

Drinking Water Facts:

# Per- and Polyfluoroalkyl Substances (PFAS) in Drinking Water

Updated April 2024

## 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 and have been used since the 1940s. 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. These chemicals do not break down in the environment.

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

PFOA, PFOS, and PFNA dissolve in water. If drinking water is contaminated, it is a primary source of exposure to PFAS as compared with other common exposure sources. Other sources of exposure to these PFAS include food, food packaging, consumer products, house dust, indoor and outdoor air, and workplaces where PFAS are used or made. Exposure in drinking water is primarily from ingestion of the water and food prepared with the water. These **PFAS are not removed from water by boiling.** Exposure to these PFAS from showering, bathing, laundry, dishwashing, and rinsing produce is not significant.

## Health effects of PFAS

Studies of the general population, communities with PFAS-contaminated drinking water, and exposed workers indicate that exposure to PFAS increases the risk of a number of health effects. **Health effects from PFAS are observed within the general population even without exposure to PFAS from contaminated drinking water.**

The most consistent human health effect findings for PFOA and PFOS – the most well studied of the PFAS types – are increases in serum cholesterol, uric acid levels, decreased birth weight, 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 of these PFAS 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 bit.ly/ATSDR-PFAS



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

NJHealth New Jersey Department of Health

## Impact of PFAS on children

Infants and children consume more water per body weight than older individuals, so their exposure may be higher than adults when drinking water is contaminated with PFAS. They may also be more sensitive to the effects of PFAS.

In humans, exposure to PFAS before birth or in early childhood may result in health effects including decreased birth weight, decreased response to vaccinations, and increased risk of infectious disease. In laboratory animals, some PFAS, including PFOA, PFOS, PFNA, and others, cause developmental delays.

## Can I have my blood tested for PFAS?

Laboratory tests are available to measure PFAS in blood serum, but this is not a routine test. Health insurance may not cover the cost of this testing. While pursuing this type of specialized testing is a personal decision between you and your doctor, it is important to understand what testing can and cannot tell you.

### What blood testing *can* tell you –

- Blood test results can be compared to national monitoring data collected from a representative sample of the U.S. population. The table below provides the most recently available (2017-2018) blood serum levels of the four PFAS most commonly detected in the U.S. population.

| PFAS | Mean (geometric) | 50th percentile | 95th percentile |
|---|---|---|---|
| PFOS | 4.25 | 4.30 | 14.6 |
| PFOA | 1.42 | 1.47 | 3.77 |
| PFNA | 0.41 | 0.40 | 1.40 |
| PFHxS | 1.08 | 1.10 | 3.70 |

- For example, if your concentration is higher than the 95th percentile, this means your blood serum is higher than the concentration found in 95% of the U.S. population.

### What blood testing *cannot* tell you –

- While exposure to PFAS can increase the risk of certain health effects, a blood test indicating that you have been exposed to PFAS cannot be used to predict whether you will experience health effects or if PFAS exposure caused any health problems you may have.
- Test results alone cannot be used to identify specific sources of exposure.
- There is no accepted treatment to reduce levels of PFAS in the blood. Levels decrease slowly over many years when exposure has been reduced or eliminated.

## What are the NJ drinking water standards for PFAS?

In 2018, NJ became the first state to establish an **enforceable** drinking water standard for a PFAS chemical when it set a Maximum Contaminant Level (MCL) for PFNA. MCLs for PFOA and PFOS followed in 2020.

| NJ MCLS for PFAS | |
|---|---|
| PFNA | 13 ppt |
| PFOA | 14 ppt |
| PFOS | 13 ppt |

Abbreviations: ppt=parts per trillion; ppt = ng/L = nanograms per liter

A maximum contaminant level (MCL) is an **enforceable** drinking water standard which requires all public water systems to routinely monitor. If levels are found to be above the NJ MCL, the water utility **must** take actions to reduce levels below the MCL. Available water treatment technologies can effectively reduce levels of PFAS. Many systems that exceeded the NJ MCLs have since reduced PFAS concentrations to non-detectable levels. Your public water utility will monitor and report these levels on a regular basis. Water results are available on NJDEP's Drinking Water Watch website.

The NJ Drinking Water Quality Institute (DWQI), an advisory body composed of scientists and technical experts from academia, the water industry, environmental health, the NJ Department of Environmental Protection (NJDEP), and the NJ Department of Health (NJDOH) is responsible for developing NJ MCLs and recommending them to the NJDEP. The NJ PFAS MCLs are based on studies of effects on laboratory animals.

Until recently, there were no national PFAS drinking water standards. In April 2024, the U.S. Environmental Protection Agency (USEPA) finalized MCLs that incorporated data on health effects in human populations exposed to low levels of PFAS. These new MCLs will result in additional public health protection from exposure to these chemicals in drinking water. The USEPA MCLs will require NJ drinking water systems to reduce PFOA and PFOS concentrations to even lower levels in drinking water and will address three additional PFAS not currently regulated in NJ. More detail is provided on Page 3.

## What are the USEPA drinking water standards for PFAS?

USEPA finalized National Primary Drinking Water Regulations (MCLs) for six PFAS in April 2024. These standards are **enforceable**.

| PFAS Compounds | Final MCL |
|---|---|
| PFOS | 4.0 ppt |
| PFOA | 4.0 ppt |
| PFHxS | 10 ppt |
| PFNA | 10 ppt |
| GenX (HFPO-DA) | 10 ppt |
| Mixture containing two or more of PFNA, PFHxS, PFBS, and GenX | Hazard Index = 1.0 |

- Public water systems must monitor for these PFAS. They have **three years** to complete initial monitoring (by 2027) and then must continue ongoing compliance monitoring. Water systems must provide the public with their monitoring results beginning in 2027.
- If levels of PFAS are found to exceed the USEPA MCLs, water systems will have **five years** (by 2029) to implement solutions to reduce levels below the MCL. By 2029, water systems will have to provide notification to the public of a violation.
- State standards may not be higher (less strict) than federal standards. Now that the USEPA has established national MCLs, NJ public water systems will be required to comply with the lower USEPA MCLs by no later than 2027.
- Water systems in NJ are currently required to monitor for three PFAS and comply with NJ MCL standards. Many NJ water systems have now reduced PFAS to non-detectable levels. NJDEP and your public water system will have the most up to date PFAS monitoring data.
- The Hazard Index approach adopted by USEPA will regulate four additional PFAS as a mixture. USEPA has developed the following Health Based Water Concentrations (HBWCs) for the four PFAS included in the Hazard Index:
  - **PFHxS** –10 ppt
  - **PFNA** –10 ppt
  - **GenX** –10 ppt
  - **PFBS** –2000 ppt
- The USEPA's Hazard Index MCL applies to any mixture containing two or more of the four PFAS (listed above). For each of the four PFAS, the calculation first divides the results of the drinking water sample by the HBWC and then adds all the values for each PFAS. If the total value is greater than 1, it would be an exceedance of the final Hazard Index MCL.
- The USEPA MCLs of 4.0 ppt for PFOA and PFOS are set at the USEPA Practical Quantitation Levels, which are the levels that laboratory methods can accurately measure PFOA and PFOS in water.
- USEPA has concluded that PFOA and PFOS are likely human carcinogens and has set their Maximum Contaminant Level Goals (MCLGs; health-based levels) at zero.
- Additional information on USEPA MCLs is available: epa.gov/sdwa/and-polyfluoroalkyl-substances-pfas

## Recommendations:

PFOA, PFOS, and PFNA build up in the body over time, and it takes many years for the levels of these PFAS in your body to decrease after exposure has ended. Since New Jersey has established MCLs, water systems across the state are taking action to reduce concentrations of these PFAS to levels below the NJ MCLs. Some utilities have achieved non-detectable levels since the NJ MCLs have been in place. You can find more information at the NJDEP website: dep.nj.gov/pfas/

## If PFAS are detected in your drinking water:

Some water systems are still working on establishing treatment solutions to reduce PFAS concentration below the NJ MCL. **If you learn that a PFAS is detected in your drinking water supply above a New Jersey MCL, until your water utility has reduced PFAS levels:**

- **For nursing (breastfed) babies:** PFAS are present in breast milk and can be transferred to nursing babies. Despite this exposure, mothers who are breastfeeding should continue to nurse. The extensive information on the health benefits of breastfeeding suggests that benefits of breastfeeding outweigh potential risk of additional PFAS exposure.
- **For all babies:** Bottled water should be used when giving infants just water and preparing juice made from concentrate for infants.
- **For pregnant women, nursing women and women considering or planning on having a child:** Switching to bottled water or using a home water filter for drinking and cooking will reduce PFAS exposure. However, PFAS are slowly excreted from the body. Therefore, risk reduction will not be immediate, as exposure to the fetus and nursing infant is influenced by the mother's past exposure.
- **For older children and adults:** If a public water utility notifies you that a PFAS exceeds the NJ MCL, they are required to promptly take actions to reduce these levels. Individuals who wish to reduce exposure to PFAS while the water utility is taking actions to reduce levels can consider switching to bottled or home filtered water for drinking and cooking. However, it is important to note that bottled water and filter technologies are not certified to reduce PFAS below the NJ MCLs.

Anyone concerned about their health should consult with their personal health care provider.

## For health care providers:

Health care providers can find more information on clinical evaluation and management of patients from ATSDR at: atsdr.cdc.gov/pfas/resources/info-for-health-professionals.html

## For the general population:

Drinking water is an important exposure source to PFAS. Your public water system is required to monitor for PFOA, PFOS, and PFNA. If results exceed the NJ MCLs, the water utility must inform you. More information on where to find water results are in the section that follows. Monitoring for additional PFAS is required by 2027.

Bottled water sold in NJ is required to meet the NJ MCLs. Additionally, some water filters are certified to reduce PFAS concentrations below 20 ppt but these alternative drinking water sources are not ensured to have PFAS concentrations lower than the NJ MCLs. More information on where to find out about bottled water monitoring and home water filters can be found on Page 5.

## How can I find out if PFAS are detected in my drinking water?

- **Public Water Users**

NJ public water systems were required to begin monitoring for PFNA in 2020 and for PFOA and PFOS in 2021. These results are available on NJDEP's Drinking Water Watch website. This is a database that is searchable by water system ID number, system name, or (if you don't know the ID number or name) by county and municipality, to identify all systems serving that area. Information on which utilities serve your area can also be found at this site.

Some water systems have earlier results through the EPA Unregulated Contaminant Monitoring Rule (UCMR3). These UCMR3 results were reported in your annual Consumer Confidence Reports (CCRs) which may be available online or mailed to your home directly by your water provider. CCRs are also found on NJDEP Drinking Water Watch. UCMR5, which began in Jan. 2023 and is testing all PWS with >3300 users for 29 PFAS at low Reporting Levels and results will be reported as they become available.

Additionally, a list of public water systems with PFOA, PFOS, and/or PFNA MCL violations is available here: visit NJDEP DataMiner: njems.nj.gov/DataMiner/ [Search by Category > Water Supply and Geoscience > Scroll to "Public Water Systems with PFAS MCL Violations"]

- **Private Well Users**

PFNA, PFOA, and PFOS have been added to the NJ Private Well Testing Act (NJ PWTA). The NJ PWTA is a consumer information law established in 2002 that requires private wells to be tested for a list of contaminants by a certified laboratory during real estate transfer. It also requires landlords to test well water supplied to tenants every five years and provide the results. The addition of PFAS to the NJ PWTA means that private wells at homes being sold in NJ were tested for these three PFAS (and other listed contaminants) starting December 1, 2021.

Well owners who are not selling their home may wish to contact a certified laboratory to have their well water tested. To find a list of certified laboratories visit NJDEP DataMiner: njems.nj.gov/DataMiner/ [Search by Category > Certified Laboratories > Scroll to "PFAS Drinking Water Certified Laboratories"]

## Did You Know?

Bottled water sold in NJ is regulated by the NJ Department of Health and is required to meet Safe Drinking Water standards. N.J.A.C. 8:21-5.1 et. seq

## How do I know that my bottled water does not exceed the NJ drinking water standards for PFAS?

Companies that sell bottled water in NJ were required to analyze for PFNA, PFOA, and PFAS annually. Bottled water companies are required to submit their annual monitoring results to NJDOH with the application for their annual license. More information on NJ's Bottled Water Program can be found here: nj.gov/health/ceohs/documents/phfpp/BWStandards.pdf

## Where can I get more information about home water filters?

Water treatment devices utilizing granular or powdered activated carbon filters, reverse osmosis, ion exchange resins and other specialized treatment media are technologies that can reduce the level of PFAS in drinking water. If a water treatment device is used, it is important to follow the manufacturer's guidelines for maintenance and operation.

NSF International, an independent and accredited organization, certifies products proven effective for reducing PFOA and PFOS below the previous USEPA Health Advisory of 70 ppt (2020 standard version). Recently, the NSF standards have been updated to more stringent levels below 20 ppt (2022 standard version). When purchasing a filter, verify that the product is NSF/ANSI standard 53 and check for the standard version to know at which level the filter is certified to remove total PFAS (PFOA, PFOS, PFNA, PFHxS, PFHpA).

Please note, these products are not certified for removal to the lower NJ MCLs of 14 and 13 ppt or the lower USEPA MCLs.

## Additional Questions

### If high levels of PFAS were detected in my water, how will it affect fruits and vegetables in my garden?

For gardening or farming, certain plants may take up some PFAS from irrigation and soil. Unfortunately, there is not enough scientific data to predict how much will end up in any specific crop. For most people the risk from the occasional consumption of produce grown in soil or irrigated with water contaminated with PFAS is likely to be low. For families who grow a large fraction of their produce, the risk of exposure to PFAS may be higher and they can consider the following steps:

- Maximize use of water from an uncontaminated source for your garden.
- Wash your produce in clean water after you harvest it.
- Modify your soil with clean compost. Increasing the organic content of your garden soil can prevent the uptake of PFAS into plants.

### If PFAS are present above the NJ MCL, what water should I give my pets?

Scientists are not certain of the health impacts to pets. If you are concerned, you may choose to give your pet bottled or filtered water until your water utility has reduced the concentrations of PFAS in the drinking water below the NJ MCL.

### If PFAS are present above the NJ MCL, what water should I use in my humidifier?

In line with USEPA recommendations, bottled water or home filtered water should be used in your humidifier until levels of PFAS in your drinking water are reduced.

### What water should I use in my continuous positive airway pressure (CPAP) machine?

Individuals should continue to follow existing medical guidance regarding the use of distilled water in CPAP machines as instructed by the manufacturer and their doctor.

## Additional Resources

**NJ Department of Environmental Protection –**

- NJDEP PFAS: dep.nj.gov/pfas/
- Drinking Water: dep.nj.gov/pfas/drinking-water/
- Site Remediation Program: nj.gov/dep/srp/emerging-contaminants/
- New Jersey Drinking Water Quality Institute: state.nj.us/dep/watersupply/g_boards_dwqi.html

**NJ Department of Health**

- Bottled Water: nj.gov/health/ceohs/documents/phfpp/BWStandards.pdf

**NSF International –**

- More info NSF certified home water filters, visit: nsf.org/consumer-resources/water-quality/drinking-water/

**CDC ATSDR –**

- PFAS Multi-site Study: atsdr.cdc.gov/pfas/activities/studies/multi-site.html
- Detailed summaries of the toxicology and epidemiology studies on PFAS: atsdr.cdc.gov/toxprofiles/tp200.pdf
- Health care provider guidance: atsdr.cdc.gov/pfas/docs/PFAS-info-for-clinicians-508.pdf

**US Environmental Protection Agency –**

- Final PFAS National Primary Drinking Regulation: epa.gov/sdwa/and-polyfluoroalkyl-substances-pfas



Drinking Water Facts:

# Per- and polyfluoroalkyl substances (PFAS) and private wells in New Jersey

Updated July 2025

## Introduction

Per- and polyfluoroalkyl substances (PFAS), also known as “forever chemicals,” are a group of manmade chemicals which have been widely used in manufacturing since the 1940s due to their heat and chemical resistant properties. Many complex PFAS do not break down in the environment and once released, will continue to persist in the environment until they are removed. This is why they are referred to as “forever chemicals”. Most people in the U.S. have detectable levels of PFAS in their bodies, but concentrations of some PFAS have greatly decreased over time since large U.S. manufacturer phase-outs of the chemicals.

Drinking water can be a significant source of PFAS exposure, when the drinking water source is contaminated with PFAS. Even low concentrations of PFAS in drinking water can lead to large increase of PFAS exposure in your body which builds up over time. Infants and children drink more water per body weight than adults and may have greater exposures than adults.

## Health Effects

Studies of the general population, communities with PFAS-contaminated drinking water, and exposed workers indicate that exposure to PFAS increases health risks. The most consistent human health effect findings for PFOA and PFOS are increases in serum cholesterol, decreased birthweight, kidney and testicular cancer, decreased antibody response following vaccination, and increases in some liver enzymes.

- Additional health studies of PFAS-impacted communities are ongoing. More information can be found here: atsdr.cdc.gov/pfas/health-studies/multi-site-study.html.
- If you have health concerns, you should contact your health care provider. Clinical guidance for your health care provider is available at: atsdr.cdc.gov/pfas/hcp/clinical-overview/index.html.
- More detailed information on health effects, biomonitoring, basis of the drinking water standards, and other frequently asked questions can be found in **our main PFAS in Drinking Water fact sheet**: nj.gov/health/ceohs/documents/pfas_drinking%20water.pdf.

## Occurrence of PFAS in NJ private well water

From December 2021 through 2023, almost 16,000 wells have been tested for PFOA, PFOS, and PFNA during real estate transfers as required by the NJ Private Well Testing Act. Among the tested wells, **11.2%** had ***at least one*** PFAS tested above a New Jersey drinking water standard.

Several communities in North Jersey have a large percentage of private well users with contamination from PFAS, but also has been detected in private well water statewide.

Visit bit.ly/NJPWTAmaps for **interactive** maps to find the well results in the 2x2 mile grid where you live. Click the tabs at the top of the webpage to explore (Counties, Municipalities, Grids, etc.).

Use the  button to enter your street address.

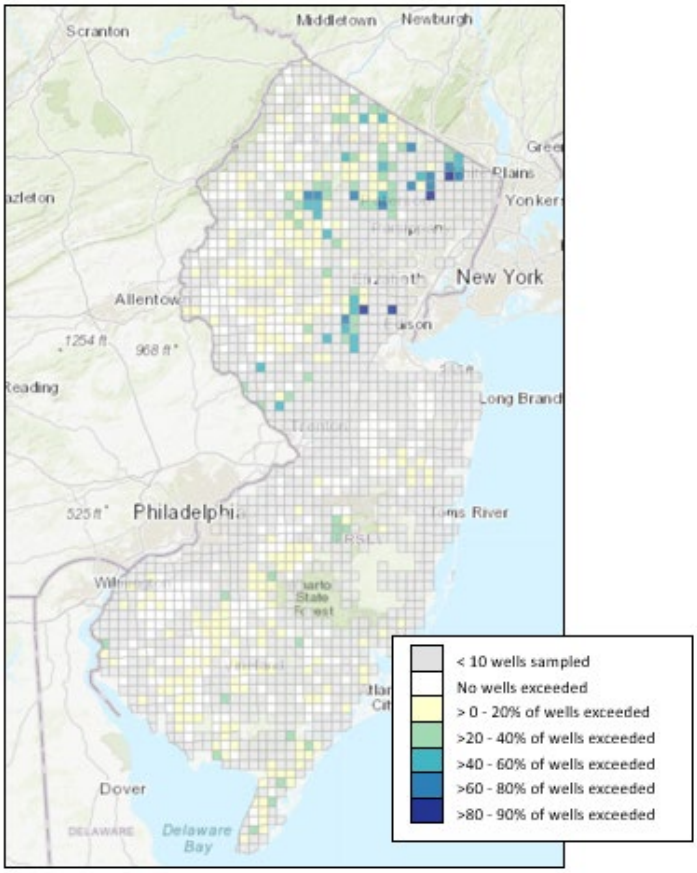



*Figure 1. PFAS detections in 2x2-mile grids NJ Private Well Testing Act 2002-2023. New Jersey Department of Environmental Protection.*

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## NJ Spill Fund

NJ Spill Compensation Fund Claims Program (NJ Spill Fund) is a program that provides financial support for private well owners impacted by discharge of hazardous substances. For eligible homeowners, the NJ Spill Fund will cover costs of some water testing, water treatment installation, and maintenance.

## Drinking Water Standards

In 2018, NJ became the first state to establish an enforceable drinking water standard for a PFAS chemical when it set a maximum contaminant level (MCL) for PFNA. MCLs for PFOA and PFOS followed in 2020.

In April 2024, USEPA finalized MCLs that are more stringent than NJ values as they consider data on health effects in human populations. Once adopted, the Federal MCLs will replace the current NJ MCLs and includes MCLS for additional PFAS.

NJ Spill Fund set financial relief criteria, based on the USEPA Maximum Contaminant Levels (MCL) to determine your eligibility for NJ Spill Fund support.

| EPA MCLs/NJ Spill Fund Financial Relief Criteria | |
|---|---|
| PFOS | 4 ppt |
| PFOA | 4 ppt |
| PFNA | 10 ppt |
| PFHxS | 10 ppt |
| GenX | 10 ppt |
| PFBS* | 2,000 ppt |

Footnotes: ppt=parts per trillion = ng/L; *= Health Based Water Concentration (HBWC). All contaminants listed are based on the USEPA's MCL with the exception of PFBS which isa *Health Based Water Concentration (HBWC)More specific details are available from USEPA (epa.gov/sdwa/and-polyfluoroalkyl-substances-pfas) for the basis and interpretation of standards.

More information on NJDEP Spill Fund Financial Relief Criteria dep.nj.gov/wp-content/uploads/srp/financial_relief_criteria.pdf

## New Jersey Private Well Testing Act

The NJ PWTA is a consumer information law that requires private well water to be tested by a certified laboratory during real estate transfer and requires landlords to test well water supplied to tenants every five years and provide the results. As of December 1, 2021, PFNA, PFOA, and PFOS were included as required parameters in the NJ Private Well Testing Act (NJ PWTA).

## Recommendations for testing your water

- **If you live near other homes with detections of PFAS, you should strongly consider testing.** You can use the interactive NJ PWTA maps to find local testing results where you live. Your local health department may send notifications to individuals living near a neighboring well with identified PFAS. Find your local health department contact information: localhealth.nj.gov.
- If you decide to test, we recommend you use a certified laboratory. NJDEP maintains a list of certified laboratories you can find online at: njems.nj.gov/DataMiner

  > Select Search by Category
  > Select Certified Laboratories
  > Scroll down and select:
  Laboratories Certified for PWTA Sample Collection
- The cost of testing can be prohibitive for many private well owners. Your local health department or township administration may have additional guidance or support. Please note, if PFAS is detected above the financial relief criteria **NJ Spill Fund** will reimburse the cost of testing.

## If PFAS is detected in your water

- If PFAS is detected above the financial relief criteria, the **NJ Spill Fund** also supports the cost and maintenance of a water treatment system. For specific eligibility and application information please visit: dep.nj.gov/srp/finance/eca-spill-fund
- **Bottled water sold in NJ** is regulated by the NJ Department of Health and is required to meet NJ state drinking water standards. Bottled water is not yet required to reduce PFAS to the new USEPA standards.
- **Water treatment devices** utilizing granular carbon filters, reverse osmosis, ion exchange resins and other specialized treatment media are technologies that can reduce PFAS in drinking water. NSF International, a third-party organization that certifies water treatment units, has certified that water treatment devices certified to NSF/ANSI Standard 53 or NSF/ANSI Standard 58 to reduce PFAS are an effective way to reduce PFAS below 20 parts per trillion (ppt).