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A few years ago, an article in the *Charlotte News* posed the question, “What are West Village residents concerned about when it comes to development?”. As a long-term West Village (WV) resident, below I share one major concern for development in the West Village.

The need for an affordable, adequate, reliable source of potable domestic water for everyone, present and future, in the Village has been a longstanding concern. Even before Charlotte zoning regulations had seen the light of day in the ‘60s, water supply in the West Village was an issue. For decades, Charlotte’s Town Plans have recognized these concerns.(A) Nevertheless, little progress has been made. The town has been reluctant to construct, monitor, maintain, manage or develop a strategic plan for municipal water supply.(A1) A fundamental question remains unanswered: *where is the source of an affordable, adequate, reliable, quantity of domestic water for all current and future residents in the West Village, and, who is going to pay for it?*

So, you might ask, from where do West Village residents get their water today? Historically, the source of water for WV homes that were built between the late 1700s and the mid 1960s was rain collected off a roof and into a cistern. Today, many of the WV colonial homes still have a cistern. Recently, at least one WV colonial home restored it’s centuries-old cistern as a back up for the 50 year old well when it fails, *again*, to provide adequate domestic water.

After the 50s, the availability of improved drill bit materials and advanced drill methods, permitted drilling wells deep into bedrock where ground water could be captured sometimes with significant yield. Several wells near the intersection of Ferry and Greenbush Road were drilled to a depth of 500 feet to obtain an acceptable supply of water.(B). Numerous wells in the West Village have been hydro-fractured with the intent of enlarging or expanding the inter-connectedness of water-bearing fractures that are intersected by the borehole. Typically this is done when a borehole no longer yields sufficient water. A few wells have been abandoned and

replaced with a new well. Testing of well yield today in a well drilled 50 years ago is rarely done. Current yields of old wells are unknown. Based on limited but concerning data, 50 year, maybe 25 year, or maybe 10 year old wells may have a declining yield. One well drilled in 1972, failed in 2018. The well was drilled deeper. The new yield declined from the original yield by as much as 80%.

Local wells acquire groundwater from aquifers. Aquifers are recharged at varying rates from rainfall.(1) When groundwater withdrawal exceeds groundwater recharge, groundwater replenishment is too slow for the aquifer to serve as a water source for residential use. Poor groundwater recharge may also occur if the soil from the surface down to the aquifer is not readily permeable to rain water. According to a hydrogeological survey commissioned by Charlotte, land from roughly Route 7 going west to the Lake, an area including the West Village, has poor groundwater recharge potential due to thick relatively impermeable clay soil west to the lake.(C). That *is* a problem for the West Village.

Charlotte for many years has regulated land for groundwater recharge in new developments.(C1) By designation of a Source Protection Area (SPA). (e.g., Wildwood West on the west side of Route 7) (D) development or other uses in an SPA are prohibited. SPAs, in theory at least, are critical for conserving a portion of land for groundwater recharge needed for wells supplying domestic water to the relevant development. The theory supporting such SPAs is that groundwater in the designated area and thus local domestic water will be protected from contamination, at least from manmade sources. Its not clear whether the size of the SPA will also ensure a sufficient source of potable groundwater indefinitely.

Greenbush Road, the main north-south route through the WV, is at least one of the largest if not the largest development in Charlotte. The West Village has numerous private wells to supply domestic water to roughly 50 Greenbush Road residences. The number of wells is uncertain but likely about thirty, maybe more. A few households (mine for example) share a well with neighbors. Yet, an SPA to protect these thirty or more wells from contamination and to ensure sufficient potable water supply for this large Charlotte residential community now and for the future, simply does not exist.(E) It should. The PC must address this now before permitting greater development and additional wells and septic systems in the WV.

West Village Groundwater

Increasing the number of buildable lots in the West Village by simply decreasing the size of allowed lots should be preceded by *first* investigating the potential impact of such development on present and future well yields *and* by considering the impact the location of septic systems will have on well positioning, even on the property of a neighbor. Overshadowing from the septic system of a first property onto a second adjacent property, is legal in Vermont. Overshadowing may introduce conflicts between neighbors because, no surprise here, overshadowing of the first property's septic system onto the second property could limit where a well could be positioned on the second developed or undeveloped property. The septic system location may conflict with the most desirable position on the second property for some other use, e.g., a building.(F)

Quality of groundwater is an important consideration in the West Village as well as other areas of the town. We should learn from the lessons of nearby towns. Hinesburg has been rocked by the discovery of town well water contamination with methylene chloride, lead, copper, radionuclides, various PFAS, and other harmful contaminants and dangerous chemicals. (F)(G) These contaminants may be found in private as well as public wells. Mitigation is required. Water needs to be tested and monitored over time for the safety of end users.(H). Who will pay for this in Charlotte?

Hinesburg's water woes are illustrative of the complexity of town management of water supply. Hinesburg, with the best of intentions, has had more than its share of well water nightmares. Hinesburg first established two town drilled wells in the town center around 2012. (G) At first the wells provided adequate water for what the town needed at that time with a little extra for development. In 2013, the well yields had diminished *below the original yields* and below what was required to meet the average day water demand. The State of Vermont issued a "notice of violation" informing Hinesburg that the town must fix the yield problem to keep up with demand. Further, a contaminant, MTBE, a gasoline additive, was identified in the well water. The state ordered that in addition to providing a new source of water to meet demand, Hinesburg must also clean up the contaminant.

Documented more than a decade ago, the 2011 “Final Report on Potential Community Wastewater Service to the West Charlotte Village” issued by the Charlotte Wastewater Committee, concluded that water supply in the West Village is a key planning consideration. (I)

The town’s concerns regarding water supply in the West Village has been reflected in the Town Plan since at least as early as 2008. (J). There is no question what the will of the Town is. The “will” of the Town has been consistently recorded in Town Plans at least from 2008 to the most recent Town Plan.

After raising the issues, I regret that I can’t provide the solutions. I’m not a hydroengineer, merely a citizen who lives in a home on Greenbush Road in the WV where my family has lived with these water issues for 70+ years. I strongly urge that the town budget for and seek advice with a qualified hydroengineer to address WV water issues.

Planning should not occur within a vacuum. Reliable data on water supply, source, affordability, quality, quantity and cost are needed to thoughtfully consider the impact of development in the West Village. We do not have the data. Without data, eagerness to develop will adversely impact the Village for decades. Problems that should be investigated and addressed by *us* now but aren’t, will be our legacy to be solved by yet another generation. That is irresponsible if not unconscionable. The 2019 CTP (see below) is replete with support for addressing water supply in the West Village and elsewhere in the town.(K) Viewing the past 50 years with hope but not much action, is merely punting a water solution down the road. Lets stop the punt. It won’t be easy. Lets pause, get the data, then plan.

Summary for action in the West Village:

All PC members read the memorandum: 2010 Geology and Hydrogeology of Charlotte Vermont;
Budget for and hire a qualified professional hydroengineer;
Locate all wells;
Obtain *current* well water yields;
Locate all septic systems;
Identify Source Protection Areas for the West Village;

Determine the source, affordability, adequacy, and reliability of water supply
Develop a plan for water supply and recharge areas in the West Village

Citations

- A.** 1984 Charlotte Town Plan Online (hereinafter, CTP); 2008 CTP, 2016 CTP, 2019 CTP;
- A1** 2008CTP: The Town will continue its policy of not taking responsibility for community water supply and wastewater systems. Page 110, 5.8.8, Item 2;
- B.** Heindel and Noyes; Water Supply Data, West Village, October, 2011;
- C.** 2010 *Geology and Hydrogeology of Charlotte, Vermont*, Vermont Geological Society, Department of Environmental Conservation, Waterbury, Vermont; Sec. 3: Hydrogeological Units, page 6;
- C.1.** 2019 CTP; Page 1-44; (The Planning Commission will evaluate the approach to protect other groundwater resources under the land use regulations including recharge areas identified on groundwater maps developed for the town.) See Map 5.
- D.** Map 5, Public Water Supply Source Protection Areas, Charlotte, Vermont; Chittenden County RPC; August 25, 2017.
- E.** **2019** Charlotte Town Plan; Geology and Groundwater (AHPV-Source protection Areas), Section 2-1 to 2-2, Map #2.
- F.** Vermont 2010 Guidance Related to Wastewater System and Potable Water Supply Rules; Guidance Document 2010-01, Notification Requirements; pgs. 1-8.
- G.** McDonald, Corey; Tensions high at Hinesburg meeting over contaminated drinking water; The Citizen March 9, 2023; vtdigger March 12, 2023.

- H. See PFAS in Public Drinking Water-Vermont Department of Health; <https://healthvermont.gov>.
- I. 2019 CTP; pg. 1-37; Item 3.
- J. 2008 CTP, readopted 2013 secs. 2.1.1.2, 2.1.2.5, 2.1.4.2, 5.5.2.8; and pages 35 (4th full paragraph), 52-53,81;
- K. 2019 CTP, Item 2, pg1-10; Item 8, pg1-13 and 1-35; Item 3, pg1-37; Items 2 and 4, pg1-38.

AFTERNOTE

Please note that the major concern in this memorandum is not quality, although quality could become a concern, but *quantity* of domestic water for the WV.

Typically well owners don't check on well yield years after, if at all, it was drilled unless there is a problem. So we really don't know what the typical decades old well is yielding today in the West Village. What is likely is that the number of wells supplying approximately 50 households in the Greenbush Road community exceeds by many times the number of wells in any other community in Charlotte. How many more wells along Greenbush can sustain new households if West Village development is unchecked? Can the Greenbush Road aquifer(s) continue to provide adequate yield to new and present households associated with development, or are the aquifers nearly depleted, i.e., "tapped out"? How would we know?

1. Low rainfall this season is a concern. At least one well in the West Village recently failed.

2019 Charlotte Town Plan; pg. 2-51, last paragraph.

Protect groundwater resources, including aquifer recharge areas by regulating land use and development to avoid aquifer contamination and aquifer depletion.
CTP Item 16, pg. 1-12.

Support the development of community based water and wastewater systems in West Charlotte Village. CTP Item 3, pg 1-35.

All new or expanded subdivisions will be required to demonstrate that there will be an adequate supply of potable water to serve their development *without adverse impacts to Areas of High Public Value, existing water supplies or to land uses* of neighboring properties. CTP Item 17, pg 1-37;[emphasis added]

Land development shall be restricted and regulated within Source Protection Areas (SPAs) serving community water supply systems. The Planning Commission will evaluate the approach to protect other groundwater resources under land use regulations. CTP Item 23 pg 1-43.