



Minnesota Pollution Control Agency (MPCA)  
PFAS Response and  
3M Natural Resource Damage Settlement

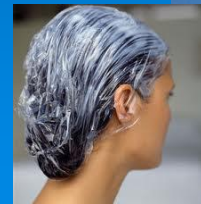
Wisconsin DNR Brownfields Study Group – September 28, 2018

Gary L Krueger, Supervisor — MPCA Superfund Program

# Per- and Polyfluoroalkyl Substances (PFAS)



- ▶ aka Perfluorochemicals (PFCs)
- ▶ First made in 1940's (3M, Dupont)
- ▶ Surfactants with unique chemical properties
- ▶ Used for many years in products that resist heat, stains, water, oil and grease
- ▶ Many other specialized industrial and commercial uses (operative word: non-stick)
- ▶ DoD Fire Suppression



# Other PFAS(aka PFCs) uses/products/sources

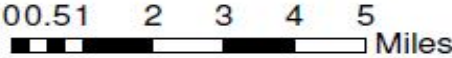
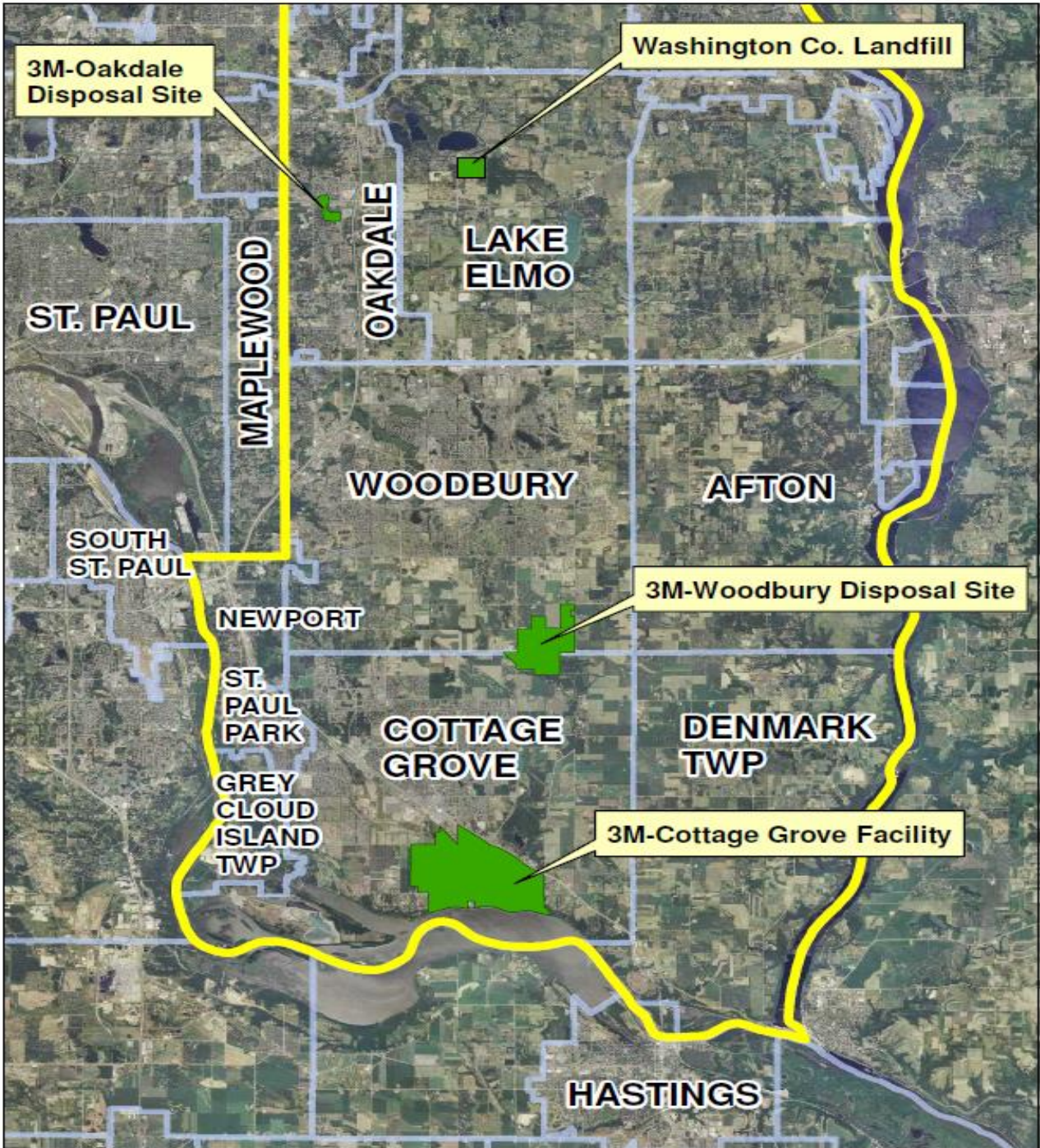
- ▶ Printing Industry
- ▶ Paper Mills
- ▶ Compostable Paper Products
- ▶ Plating Facilities
- ▶ Tanneries
- ▶ WWTP – Biosolids/Sludges
- ▶ Plastics
- ▶ Semiconductors
- ▶ Landfills
- ▶ Surgical and Medical Instruments
- ▶ Breweries (labels) !!
- ▶ And.....
- ▶ And.....



# Brief history of PFCs in the Twin Cities East Metro area

- **2002:** 3M informs MPCA of PFCs in production wells at Cottage Grove facility
- **2007:** MPCA and 3M agree to Consent Order outlining 3M is responsible for:
  - Providing safe drinking water to affected residents
  - Clean-up 3M PFC waste disposal sites (Oakdale, Woodbury and Cottage Grove)
    - Excavation of PFC contaminated soil/sediment at each 3M site (2007 – 2012)
    - Groundwater containment/treatment systems in place at each 3M site
    - Washington County Landfill – MPCA Closed Landfill Program
  - Monitoring groundwater – private/public drinking water supplies
- **2010:** Attorney General files Natural Resource Damage lawsuit on behalf of State, with MPCA and DNR as trustees

# Location of 3M PFC Sites in Washington Co., Minnesota



# Minnesota PFC Disposal Sites

- 3M PFC Disposal Sites
  - Non – PFC cleanup actions
  - 3M Oakdale – State and Federal Superfund Listed
  - 3M Woodbury – State Superfund (Voluntary Remediation)
  - 3M Cottage Grove – State Superfund Listed
  - Washington County Landfill - Closed Landfill Program/Federal Delisted
- Disposal occurred at sites 1950's – 1970's
  - Sites addressed for non-PFC contamination (VOCs)
  - Long Term O&M prior to discovery of PFC releases

# MPCA/3M 2007 Consent Order

## Background

- MPCA staff proposed to issue a Request for Response Action under MERLA to 3M.
- 3M disputed that PFCs are hazardous substances under MERLA.
- Before deciding to issue a RFRA, MPCA Citizens Board gave 3M an opportunity to voluntarily enter into an agreement.
- MPCA & 3M reached agreement - the 2007 Settlement Agreement and Consent Order.
- ***Significant*** Interest – State Legislature, Local Officials, Public

# MPCA/3M Consent Order

May 22, 2007

- MPCA Citizens Board defers decision to issue Request For Response Action (RFRA) to 3M – April 2007
- Provisions for dealing with affected municipal and private water supplies
- **Focus on PFOS/PFOA, with provisions for addressing PFBA and other PFCs in future**
- 3M responsible for additional studies needed on health effects and payment for the state's costs
- 45-day review time for MPCA
- Hazardous Waste determination and NRDA action not precluded
- MERLA Hazardous Substance – 3M/MPCA agree to disagree



# 2007 Consent Order

- Cleanup plans need to be rigorous and robust
  - “I want this stuff out of the ground and out of Minnesota!”
- 3M to follow NPL feasibility study process, with primary consideration for response actions –
  - **Excavation and destruction of PFCs; or**
  - **Excavation, engineered isolation and containment of PFCs.**
- Excavated material would not be considered to be hazardous waste based solely on PFCs.
- MPCA reserved right for natural resource damage claims

# 2007 Consent Order

## 3M Agreed To:

- Implement response actions, including provision of alternative sources of drinking water(public and private) when above health limits.
- Provide an \$8 million **grant** to the MPCA to help remediate the Washington County Landfill.
- Provide a \$5 million **grant** to the MPCA for environmental studies for PFC impacts not related to 3M PFC disposal sites.
  - State-wide survey AFFF sites, Fish Tissue & Surface Water Monitoring, WWTP Assessment, etc.
    - <https://www.pca.state.mn.us/waste/perfluorochemicals-pfcs>
    - <https://www.pca.state.mn.us/sites/default/files/c-pfc1-02.pdf>

# Environmental Investigations

- State-Wide AFFF survey
- Ambient Ground-water monitoring
- Fish-tissue and surface-water monitoring
- Storm water monitoring
- Water-quality criteria development
- Wastewater treatment plant assessment
- Air and precipitation monitoring
- Wildlife/ecological studies
- Soil microcosm studies with EPA labs
- Home garden studies and bio monitoring by MDH
- <https://www.pca.state.mn.us/sites/default/files/c-pfc1-02.pdf>
- MPCA/MDH PFAS web pages
  - <https://www.pca.state.mn.us/waste/perfluorochemicals-pfcs>
  - <http://www.health.state.mn.us/divs/eh/hazardous/topics/pfcs/index.html>

# Superfund Response Actions - Summary

- Soil/sediment excavations completed at all 3M sites (2008 – 2012)
  - Excavated material disposed in 3M cell at SKB Industrial Landfill (> 100,000 cy) (Doubled lined cell w/doubled line facility and separate leachate collection system)
- Groundwater extraction and/or treatment systems installed or in final design at 3M sites
- Drinking water monitoring & GAC installation and **maintenance** (currently nearly 950 private well advisories by MDH, 600 home GAC systems installed)
- On-going monitoring of Municipal Wells

# Washington County Landfill

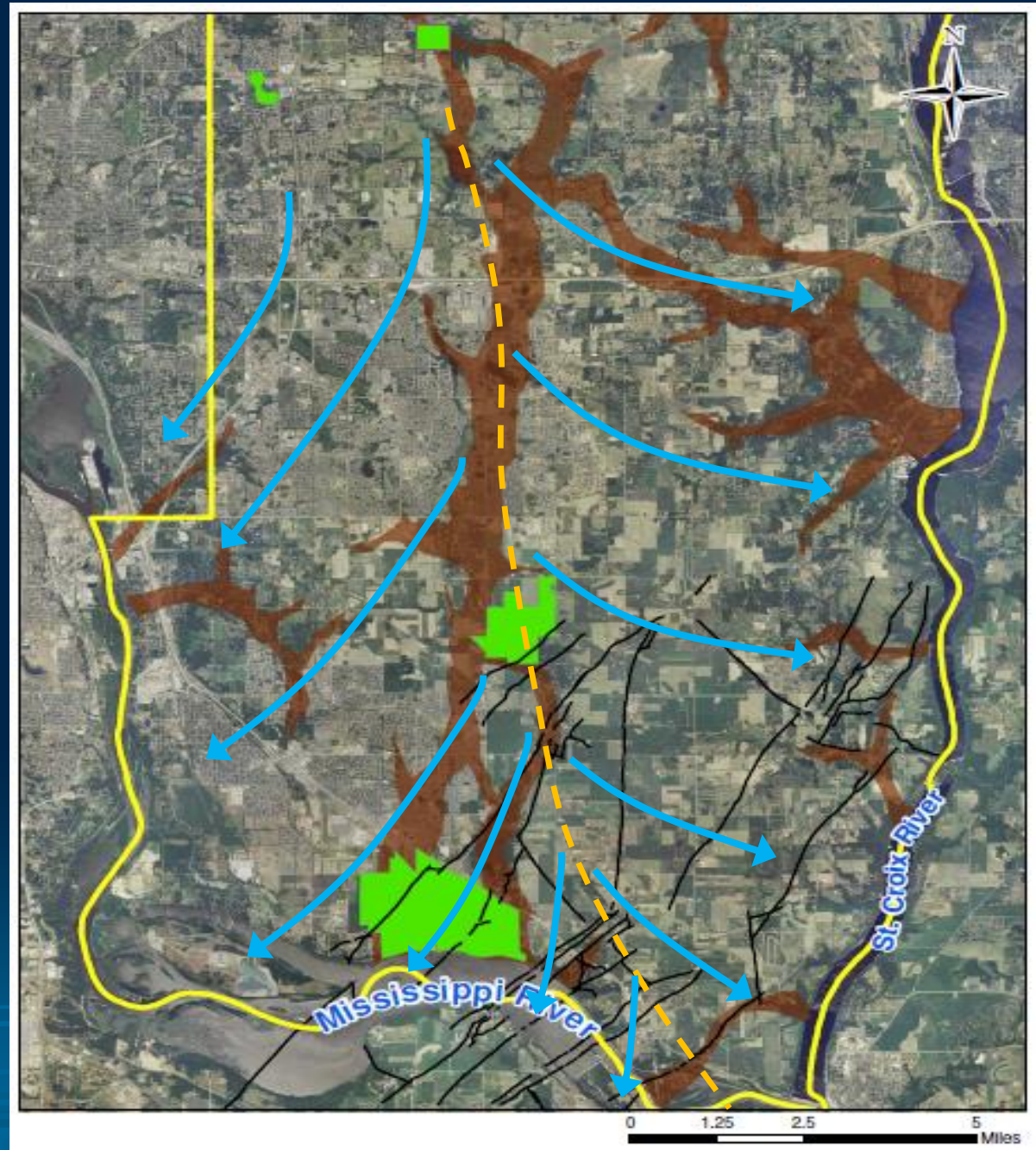
- Closed Landfill Program
  - Permitted Facility
- State responsible for long term operation and maintenance
- Remedy Evaluation using Superfund Criteria
- Construction of triple liner completed Oct. 2011
  - ▶ MN Legislation requirement
  - ▶ 3M provided funds towards construction
  - ▶ ~ 1.9 million cy garbage relocated
  - ▶ Total cost - ~ \$25 million

# Superfund Program Impacts

- MPCA Lateral Team (2005 – 2008)
  - Monthly meetings - Superfund Lead Program
  - MPCA Board - quarterly updates (2007 – 2009)
- Public Information meetings
  - 3M, MDH, MPCA
  - Press coverage
- Coordination with local officials
  - Public Works Directors, City Engineers, City/County Environmental staff
- **Significant** Legislative involvement
  - East metro working group (2007 – 2011)
- ***“All PFCs, All the Time!”***

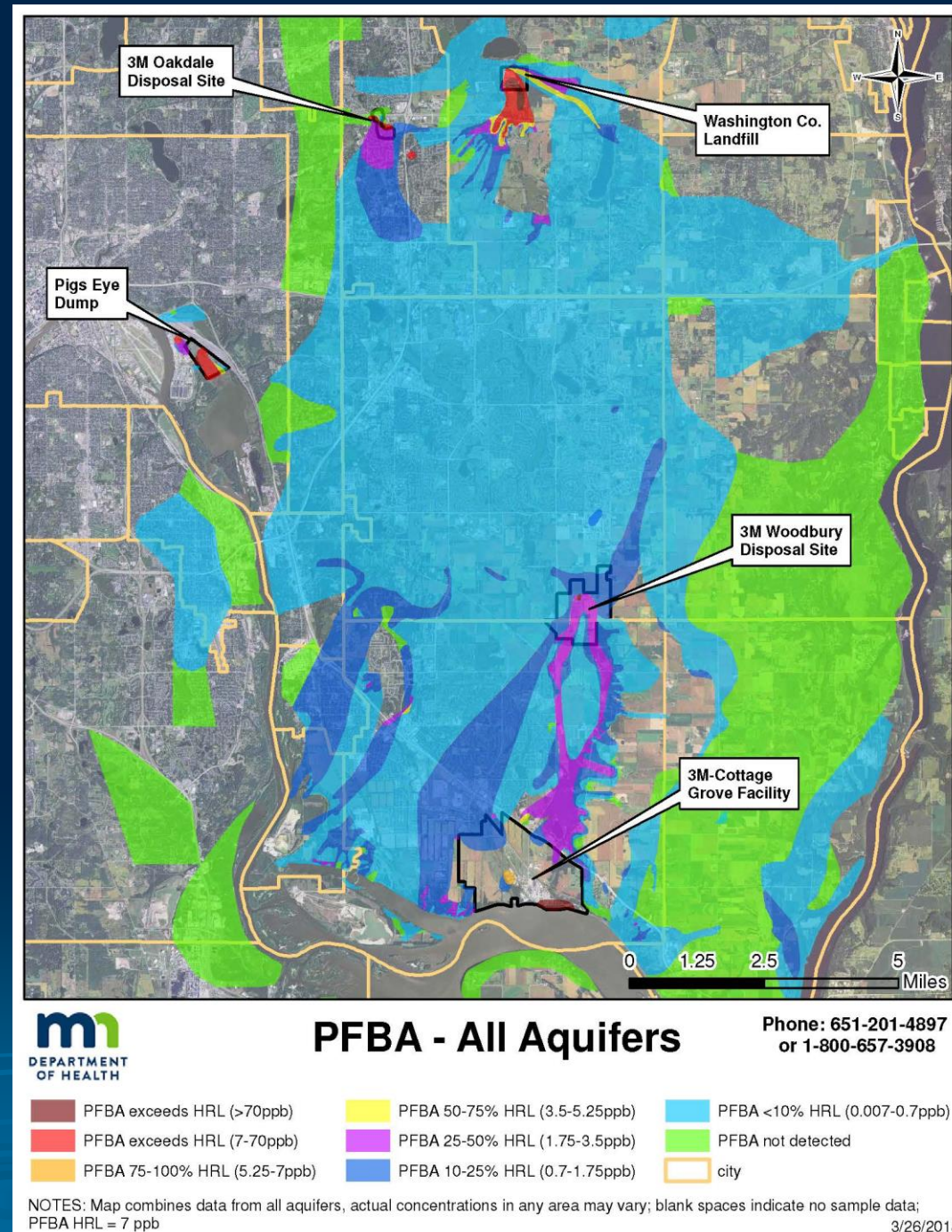
# Groundwater Flow

- A groundwater divide extends from north to south beneath the county
- East of the divide groundwater flows to the St. Croix River
- West of the divide groundwater flows to the Mississippi River
- Close to where the two rivers meet, the flow “fans out” toward either river
- Locally, groundwater flow may be influenced by pumping wells



# Result: Extremely Large “Co-Mingled” Plumes

- **Over 130 sq. mi.**
  - 4 major aquifers
  - 8 municipal systems
  - ~2000 private wells known to be impacted
  - Much larger than predicted by models
- **PFBA most widespread**
  - More PFBA in source areas
  - More mobile
- **Distribution controlled by:**
  - Bedrock features
  - Groundwater - Surface water interactions
  - PFAS chemical properties
  - Groundwater pumping
- **Several “anomalous” areas**





# Municipal Well PFAS Impacts

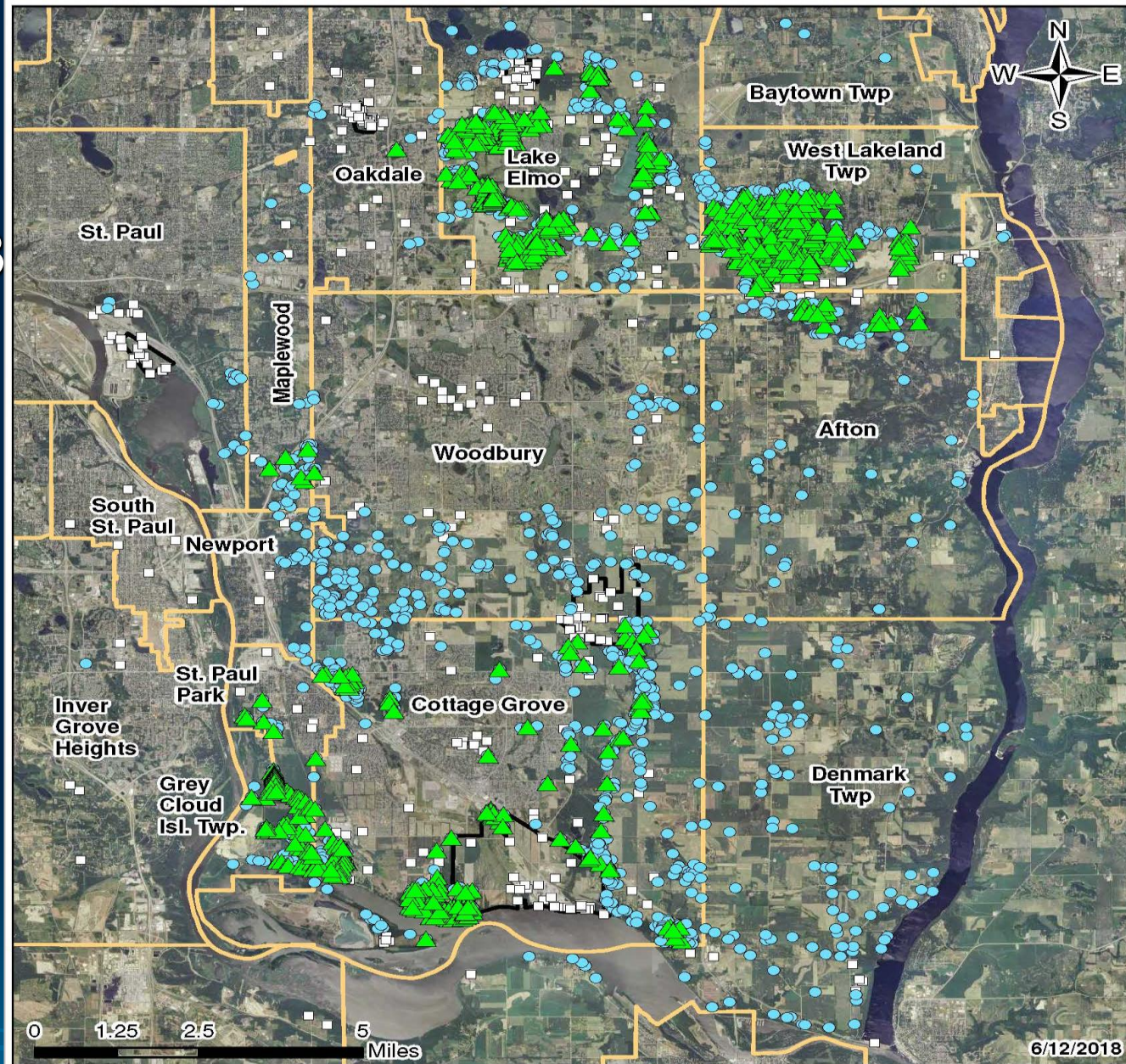
- MDH Advisories issued to Cities of Oakdale, Cottage Grove, Lake Elmo, St. Paul Park and Woodbury
- Oakdale – Carbon Treatment funded by 3M prior to CO
  - 7 of 9 wells exceed MDH guidance
- Cottage Grove – “Temporary” Carbon Treatment for 2 wells
  - 8 of 12 wells exceed MDH guidance
- Lake Elmo – Discontinue use, one of three wells
  - 3M funded connection of ~200 homes to municipal supply prior to CO
- St. Paul Park – Discontinue use, one of three Wells
  - Temporary treatment planned for 2 wells
- Woodbury – Five of 19 wells impacted
- \*\*Bemidji - Non East Metro – 2 of 3 exceed MDH guidance (AFFF)

# Private Well Sampling Effort & Drinking Water Advisories

~2,500 wells sampled since 2003

- Frequent, intensive monitoring of private wells:
  - Near source areas
  - Areas with high or changing PFAS concentrations
  - Areas with complex geology
- Less frequent monitoring of “sentry” private wells:
  - Distal portions of plumes
  - Areas with low and stable PFAS concentrations
  - Areas with relatively simple geology

>950 drinking water advisories issued

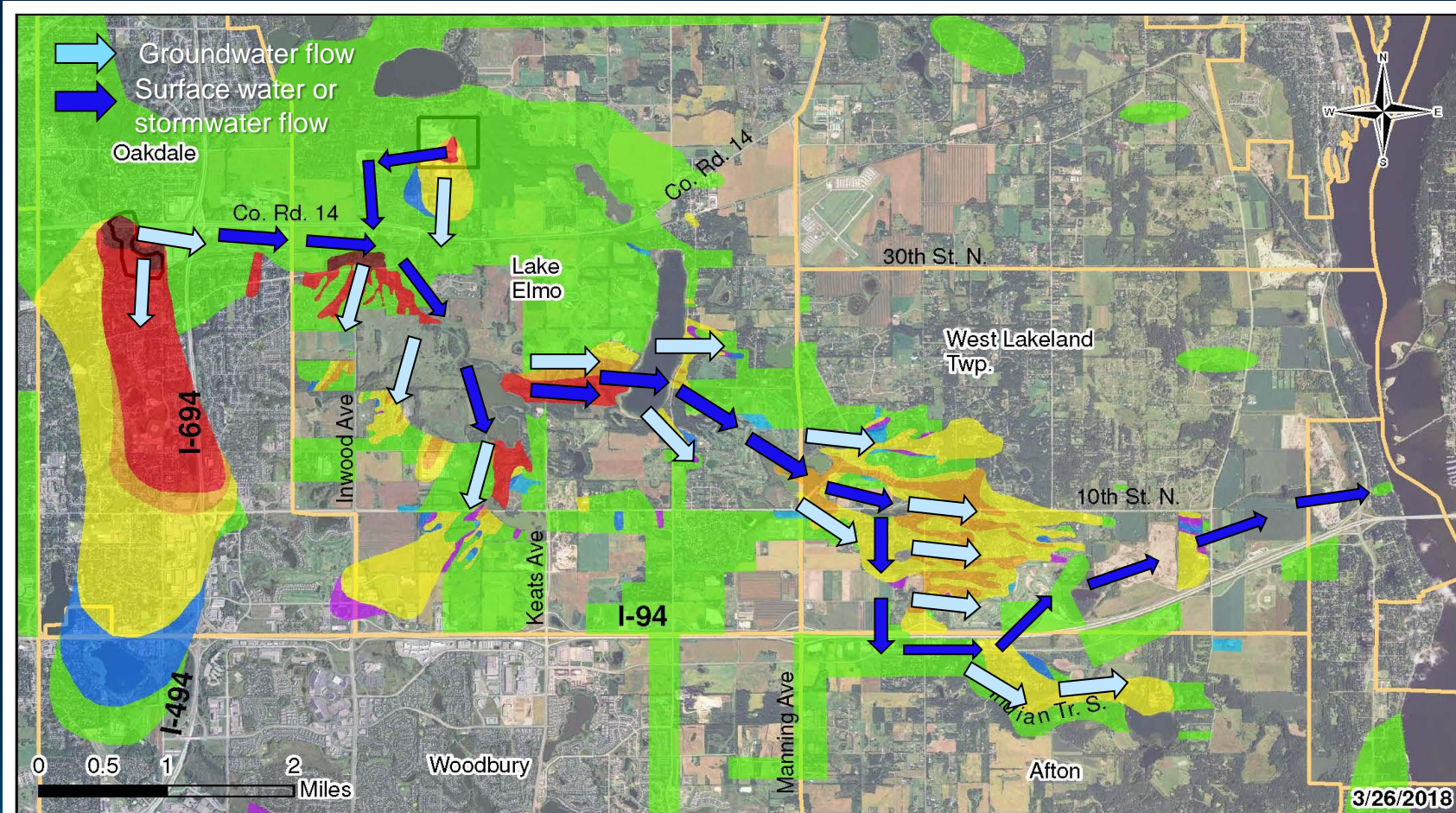


## Well Advisory and Well Sample Locations

- ▲ Well advisory issued
- Private drinking water wells sampled
- All other wells (municipal, business, church, school, monitoring, and other types of wells)









Phone: 651-201-4897  
or 1-800-657-3908

# PFAS in Surface Water – Important Transport Pathway



## PFOS - All Aquifers

Phone: 651-201-4897  
or 1-800-657-3908

 PFOS greater than 1.35ppb (>50x HBV)	 PFOS 0.021-0.027ppb (75-100% HBV)
 PFOS 0.271-1.35ppb (10-50x HBV)	 PFOS 0.0136-0.02ppb (50-75% HBV)
 PFOS 0.136-0.27ppb (5-10x HBV)	 PFOS 0.004-0.0135ppb (<50% HBV)
 PFOS 0.028-0.135ppb (1-5x HBV)	 PFOS not detected

MDH Health Based Value (HBV) for PFOS is 0.027 parts per billion (ppb; or 27 parts per trillion)

NOTES: Map combines data from all aquifers, actual concentrations in any area may vary; blank spaces indicate no sample data

# What's been done recently

- By 2016, MPCA maintained ~100 carbon treatment systems at residences
  - Monitoring ~ 200 – 250 residential wells per year
- Since EPA and MDH lowered drinking water health values in 2016 and 2017:
  - EPA – 70 ppt for PFOS and PFOA
  - MDH – 27 ppt for PFOS, 27 ppt for PFHxS\*, 35 ppt for PFOA, 2 ppb for PFBS and 7 ppb for PFBA
- Almost 2,000 additional residential wells sampled
- Almost 850 additional wells tested over MDH health values (drinking water well advisories)
  - All of these residents were offered bottled water
  - 600 of these agreed to carbon treatment systems

# What is Natural Resource Damage?

- Natural resource damage is compensation for impacts to natural resources such as:
  - Groundwater
  - Surface waters (lakes, streams, and wetlands)
  - Fisheries
  - Wildlife
  - Natural habitats
- Natural resource damage not addressed under the 2007 Consent Order.
- The 2018 settlement addresses natural resource damages.

# NRDA Litigation – Procedural History

- December 2010 - State sued 3M for natural resource damages.
- April 2012 - 3M brought disqualification motion of State's outside counsel.
- October 2012 - District Court granted 3M's motion.
- July 2013 - Minnesota Court of Appeals affirmed district court.
- April 2014 - Minnesota Supreme Court affirmed in part, reversed in part and remanded.
- February 2016 – District court denied 3M's disqualification motion.
- February 20, 2018 - Trial date scheduled to begin, agreement reached.

# 2018 NRDA Settlement: major components

- \$850 million **Grant** to the State
  - \$125 million from settlement for outside counsel
  - \$4.5 million reimbursement for MPCA's 2017 costs under the 2007 Consent Order
- \$720 million immediately available to provide long-term solutions in the east metro area for:
  - Clean and sustainable drinking water
  - Restoration and enhancement of natural resources
- Restrictions about how the grant can be used
- Expectations for community participation
  - All workgroup meetings are open to public
- Preserves 3M's obligations under the 2007 Consent Order

# Priority One — safe drinking water

- Ensure clean drinking water to meet current and future needs
- Afton, Cottage Grove, Lake Elmo, Newport, Oakdale, St. Paul Park, Woodbury and townships of Denmark, Grey Cloud Island, West Lakeland
  - Alternative sources of drinking water for cities or private well owners
  - Treat existing contaminated drinking water wells
  - Potentially connect homes with private wells to municipal drinking water systems
  - Promote water conservation
  - Preserve open spaces that recharge drinking water sources
  - Assessment of Valley Branch Water District Project 1007
    - Lake Elmo – Fish Consumption Advisory – No Fish!
  - Additional east metro communities added if PFAS impacts identified



# Priority Two — enhance natural resources

- Restore and enhance natural resources in the east metro area or downstream on the Mississippi and St. Croix Rivers
  - Restore and protect fish and wildlife habitat
  - Restore access to outdoor recreation
  - MPCA and DNR have immediate access to \$20 million in grant funds
  - Priority One projects must be completed prior to additional Priority Two projects

# Working groups/Financial Framework

- MPCA and DNR will work collaboratively to develop and prioritize drinking water and natural resources projects
  - Working groups with representatives from local government, Watershed Districts, Met Council, Minnesota Department of Health, and 3M
  - Citizen - Business Advisory Group
  - Final decisions made by MPCA and DNR
- Settlement requires grant to be deposited in Remediation Fund
- Use of dollars governed by agreement and overseen by District Court
- Financial framework established by Minnesota Superfund Statute

# Settlement Working Groups

- A main **Government – 3M Working Group** that will provide recommendations on projects and priorities to the MPCA and DNR. Members to include 3M, MPCA, DNR, Washington County, each of the affected communities and rep. from citizen and business group.
  - Work Group Support – MPCA and DNR
  - Work Group Charters
- **Citizen and Business Group** – will identify and recommend projects to the MPCA and DNR. Members will include MPCA, DNR and 15 at-large citizen, business and nongovernmental reps.
- **Drinking Water Supply** subgroup that will analyze options and deliver recommendations to the Working Group for long-term solutions for alternative drinking water sources and/or treatment of existing water supplies for affected communities. Members will MPCA, DNR, MDH, 3M, Met Council, Washington County and affected communities.
- A **Groundwater Protection, Sustainability, Conservation and Recharge** subgroup that will analyze options and deliver recommendations to the Working Group for long-term solutions for groundwater protection, recharge, conservation, sustainability, and for groundwater studies and modeling needs in the East Metropolitan Area. Members will include MPCA, DNR, MDH, 3M, Met Council, Washington County, Watershed Districts and affected communities.

# Legislative Oversight

- House File 3660 – Chief Authors - Reps. Franke and Jurgens
  - Signed by Governor on May 29, 2018
- Established Water Quality and Sustainability Account within the Remediation Fund
- Regular fiscal and progress reports
- Regular legislative updates
- Local approval for operating existing water supply systems
- Establish web page for East Metro residents to request well sampling
  - <https://www.pca.state.mn.us/waste/well-sampling-east-metro-area>
  - Reporting to local officials of private well tests conducted/results

# On-going MPCA Superfund actions

- NRDA Settlement provided additional \$40 million from 3M for temporary drinking water treatment systems (public or private)
  - Provide bottled water/installation of Granular Activated Carbon (GAC) systems at residences receiving well advisories by MDH
  - Cottage Grove and St. Paul Park temporary treatment system (and other communities if necessary)
- Continued oversight of 3M actions being done at 3M disposal sites under terms of the 2007 Consent Order
  - MPCA costs reimbursed by 3M
- Coordination with Minnesota Department of Health regarding sampling/monitoring of private/public drinking water supply wells (over 1,000 planned for this next year)

# Other on-going MPCA activities

- Statewide inventory of potential PFAS use facilities/locations
- On-going MPCA activities include monitoring lakes/fish, solid waste facilities, leachate and biosolids testing, compost facilities, wastewater facilities ....
- Re-activation of agency PFAS Lateral Team
- ITRC/ASTSWMO/ECOS workgroups
- Intra & Inter-State/EPA Coordination
- U of Minnesota research
- TBD....

# More Information

Minnesota 3M PFC Settlement Web Page

<https://3msettlement.state.mn.us/>

East Metro Well Sampling Web Page

<https://www.pca.state.mn.us/waste/well-sampling-east-metro-area>

MPCA PFC Web Page

<https://www.pca.state.mn.us/waste/perfluorochemicals-pfcs>

MDH PFAS Web Page

<http://www.health.state.mn.us/divs/eh/hazardous/topics/pfcs/index.html>

Questions/information

[pfinfo.pca@state.mn.us](mailto:pfinfo.pca@state.mn.us)

# MPCA/MDH PFAS contact information

## MPCA NRDA Settlement

Kirk Koudelka – Assistant Commissioner [kirk.koudelka@state.mn.us](mailto:kirk.koudelka@state.mn.us)

Elizabeth Kaufenberg – Project Manager [elizabeth.kaufenberg@state.mn.us](mailto:elizabeth.kaufenberg@state.mn.us)

## Environmental Investigations

Summer Streets [summer.streets@state.mn.us](mailto:summer.streets@state.mn.us)

## Landfills/Solid Waste

Jamie Wallersted [jamie.wallersted@state.mn.us](mailto:jamie.wallersted@state.mn.us)

## Minnesota Department of Health

Ginny Yingling [virginia.yingling@state.mn.us](mailto:virginia.yingling@state.mn.us) ITRC Co-Chair PFAS Team



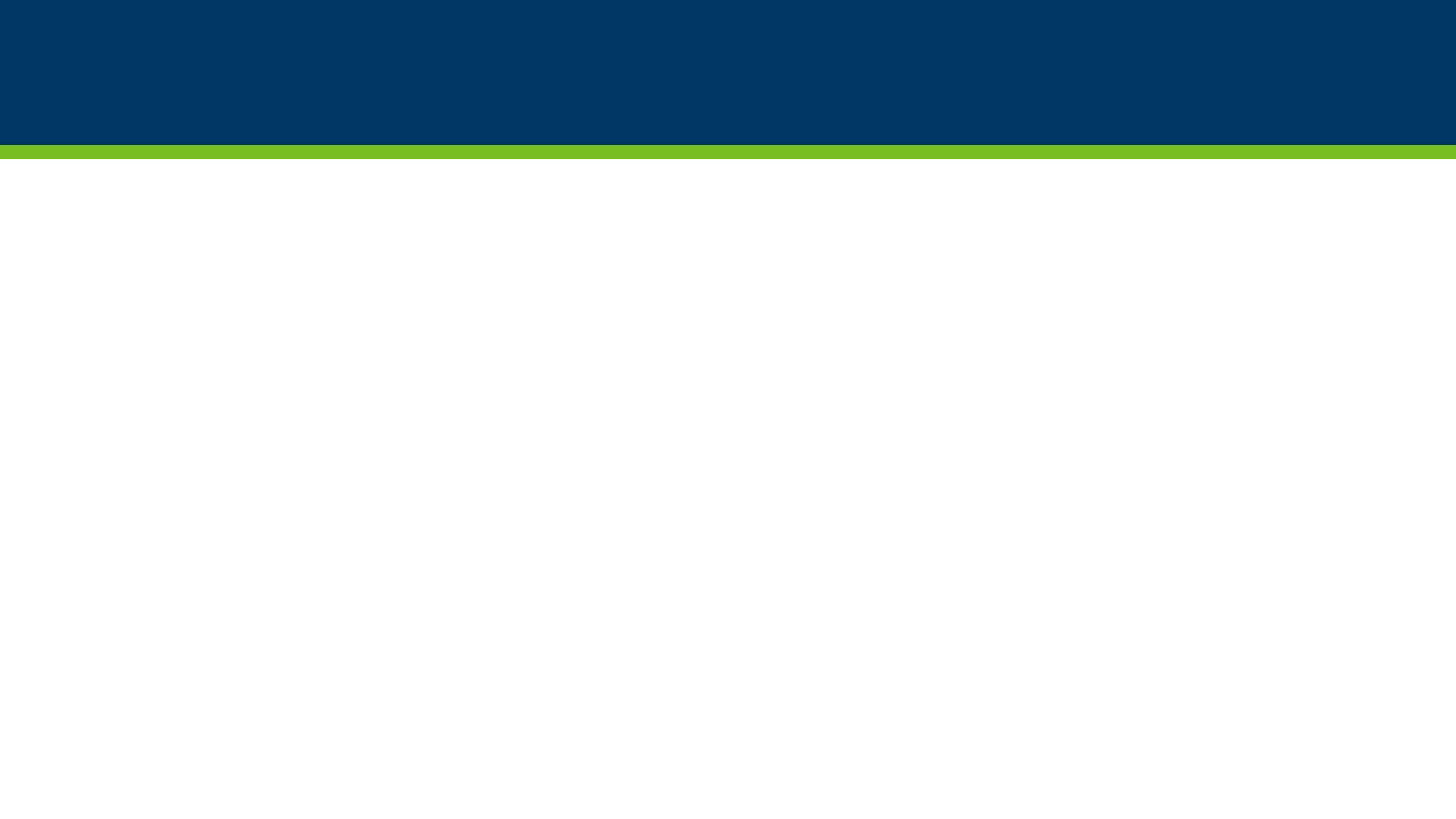
# Questions

Gary L Krueger

MPCA Superfund

651-757-2509

[gary.krueger@state.mn.us](mailto:gary.krueger@state.mn.us)



# MERLA – Definition of Hazardous Substance

Minn. Stat. 115B.02, subd. 8

- Any commercial chemical under the Federal Water Pollution Control Act.
- Any hazardous air pollutant under the Clean Air Act.
- Any hazardous waste (defined in 115B.02, subd. 9).

# Definition of Hazardous Waste

## Minn. Stat. 115B.02, subd. 9

- Any hazardous waste defined in Minn. Stat. 116.06, subd. 11 and any substance identified as hazardous waste under MPCA rules (characteristic waste or listed waste); and
- Any hazardous waste as defined in RCRA, which is listed or has characteristic of hazardous waste under federal regulations.

# Hazardous Waste - Minn. Stat. 116.06, subd. 11)

Hazardous waste is any substance which may:

- cause or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible illness; or
- pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed.

# Hazardous Waste Definition

- 3M disputed that PFCs were hazardous substances/hazardous waste both in the 2007 Consent Order negotiations and in the State v. 3M NRDA litigation.
- 2007 Consent Order – Did not resolve this issue.
- State v. 3M litigation – was an issue in the litigation.