TOWN HALL MEETING
Robinson Township
120th Avenue PFAS Study Area

AGENDA

5:30 pm: Presentations Start

Michigan Department of Environmental Quality
Abigail Hendershott, District Supervisor & Paul Knoerr, Environmental Quality Analyst/Geologist

Michigan Department of Health and Human Services
Bill Farrell, Toxicologist

6:30 pm-7:30 pm: Questions & Answers
120th Avenue PFAS Study Area

Abigail Hendershott
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Paul J. Knoerr
Project Manager-Geologist
knoerrp@michigan.gov

Remediation & Redevelopment Division
Michigan Department of Environmental Quality
DEQ Overview

- PFAS Basics and MPART
- Residential Well Sampling
- Hydrogeological Investigation
- Next Steps
What are PFAS?

Per and Poly-fluoroalkyl substances

- Generic family of chemicals = over 5000
- Man-made and do not occur naturally
- Developed in 1940’s
- Used to make products that resist heat, oils, grease, stains and water

Most Prevalent and researched: PFOS & PFOA
Per-and polyfluoroalkyl substances (PFAS)

- Strong carbon-fluorine bonds
- Surfactants
- Hydrophobic (repels water) and oleophobic (repels oil, fat, grease)
- 5,000+ compounds
PFAS Uses

- Aerospace
- Apparel
- Building and Construction
- Chemicals and Pharmaceuticals
- Electronics
- Oil & Gas
- Energy
- Healthcare and Hospitals
- Aqueous Film Forming Foam
- Semiconductors
Why the Concern?

- Pervasive
- Persistent
- Bioaccumulative
- Associated with adverse health effects
- Scarcity of information in scientific literature
- Lack of sufficient standards
Governor Snyder signed ED 2017-4 on November 13, 2017

Statewide cooperation and collaboration to strategically and proactively address this emerging contaminant.
Who is MPART?....

Statewide cooperation and collaboration to strategically and proactively address this emerging contaminant.
MPART Response

- Protect Public Health
- Standardize sampling and analytical
- Study occurrence
- Identify sources and source pathways
- Study environmental transport and fate
- Study ecological effects
- Develop standards
What Types of Sites Can Be Sources of PFAS?

- Fire training facilities
- Fire stations
- Refineries
- DoD sites/Military bases
- Commercial and Private Airports
- Landfills
- Biosolids land application
- Rail Yards
- Chemical facilities
- Plating facilities
- Textile/Carpet Manufactures
- Residential areas with septic systems
Aqueous Film Forming Foam (AFFF)

AFFF meets Military Specification

Photo Credit: U.S. Airforce
The MPART Testing Continues...

- Statewide municipal drinking water testing
- Schools/Daycare on private wells
- 40+ PFAS Contamination sites identified
- River, Lakes, Streams sampling
- Biosolids
- Landfill leachate sampling
- Fish & Deer sampling
- Foam Sampling
Statewide Municipal Drinking Water Testing Program

- 1,119 community water supplies sampled
- 461 Schools sampled
- 168 Daycares/Head start facilities sampled
40 Confirmed PFAS Sites

> 70 ppt PFOA+PFOS combined in Monitoring Well Samples

* 120th Avenue PFAS Study Area has no Monitoring Wells installed and thus is not a Confirmed PFAS Site at this time
### Ottawa County (continued)

#### Grand River
(continued from page 75)

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<td>PCBs</td>
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* When fishing the river near Lake Michigan, please use the guidelines on page 16.

### Lake Macatawa

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120th Avenue Area PFAS Study Investigations
October 29, 2018 – Statewide PFAS Testing for Robinson Township results document the presence of PFOS+PFOA at 110 ppt which exceeds EPA’s Lifetime Health Advisory of 70 ppt for PFOS+PFOA.

Grand Haven Area Public Schools (GHAPS) before noon had provided bottled water for drinking water use and will continue to provide until a long term solution is achieved.

GHAPS has been working with Ottawa County Health Department to secure a permit and met with an environmental engineering firm to do design/build and install a water filtration system on the existing Type II community well at Robinson Elementary.

GHAPS has participated in meetings with Robinson Township and the Ottawa County Road Commission to explore the potential to bring a municipal water loop to the school and surrounding area.
120th Avenue PFAS Study
Area Sampling

- Robinson Elementary School Wells (School and Irrigation Wells)
- Loving Hearts Little Hands Daycare
- Robinson Township Fire Station
- Robinson Township Office
- Robinson Township Park
- Robinson Baptist Church
- 60 Residential Wells
Private Drinking Water Well Results

PFOS + PFOA

PFOA + PFOS (ppt)
- Non-Detect (41)
- >0 - 10 (16)
- >10 - 70 (8)
- >70 (3)

120TH AVENUE
PFAS STUDY AREA
PFOA + PFOS CONCENTRATION

DRAFT
OTTAWA COUNTY, MI
Private Drinking Water Well Sampling Results

Total PFAS

Total PFAS (ppt)
- Non-Detect (32)
- >0 - 10 (12)
- >10 - 70 (16)
- >70 (8)

120TH AVENUE PFAS STUDY AREA
TOTAL PFAS CONCENTRATION

DRAFT
OTTAWA COUNTY, MI
DEQ Investigation Status:

- Only two (2) wells exceed PFOS + PFOA > 70 ppt Lifetime Health Advisory (LHA) Criteria.
- Most drinking water wells are shallow.
- Sandy aquifer: 0-50 feet deep that lies above a thick clay layer.
- Groundwater flow towards the north to slightly northeast along 120th Avenue.
- Additional investigation needed to confirm flow direction.
Proposed Hydrogeological Investigation
Hydrogeological Investigation:

DEQ plans

• Install monitoring wells to confirm GW flow
• Additional Vertical Groundwater sampling
• Sample Shallow Soils for source areas
• Sample nearby ponds
Hydrogeological Investigation

- Proposed Surface Water Sample (3)
- Proposed Soil Boring (7)

Tentative Start: Week of Feb.18
- Drilling to take 1-2 weeks
Sampling Ponds later in Spring after melt
Completion: Spring 2019
Next Steps:

DEQ plans to:

- Review Hydrogeologic data
- Determine need for additional residential wells sampling
- Determine need for additional sub-surface samples
- Continue to update the MPART and MIOTTAWA.org/pfas/ websites with the results of work completed and future plans
Questions?

www.Michigan.gov/pfasresponse
Michigan Department of Environmental Quality

800-662-9278
www.michigan.gov/deq

Sign up for email updates
Follow us on Twitter @MichiganDEQ
Per and Polyfluorinated Alkyl Substances (PFAS)

Bill Farrell
Toxicologist
Michigan Department of Health and Human Services
(517) 284-0018
Chain Lengths

**Short-chain**
- PFBS $n = 4$
- PFPeS $n = 5$

**Long-chain**
- PFHxS $n = 6$
- PFHpS $n = 7$
- PFOS $n = 8$

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**PFBS**

**PFOS**
Characteristics

- Incredibly Stable
- Highly soluble and mobile
- Grease, soil and water-repellant properties
- Bioaccumulate in Biota
Sources
Blood Levels of the Most Common PFAS in People in the United States from 2000-2014

* Average = geometric mean

The Role of MDHHS/OCDPH

- Provide Public Health Support
- Be proactive/respond immediately to protect health of people
- Evaluate residential well results and provide recommendations/public health response actions
- Outreach to residents, healthcare providers, others
Exposure to PFAS Chemicals

Health problems are not immediate

If you drink high levels of PFAS chemicals over time you could be more likely than the average person to develop some health problems in the future.
Associated Health Outcomes – PFOA and/or PFOS

• Animal
  - Liver effects
  - Immunological effects
  - Developmental effects
  - Endocrine effects (thyroid)
  - Reproductive effects
  - Tumors (liver, testicular*, pancreatic)

• Human (associated outcomes)
  - Liver effects (serum enzymes/bilirubin, cholesterol)
  - Immunological effects (decreased vaccination response, asthma)
  - Developmental effects (birth weight)
  - Endocrine effects (thyroid disease)
  - Reproductive effects (decreased fertility)
  - Cardiovascular effects (pregnancy induced hypertension)
  - Cancer* (testicular, kidney)

* PFOA only
Based on Reference Dose (RfD) derived from developmental toxicity study in rats

**Lifetime Health Advisory**
- PFOA + PFOS = 70 ppt

- Protective of unborn baby against developmental effects
- Protective of all against non-cancer and cancer effects
Illustrating the concept behind a Lifetime Health Advisory: Perfluorooctanoic acid (PFOA)

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

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)

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

70 ppt
(ng/L)

Lifetime Health Advisory for PFOA in drinking water

Lowest dose that causes an effect in rat pups

Human equivalent dose

Accounting for other exposures in the environment
Exceedance of PFOA + PFOS LHA of 70 ppt
- Advise use of filtered water for drinking, cooking
- OCDPH provides POU filter
Detectable Levels of PFAS; but PFOA + PFOS < 70 ppt
- Interim precaution - OCDPH offering filter

Purpose of filters?
- Need time to conduct investigation to:
  - Determine source area extent and strength
  - Determine horizontal and vertical extent of PFAS in groundwater
  - Gather information to determine long-term groundwater quality
- Therefore – filter provides residents with protection from potential fluctuations in PFAS levels while investigation is going on
Water Well Results
MDHHS/OCDPH Public Health Response Actions

- No detectable levels of PFAS
  - No public health actions
Point-of-Use Filter

- NSF P473 Certification
- Certified to remove up to 96% of PFOA and PFOS
- Certified only for water containing PFOA + PFOS concentrations less than 1,500 ppt

Full system certified to NSF/ANSI Standards 42, 53, 401 and conforms to NSF protocol P473.
Residential Well Water Testing

- MPART Website - PFAS Response – State of Michigan
  - Residential Well Water Testing and Results
- Handouts at MDHHS Table
  - *Sampling and Lab Information for Residents Wanting to Test Their Private Residential Well*
  - *For Homeowners – Private Residential Well PFAS Sampling*
General Process For Consumption Guideline Development

Sampling & analysis
- Planning
- Fish collection
- Fish processing (filets)
- Analysis of filets for the ESF Guides (MDHHS Analytical Chemistry Laboratory)

Data evaluation
- Comparing fish tissue chemical levels to screening levels
- Additional considerations

Issuing a guideline
- Outreach products – ESF Guides and others (statewide and site-specific)
- Michigan Public Health Code – Act 368
Statewide Safe Fish Guidelines

- These general guidelines are based on the typical amount of chemicals found in fish filets tested from around the state. Some fish may be higher or lower.

- These general guidelines can be used for lakes, rivers, and fish species not included in the Eat Safe Fish Guide.

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</tr>
<tr>
<td>Bluegill</td>
<td>Mercury</td>
<td>Any Size</td>
<td>8</td>
</tr>
<tr>
<td>Carp</td>
<td>PCBs</td>
<td>Any Size</td>
<td>2</td>
</tr>
<tr>
<td>Catfish</td>
<td>PCBs &amp; Mercury</td>
<td>Any Size</td>
<td>4</td>
</tr>
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<td>Mercury</td>
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<td></td>
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<td>1</td>
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<td>Mercury</td>
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### MDHHS: 
Lisa Fisher, Toxicologist  
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fisherl@michigan.gov  

Bill Farrell, Toxicologist  
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farrellw@michigan.gov  

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Kristina Wieghmink, Public Information Officer  
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kwieghmink@miOttawa.org  

www.miOttawa.org/PFAS