

# PERFLUORINATED COMPOUNDS: An Emerging Contaminant that Goes Bump in the Night



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What do these two men have in common?



# PFOS and PFOA-long chain PFCs

Uses: Aqueous Fire-Fighting Foam (surfactant), Teflon, Scotchgard, microwave popcorn bag liners, clothing repellent

- DOD Facilities: Migration to groundwater via unlined landfills, runway drainage ditches, fire training pits.
- DOD has identified hundreds of current and former military installations where AFFF was used
- Metal Plating Operations
- Human Chemistry
- Bioaccumulates
- Persistent

# What Is It

- SURFACTANT/COATING
- PERSISTENT, BIO ACCUMULATES IN BLOOD
- TOXICITY IS NOT SCIENTIFICALLY ESTABLISHED
- NOT A CERCLA HAZARDOUS SUBSTANCE—YET

# Fate and Transport

- DRINKING WATER-FIRE FIGHTING TRAINING IN UNLINED PITS
- POTW-LAND APPLICATION OF SLUDGE FROM TREATMENT WORKS
- AIR EMISSIONS—SETTLEMENT ON CROPS, WATER SOURCES
- RECENT NEW HAMPSHIRE ORDER TO ST. GOBAIN TO INSTALL STACK FILTER

# EVIDENCE

- HUMAN EXPOSURE MAY OCCUR FROM FOOD, AIR, WATER
- ABSORBED THROUGH INHALATION OR ORAL EXPOSURE
- 8 YEAR HALF LIFE

# Concern: Drinking Water Consumption: Carcinogenic

- Correlation or Causation?
- Kidney, bladder, testicular cancer – Teflon Plant Workers
- Passes through breast milk
- Inverse relationship of PFOS blood levels and effectiveness of childhood vaccines
- 3M just settled a PFOS water pollution lawsuit brought by Minnesota for \$850 million

# Children Exposed to Drinking Water at Child Care Center-inverse Relationship with Immune System Effectiveness

- SDWA ORDERS FRO 2 EPA REGIONS TO ADDRESS “SUBSTANTIAL AND IMMINENT ENDANGERMENT TO HEALTH OF PERSONS WHO USE THE [WATER] SYSTEM”
- ATSDR DRAFT TOXICOLOGICAL REPORT – JUNE 2018
- MOBILE IN SOIL, LEACH INTO GROUNDWATER
- FAA LEGISLATION-ELIMINATE REQUIREMENT WITHIN 3 YEARS



# FDA Determination for Food Wrappings, 4 January 2016

...data for subsets of long-chain PFCs (demonstrating biopersistence and reproductive and developmental toxicity) are applicable to long-chain PFCs on a general basis ... this data raises significant questions as to the safety of the authorized uses of the three FCSs.

For these reasons, in the absence of data ... to address reproductive and developmental toxicity, adequate migration data to determine dietary exposure to the FCSs from the food-contact use, and sufficient data to account for a consumer's systemic exposure resulting from chronic dietary exposure to these FCSs, ***we conclude that there is no longer a reasonable certainty of no harm*** for the food contact use of these FCSs. Therefore, we are amending part 176 as set forth in this document. Upon the effective date, these food additive uses are no longer authorized.

Studied by EPA since at least 1999.

Fire Fighting Foam Coalition convinced EPA in 2003 to exempt PFOS and PFOA from regulations.

Currently on the Unmonitored Contaminant List

Most recent EPA health advisory, May 2016:

Because the RfDs for both PFOA Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA) and PFOS are based on similar developmental effects and are numerically identical, where these two chemicals co-occur at the same time and location in a drinking water source, a conservative and health protective approach that EPA recommends would be to compare the sum of the concentrations ( $[PFOA] + [PFOS]$ ) to the HA ( $0.07 \mu\text{g/L}$ ).

# Current events:

MilSpec changed: New Tyco (Ansul) Safety Data Sheet reflects presence of “Fluorochemical Anionic Surfactant” and “Polyfluorinated alkyl polyamide” both of which are listed as proprietary. Both are short chain PFCs (C6, not C8)

Wisconsin 4 March 2018 proposal to regulate:

- To date, the highest levels of PFOA and PFOS in groundwater in Wisconsin have been detected at the Tyco-Ansul Fire Technology Center in Marinette.
- Reported total concentrations are as high as 202 µg/l (micrograms per liter) – 2,800 times higher than the EPA’s Health Advisory Level of only 0.07 µg/l for the compounds combined. The drinking water wells of dozens of nearby families have also tested positive for contamination.

# Other Federal action:

- EPA Regions 1 and 3 issued orders under the SDWA at Pease (NH) and (Horsham Air Guard Station (PA)
- SDWA standard (Section 1431(a)): Determination by EPA Administrator that a contaminant is in or likely to enter a public water system which may present an imminent and substantial endangerment to the health of persons who use the system

EPA-UNENFORCEABLE ADVISORY, LIMITED TO  
DRINKING WATER

21 STATES HAVE OR ARE CONSIDERING ESTABLISHING  
THEIR OWN ENFORCEABLE STANDARD

# Implications of CERCLA Designation as Hazardous Substance

- RETROFIT POTW --- IMMENSE COST, PASS TO RATE PAYERS?
- INDUSTRIAL USERS OF PFOS WOULD BE PRPs
- BAN USE-PRECEDENT—PCB, DDT
- EXCEPTION FOR AFFF USE

# Legal Action Against federal entity

- Sovereign Immunity-- waiver necessary
- Tucker Act-contract damages, Court of Federal Claims, no injunctive relief
- CERCLA-must be a hazardous substance, remediation only, except pursuant to a citizen's suit
- Federal Tort Claims Act
- Difficult to establish negligence when EPA has not set an enforceable standard after 20 years of consideration
- Correlation will not establish causation

- Indemnity Statute-Section 330, FY 1993, National Defense Authorization Act
- Limited to Base Closure property
- Covers pollutants and contaminants
- Very broad-loss, damage, claim, expense, judgment
- Service decisions-Cooperative Agreement to fund local water supplier to install mains and laterals, GAC filters
- Magnitude of problem, with no clear federal guidance, specific funding is a significant hurdle



# Civil Suits

- Between private parties-nuisance, trespass, et cet—still requires some evidence of damage, loss under state law

# Conclusion:

- No default standard at the federal level
- States will set their own, which will make OSD compliance complex