

Transportation Research Board– 1/9/2023

Decontamination of AFFF-Impacted Fire Apparatus

Speaker: Shannon Pociu, CT DEEP Remediation Division



AFFF spill to the Farmington River, Windsor, CT, June 9, 2019

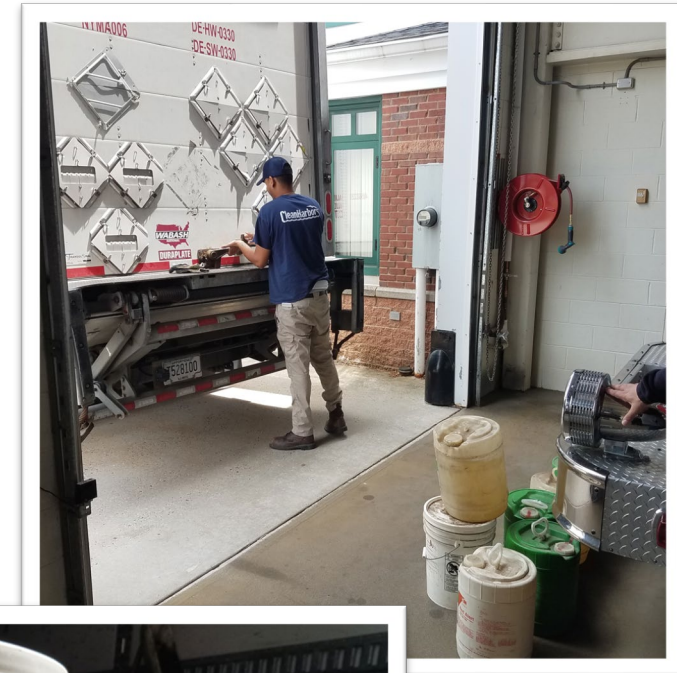
CT AFFF Take-Back Program Background

- ❑ Planning for an AFFF Take-Back Program began in 2019 prior to the State's [PFAS Action Plan](#)
- ❑ June 2019 - [Advisory Bulletin](#) issued on AFFF use
- ❑ 2020 - Bond funding received for Take-Back Program and private well testing for PFAS
- ❑ June 30, 2021 - [Alternative Fluorine-Free Foam \(F3\) identified for use](#) in state fire apparatus
- ❑ July 13, 2021 – [Public Act 21-191 signed, AAC the Use of PFAS in Firefighting Foam](#)
 - Banned training with AFFF upon passage
 - Banned most AFFF uses as of 10/1/21
 - Directed DEEP to initiate an AFFF Take-Back Program (began in April 2021)



CT AFFF Take-Back Program

- ✓ **Phase 1 – Container Collection & Disposal of AFFF concentrate from state/municipal fire departments**
 - April 2021 – March 2022
 - **35,300 gal.+ collected from >250 town fire departments**
 - **Cost of approx. \$900,000** for pick up and safe disposal of AFFF in containers
- ✓ **Phase 2 – PFAS Decontamination Study/ Regional Foam Trailer Cleaning:**
 - Summer 2021-2022
 - Now purchasing new foam trailers
- ❑ **Phase 3 – Dispose of AFFF from ~400 municipal fire trucks:** Pending funding



Decon Demonstration Project Goals

☐ Risk reduction rather than elimination

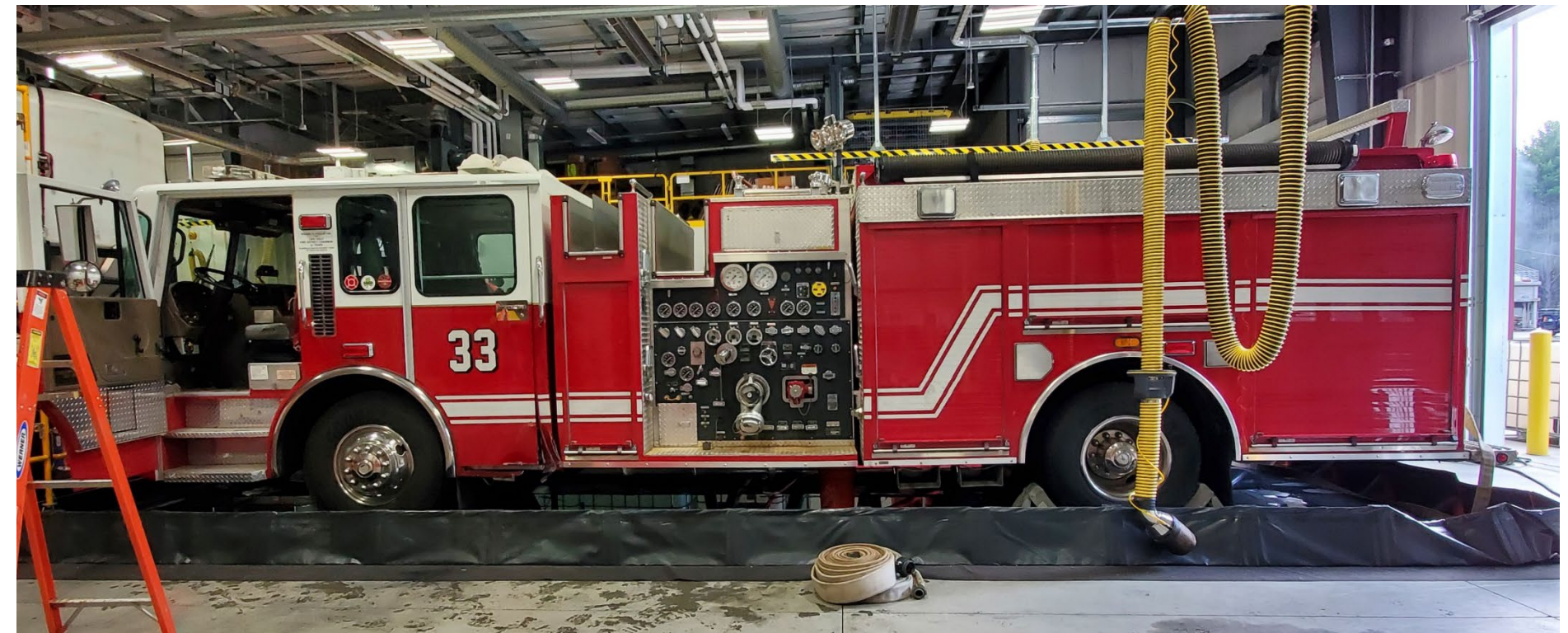
- Gross PFAS removal
- How to clean?
- Clean to what level? ppb? ppt?

☐ Waste minimization

☐ Cost-benefit analysis

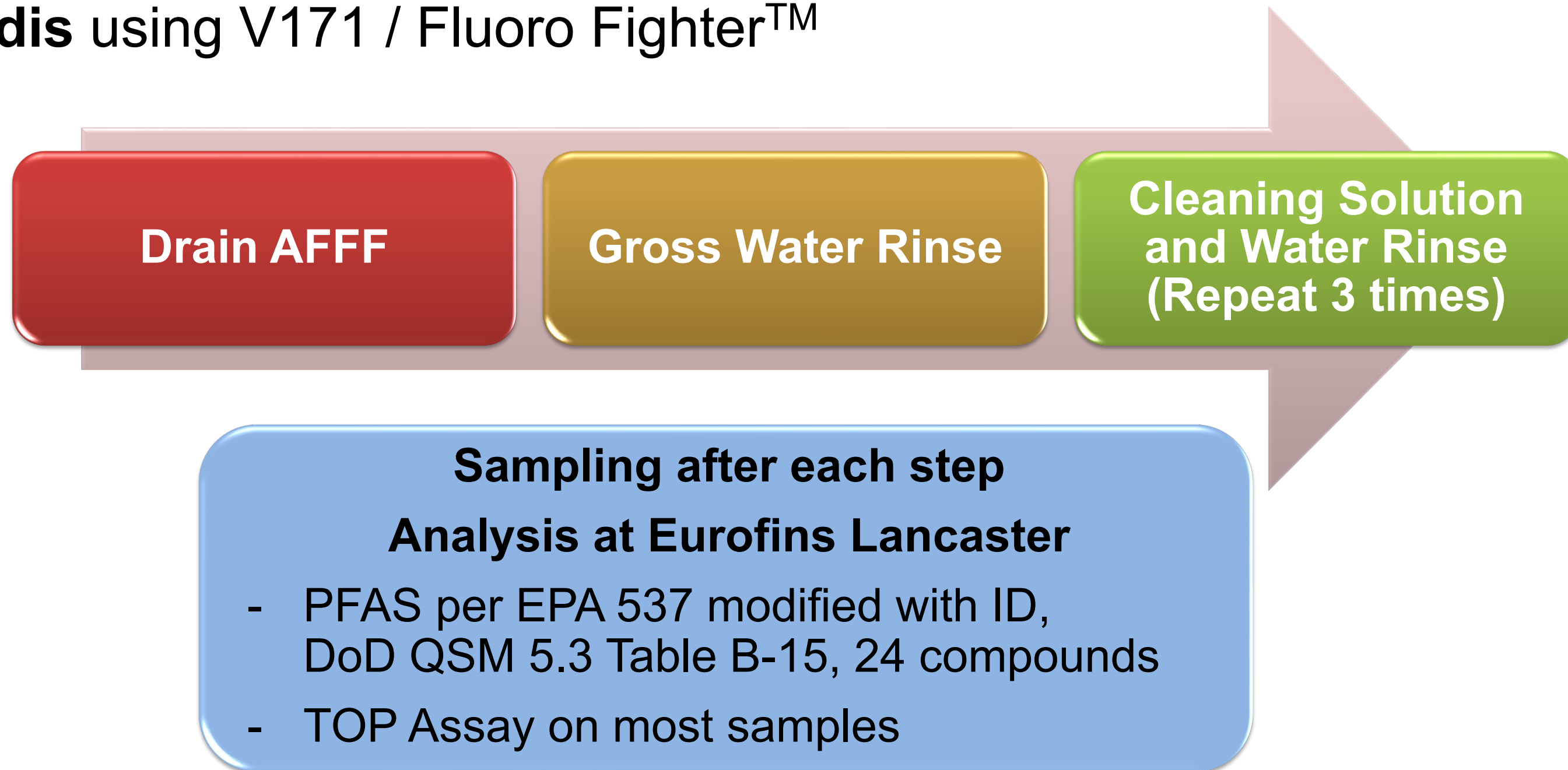
- Clean vs. replace equipment?
- On-site treatment of waste liquids vs. off-site disposal?

☐ Refine SOP for remaining trailers and tailor approach for cleaning municipal fire apparatus



Demonstration Project Approach

- ❑ 2 vendors using 2 different cleaning solutions at separate locations
 - **AECOM** teaming with TRS and Hiller using **PerfluorAd**® system
 - **Arcadis** using V171 / Fluoro Fighter™

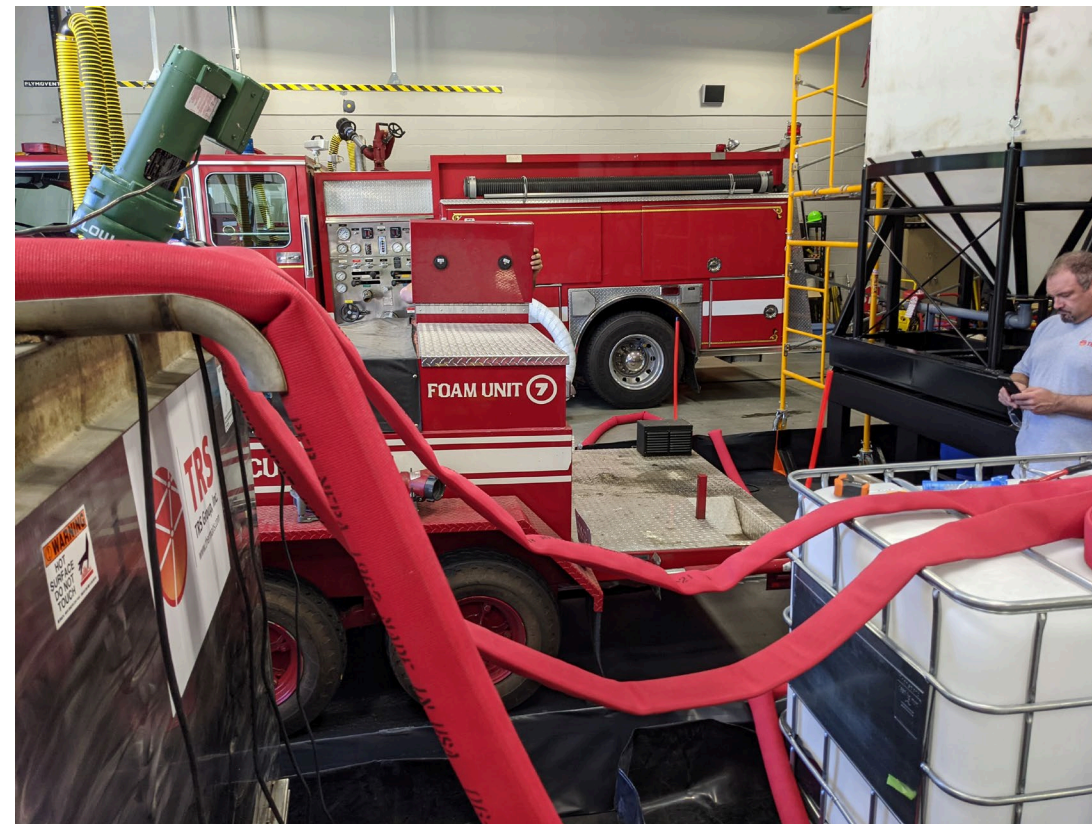


Foam Trailer Specs

- 500-gallon foam concentrate capacity, C6 AR-AFFF
- Poly tank with baffles
- 3 foam proportioners and deluge
- 3 sets of on-board hand lines
- Transfer pump assembly



AECOM/TRS/Hiller – Foam Trailer Cleaning



Foam Trailer Cleaning using **PerfluorAd[®]** system



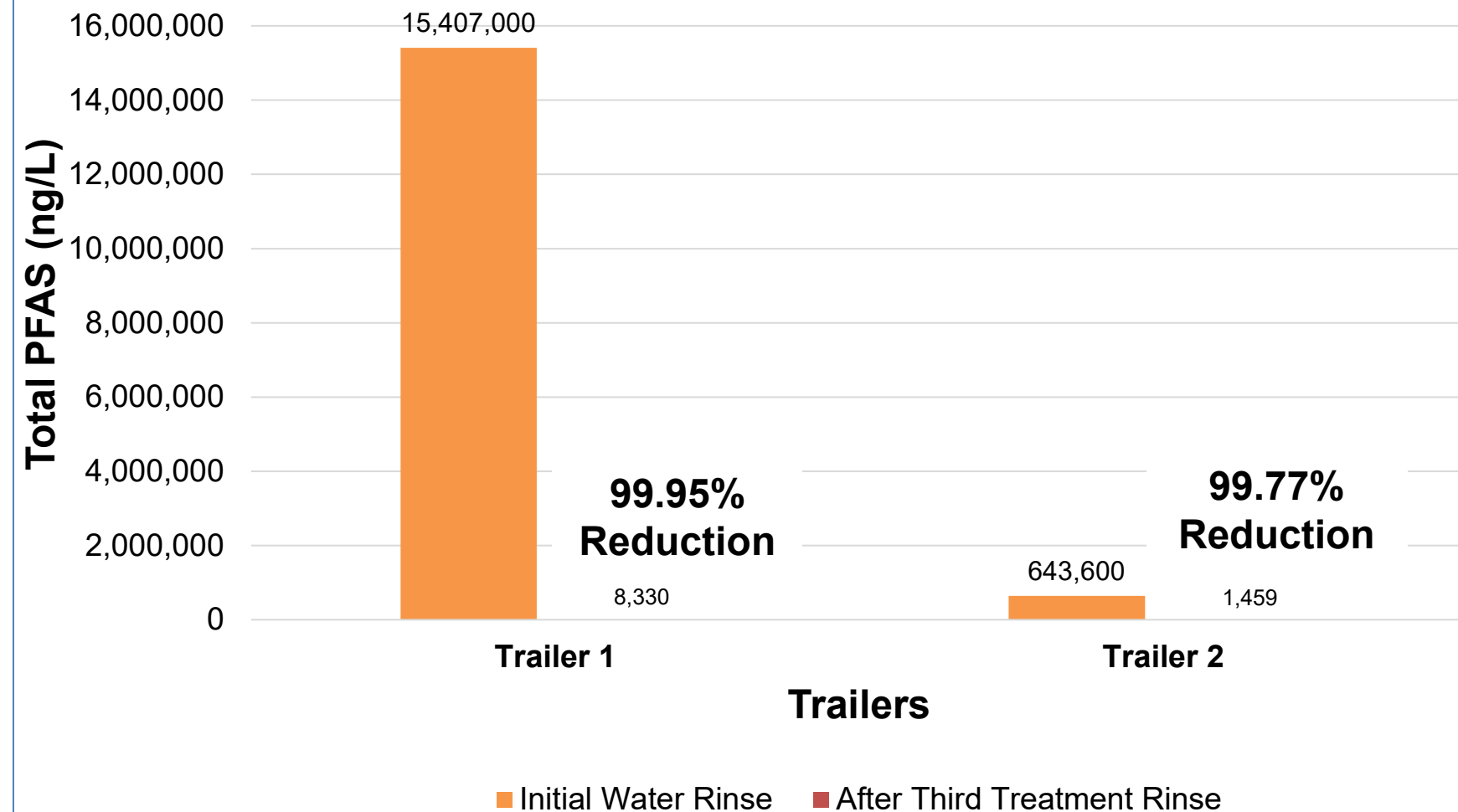
AECOM/TRS/Hiller – Fire Truck Cleaning

Fire Truck Cleaning using **PerfluorAd**® system

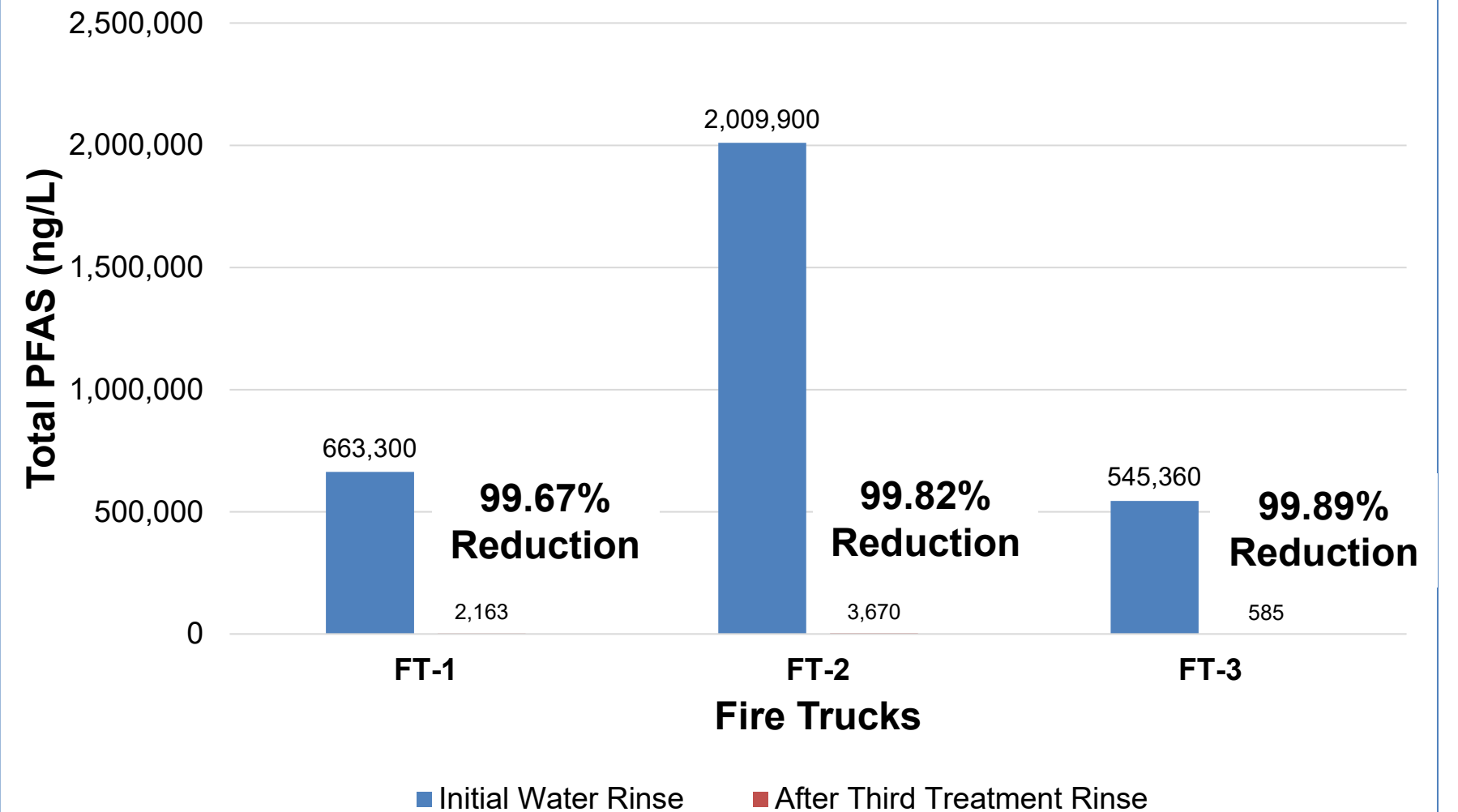


AECOM/TRS/Hiller – Preliminary Results

Foam Trailer Demonstration Cleaning PFAS Reduction



Fire Truck Demonstration Cleaning PFAS Reduction



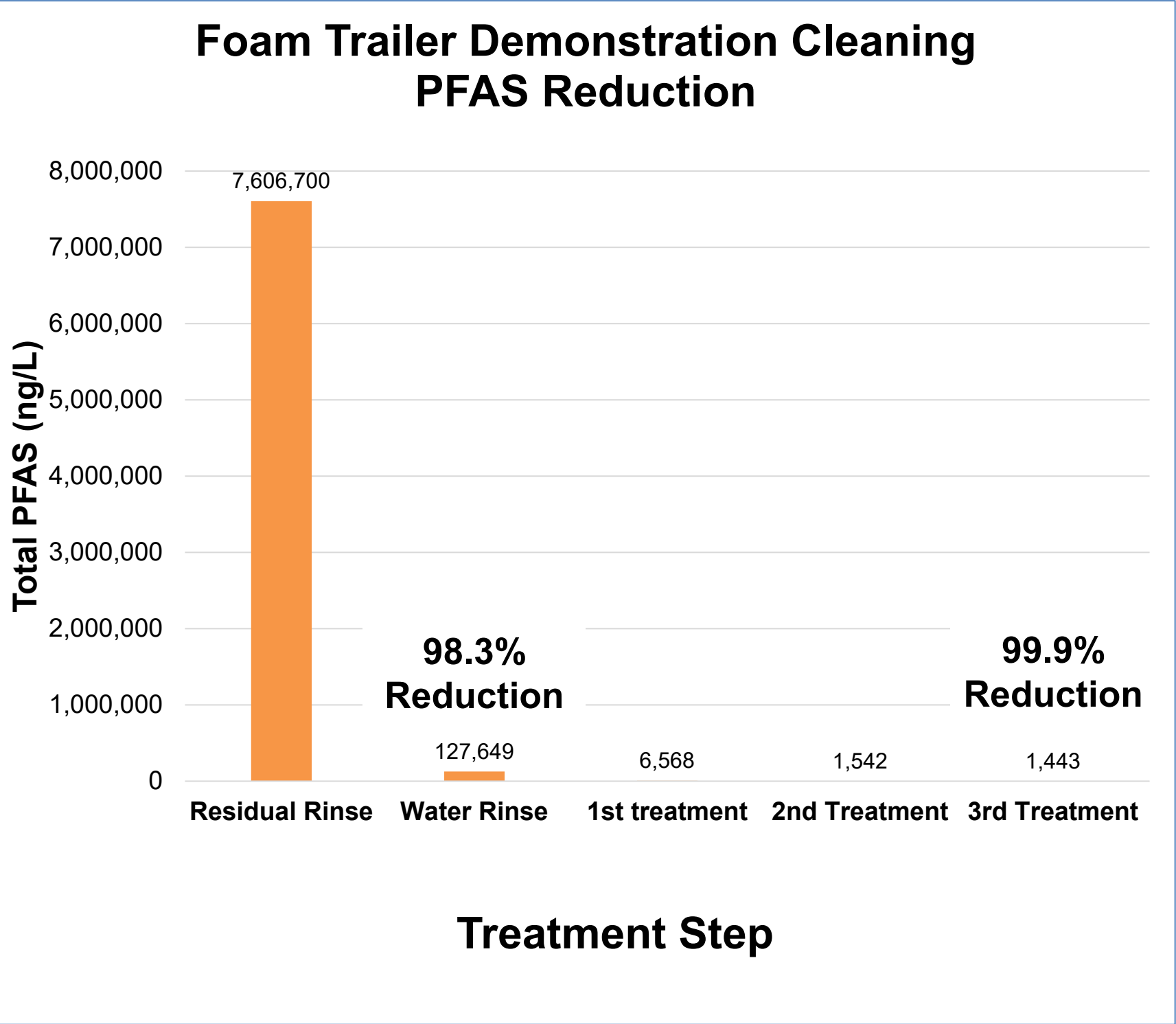
Notes: 1. Results shown for reduction after 3 treatment applications with **PerfluorAd**® system
2. Total PFAS represents list of 24 PFAS compounds, EPA 537 modified with isotope dilution

Arcadis – Trailer Cleaning



Foam Trailer Cleaning using Fluoro Fighter™

Arcadis – Preliminary Results



Notes:

- 1. Results shown for reduction after 3 treatment applications with Fluoro Fighter™
- 2. Total PFAS represents list of 24 PFAS using EPA Method 537 modified with isotope dilution



Key Take-Aways from Decon Demonstration

- ❑ **Proprietary cleaning agents were more effective** at reducing PFAS than plain water rinses (>99% vs. ~95% removal)
- ❑ However, **residual PFAS levels remain** following use of proprietary cleaning agents that will still cross-contaminate new Fluorine-Free Foam (F3)
- ❑ **Significant Logistics and Cost**
 - Fire apparatus are custom. Not a “one-size-fits-all” approach. Is the replacement foam compatible with existing equipment?
 - Look for economies of scale. More cost effective to clean multiple apparatus at the same time.
- ❑ **Disposal of AFFF and PFAS waste** can be challenging and expensive

Next Steps...

☐ **Initiate purchase of new foam trailers**

- Cost-Benefit Analysis showed price of cleaning was equivalent to purchasing new trailers
- Will avoid cross-contamination of new foam

☐ **Continued Education & Outreach to Fire Services**

- Most AFFF use is illegal in Connecticut
- Promote updated [Guidance to Municipal Fire Departments](#) that provides advice for using new foam and existing apparatus

☐ **Seek additional funding** to assist Municipal Fire Departments with disposal of AFFF in firetrucks and transitioning to F3

Risk Reduction

Transitioning to Fluorine-Free Foam and cleaning fire apparatus is collectively a significant environmental improvement over continued use of AFFF.

- However, residual PFAS remaining in fire apparatus, even after rinsing, can cross-contaminate the new foam. Deployment of the new foam may still pose a potential environmental and/or human health risk.



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For more information

[CT DEEP PFAS Webpage](#)
[PFAS Task Force Webpage](#)
[CT PFAS Action Plan](#)

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