Maryland Department of the Environment

Frequently Asked Questions (FAQ): PFAS in Class-B Firefighting Foams

The purpose of this document is to provide Class-B firefighting foam users answers to Frequently Asked Questions (FAQs) regarding the regulation of PFAS and their use in Class-B firefighting foams in Maryland. In 2020, the Maryland General Assembly enacted legislation (CH277) banning the use of PFAS-containing Class-B firefighting foams (with limited exceptions) in **testing and training practices** on and after October 1, 2021.

This document is one of several outreach documents developed to remind fire training facilities, fire stations, and other Class-B firefighting foam users of this October 1, 2021, ban.

What are PFAS compounds?

Per- and polyfluoroalkyl substances (aka PFAS) are a group of over 4,000 synthetic compounds that have been used in a variety of industries since the 1940s for their oil-, water- and stain-repellent abilities and thermal and chemical stability. These compounds are characterized by having multiple fluorine atoms attached to a chain of carbon atoms. PFAS compounds can be found in food packaging materials, non-stick products, cleaning products, stain- and water repellent fabrics, firefighting foams, and more. Certain PFAS compounds have the ability to accumulate within the body and typically do not break down. This combined with their toxicity have raised concerns about the environmental and human health risks posed by exposure to these compounds.

How are PFAS used in Fire-fighting Foams?

Firefighting foams containing PFAS were first introduced by the naval firefighting services in 1964. Firefighting foams containing PFAS compounds are designed for flammable liquid fires. Firefighting foams containing PFAS were produced to meet specifications such as Mil-Spec rather than formulated to contain a specific mixture of PFAS. These foams are a combination of both known and unidentified PFAS. The most commonly used PFAS-containing firefighting foams are aqueous film-forming foams (AFFF) and alcohol-resistant aqueous film-forming foams (AR-AFFF). Figure 1 outlines the types of Class B foams containing PFAS compounds.

Maryland Department of the Environment

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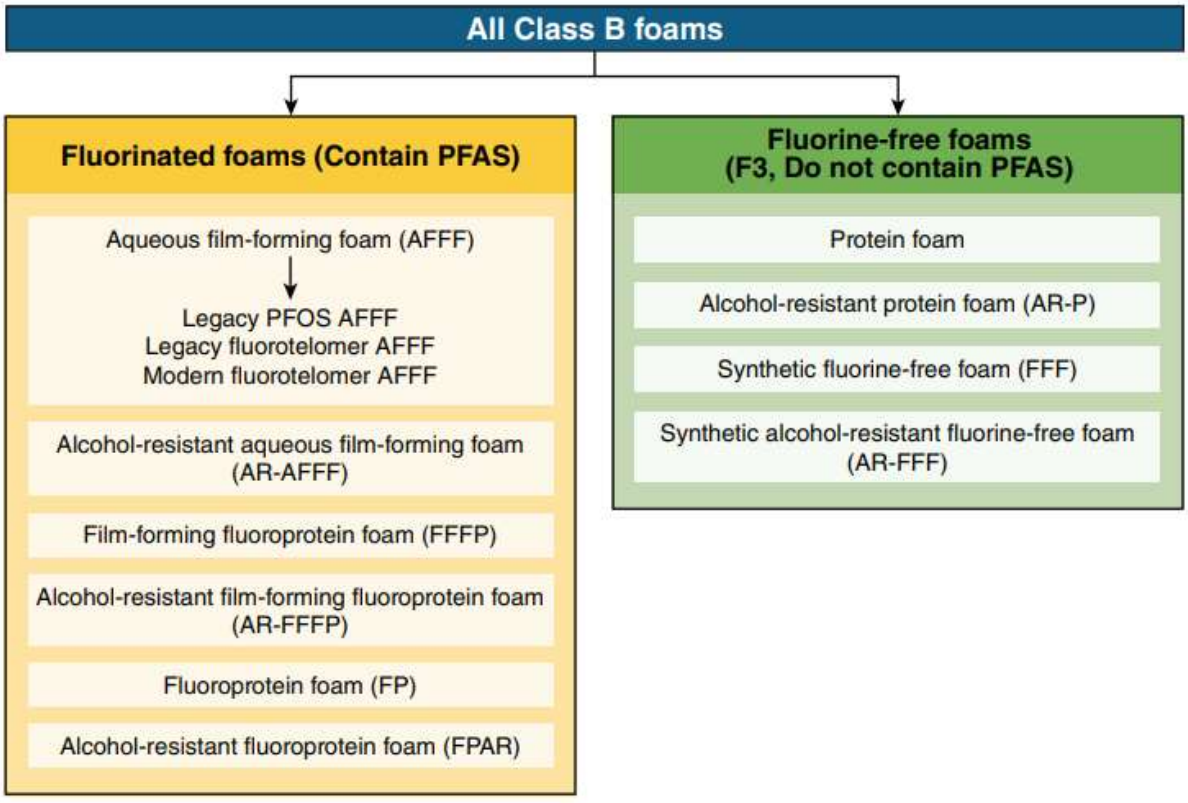

Figure 1. Types of Class B foams
(Source: S. Thomas, Wood plc, used with permission)

Figure 1 Adapted from the Interstate Technology Regulatory Council (ITRC) Firefighting Foams Webpage: https://pfas-1.itrcweb.org/3-firefighting-foams/

When firefighting foams are applied, a concentrate is mixed with water to make a foam solution. The applied foam solution typically contains a small fraction of the PFAS in the concentrate. When mixed with water, the PFAS in these foams allows the foams to spread, cool, and suppress flammable liquid fires. The aqueous film produced by PFAS-containing foams prevents re-ignition of the fire by creating a barrier between the fuel and oxygen.

Firefighting foams may be released into the environment through:

- Low-Volume Releases: during storage, transfer, or periodic calibration of firefighting equipment.
- Moderate-Volume Releases: through testing and discharge of foam suppression systems in large hangars and buildings.
- High-Volume Releases: discharge during emergency response training.

Frequently Asked Questions (FAQ): PFAS in Class-B Firefighting Foams

- Accidental Leaks: during storage, transfer from storage to pumping locations.

Users of these foams may include but are not limited to: firefighting professionals and volunteers, fire training academies, military installations, airports, oil refineries, and certain industrial sites with large volumes of flammable liquids.

The Interstate Technology Regulatory Council (ITRC) regularly publishes information on PFAS in firefighting foams and other media. ITRC's Firefighting Foams webpage can be found at: https://pfas-1.itrcweb.org/3-firefighting-foams/ . This webpage includes more background information, studies, and best management practices for PFAS in firefighting foam formulations.

How are PFAS-containing Firefighting Foams regulated in Maryland?

Under State Law (CH277), the use of PFAS-containing firefighting foams **for training and testing purposes** is generally prohibited as of October 1, 2021. (Non-fluorinated foams may be used for training and testing.) Individuals who violate this prohibition may incur a civil penalty not to exceed $500 upon the first violation. Second or subsequent violations will incur a $1,000 fine. The enacted bill (including certain narrow exceptions to the prohibition) can be found here:

http://mgaleg.maryland.gov/2020RS/chapters_noln/Ch_277_sb0420E.pdf

Should fire departments continue to use PFAS-containing Firefighting Foams outside of training?

Currently, there is no legislation or regulation that bans the use of PFAS-containing firefighting foams in Maryland in emergency response situations. In the event that PFAS-containing foams are released in emergency situations, the Department strongly recommends the entity applying these foams voluntarily provide as much information as soon as possible to MDE as to the amount, location, and proximity to surface waters of any releases. This information may be used to assess potential environmental impacts to surrounding soils, surface water, groundwater, and both public and private drinking water supplies. Useful information to provide MDE includes:

- Location of foam application (i.e., addresses, coordinates)
- Nearest surface water or potential conduit to surface water (e.g., storm drain or roadside ditch) and location of the potential conduit
- Any observations of material reaching surface water
- Duration of foam application
- Rate of foam application

- Time of day of foam application

Importantly, the EPA has announced plans to list certain PFAS compounds as hazardous substances under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or as it is sometimes referred to as, "Superfund"). The listing of certain PFAS compounds as hazardous substances under CERCLA has important implications with regard to potential future liability for environmental cleanup-related expenses associated with uncontrolled releases into the environment.

Information on foam releases may be submitted to Geoffrey Donahue at geoffrey.donahue@maryland.gov or by phone at 410-537-3932.

Are there PFAS-free alternatives for firefighting professionals?

Considerable work has gone into developing PFAS-free firefighting formulations. While fluorine-free alternatives for Class-B foams have been identified, there are still key data gaps in performance, chemical makeup, and potential toxicity (both ecological and human). The Interstate Chemical's Clearinghouse maintains a list of known PFAS-Free foams, which can be accessed at

http://www.theic2.org/publications#gsc.tab=0

In addition to the Interstate Chemical Clearinghouse, the Department of Defense (DoD) has spent considerable resources to develop and better understand the efficacy of PFAS-free foams through its Strategic Environmental Research and Development Program (SERDP). More information on this developing science can be accessed on the DoD's SERDP- Environmental Security Technology Certification Program (ESTCP) Webpage (https://www.serdp-estcp.org/).

It should be noted that the Maryland Department of the Environment does not endorse the use of any one foam.

How should fire departments dispose of PFAS containing items like the AFFF?

At this time, MDE recommends facilities properly store PFAS-containing Class-B foams, while regularly monitoring for storage system leaks and maintenance needs. In spring 2020, the U.S. Environmental Protection Agency (EPA) formed its PFAS Innovative Treatment Team (PITT) to address the data gaps in PFAS destruction and disposal. The goals of this team are to evaluate current and emerging destruction technology, understand the efficacy of these methods, and determine the feasibility of these methods. Although certain disposal techniques such as incineration of firefighting foams have been suggested by some as the preferred method of disposal, EPA has cautioned that there are data gaps as to what level

of thermal treatment is necessary to destroy these compounds in wastes. EPA has noted that incomplete combustion may lead to incomplete breakdown of PFAS and may reintroduce the compounds to the environment through air emissions and deposition, runoff, and discharge. Findings from EPA-PITT's work can be accessed on the EPA-PITT's Webpage (https://www.epa.gov/chemical-research/pfas-innovative-treatment-team-pitt).

At this time, MDE closely monitors EPA's work concerning the development of recommendations for the disposal of PFAS-containing wastes. As more research is conducted and appropriate disposal methods are identified, MDE will ensure that this information is publicly available on the Department's PFAS webpage.

Why is the State concerned about PFAS?

Maryland, similar to many states across the Country, is concerned about PFAS primarily because of their potential human health impacts, mobility, and environmental persistence. Exposure to PFAS may cause adverse human health impacts, especially with lifetime exposure to elevated concentrations of these compounds. PFAS can enter the environment (and may contaminate drinking water sources, certain types of fish, and certain other food products) through a variety of pathways, including spills of PFAS-containing materials or the use of PFAS-containing firefighting foams in emergency response actions. Individuals may also be exposed to PFAS compounds through the use of common consumer goods that have PFAS such as: some nonstick cookware; carpets treated for stain and water resistance, stain resistant upholstery, clothing, and other fabrics; certain cleaning products; and grease-resistant paper (e.g., some microwaveable popcorn bags, pizza boxes, fast food wrappers).

Certain workplace environments may also expose individuals to PFAS compounds. Common industries producing or using PFAS compounds include: chrome plating facilities, electronics manufacturing, oil recovery, and fire protection organizations. Fire protection professionals may be exposed to PFAS through the use of PFAS-containing Class B firefighting foams. There have also been reports of PFAS in personal protection equipment used by firefighters.

What is Maryland doing to address PFAS?

Because of the potential adverse human l health impacts of PFAS compounds, the State of Maryland is focused on taking a human health risk-based, scientific approach to understanding and reducing unacceptable PFAS risks. Since early 2020, the State of Maryland has increased its PFAS efforts substantially. These efforts include:

Maryland Department of the Environment

Frequently Asked Questions (FAQ): PFAS in Class-B Firefighting Foams

- **Spring 2020:** passing of state legislation to prohibit the use of PFAS-containing Class-B firefighting foams for training purposes by 10/1/2021.
- **Summer 2020:** MDE's implementation of a pilot study to assess the presence of PFAS compounds in oyster tissue and surface water samples in the St. Mary's River.
- **Early Fall 2020- Present:** MDE's implementation of statewide monitoring for PFAS compounds in public water systems.
- **Fall 2020:** MDE partnering with the University of Maryland Center for Environmental Sciences to host a PFAS Roundtable Discussion with PFAS experts to better understand existing science and data gaps and to solicit recommendations for future PFAS priorities.
- **Fall 2020:** MDE integrating PFAS analysis into MDE's existing fish tissue monitoring program.
- **Winter 2020/2021**: MDE creating and making publicly available its s PFAS Webpage, highlighting the Department's various PFAS efforts and actions.
- **Spring 2021:** MDE completing the analysis of results from its Phase 1 drinking water monitoring effort and initiated the second phase of this effort to understand and reduce the risks posed by exposure to PFAS in drinking water.
- **Summer 2021:** MDE publishing its Report from Phase 1 of its drinking water monitoring study.

Where can I find more information?

For more information on MDE's actions to address PFAS throughout the State, please contact Geoffrey Donahue at geoffrey.donahue@maryland.gov. Additional information on how MDE is managing PFAS risks can be found on the Department's PFAS Webpage: http://mde.maryland.gov/MDandPFAS.