



FINAL

FORMER MARINE CORPS AIR STATION (MCAS) TUSTIN

99th Restoration Advisory Board (RAB) Meeting Summary

September 25, 2014



Meeting Location: Tustin Senior Center, 200 South C Street, Tustin, California
Meeting Date/Time: 25 September 2014/7:00 PM to 8:30 PM
Summary Prepared by: Maaike Petrie, Accord MACTEC 8A Joint Venture (AM8AJV)

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MCAS TUSTIN
SSIC NO. 5090.3.A

Attachments:

Presentation Slides:

- Environmental Program Status, Installation Restoration Program (IRP), Former Marine Corps Air Station Tustin
- Operable Units (OU)-1A and -1B Installation Restoration Program (IRP) Sites 13S, 12, and 3 Groundwater Remedy Status Update

Attendees: A total of 15 people were in attendance for the Former MCAS Tustin RAB meeting:

Navy: Jim Sullivan, Base Realignment and Closure (BRAC) Environmental Coordinator (BEC) and RAB Co-Chair; and Morgan Rogers, Navy Project Manager (PM).

Regulatory Agencies: David Murchison, Department of Toxic Substances Control (DTSC), Patricia Hannon, Regional Water Quality Control Board, Santa Ana Region (RWQCB).

RAB Members: Desire' Chandler, RAB Community Co-Chair; Mary Lynn Norby; Randy Peebles; Robert Kopecky; Susan Reynolds; Don Zweifel; and Matt West, City of Tustin.

Other Attendees: Tony Guiang, AMEC; Maaike Petrie, AMEC; Michael Wolff, ECS, Inc., and Dhananjay Rawal, ECS, Inc.

WELCOME/INTRODUCTIONS/AGENDA REVIEW:

Mr. Jim Sullivan (BEC and Navy RAB Co-Chair) welcomed everyone to the 99th Former MCAS Tustin RAB meeting and thanked everyone for coming. He noted that this was the penultimate RAB meeting prior to celebrating the 100th RAB meeting, adding that this was a milestone event for the Former MCAS Tustin RAB. Mr. Don Zweifel (RAB member) asked that RAB members be commended for their years of service to the RAB during the milestone event. Mr. Sullivan agreed and noted the request would be taken under consideration.

Mr. Sullivan asked for self-introductions from those in attendance. Mr. Sullivan began by reviewing the meeting agenda and points of contact for both the regulatory and Navy teams. Mr. Sullivan reviewed the Information Repository (IR) and Administrative Records (AR) general information as well as helpful websites (Navy BRAC Program Management Office [PMO], United States Environmental Protection Agency [USEPA], California EPA, DTSC, California Department of Public Health, RWQCB, EnviroStor, and GeoTracker) where the public can obtain information on the Navy's environmental cleanup efforts. He reminded everyone that all RAB meetings are open to the public.

Mr. Sullivan mentioned that this meeting is the last one scheduled and that new dates should be scheduled for 2015. Ms. Chandler (RAB Community Co-Chair) suggested coming up with a more consistent 6-month rotation for the upcoming RAB meetings. She requested consensus from the RAB members to hold future RAB meetings on Thursday evenings. The RAB concurred and agreed that the next two meetings will take place on Thursday, March 26, 2015 and September 24, 2015, at the Tustin Senior Center. Mr. Matt West (City of Tustin and RAB member) informed the board that these dates are already reserved for the RAB meetings and that the backup reservations will be released. Mr. Zweifel and Ms. Chandler discussed that if there is a need for discussion on a special development, research findings, or newly issued document, it is always at the RAB's discretion to schedule an additional sub-committee meeting and invite appropriate participants. Mr. Sullivan agreed that this option is a possibility and that a teleconference call could also be scheduled.

Mr. Sullivan noted that the new up-to-date map discussed at the last RAB meeting is now available. The new map shows the 2013 dataset and is underlain by a newer aerial photo, taken in 2009 rather than 2008. Mr. Sullivan pointed out the remaining carve-out (CO; Navy-owned property) and stated that the map is a work in progress. Mr. West asked whether it would be possible to distribute this map electronically and Mr. Sullivan stated the Navy could provide copies for the RAB members. Ms. Norby (RAB member) and Mr. West noted that the legend is hard to read and that it would be clearer if the handout were in an 11"x17" format. Mr. Sullivan agreed and stated that a larger version would be emailed to the RAB members before the next RAB meeting.

Mr. Zweifel asked whether the Orange County Regional Park is impacted by the plumes shown on the poster board map. Mr. Sullivan explained that the area of CO-5, which includes the North Hangar sites, is being developed by the county. There is a Lease in Furtherance of Conveyance (LIFOC) on CO-2, 5, 6, and 9, with the exception of the 84 acres of the Regional Park site (located at CO-5).

PRESENTATIONS:

Environmental Program Status, Installation Restoration Program (IRP) Former Marine Corps Air Station Tustin

Slide 1 – Title

Mr. Sullivan presented the environmental status update, meant as a summary of the entire program. He mentioned the same information would be presented every few RAB meetings in order to keep the RAB informed and updated on the environmental cleanup progress at each of the Sites.

Slide 2 –Presentation Overview

Mr. Sullivan explained the sites at Former MCAS Tustin are grouped in clusters called Operable Units (OUs), which comprise groups of similar sites that have similar restoration schedules and documentation. The map displayed on the poster board identified the remaining OUs at Former MCAS Tustin (OU-1A, OU-1B, OU-3, and OU-4B). The environmental status update

will provide the location, an overview of the remedy, current status, and anticipated upcoming documents for each OU.

Slide 3 – OU-1A (IRP-13S) OU-1B (IRP-3 and IRP-12)

Mr. Sullivan presented a map of OU-1A and OU-1B and explained that the OUs are discussed together because the documentation for the sites is always presented together. This slide presented the new aerial map showing the locations of OU-1A and OU-1B at Former MCAS Tustin.

Slide 4 – OU-1A (IRP-13S) OU-1B (IRP-3 and IRP-12)

Mr. Sullivan provided some background and a summary of the Remedial Action Objectives (RAOs) for OU-1A and OU-1B. He noted the RAOs for the sites are similar because the sites have commonality.

Slide 5 – OU-1A (IRP-13S) OU-1B (IRP-3 and IRP-12)

Mr. Sullivan noted that the primary chemicals of concern (COCs) in groundwater are 1,2,3-trichloropropane (1,2,3-TCP) and trichloroethylene (TCE) at OU-1A, and TCE at OU-1B North and South. The numerical remedial goals (RGs) for the COCs are 0.5 micrograms per liter ($\mu\text{g}/\text{L}$) for 1,2,3-TCP and 5 $\mu\text{g}/\text{L}$ for TCE.

Slide 6 – OU-1A (IRP-13S) OU-1B (IRP-3 and IRP-12)

Mr. Sullivan provided a brief summary of the selected remedies for soil and groundwater identified in the Records of Decision (ROD) signed in 2004, including specific components of the remedy and the implementation dates for the remedial actions. Mr. Sullivan then discussed the institutional controls (ICs) at all the sites and mentioned that all the sites are on a Five-Year Review cycle. He explained that remedial actions at OU-1A and OU-1B North commenced in December 2007 and at OU-1B in January 2008, making 2014 the sixth year of implementation.

Slide 7 – OU-1A (IRP-13S) OU-1B (IRP-3 and IRP-12)

Mr. Sullivan explained that the current status of the sites is operations and maintenance and long-term monitoring (O&M/). Semiannual and annual groundwater monitoring is performed to confirm that the treatment system is operating properly and efficiently and to facilitate system optimization. Results from the semiannual groundwater monitoring are compiled into a data summary report. Results from both the semiannual and annual monitoring events are compiled into an Annual Performance Evaluation Report that assesses the effectiveness of the remedy and provides recommendations for optimization. He explained that the 2013 Annual Performance Evaluation is presented with the regulatory agencies for review and, after receiving agency comments, responses to comments will be submitted for further concurrence before a final document is produced.

Slide 8 – OU-1A (IRP-13S) OU-1B (IRP-3 and IRP-12)

Mr. Sullivan listed the documents anticipated within the next six months, including Final Explanation of Significant Differences (ESD) for each of OU-1A and OU-1B, which is basically an addendum to their RODs, and a Land Use Control Remedial Design (LUC RD) Amendment that will address potential risk of vapor intrusion. Mr. Zweifel asked whether the Final LUC RD Amendment could affect the Orange County Regional Park. Mr. Sullivan answered that it does affect the CO-5 area, but that the Navy is still working with the agencies, the city, and other stakeholders. The LUCs might be affected, but it is not clear exactly how and what might be affected.

Ms. Chandler asked whether the Five-Year Review trigger date is based on the date of the ROD or on the actual implementation of the remedial action. Mr. Sullivan explained that the start of the Five-Year Review clock is triggered by the date of the remedial action. For remedies that do not require a remedial action (e.g., monitored natural attenuation and/or ICs), the remedy start date and trigger date is the ROD signature date. The first Site to trigger a Five-Year Review sets the cycle for all the other sites requiring such a Five-Year review. Mr. West asked for confirmation of the five-year cycle duration and Mr. Sullivan answered in the affirmative and explained that it might have been different in the past, but once the initial Five-Year Review is established, other Sites enter that same Five-Year Review schedule so that all of the Sites' reviews are on the same schedule.

Ms. Chandler asked where we were on the schedule and Mr. Rogers (Navy PM) stated that the third Five-Year Review for Former MCAS Tustin is due in 2016.

Slide 9 – OU-3 (IRP-1)

Mr. Sullivan presented an aerial photograph location for OU-3 (IRP-1).

Slide 10 – OU-3 (IRP-1)

Mr. Sullivan summarized the RAOs, including controlling or eliminating discharge of contaminated groundwater into the Peters Canyon Channel, preventing or minimizing the downward migration of contaminated groundwater, preventing and minimizing exposure to contaminated groundwater, and implementing appropriate remedial action as necessary to facilitate property transfer and reuse. Ms. Chandler asked how the RAOs were derived, and Mr. Sullivan answered that the Navy derived them with concurrence from the regulatory agencies.

Slide 11 – OU-3 (IRP-1)

Mr. Sullivan presented the remedy components for the site as documented in the 2001 ROD. The remedy selected in the ROD includes a steel-reinforced concrete containment wall, groundwater, surface water, and landfill gas monitoring, inspections of the containment wall and monitoring wells, institutional controls (ICs), and Five-Year Reviews.

Ms. Mary Lynn Norby (RAB member) asked whether this included the site under Jamboree Road and Ms. Chandler answered that it is partially under the road.

Slide 12 – OU-3 (IRP-1)

Mr. Sullivan presented the status of the remedial action at OU-3 (IRP-1), reporting requirements, and documents anticipated in the next 6 months. Ms. Susan Reynolds (RAB member) asked if OU-3 will ever be transferred and whether it will always be the Navy's responsibility to maintain the site. Mr. West explained that OU-3 is no longer Navy-owned and that it was transferred a few years ago, but that there is a long-term covenant to maintain the engineering controls. Ms. Reynolds then asked if Former MCAS Tustin would be reporting on the Site and Mr. West explained that an annual LUC Compliance Certification is filed by the City of Tustin with the Navy and that it is included in the Site's annual reports. Mr. Rogers pointed out that the Navy is still performing the monitoring and inspections and that the annual inspection checklists are included in the annual reports. Ms. Reynolds asked whether the Navy will always perform the monitoring, and Mr. Rogers and Mr. West replied that the Navy would continue to maintain the site until there is concurrence by the regulatory agencies that it is no longer required.

Mr. Zweifel made an observation about natural attenuation and associated costs. Ms. Patricia Hannon (RWQCB) explained that natural attenuation is not necessarily a less-expensive option than active remediation because of the costs associated with the groundwater sampling and analysis.

Slide 13 - OU-4B (IRP-5S(a), IRP-6, IRP-11, IRP-13W, and Mingled Plumes Area [MPA])

This slide showed an aerial photograph location for OU-4B, which comprises four IRP sites (IRP-5S (a), IRP-6, IRP-11, IRP-13W, and MPA).

Slide 14 – OU-4B (IRP-5S(a), IRP-6, IRP-11, IRP-13W, and Mingled Plumes Area [MPA])

Mr. Sullivan explained that there are five IRP sites within OU-4B, but that the site is subdivided into Low Concentration Sites, where concentrations of volatile organic compounds (VOCs) in groundwater were detected at <20 µg/L, and Moderate Concentration Sites where concentrations of VOCs in groundwater were detected at >20 µg/L. Mr. Zweifel asked what the remedial goals (RGs) for the VOCs were, and Mr. Sullivan explained that it depended on the specific contaminant. For 1,2,3-TCP, the RG is 0.5 µg/L and for TCE, the RG is 5 µg/L.

Slide 15 – OU-4B (IRP-5S(a), IRP-6, IRP-11, IRP-13W, and Mingled Plumes Area [MPA])

Mr. Sullivan provided a summary of the RAOs for OU-4B and the primary COCs and RGs for the sites. Mr. Zweifel asked about the RAOs at OU-4B, and Mr. Sullivan stated that the next RAB will have a presentation on OU-4B.

Slide 16 – OU-4B (IRP-5S(a), IRP-6, IRP-11, IRP-13W, and Mingled Plumes Area [MPA])

Mr. Sullivan presented the remedy components for the IRP sites in OU-4B as documented in the 2010 ROD. The remedy selected in the ROD for the Low Concentration Sites includes ICs, groundwater monitoring, and Five-Year Reviews. The remedy selected for the Moderate Concentration Sites includes in-situ bioremediation via substrate injections, monitored natural attenuation (MNA), performance monitoring, Five-Year Reviews, and ICs. Mr. Sullivan noted

there are slightly different components for the Low versus Moderate Concentration Sites because of the contaminant concentrations.

Slide 17 – OU-4B (IRP-5S(a), IRP-6, IRP-11, IRP-13W, and Mingled Plumes Area [MPA])

Mr. Sullivan explained that there was no remedial action required at the Low Concentration Sites, but that the remedial action at the Moderate Concentration Sites was completed in January 2013. All of the sites' current status is LTM/O&M, including groundwater monitoring and reporting.

Slide 18 – OU-4B (IRP-5S(a), IRP-6, IRP-11, IRP-13W, and Mingled Plumes Area [MPA])

Mr. Sullivan explained that the Moderate Concentration Sites will have a Final Annual Performance Monitoring Report, Final LTM/O&M Plan, and Final LUC RD, and then the Navy will be preparing a draft to seek concurrence from the U.S. EPA that the OU-4B sites are Operating Properly and Successfully (OPS) (similar to what has been achieved at other sites). Mr. Sullivan explained that Former MCAS Tustin is a Non-National Priorities List (NPL) site, so the state is the lead regulatory agency but that, in the case of OPS, the U.S. EPA maintains that status.

Mr. Sullivan explained that the last slide was acronyms and asked whether there were any additional questions.

Ms. Norby asked for a brief description of ICs and asked whether they include items such as rules or fences. Mr. Sullivan explained that a typical IC would be to not use the groundwater until the RG is reached, but that ICs are basically "do's and don'ts." Examples included, "don't disturb the wells or remedial equipment during remediation" and "don't damage the landfill with activities."

Mr. Dave Murchison (DTSC) explained that ICs are typically driven by risk. For example, one typical IC is to inform people who apply for a permit to excavate that they must develop a plan of action. The notification is in the permitting process, and when the record has an area with ICs, the permit application begins a process to prevent people from coming into contact with toxins and to prevent people from using the water inappropriately. All the applicable agencies, depending on the scale, would get involved in the permitting process and outline the ICs. When this kind of work is performed in California, some kind of permit is required and the permitting process highlights the fact that there are ICs.

Mr. Sullivan introduced Mr. Rogers, who presented the next presentation.

Operable Units (OU)-1A and -1B, Installation Restoration Program (IRP) Sites 13S, 12, and 3, Groundwater Remedy Status Update

Slide 1 – Title

Mr. Rogers explained that this presentation was intended as an update on OU-1A and OU-1B, also known as IRP Sites 13S, 12, and 3, and identified their locations on the poster board map.

Slide 2 –Presentation Overview

Mr. Rogers stated that he would discuss the RAOs, the remedies, the components of the remedies, and the progress made on the cleanup and next steps.

Slide 3 –Site Locations

Mr. Rogers pointed out the locations of the OUs and the primary chemicals of concern (COCs) associated with their respective groundwater plumes. He identified CO-5, a parcel of land the Navy still owns that is under a Lease of Furtherance of Conveyance (LIFO). He also identified CO-6 which is also retained by the Navy.

Slide 4 –Remedial Action Objectives

Mr. Rogers stated that, in general, the goal is to reduce the concentrations of the VOCs TCE and 1,2,3-TCP. Also, additional goals are to protect human health and ecological receptors and to facilitate the transfer or reuse of the properties.

Slide 5 –Remedy

Mr. Rogers explained the selected remedy for OU-1A and OU-1B is hydraulic containment with hot-spot removal. He explained this meant focusing treatment on the source of the contamination at the site. Hydraulic containment refers to containing the plume so that it does not migrate off site or expand beyond its current boundaries.

The remedy components include groundwater extraction, containment, and a performance monitoring system. There are extraction wells (EWs) at each plume area that extract the impacted groundwater. The groundwater then goes to a treatment facility, where it passes through granular activated carbon filter vessels and the 1,2,3-TCP and TCE are removed. There are monitoring wells at each of the sites, and they are monitored on a semi-annual or annual basis to measure the performance of the treatment system to ensure contaminant reduction and plume containment. A soil removal action was performed to remove the 1,2,3-TCP- and TCE-contaminated source soil, which left the contaminated groundwater for future action. ICs include prohibited use of groundwater and construction on the site, and Five-Year Reviews to ensure that the remedy is still effective and protective of human health and the environment.

Slide 6 – Remedy (continued)

Mr. Rogers identified the location of the plumes and the extraction wells (EWs). There are 9 EWs associated with the plume at IRP Site 13S, and there are 4 EWs associated with the plume at IRP Site 12. He explained that at IRP Site 13, only 6 of the 9 EWs are currently being used as the other 3 EWs have been shut down for system optimization. At IRP Site 12, only 3 of the EWs are being used. The conveyance piping transports the groundwater to a treatment plant and through a granulated activated carbon treatment system that filters out the TCE and 1,2,3-TCP and other minor contaminants. Groundwater is then conveyed into the Orange County Sanitation District's (OCSD) sanitary sewer system.

Mr. Randy Peebles (RAB member) asked whether active pumping was still occurring, and Mr. Rogers replied yes.

Mr. Rogers explained that each of the EWs has a pump associated with it and all the groundwater goes to a treatment facility and then through additional piping into the OCSD's sanitary sewer system. Mr. Sullivan explained that there is a connection from the treatment facility to the sanitary sewer.

Mr. Peebles asked whether the pumping happens automatically on a cycle. Mr. Rogers explained that the pumps run continuously. Mr. Dhananjay Rawal (ECS) mentioned that there are level sensors that activate the pumps.

Ms. Norby asked for a reminder of which water-bearing zone the contaminants occur. Mr. Michael Wolff (ECS) explained that at OU-1A they are in the first water-bearing zone (FWBZ) and second water-bearing zone (SWBZ) and at OU-1B North they are in the FWBZ only. Mr. Rogers and Mr. Sullivan clarified that the figures and the poster board show the FWBZ only. Mr. Wolff added that the systems have been running continuously for 99 percent of the time since 2008, virtually non-stop.

Slide 7 – Remedy (continued)

Mr. Rogers explained that the slide presents the monitoring well network that supports the treatment system. At IRP Site 13S, there are 33 wells for performance monitoring, including both EWs and monitoring wells. At IRP Site 12, there are 11 monitoring wells including 4 EWs.

Slide 8 – Remedy (continued)

Mr. Rogers presented a diagram showing the system layout (extraction wells and conveyance piping) for the treatment system at OU-1B South.

Slide 9 – Remedy (continued)

Mr. Rogers presented a diagram showing the layout for the monitoring wells, which are monitored semiannually and annually to confirm that the system is operating properly.

Slide 10 – Cleanup Progress

Mr. Rogers expanded on the performance of the system as shown in the table on the slide. Over 12-million gallons of water were extracted from OU-1A and OU-1B North (one system) in 2013.

Mr. Zweifel brought up the fact that there is a drought in California and wanted to know whether anything was being done to recharge our depleted aquifers.

Ms. Hannon explained that the idea of recharging the aquifers had been evaluated and it was concluded that the soils were too dense to allow efficient recharging. She added it is difficult to put water back into the ground. In addition, even after the VOC contaminants are removed, there are still other contaminants in the groundwater, including salt and selenium, that vary in

concentration. She explained that the only option is to treat the water and direct it to the sanitary sewer; adding that the treated water is not appropriate for return to the aquifer.

Mr. Wolff pointed out that the OCS D performs a secondary treatment and recycles the water after it is conveyed through the Navy treatment facility. The percentage of water recycled is not known, because the sanitation district blends the water with other sources. Ms. Chandler pointed out this is the sanitation district, not the Orange County Water District. Ms. Chandler pointed out that the facility has recently been expanded to accommodate more water recycling.

Slide 11 - Cleanup Progress

Mr. Rogers stated that after the extraction of the groundwater and treatment by the filters for removal of the contaminants, a calculation (using the COCs' concentration levels and the groundwater extraction volumes) of the mass, in pounds (lbs), of the contaminants removed in one year is performed, as shown in the table on the slide. For OU-1A, 0.85 lbs of TCE and 1,2,3-TCP were removed; for OU-1B North, 0.31 lbs of TCE were removed; and for OU-1B South, 19.9 lbs of TCE were removed.

Slide 12 - Cleanup Progress

Mr. Rogers discussed the cumulative mass of COCs removed since the start of the remedies. For OU-1A, 10.77 lbs of TCE and 1,2,3-TCP were removed; for OU-1B North, 1.89 lbs of TCE were removed; and for OU-1B South, 136.5 lbs were removed since the beginning of the remediation.

Slide 13 -Cleanup Progress (continued)

Mr. Rogers showed two graphs that depict 1,2,3-TCP concentrations in two monitoring wells (222MW05S located in the northern portion of the plume and IS72MW12S located at the down-gradient edge of the plume) in OU-1A that are approaching concentrations at or below the remedial goal (RG) for 1,2,3-TCP. The graphs show decreasing concentrations since system startup. He explained that it was typical to see an initial increase in concentrations because of the extraction system pulling in the contaminant; however, over time, the concentrations are declining. Mr. Rogers noted that most of the wells follow a similar decreasing trend, although there are some wells showing increasing trends attributed to changes in pump rates and other wells showing stable trends.

Ms. Chandler asked about TCE trends, and Mr. Rogers stated that there are similar trends for TCE concentration levels.

Slide 14 - Cleanup Progress (continued)

Mr. Rogers explained the optimization measures shown on the slide. Modeling is used to fine tune the extraction pump rates for efficiency to ensure that groundwater extraction is limited to the extent of the contaminant plumes and does not extend further and extract clean water. In addition, the three granular activated carbon vessels are rotated during use for efficiency, and the number of monitoring wells has been reduced as wells are determined to no longer be necessary or data become redundant, and sampling frequencies have been reduced from

semiannual to annual for many wells. In summary, COC mass has been removed from the groundwater, most COC concentration trends are declining, and the plume is not migrating or growing and is stable, and the remedy is working as intended.

Slide 15 –Next Steps

Mr. Rogers presented the information on the slide. Mr. Zweifel asked about the pump capture ratios. Mr. Wolff explained that the ratios are intended to keep the capture focused on the contaminated water and not pump clean water from outside of the plume boundaries. The 2013 Annual Performance Monitoring Report will be published this month.

Mr. Rogers opened the floor for additional questions.

Mr. West asked whether, at the time when the remedies were selected, there was a time-frame considered for when the remedy might be complete. Is there any way to use the trend data to determine whether that timeframe is still accurate?

Mr. Rogers explained that it is very difficult to predict remediation completion timeframes and that predictions have been avoided, especially because the ROD in general commits to performing the activity for 30 years or longer, if necessary.

Mr. Wolff explained that it could be modeled but it is a difficult, expensive exercise. Mr. Rawal explained that because we are optimizing as we go, there are many variables. The goal is to optimize the remedy and be aware of diminishing returns. Mr. Zweifel pointed out that any model is only as good as the input.

FUTURE TOPICS/SCHEDULE NEXT RAB MEETING AND SUB-COMITTEE MEETING/MEETING EVALUATION AND CLOSING

Mr. Sullivan discussed the next meeting and asked for recommendations for future topics.

Ms. Reynolds noted that, at the last meeting, there was discussion about a site inspection at a Neighborhood E. She inquired as to whether there were there any significant results from the inspection.

Mr. Sullivan explained that the Site Inspection Plan for Neighborhood E would involve three rounds of groundwater monitoring. The second round of monitoring was just completed and the third round will take place in December 2014. This will result in a Draft Site Inspection Report, which will go out for review and comment. At the next RAB meeting in March 2015, there might not yet be anything to report, but the report should be complete by the September 2015 meeting. If there is anything to report in March 2015, it will be brought up.

Mr. Zweifel requested the RAB be updated on the occurrence of hot spots. Ms. Norby requested the Navy obtain a more current map than the one based on a 2009 aerial photo shown on the poster board. She added that the 2009 photo does not show some of the current features. Ms. Chandler asked whether the city has access to a more current aerial photo. Mr. West stated that he would forward the Navy an aerial photo dated spring 2013.

Mr. Sullivan asked for a meeting evaluation. Mr. Kopecky stated that the Environmental Status Update and overview was a very helpful presentation. Ms. Chandler agreed, but stated that it does not have to occur at every meeting. Ms. Reynolds commented on how well the slides were presented.

Mr. Sullivan asked that any ideas or suggestion for the 100th meeting to be sent to him or to Ms. Chandler. There was a discussion about making an effort to invite people who have been involved with the program to the 100th RAB meeting. Ms. Chandler and Mr. Sullivan agreed to include more people on the invitation list.

Ms. Chandler and Ms. Reynolds reiterated that the aerial photo needs work, but that it is a work in progress.

Mr. Sullivan thanked everyone for attending the 99th Former MCAS Tustin RAB meeting and stated that he looks forward to seeing everyone in March 2015 for the 100th meeting. The RAB meeting adjourned at 8:36 PM.

LIST OF HANDOUTS PROVIDED AT THE MEETING:

- 25 September 2014 Former MCAS Tustin RAB Meeting Agenda
- Presentation Slides: “Environmental Program Status, Installation Restoration Program (IRP) Former Marine Corps Air Station Tustin” and “Operable Units (OU)-1A and -1B Installation Restoration Program (IRP) Sites 13S, 12, and 3 Groundwater Remedy Status Update”
- September 2014 Mailers containing: Public Notice for the 25 September 2014 RAB Meeting, 25 September 2014 Former MCAS Tustin RAB Meeting Agenda, Final RAB Meeting Summary from the 21 May 2014 meeting, Former Marine Corps Air Station Tustin Environmental Program Status, and presentation slides titled, “Environmental Program Status, Installation Restoration Program (IRP) Former Marine Corps Air Station Tustin” and “Operable Units (OU)-1A and -1B Installation Restoration Program (IRP) Sites 13S, 12, and 3 Groundwater Remedy Status Update”.
- Environmental Websites
- Points-of-Contact Former MCAS Tustin
- RAB Mission Statement and Operating Procedures
- Former MCAS Tustin RAB Fact Sheet/Membership Application
- Former MCAS Tustin Mailing List Coupon

Copies of the meeting summaries and handouts are available at the IR for former MCAS Tustin located in the Government Publication Section of the University of California, Ayala Science Library in Irvine, California. Library hours are 10:00 AM to 8:00 PM Monday through Thursday; 10:00 AM to 5:00 PM Friday; and 1:00 PM to 5:00 PM on Saturday and Sunday. The library

phone number is (949) 824-7362 or (949) 824-6836. Copies of the meeting summaries and handouts are also available at the CERCLA AR File.

Final Summaries from previous RAB meetings can be found on the internet at the Navy BRAC Program Management Office (PMO) website: www.bracpmo.navy.mil.

INTERNET SITES:

Navy and Marine Corps Internet Access:

BRAC PMO Web Site (includes RAB meeting summary): <http://www.bracpmo.navy.mil/>

Department of Defense - Environmental Cleanup Home Page Web Site:

Homepage: <http://www.dtic.mil/envirodod/>

U.S. EPA:

Homepage: www.epa.gov

Superfund information: www.epa.gov/superfund

National Center for Environmental Assessment: www.epa.gov/ncea

Federal Register Environmental Documents: www.epa.gov/federalregister

California Agencies:

California Environmental Protection Agency Homepage: www.calepa.ca.gov

DTSC: www.dtsc.ca.gov

Department of Health Services: www.cdph.ca.gov

Santa Ana RWQCB: www.waterboards.ca.gov/santaana

Additional Websites: Reuse and Redevelopment

City of Tustin: www.tustinlegacy.com



Environmental Program Status

Installation Restoration Program (IRP)

Former Marine Corps Air Station Tustin

Base Realignment and Closure (BRAC) Cleanup Team (BCT) Meeting
Restoration Advisory Board (RAB) Meeting
James Sullivan, BRAC Environmental Coordinator

9/25/2014

Presentation Overview



Operable Units (OUs)

- **OU-1A, OU-1B, OU-3, and OU-4B**

Background

- **Location**
- **Remedy Overview**

Current Status

Documents Anticipated in Next 6 Months

OU-1A (IRP-13S) OU-1B (IRP-3 and IRP-12)



3

BRAC Program Management Office

9/25/2014

OU-1A (IRP-13S) OU-1B (IRP-3 and IRP-12)



Remedial Action Objectives (RAOs)

- Reduce concentrations of volatile organic compounds (VOCs) in groundwater to levels consistent with remediation goals (RGs), or until the plumes have stabilized, and prevent or limit VOC migration beyond the current plume boundaries.
- Protect human health by preventing extraction of VOC-impacted shallow groundwater for domestic use until RGs are achieved.
- Protect ecological receptors in Peters Canyon Channel and Barranca Channel by preventing the off-station migration of groundwater that contains VOCs at concentrations exceeding site RGs.
- Implement appropriate remedial actions as necessary to facilitate the transfer and reuse of the properties.

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BRAC Program Management Office

9/25/2014

**OU-1A (IRP-13S)
OU-1B (IRP-3 and IRP-12)**



**Primary Chemicals of Concern (COCs) in
Groundwater**

- **OU-1A (IRP-13S)**
 - 1,2,3-Trichloropropane (1,2,3-TCP)
 - Trichloroethene (TCE)
- **OU-1B North (IRP-12)**
 - TCE
- **OU-1B South (IRP-3)**
 - TCE

RGs

- **1,2,3-TCP = 0.5 microgram per liter (µg/L)**
- **TCE = 5 µg/L**

**OU-1A (IRP-13S)
OU-1B (IRP-3 and IRP-12)**



2004 Final Records of Decision (RODs)

- **Soil: No Further Action**
- **Groundwater: Hydraulic Containment with Hot-Spot Removal**

Remedy Components

- **Groundwater extraction, treatment, and performance monitoring**
- **Soil removal to optimize the remedy**
- **Institutional controls (ICs)**
- **Five-year reviews**

Remedial Action

- **OU-1A, OU-1B North: 7 December 2007**
- **OU-1B South: 2 January 2008**

**OU-1A (IRP-13S)
OU-1B (IRP-3 and IRP-12)**



Current Status

➤ **Ongoing Long-Term Monitoring/Operation & Maintenance (LTM/O&M)**

- Inspection and maintenance of remedial components
- Semiannual groundwater monitoring
 - Groundwater level measurements to track flow directions
 - Groundwater sampling and analysis

➤ **Reporting**

- Semiannual Data Summary
- Annual Performance Evaluation

**OU-1A (IRP-13S)
OU-1B (IRP-3 and IRP-12)**



Documents Anticipated in Next 6 Months

- **Final Explanation of Significant Differences**
- **Final Land Use Control Remedial Design (LUC RD) Amendment**
- **Final 2013 Performance Evaluation Report**

OU-3 (IRP-1)



OU-3 (IRP-1)



RAOs

- Control or eliminate the discharge of contaminated groundwater above the RGs into Peters Canyon Channel that could potentially impact human health or the environment and to preserve existing high-quality surface water.
- Prevent or minimize the downward migration of contaminated groundwater above the RGs into deeper groundwater zones to preserve existing high-quality groundwater.
- Prevent or minimize exposure to contaminated groundwater above the RGs, buried wastes, and subsurface soils that have reported contamination above health-based levels.
- Implement appropriate remedial actions as necessary to facilitate rapid transfer and reuse of the OU-3 property.

OU-3 (IRP-1)



2001 Final ROD Remedy Components

- **Steel-reinforced concrete containment wall**
- **Groundwater and surface water monitoring**
 - Final round to support the 2016 Five-Year Review
- **Inspections**
 - Steel-reinforced concrete containment wall
 - Monitoring wells
- **ICs**
- **Five-year reviews**

OU-3 (IRP-1)



Current Status

- **Ongoing LTM/O&M**
 - Inspection and maintenance of remedial components
 - Enforcement of ICs

- **Reporting**
 - Annual LTM Report

Documents Anticipated in Next 6 Months

- **Draft 2014 Annual LTM Report**

OU-4B
(IRP-5S(a), IRP-6, IRP-11, IRP-13W, and MPA)



OU-4B
(IRP-5S(a), IRP-6, IRP-11, IRP-13W, and MPA)



Low Concentration Sites

- VOCs in groundwater at concentrations <20 µg/L
- IRP-11
- IRP-13W

Moderate Concentration Sites

- VOCs in groundwater at concentrations >20 µg/L
- IRP-5S(a)
- IRP-6
- Mingled Plumes Area (MPA)

OU-4B
(IRP-5S(a), IRP-6, IRP-11, IRP-13W, and MPA)



RAOs

- **Protect human health by limiting the use of shallow groundwater containing COCs at concentrations exceeding health-protective levels.**
- **Reduce concentrations of COCs in shallow groundwater at areas of attainment for OU-4B sites to health-protective levels.**

Primary COCs in Groundwater/RGs

- **TCE = 5 µg/L**
- **1,1-Dichloroethene = 6 µg/L (only for IRP-6)**

OU-4B
(IRP-5S(a), IRP-6, IRP-11, IRP-13W, and MPA)



2010 Final ROD Remedy Components

- **NFA for Soil at All Sites**
- **Low Concentration Sites**
 - ICs
 - Groundwater monitoring (to determine need for ICs)
 - Five-year reviews
- **Moderate Concentration Sites**
 - In situ bioremediation via substrate injections
 - Monitored natural attenuation
 - Performance monitoring
 - Five-year reviews
 - ICs

OU-4B
(IRP-5S(a), IRP-6, IRP-11, IRP-13W, and MPA)



Remedial Action

- **Moderate Concentration Sites: January 2013**

Current Status (Low & Moderate Concentration Sites)

- **Ongoing LTM/O&M**
 - Groundwater monitoring
 - Reporting

OU-4B
(IRP-5S(a), IRP-6, IRP-11, IRP-13W, and MPA)



Documents Anticipated in Next 6 Months

- **Moderate Concentration Sites**
 - Final Annual Performance Monitoring Report
 - Final LTM/O&M Plan
 - Final LUC RD
 - Draft Operating Properly and Successfully Report
- **Low Concentration Sites**
 - None

Questions?



Acronyms



BCT – BRAC Closure Team	LUC RD – Land Use Control Remedial Design	RG – Remediation Goal
BRAC – Base Realignment and Closure	MPA – Mingled Plumes Area	ROD – Record of Decision
COC – chemical of concern	O&M – operation and maintenance	TCE – trichloroethene
IC – institutional control	OU – Operable Unit	TCP – trichloropropane
IRP – Installation Restoration Program	RAB – Restoration Advisory Board	VOC – volatile organic compound
LTM – long-term monitoring	RAO – Remedial Action Objective	µg/L – micrograms per liter



**Operable Units (OU) -1A and -1B
Installation Restoration Program
(IRP) Sites 13S, 12, and 3
Groundwater Remedy Status Update
Former Marine Corps Air Station Tustin**

Restoration Advisory Board (RAB) Meeting
Morgan Rogers, PE, Navy Project Manager

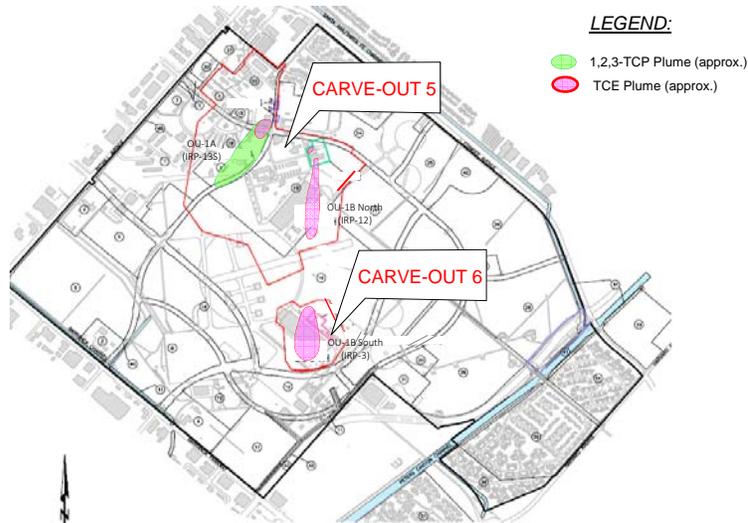
9/25/2014

Presentation Overview



- **Site Locations**
- **Remedial Action Objectives**
- **Remedy**
- **Cleanup Progress**
- **Next Steps**
- **Acronyms**

Site Locations



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Remedial Action Objectives



- Reduce concentrations of volatile organic compounds (VOCs) in groundwater to levels consistent with remediation goals (RGs), or until the plumes have stabilized, and prevent or limit VOC migration beyond the current plume boundaries.
- Protect human health by preventing extraction of VOC-impacted shallow groundwater for domestic use until RGs are achieved.
- Protect ecological receptors in Peters Canyon Channel and Barranca Channel by preventing the off-station migration of groundwater that contains VOCs at concentrations exceeding site RGs.
- Implement appropriate remedial actions as necessary to facilitate the transfer and reuse of the properties.

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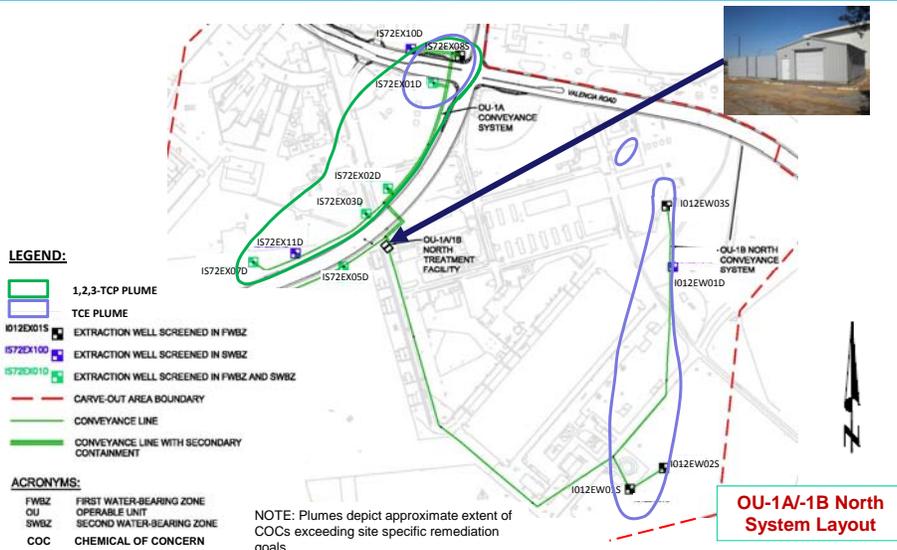


Remedy Components

- Groundwater extraction, treatment, and performance monitoring
- Soil removal to optimize the remedy
- Institutional Controls (ICs)
- Five-Year Reviews

Remedial action started:

- OU-1A/-1B North (IRP-12 & -13S): December 7, 2007
- OU-1B South (IRP-3): January 2, 2008



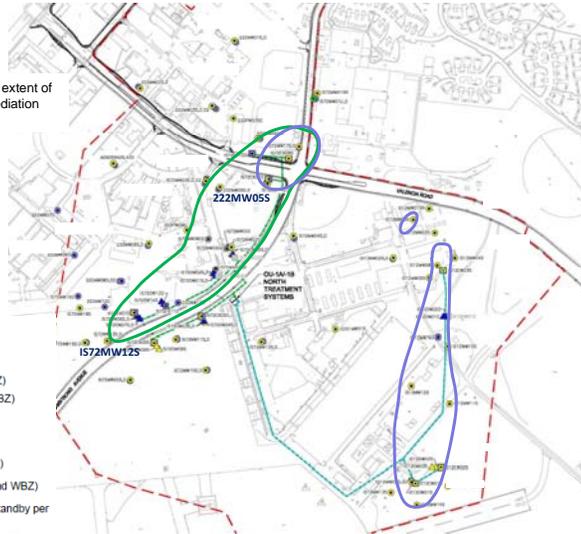
Remedy (cont.)



NOTE: Plumes depict approximate extent of COCs exceeding site specific remediation goals

LEGEND:

- 1,2,3-TCP PLUME
- TCE PLUME
- Monitoring Well (Upper Clay)
- ▲ Observation Well (First WBZ)
- Monitoring Well (First WBZ)
- Monitoring Well (Second WBZ)
- Observation Well (Second WBZ)
- Monitoring Well (Third WBZ)
- Extraction Well (First WBZ)
- Extraction Well (Second WBZ)
- Extraction Well (First & Second WBZ)
- Extraction Well Shutdown / Standby per Agency Concurrence
- COC** CHEMICAL OF CONCERN

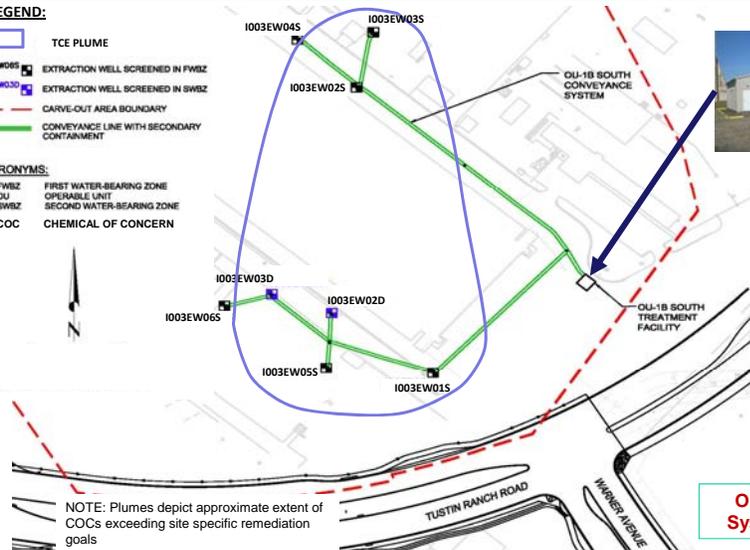


Remedy (cont.)



LEGEND:

- TCE PLUME
 - EXTRACTION WELL SCREENED IN FWBZ
 - EXTRACTION WELL SCREENED IN SWBZ
 - CARVE-OUT AREA BOUNDARY
 - CONVEYANCE LINE WITH SECONDARY CONTAINMENT
- ACRONYMS:**
- FWBZ FIRST WATER-BEARING ZONE
 - OU OPERABLE UNIT
 - SWBZ SECOND WATER-BEARING ZONE
 - COC CHEMICAL OF CONCERN



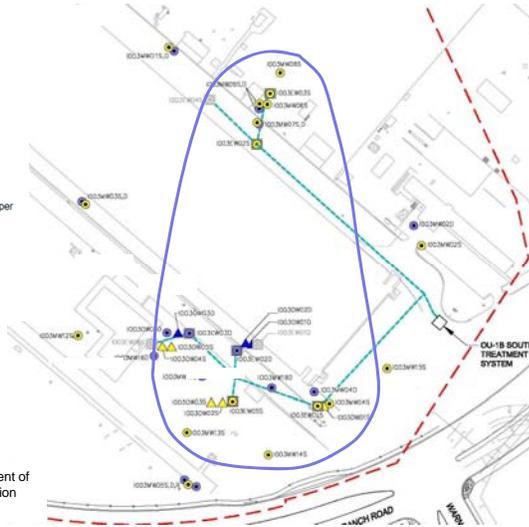
OU-1B South System Layout

Remedy (cont.)



LEGEND:

- TCE PLUME
- Monitoring Well (First WBZ)
- ▲ Observation Well (First WBZ)
- ▲ Observation Well (Second WBZ)
- Monitoring Well (Second WBZ)
- ⊙ Extraction Well (First WBZ)
- ⊙ Extraction Well (Second WBZ)
- Extraction Well Shutdown / Standby per Agency Concurrence
- COC** CHEMICAL OF CONCERN



NOTE: Plumes depict approximate extent of COCs exceeding site specific remediation goals

Cleanup Progress



– Quantity of groundwater extracted and treated 2013 (gallons)

	OU-1A (IRP-13S)	OU-1B North (IRP-12)	OU-1B South (IRP-3)
	OU-1A/-1B North Treatment System		OU-1B South Treatment System
Volume Extracted (gallons)	7.85 million	4.45 million	5.54 million
Relative contribution to treatment system (percent)	63.8	36.2	100
Average flow rate treated (gpm)	23		11
TOTALS (gallons)	12.31 million		5.54 million



– Mass of chemicals of concern (COC) removed in 2013 (pounds)

Chemical of Concern	OU-1A (IRP-13S)	OU-1B North (IRP-12)	OU-1B South (IRP-3)
trichloroethene	0.50	0.31	19.4
1,2,3-trichloropropane	0.35	NA	NA
Other	0.00	0.00	0.5*
TOTAL	0.85	0.31	19.9



– Cumulative mass of COC removed since start of remedy (pounds)

Chemical of Concern	OU-1A (IRP-13S)	OU-1B North (IRP-12)	OU-1B South (IRP-3)
trichloroethene	6.78	1.89	132.9
1,2,3-trichloropropane	3.99	NA	NA
Other	0.00	0.00	3.6*
TOTAL	10.77	1.89	136.5



Reductions of COC concentrations in groundwater

222MW05S
(March 2008 to Sept 2013)



OU-1A



IS72MW12S
(March 2008 to Sept 2013)



OU-1A



Optimization Measures

- Fine-tuned extraction rates based on capture analysis
- Reduced carbon vessels in treatment train from three to two
- Reduced number of monitoring wells in monitoring program
- Reduced sampling frequency

Next Steps



- **Continue biweekly, monthly, and quarterly Operation and Maintenance Inspections**
- **Quarterly effluent sampling**
- **Semiannual and annual groundwater monitoring and reporting**
- **Annual plume capture and optimization evaluation**
- **Final 2013 Annual Performance Evaluation Report**

Acronyms



µg/L	micrograms per liter
BRAC	base realignment and closure
COC	chemical of concern
IC	Institutional Control
IRP	Installation Restoration Program
NAVFAC	Naval Facilities Engineering Command Southwest
OU	Operable Unit
RG	remediation goal
TCE	trichloroethene
TCP	1,2,3-trichloropropane
VOC	volatile organic compound

Questions?



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