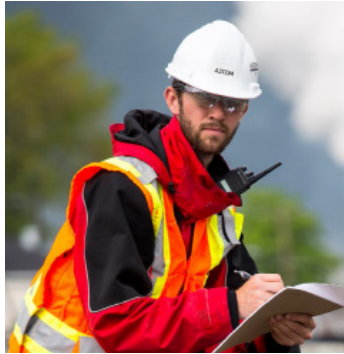


# AECOM Capability Overview — PFAS Management



## Areas of Expertise

- PFAS Sampling
- Toxicity/Risk Assessment
- Feasibility Studies/Remediation/  
Development of Treatment Technologies
- Regulatory Navigation/Negotiation
- Off-Site Release Mitigation
- PFAS Waste Management

## More Information

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**AECOM has been conducting PFAS investigations since 2001, has worked on many of the world's most significant PFAS problems, and is currently working on over 165 PFAS sites around the globe including >50 DoD and 15 R&D projects.**

## What Are PFAS?

Per- and Poly-fluoroalkyl Substances (PFAS) comprise a diverse group of synthetic chemicals used for over 50 years in various military and industrial applications and consumer products. PFAS are key components of aqueous film forming foams (AFFF) used for Class B fire fighting and fire suppression starting in the 1960s. Sources of PFAS at military and commercial airports can include: fire training areas, nozzle test areas, hangars and other buildings equipped with fire suppression equipment, fire stations, AFFF loading, handling and storage areas, aircraft and vehicle crash response areas, and AFFF ponds, sumps, and tanks. The U.S. Air Force estimates PFAS-containing AFFF may have been used at approximately 200 active and former Air Force bases, including Air National Guard and Air Force Reserve facilities.

## Properties of PFAS

- Limited sorption to soil and sediments
- Highly water soluble, non-volatile and extremely mobile in water
- Exceptional stability
- Persistent with very little attenuation
- Widely present in the environment, bioaccumulative and detected in plants, many animals, and humans

## Potential Health Effects

Toxicological data are generally limited for most PFAS with the exception of a few more highly studied compounds. The C8 Science Panel identified the following probable links to Perfluorooctanoic Acid (PFOA) exposures:

- Ulcerative colitis
- Thyroid disease
- Testicular and kidney cancer
- Pregnancy-induced hypertension
- Diagnosed high cholesterol

## Increased Regulatory Attention

Concerns associated with PFAS prompted the USEPA to include six PFAS compounds on its Unregulated Contaminant Monitoring Rule – 3 List (UCMR-3) that required sampling/analyzing the compounds in large public water systems. This sampling resulted in the discovery of impacted drinking water supplies, several linked to DoD and commercial airport sites. The USEPA promulgated Lifetime Health Advisory Levels (HALs) for perfluorooctanesulfonic acid (PFOS) and perfluorooctanoic acid (PFOA) in drinking water at 0.070 µg/l (70 parts per trillion) with a recommendation for combined PFOS/PFOA concentrations <70 ppt. While USEPA considers a broader regulation, state environmental and health agencies are setting standards for drinking water, often lower than the HALs, and often for additional compounds to PFOS and PFOA.



## Areas of Expertise

**PFAS Sampling.** PFAS sampling requires careful consideration of field sampling materials to obtain samples free of ambient contamination and high quality analytical data. AECOM developed internal training for PFAS sampling, and all field teams are required to complete this training before conducting PFAS sampling. AECOM worked closely with analytical laboratories certified to conduct PFAS analysis, audited them, and influenced their procedures.

**Toxicity/Risk Assessment.** AECOM has performed critical reviews of research on PFAS toxicity, maintains a current collection of human health/ecotoxicological information, and tracks this literature to allow us to select toxicity values that are appropriate for the receptors for different types of habitats and exposure pathways. This allows risk assessments to be targeted to the site and to reduce unnecessary remediation needs and costs by avoiding the use of default values. Our risk assessors globally have performed precedent-setting human health and ecological PFAS-specific risk assessments which assist our clients in managing PFAS impacts using state-of-the-science information.

**Feasibility Studies/Remediation/Development of Treatment Technologies.** PFAS remediation is challenging, with a limited number of commercially available effective technologies. Demonstrated options for soil include: Excavation and off-site disposal or incineration; and isolation in place. Demonstrated options for groundwater include: Pump and treat with granular activated carbon or thermal oxidation. Testing of stabilization (soil/groundwater) and ion exchange resins are showing promise. AECOM is currently conducting PFAS treatment R&D on behalf of the U.S. Air Force, Australian Defence, and Canadian Government.

**Regulatory Navigation/Negotiation.** AECOM has been actively involved in negotiating with regulators to ensure that pragmatic management measures are put in place. As the regulations continue to evolve, AECOM has the capabilities to address Applicable or Relevant and Appropriate Requirements (ARARs) for sites and contaminants regulated by USEPA and State/Local regulators. AECOM brings its regulatory expertise in solving complex waste management thereby minimizing environmental liabilities. AECOM also tracks regulatory developments for PFAS closely.

**Off-Site Release Mitigation.** Numerous AECOM personnel with PFAS experience can respond quickly to off-site releases and potential human exposures. In addition to residential or private drinking water sampling, AECOM performs community relations activities including development of communications plans, hosting community engagement meetings, and establishing call centers.

**Waste Management.** AECOM provides a wide range of capabilities to manage PFAS-contaminated wastes. Our teams utilize off-the-shelf technologies ranging from incineration for solid wastes to granular activated carbon systems for water wastes. We are also looking to newer, innovative ways to manage wastes with the goal of destroying PFAS molecules, focusing on sustainable and affordable technologies that emphasize total destruction through electrochemical oxidation, ultrasonic or enzymatic oxidative destruction. We have also evaluated the feasibility of stabilizing and reducing PFAS in soil and solid waste using commercial products such as RemBind® and innovative enzymatic oxidation destruction. Our waste management experience includes support to clients for compliance with permitted waste requirements when other chemicals of concern are also contained in the impacted media.

## Our Approach

AECOM was awarded our first PFAS project in 2001, and has since become a recognized industry leader on PFAS around the globe. We've established global and regional leaders that support PFAS projects and understand how to work closely with local teams. AECOM's PFAS Technical Practice Group (TPG) tracks regulatory and treatment technology developments and meets monthly to exchange recommendations. AECOM participates in research forums and works with leading academics globally. For example, AECOM and University of Georgia currently have an Air Force Broad Agency Announcement (BAA) grant for conducting a pilot study to evaluate treatment technologies at Wurtsmith AFB.

### Key AECOM Attributes

- Conducted PFAS activities at ~200 U.S. DoD facilities and is currently conducting PFAS preliminary assessments/site investigations, remedial investigations/feasibility studies, Conceptual Site Models (CSMs), and R&D for DoD.
- Worldwide, multi-country experience in all aspects of PFAS investigation, risk assessment and remediation in consulting, research, and regulatory developments.
- Conducting the largest PFAS investigation ever performed; collecting >15,000 samples, investigating several entire counties, and collecting samples along an 80 mile segment of a large river.
- Designed, installed, operated, monitored and maintained dozens of full scale PFAS groundwater remediation systems, hundreds of residential and 10 commercial supply well PFAS treatment systems.
- Conducting innovative on-site soil and groundwater remediation bench and pilot scale testing on behalf of the Australian and U.S. DoD.