Attachment B

Barnes Air National Guard (ANG) Base Restoration Advisory Board Meeting #14
April 23, 2026

Agenda

6:00 PM	Agenda Review and Meeting Logistics
6:05 PM	Welcome and Introductions
6:10 PM	RAB Business
6:25 PM	Independent Technical Review of BARNES ANG Co-Contaminants and Previous Remedial Treatments Impacts on PFAS
6:55 PM	Environmental Restoration Program Status Update
7:15 PM	Public Questions and Comments
7:25 PM	Closing Remarks
7:30 PM	Adjourn

Meeting Logistics

Carla Mykytiuk

Jacobs

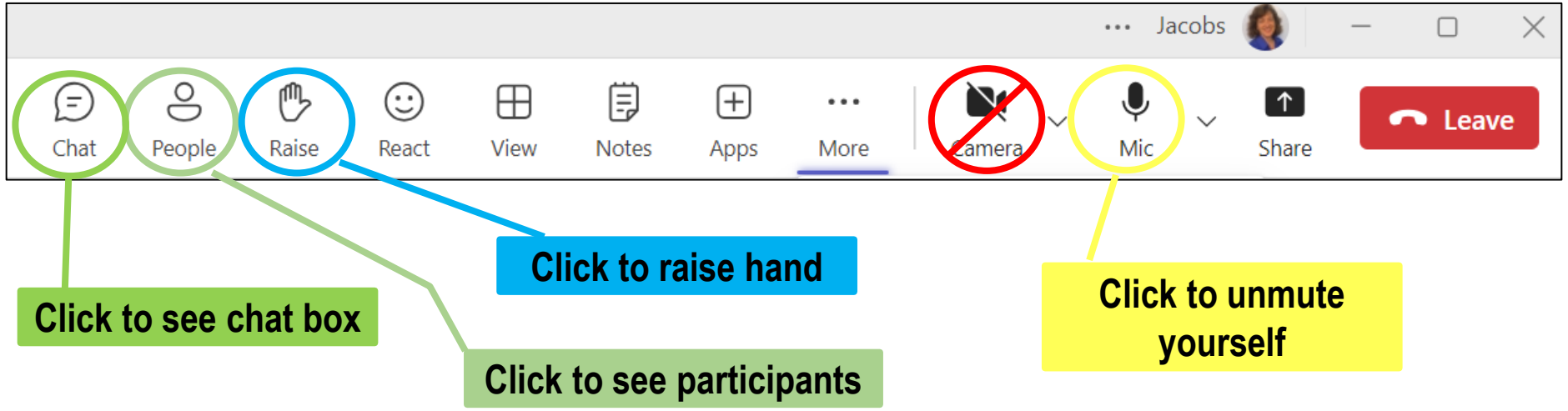
RAB Facilitator

Meeting Guidelines

- Please note that this meeting is being recorded
- RAB Members
  - Ask questions at the end of each topic
  - Raise hand to be called on to speak
  - Introduce yourself so that everyone (in the room and online) knows who is speaking
  - Please observe a 2-minute limit to enable other RAB members to participate.
- Public Participants
  - Hold questions to the end of the meeting
  - In the room, raise hand and introduce yourself when called on
  - Online, submit questions through the “chat feature”
  - Questions will be read and addressed at the end of the meeting

MS Teams - Computer

- Camera – Turn OFF to save bandwidth – presentation will be on screen
- Participants – On the lower right, click on **Participants** to open panel
- To ask a question:
  - RAB Members - **Raise hand** to be called on to speak, unmute yourself when called on
  - Public participants – Use **Chat** to type your question



MS Teams Basics – Telephone Participants

- Follow along on the slide presentation (emailed or download from 104th Fighter Wing website at https://www.104fw.ang.af.mil/About/Restoration-Advisory-Board/
- Use your phone mute button when not speaking
- Dial *5 to raise hand to be called on to speak after the presentation
  - Use *6 or your phone mute button to unmute and identify yourself when asking a question or making a comment
- Any RAB members using a phone? Please identify at beginning of meeting

Welcome and Introductions

Kathleen Hillman, Community Co-Chair

Col. Michael Glass, Base Co-Chair

Welcome and Introductions

Air National Guard Team	
Col. Michael Glass (Base Co-Chair)	Robert Lewis, National Guard Bureau
Jennifer Baker, 104th FW Environmental Coordinator	Contractors: BB&E, EA, Dawson, Jacobs
Community RAB Members	
Kathleen Hillman, Community Co-Chair	Mary Ann Babinski
Chris Clark	Sandi Gil
Kristen Mello	Mary O'Connell
Jane Okscin	Representative Kelly Pease
Dawn Thomas	Senator John Velis
Massachusetts Department of Environmental Protection	
Caprice Shaw	Thomas Keefe
Tamara Cardona-Marek, PhD	

Welcome and Introductions

U.S. Army Corps of Engineers (USACE) Team	
Tracy Williams, Project Manager/ Technical Lead	Grace Greenberg, Risk Assessor
Caitlin Brown, Project Chemist	Mike Narcisi, Wetland Ecologist/Soil Scientist
Dan Folan, PhD, PG, LSP, Geologist/Hydrogeologist	
SRS-Battelle JV Team (USACE Contractor)	
Andrew Barton, Battelle, Project Manager	James Griffin, SRS, Deputy Project Manager
Max Zelenevich, Field Lead	
Contractors	
Tom Barzyk, BB&E	Emma Kosub, Dawson
Craig Johnson, EA	Carla Mykytiuk, Kathryn Burns, Jacobs

RAB Business

Carla Mykytiuk, Jacobs

Robert Lewis, National Guard Bureau

RAB Updates

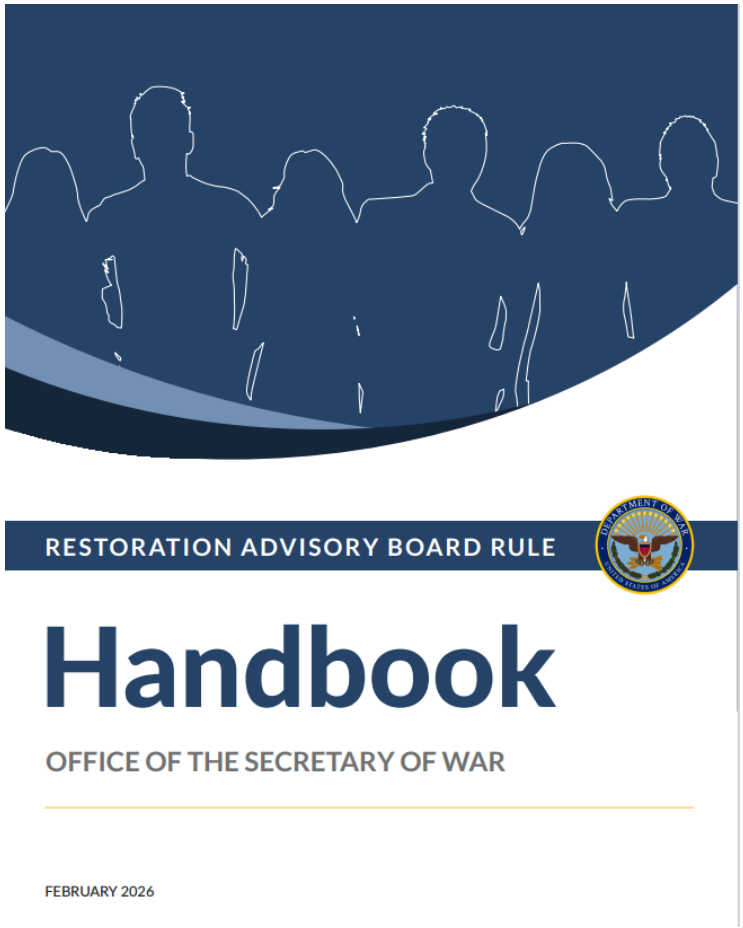
- Meeting Summary Review and Approval
- Upcoming Meetings
- Updated RAB Rule Handbook

RAB Business

- Meeting summary – comments and approval
- Upcoming meetings
  - Fourth Thursday of the month, every 3 months: January, April, July, October
  - Adjustments to be made when needed
  - Upcoming meetings: July 23, 2026
    October 22, 2026
    January 28, 2027

RAB Rule Handbook, FEB 2026

- Builds on the 2007 handbook
  - same rules, updated guidance
- Stronger focus on community engagement & transparency
- Adds best practices based on real-world RAB experience
- Expands guidance on communication, meetings, and participation
- Includes tools to support more effective, collaborative RABs



RAB Member Discussion

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- Introduce yourself at the beginning of your question or comment.
- Please limit questions to 2 minutes to give other RAB members an opportunity to participate.

INDEPENDENT TECHNICAL REVIEW of

BARNES ANG CO-CONTAMINANTS AND PREVIOUS REMEDIAL TREATMENTS IMPACTS ON PFAS

Presented by Danielle Hare, Ph.D.

University of Massachusetts Amherst

AGENDA

1. Introduction
2. AFFF co-contamination
3. Remediation Implications for PFAS
4. Recommendations
5. Q&A

INTRODUCTION

Objective: The purpose of this report is to provide an independent current literature review and technical support through document review and data interpretation of associated risks or complications with Per and Polyfluoroalkyl Substances (PFAS) and intermingled co-contaminants at Barnes Air National Guard Base.

Danielle K. Hare, Ph.D.

Ecosystem Ecology and Water Resources

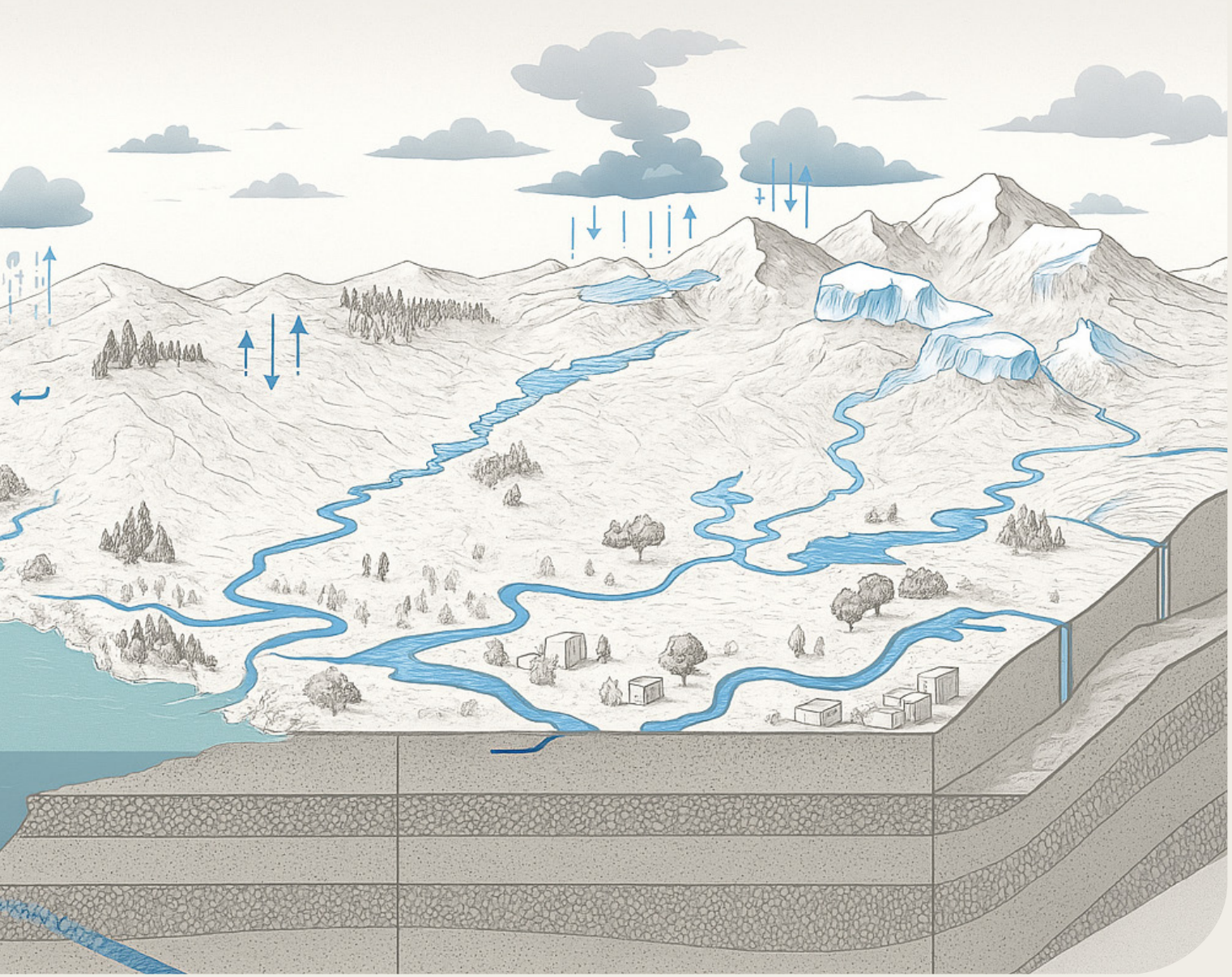
Research Assistant Professor

Earth Geographic and Climate Sciences

University of Massachusetts Amherst

PFAS AND CO-CONTAMINANTS

How could the presence of another chemical modify PFAS fate and transport dynamics?



THREE PLACES FOR CO-CONTAMINANTS TO INFLUENCE PFAS FATE AND TRANSPORT IN THE ENVIRONMENT

1. **Source Zone**

2. **Plume**

3. **Discharge Locations**

Three places for co-contaminants to influence PFAS fate and transport in the environment

Source Zone

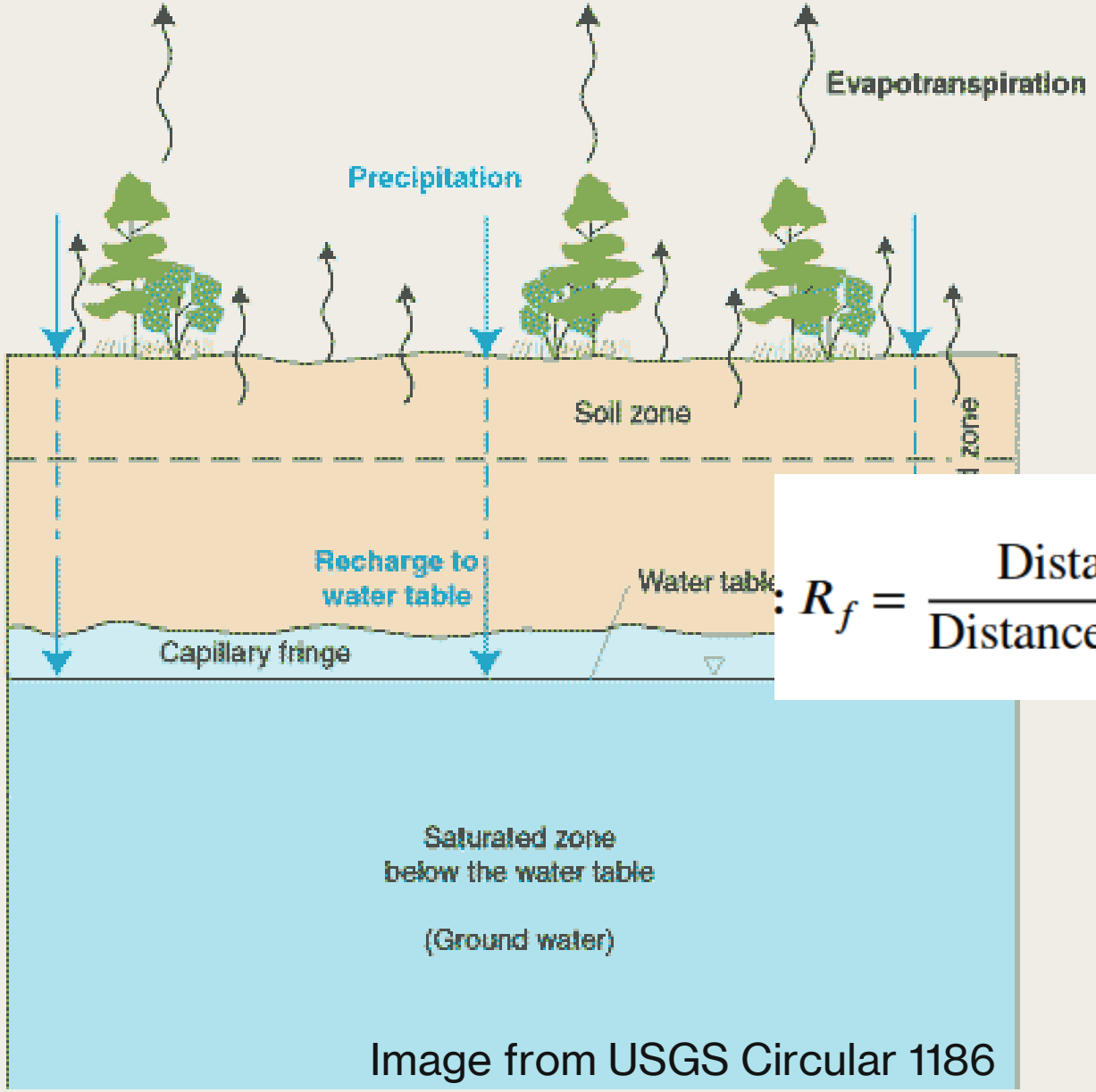


Image from USGS Circular 1186

Sorption factor

$$R_f = \frac{\text{Distance moved by the solute}}{\text{Distance moved by the solvent front}}.$$

POTENTIAL VADOSE ZONE INFLUENCES

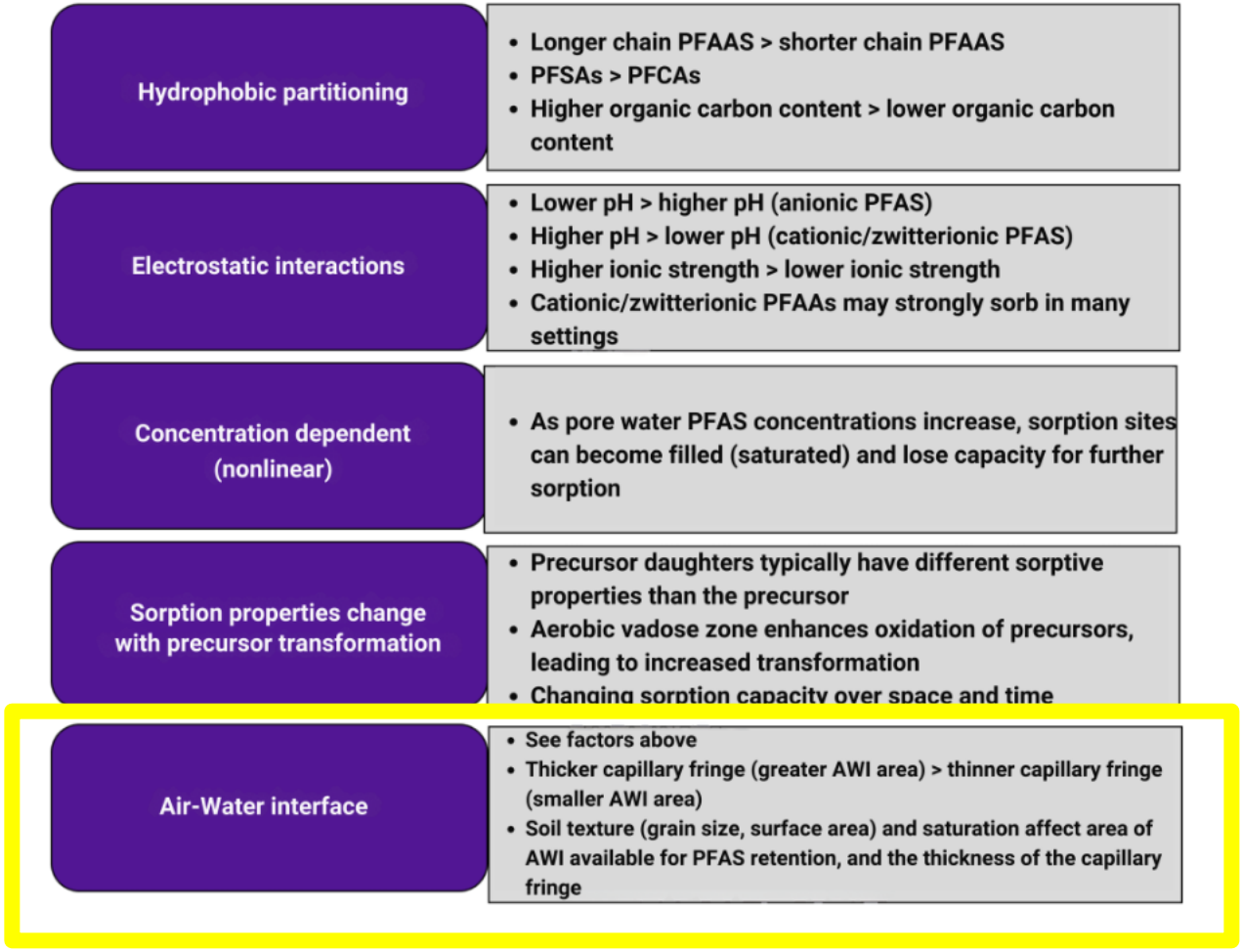
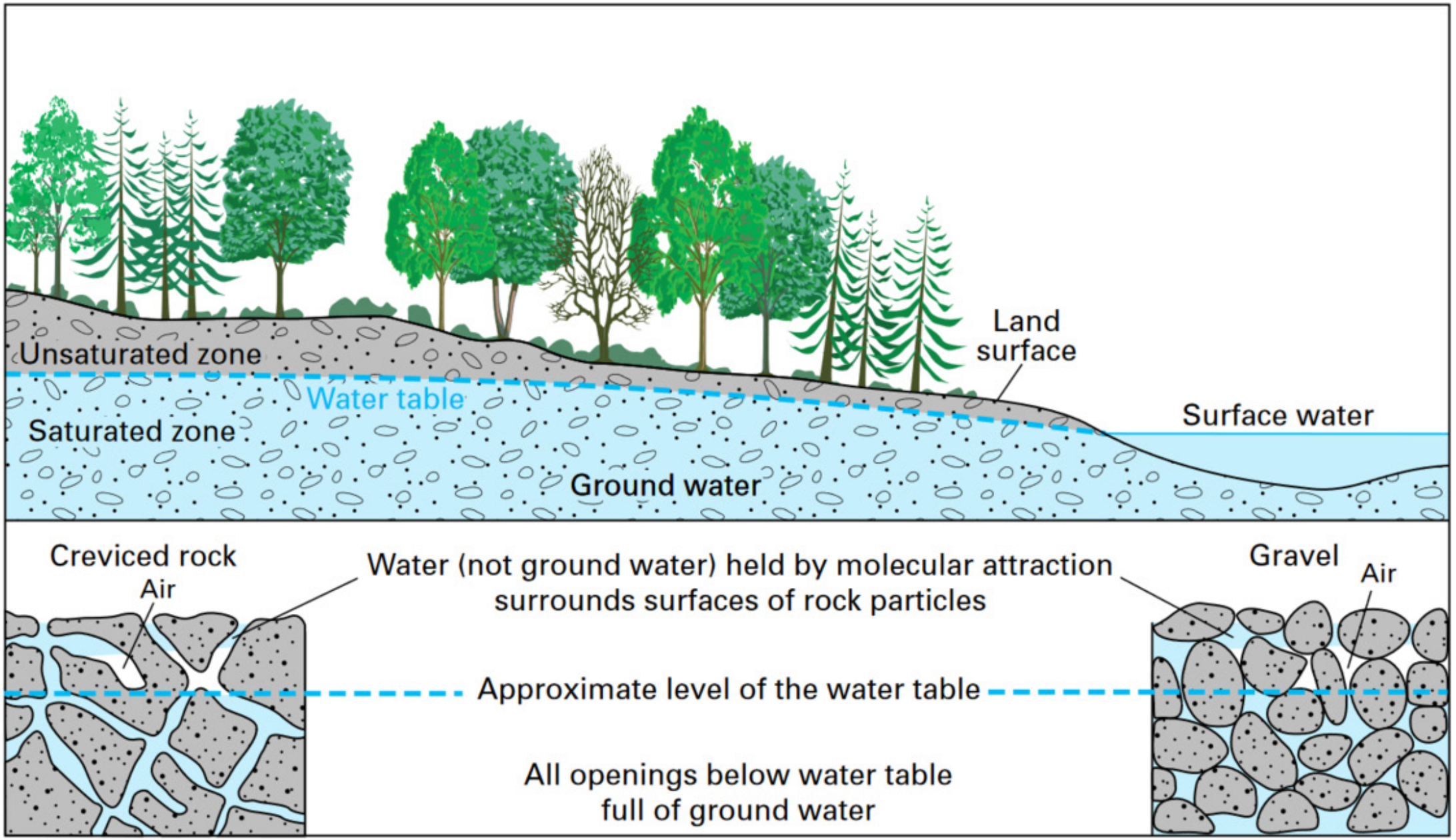


Figure 1-2. Factors influencing retention in the vadose zone.

Source: D. Drennan, BEM Systems. Used with permission.

Modified from Figure 1-2 ITRCweb.org

Overall, soil type has been shown to be a stronger factor influencing PFAS transport and recovery than jet fuel contamination (i.e., Cai et al. 2002



How ground water occurs in rocks.

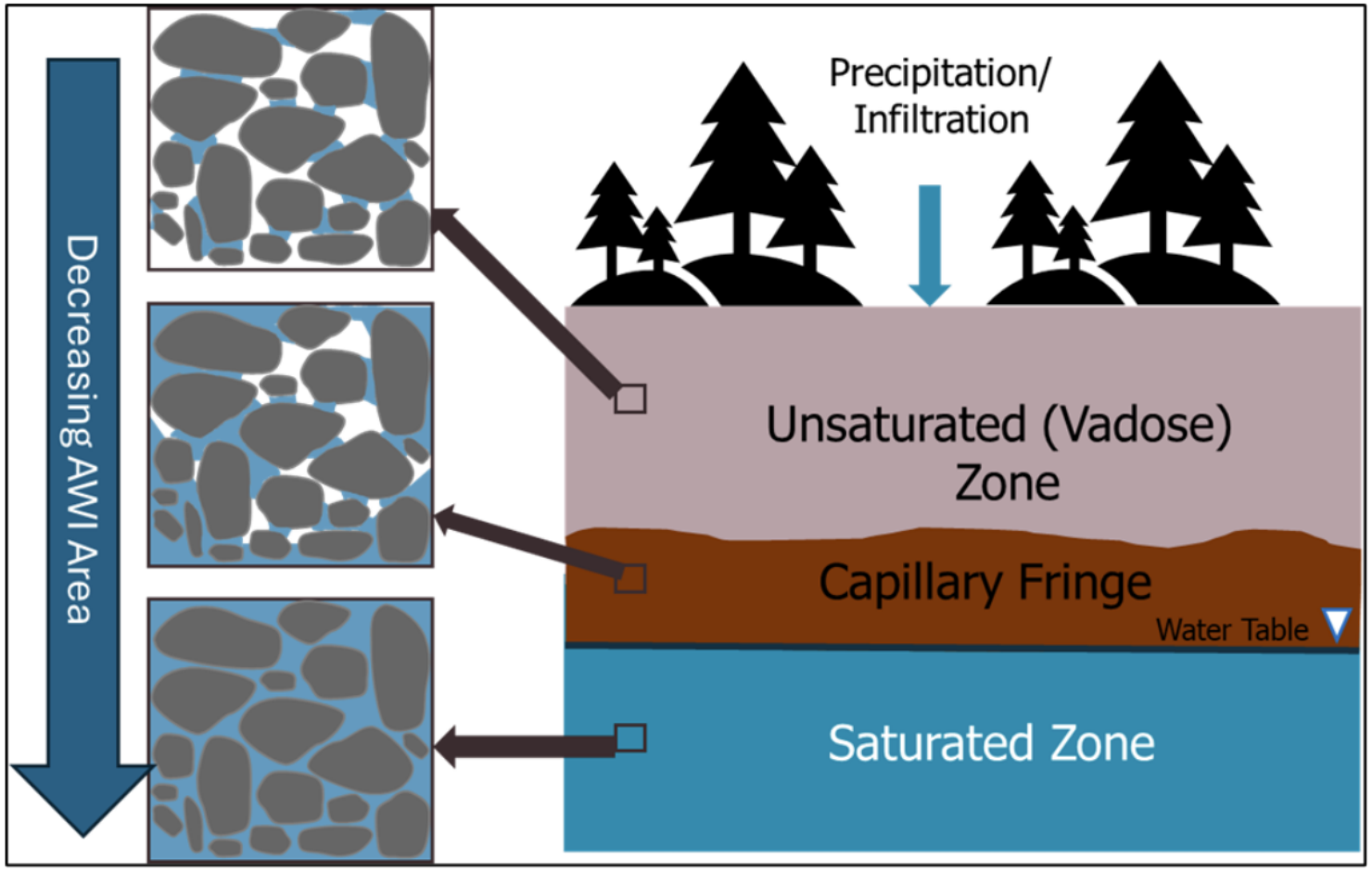


Figure 1-1. Partitioning and interfacial area. The degree of water saturation affects the amount of interfacial area in a nonlinear manner. Increased interfacial area increases retention. Factors that contribute to retention at the AWI include porewater ionic strength, PFAS concentration, and soil properties such as grain size, minerology, and moisture content, which affect the thickness of the capillary fringe.

AIR–WATER INTERFACIAL RETENTION EXHIBITS A CONTROL ON PFAS PERSISTENCE

- PFAS migration through the vadose zone is rapid, yet elevated groundwater levels indicate long-term source persistence. Why?
- Air–water interface (AWI) adsorption is a dominant control on PFAS transport in soils and subsurface systems, making AWI processes critical to understanding long-term PFAS longevity

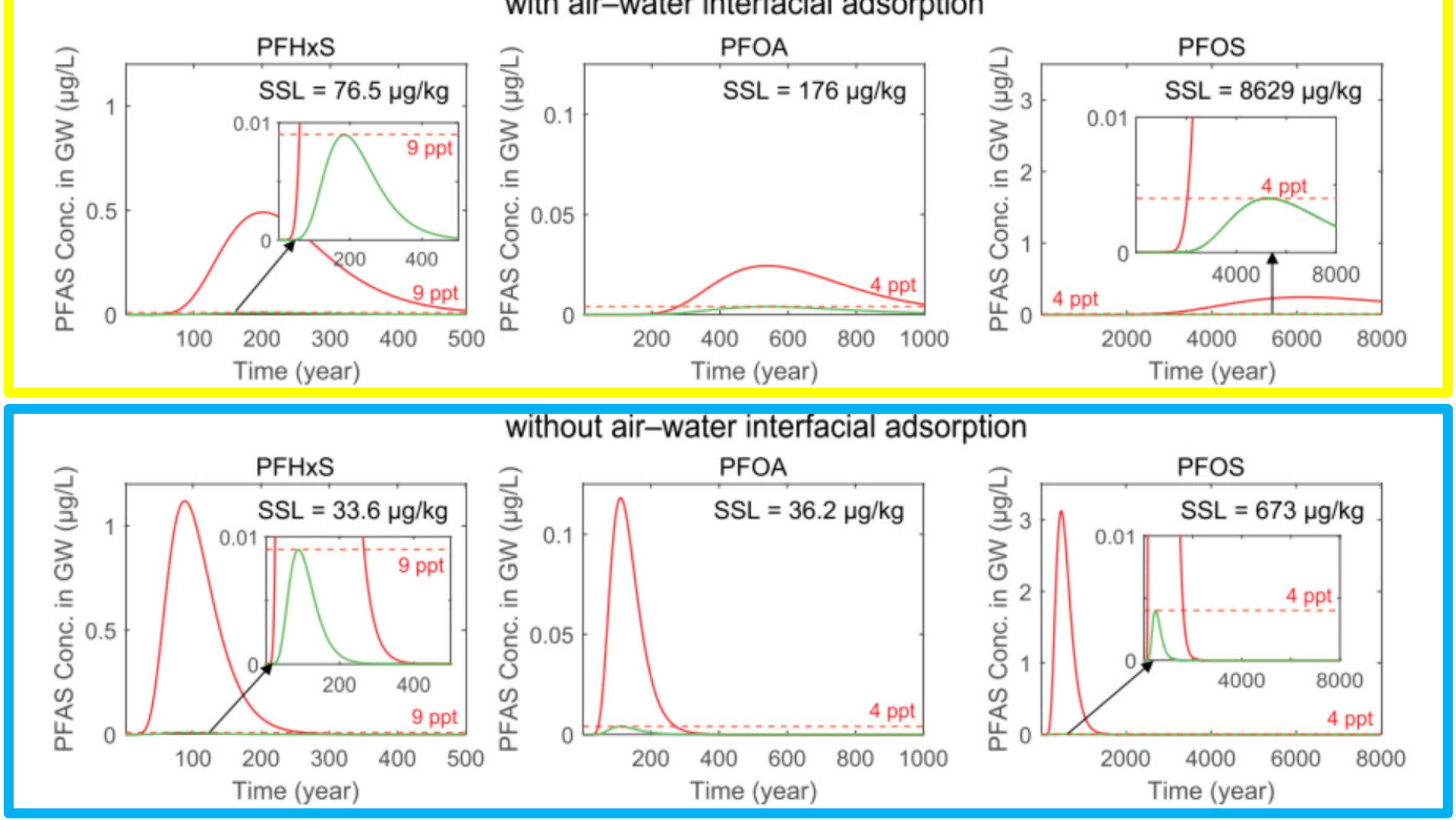


Figure from Smith et al. 2024

2. PLUME DYNAMICS

Changes in water content and turbulence during water-table fluctuations can significantly modify PFAS mobility

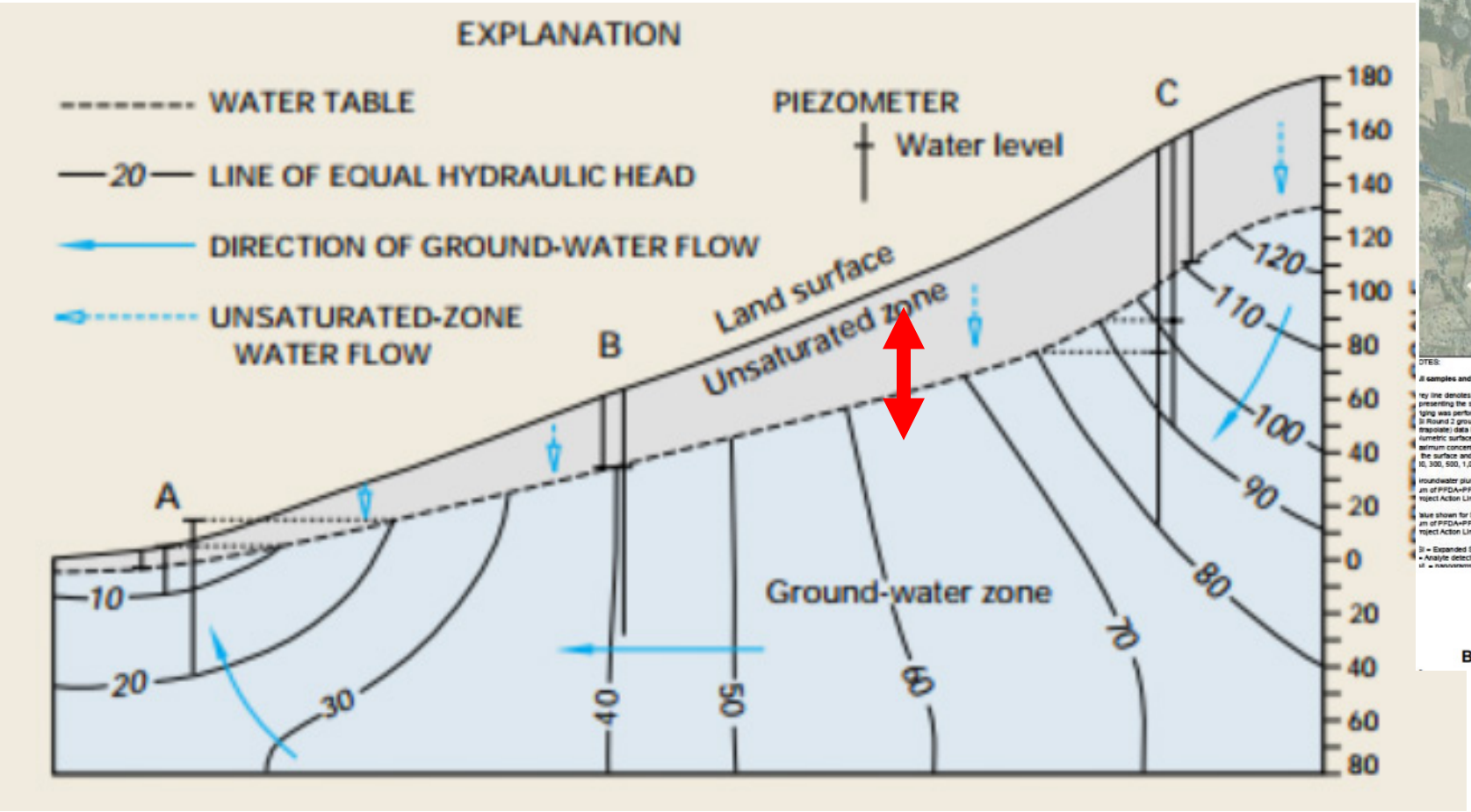


Image from Winter et al. 1998

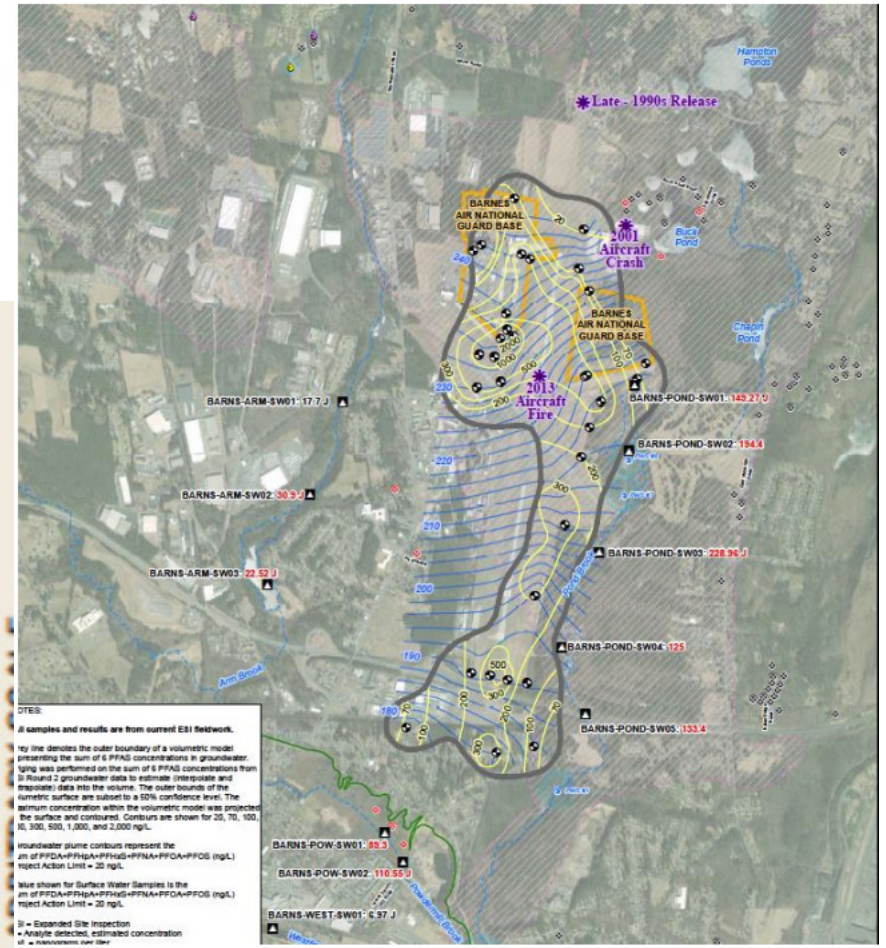


Figure 18
Receptor Survey and PFAS Groundwater Plume
Barnes Air National Guard Base

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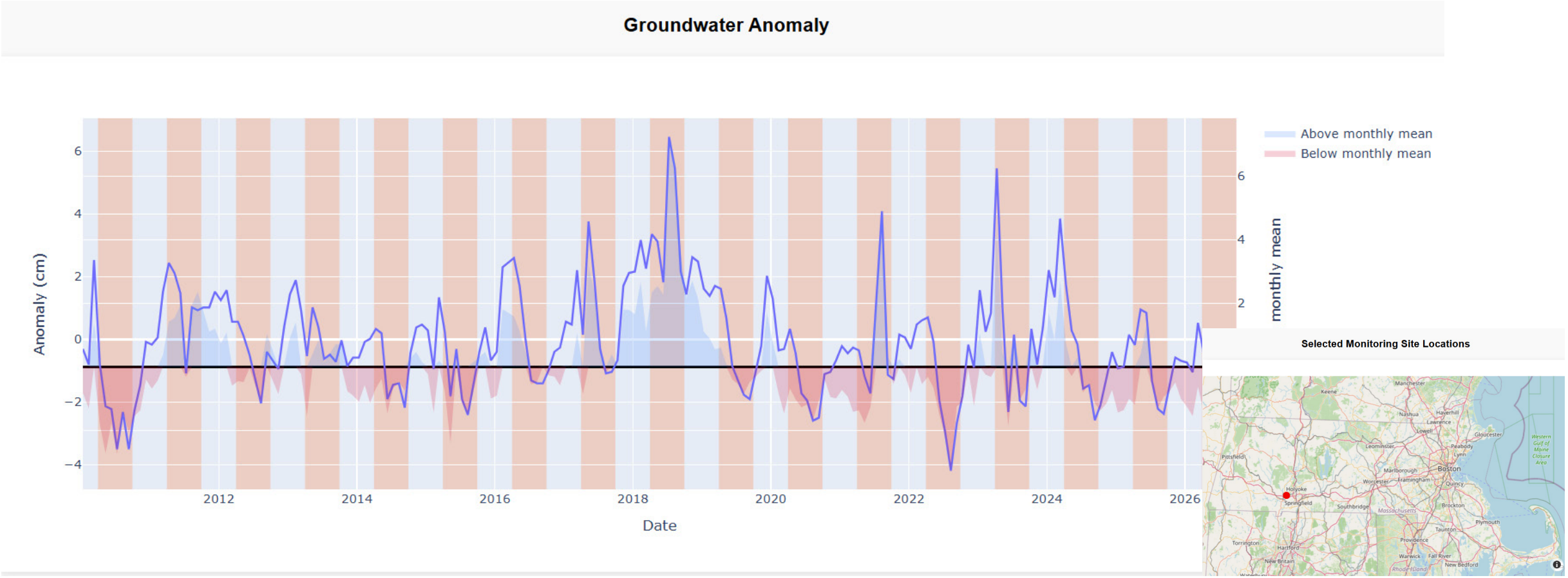

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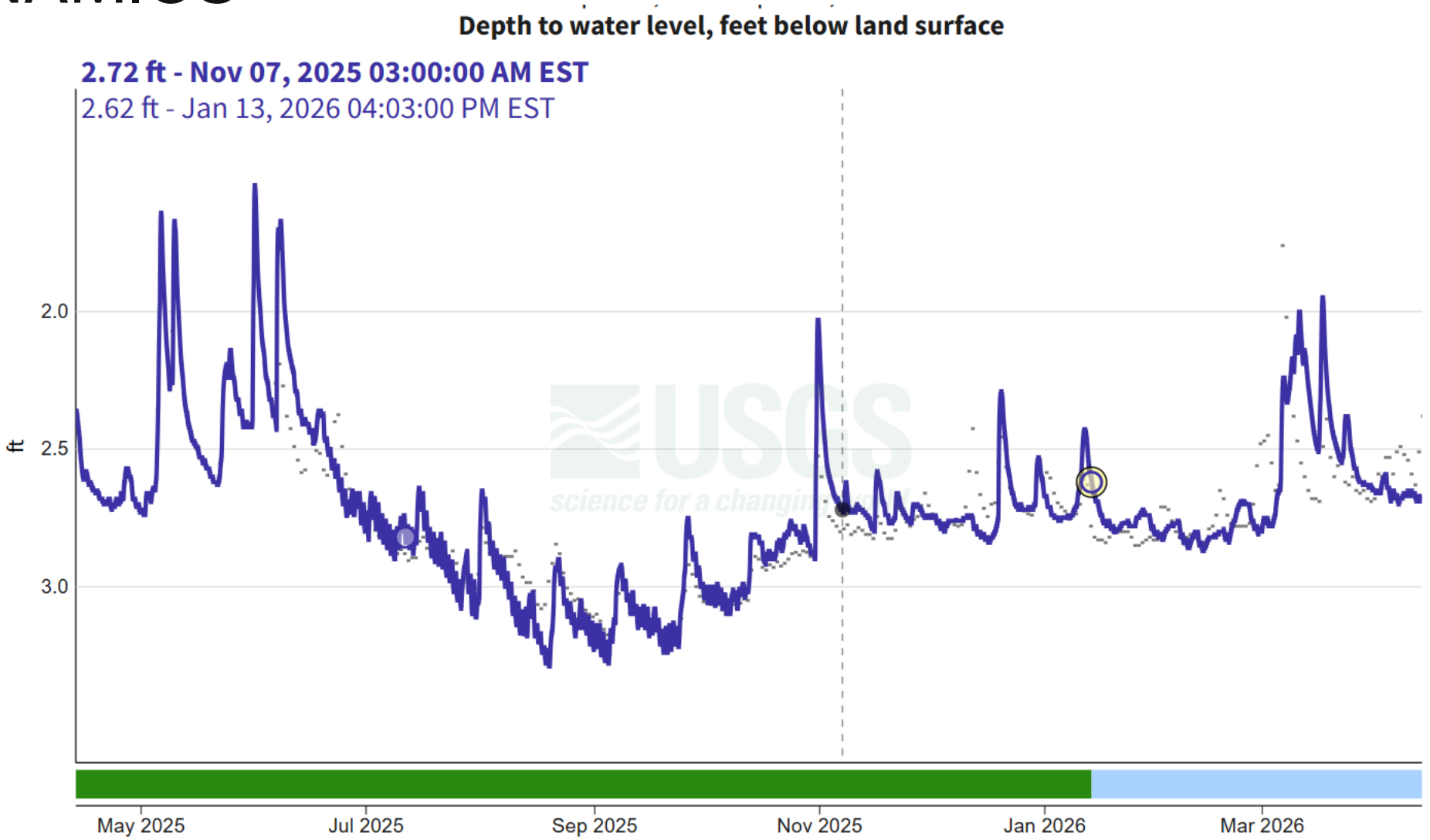


SEASONAL AND GEOCHEMICAL CONTROLS ON PFAS TRANSPORT

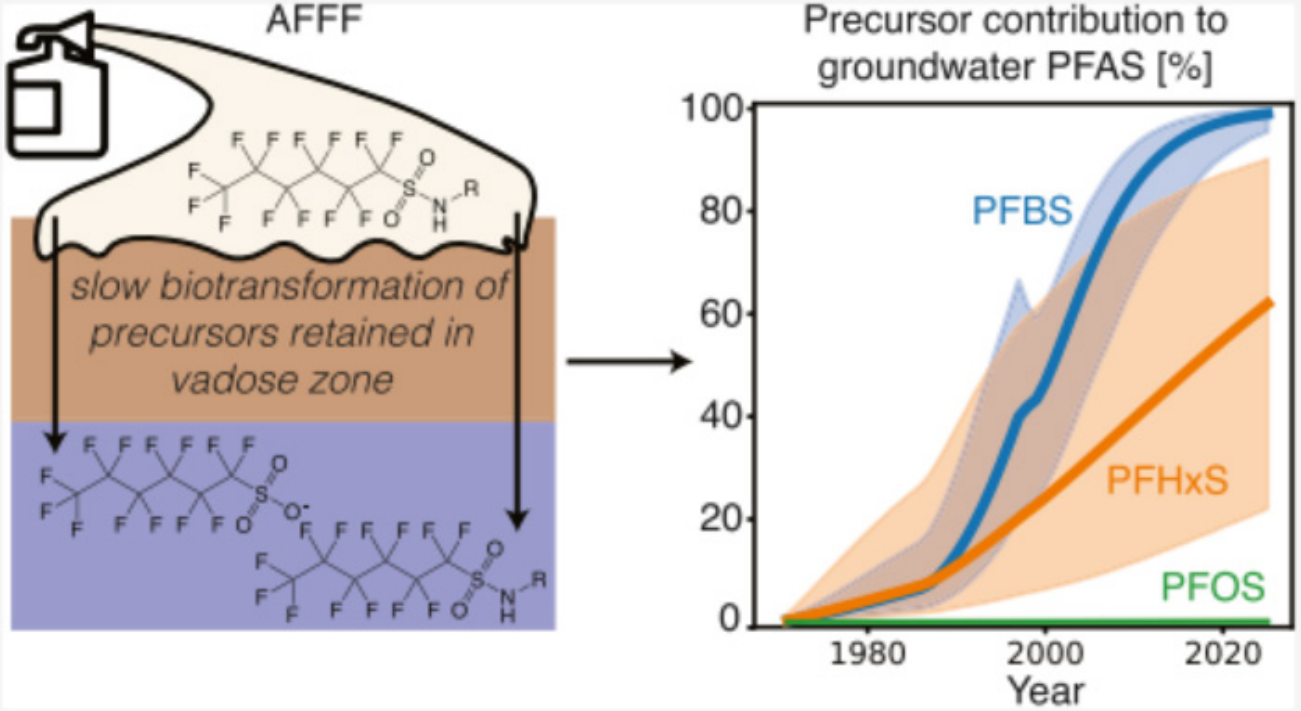
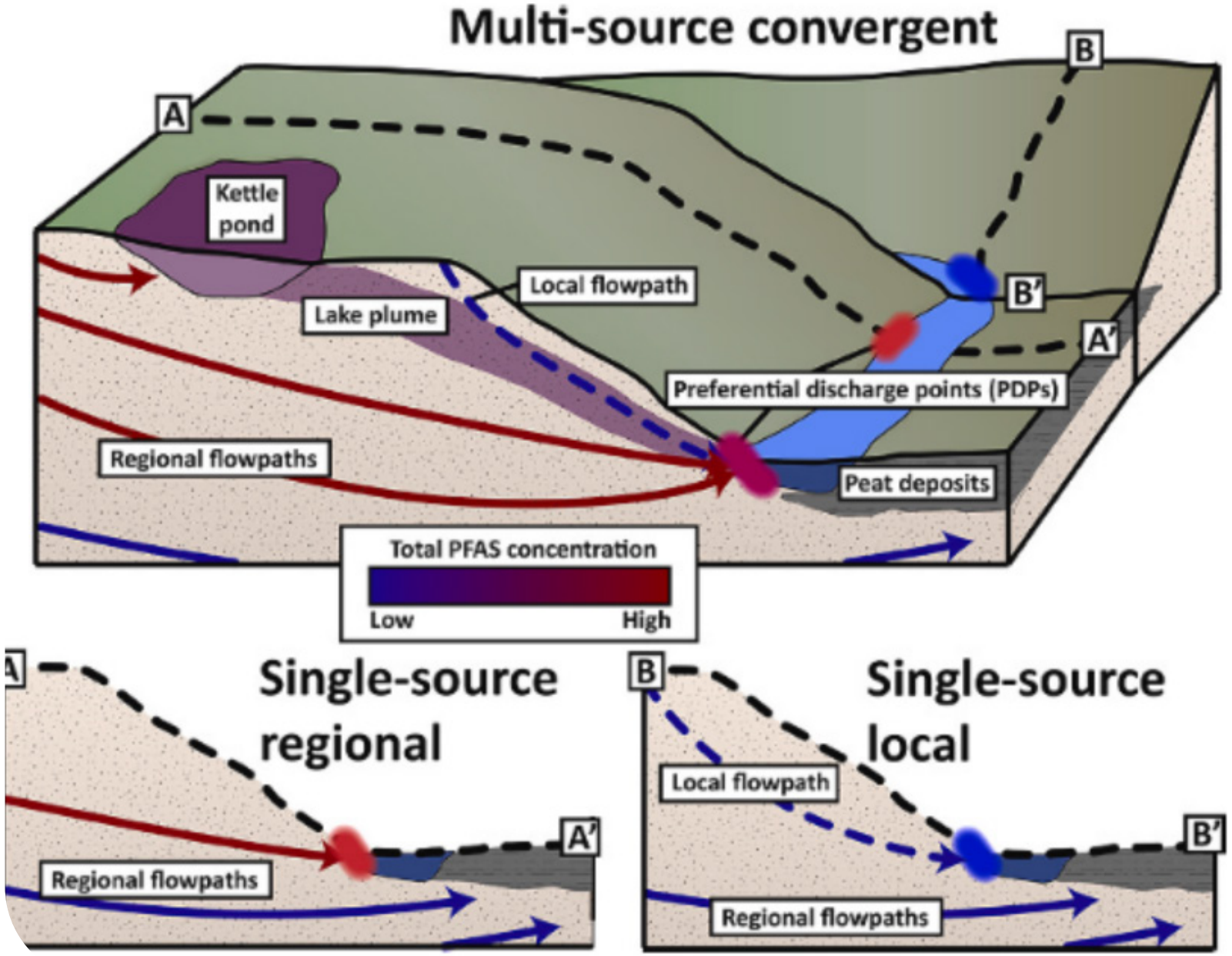


Figure from Ruyle et al.

- PFAS mobility is influenced by the timing of percolation and seasonal water-level changes
- Winter conditions can increase PFAS concentrations due to reduced biodegradation and temperature-dependent microbial activity
- Ionic strength and pH can modify PFAS retention, emphasizing the need for continuous monitoring of geochemical conditions in source zones

3. DISCHARGE LOCATIONS

Discharge zones represent areas transitioning from low-oxygen (anoxic) to high oxygen, thus these areas can have substantial spatial and temporal variability in PFAS concentrations



Rey et al. 2025

PFAS AND REMEDIATION

How could the planned or prior remediation influence PFAS fate and transport?

OVERVIEW OF PAST CLEANUP ACTIONS

- Source Zone Soil Removal
- Natural Attenuation
- Bioventing system for soil remediation, operational for 18 months
- Enhanced fluid recovery
- Oxygen-releasing compounds

POTENTIAL RESPONSE OF PFAS TO REMEDIATION

- In oxidative conditions (active and passive) PFAS precursors are susceptible to transformation, thus under oxidative remediation methods

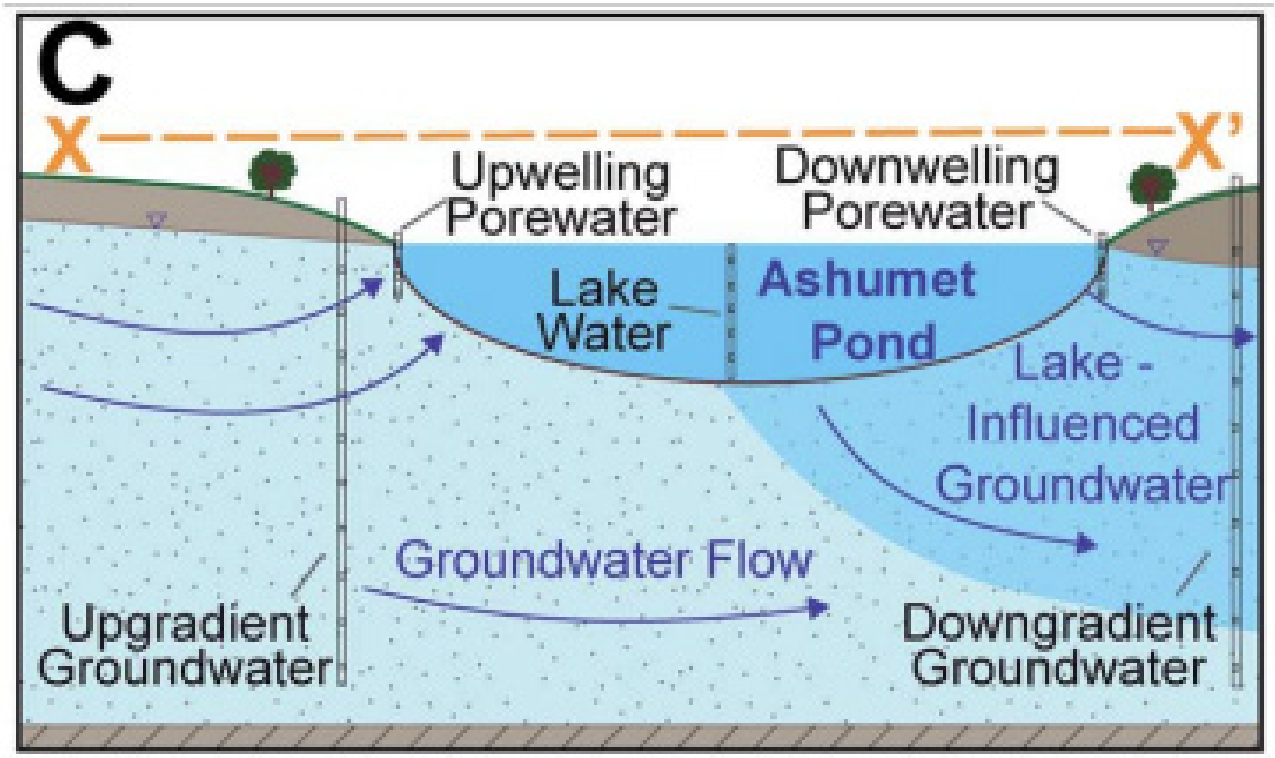
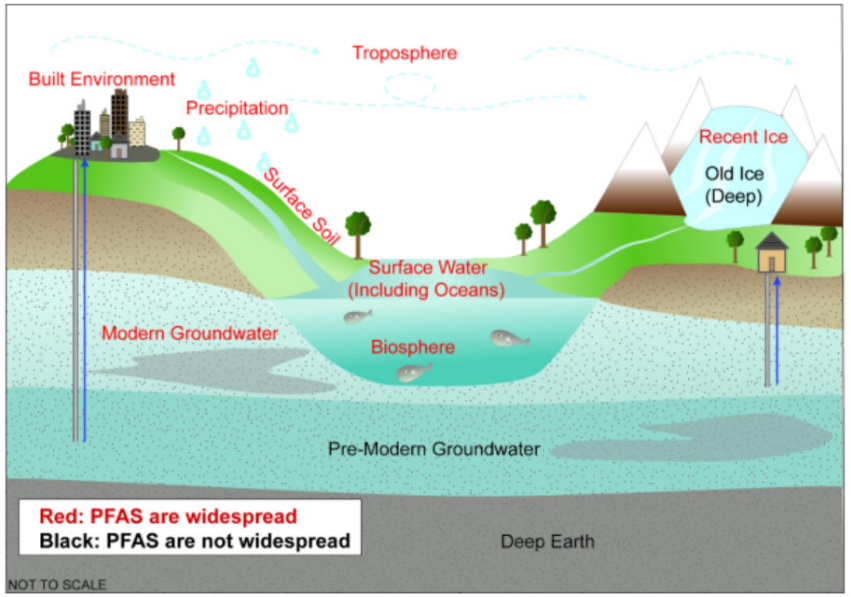


Figure fromk Tokranov et al. 2021

CONSIDERING BACKGROUND PFAS

Environmental Science & Technology pubs.acs.org/est



Tokranov et al. 2026

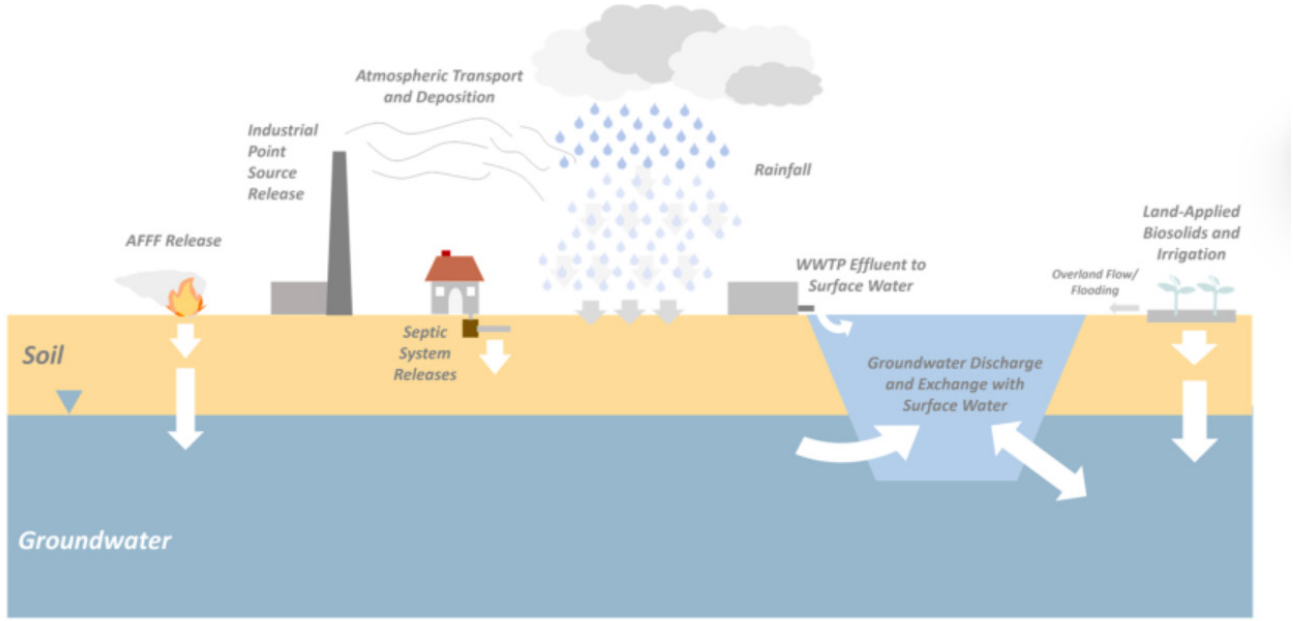


Fig. 1. Overview of PFAS Sources and Transport Pathways. Point sources include stack emissions from manufacturing facilities and land application of aqueous film-forming foam (AFFF). Non-point or diffuse sources include rainfall, biosolids, and septic wastewater discharges, with atmospheric transport, deposition, infiltration, leaching, overland flow, and groundwater/surface water exchanges as potential drivers to redistribute PFAS.

Adamson et al. 2026

Ubiquitous versus Widespread

RECOMMENDATIONS

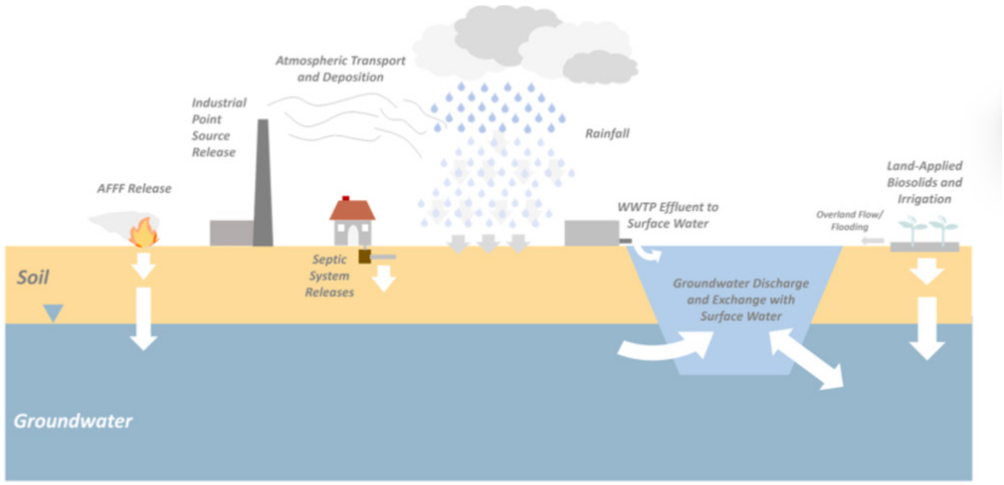


Fig. 1. Overview of PFAS Sources and Transport Pathways. Point sources include stack emissions from manufacturing facilities and land application of aqueous film-forming foam (AFFF). Non-point or diffuse sources include rainfall, biosolids, and septic wastewater discharges, with atmospheric transport, deposition, infiltration, leaching, overland flow, and groundwater/surface water exchanges as potential drivers to redistribute PFAS.

(1) Focus on delineating source zone characterization, focus on sorption dynamics

(2) Examine spatial and temporal dynamics of water table fluctuations in source zones and plumes

(3) Utilize low-cost continuous monitoring systems, such as conductivity, redox potential, and dissolved oxygen, to evaluate temporal dynamics and plume extent.

(4) Increase surface water samplings to consider seasonally specific, event- and non-event surface-water sampling, and discrete groundwater upwelling sampling.

(5) Review approaches and findings from similar geologic and hydrogeologic conditions, such as the Otis Air Force Base in Cape Cod, Massachusetts.

RAB Member Discussion

- Please raise your hands and unmute yourself when recognized.
- Introduce yourself at the beginning of your question or comment.
- Please limit questions to 2 minutes to give other RAB members an opportunity to participate.

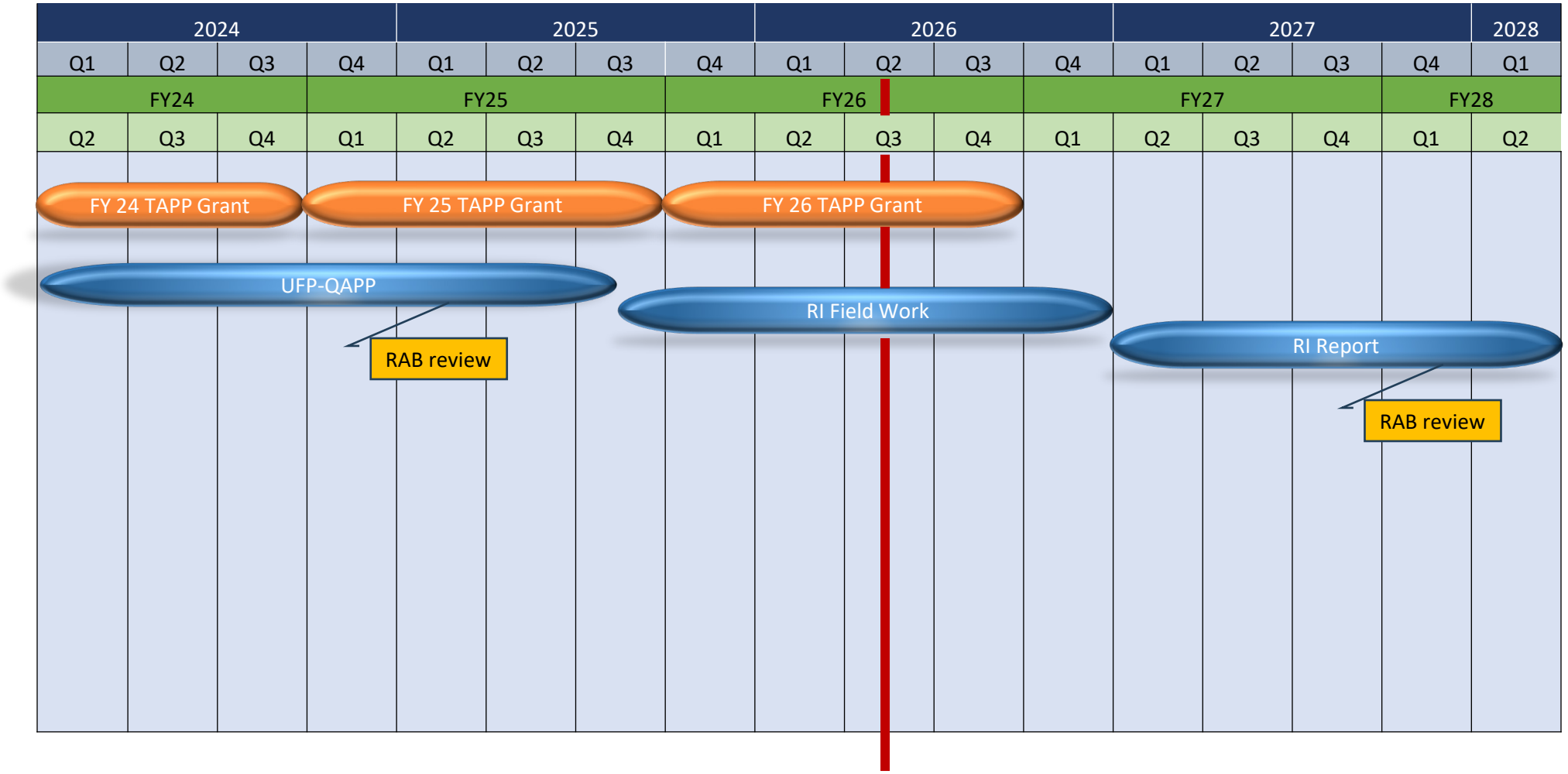
Environmental Restoration Program Status Update

Robert Lewis
National Guard Bureau
Remedial Project Manager

Environmental Restoration Program

- Site 2 Current Status
  - Activity and Use Limitation (AUL) audit conducted by MassDEP
- PFAS Remedial Investigation (RI)
  - VAS sampling underway with Monitoring Well installation to follow.
  - Soil Sampling Data provided to RAB

Barnes Restoration Calendar



Project Fieldwork Scope

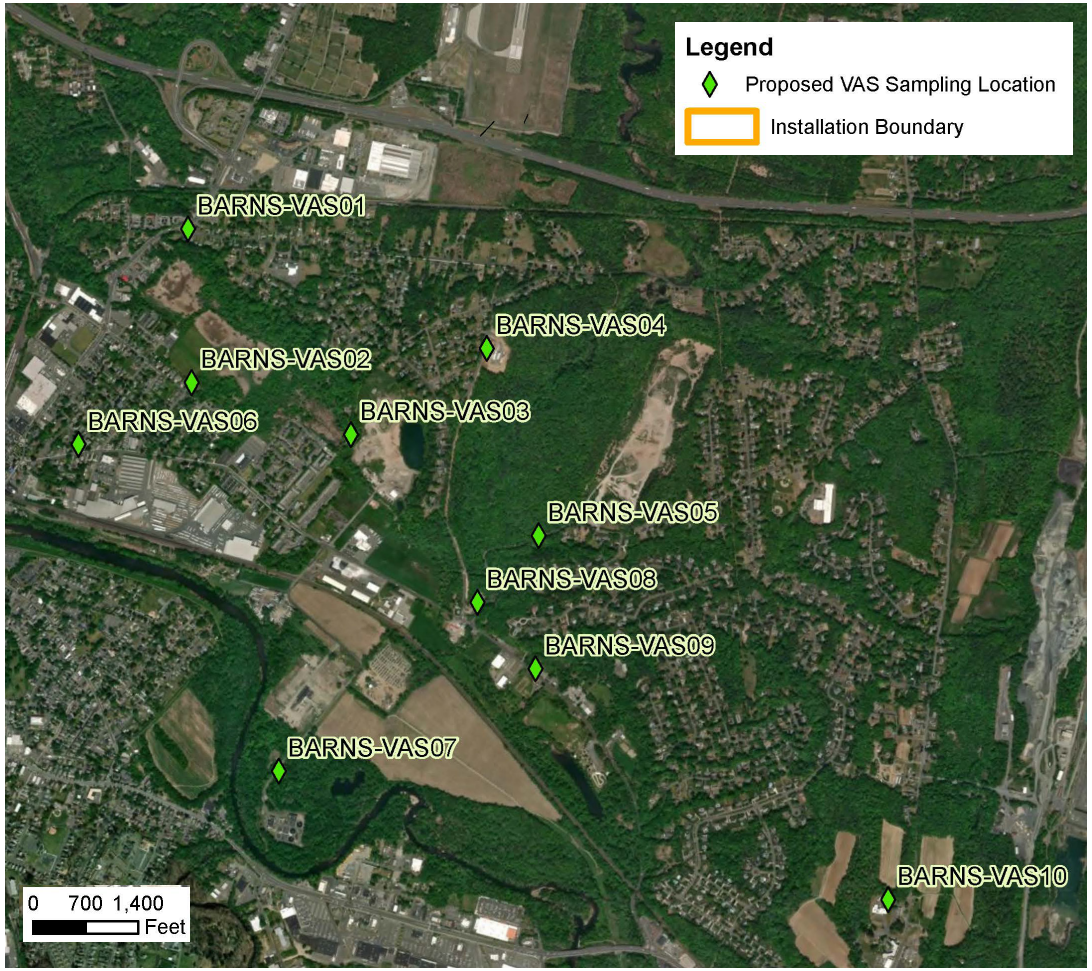
- Site Access Agreements
- Obtain applicable authorizations
- Utility location
- Surface soil sampling
- Subsurface soil sampling
- Surface water and sediment sampling
- Vertical aquifer sampling (VAS) (groundwater)
- Groundwater monitoring well installation
- Borehole geophysical logging
- Piezometer installation
- Monitoring well development
- Groundwater sampling
- Groundwater and surface water elevation monitoring
- Location surveying
- Habitat assessment
- Investigation-derived waste management and disposal
- Field record management and reporting

Green = in progress

Yellow = next steps

VAS Locations

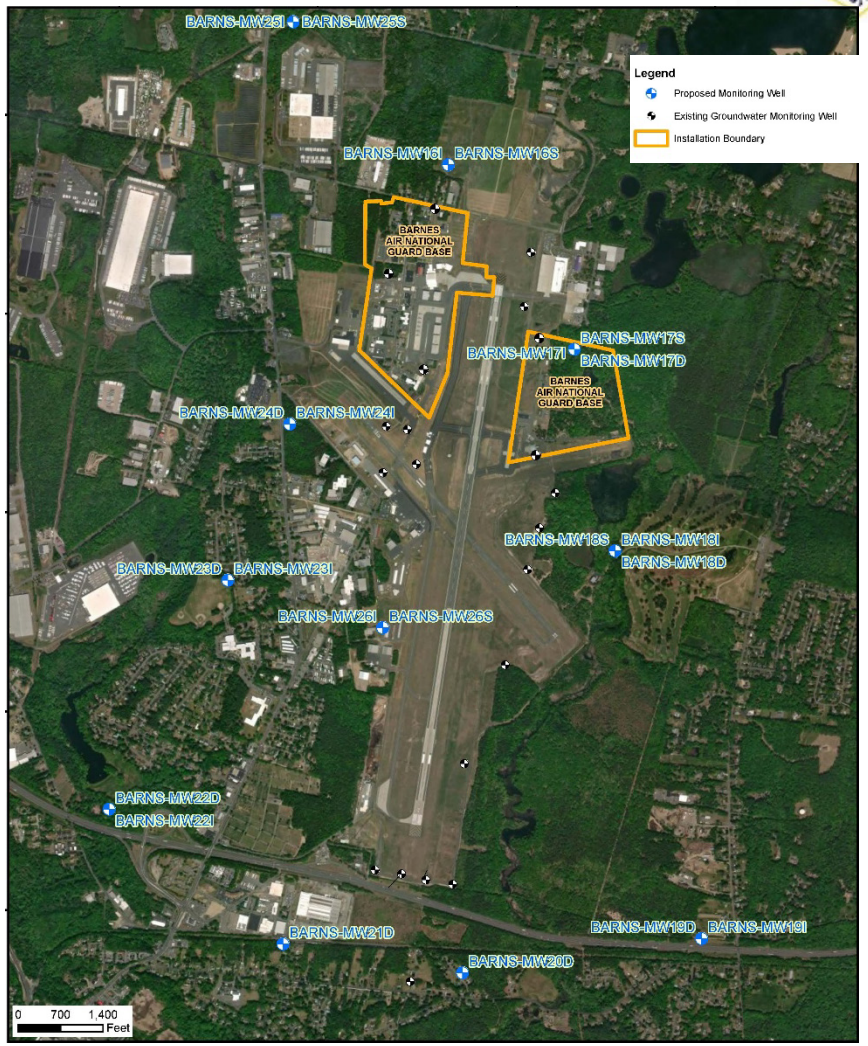
- Objective is to spatially and vertically delineate PFAS in groundwater downgradient of the Site
- 10 VAS locations – up to 4 groundwater sample depths per location
- VAS involves using direct push drilling to characterize lithology, determine groundwater level, identify groundwater sample collection depths, and collect groundwater samples
- Results will be used to evaluate need and placement of additional monitoring wells in unconsolidated/ bedrock aquifers downgradient of the Site to delineate PFAS in groundwater



VAS 01 Fieldwork

Groundwater Monitoring Well Installation

- Objective is to spatially and vertically delineate nature and extent PFAS in groundwater
- 22 new monitoring wells at 11 locations
- Designed to monitor shallow, intermediate, and/or deep unconsolidated aquifer intervals
- Process includes monitoring well installation, development, and groundwater sampling
- Results will be used to evaluate need and placement of additional monitoring wells in unconsolidated/ bedrock aquifers to delineate PFAS in groundwater



Project Fieldwork Schedule

Activity	Schedule
Access agreements & permits	Ongoing
Utility location	September 2025-ongoing
Surface soil sampling, round 1	September 2025 (complete)
Vertical aquifer sampling (VAS) (groundwater)	April 2026
Monitoring well installation and sampling (round 1)	April 2026
Piezometer installation	May 2026
Surface water/sediment sampling, round 1	May/June 2026
Habitat Assessment	May/June 2026
Monitoring well installation (round 2)*	June/July 2026

* Pending Access Agreements

Project Fieldwork Schedule (cont.)

Activity	Schedule
Background surface soil sampling	October 2026
Surface soil sampling, round 2	October 2026
Subsurface soil sampling, round 1	November 2026
Groundwater sampling, round 1	November 2026
Surface water/sediment sampling, round 2	November 2026
Subsurface soil sampling, round 2	February 2027
Groundwater sampling, round 2	May 2027

RAB Member Discussion

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Public Questions and Comments

In person: Raise hand to be recognized

Online: Submit questions using chat

Contact Information

104th Fighter Wing, Barnes Air National Guard Base		
Base Co-Chair Commander **Col. Michael Glass**	Environmental Manager **Jennifer Baker**	Public Affairs Manager **Jay Hewitt** (413) 568-9151 x 698-1202 Jerry.hewitt@us.af.mil

Community Co-Chair
Kathleen Hillman khillman179@gmail.com RAB members, please submit questions and comments through your Community Co-Chair

National Guard Bureau	Massachusetts Department of Environmental Protection	Jacobs Facilitator
Program Manager **Robert Lewis** (240) 612-8473 robert.lewis.100.ctr@us.af.mil	**Thomas Keefe** (857) 268-0408 Thomas.keefe@mass.gov	**Carla Mykytiuk** (847) 708-4878 Carla.Mykytiuk@jacobs.com

Websites for More Information

Environmental Restoration Program at 104th Fighter Wing

- General and Links to PFOS/PFOA Information: https://www.104fw.ang.af.mil/About/Environmental/
- Restoration Advisory Board: https://www.104fw.ang.af.mil/About/Restoration-Advisory-Board/

Relative Risk Site Evaluation (RRSE)

- Barnes RRSE: https://www.104fw.ang.af.mil/Portals/5/Barnes_RRSE%20Fact%20Sheet%20and%20Scoring%20Summaries_211215.pdf
- RRSE Primer: https://www.denix.osd.mil/derp/denix-files/sites/26/2025/12/RRSE_Primer_Framework_508.pdf
- **104th Fighter Wing Environmental Administrative Record**
- https://ar.cce.af.mil/Search (Select ANG radio button, select Barnes Municipal Airport, and type "Barnes" in the "Subject/Title" bar then click on search)

MassDEP PFAS Information

- https://www.mass.gov/info-details/per-and-polyfluoroalkyl-substances-pfas

Westfield Water Department PFAS Information

- https://www.cityofwestfield.org/672/PFCs-Information-Updates

RAB Rule Handbook and Information on Technical Assistance for Public Participation

- https://www.denix.osd.mil/rab/home/

Air Force Response to PFOS and PFOA

- https://www.afcec.af.mil/WhatWeDo/Environment/Perfluorinated-Compounds/

Closing Remarks

Kathleen Hillman

Col. Michael Glass

Adjourn