



Perfluorochemicals (PFCs) and Health-Based Values Oakdale

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- What are PFCs (also known as PFAS)?
 - Where do they come from?
 - Why are they important?
- What are MDH's Health-Based Values?
- What about PFCs in Minnesota?
- What have other communities done?

PFCs (also known as PFAS)

- Human-made chemicals found in everyday items
- Used since 1940s to make products that resist heat, stains, water, oil and grease; production increased rapidly in 1970s
- Many other specialized industrial and commercial uses (operative word: non-stick)



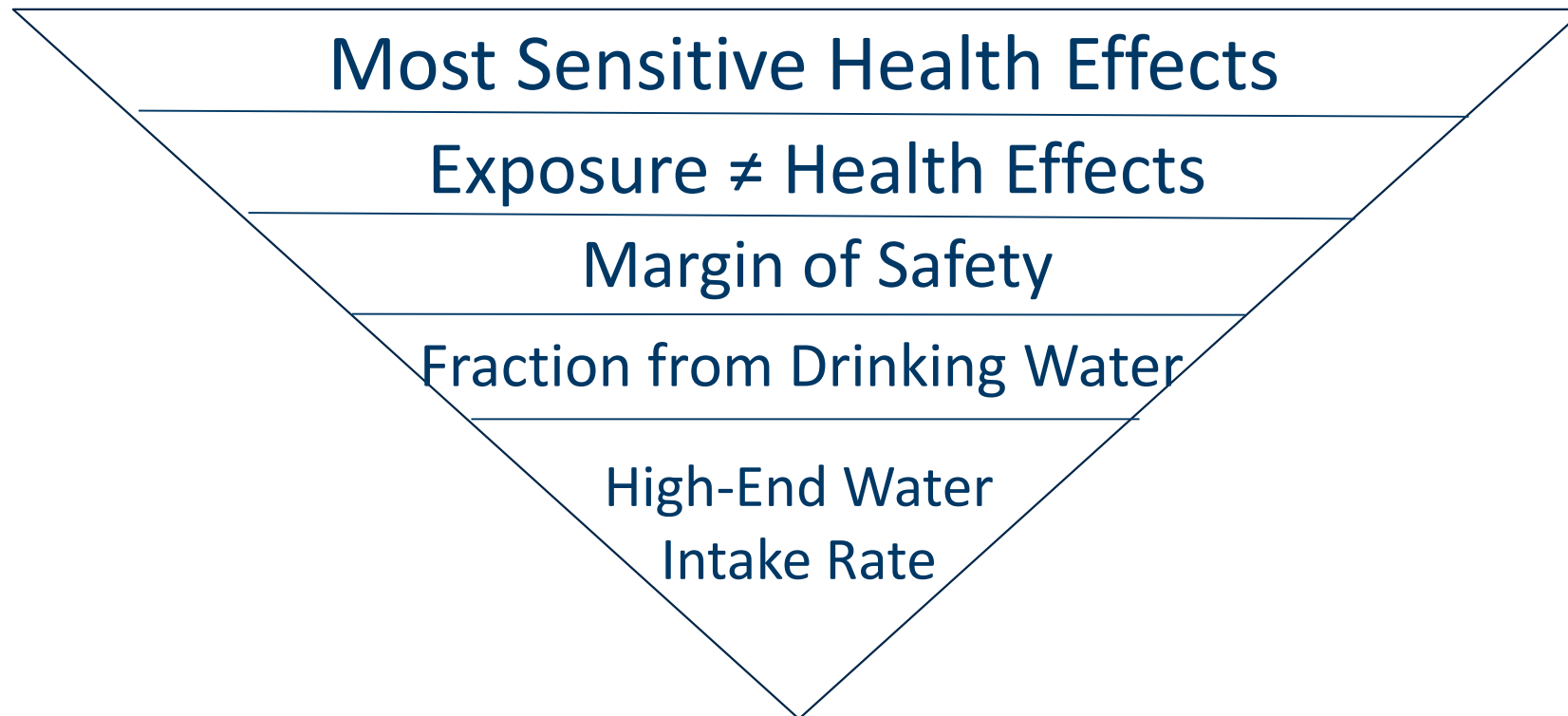
PFCs in the Environment

- PFCs are persistent in the environment
 - They don't break down and they can accumulate over time
- PFCs can be found in
 - **Food** packaged or processed with PFAS-containing materials or grown in contaminated soil/water
 - **Commercial household products**, including stain-resistant fabrics, nonstick products, polishes, paints, waxes, and cleaning products
 - **Workplaces** that use PFAS
 - **Drinking water**, typically associated with a specific facility or site
 - **Living organisms**, including fish, animals, and humans

Why are PFCs important?

- Most people have been exposed to PFCs because they are in so many products
- PFCs can accumulate and stay in the human body for long periods of time
- There is some evidence that exposure to PFCs at high levels is associated with negative health outcomes

MDH Health-Based Values



Health-Based Value

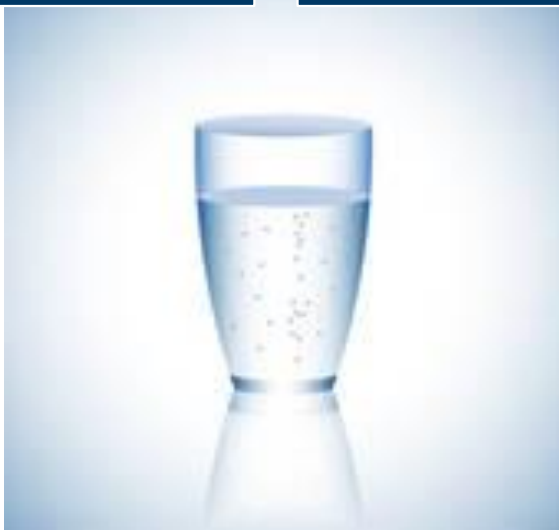
MDH Health-Based Values

PFOS:
0.027 ppb

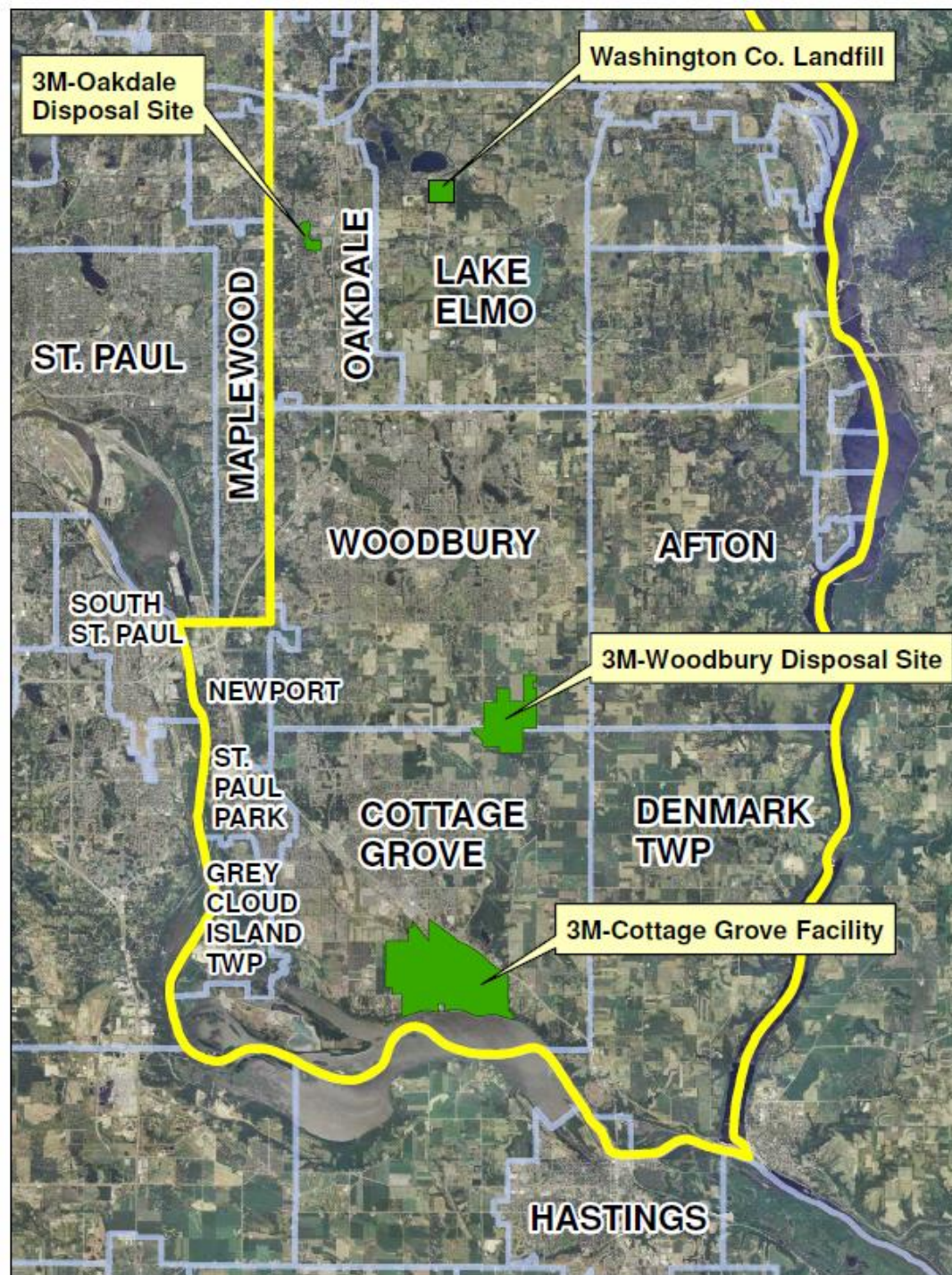
PFOA:
0.035 ppb

PFBA:
7.0 ppb

PFBS:
2.0-3.0 ppb



- MDH evaluates the combined effects of PFCs: Health Risk Index (HRI)
 - Allows us to account for differing levels of toxicity in similar chemicals
- Protective for people who are exposed over their lifetimes
- Protective for fetuses
- Based on animal studies showing slight liver and thyroid effects (adults) and immune system and developmental effects (infants/children)

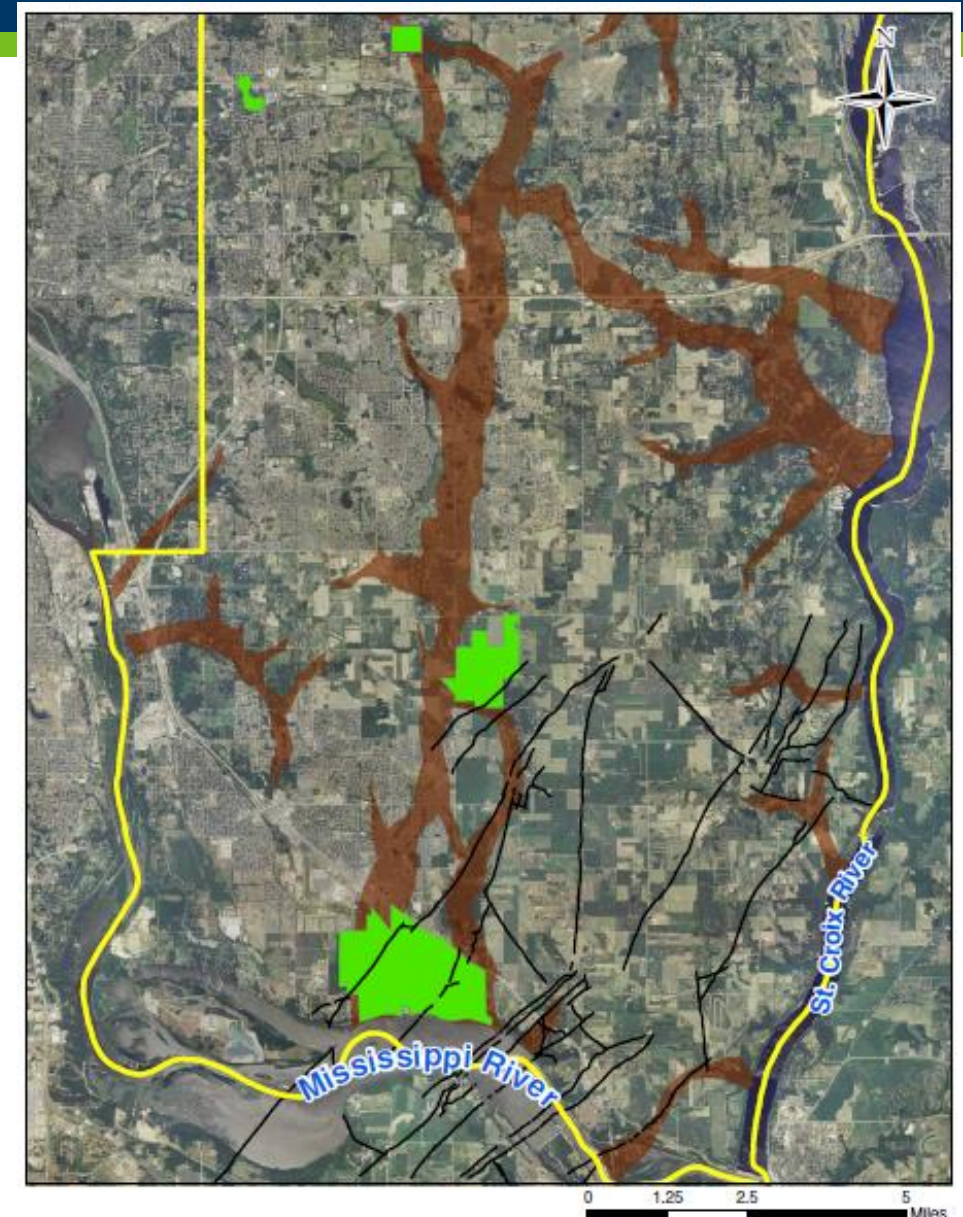


Location of 3M PFC Sites in Washington Co., Minnesota



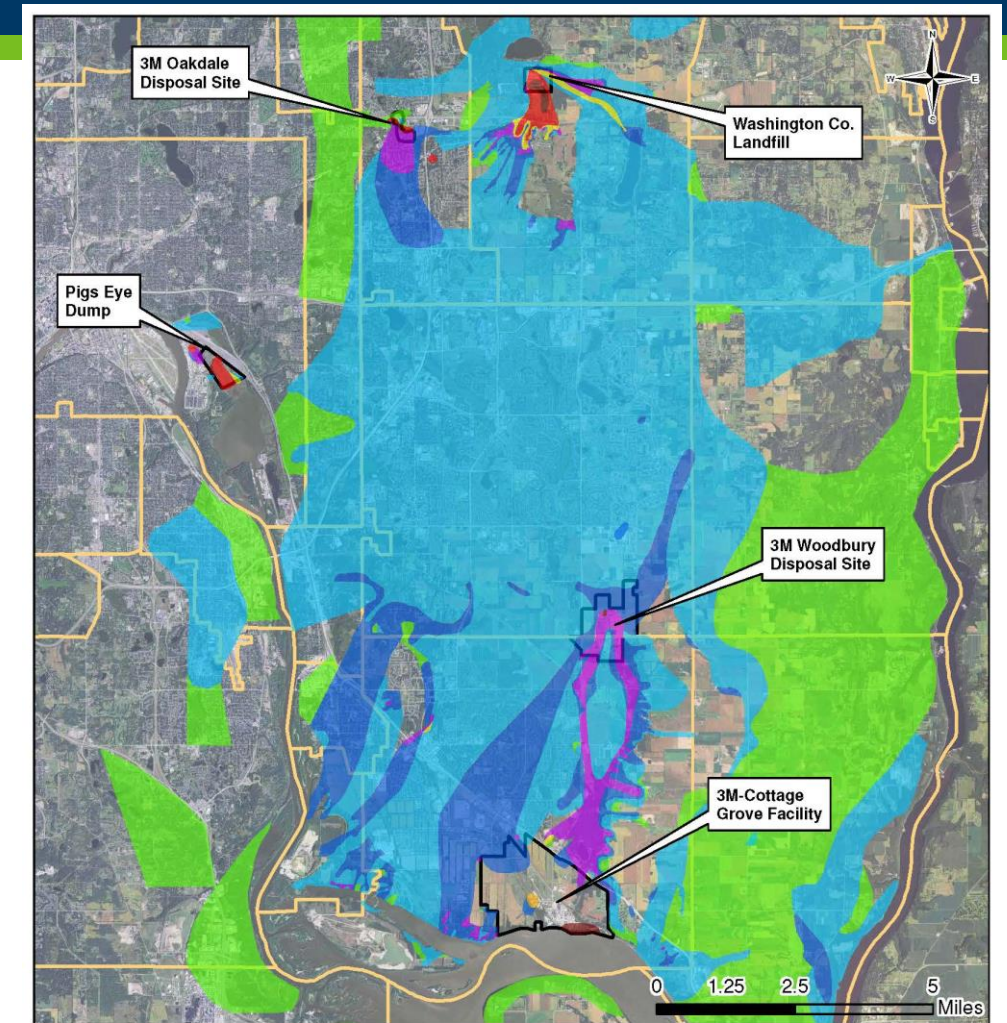
Groundwater Flow

- In the eastern half of the county, groundwater flows to the St. Croix River
- In the western half of the county, groundwater flows to the Mississippi River
- Locally, groundwater flow may be influenced by pumping wells



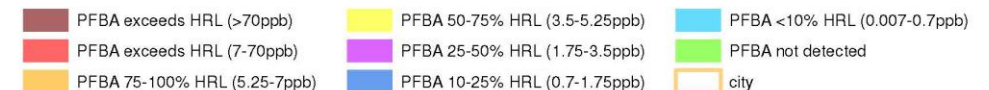
Result: Extremely Large “Co-Mingled” Plumes

- Over 130 sq. mi.
 - 4 major aquifers
 - 8 municipal systems & >1,800 private wells
 - Much larger than predicted by models
- PFBA most widespread
 - More PFBA in source areas
 - More mobile
- Movement of PFAS affected by several factors
- Several unusual areas



PFBA - All Aquifers

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



Response Actions – East Metro

- Removal & proper disposal of contaminated soil
- Treatment of groundwater
- Treatment of drinking water where Health-Based Values exceeded



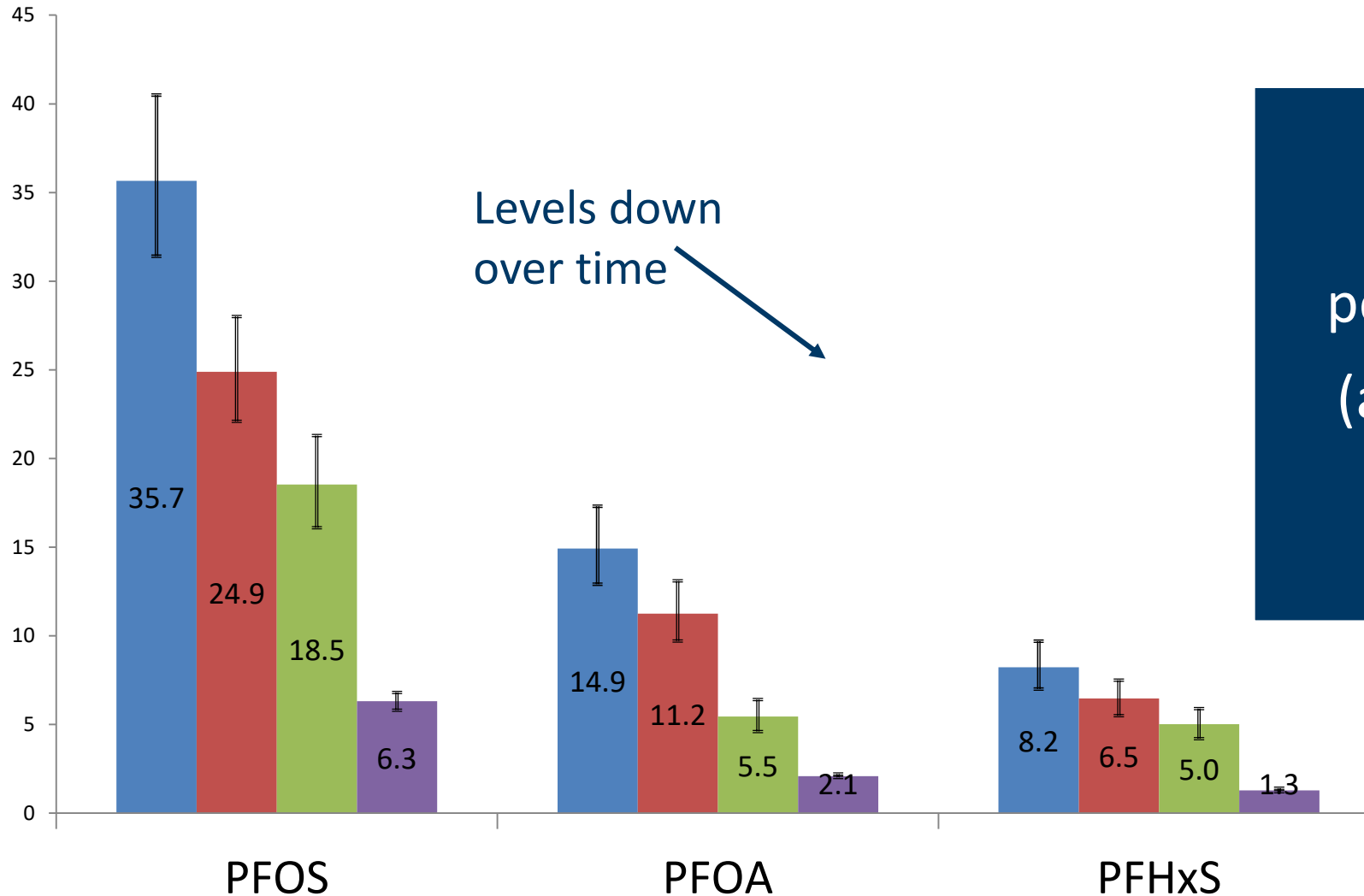
City of Oakdale water treatment plant



Residential carbon filters

Biomonitoring Shows Effectiveness of Response

■ 2008 ■ 2010 ■ 2014 ■ NHANES 2011-12



PFCs decreased in blood of people drinking treated water (average concentrations still above national averages)

- **MDH General PFAS Information:**
<http://www.health.state.mn.us/divs/eh/hazardous/topics/pfcs/index.html>
- **ITRC Factsheets:** <https://pfas-1.itrcweb.org>
- **US EPA information:** <https://www.epa.gov/pfas>
- **MDH Health Risk Limits:**
<http://www.health.state.mn.us/divs/eh/risk/guidance/gw/table.html>
- **MPCA PFC Investigations:**
<https://www.pca.state.mn.us/waste/perfluorochemicals-pfcs>

Questions?

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