

PFAS Regulatory Strategic Planning & Solutions

Overview & MN Case Study



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PFAS Remediation Industrial Leader

Safety Moment

Safety Moment

Epinephrine

A lifesaving medicine

Do You Know What Signs to Look For?
Do You Know What Device to Look For?
Do You Know How to Administer It?
Do You Know What to Do After Injection?

1. Give epi
2. Call 911
3. Support the person
 1. Other medical needs
 2. Emotional support
 3. Contacting family



Agenda

Management

Movement

Technology

Goals

Case Study & AECOM Bench

3 Take-aways

Patchwork of Regulation

PFAS rules vary widely across federal, state, and local levels. Delegation from EPA to states has led to inconsistent regulation implementation, creating compliance challenges and uncertainty.

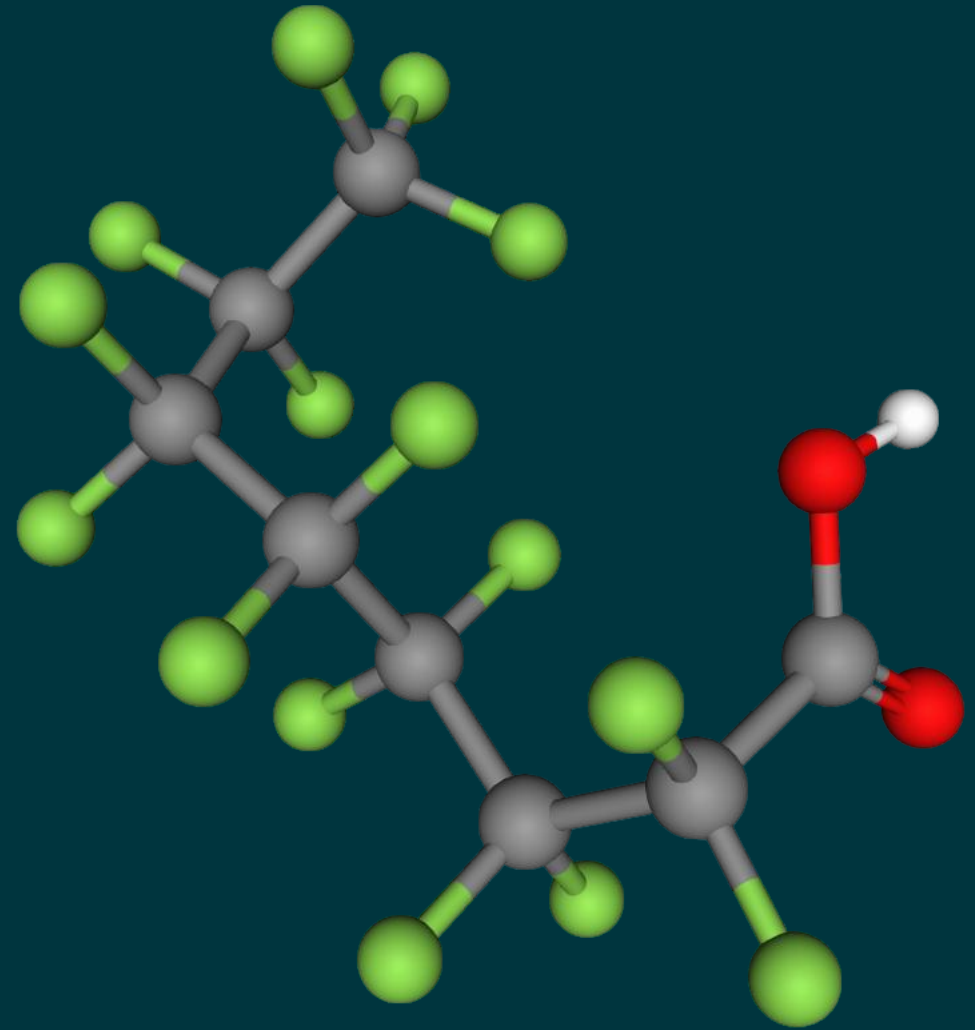
Urgency vs. Preparedness

While some industry leaders are investing in prevention and destruction technologies, many organizations remain hesitant or unprepared, highlighting a gap between urgency and readiness.

Risk Communication & Planning

PFAS concerns include financial, legal, and societal risks. Clear stakeholder communication and lifecycle planning are essential to balance expectations and build sustainable strategies.

Brief PFAS Primer



What makes PFAS a “4-letter word”?

WHAT ARE PFAS?

- Per- and polyfluoroalkyl substances
- Class of thousands of synthetic compounds
- Resist thermal, chemical, and biological degradation
- Many act as surfactants
- Used in broad range of commercial applications

WHY ARE PFAS PROBLEMATIC?

- Appear in environmental media around the globe
- Occur in the blood of >98% of the US population
- Are found in the drinking water of millions of people
- Bioaccumulate in humans, plants, and animals
- Regulations are stringent based on toxicity
- Liability is incurred in absence of destructive solution



Some Toxic



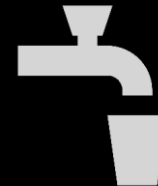
Mobile



Regulated



Researched



Consumed



Costly

PFAS Sources and Concerns



Production



Metals Plating

Source: USEPA



Textiles



Personal Care



Firefighting

Photo by Lance Cpl. Shawn Valosin USMC



Food Packaging



Landfills and Leachate



Waste Treatment



Agriculture



Drinking Water

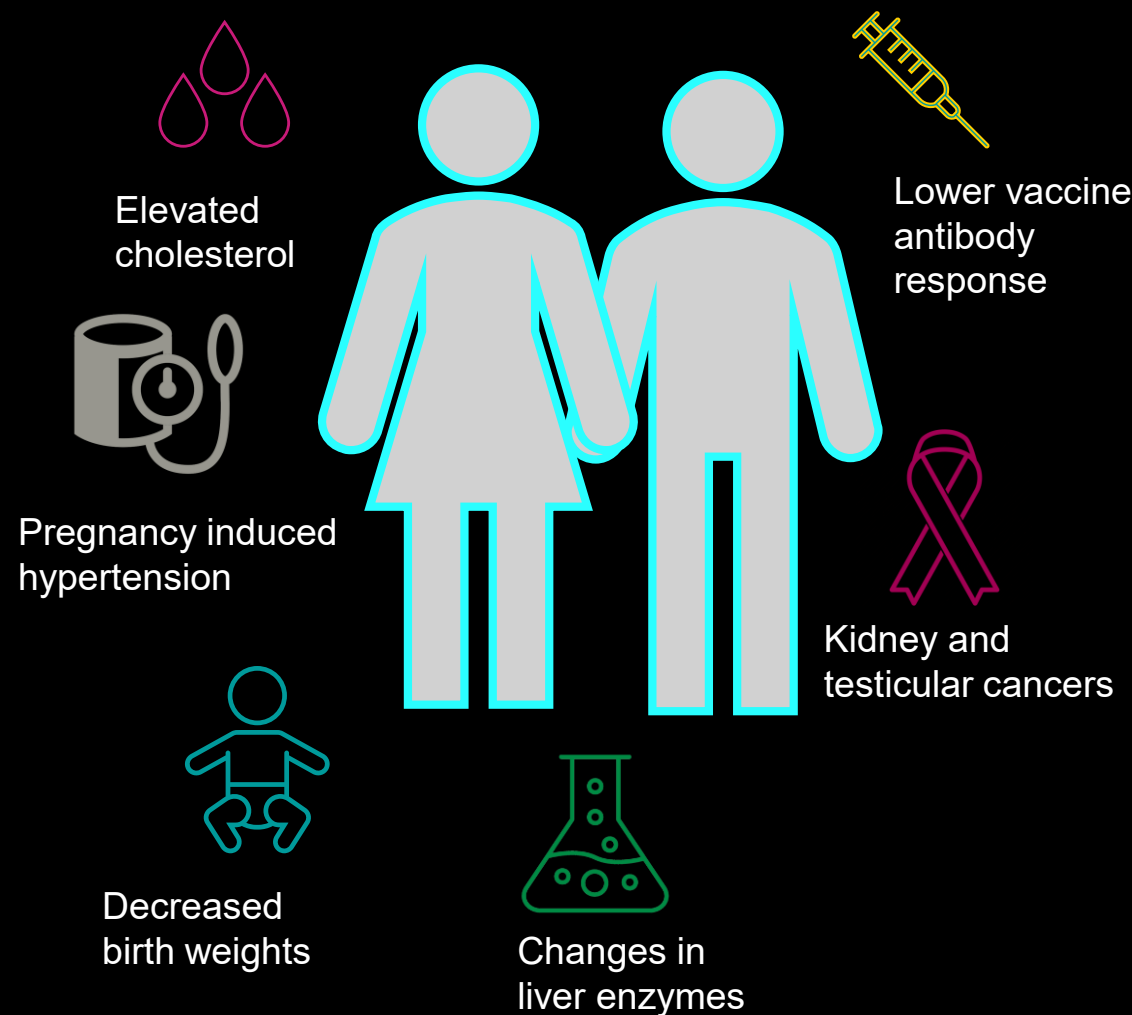
Short-term priority: protecting drinking water from historic releases
Near-term action: eliminating unnecessary PFAS from commercial goods
Long-term solution: identifying and eliminating PFAS from the environment

PFAS Exposure and Health Effects

Modes of PFAS Exposure



Potential Health Effects





01

**PFAS Management
Regulatory Entry Points**

Cooperative Federalism and PFAS Management

Regulatory Generation 2.0

- Adapting to the evolving regulatory environment
- Deconstructed top-down regulations may spur a new vision of collaboration between federal, state, and local entities



Strategic Perspectives

Thinking About PFAS From A Scalable Context

Globally for Headwinds

Operationally within the State of WI

As a Member of the Local Community

Administratively with other Decision-makers

Inward for Worker Protection

PFAS Regulation Entry Points

Long-Term Strategy Considerations

Potentially Applicable Regulatory Program Areas

Products Bans
Safe Drinking Water Act Monitoring
Clean Water Act/NPDES Permitting
MS4 & Wastewater Permitting
CERCLA/Superfund
Biosolids and Compost Permitting
OSHA Worker Exposure
RCRA/Waste & Materials Management
TSCA & TRI Reporting
Property Due Diligence/Voluntary Cleanup
Clean Air Act/Air Permitting
Tanks Program
AFFF Change-out/Take Back Programs

Types of Media Involved:

Biosolids
Soil
Surface
Water
Sediment
Groundwater
Air



Strategic Technical Approaches

Internal Readiness for Short- and Long-Term

Internal/External Education & Communication

Proactive Preparedness for Federal and State
Regulatory Dynamics

Risk-Based Decision-Making Leveraging the State of
the Science

Right-sizing Financial Reserves

Sustainable Remediation Mindset & Practice



Balance
Structure
Calm

Strategic Technical Approaches

Align Corporate Priorities
with Assets & Liabilities

Tailor Regional
Geographic Context

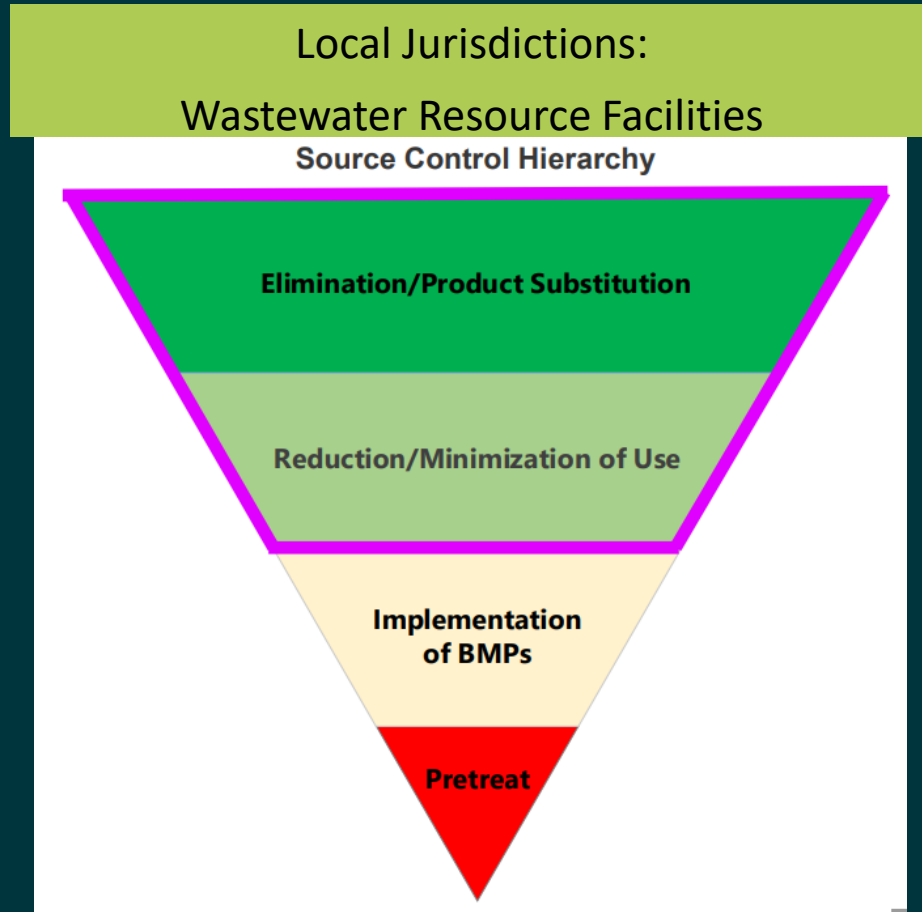
Lead Investigation &
Response with the End in
Mind

Lean into Analytical and
Technological
Advancements

Estimate Milestones &
Reserves Based on
History, Complexity, Size
and Program

PFAS Management

Now is the Time



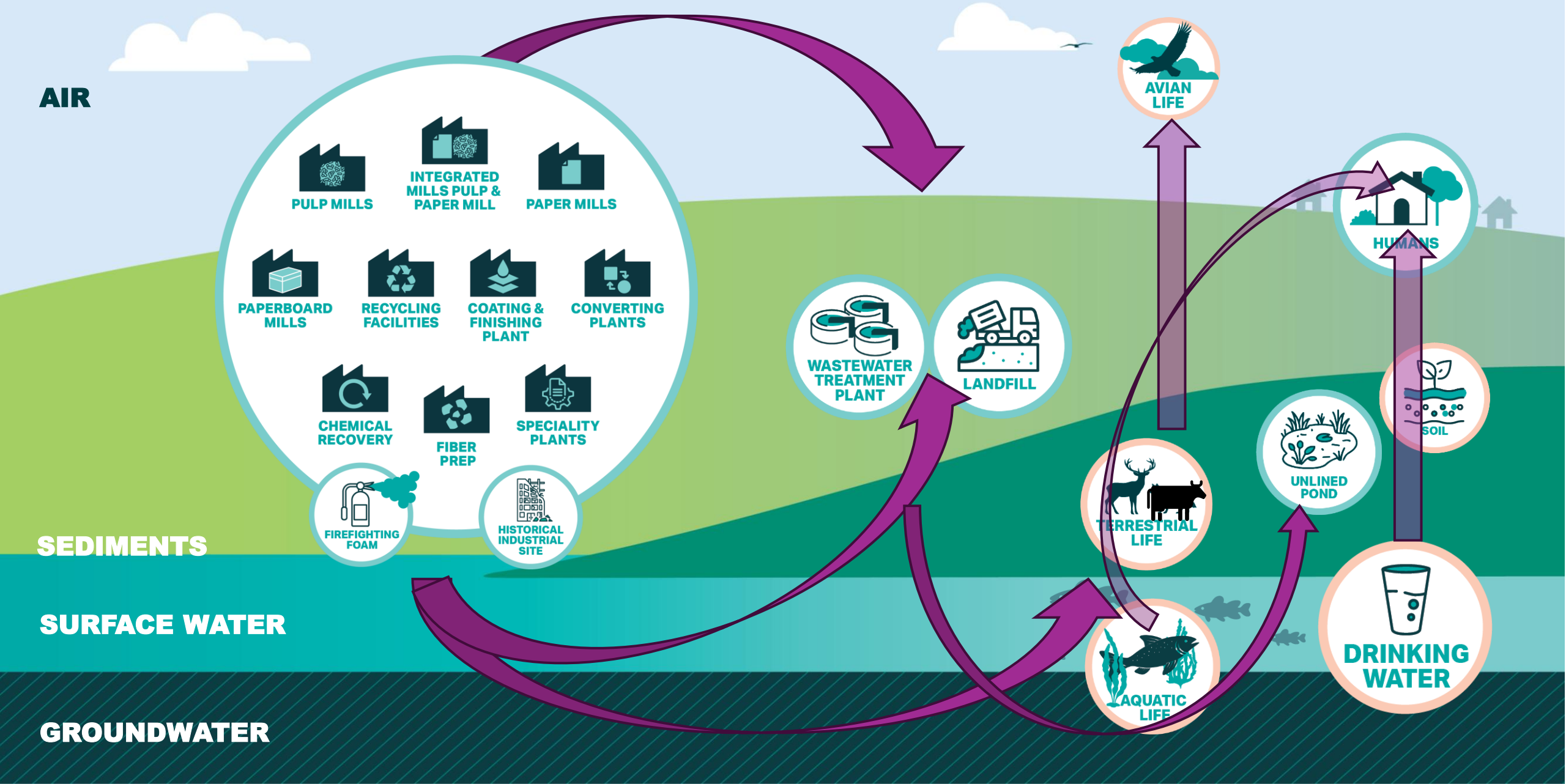
“Now is the time for source identification and reduction work, before there are limits and expensive pretreatment equipment and processes are required.”

- Metropolitan Council

02

PFAS Movement: Unique Considerations

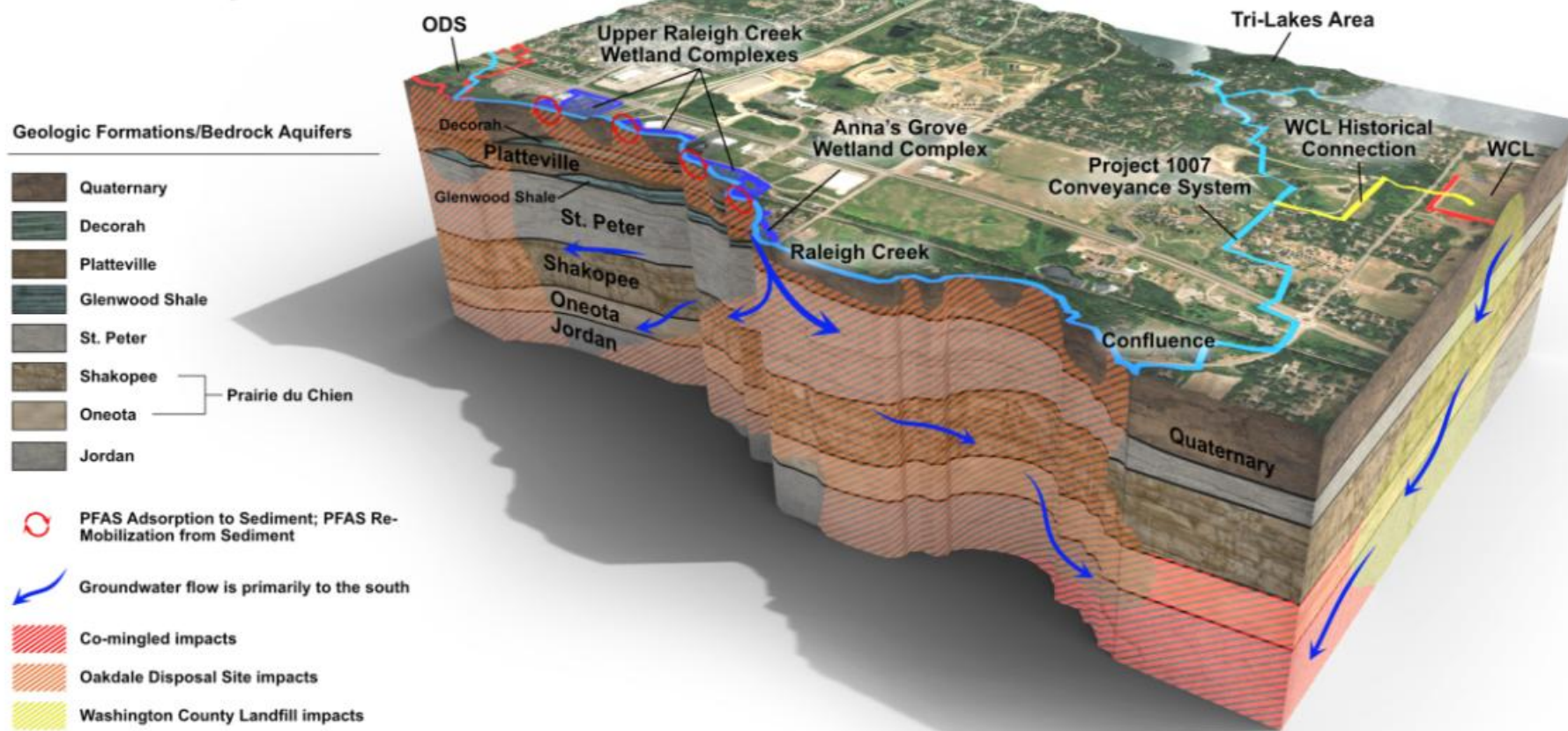
Paper Industry Potential PFAS Exposure Routes



Dynamic PFAS Movement in the Environment

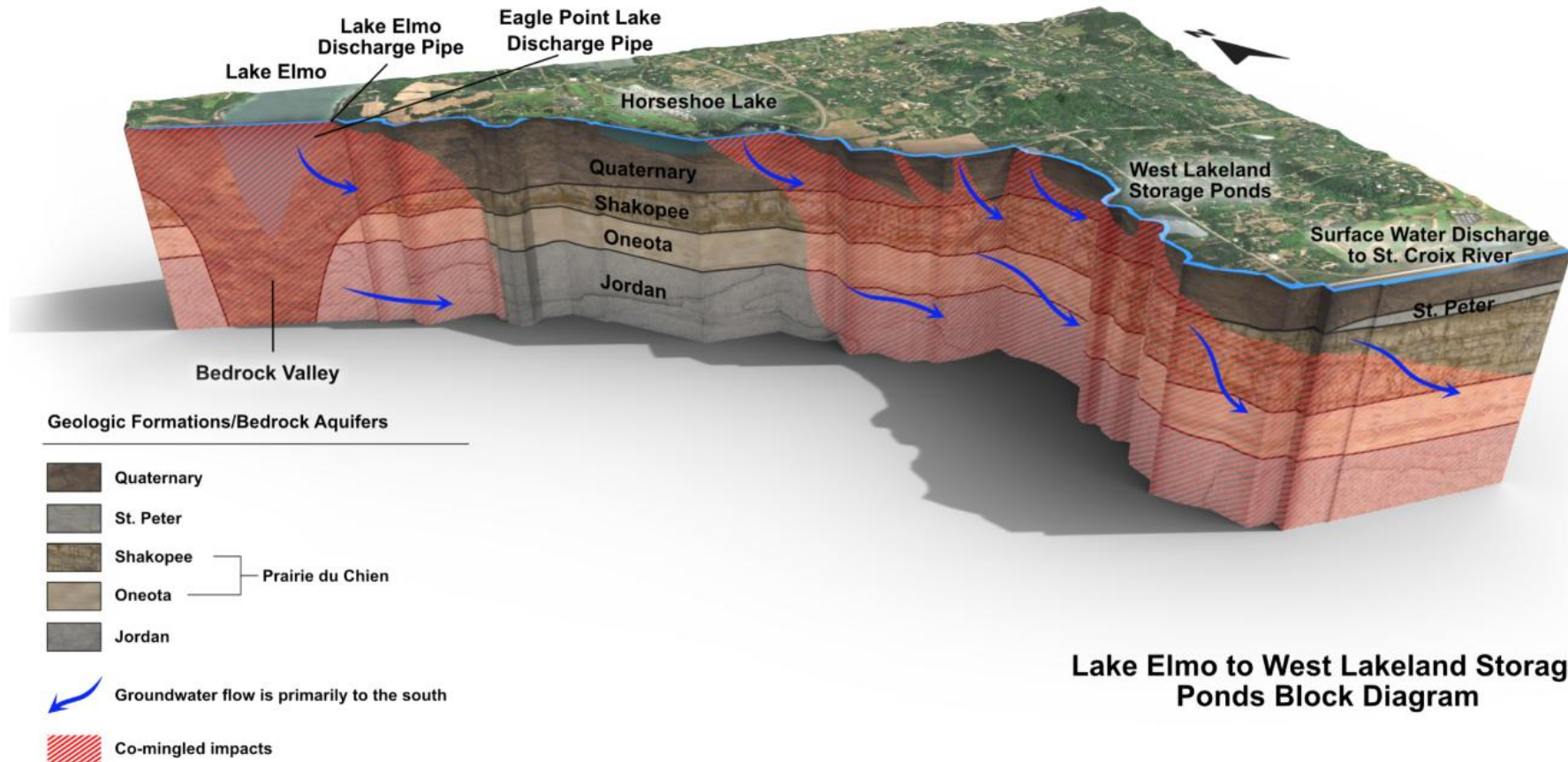
Surface to Subsurface Interactions

Wetland Complexes and WCL to Raleigh Creek Confluence Block Diagram



Dynamic PFAS Movement in the Environment

Surface to Subsurface Interactions



03

Maturing Chemistry & Treatment Options

Analytical Capabilities Snapshot

Environment-Analyst-Corporate-Guide-Identifying-and-Remediating-PFAS-2025.pdf

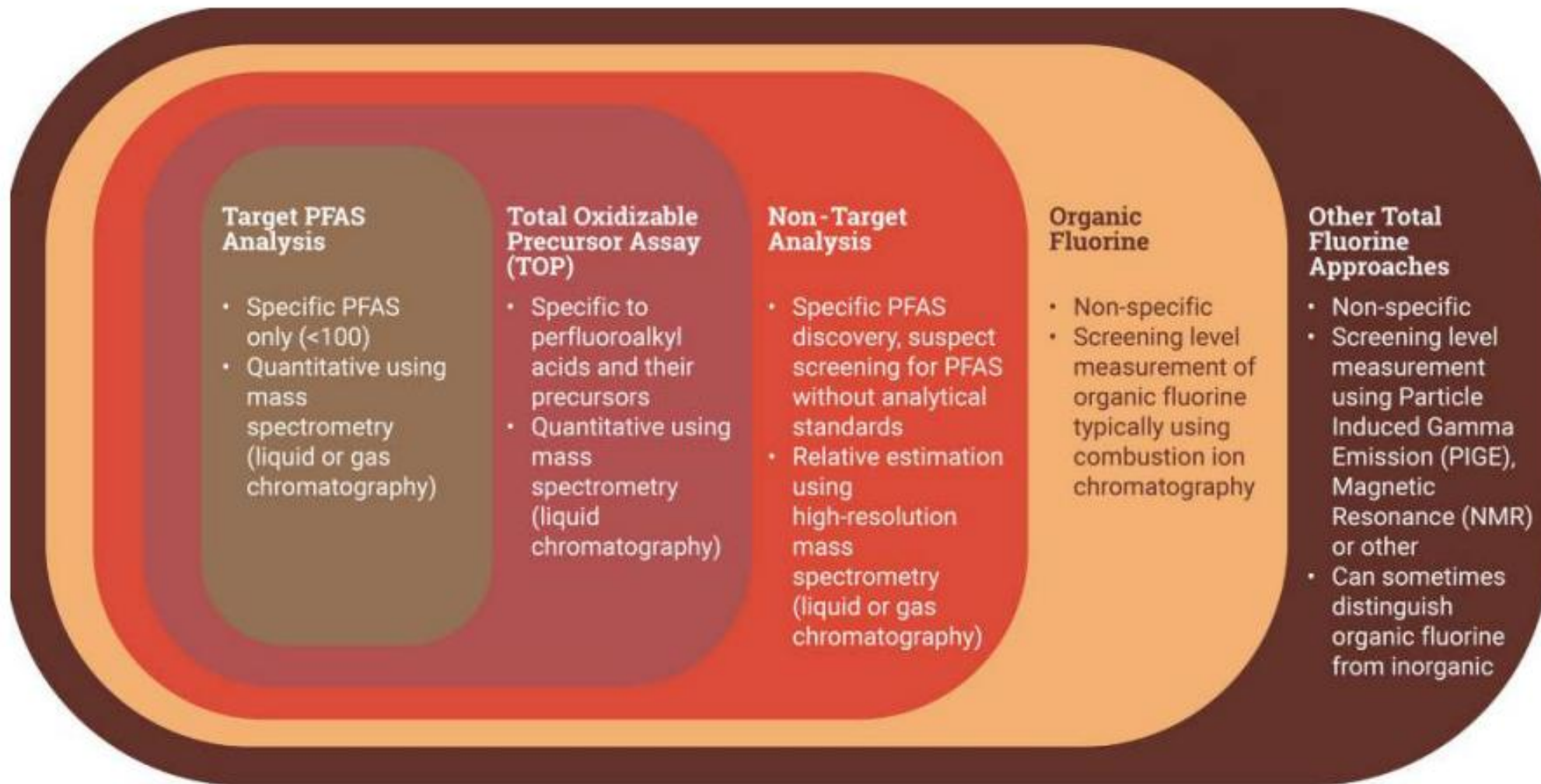
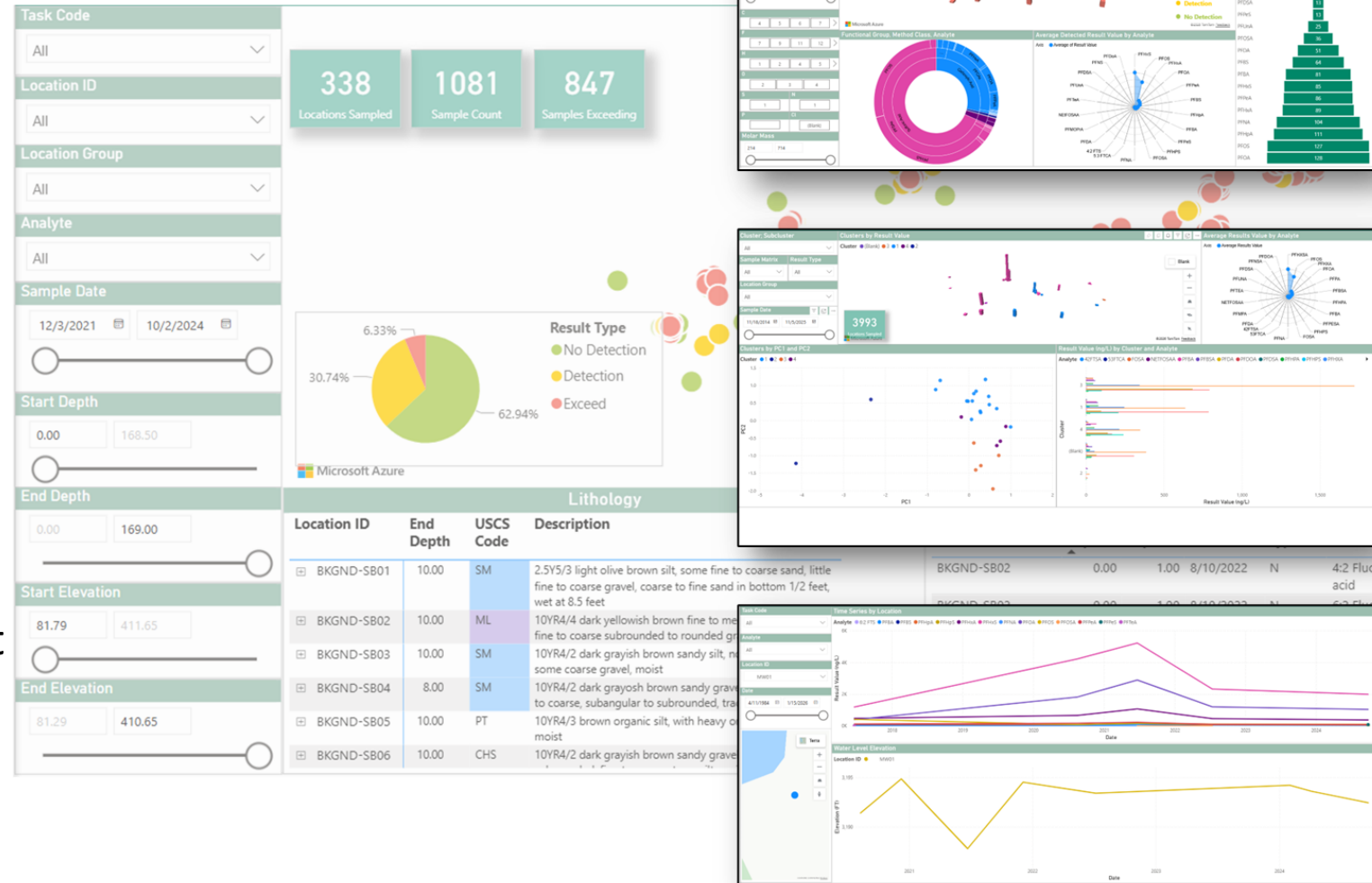


Figure 1: Overview of PFAS measurement approaches and their characteristics

PFAS Forensics Overview

- Chemometrics combined with industry-leading PFAS chemistry expertise allows us to understand our data more holistically and form a data-driven roadmap to incrementally narrow our investigation focus and outcomes
- Can be tailored to any specific question, using available data
- Part of a growing suite of dynamic digital PFAS chemistry tools we have at our fingertips
- Future directions include pairing chemometrics with PFAS fate and transport studies at AECOM's CleanTech Hub Laboratory with our in-house PFAS analysis capabilities

PFAS Remedial Investigation Dashboard



Remedial Technology Snapshot

—Status of PFAS Treatment Technologies

Soil/ Solid	In-Situ	Ex-situ	Mechanism	Readiness
Incineration		✓	Destruction	
Soil Washing		✓	Separation	
Ballmilling		✓	Destruction	
Sorption and Stabilization	✓	✓	Separation	
Thermal Desorption / Smoldering		✓	Separation	
Water/ Liquid	In-Situ	Ex-situ	Mechanism	Readiness
Incineration		✓	Destruction	
Ion Exchange (IX)/ Regenerable IX		✓	Separation	
Reverse Osmosis/ Nanofiltration		✓	Separation	
Foam Fractionation		✓	Separation/Concentration	
Granular Activated Carbon		✓	Separation	
Colloidal Activated Carbon	✓		Separation	
Supercritical Water Oxidation (SCWO)		✓	Destruction	
Plasma		✓	Destruction	
Electrochemical Oxidation		✓	Destruction	
Alkaline Hydrothermal Reaction (HALT)		✓	Destruction	
Biochar	✓	✓	Separation	
Novel Sorbents (Regenerable)		✓	Separation/Concentration	
Zeolite/ Clay Mineral	✓	✓	Separation	
Chemical Oxidation	✓	✓	Destruction	
Biodegradation	✓	✓	Destruction	
Coagulation/Flocculation		✓	Separation/Concentration	
Sonication		✓	Destruction	
Zero Valent Iron (ZVI)/ Doped ZVI	✓	✓	Destruction	

Commercially available

Field demonstrations ongoing

Effectiveness being tested

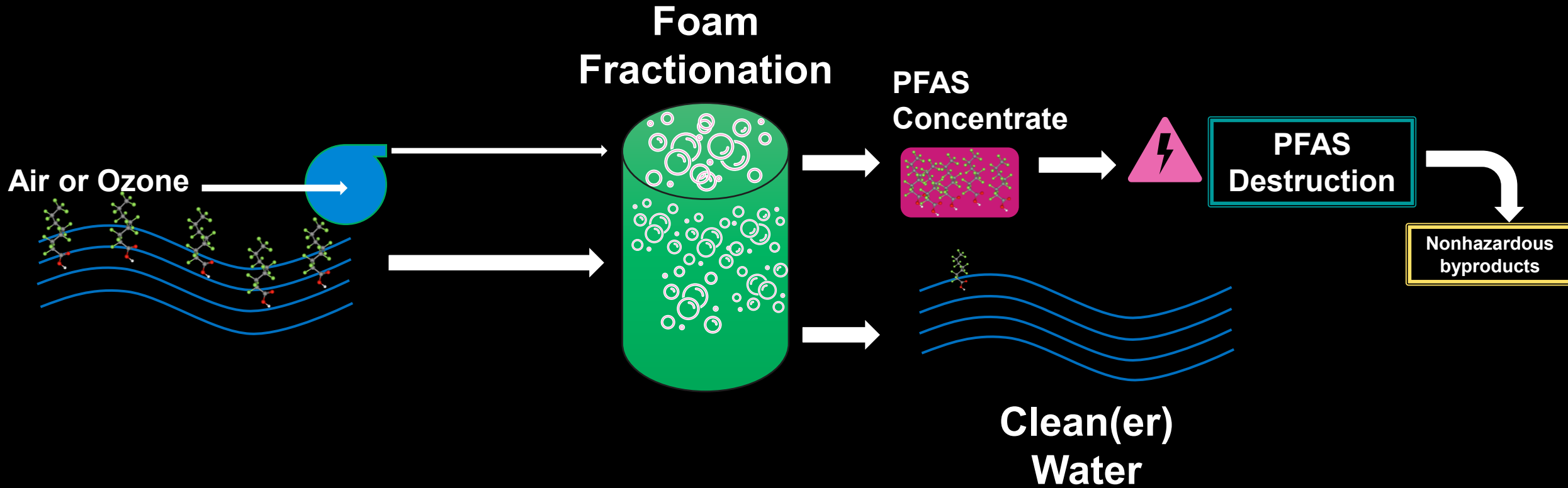
Adapted from Table 12-1
<https://pfas-1.itrcweb.org/>

Note:
 Short chain PFAA and precursor treatment are not yet fully evaluated

 aecom.com

What Can be Done?

Treatment Example

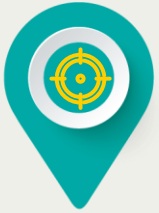


04

Goals: Reductions, Relationships & Education

Agile Long-Term Planning Elements

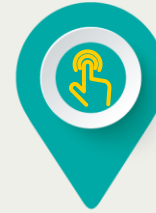
**Long-Term
Enterprise-wide
Perspective**



**Proactive
Preparedness for
Regulatory Changes**



**Agnostic Technology
Selection**



**Sustainable
Remediation Mindset &
Practice**



**Education on
Emerging Issues**



**Navigating Federal
and State Regulatory
Dynamics**



**Risk-Based Decision-
Making for PFAS
Management**



Scientists as Communicators

Effective communication strategies with decision-makers

Educating stakeholders across academic, regulatory, and business disciplines



Great PFAS Expectations

Refining our
language, science
and policies

Becoming educators
across disciplines,
programs, sectors

Harnessing global
experience



05

Case Study & AECOM Capabilities



Case Study: Project 1007

2010 State of Minnesota v. 3M Company

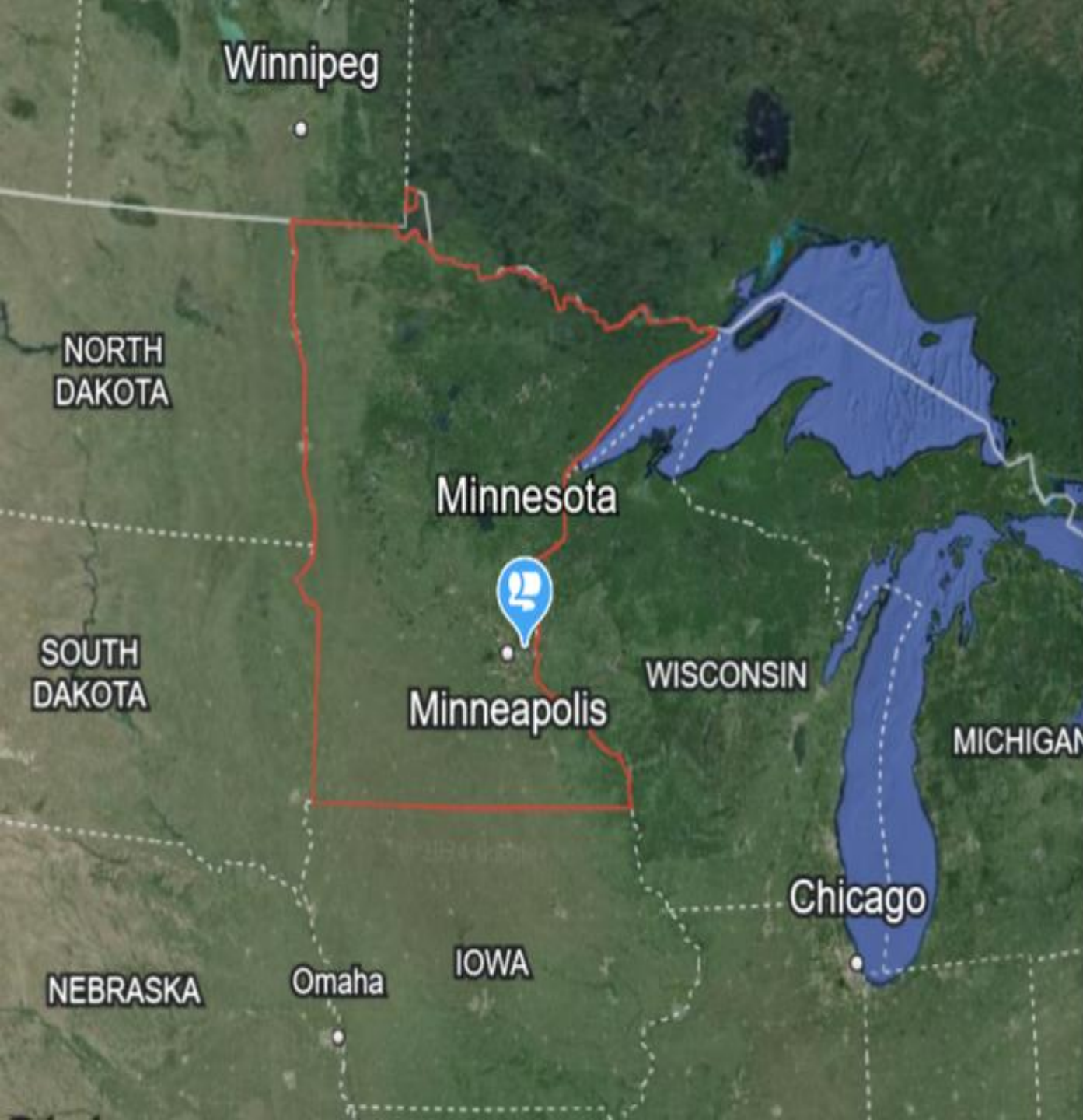
2018 \$850M Settlement

Top Priorities: **Safe and Sustainable Drinking Water Supplies**
Source Assessment and Feasibility Study for Project 1007

Storymap Link: [Project 1007 PFAS Investigation](#)



Scan me!



Minnesota



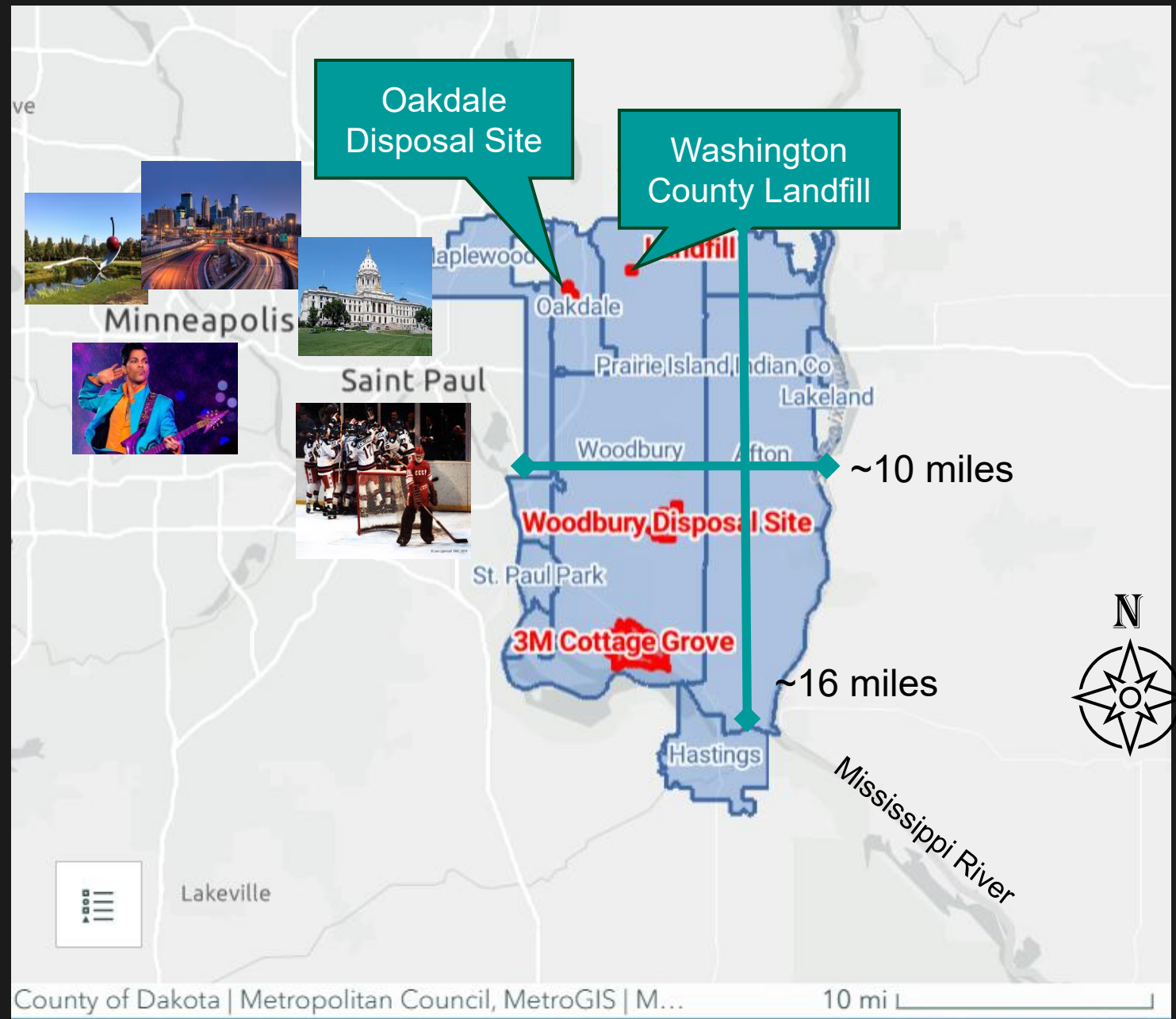
Edit

Source Image: GoogleLandsat / CopernicusData
SIO, NOAA, U.S. Navy, NGA, GEBCOINEGI

PROJECT 1007

East Metro

Regional Scale Plumes
4 Disposal Sites
50-70+ years ago



County of Dakota | Metropolitan Council, MetroGIS | M...

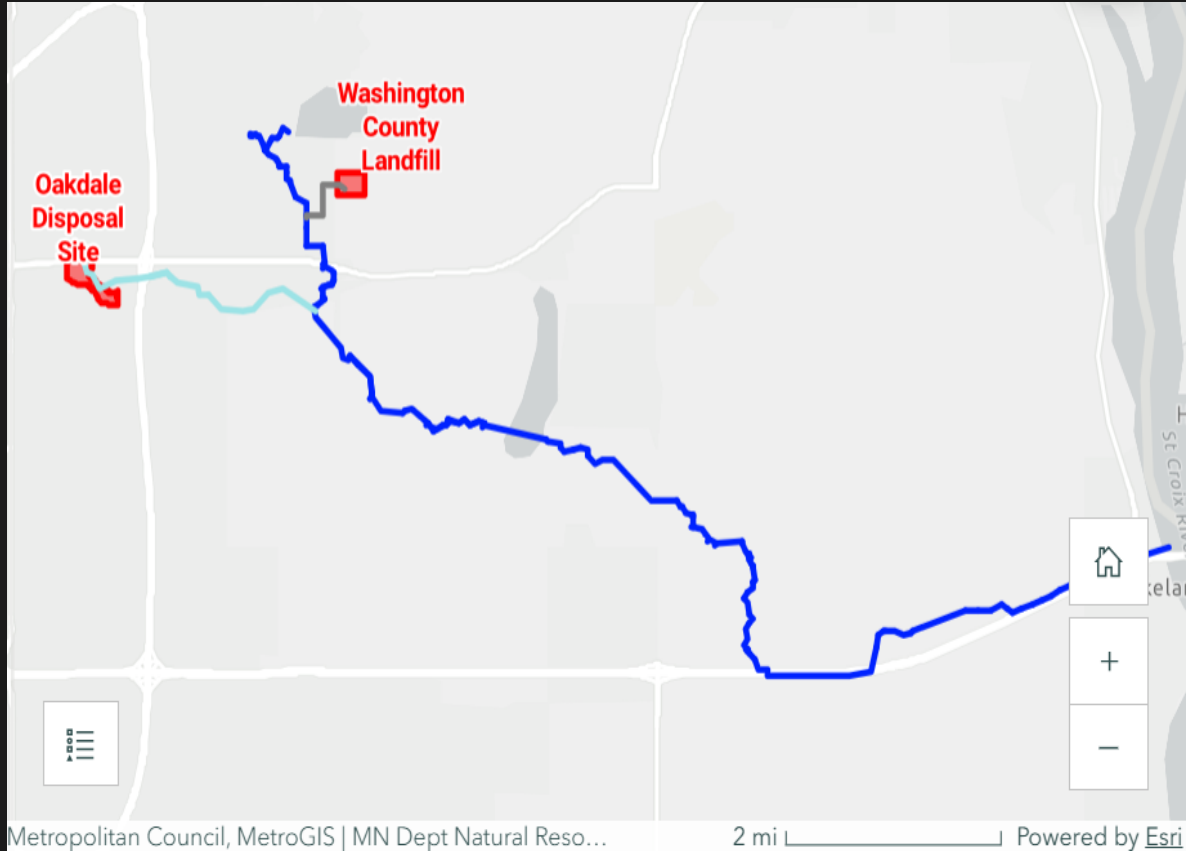
10 mi

Map Image Source Credit: MPCA Groundwater Contamination Atlas

Other Image Source Credit: [CC BY-NC-ND](#) [CC BY-SA](#)

Project 1007

Stormwater Conveyance circa 1980's



Project 1007 Stormwater System



Remedial Investigation/Source Assessment

PROJECT 1007

Primary Source Area #1: Oakdale Disposal Site

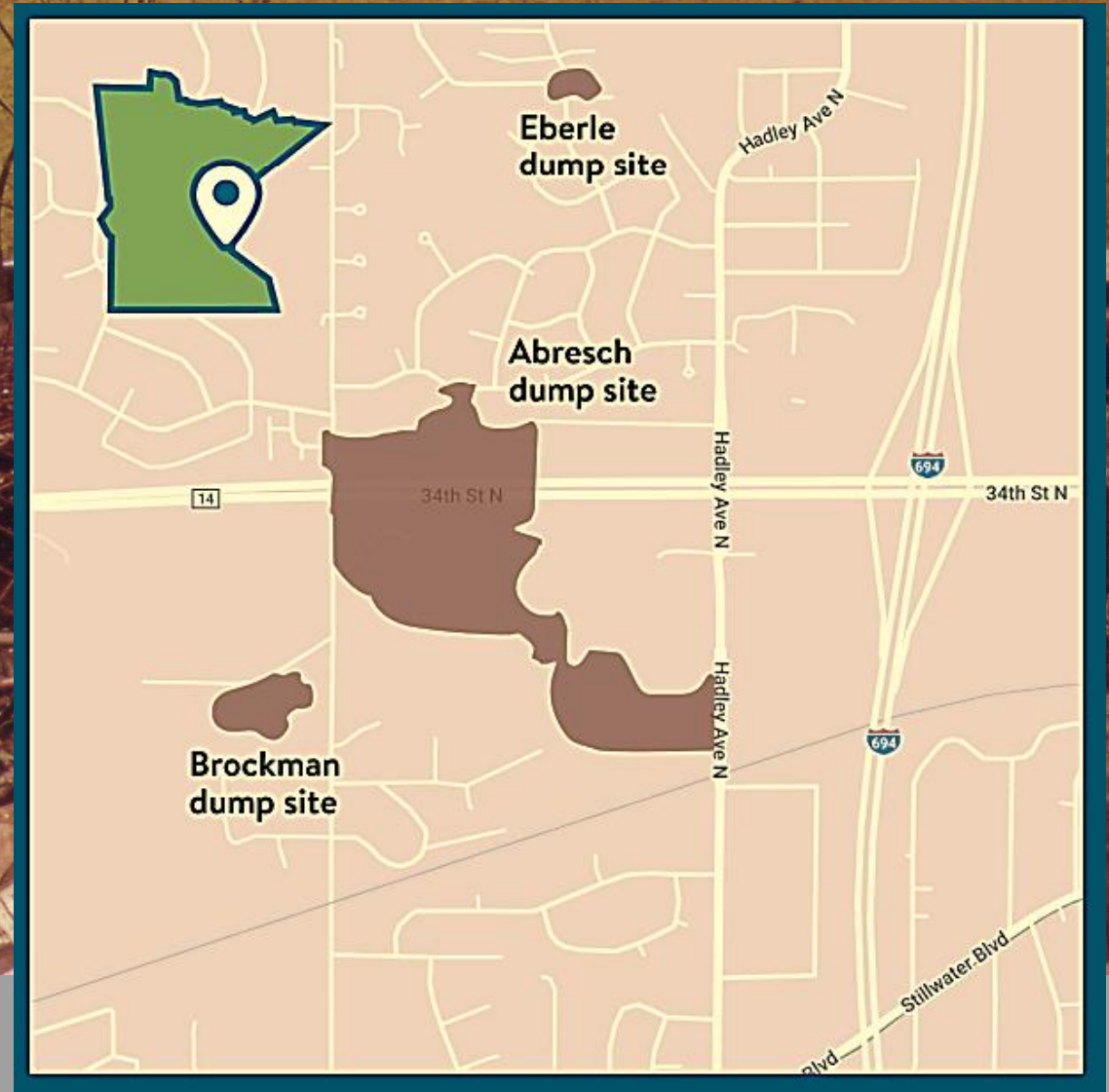


Image Source Credit: MPCA Flickr



PROJECT 1007

Primary Source Area #2: Washington County Landfill

First Permitted Landfill in MN 1969
Reconstructed 2009-2011

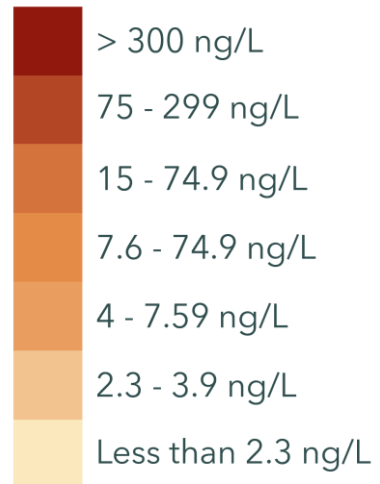
Image Source Credit: MPCA Flickr

PROJECT 1007

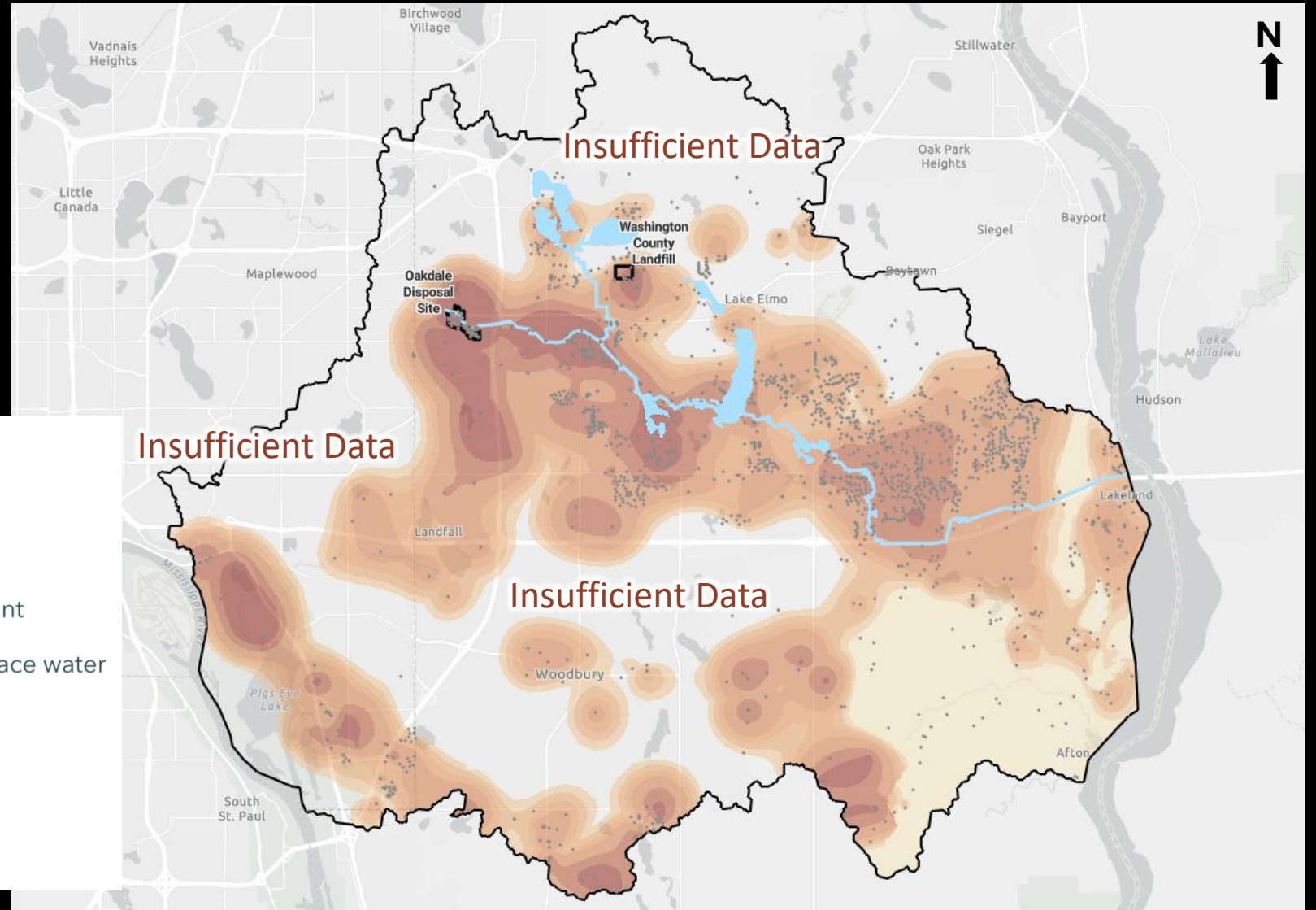
Investigation Findings

Uncontrolled PFAS spread over time can impact people & vital natural resources across regions and generations.

PFOS Concentration

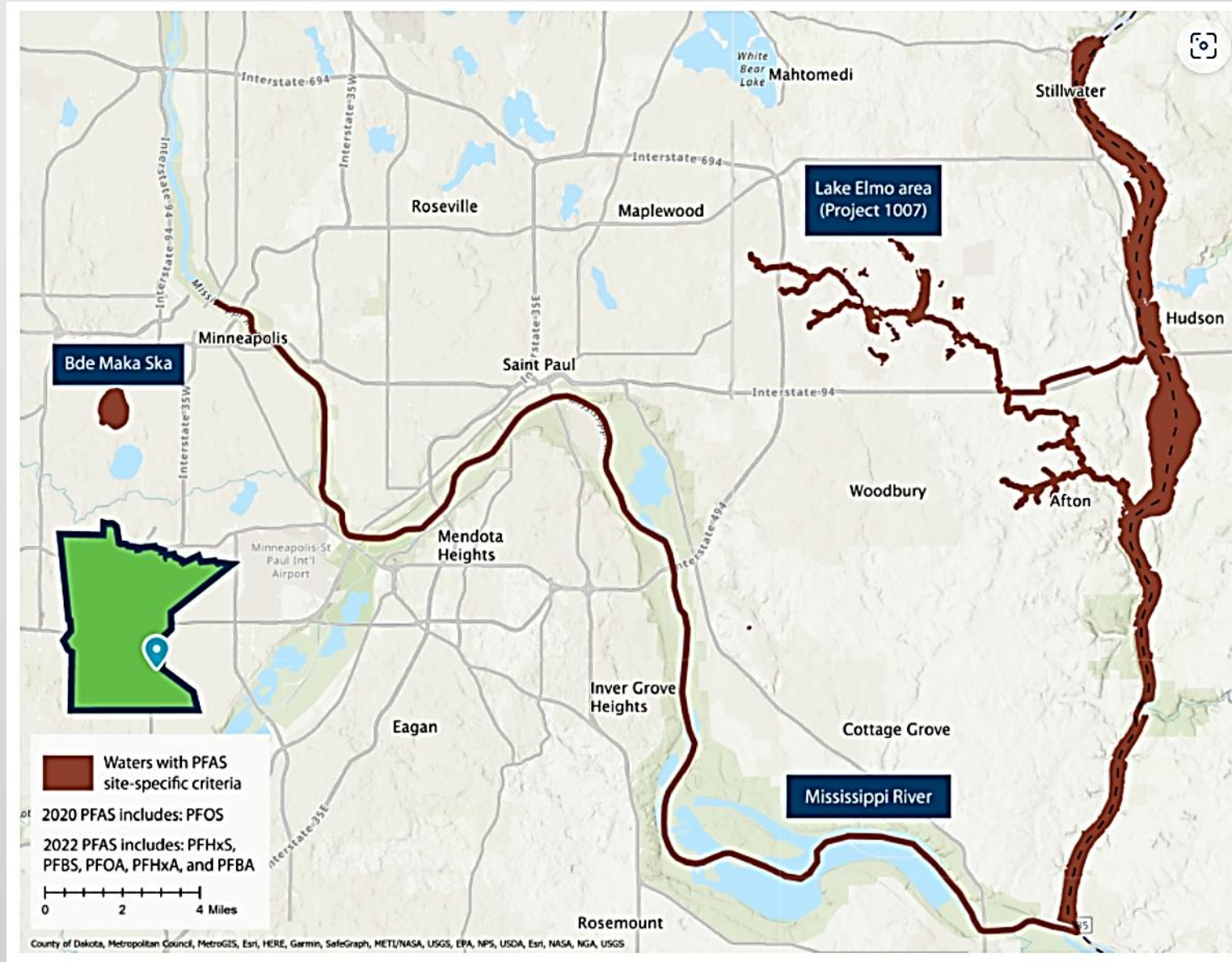


- Groundwater data point
- Project 1007 area surface water



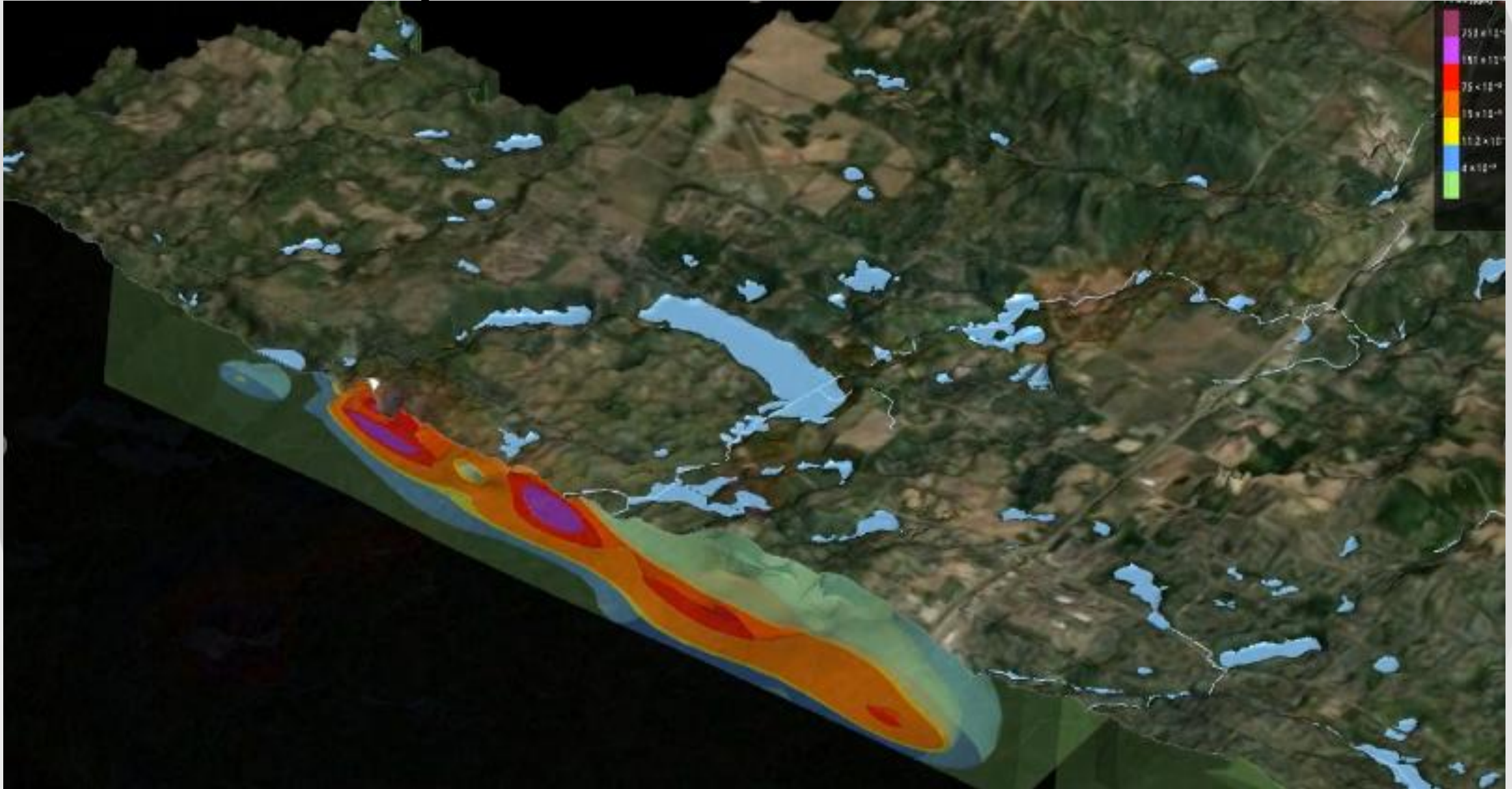
PROJECT 1007

Surface Water Quality & Fish Consumption Advice



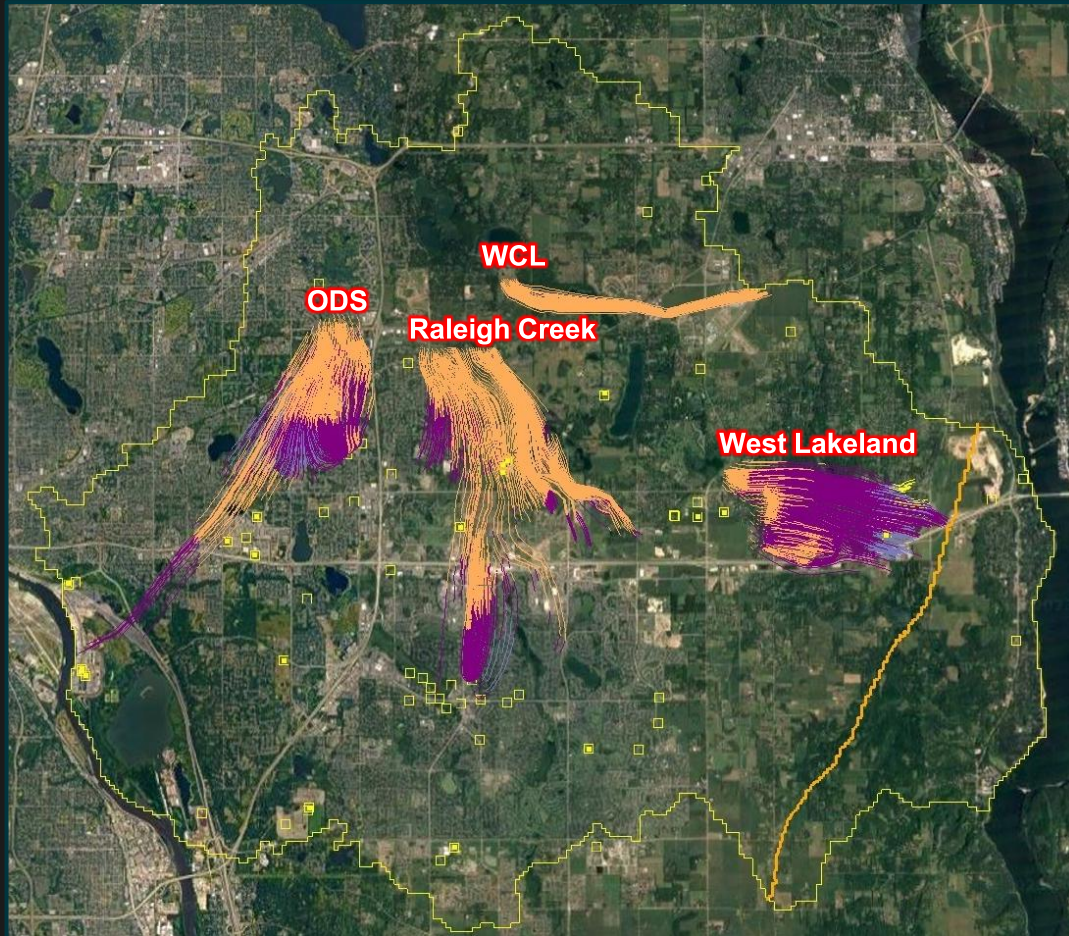
PROJECT 1007

Groundwater Impacts: Beneath Our Feet

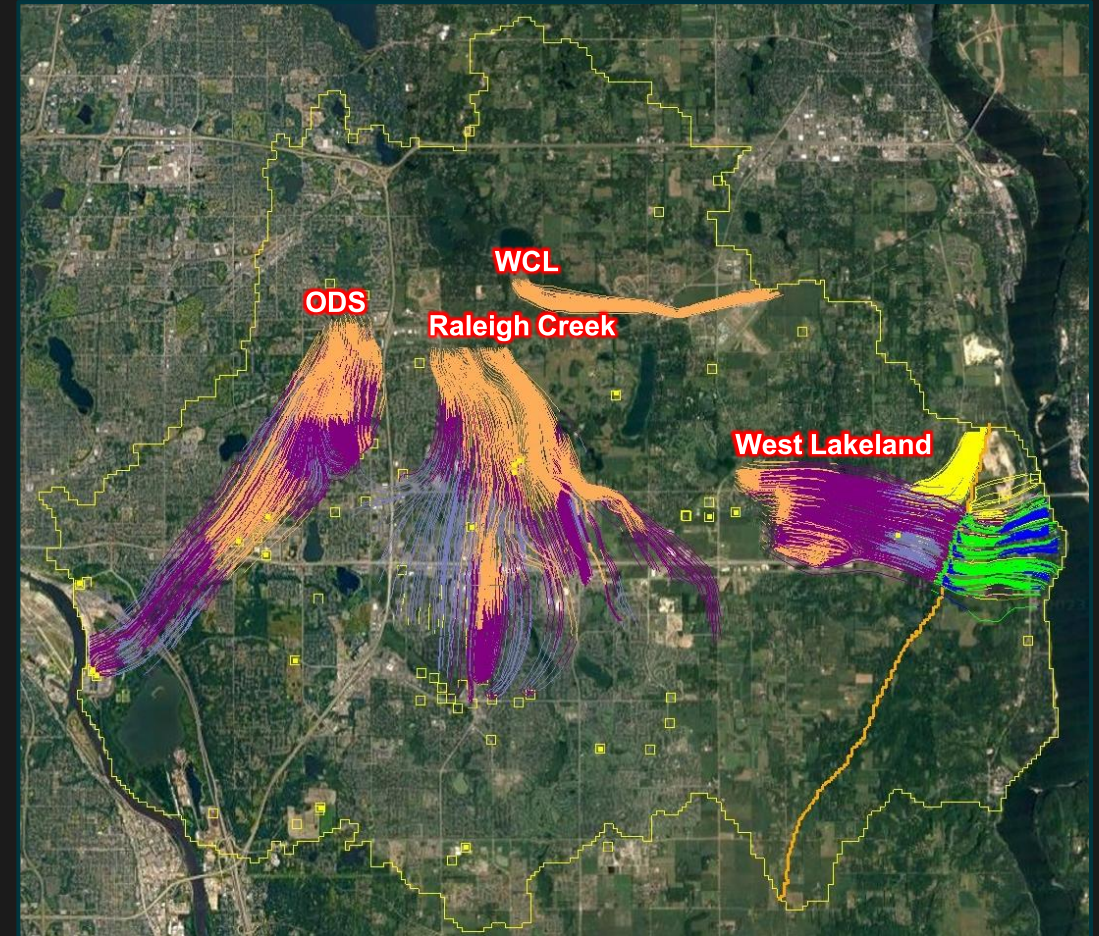


Using Groundwater Models for Generational Planning

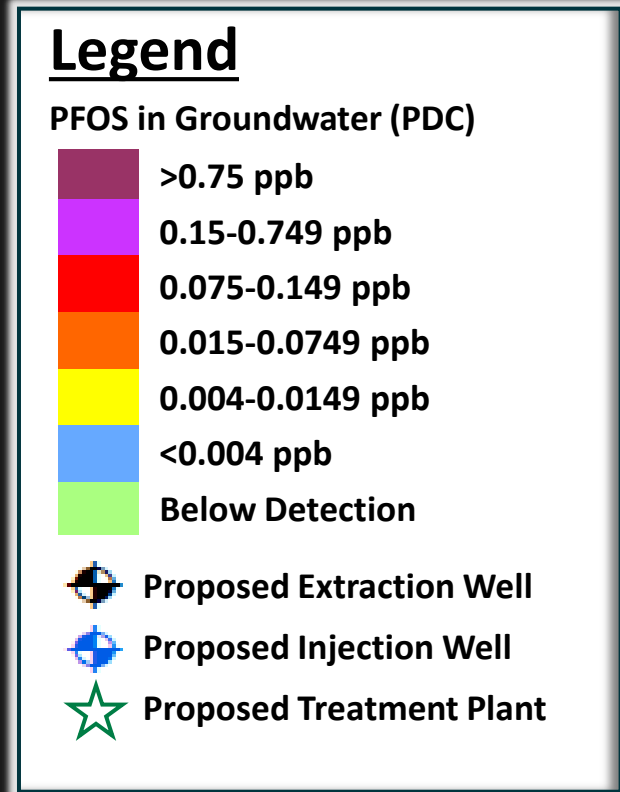
Groundwater Flow: **50 Years** into Future



Groundwater Flow: **100 Years** into Future



Cleanup Option: Multi-Benefit Well Array



PROJECT 1007

SAFF Pilot Study



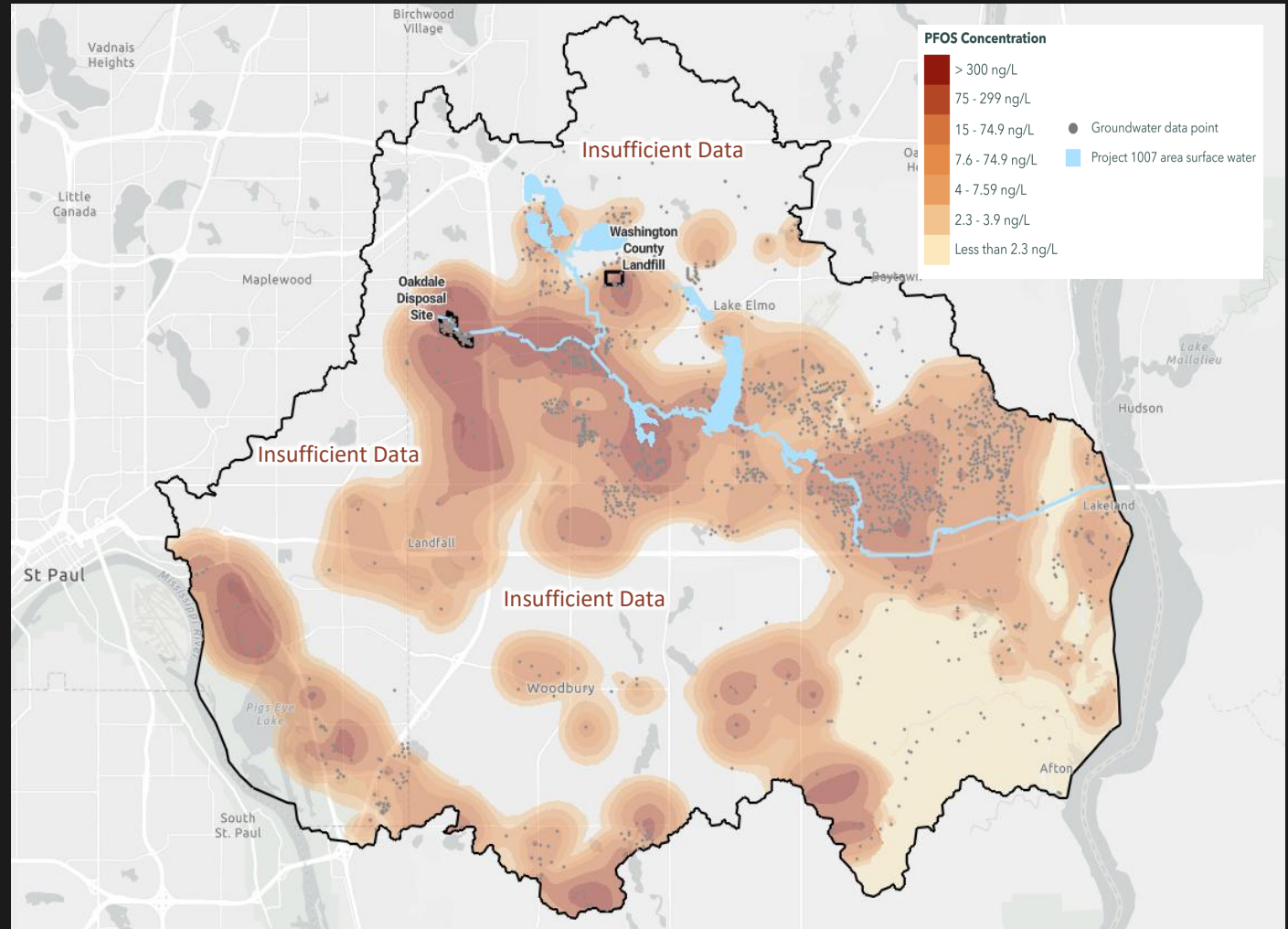
PROJECT 1007

Feasibility Study = Solutions Limiting PFAS Spread

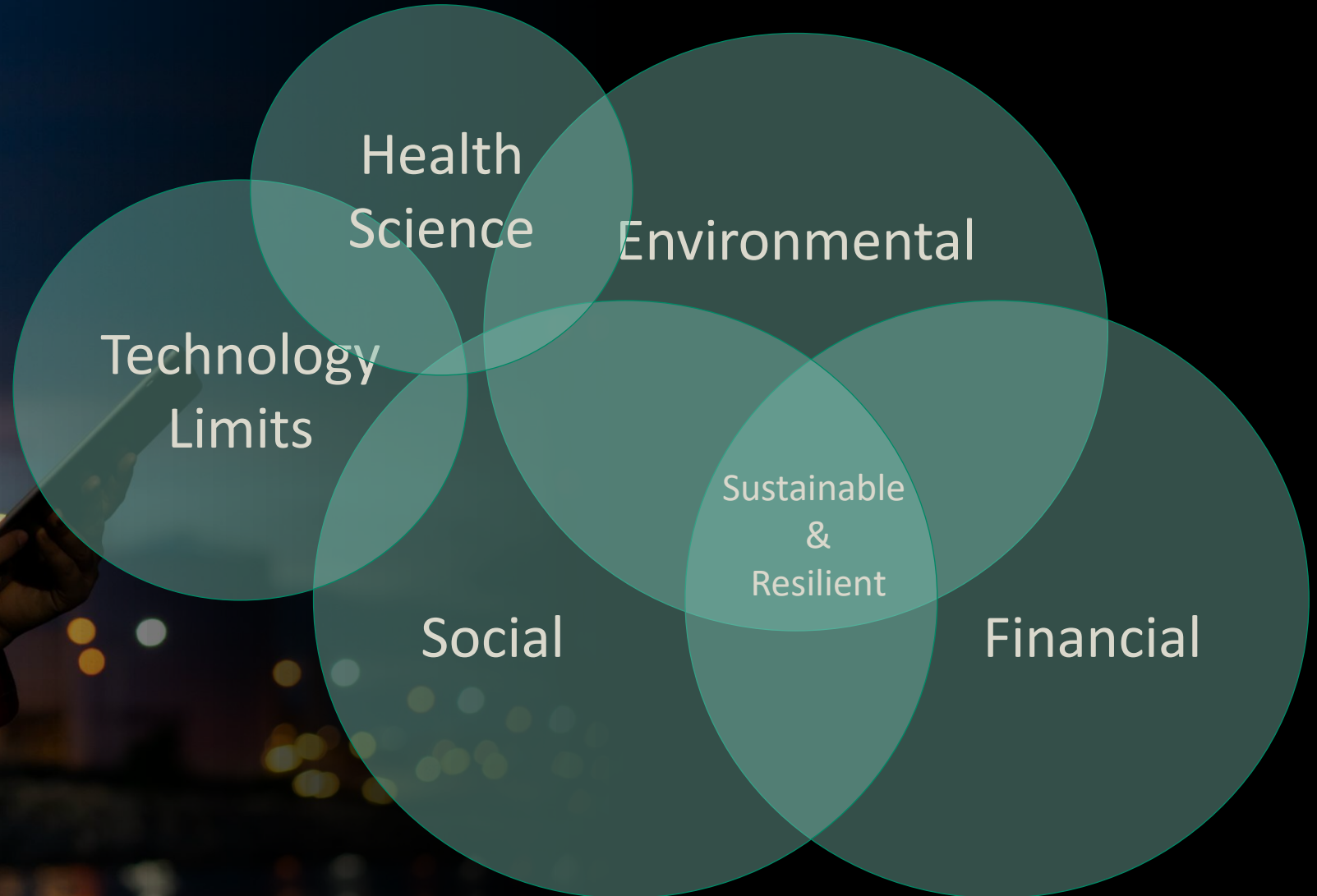
Feasibility Study Solutions:

- Aid in the long-term reduction of PFAS in the East Metro
- Reduce the continued spread of PFAS in surface water and groundwater
- Provide long term protection to drinking water supplies

Reality: Removals, Reductions and Research



PFAS Lifecycle Considerations



PFAS Strategic Advisory Service

- Provides proactive advice, guidance and coordination.
- Guides vision, mission and programmatic pathways for decision-makers.
- Maintains collaborative regulatory and stakeholder interactions and relationships.

Service Delivery:

Client advocacy and program alignment with long-term corporate goals





Discussion & Questions

Thank you.

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