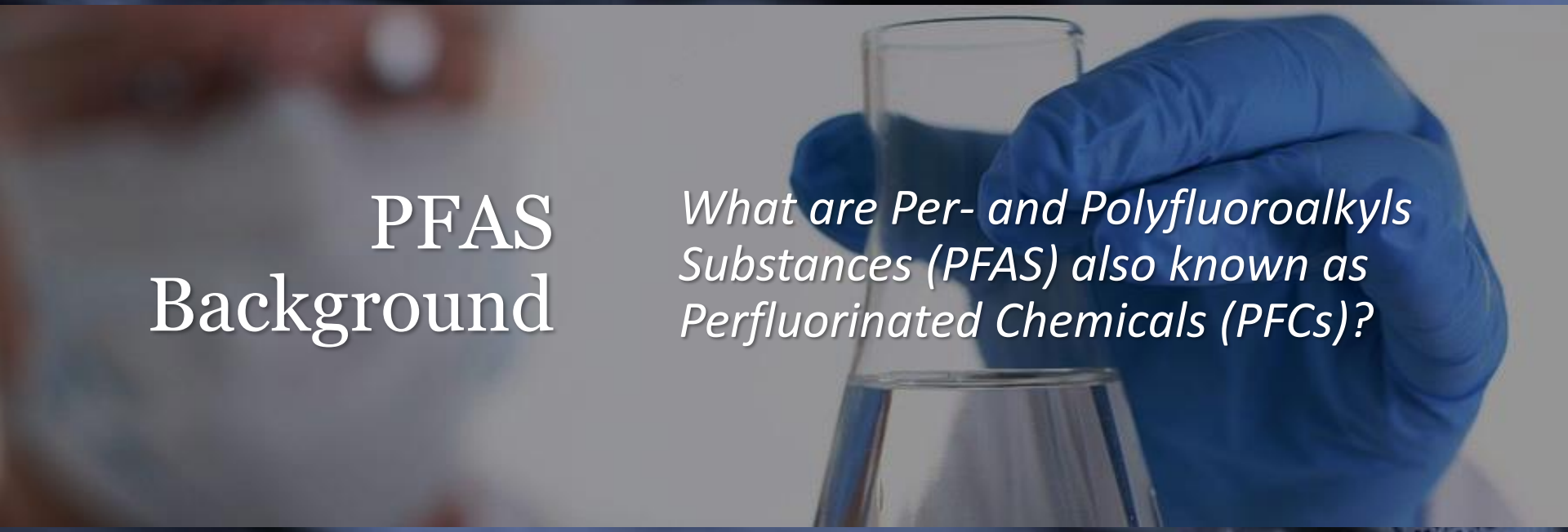
PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS)

NAPOLI SHKOLNIK PLLC

PFOA AND PFOS WATER CONTAMINATION
& COST RECOVERY PROGRAM

PFAS Background

What are Per- and Polyfluoroalkyls Substances (PFAS) also known as Perfluorinated Chemicals (PFCs)?



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What are Perfluorinated Chemicals (PFCs) and their relation to PFAS?

Scientists use "PFCs" as an abbreviation for two distinct but related sets of chemicals. Whenever you see the abbreviation, make sure you understand how the author or publisher is using it.

PFCs can be an abbreviation for either:

- *perfluorinated chemicals*, or
- a subset of perfluorinated chemicals called *perfluorocarbons*

The term Perfluorinated Chemicals (PFCs) refer to Perfluoroalkyl compounds, which are human-made substances that do not occur naturally in the environment. PFCs include but are not limited to:

- **Perfluorooctanoic acid (PFOA)**
- **Perfluorooctane sulfonic acid (PFOS)**

PFC Emissions

PFCs have been manufactured for more than 50 years where the substances PFOS and PFOA are part of a group of old-generation PFCs which will be used to a lesser extent in the future due to their potential hazards.

These hazards have resulted and will result in [litigation] and a number of [national] and international legislative bans worldwide.

Source: epa.gov

Citations

1. Kissa 2001
2. Schultz et al. 2003
3. 3M 1999
4. Hekster et al. 2003;
5. DuPont 2008
6. EPA 2008a

Posner: Perfluorinated compounds – occurrence and uses in products: 1-14. 2011.

PFCs Background
What are PFCs?

Environmental - Perfluoroalkyls are very stable compounds and are resistant to biodegradation, direct photolysis, atmospheric photooxidation, and hydrolysis (3M 2000; EPA 2008a; OECD 2002, 2007; Schultz et al. 2003). The chemical stability of perfluoroalkyls and the low volatility of these substances in ionic form indicate that perfluoroalkyls will be persistent in water and soil (3M 2000; Prevedouros et al. 2006).

[Indicating that the compounds do not easily chemically react with their environment or break down]

Bioavailability

Perfluoroalkyls are widely detected in humans and animals, indicating that several of these substances are bioavailable. (de Vos et al. 2008; Furdui et al. 2007; Martin et al. 2004b).

[Suggesting that absorption by the human body occurs relatively easily]

In living organisms, perfluoroalkyls bind To protein albumin in blood, liver, and [reproductive organs] (de Vos et al. 2008; Kissa 2001)

Firefighting Foam

Aqueous Film-Forming Foam (AFFF) containing PFCs

AFFF Background

How are AFFFs used?

- In the military, airports across the country, fire training centers and fire stations, PFCs were most commonly used in firefighting foams, referred to as **Aqueous Film-Forming Foam (AFFF).**
- The foam and film layers act to separate oxygen from the fuel surface, and are therefore able to stop the chemical reaction from burning.
- Military and airport personnel have practiced putting out fires with AFFF at numerous Fire/Crash Training Areas located at airports and military bases nationwide.

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PFOA and PFOS Water Contamination & Cost Recovery Program

Military Specification (MILSPEC)

AFFF is either **3%** or **6%** by volume in a solution of water.

MILSPEC AFFF is used to extinguish **Class B (flammable liquid)** fuel fires.

Oftentimes, this training occurred in **burn pits**, recognizable by a blackened, repeatedly-burned airplane frame at the center of an unlined dirt pit.

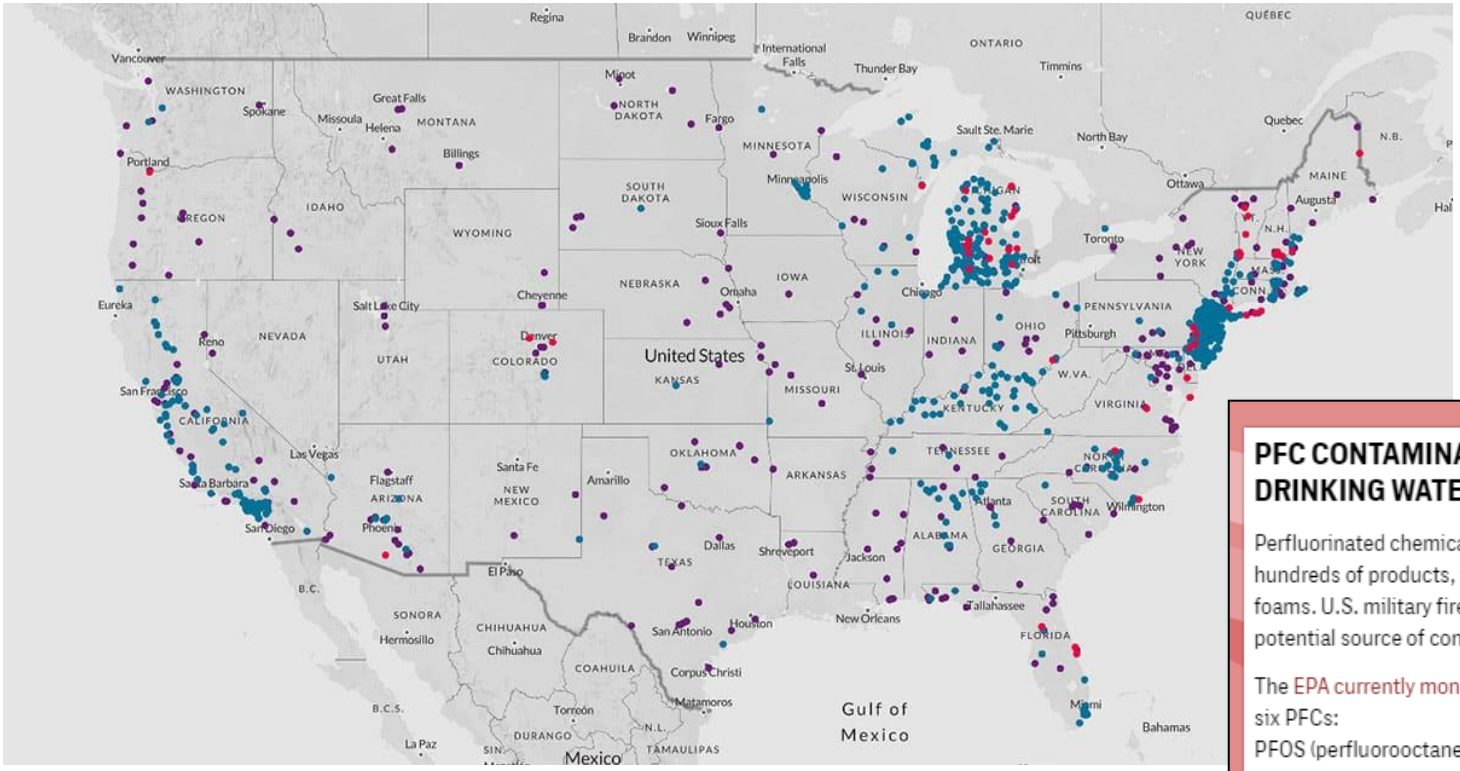
Marines extinguish a blaze during a live fire training exercise at the Marine Corps Air Station Cherry Point, in Havelock, North Carolina, on Aug. 28, 2013. Photo: Lance Cpl. Shawn Valosin/U.S. Marines

AFFF Background *Fire Fighter Training*

- While all fire fighting requires training, **putting out fuel fires via AFFF requires more rigorous *[and repeated]* training** due to the complicated nature of the equipment used and various techniques of application.
- The repetitive nature of AFFF training can lead to increased likelihood of contamination to the nearby environment.

Where was AFFF used?

PFC Contamination Sites Across the Country



PFC CONTAMINATION IN U.S. DRINKING WATER

Perfluorinated chemicals (PFCs) have been used in hundreds of products, including Teflon and fire-fighting foams. U.S. military fire or crash training sites are a potential source of contamination.

The EPA currently monitors drinking water supplies for six PFCs:

PFOS (perfluorooctanesulfonic acid)
PFOA (perfluorooctanoic acid)
PFNA (perfluorononanoic acid)
PFHxS (perfluorohexanesulfonic acid)
PFHpA (perfluoroheptanoic acid)
PFBS (perfluorobutanesulfonic acid)

PFCs detected | No PFCs detected | Not tested

U.S. Military Fire/Crash Training Area Sites

Map Source

Poisoning the Well : Toxic Firefighting Foam Has Contaminated U.S. Drinking Water (The Intercept, December 2015). Available at: https://theintercept.com/2015/12/16/toxic-firefighting-foam-has-contaminated-u-s-drinking-water-with-pfcs/

Why are PFCs Bad?

What are the Adverse Effects?

Why Are PFCs Bad?

Effects of Exposure per the Center for Disease and Control Prevention (CDC) and the Environmental Protection Agency (EPA)

- CDC: PFAS are extremely persistent in the environment and resistant to typical environmental degradation processes.

- CDC: PFOS and PFOA also persist in the human body and are eliminated slowly, with a half life of 2 to 9 years.

- EPA: Exposure to PFOA and PFOS over certain levels may result in adverse health effects, including developmental effects to fetuses during pregnancy or to breastfed infants (e.g., low birth weight, accelerated puberty, skeletal variations), cancer (e.g., testicular, kidney), liver effects (e.g., tissue damage), immune effects (e.g., antibody production and immunity), thyroid effects and other effects (e.g., cholesterol changes).

Suits and Regulations

Federal, State and Local Litigation and Legislation

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Suits and Regulations

EPA Regulations

2009 Provisional Health Advisory

400 parts per trillion (ppt) combined PFOA & PFOS

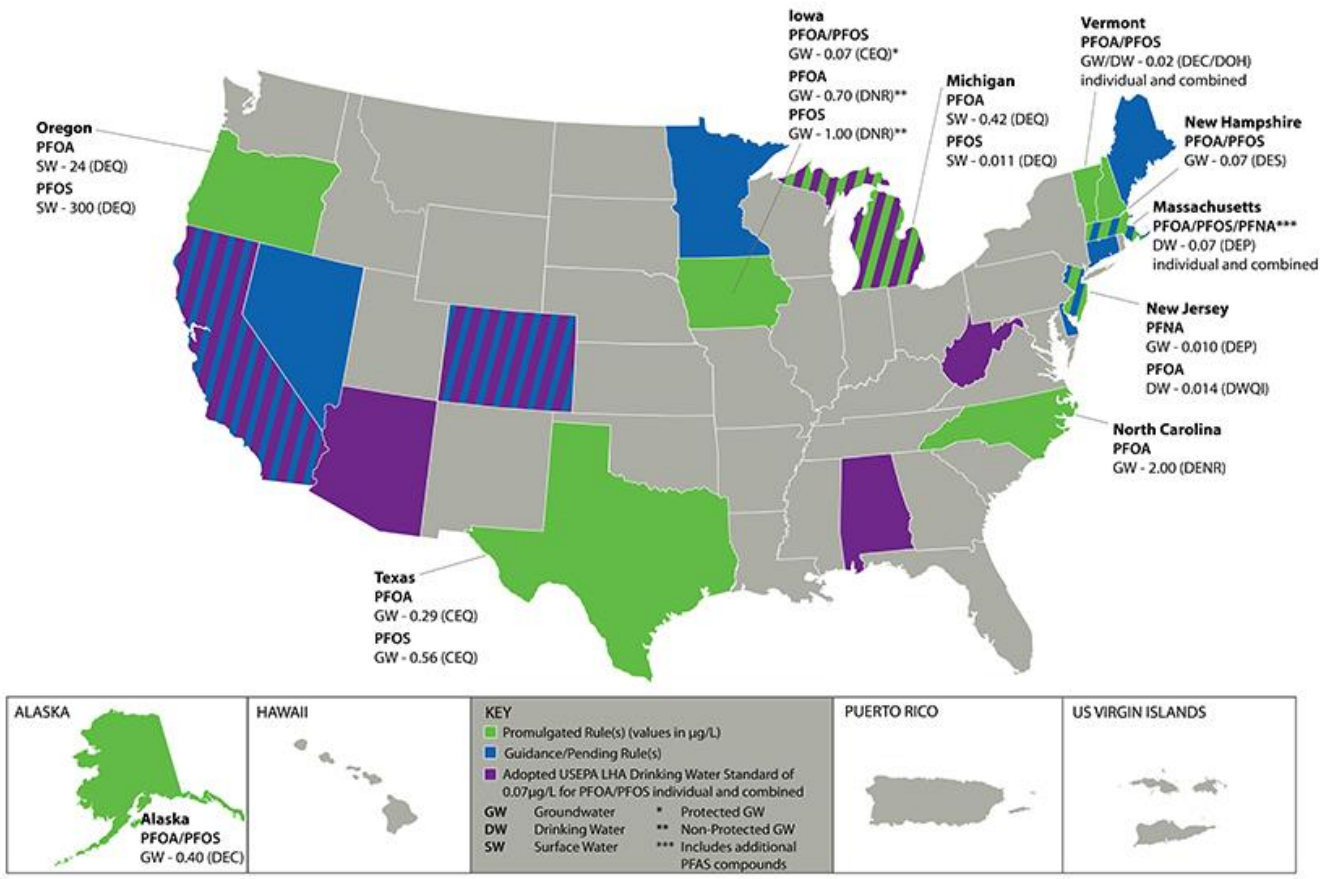
2016 Lifetime Health Advisory

70 parts per trillion (ppt) combined PFOA & PFOS

"If water sampling results confirm that drinking water contains PFOA and PFOS at individual or combined concentrations greater than 70 parts per trillion, water systems should ***promptly notify their State drinking water safety agency*** *and consult with the relevant agency on the best approach to conduct additional sampling."*

"Drinking water systems and public health officials should also ***promptly provide consumers with information*** *about the levels of PFOA and PFOS in their drinking water."*

States with numerical PFAS Limits



Treatment & Remediation

Filtration Systems

- **Water Treatment**
  - **Granular Activated Carbon (GAC):**
  - **Ion Exchange:**
- **Soil Treatment**
- **Cleaning up Legacy Sites**

How We Can Help

The hazards of PFOA and PFOS contamination are coming to light, *and thanks to Napoli Shkolnik's nationwide resources, we can speak out for your municipalities and contamination victims across the country.*

How We Can Help

1. **Free Evaluation For Your District**
2. **Investigate the Source of the Contamination**
3. **Sue Chemical Manufacturers**
   - Products liability for defective design of AFFF
   - Failure to warn about the health effects of AFFF
4. **We can help you recover capital costs associated with the installation of treatment systems at NO COST to your municipality**
   - We charge solely on a contingency basis, pay all costs, and only take a fee if we are successful

The Napoli Shkolnik Difference

Our Investment in PFOA and PFOS Costs Recovery Program

- The Napoli Shkolnik investment into the **PFOA and PFOS Costs Recovery Program** is a risk we take because we care and believe that we can be successful
- Most firms cannot invest what is required to be successful in similar litigation
- Many firms do not have the resources to properly calculate your damages, and that can be disastrous if your municipality does not get a full return on the damages rightfully owed
- Napoli Shkolnik is committed to utilizing every resource in order to achieve a win for your community

About Our Principals

Marie Napoli, Partner

Ms. Napoli is a driving force behind the push to have Congress create a Victim's Compensation Fund for families affected by contaminated water. This fund could draw from federal and state money to pay for residents' health costs. Marie and the NS legal team visited Washington D. C. with families affected by contaminated water so that the families could share their stories with Members of Congress.

Hunter J. Shkolnik, Partner

Mr. Shkolnik has appeared on national networks such as NBC and Fox News to discuss the Water Crises occurring across the country. He is also a sought-after speaker on water contamination, Co-Chairing and speaking at several Litigation Conferences focusing on Lead Poisoning. Mr. Shkolnik's legal achievements have been industry and peer recognized by Super Lawyers®.

Named Co-Liaison Counsel in the Flint Water Crisis Litigation by U.S. District Judge Judith E. Levy.

Paul J. Napoli, Of Counsel

Mr. Napoli has litigated extensively on behalf of municipal clients for contamination to land and water supplies resulting from petroleum and related chemical spills. He led the team who obtained more than $50million for environmental contamination of municipal water supplies by leaks of petroleum additive.

Named Co-Lead Counsel in the AFFF Products Liability Litigation by U.S. District Judge Richard Mark Gergel.

Named Liaison Counsel in the Colorado PFOA/PFOS Toxic Tort Litigation by U.S. District Judge R. Brooke Jackson.

Your Environmental Team

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