

There are PFAS in my water, what do I do?

If you received your sampling results and you have PFAS ([per and polyfluoroalkyl substances](#)) in your water, you might want to consider alternative options. The following information has been prepared to assist you in making decisions about water treatment options or using bottled water for drinking purposes in your home. If PFAS are in your water, they can be ingested by drinking the water and in other ways, including mixing baby formula or other powdered beverages, cooking applications, and making ice cubes, coffee, and tea. Understanding PFAS and how these chemicals can be removed from water is crucial to having safe drinking water. Boiling your drinking water will not remove PFAS! Boiling your water can increase the concentration of PFAS in the water because PFAS are highly resistant to heat.

Options for removing your exposure to PFAS in your drinking water include:

- [Filters that remove PFAS from your drinking water](#)
- [Using bottled water](#)

What kinds of water filters remove PFAS?

There are many different water filters available, but most filters will not effectively remove PFAS (per and polyfluoroalkyl substances). There are two kinds of water filters that do effectively remove PFAS from drinking water: granular activated carbon (GAC) filters and reverse osmosis (RO) filters.

In GAC filters, water passes through activated carbon particles that removes PFAS by “trapping” the contaminants through a process known as adsorption. Carbon filters can have coal-based carbon (the most common type) or coconut shells as the source of carbon. Not all GAC filters are equally effective at adsorbing PFAS, so it is important to research or ask about removal efficiency of the specific PFAS that are found in your water (see additional information in the following sections). GAC filters can also have pre and post filters that remove solids and other contaminants found in drinking water. At the end of its life cycle, GAC filters are thrown in the trash. It is important to remember that not all carbon filters will remove PFAS from water.

Reverse osmosis treatment is another way to remove PFAS from drinking water. Reverse osmosis membranes do not work well with untreated water. It is typical for water to be prefiltered and/or softened (if necessary) before passing high pressure water through a semipermeable membrane. Treated water is typically sent to a storage tank (size varies) and the contaminants that do not pass through the membrane and are discarded as wastewater. After the storage tank, the water is typically sent through a post filter and then may be treated with ultraviolet (UV) disinfection (to inactivate bacteria and viruses) before it is directed to the faucet as clean drinking water. A storage tank is typically necessary due to the slow rate at which purified water is produced (approximately two to three ounces of water per minute). Without a storage tank, it would take several minutes to fill a glass of water.

For every gallon of treated water produced, RO produces up to four gallons of contaminated water that is discarded as waste. This wastewater is either sent to a wastewater treatment plant or to your septic system. The septic system works by allowing solids to settle to the bottom and fats, oils, and proteins rise to the top. The effluent or gray water is therefore in the middle of the septic tank. Septic systems are designed to release only this gray water into the leach field. Using a RO system will remove PFAS and other contaminants from your drinking water, however the presence of PFAS contaminants in the wastewater may cause PFAS to accumulate in your leach field and re-enter the groundwater.

It is critical to keep up with maintenance of all water filters. Not changing required parts and filters at the end of their life cycle may lead to increased contaminants in your drinking water. Routine maintenance will differ from product to product. Please consult the user’s manual for more information regarding maintenance of your water filtration system.

To the best of our knowledge, this document is accurate as of October 12, 2022.

How do I find a filter that removes PFAS?

The National Sanitation Foundation (NSF) and the American National Standards Institute (ANSI) certifies carbon filters under the standard NSF/ANSI 53 Drinking Water Treatment Units – Health Effects. Manufacturers pay to have their treatment devices tested using protocols in the standard. Part of the standard allows manufacturers to have their treatment systems certified for removal of two PFAS – PFOA and PFOS to a maximum concentration of 70 ppt. The standard also specifies the influent concentrations be approximately 1,500 ppt of PFOA and PFOS. Please be advised that it is possible to have a water treatment device certified under NSF/ANSI 53, but not be certified for removal of PFOA and PFOS. The full list of treatment devices certified by NSF/ANSI 53 for PFOA and PFOS removal can be found [here](#). The salient information is summarized in the sections below.

In addition to the NSF/ANSI 53 certification, several water treatment devices were tested under a research grant by researchers at Duke University and North Carolina State University and published as “*Assessing the Effectiveness of Point-of-Use Residential Drinking Water Filters for Perfluoroalkyl Substances (PFASs)*” ([Herkert et al., 2020](#)). This study looked at removal of not only PFOA and PFOS, but also GEN-X, PFBS, PFHxS, PFBA, PFPA, PFHxA, PFHpA, PFNA, and PFDA. Actual systems installed in homes were tested with varying influent concentrations under non-controlled settings. This study was summarized in a resource document by [the North Carolina Department of Health and Human Services, Division of Public Health \(June 2022\)](#). The salient information from this study is also summarized in the sections below. Please note the tables only include information on water filter models that were able to be verified and for which information could be located.

The USEPA also tested commercially available Point of Use and Point of Entry granular activated carbon and reverse osmosis treatment systems for individual households. Testing was conducted by the USEPA Laboratory in Cincinnati, Ohio using an older NSF standard (P473) for evaluating the reverse osmosis units and ASTM D6586-03 to evaluate the granular activated carbon units. Influent concentrations were simulated to be reflective of a specific aquifer that was contaminated by six PFAS (PFOA, PFOS, PFNA, PFHpA, PFHxS and PFBS). Influent concentrations ranged from 200 ppt to 1600 ppt, depending on the specific PFAS simulated. The study is summarized in “*Effectiveness of Point of Use/Point of Entry Systems to Remove Per- and Polyfluoroalkyl Substances from Drinking Water*” ([Patterson et al., 2018](#)).

It is also recognized that advertisements for some additional water treatment devices claim removal of certain PFAS. Before choosing a filtration device, you should ask for information about the effectiveness of PFAS removal specifically for those compounds detected in your water. The effectiveness is often referred to as the removal efficiency. The following information is provided to assist homeowners, but does not contain an exhaustive list of available devices that are effective and recognizes that additional treatment devices either are or will be available in the future. No endorsement of any product is intended by the compilation of this information.

To the best of our knowledge, this document is accurate as of October 12, 2022.

Filters can be divided into two classes, depending on where they are installed in your home:

- Point of Use (filtration of water at a faucet, refrigerator or other location immediately before the water is used)
 - [GAC water pitcher filter](#)
 - [GAC refrigerator filter](#)
 - [GAC countertop filter](#)
 - [GAC under the sink filter](#)
 - [RO](#)
- Point of Entry (filtration of water as it enters the home)
 - [GAC](#)
 - [RO](#)

Do I need a permit to install Point of Entry treatment on my water system?

Yes. The Ohio Department of Health adopted regulations for private water systems that are enforced by Public Health – Dayton and Montgomery County. Ohio Administrative Code (OAC) Chapter 3701-28 contains rules that apply to all private water systems in the state of Ohio. OAC 3701-28-03(A) requires anyone that alters a private water system obtain a valid permit issued by the Board of Health. The definition of “alters a private water system” is found in OAC 3701-28-01(A)(1) and includes, but is not limited to “adding or changing water treatment”. Contact the [Private Water and Household Treatment System Program](#) of Public Health – Dayton and Montgomery County at (937) 225-4428 for more information on obtaining a permit to install a Point of Entry/whole house treatment system. Also, contact Public Health – Dayton & Montgomery County for plumbing permit requirements at 937-225-4421 or <https://www.phdmc.org/inspection-services/plumbing-inspection>.

Does the person I hire to install treatment need to be registered and bonded?

Yes. The regulations that govern private water systems require all contractors that install water treatment on a private water system be registered with the Ohio Department of Health. According to Ohio Administrative Code (OAC) Chapter 3701-28-18(A)(1), *“only registered contractors may construct, alter, develop, service, repair, install pumping equipment for a private water systems, seal private water systems, drill water wells, install pitless adapters, perform service, maintenance or other repairs to private water system treatment systems, or perform inspections, evaluations, or sampling for hire of private water systems”*. The definition of “alter” a private water system in OAC 3701-28-01(A)(1) includes, but is not limited to, adding or changing water treatment. Further, OAC 3701-28-18(A) requires all private water system contractors to register annually with the Ohio Department of Health and to comply with the surety bonding requirements of section 3701.344 of the Ohio Revised Code (ORC) and the requirements of 3701-28-18. Click [here for information on registered installers](#).

To the best of our knowledge, this document is accurate as of October 12, 2022.

GAC Water Pitcher Filter

A GAC water pitcher filter can effectively remove PFAS from contaminated water. This can be an inexpensive temporary option while looking for other Point of Use or Point of Entry filters. This can also be a permanent option. The size of the water pitchers varies from six cups to five gallons of water. It is critical to replace filters as recommended by the manufacturer.

The National Sanitation Foundation (NSF) and the American National Standards Institute (ANSI) certifies filters under the standard NSF/ANSI 53 Drinking Water Treatment Units – Health Effects. Part of the standard allows manufacturers to have their treatment systems certified for removal of two PFAS – PFOA and PFOS to a maximum concentration of 70 ppt. Please be advised that it is possible to have a water treatment device certified under NSF/ANSI 53, but not be certified for removal of PFOA and PFOS. All the filters listed in the table below are certified by this standard to remove PFOA/PFOS.

GAC Water Pitcher Filters						
Brand	Model	Quantity	Price	Filter Replacement	Filter Life Span	Contact Information
Aquasana	Clean Water Machine	8 cups	\$400	\$60 (2 pack)	300 gallons	(866) 662-6885
Zero Water	6 Cup 5-Stage Water Filter Pitcher	6 cups	\$23.99	\$34.99 (2 pack)	20 gallons	(800) 503-2939
	7 Cup 5-Stage Ready-Pour™ Water Filter Pitcher	7 cups	\$24.99			
	10 Cup 5-Stage Ready-Pour™ Water Filter Pitcher	10 cups	\$34.99			
	12 Cup 5-Stage Ready -Pour™ Water Filter Pitcher	12 cups	\$39.99			
	20 Cup 5-Stage Ready-Pour™ Water Filter Pitcher	20 cups	\$34.99			
	30 Cup 5-Stage Ready-Pour™ Water Filter Pitcher	30 cups	\$44.99			
	5 Gallon Water Cooler 5-Stage Filtration System	5-gallon Water Cooler	\$69.99			
	40 Cup 5-Stage Ready-Pour™ Water Filter Pitcher	40 cups	\$74.99			

To the best of our knowledge, this document is accurate as of October 12, 2022.

GAC Refrigerator Filter

GAC refrigerator filters are relatively inexpensive and require no initial investment if a refrigerator that dispenses water is available. This can be used temporarily or permanently, depending on your water needs. It is critical to replace filters as recommended by the manufacturer.

The National Sanitation Foundation (NSF) and the American National Standards Institute (ANSI) certifies filters under the standard NSF/ANSI 53 Drinking Water Treatment Units – Health Effects. Part of the standard allows manufacturers to have their treatment systems certified for removal of two PFAS – PFOA and PFOS to a maximum concentration of 70 ppt. Please be advised that it is possible to have a water treatment device certified under NSF/ANSI 53, but not be certified for removal of PFOA and PFOS. All the filters listed in the table below are certified by this standard to remove PFOA/PFOS.

GAC Refrigerator Filters Certified by NSF/ANSI 53 for PFOA and PFOS Removal				
Brand	Model	Filter Replacement	Filter Life Span	Contact Information
Hydroviv	Fridge/ icemaker	\$60 (2 pack)	300 gallons	(800) 676-9312
LG	LT1000P	\$55	200 gallons	(800) 243-0000
	LT800P			
	LT700P			

In addition, [Herkert et al. \(2020\)](#) studied various filters and provided removal efficiencies for 11 different PFAS (PFOS, PFOA, Gen-X, PFBS, PFHxS, PFBA, PFPA, PFHxA, PFHpA, PFNA, and PFDA). This information is also summarized in [North Carolina Department of Health and Human Services, Division of Public Health \(June 2022\)](#). Drinking water filters that showed effective removal of PFAS to below a maximum of 2.68 ppt are included in this table.

GAC Refrigerator Filters Tested by Herkert et al. (2020) for PFAS Removal					
Brand	Model	Filter Replacement	Filter Life Span	Removal Efficiency	Contact Information
EcoAqua	EFF-6027A	\$26.99 (3 pack)	6 months or 300 gallons	Average 100% n=2	Sold at lots of venues but not available from manufacturer

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GAC Countertop Filters

Countertop filters connect to the sink faucet and are easy to install. The filter connects directly to the faucet via a brass adaptor (if necessary). The water flows through the filter and filtered water is dispensed from an additional faucet adjacent to the sink faucet. It is critical to replace filters as recommended by the manufacturer.

The National Sanitation Foundation (NSF) and the American National Standards Institute (ANSI) certifies filters under the standard NSF/ANSI 53 Drinking Water Treatment Units – Health Effects. Part of the standard allows manufacturers to have their treatment systems certified for removal of two PFAS – PFOA and PFOS to a maximum concentration of 70 ppt. Please be advised that it is possible to have a water treatment device certified under NSF/ANSI 53, but not be certified for removal of PFOA and PFOS. All the filters listed in the table below are certified by this standard to remove PFOA/PFOS.

Countertop Filters Certified by NSF/ANSI 53 to Remove PFOA and PFOS						
Brand	Model	Flow Rate	Filter Life Span	Price	Filter Replacement	Contact Information
Amway	Espring UV water purifier	0.9 gpm	~1,300 gallons or ~1 year	\$1,100	\$225	(800) 253-6500
Aquasana	Claryum countertop	0.5 gpm	450 gallons or 6 months	\$130	\$60	(866) 662-6885

In addition, [Herkert et al. \(2020\)](#) studied various filters and provided removal efficiencies for 11 different PFAS (PFOS, PFOA, Gen-X, PFBS, PFHxS, PFBA, PFPA, PFHxA, PFHpA, PFNA, and PFDA). This information is also summarized in [North Carolina Department of Health and Human Services, Division of Public Health \(June 2022\)](#). Drinking water filters that showed effective removal of PFAS of at least 82.57 percent and a maximum concentration of 1.1 ppt are included in this table.

Countertop Filters Tested by Herkert et al. (2020) for PFAS Removal							
Brand	Model	Flow Rate	Filter Life Span	Price	Filter Replacement	Removal Efficiency	Contact Information
Pur	PUR PLUS Faucet Filtration System	0.52 gpm	100 gallons or 3 months	\$30	\$16	Average 82.57% n=2	(866) 649-0813

To the best of our knowledge, this document is accurate as of October 12, 2022.

GAC Under Sink Filters

Under sink GAC filters are more expensive than other Point of Use GAC options and may be more difficult to install. Some of these models recommend a qualified person install the unit ([click here for information on registered installers](#)). It is critical to replace filters as recommended by the manufacturer.

The National Sanitation Foundation (NSF) and the American National Standards Institute (ANSI) certifies filters under the standard NSF/ANSI 53 Drinking Water Treatment Units – Health Effects. Part of the standard allows manufacturers to have their treatment systems certified for removal of two PFAS – PFOA and PFOS to a maximum concentration of 70 ppt. Please be advised that it is possible to have a water treatment device certified under NSF/ANSI 53, but not be certified for removal of PFOA and PFOS. All the filters listed in the table below are certified by this standard to remove PFOA/PFOS.

Under Sink Filters Certified by NSF/ANSI 53 to Remove PFOA and PFOS							
Brand	Model	Flow Rate	Filter Life Span	Price	Replacement Filter	Comments	Contact Information
Amway	Espring UV water purifier	0.9 gpm	1,300 gallons or ~1 year	\$1,100	\$225		(800) 253-6500
AO Smith	Clean Water Main Faucet Filter Single-Stage Carbon Block	1.5 gpm	784 gallons or 6 months	\$110	\$80		(833) 232-9711
	AOW-100 - High Flow Faucet Filter	1.5 gpm	4,750 gallons	\$160	\$90		
Aqua - sana	Claryum 3 stage max flow	0.72 gpm	800 gallons or 6 months	\$450	\$80		(866) 662-6885
	Claryum 3 stage	0.5 gpm	600 gallons or 6 months	\$350	\$70		

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Aqua - sana	Claryum 2 stage	0.5 gpm	500 gallons or 6 months	\$250	\$60		(866) 662-6885
	Claryum direct connect	1.5 gpm	784 gallons or 6 months	\$250	\$80		
Hydro - viv	Under Sink Water Filter	1 gpm	6 months	\$400	\$115	State they design a water filter based on water quality of area	(800) 676-9312
Kine- tico	KPMF HC610	2.8 gpm	2,000 gallons	NA	NA	Offer free water test and state they design a water filter based on individuals results but do not provide prices on their website	(800) 944-9283
Kine- tico	KPMF HC620	2.8 gpm	5,700 gallons	NA	NA	Offer free water test and state they design a water filter based on individuals results but do not provide prices on their website	(800) 944-9283
Multi- pure	Aqua-perform	1.0 gpm	600 gallons	\$590-\$759	\$145		(702) 360-8880

In addition, [Herkert et al. \(2020\)](#) studied various filters and provided removal efficiencies for 11 different PFAS (PFOS, PFOA, Gen-X, PFBS, PFHxS, PFBA, PFPA, PFHxA, PFHpA, PFNA, and PFDA). This information is also summarized in [North Carolina Department of Health and Human Services, Division of Public Health \(June 2022\)](#). Drinking water filters that showed effective removal of PFAS of at least 99 percent and a maximum concentration of 4.9 ppt are included in this table.

To the best of our knowledge, this document is accurate as of October 12, 2022.

Under Sink Filters Tested by [Herkert et al. \(2020\)](#) for PFAS Removal

Brand	Model	Flow Rate	Filter Life Span	Price	Replacement Filter	Removal Efficiency	Comments	Contact Information
GE®	Twist and Lock Under Counter Dual Flow Water Filtration System	1.1 gpm	6 months	\$120	\$55	100% n=1		(877) 959-8688
Whirlpool	WHEM B40	0.74 gpm	350 gallons or 6 months	\$215	\$120	99% n=1		(866) 986-3223

To the best of our knowledge, this document is accurate as of October 12, 2022.

Reverse Osmosis Point of Use

Reverse osmosis (RO) removes PFAS and other contaminants. However, these units can be expensive and concentrate contaminants (including PFAS) in the wastewater. RO units typically require additional water softening due to the build-up of scale on the RO membrane. Performing descaling maintenance regularly will increase the life of the RO membrane. Constantly filtering hard water will wear out the RO membrane quicker than softened water. For this reason, many of these units recommend a water softener be installed in tandem with a RO unit. It is critical to perform maintenance as recommended by the manufacturer.

Note that some RO units produce alkaline water. Alkaline water is not known to impact PFAS removal, but you should consult a healthcare professional if you have any concerns.

The National Sanitation Foundation (NSF) and the American National Standards Institute (ANSI) certifies RO filters under the standard NSF/ANSI 58-Reverse Osmosis Drinking Water Treatment Systems. Part of the standard allows manufacturers to have their treatment systems certified for removal of two PFAS – PFOA and PFOS to a maximum concentration of 70 ppt. Please be advised no RO systems have been certified under NSF/ANSI 58 for removal of PFOA and PFOS. However, two RO systems have been certified under NSF/ANSI 53 as having a RO and carbon filtration combination that removes PFOA and PFOS. All the filters listed in the table below are certified by NSF/ANSI 53 to remove PFOA/PFOS.

Point of Use Reverse Osmosis Units Certified by NSF/ANSI 58 to Remove PFOA and PFOS						
Brand	Model	Price	Filter Life Span	Filter Replacement	Comments	Contact Information
A. O. Smith	AOW-3000	\$200	12 to 24 months for RO, 6 to 12 months for carbon and claryum filter	\$150	0.8 gallons/minute flow rate	(880) 527-1953
Aquasana	OptimH2O reverse osmosis + claryum*	\$500	Varies	\$380 (Yearly Maintenance)	Aquasana OptimH2O recommends using a qualified installer to ensure proper installation Estimated yearly maintenance, accounts for pre and post filter, RO membrane cartridge, and mineralizer	(866) 662-6885

To the best of our knowledge, this document is accurate as of October 12, 2022.

In addition, [Herkert et al. \(2020\)](#) studied various filters and provided removal efficiencies for 11 different PFAS (PFOS, PFOA, Gen-X, PFBS, PFHxS, PFBA, PFPA, PFHxA, PFHpA, PFNA, and PFDA). This information is also summarized in [North Carolina Department of Health and Human Services, Division of Public Health \(June 2022\)](#). All drinking water filters showed effective removal of PFAS of 100 percent. The table includes only the units that could be found for commercial sale.

Point of Use Reverse Osmosis Units Tested by Herkert et al. (2020) for PFAS Removal						
Brand	Model	Price	Filter Life Span	Filter Replacement (Estimated Maintenance Cost)	Comments	Contact Information
Aquatru	Countertop reverse osmosis purifier classic	\$449 or \$499	Varies	\$170 2 year cost	The \$499 model (Aquatru connect) connects to WiFi to show telemetry from system	(800) 220-6570
	Countertop reverse osmosis purifier alkaline classic	\$469 or \$519	Varies	\$270 2 year cost	The \$519 model (Aquatru Alkaline, Connect) connects to WiFi to show telemetry from system	
	Under Sink Reverse Osmosis Water Purifier	\$349 or \$369	Varies	\$170 2 year cost or \$270 2 year cost	Recommends qualified personnel for installation The \$369 model (Aquatru Alkaline Under Sink) makes alkaline water	
Culligan	Aqua-Cleer® Advanced Under Sink Water Filtration System	Contact local dealer for pricing	Varies	Contact local dealer for pricing	Culligan offers free water testing for optimal water filtration and will test for chlorine, hardness, iron and nitrates free of charge. Pricing could not be guaranteed contact Culligan water of Dayton at (937) 294-0375 Recommends qualified personnel for installation	(877) 535-1104

To the best of our knowledge, this document is accurate as of October 12, 2022.

Ecowater	Ero 375 or Hero 375Plus	Contact local dealer for pricing	Varies	Yearly fee is ~\$325 subject to change	Recommends qualified personnel for installation Plus model only differs due to WiFi connectivity Pricing could not be guaranteed contact either Dayton Soft Water at (937) 461-5900 or Greene County Soft Water at (937) 675- 2064	(800) 808-9899
Ecowater	Ero 385 or Hero 385Plus	Contact local dealer for pricing	Varies	Yearly fee is ~\$325 subject to change	Recommends qualified personnel for installation Plus model only differs due to WiFi connectivity Pricing could not be guaranteed contact either Dayton Soft Water at (937) 461-5900 or Greene County Soft Water at (937) 675- 2064	(800) 808-9899
Kinetico	K-5 Drinking water station	~\$5,000	Varies	Contact local dealer for pricing	Price includes free H2O test, water softener (\$2,000), RO unit (\$3,000+) and installation of the system Contact Integrity H2O solutions at (937) 320-7460	(800) 944-9283
Puronic	Micromax 7000 Reverse Osmosis Drinking Water System	Contact local dealer for pricing	Varies	Contact local dealer for pricing		(866) 649-0813

To the best of our knowledge, this document is accurate as of October 12, 2022.

In addition, [Patterson et al. \(2018\)](#) studied various filters and provided removal efficiencies for six different PFAS (PFOS, PFOA, PFNA, PFHpA, PFHxS, and PFBS). The results for all filters tested are presented below.

Point of Use Reverse Osmosis Units Tested by Patterson et al. (2018)							
Brand	Model	Price	Filter Life Span	Filter Replacement	Comments	Removal Efficiency*	Contact Information
Flexeon	LP-700	\$1,585.87	Varies	\$563.50	Available from several vendors	100%	Not Available
HydroLogic	Evolution RO1000	Contact local dealer for pricing	Varies	Contact local dealer for pricing		96.5%	(888) 426-5644
iSpring	iSpring RCS5T 500 GPD Residential and Light Commercial Tankless Reverse Osmosis Water Filter System	\$650	Varies	\$279 two year supply bundle from website		100%	(678) 801-9308

To the best of our knowledge, this document is accurate as of October 12, 2022.

Point of Entry GAC

Point of Entry or whole house granular activated carbon (GAC) units are the most cost-effective option for removing PFAS from all water used in your home. However, it is important to remember that whole house water treatment units must be installed by [a registered private water systems contractor](#) through the state of Ohio and the contractor must apply for a permit at Public Health – Dayton and Montgomery County that currently costs \$180. The permit fee does not include the cost of installation, which will vary depending on filtration system and existing plumbing. It is critical to perform maintenance as recommended by the manufacturer. Also contact Public Health – Dayton & Montgomery County for plumbing permit requirements at 937-225-4421 or <https://www.phdmc.org/inspection-services/plumbing-inspection>.

The National Sanitation Foundation (NSF) and the American National Standards Institute (ANSI) certifies filters under the standard NSF/ANSI 53 Drinking Water Treatment Units – Health Effects. Part of the standard allows manufacturers to have their treatment systems certified for removal of two PFAS – PFOA and PFOS to a maximum concentration of 70 ppt. Please be advised that it is possible to have a water treatment device certified under NSF/ANSI 53, but not be certified for removal of PFOA and PFOS. All the filters listed in the table below are certified by this standard to remove PFOA/PFOS.

Whole House GAC Filtration Certified by NSF/ANSI 53 to Remove PFOA and PFOS							
Brand	Model	Flowrate	Filter Life Span	Price	Replacement Filter (Estimated Maintenance Costs)	Comments	Contact Information
Aquasana	OptimH2O*	8.0 gpm	100,000 gallons	\$3,598-\$6,436	\$700	Estimated yearly maintenance, accounts for pre and post filter and optional UV lamp replacement	(866) 662-6885
Culligan	Aquasential™ Select Series™ and Select Plus Series™ Whole House Water Filters	Varies	Varies	Contact Culligan water of Dayton at (937) 294-0375	Varies	The base unit does not include the GAC filtration, this must be requested during consultation	(877) 535-1104

*Certified under old NSF Standard P473 with 98.2% removal of PFOS and PFOA

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In addition, [Herkert et al. \(2020\)](#) studied various filters and provided removal efficiencies for 11 different PFAS (PFOS, PFOA, Gen-X, PFBS, PFHxS, PFBA, PFPA, PFHxA, PFHpA, PFNA, and PFDA). This information is also summarized in [North Carolina Department of Health and Human Services, Division of Public Health \(June 2022\)](#). All drinking water filters showed effective removal of PFAS of 100 percent. The table includes only the units that could be found for commercial sale.

Whole House GAC Filtration Tested by Herkert et al. (2020) for PFAS Removal							
Brand	Model	Flowrate	Filter Life Span	Price	Replacement Filter (Estimated Maintenance Cost)	Comments	Contact Information
Aquasana	EQ-1000 (Rhino 1,000,000)	11.8 gpm	1,000,000 gallons or 10 years	\$1,898-\$4,935	\$240	Estimated yearly maintenance, accounts for pre and post filter and optional UV lamp replacement	(866) 662-6885

To the best of our knowledge, this document is accurate as of October 12, 2022.

Point of Entry Reverse Osmosis

Point of Entry or whole house reverse osmosis (RO) units remove PFAS and other contaminants. However, these units can be expensive and have a low-volume flow that requires a water storage tank for storing treated water when demand exceeds the flow rate of the unit. RO units purify the water by forcing water through a semi-permeable membrane and discharging the contaminants (including PFAS) as a concentrated wastewater. The concentrated wastewater is discharged to the sewer or a household disposal sewage system. If the concentrated wastewater is discharged to a household sewage disposal system, it will discharge to the leach field and infiltrate toward the groundwater. Most RO units are installed with a pre-filter and UV lamp to protect the RO membrane and a post filter for polishing purposes. It is important to remember that whole house water treatment units must be installed by [a registered private water systems contractor](#) through the State of Ohio and the contractor must apply for a permit that currently costs \$180. It is critical to perform maintenance as recommended by the manufacturer.

The National Sanitation Foundation (NSF) and the American National Standards Institute (ANSI) certifies RO filters under the standard NSF/ANSI 58-Reverse Osmosis Drinking Water Treatment Systems. Please be advised no RO systems have been certified under NSF/ANSI 58 for removal of PFOA and PFOS.

[Herkert et al. \(2020\)](#) studied various filters and provided removal efficiencies for 11 different PFAS (PFOS, PFOA, Gen-X, PFBS, PFHxS, PFBA, PFPA, PFHxA, PFHpA, PFNA, and PFDA). This information is also summarized in [North Carolina Department of Health and Human Services, Division of Public Health \(June 2022\)](#). Only one whole house RO unit could be found for commercial sale. The RO filter in the table below showed effective removal of PFAS of 100 percent.

Point of Entry Reverse Osmosis Unit Tested by Herkert et al. (2020) for PFAS Removal					
Brand	Model	Price	Filter Life Span	Filter Replacement	Contact Information
Ecowater	Softener + Reverse osmosis	Pricing could not be guaranteed. Contact either Dayton Soft Water at (937) 461-5900 or Greene County Soft Water at (937) 675-2064	Varies	Contact dealers for pricing	(800) 808-9899

To the best of our knowledge, this document is accurate as of October 12, 2022.

Registered Contractors

Below is a list of registered private water systems contractors from Montgomery County and surrounding counties (downloaded August 24, 2022). The complete list of registered contractors in Ohio can be found [here](#). The table below provides a listing from the Ohio Department of Health for contractors that indicated the ability to install water treatment systems. The inclusion of a contractor on this list does not guarantee that a contractor will perform installation of these systems.

The installation of a Point of Entry water treatment system to treat water received from a private water system (water well, spring, pond, rainwater cistern or hauled water storage tank) will require an installation permit from [Public Health-Dayton and Montgomery County](#). These treatment systems may only be installed by a private water systems contractor registered by the Ohio Department of Health. Also, contact Public Health – Dayton & Montgomery County for plumbing permit requirements at 937-225-4421 or <https://www.phdmc.org/inspection-services/plumbing-inspection>.

Registered Private Water Systems Contractors (downloaded 8/24/22)				
County	Contractor	Address	Phone Number	Email address
Butler	Butler Water Systems, LLC	4851 Pleasant Ave., Fairfield, OH-45014	(513) 863-5700	art@butlerwatersystems.com
Butler	North Fork Excavating	7863 N Fork Ln., Okeana, OH-45053	(513)535-3997	
Butler	Yaeger Well Drilling and Pumps	4351 W. Elkton Rd., Hamilton, OH-45011	(513) 726-5153	
Clark	Blessing Pump Service, Inc.	P O Box 1502, Springfield, OH-45501		blessingwater@sbcglobal.net
Clark	Crabtree Pump, Ltd.	3882 Snyder-Domer Rd., Springfield, OH-45502	(937) 969-8592	crabtreepumpltd@gmail.com
Clark	Delaney Plumbing & Heating, LLC	6 Sprague Rd., South Charleston, OH- 45368	(937) 605-8822	rdelaney8@yahoo.com

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County	Contractor	Address	Phone Number	Email address
Clark	Dooley Service Pro	627 High E St., Springfield, OH-45505	(937) 323-1703	info@dooleyservicepro.com
Clark	Gothard Pump	4915 Lower Valley Pike, Springfield, OH-45506	(937) 322-7242	
Clark	Hamilton & Sons	9449 Milton Carlisle Rd., New Carlisle, OH-45344	(937) 845-0425	hamiltondrilling@aol.com
Clark	Phares Pumps & Rentals, Inc.	10865 Shorey Rd., South Vienna, OH-45369	(937) 828-1404	bphares@pharesh2o.com
Clark	Ron McCarty Pump Service	P O Box 1733, Springfield, OH-45501	(937) 323-7867	mccartypump@yahoo.com
Darke	Brocius Plumbing, Heating & AC, LLC	4633 Red River West Grove Rd., Arcanum, OH-45304	(937) 447-7722	brocius.plbg2@gmail.com
Darke	North Star Plumbing, Heating & Cooling Inc	P O Box 70, North Star, OH-45350	(419) 336-5103	info@nspnc.com
Darke	Quinter Well Drilling LLC	PO Box 97, Burkettsville, OH-45310	(419) 375-4560	
Greene	Boone Water Systems, Inc.	1001 Van Eaton Rd., Xenia, OH-45385	(937) 376-4572	boonedrill@yahoo.com
Greene	Integrity Water Solutions, LLC	3870 Indian Ripple Rd., Dayton, OH-45440	(937) 320-7460	jwilson@integritywtr.com
Greene	Mark's Plumbing Service LLC	1476 Parkman Pl., Beavercreek, OH-45434	(937) 429-8815	mtaylor06@gmail.com
Greene	Massie Creek Enterprises, LLC	3980 Patterson E Rd., Beavercreek, OH-45430	(937) 469-2032	massiecreekplumbing@gmail.com
Greene	Narrow Path Plumbing LLC	2960 Enon W Rd., Xenia, OH-45385	(937) 623-2619	contact@narrowpathplumbing.com
Greene	Rain Brothers, LLC	4535 Meredith Rd., Yellow Springs, OH-45387	(937) 949-1100	info@rainbrothers.com
Miami	Browning Plumbing, LLC	205 Hemm Rd., Piqua, OH-45356		

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County	Contractor	Address	Phone Number	Email address
Miami	Glaser Softwater, Inc.	939 Main W St., Tipp City, OH-45371	(937) 667-3846	glaser@glasersoftwater.com
Miami	Hall and Jenkins Well Drilling	5120 S. Dayton-Brandt Rd., New Carlisle, OH-45344	(937) 773-8080	
Miami	Wayne E Wagner Plumbing & Heating Inc.	P O Box 279, Troy, OH-45373	(937) 339-1392	
Montgomery	All Drain Ohio, LLC	2031 Valley Pike, Dayton, OH-45404	(937) 236-2845	luke@alldrainedayton.com
Montgomery	Riddle Well Drilling and Excavating	7347 Upper Miamisburg Rd., Miamisburg, OH-45342	(937) 833-6514	
Montgomery	Roto-Rooter Services Company	9490 Byers Rd., Miamisburg, OH-45342	(937) 353-7093	cathy.lamb@rrsc.com
Montgomery	Spartan Plumbing, LLC	446 Windsor Park Dr., Dayton, OH-45459	(937) 238-8620	info@spartan-plumbing.com
Preble	Barrett Well & Pump LLC	5790 Gratis Rd., Camden, OH-45311	(937) 787-3055	barrettwater@gmail.com
Preble	Beery's Better Water	9312 New Paris Hillsboro Rd., New Paris, OH-45347	(937) 423-9765	adam.beeryservices@gmail.com
Preble	Custom Fit Plumbing LLC	225 Wayne Ave., Eaton, OH-45320	(937) 340-4441	customfitplumbing@yahoo.com
Preble	Preble County Plumbing	P O Box 292, Eaton, OH-45320	(269) 998-4630	flowerfielded@gmail.com

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What is bottled water?

The United States Food and Drug Administration (FDA) describes bottled water as water that is intended for human consumption and sealed in bottles or other containers with no added ingredients, except that it may contain safe and suitable antimicrobial agents. Fluoride may also be added within the limits set by the FDA. Bottled water is regulated under the federal Food, Drug, and Cosmetic Act as a food.

How safe is bottled water?

The FDA established the Current Good Manufacturing Practices (CGMPs) for bottled water producers to have sanitary conditions during processing, bottling, holding, and transportation. These standards also require bottled water producers to adopt quality control processes, protect water sources, and test source water and finished water. Some of the common FDA classifications for bottled water are:

- Purified water - water has passed through a filter to remove impurities but does not guarantee that the water is contaminant free,
- Mineral water - water from an underground source and must contain 250 parts per million (ppm) total dissolved solids which comes from the source and is not added later,
- Spring water - water from an underground formation that naturally flows to the surface, and
- Well water - groundwater from an aquifer.

Some bottled water is also supplied directly from municipal water supplies. However, bottlers may filter the water to their specifications before bottling the water.

Water naturally has impurities that could potentially be hazardous to human health, but not all impurities are considered contaminants. However, PFAS are contaminants and potentially impact human health. A study done by Johns Hopkins University, and [Chow et al. \(2021\)](#), found 39 out of 101 unique bottled waters in the United States contained PFAS. Of the 32 PFAS sampled, 15 PFAS were found with concentrations ranging from 0.17 ppt to 18.87 ppt.

[Consumer Reports \(2020\)](#) tested 47 bottled waters for 30 different PFAS. The testing by Consumer Reports (2020) included 35 non-carbonated waters and 12 carbonated ones. Of the 35 non-carbonated waters tested, only three brands (Arrowhead, Boxed Water is Better, and Good & Gather) were found to not contain detectable levels of PFAS. With regard to the remaining 32 brands, according to Consumer Reports (2020), 30 of the brands had detectable levels of PFAS below 1 ppt, and the remaining two –

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Tourmaline Spring and Deer Park exceeded 1 ppt of PFAS. Deer Park Natural Spring Water had 1.21 ppt of PFAS and Tourmaline Spring Sacred Living Water had 4.46 ppt of PFAS.

With regard to the 12 carbonated brands Consumer Reports (2020) tested, only Sparkling Ice Black Raspberry Sparkling Water had no detectable PFAS. Four of the brands had PFAS less than 1 ppt of PFAS ranging from 0.19 ppt to 0.58 ppt. The remaining seven brands had concentrations of PFAS in excess of 1 ppt with concentrations ranging from 1.1 ppt to 9.76 ppt.

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How do I find PFAS free bottled water?

There are many treatment options for water that remove different impurities from water. Two effective treatments to remove PFAS include: GAC (granular activated carbon) and RO (reverse osmosis). Bottled water companies may choose to release a water quality report that can be as extensive as the manufacturer desires. Some brands test for PFAS annually. Listed below are a selection of bottling companies. The table shows whether the brand uses RO and/or GAC filtration. The table also shows whether the brand has an accessible water quality report and whether the brand tests for PFAS.

Bottled Water						
Brand	Detectable PFAS as tested by Consumer Reports (2020)	Does the Brand Have a Water Quality Report?	Does the Brand Have a Report that shows it Tests for PFAS?	RO	GAC	Contact
Aquafina	Yes <1ppt	Yes	No	Yes	No	(800) 433-2652
Arrowhead Spring Water	No	Yes	Yes	No	No	(800) 873-7775
Dasani	Yes <1ppt	No	No	Yes	Yes	(800) 520-2653
Deer Park Spring Water	Yes 1.21ppt	Yes	Yes	No	No	(800) 288-8281
Essentia	Yes <1ppt	Yes	No	Yes	Yes	(877) 293-2239
Evian	Yes <1ppt	Yes	Yes	No	No	(800) 633-3363
Fiji	Yes <1ppt	Yes	No	No	No	NA
Icelandic**	NA	Yes	No	No	No	(424) 201-6800
Ice Mountains Spring Water	Yes <1ppt	Yes	Yes	No	No	(800) 678-4423
Just	Yes <1ppt	Yes	No	Unknown	Unknown	(855) 282-5878
Mountain Valley Spring Water**	NA	Yes	Yes	No	No	NA
Nestle Pure Life Purified Water	Yes <1ppt	Yes	Yes	Yes	No	(866) 599-8980
Niagara Purified Water*	Yes <1ppt	Yes	Yes	Yes	Depends on source	(877) 487-7873
Origin Spring Water**	NA	Yes	Yes	No	No	(866) 599-8980
Ozarka Spring Water	Yes <1ppt	Yes	Yes	No	No	(800) 678-4448
Poland Spring Spring Water	Yes <1ppt	Yes	Yes	No	No	(800) 477-7464
Saratoga Spring Water	Yes <1ppt	Yes	Yes	No	No	NA
Voss	NA	Yes	No	No	No	(212) 995 2255
Zephyrhills	Yes <1ppt	Yes	Yes	No	No	(800) 695-4446

*Niagara Bottling LLC produces private labels for Walmart sold as Great Value, Sam's Club sold as Member's Mark, Costco sold as Kirkland Signature, and Safeway Inc sold as Signature Select.

**Not included in [Consumer Reports \(2020\)](#).

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