

Planning for Per- and Polyfluoroalkyl Substances:

Addressing Emerging Contaminants at the County, City, and Community Planning Levels



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Agenda

- Presenters' introductions
- What are PFAS and why is this a hot topic in civil and environmental field
- Maryland county case study (confidential client)
 - Summary
 - Planning Road Map for PFAS

Presenters' Introductions

Tetra Tech	Primary Role
Simon Fong, PE	Project Manager and Remediation Engineer
Josh Mullis, PG	Project Manager, Geologist, and Field Operations Lead
Debbie Hoffman	Program Manager and Business Development Liaison

What are PFAS and Why is this a hot topic?

- According to a CDC fact sheet, per- and polyfluoroalkyl substances (PFAS) are a group of chemicals used to make fluoropolymer coatings and products that resist heat, oil, stains, grease, and water
 - Many products containing PFAS have improved our quality of life for the last 80 years
- Why is this a hot topic for our industry?
 - PFAS do not break down in the environment (everywhere)
 - PFAS can move through soils and contaminate drinking water sources
 - PFAS build up in fish and wildlife (bioaccumulate)
 - Human health effects are continuously being studied, but USEPA has issued more and more stringent screening numbers for data evaluation

Maryland County Case Study-Summary

- In November 2021, the County issued a request for proposal (RFP) to investigate PFAS at their training facility
 - Training facility used firefighting foams that may contain PFAS
 - Maryland Department of the Environment (MDE) asked the County to collect soil and shallow groundwater samples at and within the training facility area because it found PFAS in groundwater at a nearby, downgradient well
 - County is planning modifications to the training facility area
 - New building construction (tear down existing building)
 - Stormwater pond retrofit and expansion

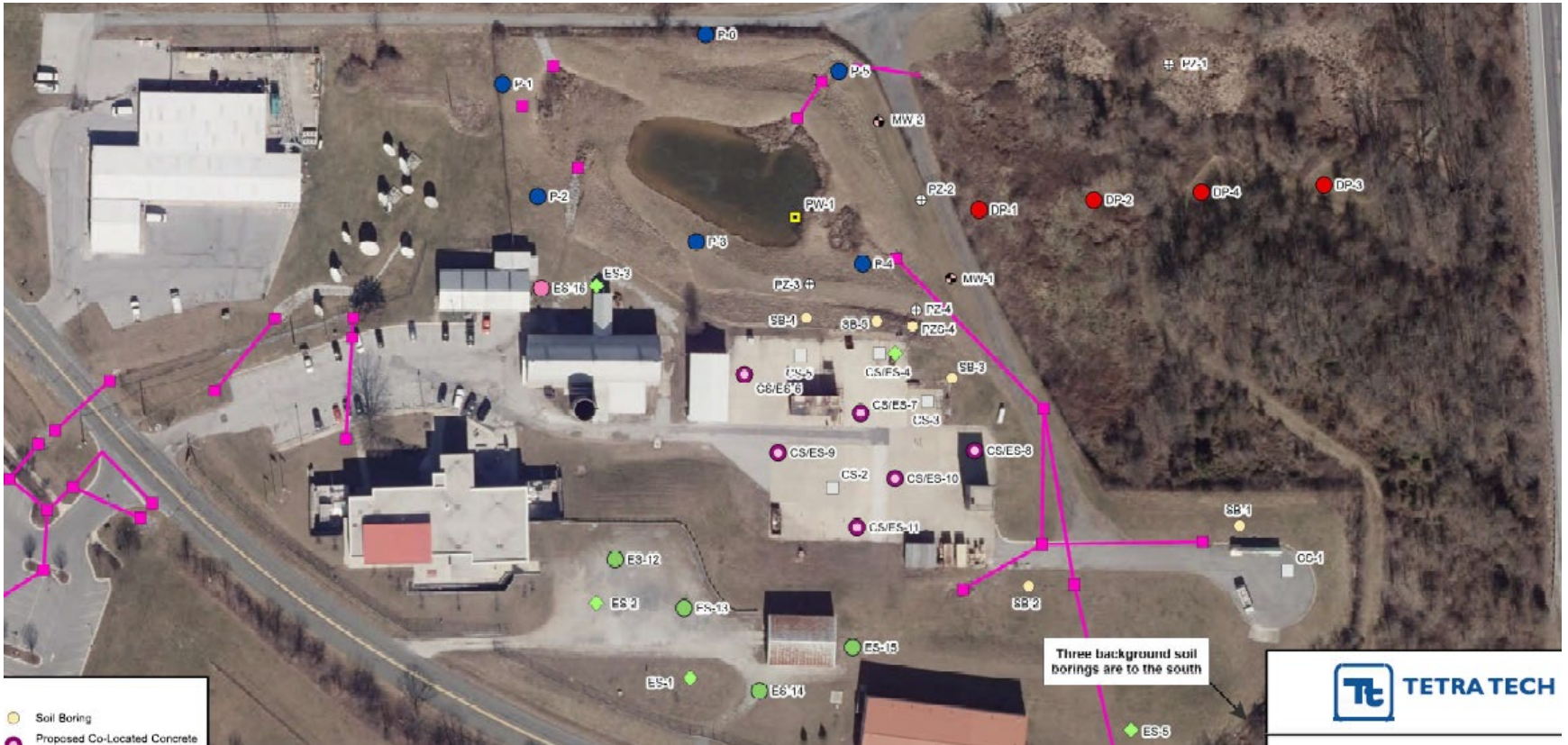
Maryland County Case Study-Summary

- In March 2022, Tetra Tech performed the initial PFAS investigation at the training facility
 - Soil, shallow groundwater, and concrete samples were collected
 - Soil and concrete results ranged from non-detect to elevated detections but below industrial screening levels
 - Groundwater results showed concentrations above EPA regional screening levels (RSLs)
- Tetra Tech recommended a remedial investigation (RI) to delineate the extent of soil and groundwater contamination
 - County is taking a phased approach
 - Pre-Construction characterization field work was just completed in mid-September 2023
 - Collect soil samples to determine if excavated soil can be reused as backfill at the stormwater pond and different portions of the training facility (i.e., new building, new parking lots)
 - Collect additional shallow groundwater samples for use in risk assessment in the future
 - Staying ahead of MDE regulations (County doesn't want completion of construction activities and then MDE discovers PFAS-laden soil underneath the new building and parking lots)

Maryland County Case Study-Summary

- Tetra Tech will be recommending additional sampling to quantify the nature and extent of PFAS
 - Nature = what particular types of PFAS
 - Extent = how widespread (lateral) and how deep the PFAS have migrated from origination source point
- All sampling data will be fed into a risk assessment to determine if there are unacceptable human health and ecological risks. If yes, Tetra Tech will be recommending remediation.

Maryland County Case Study-Summary



Maryland County Case Study-Summary



Maryland County Case Study-Planning Roadmap

- For community planners, we can no longer ignore PFAS
 - Assessment and due diligence (research)
 - Collaboration and communication
 - Forward thinking (being on-par or ahead of environmental regulations)
 - Remediation efforts (before major construction activities)

Sources and References

- [Per- and Polyfluorinated Substances \(PFAS\) Factsheet | National Biomonitoring Program | CDC](#)
- [Regional Screening Levels \(RSLs\) - Generic Tables | US EPA](#)
- [Citizen's Advisory Workgroup \(michigan.gov\)](#)

Michigan Citizens' Advisory Group

- Works with the Michigan PFAS Action Response Team (MPART)
- Represents concerns of communities negatively impacted by PFAS
- Provides input and advice to MPART to
 - Help identify and mitigate PFAS contamination
 - Protect the public from exposure and risk
 - Proactively engage MPART with communities at risk

Michigan Citizens' Advisory Group

- Engage and Empower Citizens
 - Community Forums
 - Outreach
 - Provide Resources

[Citizen's Advisory Workgroup \(michigan.gov\)](http://michigan.gov)

Public Awareness

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INTRODUCTION TO PFAS 101 "COMMUNITY AWARENESS INFORMATION"

The following information provides "community awareness documentation" and outlines an introduction in understanding the basics of exposure to PFAS chemicals as well as the associated health risks to you and your family. It also provides more detailed information and websites that you can go to learn more about how PFAS can affect your daily lives.

What are Per- and polyfluoroalkyl substances (PFAS) and why are they harmful?

Per- and polyfluoroalkyl substances (PFAS) are a large group of man-made chemicals that are resistant to heat, water, and oil. PFAS have been classified by the U.S. Environmental Protection Agency (EPA) as an emerging contaminant on the national landscape. For decades, they have been used in many industrial applications and consumer products such as carpeting, waterproof clothing, upholstery, food paper wrappings, personal care products, fire-fighting foams, and metal plating. They are still used today. PFAS have been found at low levels both in the environment and in blood samples of the general U.S. population.

These chemicals are persistent, which means they do not break down in the environment. They also bioaccumulate, meaning the amount builds up over time in the blood and organs. Studies in animals who were exposed to PFAS found links between the chemicals and increased cholesterol, changes in the body's hormones and immune system, decreased fertility, and increased risk of certain cancers. Studies in which animals were given high levels of PFAS showed effects including low birth weight, delayed puberty onset, elevated cholesterol levels, and reduced immunologic responses to vaccination. Animal studies help scientists understand what could happen in people.

How does PFAS get into drinking water?

PFAS can get into drinking water when products or wastes containing them are disposed of, spilled onto the ground or into lakes and rivers. PFAS moves easily through the ground, getting into groundwater that is used for some water supplies or private drinking water wells. When released into lakes or rivers used as sources of drinking water, they can get into drinking water supplies. PFAS released by facilities into the air can also end up in rivers and lakes used for drinking water.

For more detail on PFAS in drinking water, home filters, home sampling guidance, and laboratories offering residential well testing, visit: [Michigan.gov/pfasresponse/drinking-water](https://michigan.gov/pfasresponse/drinking-water) or [PFAS in Drinking Water for Private Residential Well Owners](#)

How could I be exposed to PFOA, PFOS and other PFAS compounds?

The main way people are exposed to these chemicals is by swallowing them. PFAS chemicals are sometimes found in drinking water and in cooking or food packaging products. PFAS can be swallowed along with the water or food and from there they can enter the bloodstream. Touching products made with PFAS or touching water that contains PFAS is not the main way people are exposed to these chemicals. Most PFAS do not easily absorb into the skin.

For more detailed information on PFAS exposure, visit: [Michigan.gov/pfasresponse/health](https://michigan.gov/pfasresponse/health)

There are also supplemental websites listed later in this document that can provide

Michigan PFAS Sites and Areas of Interest

In effort to better organize the sites that are being investigated for PFAS, MPART established two categories of investigations: PFAS Sites and Area of Interest.

PFAS Sites: As of March 2021, a PFAS site is defined as a property where EGLE has a valid groundwater monitoring well sample result that exceeds one or more of Michigan's seven PFAS groundwater cleanup criteria, and based on data, EGLE has determined the property is the location of the source of PFAS contamination (e.g., fire training area where PFAS-containing foam was used).

Area of Interest (AOI): Is an area being investigated due to the potential for PFAS contamination may be affecting residential wells for which a source has not been determined. AOIs will be created based on data showing the potential for human exposure, which may also generate significant public interest.

For more detailed information on PFAS sites and area of interests visit:

[Michigan.gov/pfasresponse/investigations/sites-aoi](https://michigan.gov/pfasresponse/investigations/sites-aoi)

Sampling in Lakes and Streams

The Michigan Department of Environment, Great Lakes, and Energy (EGLE) Water Resources Division (WRD) collects surface water samples from Michigan's lakes and streams for PFAS analysis to identify potential sources of contamination. EGLE and the Michigan Department of Natural Resources (MDNR) collect fish for contaminant analysis to assist the Michigan Department of Health and Human Services (MDHHS) in identifying where fish consumption advisories are needed.

For more detailed information on sampling in lakes, streams, watersheds, and fish, visit:

[Michigan.gov/pfasresponse/investigations/lakes-and-streams](https://michigan.gov/pfasresponse/investigations/lakes-and-streams)

You can also visit [Michigan.gov/EatSafeFish](https://michigan.gov/EatSafeFish) for the updated "Eat Safe Fish" guide.

PFAS Related Educational Videos

For educational videos to provide homeowners and community members better insight with respect to PFAS and how they can affect your daily lives, visit:

[Michigan.gov/pfasresponse/engagement/resources](https://michigan.gov/pfasresponse/engagement/resources)

PFAS Related Legislation

For more information on PFAS related legislation in your state and around the country, go to [Saferstates.org](https://saferstates.org). Then by clicking on any green highlighted states on the U.S. map, that state will appear. Then click on "learn more about (that state selected)" you can view all the current legislative bills posted as well as their status.

Additional PFAS Awareness Organizations

The organizations listed below are non-profit advocacy groups that are driven to provide PFAS related information and support for all PFAS impacted communities throughout the state of Michigan and the U.S.A. By clicking on the websites below, you will learn important information about PFAS and how it can affect you and your family, how PFAS impacted communities can share information with other impacted communities, and how PFAS is impacting water resources and wildlife in the Great Lakes region, as well as testing and certification for PFAS in consumer goods and the environment.

Public Awareness

additional information and facts on PFAS exposure.
What are the current Michigan standards for PFAS?

Drinking water and groundwater sample results are compared to:

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

(ppt = parts per trillion)

Surface water (i.e., waterbody) sample results are compared to:
The majority of surface water samples collected are compared to:

PFOA	170 ppt
PFOS	12 ppt
PFBS	670,000 ppt

Some water supplies draw water from a waterbody, treat the water, and then use it for drinking water. If surface water samples are collected directly from a waterbody that is also used as a source for drinking water, then surface water samples are compared to:

PFOA	66 ppt
PFOS	11 ppt
PFBS	8,300 ppt

(ppt = parts per trillion)

What is the state doing about PFAS?

On February 4, 2019, Governor Gretchen Whitmer signed Executive Order 2019-3, establishing the Michigan PFAS Action Response Team (MPART) as an enduring body to address the threat of PFAS contamination in Michigan, protect public health, and ensure the safety of Michigan's land, air, and water, while facilitating inter-agency coordination, increasing transparency, and requiring clear standards to ensure accountability. MPART is comprised of seven state departments, including: Michigan Department of Military and Veterans Affairs (MDMVA), Michigan Department of Environment, Great Lakes, and Energy (EGLE), Michigan Department of Health and Human Services (MDHHS), Michigan Department of Natural Resources (DNR), Michigan Department of Agriculture and Rural Development (MDARD), Michigan Department of Transportation (MDOT), Michigan Department of Licensing and Regulatory Affairs. These agencies are working with federal and local partners to conduct investigations to identify areas and sources of PFAS contamination throughout the state and appropriate public health responses are released to the public.

To build on the above executive order, the MPART Citizens Advisory Workgroup was created which formalized MPART's mission within EGLE which directed the agency to increase citizen engagement, transparency, and accountability in the ongoing state efforts to identify PFAS contamination and protect public health.

If any community member would like to get involved and become a MPART Citizen Advisory Workgroup member, please visit Michigan.gov/MPARTCAWG

Michigan Nonprofit Organizations

Great Lakes PFAS Action Network:
glpan.org/pfas-resource-guide-for-impacted-communities
local.glpan.org (PFAS in your county)

Michigan League of Conservation Voters:
Michiganlcv.org/pfas

West Michigan Environmental Action Council:
wmeac.org/pfas

Huron River Watershed Council:
hrwc.org/our-watershed/threats/pfas-and-the-huron-river

National Wildlife Federation:
nwf.org/Educational-Resources/Reports/2019/09-09-19-PFAS-Great-Lakes

Ecology Center:
ecocenter.org/our-work/protecting-communities-pfas-pollution/facts-about-pfas

Nonprofit Organizations Outside of Michigan

Toxic Free Futures:
toxicfreefuture.org/tag/pfas/

Environmental Working Group:
ewg.org

Green Science Policy:
greensciencepolicy.org/our-work/pfas/

Silent Springs Institute:
silentspring.org/project/PFAS-reach

PFAS Exchange:
pfas-exchange.org

PFAS Documentation - Governmental Agencies

Listed below are state and federal agencies websites that provide additional PFAS related information.

Center for Disease Control (CDC) and Agency for Toxic Substances and Disease Registry (ATSDR)
 About PFAS: atsdr.cdc.gov/pfas/

To learn more about PFAS health effects such as human exposure, resources providing information pertaining to PFAS, and what ATSDR is doing to protect our communities, visit the above listed website.

State of Washington-Dept. of Ecology:
ecology.wa.gov/Waste-Toxics/Reducing-toxic-chemicals/Addressing-priority-toxic-chemicals/PFAS

National Conference of State Legislatures:
ncsl.org/research/environment-and-natural-resources/per-and-polyfluoroalkyl-substances-pfas-state-laws.aspx

Environmental Protection Agency:
epa.gov/pfas/pfas-explained



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