Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection
One Winter Street Boston, MA 02108 • 617-292-5500

Charles D. Baker
Governor

Karyn E. Polito
Lieutenant Governor

Matthew A. Beaton
Secretary

Martin Suuberg
Commissioner

Date: April 17, 2019

Dear Public Water Supplier:

This notice provides important updated information regarding MassDEP's efforts to address Per- and Polyfluoroalkyl Substances (PFAS) and provides guidance on health protective limits for these chemicals in drinking water.

MassDEP PFAS Updated Information

Per- and polyfluoroalkyl substances (PFAS) are a family of chemicals used since the 1950s to manufacture stain-resistant, water-resistant, and non-stick products. PFAS are widely used fire-fighting foams and in common consumer products as coatings, on food packaging, outdoor clothing, carpets, leather goods, ski and snowboard waxes, and more. PFAS in drinking water is an important emerging issue nationwide.

The United States Environmental Protection Agency (EPA) in 2016 published a drinking water Health Advisory Level for two of the PFAS compounds (Perfluorooctanesulfonic acid, PFOS, and Perfluoroocatanoic acid, PFOA) combined at 0.070 micrograms per liter (ug/L) or 70 parts per trillion (ppt). In June 2018, MassDEP issued an Office of Research and Standards guideline (ORSG) for drinking water of 70 ppt for PFOA, PFOS, PFNA (Perfluorononanoic acid), PFHxS (Perfluorohexanesulfonic acid) and PFHpA (Perfluoroheptanoic acid) combined. The three additional PFAS were included because they share very similar chemical structures and the available data indicates they are likely to exhibit similar toxicities. The ORSG was established to be protective against adverse health effects for all people consuming the water for a lifetime and is also applicable to shorter-term exposures of weeks to months during pregnancy and breast-feeding.

Based on the current ORSG, MassDEP has recommended that:

1) consumers in sensitive subgroups (pregnant women, nursing mothers and infants) not consume water when the level of the five PFAS substances, individually or in combination, is above 70 ppt; and,

2) public water suppliers take steps expeditiously to lower levels of the five PFAS, individually or in combination, to below 70 ppt for all consumers.

As part of the agency's efforts to address PFAS compounds, MassDEP has continued to review the current scientific information, studies and assessments on PFAS. Some of these include the federal Agency for Toxic Substances and Disease Registry (ATSDR) Toxicological Profile for Perfluoroalkyls; EPA Health Effects Support and Drinking Water Health Advisory documents for PFOA and PFOS; the National Toxicology Program (NTP) Monograph, Immunotoxicity Associated with Exposure to PFOA; the December 2018 European Food Safety Authority publication on risks attributable to PFOS and PFOA in food; and recent published research and various assessments by agencies in other states.

Based on this evaluation, MassDEP is undertaking the following actions:

1) MassDEP is proposing draft amendments to the Massachusetts hazardous waste cleanup regulations (the Massachusetts Contingency Plan or "MCP"), that include groundwater and soil cleanup standards. Consistent with the proposed ORSG level described below, the proposed Method 1 GW-1 Standard – applicable to groundwater protected for its current and/or future use as drinking water – is 20 ppt for the 5 compounds noted above plus Perfluorodecanoic acid (PFDA)(six total).
2) MassDEP's Office of Research and Standards is convening its Health Effects Advisory Committee to provide scientific input on the technical basis of the proposed MCP standards and their implication regarding a potential revised ORSG with a limit of 20 ppt for the sum of the 6 PFAS compounds.
3) MassDEP also recently initiated the process to develop a drinking water standard for public drinking water systems, known as a Maximum Contaminant Level (MCL), for the six PFAS compounds. This forthcoming MCL will be promulgated under the Commonwealth's standard regulation development process, including a public comment period. MassDEP seeks to align the forthcoming MCL with the MCP GW-1 standard and any revised ORSG. In April 2019, the agency launched s stakeholder process to obtain input into the MCL development. Information on this MCL development effort, including information on upcoming stakeholder meetings, can be found at https://www.mass.gov/lists/development-of-a-pfas-drinking-water-standard-mcl.

MassDEP is accepting comment on the draft MCP regulations until July 19, 2019, including the proposed PFAS cleanup standards. Any comments received on the proposed MCP GW-1 standard will also be considered by the Department in the revision of the ORSG and the forthcoming MCL. MassDEP will keep all PWS informed on PFAS MCL development, including opportunity for public comment.

PFAS has multi-media impacts and MassDEP has initiated several actions across different media programs. These actions are described on our webpage at https://www.mass.gov/info-details/per-and-polyfluoroalkyl-substances-pfas and include the following:

- Requiring testing of drinking water sources that are proximal to known or potential sources of PFAS. As of today, MassDEP has been working with 13 of 1,729 public water systems to address PFAS related issues, and all systems with PFAS detects are shown on the webpage and all PFAS data is available on the data portal at https://eeaonline.eea.state.ma.us/portal#!/home .
- Testing new sources of drinking water during the source approval process.
- Approving laboratories for PFAS analysis.
- Conducting a fire-fighting foam [Aqueous Film-Forming Foam (AFFF)] collection and disposal program. As of April 2019, MassDEP and the Mass Dept. of Fire Services has collected and disposed of 149,000 pounds of pre-2003 foam.
- Initiated a program for Massachusetts permitted bottled water companies for voluntarily report PFAS testing of bottled water. See the current list of Massachusetts permitted Bottled Water companies that have voluntarily provided MassDEP with their results for posting at bottled water companies.
- Requiring the testing of residuals for PFAS. As of January 2019, MassDEP is requiring PFAS sampling & analysis for new and renewed land application approvals for residuals.

What should you do with this updated information?

If you have not been contacted by MassDEP's Drinking Water Program with specific instructions for your system, you do not have to take any action at this time. However, we encourage you to learn about PFAS, and to follow and engage in the PFAS MCL development process. See https://www.mass.gov/lists/development-of-a-pfas-drinking-water-standard-mcl for information on the PFAS MCL process. If you have been contacted by MassDEP's Drinking Water Program with specific requirements or recommendations for your system, follow the instructions provided.

For more information about PFAS in drinking water see:

- MassDEP webpage https://www.mass.gov/info-details/per-and-polyfluoroalkyl-substances-pfas
- MassDEP Fact Sheet – PFAS in Drinking Water: Questions and Answers for Consumers https://www.mass.gov/doc/massdep-fact-sheet-pfas-in-drinking-water-questions-and-answers-for-consumers
- USEPA's Drinking Water Health Advisories can be found at: https://www.epa.gov/ground-water-and-drinking-water/drinking-water-health-advisories-pfoa-and-pfos
- The Centers for Disease Control and Prevention's Public Health Statement for PFOS and PFOA can be found at: https://www.atsdr.cdc.gov/pfas/index.html
- For additional information on possible health effects, you may contact the Massachusetts Department Environmental Protection, Office of Research and Standards, at 617-556-1165.

We encourage you to read the MassDEP Factsheets: "PFAS in Drinking Water: Questions and Answers for Consumers" located at https://www.mass.gov/doc/massdep-fact-sheet-pfas-in-drinking-water-questions-and-answers-for-consumers and the attached "Per- and Polyfluoroalkyl Substances (PFAS) in Public Drinking Water Supplies - Questions and Answers for Public Water Suppliers". If you have any additional questions about PFAS in drinking water, such as whether you should test your water, please contact your MassDEP Drinking Water Program contacts below.

Region	Name	Phone #	Email
Western	Catherine Wanat	413-755-2216	Catherine.wanat@mass.gov
Central	Robert Bostwick	508-849-4036	Robert.Bostwick@mass.gov
Northeast	Amy LaPusata	978-694-3291	Amy.lapusata@mass.gov
Southeast	William Schwartz	508-946-2818	William.schwartz@mass.gov
Boston: Program.director-dwp@mass.gov or Margaret Finn 617-292-5746			

As we continue to work to address PFAS issues and develop a PFAS MCL, we will keep you informed.

Sincerely,

Yvette DePeiza
Program Director
Drinking Water Program
MassDEP/BWR

Attachment: MassDEP Fact Sheet "PFAS in Public Drinking Water Supplies, Questions and Answers for Public Water Suppliers"

ecc: MassDEP/DWP Regional Chief, MassDEP/ORS- Mark Smith, MassDEP/DWP Program Director
MDPH – Jana Ferguson, Jan Sullivan
Local Board of Health
Certified operator

MassDEP Fact Sheet

Per- and Polyfluoroalkyl Substances (PFAS) in Public Drinking Water Supplies - Questions and Answers for Public Water Suppliers

Introduction

This fact sheet provides answers to questions frequently asked by public water suppliers about Per- and Polyfluoroalkyl Substances (PFAS) on evaluating whether Public Water Supply (PWS) sources contain PFAS and on what a PWS should do if PFAS are detected in a public drinking water supply. A separate MassDEP fact sheet "PFAS in Drinking Water: Questions and Answers for Consumers" is available for PWS to provide to consumers and describes the sources of PFAS compounds, health effects, and MassDEP recommendations to reduce consumer exposure. This consumer factsheet is available at https://www.mass.gov/media/1854351/download.

What are the current levels of concern and are they subject to change?

In 2016, the USEPA established a lifetime Health Advisory for drinking water of 70 ppt for any combination of PFOA and PFOS, two of the most common PFAS compounds.

In June 2018, MassDEP issued a public health guideline for drinking water of 70 parts-per-trillion (ppt) to address five PFAS compounds: PFOA, PFOS, PFNA, PFHxS and PFHpA. This type of guideline, known as an Office of Research and Standards Guideline (ORSG), provides recommended contaminant levels in drinking water and is set to be protective against adverse health effects for all people consuming the water over a lifetime.

On April 19, 2019 the MassDEP Waste Site Cleanup Program issued draft regulations under 310 CMR 40.0000 (Massachusetts Contingency Plan [MCP]). The draft regulations establish reportable concentrations and clean-up standards for six PFAS compounds of 20 ppt combined in groundwater. These draft regulations are out for public comment until July 19, 2019.

In April 2019, MassDEP's Office of Research and Standards is convening its Health Effects Advisory Committee to provide scientific input on the technical basis of the proposed MCP standards and their implications regarding a potential revised ORSG with a limit of 20 ppt for the sum of the 6 PFAS compounds. In April 2019, MassDEP also initiated the process to develop a drinking water standard for public drinking water systems, known as a Maximum Contaminant Level (MCL), for the six PFAS compounds. This forthcoming MCL will be proposed through the Commonwealth's standard regulation development process, which includes a public comment period. MassDEP seeks to align the forthcoming MCL with the MCP GW-1 standard and any revised ORSG. Information on the MCL development effort, including information on upcoming stakeholder meetings, can be found at https://www.mass.gov/lists/development-of-a-pfas-drinking-water-standard-mcl

Several states have set their own standards or guidelines for PFAS compounds in drinking water that are in some cases at lower concentrations than the 2016 USEPA Health Advisory or the 2018 MassDEP guideline. Only New Jersey has established an MCL for a PFAS compound. But some other states are in the process of establishing MCLs. For more information on what other States are doing see: https://www.ecos.org/pfas/

Are Public Water Systems required to test for PFAS?

Currently, PWS are not required to test their sources for PFAS unless it was previously detected in their water source and they are required by MassDEP to do ongoing monitoring. In that situation, MassDEP will have issued a Water Quality Sampling Schedule specifying the frequency of monitoring. However, PWS are required to test all **new** sources of drinking water, including replacement sources and satellite wells for PFAS.

Should I test? What if I already tested under UCMR3?

Until MassDEP sets a MCL, or determines otherwise, sampling is not required but it is recommended for systems that have potential sources of PFAS contamination in the vicinity of their water supply. Potential sources of PFAS include airfields, fire training areas, manufacturing facilities, waste disposal sites, and landfills. Public water systems should inventory their water supply protection areas (Zone I and Zone II for wells; Zone A, B and C for reservoirs; and the watersheds of river intakes) for historic or current potential sources of PFAS and consider testing if those sources are identified.

Public Water Systems serving more than 10,000 persons and a few small systems (approximately 178 public water systems) collected samples for PFAS analysis in 2013 - 2015 under the federal Unregulated Contaminant Monitoring Rule (UCMR). For the results of the UCMR3 monitoring see https://www.mass.gov/files/documents/2017/11/15/ucmr3-2017-02.xlsx. Please note: the analytical methodologies in use for the UCMR3 sampling had reporting limits above the current levels of concern. For these systems, sampling using current guidelines and detection limits is recommended for systems near potential sources of PFAS contamination.

Please be aware if you collect and analyze samples for PFAS you must follow MassDEP current drinking water guidance. All PWS PFAS data will be posted on the Executive Office of Energy and Environmental Affairs (EEA) Portal at https://eeaonline.eea.state.ma.us/portal#!/home and thereby available to the public.

Which PFAS contaminants should I test for?

There are two EPA testing methodologies for testing drinking water for PFAS that can be used. Laboratories will analyze drinking water for PFAS using either EPA method 537 or 537.1. These methods test for either 14 or 18 PFAS compounds and both methods include the 5 PFAS compounds that are part of the MassDEP Guideline. PWS that do PFAS testing must use the PFAS Laboratory Analytical Report Form and send the results to your MassDEP regional office.

Electronic reporting of testing results via eDEP is not currently available; MassDEP will notify PWS when it becomes available.

What laboratory should I use? What detection limits should labs be using?

Until MassDEP begins certifying labs for PFAS analysis, analysis must be performed by laboratories that are capable of achieving a minimum reporting level (MRL) of 5 ppt and are either: approved by EPA for UCMR3 monitoring and are capable of achieving a minimum reporting level (MRL) of 5 ppt or lower; or certified by another state or certification authority subject to approval by the MassDEP Drinking Water Program. You should specify that the laboratory state the MRL for each analyte and that the data be reported quantitatively if above the MRL. The laboratory should also identify all samples that are below < 1/3 the MRL. See https://www.mass.gov/info-details/per-and-polyfluoroalkyl-substances-pfas#laboratories-and-testing-for-pfas-

Are there special considerations for PFAS sampling and analysis?

Yes, sampling for PFAS can be challenging because it is found in many consumer products (including certain clothing fabrics and food packaging) and the analytical detection limits are so low. MassDEP's Drinking Water Program has a Field Sampling Guide for PFAS available at https://www.mass.gov/doc/field-sampling-guide-for-pfas/download. The Association of State Drinking Water Administrators developed a Lab Testing Primer, available at https://www.mass.gov/doc/lab-testing-primer-for-pfas/download.

Why do the laboratory testing results of PFAS vary?

Variation is to be expected; PFAS can be detected in drinking water down to very low concentrations, in some cases as low as 2 parts per trillion (ppt). Check that the QA/QC was done in any laboratory report you receive. The only way to track PFAS is to take several samples over time.

How do I interpret laboratory results: MRL, RL, J values, etc.?

MassDEP will consider the following information when evaluating PFAS results:

- Values below 1/3 the MRL should be considered non-detect.
- Values above the MRL should be quantitatively included in comparison to the ORSG.
- Values between 1/3 MRL and the MRL should be treated as ½ the MRL in comparisons to the ORSG if the analyte is considered likely to be present (e.g. was previously detected at the location; was likely to have been released at the site). Otherwise they may be treated as non-detect.
- A "J" or other qualifier next to a testing result usually indicates that it is an estimated concentration, potentially due to issues relating to a quality control element that may affect the accuracy or precision of quantitation. The EPA-approved analytical methods for PFAS in drinking water (i.e., EPA Methods 537 and 537.1) do not require the establishment of method detection limits for target PFAS compounds; but instead any detected compounds or non-detects below the MRL are simply reported as < MRL or < ⅓ MRL. Some laboratories use reporting levels or limits (RLs) rather than MRLs in order to eliminate the assumption that they are their minimum RLs; however, the application of RLs is exactly the same as MRLs.
- When summing the PFAS compounds to determine if they exceed the current ORSG, or future proposed guidelines/standards, J values, if above the MRL (or RL), should be initially included. If inclusion of these values does not lead to an exceedance, the water can be considered to be below the guidance. If inclusion of these values leads to an exceedance of the guideline, the water should be re-sampled and the new sample data used if required quality control elements are achieved.

For a resource on laboratory data see PFAS: Assessing Laboratory Data Quality http://www.newmoa.org/events/docs/357_314/2019-4-4RothmanPFASLabData.pdf. Contact your MassDEP Regional Drinking Water Program, or MassDEP Wall Experiment Station (978-682-5237) for assistance with interpreting laboratory results.

What if a PFAS compound is detected but there is no established health guideline for it?

Please contact your MassDEP Regional Drinking Water Program. Depending on the level, an individual health assessment may be needed by the Department's Office of Research and Standards.

The PWS should ask for reporting limits of 5 parts per trillion (ppt) or lower for each of the following (6) PFAS: PFOA, PFOS, PFNA, PFHxS, PFHpA, and PFDA. All other PFAS contaminants should be reported at this level or, if not achievable, at the lowest feasible Minimum Reporting Level (MRL).

What are the current requirements and recommendations if PFAS is detected?

If PFAS is detected in a test sample, contact your MassDEP Regional Drinking Water Program. You may be required to take a confirmatory sample.

If the confirmed PFAS level is above the ORSG of 70 ppt, MassDEP requires that you issue a Public Notice to your consumers and reduce the level of PFAS in the finished water by: using alternative sources, blending sources or installing treatment. The Public Notice language must be approved by MassDEP.

If the confirmed level of PFAS in one of your source waters is between the proposed MCP groundwater cleanup standards of 20 ppt and the 2018 ORGS of 70 ppt, you are strongly encouraged to contact your MassDEP Regional Drinking Water Program immediately for guidance. MassDEP is encouraging you to issue a Public Notice to ensure that your elected officials and consumers are aware of the updated information on PFAS. MassDEP recommends that you consider what options are available to you to lower the PFAS level in the finished water in order to be prepared if the guideline does change.

You may be asked by MassDEP to do quarterly monitoring of your source(s).

What treatment technologies are available to remove PFAS?

Granular activated carbon (GAC), ion-exchange resin, and reverse osmosis (RO) filters have been shown to be effective in removing PFAS. The type of treatment technology you will need depends on the specific PFAS compounds and their levels in the source water. A pilot study will be required prior to installing treatment. Some resources to identify appropriate treatment technologies are:

- USEPA webpage: Reducing PFAS in Drinking Water with Treatment Technologies: https://www.epa.gov/sciencematters/reducing-pfas-drinking-water-treatment-technologies
- Interstate Technology & Regulatory Council (ITRC) fact sheets on PFAS: https://pfas-1.itrcweb.org/
- The Water Research Foundation's report and webcast on PFAS treatment. Go to their webpage www.waterrf.org and search for "Treatment Mitigation Strategies for Poly- and Perfluorinated Chemicals".

What does a PWS do with the waste stream from PFAS treatment?

If the PWS is using GAC or ion-exchange treatment, the GAC media and the ion-exchange resins can be incinerated. The PWS can also use high-pressure membranes such as nanofiltration or reverse osmosis to remove PFAS, but this will result in a concentrated waste stream. Right now there is a lack of options for disposal of the concentrated waste stream. There are some destructive treatment technologies in development. There is the possibility of disposing of the waste stream in a sanitary sewer; however, the Department's position on this issue is still under development.

What should a PWS know about bottled water to address consumer questions?

Consumers can contact the bottled water company to see if the water was tested for PFAS. In addition, MassDEP surveyed all Massachusetts permitted bottled water companies to determine if they sampled their

water sources for PFAS and to request that they voluntarily share the results of such testing with MassDEP for posting to the Commonwealth's website. See the current list of Massachusetts permitted Bottled Water companies that have voluntarily provided MassDEP with their results for posting at bottled water companies.

Can a PWS support customer use of Point of Use (POU) or Point of Entry (POE) devices to reduce PFAS?

Unless specifically required by the MassDEP Drinking Water Program, a public water supplier is not required to install POU/POE treatment devices. MassDEP is not, at this time, approving POU and POE treatment devices as the means for PWSs to fully comply with drinking water standards.

However, as a temporary treatment solution, a PWS may recommend or support the installation of POU devices at their customers' homes and businesses to address customer concerns. A Point of Use (POU) device is a treatment device installed on a single faucet or spigot used for the purpose of reducing contaminants in drinking water at that one tap. POU devices can sit on the counter, attach to the faucet, or be installed under the sink. A point entry device (POE) is a treatment device that is installed after the water meter to treat all of the water in the home.

In 2016, the National Sanitation Foundation (NSF) developed a test protocol (P473) for products that reduce PFOA and PFOS in drinking water to meet EPA's health advisory level of 70 ppt. However, the number of PFAS compounds and the levels of concern have changed since 2016. Currently, there are no independent organizations testing and certifying POU or POE filters for removal of PFAS compounds to meet these lower levels of concern. For your reference, there has been testing done by some other government agencies and academic institutions including: Minnesota, the USEPA, New Hampshire, Colorado and N.C. State University.

Because there is no national certification standard for POU/POE devices for PFAS treatment at the low levels currently being evaluated, it is recommended that a PWS considering supporting the customer installation of POU or POE devices first test the particular device(s) on their source water to confirm that the device(s) are effective in removing all the PFAS compounds present in their water down to the current levels of concern. Once the devices are put in place, and prior to operation, initial testing is recommended to confirm that devices are installed and operating properly. An ongoing operations and maintenance plan including routine monitoring plan should be put in place to verify the continued effectiveness of the devices and to determine the length of time between filter replacements. For general information on POU/POE devices see https://www.mass.gov/service-details/home-water-treatment-devices-point-of-entry-and-point-of-use-drinking-water.

Is technical and financial assistance available to PWS to evaluate their drinking water sources for PFAS and implement treatment?

Technical assistance is available from MassDEP and our technical assistance providers. Please contact your MassDEP Regional Office Drinking Water Program or Michael.Maynard@mass.gov.

The Massachusetts Drinking Water State Revolving Loan Fund (DWSRF) provides low interest (2%) loans for drinking water infrastructure projects such as installation of treatment for PFAS. Beginning with its 2019 solicitation, MassDEP has established High Priority status for project proposals that will provide treatment of drinking water affected by concentrations of PFAS compounds above the level of concern. Some principal forgiveness on the loans is available for lower-income communities. Applications for construction loans for 2020 are due in August 2019. See https://www.mass.gov/lists/state-revolving-fund-applications-forms. All available SRF funds have been allocated for 2019; any new requests for emergency funding would have to be evaluated,

and as projects on the current IUP list drop out, funds may become available at that time. For more information on DWSRF please contact Ms. Maria Pinaud, Acting Director of Municipal Services, at 617-292-5808 or Maria.Pinaud@mass.gov.

Technical assistance on a wide range of financial, managerial and technical issues is available for communities serving < 10,000 people. Contact jstarbard@rcapsolutions.org at RCAP Solutions or dkaczenski@massrwa.org at Mass Rural Water Association for a "no cost" consultation or site visit.

My questions were not answered here. Who should I contact?
Contact the MassDEP Drinking Water Program at **program.director-dwp@mass.gov,** Subject: PFAS.

Who are the MassDEP Drinking Water Program PFAS contacts?

Region	Name	Phone #	Email
Western	Catherine Wanat	413-755-2216	Catherine.Wanat@mass.gov
Central	Robert Bostwick	508-849-4036	Robert.Bostwick@mass.gov
Northeast	Amy LaPusata	978-694-3291	Amy.lapusata@mass.gov
Southeast	William Schwartz	508-946-2818	William.Schwartz@mass.gov
Boston	Margaret Finn	617-292-5746	Margaret.Finn@mass.gov

Boston: Program.director-dwp@mass.gov, Subject: PFAS

PFAS information is changing rapidly so this Factsheet will be updated periodically and provided to all public water suppliers.

4/17/19