



Shaw AFB Restoration Advisory Board Annual Meeting

Patriot Park, Sumter, SC.

May 22, 2023

Agenda

- Welcome/Introductions
- Purpose/Mission
- Shaw Environmental Restoration Program Update
 - Optimized Remediation Contract
 - PFAS Remedial Investigation
 - PFAS On-Base Interim Remedial Action - Point Source Removal
 - PFAS Off-Base Interim Remedial Action - Drinking Water
- Break
- Public Comment
- Conclusion



Welcome/Introductions

- Welcome from Co-Chairs:
 - Community – Mr. Daniel Burkett
 - Air Force – Col Matthew Davis
- Shaw AFB Remedial Project Manager/RAB Coordinator
 - Mr. Juv Salomon
- RAB Members
- Elected or Appointed Officials
- South Carolina Department of Health and Environmental Control
- Media
- Public Affairs
- Online



Agency for Toxic Substances and Disease Registry (ATSDR)

**Sue Casteel
Health Educator
ATSDR, Region 4
Atlanta Georgia
(404) 747-4185
AOV2@cdc.gov**



RAB Purpose/Mission

- Purpose:
 - Promote community awareness
 - Obtain constructive community review and input on current and proposed environmental cleanup actions
- Mission:
 - Open and interactive dialogue
 - Among the Air Force, South Carolina Department of Health and Environmental Control, and our neighbors
 - Concerning Shaw's Environmental Restoration Program



Admin/Handouts

- Tight agenda
- Restrooms
- Please silence cell phones
- Save questions for the end of each presentation
- Avoid side-bar conversations
- Sign-in sheet
- Agenda
- RAB application
- Action items
- Slides will be emailed
- Use question/comment cards



Question/Comment Cards

Question/Comment:

What is ...?
Please consider...
RAB improvements...

John Doe
123 Question St.
Sumter, SC 29154
(803) 895-XXXX
Email

***Please hand completed cards to the facilitator or
leave on the sign-in table.***



RAB Updates

- New RAB Members
Mr. Jim McCain Jr.,
Chairman of the Sumter County Council
- Accepting Applications
- RAB Member Updates
- Stakeholder Organization Updates



Shaw AFB Optimized Remediation Contract (ORC)

Environmental Remediation and Site Restoration Activities

ORC Overview

- What is an ORC Contract?
 - A performance-based contract that incorporates and strives to improve existing remedies by incorporating lessons learned from previous contracts.
- Environmental Remediation and Site Restoration Activities
 - 15 Installation Restoration Program Sites
 - 3 Defense Logistics Agency (DLA) Sites
 - 18 total sites
 - 16 managed under the installation's Resource Conservation and Restoration Act Permit
 - 2 managed under the South Carolina Underground Storage Tank program



ORC Overview continued

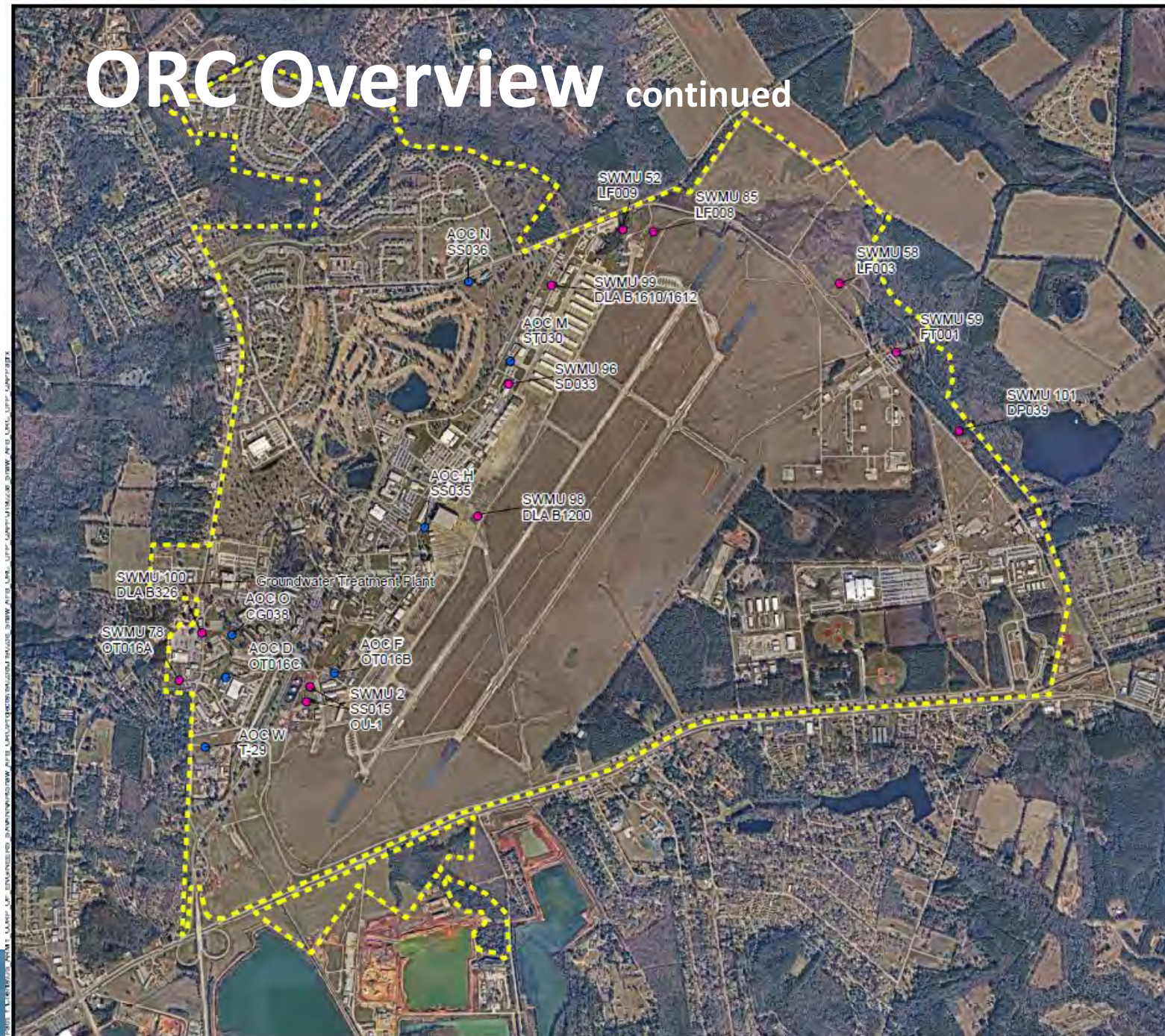


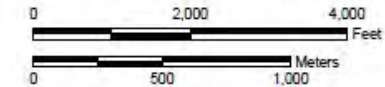
Figure 1

Shaw AFB ORC Overview

Shaw AFB ORC UFP-QAPP
Shaw AFB, South Carolina



NAD 1983 StatePlane South Carolina FIPS 3900 Feet
Basemap: Nearmap Sumter County, January 2020



- Area of Concern
- Solid Waste Management Unit
- Installation Boundary



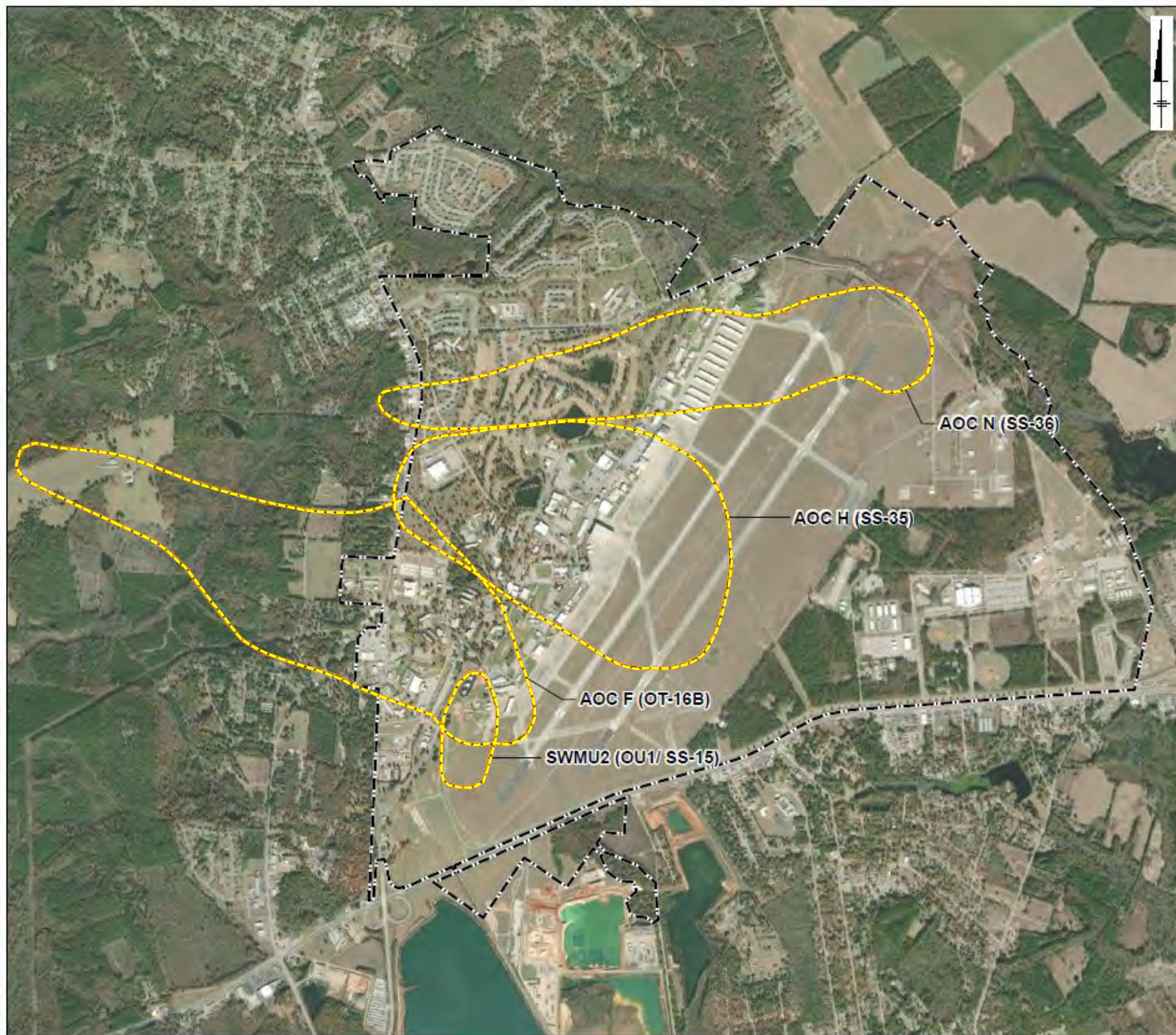
ORC Overview continued

- Period of Performance August 2020 through August 2026
 - Goals
 - Advanced Site Characterization (4 sites)
 - Remedial Action – Operation (11 sites)
 - Long Term Management (3 sites)



Advanced Characterization Sites

- 4 sites with ongoing Remedial Action- Operation (RA-O)
 - OT016B (AOC F)
 - SS015 (OU-1/SWMU 2)
 - SS035 (SD029/AOC H/AOC L)
 - SS036 (AOC N)
- Ongoing RA-O at these sites includes:
 - Groundwater Treatment Plan Operation and Maintenance
 - In Situ Chemical Oxidation for OT016B and SS035
 - Long Term Monitoring and Land Use Controls for all 4 sites
 - Includes off-base LUCs and bilateral agreement requirements



Legend:

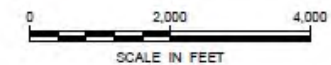
- Base Boundary
- Resource Conservation and Recovery Act (RCRA) Boundary

Notes:

1. Modifications in the 2019 RCRA Permit Renewal included consolidating SWMU 50 (OT005) and AOC K (ST014) as part of the SWMU (also cross-references as OU1 and SS-15) and consolidating AOC L (SD029) as part of AOC H.

2. Definitions:

AFB = Air Force Base
 AOC = Area of Concern
 SWMU = Solid Waste Management Unit



SHAW AIR FORCE BASE
 SUMTER, SOUTH CAROLINA
SUPPLEMENTAL SITE INVESTIGATION WORK PLAN

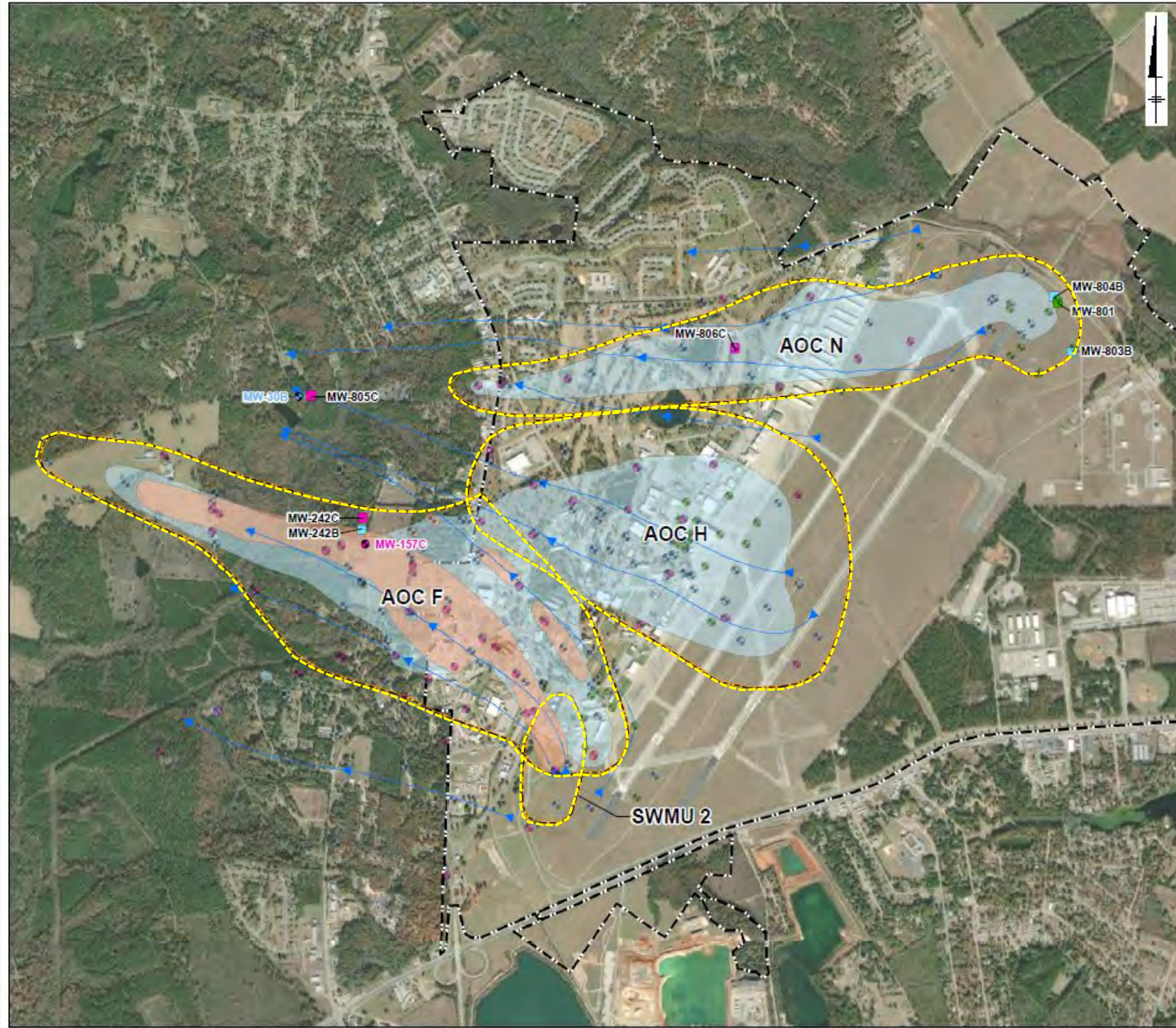
**SHAW AFB
 SITE INVESTIGATION AREAS**



FIGURE
1

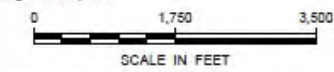






- Legend:**
- Proposed Monitoring Well Location, Duplin Aquifer
 - Proposed Monitoring Well Location, Upper Black Creek Aquifer
 - Proposed Monitoring Well Location, Lower Black Creek Aquifer
- Monitoring Well Location**
- Duplin Aquifer
 - Upper Black Creek Aquifer
 - Lower Black Creek Aquifer
- Groundwater Flow Direction in Upper Black Creek Aquifer
- ▭ RCRA Boundary
- ▭ Base Boundary
- VOC Concentrations in the Upper Black Creek Aquifer**
- PCE Impacts (> 5 µg/L)
 - TCE Impacts (> 5 µg/L)

- Notes:**
1. Plumes are based on April/May/June 2020 sampling results.
 2. Groundwater flow arrows based on March 2020 groundwater data.
 3. Definitions:
 µg/L = Micrograms per Liter
 AFB = Air Force Base
 AOC = Area of Concern
 PCE = Tetrachloroethene
 RCRA = Resource Conservation and Recovery Act
 SWMU = Solid Waste Management Unit
 TCE = Trichloroethene
 VOC = Volatile Organic Compound



HRSC Status

- Airfield Investigation 90% complete
- Off Base Well Installation – Drilling in Late Spring/Early Summer 2023
- On Base investigation – Late Spring
- Following Investigation:
 - Revised conceptual site model
 - Recommendations for additional corrective measures
 - Decision documents and Corrective Measures Work Plans



Base Groundwater Treatment Plant

- Pump, Treat, Inject System for water from sites OT016B (AOC F), SS035 (SD029/AOC H/AOC L), SS036 (AOC N)
- Online for 25 years
- The system has removed over 3,700 pounds of contaminants and treated over 4.5 billion gallons of water



Remedial Action – Operation

- 9 Sites have corrective measures ongoing:

- CG038 (AOC O)
- FT001 (SWMU 59)
- OT016C (AOC D and AOC W)
- ST018 (SWMU 87) – UST Site
- ST030 (AOC M)
- SD033 (SWMU 96)
- DLA Building 1200 (SWMU 98)
- DLA Building 1610 (SWMU 99)
- DLA Building 326 (SWMU 100)
 - – UST Site



Remedial Action Operation

- 2 RA-O sites without treatment systems:
 - DP039 (AOC32/SWMU 101)
 - Supplemental Investigation and updated Risk Assessment
 - Develop corrective measures study
 - Develop Statement of Basis
 - Develop Corrective Measures Implementation Work Plan
 - Implement LTM and LUCs with the approved CMI WP
 - OT016A (SWMU 78)
 - Supplemental Investigation for Pesticides (Dieldrin)
 - Revise Corrective Measures Implementation Work Plan
 - Continue LTM and LUCs



Long Term Management

- 3 Landfill Sites:
 - LUCs and Landfill cover maintenance
 - LF003 (SWMU 58)
 - LF008 (SWMU 85)
 - LF009 (SWMU 52)



Air Force Civil Engineer Center



Shaw AFB Remedial Expanded Site Investigation Presentation

Restoration Advisory Board
May 2023



Previous PFAS Investigations



2015 – 2016 Preliminary Assessment (PA) - involved gathering historical and other available information about site conditions as well as interviewing Air Force personnel with knowledge of past AFFF use to evaluate whether per- and polyfluoroalkyl substances (PFAS) may have been released within a site and if further investigation was needed.

2016 – 2018 Site Inspection (SI) – collected soil, groundwater, sediment, and surface water samples at each site identified for further investigation in the PA to determine if PFAS was released to the environment and is a threat to human health. Also added two sites, one from the PA and another discovered afterward for investigation.

2019 – 2021 Expanded SI - Based on the results of the SI and concern that PFAS may have migrated to or beyond the base boundary, soil, groundwater, sediment, and surface water samples were collected to assess if PFAS had migrated off base near drinking water sources.



Previous PFAS Investigations



Preliminary Assessment (PA) - Identified 11 possible sites, 4 recommended for SI.

Site Inspection (SI) - Investigated 4 sites from PA plus 2 identified afterward. All 6 sites were recommended to move on to Expanded SI.

Expanded SI - Filled in gaps in data and also confirmed that contamination extended outside of base boundary.

Samples collected During SI and Expanded SI

27 Monitoring Wells Installed (11 permanent, 16 temporary)

56 Groundwater Samples Collected from New and Existing Wells

89 Soil Samples Collected

8 Sediment Samples Collected

6 Surface Water Samples Collected



PFAS Site Inspection Sites





Remedial Investigation



Remedial Investigation*(RI) - The phase of work after the Expanded SI where more data is collected to **fully characterize site conditions and which types of PFAS have been released and at what concentrations (What, Where, and How Much)**. There will be following phases following the RI that assess risk to human health and the environment and to evaluate the cost and performance of potential treatment technologies. After the RI, a feasibility study*(FS) phase will begin when a detailed evaluation of alternative remedial actions is completed.

***EPA Definitions for RI and FS**

RI – The RI serves as the mechanism for collecting data to characterize site conditions, determine the nature of waste, assess risk to human health and the environment, and conduct treatability testing to evaluate the potential performance and cost of the treatment technologies that are being considered.

FS – The feasibility study is the mechanism for the development, screening, and detailed evaluation of alternative remedial actions.



PFAS Remedial Investigation



What Have We Completed?

- **Collected 91 surface and subsurface soil samples**
- **Collected 146 groundwater samples from new and existing monitoring wells**
- **Collected 55 surface water and sediment samples**
- **Installed 22 new monitoring wells**
- **Installed 3 lysimeters for porewater sample collection**



PFAS Remedial Investigation



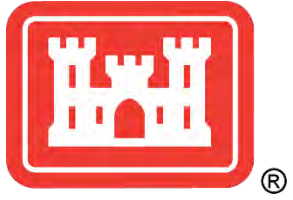
Planned Work for the Immediate Future

- **Awaiting final approval of the QAPP Addendum**
- **Install 7 new monitoring wells**
- **Install 3 new lysimeters**
- **Collect 38 sediment and surface water samples**
- **Collect 48 surface and subsurface soil samples**
- **Collect 101 groundwater samples**
- **Collect 6 porewater samples**



Hydraulic Capture and Point Source Removal Shaw Air Force Base Sumter, SOUTH CAROLINA





Hydraulic Capture and Point Source Removal

Shaw AFB Sumter, SOUTH CAROLINA



TIMELINE OF PFAS USE AT SHAW AFB

- 1970 – the Air Force began using PFAS containing AFFF for firefighting purposes.
- 1970 to present – Releases to the environment have occurred, likely during fire training, equipment maintenance, storage, and use of AFFF.



Hydraulic Capture and Point Source Removal

Shaw AFB Sumter, SOUTH CAROLINA

PFAS INVESTIGATIONS AT 3 FORMER FIRE TRAINING AREAS

- September 2018 – Shaw AFB determined AFFF use at 3 Fire Training Areas may have released PFAS compounds to groundwater.
- June 2021 – Investigation of soil and groundwater to determine extent of PFAS contamination commenced.
- May 2022 – Completed soil and groundwater PFAS Investigation at the 3 source areas.
- Investigation determined PFAS contamination present.
- Groundwater data strongly indicate that PFAS compounds in groundwater may be migrating off-base to drinking water wells to the east.



Shaw Air Force Base, S.Car., May 23, 2022. (Weston-ER/U.S. Air Force)



Hydraulic Capture and Point Source Removal

Shaw AFB Sumter, SOUTH CAROLINA



PFAS CLEANUP OPTION AT SHAW AFB

- Department of Air Force approved a proposed cleanup option based on cost estimates.
- Approved cleanup option is Pump and Treat of Groundwater via a Groundwater Treatment Plant.
- What is Pump and Treat?



Hydraulic Capture and Point Source Removal

Shaw AFB Sumter, SOUTH CAROLINA

GROUNDWATER PUMP AND TREAT

- PFAS contaminated groundwater is pumped from deep trenches that have a perforated pipe installed.
- Water is pumped through pipes to the groundwater treatment plant.
- The water is pumped through:
 - Settling tanks and filters to remove large particles
 - Media vessels to remove contaminants
 - Centrifuge to remove any remaining solids
 - Injection trenches to flush contaminants from the soil and groundwater.
- Water will be sampled weekly to verify removal of PFAS

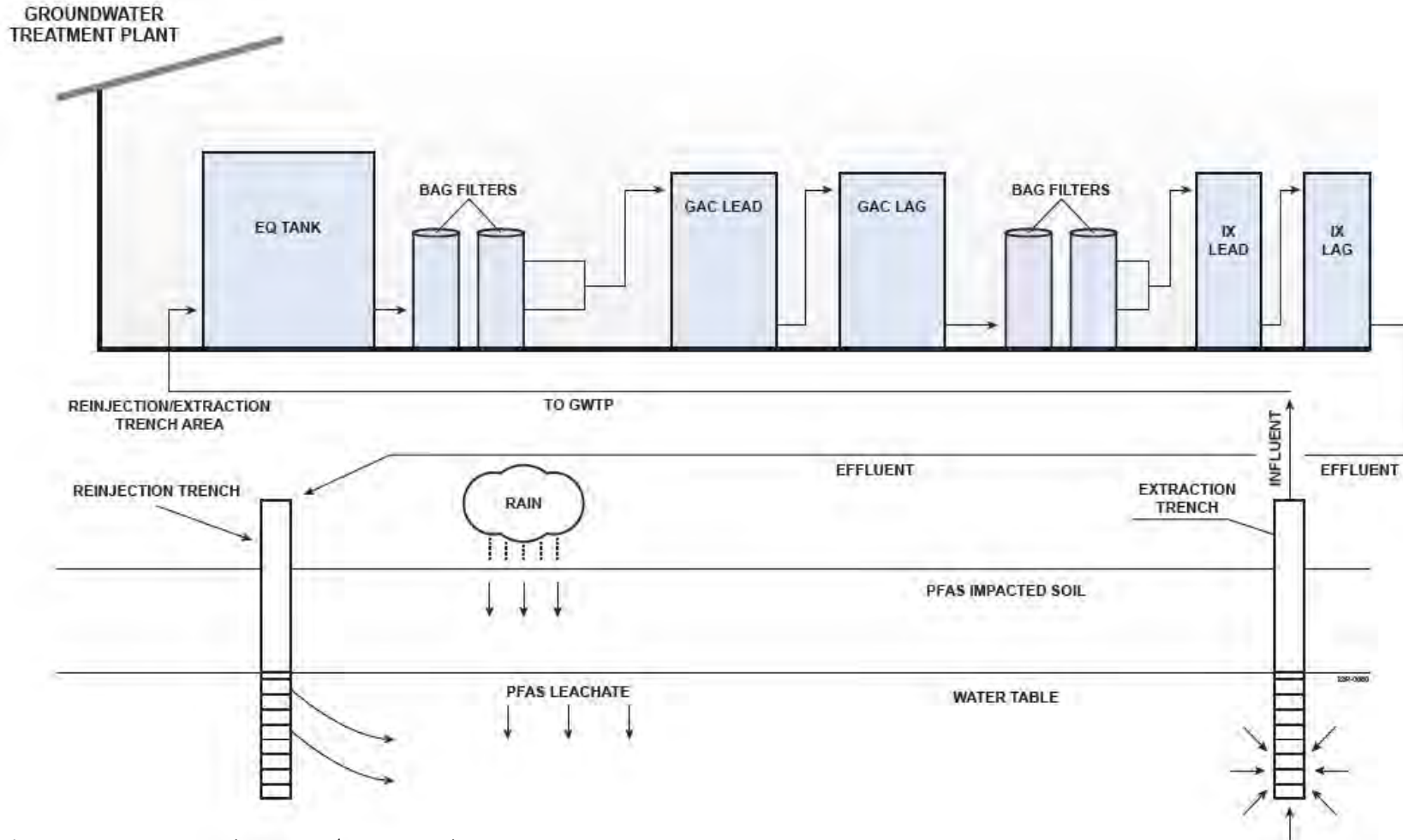


Wurtsmith Air Force Base, Mich., 2022. (Courtesy/U.S. Air Force)



Hydraulic Capture and Point Source Removal

Shaw AFB Sumter, SOUTH CAROLINA



GROUNDWATER TREATMENT

- Water is pumped to the Groundwater Treatment Plant.
- Water is treated through media engineered to remove contaminants (PFAS).
- Clean water is reinjected into trenches to flush PFAS contaminants from the soil and to the extraction trench.



Hydraulic Capture and Point Source Removal

Shaw AFB Sumter, SOUTH CAROLINA

PIPING FOR TREATMENT

- Untreated groundwater is pumped to the treatment plant via **red water lines**.
- Treated water is returned to reinjection trenches via **blue water lines**.
- Treated water flushes more contaminants to the extraction trench for treatment.



Shaw Air Force Base, S.Car. (Weston-ER/U.S. Air Force)



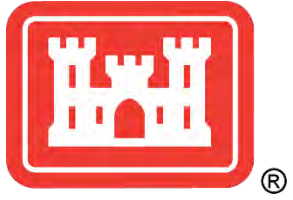
Hydraulic Capture and Point Source Removal

Shaw AFB Sumter, SOUTH CAROLINA



WHY TREAT GROUNDWATER?

- Removing the PFAS via treatment results in:
 - Cleaner soil in Fire Training Source Areas at Shaw
 - Cleaner groundwater as precipitation naturally passes through soil
 - Reduce PFAS levels in the groundwater



Hydraulic Capture and Point Source Removal

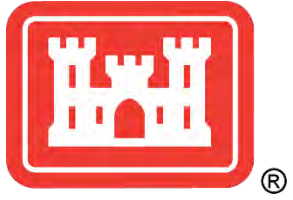
Shaw AFB Sumter, SOUTH CAROLINA

INSTALLATION OF TRENCHES

- Using the BIGGEST trencher in the United States!
- 50-foot long trenching arm!



Shaw Air Force Base, S.Car., Mar. 2023. (Weston-ER/U.S. Air Force)



Hydraulic Capture and Point Source Removal

Shaw AFB Sumter, SOUTH CAROLINA

INSTALLATION OF RISER PIPE

- Holds and protects our pumps that will pump groundwater to the treatment plant



Shaw Air Force Base, S.Car., Apr. 2023. (Weston-ER/U.S. Air Force)



Hydraulic Capture and Point Source Removal

Shaw AFB Sumter, SOUTH CAROLINA



WHAT'S NEXT?

- Groundwater Treatment Plant:
 - Construction:
May 2023 – December 2023
 - Projected operational:
January 2024
 - Estimated termination:
January 2027

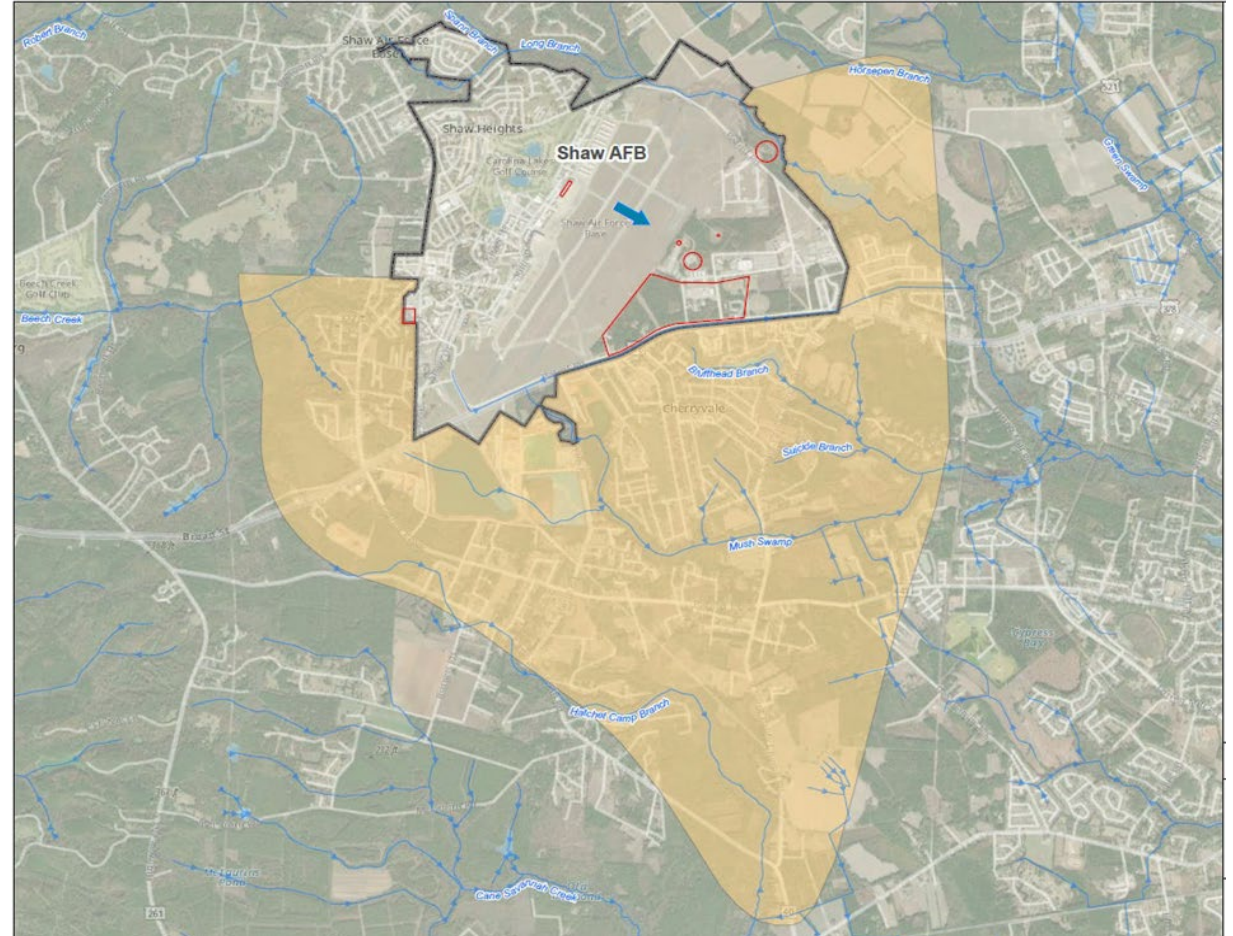


PFAS Off-Base Drinking Water



Air Force Uses a 3-step Approach

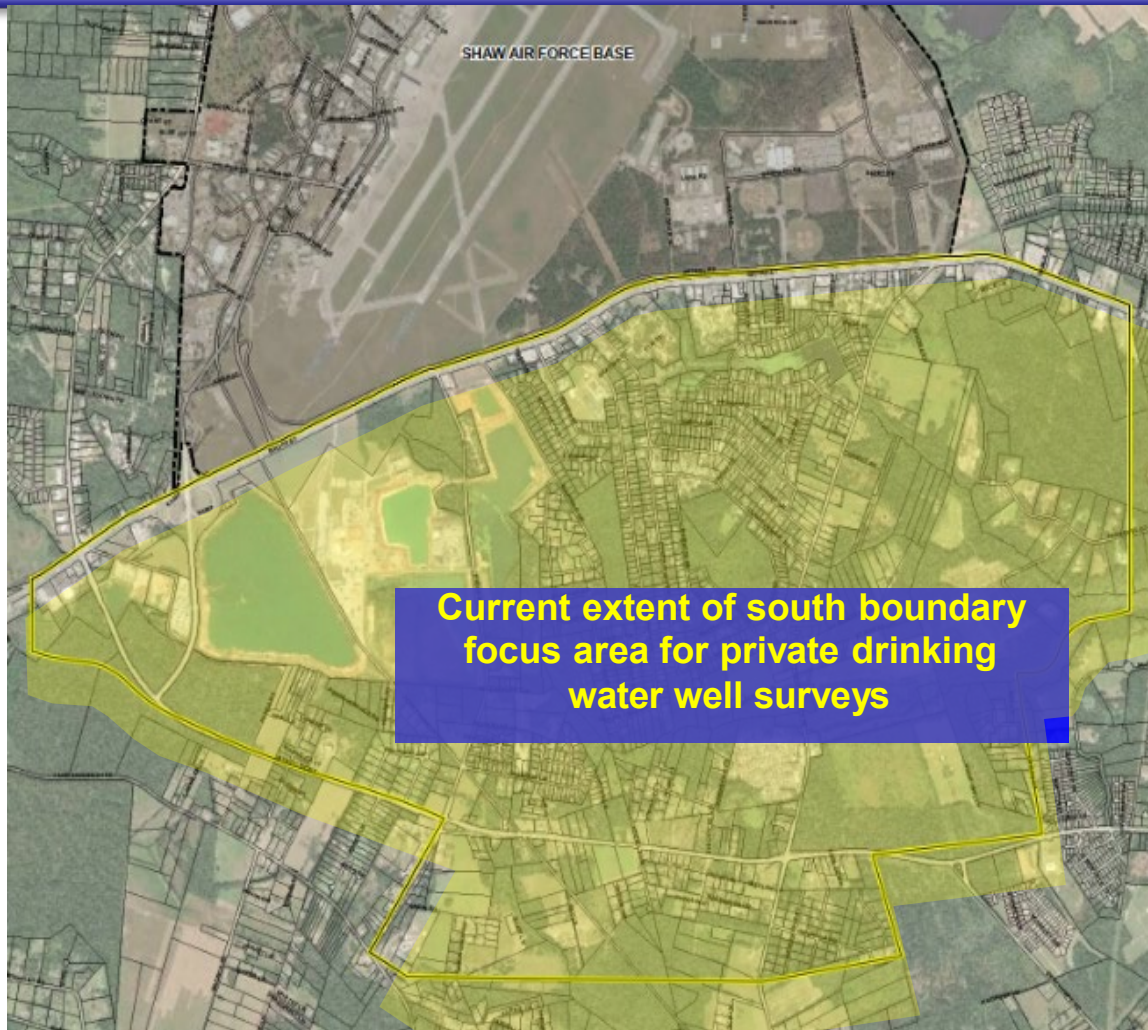
- **IDENTIFY** releases, investigate PFAS
 - Preliminary Assessment (PA)/ Site Inspection (SI)
 - Remedial Investigation (RI) (ongoing)
- **RESPOND** to PFAS in drinking water
 - Sample private wells off base
- **PREVENT** and **PROTECT**
 - Aqueous Film Forming Foam (AFFF) replacement; retrofit fire response vehicles
 - Off-Base drinking water short-term (bottled water) response transitioning to long-term response (connection to public water supply)



Battle Ready... Built Right



PFAS Off-Base Drinking Water



- Since Feb 2020, 250 Drinking Water wells sampled within the east, south, and west off-base focus areas
- 57 wells exceeded the Lifetime Health Advisory (LHA) Level of 70 parts per trillion (ppt); all are located in the **current south focus area**
- 178 residences/5 businesses on bottled water **service**
- 33 wells on quarterly/semi-annual sampling for trends analysis
- 1,120+ parcels surveyed; south/east/west of base
- 8 Mar 2023: **Conducted Open House - Public Meeting**
 - Well attended by community, stakeholders, and was covered by local press
- Currently completing administrative tasks to start field work – connect those parcels to High Hills
- Currently 20 wells are sampled quarterly and 13 wells are sampled semi-annually

PFAS Off-Base Drinking Water



- **Spring/Summer 2023 installation of long-term solution to limit exposure to PFAS**
- **Residences (including mobile home parks and businesses) on bottled water service are being offered connection to local public water service provider**
- **Locations that connect to public water service may still be able to use well water for non-consumption purposes (lawn watering, car washing, etc.)**
- **Other properties will continue to receive quarterly/semi-annual sampling to monitor trends in PFAS concentrations**

Properties within the focus area that use well water for domestic uses (such as drinking and cooking) that have not had their water tested may still request to have their water sampled and analyzed.



PFAS Off-Base Drinking Water



Community Outreach Activities

- Sent letters to residents (owners and occupants) on 27 and 28 September 2022
- Conducted informational property visits 30 November and 1 December 2022
- To date: 24 accepted, 8 declined, 3 already connected to High Hills, and 2 pending (1 verbal accept, 1 verbal decline)
- Continuing to follow-up with unresponsive locations

Next Steps

Implementation of Removal Action

- Resident account set up (ongoing)
- Install hot taps and water meters (Summer 2023)
- Connection planning site visits (late June 2023)
- Utility clearances (June-July 2023)
- Hot tap connections, including disconnecting and abandoning water supply line to existing well; tie in new location at water line; pressure and tightness testing; establish water flow, site restoration; and water sample collection (Summer 2023)
- Incidental Design and Close-out Packages (Fall 2023 - Spring 2024)



PFAS Off-Base Drinking Water



Points of Contact

- **20th Fighter Wing Public Affairs**
 - **Phone: 803-895-2019**
 - **Email: 20FWPublicAffairs@us.af.mil**
- **Juvenal Salomon, Shaw AFB Remedial Project Manager (RPM)**
 - **Phone: 803-865-9991**
 - **Email: juvenal.salomon.1@us.af.mil**
- **Scott Ross, Brice-AECOM JV1 Support Contractor**
 - **Phone: 803-201-9662**
 - **Email: scott.ross@aecom.com**



Interested in joining the RAB?

- A RAB is a forum to discuss and exchange information about Shaw AFB's environmental restoration program, identify issues of concern, and establish a direct line of communication between the Air Force, the community, and regulators.
- Reinvigorating Shaw RAB
- Accepting applications and encouraging local citizens who want to become involved with environmental Restoration activities at Shaw AFB
- Applications available at sign-in table
- Leave completed applications on sign-in table or send to 20th Fighter Wing Public Affairs Office, (803) 895-2019 or 20FWPublicAffairs@us.af.mil



Why join the RAB?

- Provide advice to the Air Force – but the RAB is NOT a decision-making body
- Bring the community's interests and concerns to the attention of the Air Force.
- Work with the Air Force to ensure investigations and cleanup plans to meet the needs of the communities involved.
- Provide feedback on important investigations, reports, and cleanup actions.
- Assist the Air Force by taking accurate information back to the communities.
- Help the local community to understand the cleanup process and encourage them to participate.



What is expected of a RAB member?

- Attend all meetings.
- Volunteers are highly encouraged to participate on the RAB for a minimum of one year.
- Provide input on environmental restoration issues in an open, honest and constructive manner to the decision makers.
- Represents and communicates community concerns to the Shaw AFB RAB.
- Act as a channel for the exchange of information between the community, Shaw AFB and SCDHEC regarding Shaw AFB's environmental restoration program.
- Review, evaluate and comment on documents and other materials related to restoration program, where applicable.
- Serves on the RAB without compensation.



Community Involvement Survey (CIP)

- CIP outlines how to keep the public informed and involved in the cleanup process
- Provides site information
- Seeks preferred ways for base officials to communicate with the public about environmental cleanup efforts
- Survey conducted every 3 years – Updated in 2022, but updating further in 2023
- Online: <https://www.surveymonkey.com/r/ShawCIP> by June 30, 2023
- See facilitator or call (210) 758-3535 by June 30, 2023, to schedule a phone interview



Public Comments

- Please keep comments brief
- Use question/comment cards as needed
- Will create Action Items and follow-up as needed



Conclusion

- Inputs from Board Members
- Action Items
- Questions? Contact Shaw AFB Public Affairs
(803) 895-2019 or 20FWPublicAffairs@us.af.mil
- Administrative Record - Official record of cleanup action
decision documents: <https://ar.afcec-cloud.af.mil/>
- Next meeting: May 20, 2024 (Tentative)



Closing Remarks/Adjourn RAB

- RAB Co-Chairs



