

State Response to PFAS

Presentation to House Resources
Committee
May 10, 2019

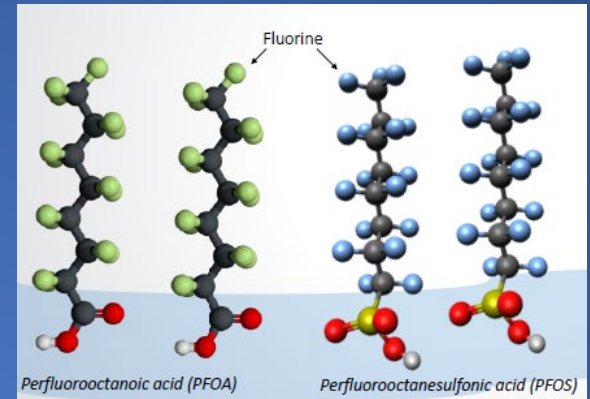


Jason Brune, Commissioner
Department of Environmental Conservation



Per- and Polyfluoroalkyl Substances (PFAS)

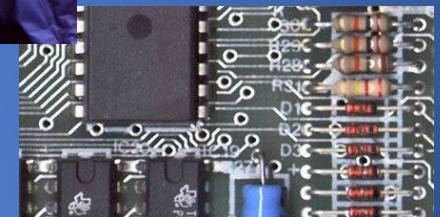
- What are PFAS?
 - Class of ~ 5,000 man-made chemicals
 - Water, oil, and heat resistant
 - Water soluble
 - Extremely **persistent in the environment** – do not break down
 - Some bioaccumulate
 - PFOS and PFOA are the two most studied PFAS





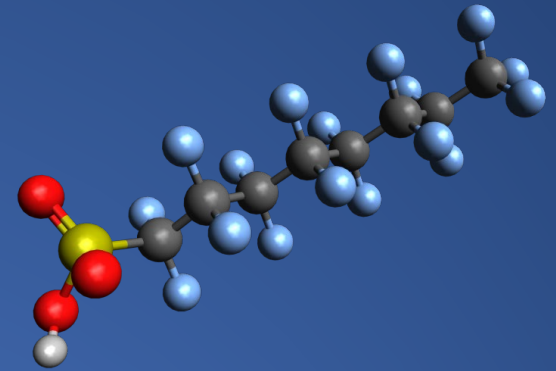
Widespread PFAS Use

- Aqueous Film Forming Foam (AFFF) for petroleum fire-fighting
- Stain-water repellants for carpets, clothing, furniture
- Cookware, pizza boxes, fast food wrappers, popcorn bags
- Cleaning products
- Personal care products – shampoo, conditioner, sunscreen, floss
- Polishes, waxes, and paints
- Oil/mining for enhanced recovery
- Electroplating





PFAS in the Environment



PFAS are globally distributed

- Atmospheric transport on airborne particulates
- Higher PFAS levels often found near urban areas
- Almost every U.S. resident has detectable PFAS levels in their blood
- Found in polar bear blood samples





Sources of PFAS in the Environment

Aqueous Film Forming Foam

- Fire training and response



Wastewater Treatment Plants

Biosolids application

Landfill leachate



Industrial, commercial, and consumer product use



Human Exposure Pathways

Contaminated Food



Household Products



Contaminated Water





Aqueous Film Forming Foam (AFFF)

Developed in the mid-1960s

- Very effective at extinguishing liquid fuel fires
- Safer for responders and anyone involved in such fires

Dept. of Defense requires use of AFFF that meets military specifications (mil-spec)

FAA requires all certified airports use AFFF meeting mil-spec

- Airport firefighters must train
- Must conduct equipment flow-tests annually, at a minimum

DoD and FAA seeking non-fluorinated foam alternatives

AFFF also used for fire response at pipeline, petroleum storage, and other private facilities

PFAS Health Effects

According to EPA (2016) and the Agency for Toxic Substances and Disease Registry -ATSDR (2018), probable links have been established between exposure to long-chain PFAS of concern (e.g., PFOS, PFOA, PFNA, PFHxS) and the following:

TARGET ORGAN / SYSTEM	HEALTH OUTCOME(S)
GASTROINTESTINAL	Ulcerative colitis
LIVER	Liver damage, abnormal fat metabolism, high cholesterol
KIDNEY	Kidney cancer and chronic kidney disease
CARDIOVASCULAR	Pregnancy-induced hypertension
IMMUNE	Decreased response to vaccines
REPRODUCTIVE	Testicular cancer and decreased fertility
ENDOCRINE	Thyroid disease
DEVELOPMENTAL	Reduced birth weight

Expert Testimony from the PFAS US Senate Hearing on 3/28/19:

“PFAS... affect multiple tissues in both males and females, of multiple species, at all developmental life stages. It’s not just cancer. It’s not just effects on the immune system, it’s not just effects, for example, on the kidney or the liver, it’s also effects on development and reproduction, and pretty much almost every system that you can think of”

- NIEHS and National Toxicology Program Director Linda Birnbaum, Ph.D.



REGULATORY CHALLENGES: *EMERGING SCIENCE & MIXTURES*

	PFOA	PFOS	PFNA	PFHxS
CARCINOGENICITY & GENOTOXICITY	9	7		
CARDIOVASCULAR EFFECTS	9	6	4	2
ENDOCRINE DISRUPTION	14	13	5	5
HEPATOTOXICITY & METABOLIC TOXICITY	41	27	14	9
IMMUNOTOXICITY	16	16	9	9
NEUROTOXICITY	1	3	4	1
RENAL EFFECTS	12	9	3	4
REPRODUCTIVE & DEVELOPMENTAL TOXICITY	52	40	12	17
SKELETAL EFFECTS	7	6	5	4
	161	127	56	51

of human health studies showing significant effects by PFAS type

Expert Testimony from the PFAS US Senate Hearing on 3/28/19:

“The science around these compounds is emerging rapidly; and so, almost as we establish a benchmark...in a matter of months, it may be out of date based on the new science”

- NCEH and ATSDR Director, Patrick Breyse, Ph.D.



REGULATORY CHALLENGES: *SOURCES OF UNCERTAINTY*

PFAS ARE CONSIDERED AN EMERGING CONTAMINANT, AND
THE SCIENCE IS STILL EVOLVING

CURRENT GUIDANCE IS BASED ON EVIDENCE FROM EPI STUDIES AND LABORATORY
TOXICITY TESTS USING ANIMALS

EPIDEMIOLOGY STUDIES

- Results are from highly exposed communities/occupations
- Differences in environment, nutrition, demographic, and social factors influence health (can confound results)

ANIMAL TOXICITY STUDIES

- Use higher exposure doses than is typical for humans
- Species differences in absorption, distribution, metabolism, excretion, development and physiology influence sensitivity



PFAS Awareness Timeline

1990s Studies find PFAS in general population blood serum

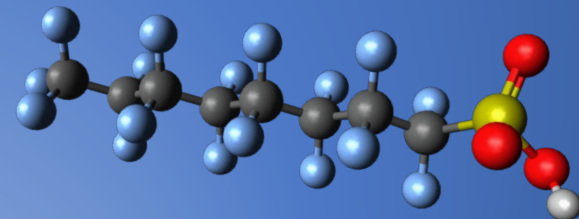
2000-2002

- Low level PFAS found globally in environmental samples
- 3M phased out of PFOS production in U.S.
- EPA issued regulations limiting PFOS use

2006 EPA stewardship program to phase out long-chain PFAS use

2009 EPA publishes Provisional Health Advisory levels

- 200 ppt PFOS
- 400 ppt PFOA





PFAS Awareness Timeline

2012-2015

- EPA required public drinking water system monitoring for 6 PFAS - Unregulated Contaminant Monitoring Rule (UCMR3)
- U.S. industry phased out PFOA production
- Eielson AFB-Moose Creek PFOS/PFOA found in drinking water

2016

- EPA Lifetime Health Advisory level 70 ppt for PFOA + PFOS
- DEC groundwater cleanup 400 ppt PFOA and PFOS (and soil cleanup levels established)
- Fairbanks Regional Fire Training Center – PFAS found in drinking water wells

PFAS Awareness Timeline

2017

- Fairbanks Int'l Airport – PFAS found in drinking water wells
- DEC letter & fact sheet to gov't officials on AFFF concerns

2018

- EPA PFAS National Summit (May)
- DEC set interim 70 ppt action level for five PFAS (Aug)
- Gustavus Airport – PFAS found in drinking water wells
- DEC proposed revised PFAS cleanup levels (Nov)



PFAS Awareness Timeline

2018 - DEC PFAS Action Plan

- Background Information
- Regulatory Overview
- Current Actions
 - Identifying sites of concern
 - Drinking water sampling
 - Ensuring alternative drinking water source for effected public
 - Site characterization and source cleanup
- Proposed Actions
 - DW - Sample targeted public water systems
 - Water – Prioritize areas for monitoring; work with wastewater treatment facility operators on sampling; public utilities, biosolids



PFAS Awareness Timeline

2019

- Revised State approach to align with EPA
 - 70 ppt PFOS + PFOA action level for alternative drinking water
 - Proposed PFAS cleanup level changes on hold
- ADF&G closed Kimberly Lake and Polaris Lake to fishing
 - Elevated PFAS levels found in fish from Kimberly Lake
 - Polaris Lake closed due to known AFFF discharge and surface water sample results

Alaska Fish Monitoring Program

- Analyzes fish from around the state for environmental contaminants (not related to known contaminated sites); considered “background”
- Samples collected in 2009 & 2010 analyzed for PFAS
- Locations:
 - **Marine** - Bering Sea, Gulf of Alaska , Southeast
 - **Rivers** – Tanana, Chena, Yukon ,Chilkat, Stikine, Matanuska
- Species:
 - Eulachon (candle fish)
 - Herring
 - Pacific Cod, Halibut
 - Salmon: Coho, Sockeye, Chinook
- Results Summary:
 - Low levels of PFAS detected in 5% (13/260) samples
 - ~1% had concentration of > 10 ng/g (ppb)





State Agency Roles & Coordination

DEC

- Establish criterion and oversee response – assessment and cleanup of hazardous substance releases
- DEC does not directly respond to PFAS contamination unless there is an imminent threat to public health and no responsible party that is willing or able to respond
- Priorities are to ensure people aren't drinking water contaminated with PFAS above the Lifetime Health Advisory level and protect groundwater
- Community outreach
- Cross agency coordination

DHSS

- Responds to public health concerns



State Agency Roles & Coordination

ADOT&PF

- Responds to releases from its facilities

DOA/Risk Management

- Responds to claims against the State
- Providing alternative drinking water where State is responsible

ADF&G

- Evaluating and responding to fish impacts



PFAS Contaminated Sites in Alaska

Communities

- Eielson AFB, Moose Creek, Fairbanks, North Pole, Gustavus, Dillingham, King Salmon, and Utqiagvik
 - PFAS were present above LHA levels in at least 366 drinking water wells
 - 13,000 individuals
-

Federal

- 79 sites located at ten current or former military facilities

State

- 5 airports
- 1 former fire training facility

Local Government

- 1 fire training center
- 1 fire response site

Private

- 11 sites (fire training areas, fire response sites, refinery)



Contaminated Site Response Process

Site Discovery

- Spill occurs and is reported
- Contamination discovered

Characterization

- What is it
- Where is it
- How did it get there
- Where is it going
- Who and what may be effected

Evaluate
Cleanup
Options

Removal Action/Cleanup

- Stop source
- Prevent exposure
(e.g., provide water)
- Cleanup and monitoring

Site Closure



ADOT Response to PFAS at State Airports

Prioritized airports based upon

- Known AFFF use
- Drinking water wells down-gradient
- Depth to groundwater

Sampled drinking water at highest priorities

Alternative water being provided to affected users

Monitoring is on-going

Additional airports warrant sampling- Aniak and Iliamna scheduled for Summer 2019 sampling



Statewide Response Actions to Date

Clean alternative drinking water provided to people relying on wells found to be contaminated by PFAS

- Bottled water immediately
- Treatment system, delivered water, or public supply longer term

Initiated cleanup at several fire training areas

Initiated surface water monitoring and fish tissue testing

DOT&PF stopped all non-emergency response AFFF use



Future Actions

- DEC and DOT continue to monitor at airports where PFAS has impacted drinking water, and work with DHSS to provide health information affected communities
- DEC and DOT to evaluate additional airports with a continued focus on potential drinking water impacts
- DEC continue to oversee DoD and others response to PFAS contamination
- Monitor federal actions including EPA PFAS Implementation Plan and ATSDR toxicology profiles to inform state decision making.
- Encourage EPA to take expeditious action to establish national consistency.



EPA PFAS Action Plan (Feb. 2019)

- Draft groundwater cleanup recommendations (PFOS/PFOA) released for comment
- Evaluating whether to set drinking water MCLs – PFOS/PFOA
- Developing laboratory test methods for media beyond drinking water
- Determining whether to classify PFOS/PFOA as CERCLA Hazardous Substances
- Conducting Toxicity Studies to support setting risk-based levels
- Limiting new uses of PFAS through the Toxic Substances Control Act (TSCA)
- Considering including PFAS in the Toxic Release Inventory



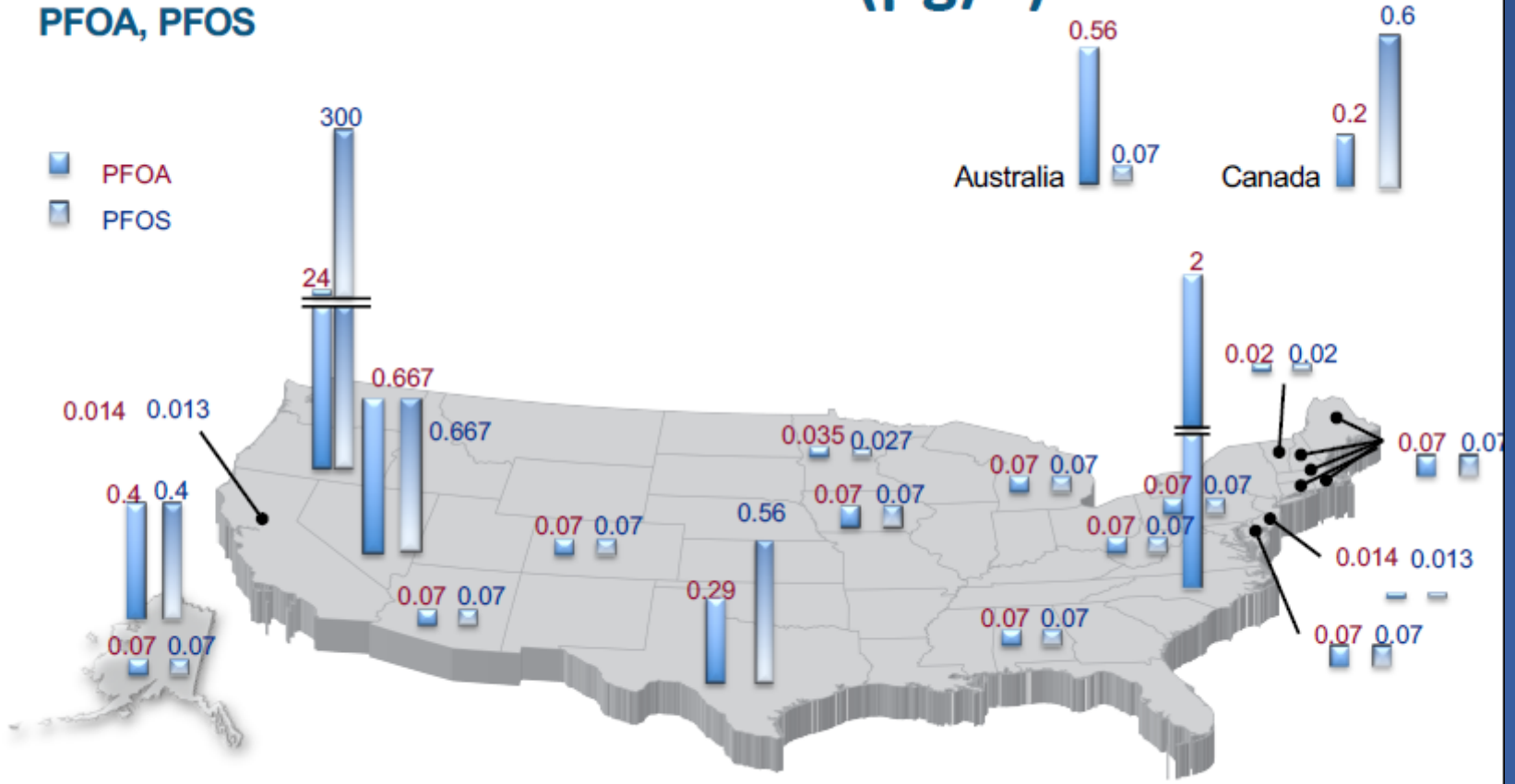
Nationwide Concern

- Some states have adopted the EPA Lifetime Health Advisory level (PFOS and/or PFOA = 0.07 ug/l) as action levels
- Several states including New Jersey, Massachusetts, Vermont, California, Minnesota and others have established more stringent levels for PFOS and PFOA based on an independent review of toxicity information
- Several states have also adopted action levels for other PFAS compounds including PFHxS, PFNA, PFBS, and PFHpA
- Only New Jersey is proposing State MCLs; PFOS=0.013 ug/l , PFOA= 0.014 ug/l
- Most states have yet to take direct action on PFAS



PFOS and PFOA in the U.S., Canada, and Australia

Guidelines and Standards ($\mu\text{g/L}$) PFOA, PFOS



As of Apr. 2019; does not include all proposed values

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