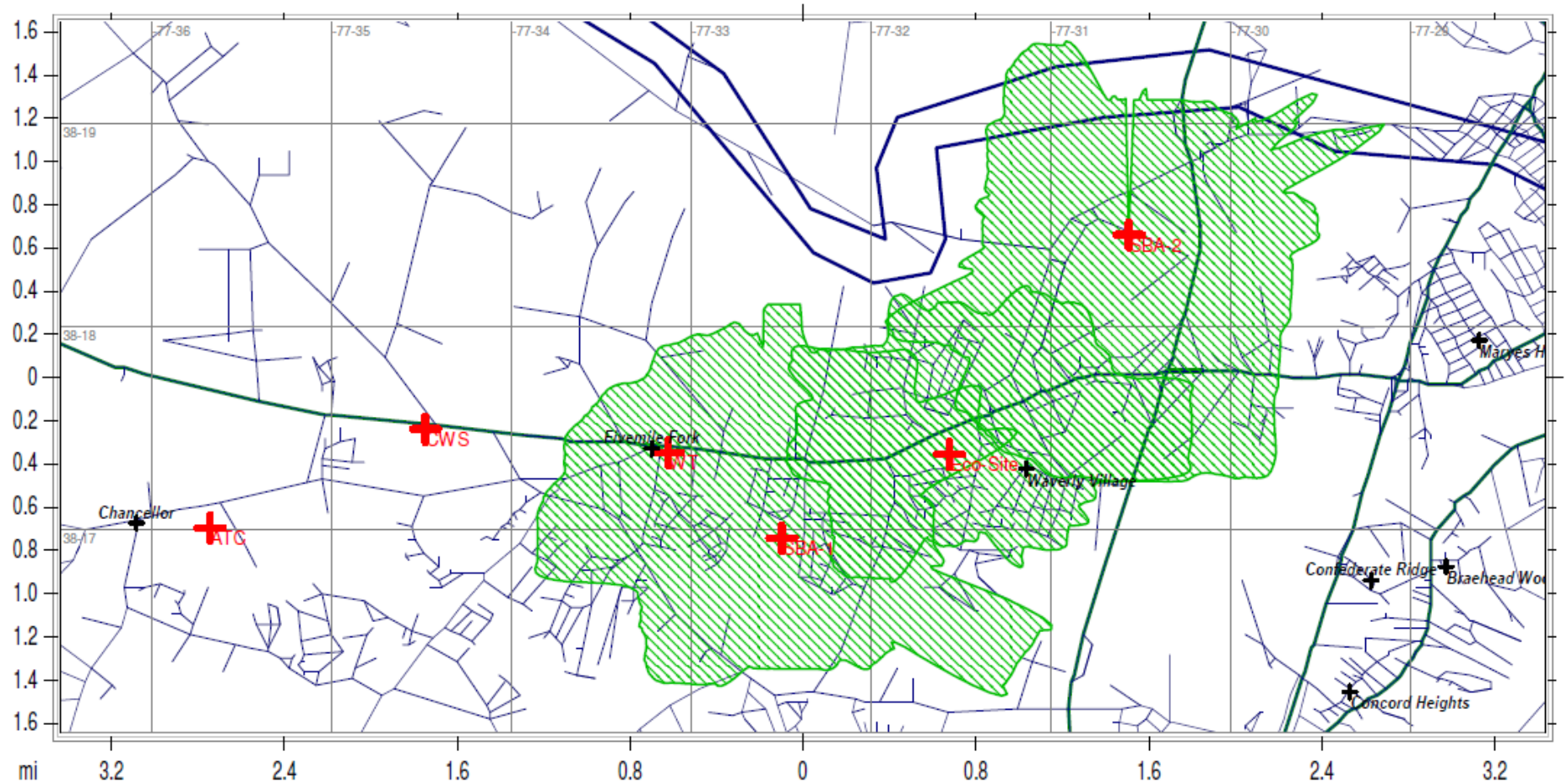
- Capacity issues (Tie into SBA sites North-East and South-West)
- Coverage Issues (North and South)
- 2 of the 3 Blocks require 150' AGL for Mobile Data/Broadband
 - Technical Solution (Proposed)
 - Eco-Site Location @ 150' AGL
 - Optional Solution: Approve at 120' AGL
 - (Less North-South Coverage Penalty 5-15%)
 - 1st Carrier: T-Mobile @ 120' AGL
 - 2nd Carrier Co-locates @ 100' AGL
 - 3rd Carrier Co-locates @ 80' AGL

Spotsylvania County, Virginia



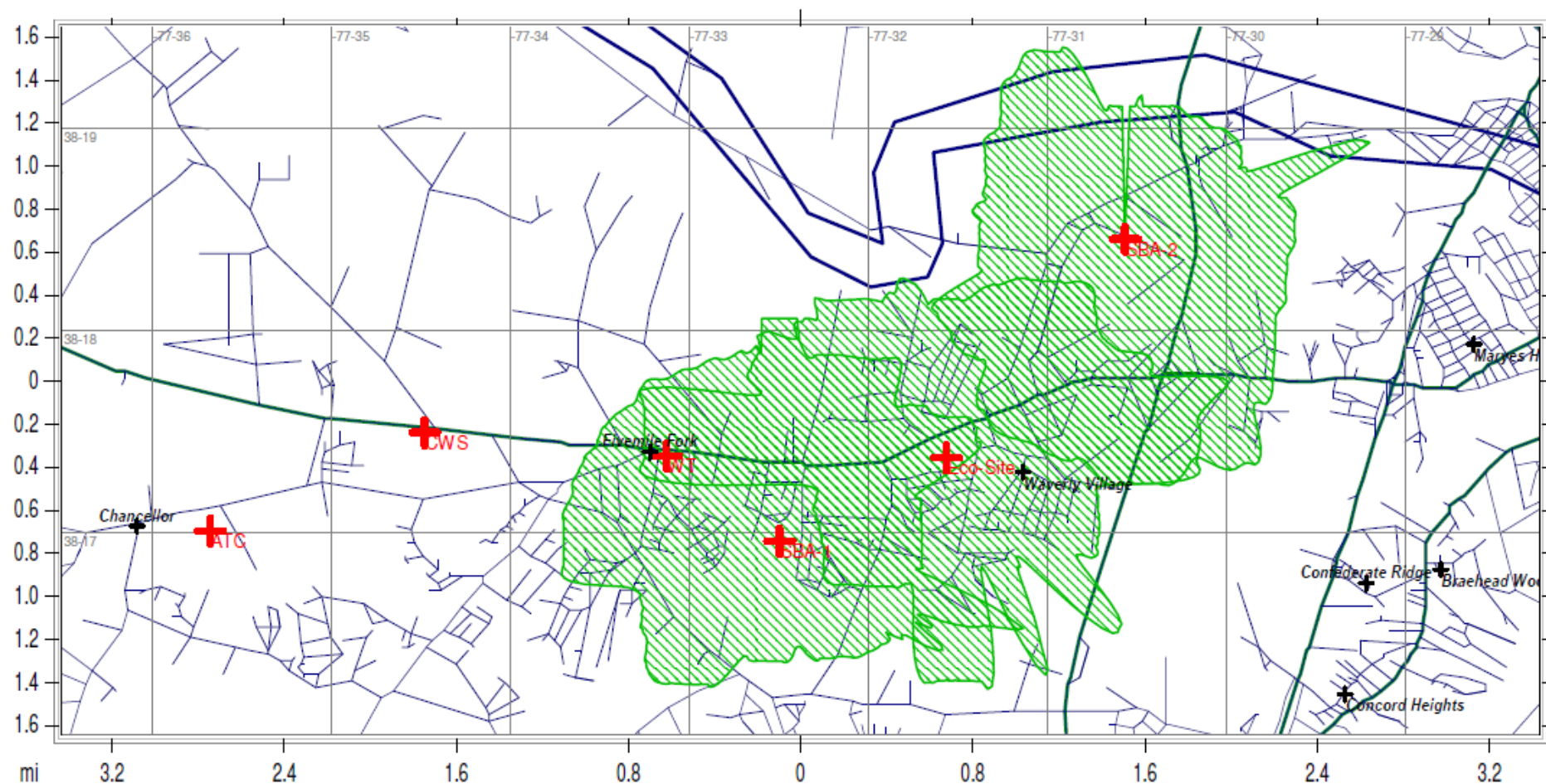
T-Mobile Existing Sites SBA 1 & SBA 2

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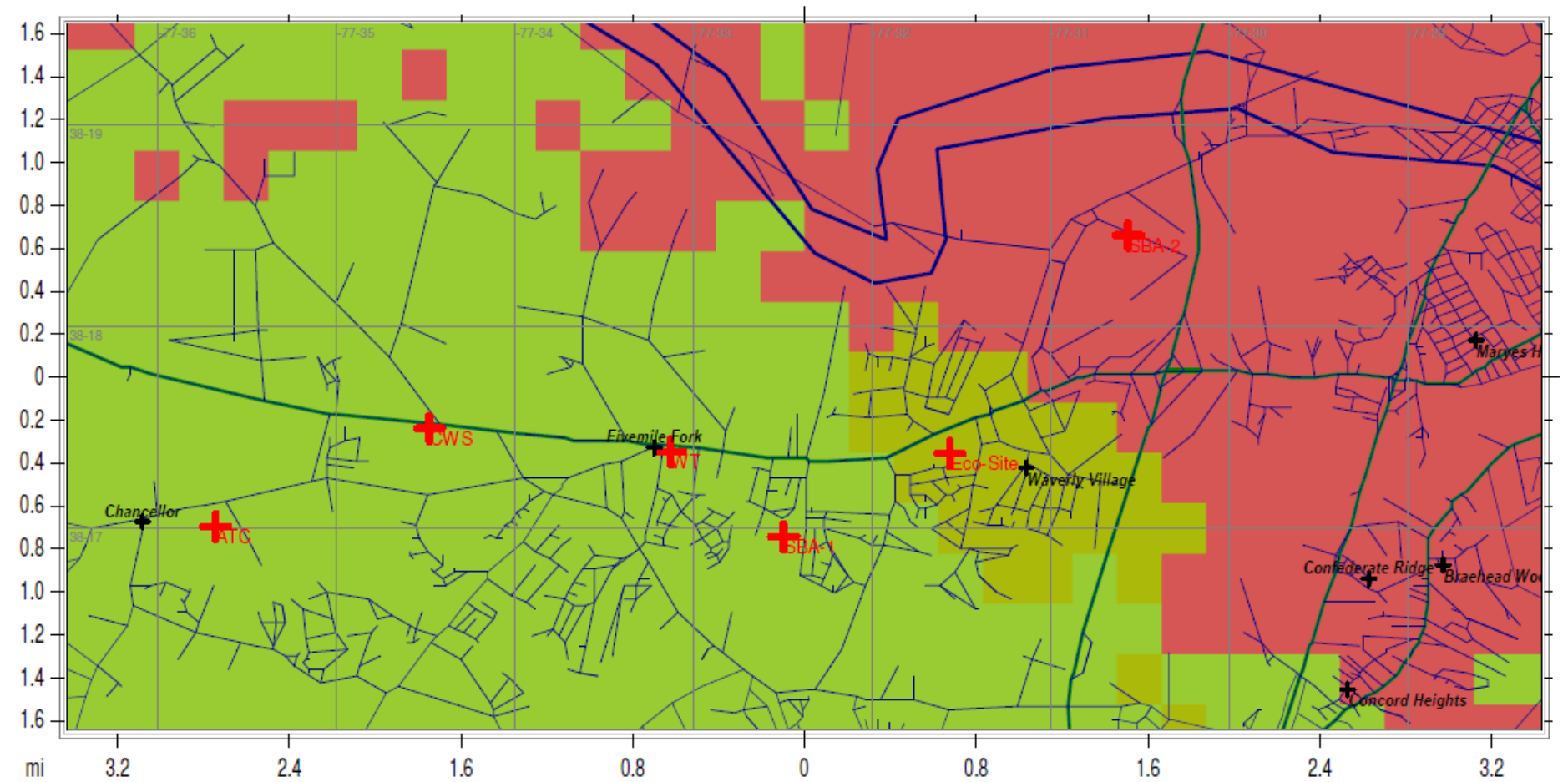
total Service (SBA #1 & SBA #2) with T-mobile @ 80' AGL

Spotsylvania County, Virginia



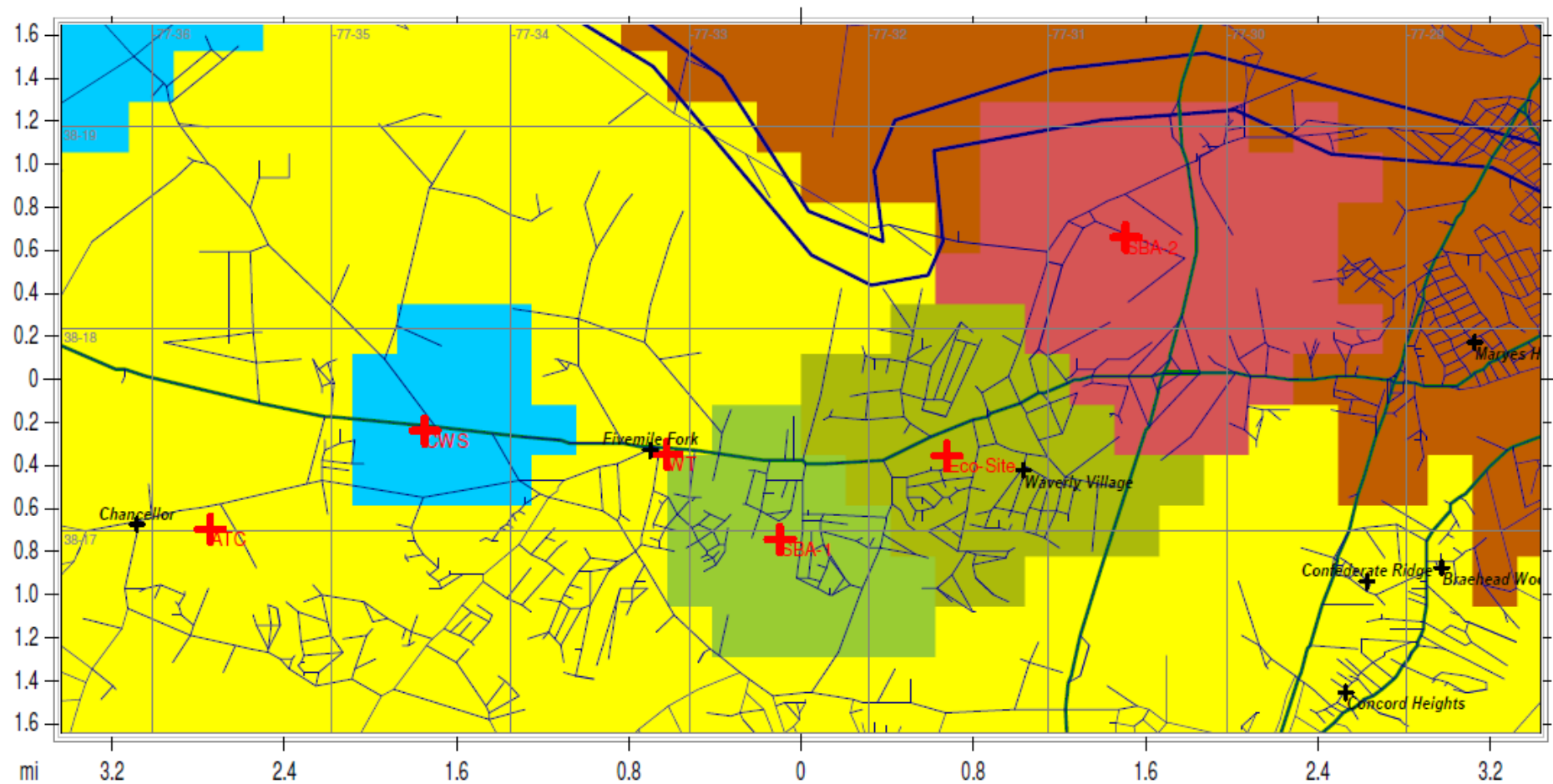
Existing Sites (SBA #1 & SBA #2) with T-Mobile @ 150' AGL

Spotsylvania County, Virginia



total Service (SBA #1 & SBA #2) with T-mobile @ 80' AGL (MLS)

Spotsylvania County, Virginia



Existing Sites (SBA #1 & SBA #2) with T-Mobile @ 150' AGL MLS