# Environmental Technology Council

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Mr. Sean Smith
Product Replacement Program Manager
Washington State Department of Ecology
Northwest Region Office
P.O. Box 330316
Shoreline, WA 98133-9716

RE: **Aqueous Film-Forming Foam Collection and Disposal Program: Draft Programmatic Environmental Impact Statement**

Dear Mr. Smith:

The Environmental Technology Council (ETC) submits these comments on Washington State Department of Ecology's Aqueous Film-Forming Foam Collection and Disposal Program: Draft Environmental Impact Statement, Publication Number 23-04-064 (December 2023).

## Statement of Interest

These comments are filed by the ETC, a national trade association of commercial firms that provide technologies and services to customers for recycling, treatment, and secure disposal of industrial and hazardous wastes. ETC member companies own and operate a wide variety of commercial units, including spent solvent distillation, oil recovery, metals reclamation, mercury recovery from fluorescent lamps, wastewater treatment plants, collection, and transfer stations, Resource Conservation and Recovery Act (RCRA) regulated secure landfills, high-temperature incinerators, cement kilns, and a variety of other technologies. ETC member companies have worked with states and federal agencies on matters concerning the safe and proper destruction and disposal of PFAS compounds, materials containing PFAS and aqueous film-forming foam (AFFF). Additionally, these companies have advanced environmental management systems to comply with the strict standards of RCRA, the Clean Air Act (CAA), the Clean Water Act (CWA), the Toxic Substances Control Act (TSCA) and many other environmental, health, and safety laws.

## Background

PFAS references a large class of man-made chemicals characterized by having a carbon skeleton with multiple fluorine atoms attached. PFAS represents thousands of different chemical compounds rather than a single chemical. PFAS compounds have been used since the 1940s and are found in many consumer products like cookware, food packaging, and stain repellents, as well as in the plating and metal finishing industry. These chemical compounds are also used extensively in AFFF. While perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) are the most studied PFAS compounds,

they have been phased out by industry in the United States, Europe, and Japan. Other PFAS compounds found in GenX and ADONA chemicals are still used in commerce. Given the relatively recent increase in interest in these compounds, a key question is what technologies can be used to safely dispose of or destroy PFAS containing AFFF. Over the years Congress and the states have been working to find answers to these questions and to get a better understanding of the technologies currently available to address both destruction and disposal.

The Aqueous Film-Forming Foam Collection and Disposal Program: Draft Programmatic Environmental Impact Statement on which the Department seeks comment focuses on the most effective collection, treatment, and disposal of AFFF stored at fire departments throughout the state of Washington. The Draft identifies a range of options for the treatment, disposal, and long-term lower risk storage of AFFF. The options presented include:

- Incineration – AFFF would be collected and transported to a selected existing treatment facility for incineration.

- Solidification and Landfilling – AFFF would be collected and transported to a selected landfill facility or facilities for solidification and disposal.

- Class I Deep Well Injection – AFFF would be collected and transported to a selected Class I Deep Well injection facility or facilities for disposal.

- Approved Hold in Place – AFFF would be held in place at participating fire stations with suitable containment approved and reimbursed by the Department until acceptable advanced treatment technology becomes available.

- No Action – AFFF would remain as is at participating fire stations.

It is worth noting that collection and storage of AFFF at a centralized location, non-vehicle (air and maritime) transport of AFFF materials and the use of emerging technologies for commercial PFAS treatment were also considered by the Department, but the Department decided to eliminate them from consideration for purposes of the Draft.

**High Temperature Incineration**

Understanding the chemical structure of PFAS compounds is important to ensuring destruction through incineration. PFAS compounds are mid-length carbon-chain compounds with the most common having eight carbons. However, the number of carbon atoms can range from as few as four to as many as 12. Each carbon atom on the chain has 2 or 3 fluorine atoms attached, except for the terminal carbon. The terminal carbon atom can be attached to a carboxylic acid group (PFOA), a sulfonic acid group (PFOS), or other heteroatom-containing groups such as sulfonamides (PFOSA).

In discussing hazardous waste combustion technologies, the Draft correctly points out that incineration is one of only a few technologies that can potentially destroy PFAS compounds. This is because commercial incinerators have the ability to achieve temperatures and residence times sufficient to break apart PFAS compounds contained in the waste stream being thermally treated. In fact, RCRA permitted hazardous waste facilities must follow stringent regulatory requirements and are required by EPA to conduct testing to determine Destruction and Removal Efficiency (DRE) performance. 40 CFR 63.1219(c). Time, temperature, and turbulence ensure good combustion and high DRE. The purpose of DRE testing is to show a percentage that represents the number of molecules of a compound destroyed in an incinerator relative to the number of molecules that entered the system. For hazardous waste combustion units EPA requires a minimum DRE of 99.99%. ETC member company Clean Harbors recently conducted tests which demonstrated a DRE of 99.9999% (test results can be requested at https://www.cleanharbors.com/PFAS-Study). Additionally, the U.S. Department of Defense lists 140 research projects on the destruction of materials containing PFAS compounds that can be found at https://serdp-estcp.org/focusareas/deb5c156-f647-4934-8313-fa00364ff55e/treatment-of-pfas-impacted-matrices.

Additionally, we stress the position that RCRA and CAA permitting requirements that provide additional regulatory oversight and include operating requirements and emission limitations to safely and effectively treat hazardous and non-hazardous contaminants cannot be overlooked. RCRA hazardous waste facilities are subject to CAA Title V permitting requirements and to maximum achievable control technology standards pursuant to § 112 of the CAA that include, emission limitations for metals, dioxin/furans, particulate matter, hydrogen chloride and chlorine gas, and carbon monoxide or hydrocarbons, as well as limits on minimum organic DRE. Also, under the authority of RCRA's "omnibus" clause (§ 3005(c)(3); and 40 CFR 270.32 (b)(2)), RCRA permit writers may impose additional terms and conditions on a site-specific basis as may be necessary to protect human health and the environment. Due to these additional safeguards, we believe RCRA regulated commercial incinerators are well suited to safely and properly destroy materials containing PFAS compounds such as AFFF.

While the Draft considers incineration as a viable destruction option, it also considers landfills and deep well injections as viable disposal options. Keeping all options in the toolbox is important given the environmental and human health harms that can be caused by PFAS compounds found in AFFF.

**Solidification and Landfilling**

In addition to regulated hazardous waste incinerators, ETC members also own and operate RCRA Subtitle C and D landfills. As noted in the Draft, permitted hazardous waste landfills are designed, per RCRA requirements, with rigorous liner and cap systems to limit the risk of releases to the environment. Specifically, Subtitle C of RCRA establishes stringent requirements for the proper management of hazardous wastes to minimize potential risks to human health and the environment. Subtitle C landfills employ extensive environmental controls such as double liner systems, waste immobilization techniques,

leachate collection technologies, and leak detection systems. Additionally, they are subject to frequent agency inspections and are required by regulations and permits to maintain extensive record keeping to track and prevent any migration of waste to the environment. Finally, RCRA regulations and specific permits require Subtitle C landfill operators to frequently conduct inspections to ensure operating conditions and environmental controls are always operating at their optimal capabilities. Subtitle D landfills are also subject to extensive federal, state, and local environmental, health and safety requirements including detailed design criteria, location restrictions, financial assurance capability, corrective action standards and requirements for closure and post-closure periods. Therefore, Subtitle D landfills should also be considered a viable option for disposal.

ETC encourages the Department to include Subtitle C and Subtitle D facilities in the mix of viable technologies to address AFFF treatment and disposal as they are very well suited to manage highly concentrated PFAS compounds in waste streams. For example, treatment methods used to stabilize wastes are applied to minimize the mobilization and migration of PFAS out of these disposed wastes. Most Subtitle C facilities, and many Subtitle D facilities, have closed-loop systems that manage leachate within the facility rather than discharging leachate for offsite treatment. PFAS compounds in waste streams that are disposed in landfills that produce minimal leachate volumes, especially those facilities that employ stabilization or solidification technologies and are in dry climates, afford heightened levels of environmental protection. Accordingly, ETC recommends that the Department recognize that these facilities offer a reduced risk of PFAS compound migration into the environment and should be considered a viable disposal option for AFFF. Again, it is important to keep all proven technologies in the mix of destruction and disposal options.

**Class I Deep Well Injection**

In addition to high temperature incineration and landfilling, ETC also views underground injection as a viable option for the disposal of AFFF. Along these lines, some ETC member companies own and operate Class I waste disposal wells. These wells are designed to dispose of and isolate liquid waste below the land surface and beneath underground sources of drinking water (USDW). The standards associated with the construction, operation and monitoring of Class I waste disposal wells are designed to ensure protection of USDW. For example, these standards include at least one confining layer between the zone in which the fluid will be emplaced and the lowest USDW.

The Draft indicates that a disadvantage of Class I deep well injection is that deep well injection facilities are generally operated under limited compliance monitoring; therefore, the long-term stability of injected wastes is undocumented. To the contrary, waste disposal via Class I injection wells is only permitted if the operator can demonstrate the waste will remain in place where it has been injected. To demonstrate this an operator must receive approval of a “no-migration petition” from EPA. A no-migration petition is used to give EPA information and modeling results using data on local and regional geology, waste characteristics, geochemical conditions of the well site, injection history, and many other factors EPA uses to determine whether the operator has adequately

demonstrated that the waste will not migrate from the disposal site. These strict requirements and oversight coupled with the fact that Class I waste disposal wells are designed to dispose of and isolate liquid wastes below the land surface and beneath USDW, make these wells a viable option for the disposal of certain PFAS compounds.

Understanding that this technology may not be available everywhere, ETC supports its use where appropriate. Underground injection to Class I waste wells can reduce the potential risks of human exposure to injected materials, assist in avoiding discharge to surface and shallow groundwater and virtually eliminate air emissions. Since Class I wells are only sited in geological areas conducive to injection operations, we agree with the Department's assessment that this may be a limited technology. However, due to the benefits of this technology it must be kept in the mix of options for destruction and disposal.

**Approved Hold in Place**

The alternative option "approved hold in place" is essentially storage. While storage of AFFF is not a destruction or disposal technology, the Draft does note that extended interim storage may be an appropriate strategy until identified uncertainties are addressed and appropriate destruction and disposal technologies can be recommended. ETC **does not** support storage in lieu of disposal. Allowing for storage of certain AFFF would create the risks of spills and accidental releases which we believe are unacceptable. Also, the presence of certain PFAS compounds when deemed a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act and supported as such under the current Administration, creates long- term liability risk to property owners, operators, parties handling waste and others that encounter material managed from a site where PFAS was identified.

**Alternatives and Actions Eliminated from Further Consideration**

Regarding the collection and storage of AFFF at a centralized location and the non-vehicle transport (i.e., air and maritime) of AFFF materials, ETC agrees with the Department that these options should not be considered. As noted previously, allowing storage of certain PFAS and AFFF would create the risks of spills and accidental releases. In the case of non-vehicle transport, the Department points out that the releases could be to air and water, thus the elimination of this option.

ETC understands that there is much uncertainty as to when many emerging PFAS compound treatment technologies will become available for commercial use. However, we encourage the Department to closely monitor the research and development conducted in this area. ETC member companies are constantly engaging in such efforts to bring about innovative technologies to address PFAS treatment and disposal.

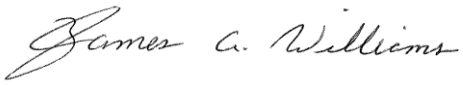
**Conclusion**

As owners of RCRA regulated hazardous waste incinerators, landfills, and Class I deep injection wells, ETC member companies understand the importance of being good

environmental stewards and ensuring that our operations do not result in harm to human health and the environment. Not only must we maintain compliance with our RCRA permits, but also with strict CAA and CWA regulations. Further, ETC member companies routinely engage in community outreach. This engagement is used to disseminate relevant information about our facilities and the operations performed. Regular community outreach also allows our member company employees the opportunity to participate in meaningful dialogue with the community and receive feedback on the impacts of facility operations with an understanding of local health trends, existing health conditions, and environmental justice concerns. Finally, as stated throughout our comments, ETC encourages the Department to keep all proven technologies in the mix of destruction and disposal options as it works to finalize this Draft.

In closing, ETC would like to thank the Department for the opportunity to submit comments on this important topic. If you have any questions, please feel free to contact James A. Williams via email at jwilliams@etc.org or at 202-731-1815.

Sincerely,



James A. Williams
Executive Director