Protection of Poolesville's Sole Source Aquifer

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Project Background

- **MDE awarded Poolesville a $15,000 grant to conduct an EPA-mandated source water assessment program (SWAP)**
- **A WHPA update was deemed necessary to include new wells (Wells 9 and 10)**
- **EPA designated Poolesville's aquifer as a "sole-source"aquifer in 1995**
- **MDE normally outsourced this work to View Engineering due to our experience in Poolesville**
- **Major work scope phases:**
  - Wellhead protection area delineation
  - Potential contaminant source delineation
  - Susceptibility analysis
  - Recommendations to minimize potential impacts

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What is a wellhead protection area?

- **The catchment area (recharge area) around a well or wellfield that provides water to the well(s) where land use should be limited to ensure pollutants do not adversely impact water quality.**
- **Examples of pollutant sources:**
  - Underground and above ground storage tanks-Petroleum products
  - Septic systems-Coliform bacteria
  - Agriculture-Fertilizers, pesticides, nitrates, coliform
  - Industrial sites-Solvents, metals
  - Roads-road salt(total dissolved solids), oils, grease, fuel
- **Examples of proactive measures taken by Town:**
  - Road salt storage covered and storage time minimized
  - Removed UST with above ground storage tank with secondary containment

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WHPA Delineation Methodology

- **MDE recommends a combination of hydrogeologic mapping and fracture trace analysis in fractured bedrock settings**
- **Steps for Town's WHPA includes:**
  1) Identified an appropriate monitoring well network (27 wells)
  2) GPS surveying of production and observation wells
  3) Water levels were recorded during pumping of wells
  4) A water table map of the area was created when wells were pumping at typical rates (May 5, 2005) showing Poolesville's well capture zone
  5) The wells' capture zone and recharge area was mapped into a GIS
- **The wellhead protection area inherently incorporates geology, fracture traces, and groundwater withdrawal**
- **Total area of 7,464 acres (2,435 acres within town and 5,029 outside of town)**

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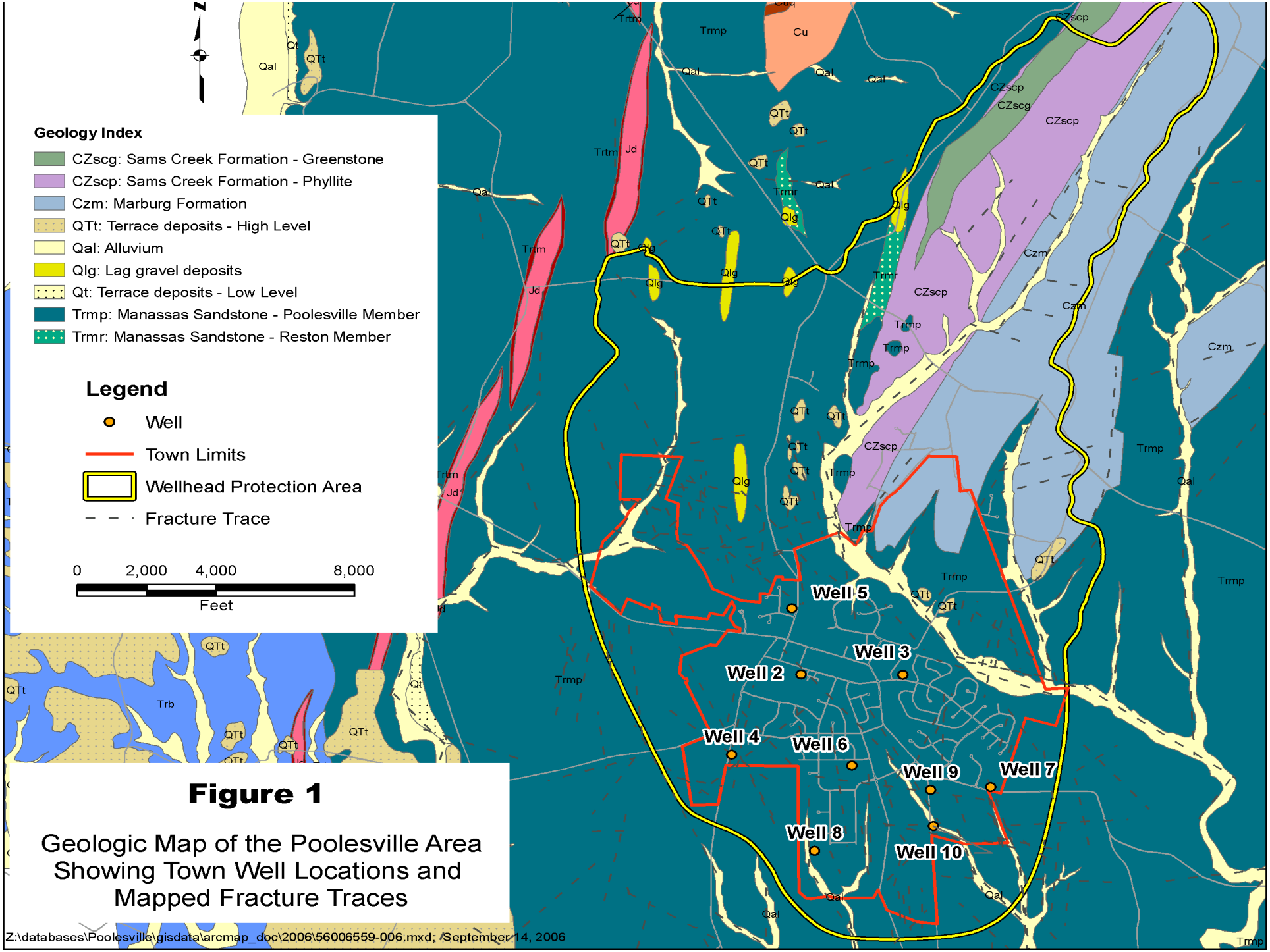

Figure 1

Geologic Map of the Poolesville Area Showing Town Well Locations and Mapped Fracture Traces

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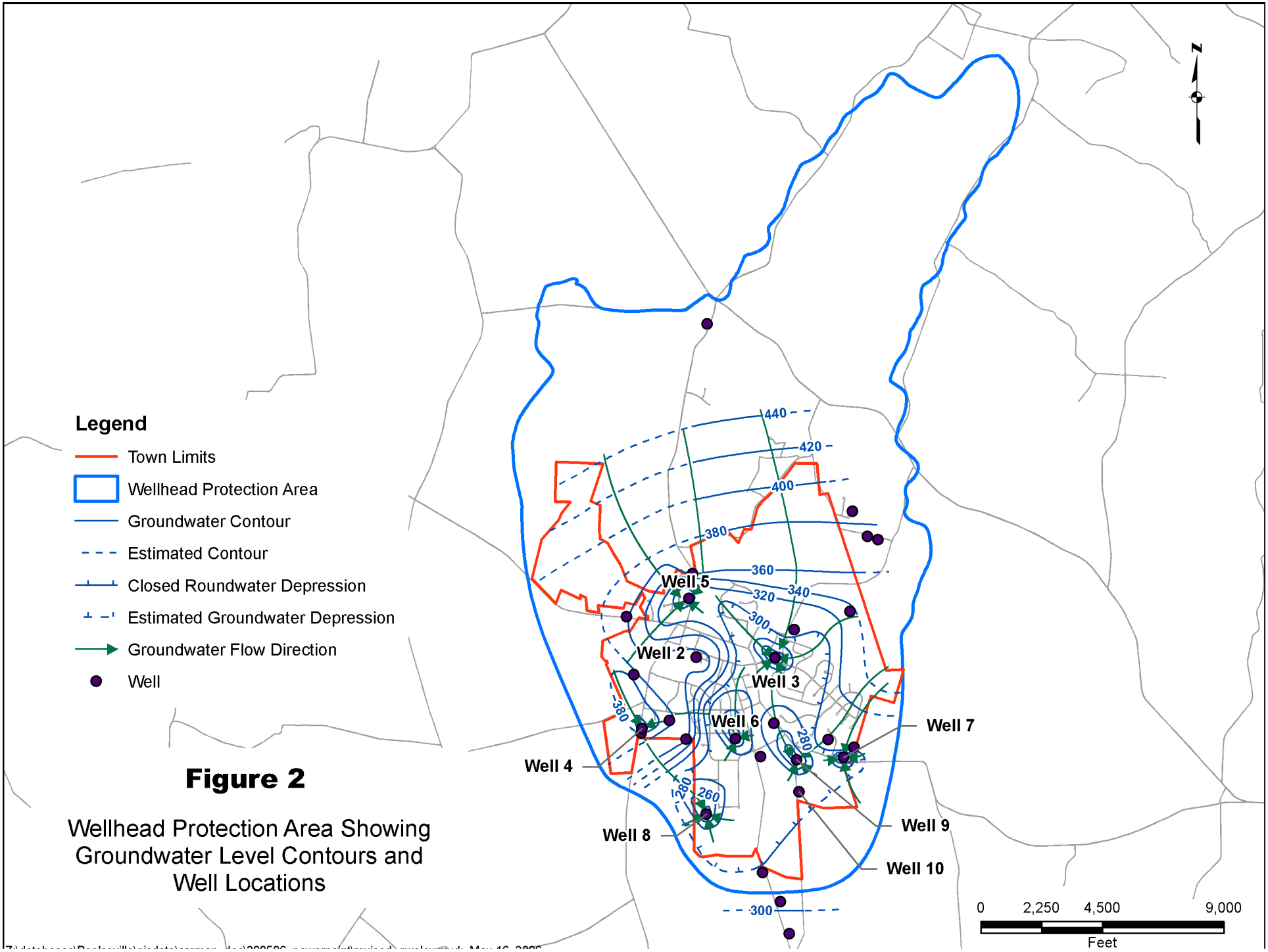

Figure 2

Wellhead Protection Area Showing Groundwater Level Contours and Well Locations

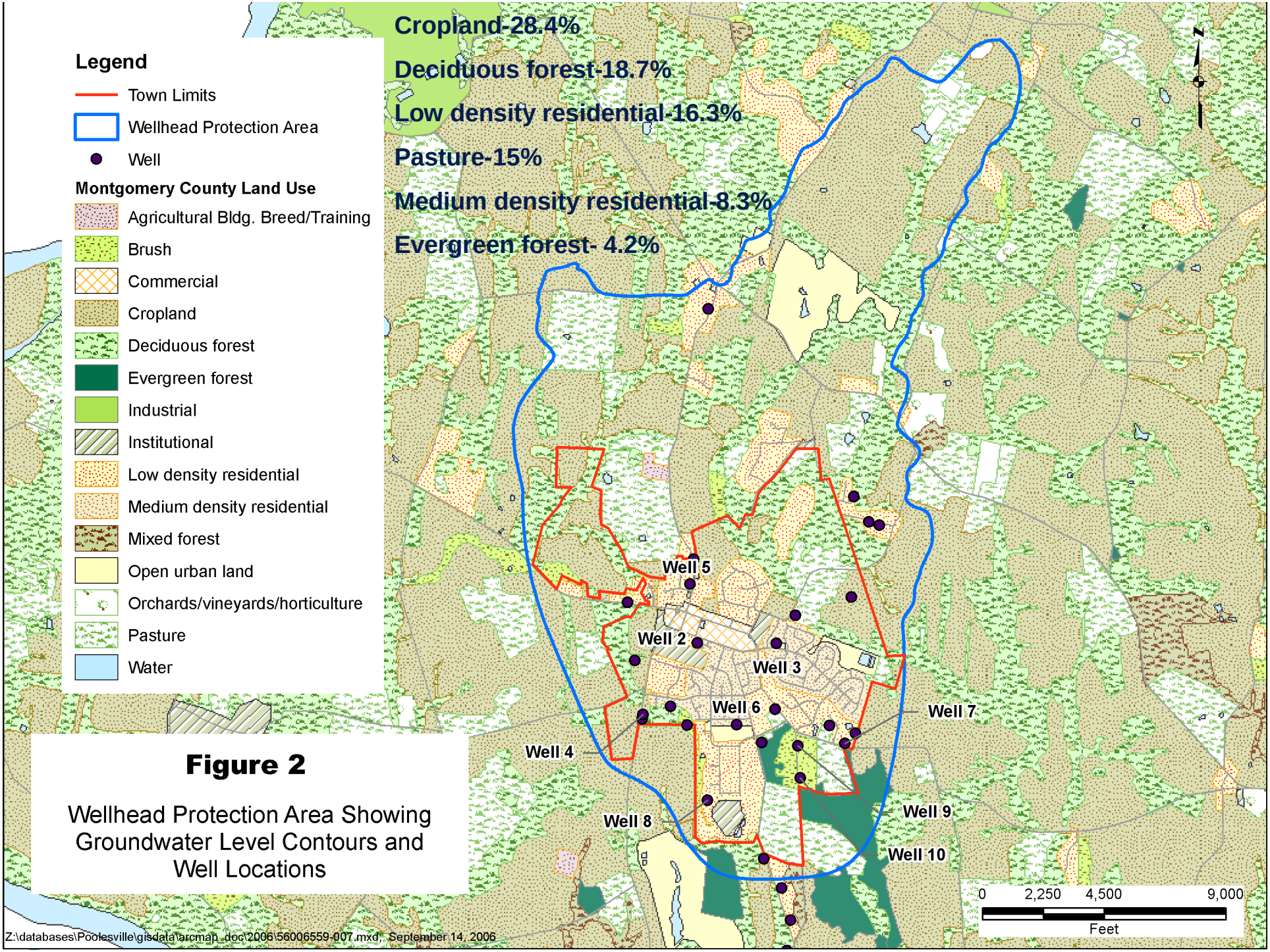

Figure 2

Wellhead Protection Area Showing Groundwater Level Contours and Well Locations

Contamination Susceptibility Analysis

- In general land use is residential, agricultural, or forested, with minor commercial and industrial facilities
- Thin soils coupled with a fractured bedrock aquifer can allow rapid contaminant migration from surface
- Leaking fuel storage tanks represent the single greatest point-source threat to water quality
- Agricultural practices/lawn care may have increased nitrates in some wells
- Leaking sewer lines or failing systems can be significant source of bacteria, nitrates, or chemicals
- Radionuclides are detected in all wells above existing or pending MCLs
- The area is moderately prone to contamination issues due to the geologic setting
- The lack of significant commercial and industrial facilities minimizes contamination potential

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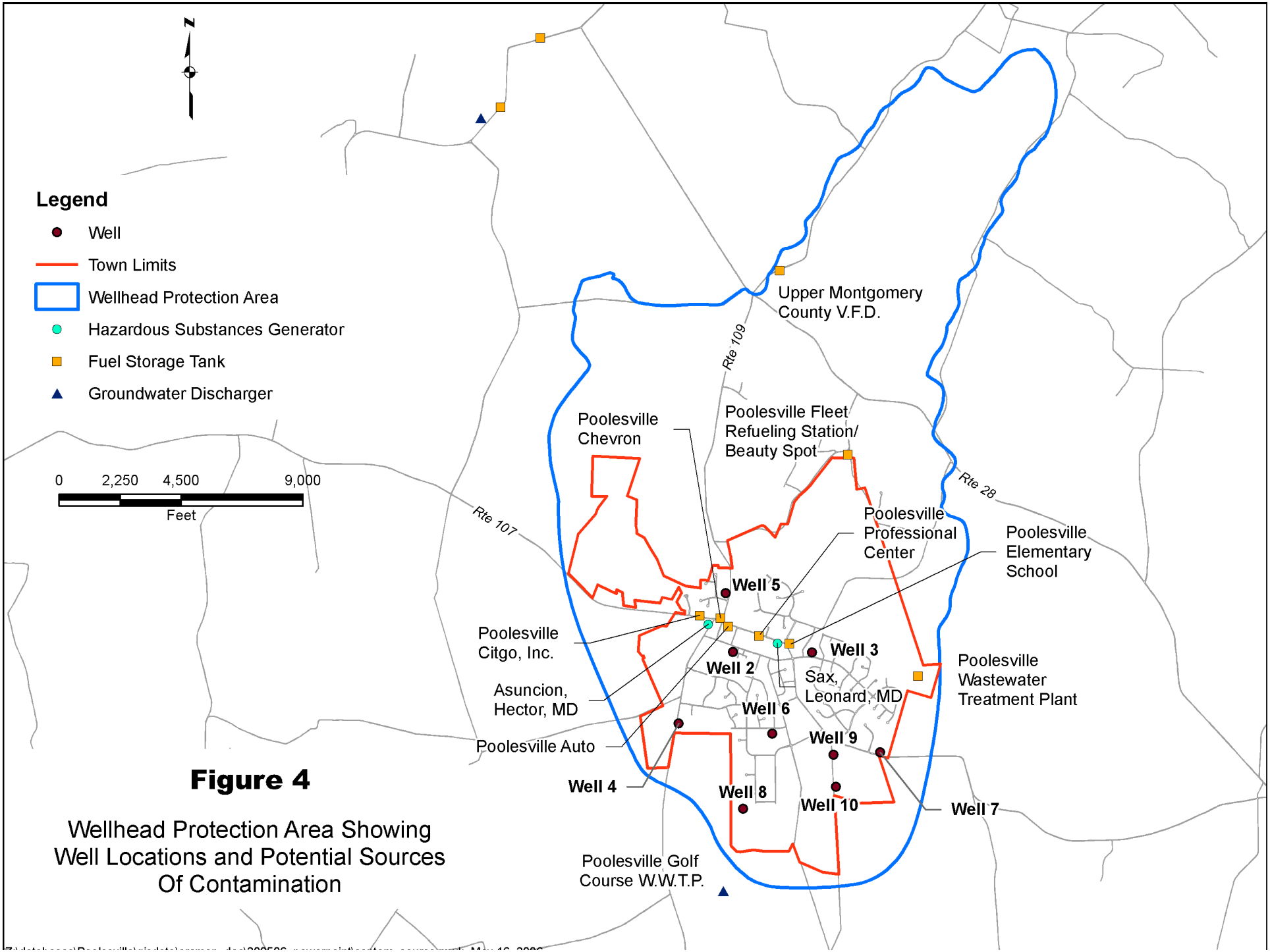

Figure 4

Wellhead Protection Area Showing
Well Locations and Potential Sources
Of Contamination

Susceptibility Analysis Results

Factors for consideration include land use, proximity of contaminant sources, contaminant concentrations, well construction, and depth of water-bearing zones.

Based on these factors the following ratings were assessed:

- **One Well-High susceptibility due to nitrates, coliform, land use**
- **Two Wells-Moderate susceptibility due to nitrates**
- **Seven Wells-Low susceptibility, high water quality**

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Wellhead Protection Area Management-What is Poolesville Doing?

- Public education and awareness!!
- Proper well construction and security
- Sewer system maintenance
- Filtration of a well that has apparent surface water influence
- Working with a road salt storage/household chemical disposal facility to minimize potential for groundwater contamination
- Agricultural Best Management Practice (minimize nutrient application, prevent runoff)
- Continued water quality monitoring
- Including all stakeholders to use collective powers for most effective implementation at the state, county, and local levels

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Questions???

Thank you!

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