



RAB MEETING MINUTES

Date/Time: Thursday, May 9, 2024, 6:30 p.m. to 8:30 p.m.

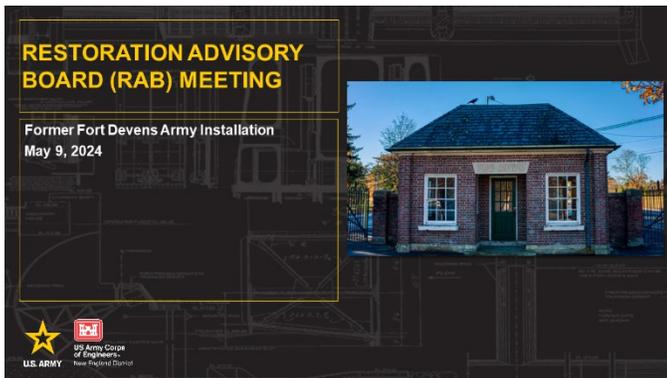
Location: Hybrid meeting in person and via Microsoft Teams

Attendees: Restoration Advisory Board (RAB) Community Co-Chair: Laurie Nehring
RAB Community Members: Julie Corenzwit, Amy McCoy, Dave McCoy, Christopher Mitchell
Thomas Lineer, Steve Cardon, Samantha Velluti-Fry (U.S. Army)
Penny Reddy, Dan Groher (U.S. Army Corps of Engineers [USACE])
Michael Daly, Shawn Lowry, Robert Ford, ZaNetta Purnell (U.S. Environmental Protection Agency [USEPA])
Joanne Dearden (Massachusetts Department of Environmental Protection [MassDEP])
Meg Delorier (Massachusetts Development Finance Agency [MassDevelopment])
Neil Angus (Devens Enterprise Commission)
Hagai Nassau, Brian Younkin (Skeo Solutions, Inc.)
Andy Vitolins, Steven Perry, Dawn Penniman, Amy Henschke, Whitney Sauve (SERES-Arcadis Joint Venture [S-A JV])
Libby Levison (Harvard Board of Health)
Cindy Carter, Tracy Clark, and other attendees participating by phone or are otherwise not able to be identified (community and guests)

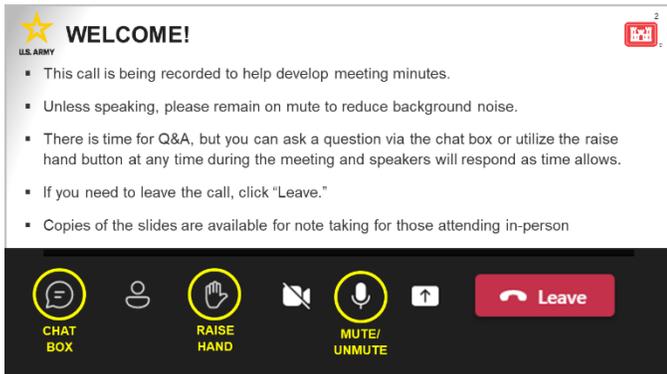
Slides: RAB meeting slides are available on the project website at:
<https://www.nae.usace.army.mil/missions/projects-topics/former-fort-devens-environmental-cleanup/>.

Please Note: Discussions described in these minutes have been paraphrased as needed for clarity. The invitation for this meeting is provided for reference at the end of these meeting minutes.

WELCOME & OPENING COMMENTS



Steven Perry (S-A JV Community Involvement Specialist) opened the meeting and welcomed the attendees both in person and online.



Steven Perry informed attendees that the meeting was being recorded to generate minutes. He reminded everyone online that microphones will be muted to avoid background noise. He noted that attendees can use the mute/unmute button at the bottom of their screen to talk or they can enter questions in the chat box. Attendees in the room were encouraged to ask questions verbally.



WELCOME!
U.S. ARMY

Thank you for joining us tonight.

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| <p>U.S. Army and Support:</p> <p>Thomas Lineer U.S. Army HQDA/ODCS G-9 Base Realignment and Closure (BRAC) Environmental Coordinator (BEC)</p> <p>Penelope Reddy U.S. Army Corps of Engineers (USACE) New England District</p> <p>Dan Groher, P.E. USACE New England District</p> <p>Andy Vitolins, Steve Perry, Dawn Penniman, and Amy Henschke SERES-Arcadis JV Team</p> | <p>Regulatory and Other Board Members:</p> <p>Michael Daly Shawn Lowry U.S. Environmental Protection Agency (USEPA) Region 1</p> <p>ZaNetta Purnell USEPA Community Involvement Coordinator</p> <p>Joanne Dearden Massachusetts Department of Environmental Protection (MassDEP)</p> | <p>Community Board Members:</p> <p>Julie Corenzwit Amy McCoy Dave McCoy Chris Mitchell Laurie Nehring: Co-Chair Alix Turner: Co-Chair</p> |
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Steven Perry led introductions for attendees. Leaders and contributors for the call included Tom Lineer (U.S. Army); Penny Reddy (USACE); Dan Groher (USACE); Steven Perry (S-A JV); Andy Vitolins (S-A JV); Dawn Penniman (S-A JV); Amy Henschke (S-A JV); Mike Daly (USEPA); Shawn Lowry (USEPA); ZaNetta Purnell (USEPA); Joanne Dearden (MassDEP); and RAB members Julie Corenzwit, Amy McCoy, Dave McCoy, Chris Mitchell, Laurie Nehring, and Alix Turner (unable to attend).

WELCOME!
U.S. ARMY

Tonight's topics

- 1 Project Updates & Upcoming Work
- 2 Area 1 PFAS Phase 2 RI Fieldwork
- 3 SHL Arsenic Background Report
- 4 Community Involvement & RAB Update
- 5 Questions & Answers

Steven Perry announced the topics for the call: ongoing project work; Area 1 Phase 2 per- and polyfluoroalkyl substances (PFAS) remedial investigation (RI) fieldwork; Shepley's Hill Landfill (SHL) arsenic background report; and community engagement activities.

1 | PROJECT UPDATES & UPCOMING WORK

Discussion Areas
PFAS Area 1
Former Fort Devens Boundary

Andy Vitolins (S-A JV Project Manager) pointed out locations of the current investigations, which focus on Main Post and North Post. He noted that there are other investigations ongoing at South Post that are not covered in these RAB meetings. The locations on Main Post are SHL; PFAS Area 1 (east side of Main Post); and Areas of Contamination (AOCs) 69W, 43G, and 57. The North Post locations include the former fire training area (FFTA) and the Moore Army Airfield (MAAF).

1 | PROJECT UPDATES & UPCOMING WORK

Supplemental Post-Record of Decision (ROD) Remedial Investigations (RIs) for Areas of Contamination (AOCs) 69W, 57, and 43G

- Quarterly groundwater monitoring event completed in February 2024
- One groundwater monitoring event remaining (May 2024)

Moore Army Airfield (MAAF) Former Fire Training Area (FFTA) PFAS Pre-RI Data Collection Treatability Study

- Lysimeter samples collected in February 2024 and April 2024; sampling complete and results pending
- Soil treatability testing results in spring 2024

Shepley's Hill Landfill (SHL)

- Groundwater extraction system operation and maintenance:
 - Arsenic treatment plant (ATP) modifications in place and start-up testing is on-going
 - Third extraction well operation part of startup testing
 - Water level monitoring for hydraulic capture evaluation is ongoing
- Barrier wall evaluation:
 - Results received, pending validation; data evaluation has begun
- Final Focused Feasibility Study submitted March 2024

Andy Vitolins shared project updates and upcoming work. One ongoing study involves supplemental post-Record of Decision RIs for AOCs 69W (Parker Charter School), 57 (stormwater outfall site along Barnum Road), and 43G (former U.S. Army gas station). These sites were petroleum contaminated sites, and their remedies have been under investigation for over a year to see whether they remain effective. Sampling last summer has been followed by quarterly monitoring events. The most recent monitoring event was completed in February, and the May event is ongoing. After the investigations are complete, a supplemental RI report will be prepared, and remedy effectiveness will be evaluated. Laurie Nehring asked if there have been surprises in the data. Andy replied that there had not been any so far.

Andy continued the updates by speaking about the RI at MAAF, which includes the FFTA where PFAS-containing foam was used. He noted there had been a lot of previous data collection there. They have installed lysimeters—wells that capture water as it is percolating down towards the groundwater—to evaluate if PFAS is leaching out of the soil. They also did some bench-scale soil treatability testing.

Andy also gave an update on SHL. Changes have been made to the way the arsenic treatment plant removes arsenic from the groundwater. They are also evaluating the incorporation of a third extraction well. In addition, the U.S. Army is evaluating how well the barrier wall, which has been in place for 10 to 12 years, is working to prevent groundwater from going to Plow Shop Pond. A lot of sampling



has been done over the last 6 months, and the results are being validated. In addition, a focused feasibility study was submitted in March, which evaluates remedial alternatives for the groundwater remedy for SHL.

Laurie asked if Andy could comment on the barrier wall evaluation. Andy replied that they are currently looking through all the data from the sediment, pore water, and surface water. They are evaluating if pore water coming from groundwater is having any impact on Plow Shop Pond. He noted that they will have data by the November RAB meeting.

1 | PROJECT UPDATES & UPCOMING WORK

Nashua River Military Munitions Update

- Analog geophysical survey was initiated April 2024 in accordance with the Munitions Response-Quality Assurance Project Plan (MR-QAPP) Addendum

Tom Linear (U.S. Army) gave an update on the Nashua River military munitions survey. They completed the survey of the five areas of interest and got 100% coverage using the analog, handheld method. They spent about 5 days last month taking out debris so that it was safe to dive. In the fall, they will do some invasive work in the areas where data showed anomalies. There have not been any recovery operations so far. However, in the spring, they will probably recover items such as bullets from a couple of sites. The dive team consisted of former Navy divers who were explosive ordnance disposal (EOD) qualified. They did not see anything in the river that would present a hazard. This summer, during the water chestnut pulling, there will be a contractor with the USACE on site in case anything is discovered.

Julie Corenzwit asked if they were planning on investigating Grove Pond. Tom answered that Grove Pond was not part of the scope, which was to investigate potential unexploded ordnance (UXO) items that were found in the river by people magnet fishing and by divers checking the foundations at the Route 2 bridge. The items found by the anglers were destroyed by the bomb squad. However, the bomb squad is not EOD qualified, so they could not determine whether they were munitions or UXO. At the Route 2 bridge, the Navy EOD specialists determined what had been found was munitions, not UXO.

Laurie Nehring stated that the water chestnut pulling that PACE does is in Grove Pond, not the Nashua River. They have been trained about what to do if they come across anything. However, some people are nervous about participating because of potential danger. She asked if it were possible to do a check there so people would feel more comfortable. Tom replied that they must have a legal driver to spend money for investigations. To his knowledge, Grove Pond was never used for any military purpose and what was found in the Nashua River was probably munitions as opposed to UXO. Therefore, there would not be any legal reason to do exploration for UXO in Grove Pond.

1 | PROJECT UPDATES & UPCOMING WORK

Draft Documents Submitted to USEPA and MassDEP Since Last RAB Meeting

- MR-QAPP, Addendum #1
- Draft Land Use Control Implementation Plan Devens Consolidated Landfill Contributor Sites
- Draft Annual Reports

Response to Comments/Revised Documents Submitted to USEPA and MassDEP Since Last RAB Meeting

- NA

Draft Final Documents Sent to RAB for Review Since Last RAB Meeting

- NA

Documents Posted to Website Since Last RAB Meeting

- Shepley's Hill Landfill Focused Feasibility Study

Andy Vitolins listed the draft documents that have been submitted since the last RAB meeting: the Quality Assurance Project Plan Addendum for the munitions response investigation, the Land Use Control Implementation Plan for the Devens Consolidated Landfill Contributor Sites, and the draft annual reports for the 2023 groundwater sampling.

Laurie Nehring asked how many contributor sites there are. Andy replied that three are covered under this plan because they had land use controls implemented after they were excavated. There were nine total sites, however, and they were army disposal sites containing debris like construction debris or landscape debris, not municipal waste.

Laurie asked if the RAB would review the annual reports. Andy replied that the annual reports will become final this summer as soon as USEPA and MassDEP comment on them. The RAB only comments on primary documents like work plans, investigation reports, and feasibility studies. The annual reports are secondary documents.

Andy continued the updates by noting that there have not been any responses to comments or revised documents submitted since the last RAB meeting, and the RAB has not reviewed any documents since the last RAB meeting. The next documents will be work plans for the PFAS RIs for Areas 2 and 3. The SHL Focused Feasibility Study was posted to the website when it was released as final in March.



1 | PROJECT UPDATES & UPCOMING WORK

ESTCP Research Study – Former Fire Training Area (AOC 31 – MAAF)

Summary

- Study is being conducted by University of Texas.
- Two adjacent cells will be created with FLUORO-SORB® absorbent material using jet-grouting technology.
- The FLUORO-SORB material will act as a filter, capturing PFAS and preventing PFAS from leaching out.
- A bottom element will be installed in one of the two cells. The bottom element will be designed to absorb all the PFAS that is in the soil above it.
- Monitoring will be conducted to demonstrate effectiveness.

Update

- Work plan under review by ESTCP Technical Review Board.

5/19/2024

Andy Vitolins gave an update on the Environmental Security Technology Certification Program (ESTCP) study by the University of Texas that was discussed at the February RAB meeting. ESTCP is a Department of Defense research program that typically involves large pilot studies for remedial technology. The study at Devens is going to test the ability of FLUORO-SORB, a clay material, to capture the PFAS that may be leaching out of the soil to the groundwater at the FFTA. There will be two cells with walls of grout and FLUORO-SORB material. One will have an open bottom that will be monitored as a control, and one will have a closed bottom of FLUORO-SORB material that will be monitored as well. The results will be compared to see if the closed-bottom cell prevents migration of the PFAS. The test area will be about 40 feet by 40 feet,

which is about a quarter of the size of the FFTA. When the test is done, a floor will be put in the open-bottom test cell. The University of Texas researchers have submitted their work plan to the ESTCP technical review board, and when it is finalized, they will perform the study.

Laurie Nehring asked what the FLUORO-SORB is made of and if it is patented. Andy replied that it is a clay-like material. Dan Groher (USACE) added that the company that makes it does not reveal exactly what is in it because it is a proprietary product. Andy mentioned it has been tested a lot already. Chris Mitchell asked if it is a barrier or if it is absorbent. Dan replied that it is a permeable sorbent that pulls PFAS out as the water goes through it. He added that the researchers do work in the laboratory first with a couple of different products to see which works best or is the easiest to work with. So, FLUORO-SORB has already been tested and determined to be the best option. Andy added that using materials like this in remediation is not new, but what is new about this study is that they are going to use jet grouting to form walls and a floor so that there is not as much earthwork needed. Dan added that there will also be less waste to dispose of.

A meeting attendee asked if the FLUORO-SORB needs to be dug up after it absorbs the PFAS. Andy replied that it will stay in place. He noted that, during the bench-top study, it was tested over time and no PFAS leached out. The attendee asked if molasses was still being used for extraction. Andy explained that, at MAAF, there was historically a volatile organic compound plume that was remediated using molasses and then emulsified vegetable oil, which caused the plume to biologically degrade. He noted that the remediation is mostly completed, and injections have not been needed. However, this area still gets monitored every year as part of the annual monitoring.

Mike Daly (USEPA) commented that FLUORO-SORB is a containment technology—it is not necessarily treating PFAS. He noted that soil washing has also started being used at sites to address soil contamination. In these cases, the soil is washed, and the wash water is captured and treated. Andy added that the biggest issue with PFAS is disposing of it since the regulations are in flux. Dan added that the purpose of the study is to give the researchers a place to try it out, and it would be determined after if it will be used at Devens.

Laurie asked if the study would address the entire problem at MAAF. Andy replied that the test cell would only cover about a quarter of the FFTA. However, the test area is big enough for them to measure the response to see if it works.

Amy McCoy asked if the cells are deep enough since the PFAS at MAAF is deeper than 15 to 20 feet. Andy replied that the vast majority of the PFAS mass is in the top 20 to 25 feet. Dan added that this method is only for unsaturated soil for above the water table so that it can keep PFAS from leaching to the groundwater. He stated that most of the PFAS at MAAF is above this depth, but they are not trying to fully fix the problem at MAAF yet—they are just testing this technology. Andy added that placing the FLUORO-SORB below the area of the highest concentration, however, does allow them to better monitor if it is working.

Laurie asked what the timeline is. Andy replied that it would take a couple of months to install it and then they would monitor it over time (2 years). Dan added that the researchers might propose to ESTCP that they monitor it for longer than planned if they think that there is more useful information to be gotten from it. He also noted that the USACE is doing pilot testing on their own, which they can compare to this ESTCP study.

Whitney Sauve (S-A JV) confirmed via the chat that most of the PFAS is in the top 20 feet, and the concentration drops very steeply below that. Robert Ford (USEPA) added that he serves on the ESTCP technical review board, and these are highly scrutinized projects. Mike asked what the schedule is. Andy replied that they would like to do the field work between May and December and that the stakeholders would be notified ahead of time. Joanne Dearden (MassDEP) asked for confirmation that the U.S. Army would let MassDEP review the work plan once it was reviewed by the ESTCP review board and before field work commenced. Andy replied that the research team did agree to that. Robert noted via the chat that he could facilitate external review of documents if reviewers sign a nondisclosure agreement.



2 | AREA 1 PFAS PHASE 2 RI FIELDWORK

Phased Approach – Each step builds upon the previous step to achieve RI objectives

- 1. Initial Phase**
 - Initial investigation of area of impacts and sources—soil borings, vertical aquifer profile (VAP) groundwater samples, surface water sampling, and geophysical investigations
- 2. Adaptive Phase**
 - Delineate sources, determine source strength, and define geometry of plume
 - Evaluate potential impacted human and ecological receptors
 - Permanent monitoring wells (overburden and bedrock)
- 3. Final Delineation Phase**
 - Monitoring to confirm nature and extent (groundwater and surface water)

Andy Vitolins discussed the Area 1 Phase 2 PFAS RI. He noted that Phase 1 consisted of the work that the U.S. Army did from 2019 through 2022, which was summarized in preliminary site characterization studies. The data from Phase 1 is being used to guide Phase 2.

Based on a similar slide presented at a previous RAB meeting, Andy described the three phases of the RI. The initial phase is investigation of the areas of impacts and sources using soil borings, temporary groundwater sampling, surface water sampling, and geophysical studies. During the adaptive phase, the data from the initial phase is used to identify sources and see if the vertical and horizontal extents are delineated. Also, potential receptors are evaluated, and permanent wells are installed. The permanent wells are needed to provide

repeatable data for risk assessments; however, they are expensive, so they need to be installed after the first two phases to make sure they are placed in the right locations. The final delineation phase involves monitoring to confirm the nature and extent of contamination.

Libby Levison (Harvard Board of Health) asked via the chat if they are getting permission from the landowners to put in the monitoring wells. Andy replied that they are getting permission for sampling on property that is not owned by the U.S. Army and that most of the rights of entry are with MassDevelopment. Libby asked if the landowners are cooperating. Penny Reddy (USACE) replied that there are two properties where they have not been able to get right of entry, and those have been sent to the Board of Health for assistance. She noted that for former Fort Devens land, the U.S. Army has the right to re-enter the property based on the deed, in which case they send a notification letter before accessing the property. Laurie Nehring asked if they have the right to enter the property of someone who lives in a residence at Devens. Penny replied that in most of the deeds there is a clause for that. Tom Lineer added that within that clause the U.S. Army has the right to go in and do work. Since the land was owned by the U.S. Army, that clause is supposed to be reported on each successive deed. Andy added that the U.S. Army still seeks permission before going on the property. Meg Delorier (MassDevelopment) added that the language from the master deed carries forward to any additional deeds for the property, including residential properties. Andy added that the USACE and the JV have spent significant time going around to all the properties and talking to the property owners, giving them fact sheets and coordinating the work. Meg added that for the sale of commercial properties, the investigative work has been disclosed even before closing on the property. Chris Mitchell added that the investigation in Harvard is on residential property. Tom replied that some of the residential property was never owned by the U.S. Army.

2 | AREA 1 PFAS PHASE 2 RI FIELDWORK

Investigation Schedule

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| In Progress | <ul style="list-style-type: none"> Remaining right-of-entry (ROE) agreements Utility clearance |
| Initial Phase Sampling: Starting May 2024 | <ul style="list-style-type: none"> Soil sampling: 228 samples from 57 locations VAP sampling: 112 samples from 14 locations Seismic survey |
| Adaptive Phase Sampling: Summer/Fall 2024 | <ul style="list-style-type: none"> Overburden and bedrock monitoring well installation: <ul style="list-style-type: none"> 29 overburden monitoring wells 15 bedrock monitoring wells Surface water and sediment sampling: <ul style="list-style-type: none"> 54 surface water samples from 23 locations 8 samples from 8 locations Fish tissue sampling: <ul style="list-style-type: none"> Grove Pond, Plow Shop Pond, Cold Spring Brook, Cold Spring Brook Pond, Mirror Lake, Robbins Pond, and Nashua River Groundwater sampling (first round) |

Andy Vitolins discussed the schedule for the RI. He noted that some right-of-entry agreements are still needed. Utility clearance has been happening where work is being done. In most cases, Dig Safe does not mark all the utilities, so geophysical techniques like ground penetrating radar or electromagnetic devices are used to detect utilities as well.

The initial phase soil sampling started last week. There are 57 locations for samples at various depths, which equals 228 samples total. For the vertical aquifer profiling (VAP) sampling, there are 14 locations, with an average of six to eight samples per boring. They take roughly one week to complete and are augmenting the samples (about 100) that were taken in Phase 1. In addition, a seismic survey, which will help map where the bedrock surface is and will look at flow pathways, has been

ongoing in rights of way, sidewalks, roadways, and the railroad. Chris Mitchell asked what the depth of the borings will be. Andy replied that they will go to refusal, which is usually 80 to 100 feet below ground surface.

Andy continued by discussing the adaptive phase. Sampling will use data from the initial phase and will occur in the summer and fall. It will involve permanent overburden and bedrock monitoring wells, as well as surface water, sediment, fish tissue, and groundwater sampling.

Laurie Nehring asked where Cold Spring Brook Pond is. Andy replied it is near the putting green at the golf course, upstream of AOC 57. Robert Ford asked via the chat if aquifer core samples were collected adjacent to Red Cove. Andy replied that soil samples were collected. Libby Levison asked via the chat where on the Nashua River fish will be taken and if different types of fish will be taken. Andy replied that there will be a field visit, probably in early June, to scope out the locations based on access.



2 | AREA 1 PFAS PHASE 2 RI FIELDWORK

Investigation Tasks and Anticipated Schedule

1. Seismic survey (May 2024)
2. Direct push soil borings (May-June 2024)
3. Direct push/sonic rig VAP (May – August 2024)
4. Monitoring well installation (bedrock and overburden) (June – November 2024)
5. Groundwater sampling (November 2024)
6. Sediment sampling (August 2024)
7. Surface water sampling (November 2024)
8. Fish tissue sampling (August/September 2024)

Andy Vitolins explained the upcoming RI investigation tasks. The seismic survey will take place in May. The soil borings (soil cores that are vibrated or hammered down into the ground) will be completed in May and June. The VAP sampling will be done in May and August with two different methods, depending on the depth: one using a direct-push rig and one using a sonic rig. At the same time, they will be installing bedrock and overburden monitoring wells. Some of the monitoring wells will be located based on previous data, but some monitoring well locations will depend on the information that is acquired from the soil borings and VAP sampling. The first round of groundwater sampling will take place in November, and the second will probably be in spring of 2025. The fish tissue and sediment sampling will happen in August.

Surface water sampling will happen at the same time as the groundwater sampling because it is easier to do in November.

Chris Mitchell asked, on behalf of the Harvard Press, how the work plans for the Phase 2 investigation will be adapted for the new USEPA guidance on PFAS. Andy replied that at the time the work plan was written, the U.S. Army used the most stringent criteria for delineation, which was the Massachusetts maximum contaminant levels (MCLs). Those were lower than the federal guidelines at the time. Now, some of the new USEPA MCLs are lower than the Massachusetts MCLs, which means that they are the more stringent requirements. So, when the data are compared to the criteria, the evaluation will consider the new MCLs.

Chris asked how many wells would be sampled during the groundwater sampling. Andy replied that about 100 wells will be sampled. Dan Groher added that they took about 800 samples in Phase 1 and will take about 400 this time to try to complete the data set.

Mike Daly added that the toxicity values that USEPA is using for their regional screening level calculator have changed, and the newer values for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) will be part of the updates to the calculator. He noted it will add another challenge to defining the nature and extent of contamination. Chris added that the Harvard Press wanted to make sure that the investigation is not locked into the previous values. Andy commented that when evaluating the nature and extent of PFAS, they are looking for it to be not detected. The new MCLs are 4 parts per trillion, and the detection limits are around 1.7 parts per trillion.

2 | AREA 1 PFAS PHASE 2 RI FIELDWORK

1. Seismic Surveying

- Used to obtain additional information on bedrock topography and the depth to bedrock.
- Helps to update bedrock topographic maps and the overall Main Post conceptual site model.

Andy Vitolins explained the seismic surveying investigation. He noted that it involves laying out a series of microphones in transects and then hitting a plate or using a peg attached to a truck to hit the ground. In both cases, sound waves are sent down into the ground where they bounce off different layers. It can be used to determine where bedrock is, and it helps identify the subsurface geology without the need to drill a lot of deep holes. For Devens, they are using the method of a peg on the back of the pickup truck. They covered all of Area 1 and some areas of Harvard within 2 weeks.

Laurie Nehring asked if the previous maps showing bedrock were estimates. Andy replied that those were interpolated from information from wells, etc. This information will give the actual bedrock location.

2 | AREA 1 PFAS PHASE 2 RI FIELDWORK

1. Seismic Surveying

- A series of receivers (geophones) are laid out in a straight line on the ground surface.
- The receivers are installed on 3-inch metal spikes, which are either driven into the ground or placed on a wooden block (if there is a roadway or paved surface).
- Each line of receivers will be between approximately 900 and 3,000 feet long. Once the receivers are installed, a sledgehammer or truck-mounted weight is used to strike a metal plate adjacent to the receivers. This generates a seismic "wave," which is measured by the receivers.
- The process is minimally intrusive and is anticipated to take less than 2 days to complete at each location.

Andy Vitolins continued to describe the seismic surveying. The diagram on the slide shows how the process works.



2 | AREA 1 PFAS PHASE 2 RI FIELDWORK

2. Direct-Push Soil Borings

- Rods are pushed into the ground via environmental drilling rig to collect soil sample cores from various depths.
- Each soil core is described in accordance with the Unified Soil Classification System and photographed.
- Soil samples are collected from specific depth intervals then sent to the laboratory for analysis.




5/19/2024

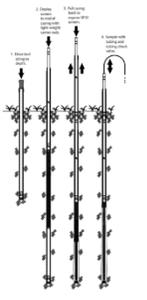
Andy Vitolins described the direct-push soil borings. He noted that, historically, drilling had been done using hollow-stem or auger rigs that rotate. With direct-push borings, the rig vibrates using a vibrating hammer and the rod is pushed down hydraulically. The rods are pulled out with a 4-foot core of soil (shown on the image on the left of the slide). The samples will be described in logs and collected from specific depth intervals.

Laurie Nehring asked how they know that the equipment does not add PFAS to the sample from the drilling fluid. Chris Mitchell added the equipment is cleaned between each location so there is no cross-contamination.

2 | AREA 1 PFAS PHASE 2 RI FIELDWORK

3. Direct Push/Sonic Rig VAP

- An environmental drilling rig is used to drill VAP borings.
- Top-down VAP sampling involves advancing dual-tube direct push casing with either a solid drive tip (without collecting soil cores) or a plastic liner for soil core retrieval from target depth interval.
- Sample is collected from the desired depth.
- Process is repeated to collect additional samples at deeper depths.

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Andy Vitolins described the VAP sampling. The diagram on the right of the slide shows how they collect groundwater samples by driving down, inserting a tube, and sampling the groundwater at defined intervals (about 10-foot intervals at Devens). This means that if the water table is at 20 feet and the bottom of the boring is at 80 feet, they will typically get about six samples from that boring. The samples are collected with a direct-push rig or a bigger rig called a sonic rig (for areas with very deep samples in sand). The photo on the slide shows an example of one of the large sonic rigs. It vibrates down like the direct-push rig, but it also rotates at the same time and recirculates fluid around it. In this way, it can drop down by vibrating the material without having to push hard.

2 | AREA 1 PFAS PHASE 2 RI FIELDWORK

4. Bedrock Drilling and Well Installation

- An environmental drilling rig will be used to drill and install permanent groundwater monitoring wells, including bedrock groundwater monitoring wells.
- Monitoring wells will be installed in the overburden and bedrock for subsequent groundwater sampling.




Rig pushes drill rods into the ground to remove soil/rock

PVC pipe is installed to create the well

5/19/2024

Andy Vitolins described the bedrock drilling and well installation. He noted that different methods can be used to get down to the bedrock, such as a sonic rig or an auger rig. During the process, the rig drills a little bit into the bedrock and then a steel casing is dropped into it and grouted into the bedrock surface. After it is grouted and cured, the rig drills into the bedrock through that steel casing, usually using a rotary method. It either uses water or air to get the cuttings back out. At Devens they will proceed down to the first water-bearing zone. Once the testing is done, a well is installed in the borehole and packed off.

2 | AREA 1 PFAS PHASE 2 RI FIELDWORK

5. Groundwater Sampling

- Groundwater is purged from monitoring wells using a pump.
- Water level is checked to ensure the flow rate is correct and water quality is measured every 3 to 5 minutes until the well is stabilized.
- The well is considered stabilized and ready for sample collection when:
 - Turbidity - within \pm 10% for values greater than 5 nephelometric turbidity units (NTUs) or if three turbidity values are less than 5 NTUs, consider the values stabilized
 - Dissolved oxygen (DO) - within \pm 10% for values greater than 0.5 mg/L or if three DO values are less than 0.5 mg/L, consider the values stabilized
 - Specific conductance - within \pm 3%
 - Temperature - within \pm 3%
 - pH within \pm 0.1 unit
 - Oxidation/reduction potential (ORP) - within \pm 10 millivolts (mV)



5/19/2024

Andy Vitolins described the groundwater sampling process. Typically, they do low-flow sampling, which removes the water from the well slowly, following USEPA guidance. Many kinds of water quality parameters can be measured. Depending on the investigation, it may require anywhere from 2 to over 20 sampling bottles to be filled.



2 | AREA 1 PFAS PHASE 2 RI FIELDWORK

6. Sediment Sampling

Sediment samples are collected by one of the following methods:

- Hand-held scoop or trowel:**
 - Shallow water depth (e.g., < 2 feet) nearshore
 - Stainless steel scoop or trowel lowered downward through the water column until it reaches the bottom
- Push core:**
 - Deeper water depth (e.g., > 2 feet) offshore
 - Tube pushed into the sediment and capped to collect sample
- Petite Ponar grab sampler:**
 - Deeper water offshore with coarse sediment or hard bottom
 - Stainless steel sampler is dredged along the bottom

Andy Vitolins described the sediment sampling process. He noted that there are several ways to do sediment sampling: by hand using a scoop or a trowel, with a core, or with a grab sampler. The top picture on the slide shows one of the sediment cores that was collected from Plow Shop Pond. The other picture is a stock photo showing a Ponar sampler, which is a clamshell dredge that is handheld. It gets lowered down to the bottom, and a weight slides down when it hits the bottom and closes the clamshell. Then it is brought back up for the sample to be collected. Depending on the depth of water, they will use either the handheld scoop or the grab sampler for the Area 1 PFAS investigation.

Laurie Nehring asked if the equipment is cleaned between locations. Andy replied that it will be cleaned using potable water free of PFAS.

2 | AREA 1 PFAS PHASE 2 RI FIELDWORK

7. Surface Water Sampling

- Shallow surface water (0.5 – 1 feet):**
 - Water is pumped through plastic tubing attached to a stainless-steel rod
 - Sample is collected in plastic bottle
- Deeper surface water (> 1 feet):**
 - Sample bottle is lowered to desired sample depth to collect sample

Andy Vitolins described the surface water sampling. He noted that if the sampling is being done in shallow surface water, it is collected straight from tubing into the bottle. If the sample is collected at a deeper location, the bottle or the tubing may be lowered to that deeper depth. Most of the surface water samples will be from the top 1 foot.

Laurie Nehring asked if plastic bottles were allowed when dealing with PFAS. Andy replied that PFAS samples are collected in glass. Other water quality parameters are sampled in plastic.

2 | AREA 1 PFAS PHASE 2 RI FIELDWORK

8. Fish Tissue Sampling

- Fish tissue samples will be collected and analyzed to evaluate potential angler exposure via fish consumption.
- Analysis will be conducted on the edible portion of the fish (filet).
- Sampling methods may include electrofishing, seining, gillnetting, trap netting, or angling.
- Samples to be collected from:
 - Grove Pond
 - Plow Shop Pond
 - Cold Spring Brook
 - Cold Spring Brook Pond
 - Mirror Lake
 - Robbins Pond
 - Nashua River

Andy Vitolins discussed fish tissue sampling. The samples are evaluated for angler exposure via ingestion. Currently, there are no guidelines or metrics for assessing ecological risk in freshwater or marine organisms. The fish are collected using the electroshock fishing method with a pole equipped with a small generator and a probe. The shocked fish rise to the surface, where they are collected with a net. This sampling will occur at various locations, not just in Area 1.

Whitney Sauve added via the chat that species may include largemouth bass, bullhead, pickerel, etc. Each sample will be a composite of at least five individuals. There are three Nashua River sampling locations: near Exit 106A off Route 2, the railroad and the Walker Road canoe/kayak launch spot, and the Lieutenant Colonel Burr M. Willey Bridge.

2 | AREA 1 PFAS PHASE 2 RI FIELDWORK

Andy Vitolins pointed out the proposed fish tissue sampling locations (yellow diamonds) on the map. In addition to the three sampling locations in the Nashua River, there will also be locations in Grove Pond, Plow Shop Pond, Cold Spring Brook, Mirror Lake, and Robbins Pond and at the confluence between Bowers Brook and Cold Spring Brook. The map also shows where surface water and sediment samples (circles and half-filled circles) will be collected.

Laurie Nehring noted a concern that there are people fishing in both Mirror Lake and Grove Pond as well as the Nashua River. Andy commented that the fish advisories are not related to PFAS; they are in place for other reasons, like the presence of mercury.



 **3 | SHL ARSENIC BACKGROUND REPORT** 

- Required by USEPA as part of the Scope of Work for the 2016 Informal Dispute Resolution for the SHL remedy.
 - » Scope of work listed specific wells to be included in the analysis (overburden and bedrock).
- Tasks included:
 - » Preparation of work plan
 - » Review of regional background arsenic concentrations
 - » Review of data collected from 2014 to 2019
 - » Collection of additional data as needed for statistical significance (four quarters of groundwater sampling; completed in 2022)
 - » Evaluation of background concentrations using USEPA guidance for statistical analysis
- Draft report submitted in November 2022. USEPA comments received in March 2023.
- Results indicate that arsenic background concentrations in overburden and bedrock are greater than the USEPA maximum contaminant level of 10 µg/L.
 - » Statistically significant difference between calculated background concentrations of arsenic in overburden (198 µg/L) and bedrock (7,839 µg/L)

5/19/2024

Andy Vitolins discussed the arsenic background report for SHL. In 2016, there was an informal dispute between the USEPA and the U.S. Army regarding the effectiveness of the groundwater remedy. Several actions came out of the dispute resolution, including a focused feasibility study, additional pilot studies, and the background study assessing the background concentration of arsenic in the landfill area.

There are a few reasons arsenic is present in this area—some of it is natural, some is from the landfill, and some is from the landfill being there but not from the landfill itself. The reason for doing the background study was to try to understand what the background level of arsenic would be if the landfill did not exist. As part of the study, wells were sampled, and historical data from those wells were also included,

to create a statistically significant dataset from which to draw conclusions. The report was produced to explain the results using USEPA guidance for statistical analysis of environmental samples. The results show that, in wells that were not impacted by the landfill, there was a difference between arsenic concentrations in the overburden (198 parts per billion [ppb]) and those in the bedrock (7,839 ppb). The concentrations in the bedrock were much higher because bedrock in New England has naturally occurring arsenic in the form of arsenopyrite. In addition, in both overburden and bedrock, arsenic was present naturally at concentrations that exceed the USEPA drinking water limit (10 ppb). These values were mentioned in the feasibility study, but no background cleanup objectives are proposed at this time.

Laurie Nehring asked if the arsenic would be in the bedrock if anaerobic conditions had not been created by the landfill. Andy replied that there are anaerobic conditions that are not created by the landfill. Robert Ford added that the numbers quoted are only statistical numbers. The amount in the overburden is relatively consistent with results from monitoring wells whereas the amount in the bedrock is not consistent with those in the annual reports because of the variability of the data that feed into the statistics. He mentioned the USEPA commented on the study and that it is worth sharing the document with the RAB members so they can see what the conversation between the USEPA and the U.S. Army has been like. He noted that they need to understand what a realistic goal would be for any remediation system because it does not take much arsenic in aquifer solids to produce concentrations on the order of a few 100 ppb. Mike Daly added that the U.S. Army will take the USEPA comments into consideration during revisions to the document.

Laurie commented that it is difficult to understand what that report means. Mike replied that it has not been a major driver of the focused feasibility study. Laurie asked if this meant the U.S. Army is saying they do not need to clean up the area. Andy replied that the U.S. Army conducted the study to address the USEPA request as part of the 2016 Informal Dispute Resolution. Laurie stated that she feels this is important to Ayer because Ayer is being directly impacted by the groundwater flowing out of SHL. Chris Mitchell asked if the background concentrations at Devens were similar to those at other sites because, given the geology at SHL, he would expect them to be elevated. Robert Ford replied that it depends on the chemistry of the groundwater because, even if there is a fixed concentration in aquifer solids at multiple sites, there can be very different concentrations in the groundwater depending on the chemistry. He noted the wells included in this study were selected based on hydraulics, location relative to the landfill, and where water was flowing. They are all outside of the perimeter of and hydraulically upgradient of the landfill. There is a range in the hydraulic conductivity of the aquifer materials in the overburden, and the amount of water exchange does affect the natural arsenic concentration in the groundwater.

Laurie asked if Robert knew of other sites that have similar concentrations. Robert replied that there is a disagreement about the bedrock value, but in terms of the overburden, yes. He noted it is not going to be uniform, and he has encountered a lack of homogeneity across an aquifer at multiple other sites. He suggested having more conversations about this topic because it is an important issue.

Julie Corenzwit commented that since background level is 20 times higher than the USEPA level, it seems impractical to have that limit at that value. Andy replied that the MCLs are mostly health based and for drinking water. However, the water in this situation is not being consumed, and when it discharges to the creek, the geochemistry changes and the arsenic drops out of solution.

Chris Mitchell commented that there are some unique things about the geochemistry at this location and having a separate session specifically about this issue would be good. Andy noted that it has been studied intensively for 20 years now and is not easy to understand and resolve. Steven Perry added that the report is on the project website, so folks who are interested can read it.



4 | COMMUNITY INVOLVEMENT & RAB UPDATE







Increased RAB public outreach efforts to raise awareness of meetings and activities

Community update fact sheet distributed on May 3, 2024

Digital AR continues to be populated with project documents; website updates are in progress

The next quarterly RAB meeting will be August 8, 2024 (Virtual)

The Community Involvement Plan (CIP) and other information is available on the Fort Devens Environmental Cleanup website at: <https://www.nae.usace.army.mil/missions/projects-topics/former-fort-devens-environmental-cleanup/>

Digital Administrative Record (AR) link is now live, and documents are being uploaded. Initial documents are available at: <https://www.nae.usace.army.mil/Missions/Projects-Topics/Former-Fort-Devens-Environmental-Cleanup/Administrative-Record/>

5/19/2024

Steven Perry mentioned that the U.S. Army and JV have been doing more advertising and outreach for the last couple of RAB meetings. Amy McCoy noted that the website needs to have the meeting date updated sooner before each meeting. Steven replied that they would work with the USACE webmaster that is responsible for the website updates. The next RAB is tentatively scheduled for August 8, 2024, but may be pushed to later in the month, if that is desired. The latest fact sheet was sent out and will be posted to the website soon.

5 | QUESTIONS & ANSWERS




5/19/2024

Shannon (last name unknown) asked via the chat for an update with respect to the Fort Devens Sudbury Annex site and PFAS testing because the investigation report is not on the website. Andy Vitolins replied that they could send it to her if an email address is provided.

THANK YOU!
YOUR PARTICIPATION IS APPRECIATED!

NEXT RAB MEETING IS:
AUGUST 8, 2024

(Second Thursday of the month)



5/19/2024

Steven Perry thanked all presenters, RAB members, and participants for attending and noted that the next RAB meeting is currently scheduled for August 8, 2024.

| Question | Answer |
|----------|--------|
| N/A | N/A |



RAB MEETING INVITE

**Former Fort Devens Army Installation
Notification**



**Please join us for the next Former Fort Devens RAB Meeting,
Thursday, May 9, 2024, at 6:30 p.m.**

Our next RAB meeting will be held in-person and via Microsoft Teams. The meeting will be held at the Mass Development Offices in the Vicksburg Conference Room at 33 Andrews Pkwy, Devens, MA 01434 or you may join by clicking this link:

Click here to join the meeting

Or you can call in to hear the audio only:

+1 213-379-9608

Phone Conference ID:

473 892 551#

We hope you will join us to actively discuss the following topics and share your ideas:

Welcome to Existing Members and New Participants!

Project Updates & Upcoming Work

Area 1 PFAS RI Fieldwork

Shepley's Hill Landfill Arsenic Background Report

Questions & Answers

Community Involvement & RAB Board Updates

Next Steps & Meeting

Bring your thoughts about the RAB and questions about the project. This meeting will be recorded, and a meeting summary will be posted on the project website at:

<https://www.nae.usace.army.mil/missions/projects-topics/former-fort-devens-environmental-cleanup/>

If you have any questions, please send an email to:

FormerFortDevensRAB@arcadis.com