

Environmental Commission Update on Water Quality Issues & Gelman Plume January 24, 2019



Emerging Issues for WTP – Council Presentation on September 17, 2018



PFAS



New Disinfection Requirements



Lead & Copper Rule Updates



What are PFAS?

- Per- and polyfluoroalkyl substances
- Used in non-stick cookware, stain-resistant textiles, waterproofing, coating on food wrappers, consumer products, fire-fighting foam, other industrial applications



- Stable and do not degrade in the environment
- A family of thousands of compounds
- Analytical methods for detection of 24 of these compounds

How might PFAS impact health?

- Most data available on perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA)
- Ingestion is the primary route of exposure
- PFAS are bioaccumulative
- Health impacts may include:
 - Interference with hormone function
 - Increase in cholesterol
 - Affect on immune system
 - Increase in cancer risk
- Limited data on health impacts of other PFAS

How are PFAS regulated?

- PFAS are not currently regulated in Drinking Water in MI
- EPA Health Advisory Level: 70 parts per trillion (ppt) of perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA)
- Proposed legislation in Michigan: 10 ppt for PFOS and PFOA
- Agency for Toxic Substances and Disease Registry (ATSDR) Report
 - Potential limit approximately 7 ppt for PFOS and 11 ppt for PFOA

PFAS in Ann Arbor



Huron River – Water



Drinking Water



Waste Water



Huron River – Fish



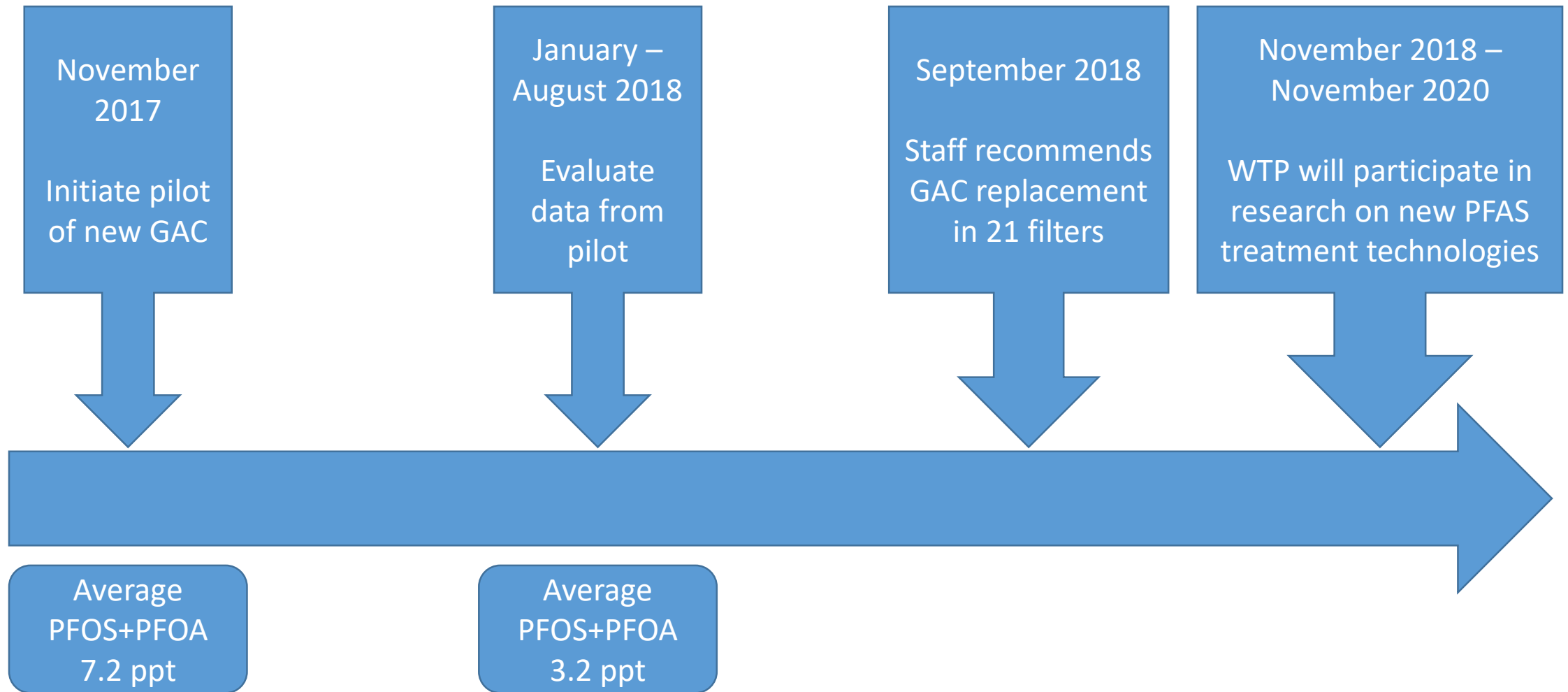
Fire-Fighting Foam



PFAS in Ann Arbor Drinking Water

- Monitoring since 2014
- Currently monitoring monthly
- Maximum detection PFOS+PFOA: 43 ppt in 2014
- 2017 Data: average 7.2 ppt PFOS+PFOA (range 0 – 9.9 ppt)
- 2018 data: average 3.2 ppt PFOS+PFOA
- Granular active carbon (GAC) filtration is the best available technology

PFAS Control Strategy – Drinking Water



Michigan PFAS Timeline

Statewide SW
Study



2001

No Criteria
Established

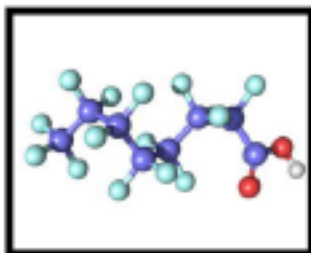
Provisional
Health Advisory



2009

PFOA = 400 ng/L
PFOS = 200 ng/L

PFOA SW
Criteria



2010

DW = 420 ng/L
Non-DW = 12,000 ng/L

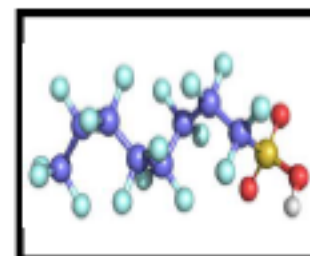
WAFB Fish
Study



2012

Filet = 9580 ppb
Liver = 73,200 ppb

PFOS SW
Criteria



2013

DW = 11 ng/L
Non-DW = 12 ng/L

Michigan PFAS Timeline

Lifetime Health
Advisory



2017

MPART
Formed



2017

DW Criteria
Promulgated



2018

PFOA + PFOA < 70 ng/L

- IPP PFAS Initiative
- Identification of Sites
- Statewide PFAS Municipal Sampling
- Biosolids Evaluation
- Epidemiological Studies

Statewide PFAS Drinking Water Testing Initiative

	Supplies Sampled	Overall Number of Supplies	% Complete	Supply Samples Received	< 10 ppt Total PFAS	10 – 70 ppt PFOS/PFOA (> 10 ppt Total PFAS)	> 70 ppt PFOS/PFOA
Community Water Supplies	1,111	1,111	100%	1,007	977	29	1
Schools on Wells	460	460	100%	411	394	16	1
Tribal Entities	16	16	100%	13	13	0	0
Total	1,587	1,587	100%	1,431	1,384	45	2
					96.7%	3.1%	0.14%

As of November 30, 2018

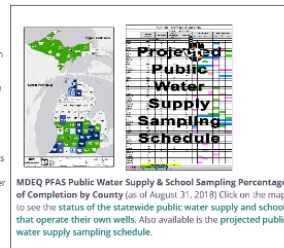


Statewide Testing Initiative

The Michigan Department of Environmental Quality (MDEQ) has begun a statewide initiative to test drinking water from all schools that use well water and community water supplies for PFAS. MDEQ is taking this precautionary step of testing these drinking water sources to determine if public health actions are needed. Information on this page summarizes current sampling results from these locations.

It is not uncommon to find low levels of PFAS in drinking water supplies, as PFAS can be found in fire-fighting foams, stain repellents, nonstick cookware, waterproof clothing, food wrappers, and many other household products. They do not break down in the environment and move easily into water.

The EPA set a lifetime health advisory (LHA) level for two PFAS in drinking water: perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS). The LHA level is 70 parts per trillion (ppt, equal to 70 ng/L) for PFOA and PFOS combined, or individually if only one is present. The EPA has not set health advisory levels for other PFAS chemicals. The State of Michigan is using 70 ppt for decision making purposes.



Results Posted:

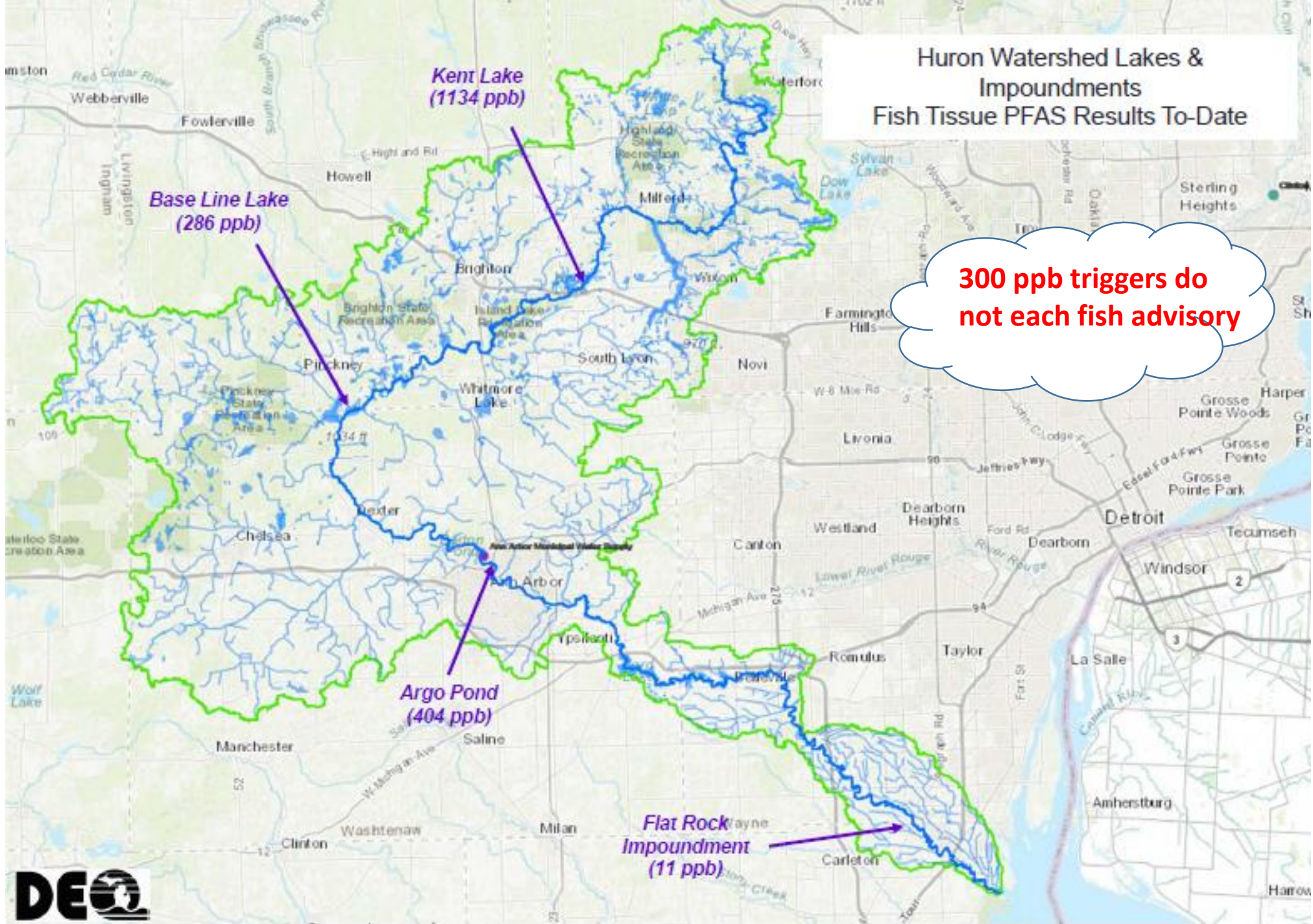
<https://www.michigan.gov//pfasresponse>

Statewide Sampling Initiative Testing Results for Public Water Supplies

Show 50 entries

County	Public Water Supply	Population Served	Sampling Date	Sample Number	Raw Water or Treated Drinking	PFOS + PFOS	Total Tested PFAS	Method
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Huron Watershed Lakes & Impoundments Fish Tissue PFAS Results To-Date



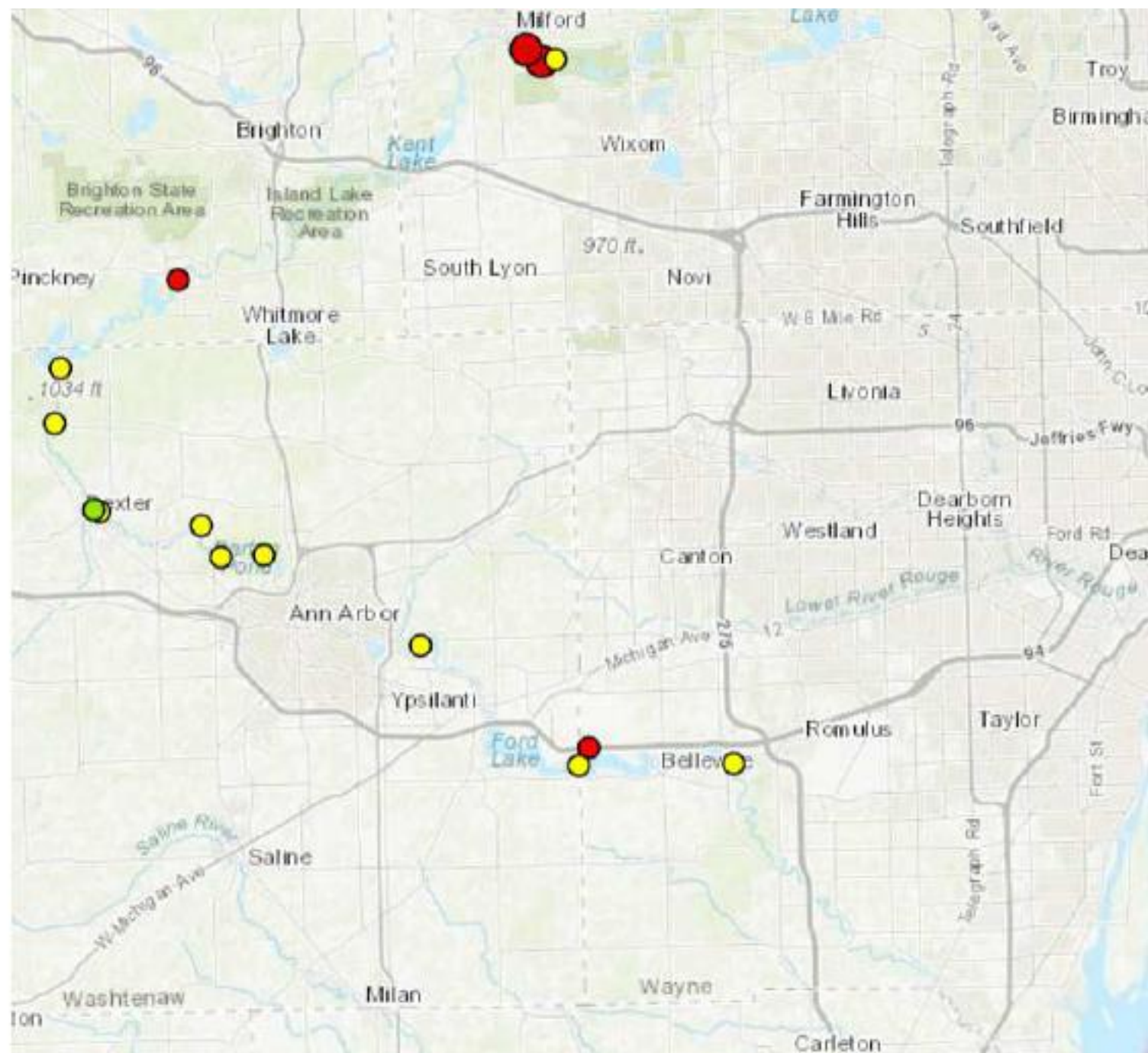
300 ppb triggers do not each fish advisory



Surface Water Sampling Results July 24, 2018

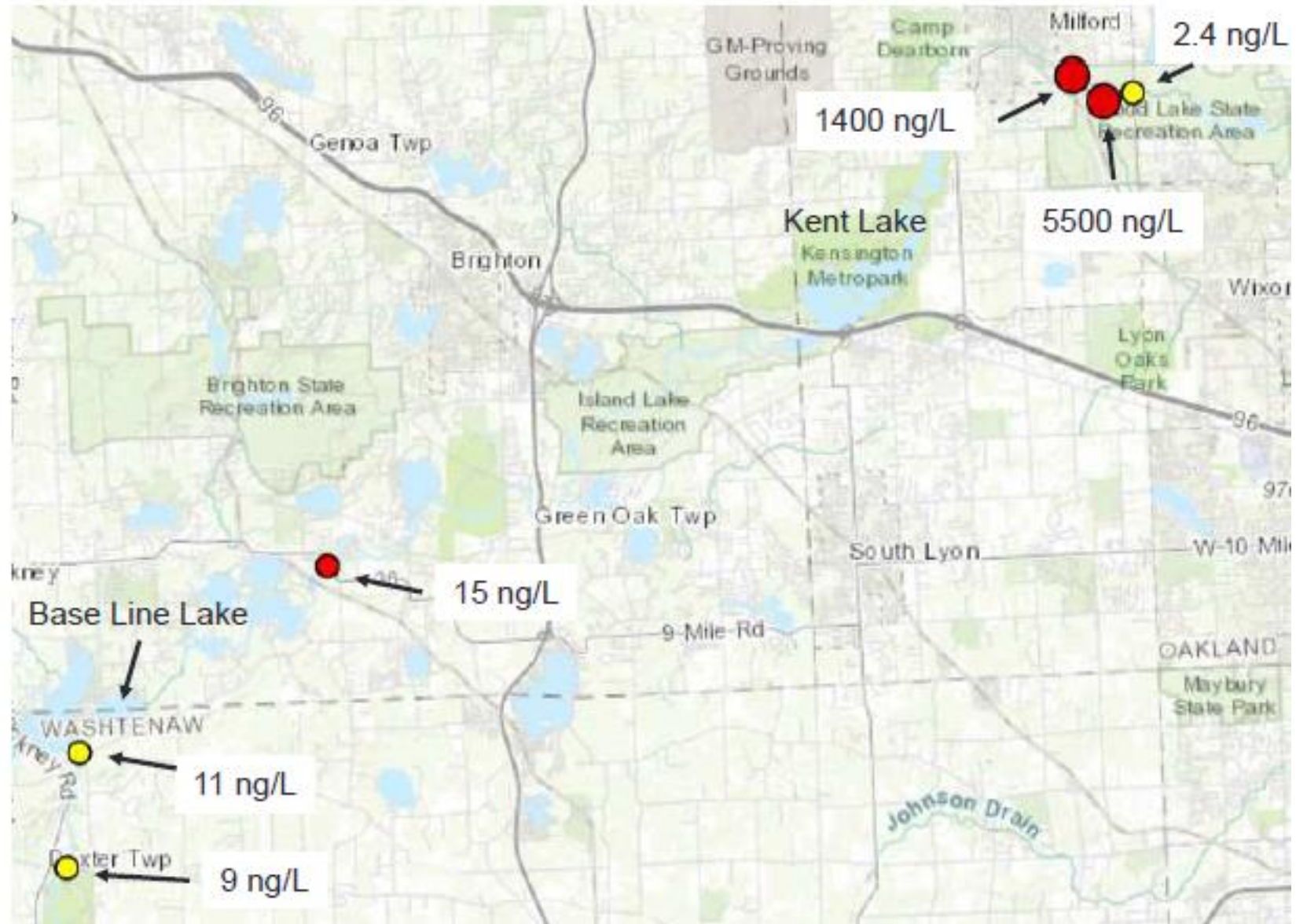
PFOS Concentration
Range (ng/L)

- >1000-5500
- >100-1000
- >12-100
- >0-12
- Non-Detect



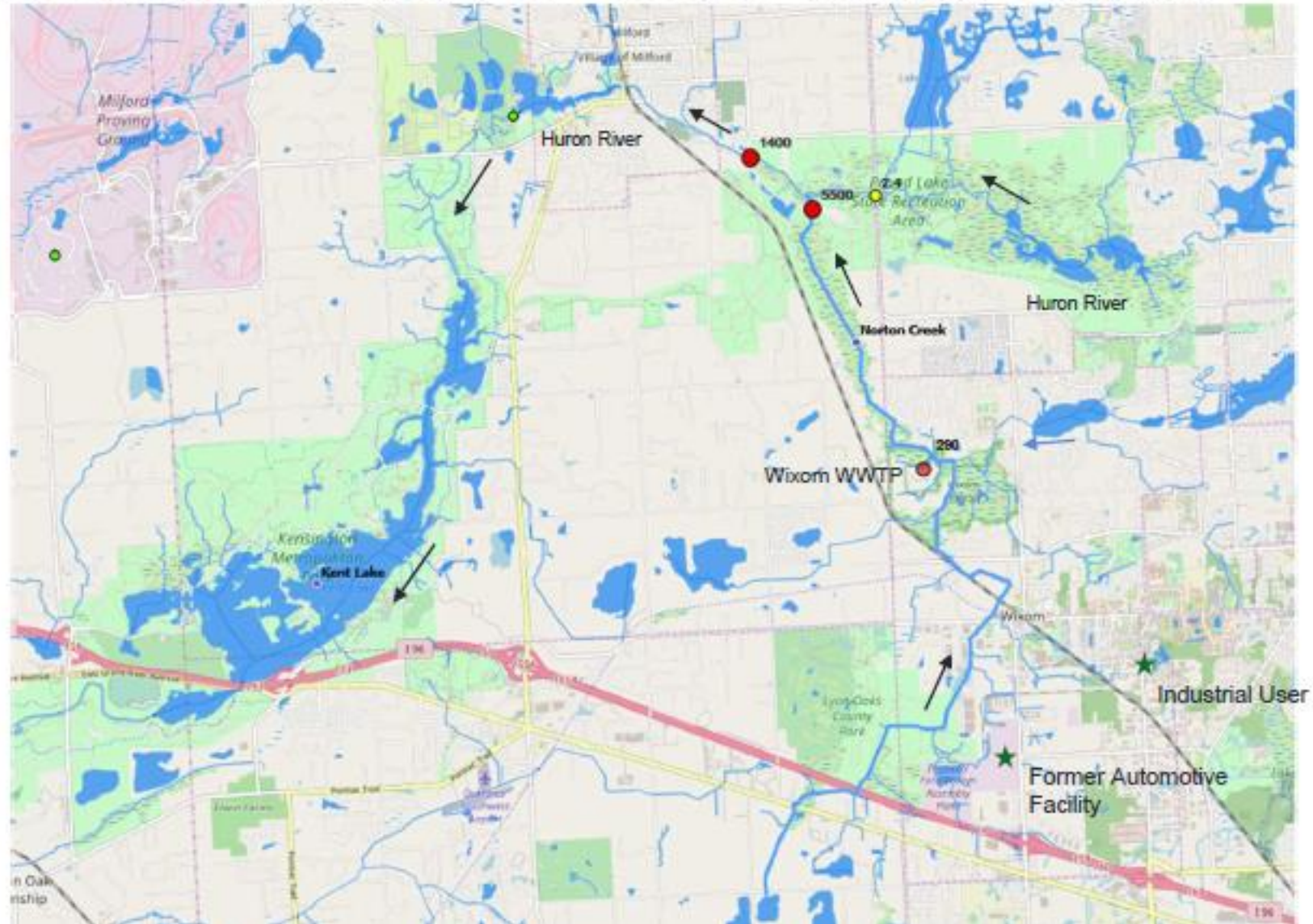
Surface Water
Sampling
Results
July 24, 2018

Upper Huron
Watershed



Other Potential Sources?

Norton Creek Drainage Area – Source Tracking Sampling



PFAS-containing Foam

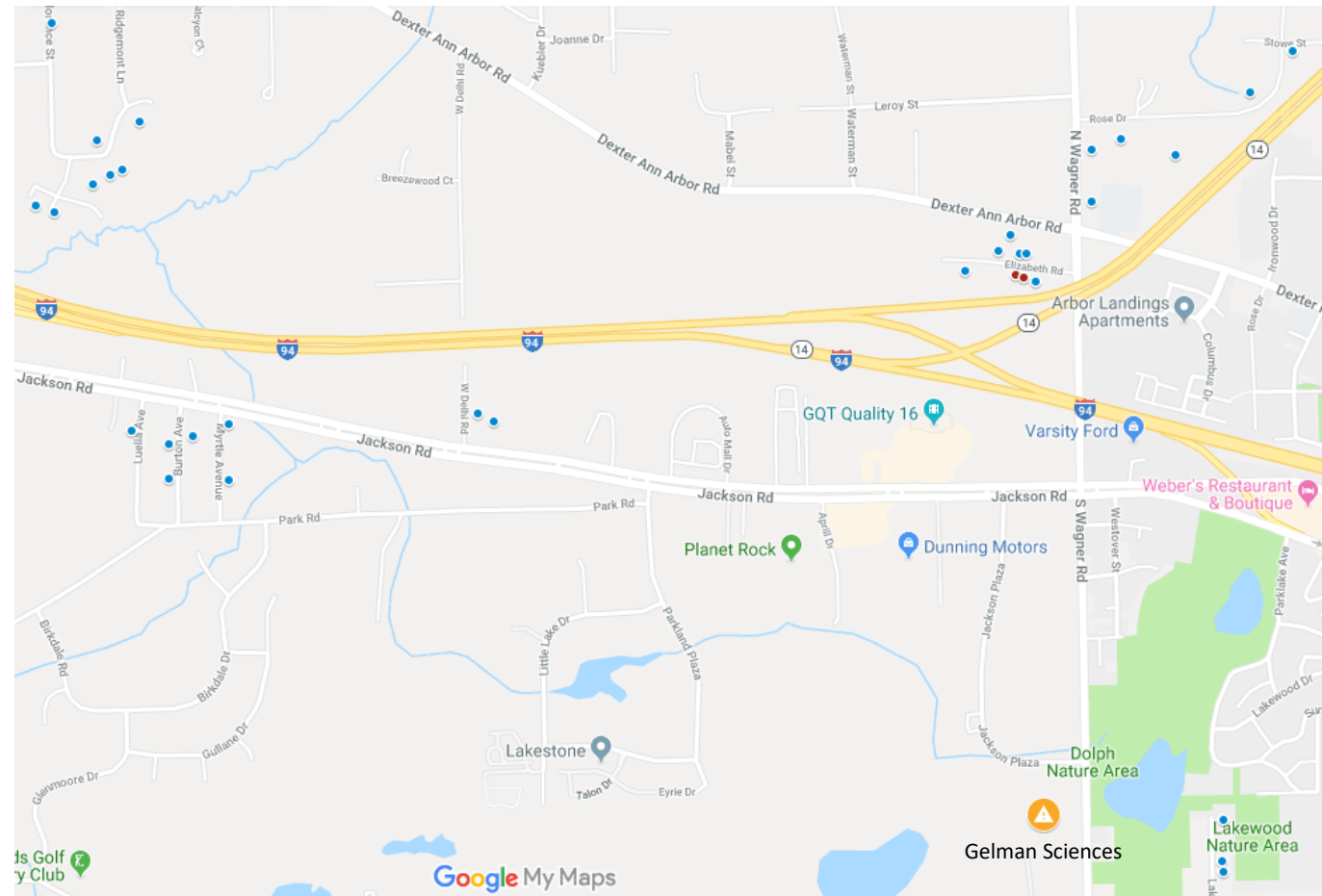
- PFAS do not go through skin readily
- Adults and children should avoid swallowing foam
- Try to keep pets out of areas with foam and rinse them off to prevent them from swallowing the foam



Foam at the Hubbell Pond Dam in Milford (9/8/2018)

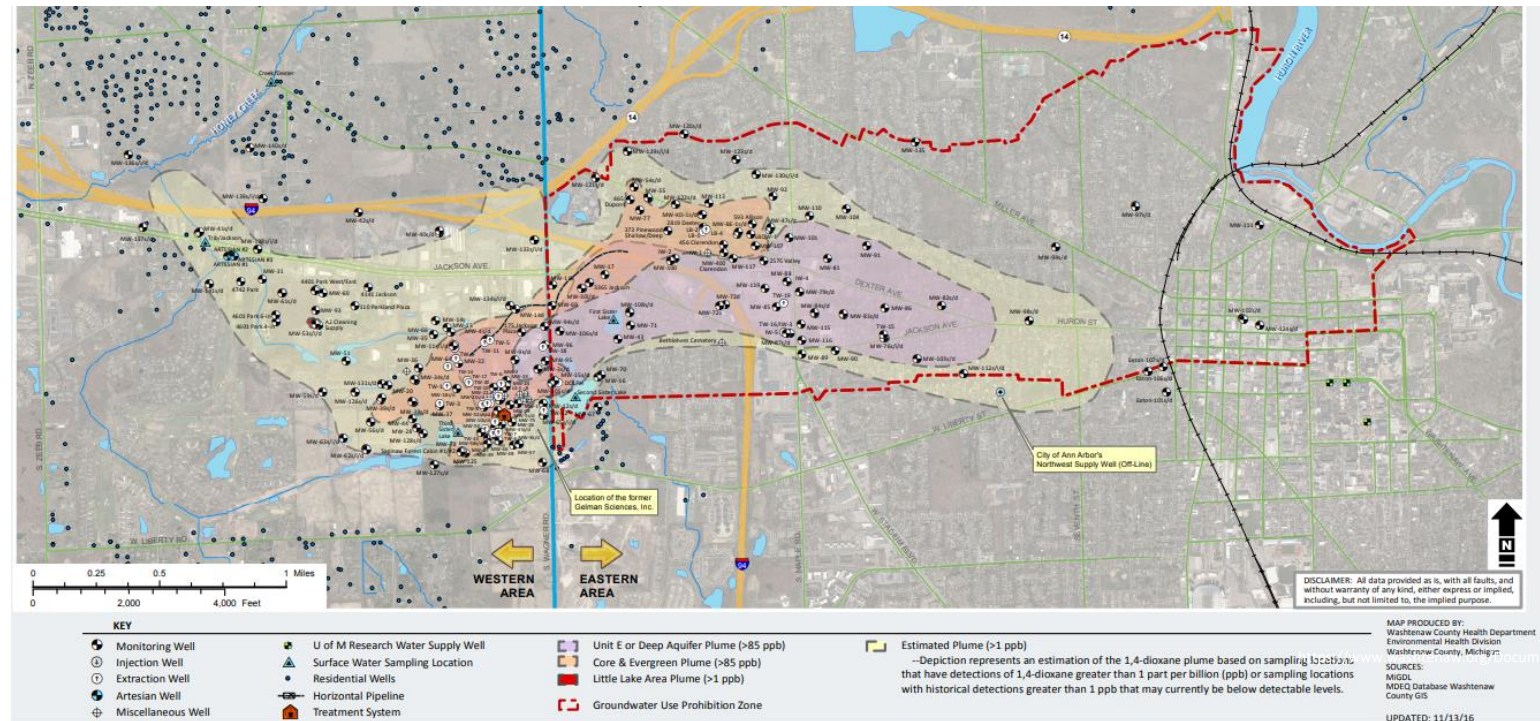
1,4-Dioxane in Water Supply Wells

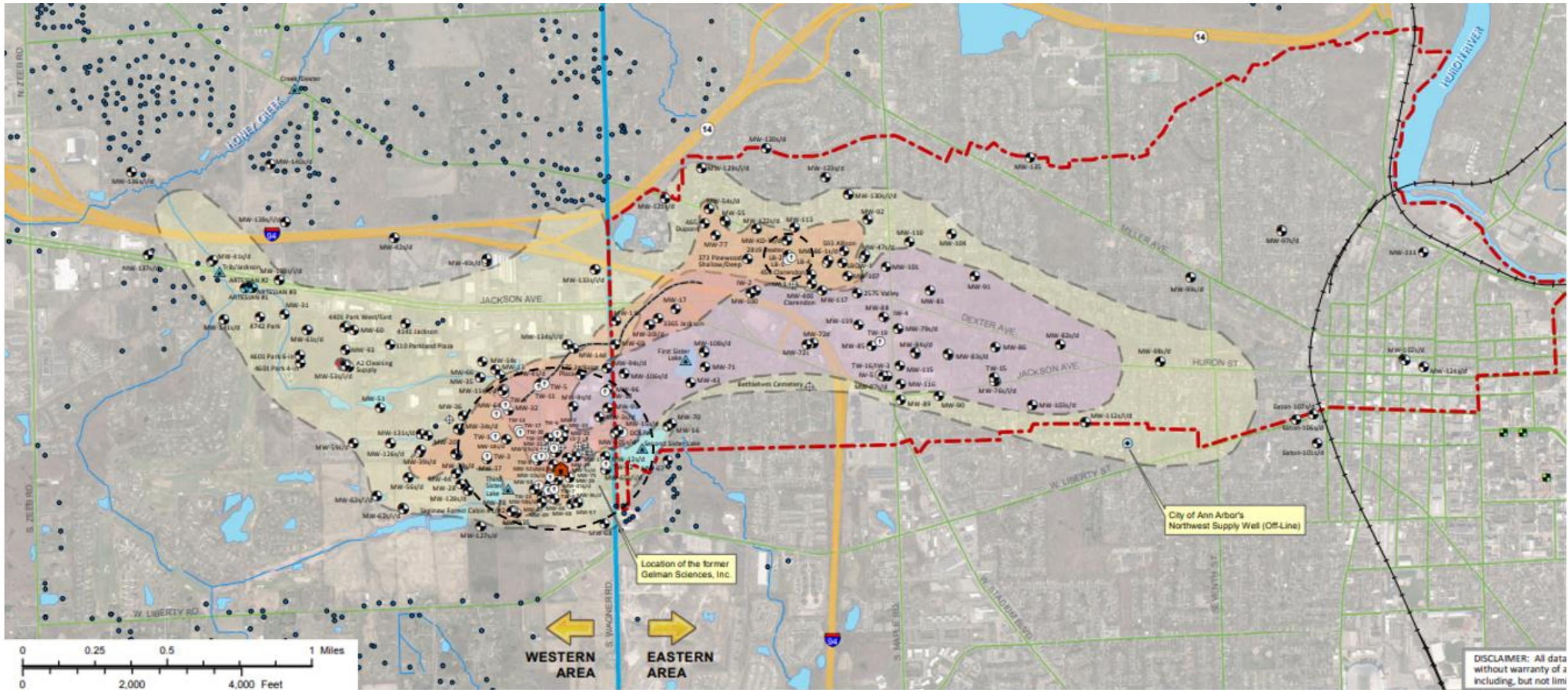
- 67 wells were sampled around former Gelman Plant
- No wells showed levels above 7.2 ppb standard
- 2 wells showed detectable levels
 - South side of Elizabeth Rd., 1-2 ppb



Gelman Sciences' Remediation

- Gelman extracts 473 gpm of contaminated ground water
 - Pumped to Gelman Sciences
- May-September of 2018, Gelman treated 81,407,286 gal
 - Ozone and hydrogen peroxide treatment
 - Removed 282 pounds of 1,4-Dioxane





DISCLAIMER: All data without warranty of accuracy including, but not limited to, monitoring well locations and plume boundaries.

KEY

- | | | | |
|--|---|--|---|
| <ul style="list-style-type: none"> Monitoring Well Injection Well Extraction Well Artesian Well Miscellaneous Well | <ul style="list-style-type: none"> U of M Research Water Supply Well Surface Water Sampling Location Residential Wells Horizontal Pipeline Treatment System | <ul style="list-style-type: none"> Unit E or Deep Aquifer Plume (>85 ppb) Core & Evergreen Plume (>85 ppb) Little Lake Area Plume (>1 ppb) Groundwater Use Prohibition Zone | <ul style="list-style-type: none"> Estimated Plume (>1 ppb)
--Depiction represents an estimation of the 1,4-dioxane plume based on sampling locations that have detections of 1,4-dioxane greater than 1 part per billion (ppb) or sampling locations with historical detections greater than 1 ppb that may currently be below detectable levels. |
|--|---|--|---|

Shallow Groundwater and Surface Water

Groundwater was tested within the Prohibition Zone and Scio Township

- 16 sites with groundwater within 20 feet of surface
- 2 sites with detectable levels of 1,4-Dioxane between 1.9 and 3.3 ppb, below the EPA RSL of 4.6 ppb

DEQ sampled 18 surface water sites

- 8 showed detectable levels of 1,4-Dioxane between 2.1 and 19 ppb



Regional Screening Level (RSL): Exposure limits corresponding to a 10^{-6} risk level for carcinogens