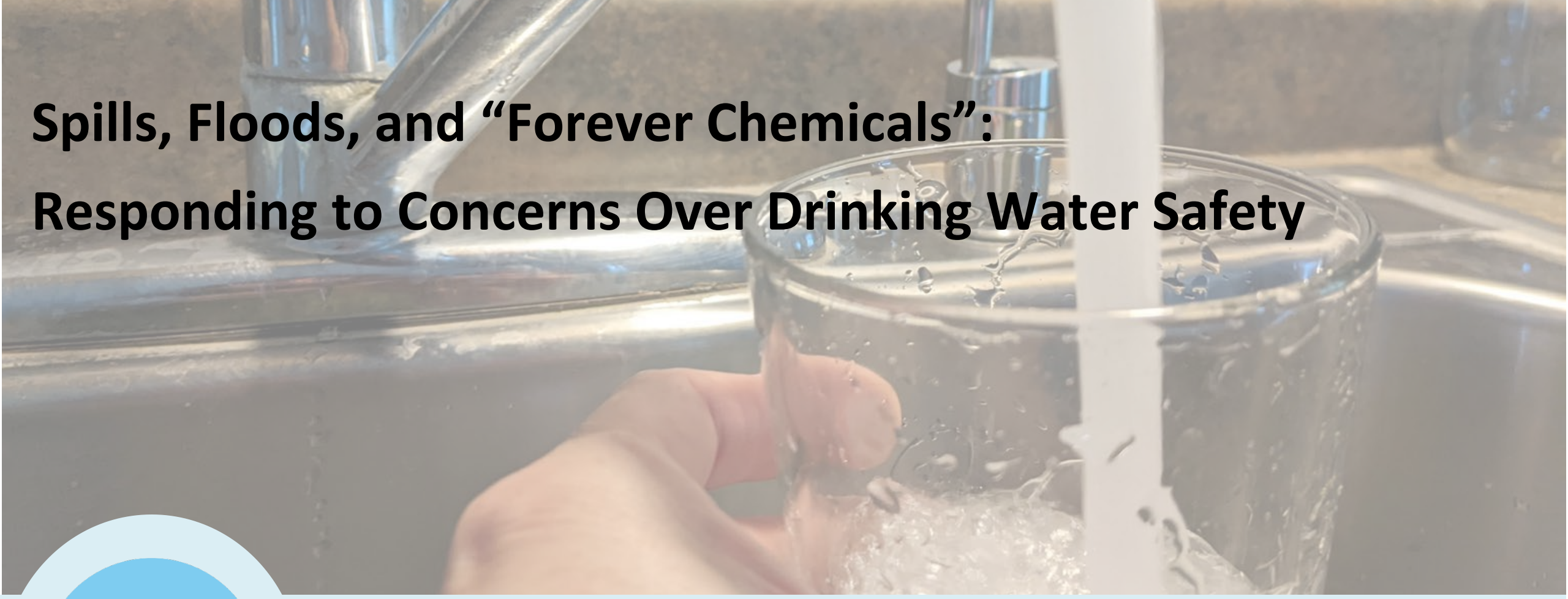


Spills, Floods, and "Forever Chemicals": Responding to Concerns Over Drinking Water Safety

Raritan Headwaters

Watershed Tools for Local Leaders

September 27, 2022

What Does Raritan Headwaters Do?

Science

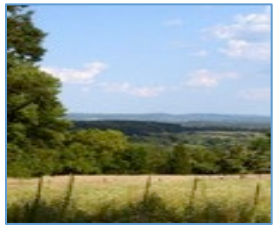
We monitor the health of surface water and groundwater, plants, and animals in the region to identify trends, discover problem areas, and measure the success of our programs.

Education

We craft education programs about water, wildlife conservation, and responsible stewardship practices for children of all ages, teachers, municipalities, home/landowners, and visitors.

Advocacy

As The Watershed Watchdog, we identify key water-related issues at all levels of government. We educate politicians to ensure they understand the environmental ramifications of the decisions before them. We also alert our membership to actions they can take to protect their water and environment.



Preservation & Stewardship

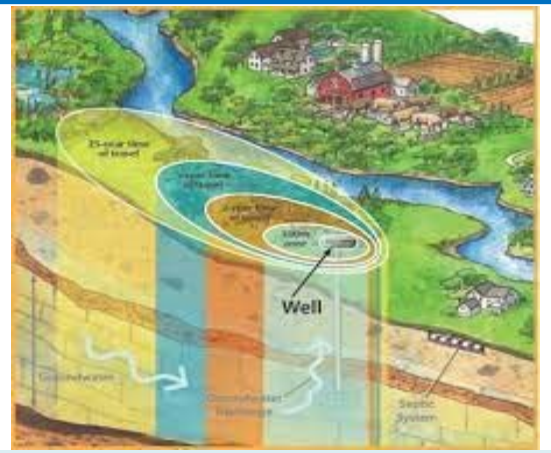
Our cleanup program engages hundreds of volunteers to remove tons of trash every year from our streams. We help preserve land with our partners. We manage our preserved lands using nationally recognized best management practices. Accredited through the Land Trust Alliance 2018.

North Branch: Headquarters
Fairview Farm Wildlife Preserve
- 2121 Larger Cross Road, Bedminster

South Branch: Well Testing Program
- 124 Main Street, Flemington

www.raritanheadwaters.org

Raritan Headwaters



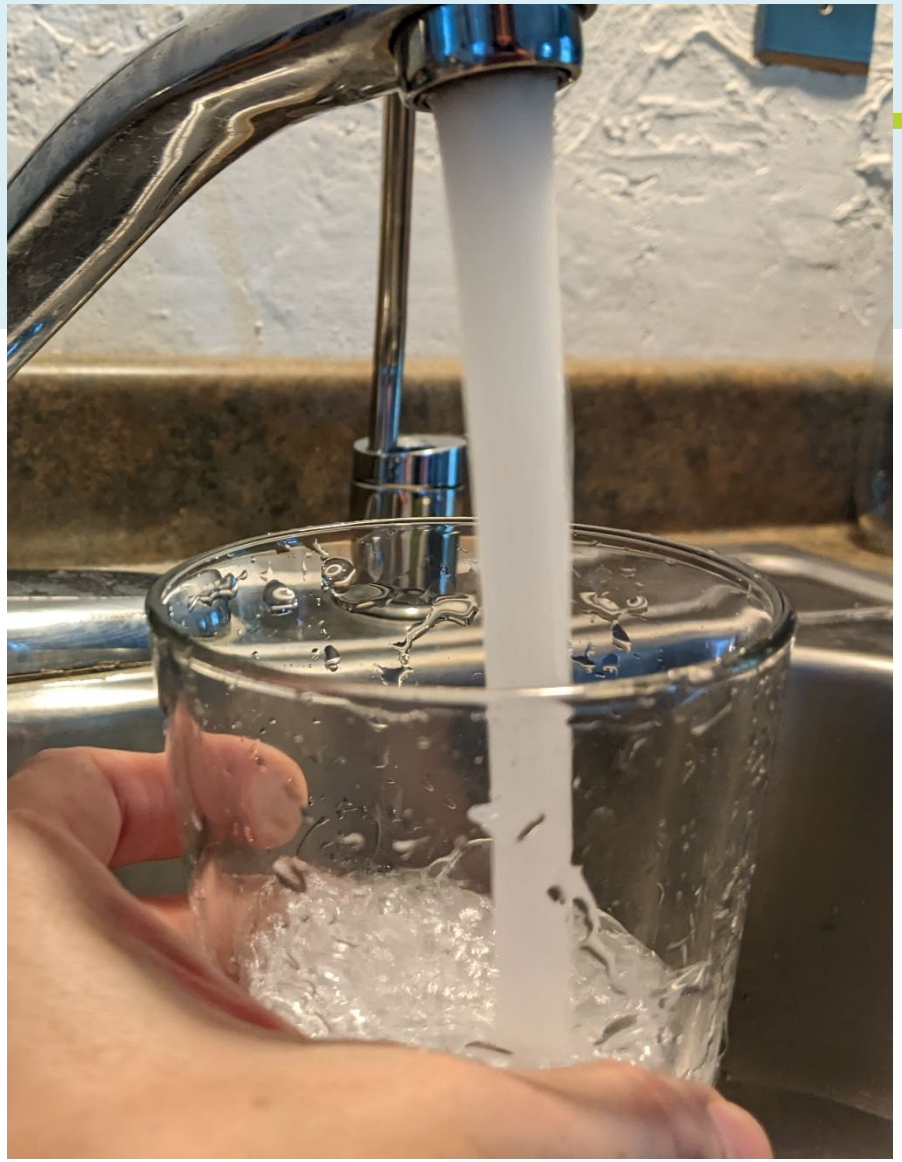
Watershed Tools for Local Leaders

www.raritanheadwaters.org/tag/watershed-tools-for-local-leaders/

- Share and apply key science, planning, and regulatory tools
- Partner on projects to identify, protect, and restore water resources

- Stormwater and Green Infrastructure
- Septic Maintenance
- Wetland Protection
- Wellhead Protection Areas
- Land Preservation
- Riparian Buffer Protection and Restoration
- Road Salt Reduction

Raritan Headwaters



Agenda

- Water Supply Basics
- Overview of drinking water regulations/testing requirements
- Public Water vs Private Wells
- Flooding and Drought Impacts on Water Quality
- PFAS
- Municipal resources- data and maps, funding for water utilities, who to contact for assistance
- NJDEP Spill Fund, Potable Loan Program, Revolving Fund
- Q&A

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Naturally occurring contaminants:

- **Arsenic**
- **Radionuclides (uranium, radium, radon)**
- **Secondary contaminants (iron, manganese, hardness)**

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Safe Drinking Water Act

- Drafted in 1974; Amended in 1986 and 1996
- Requires periodic testing by public water utilities for a number of contaminants
- Established Drinking Water Quality Institute (DWQI)
- Sets enforceable national health-based standards for drinking water to protect against both man-made and naturally occurring contaminants
- protection.

- Requires public notification of water system violations and annual water quality reports
- Includes provisions for source water protection

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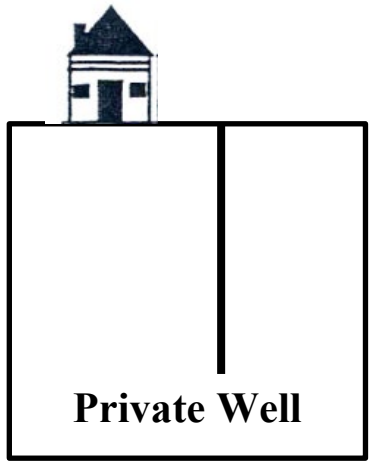
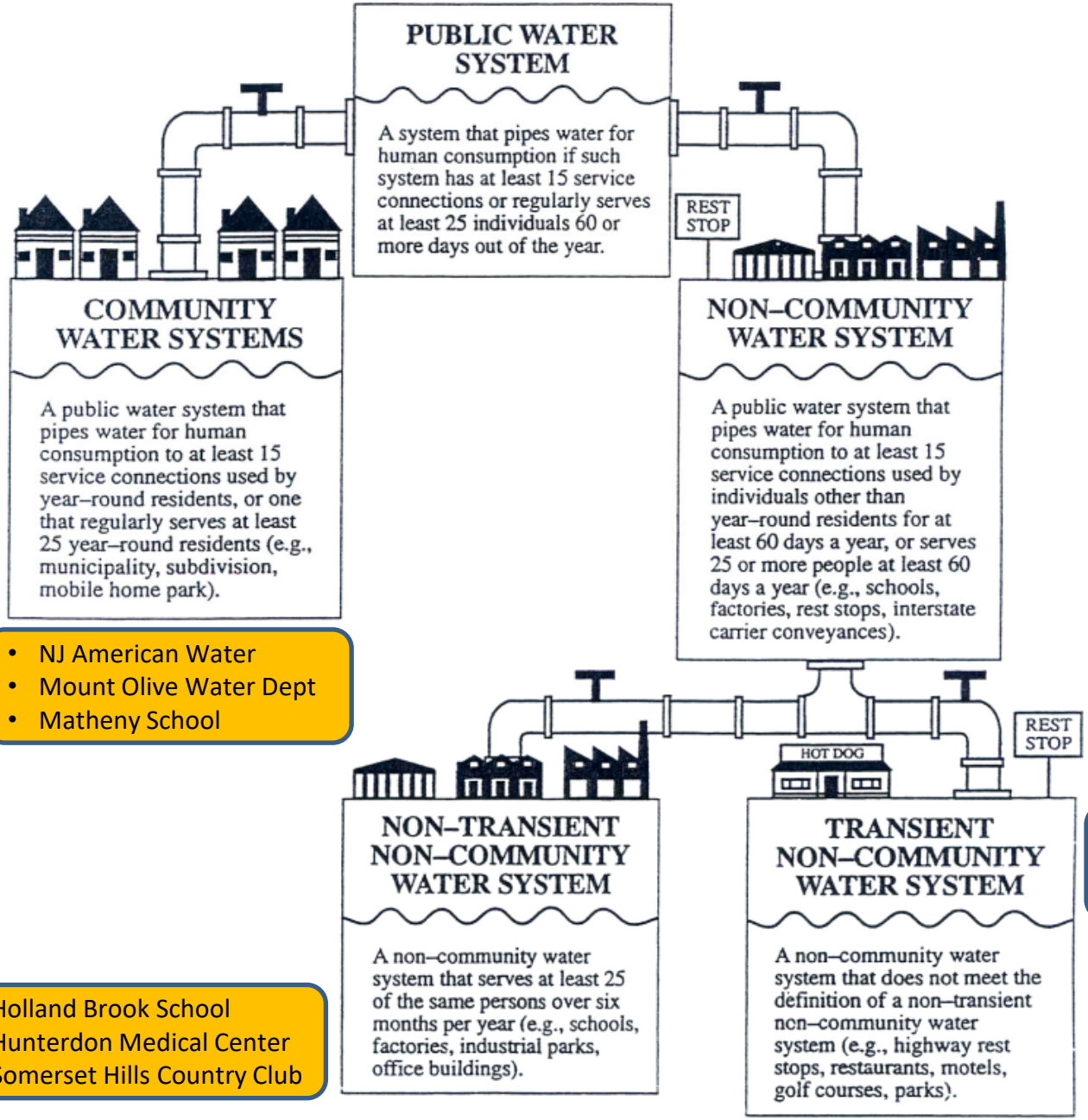
N.J.A.C. 7:10 Safe Drinking Water Act Rules: https://www.nj.gov/dep/rules/rules/njac7_10.pdf

Responsible parties, resources, and requirements for testing and notification differ depending on the type of water supply.





- NJ American Water
- Mount Olive Water Dept
- Matheny School

- Holland Brook School
- Hunterdon Medical Center
- Somerset Hills Country Club

- The Fudge Shop
- Branchburg Library
- Clinton Station Diner

From: Public Notification Handbook for Public Water Systems, USEPA Office of Water, USEPA Publication 570/9–89–002 September 1989

Raritan Headwaters

Emergency Response Plan (ERP)

Responding to emergencies resulting in a major disruption of a public water system's ability to function

- Emergency Response Plan (ERP) is a document that describes the actions a water system will take in the event of an emergency in order to protect public health by maintaining a water supply sufficient for potable use and fire-fighting.
- The ERP is required pursuant to the Water Allocation rules (N.J.A.C. 7:19-11.2) and the Rules and Regulations Governing the Licensing of Water Supply and Wastewater Treatment System Operators (N.J.A.C. 7:10A-1.12).
- **Larger water suppliers** (i.e. serving more than 3,000 residents) are required to develop and submit (and periodically update thereafter) an ERP.
- NJDEP has developed a detailed ERP template (See https://www.state.nj.us/dep/watersupply/doc/erp-template.docx) to ensure that suppliers comply with the requirement to regularly update and revise its ERP.

Emergency events that should be addressed by an ERP:

- Floods, earthquakes and other natural disasters
- Power outages
- Pollutant releases
- Failure of the distribution system prime water supply source and/or treatment facilities
- Job actions (strikes, walk-outs)
- Chemical shortages and/or accidents
- Sabotage, terrorism and explosions
- Cybersecurity incidents.

- NOT for events that result from normal operational disorders such as a minor water main break

Private Wells in New Jersey

- NJ Population: 8.9 million (2015 est.)
  - 13% of the population (1,150,000 people) have private wells for their drinking water supply.
- An estimated 400,000 private (domestic) wells in New Jersey.
- 80% of the residents in the Upper Raritan watershed rely on well water.
- No federal regulations cover private wells.
- Before 2002: state regulations applied only to newly-constructed wells.
- Private Well Testing Act mandates testing of well when home is sold.

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Private Well Testing Act (PWTA) Testing

Website: www.nj.gov/dep/pwta.

- ***Total coliform bacteria (and E.coli if Total Coliform test is positive), Nitrate, Lead, Arsenic, all volatile organic compounds (VOC's) with established Maximum Contaminant Levels (MCLs), Gross Alpha particle activity and uranium, Iron, Manganese, pH***

- **3 synthetic organic compounds (SOCs): 1,2,3-trichloropropane, ethylene dibromide, and 1,2-dibromo-3-chloropropane**

- **As of December 1, 2021 PWTA requires testing for 3 per-and polyfluoroalkyl substances: Perfluorononanoic acid (PFNA), perfluorooctanoic acid (PFOA), and Perfluorooctanesulfonic acid (PFOS).**

- **All test results are valid for 1 Year (except coliform which is valid for 6 months).**

- **Lab results reported to NJ DEP Bureau of Safe Drinking Water. Whenever a contaminant is found to exceed the drinking water standard, the NJDEP is required to notify the county or local health department who may then (but are not required to) notify affected neighboring homes and businesses without disclosing the particular well location**

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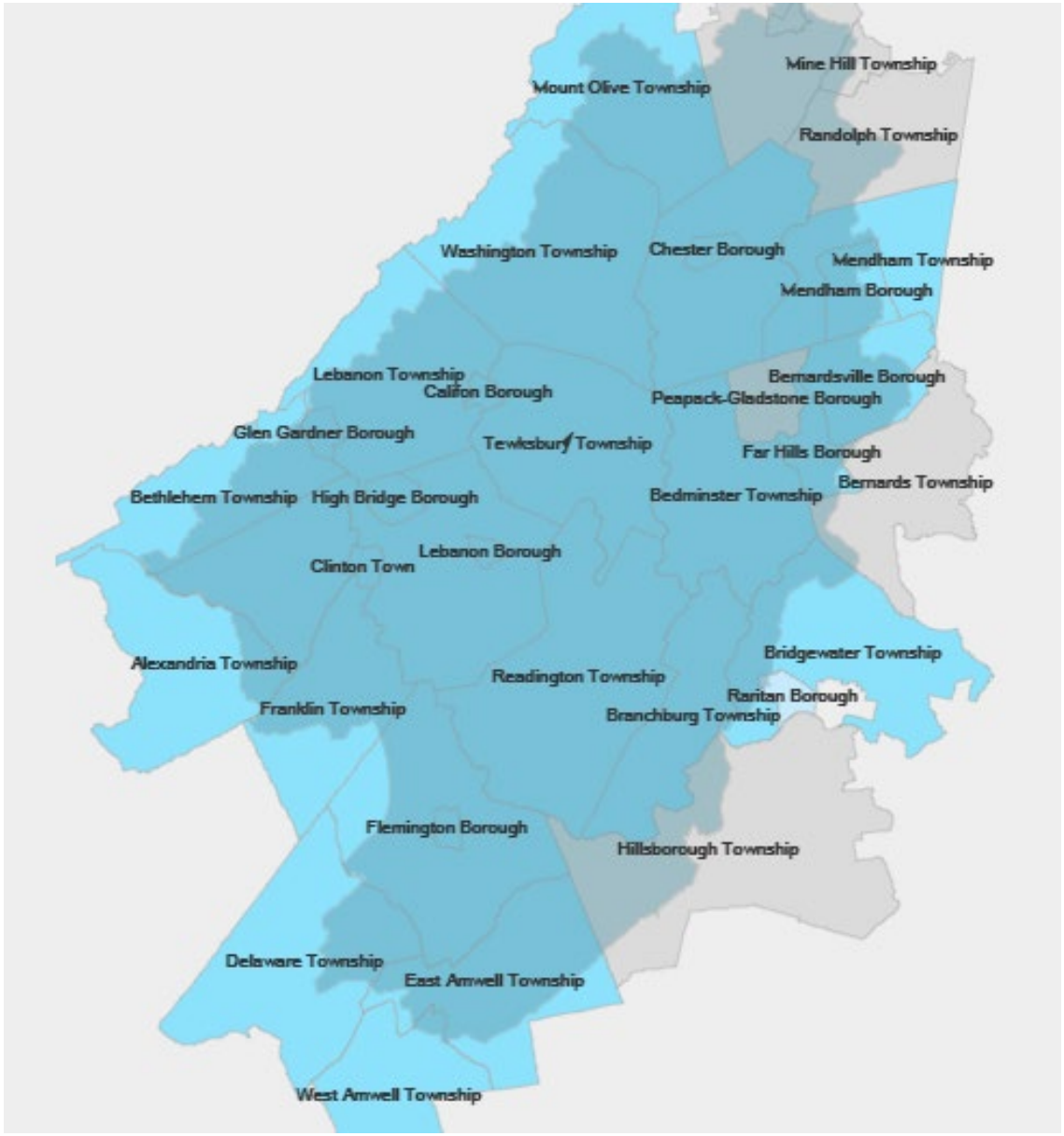
Community Well Testing Throughout the Watershed



~1,500 wells tested annually

- ✓ Established in 1974
- ✓ Over 16,000 records
- ✓ 80% of residents rely on well water

CWT Participating Municipalities

- Alexandria Township
- Bedminster Township
- Bernardsville Borough
- Bethlehem Township
- Branchburg Township
- Bridgewater Township
- Califon Borough
- Chester Township
- Chester Borough
- Clinton Township
- Delaware Township
- East Amwell Township
- Far Hills Borough
- Franklin Township
- Hillsborough Township
- Kingwood Township
- Lawrence Township
- Lebanon Township
- Mendham Township
- Mount Olive Township
- Peapack-Gladstone
- Raritan Township
- Readington Township
- Tewksbury Township
- Union Township
- Washington Township (Morris)
- Watchung Borough

Raritan Headwaters

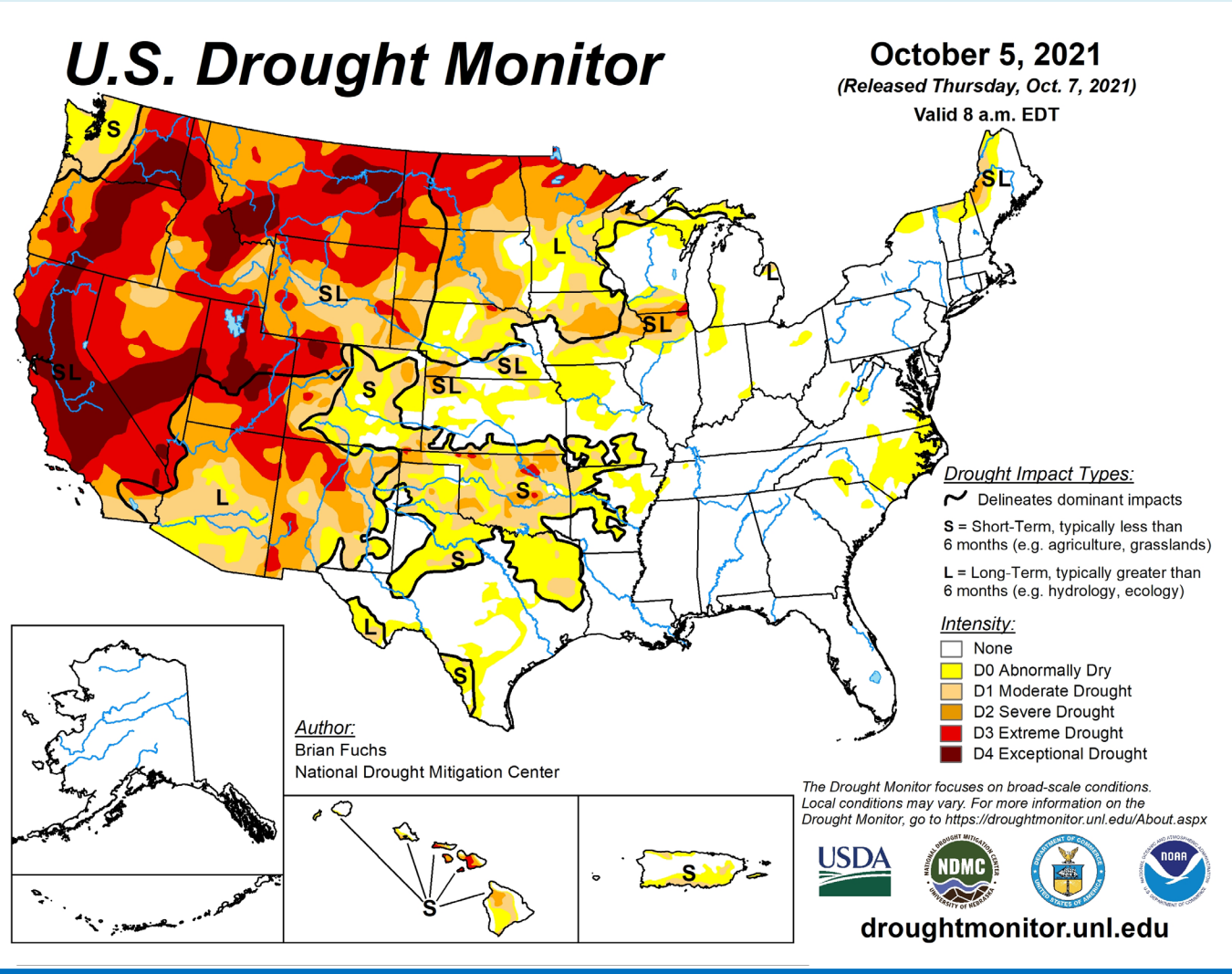
Flooding Impacts to Water Supplies

- Any well water system, whether deep or shallow, can become contaminated with bacteria, sewage, heating oil, agricultural or industrial waste, chemicals, and other substances that can cause serious illness.
- People with private drinking water wells in flooded areas should assume their water is contaminated.
- Municipalities should alert residents to the dangers of drinking contaminated well water and provide information on how to have their water tested by a certified lab.
- RHA Well Testing Program www.testmywell.org
- NJDEP List of Certified Labs www.nj.gov/dep/enforcement/oqa/certlabs.htm

Raritan Headwaters

Drought Impacts to Water Supplies

- Drought reduces the dilution of contaminants in both surface and ground water and boosts pollutant concentration in water supply
- Lower water tables make existing wells more unreliable
- Droughts trigger more intense groundwater pumping and that can put stress on shallow aquifers and pull contamination down into deeper" aquifers
- Potential shift contamination plumes
- Increase in arsenic concentration



According to the USGS, potential sources of lead in homes can include:

- Lead pipe or fittings used in homes built before 1930
- Lead solder used in copper fittings in homes built before the late 1980s
- Lead-free brass components, which, in all states except for California, may have contained up to 8% lead before 2014
- Galvanized steel that contained 0.5% to 1.4% lead

Lead by the numbers

549 HOUSEHOLDS, in 32 municipalities of the Upper Raritan Watershed tested for lead in 2019.

5 PARTS PER BILLION, (ppb) is the maximum amount of lead allowed in bottled water sold in the U.S. The limit for lead in public water supplies is 15 ppb.

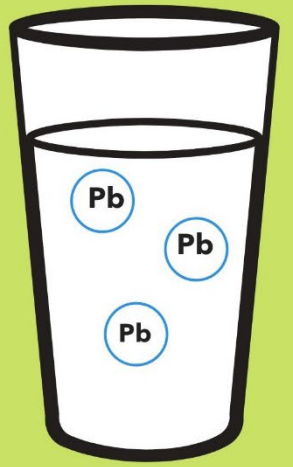
0 PPB, is the goal level for lead in drinking water.There is no known amount of lead exposure that is considered safe.

267 PARTS PER BILLION, was the highest amount of lead detected in a home water supply during the 2019 testing period.

51 PERCENT, of homes tested had some level of lead contamination.

IN THE YEAR, 1986

Safe Drinking Water Act amendments defined "lead-free" plumbing. Lead solder was banned for use in potable water systems nationwide but until 2014, products were still allowed to be sold with up to 8% lead content.



77 SAMPLES, out of 549 had lead levels over 5 ppb.

LEAD IS EASY TO TEST FOR AND EASY TO TREAT.
PROTECT YOUR HEALTH-TEST TODAY WITH RHA.

What are PFAS?

- PFAS stands for “per- and polyfluoroalkyl substances”
- PFAS are a large class of synthetic chemicals with unique chemical & physical properties that make many of them extremely persistent and mobile in the environment
- Used since 1940s in wide range of consumer and industrial applications

Manufacturing

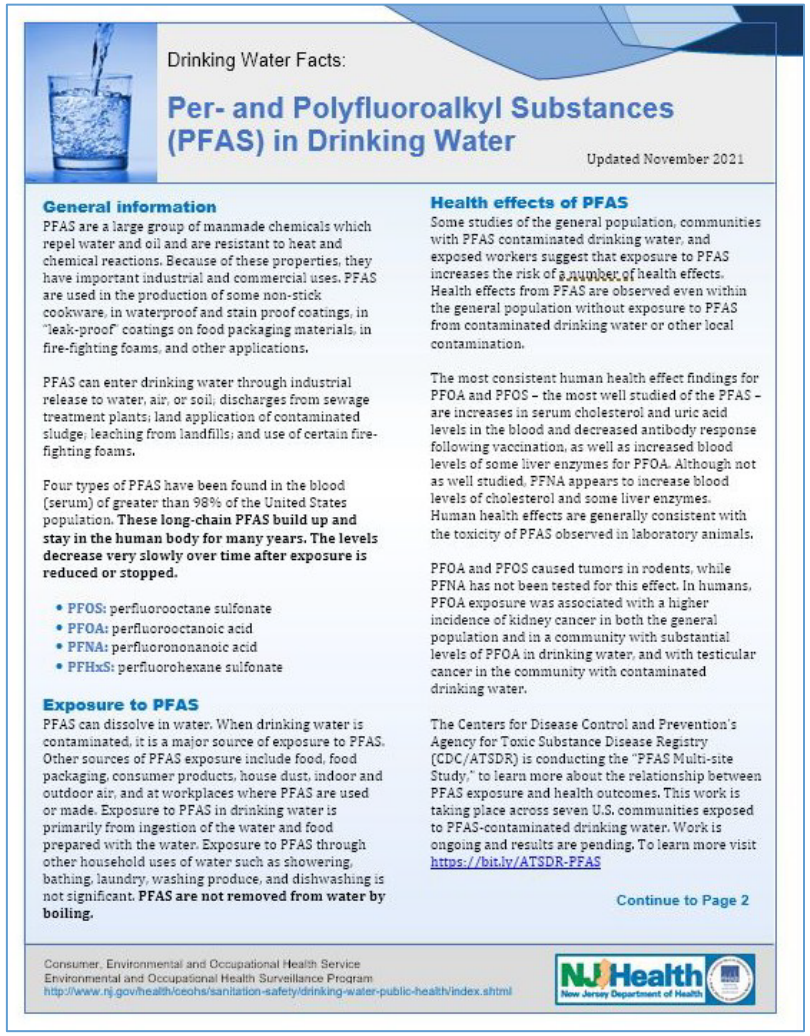
- Aerospace
- Automotive
- Chemical
- Electronics
- Metal Coatings & Plating
- Textiles

Non-industrial

- Waste Disposal Facilities
- Wastewater Treatment Plant Operations
- Biosolids Application for Agriculture

Raritan Headwaters

Health Effects of PFAS



Drinking Water Facts:

Per- and Polyfluoroalkyl Substances (PFAS) in Drinking Water

Updated November 2021

General information

PFAS are a large group of manmade chemicals which repel water and oil and are resistant to heat and chemical reactions. Because of these properties, they have important industrial and commercial uses. PFAS are used in the production of some non-stick cookware, in waterproof and stain proof coatings, in "leak-proof" coatings on food packaging materials, in fire-fighting foams, and other applications.

PFAS can enter drinking water through industrial release to water, air, or soil; discharges from sewage treatment plants; land application of contaminated sludge; leaching from landfills; and use of certain fire-fighting foams.

Four types of PFAS have been found in the blood (serum) of greater than 98% of the United States population. **These long-chain PFAS build up and stay in the human body for many years. The levels decrease very slowly over time after exposure is reduced or stopped.**

- **PFOS:** perfluorooctane sulfonate
- **PFOA:** perfluorooctanoic acid
- **PFNA:** perfluorononanoic acid
- **PFHxS:** perfluorohexane sulfonate

Exposure to PFAS

PFAS can dissolve in water. When drinking water is contaminated, it is a major source of exposure to PFAS. Other sources of PFAS exposure include food, food packaging, consumer products, house dust, indoor and outdoor air, and at workplaces where PFAS are used or made. Exposure to PFAS in drinking water is primarily from ingestion of the water and food prepared with the water. Exposure to PFAS through other household uses of water such as showering, bathing, laundry, washing produce, and dishwashing is not significant. **PFAS are not removed from water by boiling.**

Health effects of PFAS

Some studies of the general population, communities with PFAS contaminated drinking water, and exposed workers suggest that exposure to PFAS increases the risk of a number of health effects. Health effects from PFAS are observed even within the general population without exposure to PFAS from contaminated drinking water or other local contamination.

The most consistent human health effect findings for PFOA and PFOS – the most well studied of the PFAS – are increases in serum cholesterol and uric acid levels in the blood and decreased antibody response following vaccination, as well as increased blood levels of some liver enzymes for PFOA. Although not as well studied, PFNA appears to increase blood levels of cholesterol and some liver enzymes. Human health effects are generally consistent with the toxicity of PFAS observed in laboratory animals.

PFOA and PFOS caused tumors in rodents, while PFNA has not been tested for this effect. In humans, PFOA exposure was associated with a higher incidence of kidney cancer in both the general population and in a community with substantial levels of PFOA in drinking water, and with testicular cancer in the community with contaminated drinking water.

The Centers for Disease Control and Prevention's Agency for Toxic Substance Disease Registry (CDC/ATSDR) is conducting the "PFAS Multi-site Study," to learn more about the relationship between PFAS exposure and health outcomes. This work is taking place across seven U.S. communities exposed to PFAS-contaminated drinking water. Work is ongoing and results are pending. To learn more visit https://bit.ly/ATSDR-PFAS

Continue to Page 2

Consumer, Environmental and Occupational Health Service
Environmental and Occupational Health Surveillance Program
http://www.nj.gov/health/ceohs/sanitation-safety/drinking-water-public-health/index.shtml

- PFOA- high cholesterol, kidney and testicular cancer, thyroid disease, ulcerative colitis, and pregnancy-inducted hypertension; decreased antibody response following vaccination
- PFOS- increased serum cholesterol and uric acid levels; decreased antibody response following vaccination
- PFNA - increases in cholesterol and some liver enzymes
- New Jersey Department of Health PFAS Factsheet www.nj.gov/health/ceohs/documents/pfas_drinking%20water.pdf

Raritan Headwaters

Actions Taken to Address PFAS

<u>For PFOA, and PFOS, and PFNA:</u>

- Added to NJ List of Hazardous Substances giving the DEP additional authority under the Spill Act to respond to a discharge
- NJ established Maximum Contaminant Levels (MCLs)
- 2019 - Sampling required for community supply wells, including schools and businesses
- 2021 – Required under PWTA and for all Community and NTNC Water Supplies
- Establish specific Ground Water Quality Standard
- Included in NJ Pollutant Discharge Elimination System (NJPDES) permit application testing requirements/pollutant listings
- Developing Surface Water Quality Standards
- Establishing Soil Remediation Standards

- April 2022 — Maine is the first state to ban the use of biosolids that contain PFAS in land applications

Drinking Water Standards (MCLs) for PFNA, PFOA, and PFOS

Maximum Contaminant Levels or MCLs

- The highest level of a contaminant that is allowed in drinking water.
- Set at Federal and/or State level (state level may be more protective than federal level but not less)
- 90+ biological, chemical, and radiological contaminants
- Applies to Community Water Systems, Non-Transient Non-Community Water Systems (schools, etc) and Private Wells when home is sold

3 PFAS have NJ standards

- PFNA 13ppt
- PFOA 14 ppt
- PFOS 13 ppt
- Community Water Systems, Non-Transient Non-Community Water Systems (schools, etc) must:

1. Monitor for these contaminants
2. Take action to eliminate regulated PFAS from the water delivered to customers if found at levels exceeding the MCLs

Spill Fund

- New Jersey Spill Compensation and Control Act (Spill Act) enacted in 1977 created the Spill Compensation Fund
- **Administered by Environmental Claims Administration (ECA) within the New Jersey Department of Environmental Protection (NJDEP)**
- Source of funding = taxes levied on transfer of petroleum and other hazardous substances
- **Funds available to residents, municipalities, and businesses in New Jersey through damage claims filed with NJDEP**
- Claims for potable water damages and treatment made by homeowners and schools/childcare facilities take priority
- "Fund of last resort" - must exhaust all other sources of funding - including potential responsible party(ies)
- **Ineligible if Claimant knew or should have known about the discharge** (purchased a home with private well and received PWTA report).

Spill Fund Claims

- Claim application sent by certified mail
- 2 tests required- initial and confirming water test results from a NJ state certified water-testing laboratory.
- Copy of current tax bill or deed.
- 3 estimates for a point-of-entry treatment (POET) system
- If a public supply waterline is available, 3 estimates from licensed plumbers to hook-up and three (3) estimates from certified well sealer to seal the well.
- The cost of installation and operation of a POET may be covered by NJDEP so long as a resident meets a specific set of standards

More information on Spill Claims: www.nj.gov/dep/srp/finance/eca.htm

Environmental Claims Administration (609) 777-0101

Drinking Water State Revolving Fund (DWSRF)

DWSRF funding is available to community and not for profit noncommunity water systems

Projects Eligible for DWSRF Funding

- Rehabilitate contaminated sources
- Locating and replacing lead service lines
- Funding for treatment (**PFAS**, unregulated contaminants, etc.)
- Treatment facilities – new and rehabilitation/upgrade of existing
- Construction, replacement, or rehabilitation of lines
- Purchase or consolidation (i.e., restructuring) of a water system that is unable to maintain compliance for technical, financial, or managerial reasons

https://www.state.nj.us/dep/watersupply/dws_loans.html

Small Systems Engineering Contract Initiative https://www.state.nj.us/dep/watersupply/pdf/sseci_info.pdf

Potable Water Loan Program

New Jersey Housing and Mortgage Finance Agency

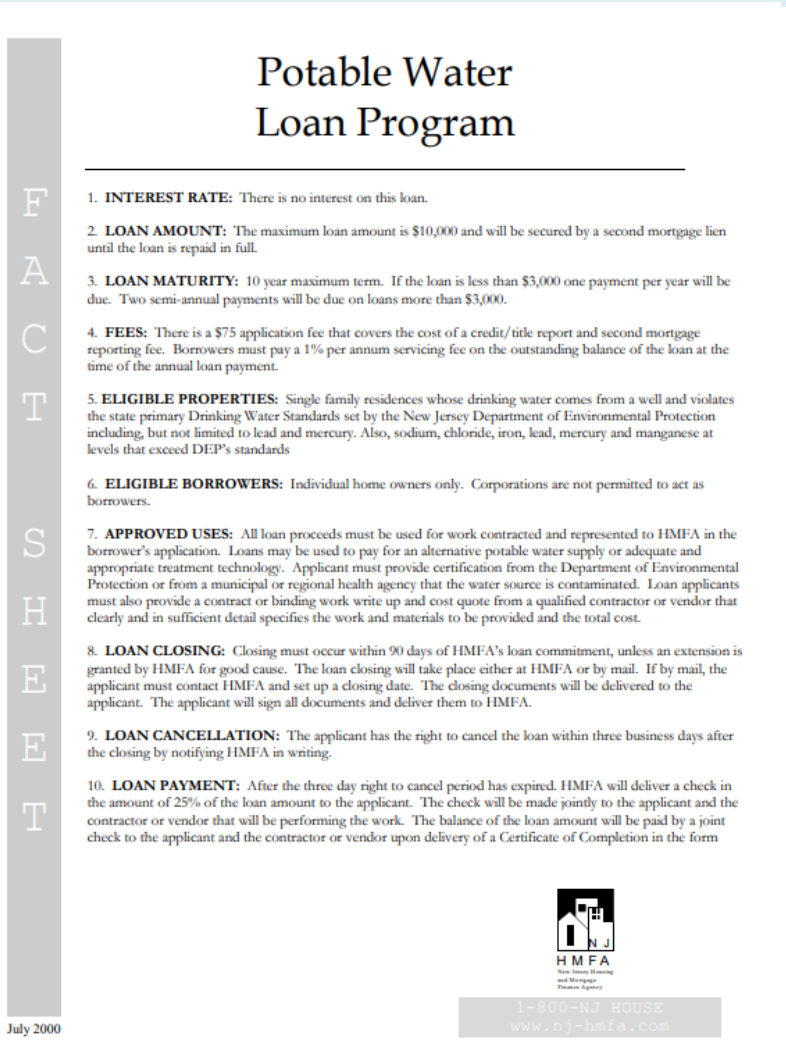
Eligibility
Single family residences whose drinking water comes from a well and violates the state primary Drinking Water Standards

Loan Details

- Loans may be used to pay for an alternative potable water supply or treatment
- No interest loan
- Maximum loan amount is $10,000 and will be secured by a second mortgage lien until the loan is repaid in full.

https://nj.gov/dca/hmfa/consumers/docs/ho_potablewater_fs.pdf

1-800-NJ HOUSE



FACT SHEET

Potable Water
Loan Program

1. **INTEREST RATE:** There is no interest on this loan.

2. **LOAN AMOUNT:** The maximum loan amount is $10,000 and will be secured by a second mortgage lien until the loan is repaid in full.

3. **LOAN MATURITY:** 10 year maximum term. If the loan is less than $3,000 one payment per year will be due. Two semi-annual payments will be due on loans more than $3,000.

4. **FEES:** There is a $75 application fee that covers the cost of a credit/title report and second mortgage reporting fee. Borrowers must pay a 1% per annum servicing fee on the outstanding balance of the loan at the time of the annual loan payment.

5. **ELIGIBLE PROPERTIES:** Single family residences whose drinking water comes from a well and violates the state primary Drinking Water Standards set by the New Jersey Department of Environmental Protection including, but not limited to lead and mercury. Also, sodium, chloride, iron, lead, mercury and manganese at levels that exceed DEP's standards

6. **ELIGIBLE BORROWERS:** Individual home owners only. Corporations are not permitted to act as borrowers.

7. **APPROVED USES:** All loan proceeds must be used for work contracted and represented to HMFA in the borrower's application. Loans may be used to pay for an alternative potable water supply or adequate and appropriate treatment technology. Applicant must provide certification from the Department of Environmental Protection or from a municipal or regional health agency that the water source is contaminated. Loan applicants must also provide a contract or binding work write up and cost quote from a qualified contractor or vendor that clearly and in sufficient detail specifies the work and materials to be provided and the total cost.

8. **LOAN CLOSING:** Closing must occur within 90 days of HMFA's loan commitment, unless an extension is granted by HMFA for good cause. The loan closing will take place either at HMFA or by mail. If by mail, the applicant must contact HMFA and set up a closing date. The closing documents will be delivered to the applicant. The applicant will sign all documents and deliver them to HMFA.

9. **LOAN CANCELLATION:** The applicant has the right to cancel the loan within three business days after the closing by notifying HMFA in writing.

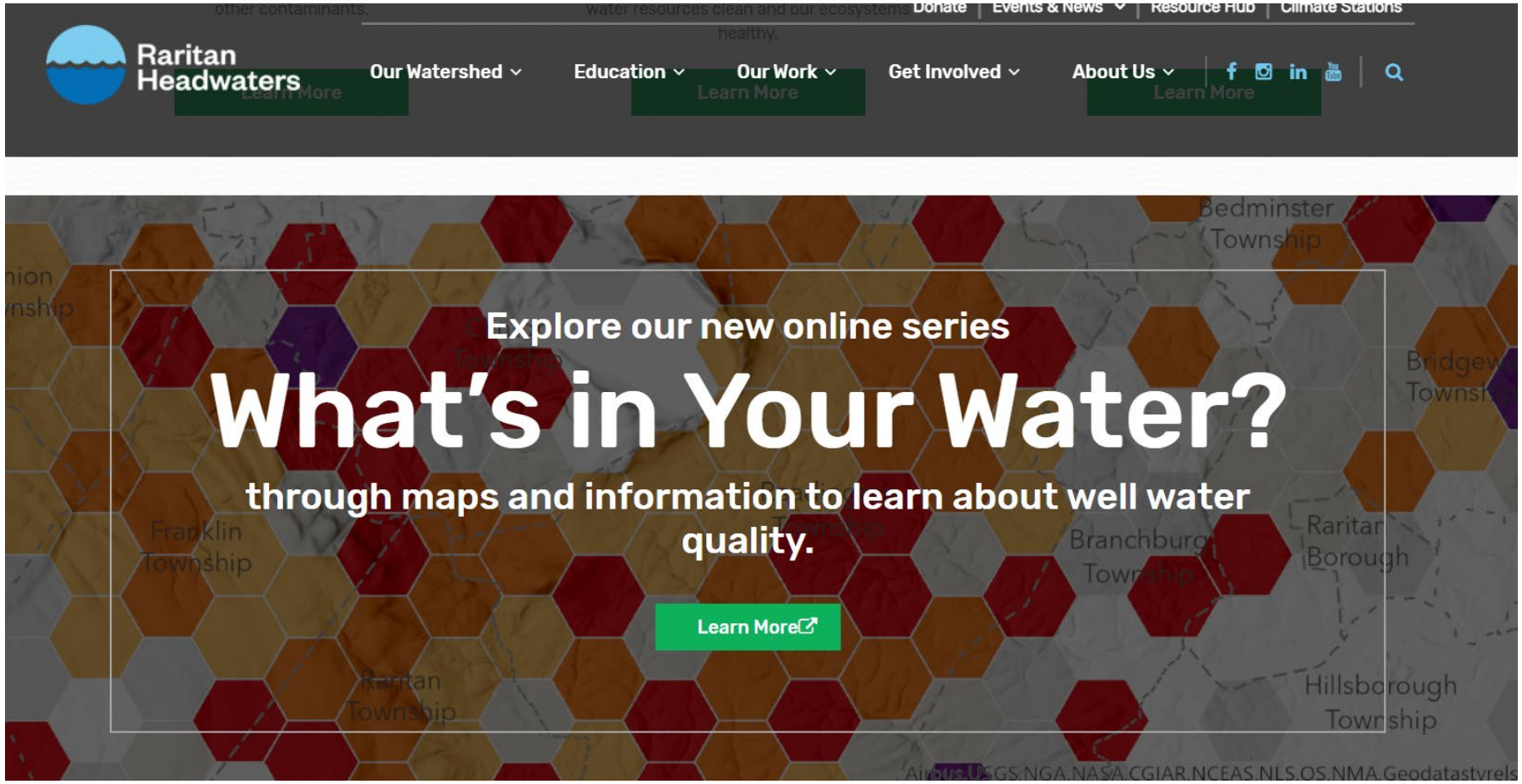
10. **LOAN PAYMENT:** After the three day right to cancel period has expired. HMFA will deliver a check in the amount of 25% of the loan amount to the applicant. The check will be made jointly to the applicant and the contractor or vendor that will be performing the work. The balance of the loan amount will be paid by a joint check to the applicant and the contractor or vendor upon delivery of a Certificate of Completion in the form

HMFA
New Jersey Housing and Mortgage Finance Agency

1-800-NJ HOUSE
www.nj-hmfa.com

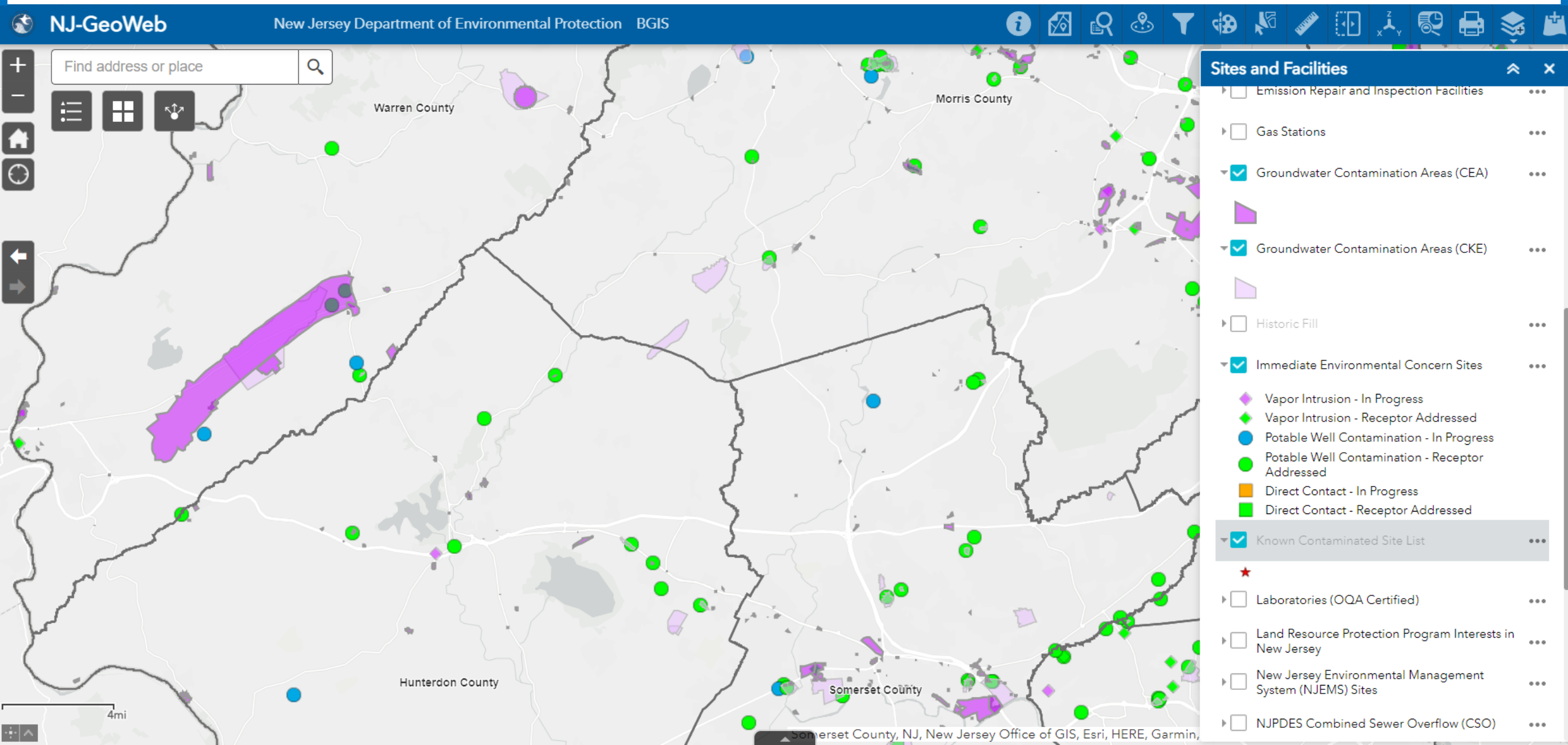
July 2000

Drinking Water Quality Data and Maps



www.raritanheadwaters.org

NJ GeoWeb: Information on Public Water Service Areas, Groundwater Contamination Areas, and more



NJDEP-Drinking WaterWatch

New Jersey County Map - Click on a county

Drinking WaterWatch from the NJDEP enables users to view drinking water information for NJ water systems.

- Current water quality data available for all Community, Non-transient non-community, and transient noncommunity water supplies
- Violations, service areas, population served, sampling schedules, and licensed operators

www9.state.nj.us/DEP_WaterWatch_public/NJMap.jsp

New Jersey Drinking Water Watch

PWSID:	NJ2004002	Water System Type:
Water System Name:	NJ AMERICAN WATER - RARITAN	System Status:
		System Ownership:
Principal County & City:	UNION, ELIZABETH CITY- 2004	Source Water Type/Operating

WATER SYSTEM INFORMATION | Total Coliform Results | Chemical Results | Monitoring | System Facilities | Site Visits | Violations | Other Data | PRINTER FRIENDLY PAGE

Lead/Copper Results for Monitoring Period: 07/01/2017--12/31/2017

Lead
63 Samples; 90th %ile: 0.003 MG/L

Co
63 Samples; 90

Collection Date	Sample Pt ID	Sample #^	Result*	Analysis Date	Date Received
09/22/2017	PBCU166	36504501	<0.001 MG/L	10/02/2017	10/05/2017
09/21/2017	PBCU159	36504801	0.002 MG/L	09/27/2017	10/05/2017
09/21/2017	PBCU171	36504201	0.001 MG/L	09/27/2017	10/05/2017
09/20/2017	PBCU164	36504101	0.001 MG/L	09/27/2017	10/05/2017
09/20/2017	PBCU10	36504601	0.017 MG/L	10/02/2017	10/05/2017
09/19/2017	PBCU163	36503801	<0.001 MG/L	09/27/2017	10/05/2017
09/19/2017	PBCU79	36503901	<0.001 MG/L	09/27/2017	10/05/2017
09/19/2017	PBCU94	36504001	<0.001 MG/L	09/27/2017	10/05/2017
09/13/2017	PBCU123	36504401	0.001 MG/L	10/02/2017	10/05/2017
09/13/2017	PBCU124	36504701	<0.001 MG/L	09/27/2017	10/05/2017
09/08/2017	PBCU115	36509701	0.001 MG/L	09/15/2017	10/05/2017
08/30/2017	PBCU180	36503601	0.004 MG/L	09/15/2017	10/05/2017
08/30/2017	PBCU139	36509601	<0.001 MG/L	09/15/2017	10/05/2017
08/30/2017	PBCU43	36503701	<0.001	09/15/2017	10/05/2017

Collection Date	Sample Pt ID	Sam #
09/22/2017	PBCU166	3650
09/21/2017	PBCU159	3650
09/21/2017	PBCU171	3650

JERSEY WATER WORKS

Smart infrastructure. Strong communities.

JERSEY WaterCheck

ABOUT HELP LOG IN

HOME JWW SHARED GOALS BENCHMARK HUB SYSTEM FINDER DOCUMENTS

Welcome to Jersey WaterCheck's search tool — the System Finder.

You can use this to learn more about the water and wastewater systems that serve New Jerseyans.

The System Finder provides New Jersey consumers a direct link to their drinking water and wastewater providers. They can also search municipalities to view certain metrics, such as those related to green infrastructure. **You can find individual systems by either interacting directly with the map or using the search bars shown alongside the map.**

Navigating the Map

On the map below, each colored dot indicates a system. The larger grey circles with numbers indicate clusters of systems. Click on these circles to zoom in (or click on the + button in the toolbar in the upper left corner). Once you get to the level of the individual systems, click on a dot to see the system pop-up box. Then, click on “Learn more” to go to the system page.

Note: When a system's dot is clicked, its service area will appear shaded. For wastewater systems, the system's discharge location(s) will also appear as small red points.

Using the Search Bars

Well Testing Act Data Summary (Sep. 2002 to Dec. 2018)

New Jersey Department of Envir

formation then click a location on the map for data.

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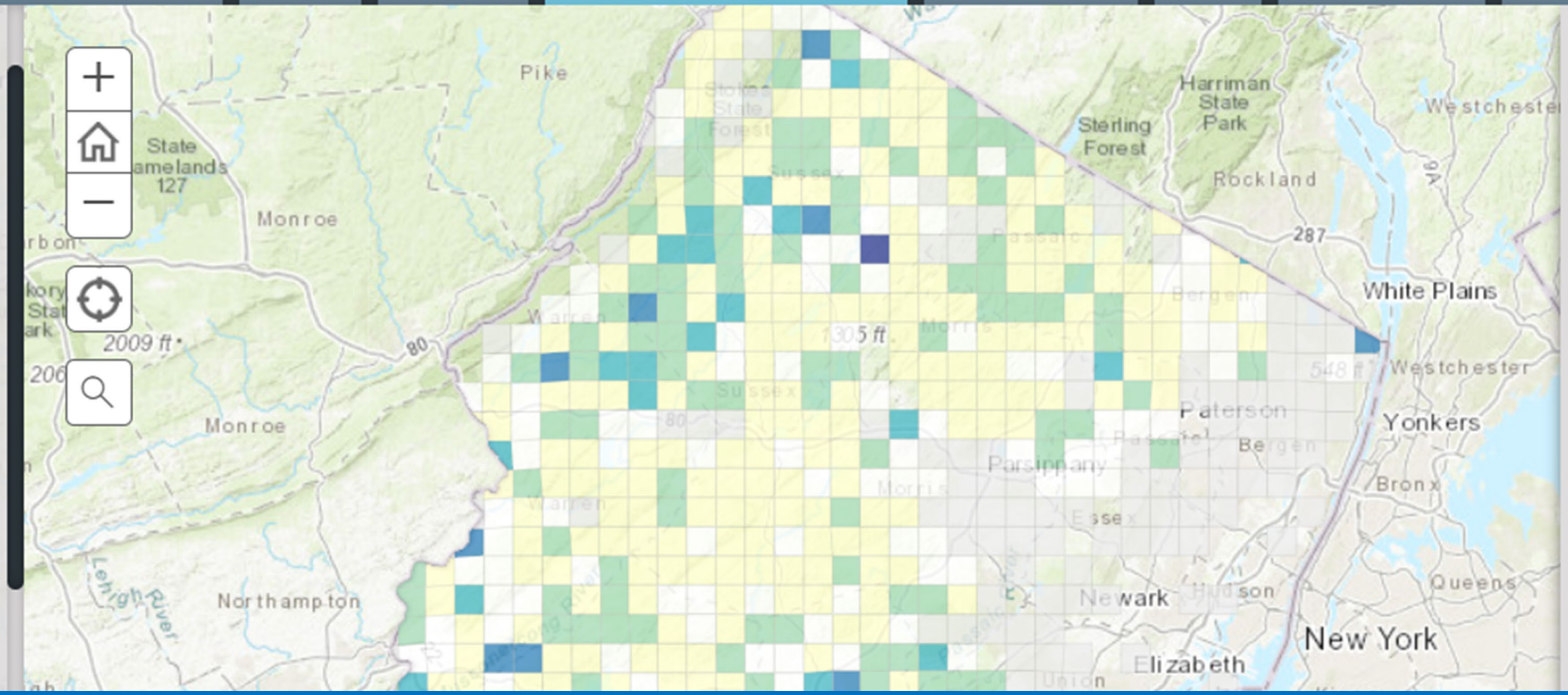
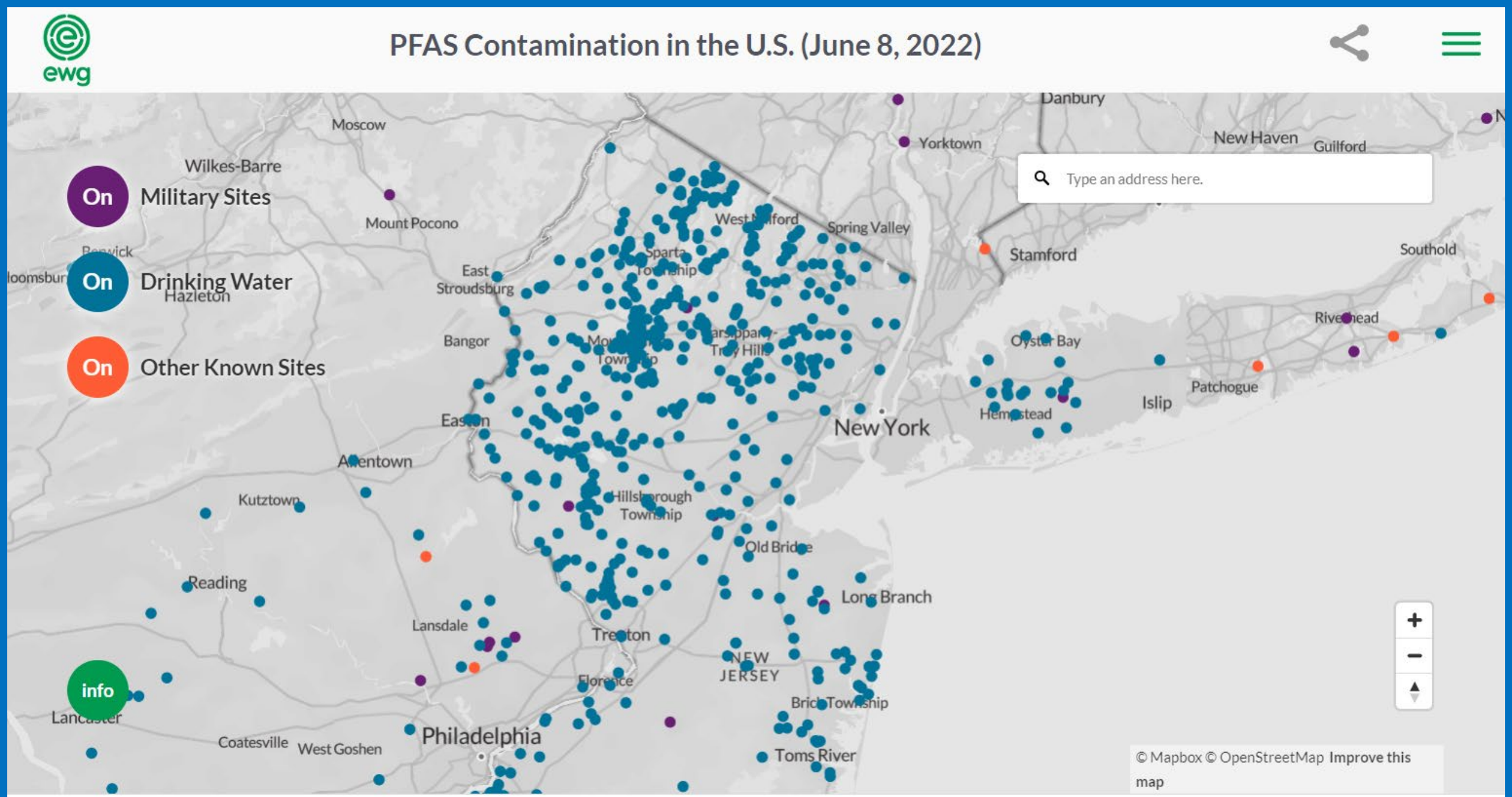
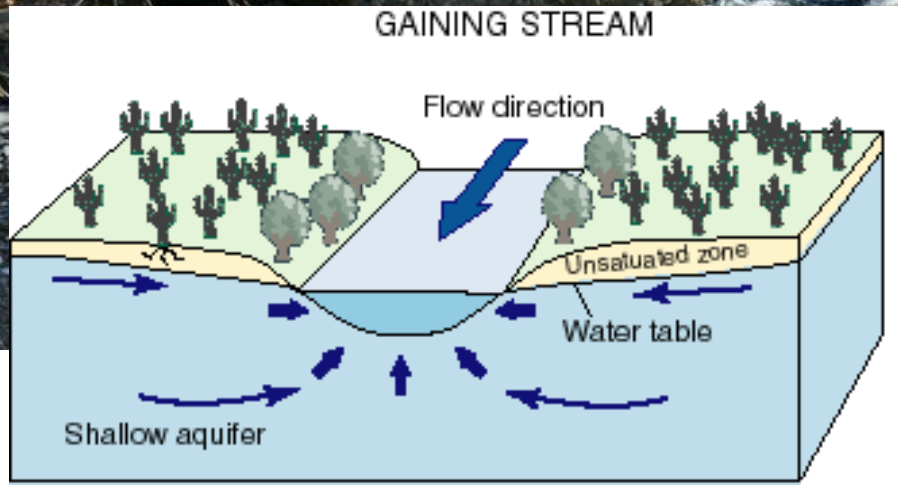
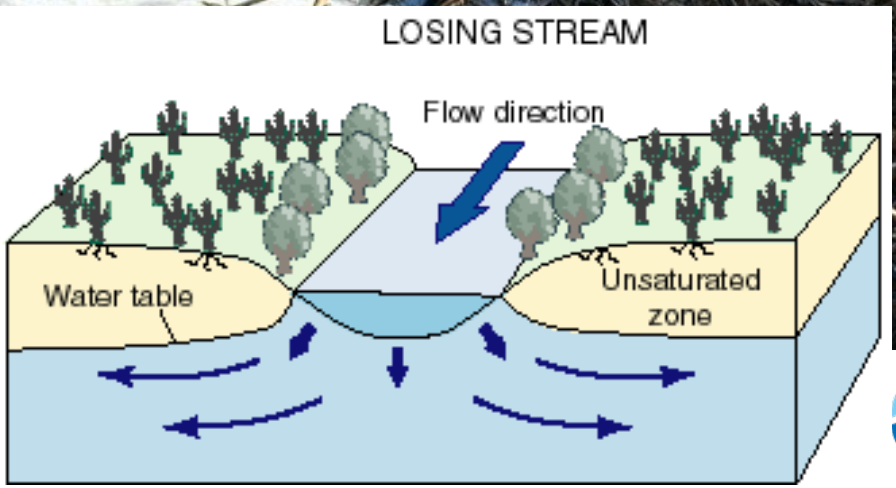




https://www.ewg.org/interactive-maps/pfas_contamination/map/

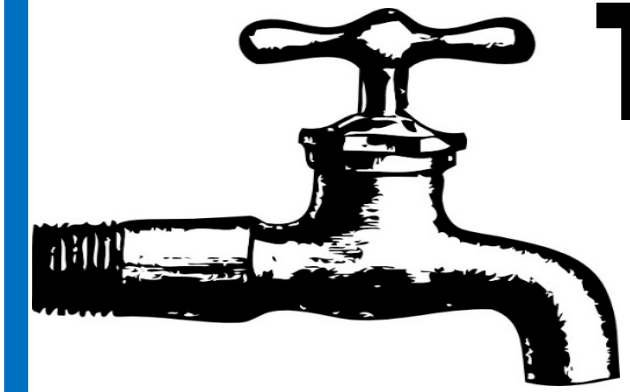
GROUND WATER AND RIVER FLOW





Raritan Headwaters


Image: Nature Conservancy



Thank you

and please don't forget to
TEST YOUR WELL

Mara Tippett
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mtippett@raritanheadwaters.org

Raritan Headwaters