

**FORMER NAVAL AIR STATION MOFFETT FIELD
RESTORATION ADVISORY BOARD MEETING
OCTOBER 18, 2018**

NOTE: An acronym list is on the last page.

Subject: RESTORATION ADVISORY BOARD MEETING SUMMARY

The Restoration Advisory Board (RAB) meeting for Former Naval Air Station (NAS) Moffett Field was held on Thursday, October 18, 2018, at the Performing Arts Center in Mountain View, California.

Community RAB Members in attendance:

Bill Berry, Gabriel Diaconescu, Rebecca Kohn, Diane Minasian, Bob Moss, Dan Wallace, and Greg Unangst,

Regulatory Agency and Navy RAB Members in attendance:

Jim Callian (U.S. Department of the Navy Base Realignment and Closure [BRAC] Program Management Office West [Navy]), Alana Lee (U.S. Environmental Protection Agency [EPA]), and Elizabeth Wells (San Francisco Bay Regional Water Quality Control Board [Regional Water Board]).

Other U.S. Department of the Navy (Navy), Regulatory Agency, National Aeronautics and Space Administration (NASA), Planetary Ventures (PV), City, and Consultant Representatives in attendance:

Don Chuck (NASA), Carolyn Hunter (Navy Community Outreach), Beth Kercher (Navy Community Outreach), Anthony LaMarca (PV), Jackie Lane (EPA), Lisa Matichak (City of Mountain View Vice Mayor), Russ Melton (City of Sunnyvale City Council), Brandon Mills (Navy), Garrett Turner (NASA), Luis Rivero (NOREAS Inc.), Dana Walker (Navy Community Outreach), Lauren Wibe (NASA), and Emina Zanicic (NASA).

Other Community Members and Agency Representatives in attendance:

Chuqiao Dong, David Eller, Jan Pfultz, M.T. Skoog, Peter Yee.

WELCOME

Jim Callian (Navy RAB Co-chair) opened the meeting at 7:00 p.m. and welcomed everyone in attendance. Mr. Callian introduced himself as the new Navy BRAC Environmental Coordinator (BEC) for Former NAS Moffett Field. Mr. Callian reviewed the agenda for the meeting. Mr. Callian stated that the focus of the RAB meeting will be on the Navy's environmental program only. Updates for other programs will need to be completed at another time.

Navy Update

Document Sign-Up Sheet

Mr. Callian noted passage among meeting participants of a document tracking sheet, and suggested that RAB members interested in receiving the following documents sign up:

DOCUMENT

1.	Site 26 2016 Annual Groundwater Monitoring Report
2.	Site 26 Remedial Design Remedial Action Work Plan
3.	Hangars 2 and 3 Site Investigation Work plan
4.	Site 28 2018 Vapor Intrusion Tier Response Evaluation
5.	Site 28 Vapor Intrusion Remedial Design Remedial Action Work Plan
6.	Site 28 Traffic Island Treatability Study Technical Memorandum
7.	Site 14 South 2016 and 2017 Annual Report

Mr. Callian (Navy) announced settlement of penalties under the Federal Facility Agreement (FFA) for the Westside Aquifers Treatment System (WATS), in the following words:

“As many of you may have been following, the operator of WATS passed away in 2016 and some monitoring data were unrecoverable. We have worked with EPA/WB and settled on a penalty under the Federal Facility Agreement of \$436,250. The WATS system is now with NASA and it is good to close out this issue.”

RAB COMMUNITY PRESENTATION – 2018 MEETING REVIEW

Greg Unangst (Community RAB Co-chair) went over a list of community outreach meetings in 2018 that are relevant to the RAB.

On March 16, 2018, Rebecca Kohn (RAB member) and Mr. Unangst met with Deb Feng, the Deputy Associate Center Director at NASA Ames. They discussed the future of the RAB given that the Navy’s activity on the base is declining, and activities of other parties are rapidly increasing. Questions were raised as to how to adjust the future of the RAB to this reality. Overall it was a productive meeting—the primary issue is determining if NASA has enough resources to support separate meetings.

In a teleconference with Army representatives on June 12, 2018 Mr. Unangst discussed the RAB status and possible pathways into the future as the Navy continues to curtail its activities at former NAS Moffett Field. On the call was Christine Ploschke, (Army Senior Environmental Advisor at Moffett Field/Reserve Installation Management Directorate at Fort Belvoir in Virginia), Colonel Victor Green (Public Works, 63rd Army RSC), Clayton Dayoc (Army Installation Management Command) and Teresa Barlow (Army Reserve Command Contractor). The conversation centered on the Army's Enhanced Use Lease Project of 30 acres near the 63rd RSC and the need for public involvement. The project is being managed and controlled from the east coast. The initial response was that since there was no active clean up

required or needed on the Army property on Moffett Field, there was no requirement to participate in the RAB. Mr. Unangst pushed back on that assertion and pointed out that hasn't been fully decided by the EPA. After further discussion, there was some agreement that better avenues of communications were needed to relay the Army's plans and activities on former NAS Moffett Field to the public. They promised to get the appropriate Army Public Affairs representative to contact the RAB.

On June 12, 2018, Mr. Unangst participated in a conference call with the U.S. Department of the Army (Army) Colonel Green (Army Director of Public Works) to discuss their projects at Former NAS Moffett Field in relation to the future of the RAB. Colonel Green provided an update on the enhanced use of the leased 30 acres near the Army 63rd Reserve Support Command at Former NAS Moffett Field. The Army's 63rd Reserve Support Command is looking to enhance their use of the 30 acres of leased land at Former NAS Moffett Field, which is controlled/directed by an office on the east coast and not locally.

On June 29, 2018, Mr. Unangst shared a call with Branden Clemens, Project Manager for Wescoat Village. Wescoat Village is a housing development at Former NAS Moffett Field with 190 units of housing. Initially the Project Manager had been enthusiastic about conducting outreach meetings to tenants, but over time had decided the best avenue would be to direct them to participate in future RAB meetings.

Mr. Unangst also met with Anthony LaMarca and Kevin Antonelli (PV) in July 2018. The RAB has support from PV for future community outreach needs. Mr. Unangst said that the next step for the RAB is to meet with EPA, the Regional Water Board, and Anna Eshoo's representatives to help determine the path forward for community outreach.

RAB member Bill Berry asked about an update on the post-2000 housing units on Former NAS Moffett Field. Don Chuck said that a developer has been selected and the lease is under negotiation. Once the developer is on board and the lease is negotiated, more information will be available.

SITE 26 HANGARS 2 AND 3 INVESTIGATION

Mr. Mills introduced himself as a Navy Remedial Project Manager (RPM) for Site 26. He first provided an overview of the history of Site 26. In 2014, an amendment to the Record of Decision (ROD) specified implementation of new remedy consisting of *in situ* biostimulation/bioaugmentation, monitored natural attenuation (MNA), and institutional controls. Mr. Mills stated the implementation of the *in situ* remedy will enhance degradation of the Volatile Organic Compounds (VOCs) in groundwater, which is more effective than the East-side Aquifer Treatment System (EATS) groundwater pump-and-treat system that was implemented in accordance with the 1996 ROD, and will reduce the timeframe to achieve the cleanup goal at IR Site 26.

In 2017, the Navy finalized the Pre-Design Technical Memorandum, which targeted three (3) specific treatment areas within Site 26, to inject reagent materials into the Upper A-Aquifer to enhance biodegradation of VOCs. A Remedial Action/Remedial Design (RD/RA) Work Plan to implement the new remedy has been approved by the regulatory agencies, and the Navy plans to begin mobilizing to the field in November 2018. Upon completion of the RA, follow-on performance monitoring will be conducted to demonstrate that the remedy is operating properly

and successfully. The Navy will then get agreement from the EPA and Regional Water Board and move into Long Term Monitoring (LTM) of the remaining plume at Site 26.

Mr. Mills presented a boundary map of Site 26 displaying the three treatment areas to undergo *in situ* injection and monitoring. Area's B1 and B2 are associated with former waste water holding ponds near the center of Site 26. Treatment Area A is associated with former Underground Storage Tank (UST) 43. It is south of Treatment Areas B1 and B2 and adjacent to the northeast corner of Hangar 3.

Next Mr. Mills displayed a map showing the lateral extent of the plume. He stated that the mapped contaminants of concern (COCs) are tetrachloroethene (PCE), trichloroethene (TCE), dichloroethene (DCE), and vinyl chloride (VC). He mentioned in the following slide that the Navy will implement the LTM plan following the RA, which will regularly monitor the VOC concentrations and natural attenuation of the Site 26 plume.

- Mr. Mills noted that Planetary Ventures (PV) decided that it would redevelop Hangars 2 and 3 at Site 26. PV had conducted sub-slab soil gas sampling in 2013 to determine if Vapor Intrusion (VI) could be an issue within the Hangars following redevelopment. The results of the sub-slab investigation identified some elevated concentrations or “hot spots” beneath the foundations of Hangars 2 and 3, and determined further investigation would be warranted to identify potential sources of VOCs within and beneath the Hangars. Based on regulatory agency input, the Navy is planning to collect (1) soil gas samples from the vadose zone (unsaturated soil) beneath the subsurface zone that previously had been sampled, and (2) shallow groundwater samples beneath the Hangars’ foundations. An initial draft work plan was submitted earlier this year; after follow-on technical meetings with the regulatory agencies, Navy has begun revising the supplemental work plan to improve the investigation strategy—installation of soil gas probes into the vadose zone around and beneath Hangars 2 and 3, as well as collection of groundwater samples. An on-site mobile lab will be used to analyze data in real-time identifying additional soil gas and groundwater monitoring locations, as needed, allowing the Navy to fully characterize the Hangars’ 2 and 3 footprint in a single mobilization. RAB member Bob Moss noted the long period of time needed to characterize this groundwater plume. He asked if the Navy has a projected date when it can better delineate the plume and identify locations of monitoring remediation wells. Mr. Mills responded that once the work plan is in place, the Navy will be able to work with the regulatory agencies and with the on-site mobile lab to acquire real-time data, which will speed the process and address the issue as accurately as possible.
- RAB member Gabriel Diaconescu asked if Mr. Mills was aware of the phytoremediation proceeding on base under Dr. Freeman, and whether that would be applicable to Site 26. Mr. Mills stated that he had seen John Freeman’s (Intrinsyx/NASA) presentation at the November 2017 RAB meeting regarding use of poplar trees for phytoremediation; however, he noted that because the wells are close to Hangars 2 and 3, and to a runway, phytoremediation is not feasible. The Navy has had success conducting in-situ treatment at Site 26.
- Mr. Berry asked Mr. Mills for an update on the structural integrity of Hangars 2 and 3. Mr. Mills said that the Navy does not have additional information in that regard, but is looking into the issue.

- A community member asked if Hangars 2 and 3 will be demolished. NASA representative Don Chuck said that PV plans to renovate Hangars 2 and 3 for future use.

SITE 28 TRAFFIC ISLAND UPDATE:

Mr. Mills next presented an update of Site 28 Traffic Island Area. The Navy conducted a treatability study in 2015 and 2016 involving *in situ* injections from 30 to 120 feet below ground surface. The study was effective in reducing concentrations of dissolved chlorinated ethenes (CE) to more than 90 percent of the September 2015 baseline concentrations within the study area. However, unsatisfactory results after performance monitoring were evident in two areas:

- Well 28SI-16, screened within the Upper A-Aquifer at the southwest corner of Traffic Island, was found to contain 120,000 micrograms per liter ($\mu\text{g/L}$) of PCE when last sampled in October 2016. Elevated concentrations of VOCs also persist in shallow soils near Well 28SI-16.
- Well 28SI-06, screened in the Lower A/B2-Aquifer, did not show immediate dechlorination, yielding 9,400 $\mu\text{g/L}$ of PCE when sampled in October 2016. Results from this well have improved, although PCE concentrations there remain above the cleanup level. Moreover, the vertical extent of VOC impacts at Well 26SI-06 remains undefined.

Mr. Mills said that the Navy will implement the ROD through source reduction and hydraulic containment via extraction wells. The Navy is developing the work plan and obtaining agency concurrence. The idea is to treat the vadose zone and the Upper A-Aquifer, and complete a source reduction via limited soil excavation to remove the old material and replace it with new, clean material. Following that excavation, the Navy will install an extraction well to further reduce the source and enhance hydraulic containment within the Upper A-Aquifer.

In the Lower A and B2-Aquifers, the Navy plans to install an extraction well in the lower A-Aquifer for source reduction and control of downward vertical migration of contaminants into the B-Aquifer. Alternatively, the Navy may screen the extraction well in the B-Aquifer to achieve the same goal. Mr. Mills said that the Navy will delineate the vertical extent of contaminants by installing a monitoring well into the C-Aquifer.

Mr. Mills presented a visual representation of the proposed shallow soil excavation in the vicinity of Well 28SI16 to achieve source removal from the vadose zone and Upper A-Aquifer soils; the proposed extraction well locations in the Upper A- and B-Aquifers; and the proposed C-Aquifer groundwater monitoring well location to achieve vertical delineation. Once these wells are in place, the Navy plans to pretreat water if needed, and then send the pretreated water to the existing WATS.

OVERVIEW OF SITE 28 VI TIERING REPORT

Luis Rivero (NOREAS, Inc.), on behalf of the Navy, presented an overview of the Draft 2018 Sampling and Vapor Intrusion Tier Response Evaluation Report for Installation Restoration (IR) Site 28. He stated that the VI Tiering Report had been submitted in late August 2018 for regulatory agency review. Mr. Rivero then laid out the agenda for his VI tiering presentation, which would include IR Site 28 background, overview of indoor air cleanup levels from EPA based on the 2010 Amendment to the Middlefield Ellis Whisman (MEW) ROD that includes IR Site 28, previous sampling events, and a discussion on the methodology and results from 2018

air sampling events. To conclude, he would present plans for future activities at IR Site 28 and respond to questions.

Mr. Rivero stated that the Navy's area of responsibility encompasses 23 different buildings, some in NASA's vicinity and some outside of it. Because groundwater is not far below ground surface at former NAS Moffett Field, PCE and TCE have been detected in some crawl spaces and above some cracks in concrete floors.

- In January 2018, results of a base-wide investigation of all 23 buildings led to agreement between EPA and the Navy regarding the collection of additional confirmation samples in some of the buildings. The confirmation sampling was conducted in February 2018.
- In June 2018, Electron Capture Detectors (ECDs) were used to acquire data in real time, allowing better definition of building pathways and collection of more samples than the typical number of samples collected using Summa canisters.

Prior to sampling, the field crew conducted a comprehensive survey of selected buildings to identify any recent modifications or reconfigurations, which might have affected air flow. Mr. Rivero said that proper functioning of heating, ventilation, and air conditioning (HVAC) systems were also verified in all of the buildings. The Navy also asked NASA facility managers if any new chemicals had been used in the buildings.

In January 2018, the Navy completed VI baseline sampling in all 23 buildings. Mr. Rivero said that the Navy had collected 214 samples-indoor air samples, samples along pathways, samples in crawl spaces, samples in elevator shafts, and samples above cracks in concrete floors. Samples were collected in 6-liter canisters placed 36 to 60 inches above the floor (the breathing zone of a person working and breathing air throughout the work day). The samples were pre-set in the buildings for 8-, 10-, or 24-hours based on the building operations. Mr. Rivero noted for example, that NASA security operates 24 hours a day, so security buildings were sampled over 24-hour periods.

During the January 2018 baseline sampling, elevated concentrations were noted in buildings that had not been noted previously by the Navy. Mr. Rivero said that Navy and EPA decided to confirm results and to collect more samples to ultimately determine the tiering number for that building.

In June 2018, the Navy used an ECD to perform real-time sampling in buildings that required additional sampling for future long-term mitigation measures. Mr. Rivero provided a photo of the ECD equipment and discussed the air sampling procedures. He stated that typically, a syringe was used to collect air samples, followed by injection of that air into the ECD for analysis. Use of an ECD allows analysis of one sample every 7 minutes with detections of concentrations as low as 1 microgram per cubic meter, and continual sampling over 24-hour periods. Because the ECD has eight ports, eight tubes can be run to various sampling locations throughout a building; and analyses are rotated through the ECD ports when sampling.

To conclude, Mr. Rivero stated that buildings classified as Tier 1 or Tier 2 will undergo mitigation, institutional controls, and long-term monitoring. The 2018 Tiering Report identified three Tier 1 and three Tier 2 buildings. Mr. Rivero mentioned that once acceptable indoor air levels are achieved for an area, the area would move down a level on the tiering scale. For example, once an area identified as Tier 1 achieves an acceptable reading, it would be identified

as Tier 2. The Navy drafted a 2018 Site 28 Air Sampling and VI Tier Response Evaluation, as well as a revised Work Plan for Tier 1 and Tier 2 buildings. Upon obtaining concurrence by the regulatory agencies, the Navy will begin implementing the proposed sampling approaches: quarterly sampling at Building 10 will cease and Building 10 will be included in annual indoor air sampling events.

- Mr. Berry asked about health concerns within areas identified as Tier 2. Mr. Rivero stated that Tier 1 buildings are of greater concern than Tier 2 buildings since Tier 1 requires an engineering control to be implemented while Tier 2 requires the operation of existing controls such as an HVAC system to control indoor air concentrations.
- Mr. Berry referred to a study by the California Department of Public Health on Parkinson's and Amyotrophic Lateral Sclerosis (ALS) within the NASA facility. He asked if this study has any correlation to the VI investigation. Mr. Callian stated that the Navy targets meeting clean-up goals set by EPA when implementing the environmental restoration at Former NAS Moffett Field. Mr. Chuck said that unfortunately, the study on ALS was not complete, but no links to cancer had been found, and the number of incidents of Parkinson's at the facility was no higher than anywhere else. He did mention higher rates of ALS on site than normal, but no proof of correlation to VI had been found, and no final conclusions had been confirmed. Mr. Chuck stated that the history of exposure data was not very complete. Mr. Berry agreed that the study was flawed. He stated that more than 2,500 people had never been present on the NASA Ames campus on any given day. It seems that many people were sampled twice, negatively affecting the data presented from the study.
- Mr. Diaconescu asked if the Navy had provided information to the workers in the buildings where VI sampling would occur. Mr. Rivero responded that the Navy had coordinated with NASA and informed site managers of the work. Mr. Diaconescu asked if others present in the buildings who were not NASA employees had been informed of the work. Mr. Chuck said that NASA holds regular town hall meetings that are open to everyone on the NASA Ames campus at Former NAS Moffett Field. Mr. Chuck said that areas had been relocated due to elevated VI, including the Moffett Historical Museum where all staff are volunteers. The Navy has interim controls in place at the Moffett Historical Museum while NASA awaits the final remedy from the Navy.

REGULATORY AGENCY UPDATES

Regional Water Board Update: Elizabeth Wells (Regional Water Board) stated that the Regional Water Board awaits Navy issuance of work plans for Site 28 and Site 26 Hangars 2 and 3. Ms. Wells reviewed the Navy's report requesting closure of the Navy's last remaining petroleum site at Former NAS Moffett Field. The Navy has been responsible for closure of more than 100 petroleum sites, and now, 12 years later, only one remains.

EPA Update: Alana Lee (EPA) stated that EPA will be preparing its fourth Five-Year Review in Fiscal Year 2019 that includes information on the MEW site, the Former NAS Moffett Field plume, the regional groundwater contamination plume, and VI investigations. Ms. Lee said that EPA's Five-Year Review will be finalized in September 2019. The document will be streamlined because EPA is also preparing a focused feasibility study and a proposed plan for shallow groundwater, soil, and VI also to be released in 2019.

PUBLIC COMMENT PERIOD

- Community member Tami Skoog referred to recent radiological reassessment activities at Hunter's Point Shipyard and asked if the Navy would undertake any re-evaluation at Former NAS Moffett Field. Mr. Callian said the BRAC office has coordinated with all BRAC bases with regard to the sampling concerns at Hunters Point Shipyard. Mr. Callian was not aware of a need to conduct any re-evaluation at Former NAS Moffett Field.
- Anthony LaMarca (PV) stated that he had brought pictures to share of work at Hangars 1, 2, and 3, if the RAB would be interested in seeing them. Mr. Callian said that he wanted to retain focus during the RAB meeting only on the Navy's environmental program, and asked that PV present that information at another time.
- Mr. Moss asked how many community members and organizations were contacting EPA, the Regional Water Board, and other relevant parties outside of the RAB meeting. Mr. Callian replied that he had not received any requests for information outside of the RAB. He stated that all drafts and final reports go through the BRAC Cleanup Team (BCT), comprised of representatives from the Navy, regulatory agencies, and NASA. Mr. Callian said that RAB meetings are open to the public, and information regarding the Navy's program is accessible on the Former NAS Moffett Field website.

FUTURE MEETING SCHEDULE

Mr. Callian stated that the next RAB meeting is tentatively scheduled for Thursday October 17, 2019, and the Navy will send out more information to the RAB at a time closer to the next meeting.

ADJOURN

Mr. Callian thanked all present for attending the meeting and encouraged everyone to fill out the RAB evaluation forms outside. The meeting was then adjourned. The Navy can be contacted to receive any comments or questions:

Mr. Jim Callian

Former NAS Moffett Field Base Realignment and Closure (BRAC) Environmental Coordinator
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ACRONYM LIST:

µg/L	Micrograms per liter
ALS	Amyotrophic Lateral Sclerosis
Army	U.S. Department of the Army
BRAC	Base Realignment and Closure
BCT	BRAC Cleanup Team
BEC	BRAC Environmental Coordinator
CE	Chlorinated ethenes
COCs	Contaminants of concern
DCE	Dichloroethene
EATS	East-side Aquifer Treatment System
ECD	Electron capture detector
EPA	U.S. Environmental Protection Agency
FFA	Federal Facility Agreement
HVAC	Heating, ventilation, and air conditioning
IR	Installation Restoration
LTM	Long-term monitoring
MEW	Middlefield Ellis Whisman
MNA	Monitored natural attenuation
NAS	Naval Air Station
NASA	National Aeronautics and Space Administration
Navy	U.S. Department of the Navy
PCE	Tetrachloroethene
PV	Planetary Ventures
RAB	Restoration Advisory Board
RD/RA	Remedial Design/Remedial Action
Regional Water Board	San Francisco Bay Regional Water Quality Control Board
ROD	Record of Decision
RPM	Remedial Project Manager
TCE	Trichloroethene
UST	Underground storage tank
VC	Vinyl chloride
VI	Vapor intrusion
VOC	Volatile organic compound
WATS	West-Side Aquifers Treatment System