Update on Huron River Watershed Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS) – State Response

Michigan Department of Environment,
Great Lakes, and Energy (EGLE)
Michigan Department of Health and Human Services (MDHHS)
Michigan Department of Natural Resources (MDNR)

MPART

Introductions

- **Stephanie Kammer** – EGLE, Water Resources Division, Emerging Pollutants Section
- **Sarah Bowman** – EGLE, Water Resources Division, Surface Water Assessment Section
- **Brandon Armstrong** – EGLE, Water Resources Division, Surface Water Assessment Section
- **Gary Klase** – Michigan Department of Health and Human Services, Division of Environmental Health
- **Ian Smith** – EGLE, Drinking Water & Environmental Health Division
- **Stephanie Johnson** – EGLE, Drinking Water & Environmental Health Division

Goals for this Webinar

- Provide update on fish & surface water sampling
- Review fish and foam advisories
- Provide update on MDNR actions
- Provide status on sources, including Wixom Wastewater Treatment Plant (WWTP)
- Provide update on Drinking Water MCLs
- Provide update on City of Ann Arbor Municipal Water Supply PFAS testing
- Discuss planned next steps

Surface Water Investigations

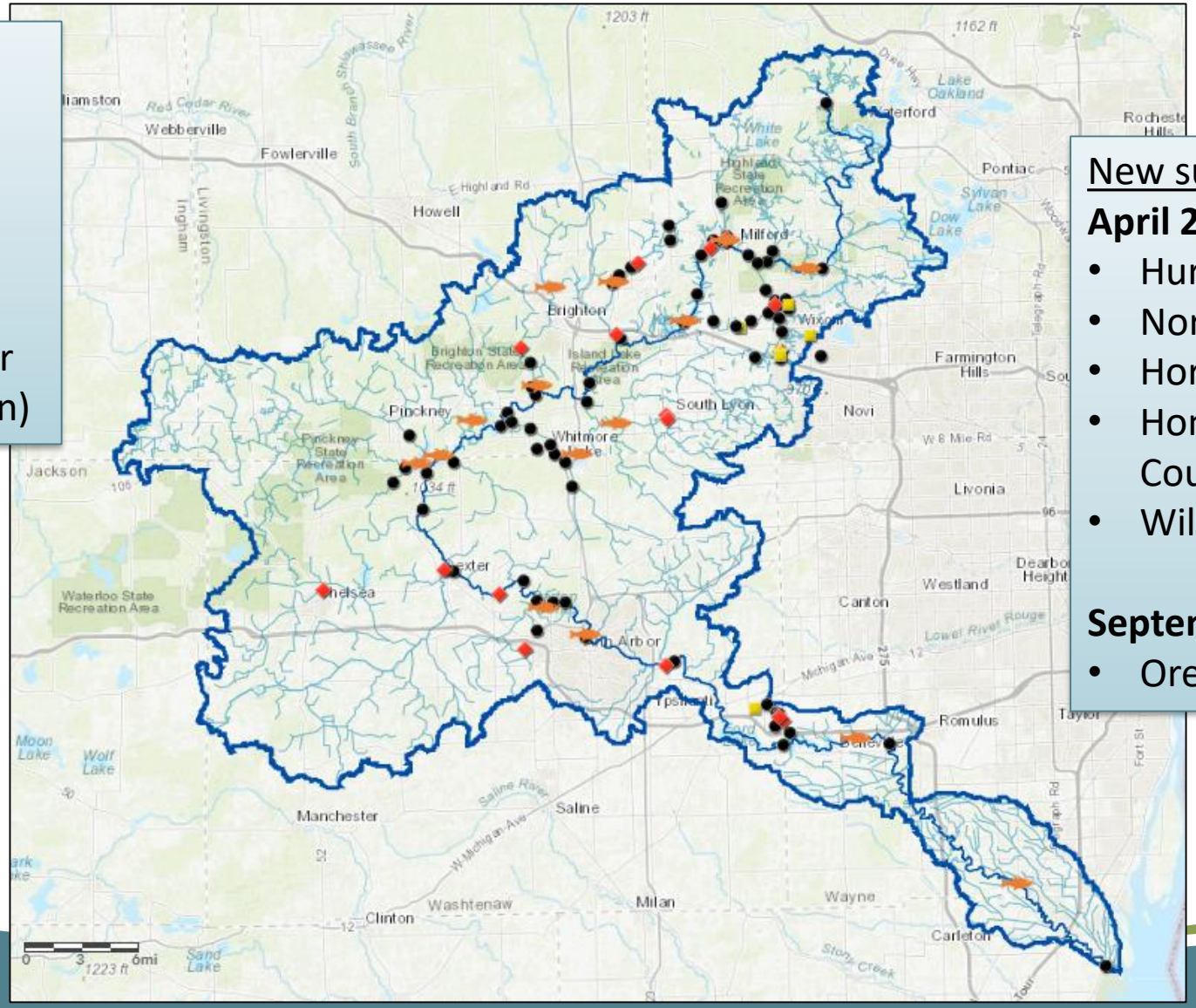
- Ambient (lakes and streams)
- Fish
- Passive samplers

Surface water, wastewater, and fish data through December 2019 are summarized in report on MPART website.

Surface water and fish samples (to-date)

Summary

- 119 surface water or storm water samples collected at 78 sites (black dots)
- Fish sampled and analyzed from 15 water bodies (orange fish icon)



New surface water monitoring:

April 2019

- Huron River
- Norton Creek
- Horseshoe Creek
- Honey Creek (Washtenaw County)
- Willow Run

September 2019

- Ore Creek and Ore Lake

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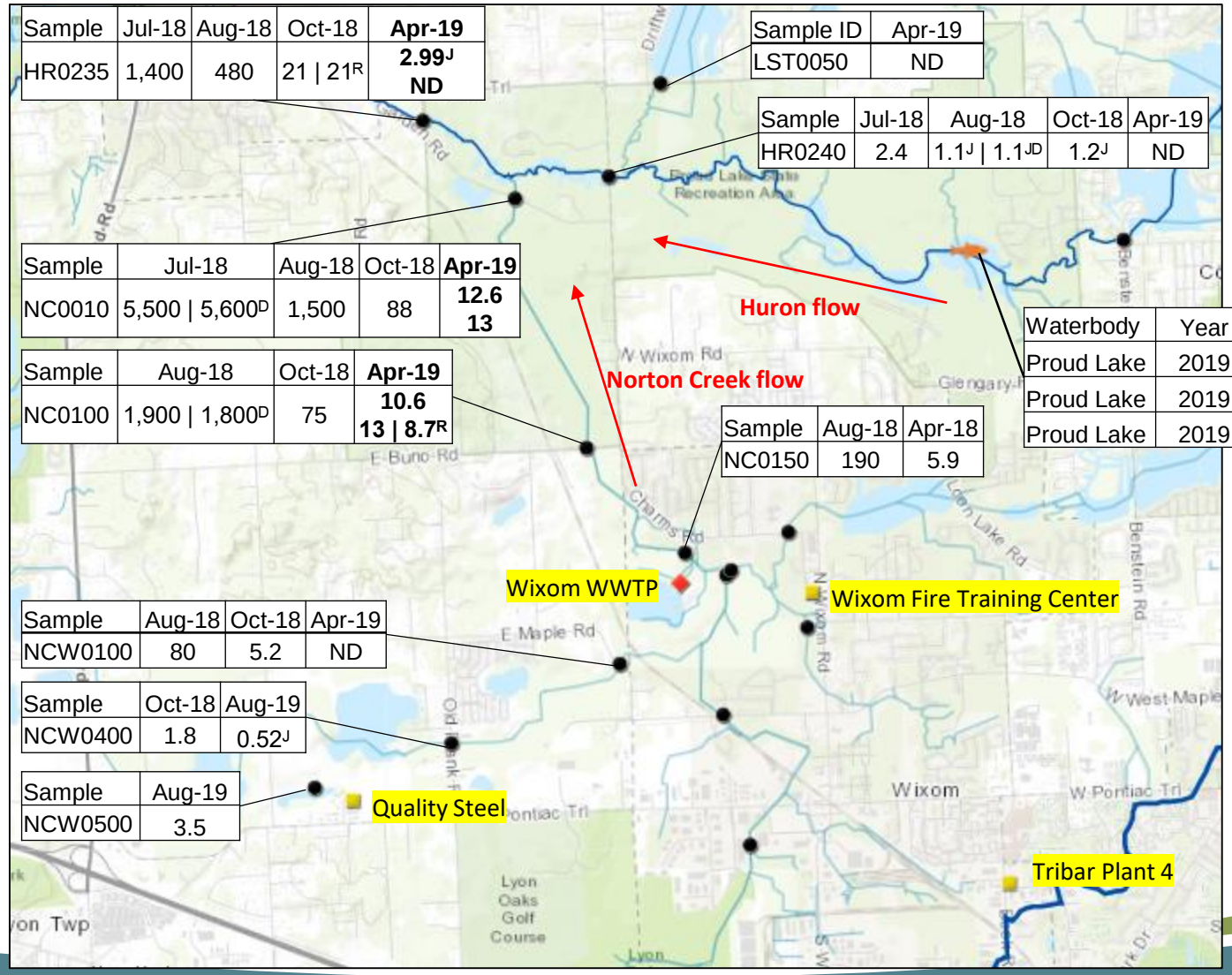
Norton Creek (PFOS ppt)

<u>April and August 2019 Summary</u>

- Huron River upstream of Norton Creek consistently low
- Norton Creek downstream Wixom WWTP, lower relative to other sampling events (Tribar installed treatment in October 2018)
- Huron River downstream Norton Creek, lower relative to other sampling events
- Surface water near Quality Steel below Rule 57 water quality value for PFOS



Sample	Jul-18	Aug-18	Oct-18	**Apr-19**
HR0235	1,400	480	21 | 21[R]	**2.99[J]** **ND**

Sample ID	Apr-19
LST0050	ND

Sample	Jul-18	Aug-18	Oct-18	Apr-19
HR0240	2.4	1.1[J] | 1.1[JD]	1.2[J]	ND

Sample	Jul-18	Aug-18	Oct-18	**Apr-19**
NC0010	5,500 | 5,600[D]	1,500	88	**12.6** **13**

Sample	Aug-18	Oct-18	**Apr-19**
NC0100	1,900 | 1,800[D]	75	**10.6** **13 | 8.7[R]**

Sample	Aug-18	Apr-18
NC0150	190	5.9

Sample	Aug-18	Oct-18	Apr-19
NCW0100	80	5.2	ND

Sample	Oct-18	Aug-19
NCW0400	1.8	0.52[J]

Sample	Aug-19
NCW0500	3.5

Waterbody	Year	Species	95% UCL
Proud Lake	2019	Bluegill	10
Proud Lake	2019	Rock Bass	8.2
Proud Lake	2019	Largemouth Bass	120

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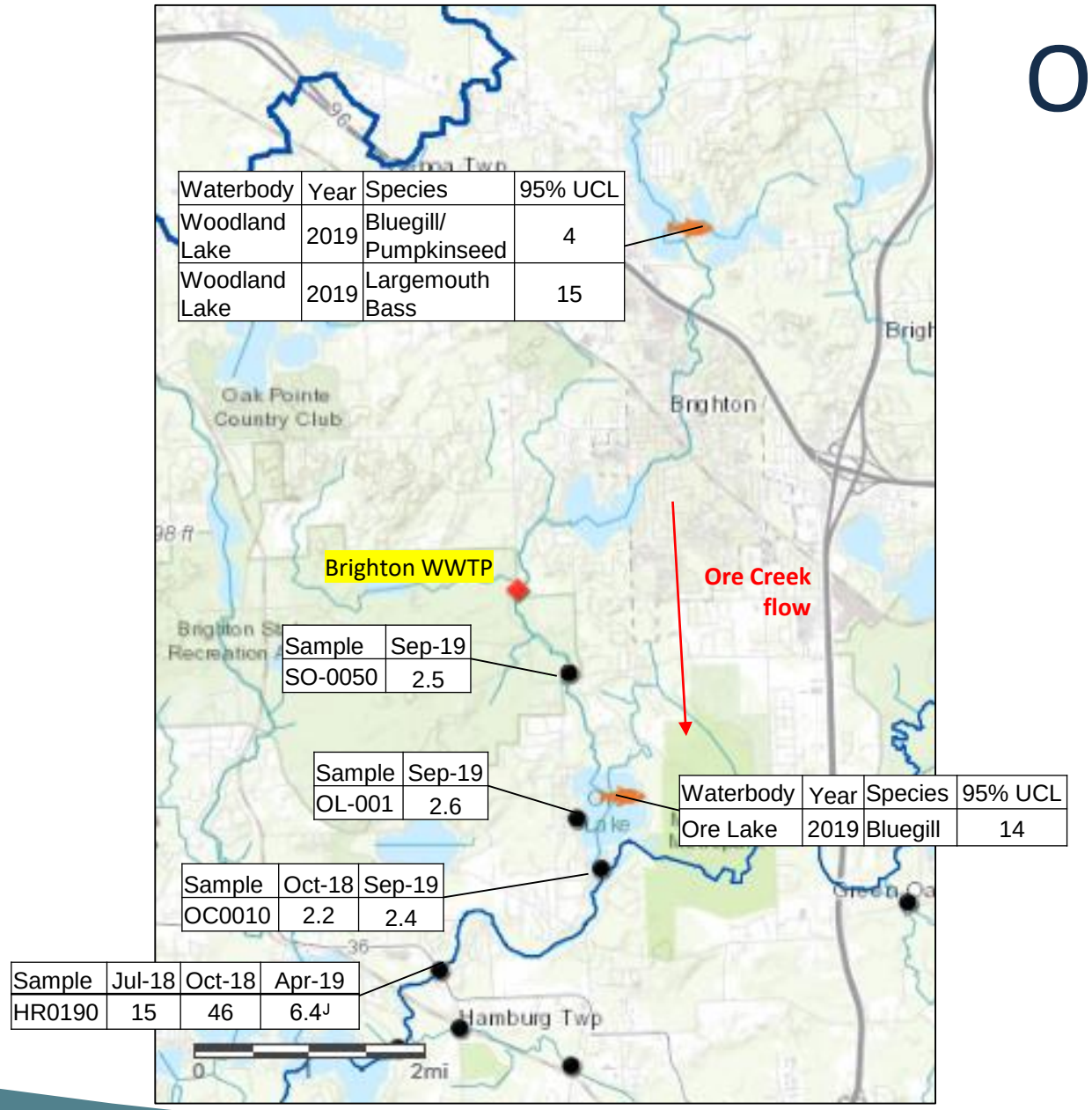
Ore Creek (PFOS ppt)



Brighton WWTP

- Exceedances of Rule 57 value for PFOS three times in 2019 (Brighton WWTP working on source identification)

September 2019 Summary

- Samples collected from Ore Creek and Ore Lake were below R57 water quality value

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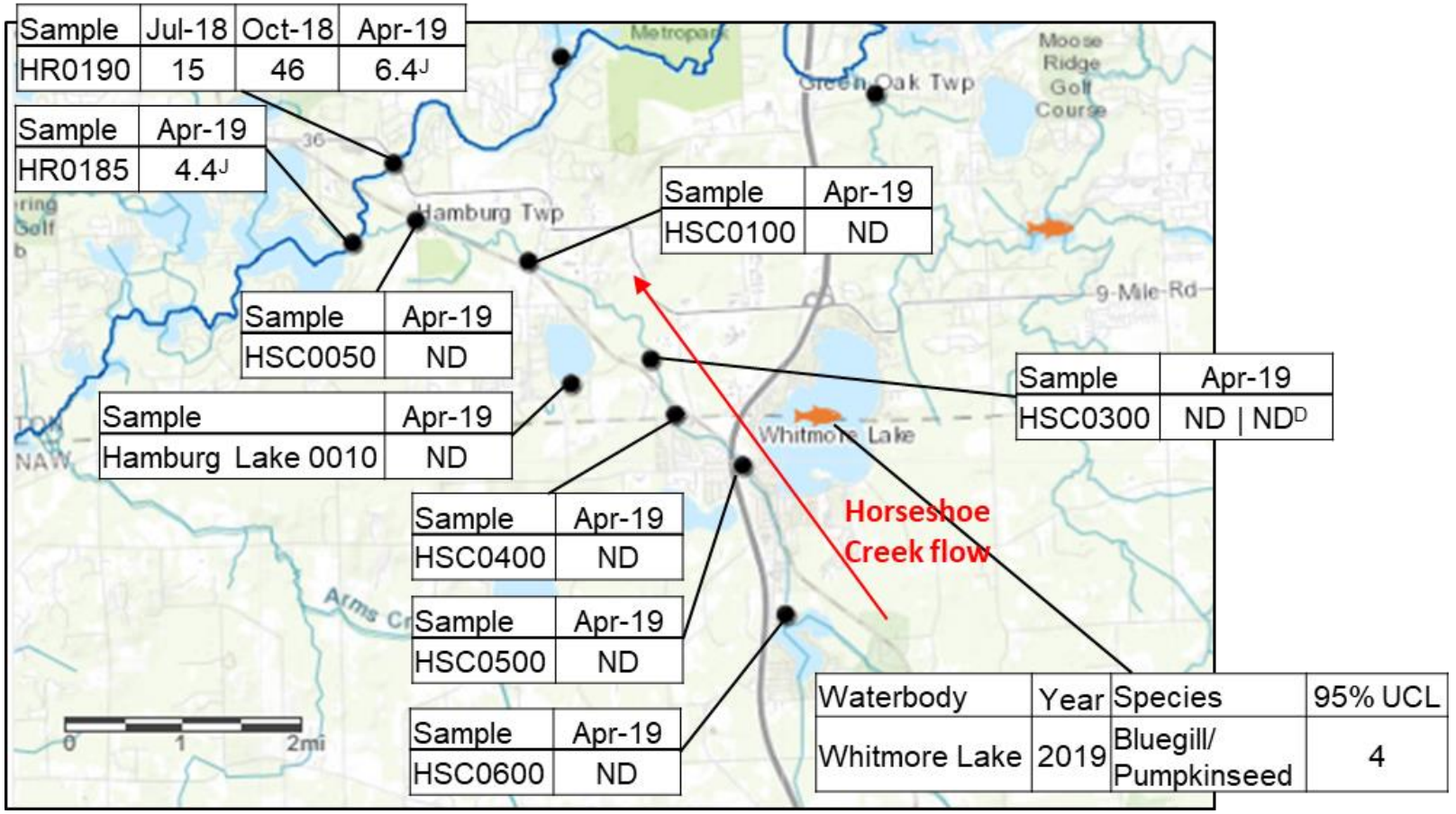
Horseshoe Creek (PFOS ppt)

April 2019 Summary

- Samples from Horseshoe Creek non-detect for PFOS
- This one-time sampling event did not reveal any PFOS sources to Horseshoe Creek



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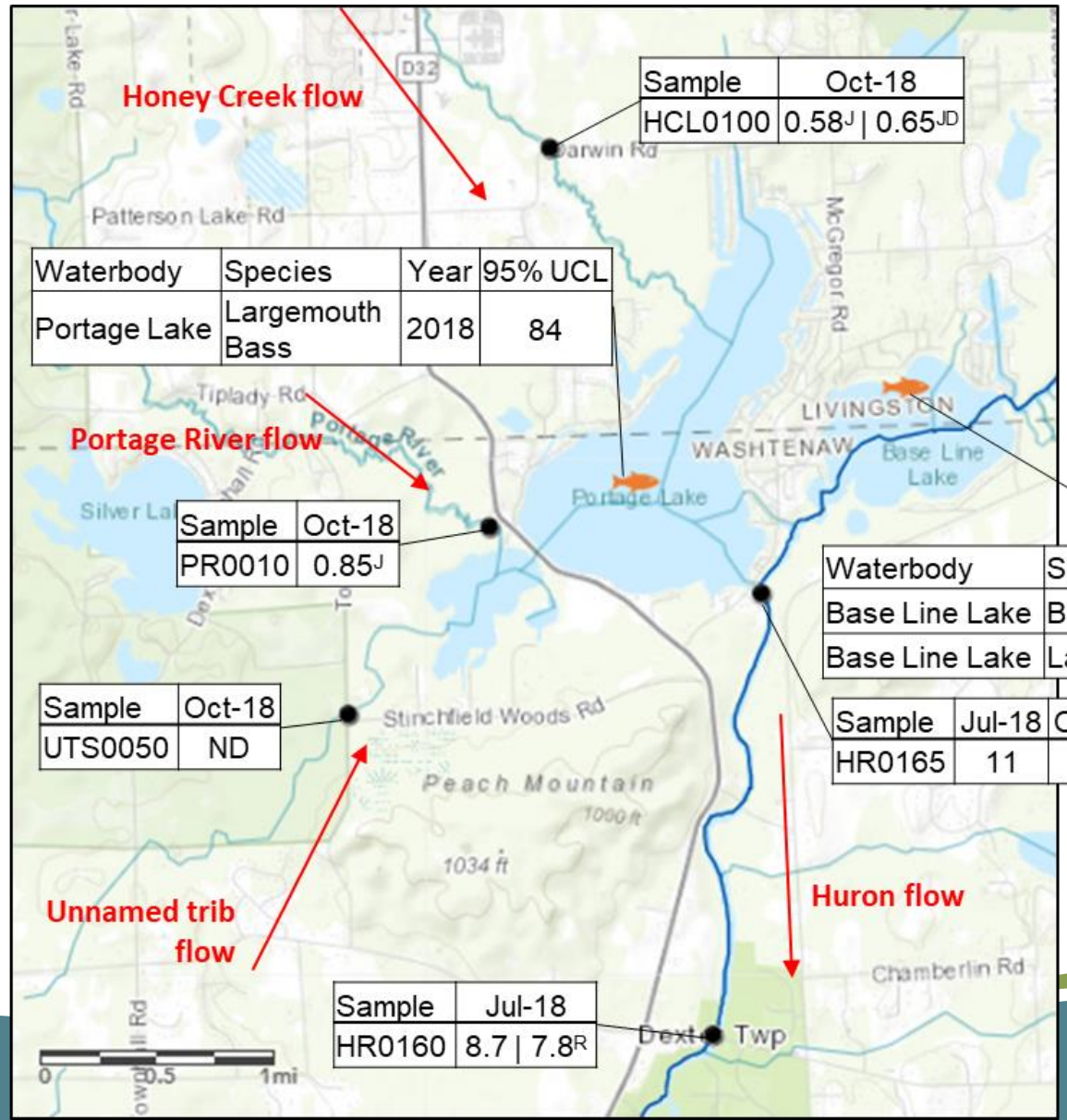
Portage Lake (PFOS ppt)

Summary

- October 2018 surface water sampling did not reveal any potential sources of PFOS to Portage Lake
- EGLE has received many foam complaints for Portage Lake
- EGLE staff met on May 11, 2020 to discuss potential sources of PFAS to Portage Lake and potential future sampling



Sample	Oct-18
HCL0100	0.58[J] | 0.65[JD]

Waterbody	Species	Year	95% UCL
Portage Lake	Largemouth Bass	2018	84

Sample	Oct-18
PR0010	0.85[J]

Sample	Oct-18
UTS0050	ND

Sample	Jul-18
HR0160	8.7 | 7.8[R]

Waterbody	Species	Year	95% UCL
Base Line Lake	Bluegill	2018	129
Base Line Lake	Largemouth Bass	2018	286

Sample	Jul-18	Oct-18
HR0165	11	88

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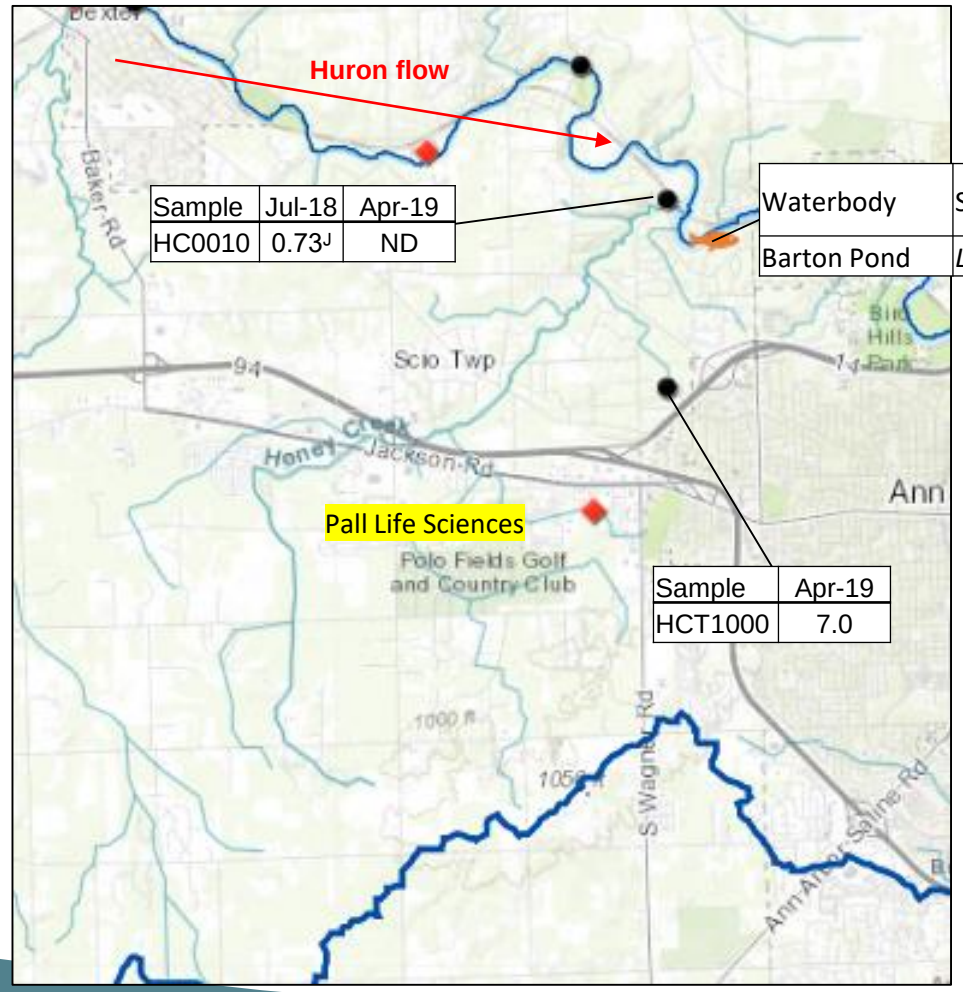
Honey Creek (PFOS ppt)



Sample	Jul-18	Apr-19
HC0010	0.73[J]	ND

Waterbody	Species	Year	95% UCL
Barton Pond	*Lepomis*	2018	17

Sample	Apr-19
HCT1000	7.0

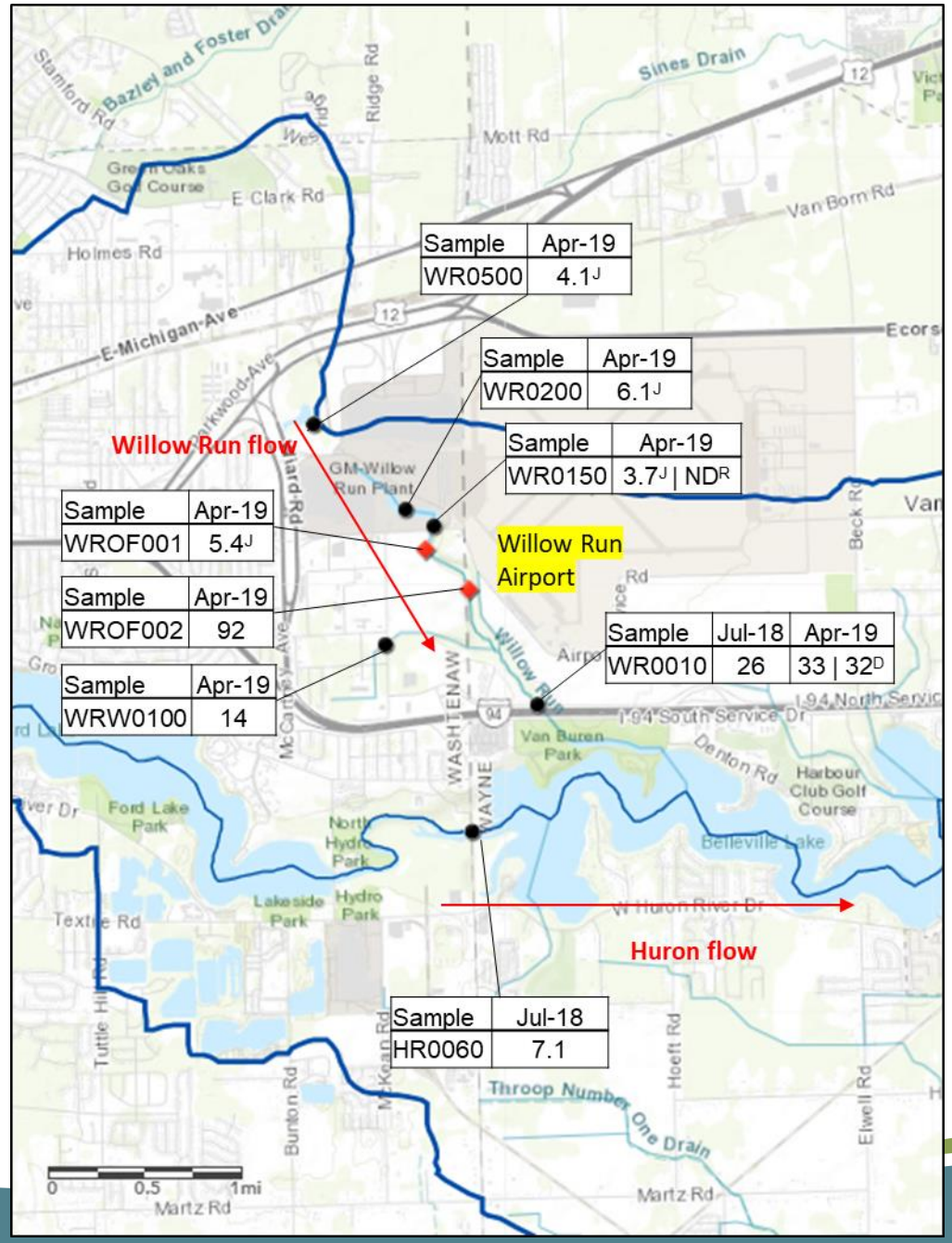
<u>Summary</u>

- Samples from Honey Creek below Rule 57 water quality value for PFOS
- Pall Life Sciences non-detect for PFOS

Willow Run (PFOS ppt)

April 2019 Summary

- Results suggest potential source(s) between I-94 Service Drive and Tyler Road and on the West Branch of Willow Run
- Storm water from Willow Run Airport exceeded Rule 57 water quality value for PFOS – EGLE working with airport to identify source(s)



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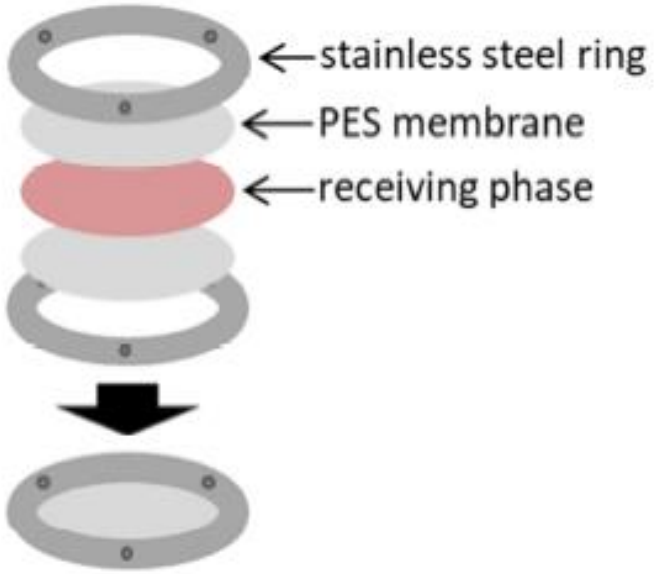
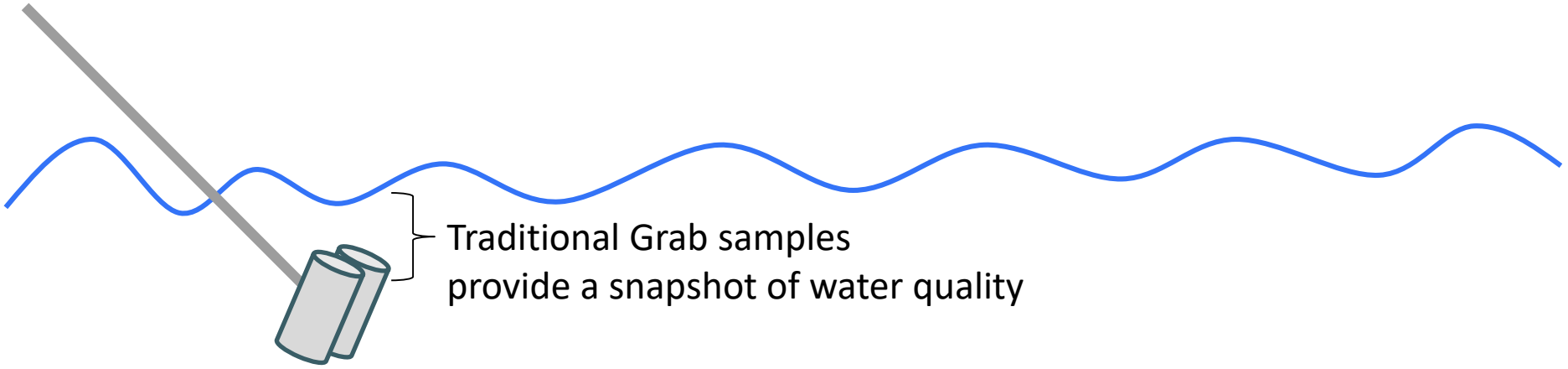
What are POCIS?

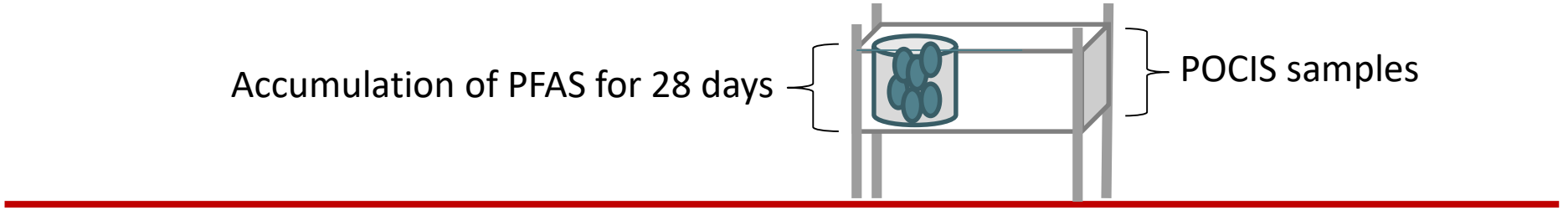
Polar Organic Chemical Integrative Samplers



For more information about POCIS samplers:
https://www.usgs.gov/centers/cerc/science/passive-sampling-using-spmds-and-pocis?qt-science_center_objects=0#qt-science_center_objects


Traditional Grab samples
provide a snapshot of water quality

Flow


Accumulation of PFAS for 28 days
POCIS samples

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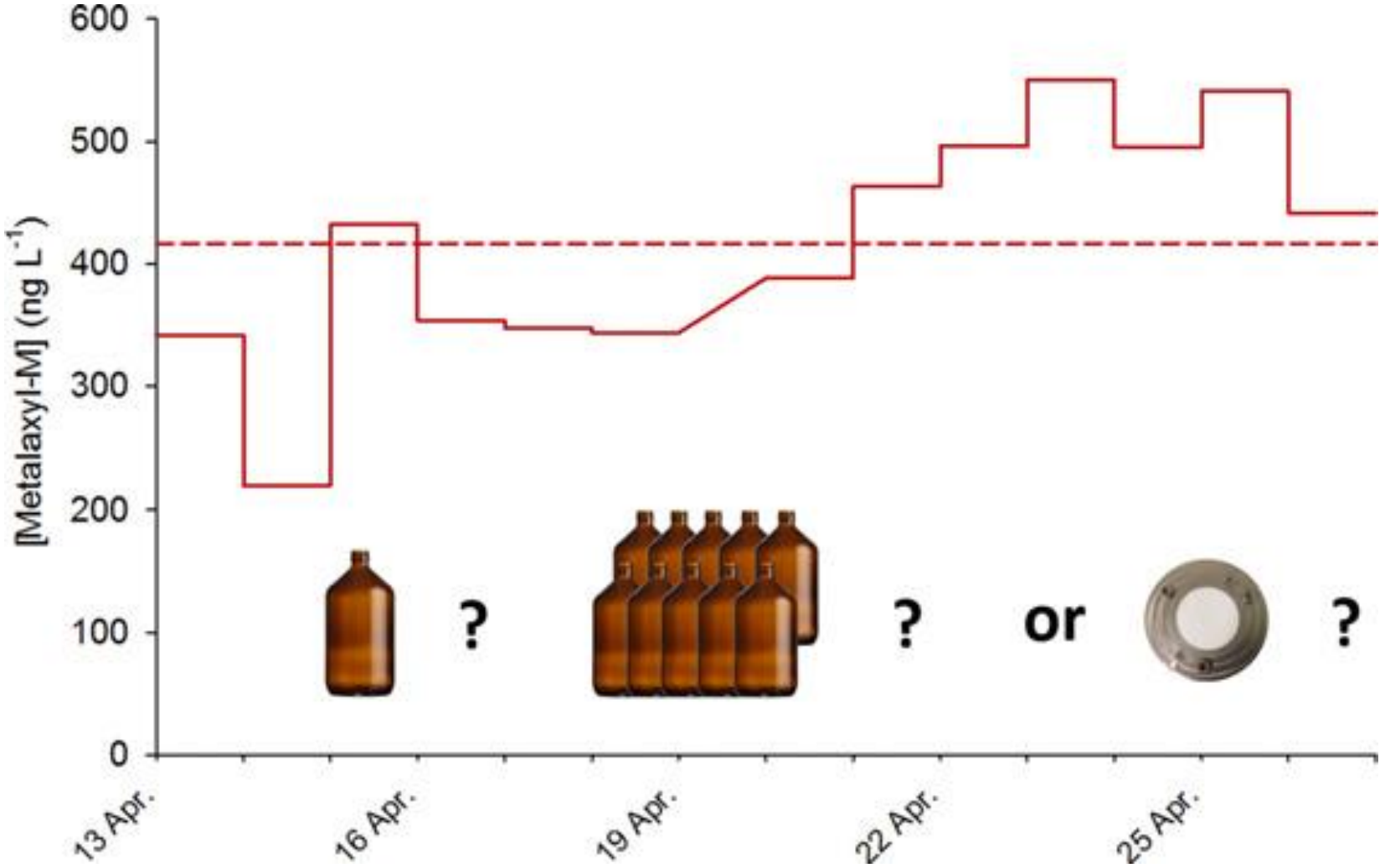


Criquet et al. (2017)

Methods: POCIS Deployment

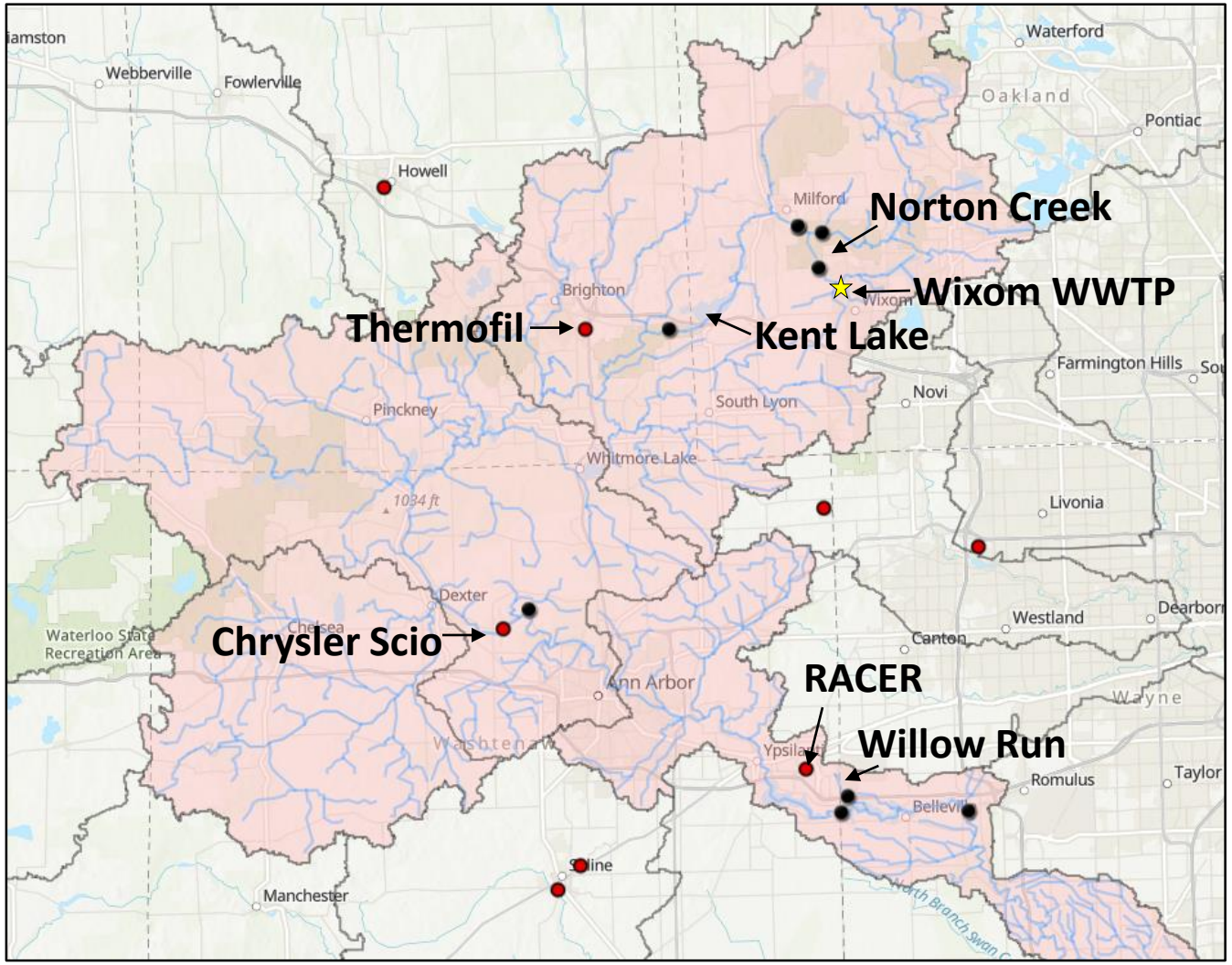
- POCIS were secured to a holder and secured inside a canister which is locked inside a cage

Methods: POCIS Deployment

- Deployment lasted 28 days beginning on September 26th, 2019 and ending on October 24th, 2019.
- POCIS were removed from their canisters and stored in original shipping containers.



Methods: Sampling Locations (•)



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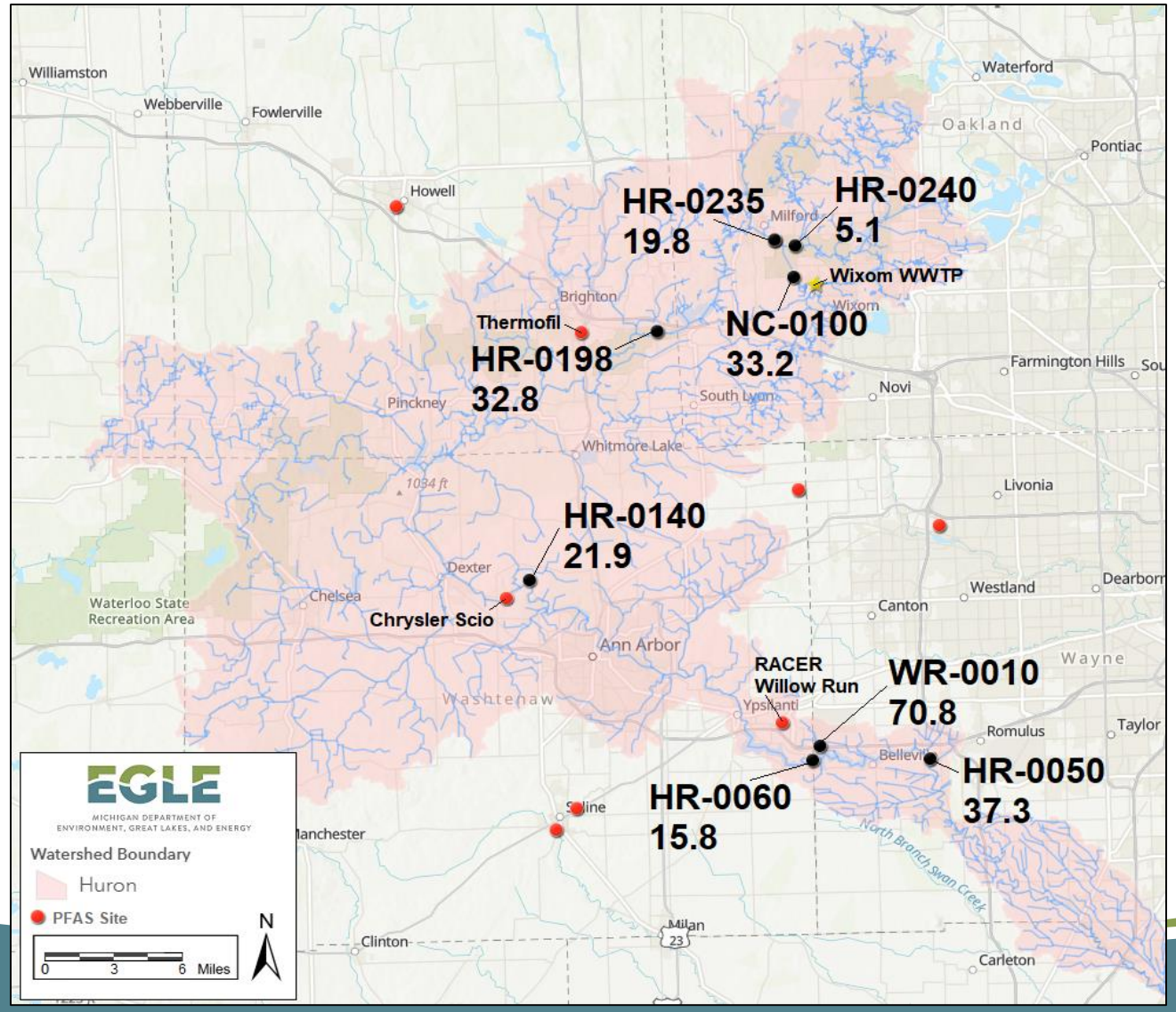
PFOS (ng/POCIS)*

* cannot be compared to water quality standards or a water concentration



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Conclusions

- POCIS can be used as an additional PFAS source tracking tool
- Results point to potential sources of PFAS loading in Norton Creek and Willow Run
  - Significantly higher PFOS concentrations
  - Other PFAS detected in these samples point to Wixom WWTP and Willow Run airport as sources of PFAS to the Huron River
- Drafting report summarizing POCIS study results
  - Will be available on the MPART website once it is finalized

Future Work

- Redeployed periodically at the same locations in the Huron River watershed
  - Trend monitoring of PFAS
  - Show improvements of ongoing PFAS mitigation activities

Fish Contaminant Monitoring
Fillet PFOS data (ppb)

Water Body	Location	Species	Year	95 % UCL
Lake Erie	Huron River Flat Rock	Rainbow Trout (Steelhead)	2019	4
Huron River	Proud Lake	Bluegill	2019	10
		Rock Bass	2019	8.2
		Largemouth Bass	2019	120
	Kent Lake	Largemouth Bass	2017	1,740
			2019	387
		Black Crappie	2017	1,134
		Pumpkinseed	2019	115
Davis Creek	Sandy Bottom Lake	Lepomis Species	2019	8
		Largemouth Bass	2019	32
Ore Creek	Woodland Lake	Lepomis Species	2019	4
		Largemouth Bass	2019	15
	Ore Lake	Bluegill	2019	14
Horseshoe Creek	Whitmore Lake	Lepomis Species	2019	4
Hay Creek	Bass Lake	Bluegill	2019	5
		Largemouth Bass	2019	8
Silver Lake	South of Pinckney	Bluegill	2020	Pending

Fish Monitoring

Waterbody	Location	Year	Species
Base Line Lake	Livingston/Washtenaw County	2018	Bluegill, largemouth bass
Bass Lake	s.e. of Brighton	2019	Bluegill, largemouth bass
Huron River	Argo Pond	2015	Rock bass
Huron River	Argo Pond	2018	Bluegill, pumpkinseed, rock bass
Huron River	Barton Pond	2018	Bluegill
Huron River	Belleville Lake	2018	Bluegill, smallmouth bass
Huron River	Wayne County, Flat Rock	2017	Channel catfish
Huron River	Wayne County, Flat Rock	2018	Bluegill, largemouth bass
Kent Lake	Oakland County	2017	Black crappie, largemouth bass
Kent Lake	Oakland County	2019	Largemouth bass, pumpkinseed
Mann Creek	Moraine Lake	2018	Black crappie, bluegill, largemouth bass
Ore Lake	s. of Brighton	2019	Bluegill
Pettibone Creek	Milford Pond	2018	Bluegill
Portage Lake	Washtenaw/Livingston County	2018	Largemouth bass
Proud Lake	Oakland County	2019	Bluegill, largemouth bass, rock bass
Sandy Bottom Lake	n.e. of Whitmore Lake	2019	Bluegill, pumpkinseed, largemouth bass
Whitmore Lake	Livingston County	2019	Bluegill, pumpkinseed
Woodland Lake	Livingston County	2019	Largemouth bass, pumpkinseed

EGLE expects continued periodic monitoring of PFAS levels in fish from selected waterbodies in the Huron River Watershed for several years.

Future fish monitoring:

- Base Line Lake
- Huron River, Flat Rock
- Huron River, Ford Lake
- Huron River, Argo Pond
- Kent Lake
- Silver Lake*

Huron River “Do Not Eat” Fish Advisory

- “Do Not Eat” consumption advisory placed on Huron River in August 2018 due to high levels of PFOS
  - Last updated August 31, 2018

- Do Not Eat any fish:
  - From Huron River at N Wixom Rd in Wixom to Lake Erie
  - Includes connected lakes and ponds plus Norton Creek
  - Includes portions of Oakland, Livingston, Washtenaw, Wayne, and Monroe counties

Huron River Foam Advisory

- Foam advisory placed on Huron River September 2018
  - Based on high levels of PFAS in water and fish

- Avoid swallowing foam
  - Best to avoid contact
    - PFAS does not move through skin easily, but residue could be swallowed
  - Wash hands after touching
  - Rinse dogs with fresh water if they contact foam
    - They could swallow foam residue grooming their fur

Huron River Advisory Signs

- Fish and foam advisory signs have been installed along the Huron to alert the public
- Posted in up to 5 languages depending on local needs
- Posted in collaboration with local health departments, Huron Clinton Metroparks, Village of Milford, and MDNR

Huron River Advisory Signs

MPART

Huron River Advisory Links

- PFAS in Fish
  - https://www.michigan.gov/pfasresponse/0,9038,7-365-86512_88987_88989---,00.html
- PFAS Foam on Lakes and Streams:
  - https://www.michigan.gov/pfasresponse/0,9038,7-365-88059_91295---,00.html

Norton Creek Well Testing

- Wells near Norton Creek were tested for PFAS in 2019
  - Wells chosen based on geological study with MSU
  - Tested locations that were most likely to be impacted if river water was contaminating groundwater

- Well study included:
  - 14 residential wells
  - 7 campground wells (Proud Lake)
  - 2 municipal supply wells (Village of Milford)

Norton Creek Well Testing

- Results:
  - **All residential wells were non-detect (ND) for PFAS**
  - Most campground wells were ND for PFAS
    - One campground had 11 ppt PFOA detected in April 2019
      - Same well was ND for PFAS in October 2019
    - Campground well with PFOA has been temporarily disabled by MDNR
  - Both Village of Milford supply wells were ND for all PFAS

- Conclusion: Groundwater wells do not appear to be impacted by PFAS from Norton Creek

Deer Tested for PFAS Statewide

2018

- Deer sampled for PFAS from a volunteer program for disease testing (48 deer from throughout the state) and from know surface water contamination sites (80 deer total from Alpena, Oscoda, Rockford, Grayling
  - The only deer that showed accumulation in muscle tissue were from the Oscoda area.
  - One deer level was high enough to promulgate a Do-Not-Eat consumption advisory for 5 miles around Clark's Marsh the known contamination site

Deer Tested for PFAS in Huron River Watershed

2019

- High PFAS levels in Norton Creek prompted an assessment for PFAS in deer in the area
- 20 deer sampled from Proud Lake State Recreation Area, near Norton Creek
- We tested muscle, liver, kidney, heart for over 10 PFAS & for PCBs
  - All samples were non-detect in their muscle tissue for both PFAS & PCBs
- No consumption advisory was deemed necessary
- Final report on the MPART website, Fish and Deer tab - https://www.michigan.gov/documents/mdhhs/2019-10-01_Huron_River-Norton_Creek_deer_report_FINAL_667401_7.pdf

Next Steps in Progress by the PFAS Wildlife Workgroup

Ducks and Geese

- Plans in development right now
- Sampling would occur in the fall
- Sampling will occur at locations with known PFAS contamination and those without to address the fact that waterfowl are highly mobile
- Will use these results to establish a more refined study in the future if warranted

Next Steps in Progress by the PFAS Wildlife Workgroup

- Huron River Ecosystem Studies

(currently on hold pending budget determination for 2020)

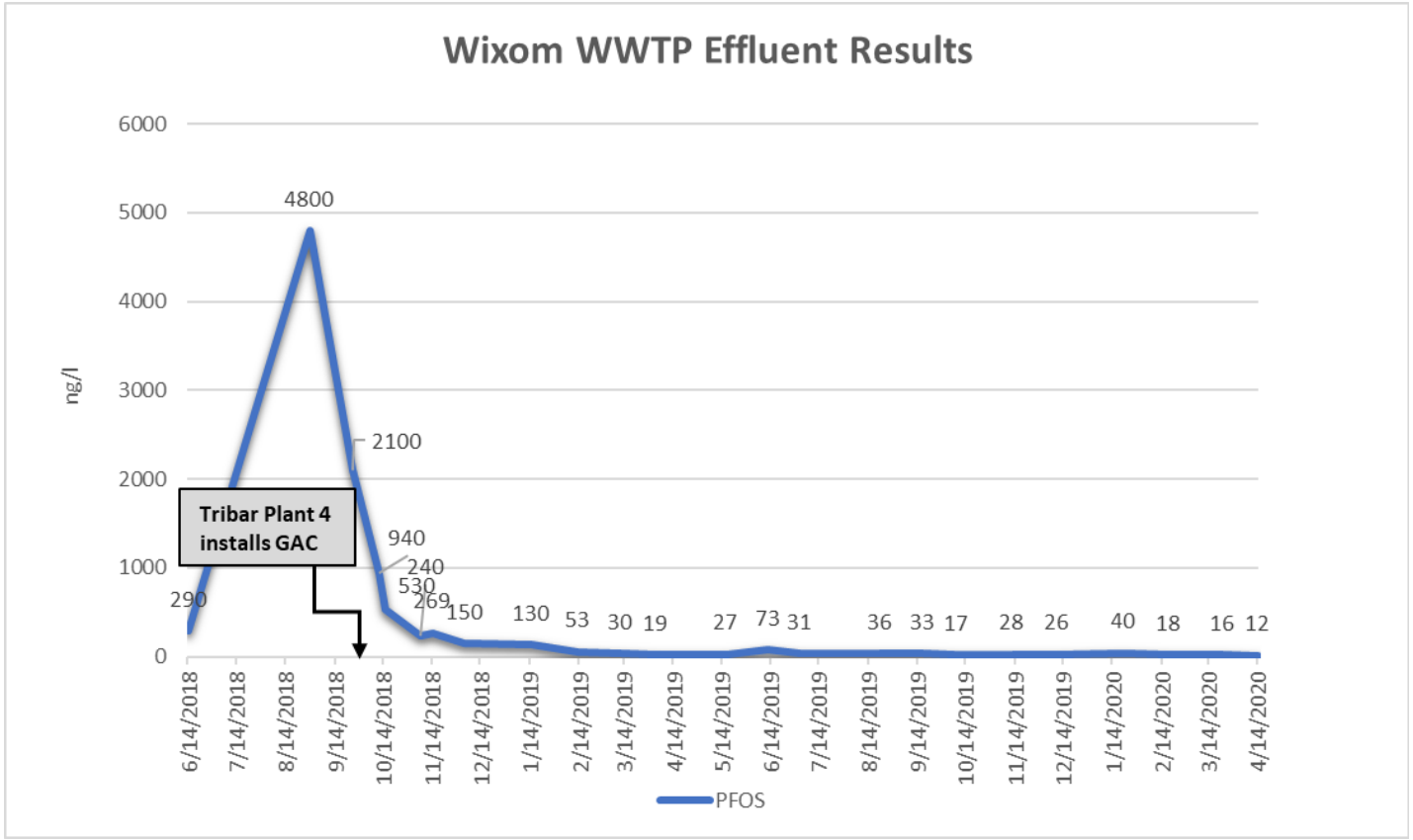
  - **Fate, transport and bioaccumulation of PFASs in the Huron River Watershed** (*Michigan State University)*

  - **Integrated Hydrobiologic Analysis of PFAS Bioaccumulation, Fate and Transport Throughout the Huron River Watershed** (*Western Michigan University)*

Wixom Wastewater Treatment Plant (WWTP)

Industrial Pretreatment Program (IPP) PFAS Initiative

- October 5, 2018: Tribar Plant 4 installed a Granular Activated Carbon (GAC) unit to treat discharge for PFOS
- April 2020: WWTP effluent PFOS = 12 ppt



Additional information on IPP PFAS Initiative: https://www.michigan.gov/pfasresponse/0,9038,7-365-86510_88079-476131--,00.html

Other On-going PFAS Site Investigations in the Watershed

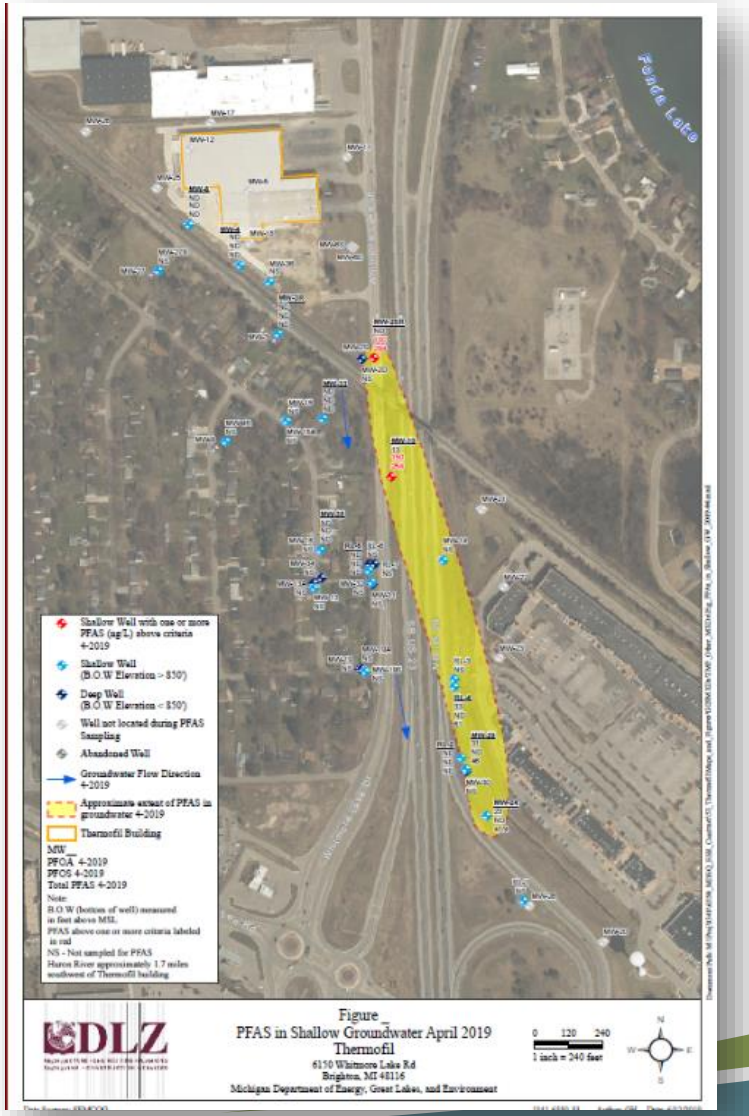
Daimler Chrysler Scio Facility:

- MPART PFAS Site
- PFOS venting to the Huron River in four areas over GSI criterion
- Additional investigation underway to refine PFOS venting plumes and define source areas
- Feasibility study underway to evaluate alternatives for eliminating PFAS discharge to Huron River
- Sampling of potentially most vulnerable residential wells downstream from facility being planned and likely implemented this summer

Other On-going PFAS Site Investigations in the Watershed

Thermofil, Green Oaks Twp:

- MPART PFAS Site
- PFOS + PFOA concentrations over drinking water criterion
- Does not appear to impact surface waters
- Additional sampling of monitoring wells to further delineate plumes is planned



Reporting of Foam Sightings

- MPART foam website updated: https://www.michigan.gov/pfasresponse/0,9038,7-365-88059_91295---,00.html
- Reporting PFAS foam on lakes & streams:
  - Call PEAS hotline: 800-292-4706; OR
  - Fill out the Spill/Incident/Pollution Form
    - **Photos of foam are helpful & can be included in the form**
  - EGLE staff will contact person who filed complaint
    - Compliant added to database to help inform future sampling on lakes & streams

Statewide Survey and Monitoring Programs (2020)

- Additional monitoring of PWS with “mid-tier” results from Statewide Survey Testing
  - Type I Community Water Supplies
    - Regional and Municipal Supplies
    - Apartments, Condominiums, Manufactured Housing, and others
  - Type II Noncommunity Water Supplies
    - Schools
    - Child Care Providers
    - Adult Foster Care Providers
    - Medical Care Providers
    - Children’s Camps
    - Industry/Offices
    - Motels/Resorts
- Sampling of source wells associated with PFAS site investigations

PFAS MCL Rulemaking Process (So Far)

- Mar 26, 2019: Gov. Whitmer Issues Executive Directive
- Apr – Jun 2019: MPART Science Advisory Workgroup Develops Health Based Values (Starting Point for MCLs)
- July – Oct 1, 2019: Stakeholder Input/EGLE Provides Draft Rule
- Nov 14, 2019: Environmental Rules Review Committee (ERRC) Moves Draft to Formal Rulemaking
- Dec 2019 - Jan 2020: Official Public Comment Period
- Feb 27, 2020: ERRC Approves Draft Rule
- Mar 16, 2020: Draft Rule Submitted to Joint Committee on Administrative Rules (JCAR)

Public Water Supplies Impacted by MCLs

- Community Public Water Supplies (Type I)
- Non-transient Noncommunity Public Water Supplies (Type II)
- EGLE can require sampling of other regulated supplies

General PFAS MCL Requirements

- Sampling at entry point to distribution system, representing each source after treatment
- Initial sampling round to determine ongoing monitoring schedule:
  - Quarterly: Supplies with detection above reporting limit unless/until determined reliably and consistently below the MCL or exceeding an MCL
  - Annually: Supplies with no detections above RL or determined to be consistently below MCL
- Compliance calculation based on running annual average at each sampling point
- If one sampling point is out of compliance supply is out of compliance
- Public notification is required if a supply is in noncompliance, consistent with existing public notification requirements for similar contaminants

Ann Arbor Municipal Water Supply

- The City has been proactive in conducting regular water sampling of PFAS since early 2016.
  - Water samples are collected monthly from the Main Water Reservoir (treated water) and from the Raw River Intake (untreated water)
  - Additionally, the city has also collected additional water samples at other locations including:
    - Two raw water production wells (untreated groundwater)
    - Within the Huron River, Barton Pond, and Honey Creek (upstream of intake, untreated surface water)
- The filter media was replaced with full bed-depth Granular Activated Carbon (GAC) in 2019. System operators are continuing to conduct filter studies to determine the efficacy of granular activated carbon in removing PFAS.

Ann Arbor Municipal Water Supply

- EGLE performed monthly sampling of raw and finished water in 2019 as part of the statewide initiative.
  - All 2019 results for finished drinking water were below Michigan's proposed MCLs.
  - All 2019 results for raw source water were below applicable water quality standards.
- Results posted on MPART

Next Steps to address PFAS in the Watershed

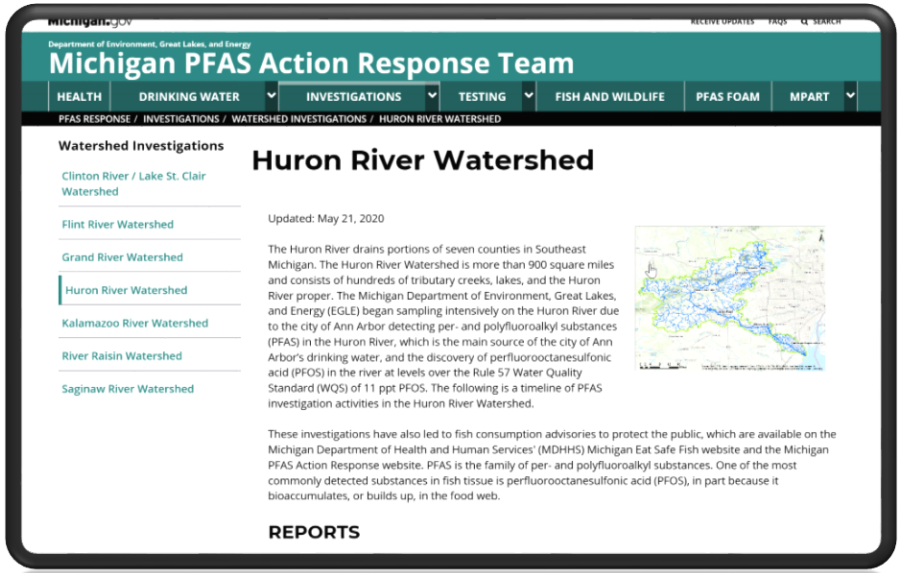
- Additional fish & surface water sampling within the watershed
- Continue to work with the known sources on reduction/elimination
- Conduct source investigations on potential sources as new information arises
- Catalog foam complaints to help inform future surface water sampling efforts

Huron River Watershed PFAS Timeline

- A detailed timeline and updated next steps of the State's response to the PFAS issue within the Huron River Watershed can be found on our PFAS Response Website:

  www.Michigan.gov/pfasresponse

  - Click on Investigations
  - Click on Watershed Investigations
  - Select Huron River Watershed



Contact Information & Questions

Brandon Armstrong, Ph.D.: 517-256-1853; ArmstrongB5@michigan.gov – questions related to fish sampling and passive samplers

Sarah Bowman, Ph.D.: 517-290-3675; BowmanS4@michigan.gov – questions related to surface water sampling

Stephanie Kammer: 517-897-1597; KammerS@michigan.gov – questions related to overall efforts to address PFAS in the Huron River, Norton Creek

Gary Klase: 517-284-9024; KlaseG@michigan.gov – questions related to fish advisories, PFAS, and its public health consequences

Tammy Newcomb, Ph.D.: 517-284-5832; NewcombT@michigan.gov – questions related to wildlife and ecosystem sampling

Ian Smith: 517-256-2472; SmithI@michigan.gov – questions related to drinking water sampling

Stephanie Johnson: 586-506-6137; JohnsonS18@michigan.gov – questions related to the Ann Arbor drinking water plant

Anne Tavalire: 248-508-1102; TavalireA@Michigan.gov – questions related to the Industrial Pretreatment Program (IPP) PFAS Initiative

MICHIGAN PFAS ACTION RESPONSE TEAM (MPART)

www.Michigan.gov/PfasResponse

EGLE
MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

Michigan Department of AGRICULTURE & Rural Development

MDHHS
Michigan Department of Health & Human Services

MDOT
Michigan Department of Transportation

DEPARTMENT OF NATURAL RESOURCES DNR MICHIGAN

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