Welcome to the NACCHO and AAAS EPI Center Webinar

PFAS in Drinking Water: What Local Health Departments Need to Know
National Association of County and City Health Officials (NACCHO)

NACCHO represents all the nearly 3,000 local health departments across the United States. Our mission is to serve as a leader, partner, catalyst, and voice with local health departments.

NACCHO Resources for PFAS:

• PFAS Factsheet
• Water, Sanitation, and Hygiene (WASH) Preparedness Resource Library

Contact: WASH@naccho.org
AAAS: World’s largest multidisciplinary science organization

120K Members
91 Countries
250 Affiliate organizations
Making it easier for policymakers and other decision-makers to access relevant scientific information and integrate that evidence into their decision-making process.
AAAS EPI Center Projects

- PFAS Emerging Drinking Water Contaminants
- Orphan Wells Hydraulic Fracturing Methane Emissions
- Voting Technology and Election Security
- Green Stormwater Infrastructure
- AI Pandemic Response Judicial Risk Assessment Tools
- Substance Use Disorder and Treatment
- Structural Racism and Policing
PFAS: Emerging Drinking Water Contaminants

The role of the AAAS EPI Center –

• Created a set of guides on PFAS in drinking water designed for decision-makers
• Convening scientists, engineers, and policymakers to discuss how to address PFAS
• Sharing the scientific evidence, best practices, and lessons learned
• Building and supporting collaborative relationships to address PFAS

https://www.aaas.org/programs/epi-center/pfas-guides
A PFAS Primer

Tom Bruton, PhD
Green Science Policy Institute
PFAS
(Per and Polyfluoroalkyl Substances)

Carbon-Fluorine bond strength:
• Leads to oil and water repellency
• “Forever chemicals” -- last for geologic time!

Courtesy: Dr. Jennifer Field
Common Uses

- Carpets
- Carpet cleaning products
- Food packaging
- Furnishings
- Cosmetics
- Outdoor gear
- Clothing
- Adhesives and sealants
- Protective coatings
- Non-stick cookware
- Car seats
- Firefighting foam

GREEN SCIENCE POLICY INSTITUTE
www.GreenSciencePolicy.org
Scientific publications on PFAS

Grandjean, Environ. Health. 2018
Ubiquitous in the Environment

‘Forever chemicals,’ other pollutants found around the summit of Everest

Newer PFAS compound detected for first time in Arctic seawater

‘Canary in a coal mine’: Scientists test alligators for PFAS chemical compounds

Washington Post, April 17, 2021
ACS News, July 29, 2020
Fayetteville Observer, May 7, 2021
PFASs exposure is a health concern

Exposure linked to health risks:
- Cancer
- Elevated cholesterol
- Obesity
- Immune suppression
- Endocrine disruption

(Ref: Lewis et al., 2015; Grandjean et al., 2012; Braun et al., 2016; Barry et al., 2013)

Courtesy, Cindy Hu, Harvard University
Effects of PFAS on Human Health

- Thyroid disease
- Increased cholesterol levels
- Breast cancer
- Liver damage
- Kidney cancer
- Inflammatory bowel disease (ulcerative colitis)
- Testicular cancer
- Increased time to pregnancy
- Pregnancy induced hypertension/pre-eclampsia (increased blood pressure)

Developmental effects affecting the unborn child:
- Delayed mammary gland development
- Reduced response to vaccines
- Lower birth weight
- Obesity
- Early puberty onset
- Increased miscarriage risk (i.e. pregnancy loss)
- Low sperm count and mobility

Source: European Environment Agency
PFAS in Drinking Water

EPA Lifetime Health Advisory Level of 70 ng/L PFOA + PFOS

PFAS in Drinking Water

https://www.ewg.org/interactive-maps/pfas_contamination/map/
Exposure Sources & Pathways

- Drinking water
- Diet (foodstuffs & food packaging)
- Dust
- Air
- Consumer Products

Sunderland et al., JESEE, 2018.
DOI: 10.1038/s41370-018-0094-1
Drinking Water Health Guidelines for PFOA
(parts per trillion)

Post, G.. Environmental Toxicology and Chemistry, 2020. DOI: (10.1002/etc.4863)
Water Treatment Costs: North Carolina

Brunswick County: reverse osmosis filtration:
- $99M to build
- $2.9M to operate each year

Cape Fear Public Utility Authority activated carbon filtration:
- $46M to build
- $2.7M to operate each year

Wilmington Star News, May 9th & 10th, 2018
• There are **many** PFAS: 4000? 9000? More?
• Extreme persistence and potential toxicity make all PFAS suspect
• Not enough time to study them all
• Avoid use when possible
PFAS are Problematic & Difficult to Clean Up

Prevention is preferable!
Only use when necessary
Congressional PFAS Task Force

- Launched 1/24/19
- Goals
  - Educate
  - Elevate
  - Legislate
  - Appropriate

- Accomplishments
  - CDC Health Studies
  - USGS monitoring
  - Stop DoD and FAA use of PFAS firefighting foam
U.S. EPA

• May 2018: PFAS Summit
• Feb. 2019: PFAS Action Plan
  • Drinking water
  • Cleanup
  • Toxics
  • Monitoring
  • Research
  • Enforcement
  • Risk Communication
State policy

Banned PFAS in food packaging
• 2018: WA
• 2019: ME
• 2020: NY

Banned PFAS in firefighting foam
• 2018: WA
• 2019: MN, NH, NY
• 2020: CA

www.saferstates.com/toxic-chemicals/pfas/
Questions?

tom@GreenSciencePolicy.org

Learn More

• GreenSciencePolicy.org
• PFASCentral.org
Strategies for Communicating with Constituents and Collaborating to Address PFAS Contamination

Per- and Polyfluoroalkyl Substances (PFAS) in Drinking Water: What do Local Health Departments Need to Know

Melissa Harclerode

August 12, 2021
Principles of Risk Communication

- Establish dialogues early and continue through resolution.
- Include community in the decision-making process.
- Present accessible and clear information.
- Communicate both the known and the uncertainties.
- Listen, acknowledge and follow up on specific concerns.
- Communicate context for the risk.

Risk Communication Challenges: Example Community-Specific PFAS Cycle

Public Outreach Strategy & Plan

- Formalized outreach strategy planning framework
- Community assessment
  - Underserved populations
  - Customer profiles
  - Community values
- Communication methods
  - Virtual meetings, including use of Gather tool
  - Fact sheets, FAQs, surveys, press releases, magnets, social media

ITRC Risk Communication Toolkit

Steps 1 & 2 Identify the Issue & Set Goals
- Agenda for First Internal Communication Team Planning Meeting
- PFAS-specific SMART Goals

Steps 3 & 4 Audience Assessment
- Actor Mapping Tools, including PFAS-specific examples

Steps 5 Identify Messages
- Message Mapping Guide
- PFAS-specific Key Messages

Step 6 PFAS-Specific Communication Methods
- Case Studies
- Active Centralized Information Repositories
- Community Education Classes
- Guidance for Writing Analytical Results Summary Letters
- Guidance for Writing Press Releases
- Social Factors Vision Board
- Analytical Data Package Public Information Fact Sheet
- Tracking Form of Media Correspondence

Compilation of PFAS Fact Sheets, FAQs and other resources developed by the ASTHO and ECOS are available:
- https://www.astho.org/PFAS/

Consider Community-Specific EJ Populations

- More equally distribute unintended and intended community impacts from site activities and redevelopment
- Preliminary identify communication needs
  - Cultural considerations
  - Translation needs
  - Educational level
- Example tool: EPA’s Environmental Justice Screening and Mapping Tool
  - Minority population layer example (darker color is increased demographic population)
## Integrating Community Assessment Findings

<table>
<thead>
<tr>
<th>Select Community Assessment Findings</th>
<th>Select Community PFAS Risk Perception Factors</th>
<th>Select Key Message Topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community concern regarding chronic PFAS exposure and lack of information about and access to POET systems</td>
<td>Current lack of confidence in regulatory authority, public utility, mitigation measures, and treatment technologies</td>
<td>Interim mitigation measures are available and being implemented and description/efficacy of treatment technologies</td>
</tr>
<tr>
<td></td>
<td>Health impacts of PFAS</td>
<td>Communicate results of drinking water distribution sampling and the relative risk of exposure based on the sampling results</td>
</tr>
<tr>
<td></td>
<td>Water supply issues (well contamination)</td>
<td>Drinking water with PFOA + PFOS above HAL may pose a risk to human health</td>
</tr>
<tr>
<td></td>
<td>Impacted resources are associated with employment and local economic stimulus</td>
<td>Short-term actions performed to mitigate exposure to PFAS levels above HAL</td>
</tr>
<tr>
<td></td>
<td>Potential impact of PFAS contamination on property values, ecological resources, and local economy</td>
<td>Long-term treatment will be evaluated to perform PFAS source control, reduction, and mitigation</td>
</tr>
</tbody>
</table>

**Bolded** indicates a risk perception factor relating to Place & Locality  
**Italicized** indicates a risk perception factor relating to Trust & Communication  
**Underlined** indicates a risk perception factor relating to Agency & Power
## PFAS Communication Team Example RACI

<table>
<thead>
<tr>
<th>Engagement decision factor: Prepare fact sheet to address recent PFAS detections above screening criteria</th>
<th>Town Administration</th>
<th>Department of Public Works</th>
<th>Sewer Department</th>
<th>Drinking Water Utility</th>
<th>Health Department</th>
<th>Town Elected Officials</th>
<th>Citizen Action Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Draft Materials</td>
<td>R/A</td>
<td>C</td>
<td>C</td>
<td>C</td>
<td>C</td>
<td>I</td>
<td>C/I</td>
</tr>
<tr>
<td>Review Materials</td>
<td>R/A</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>I</td>
<td>C/I</td>
</tr>
<tr>
<td>Finalize Materials</td>
<td>R/A</td>
<td>C</td>
<td>C</td>
<td>C</td>
<td>C</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>Approve Materials</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>C/A</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>Distribute Materials</td>
<td>R/A</td>
<td>I</td>
<td>I</td>
<td>R/I</td>
<td>I</td>
<td>I</td>
<td>R</td>
</tr>
</tbody>
</table>

RACI = R – responsible; A – authorize; C – consult; I – inform
PFAS GROUNDWATER CONTAMINATION IN NORTHERN KENT COUNTY, MICHIGAN

SARA SIMMONDS – REHS, MPA - KENT COUNTY ENVIRONMENTAL HEALTH DIVISION DIRECTOR
KARLA BLACK – PHD, MEP, PEM, REHS – EMERGENCY PREPAREDNESS COORDINATOR
AUGUST 12, 2021
WHERE IS KENT COUNTY, MICHIGAN?
KENT COUNTY’S INTRO TO PFAS

• IN LATE 2016, PLAINFIELD TOWNSHIP UCMR HEALTH ADVISORY PFAS EXCEEDANCE IN TYPE I DRINKING WATER SUPPLY

• IN SPRING OF 2017 IN ABOUT THE SPAN OF THREE MONTHS:
  • NOTIFICATION OF CONCERN ABOUT A HISTORIC DUMP ON HOUSE STREET WITH PFAS CONTAMINATION
  • CONCERNED CITIZENS FOR RESPONSIBLE REMEDIATION
  • BRITTANY AND BRENT
  • INDEPENDENT RESIDENT COMPLAINT
  • DOD TESTING OF SITES FOR PFAS
1855 HOUSE STREET

- OWNED BY WOLVERINE WORLDWIDE
- LICENSED LANDFILL FROM AS EARLY AS THE LATE 1950’S CLOSED BY 1970
- REGULATED UNDER ACT 87 OF 1965 UNTIL 1976 WHEN RCRA WAS ADOPTED
- USED FOR THE DUMPING OF WASTE FROM THE TANNERY
- USED A METHOD OF DIGGING TRENCHES OR “SEEPAGE PITS” TO DISPOSE OF “LIME LIQUOR”

The lime liquor is a by-product of the Tanning operation; a mixture of lime, water, dissolved protein and fat.

Excerpt from WWW Plant Engineer letter from May 4, 1966 from WWW Plant Engineer to MDPH Director requesting addendum to Solid Waste Disposal License
REQUEST FOR A NEW RESIDENTIAL WELL PERMIT

BRITTANY AND BRENT

Testing overseen by MDEQ (now EGLE) and completed by Rose & Westra consultant for Wolverine Worldwide
JUST GET IN THE CAR, ALICE, I'LL EXPLAIN ON THE WAY.
DRINKING WATER WELL PERMITTING IN KENT COUNTY

- LOCAL HEALTH DEPARTMENTS AND DISTRICTS ARE DELEGATED THE AUTHORITY TO PERMIT RESIDENTIAL AND NON COMMUNITY WELLS BY THE PUBLIC HEALTH CODE
- RURAL AREA IMPACTED DOES NOT HAVE READY ACCESS TO MUNICIPAL WATER
STATE AND LOCAL RESPONSE

- THERE WAS NO ROAD MAP OR PROCESS IN PLACE FOR THIS RESPONSE
- PARTNERSHIP IN THE PUBLIC HEALTH INFRASTRUCTURE
- WORKING OUT THE KINKS
  - UNDERSTANDING ROLES AND SKILLS
  - UNDERSTANDING THE DATA AND ITS SIGNIFICANCE
- DAILY EVENING MEETINGS WITH COMMUNITY PARTNERS – DHHS, EGLE, PLAINFIELD TOWNSHIP, AND WOLVERINE WORLDWIDE FOR THE FIRST THREE AND HALF MONTHS FROM SEPTEMBER TO EARLY DECEMBER
- MONTHLY MEETINGS WITH THE EPA AND ATSDR
- ORDER TO RESTRICT THE DRILLING IN KNOWN AREAS OF CONTAMINATION
- LENGTHY DISCUSSIONS WITH STATE AGENCIES ABOUT THE IMPLICATIONS OF RESIDENTIAL MANAGEMENT OF A FILTRATION SYSTEM

https://www.epa.gov/pfas/epa-drinking-water-laboratory-method-537-qa
SAMPLING TO DATE

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential Wells Tested</td>
<td>1722</td>
</tr>
<tr>
<td>Samples received</td>
<td>1772</td>
</tr>
<tr>
<td>Not detected</td>
<td>926</td>
</tr>
<tr>
<td>Number between not detected and the</td>
<td>670</td>
</tr>
<tr>
<td>standard</td>
<td></td>
</tr>
<tr>
<td>Number greater than or equal to</td>
<td>126</td>
</tr>
<tr>
<td>Standard</td>
<td></td>
</tr>
<tr>
<td>Highest Level of PFOS+ PFOA Detected</td>
<td>96,000 ppt</td>
</tr>
</tbody>
</table>

https://www.michigan.gov/pfasresponse/0,9038,7-365-86511_82704_83030---,00.html
RISK COMMUNICATION: COMMUNICATING THE UNKNOWN

WATER RESULTS:

• KCHD CALLED RESIDENTS WITH DETECTIONS OVER 70 PPT AND NOT DETECTED
• DHHS CALLED THE MID RANGE SAMPLES ABOVE 10 PPT UNDER 70 PPT
• MENTAL HEALTH CONCERNS FOR RESIDENTS DUE TO STRESS AND UNCERTAINTY

UNCERTAINTY IN SCIENCE

• WHAT DOES THE 70 PPT MEAN?
• INITIALY DRIVEN BY RESIDENTIAL WATER WELL SAMPLES
• METHODS BEING USED BY LABS DIFFERED – EPA 357.1 OR MODIFIED
• WALKING BACK
WRITTEN AND IN PERSON COMMUNICATIONS

• BUILDING TRUST THROUGH CONSISTENT FACTUAL COMMUNICATE WITH THE RESIDENTS IN A TIMELY MANNER

• CREATING A UNIVERSAL MESSAGE BETWEEN AGENCIES
  • WEEKLY NEWSLETTERS FOR THE FIRST SIX MONTHS TO A YEAR
  • THREE TOWNHALL MEETINGS WITH THE COMMUNITY
  • EVENTUALLY LIVE STREAMING
  • SMALL COMMUNITY MEETINGS AT THE NEIGHBORHOOD LEVEL WITH EGLE AND MDHHS

• ADVOCACY. ADVOCACY. ADVOCACY.
WHERE ARE WE NOW?

- DATA COLLECTION
- MUNICIPAL WATER EXTENSION AND FILTRATION OPTIONS
- LAWSUITS
- NOW 17 AREAS OF INVESTIGATION OR INTEREST IN KENT COUNTY
- HEALTH STUDY
WHAT ABOUT MY HEALTH?

• RETROSPECTIVE CANCER INCIDENCE STUDY
  • PROSTATE CANCER

• EXPOSURE ASSESSMENT
HOW AN EXPOSURE ASSESSMENT IS DIFFERENT FROM A HEALTH STUDY

• EXPOSURE ASSESSMENT: AMOUNT OF CHEMICAL IN BLOOD OR URINE

• HEALTH STUDY: AMOUNT OF CHEMICAL IN BLOOD OR URINE AND INFORMATION ON HEALTH CONDITIONS
PURPOSE OF THIS EXPOSURE ASSESSMENT PROJECT

• LEARN THE AMOUNTS PFAS IN THE BLOOD OF PEOPLE FROM NORTH KENT COUNTY WHO HAD PFAS IN THEIR PRIVATE DRINKING WATER WELLS,

• COMPARE THAT TO AMOUNTS OF PFAS IN THE U.S. POPULATION,

• COLLECT WATER SAMPLES THAT REPRESENT CURRENT AMOUNTS OF PFAS IN THE PARTICIPANT’S PRIVATE DRINKING WATER, AND

• IDENTIFY FACTORS THAT CAN AFFECT HOW MUCH PFAS IS IN PEOPLE’S BLOOD.
ELIGIBILITY:

Their drinking water was tested by or at the direction of the DEQ as part of the House Street or North Kent environmental investigation and PFAS was detected.

Random Selection

Lived in the home before January 1, 2018

Have ever used the private well water for drinking

Weigh more than 16 pounds

Agree to blood sample, water sample, and questionnaire
CLINIC STRENGTHS AND CHALLENGES

• STRENGTHS
  • POD PLANNING
  • EXERCISING
  • TIME FRAME

• CHALLENGES
  • IRB PROCESS/TIME FRAME
  • RECRUITMENT
  • STAFFING NON-TRADITIONAL ROLES
  • LOGISTICS
  • PARTNERSHIPS
  • PEOPLE DIDN’T KNOW WHAT WE CAN DO!

Results: https://www.michigan.gov/mdhhs/0,5885,7-339-71548_54783_54784_74881-537202--,00.html
THANK YOU

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PLAINFIELD TOWNSHIP
ALGOMA TOWNSHIP