

My water department
just told me there's

PFAS

in my water. Now what?

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Overview

If you've received a notice from your Water Department that PFAS has been detected in your drinking water, or you're just curious about PFAS, this resource is for you.

We've designed this eBook to provide you with a complete and straight-forward understanding of how PFAS might have gotten into your public water supply, the risks PFAS pose, and what your options are for protecting your family's health from the harmful effects of drinking water that has been contaminated by PFAS.

We realize the notification you received from the public water department may be limited in information and full of legal jargon.

By the end of this eBook, you'll be empowered with the knowledge you need to protect your family's health.

You always have choices when it comes to protecting your family, and reading this eBook is an important first step in educating yourself and planning your next move.



Chapter 1

What Are PFAS?

PFAS (PerFluoroAlkyl Substances) are man-made chemicals that have been manufactured since the 1940s. They have been used extensively in common household products such as nonstick pans, food packaging (pizza boxes, microwave popcorn bags, etc.), clothing and upholstery protectors (GoreTex, Scotchgard, etc.), and some personal care products and cosmetics. PFAS were also an ingredient in fire-fighting foam.

PFAS do not break down in water or soil They may be carried over great distances by wind, rain or groundwater.

PFAS are nearly indestructible They have an extremely strong, stable chemical bond of carbon and fluorine atoms, which makes them heat-resistant and water- and oil-repellent. This is why they've been used in such a wide variety of industrial and commercial products.

Much of the contamination that is being discovered today may have originated years ago, before suspicion of the damaging environmental and health effects was raised.

There are over 4,700 different PFAS chemicals Within this really big family of chemicals, we have quite a bit of information about two in particular: **PFOS** and **PFOA**.

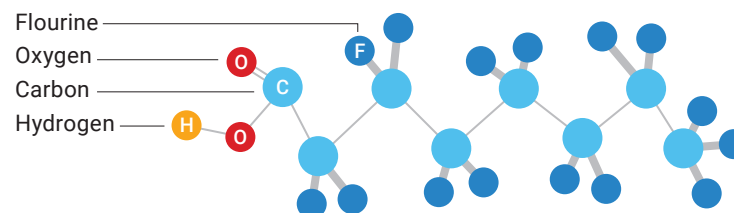
PFOS and PFOA are no longer produced in the U.S., in part because we've learned quite a bit about the negative health effects of exposure to them. But Americans continue to be exposed to these chemicals today:

- They are still produced in other countries
- They can still be found in domestic and imported products
- PFOS and PFOA produced decades ago linger in our soil and water.

While we don't know as much about other PFAS chemicals, they all have this feature in common: The chemical bonds that hold them together don't break down under normal circumstances. Because of that, we refer to this family of substances as "forever chemicals."

What is a "Forever Chemical"?

Forever chemicals have extremely strong bonds of carbon and fluorine that don't break down over time, allowing them to build up in water, soil, and our bodies.



Chapter 2

How Do PFAS Get Into My Drinking Water?

The main sources of exposure to PFAS, particularly PFOA and PFOS, are by consuming food and drinking water that is contaminated with these chemicals.

PFAS may have entered groundwater from:

- Industrial facilities where PFAS were produced or used to manufacture other products
- Locations where firefighting foam was used for training or car accidents
- Leachate from landfills (including informal dumping sites)
- Agricultural, commercial, and residential application of PFAS-contaminated fertilizers

Ultimately, all of these PFAS sources end up in our drinking water.



Unregulated PFAS releases from industrial operations enter the environment through air emissions and discharges to surface water and ground water.

Nutrient-rich materials that remain after wastewater treatment are used on farms as low-cost fertilizers.

Firefighting foams which may contain PFAS are used at airports, military bases and training sites. Runoff containing PFAS migrates through soil into surface and groundwater.

Wastewater from PFAS-contaminated waste may leach from landfills into groundwater or enter surface water; PFAS may remain even after landfill leachate treatment.

New technologies have enabled recent detection of PFAS in drinking water supplies. Water treatment facilities that hadn't previously known of PFAS in their water supplies are determining the most effective treatments for removal.

PFAS continue to be used in common household products such as stain repellents and non-stick cookware. Their use contributes to PFAS exposure in humans and drinking water, source water and ground water.

Source: American Water Works Association

Chapter 3

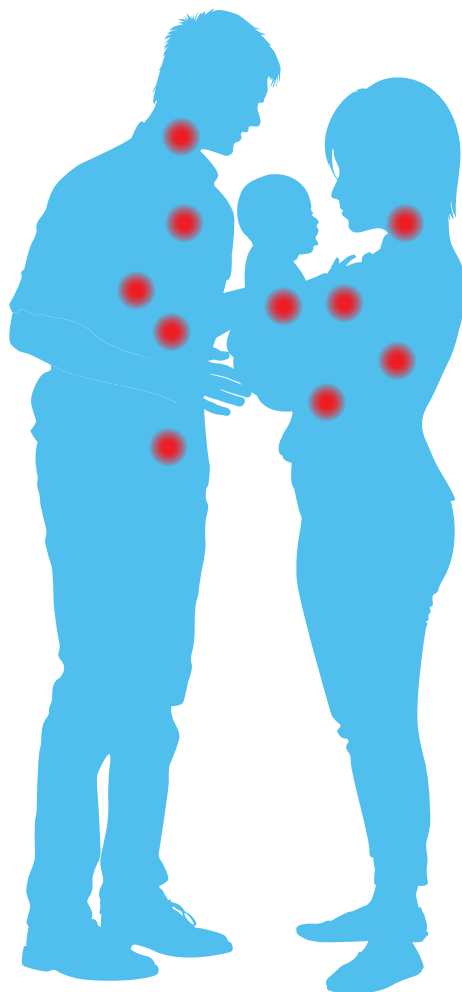
Health Effects of PFAS

PFAS either are, or degrade to, persistent chemicals that accumulate in humans, animals and the environment. This adds to the total burden of chemicals to which people are exposed and increases the risk of health impacts. Of the relatively few well-studied PFAS, most are considered moderately to highly toxic, particularly for children's development.

People most at risk include:

- Those exposed to high levels of PFAS
- Children
- The elderly
- Other vulnerable populations
- Those exposed to low levels of PFAS over a long period of time

PFAS Cause health issues throughout the body.



Cancer

- Breast cancer
- Kidney cancer
- Testicular cancer

Pre- and Post-Natal

- Low birth weight
- Longer time to conceive
- Increased risk of high blood pressure and preeclampsia in pregnant women

Chronic Damage

- Immune system response
- Reduced vaccine response
- Liver damage
- Thyroid disease
- Increased cholesterol levels
- Increased systemic inflammation

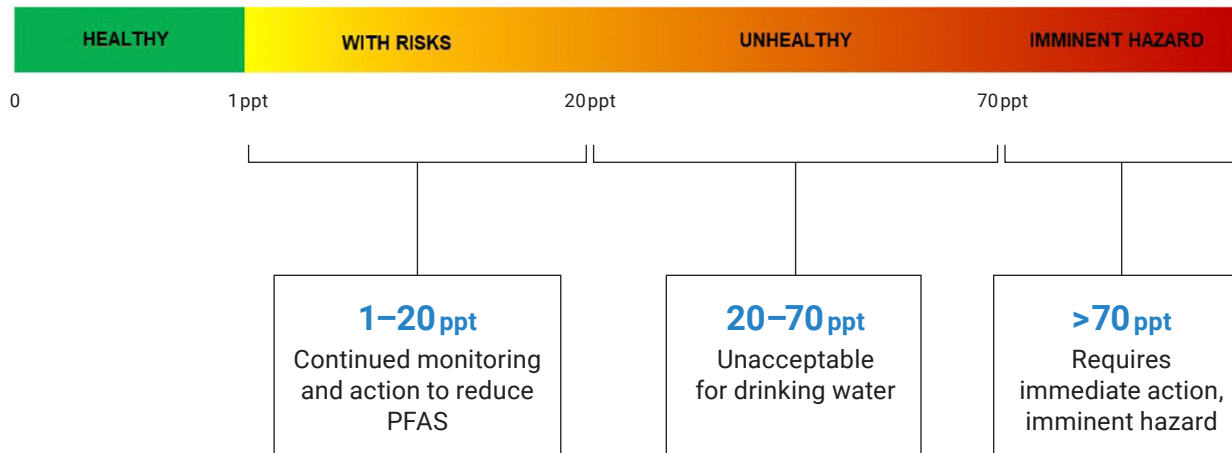
Sources: US National Toxicology Program, (2016); C8 Health Project Reports, (2012); WHO IARC, (2017); Barry et al., (2013); Fenton et al., (2009); and White et al., (2011).

Health Risk Scale for PFAS

When it comes to establishing standards to protect people from the adverse health effects of PFAS in drinking water, New Hampshire and Massachusetts are leading the way in the U.S. by setting Maximum Contaminant Levels for PFAS in water.

The scale below can help you evaluate the impact of PFAS in your well or town.

Health Risk Scale



More and more towns are discovering PFAS in their water supplies.

Any amount of PFAS that accumulates in the body isn't good.

These “forever chemicals” are not going away anytime soon.

Chapter 4

Water Department Action Plans

Public Water Systems (PWS) in most states have just recently been required to test for PFAS contaminants. Some states started testing in 2019, and some are still in the planning stages. Most PWS will not test for PFAS until it's legally required. This is because if PFAS levels exceeding the limits are found in their water system, it triggers a huge formal, state-driven process to ensure the reduction of PFAS levels to meet the requirements for public health protection. This process will take years and cost millions of dollars to implement.

The following example outlines the typical process public water systems must follow when PFAS has been detected in their water supply. The specific process and approval system varies from state to state.



Water Department PFAS Remediation Action Plan

**Estimated time to completion:
2-5 Years**

1. Notification
2. Initial Investigation
3. Preliminary Action
4. Approval of Funding
5. Comprehensive Investigation
6. Solution Selection
7. Approval of Solution Funding
8. Solution Implementation
9. Final Testing/Sign-off



Water Department PFAS Remediation Action Plan

1. Notification Phase

All public water customers will be notified of PFAS in their drinking water, usually by way of a letter mailed to the public water customer's address. The letter states what the PWS knows to date, any actions they have taken and where customers can get more information.

2. Initial Investigation

The PWS usually hires a Licensed Site Professional (LSP) to lead the investigation and keep the PWS in compliance with all the necessary state filings and reviews. This can take a few weeks to a few months – maybe longer, if the PWS does not already have an LSP under contract. The LSP will then review the initial findings and determine several preliminary actions to protect the public.

2. Preliminary Actions

This phase takes the knowledge from the preliminary investigation and defines what is going to be evaluated in the comprehensive investigation. This plan is then reviewed and approved by the state.

These actions almost always involve providing an alternative drinking water source: bottled water. It may be delivered to the home, or you may be able to pick it up at a designated location. Either way, this can be a huge inconvenience. Managing delivery and pick-up schedules and the storage of bottled water can be the biggest impact felt by your family. Bottled water delivery can go on for years in many towns until a permanent solution is implemented. (See more in [Chapter 7](#).)

4. Approval of Funding for Investigation

Most water departments, depending on their governmental structure, will need to seek approval for additional funding from the town. Depending on Town bylaws, either the Town's governing body (Board of Selectmen, City Counsel) will need to approve additional funding, or in some cases, a Town meeting vote may be required.

5. Comprehensive Investigation

This phase of process consists of attempting to determine the party responsible for the PFAS contamination, the extent of the contamination, the sources of contamination, and the potential solutions for remediating the contamination. This is a very long, detailed, process, which can take 12–18 months. This investigation may involve ground water sampling, drilling of test wells and soil sampling. Once all the data is gathered and evaluated, multiple options may be presented to the state for further discussion and evaluation.

6. Select a Solution

Final options are presented and solution to the PFAS problem is selected between all parties (the Engineering Firm, the Town, The Water Department and the State) and the final scope of the project is then finalized.

7. Approval of funding for Solution

Remediation of PFAS by public water systems usually requires

a significant capital outlay. New, specialized treatment equipment will need to be installed. The existing water treatment facility may be large enough to accommodate this new equipment, or a facility expansion may be required. PFAS treatment solutions for public water systems can cost hundreds of thousands of dollars, up to multiple millions of dollars. Again, funding is required to start the next phase of the process.

8. Solution Implementation

Once funding is approved, permits can be applied for and construction can begin on the PFAS Remediation solution. The construction and implementation phase can take 6–18 months to complete.

9. Final Testing and Sign-off

Once the new treatment systems can be brought online, testing will be required to prove the equipment is working as planned and is removing the appropriate levels of PFAS. Final sign-off can be completed by the state and the system can be placed into production.

Chapter 5

Protecting Your Family

Until your public water system implements a PFAS remediation solution, you and your family will continue to be exposed to the harmful effects of PFAS. The good news is that there are steps you can take now to protect your family:

- 1 **Stop drinking water from your faucets.**
- 2 **Don't use ice from your freezer's ice maker.**
- 3 **Don't use the water for cooking.**

These three steps will stop the PFAS from entering and accumulating in your body.

You have a choice:

Option A Rely on bottled water for 3–5 years while you wait for your public water system implements a solution.

Option B Install a home water filtration system to protect your family now.

The comparison chart below provides an overview of bottled water vs. home water filtration. We dive into the details of each of these options on the following pages.

Public vs. Bottled vs. Home Filtration	Public Water	Bottled Water	Filtration (Whole House)
PFAS-free water	Mostly unknown	Not always	Yes
Convenient	Yes	No	Yes
Unlimited healthy water	Never	No	Yes
Environmental impact	No	Plastic waste, manufacturing waste and pollution, transportation pollution	No
Installation cost	No	No	\$1,500–\$3,000
Cost/year (approx.)	\$600	\$1,113*	\$200
Removes other contaminants	No	No	Yes
Removes all contaminants year after year	No	No	Yes

Option A: Bottled Water

Not all brands are PFAS-free Most bottled water companies do a good job of producing a consistent, quality product. A few have voluntarily tested their source water for PFAS and have not found any issues. However, there are brands that have been identified as containing PFAS. If you decide to use bottled water, do your research to find a brand that has been confirmed to be PFAS-free.



The Cost of Bottled Water

The average cost of bottled water is \$1.22 per gallon.

A family of four typically consumes about 2 ½ gallons a day, or just over 912 gallons per year.

That adds up to about \$1,113 per year.

If it takes your public water system 3 to 5 years to install a town-wide filtration system, **you could end up spending as much as \$5,500 dollars or more on bottled water.**

One case at a time, limited pick-up options Some public water systems will provide bottled water at no cost. Usually, you can only get one case at a time, and you must arrive at a designated location (typically your local fire station) at a specific time to pick up your water. You then have to carry your water into your home and distribute it to locations around your house where drinking water is used.

It's a lot to carry Another option is to purchase bottled water at a store. In this case, too, you will still need to load it in your car and lug it into your home, week-after-week.

Bottled Water vs. The Environment*



The entire life cycle of bottled water uses fossil fuels, contributes to global warming, and causes pollution.



More than 17 million barrels of oil are required to produce enough plastic water bottles to meet America's annual demand for bottled water.



According to the Container Recycling Institute, 86% of plastic water bottles used in the U.S. become garbage or litter.

*Source: Harvard University Office of Sustainability

Option B: Home Filtration

Going beyond PFAS removal When we think about home filtration we first need to step back and think about the link between the water we use to drink and bathe, and our family's health. We like to refer to this as the "Water-Health Connection."

Local public water systems remove many contaminants to make water "safe," however the process isn't perfect. **Low levels of contaminants remain in public water, along with disinfection byproducts, which can cause cancer.**

The best way to think about this is that your public water system is legally required to deliver you safe water, but it may not be healthy (without health risks). That difference is allowing contaminants in your water that may be harmful to your family's health.

Home filtration systems remove trace contaminants and disinfection byproducts left behind by public water systems.



► **The Bottom Line** As you review the options for protecting your family from PFAS, consider this: **A home water filtration system provides many benefits in addition to removing PFAS!**

The Challenges of Public Water Systems

1 Legal Limits vs. Cost

A PWS's main focus when treating water is to meet the legal requirements, known as **Maximum Contaminant Levels (MCL)**, for individual contaminants set by the US EPA and state agencies.

The issue with these legal limits is that they are based not only on health, but also on the costs to remove the contaminants.

2 Goals vs. Enforcement

The US EPA and states may also set **Maximum Contaminant Level Goals (MCLG)** for some contaminants, which are levels at which there is no known health risk. MCLGs are typically much lower than the MCLs.

The problem is that MCLGs are not enforceable, so there is no incentive for PWS to meet them. This means there may still be levels of contaminants in your water that can have a negative effect on your health.

3 Bacteria vs. Disinfection Byproducts

After water is run through the treatment plant, it needs to be loaded with disinfectants – typically chlorine and/or ammonia – so it can make it safely to your home through an extensive, aging infrastructure of pipes and pumps. This critical step protects you from harmful bacteria.

The downside is that the added chlorine and ammonia react with natural organic material in the water and form **disinfection byproducts** called Trihalomethanes and Haloacetic Acids.

Many of these disinfection byproducts are known carcinogens and pose significant health risks.

Chapter 6

Home Filtration Systems

There are two categories of home water filtration systems:

Point-of-Entry (POE)

Also known as a “whole house system,” POE filtration is installed in the basement where the water enters your home and filters all the water used in your house.

Point-of-Use (POU)

Usually installed under your kitchen sink and only filters at one location in the home. Options include Reverse Osmosis (RO) and Carbon Block Under Sink Filtration.

This comparison chart outlines the features of POE and POU systems. We break down each of these systems in detail on the following pages.

Point-of-Entry vs. Point-of-Use	POE	POU	
		Reverse Osmosis	Carbon Block
Removes PFAS	Yes	Yes	Yes
Removes disinfection byproducts	Yes	Yes	Yes
Remove other harmful contaminants	Yes	Yes	Yes
Removes foul odor	Yes	Yes	Yes
Unlimited healthy water	Yes	Yes	Yes
Convenient	Yes	Yes	Yes
Size of system	13" x 54"	Compact	Compact
Installation location	Basement/utility/laundry room	Kitchen sink/separate faucet	Kitchen sink/separate faucet
Installation cost	\$1,500–3,000	\$900–\$1,100	\$750
Maintenance cost	\$200	\$100	\$100
Maintenance frequency	Periodic media replacement	Change filters annually	Change filters every 6 months
Environmental concerns	Dispose of spent media properly	Dispose of used filters properly	Dispose of used filters properly
Treats all water/whole house?	Yes	Kitchen faucet only	Kitchen faucet only

Point-of-Entry (POE)



Highly effective Having PFAS in your water can be frightening. Fortunately, PFAS is easily removed with **activated carbon filters**. This filtration technology has been in use for many years and has proven to be highly effective.

No more “swimming pool” odor Have you ever noticed a strong chlorine odor in the water at a hotel or friend’s house—or maybe even in your own home? What you’re smelling are chlorine and disinfection byproducts, which can impact your health and quality of life.

The whole-house carbon advantage The carbon used to remove PFAS also removes chlorine and disinfection byproducts. With a whole-house carbon system, your family will be protected from health risks associated with the accumulation of disinfection byproducts their bodies.

System maintenance Every few years, depending on the PFAS concentration coming into your home, the carbon becomes exhausted (saturated) and will need to be replaced to continue to protect your family’s health over the life course.

Cost vs. benefit The average cost of a POE system, fully installed in your home, ranges between \$1,500–\$3,000, depending on PFAS concentrations. Not inexpensive, but **it is the best solution for protecting your family by delivering the healthiest water throughout your home.**

Showering with public water is even worse than drinking it.

Chlorine is a volatile chemical, which means it vaporizes easily and is readily absorbed through the lungs.

In fact, **8 times more chlorine and disinfection byproducts are inhaled through water vapor in the shower** than are ingested by drinking a single glass of water.

With a whole house POE system, you are not only removing PFAS from your water, you’re also removing disinfection byproducts,



making the water — including the water you shower with — a lot healthier throughout your home.



POE systems provide the maximum protection for your family because they filter all of the water throughout your home.

Point-of-Use (POU)

POU systems are usually installed under the kitchen sink. They have a separate faucet that is mounted next to your kitchen faucet. They may also deliver water to your refrigerator for ice, if that option is available.

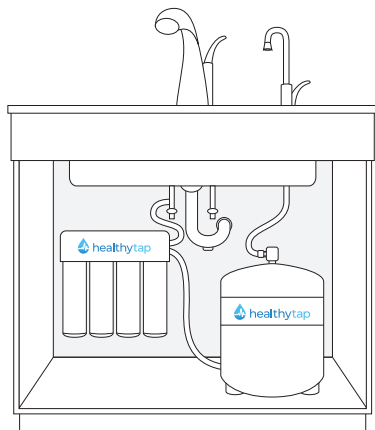
There are two types of POU systems to consider:

- **Reverse Osmosis (RO)**
- **Carbon Block Under Sink Filtration**

Reverse Osmosis Systems (RO)

A comprehensive filtration system Reverse osmosis (RO) systems remove any molecule larger than water (H₂O), including municipal water treatment byproducts, PFAS, lead, sodium and a litany of other harmful contaminants. This is the same technology that bottled water companies like Aquafina and Dasani use in their bottling plants.

A unique technology RO systems leverage your home's water pressure to push water through a membrane which captures contaminants while allowing the water molecules to pass through. Carbon and sediment filters screen out particles prior to the water entering the membrane to maximize efficiency and effectiveness. Once the water has passed through the RO's membrane, a final carbon filter removes any foul odors and improves the water's overall taste.



System maintenance Annual maintenance and filter changes are required to keep the system performing efficiently and effectively to protect your family's health.

RO systems backwash the filters, creating a waste stream that can have concentrated contaminants. It's important to appropriately manage the discharge into a public sewer system.

The filters must also be properly disposed of as they can also contain a build-up of contaminants.

Advantages of RO systems

- Affordable, compact and easy to maintain
- Filter a wide variety of contaminants
- Remove odors and improve the taste of the water

Disadvantages

- Waste stream and filters must be properly disposed of
- Filtered water is only available at the kitchen sink (and refrigerator water dispenser and ice maker, if that option is available)

RO systems are affordable, compact and easy to maintain. They offer a really good "bang for the buck."

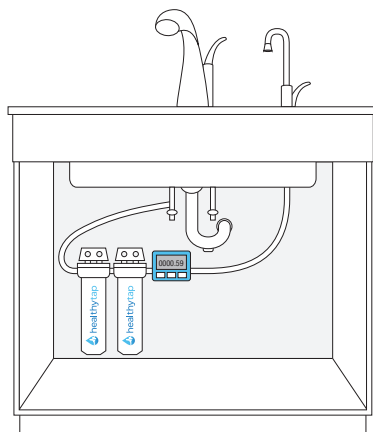


Carbon Block Under Sink Filtration

Cost-effective A dual-stage carbon block filtration system is a cost-effective solution for removing PFAS in your drinking water. Carbon block cartridges consist of granular activated carbon which has been compressed under high heat and pressure to form a carbon block. This block will remove any molecule larger than 0.2 microns, including municipal water treatment byproducts, PFAS and other harmful contaminants. It also improves taste and removes foul odors.

System maintenance

Semi-annual. Unlike RO systems, the carbon block system does not backwash the filters, so regular maintenance is key to the performance of the system.



These filtration systems should be installed with a volume meter to notify you when the filters should be changed.

Advantages of carbon block systems

- Cost effective
- Remove PFAS, disinfection byproducts and other contaminants.
- Remove odors and improve the taste of the water
- No environmental waste stream to discharge

Disadvantages

- Require maintenance (usually every 6 months)
- Filtered water is only available at the kitchen sink.



Carbon block under sink systems are a low cost solution for protecting your family from PFAS.



Taking Action

Let's review what you can do about PFAS in your drinking water. Essentially, you have four options:

Do nothing

You can wait for your local water department to implement a solution, but public water will always have risks.

- **Good health doesn't wait**
- It could take 3–5 years for a town-wide PFAS remediation system to be installed
- Even low levels of PFAS (>1ppt) can have serious health effects
- As we continue to learn more from research on the harmful effects of PFAS-contaminated food and water on our health, we're going to see a growing list of impacts.

Use bottled water

Provides protection from PFAS.

- **Not all brands of bottled water are PFAS-free**
- Ongoing inconvenience of lugging bottled water into your home
- Environmental impact of plastic waste and fossil fuel use in the production of water bottles
- Cost, depending on where your bottled water may be sourced

Install POE water filtration

Provides maximum protection for your family.

- **Healthy water throughout your home**
- Complete protection from PFAS, chlorine disinfectant byproducts and other harmful contaminants
- Healthy, odorless, tasteless water
- Located out of sight in your basement

Install POU water filtration

Reverse Osmosis (RO) and Carbon Block options both provide PFAS-free water.

- **Healthy water from a single faucet**
- Continuous protection from PFAS, chlorine disinfectant byproducts and other harmful contaminants
- Healthy, odorless, tasteless water
- Located under your kitchen sink

You have options. Health doesn't wait. Are you ready for healthy water?

So here's the good news!

You have the power to protect your family's health.

You've already taken the first step by reading this resource to become informed about PFAS and the potential harmful effects they have on your health.

Based on our knowledge and experience from our PFAS Initiative and working with many residents and towns throughout Massachusetts and New Hampshire, **POE and POU filtration are your best options for dealing with PFAS** at the end point—in your home.

We can help.

We are experts in the removal of PFAS and other harmful contaminants from drinking water, with years of experience to back it up. We offer filtration solutions to remove PFAS from your water, so you and your family can have peace of mind.

To learn more about PFAS and filtration options, please contact a member of the SafeWell team today.

► Learn how we can help:

Call **888-450-9355**,
Email **support@safewell.us**,
Visit **safewell.us/pfas-contamination/**
Or click this button:

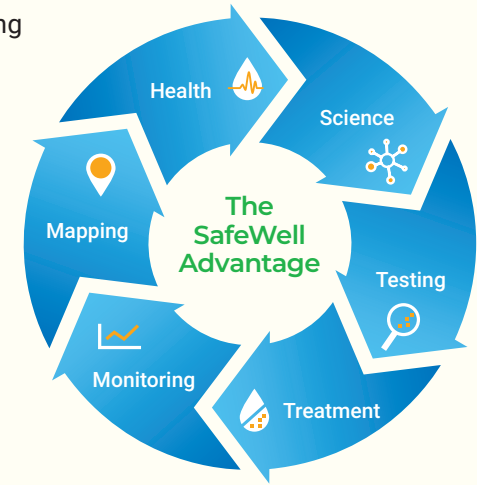
Contact Us



SafeWell's PFAS Initiative

SafeWell is a drinking water protection company with expertise in PFAS removal.

- ✓ We are one of the leading PFAS testing and treatment companies in Massachusetts.
- ✓ We provide solutions.
- ✓ We understand the health risks and the science.
- ✓ We are local.



About the Author



Dan Gaffney is the President of SafeWell Corporation and a leading expert in the science, testing and remediation of PFAS from drinking water. He assists town administrators, well owners, public water users, and companies struggling with the removal of PFAS from their drinking water. His approach is always the same: inform to empower so homeowners have options to protect their family's health. SafeWell's mission is to make sure every tap in America has healthy water. He's not going to let PFAS stand in the way of the mission! Dan can be reached at dgaffney@safewell.us

Why SafeWell?

SafeWell is a drinking water protection company with expertise in PFAS removal.

We're passionate about clean water. Our company grew out of the realization that most people don't typically think much about the quality of their drinking water even though it has a huge impact on their family's health.

SafeWell is the first to offer a continuous active management program, "TotalCare," based on the highest standards in the world for healthy water. Working with standards from the EPA and the Environmental Working Group (EWG) based out of Washington, D.C., we've developed a Residential Water Score system for continuously tracking the quality of your water.

We monitor your water for life and we're there for you with a fleet of water quality specialists 365 days/year.

We love keeping harmful contaminants out of your water!

To learn more about PFAS removal or to talk to a PFAS expert, contact SafeWell today.

Call **888-450-9355**,
Email support@safewell.us,
or visit safewell.us/pfas-contamination/
Or click this button:

Contact Us

**Our Promise:
Not just safe water.
Healthy water.**

