Greenbush Water System Status Update

Dutchess County Water and Wastewater Authority

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Slides presented at public meeting
5:30 p.m. January 29, 2026
Roosevelt Fire Station #3

Our Goals Tonight

Introduce

Introduce DCWWA staff directly involved in improving drinking water in your area

Inform

Explain how the DCWWA operates, the current system status, moving forward from tonight, and upcoming infrastructure improvements

Listen

Hear your thoughts, concerns, and level of interest

Plan

Work together to determine the next steps that best serve the Greenbush community

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About DCWWA

- Not-for-profit public benefit corporation
- Independent of Dutchess County Government
- NYS procurement: competitive bidding
- Annual financial audits to ensure transparency
- Committed to providing safe, reliable drinking water and effective, responsible wastewater treatment
- A dedicated team of professionals delivering full-service solutions for water and wastewater systems

Where does drinking water come from?

Groundwater

Pumped from underground aquifers

Surface Water

Taken from reservoirs, lakes, or rivers

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Where does <u>our</u> drinking water come from?

City/Town Poughkeepsie JWTF

Hudson River source

16,000,000 gallons per day

Meets all State and Federal standards

Hyde Park Regional

Hudson River source

1,400,000 gallons per day

Meets all State and Federal standards

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Summer 2025
A Real-World Comparison of System Resilience

Challenging Seasonal Conditions

- Extended regional drought
- Harmful Algal Bloom (HAB) event
- Salt front intrusion in the Hudson River

Town of Poughkeepsie Water System

- Required major treatment adjustments to manage harmful algae and associated toxins
- Exceeded State and Federal standards for chloride

Hyde Park Regional Water System

- Experienced only a slight increase in dissolved ions
- Produced safe water with no treatment adjustments

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What is a Harmful Algal Bloom (HAB)?

- HABs occur when algae grow rapidly under warm, stagnant conditions
- Most common during hot, dry summer weather
- Can affect water’s taste and odor
- May produce toxins that affect the liver and central nervous system
- Filtration can remove algae and their toxins, but efficacy varies

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Water Quality During the HAB

- The Hudson River does not typically contain detectable levels of algal toxins
- During the HAB event, untreated (raw) river water contained microcystin concentrations ranging from **1.4 to 2.5 ppb**
- Finished drinking water from both the Poughkeepsie and Hyde Park Water Treatment Plants **never contained detectable levels of microcystin**

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The Salt Front

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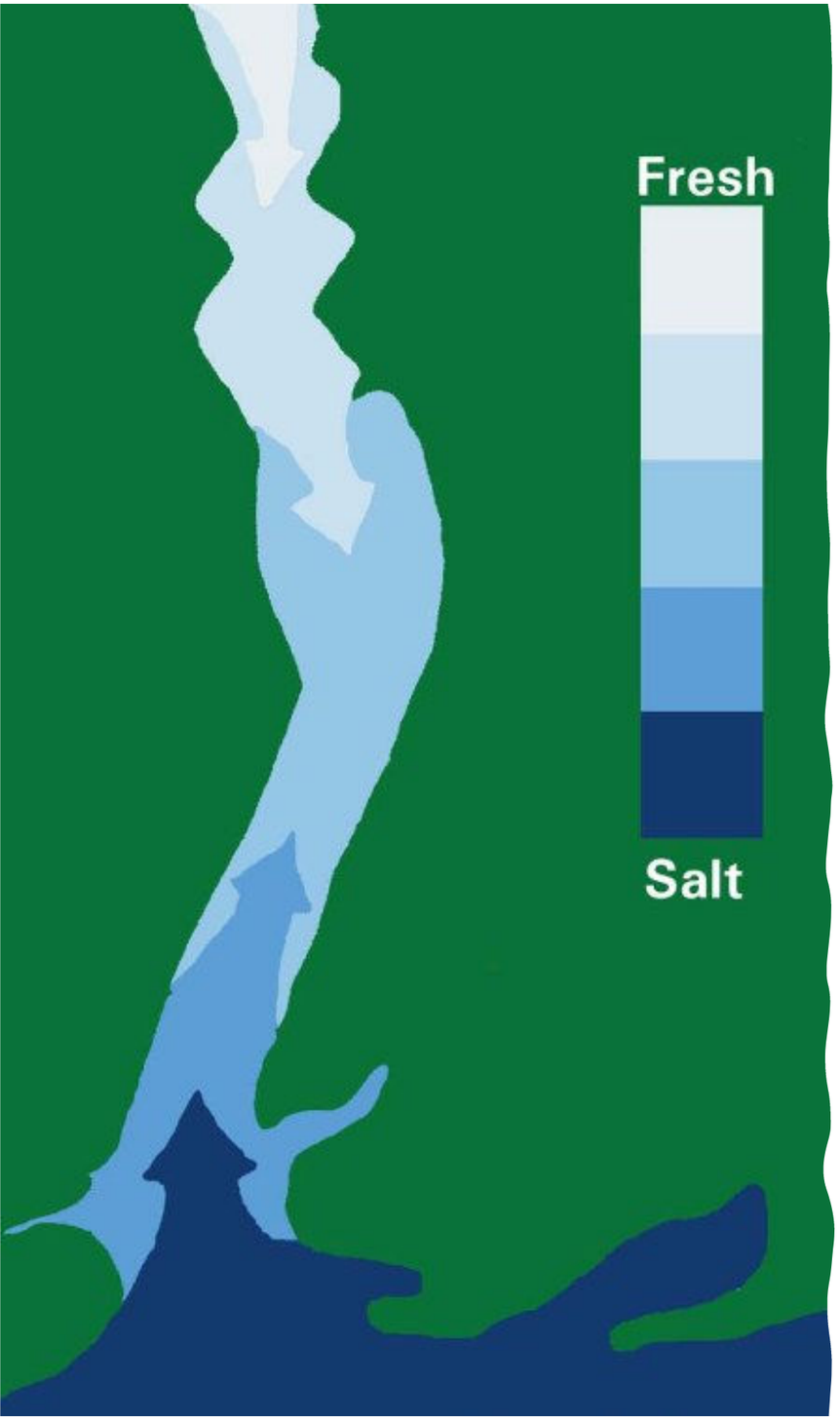

What is the salt front?

- The point in the Hudson River where ocean saltwater meets freshwater
- Exact location moves north or south depending on river flow
- The Hudson River naturally experiences seasonal changes in salt front location
- During droughts, reduced river flow allows salt front to move farther north
- This can increase sodium, chloride, and bromide levels in drinking water drawn from the Hudson River
- These changes are driver by source water conditions, not by treatment or operations

Seasonal Salt Front Effects at the Poughkeepsie Intake

- Poughkeepsie's water intake is the **southernmost** of the Hudson 7 intakes
- During especially dry summers, the **salt front can reach this area**
- When it does, source water quality can be temporarily affected
- **Conventional water treatment does not remove salt front constituents** (sodium, chloride, and bromide)
- In **September 2025**, salt front conditions reached Poughkeepsie's water intake

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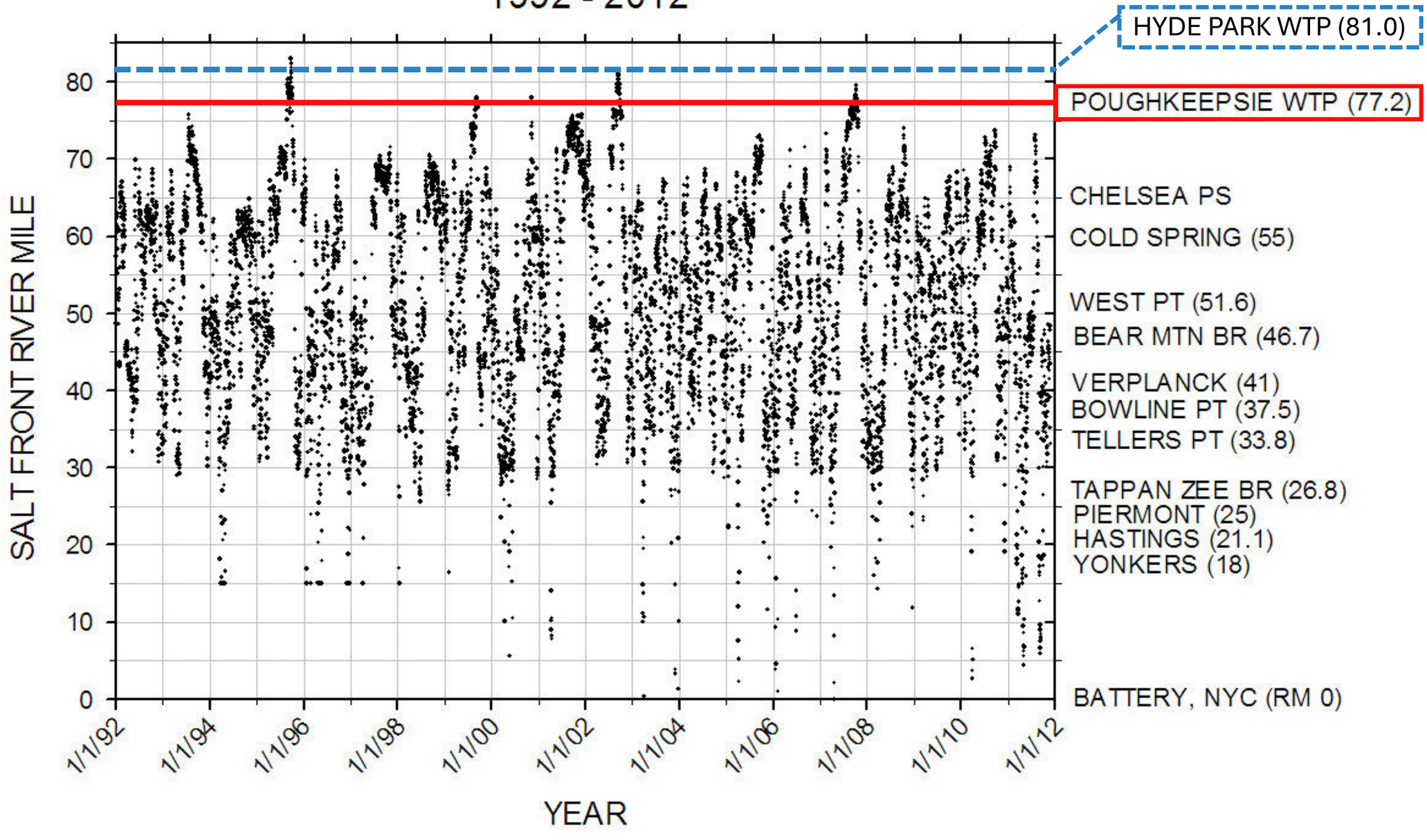
Maximum Daily Location of Salt Front in Hudson River 1992 - 2012



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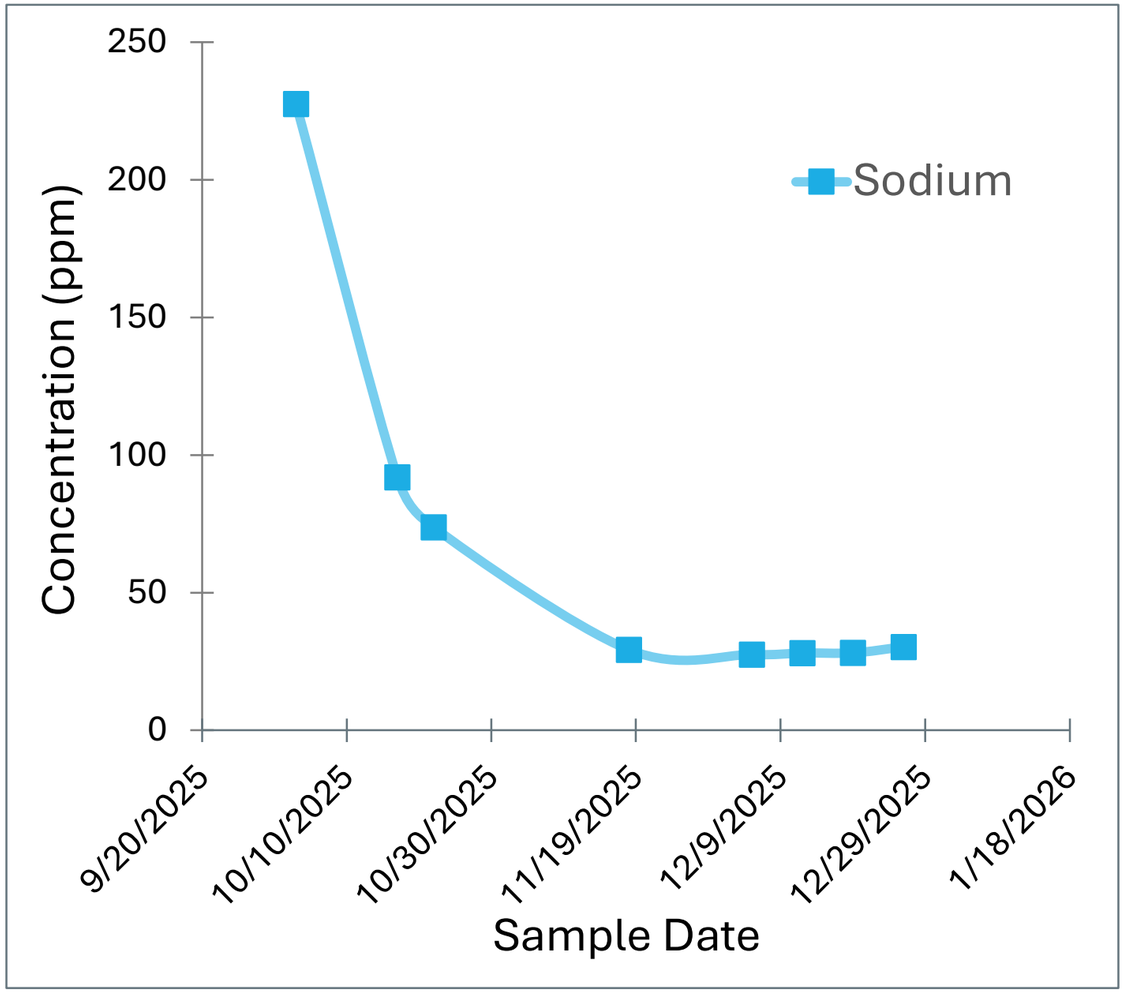
Salt Front Impacts
Sodium

- **There is no drinking water standard for sodium**
- Health guidance recommends no more than 20 ppm for people on very low-sodium diets
- A **guideline of 270 ppm** is used for people on moderately sodium-restricted diets
- **Most dietary sodium comes from food**, not water
- **Sodium affects personal dietary considerations rather than drinking water safety** and is not routinely monitored in Greenbush.
- During the salt front event, DCDOH required additional monitoring to track salt front impacts
- The highest sodium level seen in Greenbush during the salt front event was **227.5 ppm**
- **All samples have been compliant**



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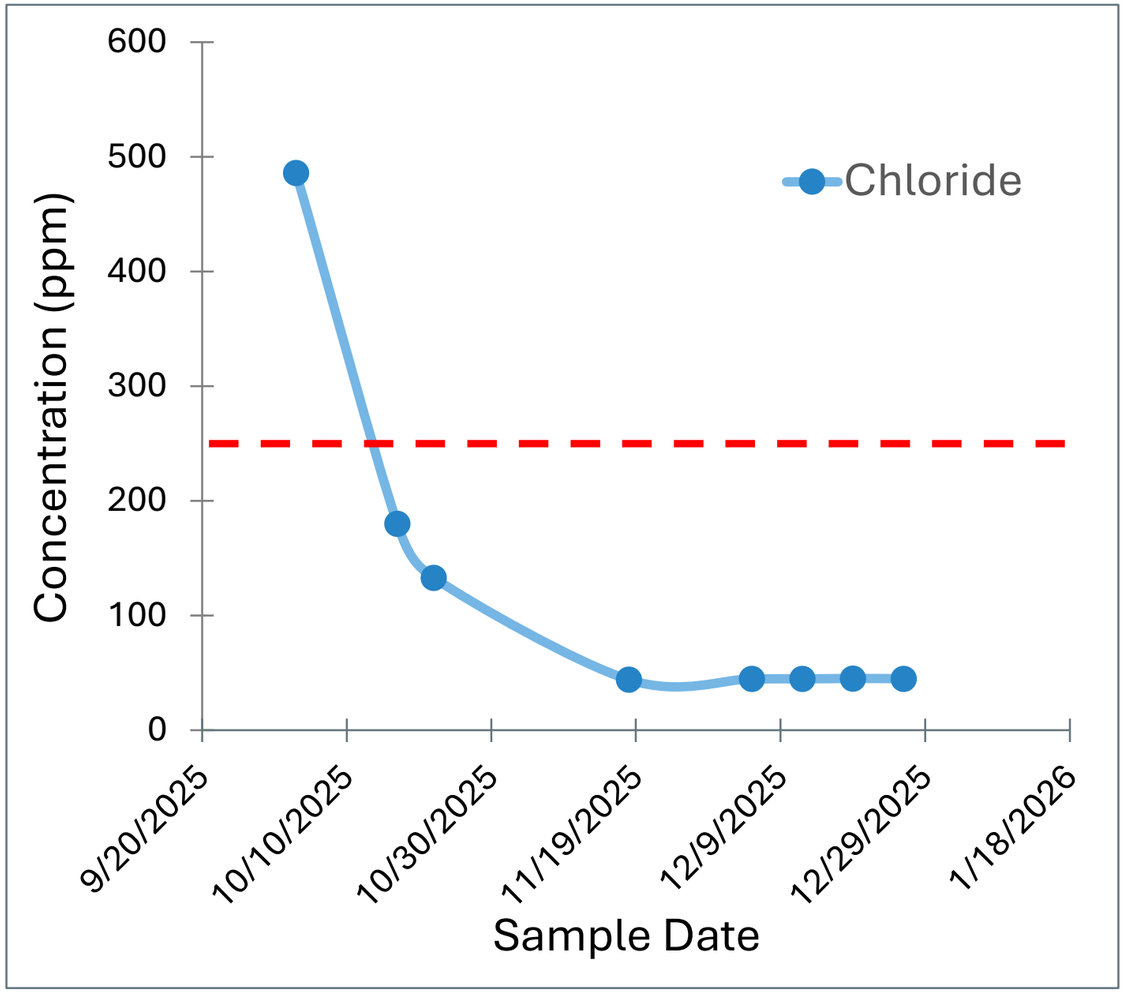
Salt Front Impacts
Chloride

- The salt front is defined as the point where chloride exceeds 100 ppm
- Drinking water standards set a chloride **limit of 250 ppm**
- **Chloride affects taste rather than drinking water safety**, and it is not routinely monitored in Greenbush
- During the salt front event, DCDOH required additional monitoring to track salt front impacts
- One sample collected in the Greenbush community measured **486 ppm**
- **All follow-up samples have been compliant**



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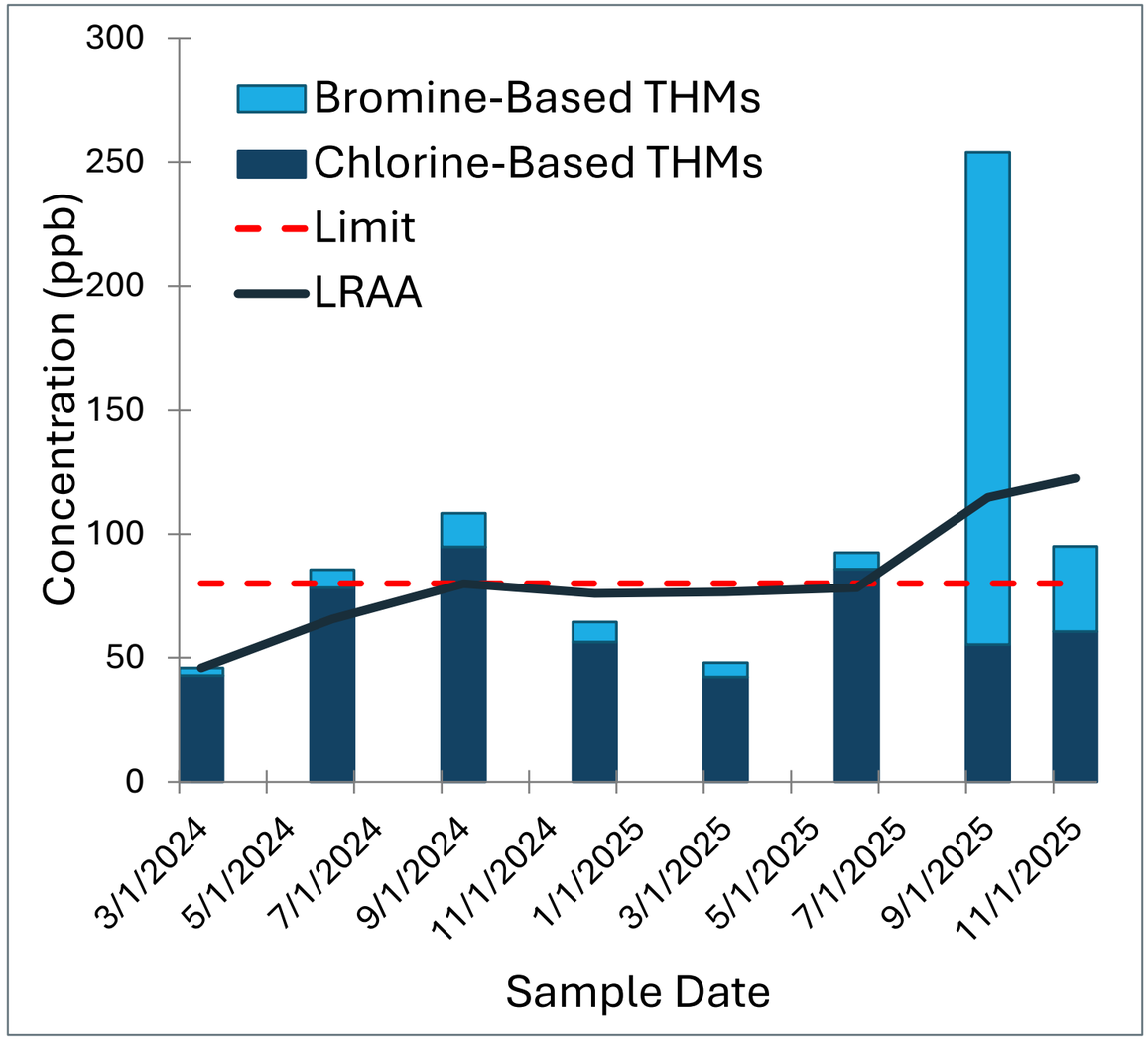
Salt Front Impacts
Bromide

- Naturally occurring component of seawater
- **Not individually regulated** in drinking water
- During treatment, **bromide can increase the formation of regulated disinfection byproducts**
- Disinfection byproducts known as Trihalomethanes (THMs) are monitored quarterly and limited to an **annual average of 80 ppb**
- Extremely high bromide levels in September led to a **single very elevated THM result**
- That result significantly increased the locational running annual average (LRAA)
- The violation will remain in effect for at least one year, even though **conditions have returned to normal**



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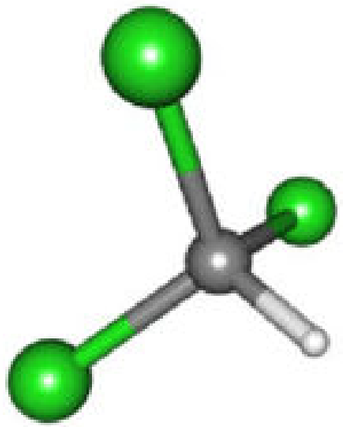
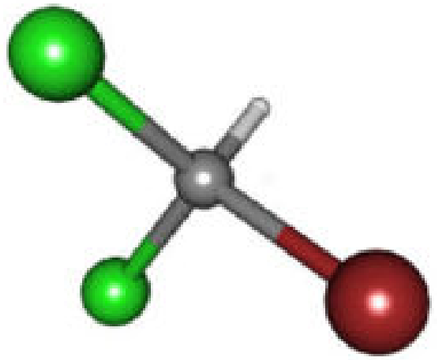
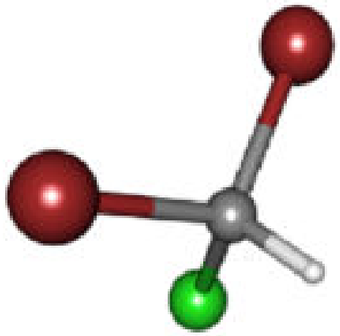
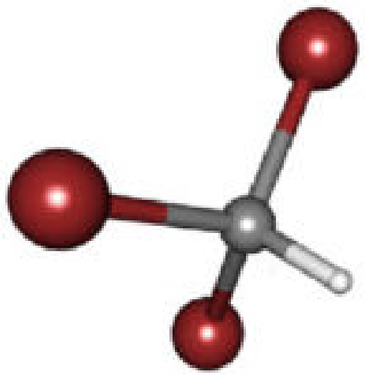
			
(a) Chloroform ($CHCl_3$)	(b) Bromodichloromethane ($CHBrCl_2$)	(c) Dibromochloromethane[7] ($CHBr_2Cl$)	(d) Bromoform[8] ($CHBr_3$)

Why THMs are Regulated Using LRAA

- Health risks from THMs are associated with long-term exposure
- Levels naturally change with seasons and source water conditions
- Regulations focus on sustained conditions, not isolated high-level events
- Regulatory limit is set conservatively with a large margin of safety
- Standards are designed to protect sensitive populations over a lifetime

What Does This Mean?

Sodium never exceeded the level generally considered safe

Chloride exceeded aesthetic standards in one sample, but was resolved the following week

Bromide levels have declined, but remained slightly elevated in November disinfection byproduct sampling

Greenbush will remain in a THM violation through at least September 2026 due to how annual average is calculated

Quarterly notices will continue as required by NYSDOH and do not necessarily indicate new exceedances

Salt front conditions are not common, but they may occur again during future dry summers

What is the Path Forward?

DCWWA will continue targeted flushing to reduce water age and improve water quality

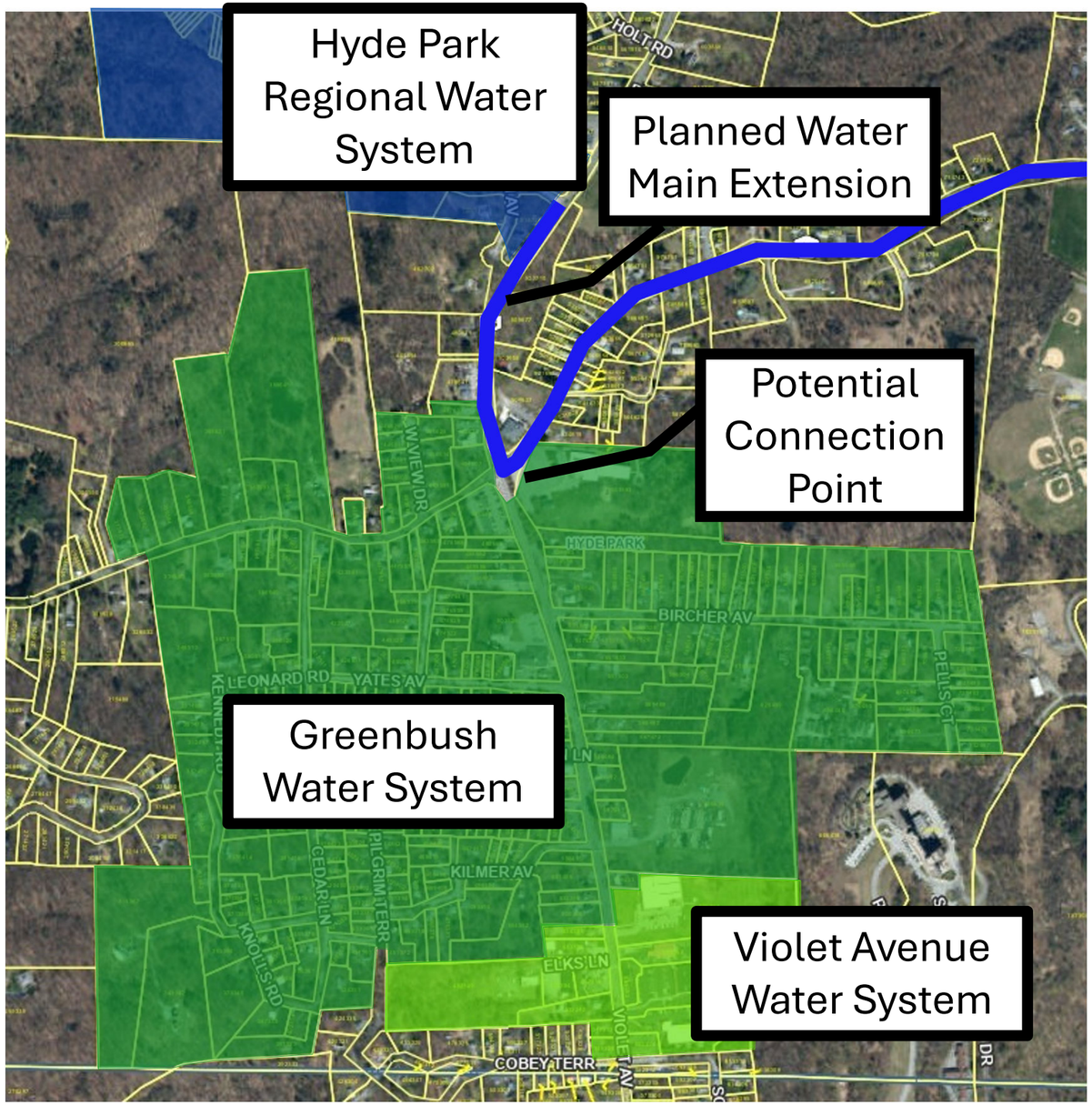
DCWWA will continue to coordinate with the Town of Poughkeepsie Water Department on concurrent flushing

DCWWA is exploring a potential mutual aid connection between Greenbush and the Hyde Park Regional Water System

These actions will help reduce the impact of seasonal salt front conditions in the future

What is a Mutual Aid Connection?

- Potential interconnection between neighboring water systems
- Intended to provide flexibility during unusual or emergency conditions
- DCWWA is building new water main near Greenbush
- This creates the opportunity to consider a mutual aid connection
- Evaluations will be subject to existing agreements, regulatory approvals, and customer interest



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What are the benefits?

Fire Protection

- Elevated storage could support fire protection in much of the area
- Potential for ISO rating, which could lower insurance rates

Improved Pressure

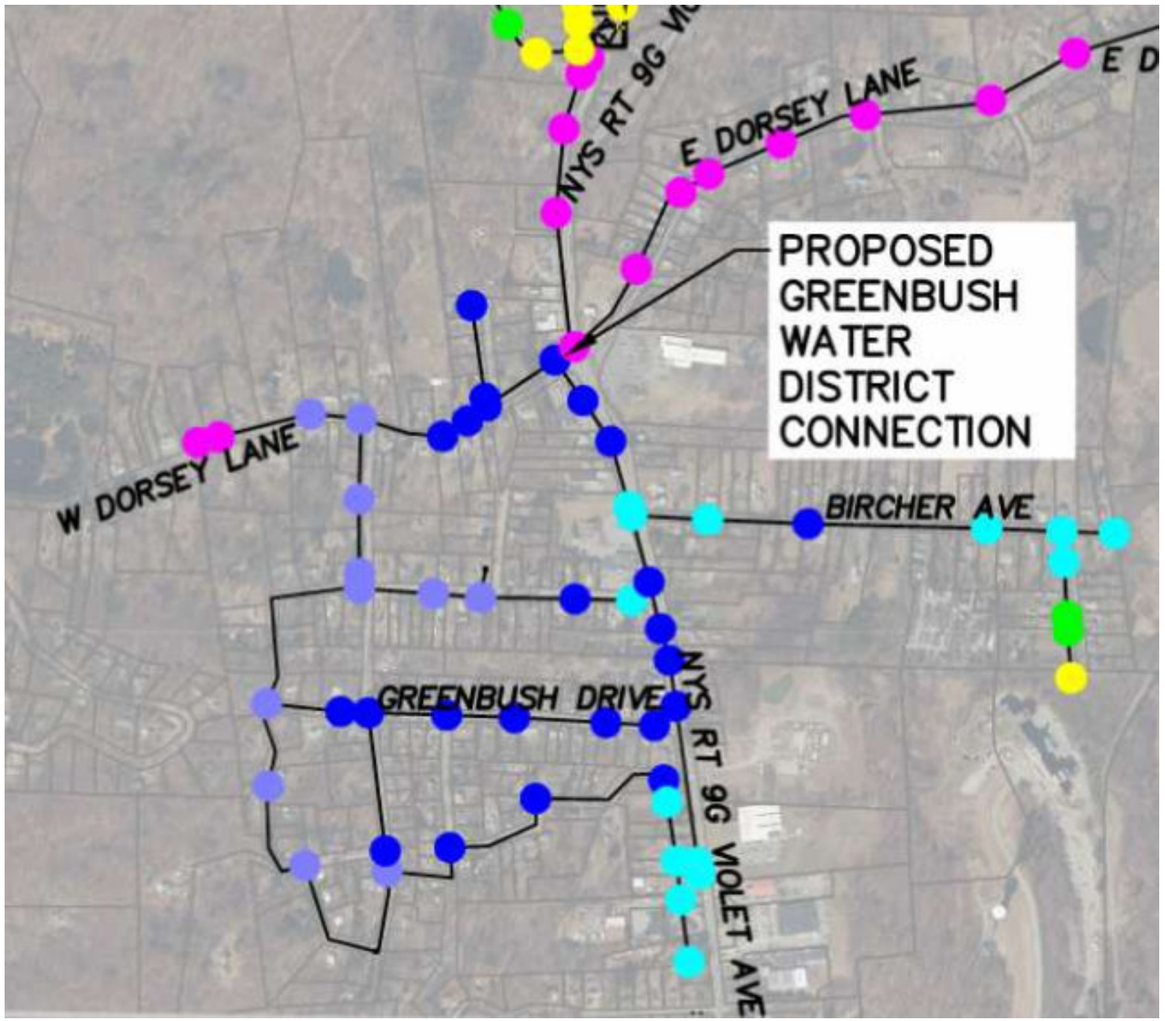
- Supplied by a new high-capacity booster station serving Greenfields
- Backed by a 500,000-gallon storage tank
- Reduces or eliminates reliance on local booster pumping systems

Resilience

- Source water intake located farther from the Hudson River salt front
- Deeper intake point reduces vulnerability to Harmful Algal Blooms
- Access to multiple water systems provides operational flexibility and improves long-term reliability

Operational Efficiency

- End-to-end ownership allows DCWWA to better manage system needs
- Reduced flushing frequency results in less unbilled water



Fire Protection

Actual protection depends on design and field conditions, but conceptual modeling shows strong potential.

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What are the Costs?

Capital Improvements

- Master PRV Pit
- Looped Water Connections
  - Yates Ave / Rt 9G
  - Greenbush Dr / Rt 9G
- Individual PRVs installed at each home
- Funding Approach:
  - Target 60% grant funding
  - Remainder financed through subsidized loan
- **Goal: <u>no more than $300</u>**
  (annual benefit assessment per typical residence)

Operations and Maintenance (O&M)

- Current Greenbush charges:
  - Monthly service charge: **$20.00**
  - Metered Rate: **$7.56 per 1,000 gal**
- Current Hyde Park Regional charges:
  - Monthly service charge: **$25.22**
  - Metered Rate: **$9.12 per 1,000 gal**

- **Estimated annual difference: <u>$157</u>**
  (per household, based on typical residential use)

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What Does this Mean?

- Interconnection would be a major infrastructure project requiring a **long-term investment**
- **Hyde Park Regional's water rates are higher** than the rates you currently pay
- DCWWA is in the early, conceptual stage of evaluating this option and gauging customer interest
- **No formal cost estimates have been developed**; figures shown are preliminary and based on regional experience with similar projects
- Conceptual estimates suggest interconnection **could increase annual water costs by up to $450**
- All water infrastructure, including Poughkeepsie's water treatment plant, periodically requires upgrades, and **future improvements Poughkeepsie is currently evaluating could increase rates for Greenbush**
- The Hyde Park Regional Water System is also currently undergoing treatment plant upgrades, and **those known costs have already been accounted for in the Hyde Park benefit assessment estimates shown**

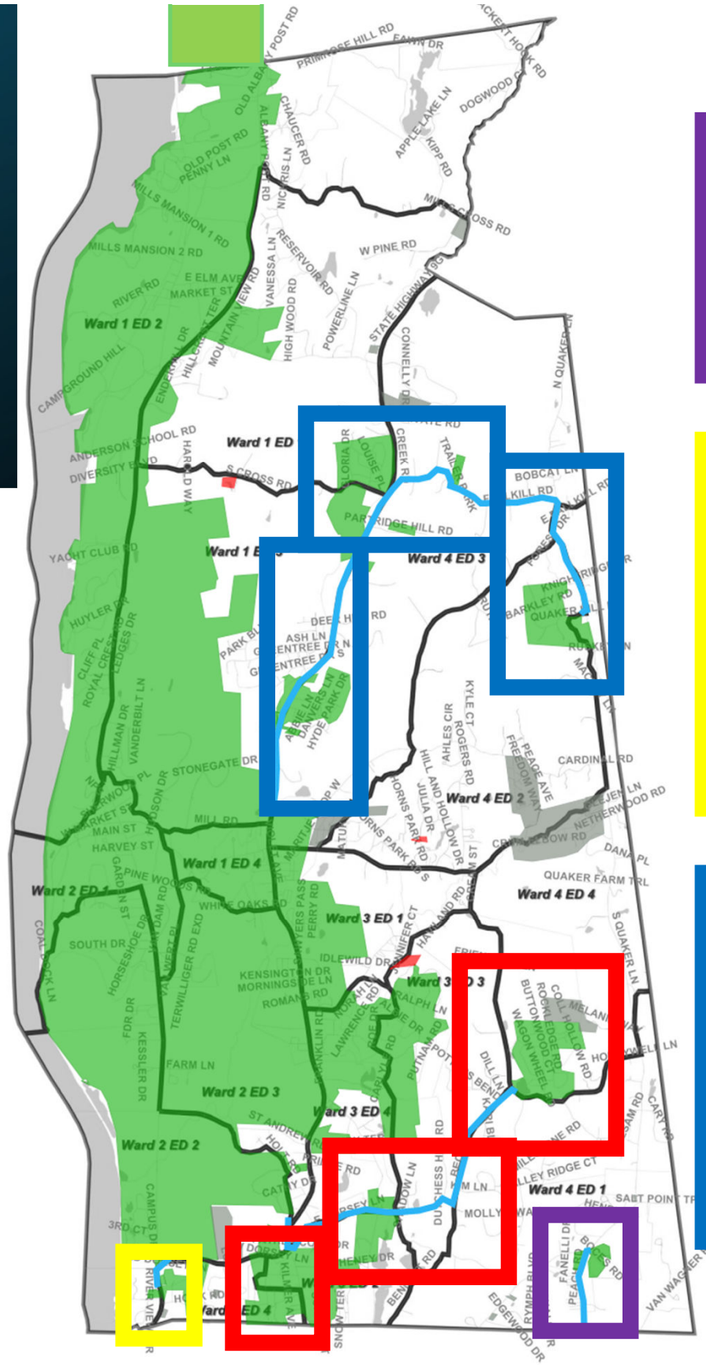
Hyde Park Regional Water System Expansions

DCWWA is currently **expanding water infrastructure** in Hyde Park as a **sustainable solution** to current and future water quality problems

~2029 – Anticipated completion of water main to the Greenfields Community. This positions the Greenbush water system in proximity of a mutual aid connection to Hyd Park Regional

DCWWA is evaluating the feasibility of pursuir NYSEFC WIIA grant funding to offset the cost c a potential interconnection, should all contractual and regulatory conditions be satisfied.

Customer feedback will be an important pa of evaluating next steps



2026 Anticipated completion of water main on Peach Road to DC BOCES and Auto Center

~2027 – Anticipated completion of water main on West Dorsey, Old West Dorsey and Route 9, expanding south of CIA

~2030 – Anticipated completion of water main to the Quaker Hills/South Cross/Dutchess Estates/North Park Community

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You asked: Questions from the Community

Q: ***Why do the contaminants consistently exceed safe and acceptable levels?***

A: The USEPA and NYSDOH regulate more than 90 drinking water contaminants. Greenbush's drinking water does not consistently exceed safe levels and very rarely exceeds the compliance level for any of these contaminants.

In 2011, Poughkeepsie changed its primary disinfectant from chloramines to free chlorine. During that period, THM exceedances were more frequent systemwide. In late 2016, ozone was added to the treatment process to reduce chlorine demand and limit disinfection byproduct formation, which resulted in improved THM control.

Since DCWWA acquired the Greenbush Water System in February of 2016, our operators have conducted 40 calendar quarters of monitoring. During that time, THM exceedances occurred in four quarters, or 10% of the monitoring periods. Prior to this summer's extreme seasonal conditions and the associated salt front intrusion, **Greenbush's drinking water had not exceeded any regulatory standard since the fourth quarter of 2017.** That represents nearly **eight consecutive years of reliably safe drinking water**.

This history shows that **THM levels are not consistently elevated** but instead respond to specific treatment configurations and unusual environmental conditions. DCWWA continues to work with its treatment partners to minimize THM formation while maintaining effective disinfection to protect public health.

You asked: Questions from the Community

Q: ***I'm paying for water that isn't safe to use. Where is the reimbursement or free bottled water to use?***

A: Greenbush's drinking water is currently safe to use for all household purposes. While monitoring in 2025 showed that the locational running annual average (LRAA) for trihalomethanes (THMs) was exceeded, this standard reflects potential risk from long-term, lifelong exposure rather than an immediate health concern.

DCWWA water systems are financially independent and entirely funded by the customers they serve. There are no outside operating subsidies or third-party funding sources that can be used to provide reimbursements or free bottled water. Any cost associated with bottled water would ultimately be paid for by the same customers through higher rates.

Some customers may still choose to use bottled water during periods when THM levels are more likely to be higher, typically in the late summer, out of an abundance of caution, but DCWWA's focus remains on system-level improvements that benefit all customers rather than short-term measures that would increase costs.

You asked: Questions from the Community

Q: ***Why can't the Greenbush Water District connect to the Hyde Park Water District on a permanent basis as had been discussed at a previous meeting?***

A: At this time, a permanent connection between the Greenbush Water District and the Hyde Park Water District cannot yet move forward due to existing contractual and regulatory constraints. In addition, until recently there has not been Hyde Park Regional Water System infrastructure close enough to Greenbush to make such a connection technically and financially feasible. New infrastructure planning in nearby areas may change what is possible in the future.

You asked: Questions from the Community

Q: ***We had to pay 20 years for the Greenbush water district to deal with MTBEs caused by a gas station. And since it was created the Greenbush water district has had to deal with THMs.***

A: MTBE contamination, caused by releases from several local service stations, was documented by the New York State Department of Environmental Conservation in the late 1980s. By the 1990s, more than 120 residential wells were found to be impacted. To address this long-standing groundwater contamination, a regional water supply project was developed to connect Greenbush to the City of Poughkeepsie Water System. The total project cost was approximately $3.1 million, of which NYSDEC contributed $1.9 million, significantly reducing the cost to local ratepayers.

The Greenbush Water District was established in 2002, the same year the U.S. Environmental Protection Agency implemented its first federal regulations for disinfection byproducts, including THMs. Drinking water regulations continue to evolve as new information becomes available. While it is not possible to anticipate every future regulatory change or emerging contaminant, DCWWA works to stay ahead of these challenges through proactive monitoring and long-term planning.

We understand the frustration that comes with addressing one contamination issue only to encounter another. DCWWA is actively working to reduce THM levels through operational adjustments.

You asked: Questions from the Community

Q: ***The THMs do not always exceed the four quarter EPA level like it did in 2025, but there are frequently quarters in which it exceeds the EPA level.***

A: THM compliance is based on a locational running annual average (LRAA), which reflects potential health risk from exposure over time. A single quarterly result above the EPA limit does not, by itself, constitute a regulatory exceedance or an immediate health risk. An exceedance occurs only when the four-quarter running annual average exceeds the standard.

It is also important to note that **disinfection is essential to protect public health**. The health risks associated with pathogens in untreated or inadequately disinfected water are far greater and more immediate than the long-term risks associated with regulated disinfection byproducts. Water treatment is carefully balanced to ensure effective disinfection while minimizing THM formation as much as possible.

You asked: Questions from the Community

Q: ***We do not find out about these high levels in a timely manner.***

A: Notifications for elevated THM levels are issued in accordance with New York State Department of Health (DOH) requirements. THMs are regulated as a Tier 2 public notification because they are associated with **potential long-term exposure risk, not an immediate health emergency**.

The notification timeline is set by regulation and includes several required steps. A water sample is collected and sent to a certified laboratory, and results are typically received within three to four weeks. Once results are received, the water system is required to prepare and issue a public notification within 30 days. That notification must be reviewed and approved by DOH before it can be distributed to customers.

We understand that this process can feel slow from a customer perspective, particularly for those concerned about exposure.

You asked: Questions from the Community

Q: ***The only way to minimize the negative effects is by buying water, which is costly, inconvenient and not environmentally friendly. In addition, we cannot totally avoid the effects by buying water, because the contaminants are inhaled when showering and washing dishes.***

A: Customers who wish to take additional precautions may consider using an **NSF/ANSI 53 certified carbon filter** for drinking water. These filters can significantly reduce THMs as well as many other common drinking water contaminants and offer an alternative to relying on bottled water.

Certified carbon filters are available for a variety of installations and at a range of prices, with many under-sink units available for under $100. While filters require routine maintenance and cartridge replacement, a typical unit can treat approximately 1,600 gallons of water, equivalent to more than 12,000 standard 16.9-ounce bottles. This approach can be more affordable, convenient, and environmentally sustainable than purchasing bottled water.

While THMs can also be absorbed through breathing water vapor or skin contact, these pathways generally contribute much less to overall exposure than drinking water. For customers who are concerned about exposure during showering or dishwashing but don’t wish to install an in-home filter, increasing ventilation by using an exhaust fan or opening a window can help reduce inhalation of water vapor.

You asked: Questions from the Community

Q: ***Please give serious consideration to the health of your customers and join the Greenbush Water District permanently to the Hyde Park Water District. We look forward to the day that we can get a glass of water from the tap and take a shower without worrying about the negative effects to our health.***

A: Protecting the health of our customers is our highest priority, and we understand why long-standing water quality concerns make it difficult to feel fully confident using your water without worry. Your concerns about drinking water, showering, and daily household use are taken seriously.

We share your goal of reaching a point where customers can drink water from the tap and use their water every day without concern. Customer feedback is an important part of shaping future planning decisions, and your comments will continue to inform how we evaluate long-term solutions for the Greenbush community.

Questions?

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