

# What is PFAS?

- Perfluoroalkyl and Polyfluoroalkyl Substances
- Includes Perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS)
- In recent years, experts have become concerned by potential effects high levels of PFAS can have on human health
- There is a lot more to learn about PFAS and human health and the State of Michigan takes this issue seriously

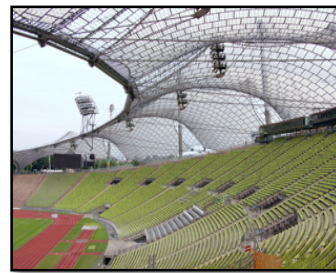
# PFAS Uses



**Aerospace**



**Apparel**



**Building and  
Construction**



**Chemicals and  
Pharmaceuticals**



**Electronics**



**Oil & Gas**



**Energy**



**Healthcare and  
Hospitals**



**Aqueous Film  
Forming Foam**



**Semiconductors**

# What is an Emerging Contaminant?

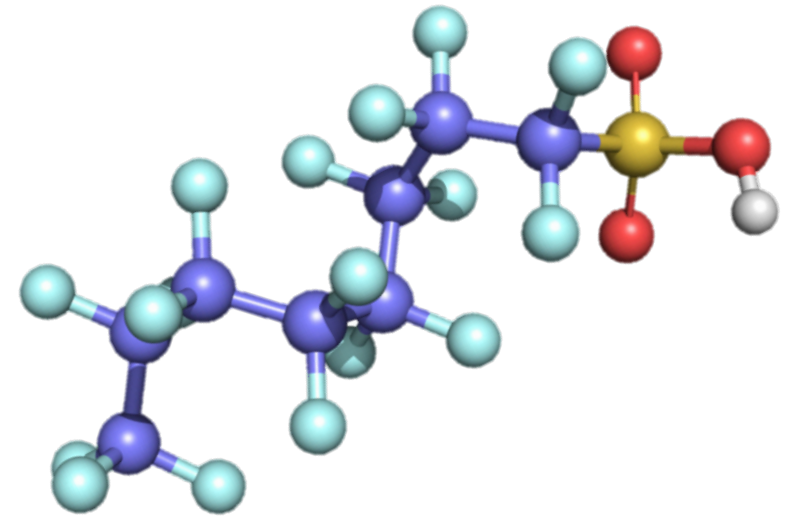
Chemicals and materials that can enter the environment and present real or potential human health or environmental concern...

and either

Do not have peer-reviewed human health standards.

or

Standards/regulations are evolving due to new science, detection capabilities or pathways.



# Michigan Leadership

- Michigan is one of the first states in the nation to establish a clean-up standard for PFAS in groundwater used for drinking water
- Michigan has taken a leadership role to protect citizens
- Leads nation with 34 confirmed sites

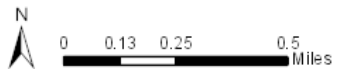
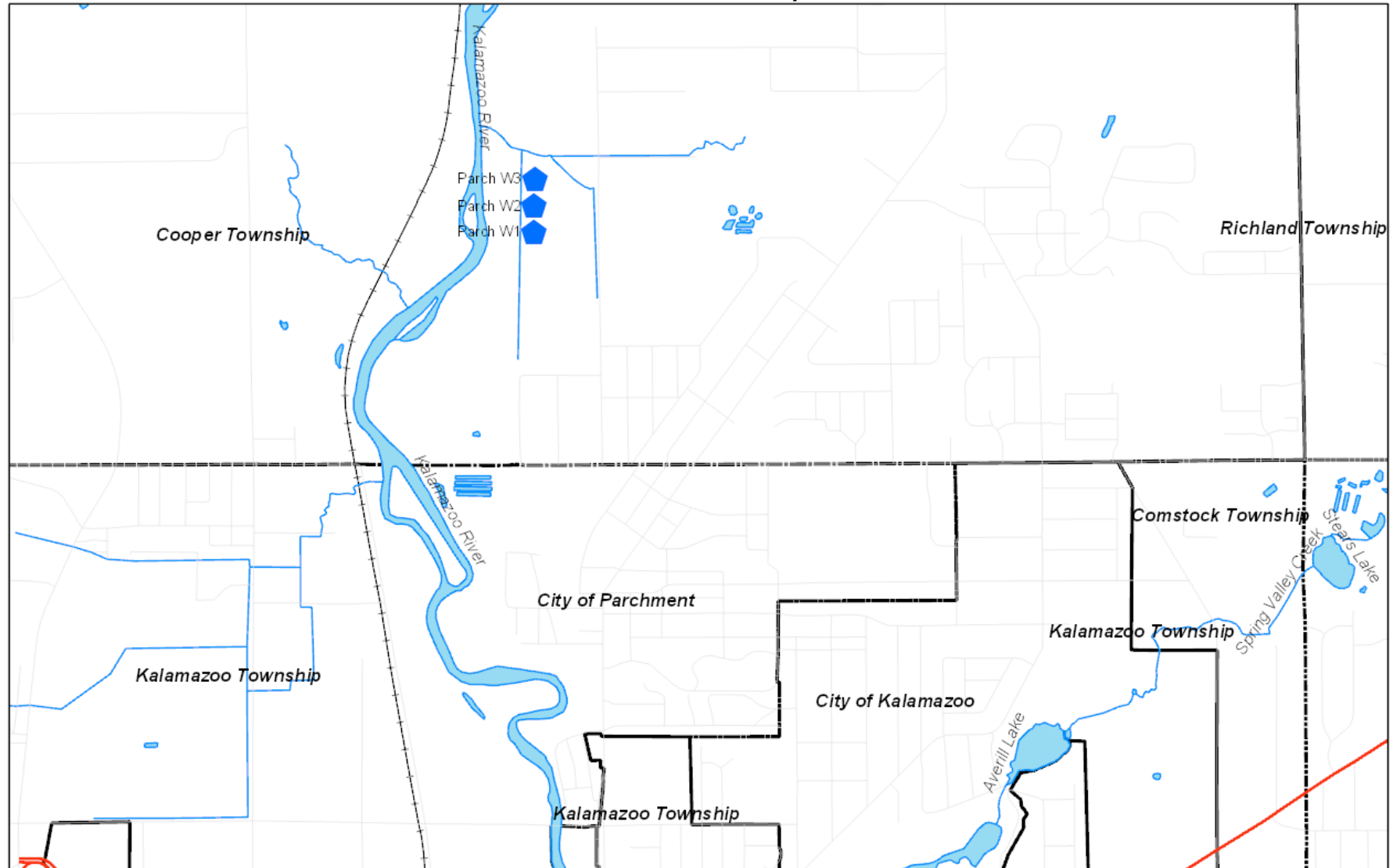



# MPART

- Governor Rick Snyder established the Michigan PFAS Action Response Team (MPART)
- Put in place a plan to test all community water systems and schools that have their own wells in the State of Michigan
- DEQ received test results for the Parchment Water System Thursday afternoon, July 26, 2018
- PFOS and PFOA combined were detected above the lifetime health advisory of 70 ppt

[Michigan.gov/PFASresponse](https://Michigan.gov/PFASresponse)

## Parchment Water Response

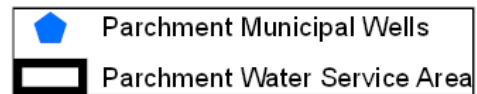
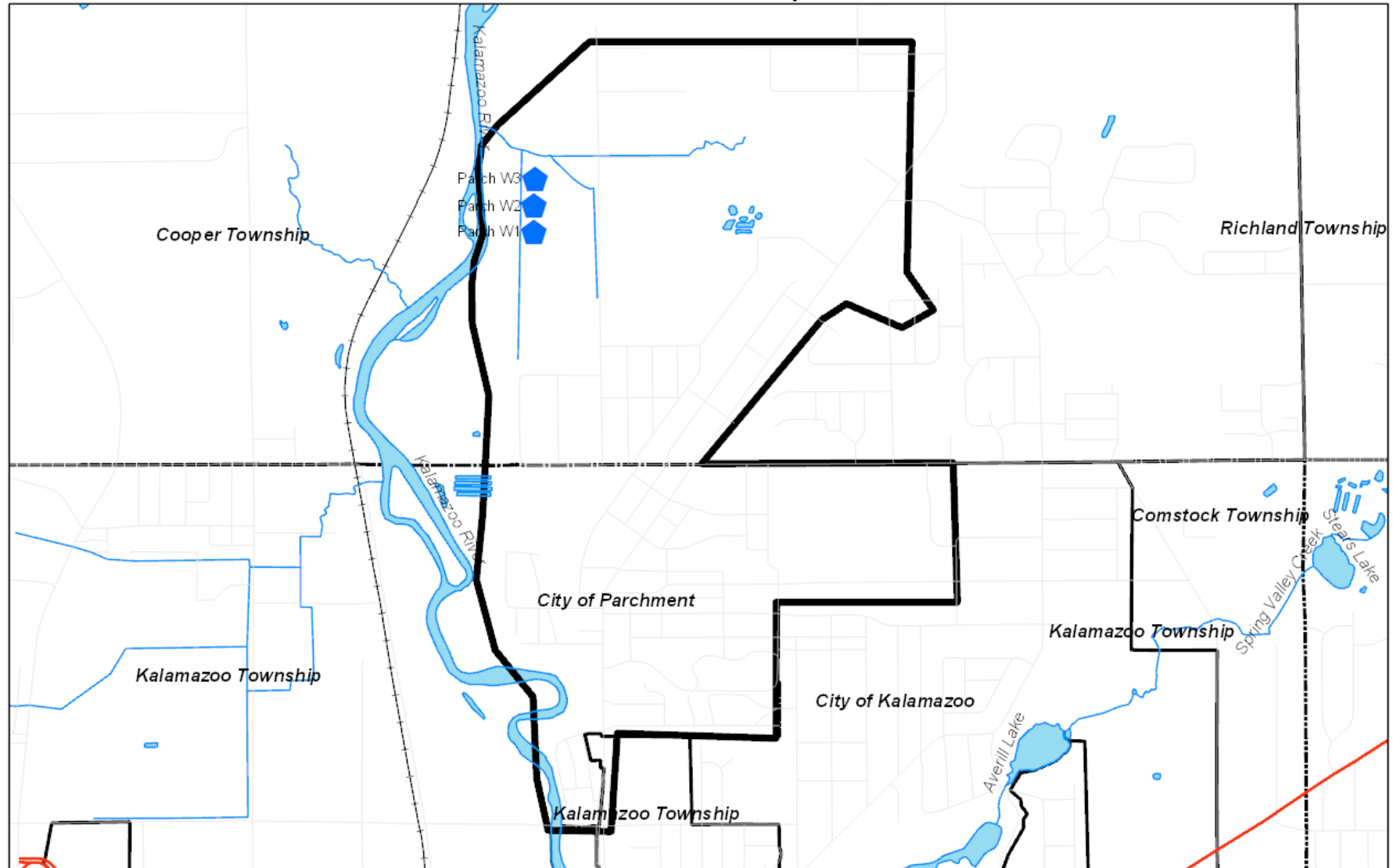


 Parchment Municipal Wells



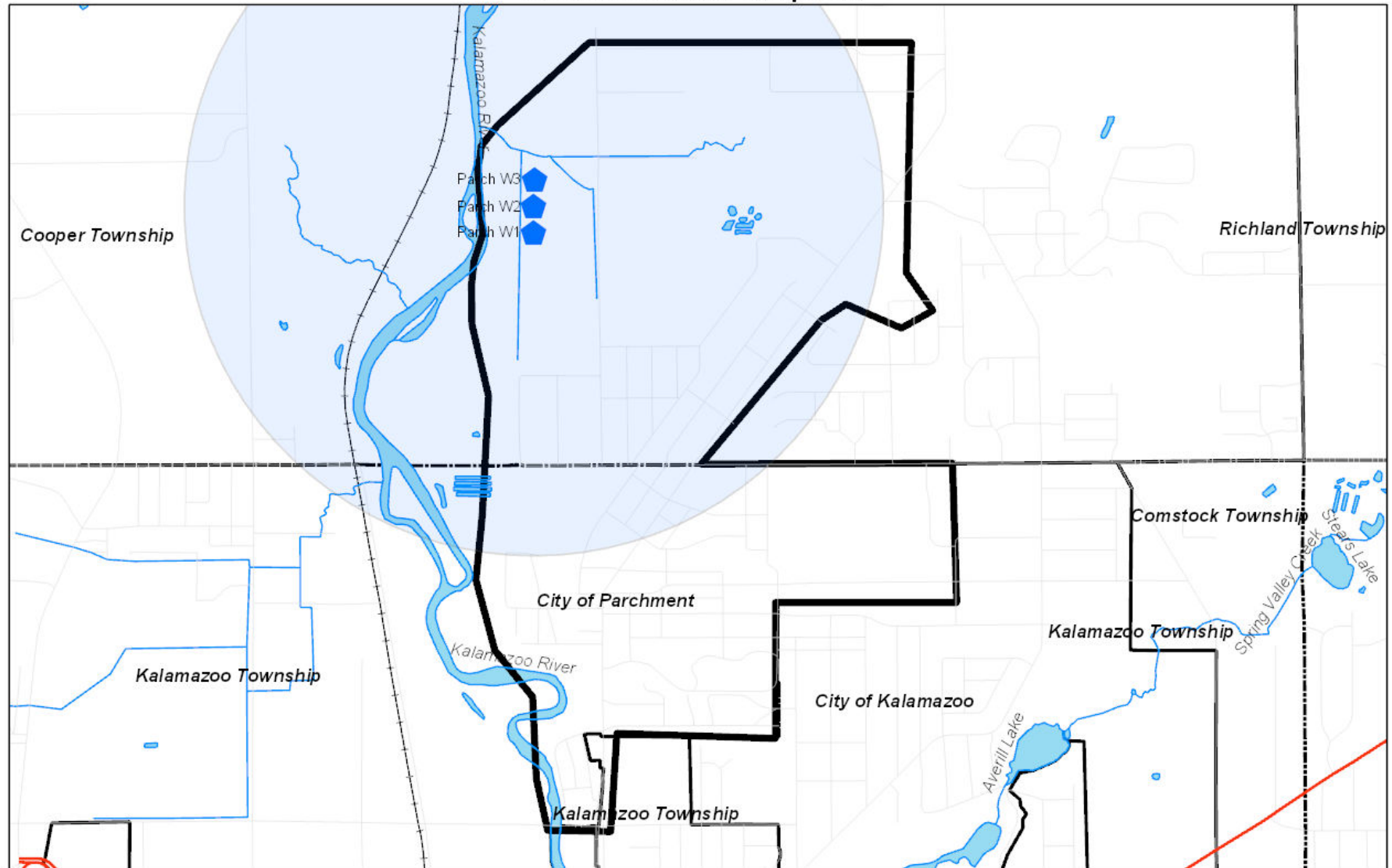
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## Parchment Water Response



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## Parchment Water Response



0 0.13 0.25 0.5  
Miles



Parchment Municipal Wells



Parchment Water Service Area



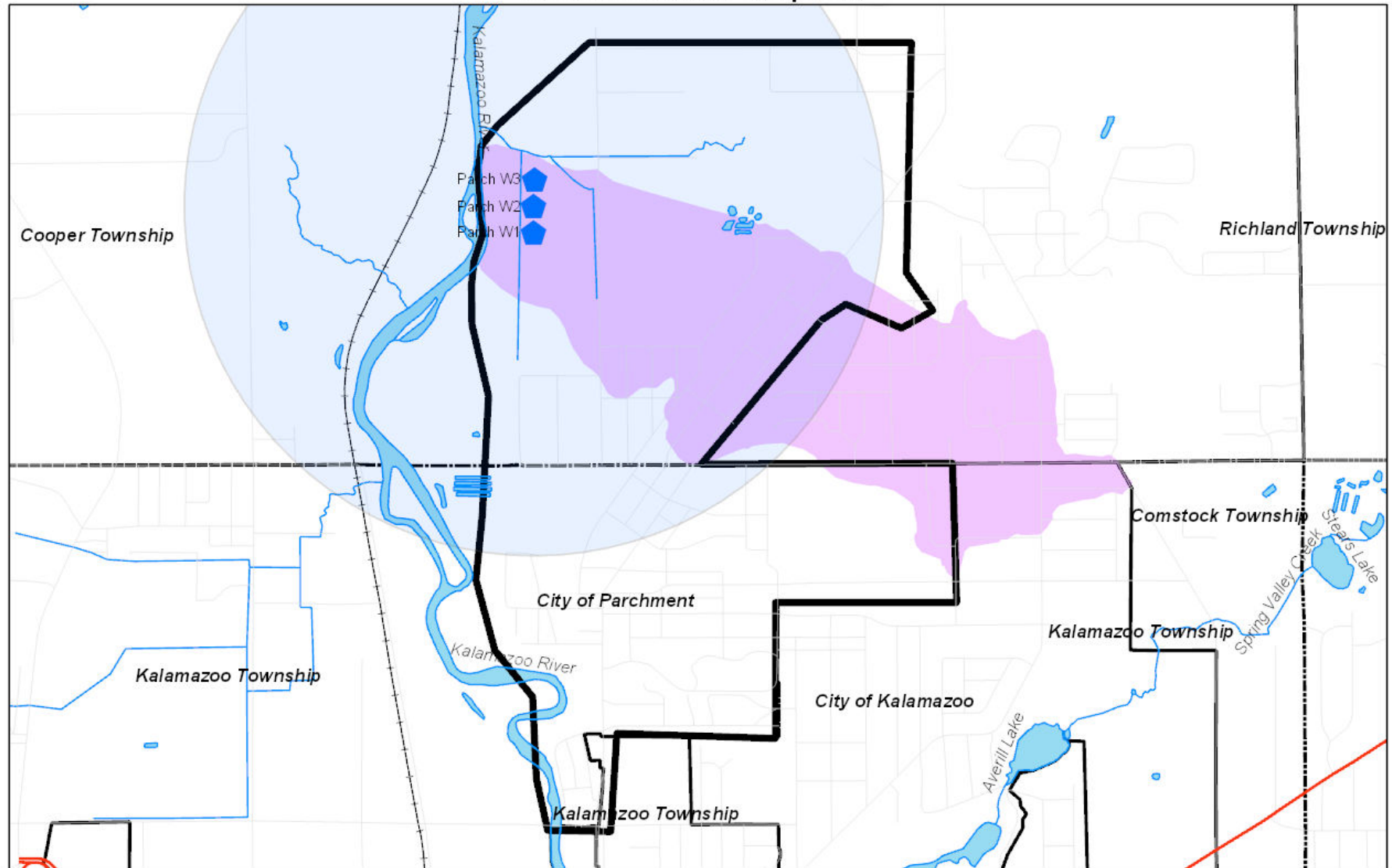
Parchment Municipal Wells 1 Mile Buffer



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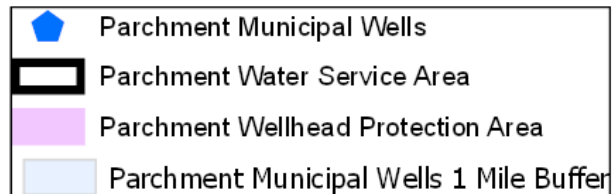
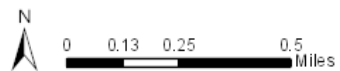
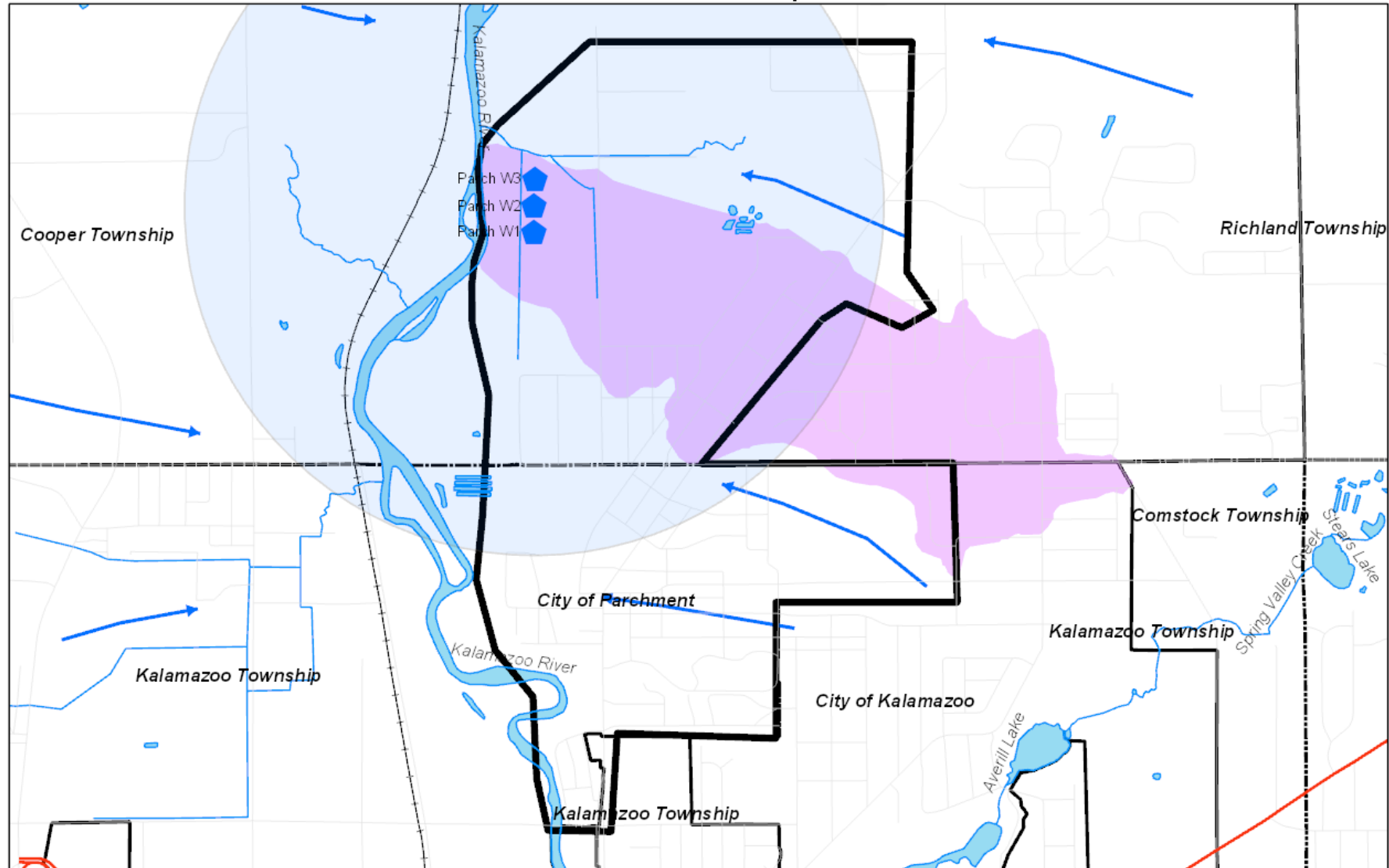


## Parchment Water Response



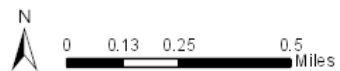
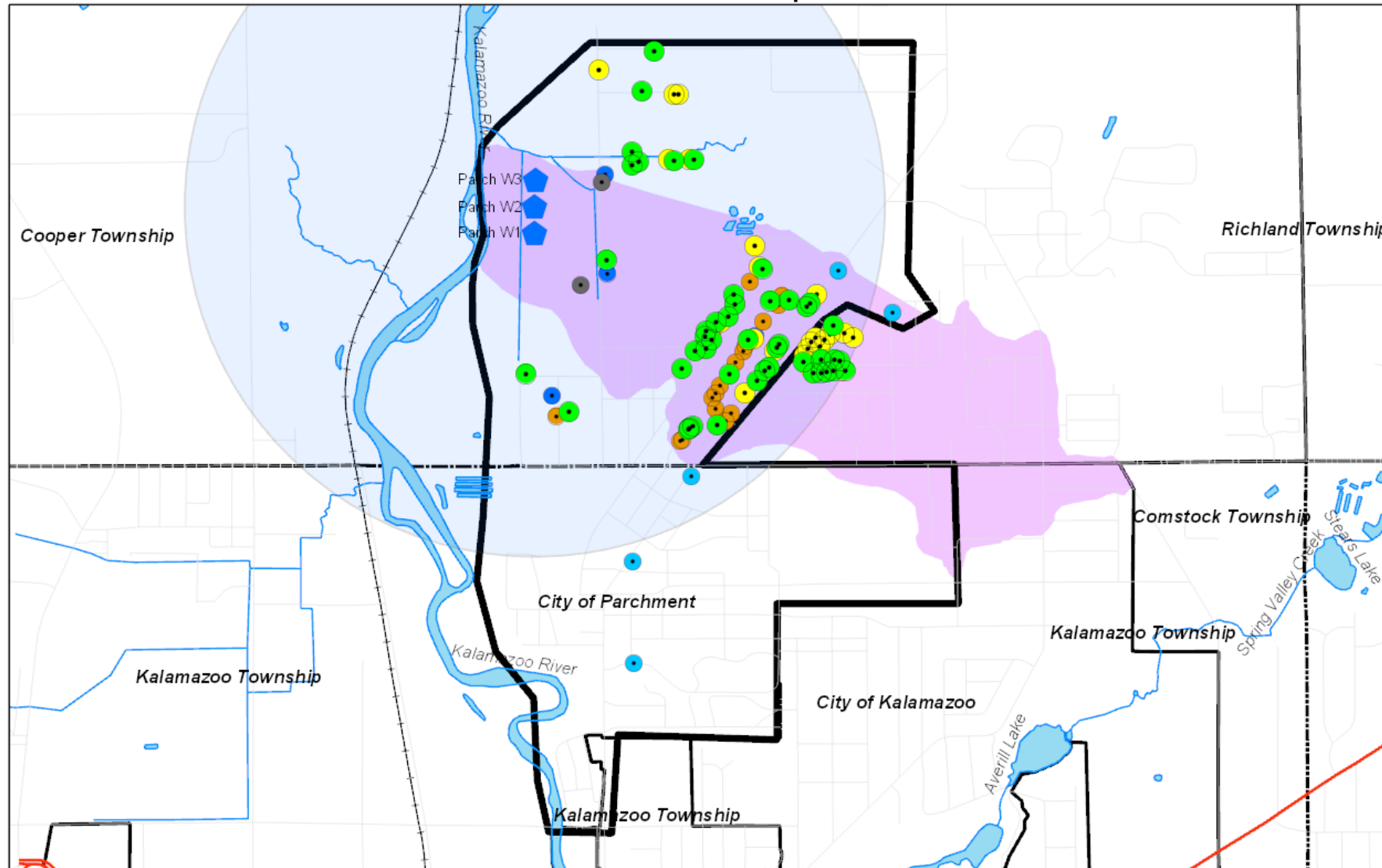
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## Parchment Water Response



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# Parchment Water Response

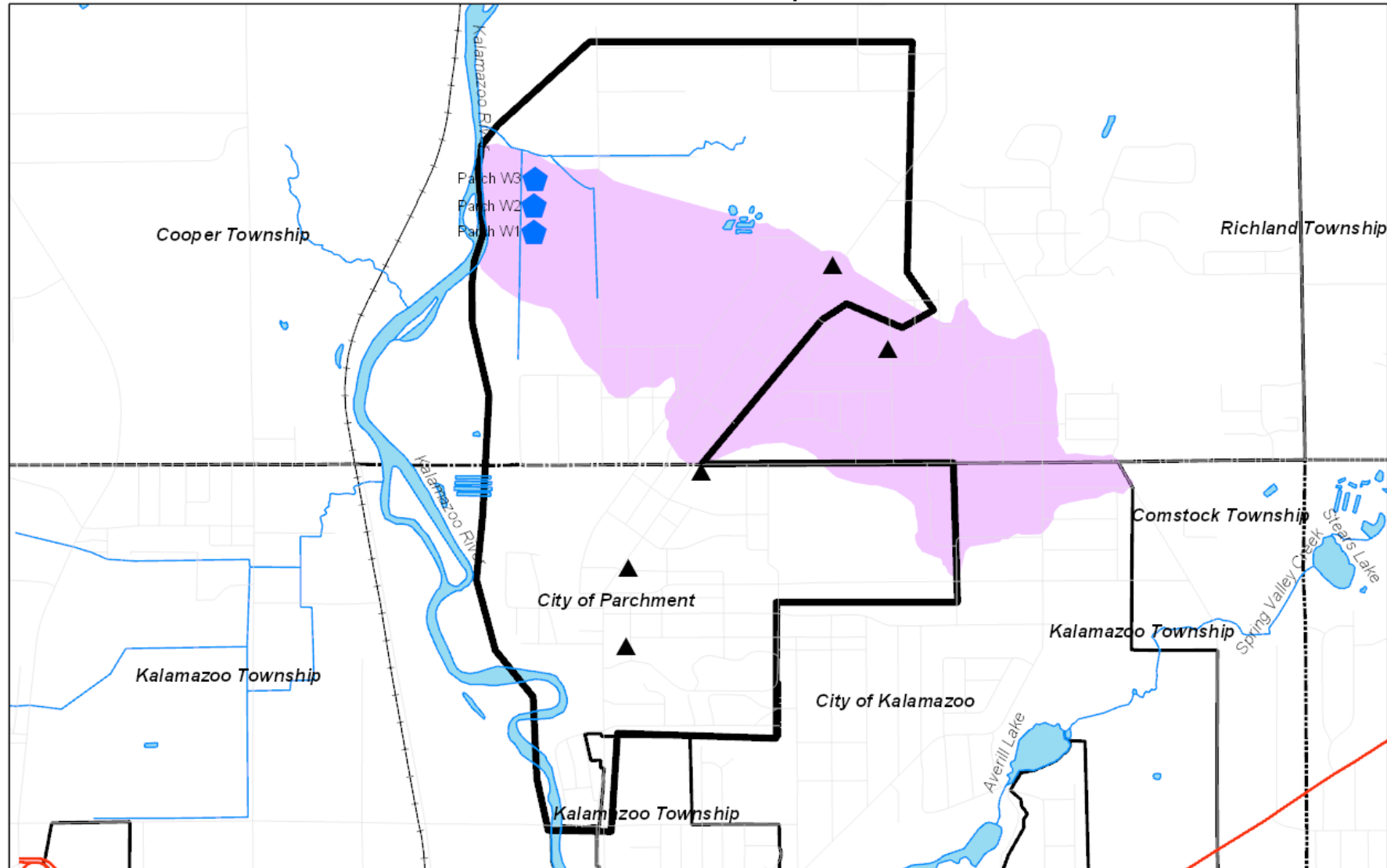


- |   |  |
|---|--|
| Parchment Municipal Wells               | Canvassed, Left Flyer (20)                 |
| Parchment Water Service Area            | Resident Not Home, Did Not Leave Flyer (2) |
| Parchment Wellhead Protection Area      | Vacant (17)                                |
| Parchment Municipal Wells 1 Mile Buffer | Sampled, Municipal Water (5)               |
| 7/28 - 7/30 Residential Canvass Event   |  |
| Residential Sampling Event              |  |
| Sampled (25)                            | Confirmed Municipal Water (4)              |



7-31-2018

## Parchment Water Response

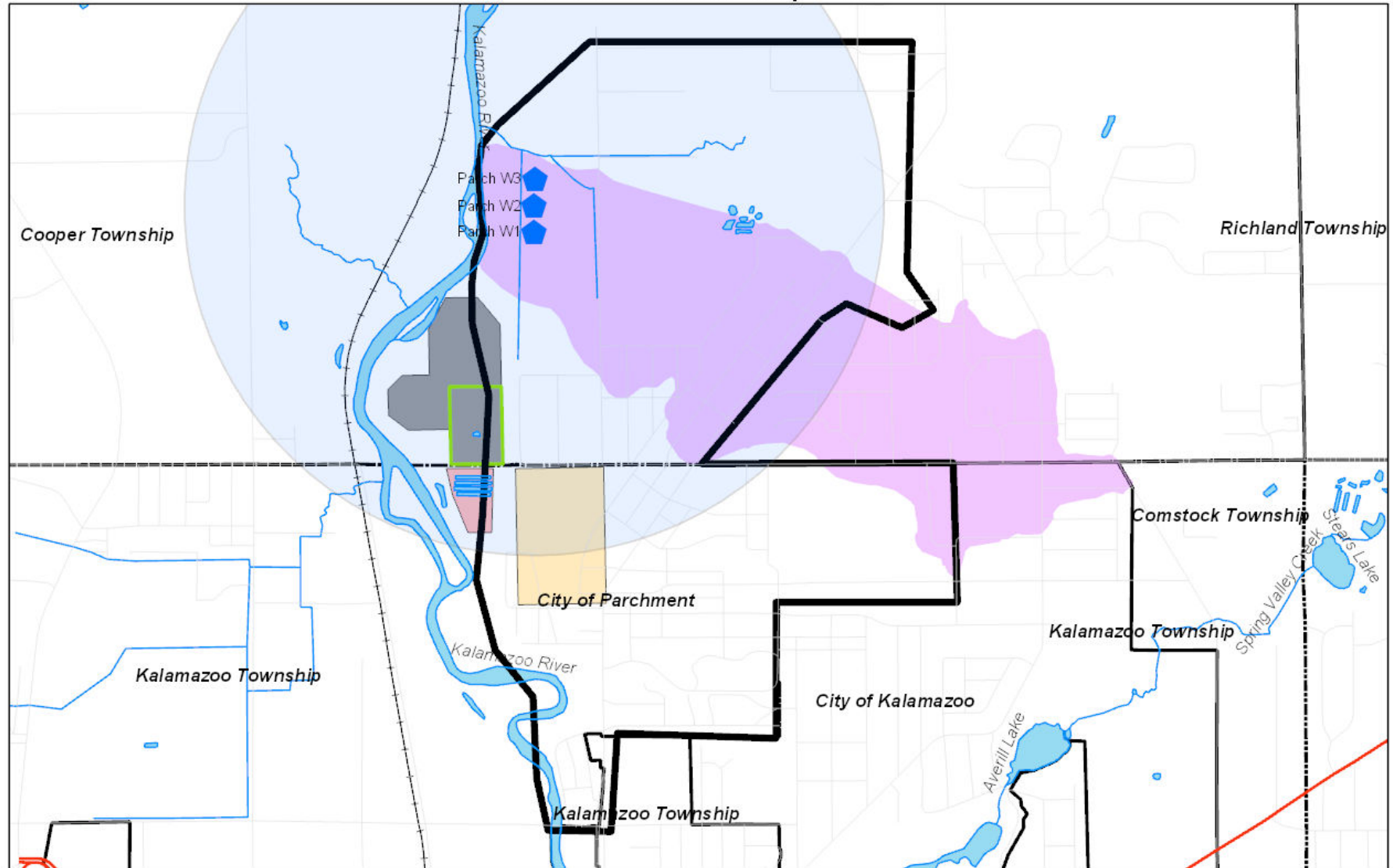


- ▲ Parchment Water Supply Sampling Locations
- ◆ Parchment Municipal Wells
- ▬ Parchment Water Service Area
- Parchment Wellhead Protection Area



7-31-2018

## Parchment Water Response



7-31-2018

# Next Steps

- Communicate test results to the community as they are received
- Continue to test water chemistry, lead and copper, and PFAS in Parchment Water System
- Flush service lines
- Develop a collaborative plan for a more robust temporary connection of the Kalamazoo Water System to the Parchment Water System
- Test drinking water wells
- Test monitor wells
- Test surface water



# Parchment PFAS Contamination – State Health Role

Christina Bush  
MDHHS, ATSDR Site Unit Manager  
July 31, 2018

# MDHHS's Actions at PFAS Sites

- Proactive
  - Not just about the number
- Immediate
  - Stop exposures that could be harmful
- Protective of public health
  - Partner with local health department



# Health Issues Associated with PFOS and PFOA

## High-dose exposures in people have been linked to:

- Higher cholesterol
- Thyroid disease
- Ulcerative colitis
- Testicular and kidney cancer
- Changes to the immune system
- High blood pressure during pregnancy

## High-dose studies in laboratory animals have shown:

- Exposure during pregnancy
  - Affected paw development
  - Lowered pup birth weight
  - Caused earlier puberty in male pups
- Immune system problems
- Changes in liver and kidney weight

# Environmental Protection Agency's "Health Advisory" Level

- USEPA Lifetime Health Advisory (LHA) protection level
  - Based on developmental toxicity in rodents
- Lifetime Health Advisory (LHA) for Drinking Water
  - PFOA + PFOS = 70 ppt (ng/L)
  - Short-term (during pregnancy) and long-term (lifetime) exposure
- Protects unborn baby against potential development effects
- Protects all people against cancer and noncancer health issues

**6,000,000\* ppt**  
(1,000,000 ng/kg/day)



Rodent to human  
conversion



**98,000 ppt**  
(5,300 ng/kg/day)



Human  
protections



**350 ppt**  
(20 ng/kg/day)



Accounting for  
other exposures  
in the  
environment



**70 ppt**  
(ng/L)

Lowest dose that causes  
an effect in rat pups

Human equivalent  
dose

Dose that is safe in the most vulnerable  
people (like developing babies)

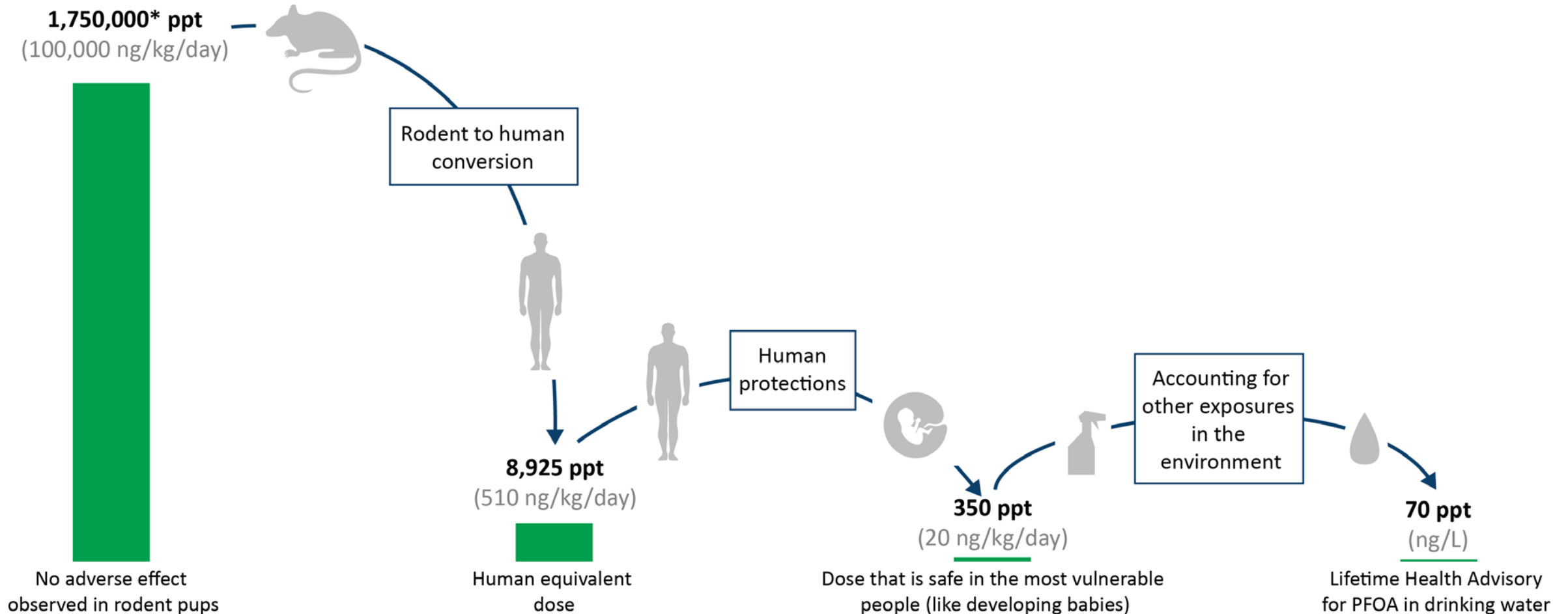
Lifetime Health Advisory  
for PFOA in drinking water

## Illustrating the concept behind a Lifetime Health Advisory: Perfluorooctanoic acid (PFOA)

\* Exact numbers have been generalized for illustration  
ppt = Parts per trillion

## Illustrating the concept behind a Lifetime Health Advisory: Perfluorooctanesulfonic acid (PFOS)

\* Exact numbers have been generalized for illustration  
ppt = Parts per trillion



## Additional Information

- MDHHS Toxicologist = Jordan Bailey
- Contact us at 800-648-6942 (MDHHS Toxics Hotline).
- Eat Safe Fish information at [www.mi.gov/eatsafefish](http://www.mi.gov/eatsafefish)
- Site updates posted at [www.mi.gov/pfasresponse](http://www.mi.gov/pfasresponse)

# MDHHS' Role

- Provide public health information and advice
  - Support local health department and other agencies
  - Respond to the public's questions and concerns
- Understand the chemicals
  - How they move, how they could impact health, what can be done to prevent harm
- Maintain scientific knowledge
  - Science is constantly changing
  - Provide expert, up-to-date recommendations

# MDHHS Response

- Immediate coordination with Kalamazoo County Health Dept to provide clean (bottled) water
- Immediate coordination with all partners to plan further investigation
  - Who else may be affected
- First priority is finding affected residents and providing clean water
  - Long-term, develop a permanent solution

# Eat Safe Fish

- PFAS (specifically PFOS) is known to be in fish in the Kalamazoo River downstream of Morrow Dam (City of Kalamazoo)
  - Fish already “Do Not Eat” for other chemicals
  - [www.mi.gov/eatsafefish](http://www.mi.gov/eatsafefish)
- Investigation will assess other lakes, rivers as needed



## Next Steps

- Remain engaged in investigation and outreach.
- Provide support to State, County, and City.
- Evaluate public water data and private residential well results.
- As needed, work with local Health Department to provide PFAS-free water until the long term solution is in place.

# Dr. William Nettleton

Medical Director, Kalamazoo County Health and Community  
Services Department

Assistant Professor, Family and Community Medicine

Western Michigan University Homer Stryker, MD School of  
Medicine

# Next Steps

- Continued review and dissemination of the most updated health information related to PFAS in partnership with MDHHS

# **Emergency Response in Parchment**

**James Baker, PE**

*Public Services Director*



# Immediate Response

- More than 50 Kalamazoo Public Services & Public Safety staff mobilized immediately
- Water flowing into Parchment within 6 hours
  - Available for fire protection, sanitary needs, laundry, etc.
- Measures in place to protect Kalamazoo water









# Immediate Response

- Detailed flushing & sampling plan created
  - Water tower cleaned first, drained to KWRP
  - Storm/sanitary bypass plan
  - System completely flushed within 72 hours
  - Awaiting PFAS test results of Kalamazoo water in Parchment system
  - Sampling & monitoring plan established with MDEQ



# Interim Solution

- Connection of Kalamazoo and Parchment systems
  - Water main installation at G avenue began this morning (7/31)
  - Reduces dependency on pumps, fire trucks
  - Interim solution, potential long-term solution
  - PFAS test results from Parchment expected 8/3

# Service Line Flushing

- Customers connected to Parchment City Water should begin flushing service lines
  - We're sending out detail instructions on how to flush your home or business
  - Use the faucet furthest from water meter



# Water Distribution Action Plan

**Mission:** to provide safe, clean drinking water in an effective and efficient manner to community members impacted by this crisis.





# Thursday, July 26<sup>th</sup>- Day I

- **7:00 PM** Organizational Meeting at Emergency Operations Center (EOC)
  - Water safety plan initiated by Office of Emergency Management in conjunction with Kalamazoo County Health Department, City of Kalamazoo, DEQ, DHHS and others.
- **7:30 PM** Water Supply secured from City of Battle Creek
- **7:45 PM** Distribution Center identified at Parchment High School



# Thursday, July 26<sup>th</sup>- Day I continued

## ■ 8:00 PM

- Transporting of water secured by Kalamazoo County Sheriff utilizing McDonald's Towing
- Two Township of Kalamazoo Police Officers secured entrances of Parchment High School and initiated 24 hour security of site

- **9:30 PM** Kalamazoo Department of Public Safety deploys personnel and equipment to carry out EOC's water plan



# Friday, July 27<sup>th</sup>- Day 2

- **12:30 AM** First two trucks arrive with water. Total received-10,000 cases of water (40 bottles/case)
- **2:30 AM** Township of Kalamazoo Police Officers establish process of delivery to community and set-up barricades and cones.
- **6:00 AM** Unloading of water starts with 10 people
- **6:30 AM** Water Distribution Center opens
- **7:00 AM** Official Announced Time of Opening of Water Distribution Center



# Friday, July 27th- Day 2

- **8:00 AM Parchment Football Team arrives and starts unloading first of 3 semi-truck trailers of water.**





# Friday-Monday

## July 27<sup>th</sup>- July 30<sup>th</sup>: Days 2-5

- Handed out 5,594 cases of water for an approximate average of 1,400 cases per day
- **Other partners** include Michigan State Police, Kalamazoo County Sheriff's Reserve Officers, American Red Cross, Salvation Army, Parchment Public Schools, and elected officials.
- **Numerous Volunteers** include Boy Scout Troops, area high school and middle school students, community members and others.



# Distribution Eligibility

- On City of Parchment water line
- Distance from identified wells
  - DEQ one mile radius suggestion
  - Extended to include associated neighborhoods to 1 1/2 miles.



# Next Steps

- Committed to operation of water distribution center until safe drinking water is provided to residents through municipal system.
- State of Michigan delivering 2 semi-trailers tomorrow 8/1/18. Each with 1,500+ cases.
- Expecting further deliveries every M/W/F
- Water Distribution continues this week from 12:00 p.m. to 8:00 p.m. (Weekend hours to be determined.





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