



Final FORMER MARINE CORPS AIR STATION (MCAS) El Toro 109th Restoration Advisory Board (RAB) Meeting Summary



Meeting Location: Orange County Great Park (OCGP), Operations Trailer, Irvine, California

Meeting Date/Time: 21 August 2013/ 5:30 PM to 6:30 PM

Minutes Prepared by: Erika Marx, Accord MACTEC 8A Joint Venture (AM8AJV)

ATTACHMENTS:

Sign-In Sheets for the 21 August 2013 RAB Meeting

Presentation Slides:

- Status Update - Remedial Design/Remedial Action IRP Sites 1 and 2 Groundwater Former MCAS El Toro

ATTENDEES: A total of 26 people attended the RAB meeting:

Navy: Jim Callian, Base Realignment and Closure (BRAC) Environmental Coordinator (BEC) and RAB Co-Chair; Content Arnold, Lead Navy Remedial Project Manager (RPM); Marc P. Smits, Navy RPM; and Scott Kehe, Navy Field Engineering Acquisition Division (FEAD) Representative.

Regulatory Agencies: Mary Aycock, United States Environmental Protection Agency (U.S. EPA); Viola Cooper, U.S. EPA; Eileen Mananian, California Department of Toxic Substances Control (DTSC); and Patricia Hannon, California Regional Water Quality Control Board, Santa Ana Region (RWQCB).

RAB Members: Bob Woodings, Community Co-chair; Marcia Rudolph, Technical Subcommittee Chair; Peter Hersh; and Chris Crompton.

Other Attendees: Crispin Wanyoike, AECOM; Desire´ Chandler, E2 Managetech; Dhananjay Rawal, Enviro Compliance Solutions, Inc. (ECS); Robert Reitenour, Lowe Enterprises; Grace Pina Garot, Caltrans; Jim Werkmeister, FivePoint Communities; Cliff Wallace, OCGP; Marcus Ginnaty, OCGP; Kim Pierceall, Orange County Register and Irvine World News; John Owsinski, resident; Harvey Liss, resident; Susan Sayre, resident; Tony Guiang, AM8AJV; and Erika Marx, AM8AJV.

WELCOME/INTRODUCTIONS/AGENDA REVIEW:

Mr. Jim Callian, BEC and Navy RAB Co-Chair, welcomed everyone to this Former MCAS El Toro 109th RAB meeting. Mr. Callian asked everyone to please sign in on the sign-in sheets. He also asked that if any RAB members are unable to attend, please contact himself or Mr. Woodings. There were two excused absences at the meeting - Mr. Roy Herndon and Ms. Mary Aileen Matheis. Mr. Callian also thanked Mr. Cliff Wallace for providing the OCGP facilities for the RAB meeting. Mr. Callian asked Ms. Marcia Rudolph, RAB member and Technical Subcommittee Chair, to lead the Pledge of Allegiance.

ANNOUNCEMENTS/ REVIEW OF ACTION ITEMS:

Mr. Callian began the meeting with the following announcements and discussion:

- Mr. Callian initiated self-introductions and referenced the meeting agenda for old business, new business, and the subcommittee report.
- There were no action items to cover since the last RAB meeting.
- Mr. Callian mentioned that there were a few items that needed to be covered that are not on the agenda:
 - The first item was presented by Mr. Woodings. He stated that he received a RAB membership application from Ms. Desire´ Chandler. Mr. Woodings stated that her application was reviewed and made a motion to approve Ms. Chandler as a RAB member. There was no opposition to the nomination and therefore the motion was approved. He welcomed Ms. Chandler as a new member of the RAB.
 - Mr. Callian announced that the second item not on the agenda is the RAB Community Co-Chair election, which will be held at the next RAB meeting in April 2014. Mr. Woodings has served as the Community Co-Chair for more than two years. Mr. Callian explained that RAB members are asked to volunteer their own time to review documents and disseminate information to the public. He asked the meeting attendees consider either a self-nomination or nominating another RAB member to be the RAB Community Co-Chair.
- Mr. Callian announced that tonight’s RAB meeting would be followed by a tour of Installation Restoration Program (IRP) Site 24.
- Mr. Callian stated that he had received several questions regarding the Hangar 296 Radiological Site Inspection (SI). He mentioned that the Work Plan had already been disseminated to the RAB for review. Mr. Callian explained that the purpose of the Site Inspection is to radiologically survey the piping and surfaces within the building and to collect samples for laboratory analysis to evaluate the need for further action. If the samples and the survey data indicate that no further action is required, the Site would achieve Site Closeout at the SI stage of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process. If contamination is identified, further investigation would be conducted, as appropriate.
- In advance of her subcommittee report, Ms. Rudolph noted that the RAB subcommittee discussed Hangar 296. The discussion focused on a detailed study of Hangar 296 that was conducted 10 years ago. Ms. Rudolph asked that data obtained from this previous study, with which Mr. Peter Hersh was involved, be presented to the current contractor as part of the current investigation. Ms. Rudolph stated that this project was a significant investment by the City of Irvine and the RAB members at that time and the previous study should be considered for what is being done at the Site today.
- Mr. Hersh added that he is concerned that the Work Plan for Hangar 296 is not written in layman’s terms and therefore would be difficult for the RAB and community members to understand. Mr. Hersh asked if the Navy could present a summary of the investigation and the alternative remedial actions selected for the Site at the next RAB meeting scheduled for April 2014. Mr. Callian responded that he could give a presentation at the next meeting, but it is not certain at this point whether an alternative remedial action would even be necessary. He reiterated the objective of the current investigation was to evaluate whether further action is required at all. Mr. Callian asked Mr. Hersh to provide his written comments on the Work Plan. Mr. Callian added that the regulatory agencies had very few comments on this Work Plan.

- Mr. Callian presented slides listing key Navy and Regulatory Agency contacts, RAB points-of-contact (POCs), CERCLA Administrative Record (AR) File and Information Repository (IR) locations and hours. Mr. Woodings added that Ms. Rudolph's contact information needed to be updated on the RAB POC slide.
- Mr. Callian presented a slide listing environmental and reuse/redevelopment websites. He reiterated the RAB's focus is environmental issues and restoration rather than reuse, according to its charter from Congress; however, for information regarding reuse, contact information can be found on one of the meeting handouts.
- Mr. Callian presented a slide with the dates for the upcoming RAB meetings, which are slated for April 23, 2014 and either August 20, 2014 or November 19, 2014.
- Mr. Callian mentioned that the RAB mailers have been revised to include: an agenda for the current meeting, a public notice for the current meeting, and final meeting minutes from the prior RAB meeting. Any comments regarding the draft meeting minutes should be sent to Mr. Bob Woodings, who will then forward them to the Navy for incorporation into the final meeting minutes, which will then be posted on the BRAC website.
- Mr. Hersh asked if there would be a RAB meeting this November. Mr. Callian responded that there would not be a RAB meeting.
- Mr. Callian summarized the mission statement for the RAB.

SUBCOMMITTEE MEETING REPORT: Ms. Rudolph indicated that she had already covered the subcommittee discussion, regarding Hangar 296, earlier in the meeting. She suggested Hangar 296 be considered as a future topic for the next RAB meeting.

REGULATORY AGENCY UPDATE:

Ms. Eileen Mananian (DTSC)

Ms. Mananian stated that she is in the process of reviewing several monitoring reports as well as providing comments on the Hangar 296 Work Plan. She explained that DTSC is working with the California Department of Public Health to provide comments before submitting them to the Navy.

Ms. Patricia Hannon (RWQCB)

Ms. Hannon stated that she is currently reviewing responses to comments on the Remedial Design/Remedial Action Work Plan for IRP Sites 1 and 2 Groundwater. Ms. Hannon also mentioned that the RWQCB has a new permit for in-situ remediation, and she needs additional information from the Navy to complete her evaluation of the Work Plan.

Ms. Mary Aycock (U.S. EPA)

Ms. Aycock began by expressing her gratitude toward Mr. Smits for providing her a tour of Hangar 296. The U.S. EPA concurs with the Work Plan as written and will support the Navy through the completion of this investigation.

Ms. Aycock also mentioned that the U.S. EPA is in the process of publishing a Notice to Delist approximately 2,000 acres of Former MCAS El Toro property in the Federal Register. The purpose of this Notice is to petition the delisting of parcels from the National Priorities List. The Notice will be published within the next month. Ms. Aycock stated that the public will be given 30 days to comment on the Notice and that she looks forward to receiving public input.

Ms. Rudolph asked if Hangar 296 would be included in the acreage that is proposed for delisting. Mr. Callian responded that the acreage only includes land that does not have ongoing remedial actions or investigations, so Hangar 296 will not be included.

Mr. Hersh asked how the delisting process relates to the Lease in Furtherance of Conveyance (LIFOC) process. Mr. Callian responded that this is a separate process. Ms. Aycock added that the properties proposed for deletion have already been transferred under the Finding of Suitability to Transfer (FOST) process. Mr. Callian explained that FOST stands for “Finding of Suitability to Transfer” and is a Navy document that summarizes all of the appropriate information, notifications, and restrictions that may apply to a property being transferred.

Mr. Callian asked if there were any more questions, and there were none. Mr. Callian introduced the presenter for the meeting - Mr. Crispin Wanyoike (AECOM).

PRESENTATIONS:

Status Update - Remedial Design/Remedial Action IRP Sites 1 and 2 Groundwater Former MCAS El Toro

Slide 1 - Title slide.

Slide 2 - Presentation overview.

Slide 3 – Presents a figure of IRP Sites 1 and 2 locations.

Slide 4 – Presents descriptions for IRP Sites 1 and 2.

Mr. Wanyoike provided brief descriptions of IRP Sites 1 and 2. He explained IRP Site 1 is a Former Explosive Ordnance Disposal (EOD) Training Range that operated from 1952 to 1999. The chemical of concern (COC) is perchlorate in groundwater, which ranges from very low concentrations to approximately 500 micrograms per liter ($\mu\text{g/L}$). The groundwater cleanup goal for perchlorate is 6 $\mu\text{g/L}$. Perchlorate was used as a rocket propellant in JATO or “Jet Assisted Take Off” bottles which are attached to aircraft to boost their propulsion during take-offs.

IRP Site 2 was the former Magazine Road Landfill from the 1950s until about 1980. Groundwater COCs for the Site include trichloroethene; tetrachloroethene; cis-1,2-dichloroethene; 1,1,2-trichloroethane; and 1,2-dichloroethane. Mr. Callian added that these COCs are more generally described as volatile organic compounds (VOCs).

Slide 5 – Presents the selected remedy for IRP Site 1 Groundwater.

Mr. Wanyoike stated that the Site is now in the remedial design/remedial action phase. The selected remedy includes a combination of in-situ bioremediation (ISB) including a permeable reactive barrier (PRB), groundwater monitoring, institutional controls (ICs), and Five-Year Reviews.

Slide 6 – Presents the ISB locations at IRP Site 1 groundwater.

Mr. Wanyoike explained that food-grade high fructose corn syrup is injected into a series of injection wells arranged in a grid-like pattern to cover the contaminated area at the Source Area. The substrate chosen for the downstream permeable reactive barrier (PRB) area is a food-grade soybean oil and vegetable oil referred to as Electron Donor Solution (EDS). He noted the substrate is self-emulsifying when mixed with water and is long lasting in the environment.

Slide 7 – Presents an illustration of substrate injection schematics.

He explained the substrate acts as a food source for the naturally occurring bacteria in the groundwater. Once the food source is consumed by the bacteria and oxygen is depleted; bacteria are forced to consume the COC in groundwater, specifically perchlorate.

To explain the substrate injection schematic at the PRB location, Mr. Callian used a “picket fence” analogy to describe what happens when groundwater passes through the “picket fence” array of injection wells. He noted that groundwater that passes through the “picket fence” will come out on the other side with minimal to no contamination.

Slide 8 – Presents a description of the selected substrates planned for injection.

Mr. Wanyoike explained both substrates are approved for injection by the RWQCB. He provided the RAB attendees with samples of both substrates to show substrate characteristics when mixed prior to injecting them into the subsurface.

Slide 9 – Presents the selected remedy for IRP Site 2 groundwater.

Mr. Wanyoike stated that the remedy for IRP Site 2 is monitored natural attenuation (MNA), ICs, and Five-Year Reviews. He noted that the next Five-Year Review would be completed in 2014.

Slide 10 - Presents a figure of VOC-impacted groundwater at IRP Site 2.

Slide 11 – Describes the supplemental groundwater monitoring and direct-push technology (DPT) evaluation conducted in January 2013.

Mr. Wanyoike explained that the purpose of the monitoring and evaluation was to provide supplemental data to refine and optimize the remedial design; and to test the feasibility of using DPT for ISB injections in the area between IRP Sites 1 and 2. The conclusion was that perchlorate concentrations are lower than before, VOC concentrations have remained stable, and DPT may be used for full-scale substrate injections between the two Sites.

Mr. Callian added that DPT reduces the carbon footprint because this technology generates minimal waste when compared with installing injection wells.

Slide 12 – Presents a schedule of upcoming documents and events.

Slide 13 - Acronyms and abbreviations.

Mr. Wanyoike asked if anyone had any questions on his presentation.

Mr. Owsinski asked if there is a timeline available to show the progress of the project for the general public. Mr. Wanyoike responded that periodic updates would be available after monitoring and reporting have been conducted. The updates will compare initial concentrations to recently obtained concentrations to show the progress of the remedy.

Mr. Hersh asked why corn syrup and oil are used for the injection process. Mr. Wanyoike responded that these specific substrates are used because they are good food source for the bacteria population to consume and once the oxygen is used up, the bacteria will start consuming the contaminants.

Mr. Hersh asked how the effectiveness of the remedy can be proven given the lack of recent rainfall. Mr. Wanyoike responded that an extensive pilot study was conducted using a similar substrate, and the results showed that perchlorate and VOC concentrations were significantly reduced.

Mr. Callian added that Five-Year Reviews would also be conducted to evaluate the effectiveness of the remedy in reducing the concentrations of contaminants.

Mr. Hersh asked if the remedy is modeled first and then results are assumed based on this model. Mr. Wanyoike confirmed that the pilot test was used to test the remedy before its full-scale implementation. He also added that the remedy relies on the natural flow of groundwater through the "picket fences."

Mr. Woodings asked where the monitoring wells are located and how is it ensured that the plumes are being monitored outside of the base boundary. Mr. Wanyoike explained that the black dots (on Slide 6) are all monitoring well locations that are sampled as part of the remedy. There are monitoring wells located slightly off the base property to monitor the effectiveness of the remedy.

Mr. Callian asked if there were any general questions that anyone would like to ask.

Mr. Harvey Liss stated that some of the reports at the Information Repository at Heritage Library are missing CDs. He asked if these CDs could be made available so that he can view the pictures at a larger scale than are in the report. Mr. Callian responded that he would look into this. Mr. Liss also mentioned that the meeting summary from the April 2013 meeting was not available. Mr. Callian responded that he would look into this as well.

Ms. Susan Sayre inquired about the status of IRP Site 3. Mr. Callian responded that the landfill cap had been completed and the Site is now in the long-term monitoring phase, which includes periodically taking groundwater samples to see if the landfill site was impacting the groundwater. Ms. Sayre stated that according to a July 2012 report, IRP Site 3 is not available for reuse activity. She asked if this means that this area cannot be built upon. Mr. Callian confirmed she is correct. Ms. Sayre stated that there is a high school proposed to be built near IRP Site 3. Mr. Callian responded that the school will not be built on the landfill cap itself, and that there are systems in place to make sure that there is no migration of any contaminants that would affect anyone in the vicinity. Mr. Callian explained that the boundary of the landfill cap is what is protected by ICs. Prior to this, the IRP site boundary was much larger. When the landfill cap was constructed, waste from the outlying areas within the boundary of the IRP site was consolidated and put into the landfill before the cap was created. The deed restrictions are only for the landfill cap itself. Mr. Liss asked why IRP Site 3 is listed as "further action required." Mr. Callian responded that the further action that is required is the long-term monitoring.

Mr. Callian asked if there were any more questions, and there were none. He asked Mr. Woodings to provide the meeting evaluation.

MEETING EVALUATION AND CLOSING:

Mr. Woodings stated that Mr. Wanyoike did an excellent job on the presentation. He asked if Ms. Rudolph had any comments or concerns.

Ms. Rudolph stated that she had two issues that she would like to have addressed at the next RAB meeting. The first is Hangar 296; the second is IRP Site 1 and the FBI's involvement with the site. She would like to have an update as to what the FBI is doing and what they are planning to do with the site. Mr. Callian responded that the Navy has requested the FBI's presence at the RAB meetings, but they have declined.

Ms. Rudolph stated that she would like an update on Site 1 at the next meeting. Mr. Callian asked which aspect of the Site she would like an update on. Ms. Rudolph stated that she is concerned about the impact of the remedy on the fairy shrimp population; what protections the Navy has put in place to address the perchlorate contamination; and also what kind of protections are in place for the area immediately off site. Mr. Callian responded that the fairy shrimp are located on IRP Site 1, and this Site has not been transferred and will remain under the Navy's protection; therefore, the fairy shrimp will remain protected. Mr. Callian also mentioned that Mr. Wanyoike's presentation covered the topic of perchlorate migration. Ms. Sayre asked if there are any deed restrictions for the 2,000 acres that are being delisted. Mr. Callian responded that those acres are free from any deed restrictions. Ms. Sayre inquired if the delisted acres can be used for growing crops. Mr. Callian confirmed that crops could be grown in those areas.

Mr. Callian asked if anyone had any suggestions for future meeting topics.

Mr. Woodings stated that the RAB Mission Statement is out of date because the meetings are now held semi-annually rather than quarterly. He also added that the responsibilities of the Community Co-Chair need to be reassessed before the next election to determine if anything needs to be added, removed, or changed.

Mr. Woodings also stated that he had previously requested that the sign-in sheets for the prior RAB meetings be included as part of the meeting summary. Mr. Callian apologized and responded that he would look into this.

Mr. Callian thanked everyone for attending the RAB meeting and invited everyone to attend the next meeting, which will be held on April 23, 2014 at the Irvine City Hall. The meeting adjourned at 6:30 PM and was followed by a site tour of IRP Site 24.

LIST OF HANDOUTS PROVIDED AT THE MEETING:

- Presentation Slides: Status Update - Remedial Design/Remedial Action IRP Sites 1 and 2 Groundwater Former MCAS El Toro
- 21 August 2013 Former MCAS El Toro RAB Meeting Agenda
- Public Notice for the 21 August 2013 RAB Meeting
- Final RAB Meeting Summary from the 24 April 2013 meeting
- Note to RAB Members (regarding the RAB Meeting tour)
- Orange County Great Park Hours and Directions
- Orange County Great Park Operations and Construction Trailers Map and Directions
- Map to Great Park Operations Trailers
- Where to Get More Information & Environmental Websites
- Former MCAS El Toro IRP Site Location Map
- Former MCAS El Toro RAB Mission Statement and Operating Procedures
- Former MCAS El Toro RAB Fact Sheet/Membership Application
- Former MCAS El Toro Mailing List Coupon

Copies of the RAB Meeting Summaries and handouts are available at the IR for former MCAS El Toro located in the Government Publication Section of the Heritage Park Regional Library, in Irvine, California. Library hours are 10:00 AM to 9:00 PM Monday through Thursday; 10:00 AM to 5:00 PM Friday and Saturday; and 12:00 PM to 5:00 PM on Sunday. The library phone number is (949) 936-4040. In addition, copies of the meeting minutes and handouts are also available at the CERCLA AR File.

Final Meeting 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 Website (includes RAB meeting minutes): <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, reorganized into the Department of Health Care Services and the Department of Public Health: www.dhs.ca.gov

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

Additional Websites: Reuse and Redevelopment

Orange County Great Park: www.ocgp.org

Great Park Conservancy: www.orangecountygreatpark.org

**FORMER MCAS EL TORO
RESTORATION ADVISORY BOARD MEETING
*NAVY SIGN-IN SHEET***

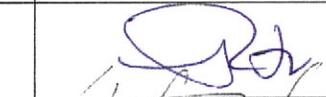
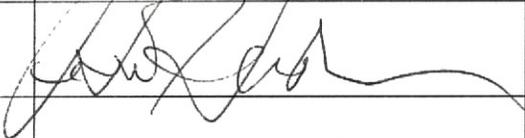
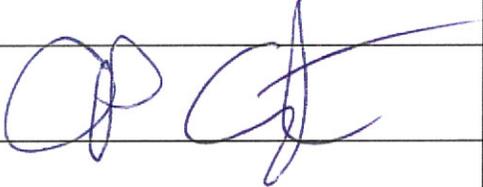
August 21, 2013

Name	Signature
Content Arnold, Lead Navy RPM	PRESENT.
Jim Callian, BRAC Environmental Coordinator and RAB Co-chair	J. Callian
Louie Cardinale, Navy RPM	
Marc P. Smits, Navy RPM	Marc P. Smits

Marcia Rudolph

**FORMER MCAS EL TORO
RESTORATION ADVISORY BOARD MEETING
AGENCY AND RAB MEMBER SIGN-IN SHEET
August 21, 2013**

Please sign in on the appropriate line. If your address and/or phone number has recently changed, help us update our records by writing your new information on the back of the sign-in sheet. Thank you.

Name	Signature	Name	Signature
Bob Woodings, Community Co-chair		Mary Aycock, U.S. EPA	PRESENT
Peter Hersh		Viola Cooper, U.S. EPA	
Mary Aileen Matheis		Patricia Hannon, RWQCB	
Chris Crompton		Eileen Mananian, DTSC	
Marcia Rudolph, Subcommittee Chair		Triss Chesney, DTSC	
Roy Herndon			
John Hills			
Donald Zweifel			

**GUEST
SIGN IN**

**FORMER MCAS EL TORO
RAB MEETING- SIGN-IN SHEET**

August 21, 2013

NAME <u>PLEASE PRINT</u> <u>CLEARLY</u>	AFFILIATION <i>(community member/resident, elected official, agency official)</i>	MAILING ADDRESS	PHONE EMAIL FAX	SHOULD WE ADD YOU TO THE MAILING LIST? <i>(yes/no)</i>	NEW TO MEETING? HOW DID YOU HEAR ABOUT THIS MEETING
Grace PinaGant	Caltrans				
Jim Werkmeister	Five Pt Comm				
Desire Chandler	EZ Manag Tech				
CRISPIN WANYOME	AECOM				
Vicki Cooper	USEPA				
John Owsinski	Interested citizen				

**GUEST
SIGN IN**

**FORMER MCAS EL TORO
RAB MEETING- SIGN-IN SHEET**

August 21, 2013

NAME <u>PLEASE PRINT</u> <u>CLEARLY</u>	AFFILIATION <i>(community member/resident, elected official, agency official)</i>	MAILING ADDRESS	PHONE EMAIL FAX	SHOULD WE ADD YOU TO THE MAILING LIST? <i>(yes/no)</i>	NEW TO MEETING? HOW DID YOU HEAR ABOUT THIS MEETING
Erika Marx	AEI				
Scott Kette	NAVY				
Susan Sagre	Community				
HARVEY LISS	resident	h. 12			y
Tony Guiang	AMEC				
ROB REITENOUR	LOWE ENTERPRISES				

**GUEST
SIGN IN**

**FORMER MCAS EL TORO
RAB MEETING- SIGN-IN SHEET**

August 21, 2013

NAME <u>PLEASE PRINT CLEARLY</u>	AFFILIATION <i>(community member/resident, elected official, agency official)</i>	MAILING ADDRESS	PHONE EMAIL FAX	SHOULD WE ADD YOU TO THE MAILING LIST? <i>(yes/no)</i>	NEW TO MEETING? HOW DID YOU HEAR ABOUT THIS MEETING
Dhananjay Rawal	ECS				
CLIFF WAINCE	OCGP PRESENT				
MAREUS GINNETY	OCGP PRESENT				
KIM Pierceall	OC Register PRESENT				



Status Update Remedial Design/Remedial Action IRP Sites 1 and 2 Groundwater Former MCAS El Toro

**Presented By
Crispin Wanyoike, PE (AEJV)
21 August 2013**



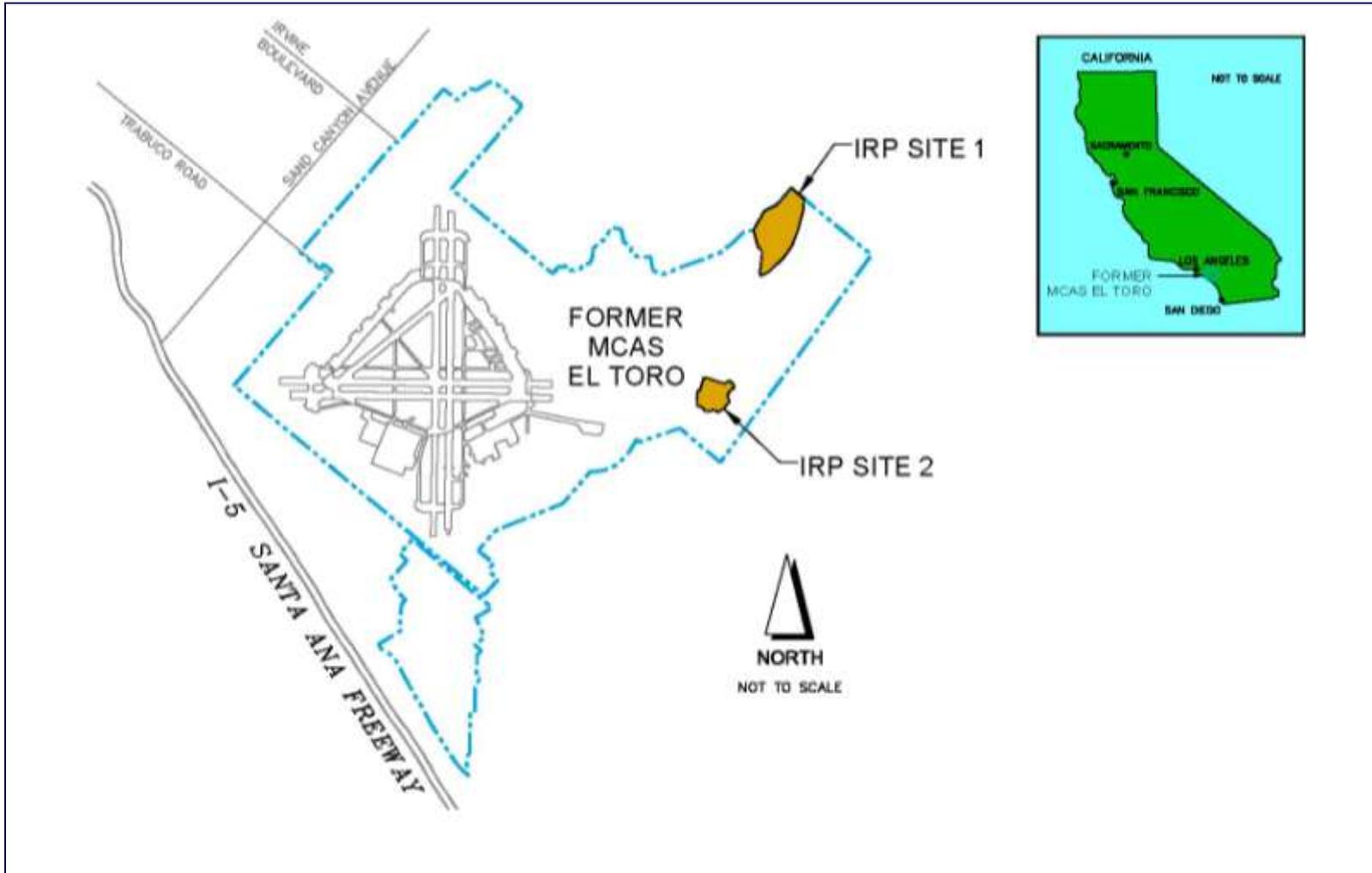
Presentation Overview



- Brief Site Background
- IRP Site 1 - Design Overview of Selected Remedy
- IRP Site 2 - Design Overview of Selected Remedy
- Overview of Supplemental Groundwater Monitoring and Direct-Push Technology Testing Completed in January 2013
- Schedule



Site Locations





Site Descriptions



- IRP Site 1
 - Former Explosive Ordnance Disposal (EOD) Training Range (1952 until Station closure in 1999)
 - The chemical of concern (COC) is perchlorate
 - Perchlorate in groundwater at concentrations exceeding the cleanup goal (CG) extends from the central portion of IRP Site 1 to approximately the former Station Boundary
- IRP Site 2
 - Former landfill known as Magazine Road Landfill (late 1950s until about 1980)
 - The construction of a landfill cap, the selected remedy for soil, was completed in February 2008.
 - COCs : trichloroethene; tetrachloroethene; cis-1,2-dichloroethene; 1,1,2-trichloroethane; and 1,2-dichloroethane



Selected Remedy IRP Site 1 Groundwater



- In-Situ Bioremediation (ISB)
 - Source Area;
 - Downgradient of the Source Area between IRP -1 and -2; and
 - Near the former Station Boundary
- Groundwater Monitoring;
- Institutional Controls (ICs); and
- Five-Year Reviews.



ISB Locations IRP Site 1 Groundwater



Definitions

In situ Bioremediation (ISB)

Permeable Reactive Barrier (PRB)

Intermediate Area PRB

Active ISB within Source Area

Source Area PRB

Former MCAS El Toro Boundary PRB

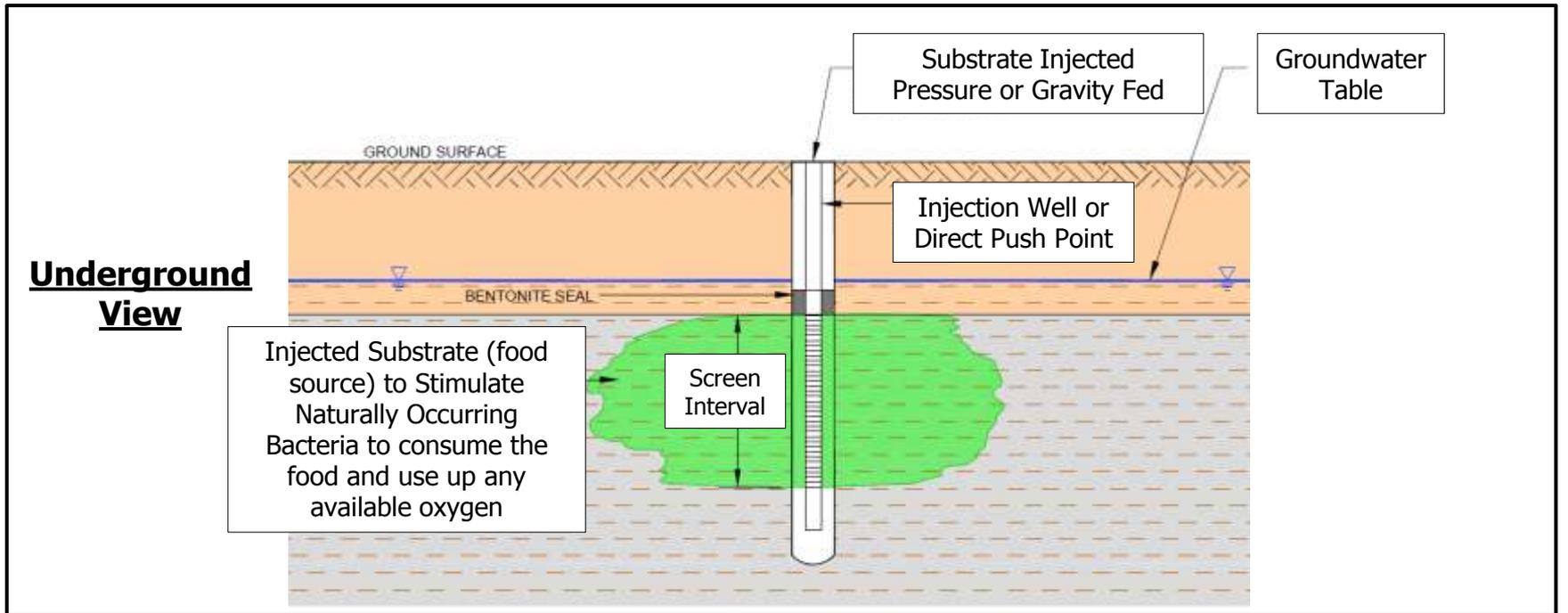
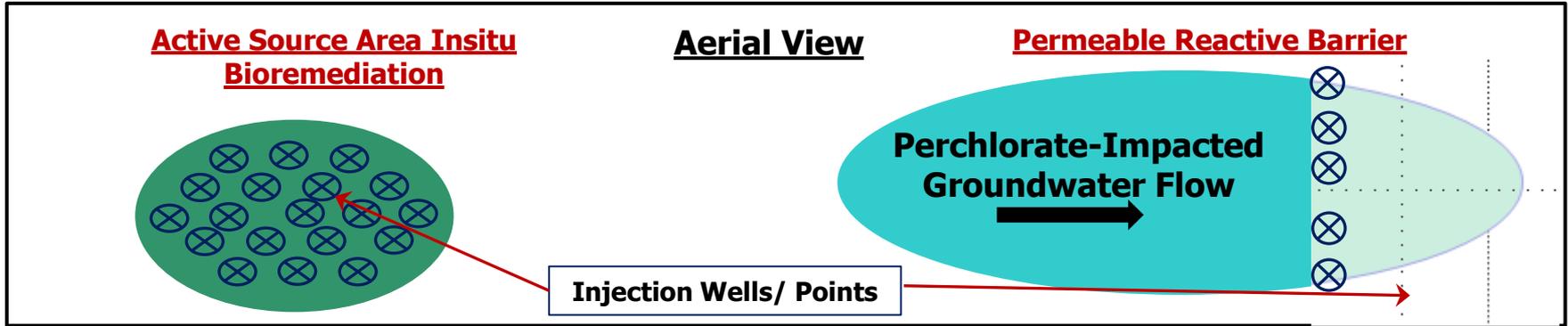
LEGEND:

- GROUNDWATER SAMPLING LOCATION (PERCHLORATE LESS THAN CLEANUP GOAL)
- ✦ GROUNDWATER SAMPLING LOCATION (PERCHLORATE EXCEEDING CLEANUP GOAL)
- IRP SITE BOUNDARY
- - - EPHEMERAL STREAM OR WASH
- FORMER MCAS EL TORO BOUNDARY
- FORMER EOD TRAINING RANGE BOUNDARY





Substrate Injection Schematics





Substrates Planned for Injection



- Electron Donor Solution – Extended Release (EDS-ER)
 - Soybean Oil and Vegetable Oil Derived Fatty Acid Esters
 - Food-grade
 - Self-emulsifies when mixed with water
 - Approved by the California Regional Water Quality Control Board, Santa Ana Region (RWQCB)
- High Fructose Corn Syrup
 - Food-grade
 - Approved by the RWQCB



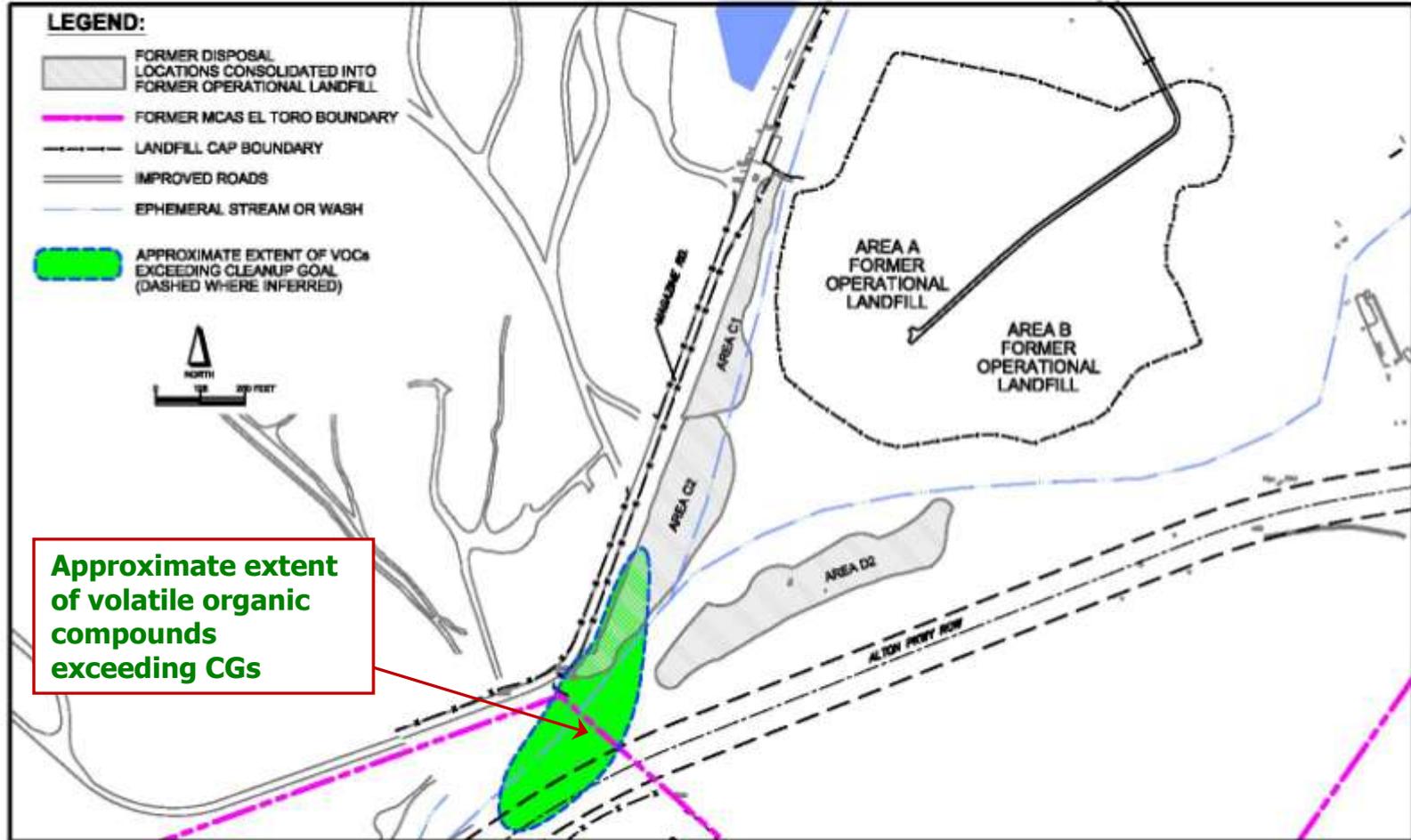
Selected Remedy IRP Site 2 Groundwater



- Monitored Natural Attenuation (MNA)
 - Relies primarily on natural attenuation physical processes such as dispersion, dilution, sorption, and volatilization.
 - Groundwater Monitoring
- ICs
- Five-Year Reviews



VOC-Impacted Groundwater IRP Site 2





Supplemental Groundwater Monitoring and DPT Evaluation – January 2013



- *Purpose*
 - To supplement data collected during previous groundwater monitoring events and to refine and optimize the remedial design
 - To test the feasibility of using direct-push technology (DPT) for full-scale ISB injections in the area between IRP Sites 1 and 2 (*Intermediate Area PRB*)
- *Conclusions*
 - Perchlorate concentrations are lower compared to the most recent results
 - VOC concentrations are generally consistent with previous results
 - DPT can be used for full-scale substrate injections at the Intermediate Area PRB



Schedule



- Issue Draft Final RD/RA Work Plan – September 2013
 - Will incorporate the supplemental monitoring results from January 2013 and the regulatory agency comments received in July 2013
- Issue Final RD/RA Work Plan – November 2013
- Issue Remedial Action Fact Sheet – November 2013
- Begin Remedial Action Implementation – November 2013



Acronyms and Abbreviations



AEJV	AECOM Envirocon Joint Venture
CG	cleanup goal
COC	chemical of concern
DPT	direct-push technology
EDS-ER	Electron Donor Solution Extended Release
EOD	explosive ordnance disposal
IC	institutional control
IRP	Installation Restoration Program
ISB	in-situ bioremediation
MCAS	Marine Corps Air Station
MCL	maximum contaminant level
MNA	monitored natural attenuation
PRB	permeable reactive barrier
RWQCB	Regional Water Quality Control Board
VOC	volatile organic compound