
City of Portsmouth

Department of Public Works

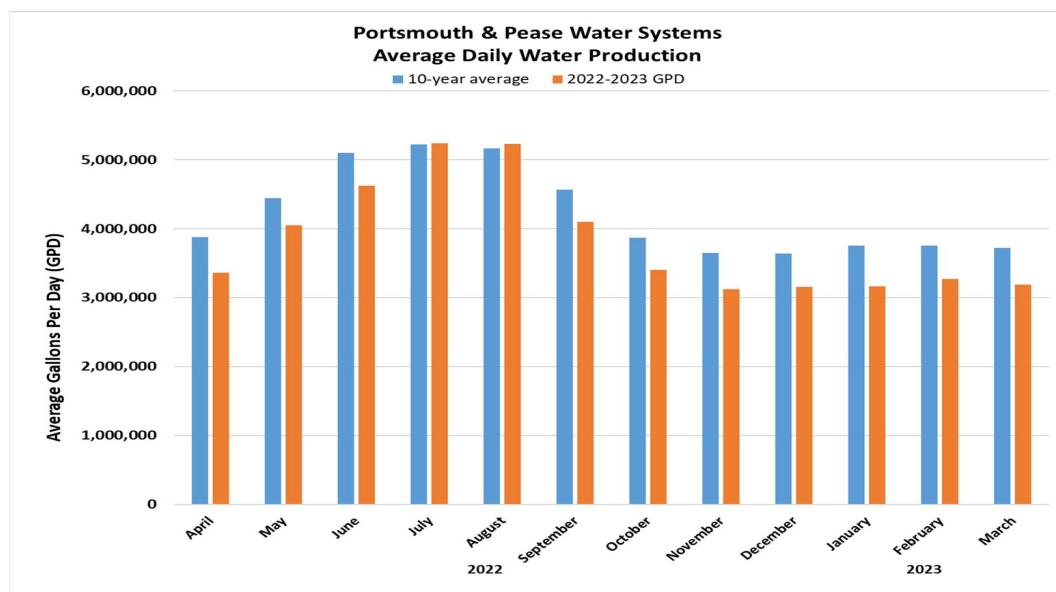


Portsmouth and Pease International Tradeport Drinking Water Status Report 2023 – First Quarter – January to March

Highlights of 2023 – First Quarter

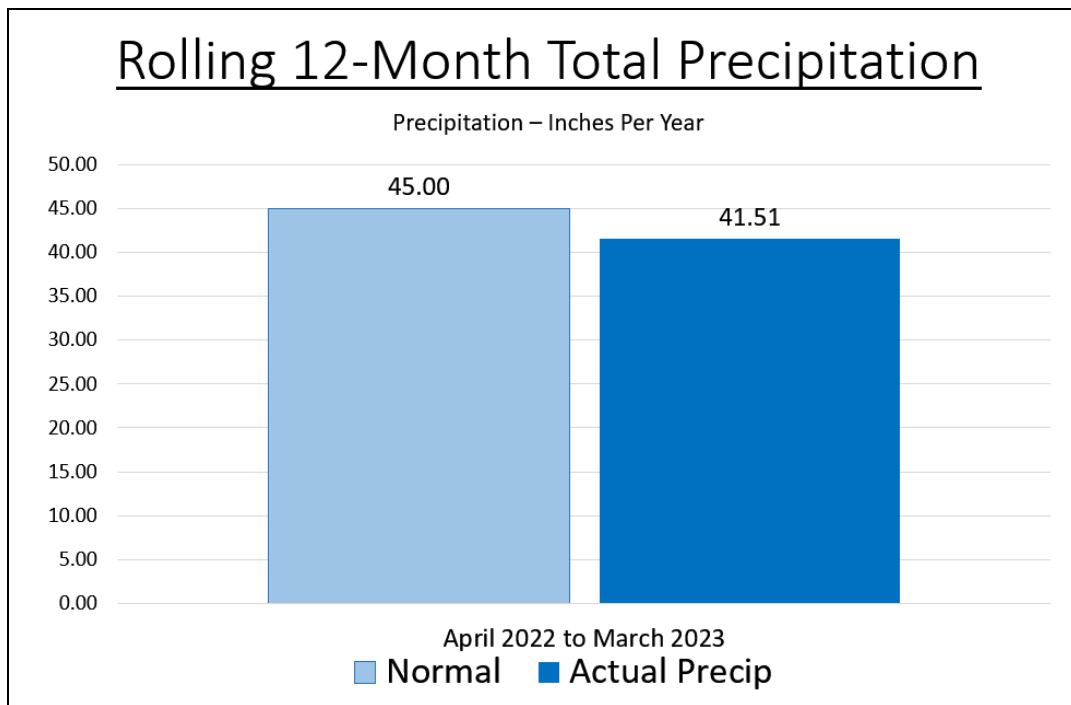
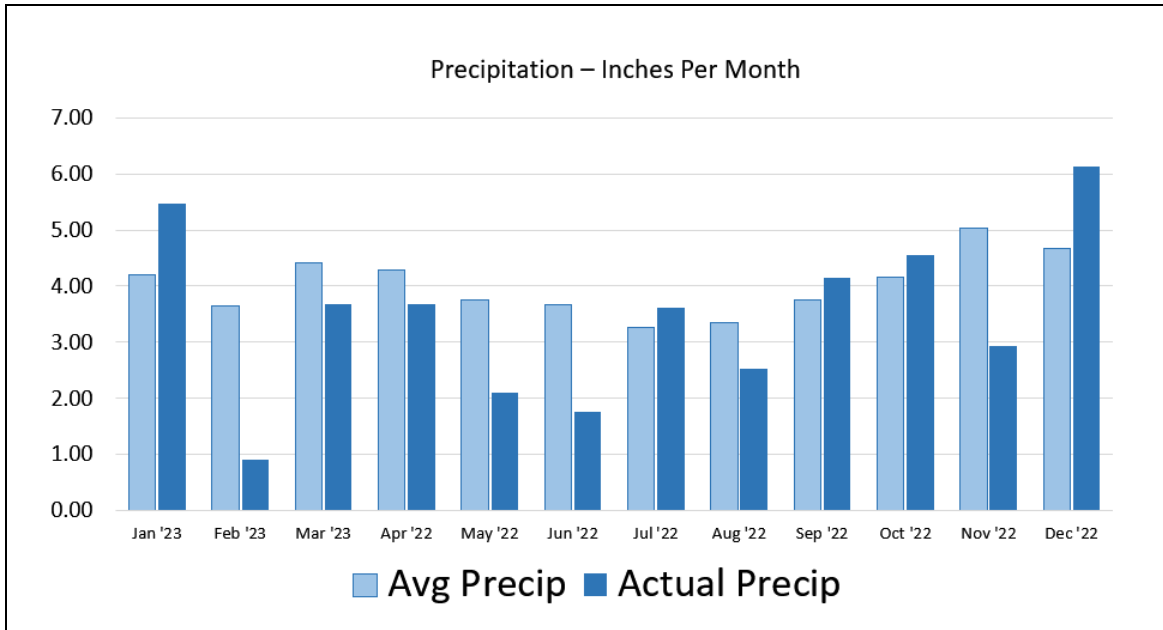
The following report provides a summary of the water system operations for the Portsmouth and Pease International Tradeport drinking water systems. Highlights from this period for both water systems include:

- The Portsmouth and Pease drinking water systems had no drinking water quality violations in this quarter.
- Water Production:
 - Were just over 3.2 million gallons per day combined, which is below the 10 year historic average as shown in the graph below
- January precipitation was above average while February and March were below average.



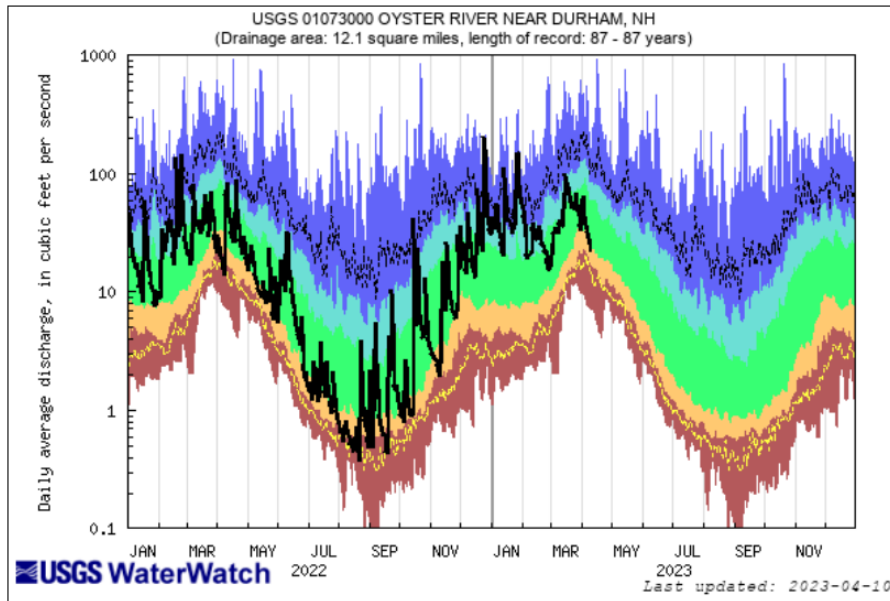
Precipitation and Weather

The overall water supply conditions for the Portsmouth and Pease water systems are doing well. The following graphics show the monthly precipitation as recorded at the Pease NOAA weather station and the cumulative precipitation over the last twelve months.

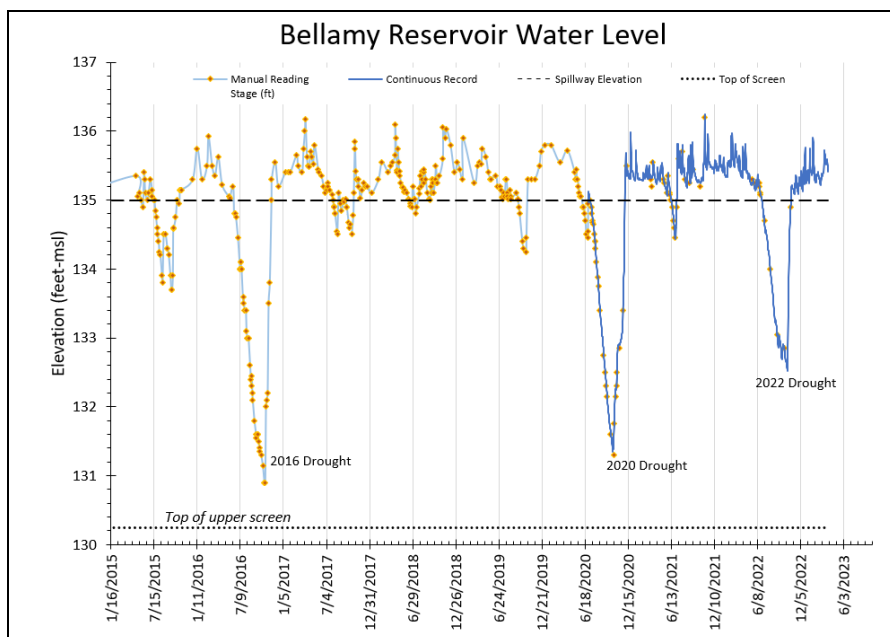


River Flows and Reservoir Levels

The following graphic shows the flow trend, according to the gauged Oyster River, which we use to assess the flow into the Bellamy Reservoir, for 2022. Low flow conditions started in late June and continues until December, when the watershed experienced over six inches of precipitation. Currently conditions have been normal but are now trending toward below normal in April 2023.



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

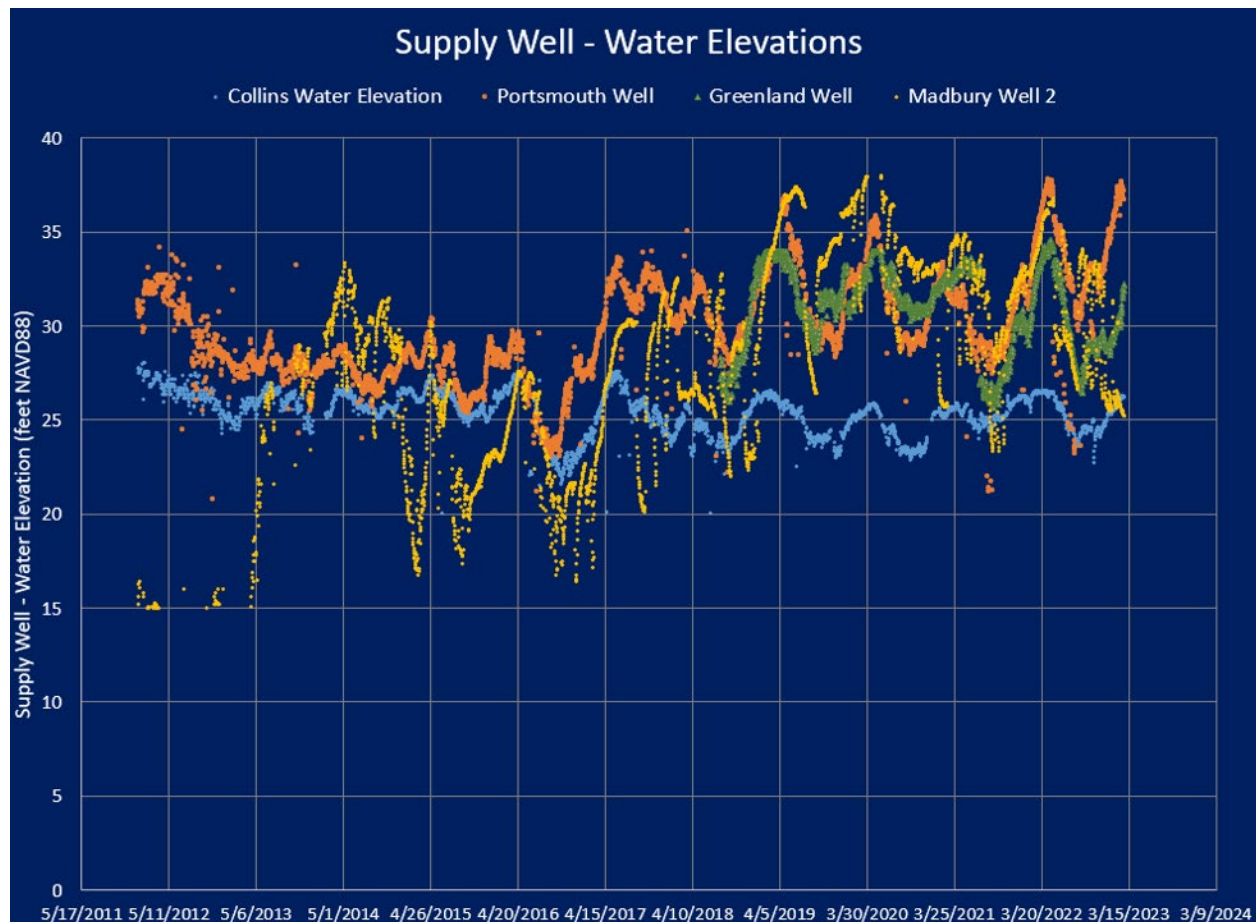


The reservoir trend also tracked similar to the weather, with low flow conditions occurring until June 2022, when the river recovered from the previous dry weather. The trends also show the extreme drought experienced in 2016 as well as the 2020 drought, which was almost as dry as 2016.

Groundwater Levels and Status

Groundwater levels in most of our water sources are much better than normal. In fact, some of the well levels are higher than they have been in years. This can be somewhat attributed to the way we received precipitation, 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 has allowed well levels to be maintained in a sustainable manner and more water availability for the system to meet peak demand. 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.

The following graphic shows the overall well trend of a number of the water supply sources over time:



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**

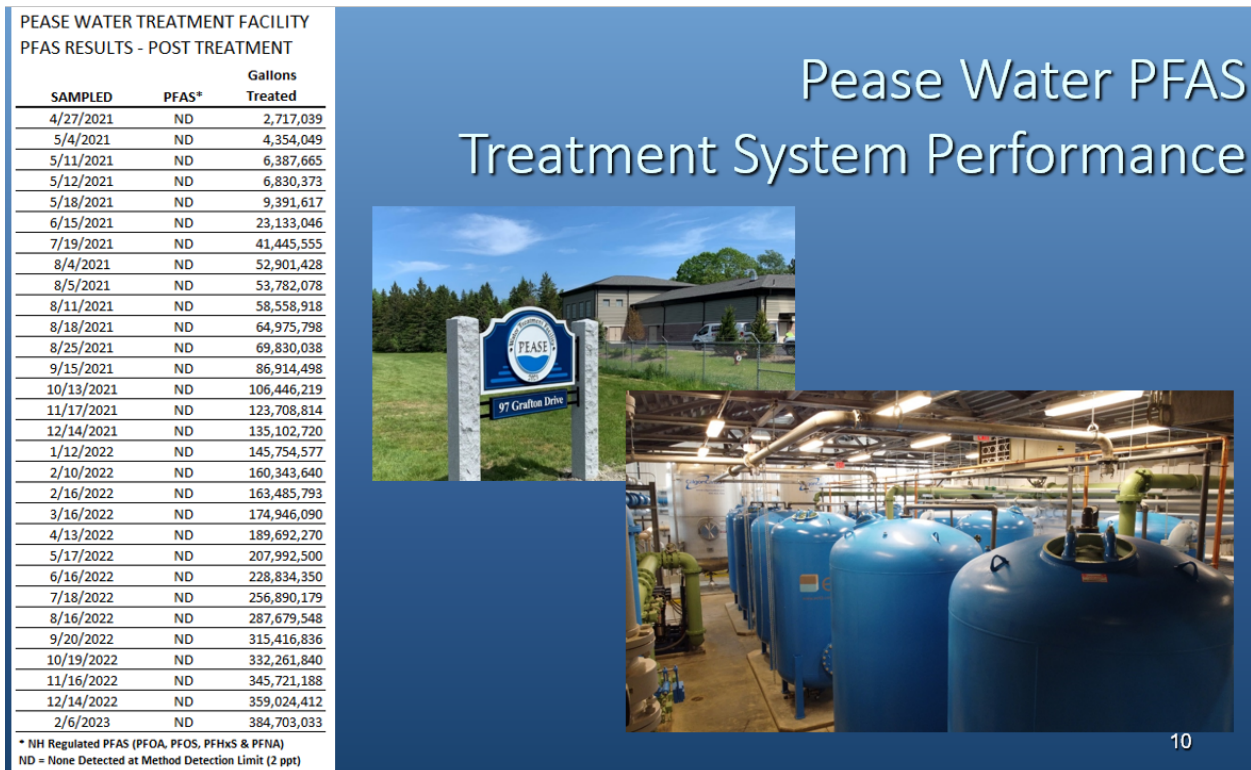
Our efforts to track and treat the PFAS contamination at the Pease International Tradeport continue. PFAS stands for a broad group of perfluoroalkyl and polyfluoroalkyl substances, produced and found in many commercial products and also used in firefighting foam. Per- and polyfluoroalkyl substances (PFAS) are currently unregulated by the Safe Drinking Water Act. However, the EPA Health Advisory concentration standard is 70 parts per trillion (ppt) for perfluorooctane-sulfonic acid (PFOS) and perfluorooctanoic acid (PFOA). In response to the discovery of PFOS in the Haven Well in May 2014 at levels that exceeded the EPA Provisional Health Advisory (200 ppt at that time), the Haven Well was removed from service. With the completion of the new Pease Water Treatment Facility with resin and activated carbon filters, the Haven Well was reactivated in August 2021. 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. 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. On March 14, 2023, the US Environmental Protection Agency (EPA) issued a proposed rule that would limit acceptable levels of Per- and Polyfluoroalkyl Substances (PFAS) in drinking water nationally. This proposed rule will be open for public comment for 60 days. EPA is requesting input on the proposal from all stakeholders, including the public, water system managers, and public health professionals. Comments may be submitted through the public docket, identified by Docket ID

No. EPA-HQ-OW-2022-0114, at www.regulations.gov. For more information on this proposal, please visit EPA’s Per- and Polyfluoroalkyl Substances (PFAS) website. The US EPA currently has unenforceable health advisory levels for four PFAS compounds as described below. This proposed rule does not affect current regulatory requirements for PFAS this time. New Hampshire water suppliers must continue comply with the PFAS maximum contaminant levels (MCLs) established by the NH Department of Environmental Services (DES) in 2019 for four PFAS compounds until they are either changed by the NHDES or the EPA rule goes into effect. In the meantime, water operations staff are working with our consultants to assess what type of treatment and costs might be associated with meeting new regulatory requirements related to PFAS.

Go to City Water Division memo on EPA Proposed PFAS Regulation (Mar 14, 2023) 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 (April 2022-March 2023)

	Parts Per Trillion (PPT)	NH MCL	RAW*	MADBURY WTP FINISHED	MADBURY WELL 2	MADBURY WELL 3	MADBURY WELL 4	MADBURY WELL 5	PORTSMOUTH WELL	COLLINS WELL	GREENLAND WELL	PEASE WTP
PFHxS	ng/L	18	0	0	0	0	0	0	9	2	1	0
PFOS	ng/L	15	0	0	0	0	0	0	5	4	3	0
PFOA	ng/L	12	2	2	4	4	0	4	7	4	4	0
PFNA	ng/L	11	0	0	0	0	0	0	0	0	0	0

- Total Trihalomethanes (TTHMs)**

Total Trihalomethanes (TTHMs) are disinfection byproducts (DBPs) which are created when 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).

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 current 4-quarter rolling TTHM average in the distribution system at the four sampling locations is 32 ppb.

Modifications to the Bellamy Reservoir oxygen management system were performed during the summer of 2022. These included the replacement of the hypolimnetic curtain and the installation of an additional air diffuser platform. Staff will continue to track the effectiveness of these improvements to the water quality.

- **Lead Sampling**

Both of the water systems were sampled for lead in 2022, and they are all in compliance with the requirements for lead concentrations. The results from our lead sampling program in 2022 were below the lead action level of 15 parts-per-billion (ppb) at the 90th percentile value in each of the Portsmouth, and Pease Tradeport water systems. Samples were not required from the New Castle system in 2022. Of the 30 residential samples collected in the Portsmouth system in 2022, 26 had no detected lead, and 4 had less than 5 ppb. In the Pease water system, there were 37 of the 42 samples that had no lead detected, and 5 samples that had less than 5 ppb measured.

Due to the upgrades of the Pease Water Treatment Facility, at least 40 lead and copper samples were required for compliance during the first 6 months of operation. This was double the number of samples typically required for this system. The Pease Tradeport system samples resulted in 37 of the 42 samples having no detected lead, and 5 samples with less than 5 ppb measured. These results are typical of what have been measured over the past 17 years since our corrosion control program has been in effect. This is an annual sampling program, and we will be sampling 40 sites again in the Pease System between July 1 and September 30, 2023 and 60 sites in the Portsmouth System twice throughout 2023.

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](https://www.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 four times in 2022 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 first meeting of 2023 was held on March 7, 2023. The next meeting is scheduled for June 7, 2023. Video recordings SWAG meetings are posted on the City's website and YouTube channel:

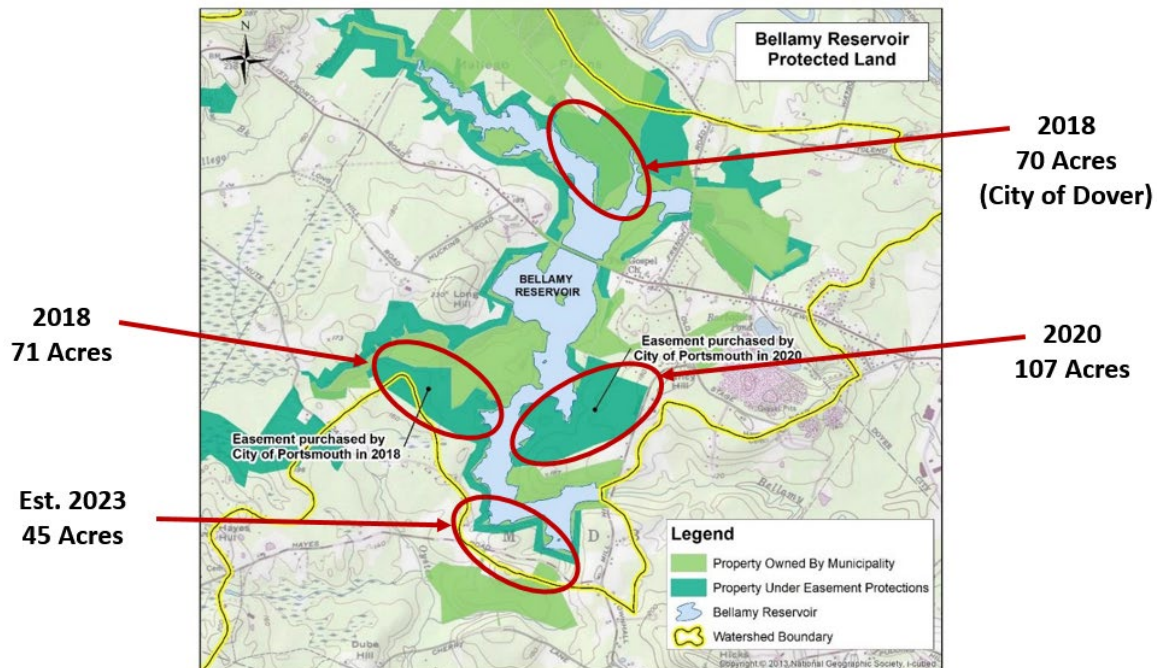
<https://www.cityofportsmouth.com/citycouncil/safe-water-advisory-group>

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.

Portsmouth – Bellamy Reservoir Source Water Protection Efforts



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. We are currently working on acquiring a 45 acre parcel near our surface water intake.

SOURCE WATER PROTECTION LAND AND EASEMENT PURCHASE RECORD														
SOURCE	PARCEL/ PROJECT NAME	DATE PROTECTED	PROTECTION	PORTSMOUTH ROLE	BOOK & PAGE	ACRES	PROXIMITY TO SOURCE	CITY FUNDS	DWGTG	GBRPP	OWNER FUNDS	TOWN FUNDS	TOWN	
Harrison Well	Sherburne Rd Property	5/21/2003	City Property	Owner	4035-2172	4.34	Adjacent to Harrison Well Parcel							
Bellamy Reservoir	Souther Property	3/15/2018	Dover Owned	None	1506-295	69.3	Adjacent to Reservoir	\$0				\$125,000	Dover	
Bellamy Reservoir	Olson Easement	12/18/2018	Conservation Easement	Easement Holder	4624-0179	70.8	Adjacent to Reservoir	\$223,130	\$200,000				Madbury	
Bellamy Reservoir	Haley-Rubinstein-Goodwill	2/21/2020	Conservation Easement	None	4735-874	210	Watershed	\$10,000	?			?	Barrington	
Bellamy Reservoir	Duffy Easement	12/29/2020	Conservation Easement	Easement Holder	4851-456	107	Adjacent to Reservoir	\$271,403	\$283,600	\$11,504	\$1,000	\$0	Madbury	
Greenland Well	Chick Property	11/6/2020	Portsmouth Property	Owner	6191-124	3.11	Within 400 ft SPA of Well	\$220,000					Greenland	
Bellamy Reservoir	Fernald Property		Conservation Easement	Easement Holder		45	Adjacent to Reservoir						Madbury	

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 anticipate a report from Dover’s staff will be presented to the SWAG at an upcoming 2023 meeting.

Water Supply Infrastructure Projects

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

This project is in final design and awaiting agreements from abutting land owners. After negotiations with the abutting land owners are complete, the project can go through the final permitting through the NHDES which includes a public hearing. This project is tentatively set to go out to bid by early summer 2023 so the selected contractor can begin to order the materials for the construction and have them delivered in time for the acceptable construction period. The construction must occur during the winter (December – April) to 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 were 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), conducted a pumping test in October 2022. The results of

this test will be submitted to the NHDES for their evaluation in the permitting process. An extensive network of monitoring wells has been established in the area and will be used to assess the effect of the Collins Wells on the aquifer.



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.