PFAS in Packaging, Compost, and the Environment - What We Know

Michigan Recycling Coalition
Virtual May 2020 Conference
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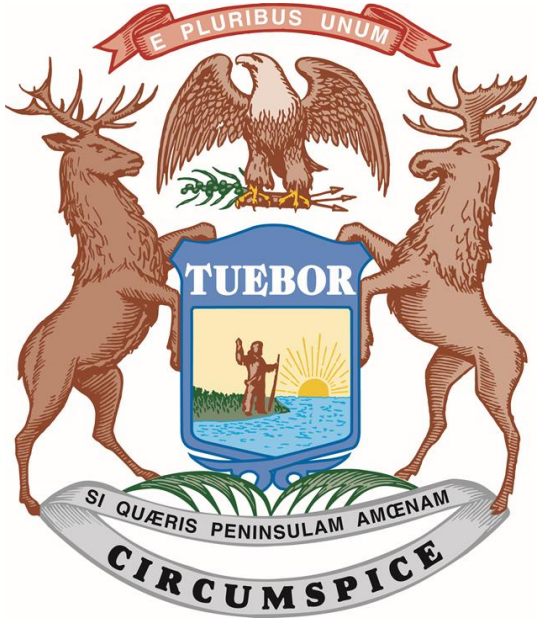
Steve Sliver, Executive Director
Michigan PFAS Action Response Team
517-290-2943 | SliverS@Michigan.gov

Michigan PFAS Action Response Team (MPART)



- Unique multi-agency approach
- Leads coordination and cooperation among all levels of government
- Enables a proactive, comprehensive approach to identify and reduce exposures to PFAS contamination

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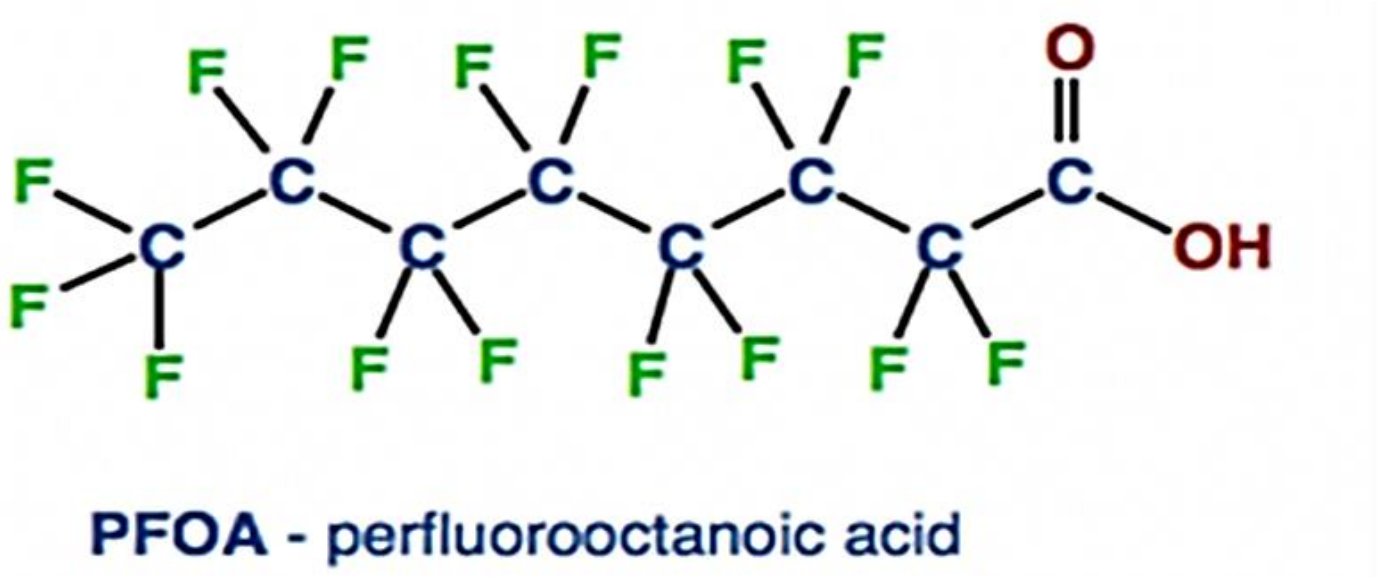
Per- and Polyfluoroalkyl Substances (PFAS)



PFOA - perfluorooctanoic acid

- **Strong Carbon-Fluorine Bonds**
- Highly stable
- Surfactants
- Repel water, oil, fat, and grease
- Began developing in 1940s
- 5,000+ Compounds today

PFAS Uses

Aerospace

Apparel

Building and Construction

Chemicals and Pharmaceuticals

Electronics

Oil & Gas

Energy

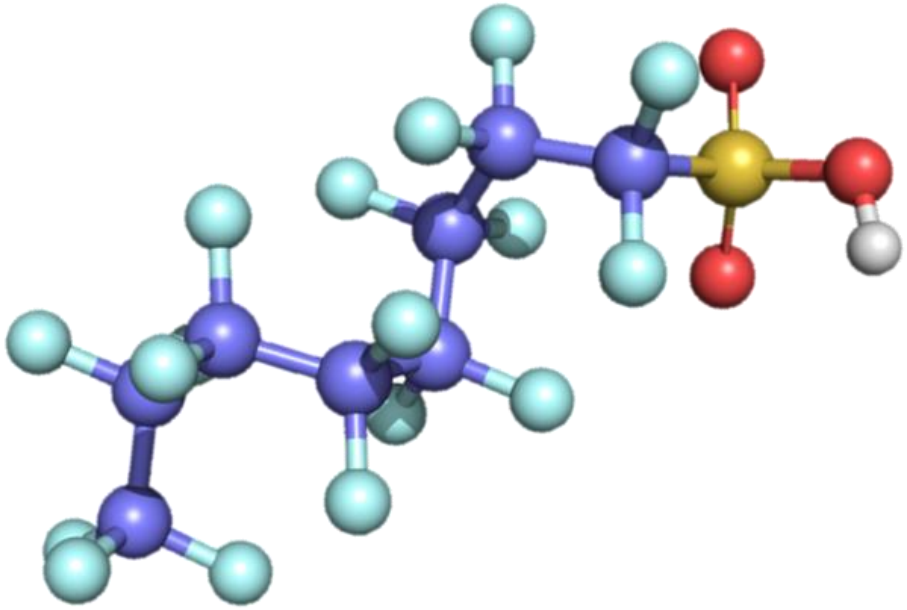
Healthcare and Hospitals

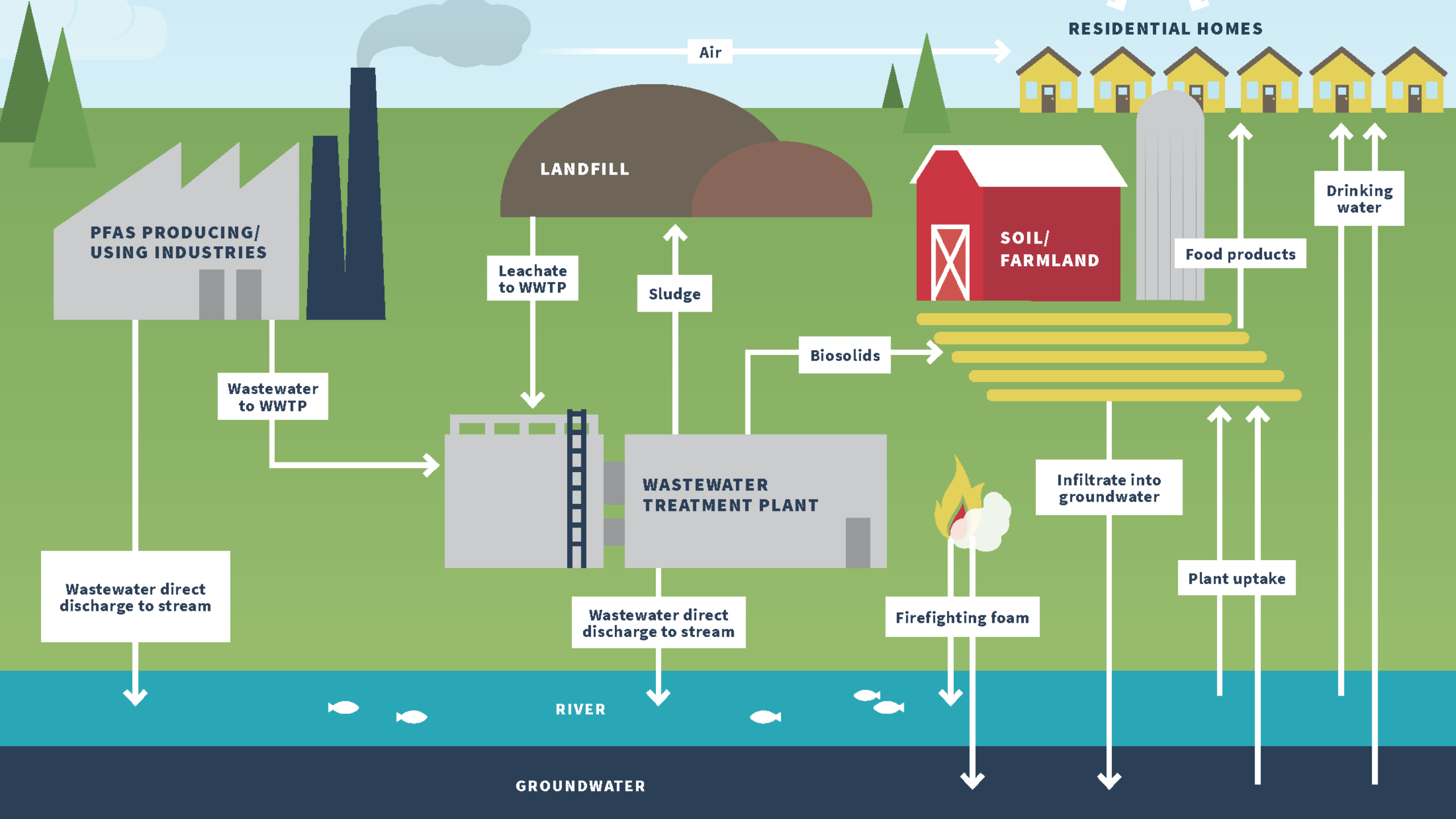
Aqueous Film Forming Foam

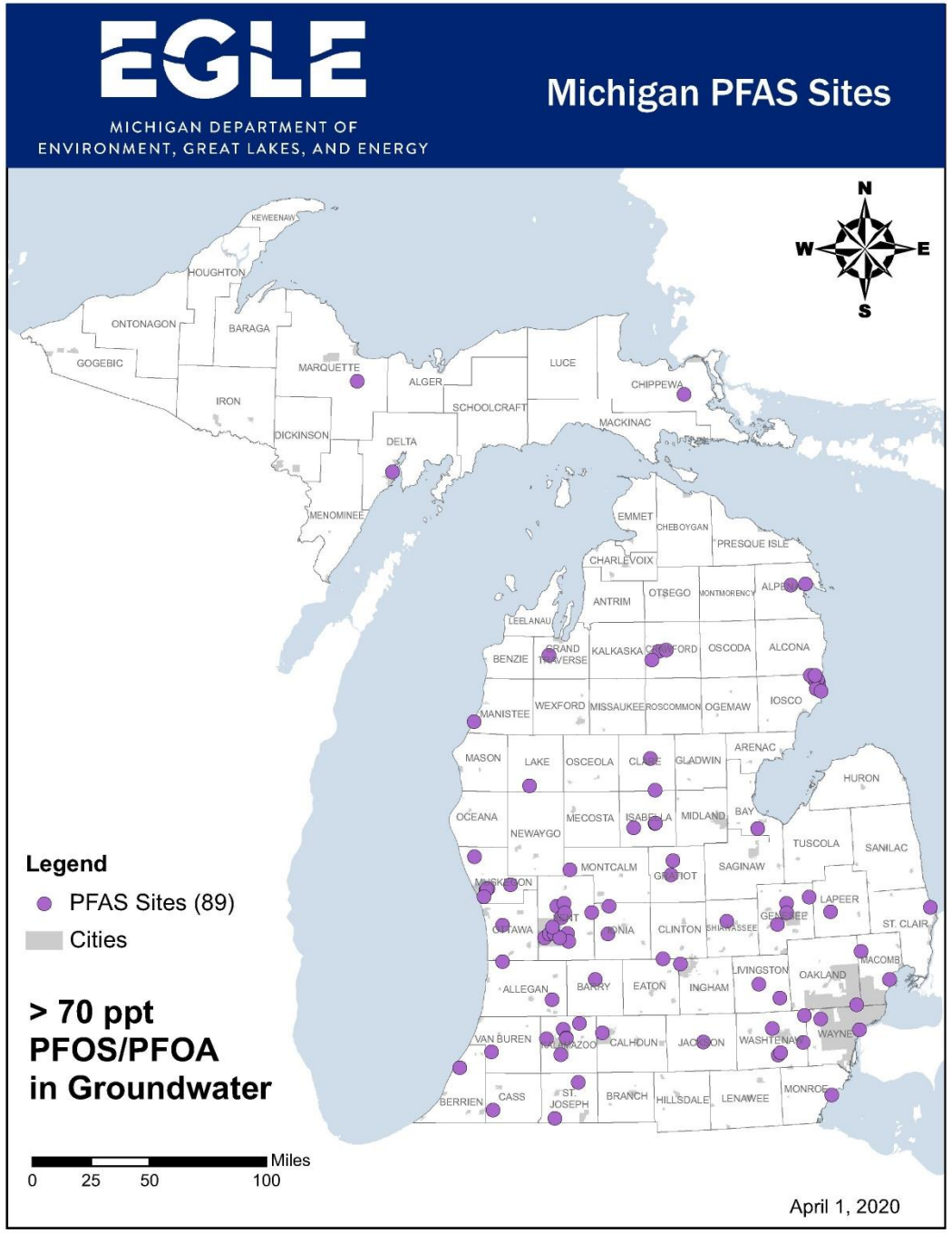
Food Packaging

Why the Concern?

- Widespread
- Don’t break down easily - hard to get rid of
- Bioaccumulative – build up in our bodies
- Some PFAS may affect health
- Lack of information
- Lack of regulations




RESIDENTIAL HOMES
Air
LANDFILL
PFAS PRODUCING/
USING INDUSTRIES
SOIL/
FARMLAND
Drinking
water
Food products
Leachate
to WWTP
Sludge
Biosolids
Wastewater
to WWTP
WASTEWATER
TREATMENT PLANT
Infiltrate into
groundwater
Plant uptake
Wastewater direct
discharge to stream
Wastewater direct
discharge to stream
Firefighting foam
RIVER
GROUNDWATER



Groundwater Investigations

- Prioritized based on known or suspected sources, potential for exposure
- Protect drinking water pathway
- Multiple other investigations underway




Surface Water Investigations

- Survey of surface water and fish
- Foam
- Wastewater

Reducing PFAS in Surface Water

- Surface water quality criteria
  - **11/12 ppt PFOS**
  - 420/10,000 ppt PFOA
- Major sources of PFOS to WWTPs include metal finishers (up to 240,000 ppt), AFFF sites, other manufacturers, landfills
- WWTP PFOS discharges reduced over 90% with pretreatment at sources

MI Public Water Supply Testing

- Phase I - 2018
  - All community water supplies (1,114)
  - All NTNCWS schools and day cares (619)
  - All Tribal systems (17)
- Phase II - 2019
  - Non-community water supplies (750 total)
    - 237 children's camps
    - 162 medical care facilities
- Monitoring
  - All 65 surface water systems
  - 61 systems > 10 ppt Total Phase I
- Phase III – 2020 under development

Phase 1 & 2 - PWS Sampling Results

Non-Detect	Total PFAS < 10ppt	Total PFAS > 10ppt	PFOS+PFOA > 70ppt

Phase 1 = 1,740 Supplies

89.7% (1,561)	6.6% (115)	3.6% (62)	0.1% (2)

Phase 2 = 482 out of 632 Supplies

91% (439)	5% (24)	3.8% (18)	0.2 % (1)

Establishing Drinking Water Standards

- No federal standards on the horizon
- Science Advisory Panel Report, December 2018
  - **70 ppt standard for PFOA/PFAS could be too high**
  - **Other PFAS should be considered as well**
- Michigan's two-step approach
  - **Science Advisory Workgroup recommendations on June 27, 2019**
  - **Rulemaking underway**

Proposed Drinking Water Standards

- Versus 70 ppt PFOA+PFOS
  - Evolving science
  - Differences among PFAS
- 2,700 water systems
- Implications for groundwater cleanup standards

Specific PFAS	Parts Per Trillion (ppt)
PFOA	8
PFOS	16
PFHxS	51
PFNA	6
PFBS	420
GenX	370
PFHxA	400,000

Studies and Research

- Understand occurrence of PFAS
- Develop guidance and regulation
- Inform policy

MI Statewide Soil Survey

Distribution of PFAS in surficial soils in 4 land uses

- Agriculture and pasture
- Forested (Deciduous, Coniferous, and Mixed)
- Open and low intensity urban
- Medium and high intensity urban

Leach testing (SPLP or ASTM Neutral Leach v. TCLP)

- Is standard practice of “20 times the soil number” appropriate for estimating leach potential?

Statistically valid survey

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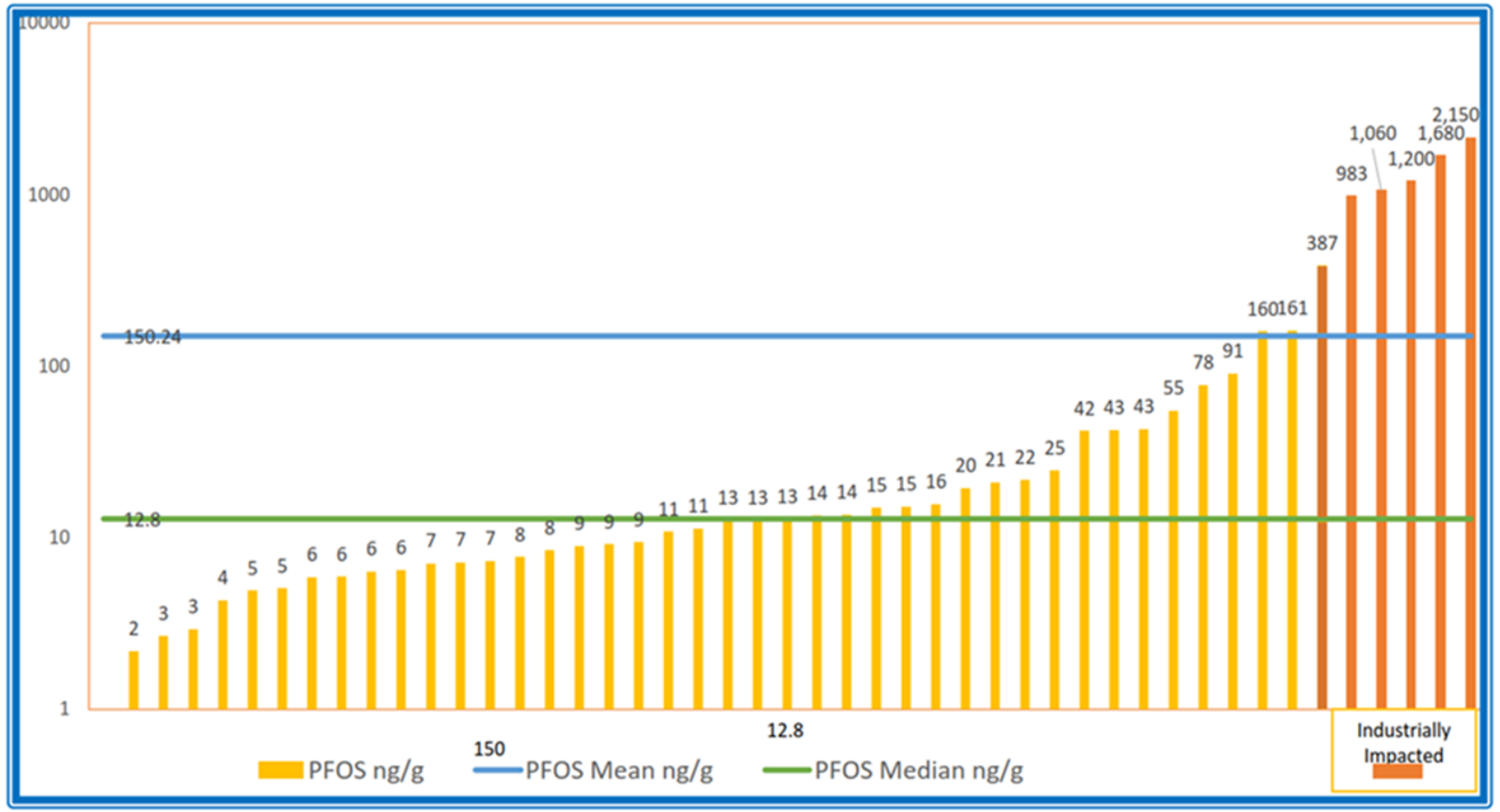
Statewide Biosolids Study Results

- 42 WWTPs
- Also studying impacts on soil, groundwater, surface water, crops
- Developing guidance



Biosolids Study 2020 Next Steps

Establish	Expand	Continue
Establish interim PFAS biosolids concentrations screening levels. These levels can be adjusted periodically as new evaluations are completed.	Expand biosolids monitoring requirements to select WWTPs	Continue to evaluate land application sites as necessary including non-biosolids land application.

Paper Mill Sludges

- 8 MI paper mills land apply or compost
  - 130,000 wet tons in 2019
- New sludge
  - PFOA up to 1.4 ppb
  - PFOS up to 5.4 ppb
- Old finished compost
  - PFOA = 870 ppb
  - PFOS = 110 ppb

Animal Health & Food Safety

- MDARD coordinating with sites with soil contamination
  - Land application of biosolids or paper mill sludges
  - Contaminated irrigation water
  - 3 requests to FDA on potential health risks from crops (animal feed)
- PFAS found by FDA in 15% of nation's food supply
  - No human health risk at levels found in food

PFAS Challenges in Composting

- PFAS in food packaging
  - No PFOA or PFOS
- Industrial impacted biosolids
- PFAS in industrial by-products (e.g., paper mill sludges)
- Impacted plant material
  - PFAS in irrigation water
  - PFAS in material land applied
- Wastewater and stormwater runoff
- No standard for finished compost

PFAS in the Environment

- Priority on drinking water sources to protect public health
- More studies needed to understand occurrence and risk in soil and materials applied to the land
- Evidence-informed policy-making

MICHIGAN PFAS ACTION RESPONSE TEAM (MPART)

www.Michigan.gov/PfasResponse

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MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

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