A Perspective on Water & Wastewater Issues in Waterford and Paeonian Springs

Waterford Preservation Group – January 20, 2026

SUMMARY

Certain residents in Waterford and Paeonian Springs may be experiencing health risks due to well water and/or wastewater issues, although the exact number is unknown. Loudoun County's response is a $60+ million project to interconnect water and sewage systems of the two villages by 2029. The Waterford Preservation Group (WPG) believes this "interconnect proposal" should be immediately terminated, and replaced with separate plans for each village, tailored to their specific needs, and not connected to each other.

Flawed assumptions: The interconnect proposal relies on outdated and incomplete well and septic-field data. An oversized solution was proposed before the extent of the actual problems was fully defined. The three-year construction timeline does not address the immediate needs of residents who may currently be experiencing problems with water or sewage.

Unwanted Consequences: The project would impose significant financial burdens on residents ($8,000 to $15,000 per connection, plus quarterly usage fees), may require mandatory participation, and could harm private wells, the local aquifer, and the environment. Additional concerns include land acquisition through eminent domain, destruction of the tree canopy along Clarkes Gap Road, and more.

Public Opposition: Yard signs attracted 400+ people to the WPG website to petition against the interconnect proposal. A subsequent mailing program resulted in 450 local residents voting online to oppose the interconnect proposal. Public meetings on the subject have been well attended and lively.

A Better Solution, proposed by the WPG, is to abandon the monolithic "interconnect proposal" in favor of separate projects for each village, with no interconnection. Each project would identify the specific needs of its residents, and implement appropriate remedies, ranging from small-scale solutions for single parcels to community-based infrastructure solutions for multiple parcels.

THE WPG PERSPECTIVE

Background: Two Villages, Different Problems

The water and wastewater challenges facing Waterford and Paeonian Springs are distinct:

Waterford Village: While Waterford as a whole has an adequate water supply, some homes may struggle with unreliable water flow, especially during drought periods. The exact number of homes currently having issues is unknown. Prior estimates are years old and unreliable due to the polling methods used and the failure to disclose costs to be incurred by residents. The quality of Waterford's water is generally good. Waterford has a reliable wastewater system that is well-maintained and is currently being upgraded to meet new DEQ standards.

Paeonian Springs Village: Paeonian Springs as a whole has an adequate water supply, with minimal water flow issues in private wells. However, the village relies entirely on private septic fields for wastewater disposal, and some homes (exact number unknown) have aging septic fields that are performing poorly, sometimes contaminating nearby well water.

Loudoun County's Interconnect Proposal

Over many years, some residents of each village have requested County assistance to address water and/or wastewater issues in their respective village. Plans were developed for each village but never implemented. No resident ever proposed connecting the two village systems together. In November 2024, without any prior outreach to affected residents, the County shelved the previous plans and instead proposed one massive $60+ million infrastructure project that would interconnect the water and wastewater systems of both villages.

Water Supply: Up to five large-scale wells outside the villages would pull hundreds of thousands of gallons per day from the already weakened aquifer. A new water treatment plant – also outside the villages along the Clarkes Gap Road (CGR) Scenic Byway – would pump that water into both villages via 2.5 miles of pipes buried alongside or possibly beneath the roadbed, traversing residential lots and land protected by conservation easement. Over 20 acres of land needed for this infrastructure could potentially be taken by eminent domain.

Sewage Disposal: Sewage from Paeonian Springs would be pumped 2.5 miles along Clarkes Gap Road to Waterford. After treatment in an expanded Waterford wastewater plant, effluent would be discharged into Catoctin Creek and ultimately the Potomac River, with no recharge of the already weakened aquifer.

Cost: Loudoun County estimated construction costs at $60+ million in 2024 dollars, likely to increase significantly over the estimated 3 year construction timeline. The County's proposal excludes significant costs: the costs incurred by village residents to connect to the new system, the costs to repair or replace private wells damaged by new County wells, and the substantial environmental impact on the area.

Why the Interconnect Proposal is Flawed

The interconnect proposal does not serve the best interests of Western Loudoun residents:

- **Insufficient Justification:** The proposal to interconnect the villages was started without input from all affected residents, and without updating old information about water flows, water quality, septic-field performance, and the willingness of residents to connect. The County claims that construction costs for a single integrated system will be less than those for separate systems for each village. However, a more complete analysis should have included costs incurred by residents to connect, costs to repair damaged wells, and remediation costs for environmental harm. No such analysis has ever been made public, and the economic viability of the interconnect project is questionable if only a few village residents volunteer to connect. This could result in mandatory connections, discussed below.
- **Ineffective Timing:** For residents who need immediate help with water or sewer issues, the County's plan requires at least a 3 year wait for relief, while small-scale solutions can be implemented within weeks or months.
- **Disproportionate Scale & Cost:** Spending $60+ million on heavy infrastructure to help a small number of households is wildly disproportionate. In other words, this is akin to "swatting a fly with a hammer."
- **Costs to Residents:** Loudoun Water has said that they could waive the substantial administrative fees normally charged for hook up. However, village residents would still incur costs to physically connect to the community water system ranging from $8,000 to $15,000 per connection plus quarterly usage fees. Additional costs of around $3,000 may be incurred for well capping. Paeonian Springs residents may face comparable additional costs for connection to a community wastewater system.
- **Mandatory Connection:** Despite claims to the contrary, if enough residents do not voluntarily hook-up, there is a risk that village residents could either be forced to connect at their own expense or per Commonwealth law, be obligated to pay an equivalent fee even if they don't connect (see Note 1 for Loudoun Water's Engineering Design Manual requirements, and the Virginia Code).

- **Well Interference:** High-volume County wells would likely interfere with existing private wells – even miles away – and may cause some to dry up. In such cases the interconnect proposal offers no compensation or the ability to connect to the new system.
- **Groundwater Depletion:** Pumping hundreds of thousands of gallons of water daily from the Clarkes Gap Road corridor and flushing the effluent into the Potomac River prevents groundwater recharge at the point of extraction, risking catastrophic consequences for the water table.
- **Property Rights:** While the County claims they are "loathe to use it," eminent domain remains on the table. Taking land for infrastructure in rural areas is an overreach of government power. Such actions, plus the degradation of the rural ambience, could depress home and farm values along or near CGR.
- **Environmental Consequences:** Laying pipes along Clarkes Gap Road would destroy the tree canopy of this Scenic Byway and devastate the rural environment. Local streams, undergrowth and wildlife would be permanently impacted. Catoctin Creek would be adversely affected by soil erosion caused by surges north of the Waterford Wastewater Treatment Plant (WWTP) and running dry at times south of the WWTP.
- **Development Sprawl:** After completion of the interconnect project, developers would inevitably seek access to parts of the system (especially water and sewer pipes) currently intended for exclusive use by village residents. While current Supervisors may promise not to grant exceptions, future administrations are not bound by those promises. Sprawl is the inevitable result of such infrastructure.
- **Traffic Disruption:** Construction would cause significant traffic delays, especially through Waterford village and the surrounding roads, for a year or more.

These shortcomings have generated widespread public opposition. In Spring 2025, 400+ residents petitioned against the interconnect proposal. In mid-2025, a survey that included average connection costs resulted in 450 responses, almost unanimously voting against the interconnect proposal. Local media and public hearings have given voice to widespread dissatisfaction in print and in person.

The County has taken notice. Despite earlier breakdowns in communications, Western Loudoun residents are now helping decision makers and staff rethink their options in some key areas:

- **Public Engagement:** At an October 28, 2025, meeting, Chair Randall admitted, "We haven't done a good job of communicating, this has to change, we need to do better." She suggested having meetings with geographically separate groups of residents to better understand their specific needs, which vary by location, and to hold quarterly progress meetings with all residents. We are looking forward to the first of these meetings.
- **Survey Interpretation:** In 2022 a county survey showed only one Waterford resident reported daily problems with water. No newer data was collected before unveiling the interconnect proposal, which was widely viewed as "a solution looking for a problem." More recently, County staff agreed that "we will absolutely send a survey out again." We look forward to working with County staff to develop an improved survey, designed with the assistance of an impartial survey professional, and accompanied by relevant facts about costs, timing, etc.
- **Groundwater Recharge:** In the wake of recent widespread concerns about the long-term viability of our groundwater, experts and decision makers need to re-evaluate assumptions about groundwater recharge. It is becoming clear that in the long term a few high-volume wells may be less viable than a larger number of smaller, local wells. Also, keeping wastewater disposal local to recharge the aquifer is better for Western Loudoun's vulnerable water-table than discharging it into the Potomac River.
- **Project Scope & Timing:** Since the interconnection of systems would no longer be necessary, and each village would be developing solutions relevant to its specific needs, the timing of the projects in each village could differ, as discussed further in the following section.

A Better Path Forward: Separate Community-Specific Solutions

The Waterford Preservation Group proposes to discontinue the interconnect proposal in favor of two separate, community-specific projects, with no interconnection between the systems of Waterford and Paeonian Springs.

Immediate actions

- Terminate the interconnect project and transfer funds to the two new projects.
- Identify homes that are currently experiencing water or wastewater problems. Ensure that all parcel owners and renters receive notification so that all affected residents can self-identify.
- Verify which properties are potential health risks and proceed immediately to recommend and implement remedies. Provide financial assistance where necessary.
- Offer similar advice and financial assistance to other residents who wish to pursue small-scale solutions for non-emergency water or wastewater issues.

Longer-term Planning

- Designate each village's project as a "Small Area Plan" like the recent St Louis plan (see below), and use similar cooperative decision-making processes.
- Define the Plan boundaries around each village to include all parcels that may be affected by implementation of the plan, including indirect consequences such as potential well interference.
- Establish methods for communications, outreach, and joint planning between affected residents, County staff, Loudoun Water, consultants, the Waterford Foundation, and the Board of Supervisors.
- Ensure coordination with other planning groups such as the Foundation's *Waterford 2033* team, and relevant independent organizations such as *Save Rural Loudoun*, and the *WPG*.
- Establish guidelines to be followed by all participants in the planning process, such as:
    - Minimize temporary disruption and long-term damage to historic areas, the rural environment, existing structures, and Western Loudoun aquifers.
    - Locate any new wells inside or as close as possible to the villages, and explicitly preclude them along the Clarkes Gap Road corridor between the villages.
    - Evaluate and include both direct costs (e.g. infrastructure) and indirect costs (e.g. connections to the home, and repairs due to well interference).
    - Prohibit the taking of land by eminent domain, and mandatory hook-ups.
    - Require fair compensation for unavoidable and/or unanticipated harms (e.g. well interference).
- For each village, procure a 60% favorable vote (per County guidelines) from all residents within the plan boundary before moving into the design phase.

The St Louis Plan as Precedent

The recent report developed by St. Louis village serves as a successful model for small area planning. The County gave significant assistance to the village of St Louis in creating a small area plan that addressed water quality issues and real-estate development concerns. Residents expressed preference for small-scale solutions similar to those discussed here. The County is now finalizing a program that offers St Louis residents low-interest loans, potentially forgivable over time, to offset the cost of immediate well repairs.

Examples of Small-Scale Solutions

The following are illustrative examples of small-scale solutions that might be implemented. The County should select qualified contractors to help identify and implement appropriate solutions, while providing financing options for those who cannot afford the upfront costs incurred by residents.

Solutions for Water Quantity (Low Flow/Yield)

- Intermediate Storage Systems (Cisterns): Installing a large holding tank (e.g., 500 to 1,000 gallons) in the basement or underground allows a low-yield well to trickle-fill the tank 24 hours a day, creating a reservoir of pressurized water ready for peak usage times (mornings/evenings).
- Well Deepening: Drilling an existing well deeper to access lower aquifers, which is often a fraction of the cost of drilling a completely new well or connecting to a municipal system.
- Shared Well Agreements: These would allow a property with a low-yield well to legally connect to a neighbor's high-yield well via a private easement and maintenance agreement.
- Multi-parcel sharing: Similar to a small community well system, and subject to relevant regulations, one well could provide water to several homes in close proximity, with each home installing filters and other equipment to ensure potability, just like most homes in rural areas.
- Well Hydrofracking: This well rehabilitation technique injects water at high pressure into an existing well to clear debris and open up new rock fractures.

Solutions for Water Quality (Contamination)

- Whole-House UV Disinfection: Ultraviolet (UV) light systems installed at the "point of entry" neutralize bacteria caused by septic interaction, while avoiding chemical additives.
- Reverse Osmosis (RO) Systems: Point-of-Use or Whole-House RO systems can be installed to remove dissolved solids, nitrates, and chemical contaminants that standard filters miss.
- Iron & Sulfur Oxidizing Filters: Specific filtration systems designed to remove the "rotten egg" smell and orange staining common in groundwater, improving aesthetics and potability.

Solutions for Wastewater/Septic (Small Lots/Failing Fields)

- Alternative On-Site Sewage Systems (AOSS): "Advanced Treatment Units" treat wastewater to a higher standard before it enters the soil. These systems (such as peat filters or textile media) require much smaller drain fields than traditional septic systems, making them ideal for small lots.
- Drip Dispersal Systems: Instead of deep trenches, these systems use shallow drip lines (similar to irrigation) to disperse treated wastewater into the topsoil, which is effective for lots with poor soil depth.
- Pump and Haul (Interim solution): Pending an AOSS solution, the County could authorize "pump and haul" permits, where a holding tank is installed and pumped out regularly by a truck.

NOTES

Note 1: Mandatory Connection

All Loudoun Water (LW) projects must conform to specifications defined in the "*Loudoun Water Engineering Design Manual (EDM) May 2025 Edition*," available at https://www.loudounwater.org/engineering-design-manual. The EDM contains important conditions imposed on Community water systems. Section 7.2.C.5 states, "*Each Community Water System shall be financially self-sustaining.*" If insufficient fees are collected, then operating costs "*shall be borne by the owners of all properties within the service area*" and "*a mandatory connection provision may be required*."

Also see Virginia Code § 15.2-5137 which mandates connection or, for residents with a working well who choose not to connect, requires payment of a connection fee, a monthly non-user charge and other fees. Additionally, LW may require a minimum number of connections to ensure that water or wastewater infrastructure is physically capable of operating.

Based on the County's own survey results, and subsequent community polling, it seems likely that "voluntary connection" will not result in sufficient connections to achieve financial break-even or operational efficiency. Even if the County finds a way to subsidize the system, a future BoS could require mandatory connection for the system to be financially self-sustaining and operationally feasible.

Note 2: Well Interference and Remediation

When new, large-scale County wells are drilled, there is a strong chance they will interfere with pre-existing wells as much as a mile or more away. When municipal wells impact private homeowners, and there are no superseding State laws, local governments often establish funds to make good on the damage, or connect them to the public supply at no cost, or provide some other form of compensation.

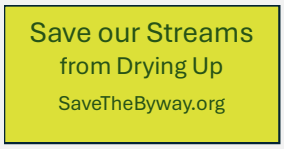
Loudoun County should enact similar ordinances to provide appropriate remediation or compensation to homeowners whose wells are affected by large-scale County wells.

Poolesville, MD is a good case study. After expanding its municipal water system in the 1970s, a dozen private wells began to fail. The Town paid for the replacement of those private wells. In 2007, the Town drilled two new municipal wells. Five domestic wells about a mile away experienced low pressure, turbidity, or went dry. The Town of Poolesville paid to drill deeper replacement wells for the affected homeowners.

Small towns that are not explicitly covered by State laws, as is the case in Virginia, often enact ordinances that limit pumping, require impact studies, and remediate well interference at no cost to the affected homeowner. Loudoun County should enact such ordinances.

What is the Waterford Preservation Group?

You may have noticed our Yard Signs along Clarkes Gap Road:



Originally established to address Waterford water issues, our scope expanded to include Paeonian Springs and the Clarkes Gap corridor due to the risks posed by the Interconnect proposal.

Contact Us & Get Involved

Website: Visit www.savethebyway.org for more information and to take our quick survey regarding the Interconnect proposal. *Email: waterfordpreservationgroup@outlook.com*