Welcome to the 2025 DoD Environmental Monitoring and Data Quality Workshop

Session II: EDQW Training

June 25, 2025

Environmental Data Quality Workgroup

- Develop and recommend strategies related to sampling, testing, and quality assurance for environmental programs to eliminate redundancy, streamline programs, improve data quality, and promote data integrity.
- Coordinate the exchange of information among DoD components.
- Develop DoD issuances to implement environmental quality systems and promote cost effective government oversight.
- Implement and provide oversight of the DoD ELAP.

2025 DoD EM/DQ Webinar Series

- Session I: Emerging Issues & Data Management
  - June 18, 2025, 1200-1530

Recording will be published on the EDQW page of DENIX

- **Session II, June 25: EDQW Training**
  - **June 25, 2025, 1200-1615**
- Session III, June 30: Per- and Polyfluoroalkyl Substances
  - June 30, 2025, 1200-1530

Webinar Logistics

- Cameras and microphones for all attendees have been disabled.
- Submit any content-related questions or responses via the chat function.
- Send any technical issue requests via email to any of the meeting organizers/moderators.
  - Adam.r.teufel.civ@us.navy.mil
  - Cantwell_Emma@bah.com
  - zachary.r.walton4.ctr@us.navy.mil
- These webinars will be recorded and uploaded to the EDQW DENIX page.

Data Review and Implementation Training

Phase One: Planning

Nancy Cooper, Chemist, USACE EM CX

Richard R. Bernhardt, Ph.D., Toxicologist/Risk Assessor, USACE EM CX

Denise Rivers Ph.D., Chemist, USACE EM CX

Phase Two: Implementation

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Data Review and Implementation Training

Phase One: Planning

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Goal of Phase One

- Selecting appropriate laboratories
- Differentiate between Definitive and Screening Data
- Understand Key Considerations when Planning for PFAS Investigations
- Project-Specific Sampling and Analytical Requirements
- Promote Positive and Proactive Communication

DoD Environmental Laboratory Accreditation Program (ELAP)

"The DoD ELAP is a unified DoD (Army, Navy, Air Force) program that uses accrediting bodies through which commercial laboratories can voluntarily demonstrate competency and document conformance to both

DoD and international standards *for environmental sampling and testing.*

The DoD ELAP is described in ***Part 188 of Title 32****, Code of Federal Regulations and DoD Manual 4715.25."*

- Citation DODI 4715.15

DoD ELAP Requirement

Citation: 32 CFR 188.4

"It is DoD policy, in accordance with **DoD Instruction 4715.15**, to implement the DoD ELAP for the collection of **definitive data** in support of the Defense Environmental Restoration Program (DERP) at all DoD operations, activities, and installations, including government-owned, contractor-operated facilities and formerly used defense sites."

Definitive vs Screening Data

- **Definitive:** "Analytical data of known quality, concentration, and level of uncertainty. The levels of quality and uncertainty of the analytical data are consistent with the requirements for the decision to be made. **Suitable for final decision making."**
  - Citation DoDI 4715.15
- **Screening**: "data are of sufficient quality to support an intermediate or preliminary decision but must eventually be supported by definitive data."
  - Citation DoD ELAP Fact Sheet 2019
- **PFAS Screening**: "determine presence or magnitude of PFAS concentrations, but not to confirm absence."
  - Citation ASD(EI&E) Memo Establishing a Consistent Methodology for the Analysis of Per- and Polyfluoroalkyl Substances in Matrices Other than Drinking Water
    - Strongly encourages using a DoD ELAP accredited laboratory for screening data

DoD and International Standards

- **International Standard:** International Organization for Standardization (ISO)/International Electrotechnical Commission (IEC) 17025: (year of publication- as updated)
- **DoD Standard:** DoD/DOE Quality Systems Manual for Environmental Laboratories (DoD/DOE QSM)
  - Latest version- DoD/DOE QSM Version 6.0: Incorporates requirements from ISO/IEC 17025:2017

Project Chemist Should Develop/Review

- For Project-Specific Requirements:
  - QAPP Worksheet (WS)- Ideally, **EVERYTHING**
    - 6, **11**, **12**, **15**, **19 & 30**, 20, **23, 24, 25, 28**, 34, 35, **36**, and 37
  - Laboratory Procedures!
    - Yes, the Accreditation Bodies will review the procedures BUT their review does not consider project-specific factors.
  - Field Sampling Procedures
    - Good data starts at collection
  - Data Validation Procedure

QAPP WS # 36

Planning QAPP WS # 15

- List for each analyte, method, and matrix:

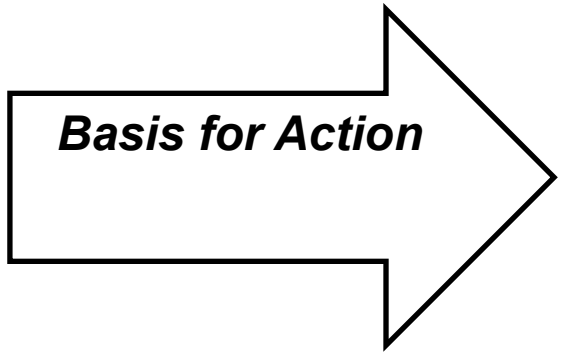
QAPP WS #15

Project Action Limit (PAL)	PAL Reference	Project Quantitation Limit (PQL) Goal	Laboratory specific quantitation limit (LOQ)	Laboratory specific detection limit (DL)

– Citation Optimized Uniform Federal Policy for QAPP WS

Risk Assessor-PSL vs PAL-Chemist

- **PSL (Project Screening Level)/ (PA Limit)**
- **PAL (PA Level)**



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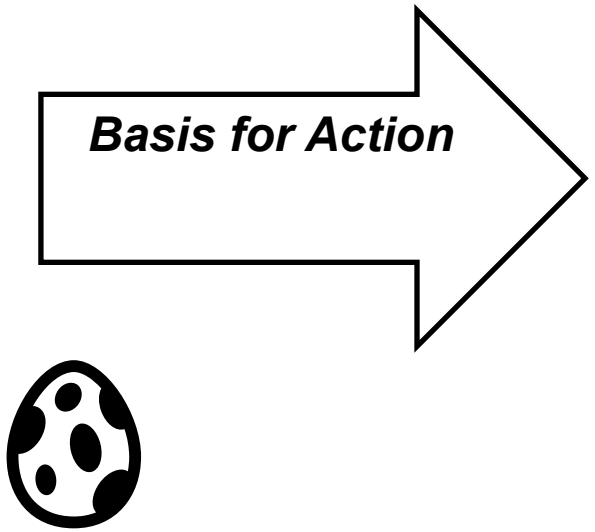

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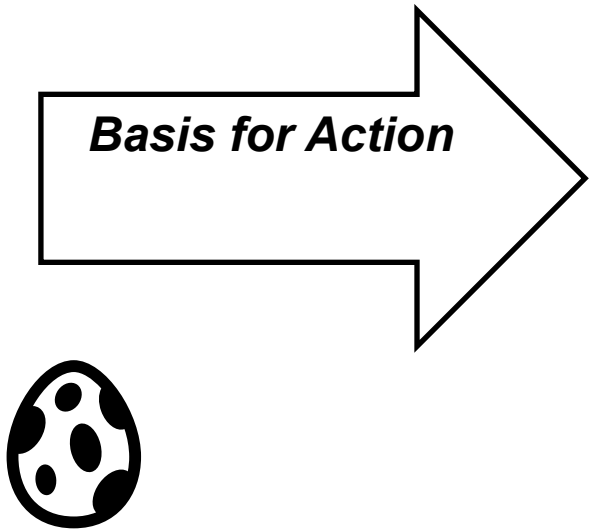
- **PSL (Project Screening Level)/ (PA Limit)**
  - Used to identify contamination that may require:
    - Further investigation
    - A formal risk assessment
    - Or potentially an action
  - In risk assessment, they help determine:
    - Which chemicals are carried forward for detailed evaluation



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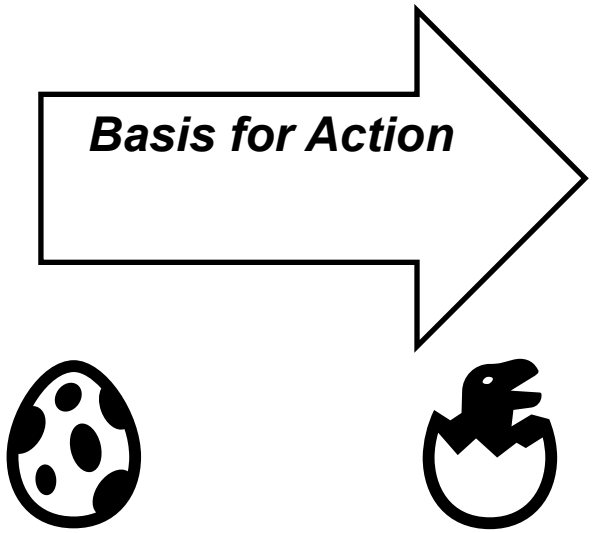

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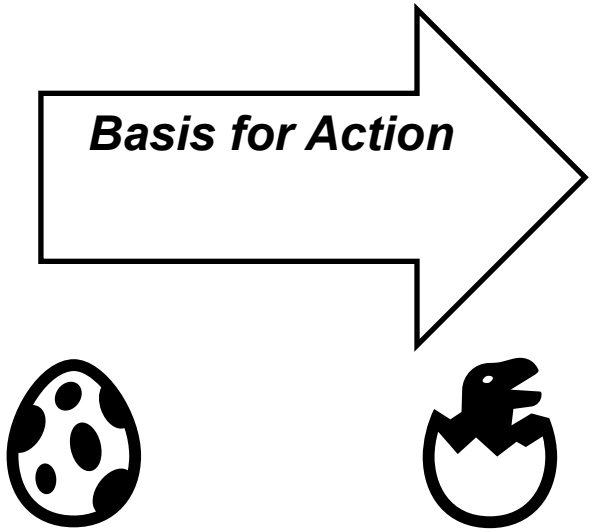

- **PAL (PA Level)**
  - Once unacceptable risk is identified then the project will
    - take **"action"**
      - e.g., removal action, remedial action, implement land use controls (LUCs)
    - Identify Action levels
      - Maximum Contamination Limits (MCLs)
      - State Applicable or Relevant and Appropriate Requirements (ARAR)

Planning QAPP WS # 15

- List for each analyte, method, and matrix:

QAPP WS #15

Project Action Limit (PAL) /Project Screening Level (PSL)	PAL/PSL Reference	Project Quantitation Limit (PQL) Goal	Laboratory specific quantitation limit (LOQ)	Laboratory specific detection limit (DL)

When LOQs Are Too High: Options

- Alternative Methods: Consult lab for better analytical methods
- Method Modification:
  - Larger sample volumes
  - Concentrated extracts
  - Alternate wavelengths
  - SIM mode (Selective Ion Monitoring)
- Use Another Lab: Consider expertise and instrumentation
- Use BTV (Background Threshold Value): If LOQ < BTV > PAL
- Elevate the PSL

When LOQs Are Too High: Options

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- ~~Use Another Lab: Consider expertise and instrumentation~~
- ~~Use BTV (Background Threshold Value): If LOQ < BTV > PAL~~
- **Elevate the PSL**

Is PFAS Different?

Analyte	EPA RSLs (Nov 2024; 10^{-6}, HQ = 0.1)			Analytical Capabilities		CUL
	Res Soil (mg/kg)	PGw (mg/kg)	Tap Water (ug/L)	Pooled MDL (soil; mg/kg)	Pooled MDL (water; ug/L)	MCL (ug/L)
PFOS	0.00063	0.0000015	0.0002	0.00000007	0.00063	0.004
PFOA	0.000019	0.00000004	0.0000027	0.00000007	0.00054	0.004
PFNA	0.019	0.000025	0.0059	0.00000014	0.00045	0.01 or Hazard Index ≤1
PFHxS	0.13	0.000017	0.039	0.00000008	0.00054	
PFBS	1.9	0.0003	0.6	0.00000005	0.00037	
HFPO-DA	0.023	0.0000015	0.0015	0.00000025	0.00051	

Pooled liquid MDL exceeds RSL

Pooled solid MDL exceeds RSL

Elevated Reporting Levels (> PSLs)

- **Different Priorities in SI, RI Phase I, RI Phase II, etc., Risk Assessment**
- **3 Options when Best Available Technology isn't good enough**
  1. **Raise PSLs up front**
  2. **Carry insufficient PSLs and preliminary COPCs into risk assessment**
  3. **Advocate for policy guidance**

Option 1: Raise the PSL Up Front
(PSL Selection)

- **PSL Selection**
- **CSM identifies receptors**
- **Receptors determine screening level categories**
  - **Human receptors and/or Ecological receptors**
  - **Which human or Eco receptor types drive SLs?**
  - **Are all human or Eco receptor types present?**
- **Screening level values determined methodically**
- **Understanding SL development informs about sample accuracy and precision needs**

Methodical PSL Derivation

Non-carcinogenic example

- Start with reliable NOAEL or LOAEL Toxicity Reference Value — NOAEL = 100 ppm
- Divide TRV by 10 to extrapolate from animal studies — TRV = 10 ppm
- Divide by 10 for human variability & sensitive subpopulations — TRV = 1 ppm
- Divide by 10 for using subchronic studies — TRV = No Change
- Divide by 10 if based on LOAEL — TRV = No Change
- Divide by >0 to 10 for subjective uncertainty — TRV = 0.1 ppm
- Scale with default receptor and exposure assumptions — RSL = 2.3 ppm

- Typical composite uncertainty factors ~ few hundred to few thousand
- What's the linchpin?

Cost / Benefits of Raising PSL

- **Q: How important is analytical imprecision near DL/LOD/LOQ?**
- **Q: How important are PSL exceedances near DL/LOD/LOQ?**
- **Consequences of Raising PSLs:**
  - **A: Debate during each QAPP & work plan review**
  - **A: Extended debate over comment matrices**
  - **A: Repeated debate may affect regulatory concurrence**
  - **A: Potentially adversarial advocacy for non-standard approach**
- **Benefit: Demonstrates great regulatory relationships and common understanding**
- **Benefit: Eliminates misunderstandings**

Option 2: Carry Insufficient PSLs & pCOPCs into Risk Assessment

- **Potential impacts of NDs with elevated Reporting Levels discussed in Risk Assessment's Uncertainty Section**
  - **Typically involves multiple lines of evidence**
- **Concentrate 10% (?) of samples to report presence/absence when analyte is ND (prioritize downgradient samples) before RA**
- **Won't remediate based on undetected compounds (NDs)**
- **If future information suggests a release, we'll address like any other newly discovered release**
- **Consequence: Repeatedly showing unachievable standards**
- **Benefit: Standard practice**

Option 3: Advocate for Policy Guidance

- **Recommendations go further than requests**

When to Engage Risk Assessor

- **Any time PDT wants to ensure data usability in risk assessment**
- **Ensure risk assessor knows when reporting level issues are anticipated**
- **When initially selecting PSLs for “frequent fliers”**
- **Before struggling to describe PSL decision making process in QAPP WS#11, DQO Step 5 or 6**
- **Near end of SI with elevated RLs; before last sampling event**

When to Engage Risk Assessor

- **When elevated Reporting Levels are due to correctable field or lab issues**
  - **Can resampling resolve concerns?**
- **Near end of RI with elevated RLs; before last risk assessment sampling event**
  - **Risk assessment's Uncertainty Section must address RL issues**

Data Use and Decision-Making Documentation

- If the LOQ > PSL/PAL
  - –Identified in the QAPP
  - –Include project-specific decision and rationale for how to proceed

QAPP WS # 11 specifically DQO 5 or 6

Total Suspended Solids (TSS) Threshold

- Method 1633A **recommends** a limit of <50 mg
- Threshold based on:
  - Other SPE methods (e.g., Method 533)
  - 1633 single-lab validation study
- >50 mg solids can:
  - Clog SPE cartridges, potentially leading to higher sensitivity limits due to reduced sample volume for analysis
  - Delay extraction
  - Incur concern that results may be biased low

TSS Project-Specific Threshold

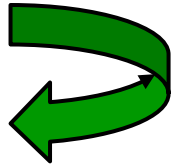
- Method 1633A **recommends** a limit of <50 mg
- Project team is responsible for:
  - Determining an acceptable TSS threshold to meet project DQOs (e.g., may be the Method 1633A limit or lower)
  - Discussing sample preparation options with the contracted laboratory
  - Determining which sample preparation meets the project DQOs, with potential input from the regulator(s)
  - Documenting the sample preparation decision and communication pathways in the Work Plan/QAPP
    - At a minimum- QAPP WS # 6 and 12
    - Recommended- discussion in QAPP WS #11, specifically DQO Step 6

QAPP WS #6, 11, and 12

Turbidity Threshold and Communication

- Turbidity ≠ TSS ► decent surrogate

  - The Project Team would agree on a turbidity benchmark (e.g., 100 NTU) that would launch a series of communications and actions by the Project Team, contract laboratory, and data validation team.
- Field Procedure should address:
  - How field team will attempt to reduce turbidity below the benchmark
  - Recording turbidity measurements on field paperwork and chain of custody



- Communication Procedure should address:
  - Communication steps and timeframe for turbidity values above threshold
    - Field Team Lead→ Project Team, especially the Project Chemists
    - Contractor Project Chemist → Laboratory Project Manager (PM)
    - Contractor Project Chemist → Data Validator + Data Usability Assessment (DUA) Team

Importance of Establishing TSS Communication and Protocols

- Why Proactive Steps on TSS Matter:

PLAN:
Threshold * Communication * Sample Prep

  - The field crew will work toward that turbidity threshold and know who to contact if it cannot be met.
  - The laboratory will use agreed protocols without delay.
  - The data validator will review sample preparation and results with an eye for qualification, as appropriate.

Set clear expectations → Meet project goals

Method 1633 Flexibility for TSS

- Method modification is permitted to improve separations or lower measurement costs (Section 9.1.2 of EPA Method 1633A)
- Sample volumes are a project-specific decision
  - Matrix complexity or difficult collection (e.g., lysimeters), may necessitate smaller sample volume.
  - Method-stated volume (500 mL) ≠ a representative sample of field conditions. The volume of sample collected is the Project Team's decision.
  - Minimum aqueous field sample = 100 mL
    - EDQW Memo: EPA Method 1633 Sample Volume Modifications
    - Method 1633B will state this volume as the minimum limit for collection.

Flexibility for TSS Continued

- Method modification is permitted to improve separations or lower measurement costs (Section 9.1.2 of EPA Method 1633A)
- Sample volumes are a project-specific decision
- Modifications to sample clean-up procedures:
  - Visual Inspection in lieu of TSS analysis
  - Multiple SPE cartridges allowed - May increase cost, uncertainty and turn-around time
  - Centrifugation - Project-Specific Decision
  - Subsampling not permitted (Section 8.2.1) - Permitted only when screening determines concentrations of PFAS are too high for the whole sample to be prepared

Centrifugation-Project-Specific Decision

- Allowed per Section 11.1.1.5 of Method 1633A, but:
  - Must be a Project-Specific Decision
    - Add Extracted Internal Standards (EIS) before or after centrifuging
    - Add original container rinse to solid or aqueous phase
    - Decision to analyze the pellet separately (nominal weight is 5 g)
  - Depends on Data Quality Objectives (DQOs)
- Lab must consult with Project Team | Project Team must consult the Lab
- Project Chemist (Government & Contractor) should review the laboratory SOP

QAPP WS #11 (DQO 6), 12, and 28

Planning QAPP WS #19 & 30

Analyte	Matrix	Method/ SOP	Accreditation Expiration Date	Container(s) (number, size, & type per sample)	Preservation	Preparation Holding Time	Analytical Holding Time	Data Package Turn Around Time
PFAS	Groundwater	Project Specific	Project Specific	• **EPA Method 1633** • **EDQW Memo(s)-#2**	• **EPA Method 1633**	• **EPA Method 1633** • **EDQW Memo(s)-#1**	• **EPA Method 1633** • **EDQW Memo(s)-#1**	Project Specific

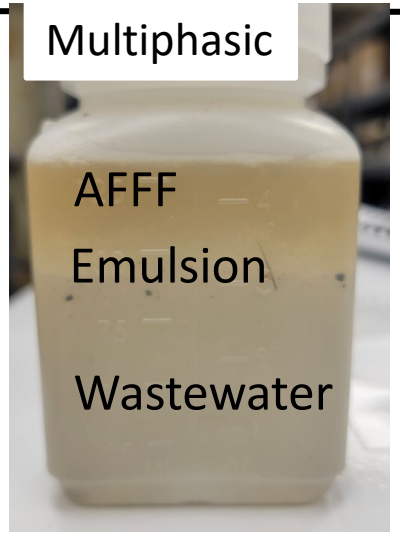
Current EDQW Memo(s) as of 25 June 2025:

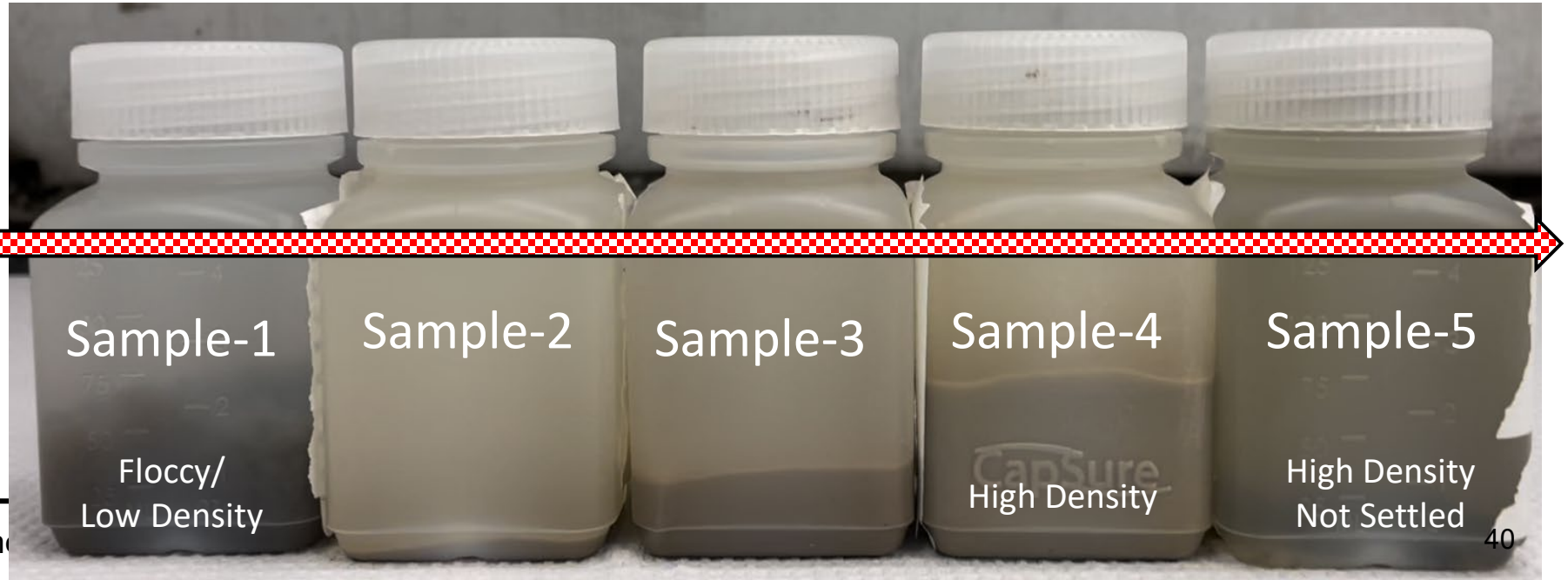
- DENIX –EDQW Outreach and Guidance
  1. Recommendation to Address Shorter Holding Times for Specific Per- and Polyfluoroalkyl substances (PFAS) When Using EPA Method 1633 for PFAS Investigations
  2. EPA Method 1633 Sample Volume Modifications

QAPP WS # 19 & 30

Aqueous Matrices

- Aqueous (not solvent)
- Low TSS (<50mg in bottle)
- Does not foam
- Not multiphasic
- Homogenous
- **Do not fill the bottle past the shoulder**

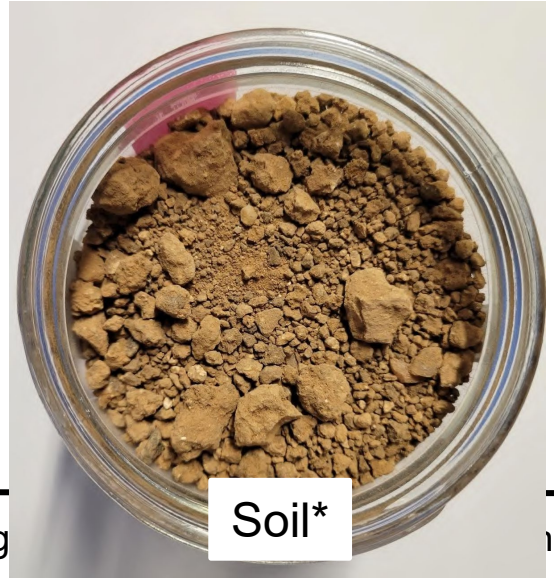




Figures provided by Sarah Choyke, Ph.D.
Eurofins Denver

Soil Matrices

- Solid (%Moisture < 80%)
- Homogeneous & < 1mm
- No organic material
- No large rocks
- Remove rocks, invertebrates, and foreign objects
- **Fill no more than ¾ full**



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Clay


Clay with water*

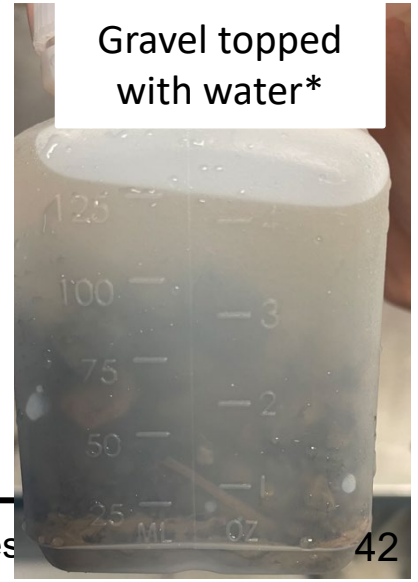
Cannot be mixed


Mud with Rocks*

Can be mixed, avoid rocks


Wet soil with Sticks*


Organic Matter, not Soil*


Gravel topped with water*

Figures provided by Sarah Choyke, Ph.D. Eurofins Denver

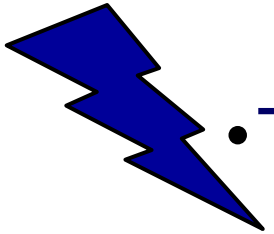
Sample Collection Procedures

- Field Procedure should include:
  - Sampling techniques to meet EPA Method 1633 requirements
- Communication Procedure should address:
  - Outline communication steps for when proper sample collection is not possible
    - Field Team Lead→ Project Team, especially the Project Chemists
    - Contractor Project Chemist → Notify Laboratory Project Manager (PM)

Properly Collect Samples

Why it Matters:

- Set clear expectations
  - Increase abilities to met project goals
  - Decrease time
  - Decrease uncertainty



- There will be a quiz!

QAPP WS # 19 & 30

Understanding Reporting Requirements

- QSM v6.0, Module 2, Section 7.8
  - Represents the minimum requirements to reconstruct a Level 4 Data Package.
- Waivers approved by the Project Team
  - Determine minimum reporting requirements

QAPP WS # 34

Poll Question

Which of the following is a key requirement for reconstructing a Level 4 Data Package?

A. A waiver approved by the Project Team

B. The inclusion of all data outline in the QSM

C. Determining minimum reporting requirements

D. No reporting requirements are needed

Poll Question

"Which of the following is a key requirement for reconstructing a Level 4 Data Package?“

A. A waiver approved by the Project Team

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Phase One Conclusion

Proper Planning Sets the Basis for Effective Implementation

- Clarity upfront reduces rework later
- Project Chemist bridge policy and application
- Communication is part of the technical process
- Documenting decisions increases defensibility
- What we plan sets the stage for implementation

Resources Phase 1 & 2

- DENIX- EDQW Home Page https://www.denix.osd.mil/edqw/
  - What's New-Updated Frequently!
- DENIX- EDQW Accreditation Page
  - DoD ELAP Fact Sheet- https://www.denix.osd.mil/edqw/featured-content/documents/dod-elap-fact-sheet/
- DENIX- EDQW Quality System Manuals Page
  - QSM Version 6.0- https://www.denix.osd.mil/edqw/denix-files/sites/43/2024/01/QSM-Version-6.0-FINAL-Dec-13-2023.pdf
- DENIX- EDQW Data Validation Guidelines Page
  - Module 6 Data Validation Guidelines- https://www.denix.osd.mil/edqw/denix-files/sites/43/2023/02/Module-6-Data-Validation-Guidelines-1633-PFAS-Final-1.pdf
    - Update under revision as of June 25, 2025

Resources Phase 1 & 2

- DENIX- EDQW Outreach and Guidance
  - Find EM/DQ Workshop Slides- https://www.denix.osd.mil/edqw/outreach/
  - EPA Method 1633 Clarification Update
  - Recommendation to Address Shorter Holding Times for Specific Per- and Polyfluoroalkyl substances (PFAS) When Using EPA Method 1633 for PFAS Investigations
  - EPA Method 1633 Sample Volume Modifications
  - EPA Method 1633 Sequence Requirements as of July 17, 2025
- EPA Method 1633
  - https://www.epa.gov/cwa-methods/cwa-analytical-methods-and-polyfluorinated-alkyl-substances-pfas
- Uniform Federal Policy for Quality Assurance Project Plans - Training Materials
  - https://www.epa.gov/fedfac/uniform-federal-policy-quality-assurance-project-plans-training-materials
- Optimized Uniform Federal Policy for Quality Assurance Project Plans Worksheets
  - https://www.epa.gov/fedfac/optimized-uniform-federal-policy-quality-assurance-project-plans-worksheets

Resources Phase 1 & 2

- Part 188 of Title 32-ELAP Requirement
  - https://www.ecfr.gov/current/title-32/subtitle-A/chapter-I/subchapter-L/part-188
- DoDI 4715.15
  - https://www.denix.osd.mil/international/policy/dodi/
- DoD PFAS Task Force Home Page https://www.acq.osd.mil/eie/eer/ecc/pfas/tf/policies.html
- ASD(E&IE) Memos
  - Establishing a Consistent Methodology for the Analysis of Per- and Polyfluoroalkyl Substances in Matrices Other than Drinking Water
    - Great to support screening data concept- “Screening samples to determine the presence or magnitude of PFAS concentration, but not to confirm absence”.
    - Recommends using a DoD ELAP accredited laboratory for screening methods.
  - Investigating Per- and Polyfluoroalkyl Substances within the Department of Defense Cleanup Program
    - Great to support considering additional target PFAS analytes not included in EPA Method 1633 with project-specific considerations.