Travis Air Force Base
Environmental Restoration Program
Restoration Advisory Board (RAB) Meeting

Meeting Minutes

20 April 2017

I. Welcome and Introduction

Mr. Duke, the Restoration Program Manager, called to order the regular meeting of the **Travis AFB RAB** at **7 pm** on **20 April 2017** in the **classroom at the Northern Solano County Association of Realtors office**. General introductions were made. Mr. Duke thanked Mr. John Dunn for sitting in for Col Lance Clark in his absence. Mr. Duke also thanked the Travis Installation Support Team Section Chief, the USACE Omaha District, the regulatory agency representatives, RAB members, and everyone else for attending. Mr. Duke introduced two new members of the Installation Support Section; Mr. Milton 'Gene' Clare who transferred from AFCEC San Antonio, TX, and Ms. Monica O'Sullivan, formerly with EPA.

Roll Call

The following RAB members were present:

Name	Affiliation	Present
Col Lance D. Clark	USAF, Travis AFB (Air Force Co-Chair)	
John 'Tom" Dunn	Suisun City Resident (Air Force Representative)	✓
David Marianno	Suisun City Resident (Community Co-Chair)	✓
Nadia Hollan Burke	U.S. Environmental Protection Agency (EPA)	✓
Adriana Constantinescu	SF Bay Regional Water Quality Control Board	✓
John Foster	Nat'l Association of Uniformed Services	✓
Mike Reagan	Travis Regional Armed Forces Committee	✓
Ben Fries	Dept. of Toxic Substances Control (DTSC)	✓
Jim Dunbar	City of Fairfield Representative	
David M. Feinstein	Principal Planner, City of Fairfield	✓
Gale Spears	Communications Director, City of Fairfield	✓
Thomas Randall	AMC Civic Leader	✓
Mark Pennington	Principal, Scandia Elementary School	
George Hicks	Dept. of Public Works City Hall	✓
W.T. Jeanpierre	American Legion	✓
Mayrene Bates	Solano County School Board Trustee, Dist. 4	✓
Debi Tavey	President, FF-SS Chamber of Commerce	
Amit Pal	PG&E Representative	

Public Members present:

- Bill Cumberland — Citizen
- Mark Smith — Citizen
- Rosemary Caraway — Citizen

Agencies and Contractors present:

- Glenn Anderson — Travis AFB AFCEC/CZOW
- Lonnie Duke — Travis AFB AFCEC/CZOW
- Milton 'Gene' Clare — Travis AFB AFCEC/CZOW
- Monika O'Sullivan — Travis AFB AFCEC/CZOW
- Angel Santiago — Travis AFB AFCEC/CZOW
- Carol Gaudette — Travis AFB AFCEC/CZOW
- Merrie Schilter-Lowe — Travis AFB AMW/PA
- Dezso Linbrunner — USACE, Omaha District
- Mike Wray — CH2M
- Doug Berwick — CH2M
- Colleen Reilly — CH2M
- Jill Dunphy — CH2M
- Jeannette Cumberland — CH2M

II. Approval of minutes from last meeting

The previous meeting minutes were approved as written.

III. Additional Agenda Items and Questions

Mr. Duke asked if there are any questions about the agenda or if anyone had any additional items not already on the agenda. He stated that there will also be an opportunity at the end of the meeting to add agenda items or ask questions.

Mr. Duke told the audience that Mr. Wray and Mr. Berwick will discuss 2016 Technology Demonstrations. Mr. Clare will discuss 2017 Construction Season Preview. And Ms. O'Sullivan will discuss Perfluorinated Compounds.

IV. Discussion Topics

a) Mr. Wray presented information on five (5) of the six (6) environmental construction projects that were conducted in the summer of 2016.

The following five construction projects were completed last summer:

1) Injection of emulsified vegetable oil (EVO), and specialized bacteria to conduct a technology demonstration.
2) Two site investigations to determine the extent of soil contamination.
3) Three sites achieved regulatory closure last year. The final step to closure is to remove all the wells and remediation infrastructure.
4) Installed "recycled drywall bioreactor" to anaerobically treat a fuel plume. This project is also a technology demonstration.
5) Installed a "washboard bioreactor" to aerobically treat a Stoddard Solvent plume. This project is also a technology demonstration, designed to compare results with the drywall bioreactor.
6) Attempted to close 12 inactive oil-water separators.

Technology Demonstration at Sites ST027B and SD036. EVO verses EVO plus Bioaugmentation:

This technology demonstration is designed to compare emulsified vegetable oil (EVO) verses EVO plus bioaugmentation. Bioaugmentation consists of the addition of specialized bacteria that break down contaminants in the groundwater.

- Site ST027B has a small TCE plume located near the runway.
- The demonstration involved two different parts of this site; one part was injected with just EVO, and the other part was injected with EVO plus bacteria.
- We also conducted a similar study at site SD036. Both studies allow us to collect and compare as much data as possible for a complete evaluation of bioaugmentation technology.
- Prior to the injection of bioaugmentation culture, the EVO is injected to create anaerobic conditions in the groundwater. Nitrogen gas is used to maintain anaerobic conditions in the well casing while injecting the bacteria culture.

Soil Investigations at Sites SS016 and SD031:

- The investigations are designed to determine the extent of the soil contamination.
- Once an area is cleared for utilities, and the dig permit has been approved, we begin the soil boring by using a hand-auger to dig 5 feet. This is in the exact location where drilling continues using a drill rig (another added precaution to avoid any underground utilities or buried pipes).

- Last year we were required to have a California Tiger Salamander (CTS) barrier around our work sites. We used 12-inch bio wattles wrapped in burlap placed around a drill rig to protect CTS from falling into a borehole.
- Once drilling begins, geologists examine the continuous cores to analyze and describe soil attributes and perform simple tests to check for contaminant vapors. All this information is recorded on soil boring logs.

Ms. Bates asked if special personal protective equipment (PPE) is needed. Mr. Wray said yes, we use level D PPE; such as hardhats, safety glasses, gloves, steel toed boots, and traffic safety vests. He added that we always check air quality using air monitoring equipment.

Well Decommissioning and Site Closure at Sites CG508, ST028, and ST032:

Last year we obtained site closure from the regulators at three (3) different sites; CG508, ST028, and ST032.

- The final step following regulatory approval of site closure is to remove the wells and any remaining remediation infrastructure (i.e., piping, treatment equipment).
- Wells are removed by a decommissioning process of drilling out the upper part of the well casing, and pressure grouting the well up to the ground surface. The grout provides a seal that prevents surface water from infiltrating local groundwater.
- After the well is filled with grout, the concrete well collar is removed, and the ground surface is restored to the surrounding conditions.

Protecting wildlife at Travis is a priority: at site CG508 a nest of burrowing owls was observed near the work site. We had a full-time biologist monitoring the situation while conducting the field work to make sure the owls were not injured or stressed.

Site SS014 Drywall Bioreactor Installation:

At site SS014, there is fuel contamination in soil and groundwater from leaks associated with a fuel tank farm and distribution facility. With the fuel source area and plume being well known, we wanted to demonstrate a new technology of sulfate reduction to anaerobically treat petroleum hydrocarbons.

- We developed a technology demonstration to utilize recycled drywall as a sulfate source. Drywall is also known as sheetrock.
- Two extraction wells extract contaminated groundwater from the toe of the plume and push it through the bioreactor. This sets up a recirculation cell with

primary treatment occurring in the bioreactor. The entire system is powered by solar panels.

- The bioreactor is backfilled with 87 percent pea gravel, 10 percent crushed gypsum drywall, 2 percent wheat straw, and 1 percent iron pyrite gravel. These components form the guts of the bioreactor.
- We used perforated pipe to distribute the recirculated groundwater evenly through the bioreactor. Note: as a general policy, when we are building bioreactors we install spare piping in case the primary pipes become clogged.
- Once the gravel mixture is backfilled and distribution piping placed on top of the gravel, we lay a sheet of filter fabric over the top to keep the overlying soil from infiltrating down into the gravel.

Ms. Bates asked where we purchase the materials. Mr. Wray answered that we try and use local businesses as much as possible. The drywall was purchased locally, and the EVO came from Wisconsin via rail.

Site SD034 Washboard Bioreactor Installation:

At Site SD034 we implemented a “sister” technology demonstration to treat a Stoddard solvent plume. Stoddard solvent is a petroleum based solvent that was used to clean engine parts.

- The Stoddard solvent plume is partially underneath hangar 811. One of the design parameters was to treat the portion of the plume that’s under the hangar.
- Instead of one big bioreactor we had to design this one as a series of trenches, arranged perpendicular to the hangar. This approach ensured the walls of the hangar would not be compromised during the excavation.
- This bioreactor works aerobically to degrade the Stoddard solvent. The results of this technology demonstration will be compared to the drywall bioreactor to determine if one technology works better than the other.
- An oxygen gas infusion technology was installed in the extraction wells. The oxygen infusion device (called an iSOC) contains over 700 hydrophobic microporous hollow fibers that supersaturate groundwater with dissolved oxygen (DO). The iSOC does not require electricity and has no moving parts, the oxygen is pushed through these devices by the pressure in the oxygen tanks.
- The washboard effect is induced by pumping from one side of the bioreactor for a while and then pumping from the other side. Oxygen is pushed out into the

formation on the opposite side of the bioreactor. The pumped groundwater is recirculated through the bioreactor.

- One complication we ran into is an inordinate concentration of buried utilities in the small work area of this site. There was also an existing oil-water separator and an above-ground storage tank at the site. We brought in a Hydrovac to expose the buried utilities. Because of the small work area, we wanted to see exactly where the pipes were located. The Hydrovac incorporates a combination of high-pressure water, and vacuum, combined in one self-contained mobile excavation unit. Once the utilities were exposed, we had to adjust where each of the bioreactor trenches could be placed.
- Each bioreactor trench had to be backfilled with a precise mixture of gravel, calcium peroxide (another source of oxygen), and vitamins and nutrients to feed the bacteria.
- A small shed was erected to house oxygen tanks that push the oxygen into the bioreactor trenches.

Mr. Reagan asked if Travis AFB is sharing technologies. Mr. Wray said yes, information is shared at the Battelle Conference, in the Remediation Journal, and will be presented to the Army Corp of Engineers in Omaha in May 2017.

Mr. Berwick presented information on the closure of oil water separators (OWS).

The Leaking Underground Storage Tank (LUST) guidance manual states that there are two acceptable ways to close an OWS: 1) Remove the OWS by digging it out and excavating any surrounding contaminated soil, or 2) Close in place by backfilling with concrete or clean soil.

CH2M closely coordinated the closure of 12 OWSs with Travis AFB. They determined the most efficient closure process and safest plan with minimal disturbance to surrounding areas.

Three scenarios were considered when discussing whether to close in-place or remove:

- OWS close to a building: probably close in-place.
- OWS closure that requires soil excavation and removal of infrastructure.
- OWS located in a nest of utilities, better to close in-place to avoid damage to buried utilities.
- In all cases, confirmation soil samples were collected to confirm if there were any leaks in the OWSs. We collected soil samples from the center bottom and the four sidewalls of each OWS.

- OW050 and OW051 were previously removed. Confirmation soil samples were collected to substantiate any possible remaining contamination.

The following presents the key activities with each of the 12 OWS closures

OW040 Former MAC wash rack.

- Initial confirmation soil samples confirmed that contamination was present in the surrounding soil.
- We removed the OWS so we would have room to work in the excavation footprint, which was about the size of a small swimming pool, and approximately six (6) feet deep.
- Clean soil was brought in to backfill the excavation, and then it was capped with asphalt to blend with the surrounding pavement.

OW047 Former SAC wash rack, OW048 near air freight terminal, and OW049 near former sewage treatment plant.

- These three OWSs are discussed together due to their similarities in size, piping, and other supporting infrastructure. The size of the OWS are also the size of a small swimming pool, and approximately eight (8) feet deep. The decision was made to close these three (3) OWSs in-place.
- When working inside the OWS structures, a tripod was set up with a safety harness connected to the operator to allow for quick removal of the employee in the event of an emergency. A ladder was always in place. Fresh air was pumped into the OWS when people were present. An air quality monitor was also used while the work was being conducted.
- Once all the piping, valves, and other components in the OWS had been removed, all that was left were the concrete floors and side walls.
- The concrete floor and side walls were pressure washed. We employed a Marine Chemist to verify and certify that the OWS had been cleaned adequately.
- When cleaning was completed, holes were drilled in the concrete floor for drainage after closure.
- Confirmation soil samples were then collected and confirmed clean before moving forward. The top 3 or 4 feet of the sidewalls were broken into small fragments and placed inside the cavity. The OWSs were backfilled with clean soil, followed by seeding the ground surface with an approved native grass seed.

OW052 East of Hangar 810.

- This OWS was mostly above ground, and extended underground by a couple of feet.
- The plan was to remove this OWS, because the collection and analysis of confirmation samples identified contamination in the surrounding soil.
- After removal of the OWS, compaction testing was conducted on the clean backfill to measure soil density. The area was then covered with asphalt to blend with the rest of the parking area.

Mr. Foster asked the reason for using asphalt verses concrete. Mr. Berwick said we followed base guidelines and matched the existing surroundings.

OW053 Hangar 818 North, and OW054 Hangar 818 South.

- These two (2) OWSs are located at the northwest and southwest corners of Hangar 818. These OWSs are relatively small and were constructed entirely underground.
- The OWSs were built right up against the hanger sidewall, which is a classic example of closure-in-place. There are also a lot of utilities in the area. The Air Force indicated that these OWSs should be closed-in-place.
- All piping that carried liquid from the building into the OWS was plugged with grout. Then the OWS cavity was backfilled with concrete.

OW055 East of Hangar 14.

- This OWS was constructed entirely underground and relatively large.
- There were several access ports in the overlying sidewalk that were accessible through manhole covers.
- This OWS was located approximately 10 feet away from the hangar building. The base didn’t want a huge excavation ditch in this area. Therefore, close-in-place was selected.
- The only thing left to do after the 2016 construction season ended was cosmetic; remove the manhole covers and repave the sidewalk area that was disturbed.

Mr. Linbrunner mentioned that the person going into the confined space needs a lot of training (how to use supplied air, etc.). And, the person at the ground surface watching the person in the confined space also needs special training and certification.

OW056 Southwest of Building 18.

- This OWS was located close to an unoccupied storage structure. This OWS did have contamination in the soil surrounding the OWS. Therefore, this OWS is planned for removal and soil excavation in the summer of 2017.

OW057 West of Hangar 810.

- This OWS was a challenge as it was the closest OWS to a building that we had to work with.
- This OWS was removed by others a year ago but there was some rubble left in the ground. Contaminated soil was detected at this site. The former OWS was about 8 to 10 feet deep.
- Due to the OWS's close proximity to the building, and the contamination present in the soil, the entire area was excavated. Building experts were called in to ensure the excavation did not compromise the structure. Following excavation of the rubble and contaminated soil, the area was backfilled with clean compacted soil. Then it was paved with asphalt to match the surrounding parking area.

OW050 will be completed in the summer of 2017.

Mr. Foster asked how many in-use OWSs are left on base. Mr. Duke said probably about 20 or 25.

Mr. Foster said that he would be remiss if he didn't mention the October 2016 RAB tour. He saw a lot of these sites during the tour. It was one of the best RAB tours experiences he's had. Mr. Foster thanked Mr. Duke, Mr. Anderson, and Mr. Wray.

Mr. Clare Presented the 2017 Construction Season Preview.

Mr. Clare said the 2017 won't be as robust as 2016. However, so far we currently have about 30 dig permits in process in anticipation of the 2017 field work.

- Collect soil samples at sites: SD033, OW050, SD031, and FT004. To delineate contaminant boundaries.
- Install wells at Sites SD031 (soil borings to delineate plume boundary), SD036 (injections wells), DP039 (down-gradient monitoring wells) and SS015 (injection wells).
- Replace sidewalk at OW055.
- Remove OWS and impacted soil at OW056.
- Soil excavation at the former skeet range Site TS060. The contaminants at this site are lead and polynuclear aromatic hydrocarbons (PAHs).
- Inject EVO at Sites SS015, SD036, FT004 and SD031.

- Redevelop wells at Sites ST018, SS029 and FT005. This is considered routine maintenance.
- Aquifer testing at Sites SS030, FT005, LF006, SD031 and TA500.
- Potential background soil study at 27 locations to conduct soil analyses for thallium and hexavalent chromium.
- Possible installation of additional bioreactor trench at Site SD034.
- Excavate soil at Sites SD043 and SS046, after conducting a risk assessment first.

Ms. O'Sullivan presented information on the Perfluorinated Compounds program.

Perfluorinated compounds represent a new emerging contaminant class. An emerging contaminant is a perceived, potential, or real threat to human health and the environment, often characterized by a lack of published health standards.

- Perfluorinated compounds are known for their non-stick, anti-greasing properties, found in products we use every day: non-stick pots and pans, fabric softener, textiles, write in rain paper, to name a few.
- Perfluorinated compounds are a man-made chemical used in various commercial and industrial products: Aqueous film forming foam (AFFF), which is a fire-fighting foam used to extinguish fuel fires.
- Perfluorooctane sulfonate/Perfluorooctanoic acid (PFOS/PFOA). In 2016 EPA established a preliminary health advisory level in drinking water of 70 parts per trillion.
- In the early 2000's this product began being phased out by major manufacturers due to EPAs findings.
- In 2012 the Air Force provided guidance on the use of PFCs.
- In 2015 a preliminary assessment (PA) was conducted to determine if there were AFFF releases on base at Travis AFB. The PA consisted of record reviews, document reviews, a desk top audit, and employee interviews.
- In 2016 AFFF was replaced with high expansion foam at hangars (PFOS/PFOA-free).
- 2017 Next Steps: Conduct the site inspection (SI) this summer. The goal is to confirm the presence or absence of PFOS/PFOA from AFFF releases.
- Sample collection will be conducted during the 2017 field season. In each location four (4) soil and/or groundwater samples will be collected.

Ms. O'Sullivan provided a map with the proposed sample locations.

V. Cleanup Program Status

Mr. Duke announced that Travis AFB won the General Thomas D. White Award for Environmental Restoration.

The selection process for the General Thomas D. White Award: Air Force award winners are selected by a panel consisting of members from AFCEC, CE Directorate Staff, and a MAJCOM. The panel reviews all the packages and selects a winner and runner up for each category. Prior to centralization, each MAJCOM selected winners and runner ups who then competed for best in Air Force.

- Travis AFB track record: Travis AFB restoration program won for Air Mobility Command for 2001.
- Runner up for Air Force level for 2001.
- Won again for AMC for 2009.
- Best in Air Force for 2016!

SecDef Level Award:
As the Best Restoration Program in Air Force, we are now competing with other Department of Defense Agencies for the Secretary of Defense Environmental Award. The SecDef winners will be officially announced on 22 April, Earth Day.
Mr. Duke said "I believe we have a strong package put together that is very competitive."

Ms. Schilter-Lowe interrupted Mr. Duke to make the following announcement: "It was recently announced that CE Environmental won the Secretary of Defense Environmental Award." Mr. Linbrunner elaborated on how impressive this follow-on award is, because it is presented to the best program in the Air Force, Army, Navy, Coast Guard, and every other organization under the Department of Defense.

Mr. Duke said in order to compete the installation must:

- Have an environmental management system.
- Provide current data for a report to Congress.
- Not have open enforcement actions.
- Have a good record of environmental stewardship.

The third bullet did provide some challenges, because there was a base discrepancy that was still open in the EPA database, even though it had been addressed and should have been closed. CE had to request that this incident be closed to allow Travis AFB to be considered for the award. Mr. Duke wanted it known that the still-open incident was an oversight.

The Travis IST, which supports both Travis and Beale AFBs, sets the bar high.
Beale AFB was awarded the General Thomas D. White award for the best restoration program for 2015.
Beale AFB was awarded the Secretary of Defense Environmental Award for best in DoD for 2015.

VI. Regulatory Agency Reports

Ms. Constantinescu introduced herself as an engineering geologist with San Francisco Bay Water Board which oversees cleanup of groundwater plumes.

Ms. Constantinescu presented an update on drought information and actions; Update on petroleum only contamination sites also known as POCO sites; and GeoTracker, the State of California data management system.

Drought update:

Ms. Constantinescu presented a picture of Lake Shasta in 2015 (peak of drought) and in March 2017 when Shasta Dam makes history as water flows from the top gates for the first time in 20 years.

Governor Brown announced that the drought emergency is over, however, there is another drought right around the corner. Conservation must remain a way of life.

OWS status:

Ms. Constantinescu discussed OW040 as an example on how the proposed remedial action was selected, and how the Water Board and Travis AFB work together to reach an agreement on closure. A preliminary investigation on OW040 began in 1995, then again in 2011 and 2015. The data collected provided information needed to determine how to close this OWS.

Geotracker:

Ms. Constantinescu said she kept this as a topic to remind everyone this tool is available and to provide information on recent changes. One of the main regulatory tools we use is GeoTracker, (the state environmental management database) to which the public has access. GeoTracker is a data management system used for managing sites that impact groundwater, especially those that require groundwater cleanup, as well as permitted activities, such as operating underground storage tanks and land disposal sites. By accessing this database you can check to see if there is an immediate and potential threat to the public from leaking underground fuel tanks, and the progress made in the cleanup actions.

The new addition to Geotracker is public access to the list of the actual locations of public water system production groundwater wells. The website is https://geotracker.waterboards.ca.gov and email address WB.GAMA@waterboards.ca.gov.

Mr. Reagan asked if Geotracker listed monitoring wells. Ms. Constantinescu said yes, you can obtain water quality data on monitoring wells.

Ms. Burke/EPA said she wanted to thank the Air Force and the Installation team for doing such a great job and winning the award, "they deserve this award". Ms. Burke also mentioned that she works with Ms. Constantinescu who not only oversees the POCO sites, she also oversees CERCLA sites.

Mr. Fries/DTSC of the California Department of Toxic Substances Control did not have any comments.

VII. Focus Group Reports

Mr. Duke thanked the technical focus group for their continued support in reviewing the current list of documents, including: POCO Closure Report for OW051, OW053, and OW054, ST028 Well Decommissioning and Closure, DP039 Remedial Action Construction Completion Report, and the Community Involvement Plan.

VIII. RAB/Public Questions

Mr. Marianno said as a charter member of the community of the RAB he wanted to thank Mr. Smith, Mr. Duke. Mr. Anderson, Mr. Wray and "I'll even a take a little credit myself".

IX. Set Date and Place for Next RAB Meeting

The next RAB Meeting is scheduled for **19 April 2018** at the office of the Northern Solano County Association of Realtors in Fairfield.

X. Adjournment

Mr. Duke adjourned the meeting at **9:18 pm**.

Minutes submitted by: Jeannette Cumberland, CH2M

Minutes approved by: The Travis AFB RAB members on 19 April 2018