PFAS: THE MUNICIPAL WASTEWATER PERSPECTIVE

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BRIEF BACKGROUND

- PFAS stands for:
  - perfluoroalkyl substances, and
  - polyfluoroalkyl substances
- Large family of compounds containing carbon-fluorine bonds
- Man-made; over 4,000
- Wide variety of physical and chemical properties
  - Gases, liquids, surfactants, solid material

BRIEF BACKGROUND

- Highly Useful
  - Repel oil and water
  - Reduce surface tension by concentrating at the liquid-air interface
  - Temperature resistance
  - Friction reduction

THEY ARE EVERYWHERE!

- PAPER AND PACKAGING
- CLOTHING AND CARPETS
- OUTDOOR TEXTILES AND SPORTING EQUIPMENT
- SKI AND SNOWBOARD WAXES
- NON-STICK COOKWARE (TEFLON)
- CLEANING AGENTS AND FABRIC SOFTENERS
- POLISHES AND WAXES
- PESTICIDES AND HERBICIDES
- HYDRAULIC FLUIDS
- WINDSHIELD WIPERS
- PAINTS, VARNISHES, DYES AND INKS
- ADHESIVES
- MEDICAL PRODUCTS
- PERSONAL CARE PRODUCTS
- FIREFIGHTING FOAM

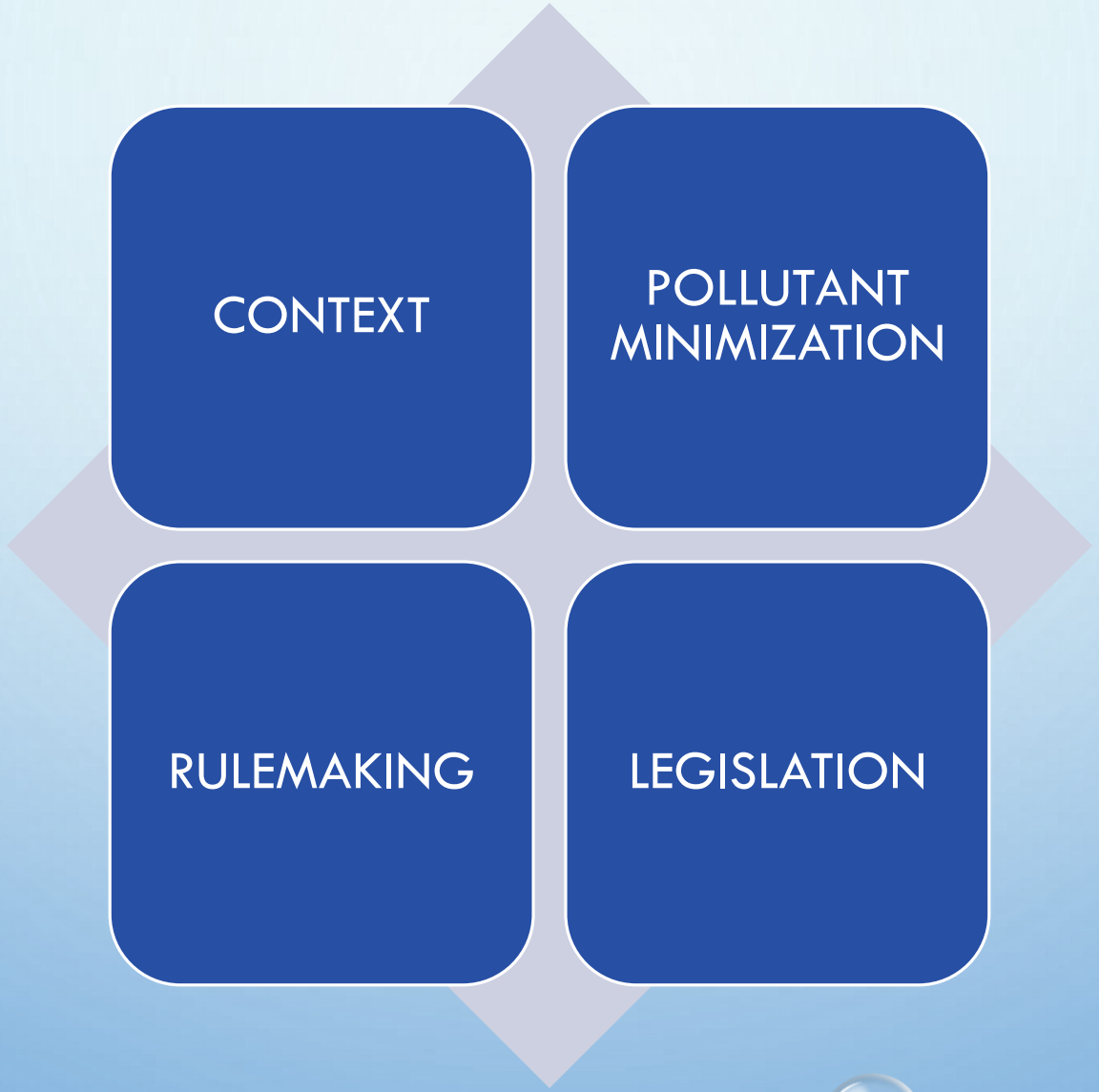
Table 2-1. Discovery and manufacturing history of select PFAS

PFAS[1]	Development Time Period							
	1930s	1940s	1950s	1960s	1970s	1980s	1990s	2000s
PTFE	Invented	Non-Stick Coatings			Waterproof Fabrics			
PFOS		Initial Production	Stain & Water Resistant Products	Firefighting foam				U.S. Reduction of PFOS, PFOA, PFNA (and other select PFAS[2])
PFOA		Initial Production		Protective Coatings				
PFNA					Initial Production	Architectural Resins		
Fluoro-telomers					Initial Production	Firefighting Foams		Predominant form of firefighting foam
Dominant Process[3]		Electrochemical Fluorination (ECF)						Fluoro-telomerization (shorter chain ECF)
Pre-Invention of Chemistry /			Initial Chemical Synthesis / Production			Commercial Products Introduced and Used		

Notes:
1. This table includes fluoropolymers, PFAAs, and fluorotelomers. PTFE (polytetrafluoroethylene) is a fluoropolymer. PFOS, PFOA, and PFNA (perfluorononanoic acid) are PFAAs.
2. Refer to Section 3.4.
3. The dominant manufacturing process is shown in the table; note, however, that ECF and fluorotelomerization have both been, and continue to be, used for the production of select PFAS.

Sources: Prevedouros et al. 2006; Concawe 2016; Chemours 2017; Gore-Tex 2017; US Naval Research Academy 2017

Source: Interstate Technology and Regulatory Council (ITRC), 2017, PFAS Fact Sheet, *History and Use of Per- and Polyfluoroalkyl Substances (PFAS)*.


CONTEXT
POLLUTANT MINIMIZATION
RULEMAKING
LEGISLATION

CONTEXT

- Distinction between sources and receivers
  - POTWs are not a source of PFAS
- Distinction between concentrations in different media
  - No standards applicable to wastewater or biosolids
- Spills v. Background concentrations
  - Ex. background concentrations found in soils in the National Forests range from 0.1 to 1.8 ppb

POLLUTANT MINIMIZATION PROGRAMS

- Limited treatment options at a POTW
  - PFAS is difficult and costly to treat
  - Treatment leaves a problematic media for disposal
- Pollutant minimization from industrial dischargers is likely more effective and less costly
  - Directly address sources of PFAS

RULEMAKING

- DNR has begun the rulemaking process for a number of standards relating to PFAS
  - Drinking water (Revisions to NR 809)
  - Groundwater (Revisions to NR 140)
  - Surface water (Revisions to NR 105, NR 106, and NR 219)
- Holistic approach to regulation is necessary

LEGISLATION

- SB 310/AB 323: prohibits the use of firefighting foams that contain intentionally added PFAS in training.
- SB 109/AB 85: would impose a 90-day timeframe for the establishment of groundwater quality standards for PFOA and PFOS.
- SB 774/AB 845: would create PFAS Management Zones around areas of PFAS contamination. Within these zones, people would be eligible for well compensation funding to provide treatment and/or well replacement. Biosolids land applied within these zones would be subject to testing.

LEGISLATION

- SB 302/AB 321: would require the DNR to establish and enforce standards for a wide range of PFAS. This would include standards for drinking water, surface water, solid waste, soil and sediment among other things, potentially as emergency rules.
- SB 772/AB 843: would require DNR to promulgate emergency rules for groundwater standards, but not surface or drinking water standards, and, as amended, would establish a municipal grant program for PFAS investigation and remediation.

HOW CAN YOU BE INVOLVED?

- Participation in numerous regulatory groups:
  - Wisconsin PFAS Action Council Local Government Subgroup: March 5
  - PFAS Technical Advisory Groups
  - Rulemaking Stakeholder Group
- Contact with Legislators
- Call us!

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