Jacobs

Meeting Minutes

Subject Meeting #14- Barnes Air National Guard Base (ANGB) Restoration Advisory Board (RAB)

Prepared by Kathryn Burns, Jacobs

Location Westfield Atheneum and Microsoft Teams

Date/Time April 23, 2026, 6:00 p.m.

RAB Members	Additional Participants
Kathleen (Kathy) Hillman, community co-chair	Col Michael Glass, 104 FW Barnes ANGB
Mary O'Connell	Lt. Col. Sarah Sinclair, 104 FW Barnes ANGB
Dawn Thomas	Jennifer Baker, 104 FW Barnes ANGB
Chris Clark	Robert Lewis, National Guard Bureau (NGB) Restoration Program Manager (RPM)
Mary Ann Babinski	Tracy Williams Jr., USACE
Kristen Mello	Thomas (Tom) Keefe, Massachusetts Department of Environmental Protection (Massachusetts DEP)
Jane Okscin	Dr. Danielle Hare, University of Massachusetts Amherst
	Andrew Barton, Batelle
	Kathryn Burns, Jacobs
	Carla Mykytiuk, Jacobs

A full list of attendees is provided in **Attachment A**.

The Barnes ANGB RAB Meeting No. 14 was held on April 23, 2026, at 1800 in a hybrid format, in person at the Westfield Atheneum and via Microsoft Teams. The following notes summarize key discussions and decisions and are not a verbatim transcript. A copy of the slide presentation is provided in **Attachment B.**

1. Meeting Logistics and Welcome

(1) RAB facilitator Carla Mykytiuk (Jacobs) opened the meeting with logistics (recording notice; RAB member questions after each topic; public questions held to the end; use of the Teams "Raise Hand" and Chat features).

(2) Kathy Hillman (RAB Community Co-Chair) opened the meeting and welcomed attendees.
(3) Col. Michael Glass (104 FW Barnes ANGB Base Co-Chair) introduced himself as the new 104th Wing Commander, stated his appreciation for the RAB process, and emphasized the importance of continued collaboration and communication with the community.
(4) Carla Mykytiuk (Jacobs) reviewed meeting participants and acknowledged representatives from the Air National Guard, MassDEP, USACE, contractors, and community RAB members.

2. RAB Business:

(1) Carla Mykytiuk (Jacobs) reviewed the January 29, 2026 meeting minutes and requested comments or revisions from the RAB. No revisions were requested, and the minutes were approved as presented.
(2) Upcoming RAB meetings were reviewed:
- July 23, 2026
- October 22, 2026
- January 28, 2027

(3) Carla Mykytiuk (Jacobs) provided an overview of the updated February 2026 RAB Rule Handbook, noting:
- It builds on the 2007 handbook while retaining the same foundational rules.
- It places greater emphasis on community engagement and transparency.
- It incorporates lessons learned and best practices from RABs nationwide.
- It expands guidance related to communication, meetings, and participation.
- It includes tools intended to support more effective and collaborative RABs.

(4) No additional RAB business questions or comments were raised.

3. Technical Advisory Public Participation (TAPP) Presentation – Co-Contaminants and PFAS Fate & Transport

Lt. Col. Sarah Sinclair (104 FW Barnes ANGB) introduced Dr. Danielle Hare (University of Massachusetts Amherst), who presented findings from the TAPP grant technical review regarding co-contaminants and previous remedial treatment impacts on PFAS.

Dr. Hare provided background on her professional experience in hydrogeology, groundwater-surface water interactions, remediation science, and ecosystem ecology.

Key presentation topics:

(1) Definition of co-contamination and how contaminants such as jet fuel hydrocarbons may influence PFAS fate and transport.
(2) Discussion of the three primary areas where co-contaminants may influence PFAS behavior:
- Source zones
- Groundwater plumes

- Discharge locations

(3) Explanation of the vadose zone, capillary fringe, and air-water interface, and how PFAS affinity for the air-water interface contributes to long-term retention and persistence.
(4) Discussion of how soil type and hydrogeologic conditions influence PFAS mobility.
(5) Overview of seasonal groundwater fluctuations and event-driven groundwater changes that may mobilize PFAS.
(6) Discussion of remediation implications, including how oxidation-based remediation approaches may increase transformation of PFAS precursors from longer-chain to shorter-chain compounds.
(7) Discussion of discharge zones where groundwater transitions from low-oxygen to higher-oxygen environments and how these transitions may affect PFAS transformation and variability.
(8) Review of ongoing PFAS background studies and distinctions between "ubiquitous" and "widespread" PFAS contamination.
(9) Recommendations presented by Dr. Hare included:
    - Additional source-zone characterization and focus on sorption dynamics.
    - Examination of spatial and temporal groundwater fluctuations.
    - Use of continuous geochemical monitoring tools.
    - Increased seasonal and event-based surface water sampling.
    - Continued review of research and findings from comparable hydrogeologic settings, including Cape Cod and Otis Air Force Base.

4. RAB Questions and Discussion on TAPP Presentation (6:36 p.m. – 7:00 p.m.)

6:36 p.m. Kathy Hillman (RAB Community Co-chair) facilitated the start of RAB discussion and confirmed that questions would proceed in order. Kathy questioned how the hydrogeology at Barnes could be compared to Cape Cod due to differing regional topography.

Dr. Hare (University of Massachusetts Amherst) explained that while the overall regions differ, the sandy aquifer characteristics and groundwater behavior are sufficiently similar to support useful scientific comparisons. Dr. David Boutt (University of Massachusetts Amherst) later added that the Barnes aquifer system and Cape Cod aquifer system share similar geologic origins and hydrogeologic properties associated with glacial deposits.

6:40 p.m. Chris Clark (RAB member) asked for clarification regarding graphical PFAS transport curves and whether PFAS residence time increases in capillary fringe zones due to air-water interface effects.

Dr. Danielle Hare (University of Massachusetts Amherst) explained that PFAS are expected to persist longer in areas containing air-water interfaces because of adsorption processes, particularly for longer-chain compounds.

Chris Clark (RAB member) also asked how oxidation affects PFAS transformation given the stability of fluorinated carbon bonds.

Dr. Danielle Hare (University of Massachusetts Amherst) explained that observed differences between anoxic and oxic conditions suggest that precursor compounds may transform into shorter-chain PFAS under oxidizing conditions, though she noted that additional chemistry expertise would be required to fully explain the mechanisms.

Chris Clark (RAB member) further discussed whether observed changes could reflect different groundwater flow paths and compartmentalization rather than direct transformation alone.

Dr. Danielle Hare (University of Massachusetts Amherst) explained that multiple groundwater flow paths may converge at discharge zones, making interpretation more complex, but additional tracers and hydrogeologic tools can help distinguish those pathways.

6:49 p.m. Kristen Mello (RAB member) asked about modeling figures that suggested PFAS persistence over hundreds or thousands of years.

Dr. Danielle Hare (University of Massachusetts Amherst) clarified that the figures represented modeling exercises intended to demonstrate the importance of air-water interface processes and long-term legacy behavior rather than exact predictions.

Kristen Mello (RAB member) also asked whether drinking water wells screened below the water table would be affected by contaminants retained near the capillary fringe.

Dr. Danielle Hare (University of Massachusetts Amherst) clarified that the air-water interface discussion primarily related to source-zone behavior and contaminant migration into groundwater, whereas drinking water wells would primarily be influenced by groundwater transport within the aquifer.

Kristen Mello (RAB member) additionally asked how drought and groundwater rebound conditions might affect PFAS movement.

Dr. Danielle Hare (University of Massachusetts Amherst) explained that contaminant mobilization is more likely during groundwater rebound periods when fluctuating water tables redistribute contaminants retained near the air-water interface.

Kristen Mello (RAB member) also asked whether daughter products formed at groundwater-surface water discharge zones would be reflected in Total Oxidizable Precursor (TOP) assay results.

Dr. Danielle Hare (University of Massachusetts Amherst) confirmed that those daughter products would be represented within TOP assay analyses.

5. Environmental Restoration Program (ERP) Status Update

Robert Lewis (NGB) provided updates regarding ongoing ERP activities and the PFAS Remedial Investigation (RI).

IRP Site 2

(1) Robert Lewis (NGB) reported that the Activity and Use Limitation (AUL) audit for IRP Site 2 had been completed by MassDEP.

(2) **7:04 p.m.** Thomas (Tom) Keefe (MassDEP) explained that:

- A permanent solution statement has been issued for IRP Site 2 under state petroleum regulations.
- Residual petroleum contamination remains at the site but complies with state requirements under current land-use conditions.
- Any future site development would require environmental review and consideration of vapor intrusion.
- Documentation associated with the site is publicly available through the administrative record and the MassDEP public file system.

(3) Kristen Mello (RAB member) requested the Release Tracking Number (RTN) and public access information for the IRP Site 2 documentation. At the end of the RAB meeting, Kristen provided the RTN to meeting participants, 1-0000288.

(4) Thomas (Tom) Keefe (MassDEP) stated that he would provide the RTN and a link to the public file.

PFAS Remedial Investigation (RI) Activities (7:17 p.m. – 7:24 p.m.)

(1) Robert Lewis (NGB) stated that investigation of PFAS at IRP Site 2 and other locations remains ongoing as part of the remedial investigation program.

(2) Tracy Williams Jr. (USACE) and the project team reviewed current and upcoming RI field activities.

(3) The project team, including Thomas (Tom) Keefe (MassDEP), Jennifer Baker (104 FW Barnes ANGB), Robert Lewis (NGB), Lt. Col. Sarah Sinclair (104 FW Barnes ANGB), and Andrew Barton (Battelle), provided the following updates:

- Vertical aquifer sampling began on April 13, 2026, and was approximately halfway complete at the time of the meeting.
- Groundwater monitoring well installation was scheduled to begin during the week of April 27, 2026.
- Ongoing field activities included surface soil sampling (Round 1 completed), vertical aquifer sampling, monitoring well installation, and preparation for upcoming surface water and sediment sampling.
- Planned future work includes background soil sampling, seasonal groundwater sampling events (fall and spring), and potential installation of additional monitoring wells based on investigation results.

6. Additional RAB and Public Questions (7:18 p.m. – 7:26 p.m.)

7:18 p.m. Kristen Mello (RAB member) asked when surface water sampling results would become available and confirmed that Pond Brook and Arm Brook are included in the sampling plan.

The project team, including Tracy Williams Jr. (USACE), Robert Lewis (NGB), Jennifer Baker (104 FW Barnes ANGB), and Andrew Barton (Battelle), confirmed that surface water and sediment sampling are scheduled for May/June 2026 and that laboratory analysis and validation would occur following sample collection.

Kristen Mello (RAB member) also discussed potential future TAPP concepts related to ecological and toxicological interpretation of PFAS impacts within surface water systems and fisheries.

7:19 p.m. Chris Clark (RAB member) requested whether spatial coordinates and GPS locations for sampling locations could be shared to support independent analysis and modeling.

The project team, including Tracy Williams Jr. (USACE) and Robert Lewis (NGB), explained that maps identifying sample locations are already available and noted that some site-specific information associated with private properties may not be releasable.

7:21 p.m. Mary Ann Babinski (RAB member) relayed a public concern regarding localized flooding near airport property and whether the flooding could be related to PFAS investigation activities.

Lt. Col. Sarah Sinclair (104 FW Barnes ANGB) clarified that runway and drainage-related work is managed by the municipal airport and not by the PFAS investigation team. Project representatives further stated that the current PFAS field activities were not responsible for the reported flooding conditions.

7:24 p.m. – Dr. David Boutt (University of Massachusetts Amherst) reiterated the value of lessons learned from similar hydrogeologic settings and encouraged continued integration of academic research into site decision-making.

7. Additional TAPP Discussion

Kristen Mello (RAB member) initiated a discussion regarding a potential future TAPP proposal focused on ecological and toxicological impacts associated with PFAS in Pond Brook, Arm Brook, and nearby kettle ponds. Kristen explained that the intent of the proposed effort would not necessarily involve collecting new environmental data but rather obtaining independent technical expertise to help interpret existing and future sampling results and better understand potential ecosystem and human-use impacts.

Kristen Mello (RAB member) noted that fish consumption and ecological concerns remain important to community members, particularly given existing fish consumption advisories and concerns regarding PFAS in local surface waters.

Kristen Mello (RAB member) raised questions regarding whether a new TAPP proposal could or should be submitted before the ongoing RI surface water sampling data are available. Kristen expressed concern that waiting too long could create challenges if future TAPP funding availability changes.

Chris Brown (NGB/A4VR) joined remotely discussed practical timing considerations associated with TAPP grants, including the benefit of having additional environmental data available before fully defining the scope of work for a future technical review.

Kristen Mello (RAB member) also referenced concerns about broader federal funding uncertainties and delays that had affected environmental restoration work in previous years.

Chris Brown (NGB/A4VR) advised the RAB to proceed with submitting TAPP ideas and concepts even if all supporting technical information is not yet available. Chris Brown explained that NGB staff could work collaboratively with the RAB to refine the scope, develop the technical objectives, and pursue funding opportunities in future fiscal years.

Chris Brown (NGB/A4VR) further explained that the TAPP proposal development process allows for discussion and refinement over time and encouraged the RAB not to delay conceptual development of future technical assistance requests.

The discussion concluded with general agreement that future TAPP concepts related to ecological interpretation and PFAS impacts in local water bodies remain of strong interest to the RAB and community members.

8. Closing Remarks and Adjournment 7:33 p.m.

Kathy Hillman (RAB community co-chair) and project representatives thanked participants for their engagement and constructive discussion. Contact information and administrative record access instructions were reiterated. The meeting was adjourned at approximately 7:33 p.m.

Action Items

1. Ask about the possibility of providing validated datasets (including spatial coordinates such as GPS location, longitude, and latitude) for base site-specific water sampling locations, while ensuring no private information is disclosed, to be shared with RAB members.
2. Confirm Dr. Danielle Hare's (University of Massachusetts Amherst) contact information has been shared with RAB members so they may ask follow-up questions related to her presentation and receive the comprehensive literature references included in her research review.
3. Collect any additional questions from RAB members and forward them to Lt. Col. Sarah Sinclair (104 FW Barnes ANGB) for inclusion in TAPP-related follow-up materials and future TAPP proposal concepts to be coordinated with Chris Brown (NGB/A4VR) for review, scope development, and funding consideration.
4. Provide RAB members with the Release Tracking Number (RTN): 1-0000288 (MA DEP), Air Force Civil Engineer Center (AFCEC) Administrative Record Number: 650068 record link for IRP Site 2 via email. The title of the document is "Notice of Audit Findings Activity and Use Limitation (AUL) Audit and Technical Screening Audit IRP Site 2".
5. Provide the final TAPP report, including responses to questions raised during the meeting, to RAB members following completion of the review process.

Attachment A

RAB Meeting Attendees (attended online*)

April 23, 2026

Last Name	First Name	Organization
Baker	Jennifer	104th Fighter Wing, Environmental
Babinski	Mary Ann	RAB member
Barzyk*	Tom	BB&E
Barton	Andrew	Batelle
Boutt*	David	UMass Amherst
Brown*	Caitlin	USACE
Brown*	Chris	NGB/A4VR
Burns	Kathryn	Jacobs
Cardona-Marek*	Tamara	Massachusetts DEP
Clark*	Chris	RAB member
Driscoll*	Ellie	USACE
Folan*	Dan	USACE
Glass	Michael	104th Fighter Wing, CC
Hare	Danielle	UMass Amherst
Hewitt*	Jay	Barnes ANGB
Hillman	Kathleen	RAB member
Keefe	Tom	Massachusetts DEP
Lewis	Robert	National Guard Bureau
Mello	Kristen	RAB member
Montana*		DAWSON
Mykytiuk	Carla	Jacobs
Narcisi*	M	USACE
O'Connell	Mary	RAB member
Okscin	Jane	RAB member
Porter*	Amy	
Sinclair	Lt Col Sarah	104th Fighter Wing, CES
Stefanik*	Lydia	
Thomas	Dawn	RAB member
Williams	Tracy	USACE
Zelenevich	Max	Batelle
1(860)810-9569*		

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

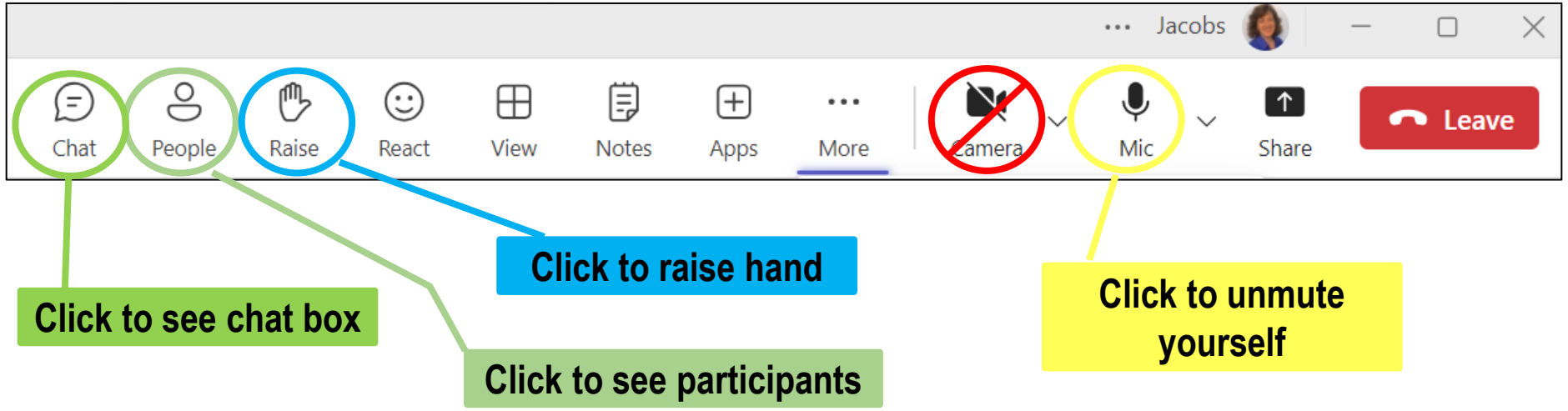
RAB Facilitator

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

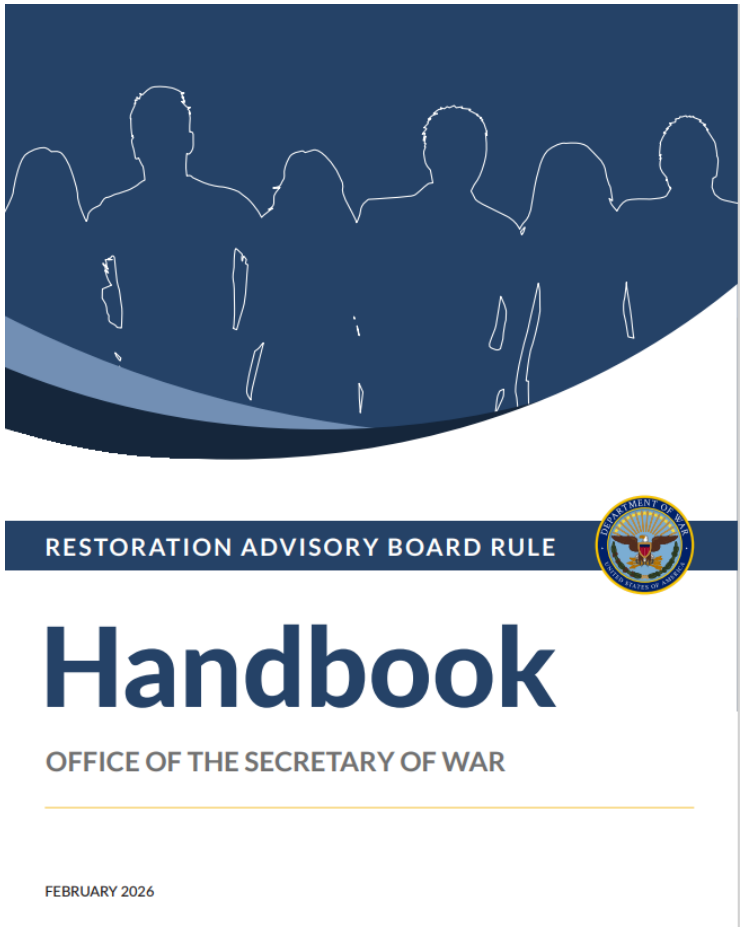
- Meeting Summary Review and Approval
- Upcoming Meetings
- Updated RAB Rule Handbook

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

- 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.

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

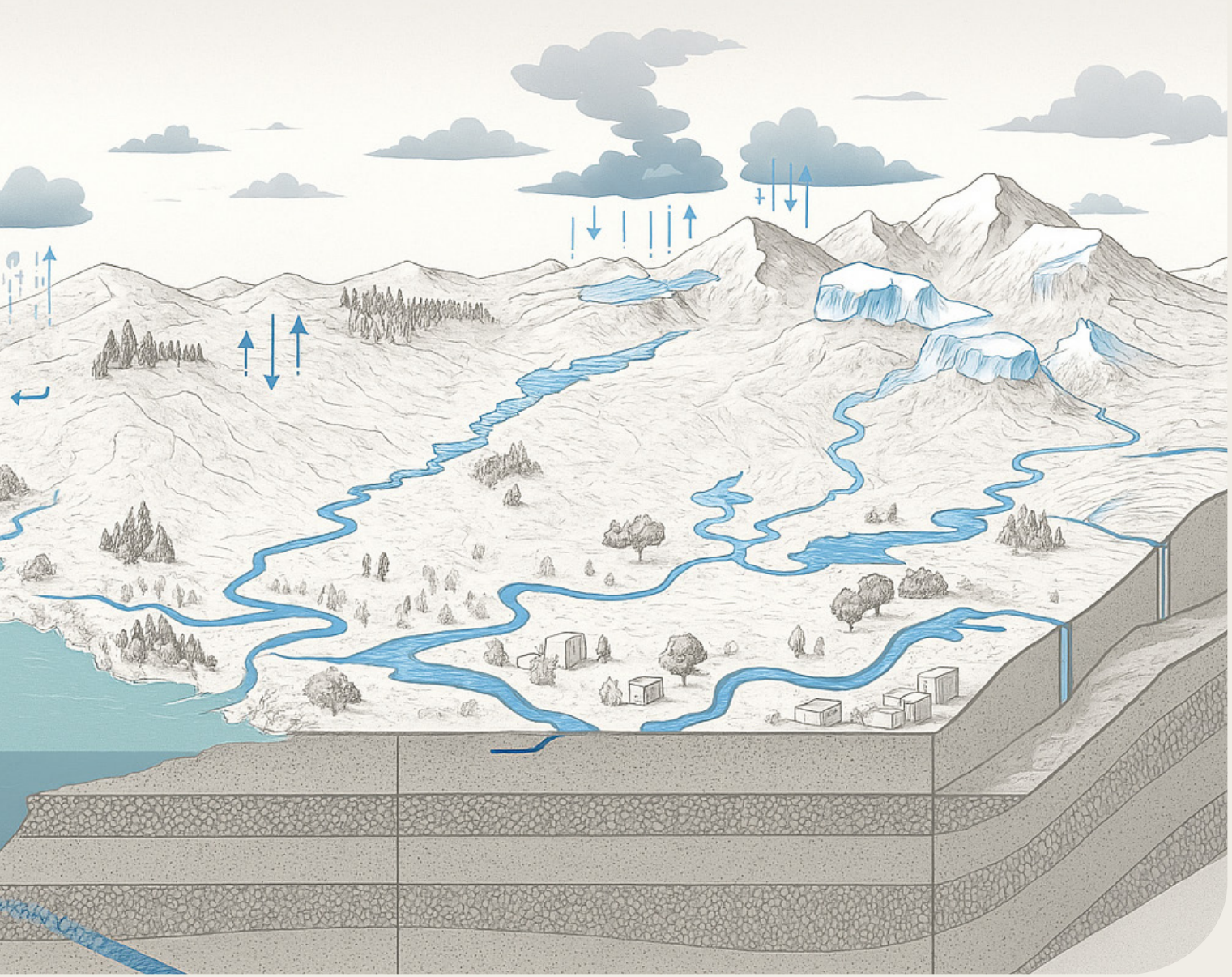
Research Assistant Professor

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

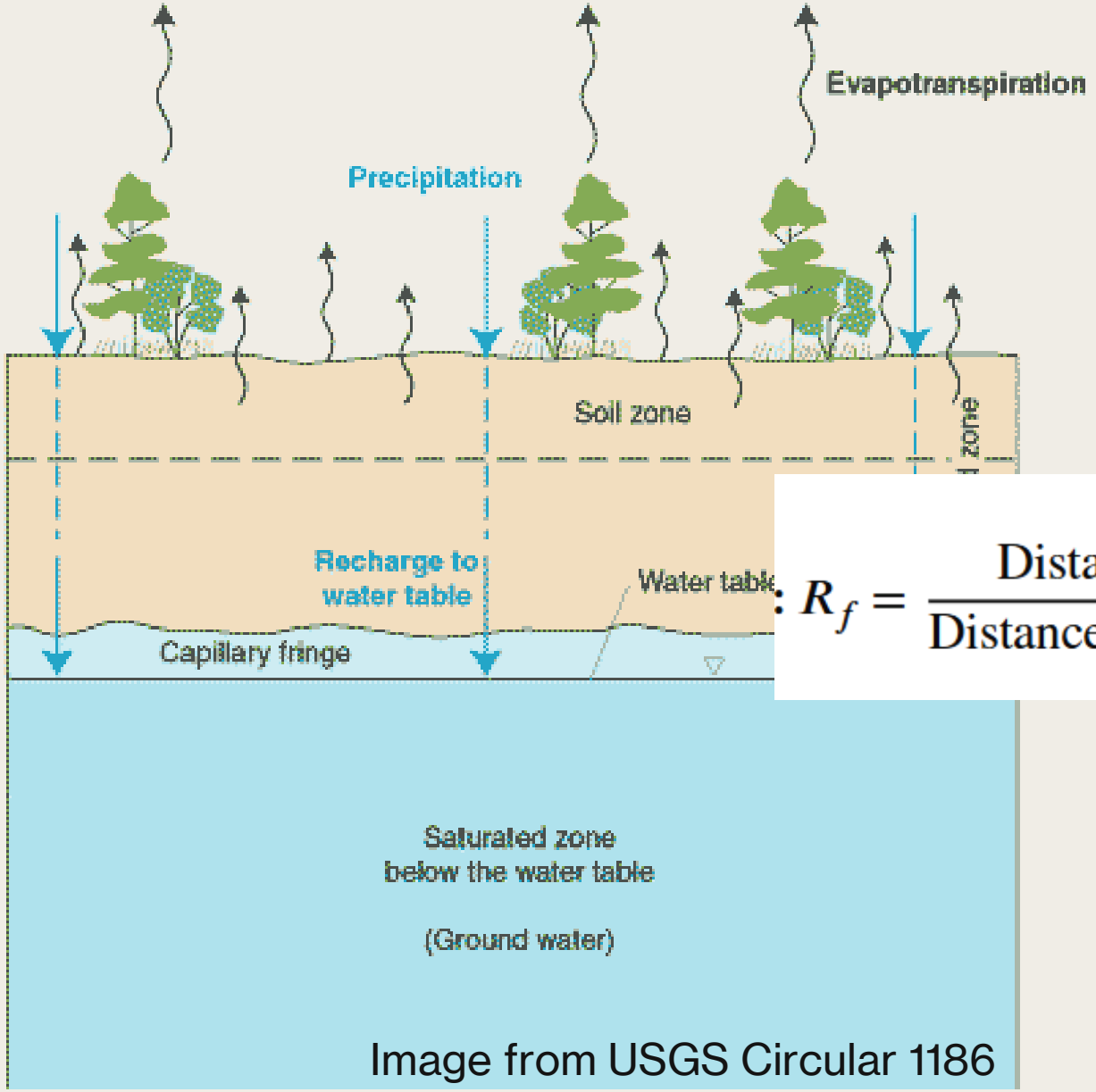


Image from USGS Circular 1186

Sorption factor

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

POTENTIAL VADOSE ZONE INFLUENCES

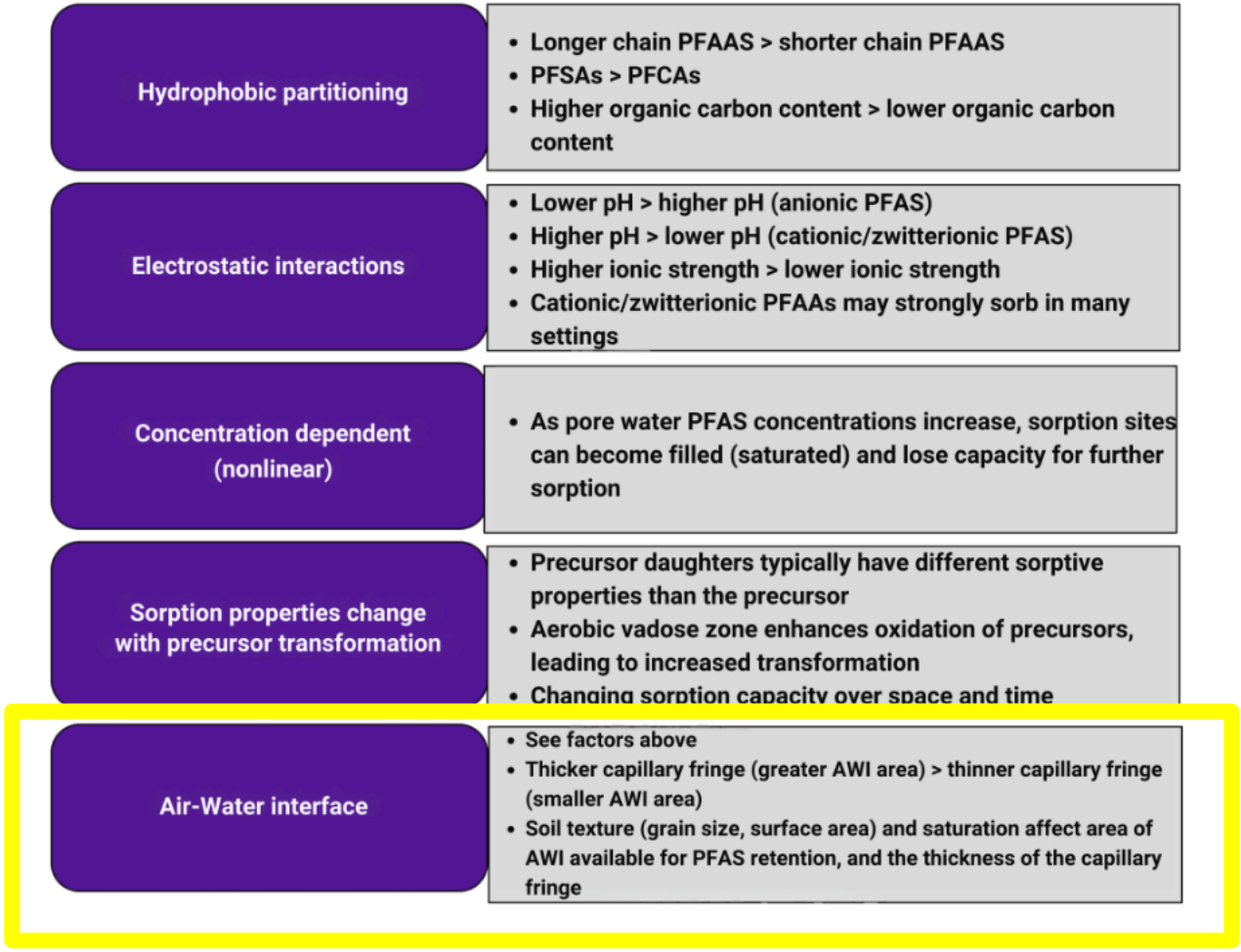
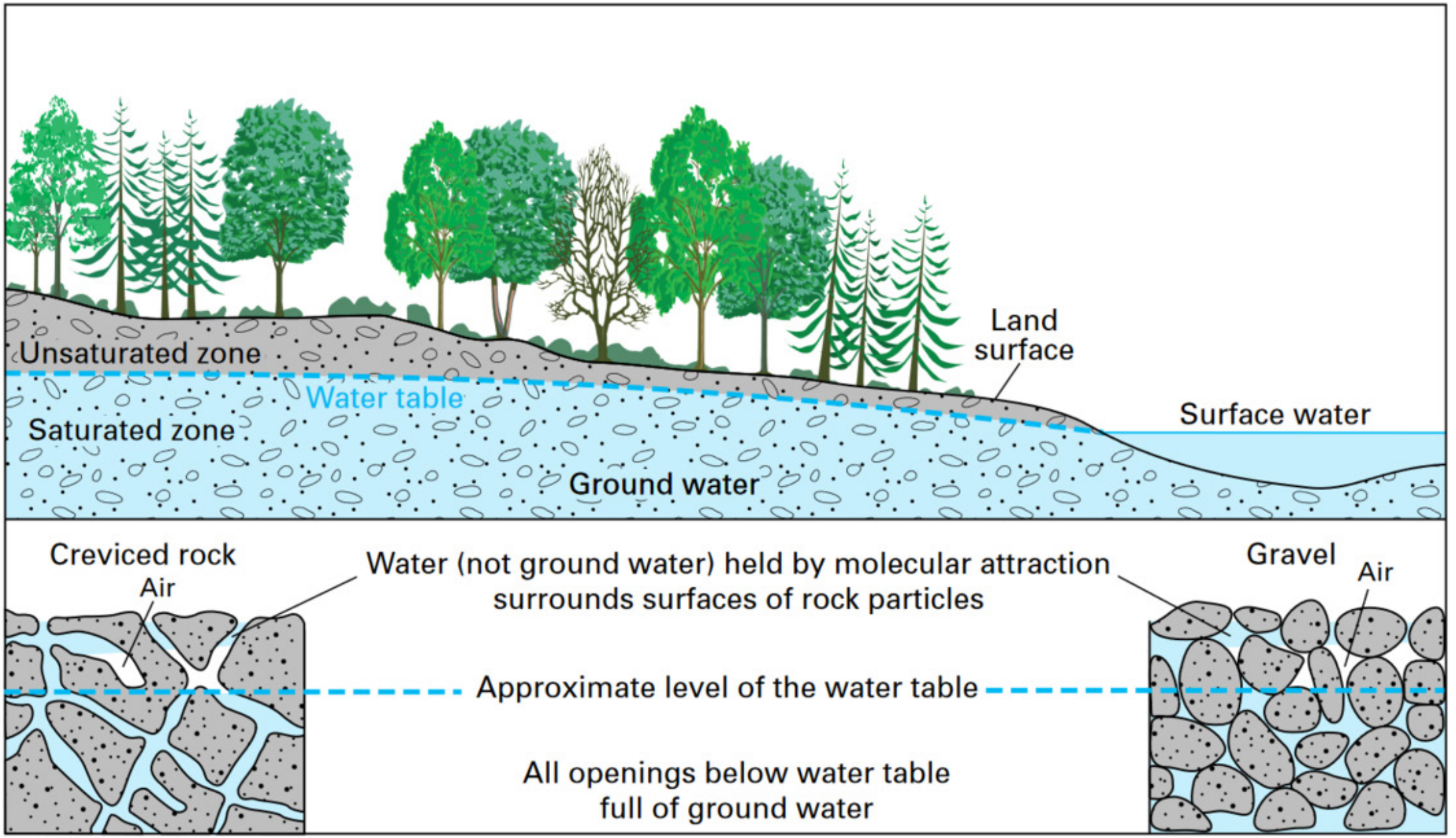


Figure 1-2. Factors influencing retention in the vadose zone.

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.

AIR–WATER INTERFACIAL RETENTION EXHIBITS A CONTROL ON PFAS PERSISTENCE

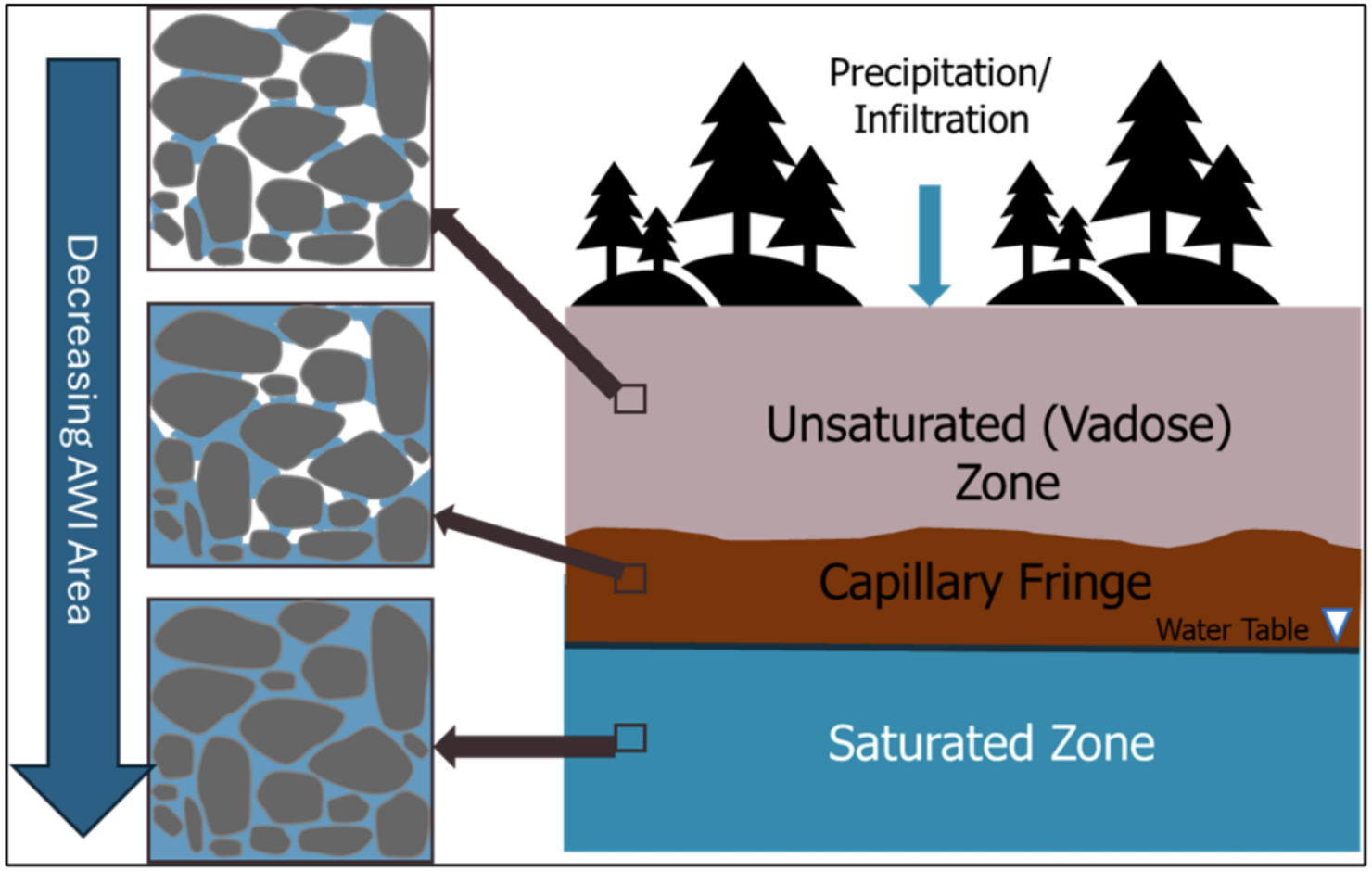


Figure 1-1. Partitioning and interfacial area. The degree of water saturation affects the amount of interfacial area in a nonlinear manner. Increased interfacial area increases retention. Factors that contribute to retention at the AWI include porewater ionic strength, PFAS concentration, and soil properties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

- 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

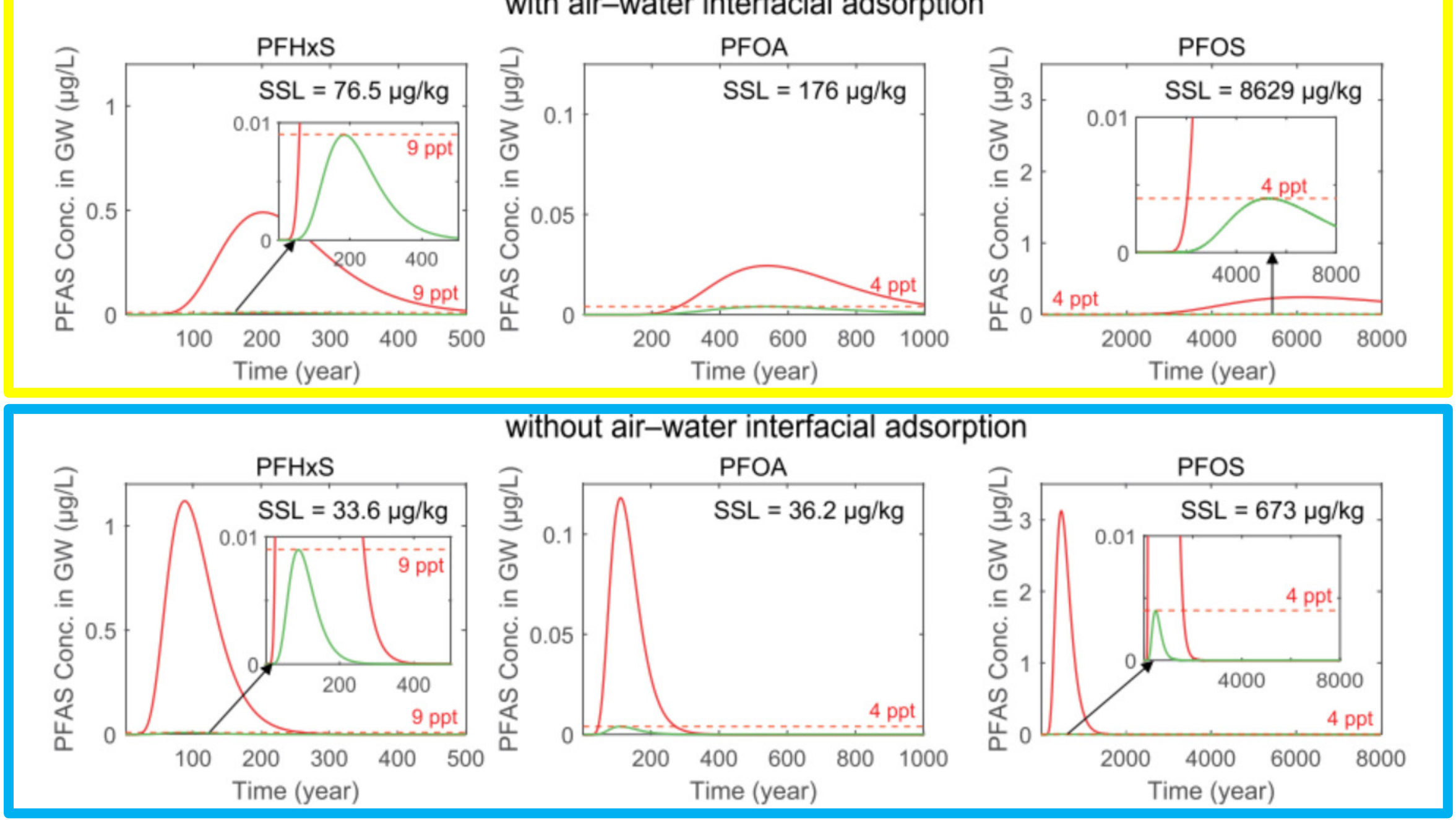


Figure from Smith et al. 2024

2. PLUME DYNAMICS

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

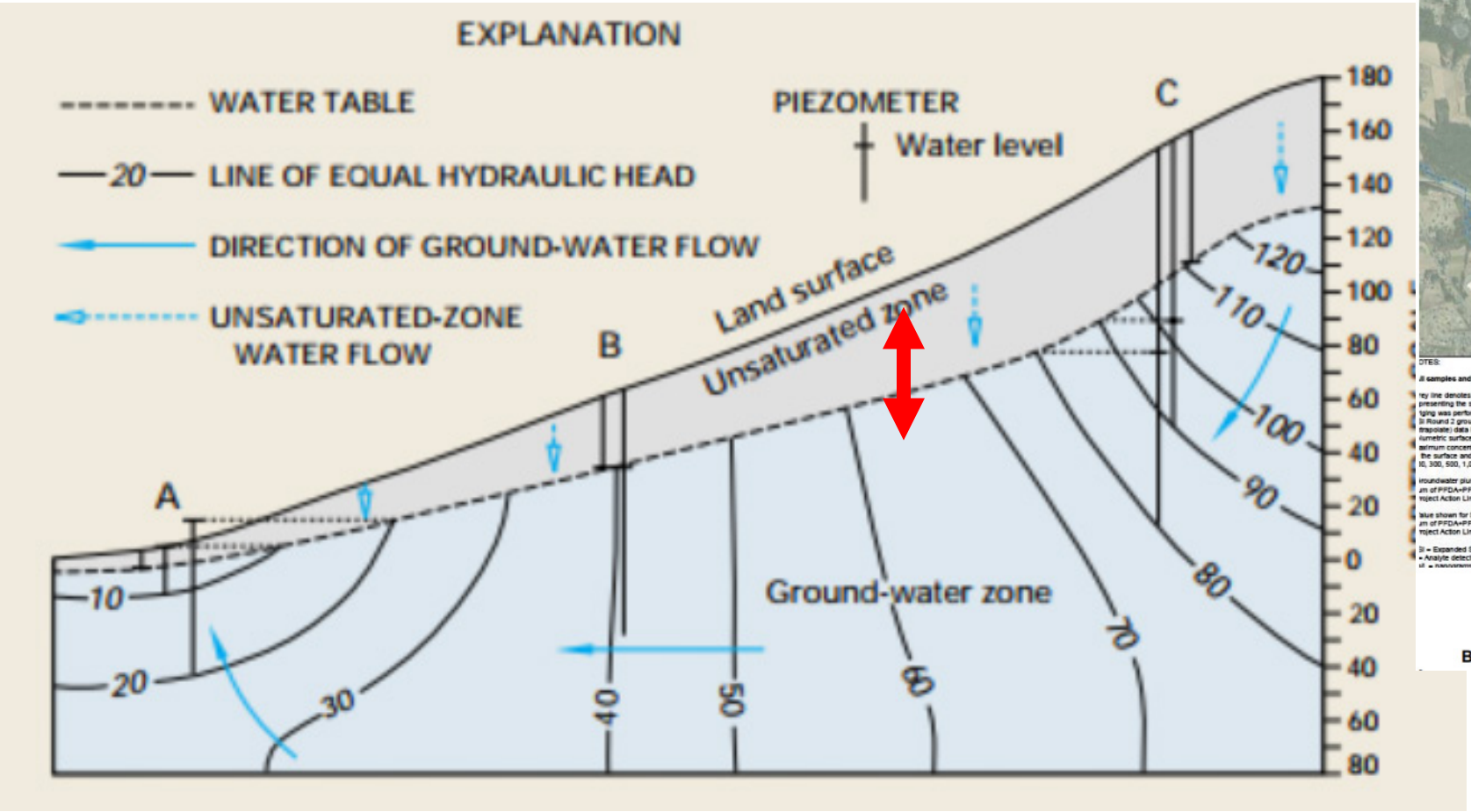


Image from Winter et al. 1998

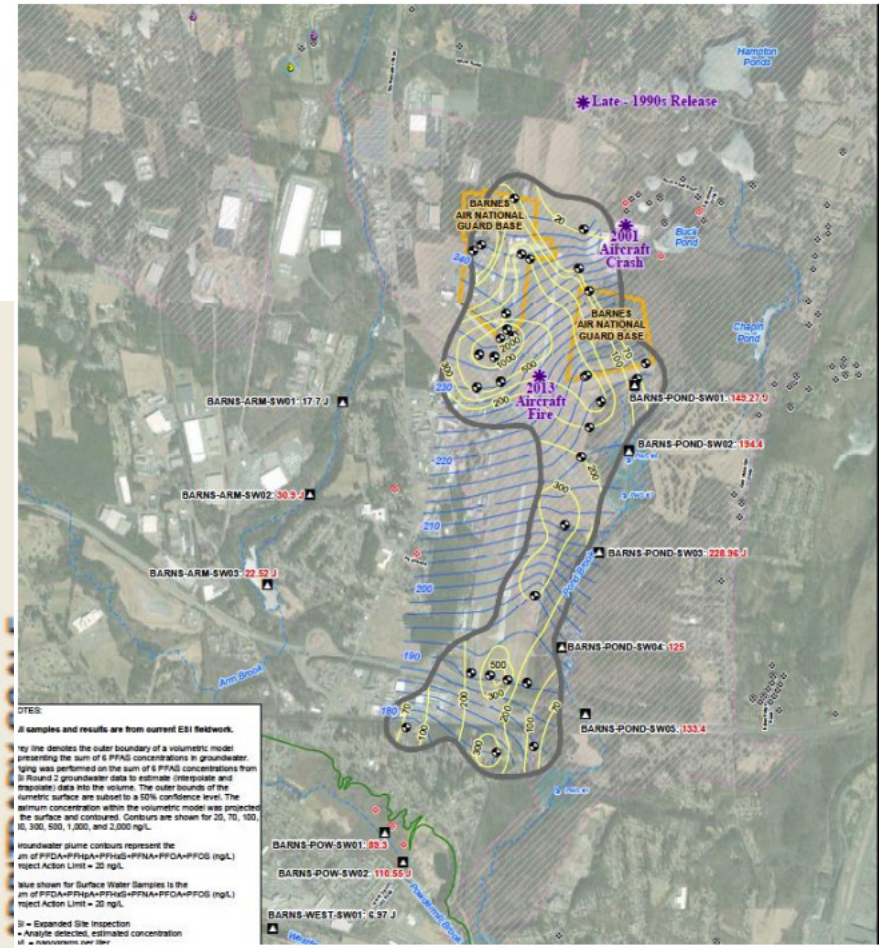
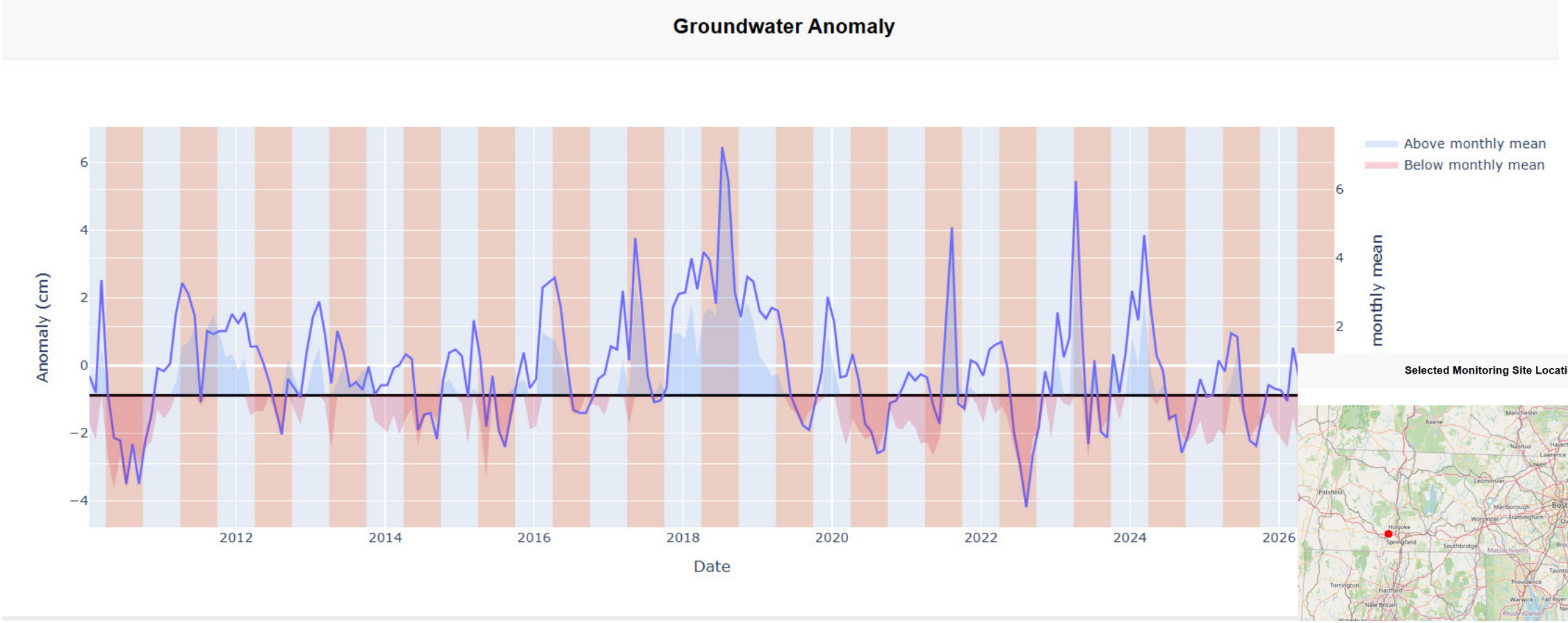


Figure 18
Receptor Survey and PFAS Groundwater Plume
Barnes Air National Guard Base

2. PLUME DYNAMICS

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



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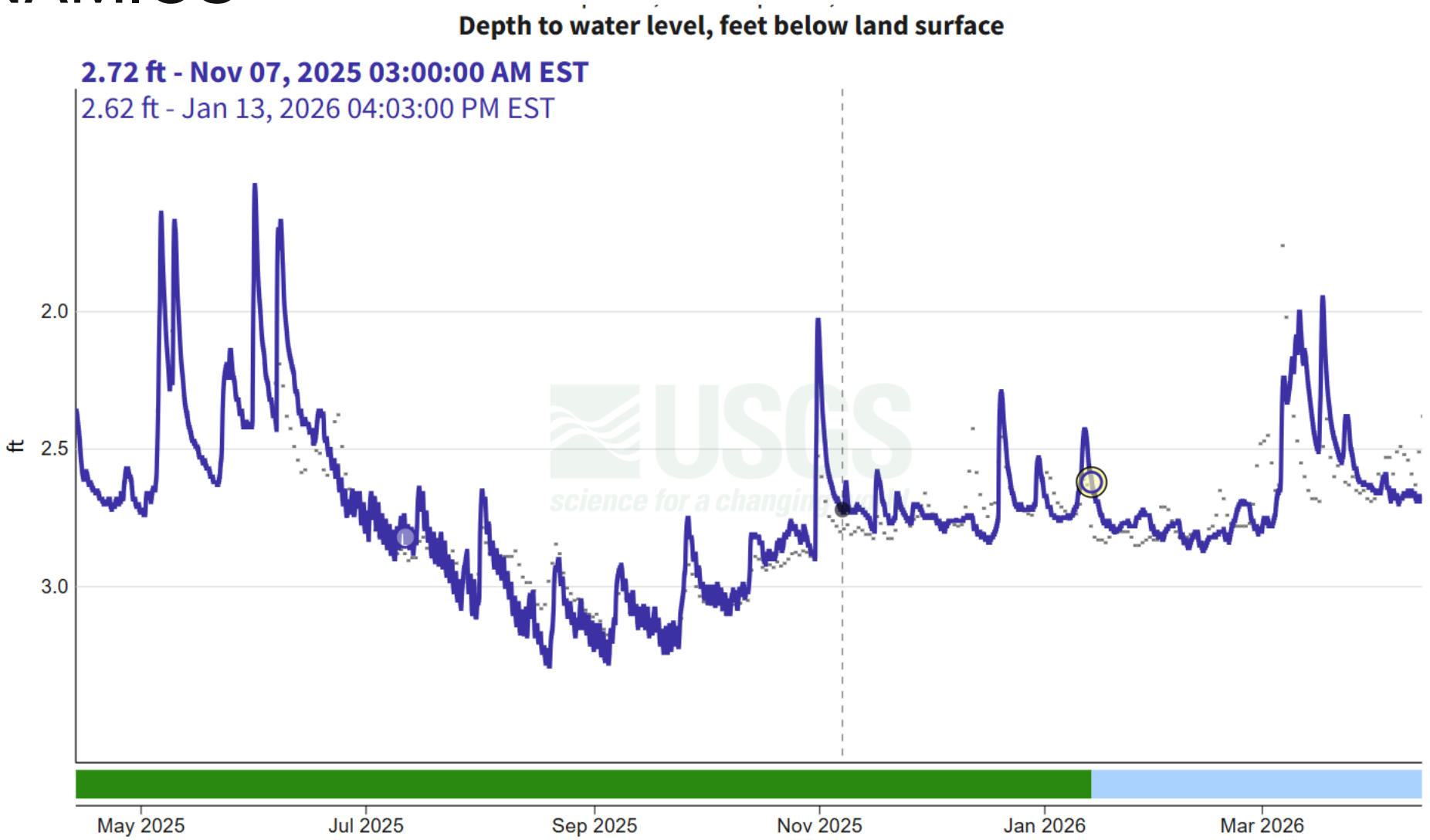


SEASONAL AND GEOCHEMICAL CONTROLS ON PFAS TRANSPORT

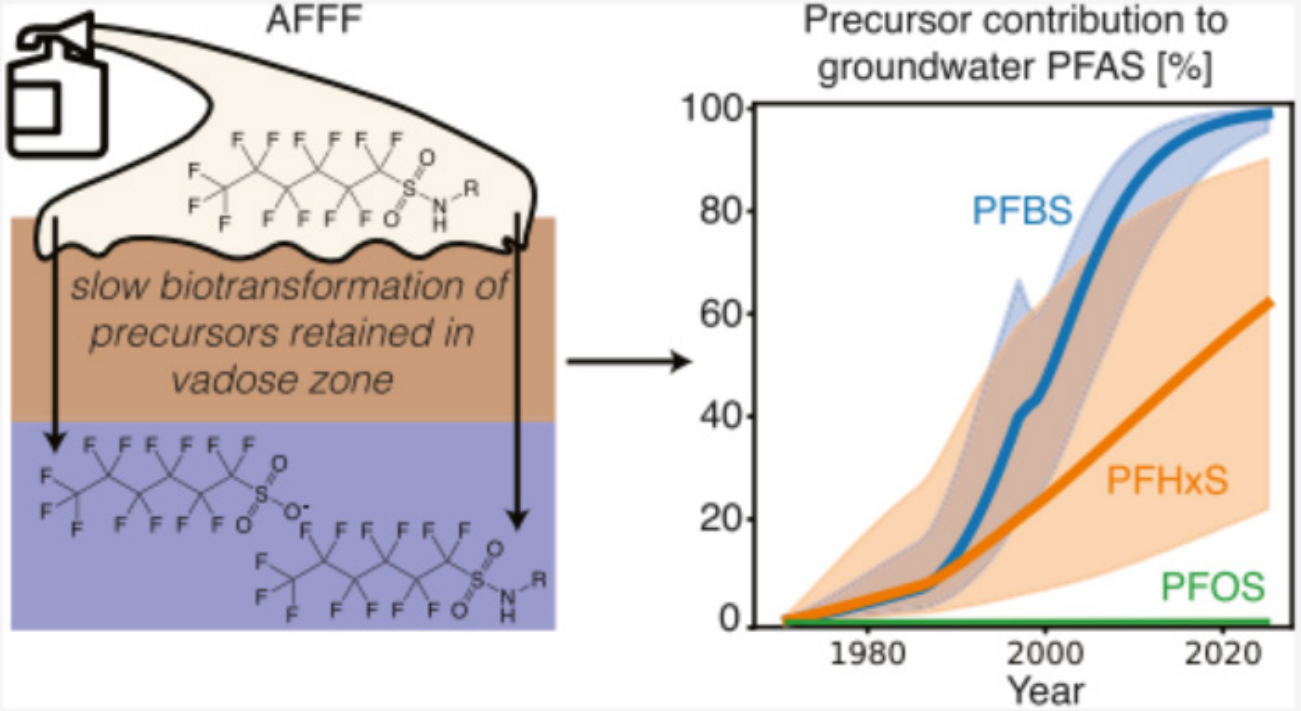
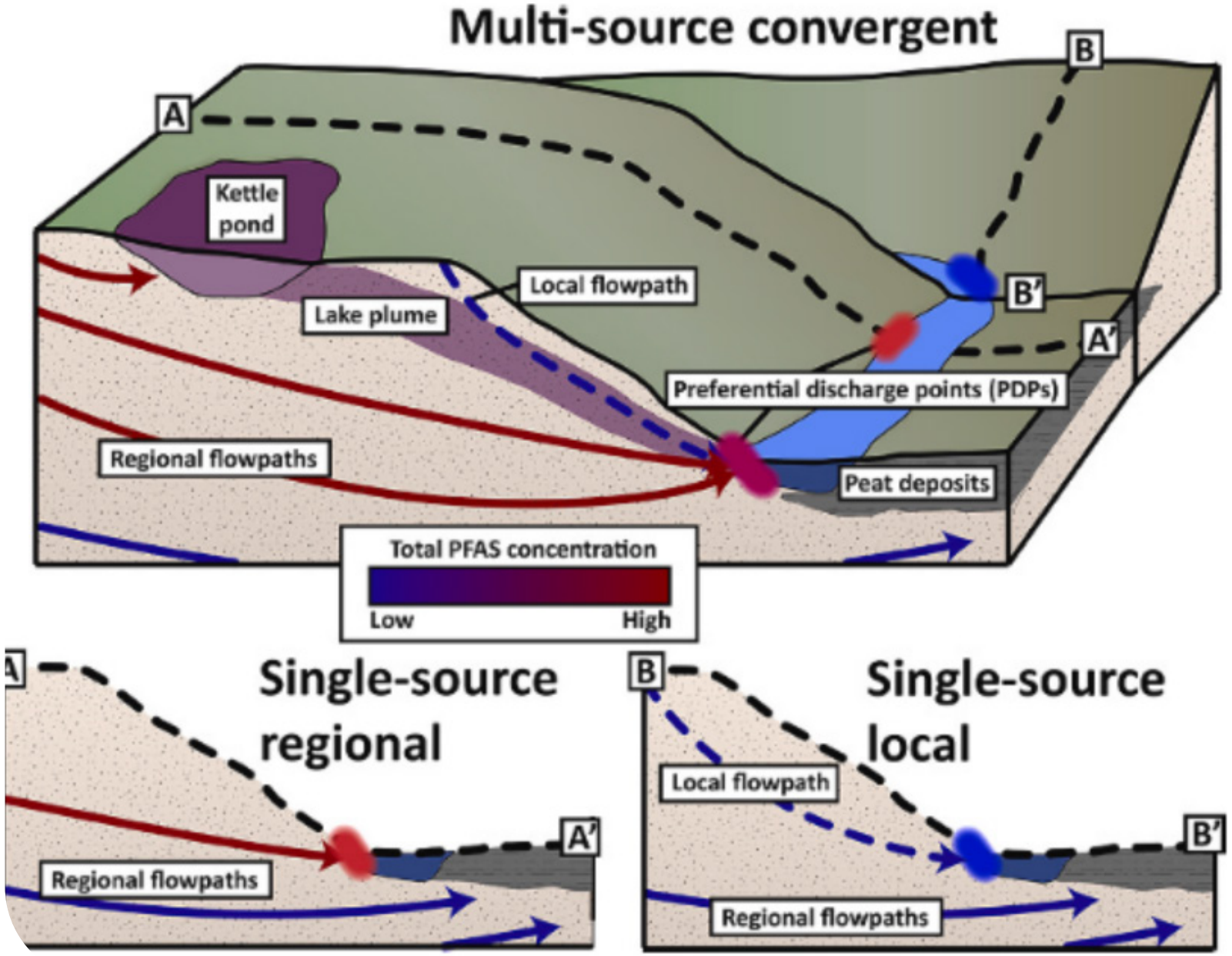


Figure from Ruyle et al.

- 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

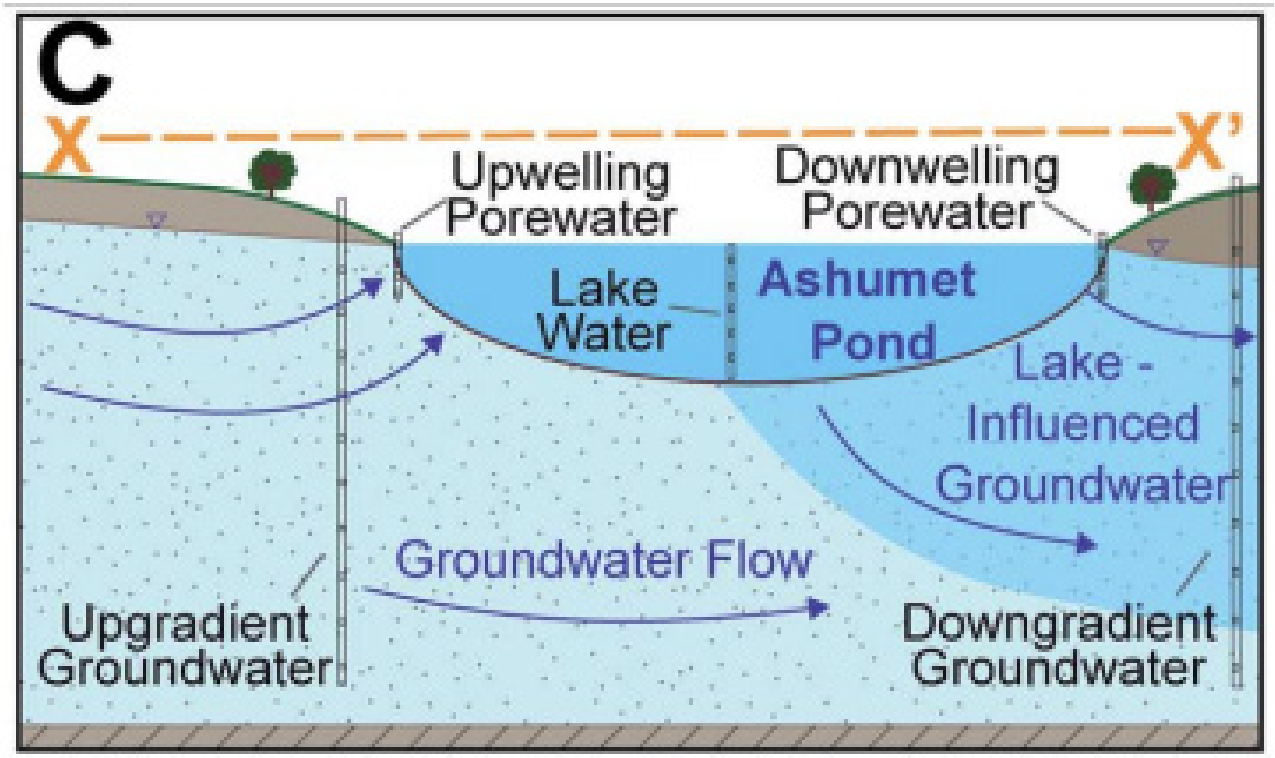
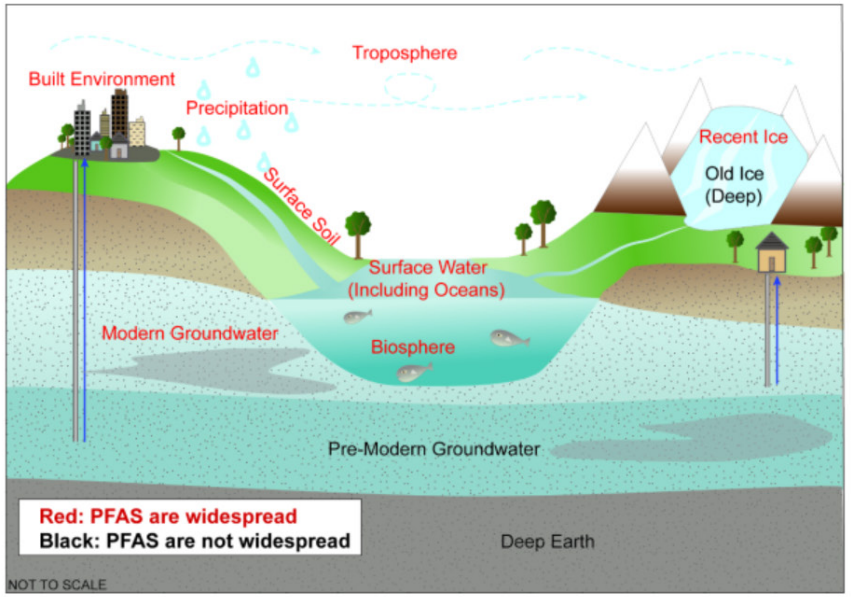


Figure fromk Tokranov et al. 2021

CONSIDERING BACKGROUND PFAS

Environmental Science & Technology pubs.acs.org/est



Tokranov et al. 2026

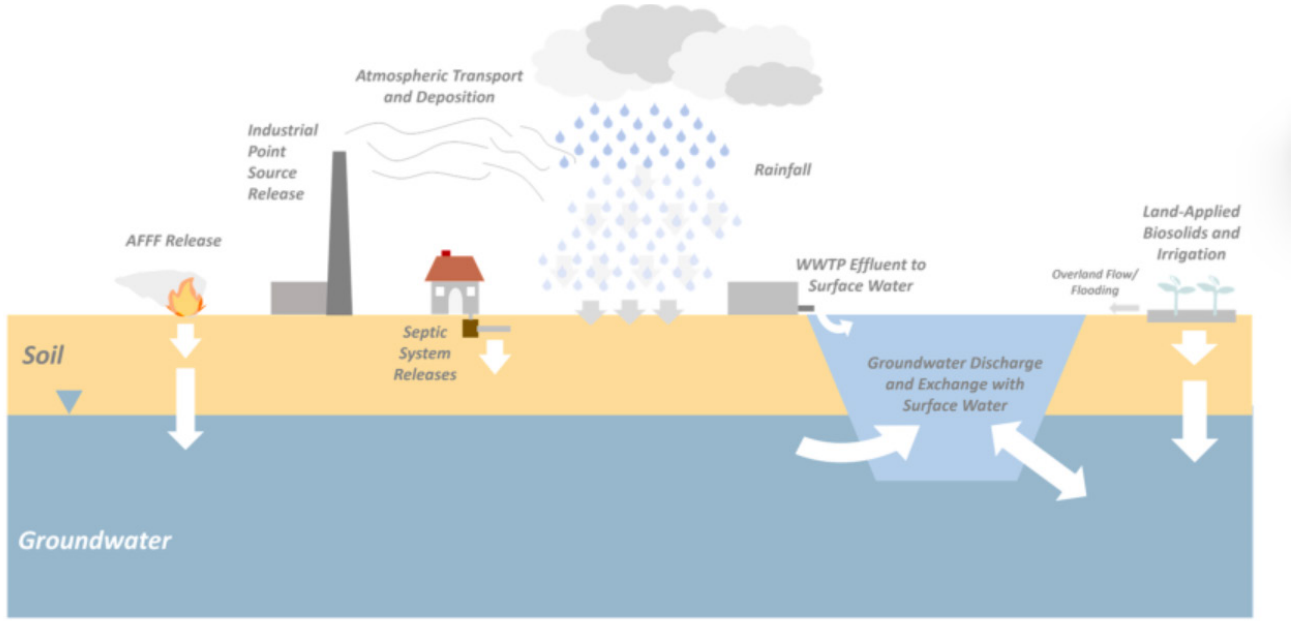


Fig. 1. Overview of PFAS Sources and Transport Pathways. Point sources include stack emissions from manufacturing facilities and land application of aqueous film-forming foam (AFFF). Non-point or diffuse sources include rainfall, biosolids, and septic wastewater discharges, with atmospheric transport,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

Adamson et al. 2026

Ubiquitous versus Widespread

RECOMMENDATIONS

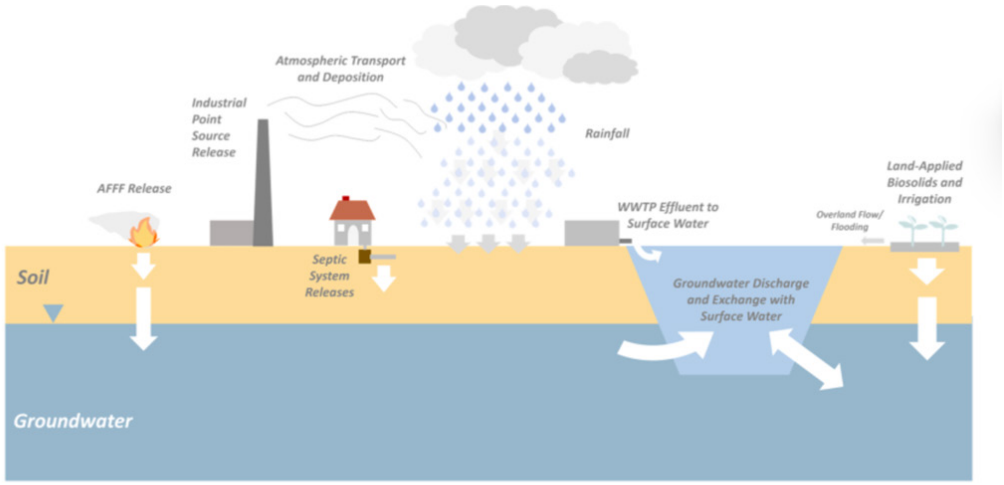


Fig. 1. Overview of PFAS Sources and Transport Pathways. Point sources include stack emissions from manufacturing facilities and land application of aqueous film-forming foam (AFFF). Non-point or diffuse sources include rainfall, biosolids, and septic wastewater discharges, with atmospheric transport, 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.

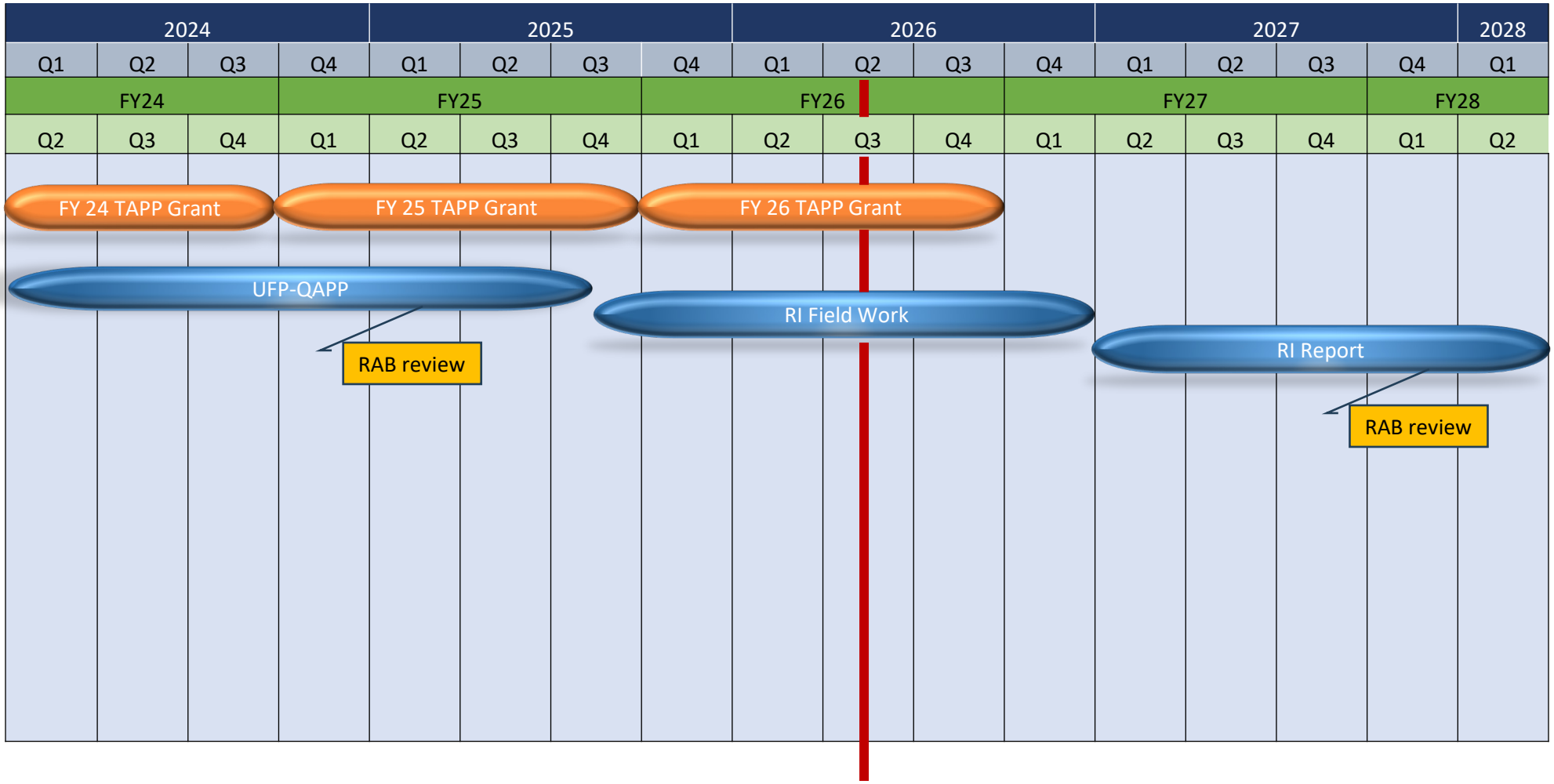
Environmental Restoration Program Status Update

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

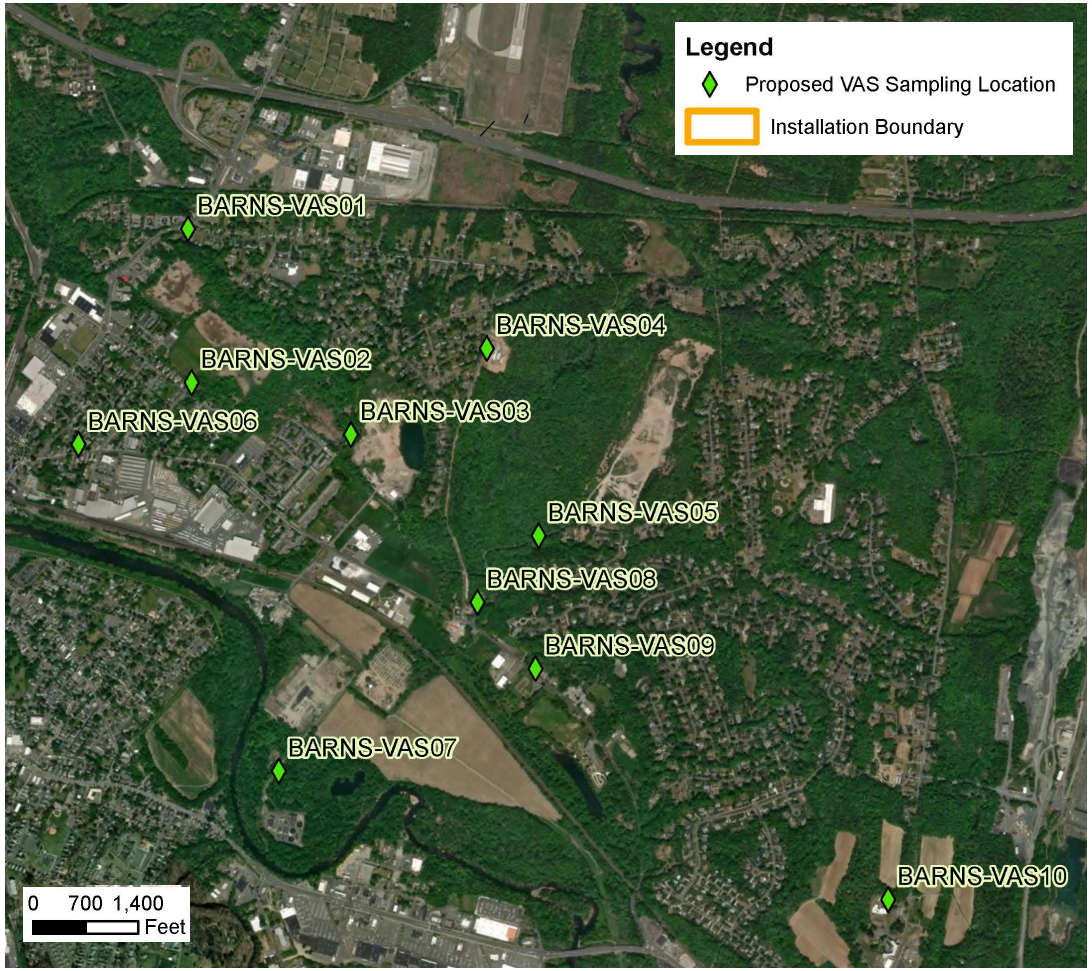
- Site Access Agreements
- Obtain applicable authorizations
- Utility location
- Surface soil sampling
- Subsurface soil sampling
- Surface water and sediment sampling
- Vertical aquifer sampling (VAS) (groundwater)
- Groundwater monitoring well installation
- Borehole geophysical logging
- Piezometer 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

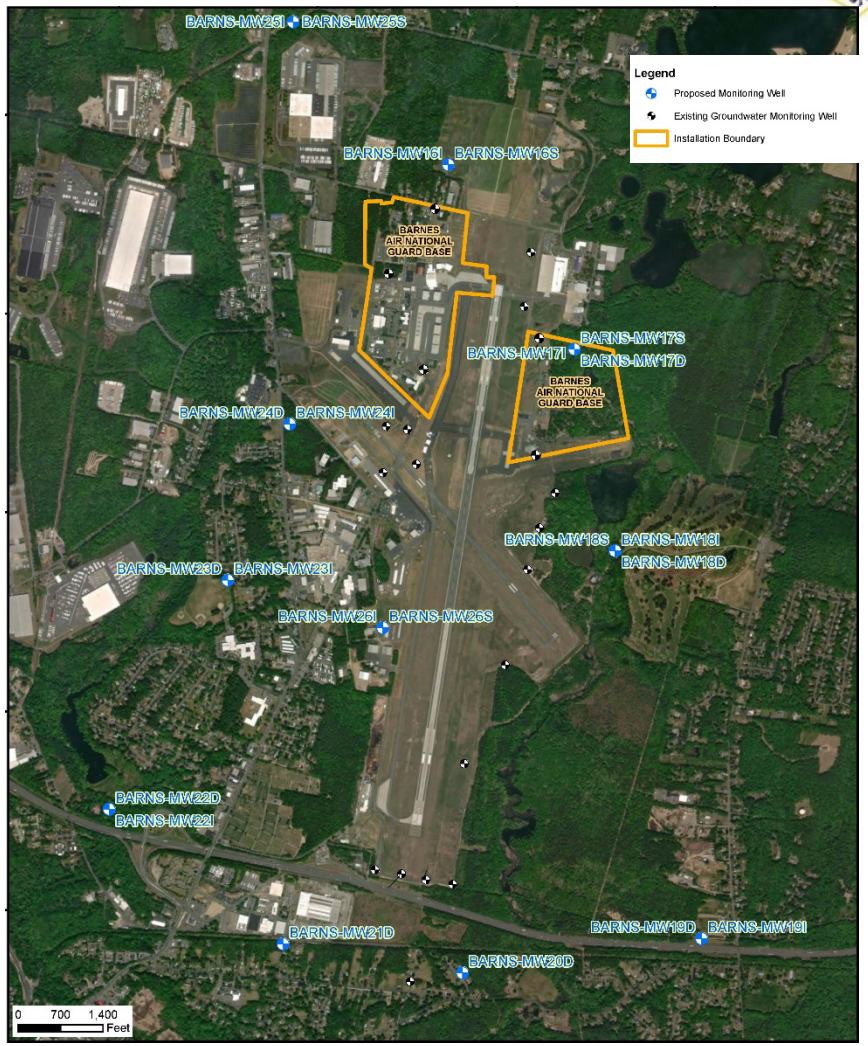
- Objective is to spatially and vertically delineate PFAS in groundwater downgradient of the Site
- 10 VAS locations – up to 4 groundwater sample depths per location
- VAS involves using direct push drilling to characterize lithology, determine groundwater level, identify groundwater sample collection 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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- 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.

Public Questions and Comments

In person: Raise hand to be recognized

Online: Submit questions using chat

Contact Information

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

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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