



Environmental Cleanup Program

Restoration Advisory Board Update

With 2022 on the horizon and the global COVID-19 pandemic an ongoing concern, the continuation of pandemic restrictions has meant that we have missed our usual opportunities to connect with you—the Restoration Advisory Board (RAB) members and the greater community around Beale Air Force Base (AFB). We have begun thinking about “the new normal” as it applies to our interactions with our members and the community. To reconnect and check in on how you feel about the current RAB events and how we will engage with you in the future, we recently sent out a link to an online survey and reached out to RAB members via phone for feedback.

The survey, sent in October, asked questions about membership; preferences for meeting frequency, time, date, location, and format; how you would like us to communicate with you when we cannot hold in-person meetings; and solicit general feedback. Eight RAB members and two members of the greater community responded to the survey.

Based on the majority of responses received, once we are permitted to meet in-person again, we will continue to hold three meetings per year at the One Stop Center for Business and Workforce Development, on the third Thursday of January, May, and November, at 6:00 p.m. local time (unless otherwise announced). We are tentatively planning on holding our January meeting in person, but please stay tuned to your e-mail for an official announcement. We will continue with the technical briefings and open discussion, but we may add some posters and time for more casual conversations. We will also continue to host one in-person tour annually. When we are unable to meet in person, we will publish a newsletter so that everyone can stay up to date on Environmental Restoration Program (ERP) and Military Munitions Response Program (MMRP) activities at Beale AFB.

In addition to gaining insights from the survey responses, we were also able to chat with most of our current RAB members. These conversations reiterated the need for the RAB to continue, and technological challenges related to virtual meeting attendance were discussed. We also heard that you would like routine updates on familiar sites and would like to know how factors such as drought or excessive rain, water diversion, levees, and other activities affect our environmental projects onbase.



Recent RAB tours have included live demonstrations of EOD equipment operation. Here, Staff Sargent Travis Ditmanson demonstrates operation of one of the EOD remotely operated vehicles.

We will also be ramping up our efforts to recruit new members for the RAB. We will be inquiring about the use of more print and online/social media to advertise our meetings and tours, and to advertise and distribute our newsletter.

Thank you to everyone who took the time to respond to the survey and chatted with us on the phone; your honest feedback is important to the future of the RAB. We look forward to seeing you in person as soon as we are able.

The Restoration Advisory Board Needs YOU!

The Beale AFB RAB invites YOU to be a member. Membership is open to anyone onbase and in the communities surrounding Beale AFB, and you do not need a technical background to join us.

The RAB is the community advisory group that meets regularly with U.S. Air Force and regulatory agency representatives in a public meeting format to discuss the installation’s ERP and MMRP at Beale AFB. The primary purpose of the RAB is to involve the local community in the decision-making process for cleanup actions by making information about the cleanup processes, risks, and progress

available to the public, and establishing an official forum for public participation on the project.

RAB members are expected to attend all meetings and tours, provide input on environmental restoration issues, and serve as voluntary liaisons to the community. Meetings currently include a technical briefing and time for discussion of the topics presented. Recent tours have included an inside view of the PAVE PAWS radar system, a demonstration of remotely operated vehicles used by the Beale AFB Explosive Ordnance Disposal (EOD) and Response Team, and up-close demonstrations of various sampling and remediation processes at our cleanup program sites.

If you are currently a member, please share our newsletter with a friend or colleague and bring them along to our next meeting or tour. If you are not a member but would like to join or receive more information about the RAB, please contact Darren Rector at darren.rector.2@us.af.mil for more information. We welcome you to be part of the future of the RAB.

Plume CG041-509 In Situ Chemical Oxidation Injections

Plume CG041-509 is the groundwater contaminant plume located beneath Site TU509, which is located at the Base medical clinic at 15301 Warren Shingle Boulevard, near the intersection with Camp Beale Highway. The clinic was identified as an environmental site in 1998 when soil contamination was discovered during decommissioning and removal of three diesel underground storage tanks.

In 2019, a chemical oxidant was injected into the floor of the former soil excavation at Plume CG041-509 via buried, horizontal injection pipes to treat the light nonaqueous phase liquid contamination remaining in the lower part of the soil/groundwater smear zone, and to address the rebound of total petroleum hydrocarbons as diesel (TPH-D), benzene, and naphthalene concentrations in groundwater. This process is known as in situ chemical oxidation (ISCO) injection. The horizontal injection pipes were installed in 2015 into the excavated area following excavation activities to remove contaminated soil as part of the Site TU509 remediation.

Although contamination concentrations in the Plume CG041-509 groundwater decreased following the 2019 ISCO injections, additional treatment was necessary to continue the reduction. Therefore, in August 2021, three new injection wells were installed (using an air percussion drilling method and screening them between 13 and 35 feet below ground surface), and in October, additional ISCO injections were started into the new wells and into the existing horizontal injection pipes.

Klozur CR is the oxidant being used for the ISCO injections. It is a blend of sodium persulfate and calcium peroxide. The Klozur CR oxidant is capable of rapidly oxidizing and destroying petroleum hydrocarbons and can provide extended release of oxygen for up to 1 year to promote aerobic bioremediation of dissolved-phase petroleum hydrocarbons.

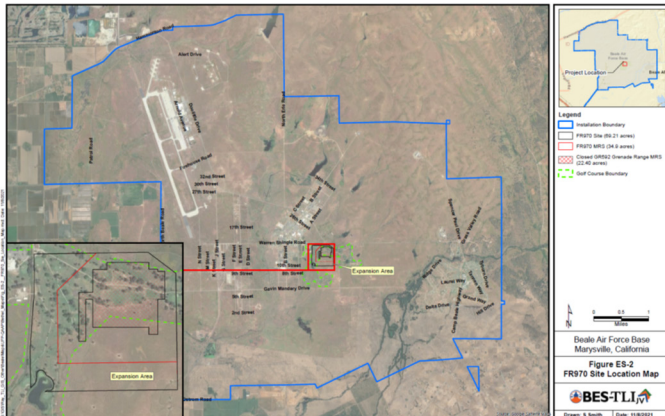
Klozur CR is shipped as a dry granular product contained in plastic 6.5-gallon pails. In order to inject the Klozur CR into the horizontal injection pipes and new injection wells, it was mechanically mixed with water. To evaluate lateral and vertical dispersal of the Klozur CR in the groundwater, dissolved oxygen (DO) and oxidation-reduction potential (ORP) were measured in injection area wells before, during, and after ISCO injections. Increases in DO concentrations and ORP at given locations are indicators that the oxidant has migrated to those locations.

The groundwater will be monitored following injections to evaluate the performance of the action. Groundwater samples will be collected and analyzed in the field for temperature, conductivity, turbidity, pH, ORP, and DO concentrations. Groundwater samples will also be analyzed in the laboratory for TPH-D, volatile organic compounds, dissolved chromium, dissolved manganese, and total dissolved solids.

Military Munitions Response Program Investigations

In 2015, an MMRP Remedial Investigation (RI) was completed to define the nature and extent of munitions and explosives of concern (MEC) and munitions constituents (MC) at 16 munitions response sites (MRSs). Based on the results of the RI, one MRS (GR592) was recommended for an Interim Removal Action. During the Interim Removal Action, a new MRS (FR970) was identified requiring investigation. Beale AFB implemented the fieldwork in support of an RI of the 34.9-acre MRS FR970 in July 2018, which continued through November 2018. The location of MRS FR970 within Beale AFB is shown on the inset below. The goal of the fieldwork was to collect sufficient data to determine the nature and extent of MEC and MC so that informed risk management decisions could be made to select appropriate future response actions.

RI fieldwork consisted of a surface sweep, digital geophysical mapping (DGM) survey, intrusive investigations of anomalies, and MC sampling and analysis. Nesting bird surveys preceded the field effort and were completed to identify any nesting bird activity that would need to be avoided.



Location of MRS FR970 at Beale AFB

A MEC item (M6A1 2.36-inch high-explosive rocket) was recovered just 3 inches below ground surface at MRS FR970, which spans the Coyote Run golf course and open grassland used for cattle grazing. The M6A1 2.36-inch rocket is a high-explosive anti-tank rocket capable of penetrating up to 5 inches of homogeneous armor. It contains a base-detonating fuze that may be extremely sensitive in the fired or unfired state. MC sampling, analysis, and risk assessment resulted in a finding of no unacceptable risk to human or ecological receptors.



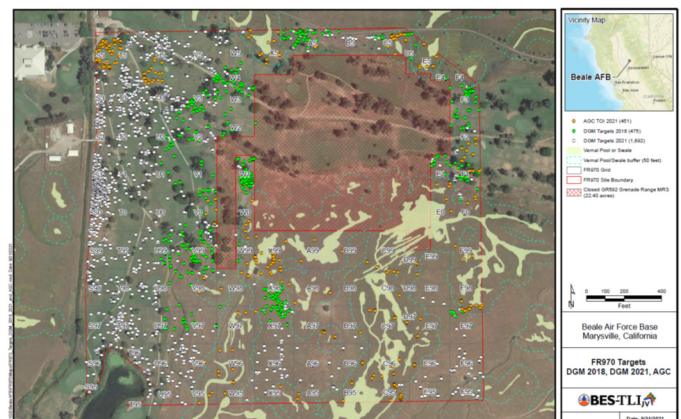
MEC (U.S. Rocket, 2.36-inch, M6A1)

Because of the imminent and substantial threat associated with the recovered MEC, the U.S. Air Force implemented a Non-Time Critical Removal Action (NTCRA). In addition, based on the location of the recovered MEC and other 2.36-inch rocket-related munitions debris, the RI recommended an expansion of the 34.9-acre MRS FR970 to include a 400-foot buffer (34.31 acres) beyond the current western and southern boundaries. An Engineering Evaluation/Cost Analysis was subsequently prepared, and the final Action Memorandum was signed in April 2021.

The NTCRA at MRS FR970 included the following primary field activities:

- Surface sweep to remove any MEC on the surface and any metallic debris that may interfere with DGM.

- Conventional grid-based DGM employing EM61 technology to map subsurface metallic anomalies and select targets representing potential MEC.
- Advanced Geophysical Classification (AGC) cued target analysis on target anomalies identified through DGM. AGC cued analysis was performed in sensitive areas, including vernal pools and swales, with the purpose of refining the information provided by EM61 to more accurately identify targets representing potential MEC. The use of AGC provides an opportunity to down-select the targets and minimize the number of anomalies requiring intrusive investigation.
- Relocation and intrusive investigation of the following (the inset map below shows the location/distribution of these targets across the site):
 - All target anomalies that were identified but not intrusively investigated during the 2018 RI
 - All target anomalies identified in the newly surveyed areas outside of vernal pools
 - That subset of cued targets potentially representing MEC within vernal pools.
- Analog geophysics employing hand-held all-metals detectors in those areas not accessible to DGM equipment.
- Detonation of any recovered MEC, and inspection and disposition of all recovered material potentially presenting an explosive hazard and non-munitions-related debris.
- MC sampling and analysis.
- Site restoration.



Location of DGM surveys and AGC targets at MRS FR970

The surface sweep resulted in the recovery of a single munitions item initially thought to be MEC but later confirmed to be an M7 practice 2.36-inch rocket not

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containing explosive material. Two MEC items (both M6, 2.36-inch rockets) and three additional M7 practice, 2.36-inch rockets were recovered during the intrusive investigation. The recovered MEC items were safely detonated within the site on the day they were recovered. Approximately 154 pounds of munitions debris were also recovered. The use of AGC within sensitive areas allowed the project team to reduce the number of digs from an initial count of 164 EM61 targets to a count of 7, significantly reducing the impact on sensitive areas. MC samples were collected at the demolition location and also at one location where the MEC recovered was breached with exposed energetic material. The results of MC sampling are pending.

The results of the NTCRA are currently being analyzed and will be reported in a site-specific final report.

Restoration Advisory Board Tours and Meetings

You are cordially invited to attend the public RAB meetings and tours. **The next RAB meeting is tentatively scheduled for January 20, 2022**, from 6:00 p.m. until 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 e-mail for updates.**

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

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Tentative 2022 RAB Schedule

January 20 No RAB Events	February No RAB Events	March No RAB Events
April No RAB Events	May 19 No RAB Events	June No RAB Events
July No RAB Events	August No RAB Events	September No RAB Events
October No RAB Events	November 10 No RAB Events	December No RAB Events

