



Beale AFB RAB at the Air & Space Expo 2025

The Beale Air Force Base (AFB) Environmental Restoration Program (ERP) and Restoration Advisory Board (RAB) hosted a booth on June 7 and 8 at the Beale AFB Air & Space Expo 2025. Nestled in a hangar together with robots and slot cars, the explosive ordnance disposal team, and turtle shells and snake skins, and under the roar of the U.S. Air Force Thunderbirds, the ERP and RAB booth presented an array of multimedia information for attendees. Recent RAB newsletters were among the printed information available, as well as fact sheets about various aspects of the ERP, and maps showing the many active environmental cleanup sites across the Base. A slideshow with photographs of recent field activities, including groundwater sampling and well installation, played on a loop next to groundwater sampling equipment. The team also handed out snacks and cold water for those needing a respite from the heat.

The team talked to several hundred people on both days, answering thoughtful questions from young children, students, and adults from a variety of backgrounds. Popular topics of interest included the status of ongoing groundwater and soil cleanup activities, unexploded ordnance, membership in the RAB, and per-and polyfluoroalkyl substances (PFAS). Many visitors to the booth signed up for the RAB informational mailing list and expressed interest in joining the RAB. The Beale AFB ERP team thoroughly enjoyed interacting with the community during the Air & Space Expo 2025 and hopes to see some familiar faces at the upcoming meeting in November. Details about the upcoming meeting are provided at the end of this newsletter.



L: SR-71 pilot in full gear and R: Clayton Drummond (Jacobs), dressed in partial explosive ordnance disposal gear, pose together at the Air & Space Expo 2025.

Community Involvement Plan Available to the Public

The Beale AFB ERP recently updated its Community Involvement Plan (CIP), and the plan is now available to the public. CIPs are a requirement of the Comprehensive Environmental Response, Compensation, and Liability Act, otherwise known as CERCLA or Superfund. CIPs serve to solicit public participation in the decision-making process regarding remedial actions and remediation-related documents. This updated CIP will allow for continued communication between ERP and interested parties; the plan also provides ERP contacts so that the public can provide input about the cleanup program.

The previous CIP for Beale AFB ERP was completed in 2011. This 2025 updated CIP covers program changes since that time, including information about ongoing cleanup



L: Darren Rector (Beale AFB) and R: Scott Dressler (Brice Environmental) at the Beale AFB ERP and RAB booth at the Air & Space Expo 2025.

efforts across the Base, sites identified since the last update, and emerging contaminants, such as (PFAS, 1,2-dioxane, and 1,2,3-trichloropropane. The updated CIP identifies community concerns such as PFAS contaminants, drinking water and groundwater, potential health impacts, soil, and surface water and stormwater. The updated CIP describes ways the public can communicate these concerns to the ERP team. It also summarizes the purpose and operational procedures of the Beale AFB ERP RAB, requirements for RAB membership, and general RAB member responsibilities.

This CIP update was made available to RAB members for review in summer 2024 before the document was finalized in March of 2025. The latest CIP update is available online by clicking on the following link or typing the address in your web browser: www.beale.af.mil/Portals/110/CIP%20Environmental_1.pdf.

Beale Air Force Base Completes Study for Per- and Polyfluoroalkyl Substances Contamination

Beale AFB is taking action to identify tools to clean up harmful chemicals in groundwater. A treatability study was recently conducted to help identify methods for treating contamination from a class of compounds known as PFAS. PFAS are man-made chemicals known for their resistance to breaking down in the environment. For decades, the Air Force used firefighting foams containing PFAS to protect service members and equipment during emergencies. Over time, these chemicals have seeped into the groundwater at bases like Beale AFB. To address this, the Air Force conducted a treatability study to find feasible, implementable, and cost-effective technologies to remove these contaminants. The goal was to test destructive technologies that could permanently break down the PFAS molecules.

Testing Process

The treatability study involved the following two-step approach using three technologies between 2023 and 2024:

- 1. Concentration:** First, a technology called surface active foam fractionation (SAFF) was used. SAFF works by injecting air bubbles into the contaminated groundwater after pumping it to above the ground surface. PFAS are drawn to the surface of the bubbles, creating a concentrated foam. This process separates the PFAS from the water, leaving behind cleaner water and reducing the total volume that needs further treatment.

- 2. Destruction:** Second, the concentrated PFAS foam was then treated with two different destructive technologies designed to break the strong chemical bonds of PFAS:

- Hydrothermal Alkaline Treatment (HALT): This method uses high-alkalinity water at high temperatures and pressures to break down PFAS into harmless substances.
- Plasma Vortex (PV): This technology uses ionized gas, or plasma, within a vortex to break down PFAS into harmless substances.

Analysis of Results

After field testing, a technical memorandum was prepared to evaluate how well the concentration and destructive technologies performed and to compare them to proven non-destructive technologies.

The liquid effluent (the water left behind after the foam was created) from the SAFF concentration step resulted in PFAS concentrations lower than the U.S. Environmental Protection Agency's maximum contaminant levels. HALT and PV reduced PFAS concentrations in the foam; however, some PFAS concentrations still exceeded maximum contaminant levels, and SAFF, HALT, and PV struggled to remove other commingled pollutants in the groundwater, known as volatile organic compounds.

Conclusion

After comparing the results of the tested technologies to proven non-destructive methods, it was concluded that the destructive technologies may not be quite ready for full-scale implementation at Beale AFB. Instead, the most feasible, implementable, and cost-effective solution at this time is a combination of SAFF followed by ion exchange resin (IXR [not tested as part of the treatability study]). IXR uses a porous polymer material that acts like a magnet, capturing and removing PFAS molecules from water. While IXR does not destroy the chemicals, it is highly effective at removing them. This method ranked higher because it is less expensive than the emerging destructive technologies, requires less electricity, and uses readily available equipment.

The treatability study marks a significant step forward in Beale AFB's understanding of the options available to clean up its groundwater. A remedial investigation is in progress to determine the full extent of PFAS in groundwater at Beale AFB. The final report is scheduled to be completed in 2027.

The PFAS Treatability Study Technical Memorandum is provided on the Air Force Civil Engineer Center Administrative Record by clicking on the following link or typing the address into your web browser: <https://ar.cce.af.mil/>.



Extraction of groundwater by the CG044-013 Groundwater Treatment System.



Foaming in the SAFF unit.



Crane setting the SAFF unit.



HALT system setup.



PV reactor.

Environmental Information Webpage Update

Beale AFB recently updated its Environmental Information webpage. Information specific to the ERP has been added, including a section called “RAB Info,” which provides RAB information, including links to the membership application and most recent CIP. Links to the last several RAB newsletters are also included under RAB Info. A section with links to the five-year review reports from 2019 and 2024 has also been added to the webpage.

Public notices and documents that were previously available for public review and comment have their own section. The Environmental Policy and Plans section includes links to Beale AFB’s most recent environmental policy statement, the Integrated Natural Resources Management Plan, and water quality reports from 2024 and 2025.

The Beale AFB Environmental Information webpage is available by clicking on the following link or typing the address in your web browser: www.beale.af.mil/Information/Units/Environmental-Information/.

The Beale AFB CIP is available by clicking on the following link or typing the address in your web browser: www.beale.af.mil/Portals/110/CIP%20Environmental.pdf.

The membership application for the Beale AFB RAB is available by clicking on the following link or typing the address in your web browser: www.beale.af.mil/Portals/110/Beale%20RAB%20Membership%20Form%202025.pdf.

Restoration Advisory Board Meetings and Tours

You are cordially invited to attend the public meetings and tours of the Beale AFB RAB. **The next RAB meeting is scheduled for November 13, 2025**, from 6:00 to 7:00 p.m. at the One Stop Center for Business and Workforce Development, Second Floor, 1114 Yuba Street, Marysville, California. **Please stay tuned to your email for updates.**

To find out more about the RAB at Beale AFB, to be placed on the email mailing list, or to inquire about becoming a RAB member, please contact any of the following individuals:

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Environmental Cleanup Program



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2025 RAB Schedule

January <i>No RAB Events</i>	February 20 	March 	April <i>No RAB Events</i>
May 15 	June 	July CANCELLED	August
SUMMER			
September 	October <i>No RAB Events</i>	November 13 	December <i>No RAB Events</i>

