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MassDEP Legacy Firefighting Foam Take-Back Program 2018

Project Summary

By Nicholas J. Child, MassDEP - 02/01/19

This document provides a summary of the Massachusetts Department of Environmental Protection's (MassDEP) project for the collection and proper disposal of legacy Aqueous Film Forming Foam (AFFF), stored by municipal fire departments and other public safety partners in Massachusetts.

Poly- and Per-Fluoro Alkyl Substances (PFAS) have been identified as man-made emerging contaminants that can cause health issues at very low concentrations (in parts per trillion). PFAS are generally mobile, persistent, and bioaccumulate in the environment. These chemicals have been used in numerous common products, such as non-stick cookware, waterproof clothing, carpet, paint, and food packaging. PFAS have also been used in firefighting foam; specifically, Class B AFFF, which is used to extinguish burning hydrocarbons or flammable liquids. MassDEP gathered information from other states' regulatory agencies and the foam manufacturing industry and confirmed that these legacy foams contain between 2%-5% PFAS by volume. In consultation with the Massachusetts Department of Fire Services, MassDEP chose to implement a foam "take-back" program to assist fire departments in removing these foams from current stockpiles and ensuring they are properly disposed of, rather than used during trainings or firefighting and subsequently released into the environment.



Figure 1 - 3M AFFF foam

MassDEP's program targeted foams manufactured before 2003, as manufacturers stopped production of suspect foams in 2002. Recognizing the challenges proper disposal would present to the budgets of most municipalities, MassDEP decided to fund the disposal of these legacy foams through its Massachusetts Chapter 21E/Bureau of Waste Site Cleanup (BWSC) capital funding, consistent with programmatic goals of "pollution prevention" and elimination of "threats of release" of hazardous materials. Under the "take-back program," MassDEP offered to pay for foam removal and disposal; the local fire departments were responsible for replacing the foam with safer foam alternatives.

MassDEP procured the services of one of the agency's hazardous material cleanup contractors, New England Disposal Technology, Inc., to support the removal program. MassDEP initially planned to have

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each fire department self-transport the legacy foam to NEDT's two facilities in Massachusetts. Based on review of photos submitted by interested fire departments of legacy foam containers (some more than 50 years old), MassDEP determined that the containers required an integrity inspection before transport. Based on this requirement, MassDEP determined it would be more efficient for NEDT to collect the containers from each fire department. After collection by NEDT, the foam was transported to a fuel-blending facility in Ohio, which packaged the final material for destruction at one of two state-of-the-art Refuse Derived Fuel Incinerators.

The Initial outreach on the take-back program was done by the Fire Marshal's Office, which contacted every fire department across the state, and follow-up with press releases from MassDEP. The response to the program from fire departments significantly exceeded expectations. Over five months, MassDEP was contacted by 105 fire departments, fire districts, and public safety entities. MassDEP developed a master list of locations, volumes, container sizes, and photographs. Responses fit into four groups:

- **31** fire departments/public safety entities confirmed that they no longer had legacy foam. This included several major cities in the Commonwealth where we had anticipated that large amounts of legacy foam may have existed.
- **69** fire departments confirmed that they had small quantities of legacy foam and needed help with its disposal. These were all small volumes as originally expected, but at locations spread across the state from the tip of Cape Cod to the corner of the Berkshires. These 69 fire departments accounted for 25% of total legacy foam recovered.
- **5** fire departments/regional fire districts (35 town cache)/public safety entities indicated that they had large volumes of legacy foam from area foam caches or major facilities in their jurisdiction. These 5 accounted for 75% of total foam recovered.



Figure 2 - Nick Child of MassDEP & Mike Robertson of NEDT

As the take-back program progressed, many fire departments requested confirmation that current Class B AFFF foam was safe. While these foams often contain some amount of PFAS, it is at lower levels than legacy foam and includes PFAS that are more stable (so-called "short chain") and expected to have less of an impact on the environment. New "Fluorine Free Foam" aka "3F" foam is entering the market. The cost is comparable per gallon to current foam, but there are questions about its efficacy compared to the current Class B AFFF foams. MassDEP is continuing to evaluate information and ongoing research about impacts of various foams and will continue efforts with the users, the Office of Technical Assistance & Technology, and the Mass. Department of Fire Service to identify effective and safe alternatives to PFAS foams.

The total volume of legacy foam identified, removed, and destroyed was 149,016 pounds (or 17,531 gallons). The costs can be categorized as 74.1% on disposal; 16.2% on transport; 5.3% on sorbents/containers; and 2.4% on specialized personnel and equipment.