



Polyfluoroalkyl Substances (PFAS): Regulation, Research, Risk, Mitigation & Alternatives

A Continuing Education Program Sponsored by the Massachusetts Chemistry &
Technology Alliance (MCTA)

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Dow Chemical, ATC Upper
255 Forrest Street
Marlborough, MA

Introduction to PFAS

Karen Kinsella, Ph.D., Technical Specialist, Biochemistry
GZA GeoEnvironmental

Karen Kinsella's presentation will introduce per- and polyfluoroalkyl substances (PFAS). PFAS are a large class of man-made chemicals that are an emerging worldwide priority in environmental and human health because some are environmentally persistent, bioaccumulative, and pose human health risks. Two of the more persistent and bioaccumulative PFAS, perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS), are no longer manufactured or used by major chemical companies in the U.S. as a result of voluntary phaseouts. In May 2016 the U.S. Environmental Protection Agency (EPA) issued a lifetime drinking water Health Advisory for PFOA and PFAS of 0.07 micrograms per liter ($\mu\text{g/L}$). Since then, many states have issued drinking, groundwater, and/or surface water advisories and regulatory limits. The Massachusetts Toxics Use Reduction Science Advisory Board (TUR SAB) has recommended that PFOS and PFOA be added to the TUR list of regulated chemistries. This introduction will provide a brief overview of the various sub-classes of PFAS, how they are used, and where they are found.

Introduction to PFAS: Alternative Fluorochemistries to PFOS, PFOA, and other PFAS with Known Human Health Risks

Jessica Bowman, Executive Director
FluoroCouncil, Administered by the American Chemistry Council

Jessica Bowman's presentation will focus on stewardship efforts from manufacturers and users to transition to improved alternatives to PFOS, PFOA, and other PFAS with associated human health risks, including efforts to support the adoption of best practices. She will also highlight

the role of PFAS to modern society and the challenges associated with non-fluorinated alternatives.

Hazard & Risk Associated with PFAS under Regulatory Consideration

Denise Kmetzo, DBAT, Principal
Collaborative Risk Solutions, LLC

Denise Kmetzo's presentation will focus on the current understanding regarding hazards associated with PFAS, including a discussion of persistence and bioaccumulation potential, as well as human health effects. Denise will present the toxicological basis for EPA's drinking water Health Advisories for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS). She will also include a discussion of those compounds expected to be regulated by the Massachusetts Department of Environmental Protection, including PFOA, PFOS, perfluorononanoic acid (PFNA), perfluorohexanesulfonic acid (PFHxS), and perfluoroheptanoic acid (PFHpA). In addition, Denise will discuss PFAS compounds currently under review by the Massachusetts Toxics Use Reduction Act Science Advisory Board (TURA SAB), including perfluorobutanoic acid (PFBA), perfluorobutane sulfonic acid (PFBS), perfluorohexanoic acid (PFHxA), and PFHxS. The presentation will provide the basis for federal health-based advisories for PFOA and PFOS, and an understanding of general environmental and toxicological concerns associated with compounds under review for potential regulation in Massachusetts.

PFAS: Pathways & Mitigation

Richard Desroisiers, Associate Principal, Hydrologist
GZA GeoEnvironmental

Rich Desrosiers' presentation will focus on how PFAS compounds enter the environment and how these compounds do not degrade, resulting in significant migration pathways. If PFAS was comingled with another contaminant (i.e., chlorinated solvent), the treatment process for the chlorinated solvent would not have been effective at treating the PFAS compounds. Regulators have begun re-opening old remediated sites, targeting PFAS compounds, and Rich will provide an overview of regulations proposed or promulgated in the greater New England region. This presentation will also explore available treatment remedies aimed and their implementation within the environmental (soil, groundwater, surface water), impacts to wastewater treatment plants (from permitted discharges) and drinking water supplies (point of entry and the distribution) as well as mechanisms to prevent or reduce release. A case study will be presented.

PFAS Sampling & Analytical Considerations

James Occhialini, Vice President, Specialty Practice Leader
Alpha Analytical

Jim Occhialini's presentation will focus on the analytical chemistry aspects of PFAS. The assessment of PFAS in the environment can be considered a "moving target" in terms of the gradually evolving chemical, engineering, toxicological, and regulatory body of knowledge associated with these compounds and their impacts on human health and the environment. The

same can also be said for the sampling and analytical considerations associated with PFAS. What compounds can be analyzed for, with what sensitivity and by what methodologies? What is the risk of sampling cross-contamination and are there other laboratory associated challenges to be aware of? In addition to the EPA and DoD, many states have been taking the lead in drafting policies and regulations. As such, there are differing requirements in terms of analytical methods, target compound lists, regulatory standards, and detection limits etc. Jim Occhialini's presentation will provide an overview of PFAS from the laboratory perspective that addresses these questions and the challenges associated with this rapidly evolving landscape.

Regulation & Ramifications

Emilee Scott, Associate

Robinson + Cole

Emilee Scott's presentation will outline emerging areas of legal exposure associated with PFAS. She will outline the status of the developing regulatory requirements related to PFAS, in Massachusetts and elsewhere in New England. She will also discuss potential ramifications associated with remediation and site closure, workplace exposure, and toxic torts. Finally, she will discuss potential pitfalls in the transactional context faced by buyers and sellers.