



Overview of EPA's PFAS Innovative Treatment Team (PITT)

***Hoosick Falls CPWG Meeting
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Tim Watkins
Director, Center for Environmental Measurement and Modeling
US EPA Office of Research and Development



EPA's PFAS Research

- The EPA is rapidly expanding the scientific foundation for understanding and managing risk from PFAS.
- This research is organized around:
 - understanding **toxicity**
 - understanding **exposure**
 - assessing **risk**
 - identifying effective **treatment and remediation** actions
- For more information visit EPA's website: Research on Per- and Polyfluoroalkyl Substances (PFAS)
 - <https://www.epa.gov/chemical-research/research-and-polyfluoroalkyl-substances-pfas>



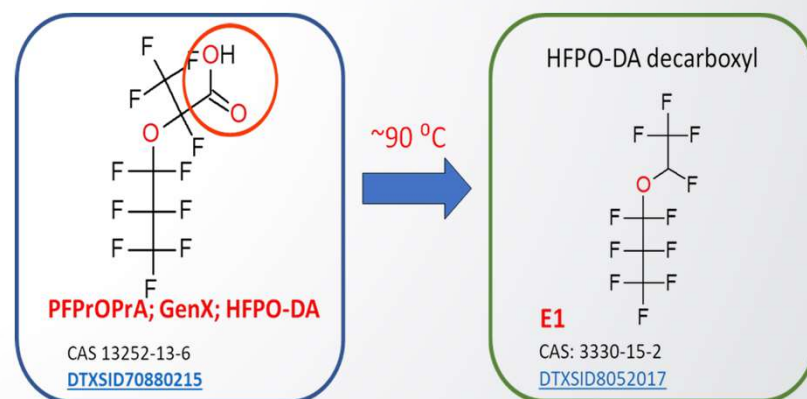
Questions

- How do we properly treat PFAS-containing wastes?
- Do treatment technologies have uncharacterized environmental releases?
- Are current thermal treatment technologies sufficiently protective of human health and the environment?
- What alternatives to thermal treatment are promising?



The Challenges

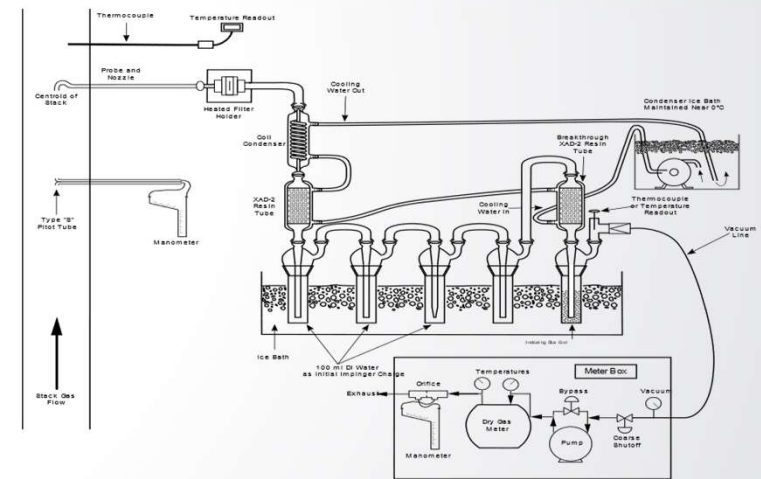
- Efficacy of thermal treatments is unknown
 - C-F bond is strong
 - Sampling and analytical methods are under development
 - 1,000's of compounds
 - Volatile, non-volatile, polar, non-polar
 - Limited number of analytical standards available
 - Field sites have not been sampled
 - Historical laboratory research on “destructibility” has not reported products of incomplete combustion (PICs)
 - Loss only of the functional group?





EPA Research Approach

- Parallel efforts:
 - Develop sampling and analytical methods
 - Conduct laboratory and pilot scale thermal research
 - Destructibility
 - Measurements
 - Surrogates
 - Sample existing treatment facilities
 - Data on effectiveness
 - Promote innovative treatment technologies
- Produce science-based answers



Modified EPA Method 5 Train for targeted and non-targeted PFAS compounds



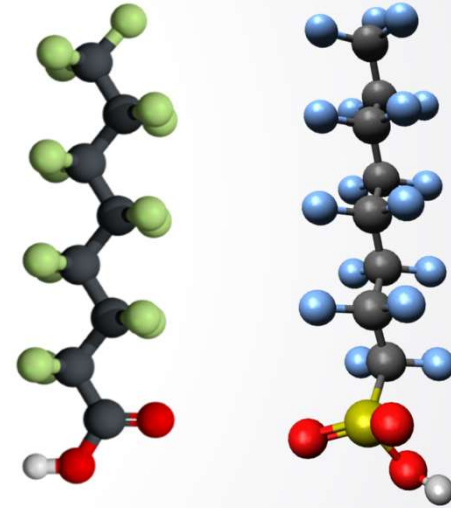
PFAS Innovative Treatment Team (PITT)

- Full-time team that brings together a multi-disciplined research staff
- Concentrating efforts and expertise on a single problem: **how to remove, destroy, and test PFAS-contaminated media and waste**
- Over the next few months, the PITT will work to achieve the following goals:
 - Assess current and emerging destruction methods being explored by EPA, universities, other research organizations, and industry
 - Explore the efficacy of methods while considering by-products to avoid creating new environmental hazards
 - Evaluate methods' feasibility, performance and costs to validate potential solutions
- States, tribes and local governments will be able to use this information to select the approach that best fits their circumstances, leading to greater confidence in cleanup operations and safer communities
- The results of this rapid research project are expected later this year



Focus: PFAS Sources

- Biosolids, sludge
- AFFF-contaminated soils
- MWCs, landfills, landfill leachate
- GAC, anion exchange resins
- AFFF concentrate, spent AFFF





Non-Incineration Technologies Reviewed

- Chemical
- Biological
- Plasma
- **Mechanochemical**
- Sonolysis
- Ebeam
- UV
- **Supercritical water oxidation**
- Deep well injection
- Sorption/stabilization
- **Electrochemical**
- Landfill
- Land application

Assessment Factors:

- Technology readiness
- Applicability
- Cost
- Required development remaining
- Risk/reward of technology adoption

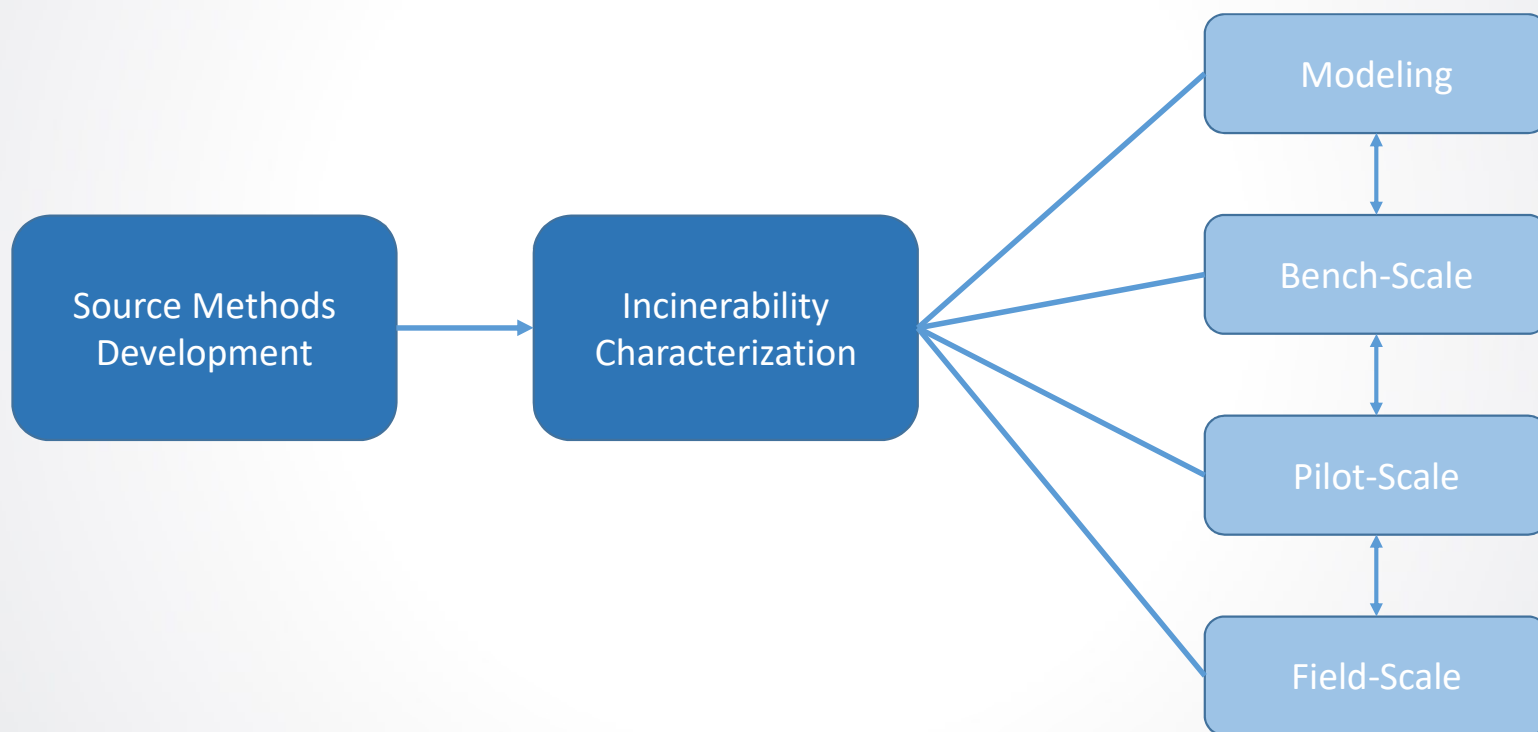
Innovative technologies selected for further investigation.



**Cool Ways to
Destroy PFAS**
PER- AND POLYFLUOROALKYL SUBSTANCES



Thermal Treatment Research Approach





Incinerability Characterization

- Conduct modeling, bench, and pilot scale research to characterize conditions conducive for thermal destruction of PFAS in controlled settings
- Obtain field data to show PFAS destruction with thermal incinerability
 - Necessary temperature and time conditions
- Analyze for products of incomplete combustion
- Examine whether a surrogate burn (CF_4 , C_2F_6) can indicate incinerability efficiency
- Determine effectiveness of air pollution control equipment

 Is incineration of PFAS waste a sufficient treatment technology?



Planned Products

- **PFAS Treatment**

- Publication of results to characterize fundamental understanding of thermal treatment of PFAS
- “Toolbox” with technical guidance/state-of-science on treatment of PFAS
- Decision support tools

- **Air Emission Measurement Methods for PFAS**

- PFAS Method OTM 45
- Total Organic Fluorine Methods
- Non-targeted Measurement Approaches to Identify PFAS

- **Other Contributions**

- Supporting Incineration Guidance as part of the National Defense Authorization Act



PITT Relation to Hoosick Falls

- Identifying solutions for the treatment of PFAS contaminated media and waste.
- Advancing the scientific understanding and technical capabilities to measure and characterize air emissions.
- Informing the development and evaluation of thermal emission control devices.



Questions