

# Taking Action on PFAS

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MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

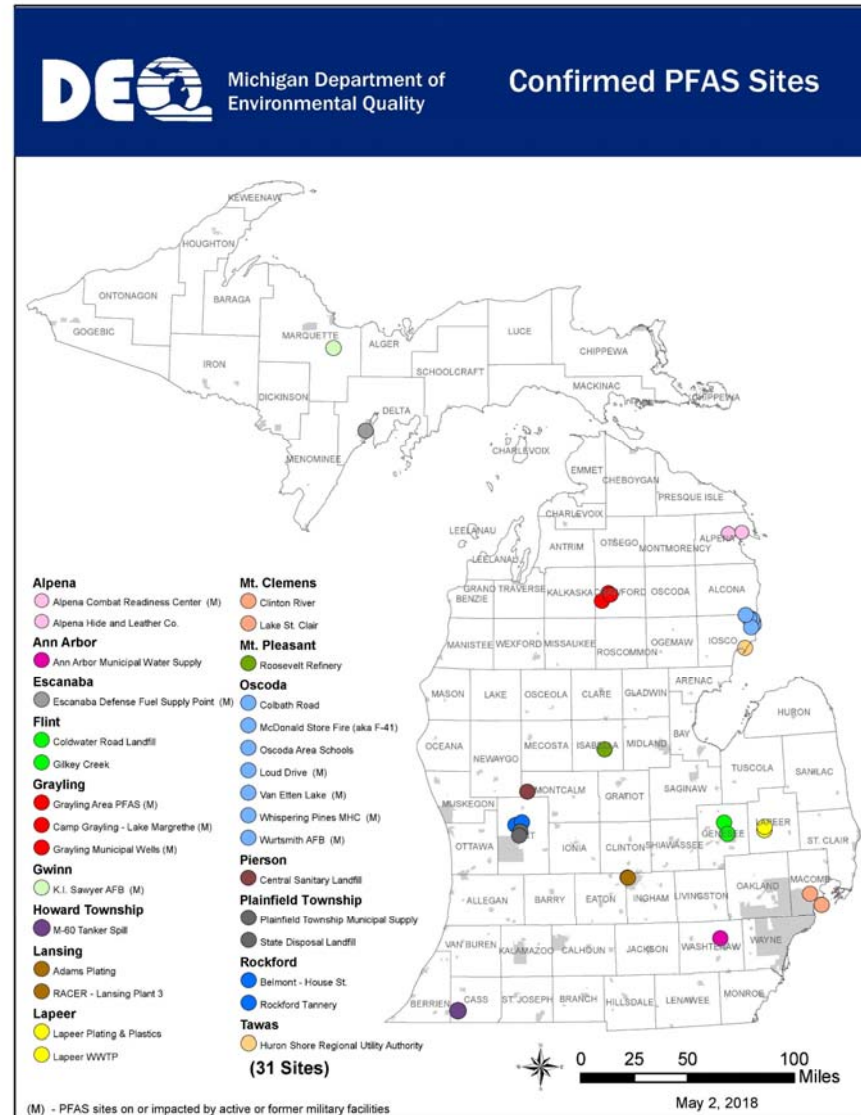


# How We Got Here

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- 2012 Wurtsmith “do not eat fish”
- 2013/2014 PFOS/PFOA recon sampling in surface waters
- 2017 connecting channels data
- Grayling – 2017 g.w. sample data from DMVA
- Wolverine – concerned citizens 1/24/2017

# Current Magnitude



# PFAS Uses

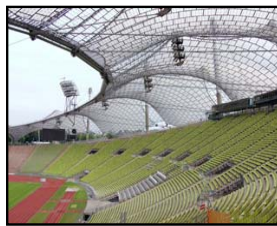
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**Aerospace**



**Apparel**



**Building and Construction**



**Chemicals and Pharmaceuticals**



**Electronics**



**Oil & Gas**



**Energy**



**Healthcare and Hospitals**

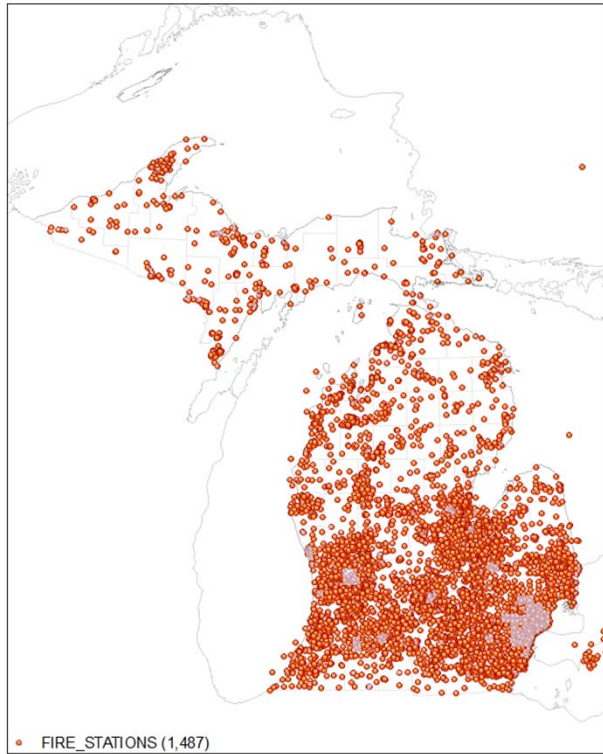


**Aqueous Film Forming Foam**

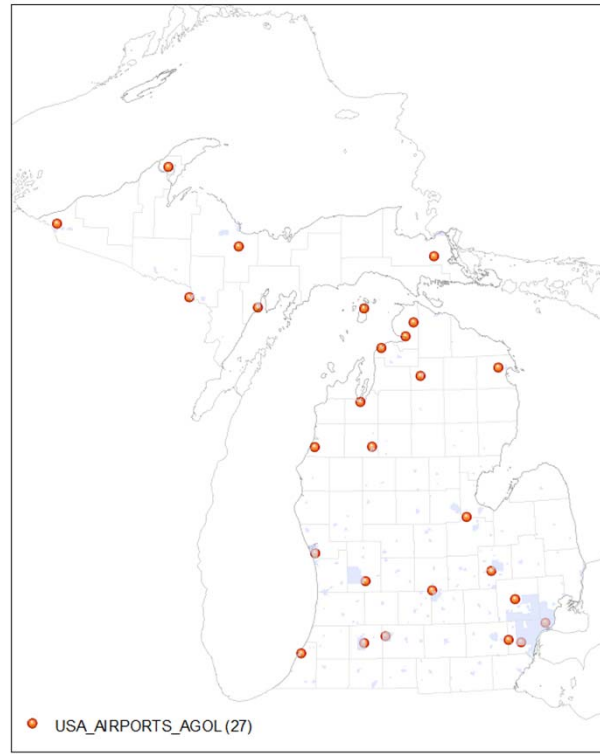


**Semiconductors**

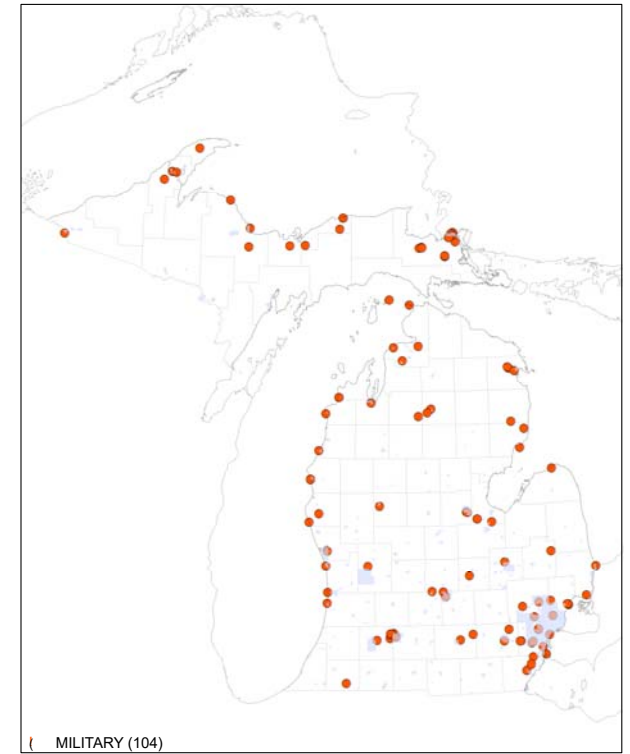
FIRE STATIONS



MAJOR AIRPORTS

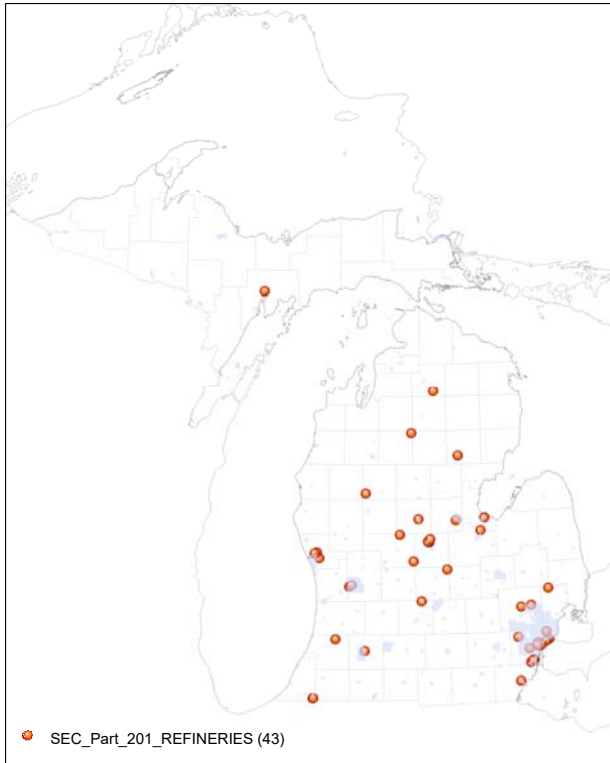


MILITARY

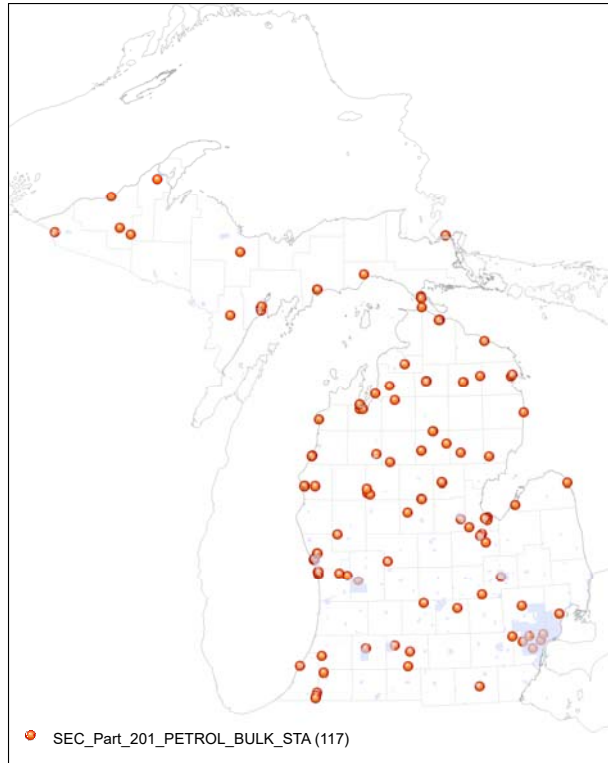


# Potential PFAS Sites - AFFF

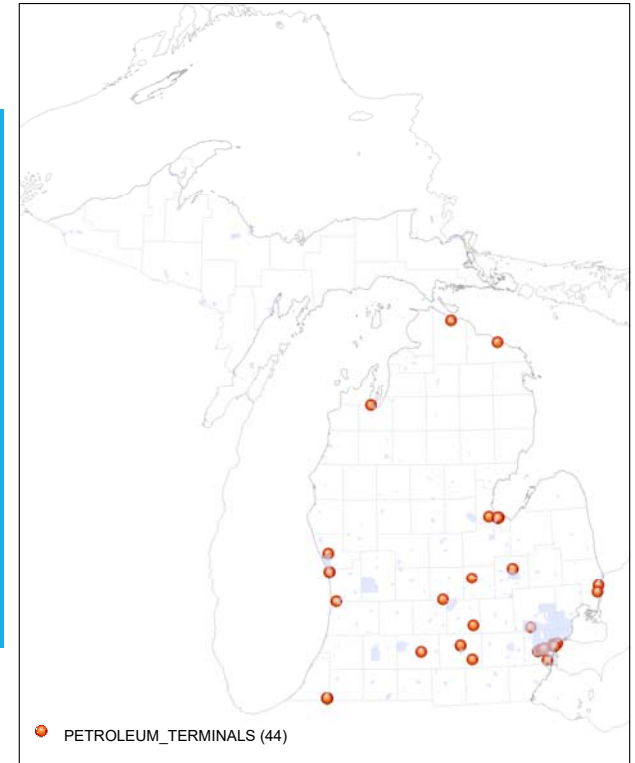
REFINERIES



PETROLEUM BULK STATIONS

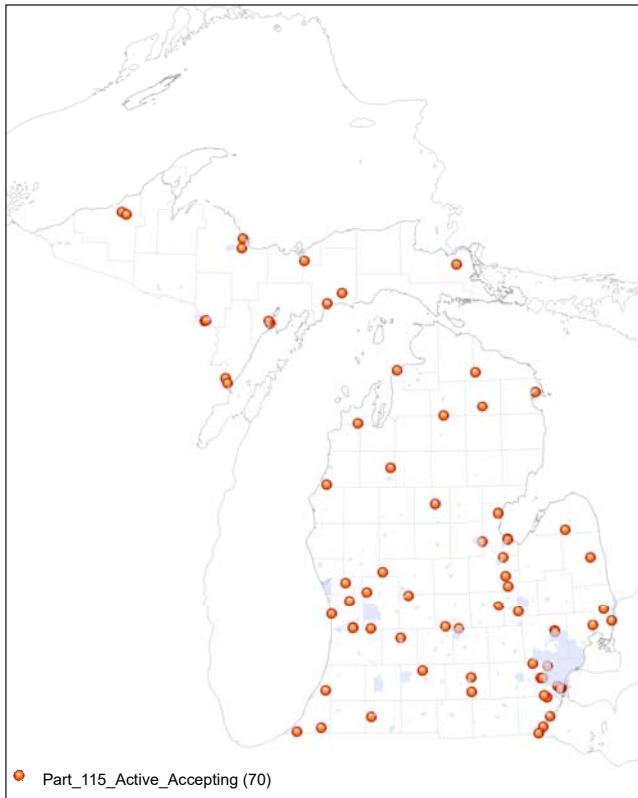


PETROLEUM TERMINALS

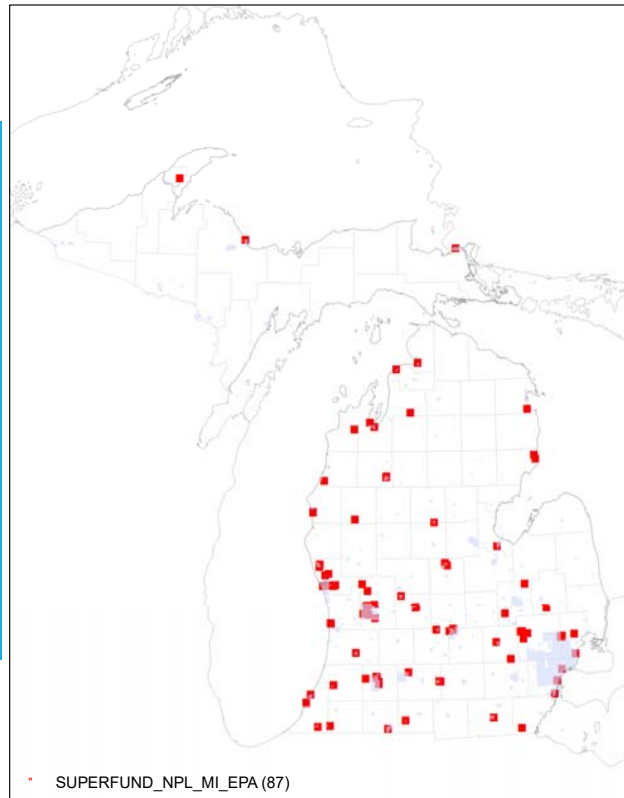


# Potential PFAS Sites - AFFF

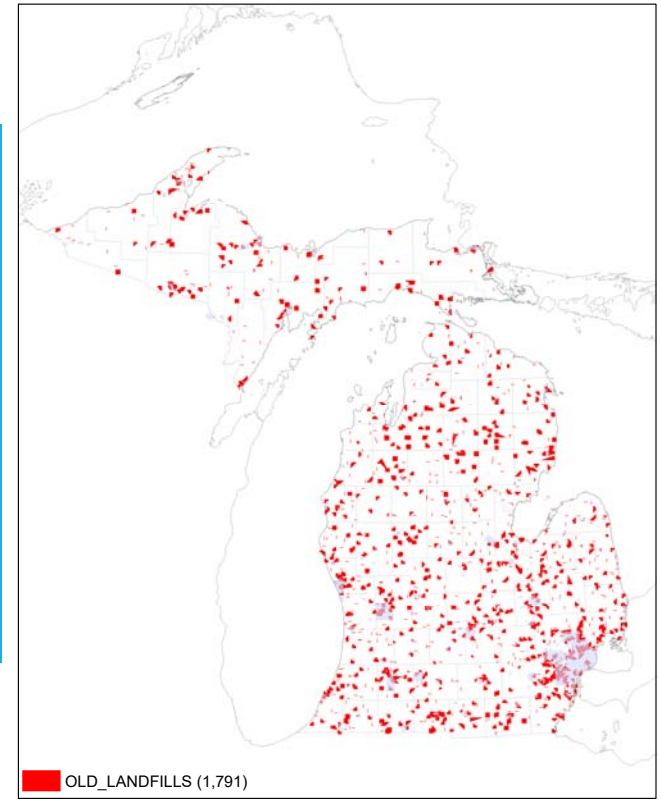
ACTIVE LANDFILLS



SUPERFUND SITES

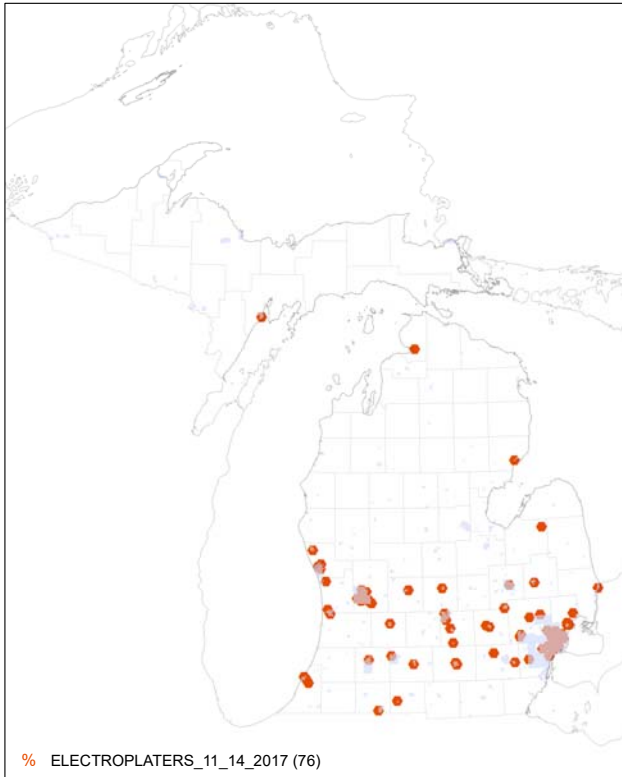


OLD LANDFILLS

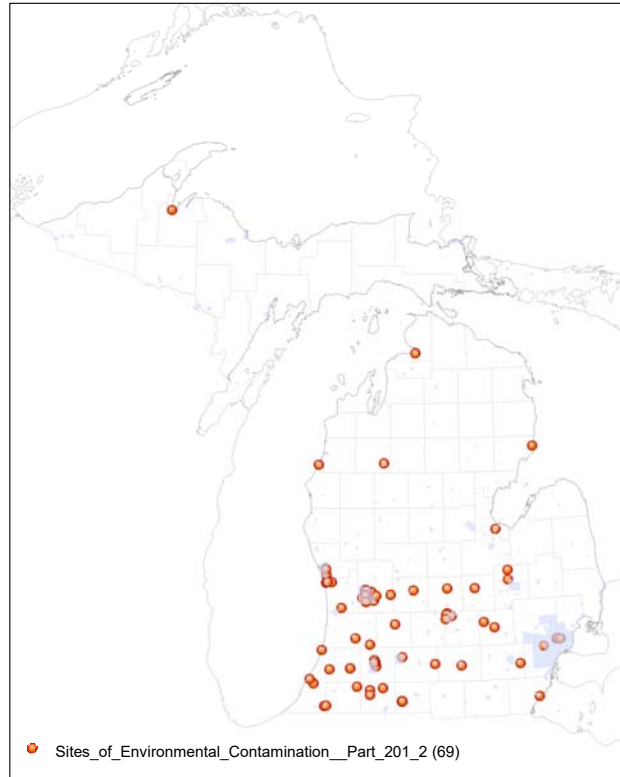


# Potential PFAS Sites - Waste

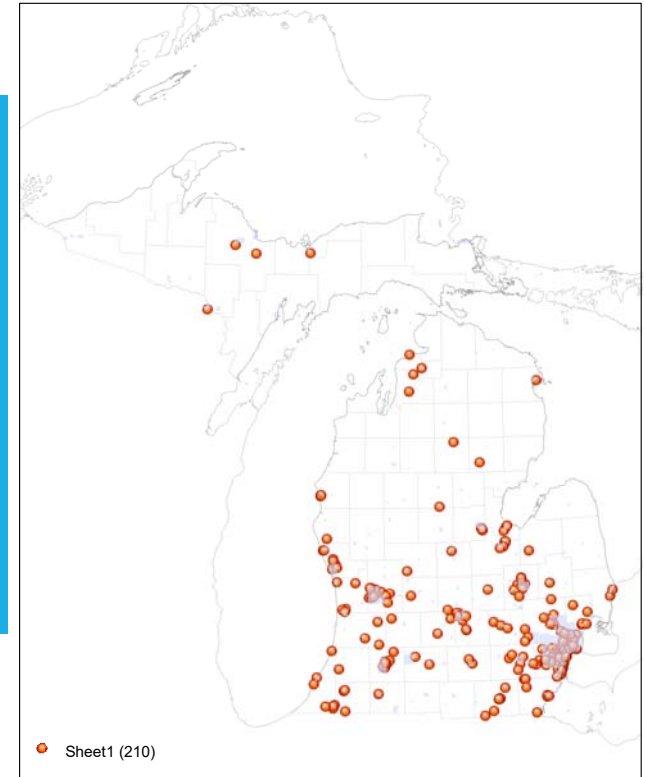
ELECTROPLATERS



PART 201 PLATERS & POLISHERS



TSD ELECTROPLATERS

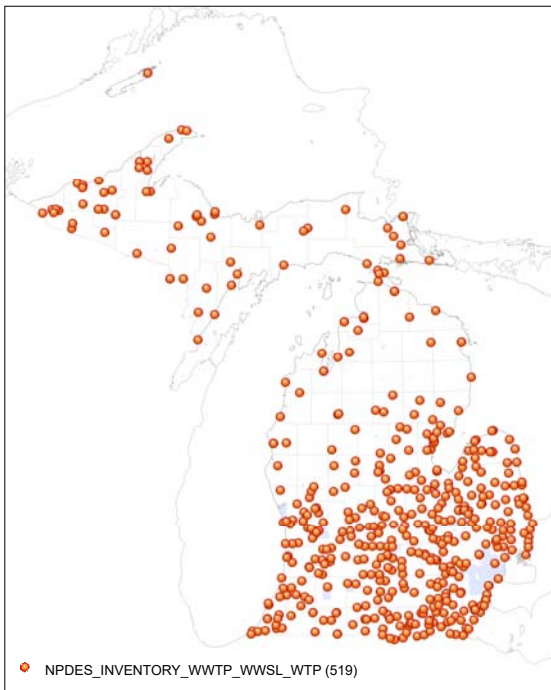


# Potential PFAS Sites - Electroplaters

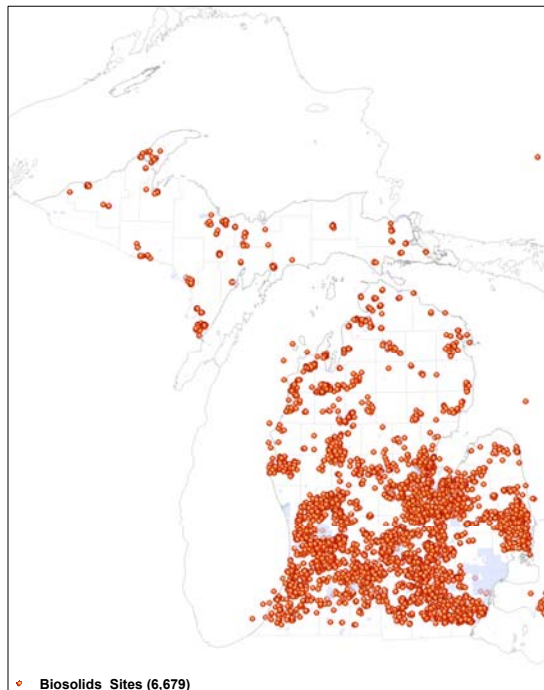


# Potential PFAS Sites

NPDES WASTE WATER TREATMENT PLANTS & WWSL



BIOSOLIDS SITES



## Other Potential PFAS Sources:

- Footwear Manufacturers
- Furniture Manufacturers
- Carpet Manufacturers
- Car Washes
- Scrap Tire Fires

# Michigan PFAS Action Response Team (MPART)

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- Governor Snyder signed ED 2017-4 on November 13, 2017
- Design: ensure comprehensive, cohesive, timely response to continued mitigation PFAS substances (PFAS) across Michigan
- Goal: provide cooperation and coordination among all levels of government

# MPART's Approach

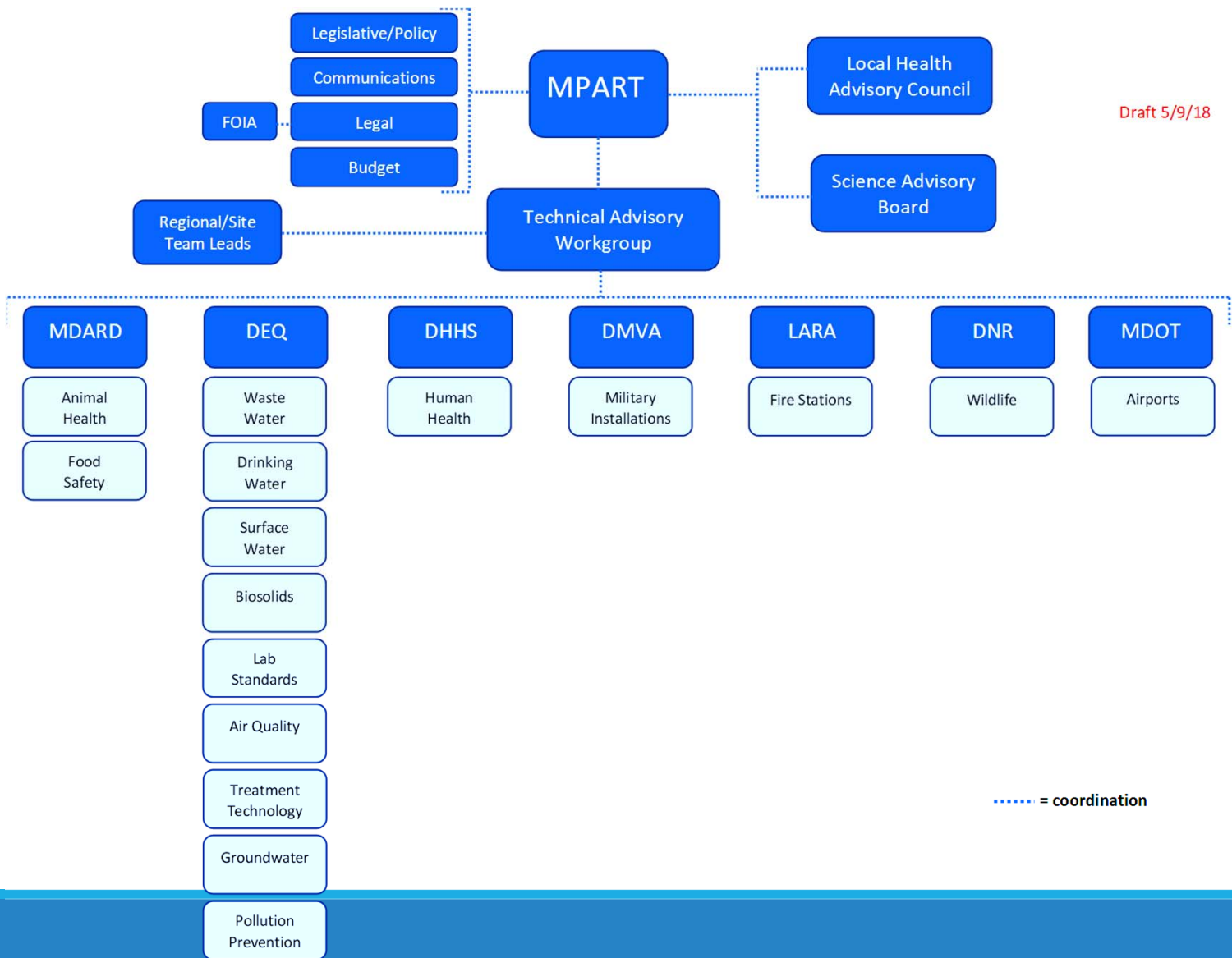
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Addressing known sites – focus on public health

Proactive efforts - PWS sampling

Investigating new potential sites

Prevention



Draft 5/9/18

# Regular Monitoring Plus

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- Site-specific monitoring of known PFAS sites
- Monitoring of PFAS in rivers, lakes and streams, and fish
- Monitor point sources (Direct Discharges)
- Industrial Pretreatment Program Initiative (Indirect Discharges)
- Biosolids program
- Superfund program
- Coordinate with other Divisions (AQD, WMRPD and DHHS, others)



## Example: Lapeer WWTP

- Elevated PFAS results in Flint River tracked to Lapeer WWTP
- DEQ found PFOS in discharge in June 2017
- Worked with City to find the source
- City working with source to eliminate PFOS

# PFOS in Lapeer WWTP Biosolids

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- 8/24/2017: PFOS = 2,100 µg/L (ppb)
- 9/29/2017: DEQ suspended Lapeer's land application program.
- Biosolids now disposed at a landfill
- City of Lapeer issued order to plater requiring reduction/elimination of discharge to WWTP to 12 ppt PFOS
- Source reduction efforts appear to be successful in lowering levels in biosolids at WWTP
- Biosolids study

# Sources of PFOS & PFOA for WWTPs

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- Platers using fume suppressants/demisters/wetting agents
- Leather and fabric treaters, tanneries
- Paper and packaging manufacturers
- Manufacturers of parts w/PTFE coatings
- Landfills (leachate)
- Centralized Waste Treaters
- AFFF fire fighting foam





# IPP PFAS Initiative Requirements

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- Potential Source Screening
- Monitor Probable Sources
- If sources found:
  - Reduce/Eliminate PFOS & PFOA Sources
  - Monitor POTW effluent; report if exceeds standards
- Submit Interim Report – due 6/29
- Continue Source Reduction & Monitoring
- Submit Summary Report – due 10/26

Alternative Plan:  
-More time  
-Fewer samples  
-For larger POTWs

# Landfill Leachate

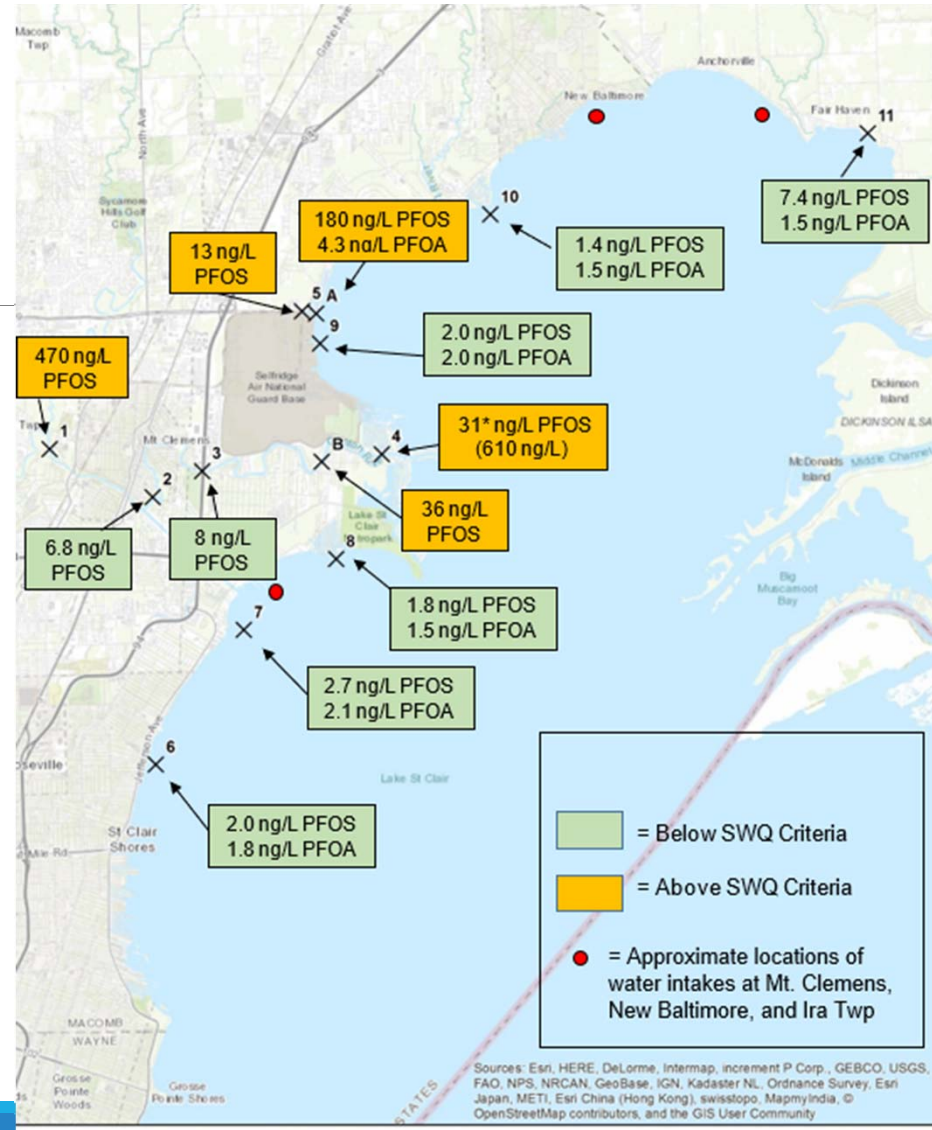
70 active solid waste landfills

Draft sampling guidance

Trial run April 19, 2018

Statewide Fall 2018

# Another Surface Water Investigation



# Fish Collection and Analysis in partnership with DHHS

- 365 fish collected in 2017 are being analyzed
- 132 fish planned in 2018

Waterbody	Location	Species	# of samples
Flint River watershed	Flint River @ Flint	Walleye, channel catfish	20
	Mott/Holloway Reservoirs	Bluegill	10
	Kearsley Reservoir	Bluegill, channel catfish	10
	Thread Lake	Bluegill, channel catfish	10
Rogue River	u/s & d/s of Rockford	Rockbass	20
	Rockford area lakes	Panfish	30
Caged fish	Au Sable/Grayling vicinity	4 sites	16
	Rogue River	4 sites	16
Total			132

# Fish Consumption

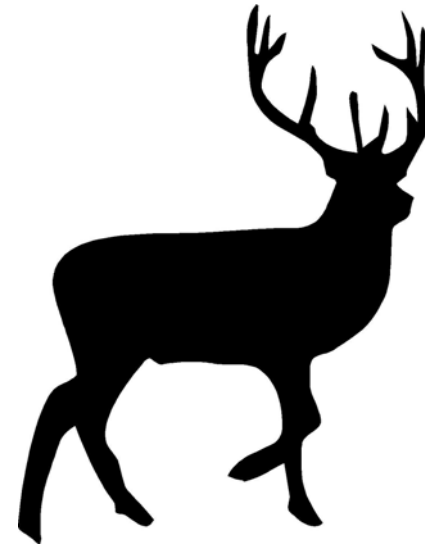
## Lake St. Clair

Type of Fish	Chemical Causing MI Serving Guideline	Size of Fish (length in inches)	MI Servings per Month
Bluegill	PFOS	Any	4
Carp	PCBs	Any	Limited
Catfish	Dioxins	Any	Limited
Black Crappie	Mercury	Under 9"	8
		Over 9"	4
Freshwater Drum	PCBs and Mercury	Any	2
Largemouth and Smallmouth bass	PCBs and Mercury	Under 20"	2
		Over 20"	1
Muskellunge	Mercury	Any	<b>Do Not Eat</b>
Northern Pike	Mercury	Any	2
Rock Bass	PCBs	Any	1 <sup>2x</sup>
Sturgeon	PCBs	Any	Limited
Sunfish	PFOS	Any	4
Walleye	PCBs and Dioxins	Any	6 per Year <sup>2x</sup>
White (Silver) Bass	PCBs	Any	Limited
White Crappie	Mercury	Under 9"	8
		Over 9"	4
Yellow Perch	Mercury	Any	4

# Deer Collections - MDNR

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- 20 deer from 4 PFAS contaminated surface water locations
  - Oscoda
  - Alpena
  - Grayling
  - Kent County
- 48 deer head muscle samples
  - 39 counties in Michigan



## Public Water Supply Testing and Schools

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1,380 community water supplies

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461 schools

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Represents 75% of MI residents

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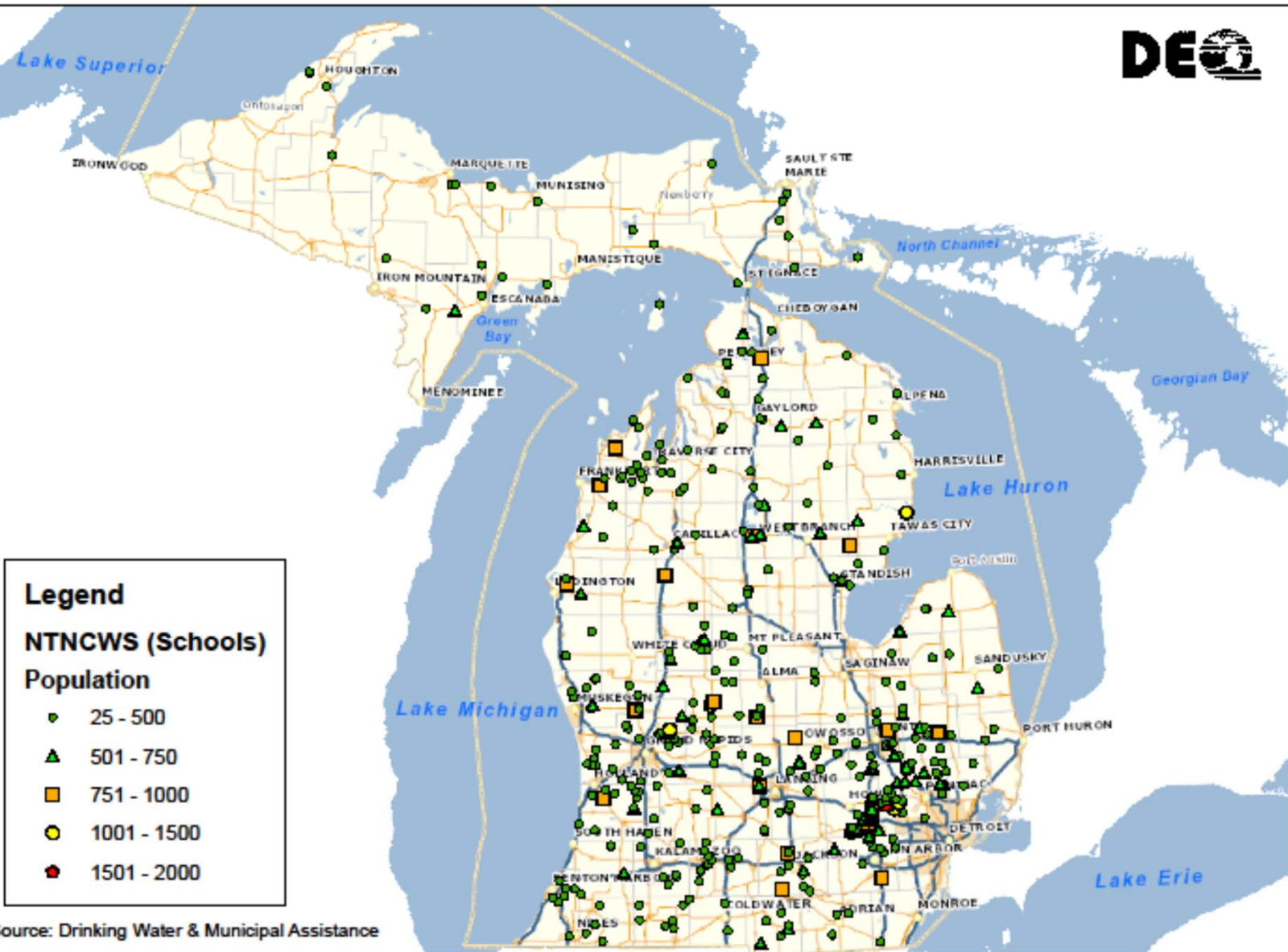
Sampling began as a pilot in April, paused and launched in full on May 18

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Involves 1-3 teams

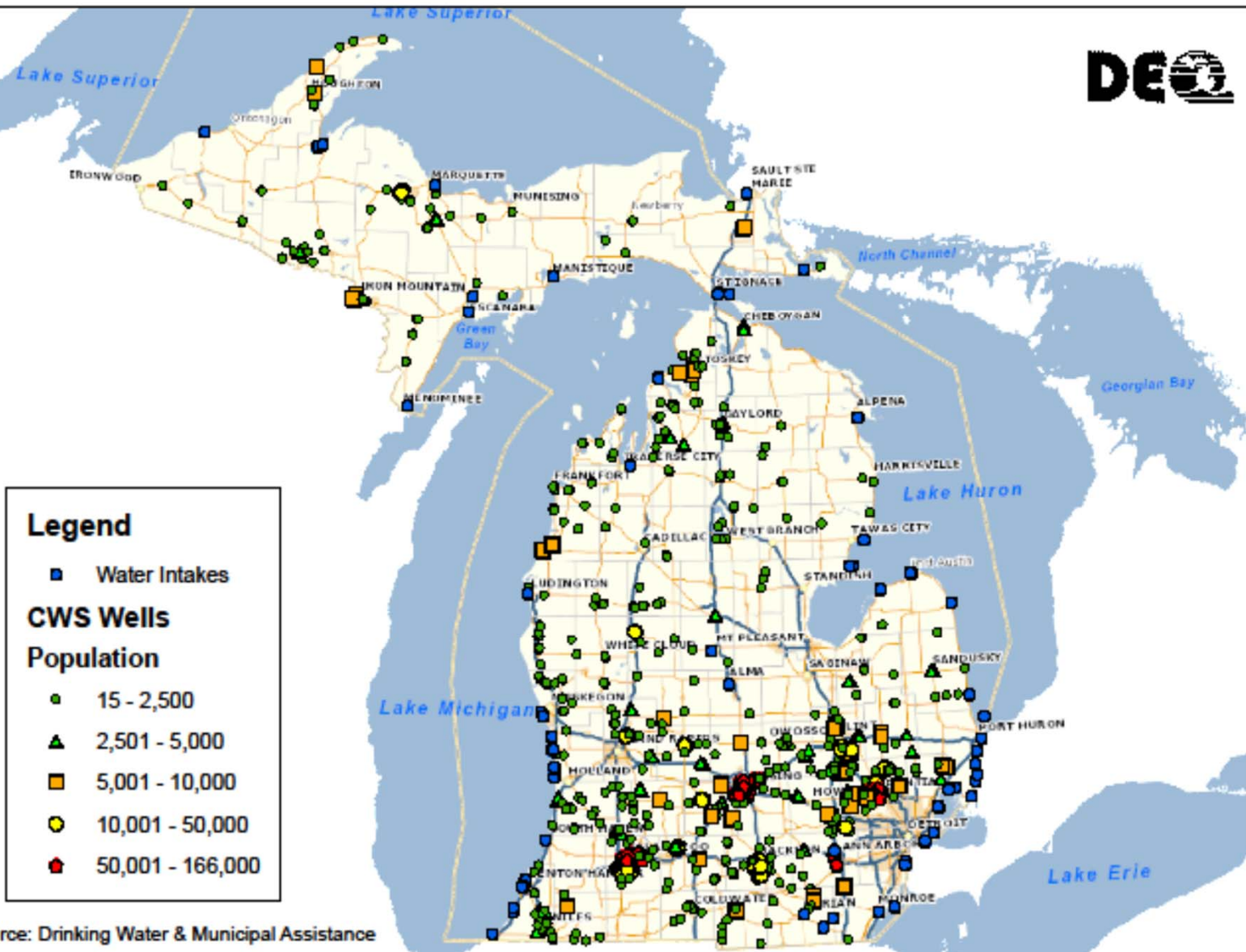
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To be completed December



Source: Drinking Water & Municipal Assistance





# PFAS Environmental Testing Factoids

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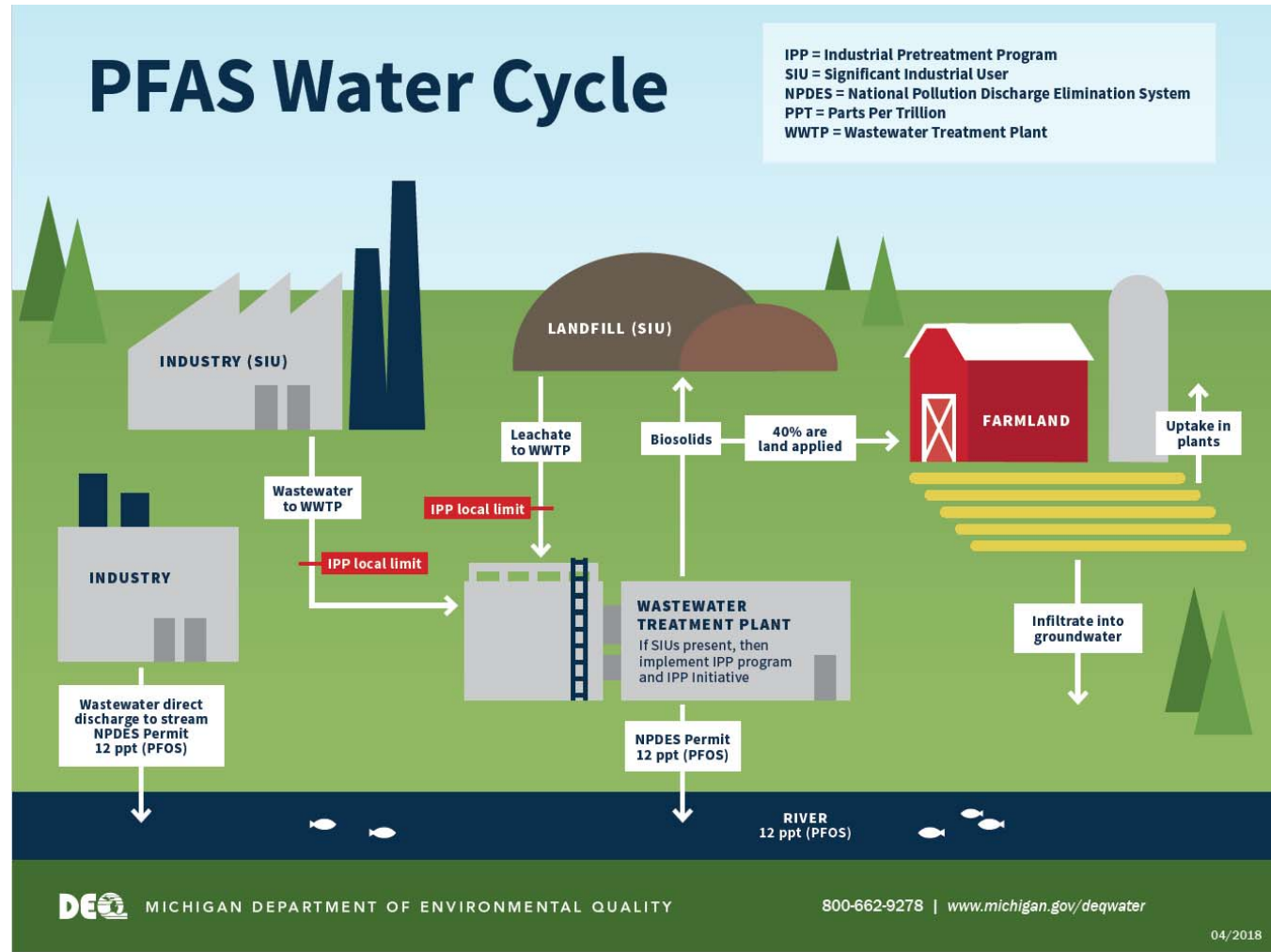
As of the end of May 2018:

~ 4,700 samples taken by MDEQ for PFAS throughout all 31 sites, for drinking water, groundwater, and surface water

- 2,755 drinking water samples taken, including public water supplies and residential wells
  - Out of 2674 results back,
    - 1688 ND (63%)
    - 863 between ND – 70ppt (32%)
    - 22 over 70 ppt (5%)
- 1,681 groundwater samples taken
  - Out of 1651 results back,
    - 340 ND (21%)
    - 833 between ND and 70 ppt (50%)
    - 478 over 70 ppt (29%)

# Challenges:

- Media Transfer
- Disposal
- Landfill/Leachate



# Challenges: Criteria

- Lack of federal standards
  - Primary drinking water criteria, hazardous constituents, biosolids,...
  - EPA Lifetime Health Advisory Level of 70 ppt PFOA and PFOS combined or individually not enforceable
- Michigan standards
  - Groundwater for drinking water clean-up standard (January 10, 2018)
    - 70 ppt PFOA and PFOS combined or individually
- Surface Water - Rule 57 Water Quality Standards
  - PFOS:
    - 11ppt (drinking water source)
    - 12 ppt (non-drinking water source)
  - PFOA:
    - 420 ppt (drinking water source)
    - 12,000 ppt (non-drinking water source)

Challenges:  
Prioritizing Sites

Identify

Investigate

Remediate

## Challenges: Sampling Strategy

- Where to sample
- When to sample
- What to sample
- What do we know about
  - Source(s)
  - Geology
  - Groundwater flow direction

## Challenges: Analysis

Laboratory Analytical  
Methods

14 or 24 analytes depending  
on method and media

Over 3,000 PFAS chemicals

## Challenges: Reporting Results

- Significant digits  
~~12.345~~ or 12
- ~~J flags~~ or ND
- ND below RL
- Total PFAS  $\neq$  Sum of estimates





Challenges:  
Airports/Fire  
Departments

Potential contamination  
from use of AFFF

Current inventory of AFFF

Best practices for training and  
use

Challenges:  
Surface Water Foam

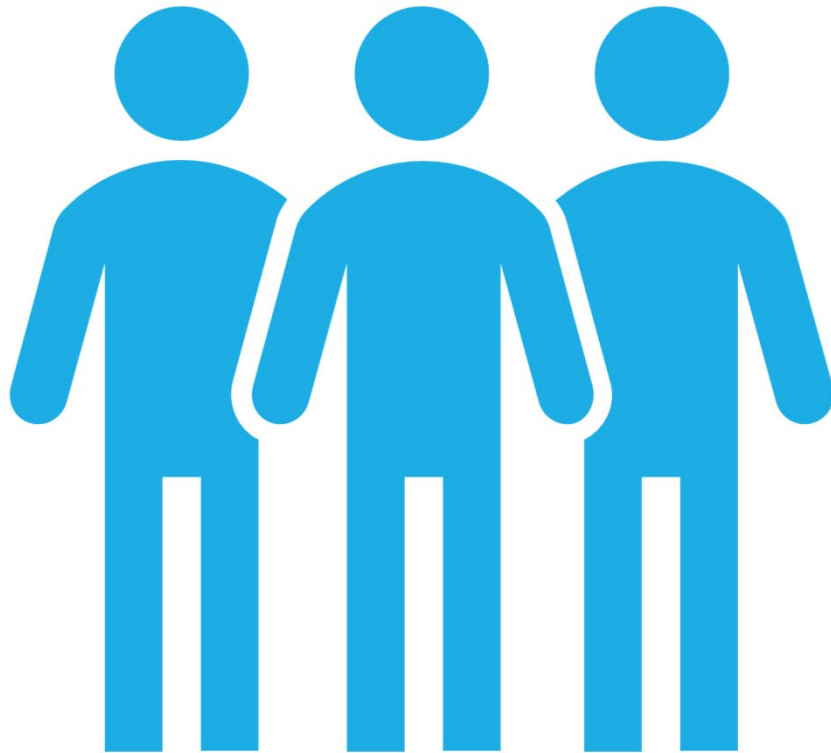


Challenge:  
Resources

Funding



Agency  
capacity



## Challenges: Communication

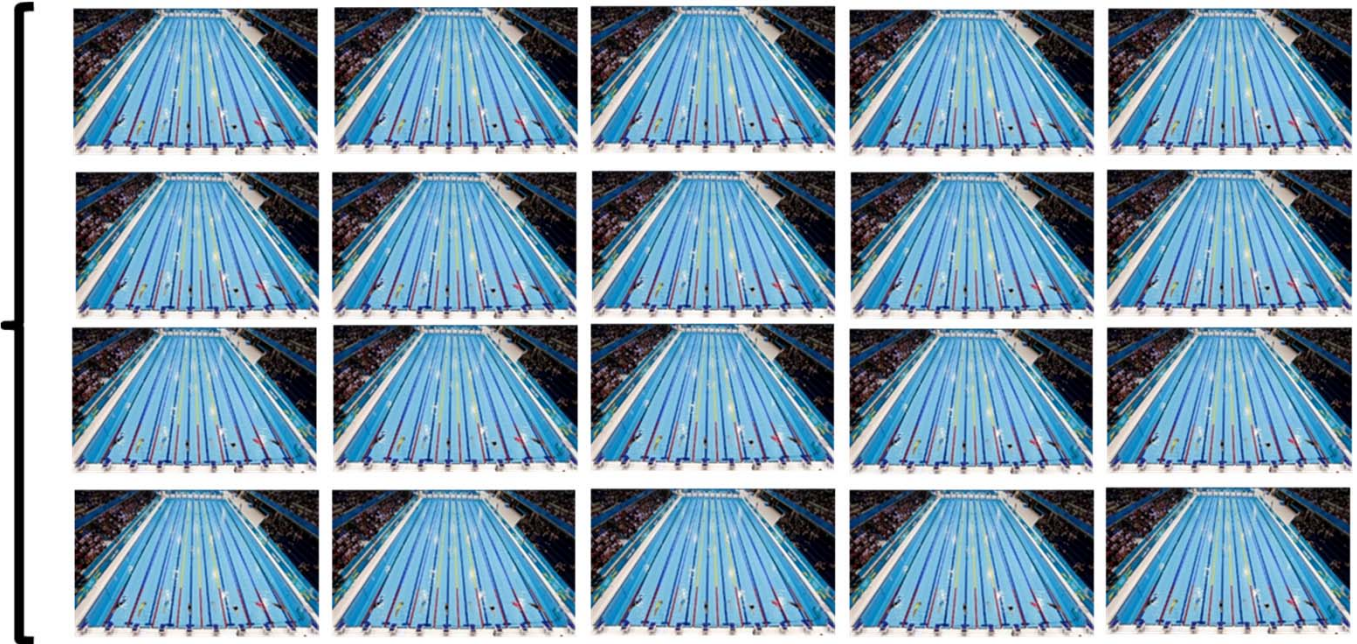
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- Risk
  - Need consistent message
- Coordination among agencies
- Community engagement



# Parts per trillion

1 ppt = 1 drop  
(0.05mL) in  
20 Olympic  
Swimming Pools



Note: 1 Olympic Pool = 660,000 gallons

PFAS RESPONSE

# TAKING ACTION, PROTECTING MICHIGAN

HEALTH

HOME WATER TREATMENT

MICHIGAN PFAS SITES

WILDLIFE

FIREFIGHTING FOAM

ABOUT MPART

## TAKING ACTION TO PROTECT THE PUBLIC'S WATER

Perfluoroalkyl and polyfluoroalkyl substances (PFAS), such as perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS), are part of a group of chemicals used globally during the past century in manufacturing, firefighting and thousands of common household and other consumer products.

In recent years, experts have become increasingly concerned by the potential effects of high concentrations of PFAS on human health.


Although there is more to learn about PFAS and human health, the State of Michigan takes this issue seriously and is one of the first states in the nation to establish a clean-up standard for PFAS in groundwater used for drinking water.

Launched in 2017, the Michigan PFAS Action Response Team (MPART) is the first multi-agency action team of its kind in the nation. Agencies representing health, environment and other branches of state government have joined together to investigate sources and locations of PFAS contamination in the state, take action to protect people's drinking water, and keep the public informed we learn more about this nationally emerging contaminant.



# Contact Information & Questions

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- Environmental Assistance Center: 800-662-9278
- Twitter@MichiganDEQ 
- [www.Michigan.gov/pfasresponse](http://www.Michigan.gov/pfasresponse)
- Steve Sliver, [slivers@Michigan.gov](mailto:slivers@Michigan.gov)