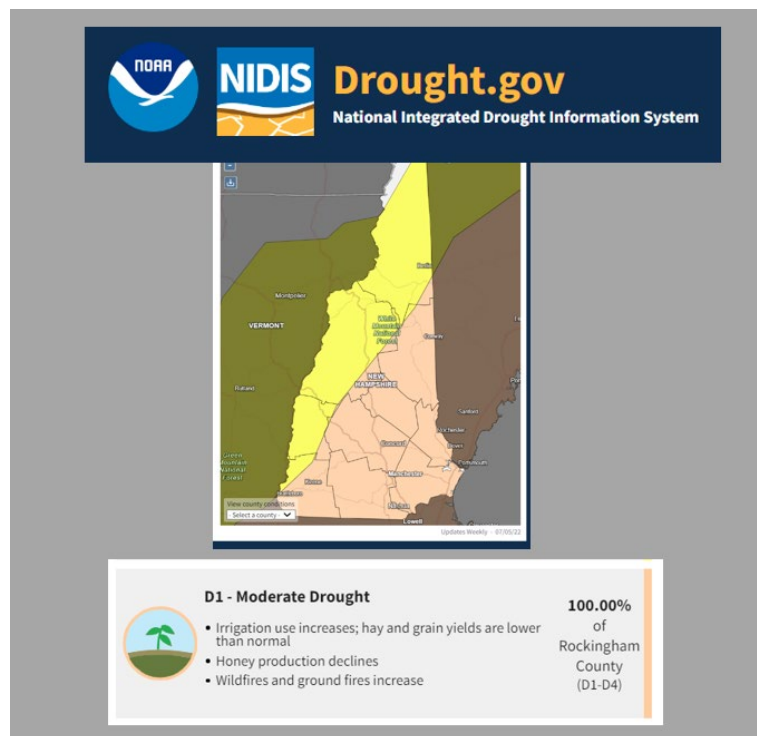




Portsmouth and Pease International Tradeport Drinking Water Status Report 2022 – 2nd Quarter

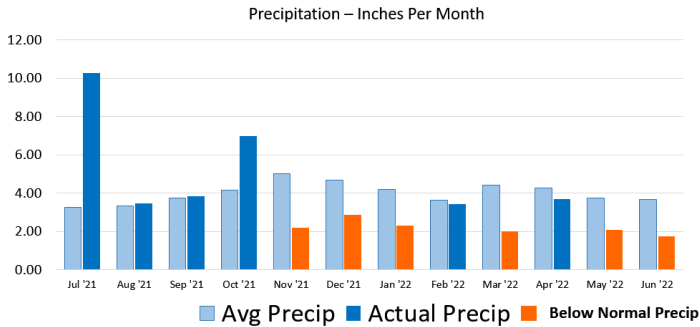
Precipitation and Weather

Currently, weather conditions in the Seacoast area are in moderate drought:

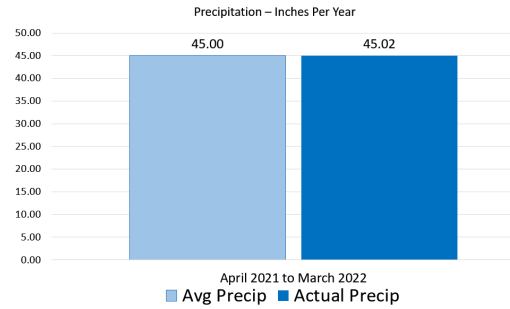


The following graphics show the monthly precipitation as recorded at the Pease NOAA weather station and the cumulative precipitation through the year. Currently, the total precipitation of 45.02 inches is just above our normal of 45 inches. However, as the graphics show, if not for the rainfalls in July and October of 2021 we would be well below normal, as most other months experienced less precipitation than normal.

Last 12 Months of Precipitation

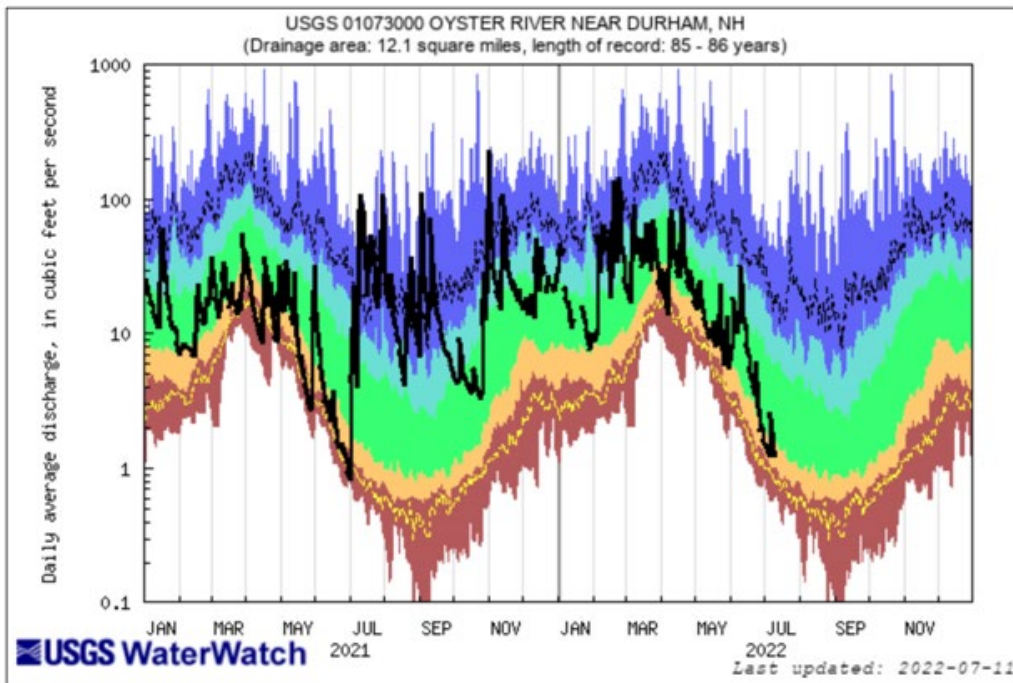


Rolling 12-Month Total Precipitation



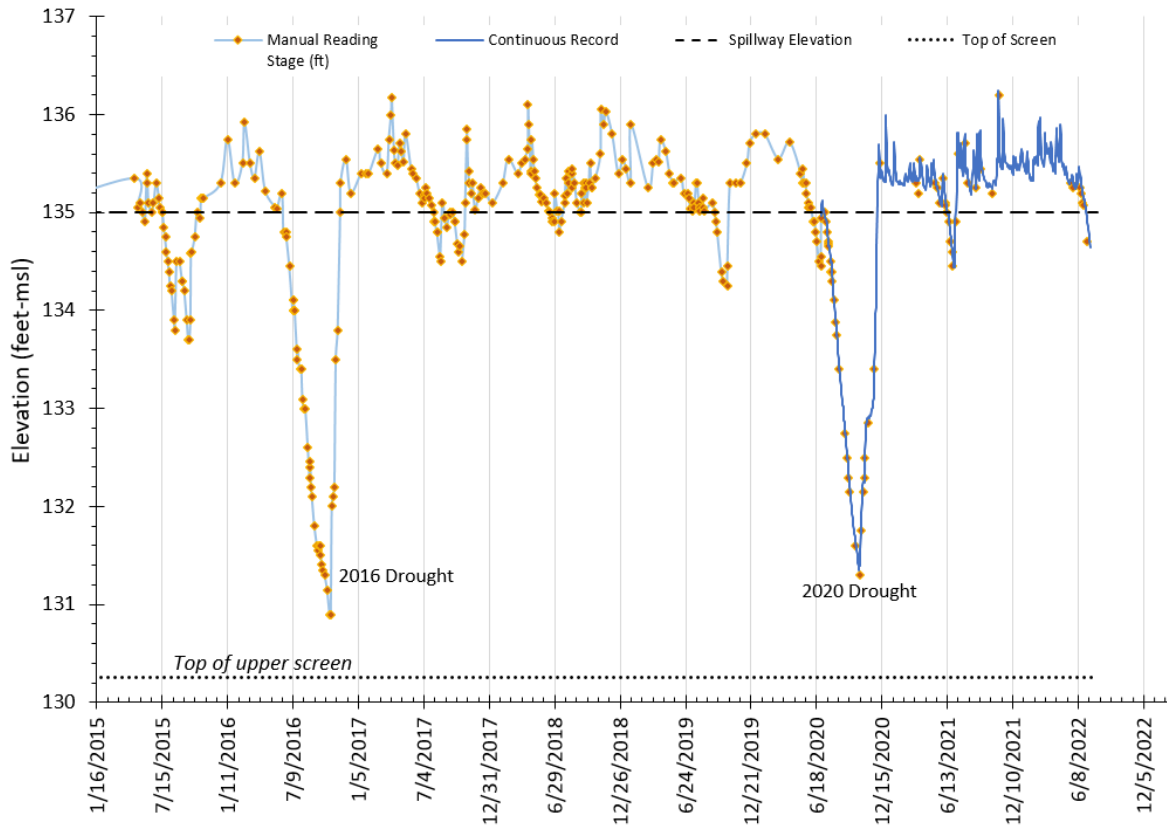
Reservoir Levels and Flow

The following graphic shows the flow trend, according to the gauged Oyster River, which we use to assess the flow into the Bellamy Reservoir. The low flow conditions that persisted until July are highlighted. Flows picked up after those rainfall events and continued through the rest of the year. However, current dry conditions through the end of June have lowered the flow. We will continue to track and assess conditions as the summer continues.



Explanation - Percentile classes						
lowest-10th percentile	5	10-24	25-75	76-90	95 90th percentile - highest	Flow
Much below Normal	Below normal	Normal	Above normal	Much above normal		

Bellamy Reservoir Water Level



Water continued to flow over the Bellamy dam spillway through June, but the water level declined and the flow ended around July 1st. This timing is typical; however, the lack of rain has caused the reservoir water level to rapidly decline in early July. The flow of water into the Bellamy downstream of the dam is controlled by a gate valve in the outlet chamber on the dam. Flow rates are monitored and adjusted to mimic stream flow rates that may have existed if the dam was not in place in order to provide aquatic habitat.

Groundwater Levels and Status

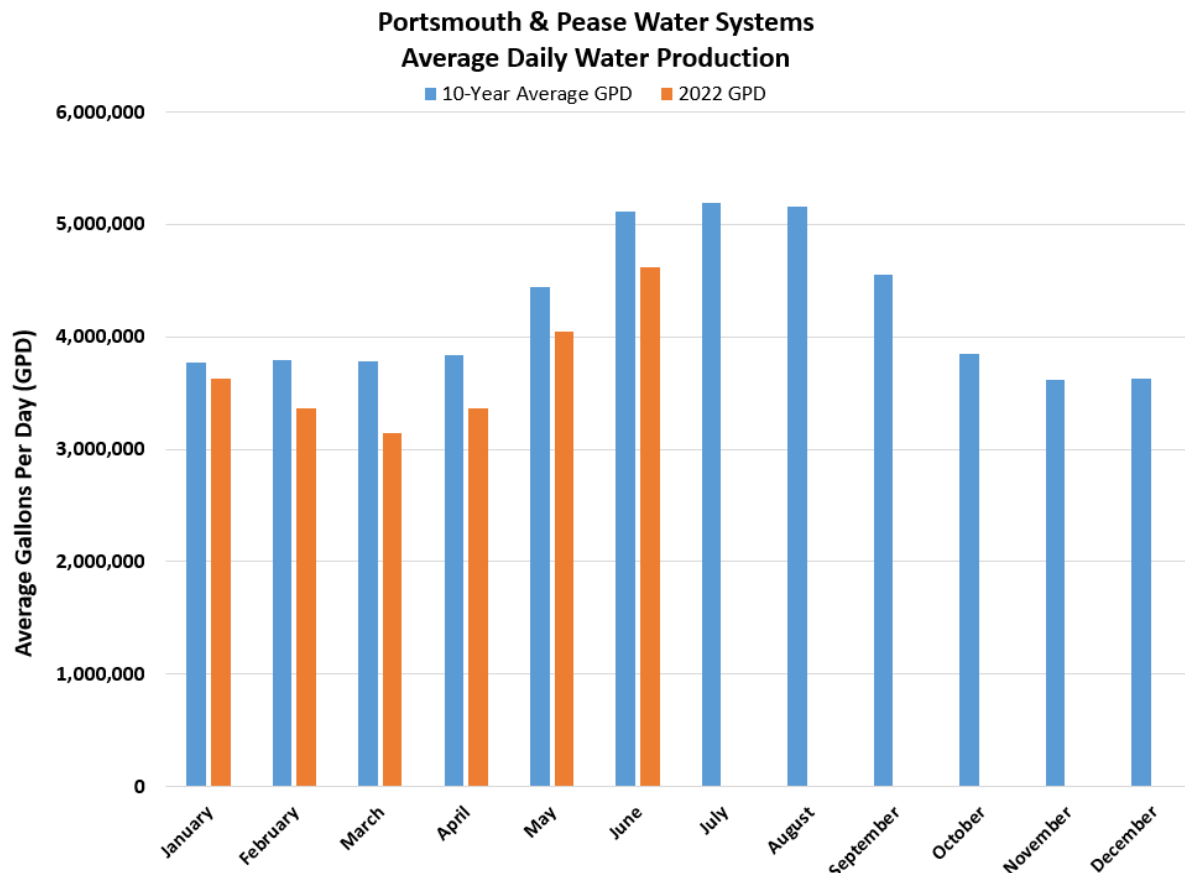
Groundwater levels in most of our well-water sources are generally within ranges that are typical for this time of year. Some of the well levels are higher than they have been in previous years. This can be somewhat attributed to lower water demands, however, it can also be attributed to our water operations staff's optimization of the use of surface water versus groundwater. Cutting back our groundwater withdrawals during the winter and spring has allowed groundwater levels to be maintained such that more groundwater is available for the system during the summer to meet peak demand periods. Each well has a continuous water level meter and the water pumped is also metered. This allows system operators the capability of assessing groundwater level trends and we are able to determine overall source of supply capability. Additionally, we are soon to activate our new Madbury Well 4r and Madbury Well 5. Each of these wells is capable of pumping approximately 450 gallons-per-minute into the water system.

Water Production

Through the second quarter of 2022, water demands were lower than average. In May, there was slightly greater demand than in May of 2021. Spring and summer water demands fluctuate very closely with precipitation and demands for irrigation. We are currently experiencing normal water demands for this time of year; however, the recent dry weather has resulted in an increase in irrigation usage. The following table and chart shows the monthly water supply production expressed as average daily rates for the Portsmouth and Pease Tradeport water systems in 2022 and 2021 relative to the 10-year average:

Portsmouth & Pease Water Systems
Average Daily Water Production

	10-year average	2021	2022
April	3.88	3.38	3.36
May	4.44	3.86	4.05
June	5.10	4.95	4.62



Water Efficiency Rebates

The City also continues to offer water efficiency rebates of \$100 per low flow toilet and \$150 for the purchase of a high efficiency washing machine. These are available to all residential customers, including multi-family customers. To date, over 1,000 rebates have been issued. According to the NHDES we are currently the only public water system in New Hampshire offering these rebates.

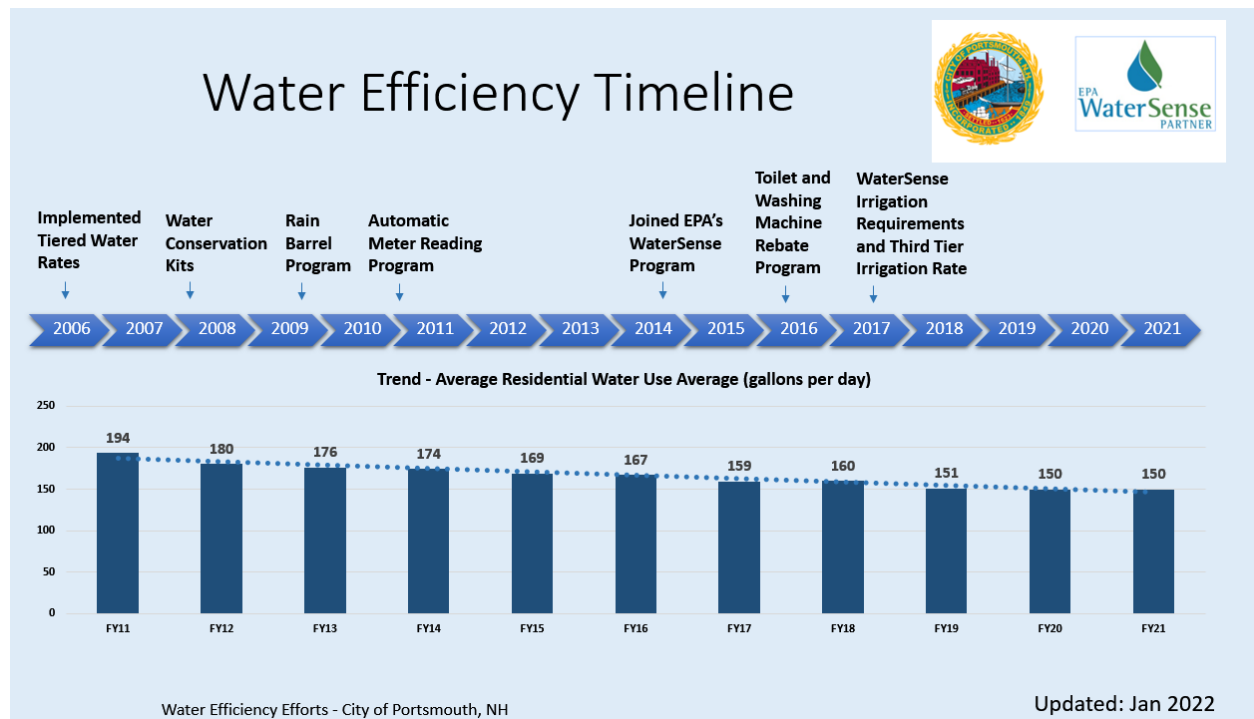
As of the end of FY22, nearly 1,500 rebates have been issued. The following table shows the estimated savings from these rebates, amounting to approximately 50,000 gallons-per-day, or 1.5% of the daily water demand for the water system:

Rebate Type	TOTAL	Gal/Day Saved per Rebate	Total Gal/Day
Low-Flow Toilet	1,148	36	40,754
High-Efficiency Washing Machine	348	27	9,396
	1,496		50,150

Additional information and rebate applications can be obtained from the City's water billing department or from the City's website:

<https://www.cityofportsmouth.com/publicworks/water-efficiency-rebate-program>

The following graphic shows the success of this program over time:



As the graphic shows, average overall residential water use has gone from 194 gallons per day down to 150 in the last 10 years, a 22% reduction. We intend to continue with the rebate program and expand our outreach efforts to focus on ways that customers can be more efficient with summertime water use for irrigation and cooling needs.

Water Quality Information

The Portsmouth Water Division routinely monitors water quality parameters and performs water quality sampling and analysis as directed by the Federal Safe Drinking Water Act and the New Hampshire Department of Environmental Services. Water sources are monitored for radioactive, biological, inorganic, volatile organic, or synthetic organic contaminants. Critical water treatment parameters for turbidity, pH, chlorine, orthophosphate and fluoride are continually monitored and tracked by our system operators. The regulations require us to monitor for certain substances less often than once per year because the concentrations of these substances do not change frequently. In these cases, the most recent sample data are reported, along with the year in which the sample was taken. Annual Water Quality Reports for both water systems detail these efforts and are mailed to each water system customer annually. They are also available on the City's website at:

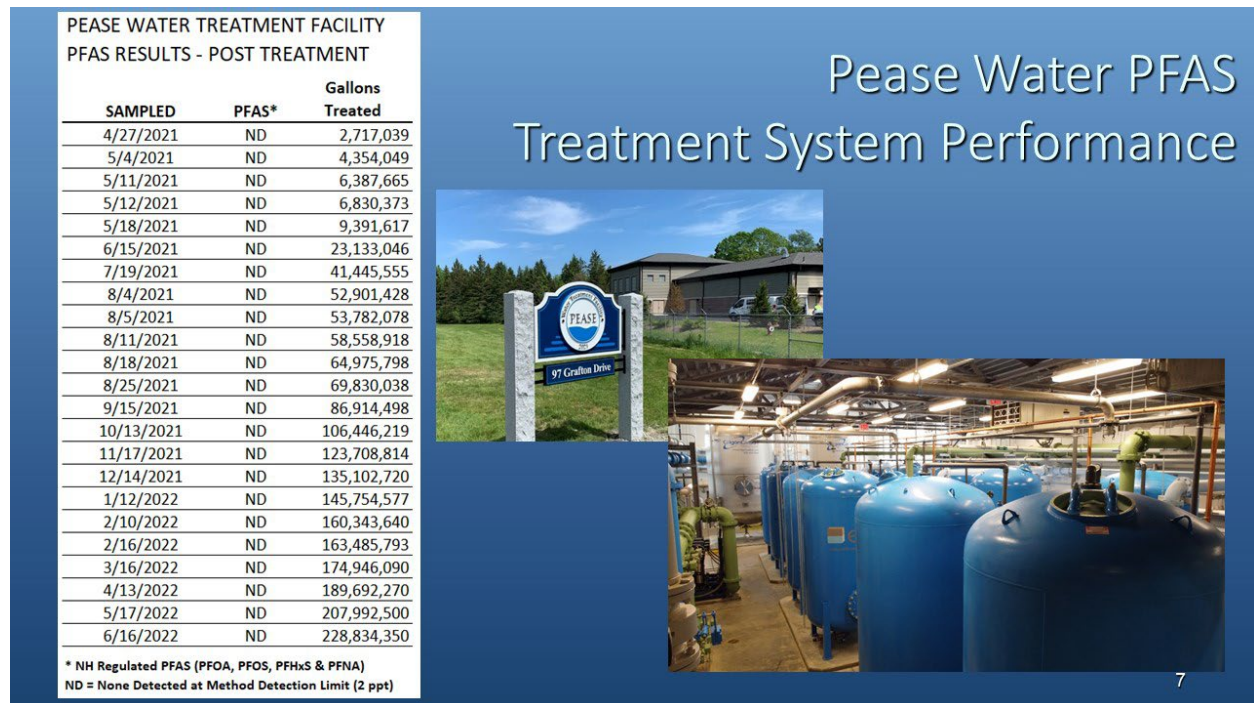
<https://www.cityofportsmouth.com/publicworks/water/drinking-water-quality>

- **PFAS Tracking and Regulations**

Our efforts to track and treat the PFAS contamination at the Pease International Tradeport continue. PFAS stands for a broad group of perfluoroalkyl and polyfluoroalkyl substances, produced and found in many commercial products and also used in firefighting foam. Per- and polyfluoroalkyl substances (PFAS) are currently unregulated by the Safe Drinking Water Act. On June 15, 2022, the United States Environmental Protection Agency (EPA) issued an Interim Health Advisories for perfluorooctane-sulfonic acid (PFOS) and perfluorooctanoic acid (PFOA) and Final Health Advisories (HA's) for perfluorobutane sulfonic acid and its salt (PFBS), and hexafluoropropylene oxide (HFPO). Prior to the issuance of these Interim HA's, the EPA's HA concentration in drinking water for PFOS and PFOA, as established in 2016, were 70 parts per trillion (ppt) each. The new Interim HA's for PFOS and PFOA are 0.02 and 0.004 ppt; respectively. Health Advisories are not regulatory standards. According to the EPA, "*HA values/levels identify the concentration of a contaminant in drinking water at which adverse health effects and/or aesthetic effects are not anticipated to occur over specific exposure durations (e.g., 1 day, 10 days, a lifetime). ... HA's are not to be construed as legally enforceable federal standards and are subject to change as new information becomes available*" (<https://www.epa.gov/sdwa/drinking-water-health-advisories-has>).

The source of the PFAS at the Tradeport was aqueous film-forming foam that had been used to extinguish fires and in training exercises at the former Air Force Base. Since 2014, the Harrison Well and Smith Well on the Pease Tradeport water system, and Portsmouth Well #1 and Collins Well in the Portsmouth water system, have been routinely monitored for PFAS by the Air Force.

Activated carbon filters treated the Harrison and Smith wells at Pease from 2016 to 2021 while an entirely new treatment facility was constructed to treat those two wells together with the reactivation of the Haven well. The new treatment facility went into full operation in August 2021 and utilizes anionic exchange resin media as well as granular activated carbon to remove PFAS. The PFAS removal process is monitored through a monthly sampling program and at this time, the facility is performing as anticipated. After over 230 million gallons treated through the facility, none of the regulated PFAS have been detected breaking through the first treatment vessels in any of the paired treatment trains. PFAS tracking of the other Portsmouth surface and groundwater drinking sources continues on a quarterly basis and all data is posted on the city’s website.



The State of New Hampshire promulgated maximum contaminant level (MCL) regulations for four compounds in 2019 – PFOA, PFOS, PFHxS and PFNA. The City has been sampling quarterly according to these regulations and periodically posts that data on the City’s website at: www.cityofportsmouth.com/publicworks/water. The following graphic provides a summary of the rolling average of the quarterly sampling of the Portsmouth water supply sources:

PFAS Average – 12 Month Rolling New Hampshire Regulated Compounds - All Sources In Compliance (July 2021 – June 2022)

	Parts Per Trillion (PPT)	NH MCL	RAW*	MADBURY WTP FINISHED	MADBURY WELL 2	MADBURY WELL 3	MADBURY WELL 4	PORTSMOUTH WELL	COLLINS WELL	GREENLAND WELL	PEASE WTP
PFHxS	ng/L	18	0	0	0	0	0	8	2	1	0
PFOS	ng/L	15	0	0	0	0	0	5	3	4	0
PFOA	ng/L	12	2	2	4	3	0	7	4	4	0
PFNA	ng/L	11	0	0	0	0	0	0	0	0	0

8

The City of Portsmouth and Pease drinking water systems have been tracking this issue since the contamination of the Haven well from PFAS was discovered in May 2014. The City of Portsmouth has followed NHDES guidance for the past eight years and continues to comply with all standards regulating levels of PFAS in the City of Portsmouth water systems. Monitoring and tracking these health advisory levels will continue and the water systems will explore options to appropriately respond. Additional information can be found on the water section of the City’s website.

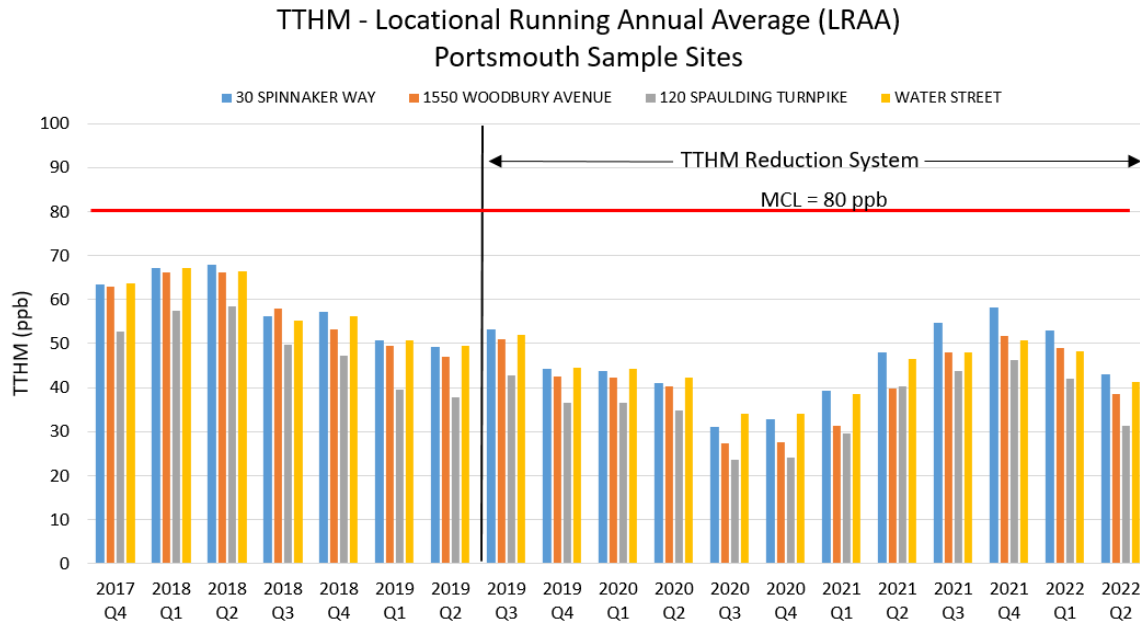
- **Total Trihalomethanes (TTHMs)**

Total Trihalomethanes (TTHMs) are disinfection byproducts (DBPs) which are created when chlorine, which is used for a disinfectant in the Portsmouth and Pease Water Systems, reacts with natural organic matter in the water. On average, the Water Treatment Facility in Madbury removes about 71% of the total organic carbon (TOC) through the treatment process. The EPA Disinfectants and Disinfection Byproducts Rules (Stage 1 and Stage 2) requires TOC removal of 50% for the type of water that is typical from the Bellamy Reservoir. The TOC that remains in the water after treatment reacts with the chlorine and creates DBPs. Historically the TTHM concentration in the Portsmouth Water System has averaged 56 parts per billion (ppb). The maximum contaminant level (MCL) for TTHM as a site-specific annual rolling average is 80 ppb.

A storage tank mixer and aeration system were installed at the Newington Booster Pumping Station as part of the upgrade to that facility. These systems became operational in September 2019. These improvements were designed to reduce the concentrations of trihalomethanes in the water distribution system. The average TTHM in the distribution system since this system has

been in operation is 37 ppb. The April 2022 TTHM average concentration was 28 ppb, which is lower than the average for this time of year of 45 ppb.

Pease and Portsmouth Water Systems are currently in compliance with regulatory standards for these compounds and we will continue to sample quarterly in both water systems as required.



- Lead Sampling**

During the second quarter of 2022 (April-June), 42 samples were collected throughout the Pease Tradeport Water System for the analysis of lead and copper. Of these samples, 37 samples had no detected lead above the method limit of 1 parts per billion (ppb). The five samples that had detected levels of lead, had concentrations of 1 or 2 ppb. This is considerable less than the lead action level of 15 ppb. The Pease Tradeport will be sampled again during quarter 3 (July-September) 2023.

The Portsmouth Water System lead and copper annual compliance sampling period is during the third quarter of the year. Customers in the Portsmouth system are currently being contacted to assist with this year’s sample collection. The age of the house and type of service line material are considered when selecting sites for this sampling program. Customers that live in homes that were built prior to 1986 and have not replaced the plumbing, and houses that have galvanized or lead service lines are the focus of this program.

Lead is not present in the water when it leaves our treatment and well facilities, or in the water mains that run below the streets. However, lead can be present in old service line connections that tie homes to the water system or plumbing inside homes and businesses. Due to the age of many homes in Portsmouth and surrounding towns, and the associated potential for leaded


plumbing components, we encourage customers to have their water tested by a certified laboratory, especially if there are children under six or pregnant women in the household. We actively adjust the water chemistry at the treatment facility and well facilities according to our Corrosion Control Program, to reduce the potential for lead in households to dissolve into the water and end up at the tap. But if lead is present in your plumbing system, and is in contact with water, some risk remains. Information about our Corrosion Control Program can be accessed online: cityofportsmouth.com/publicworks/water.

- **Safe Water Advisory Group (SWAG)**

The Safe Water Advisory Group was created with the approval of City Council on October 5, 2020. Its mission is to review and communicate the latest science on the health and environmental effects of drinking water contaminants (with a heavy focus on PFAS), to monitor federal and state level legislative changes, and to anticipate policy changes that could impact the city of Portsmouth.


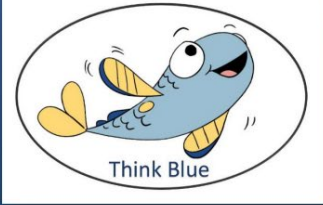
The SWAG met five times in 2021 and discussed topics including PFAS regulations, extent, treatment, and testing programs; legislative items associated with drinking water, private well studies, climate change, and community organizing. The group also toured the Portsmouth Surface Water Treatment Facility in Madbury. Video recordings SWAG meetings are posted on the City's YouTube channel.

The 2022 Portsmouth City Council voted to reinstate the SWAG for another year. The public is invited to attend meetings and encouraged to be involved with the community and informed of all aspects of the City's water supply.



The poster features a dark blue rounded rectangle on the left containing the text: "Community Water Forum", "Tuesday May 3, 2022", and "Portsmouth City Hall". To the right is a photograph of water being poured from a glass pitcher into a glass.

Safe Water Advisory Group
City of Portsmouth



The "Think Blue" logo shows a cartoon blue fish with yellow fins and a smiling face, with the text "Think Blue" below it. The City of Portsmouth seal is circular with a gold border, featuring a red building, a ship, and the text "CITY OF PORTSMOUTH, NH", "INCORPORATED 1842", and "SETTLED 1678".

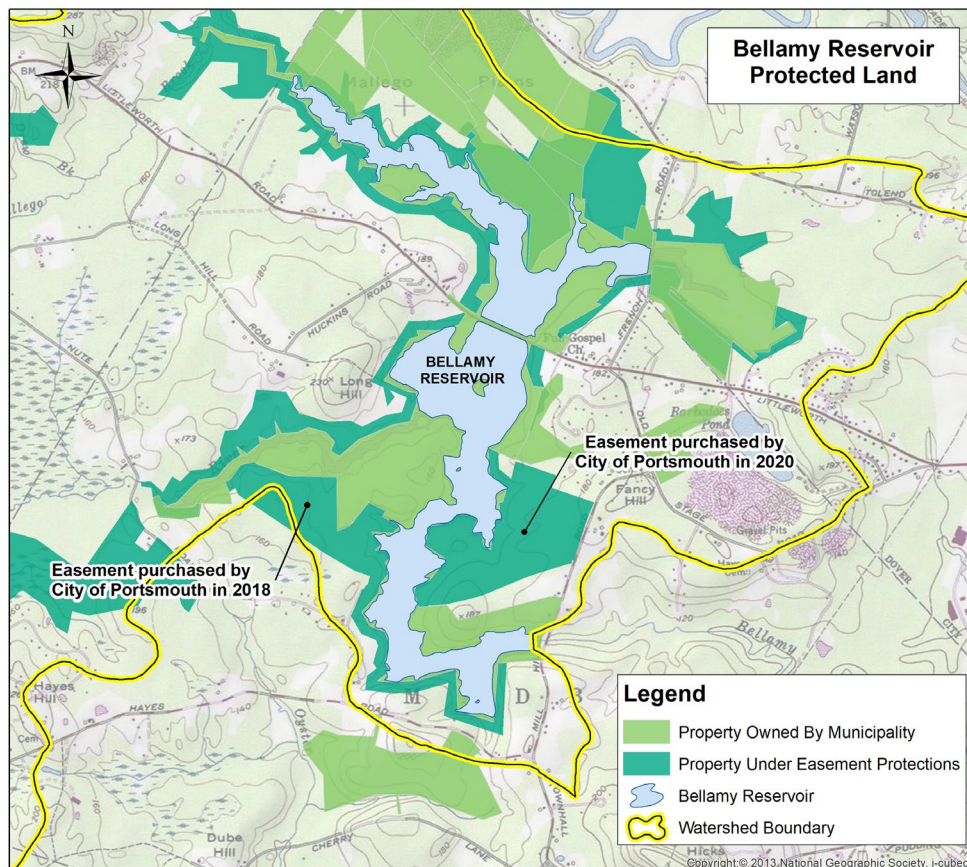
A Water Forum was held during National Drinking Water week on May, 3rd 2022 at City Hall. Overviews, presentations and videos of the water system components, sources of supply and water quality were given to those in attendance and also virtual participants. Information from the meeting can be accessed on the city's website at:

<https://www.cityofportsmouth.com/publicworks/water/reference-documents>

Source Water Protection

- **Bellamy Reservoir**

The City continues to work with the communities of Madbury and Dover to monitor and track the land within the Bellamy Reservoir watershed. The City of Portsmouth's water division either owns or has easements around the entire reservoir. This provides a protective water quality buffer for the surface water that is piped to and treated at the Madbury Water Treatment Facility. In addition to these buffers, the water division, in cooperation with the Town of Madbury and the New Hampshire Department of Environmental Services, has historically restricted activities in and around the reservoir. The following activities are not permitted; swimming, motor boats and campfires. Kayaks, canoes and other non-motorized boats are permitted on the reservoir.



The City has acquired conservation easements in 2018 and 2020 of properties that abut the Bellamy Reservoir. Easements on these parcels, totaling 179 acres, were obtained through the combined efforts of the City, Southeast Land Trust and the Town of Madbury to coordinate due diligence activities and prepare the easement documents. The City received approximately \$487,000 in grant funds for these easements from the New Hampshire Groundwater and Drinking Water Trust Fund and approximately \$14,500 from the Great Bay Resource Protection Partnership.

The protection of the Bellamy Reservoir is a high priority for the City of Portsmouth because the Reservoir is the primary water supply for the City. The Bellamy surface water is treated at the City's Water Treatment Facility in Madbury and delivered to regional communities around the seacoast. Conserving land within the watershed and areas that abut the reservoir and surrounding wetlands, rivers, and streams, protect the water quality from the pressures of development and helps the municipal water system provide quality drinking water.

The City of Dover continues to update our water system staff about their efforts to track and remediate their closed landfill, which is in the Bellamy Reservoir watershed. Dover must comply with EPA and DES requirements regarding the level of remediation they need to perform to protect all water sources around their site. We will report any updated information about these efforts as it becomes available.

Water Supply Infrastructure Projects

- **Madbury Wells Upgrade Project**

The replacement well for the failing Well 4 in Madbury along with the newly permitted Well 5 are currently being connected to the water distribution system. This involves the construction of new water mains, a water meter and treatment building and all associated controls, metering and pumping equipment. These wells are scheduled to be activated in mid-July.

- **New Water Transmission Main Under Little Bay**

This project is in final design and awaiting agreements from abutting land owners. Recent work has included an assessment of accessing the construction site through the city's existing easement through the Town of Durham's Wagon Hill Farm property. Meetings have taken place between the City staff and town officials to gather the necessary information needed to update the permit application and construction design to accommodate this change. After design is completed, the project can go through the final permitting through the NHDES which includes a public hearing. The project is currently scheduled to go out to bid in 2023, with construction to occur during the winter (December – April) 2023/2024 which will minimize impacts to the tidal ecosystem and fisheries.

- **Collins Well #2**

After investigating the geology in the area of the existing Collins Well through the drilling and construction of test wells, a hydrogeologically favorable location was identified for the construction of a new well, Collins Well #2. This well is intended to provide mechanical redundancy to the existing source as well as allow the water yield capacity to be recovered to the 450 gallons per minute that was originally available from the Collins Well. Over time the withdrawal rate from the Collins Well has declined and routine cleaning of the well screen and redevelopment of the gravel pack has resulted in only moderate recovery of the well yield.

Collins Well 2 has been drilled and constructed, and the City’s consultant, Emery & Garrett Groundwater Investigations (EGGI) is preparing a pumping test plan that will be submitted to the NH Department of Environmental Services to begin the well permitting process. An extensive network of monitoring wells will be used to assess the effect of pumping Collins Well #2.



- **Dover/Portsmouth Water System Interconnection**

Design of a water system emergency interconnection between the Portsmouth and Dover drinking water systems will commence soon. This interconnection is intended to be installed over the soon to be constructed bicycle/pedestrian bridge adjacent to the Spaulding Turnpike. Funding from the State’s Drinking Water and Groundwater Trust for this work was requested by the two communities and \$223,000 was granted for this effort. Design of the bridge and pipeline is anticipated to take a little over a year. Bidding for the project is scheduled for the summer of 2023 with construction to take approximately two years to complete. The two communities continue efforts to secure additional funding the pay for the waterline portion of the project, which ultimately would lead to the interconnection of four water systems north of the bridge and eight systems south of the bridge, all the way to the Massachusetts border.

Further Updates and Information

This information will be distributed electronically on the City of Portsmouth's website in the Department of Public Works > Operations > Water section. If anyone needs additional information or has questions contact Al Pratt, Water Supply Operations Manager at 520-0622 or Brian Goetz, Deputy Director of Public Works at 766-1420.