Emerging Contaminant: PFAS in Michigan

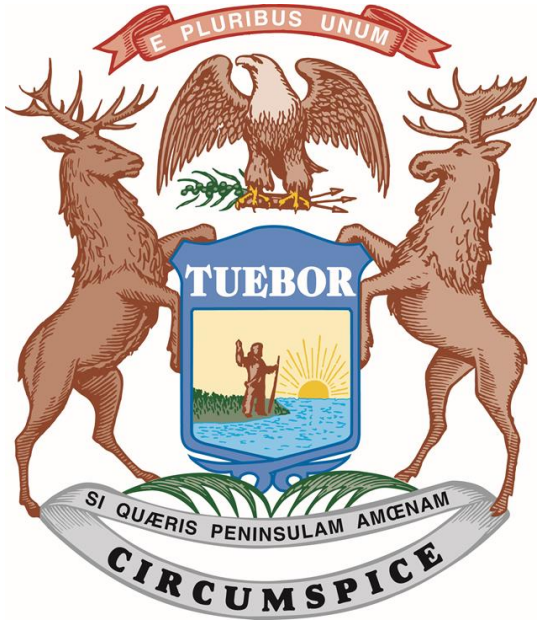
Michigan Dairy Industry Conference

August 19, 2021

Christine Kosmowski
PFAS and Emerging Contaminant Specialist
Michigan Department of Agriculture and Rural Development

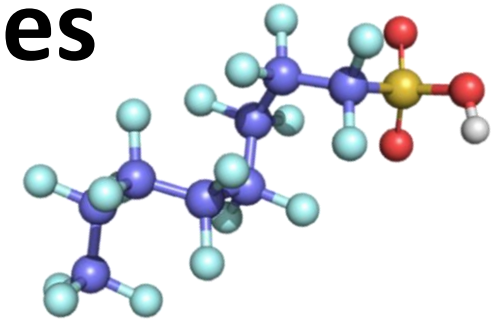
MPART

Michigan PFAS Action Response Team (MPART)



- Executive Order 2019-03
- Unique Multi-Agency Approach
- Leads Coordination and Cooperation Among All Levels of Government
- Directs Implementation of State's Action Strategy

Per- and Polyfluoroalkyl Substances (PFAS)



What are they?

- Strong Carbon-Fluorine Bonds
- Surfactants
- Highly Stable
- Repel Water, Oil, Fat, and Grease
- Began Developing in 1940s
- 5,000+ Compounds Today

Why the concern?

- Widespread through the ecosystem
- Don’t Break Down Easily - Hard to Get Rid of
- Bioaccumulate – Build Up in Our Bodies
- Some PFAS May Affect Health
- Some emerging science/information
- Lack of Federal Standards

PFAS Uses

https://www.sixclasses.org/videos/pfas

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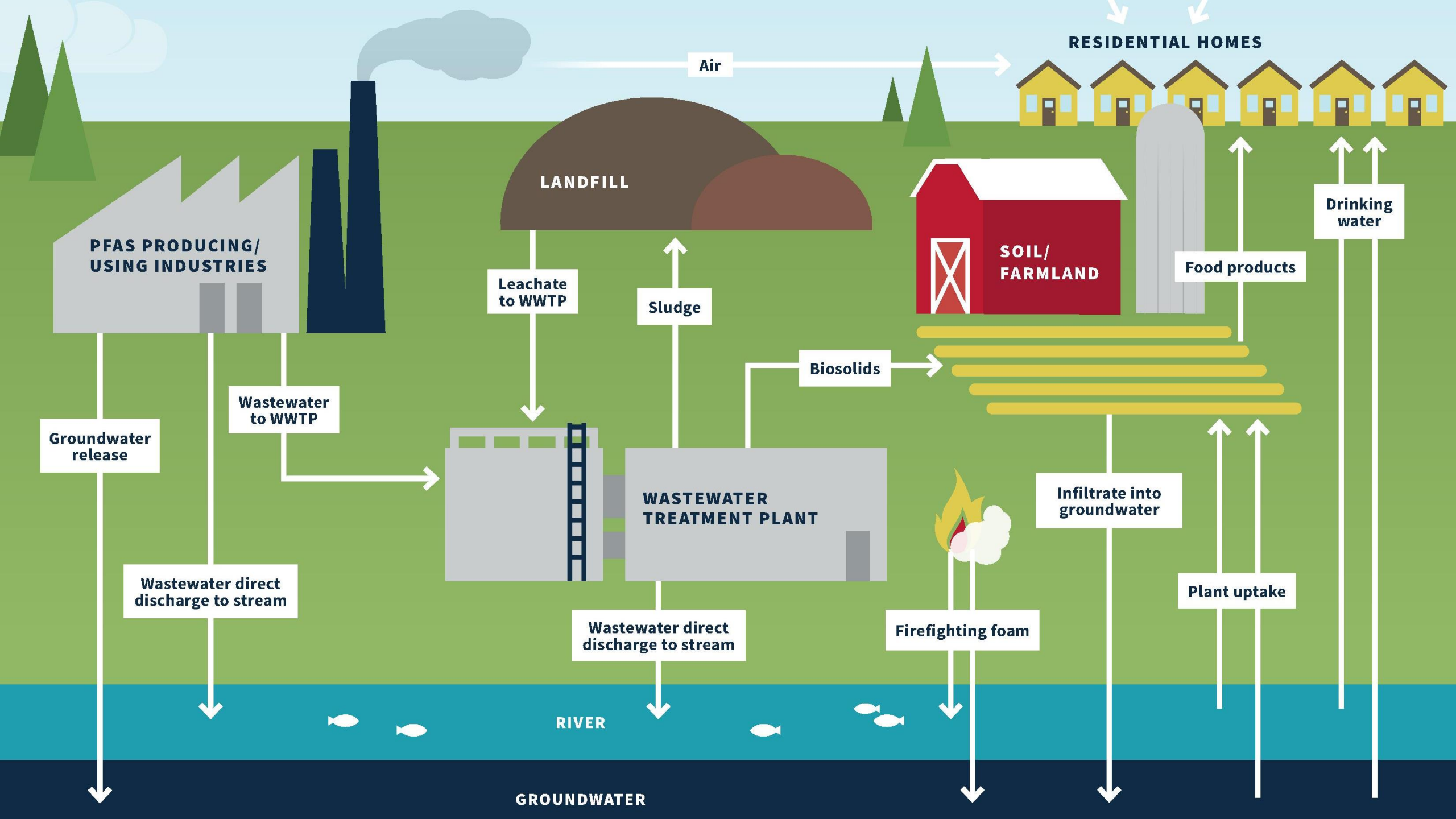
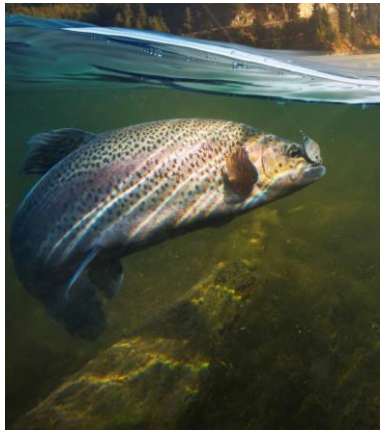

RESIDENTIAL HOMES
Air
LANDFILL
PFAS PRODUCING/
USING INDUSTRIES
SOIL/
FARMLAND
Drinking
water
Food products
Leachate
to WWTP
Sludge
Biosolids
Wastewater
to WWTP
Groundwater
release
WASTEWATER
TREATMENT PLANT
Infiltrate into
groundwater
Plant uptake
Wastewater direct
discharge to stream
Wastewater direct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

Exposure to PFAS Chemicals

- Drinking contaminated water
- Eating fish caught from water contaminated by PFAS
  - "Eat Safe Fish" Guidelines
- Incidental swallowing of contaminated soil or dust
- Eating food packaged in materials containing PFAS
- Using some consumer products
- PFAS absorption through skin is typically not a concern



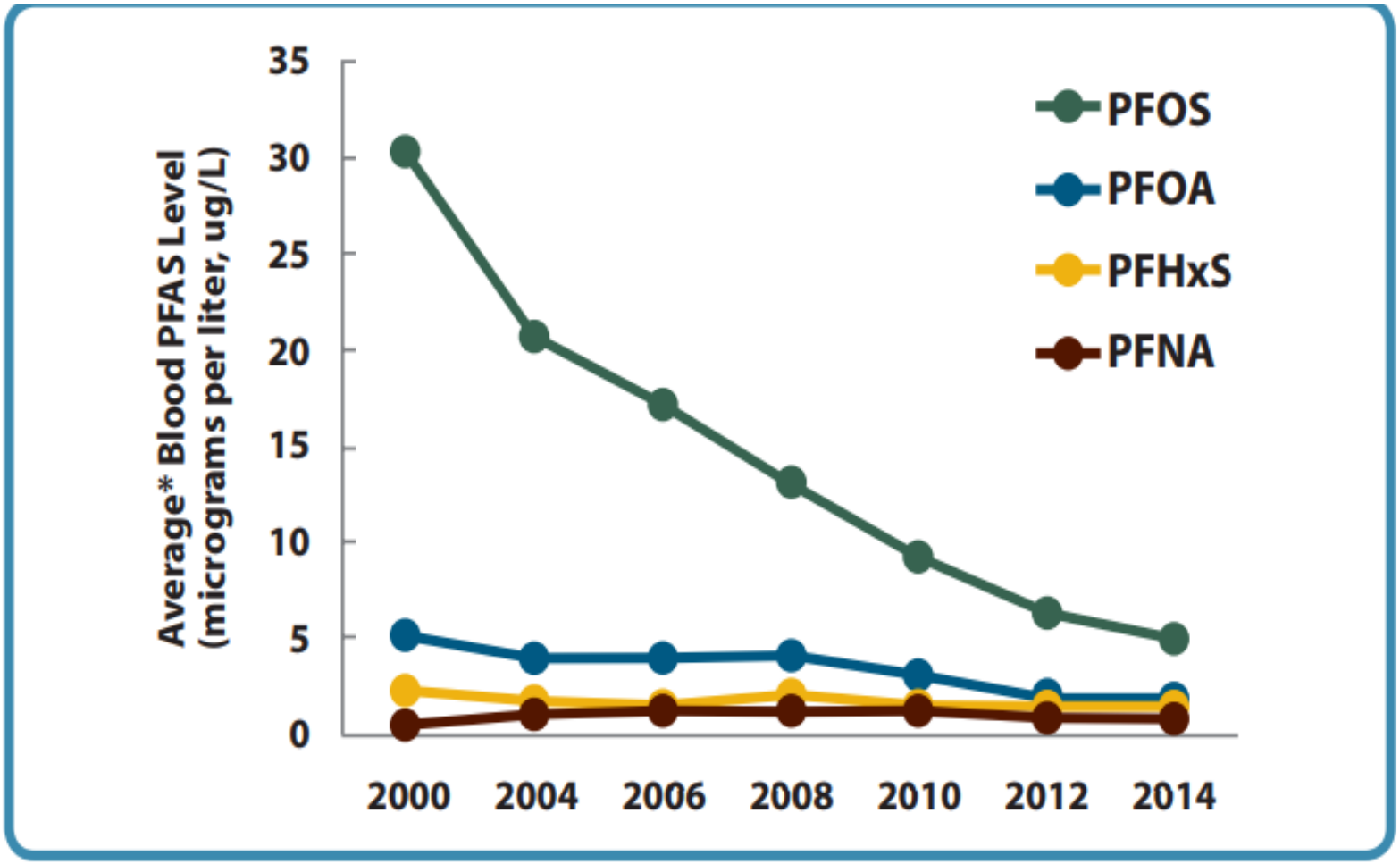
Associated Human Health Outcomes PFOA and/or PFOS

- Reduced fertility
- High blood pressure or pre-eclampsia in pregnant women
- Small decreases in infant birth weight
- Higher cholesterol
  - Especially total cholesterol and LDL cholesterol

Associated Human Health Outcomes PFOA and/or PFOS

- Thyroid disease
- Liver damage
- Decreased immune system response to vaccines
- Developing certain types of cancer
  - In particular, kidney and testicular cancers*

* PFOA only



Blood levels of the most common PFAS in people in the United States 2000-2014

* Average = geometric mean

Data Source: Centers for Disease Control and Prevention. Fourth Report on Human Exposure to Environmental Chemicals, Updated Tables, (January 2017).

Michigan PFAS Standards

Compound	Michigan Standards
PFNA	6 ppt
PFOA	8 ppt
PFOS	16 ppt
PFHxS	51 ppt
GenX (HFPO-DA)	370 ppt
PFBS	420 ppt
PFHxA	400,000 ppt



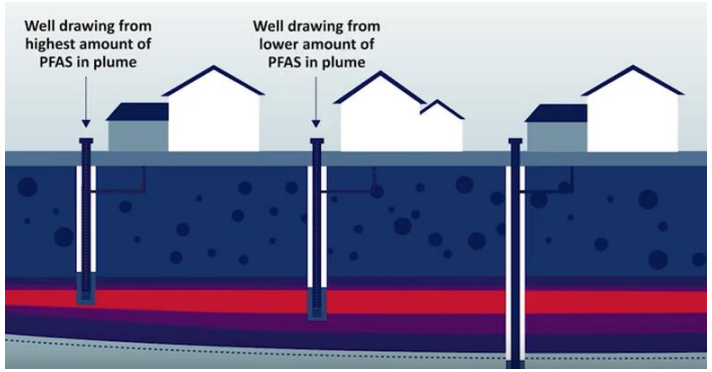

Lakes and Streams Investigations

- Collecting water and fish samples

Site–Specific Information

Known Source

Geology



Plume

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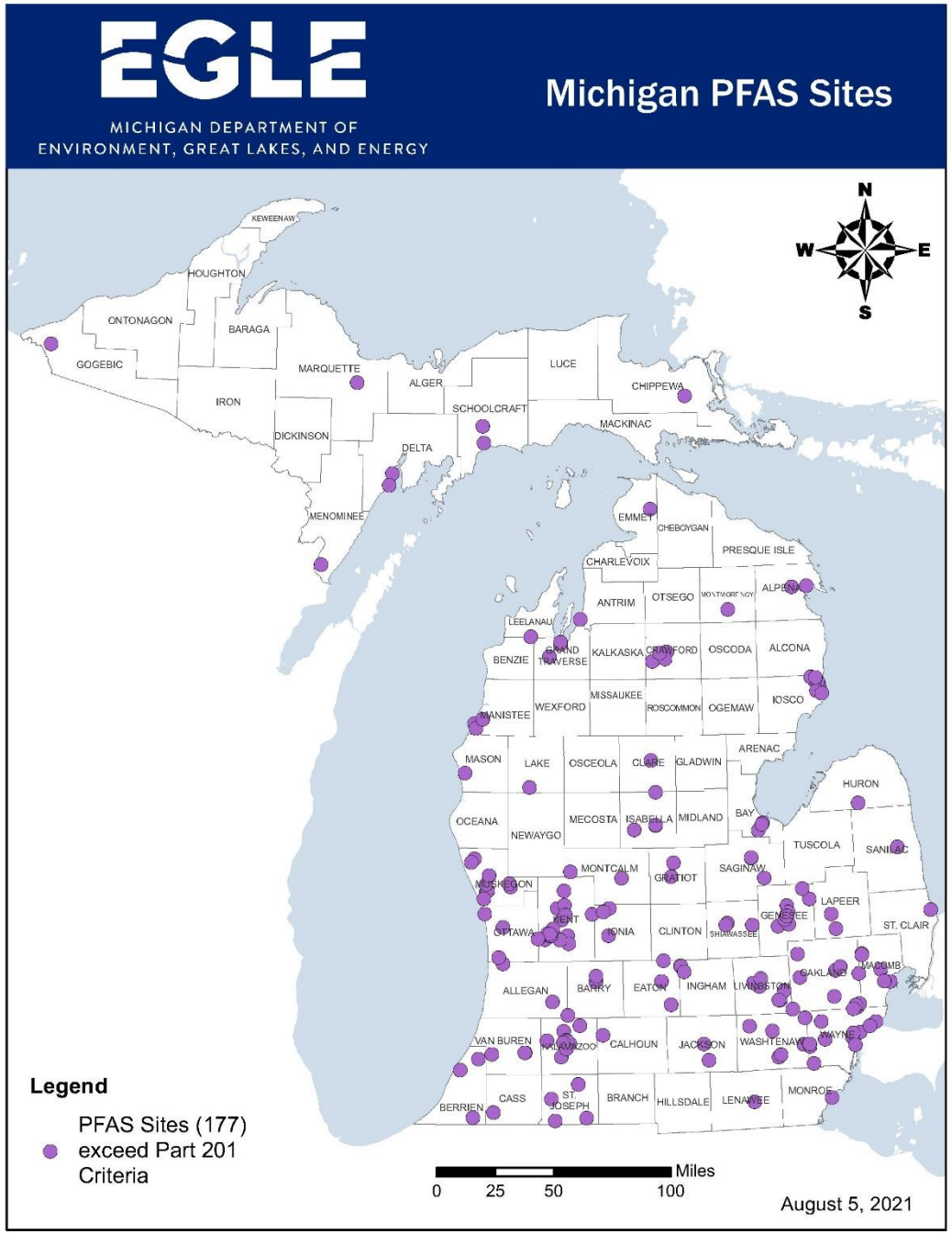


Sites Being Investigated

- Prioritized Investigations Based on Known or Suspected Sources, Potential for Exposure
- Protect Drinking Water Pathway
- Multiple Other Investigations Underway

MDARD's Role

- New sites are reviewed by MDARD for possible impacts to animals, migrant labor housing, high-capacity wells, and so forth.
- Lead or participate on MPART workgroups pertinent to MDARD's mission:

Animal Health & Food Safety	Drinking Water
Land Application	Wildlife
Human Health	Groundwater
Surface Water	Soils

Michigan's Biosolids Interim Strategy

- Currently no established criteria for PFAS for biosolids under 40 CFR Part 503
- States under increasing pressure to answer questions about PFAS in Biosolids
- Michigan developed a strategy to mitigate risks and reduce PFAS sources

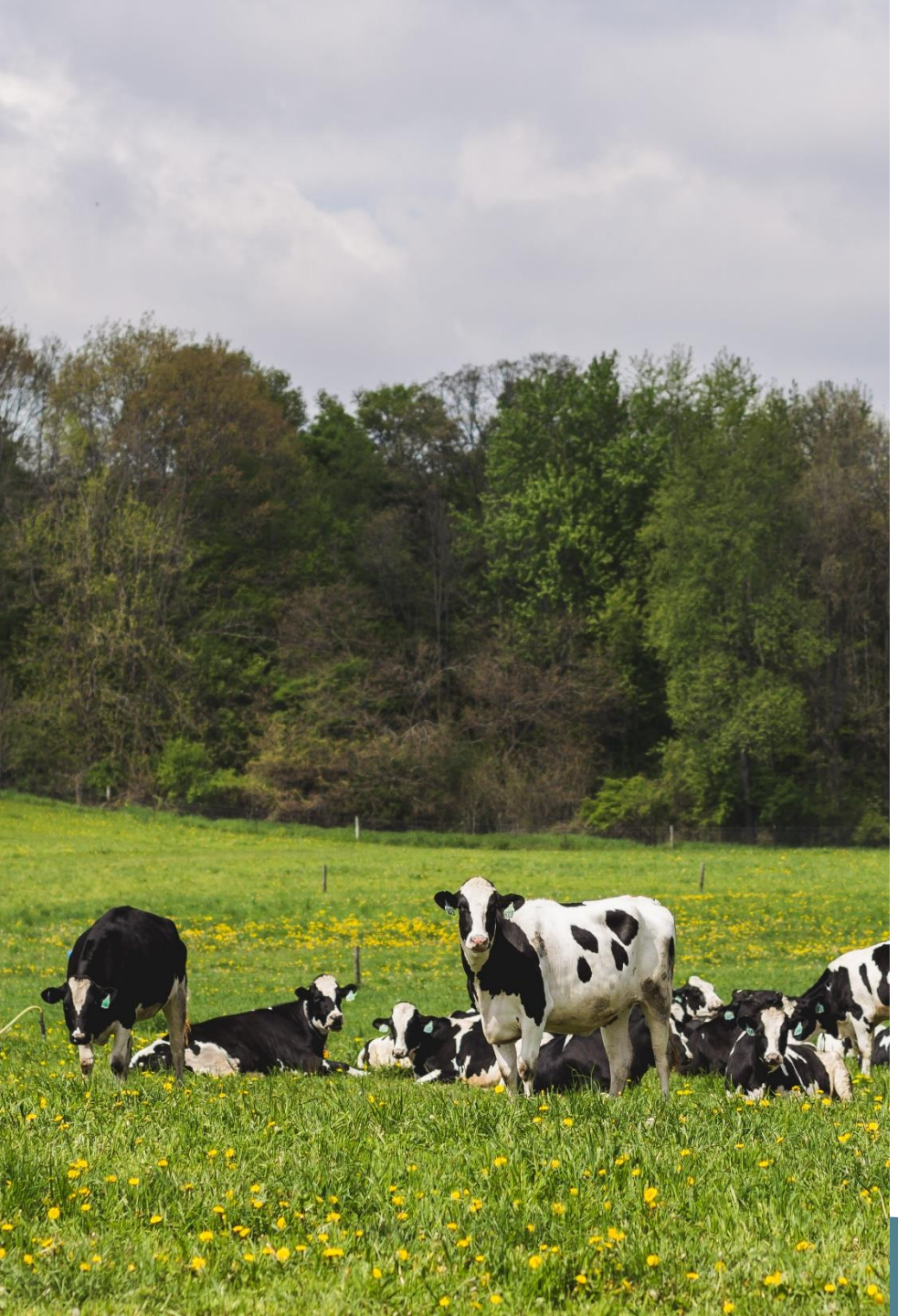
Michigan's Biosolids Interim Strategy

- Reduce PFAS concentrations quickly in biosolids to the maximum extent practicable by increased testing at WWTPs.

- Prevent land application of industrially impacted biosolids.

Statewide Biosolids Study

- Generally found higher concentrations on historic sites of WWTPs deemed industrially impacted.
- Did not find significant wide scale groundwater impacts at the historic sites. Still have more work to do to investigate potential legacy sites.
- Did find some elevated concentrations in surface water, ie ponded water etc.
- Source reduction efforts have been highly successful in significantly decreasing PFOS concentrations in the influent, effluent, and biosolids/sludge.



Land Application Legacy Site Review

- Identify potential industry sectors that may have used PFAS and conducted land application of residuals.
- Generate and prioritize a list of historical sites.
- Develop a strategy for evaluation and investigation of historical land application sites that may have received residuals containing PFAS.
- Conduct initial investigations at a couple of the highest priority sites.
- Coordinate with MPART and other agencies on work.

Michigan PFAS Action Response Team (MPART)

www.Michigan.gov/PfasResponse

EGLE
MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

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MDOT
Michigan Department of Transportation

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Questions?