



PFAS at DOE: Present, Past, Future

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PFAS R&D Workshop
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Outline

- The Present
 - PFAS Policy and Roadmap
- The Past
 - Historic & Current Uses at DOE
 - Challenges and Analogues
- The Future
 - Role of National Labs and R&D





DOE Actions: Timeline

September 2019

DOE PFAS Work Group established

September 2019

Operating Experience Level 3 Document [PFAS Awareness](#), published

March 2020

[Emerging Contaminants in Groundwater at Brookhaven National Laboratory](#), published

September 2021

Deputy Secretary [memorandum](#) addressing PFAS at DOE

August 2022

[PFAS Roadmap](#) released

August 2022

[DOE PFAS Website](#) went live

December 2021

[DOE Guidance on Reporting PFAS-Containing AFFF Releases or Spills to the Environment](#) issued

November 2021

PFAS Coordinating Committee (PCC) established

November 2022

[Initial Assessment Report](#) released

December 2022

[R&D Report](#) published

January 2023

[Historical/Current Use Records Search](#) issued

August 2023

[Environmental Sampling Guidance](#) issued

↑
Ongoing
DOE
Research
↓

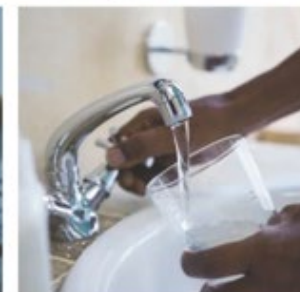
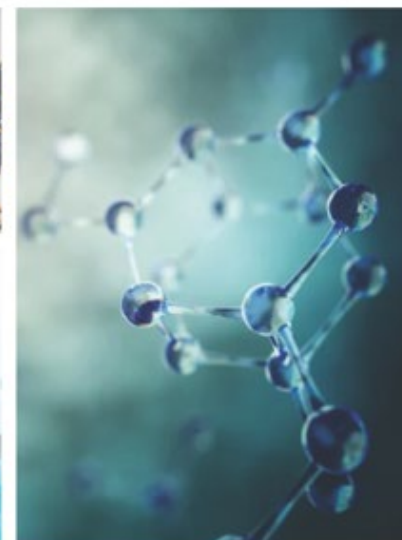
PFAS Coordinating Committee Actions: DOE PFAS Roadmap

The *PFAS Strategic Roadmap: DOE Commitments to Action 2022-2025* was published on August 18, 2022.



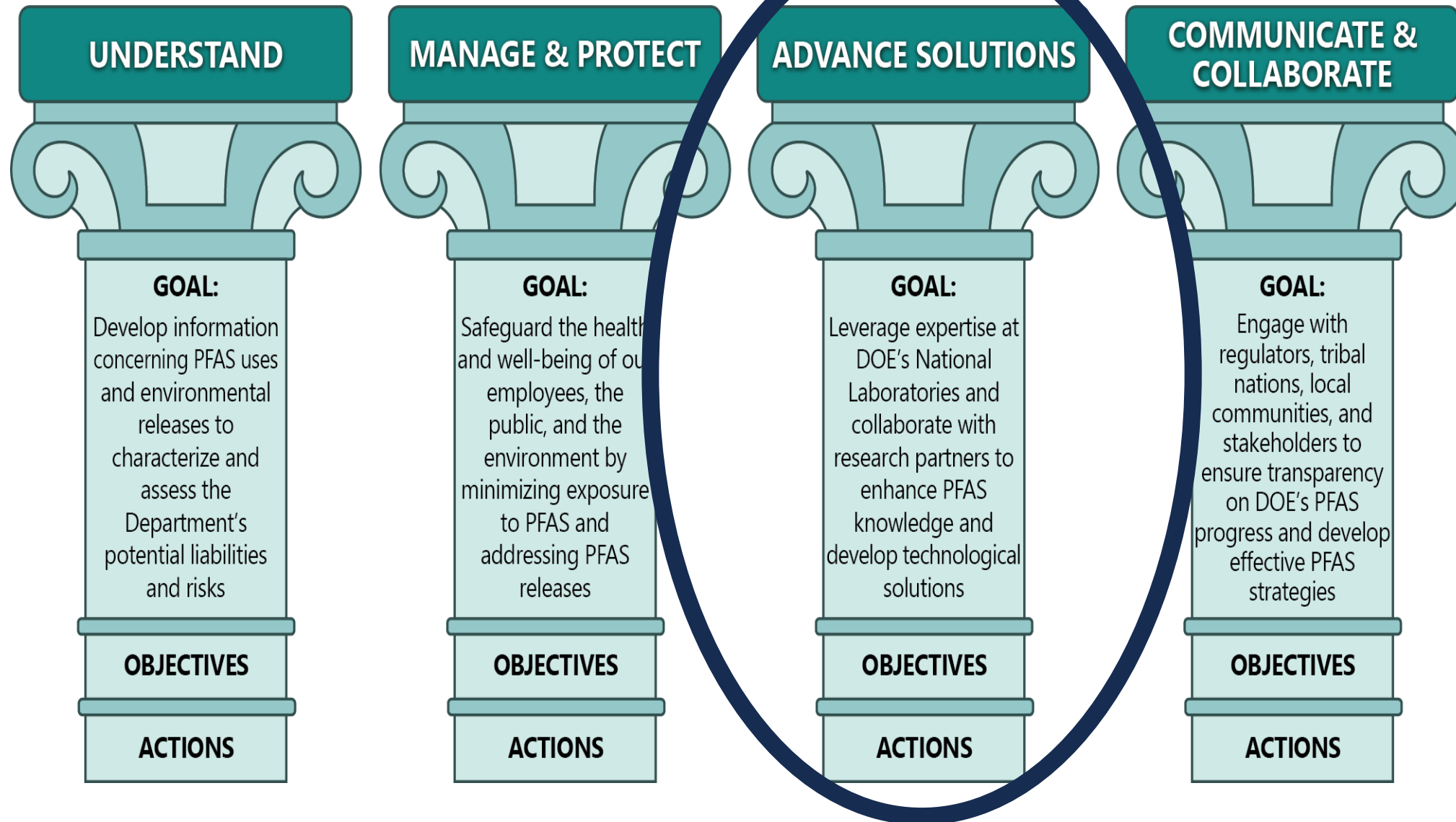
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PFAS Strategic Roadmap: DOE Commitments to Action 2022-2025





DOE Actions: DOE PFAS Roadmap



DOE Actions: Historical and Current Use Guide

The *Guide for Investigating Historical and Current Uses of PFAS at DOE Sites* was published on February 16, 2023.



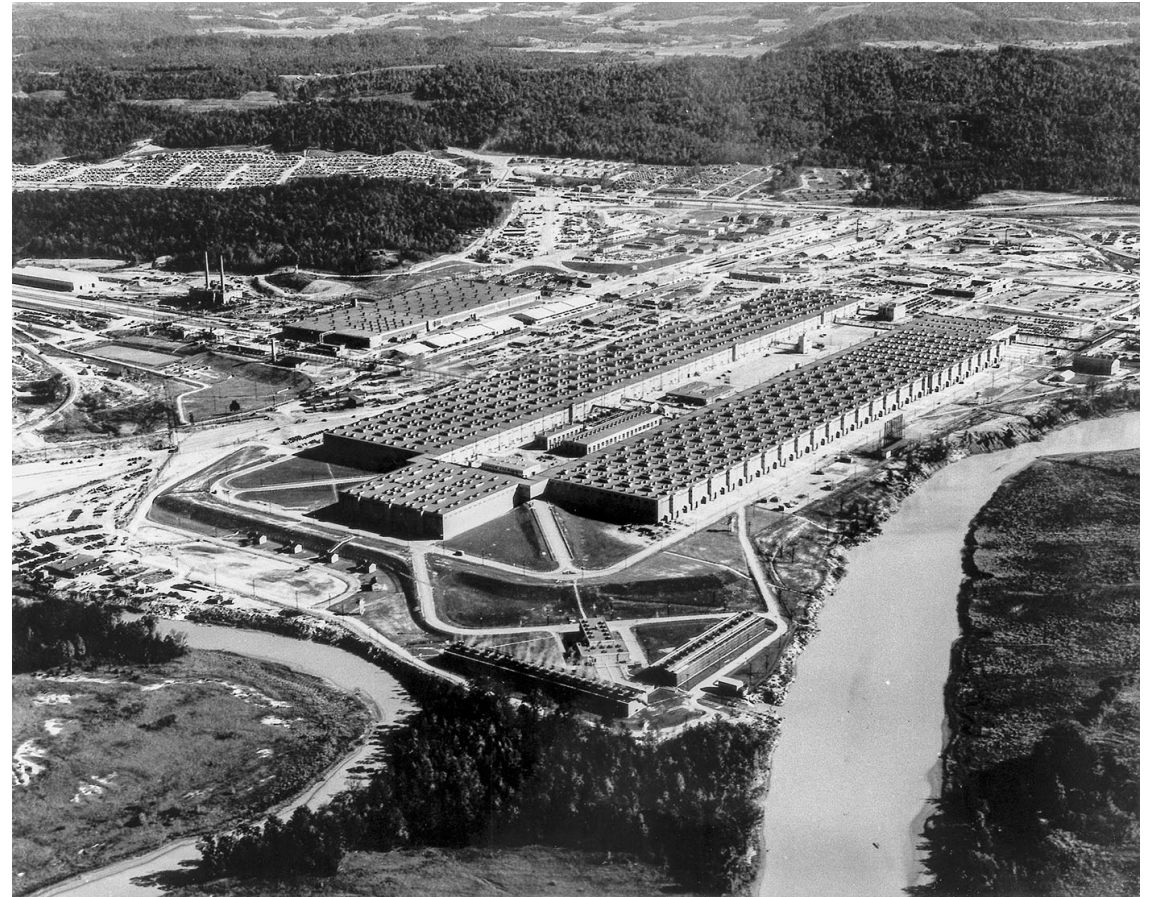
Guide for Investigating Historical and Current Uses of Per- and Polyfluoroalkyl Substances at Department of Energy Sites



DOE's unique historic role with PFAS

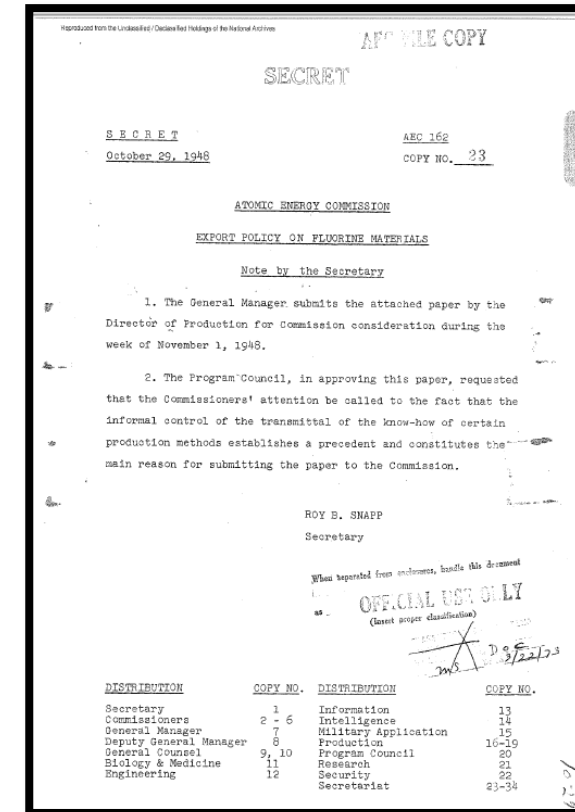
PFAS were first produced on an industrial scale for use in uranium separation activities during the Manhattan Project.

- 1938 - Teflon® (polytetrafluoroethylene, PTFE) discovered by DuPont scientists
- Enrichment of U235 for a-bomb project used gaseous UF₆ (highly corrosive).
- Teflon® and other liquid fluorocarbons found to be highly resistant to corrosion
- First (classified) industrial use of PFAS- identified through historical record review in March 2020.
- Fluorocarbon chemistry declassified after the war, begins commercial use in 1949



Example from Unclassified NARA Records: Export Policy on Fluorine Materials

- “About 2,000 tons of fluorocarbons were produced by the Manhattan District.”
- “Nearly all the project fluorocarbons and the required fluorine for their production was prepared in Manhattan District plants...operated by DuPont and Hooker Electrochemical.”
- Many companies were already seeking peace-time applications for fluorocarbons
- Report included annual estimated volumes used



Office of the Secretary General
Correspondence, “AEC Export Policy on
Fluorene Materials,” 1948, NARA, A1E67-
A1 NN3-326-93-007.



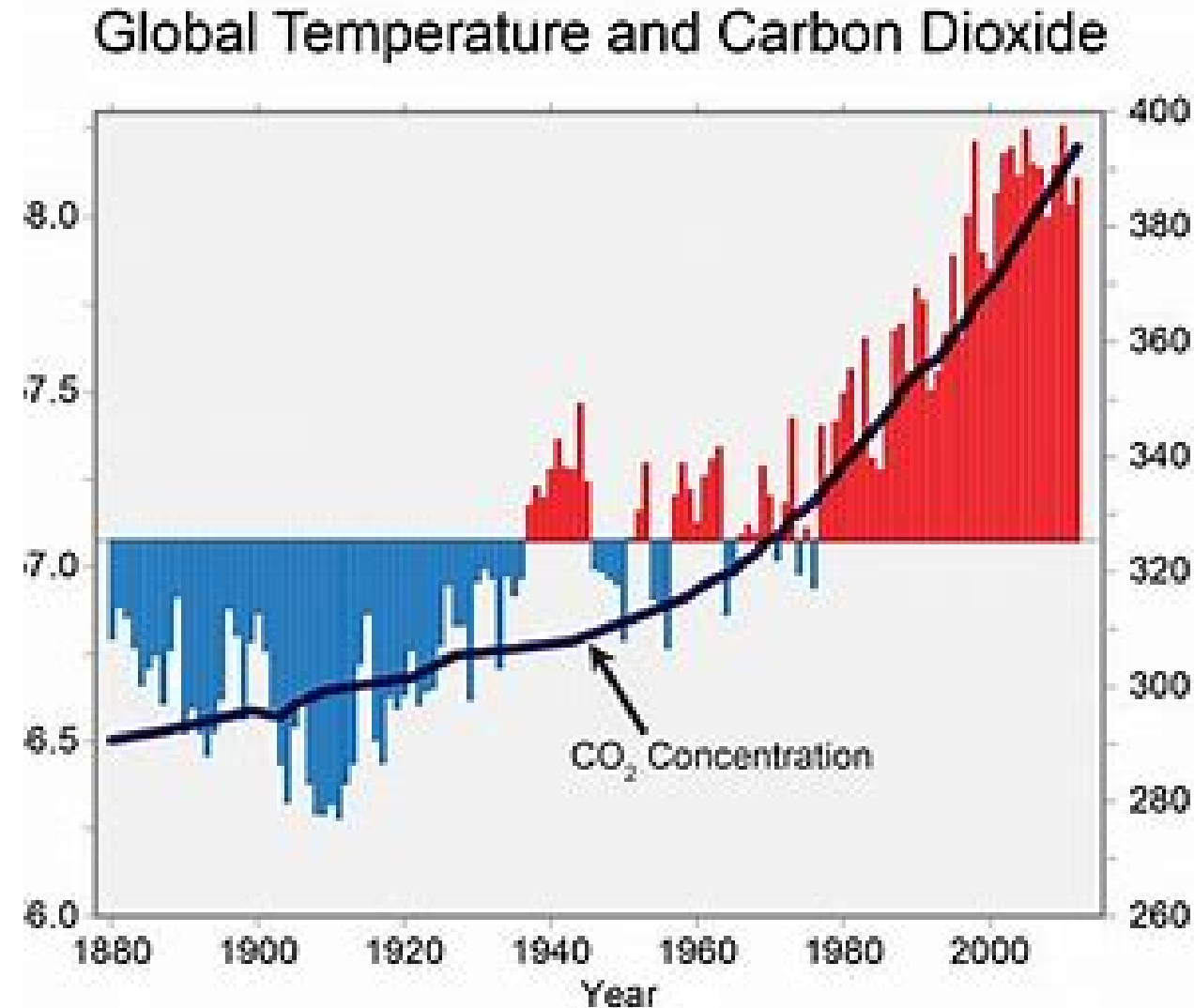
The Challenges of PFAS

- PFAS rapidly became invisibly ubiquitous
 - Used in dizzying array of products and applications
- Industries (and USG essential missions) rely on PFAS
 - The properties that make them useful also make them challenging
- Knowledge of health impacts continues to grow
 - Challenge of regulating at PPT/PPQ levels

What are right historic analogues and mental models to help us understand PFAS?



- DDT
- HCFCs
- Lead
- Climate Change





The Future: What do we need from R&D?

Detect, Measure, Monitor	Identify more types of PFAS in more types of media with greater precision at lower cost to track pathways and mobility
Destroy	Break the carbon-fluorine bond at scale, affordably, without emitting toxins or greenhouse gases
Replace	Identify low-risk materials with properties that have potential to support key applications
Communicate & Collaborate	We cannot do this alone

