

**FINAL MEETING MINUTES - 3 DECEMBER 2008  
FORMER MARINE CORPS AIR STATION (MCAS) EL TORO  
93<sup>d</sup> RESTORATION ADVISORY BOARD (RAB) MEETING**



**Meeting Location:** City of Irvine, Conference Training Center, Irvine California

**Meeting Date/Time:** 3 December 2008/6:40 pm – 8:15 pm

**Minutes Prepared by:** Tony Guiang, CDM

**Attachments:**

1. Presentation Slides: "Installation Restoration Program (IRP) Sites 18 and 24 Remedial Action Status".
2. Irvine Ranch Water District (IRWD) Memorandum – Irvine Desalter Project Update.
3. Presentation Slides: "Installation Restoration Program (IRP) Sites 1 & 2 Groundwater Pilot Study Update".

*\*Attachments will be provided on the Navy Base Realignment and Closure (BRAC) website ([www.bracpmo.navy.mil](http://www.bracpmo.navy.mil)) with the Final RAB meeting minutes.*

**WELCOME/INTRODUCTIONS/AGENDA REVIEW:**

Ms. Debra Theroux (Interim BRAC Environmental Coordinator [BEC] and Interim Navy RAB Co-Chair) welcomed everyone and asked for self-introductions. Self-introductions by all those in attendance followed. A total of 29 attendees were present. Ms. Theroux then reviewed the RAB meeting agenda; no changes to the agenda were suggested by the RAB.

**APPROVAL OF 8/20/08 RAB MEETING MINUTES**

Mr. Bob Woodings (RAB Community Co-Chair) opened the floor for discussion on any questions or corrections to the August 20, 2008 RAB meeting minutes. No comments were provided. The meeting minutes were approved by the RAB.

**ANNOUNCEMENTS/ REVIEW OF ACTION ITEMS**

Ms. Theroux reviewed the status of the following action items discussed at the last RAB meeting (August 20, 2008):

**IRP Site 1 Update and Tour**

Ms. Theroux noted there would be a presentation on IRP Site 1 during tonight's RAB meeting to address the RAB's request for an update on IRP Site 1. In response to the RAB's request to conduct a tour of IRP Site 1, Ms. Theroux asked for a show of hands to identify the number of people interested. Four attendees (Mr. Woodings, Mr. Peter Hersch [RAB member], Ms. Rudolph [RAB member, Subcommittee Co-Chair], and Mr. Quang Than [Department of Toxic Substances Control [DTSC]]) showed an interest in participating in the IRP Site 1 tour. Owing to the limited daylight hours available during the winter months, Ms. Theroux suggested scheduling the tour for April 2009. Mr. Hersch requested the tour be held sooner than April 2009 and suggested holding it in the morning to accommodate working schedules and limited

daylight hours. Ms. Theroux recommended she meet with the four interested parties after the RAB meeting to determine a convenient time for the tour.

#### **Trichloroethene (TCE) at IRP Sites 18 and 24**

Ms. Theroux noted there would be a presentation on the status of the IRP Sites 18 and 24 remedial action during tonight's RAB meeting to address the RAB's request for additional information on TCE at IRP Sites 18 and 24.

#### **Finding of Suitability to Transfer (FOST) Update**

Ms. Theroux explained that during the regulatory agency update at tonight's RAB meeting, DTSC would provide an update on the status of the most recent FOST.

#### **Upcoming RAB Meetings**

Ms. Theroux noted the next RAB meeting is scheduled for January 28, 2009. She explained that the Navy's intent was to hold a Public Meeting for the Anomaly Area 3 (AA3) Proposed Plan during the next RAB meeting. However, the Navy is not certain the Proposed Plan will be ready by that time and the Public Meeting may have to be held at a later date. Instead of holding a RAB meeting on January 28, 2009 the Navy proposed two alternatives for the RAB to consider in lieu of a formal RAB meeting. One alternative was to have the Orange County Great Park provide a property reuse update to the RAB on January 28, 2009. Another alternative was to provide RAB members with an email update on site activities and regulatory agency updates. Ms. Theroux asked for input from the RAB on the proposed alternatives to the January 28, 2009 RAB meeting.

Ms. Rudolph recommended not canceling the January 28, 2009 meeting and expressed interest in a presentation from the Orange County Great Park on the updated property reuse status/plans. In addition, she requested a map showing the Orange County Great Park proposed developments and the location of IRP sites. Mr. Hersch added that the Orange County Great Park presentation could include an update from Lennar regarding their development plans and how they relate to the IRP cleanup efforts.

Mr. Woodings noted interest in hearing from the County or the Navy regarding the Alton Parkway project.

Ms. Rudolph explained that the Navy usually provides a "State of the Station" presentation at the first RAB meeting of each calendar year and further stressed the importance of not canceling the January 28, 2009 RAB meeting.

Ms. Theroux stated the Navy would take the comments under consideration, including asking the Orange County Great Park, Lennar, etc. to address the RAB. She also noted the need to keep focus on the mission of the RAB which is the environmental cleanup program.

#### **Available Information/Contacts**

Ms. Theroux presented a series of slides listing key Navy and regulatory agency contacts. She provided Navy, Department of Defense, regulatory agency, and reuse/redevelopment websites and she explained that the Administrative Record (AR) File is maintained at Building 307 at

former MCAS El Toro and the Information Repository (IR) is located at Heritage Park Public Library. She further noted that Ms. Sue Rawal is the new document coordinator for the AR File and the business hours are 9am to 1pm Monday through Thursday.

Mr. Roy Herndon (RAB member) asked what the difference was between the AR and the IR. Ms. Content Arnold (Navy Lead Remedial Project Manager [RPM]) explained the AR File maintains a complete documentation of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) record while the IR only maintains some documents that may be of interest to the general public. Ms. Theroux added that if documents are not available in the AR File at MCAS El Toro, the Navy also maintains a complete AR File in San Diego.

## **SUBCOMMITTEE MEETING REPORT**

Ms. Rudolph thanked the regulators for their attendance at the Subcommittee Meeting (held prior to the RAB meeting) and for allowing her the opportunity to ask questions. Before starting her report she presented Ms. Theroux and Mr. Woodings with an article from the local paper written by the United States Environmental Protection Agency (U.S. EPA) stating that perchlorate can remain in water. Ms. Rudolph added that it may be to the public's best interest to find out more about the article.

Ms. Rudolph provided a summary of the Subcommittee Meeting discussions and the resulting questions for the Navy as follows:

- During the last RAB meeting, Ms. Rudolph participated in the IRP Site 2 tour and noted a new building on the site presumably used by the Federal Bureau of Investigation (FBI) and Federal Aviation Administration (FAA). She asked the Navy what type of processes/procedures were followed to administer a federal to federal transfer of property and if such an approval took place, was it administered under a Department of Defense protocol?
- She noted perchlorate continues to be a concern for the RAB Subcommittee.
- The Subcommittee would like information from the FBI regarding how they plan to use properties transferred to their jurisdiction. The Subcommittee is concerned that after the Navy completes the site cleanup (using taxpayer money), the FBI will recontaminate the site through their reuse of the property. She asked whether the FAA, FBI, and Navy communicated with each other regarding the cleanup and reuse of property. She noted the Subcommittee would like information from the FBI regarding how they will cleanup any contamination they cause at the site.
- Ms. Rudolph requested information on the Department of Defense's process for addressing munitions cleanup, particularly at IRP Site 1.
- Ms. Rudolph requested information on how the Navy plans to handle the radioactive material from the IRP Sites 3 and 5 cleanup.
- Ms. Rudolph requested the RAB prepare a letter of commendation to Bob Coleman for his past service to the RAB.

- Ms. Rudolph reminded the RAB that the next Subcommittee Meeting is scheduled for January 28, 2009 at 5:00pm presuming that the January 28, 2009 RAB would meet as scheduled. In closing, she opened the floor to any questions and comments.
- Mr. Hersch reiterated the importance of the community understanding the relationship between the Navy's clean-up effort and the intended use of land by the FBI. He requested the Navy contact the FBI and have them provide a presentation to the RAB regarding their property reuse plans and what measures they are taking to ensure contamination at the site does not re-occur. Mr. Hersch requested that if the January 28, 2009 RAB meeting is canceled, the Navy inform the RAB via email who to contact with the FBI to get this information. Mr. Bill Turner noted that it is unlikely the FBI is involved or will be involved with the use of chemicals such as TCE or perchlorate. Ms. Rudolph noted the community's lack of understanding regarding the FBI's plans/activities is the problem and reiterated the importance of having the FBI provide the community with this information.

## **REGULATORY AGENCY UPDATE**

### **Mr. Rich Muza (U.S. EPA)**

Mr. Muza provided the following summary of documents currently being reviewed by the U.S. EPA:

- Pilot Study for In-situ Groundwater Treatment at IRP Site 1 (Former Explosive Ordnance Disposal [EOD] Training Range) – U.S. EPA reviewed the draft document and submitted comments only on the Sampling and Analysis Plan.
- Draft Proposed Plan for AA3 – U.S. EPA submitted comments on the document.
- Potential Release Location Sites Group 6 – U.S. EPA concurred with the draft report.
- Remedial Action Completion Reports for IRP Sites 2 and 17 – U.S. EPA is currently reviewing the reports.
- Explanation of Significant Differences (ESD) for IRP Sites 2 and 17 – U.S. EPA is currently reviewing the ESD which will finalize the interim remedy for the sites and will provide comments to the Navy in the next few weeks.
- Draft Remedial Design/Remedial Action Work Plan for IRP Sites 3 and 5 – U.S. EPA submitted comments on the document.

Ms. Theroux reminded the RAB that copies of correspondence letters from regulatory agencies are available for public review at the AR and IR and Mr. Woodings and Ms. Rudolph are copied on all agency correspondence. Ms. Theroux added that if anyone is interested in obtaining copies of regulatory agency correspondence, to ask her, Ms. Arnold, or Ms. Randa Chichakli (CDM – Navy contractor) after the RAB meeting.

### **Mr. Quang Than (DTSC)**

Mr. Than explained that DTSC reviewed the same documents listed by Mr. Muza. He noted DTSC deals mainly with issues regarding hazardous substances and if there is a need for additional expertise, DTSC involves other state agencies such as the Department of Fish and Game (DFG).

He stated DTSC is currently making a Resource Conservation and Recovery Act (RCRA) Corrective Action Complete Determination for a group of parcels under FOST #4 at MCAS El Toro. These determinations are made if there is no evidence of a release or if the cleanup is determined to be complete; i.e., there is no regulatory obligation under RCRA for the site. He explained DTSC's determination is currently under public review (public comment period: November 22, 2008 through January 6, 2009); the Determination was distributed to the MCAS El Toro mailing list and advertised in the Los Angeles Times (Orange County edition) and the Orange County Register. He encouraged the RAB to review the Determination and submit comments prior to the end of the comment period.

## **IRP SITES 18 AND 24 REMEDIAL ACTION STATUS UPDATE**

Mr. Marc P. Smits (Navy RPM) provided a presentation entitled "Installation Restoration Program (IRP) Sites 18 and 24 Remedial Action Status" (Attachment 1) which included site descriptions, a summary of the background and origin of contaminants at the sites, a system operations update, maintenance activities, groundwater monitoring, system optimization, future activities, and upcoming project documents for the sites.

He presented a conceptual site model showing the cleaned-up soils and identifying the contamination that remains in the groundwater. The remedial design for IRP Site 24 was implemented in 2005 and 2006 and is comprised of 39 extraction wells: 5 located along the base boundary and the remaining wells located along the center of the plume (see Slide 5 in Attachment 1). Wells along the base boundary were designed to pump at 20 gallons per minute (gpm) while those along the center on the plume were designed to pump at 10 gpm. Water is pumped to a transfer station and then into an equalization tank before it is pumped to the off-site treatment plant operated by IRWD.

Mr. Smits provided information from the system's second year of operation (September 2007 to August 2008) on flow rates, pump rates, the volume of water pumped to the IRWD treatment plant, and the amount of volatile organic compounds (VOCs) removed from groundwater. The system has been operating at 94.2 percent efficiency compared to one year ago when it was operating at 62 percent efficiency. Graphs were presented showing the system has been pumping between 15 and 20 million gallons per month with the exception of August 2008 owing to annual maintenance activities. Other graphs showing a consistent increase in cumulative flow, efficiency above 90 percent with the exception of August (annual maintenance), and a consistent increase in cumulative mass removed were included in the presentation. Mr. Smits explained maintenance activities involved weekly, monthly, and annual inspections of all treatment system components. In addition, IRWD also performed an annual inspection on their off-station groundwater treatment system.

Mr. John Hills (IRWD) continued the IRP Sites 18 and 24 presentation by providing an overview of the Irvine Desalter Project (Attachment 2). His presentation provided an overview of the IRP Site 18 Principal Aquifer CERCLA Components which include Well ET-1, Treatment Plant ET-1, Well ET-2, and Well 78. Similar to Mr. Smits' presentation, the update covered the second year of operation ending in September 2008.

For each extraction well, Mr. Hills provided start dates for pumping total gallons of water extracted, pump rates, and current concentrations of TCE. Interruptions and failures associated with each well over the past year of operation were also summarized. Mr. Hills noted the total

gallons of water pumped at Wells ET-1 and ET-2 were very similar; however, for Well 78 the total fell below their expectations owing to a pump failure which resulted in the well only being run for six months.

Mr. Herndon noted that per the presentation, 650 pounds of VOCs (mostly TCE) have been removed from the groundwater and he asked what percent of the total VOCs present in the groundwater that represents. Mr. Smits explained the Record of Decision estimated approximately 2,500 pounds of VOCs were present in groundwater; therefore, it is estimated that 650 pounds is approximately 25 percent of the total. He noted that higher removal rates are expected in these beginning years of operation.

## **IRP SITES 1 AND 2 GROUNDWATER PILOT TEST UPDATE**

Mr. Jim Callian (Navy RPM) and Mr. Dan Herlihy (ECS) provided a presentation entitled "Installation Restoration Program (IRP) Sites 1 & 2 Groundwater Pilot Study Update" (Attachment 3). The presentation provided an overview of the proposed study of in-situ groundwater remediation of perchlorate at IRP Site 1 and TCE at IRP Site 2 and some of the specific objectives of the study. They explained how the pilot study addresses the different geology at the sites by evaluating the effectiveness of two injection techniques: regular injection and hydraulic fracturing. Mr. Callian noted that before pilot test locations are finalized, data obtained from monthly water levels in addition to a round of baseline groundwater monitoring will be used to help determine the most optimum locations.

Mr. Herndon asked how many injection wells would be installed at each site and at what depths. Mr. Callian and Mr. Wanyoike (Earth Tech-AECOM) explained that for the pilot study, injection wells would be installed at each site, 60 feet deep at IRP Site 1 and 80 feet deep at IRP Site 2.

Mr. Ray Ouellette (Mission Viejo resident) asked what concentration of sodium bromide, used as a conservative tracer, would be injected into the groundwater and what impact it would have on groundwater quality; i.e., would the groundwater be usable after treatment. He noted concern with removing one set of contaminants only to replace them with another citing that if the groundwater was used as drinking water it would need to be disinfected and this process would create bromate. Mr. Herlihy and Mr. Wanyoike explained that a 10-20 parts per million (ppm) concentration of sodium bromide was to be injected and noted that at these low concentrations, sodium bromide is very soluble. Mr. Wanyoike added that a small volume of sodium bromide, widely used as a tracer, would naturally attenuate with the aquifer. In addition, the sodium bromide would only be used during the pilot study and not during the full scale groundwater remediation. Ms. Arnold added that the Work Plan for the pilot study was currently being reviewed by the Regional Water Quality Control Board (RWQCB) and the RAB's comments would be taken into consideration.

Mr. Woodings asked if the Alton Parkway project would have any impact on the current groundwater monitoring wells. Mr. Wanyoike noted that a few wells within the Alton Parkway right-of-way will be evaluated, and their locations adjusted accordingly.

Mr. Turner asked whether the vapor intrusion issue at IRP Sites 18 and 24 has been addressed by the Navy. Ms. Arnold stated she would provide him with a document reference addressing his question.

## **OPEN Q&A/MEETING SUMMARY/CLOSING**

Ms. Theroux stated that all suggested agenda topics for the tentative January 28, 2009 RAB meeting will be taken into consideration. She noted the Navy will know more by January 1, 2009 whether the Public Meeting for the AA3 Proposed Plan will take place during the January 28, 2009 RAB meeting.

In closing, Mr. Woodings acknowledged and applauded the participation from the regulatory agencies. Ms. Theroux thanked everyone and the December 3, 2008 meeting was adjourned at 8:15pm.

## **LIST OF HANDOUTS PROVIDED AT THE MEETING**

- December 3, 2008 Former MCAS El Toro RAB Meeting Agenda and Upcoming RAB meeting schedule
- Where to Get More Information & Environmental Websites
- Presentation Slides: "Installation Restoration Program (IRP) Sites 18 and 24 Remedial Action Status"
- Irvine Ranch Water District Memorandum - Irvine Desalter Project Update
- Presentation Slides: "Installation Restoration Program (IRP) Sites 1 & 2 Groundwater Pilot Study Update"
- 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
- Fact Sheet: IRP Sites 18 and 24 Groundwater Cleanup - August 2008

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Copies of the meeting minutes and handouts provided at the December 3, 2008 RAB meeting are available at the IR for former MCAS El Toro located in the Government Publication Section of the Heritage Park Regional Library, Irvine, California. Library hours are 10am to 9pm Monday through Thursday; 10am to 5pm Friday and Saturday; and 12pm to 5pm on Sunday. The library may be reached at (949) 936-4040. In addition, copies of the meeting minutes and handouts are also available at the AR File maintained at Building 307 at former MCAS El Toro by Ms. Rawal. Documents can be viewed by appointment; (call Ms. Rawal at (949) 726-5398 between 9am and 1pm Monday through Thursday).

Final minutes from previous RAB meetings can be found on the internet at the Navy BRAC website: [www.bracpmo.navy.mil](http://www.bracpmo.navy.mil)

## INTERNET SITES

### *Navy and Marine Corps Internet Access*

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

### *Department of Defense - Environmental Cleanup Home Page Web Site:*

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

### *U.S. EPA:*

Homepage: [www.epa.gov](http://www.epa.gov)

Superfund information: [www.epa.gov/superfund](http://www.epa.gov/superfund)

National Center for Environmental Assessment: [www.epa.gov/ncea](http://www.epa.gov/ncea)

Federal Register Environmental Documents: [www.epa.gov/federalregister](http://www.epa.gov/federalregister)

### *Cal/EPA:*

Homepage: [www.calepa.ca.gov](http://www.calepa.ca.gov)

Department of Toxic Substances Control: [www.dtsc.ca.gov](http://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](http://www.dhs.ca.gov)

Santa Ana Regional Water Quality Control Board: [www.waterboards.ca.gov/santaana](http://www.waterboards.ca.gov/santaana)

### *Additional Websites: Reuse and Redevelopment*

Orange County Great Park: [www.ocgp.org](http://www.ocgp.org)

Great Park Conservancy: [www.orangecountygreatpark.org](http://www.orangecountygreatpark.org)

Heritage Fields LLC, a joint venture of Lennar Homes of California, Inc. LNR Property Corporation Rockpoint Group, L.L.C: [www.lennar.com](http://www.lennar.com)

City of Irvine Planning Commission:

[www.ci.irvine.ca.us/council/comms/planning/default.asp](http://www.ci.irvine.ca.us/council/comms/planning/default.asp).



# INSTALLATION RESTORATION PROGRAM (IRP) SITES 18 AND 24 REMEDIAL ACTION STATUS

*Presented By*  
**Marc P. Smits, P.E.**  
**Base Realignment and Closure (BRAC) Program**  
**Management Office West**  
**December 3, 2008**



## OVERVIEW

- SITE DESCRIPTION
- SYSTEM OPERATIONS UPDATE
- MAINTENANCE ACTIVITIES
- GROUNDWATER MONITORING
- SYSTEM OPTIMIZATION
- FUTURE ACTIVITIES
- PROJECT DOCUMENTS

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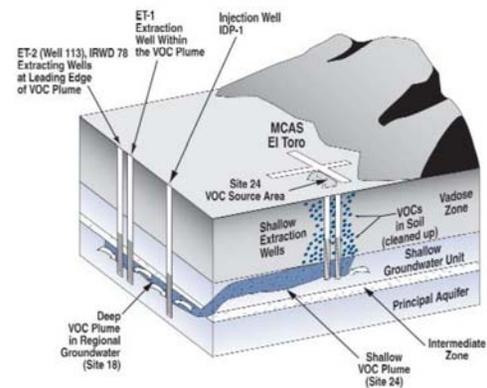
## SITE DESCRIPTION

- Past operations and aircraft maintenance activities at Site 24 (source area) used solvents including volatile organic compounds (VOCs), primarily trichloroethylene (TCE)
- VOCs traveled through the soil to the Shallow Groundwater Unit (IRP Site 24) and migrated to the Principal Aquifer (IRP Site 18)
- Cleanup remedy including groundwater extraction and treatment was selected in the Final Record of Decision (June 2002)
- Soil remedy implemented and no further action achieved in 2006
- Groundwater cleanup being coordinated under a Settlement Agreement between the Navy, Department of Justice, Irvine Ranch Water District (IRWD), and Orange County Water District (OCWD)

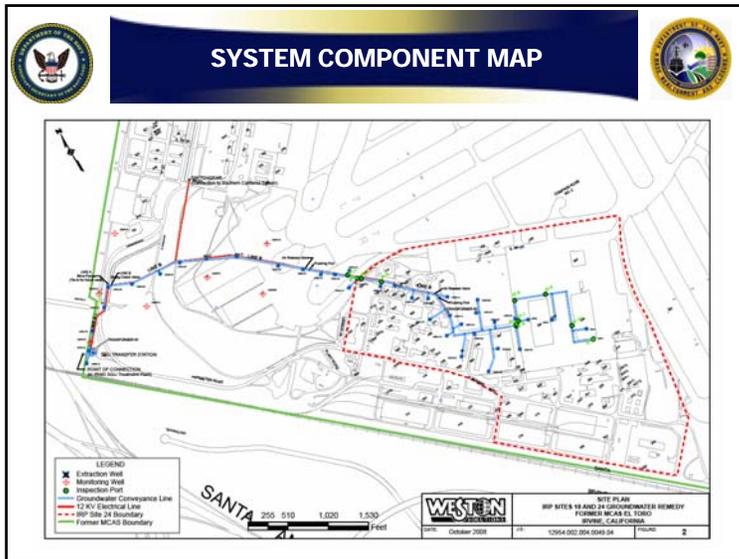
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## SITE CONCEPTUAL MODEL

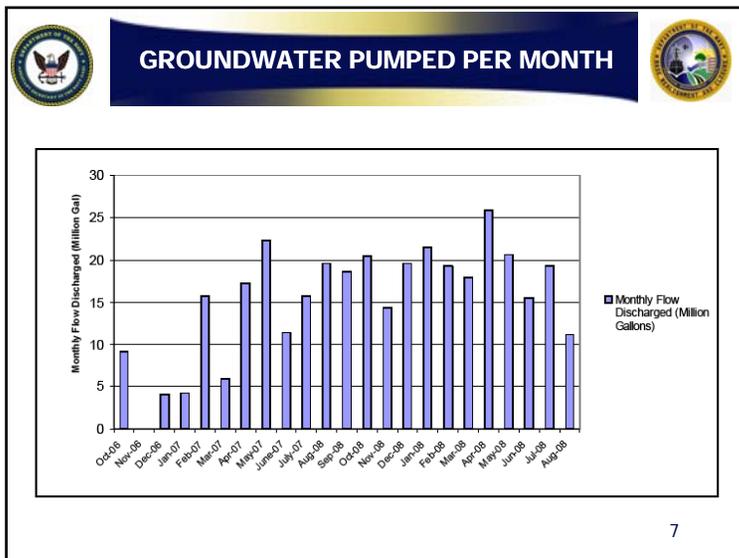


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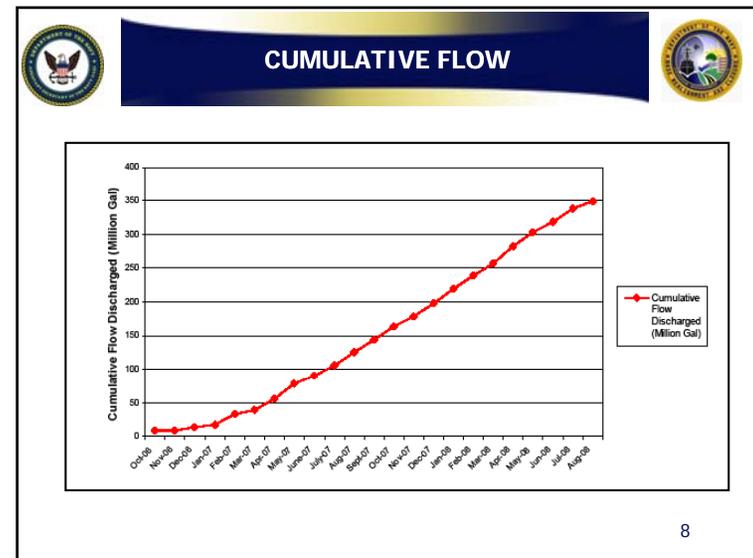


- ## SYSTEM OPERATION UPDATE
- System has been operating at a system uptime efficiency of 94.2% in Second Year of Operation (September 2007 to August 2008)
  - Flow rates from the combined wells averaged 423 gallons per minute between September 2007 and August 2008
  - To optimize pumping along the station boundary and hot spots, wells throughout the plume are pumped using a “phased” approach
  - Total groundwater pumped to IRWD treatment plant as of 28 November 2008 is approximately 389 million gallons of groundwater
  - Approximately 650 pounds of volatile organic compounds (VOCs), mainly trichloroethylene (TCE), removed from the groundwater since startup

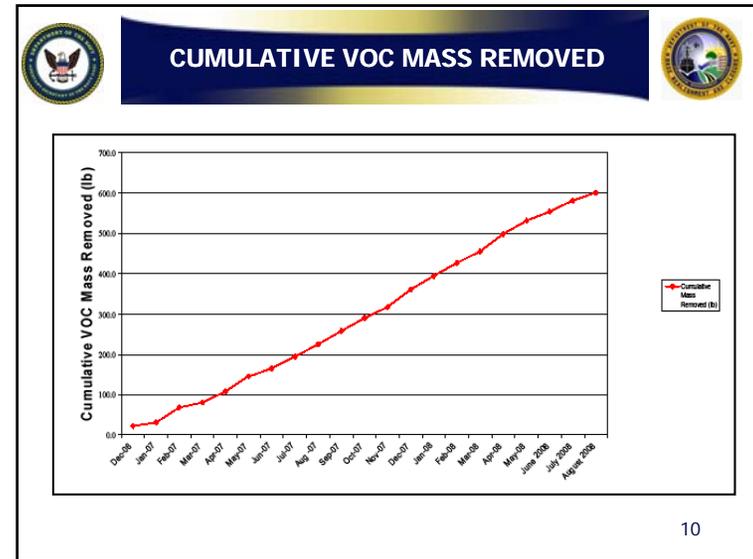
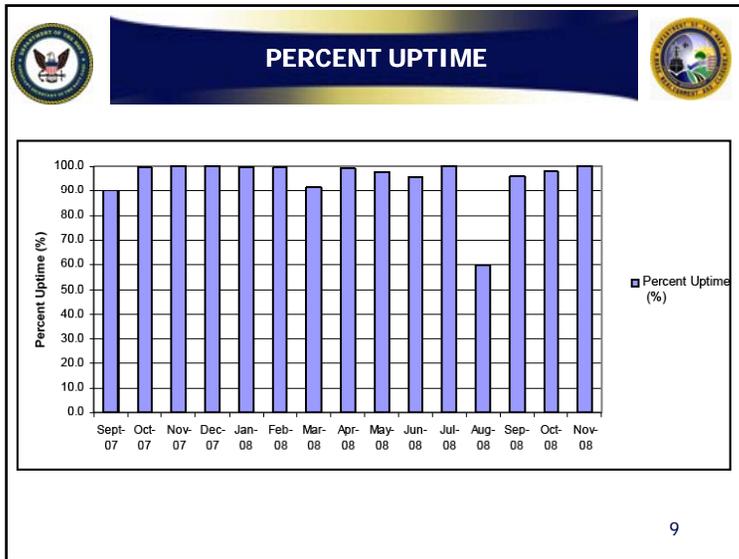
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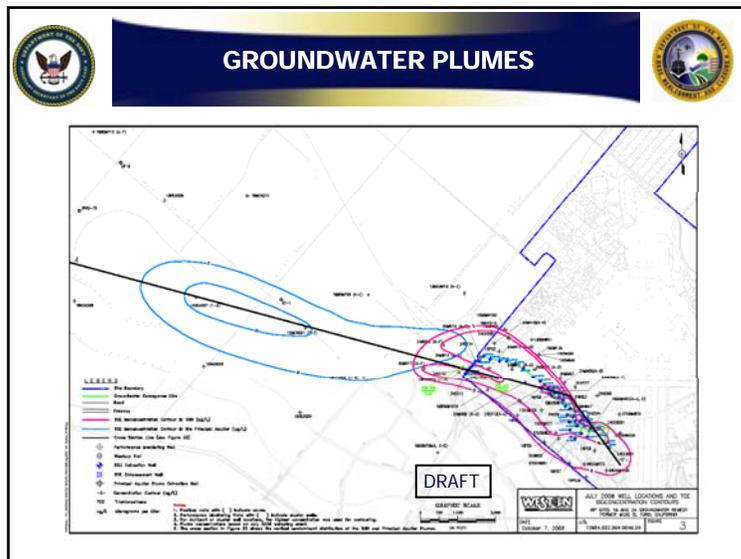


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- ## MAINTENANCE ACTIVITIES
- Weekly Inspections (transfer station equipment, wellhead equipment, and detection of alarms)
  - Monthly Inspections (transfer pumps, all valves, fire extinguisher, leak detection ports)
  - Annual Inspections (clean out equalization tanks, checking sensors, calibration of meters, function test air-release valves)
  - IRWD conducted an annual inspection of the associated Shallow Groundwater Unit (SGU) Treatment System in August 2008
  - Limited non-routine maintenance required over the second year of operation (transducers and electrical components)
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- ## GROUNDWATER MONITORING
- Collection of groundwater data, including water levels, is the basis for conducting evaluations of the effectiveness of the groundwater remedy
  - Groundwater samples and water levels are collected from up to 151 wells or ports located throughout IRP Sites 18 and 24 on a quarterly basis
  - Samples are collected at various depths throughout the shallow groundwater unit and the principal aquifer
  - Extraction wells are sampled on a monthly basis for VOCs
  - Influent to the transfer station is samples monthly to evaluate the concentrations prior to pumping to the IRWD treatment system
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- ## SYSTEM OPTIMIZATION
- Optimization consists of strategies for improving the system efficiency over time to facilitate meeting the remedial action objectives (RAOs)
  - Typical optimization strategies include:
    - changes in pumping rates
    - modifying system components (e.g., larger well pumps)
    - adding system components (e.g., new extraction wells)
  - Performance data can be utilized to evaluate the system performance in comparison to the initial modeling for the plumes
  - Comparison helps to identify areas in the system that could be optimized to ensure the effectiveness of the overall system

- ## FUTURE ACTIVITIES
- Comprehensive performance monitoring program is in place which includes monitoring of pumping rates, water levels, extraction wells, and other sampling locations
  - Status reports on the performance of the groundwater cleanup system are provided annually to the regulatory agencies and water districts
  - Comprehensive evaluations of the system will be performed every 5 years to ensure it remains effective and protective of human-health and the environment
  - Long-term cleanup requires continuous evaluation to optimize the system and meet RAOs

- ## PROJECT DOCUMENTS
- ### EXISTING DOCUMENTS
- INTERIM-REMEDIAL ACTION COMPLETION REPORT – Documents the remedy components are in place per the design (e.g., As-Built Drawings)
  - OPERATION AND MAINTENANCE MANUAL – Provides guidance and requirements to operate and maintain the groundwater extraction wellfield and conveyance system at IRP Site 24
  - PERFORMANCE MONITORING AND SAMPLING AND ANALYSIS PLAN – Identifies the monitoring and analysis methods to evaluate the performance of the IRP Sites 18 and 24 remedies
  - ANNUAL REMEDY STATUS REPORT (SEP 06 – AUG 07) – Documents and evaluates the data collected for the first year of groundwater monitoring and operation at IRP Sites 18 and 24



## PROJECT DOCUMENTS



### FUTURE DOCUMENTS

- ANNUAL REMEDY STATUS REPORT (SEP 07 – AUG 08)
  - Documents and evaluates the data collected for Second Year of groundwater monitoring and operation at IRP Sites 18 and 24
  - Includes a Technical Memorandum on Capture Zone Analysis
  - Scheduled to be issued in December 2008
  
- OPERATING PROPERLY AND SUCCESSFULLY REPORT
  - Documents that the remedy is operating as designed, operation will achieve the cleanup levels or performance goals in the Record of Decision, and is protective of human health and the environment
  - Scheduled to be issued January 2009
  
- FIVE-YEAR REVIEW
  - Evaluates whether the remedy is performing as intended and remains protective of human health and the environment
  - Scheduled to be issued in September 2009

# IRVINE RANCH WATER DISTRICT

## MEMORANDUM

TO: **Former MCAS El Toro  
Restoration Advisory Board**

FROM: **John Hills**

DATE: December 3, 2008

FILE NO.: RAB Update 12-03-08.doc

SUBJECT: **Irvine Desalter Project Update – One Year Period ending September 30, 2008**

### **Site 18 Principal Aquifer CERCLA Components**

- Well ET-1 at Jeffrey and Irvine Center Drive
- Principal Aquifer Treatment Plant at ET-1
- Well ET-2 at Culver and Irvine Center Drive
- Well 78 at Culver and Warner

### **Principal Aquifer Well ET-1 Status**

- Started pumping August 16, 2006, with the well water being treated at the Principal Aquifer Treatment Plant.
- Year total – 1,319 AF or 429,894,690 gallons (annual daily average of 818 gpm).
- Raw well water quality (sampled quarterly) – averaged 6.9 ppb TCE.
- Well ET-1 was run for 12 months during the reporting period (2 months more than the desired 10 months).
- There were a few periodic well pump failures, lasting not more than a few days at a time.

### **Principal Aquifer Treatment Plant at ET-1**

- Started treating August 16, 2006, with the treated effluent discharging into the IRWD non-potable water system.
- Effluent water quality – non-detect, less than 0.5 ppb (goal is less than 5 ppb).
- During the initial year, the low-profile air strippers were not properly operating (flooding occurred in the air stripper trays) at the 1,000 gpm well discharge rate. The well pump was adjusted to approximately 850 gpm to have proper air stripper operations.
- There were periodic air stripper, carbon adsorber, antiscalant addition, and discharge pump interruptions/failures, lasting not more than a few days at a time.
- Carbon change-out for both carbon adsorber tanks occurred on May 1, 2008.

### **Principal Aquifer Well ET-2 Status**

- Started pumping January 3, 2007, with the well discharging into the IRWD non-potable water system.
- Year total – 1,328 AF or 432,743,056 gallons (annual daily average of 823 gpm).
- Water Quality – averaged 0.9 ppb TCE.

- The well is set to produce approximately 1,000 gpm, depending on water depths.
- Well ET-2 was run for 12 months during the reporting period (2 months more than the desired 10 months).
- There were periodic pump failures, lasting not more than one day at a time.

**Principal Aquifer Well 78 Status**

- Started pumping April 25, 2006, with the well discharging into the IRWD non-potable water system.
- Well motor burned out in September 2007 due to a damaged flexible pump column. The rebuilt motor and hard-piped pump column were reinstalled on April 2, 2008. This resulted in the well running for only 6 months during the reporting period, rather than the desired 10 months.
- In November 2008, the pump shut down and staff is currently performing pump diagnostics.
- Year total – 395 AF or 128,551,255 gallons (annual daily average of 245 gpm).
- Water Quality – averaged 1.0 ppb TCE.
- Well is pumping at the desired 600 gpm flow rate.

**Principal Aquifer TCE Removed (pounds) for One Year Period ending 9/30/08**

• Well ET-1	25
• Well ET-2	3
• Well 78	1
• TOTAL	29

**Shallow Groundwater Unit Treatment Plant**

- Started treating October 11, 2006, with all treated effluent being conveyed to the Aliso Creek ocean outfall. Effluent is not being injected to Well IDP-1 due to slightly elevated perchlorate levels (8 to 11 ppb) – the limit is 6 ppb.
- Year total – 669 AF or 217,948,884 gallons (annual daily average of 415 gpm). The contractual flow volume is 208,000,000 gallons per year.
- Effluent water quality – no permit exceedances.
- Carbon change-out for both carbon adsorber tanks occurred on April 30, 2008
- Carbon change-out for one carbon adsorber tank occurred on October 2, 2008



# WELCOME



## Installation Restoration Program (IRP) Sites 1 & 2 Groundwater Pilot Study Update Former MCAS El Toro, California Restoration Advisory Board Meeting December 3, 2008

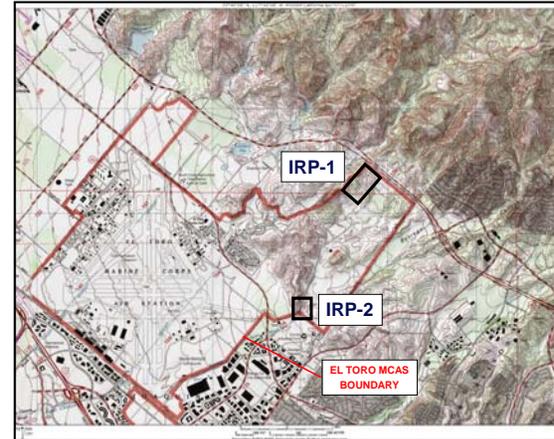
*Presented By*

Jim Callian, PG, CEG, CHG, Navy BRAC Project Manager  
Dan Herlihy, PG, CEG, CHG, ECS Project Manager

1



# Project Location Map



2



# Pilot Study for *In Situ* Bioremediation of Perchlorate



- Purposes of Pilot Study
  - Gather site-specific performance data to reduce the uncertainty with respect to overall effectiveness of *in situ* remediation of perchlorate-impacted groundwater associated with IRP Site 1
  - Evaluate whether *in situ* treatment of perchlorate-impacted groundwater at the Station Boundary is complimentary to treatment of trichloroethene (TCE)-impacted groundwater associated with IRP Site 2
  - Refine cost estimates for remedial alternatives

3

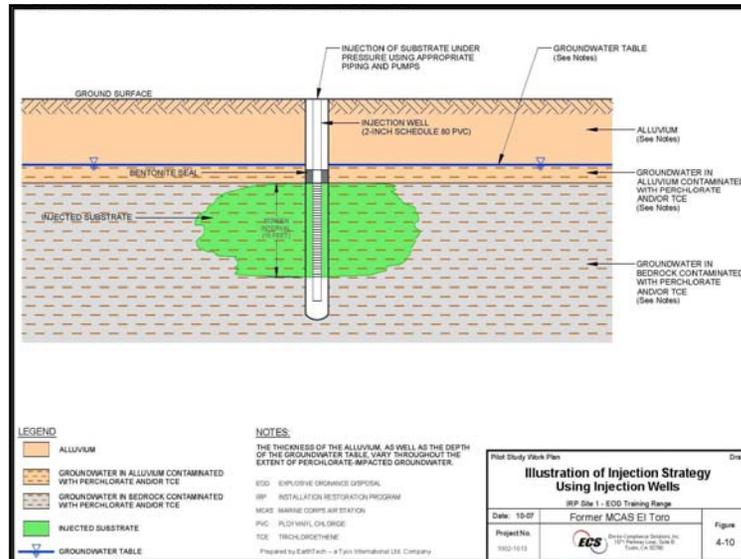


# Pilot Study Specific Objectives



- Evaluate/Determine:
  - Effectiveness of emplacement techniques (regular injection and hydraulic fracturing)
  - Design parameters including radii of influence and volume of amendments needed
  - Effectiveness of direct injection and permeable reactive barrier (PRB)
  - Amendment longevity and reapplication time frames
  - Whether *in situ* treatment of perchlorate is complimentary to the *in situ* treatment of commingled TCE-impacted groundwater at IRP Site 2, near the Station Boundary

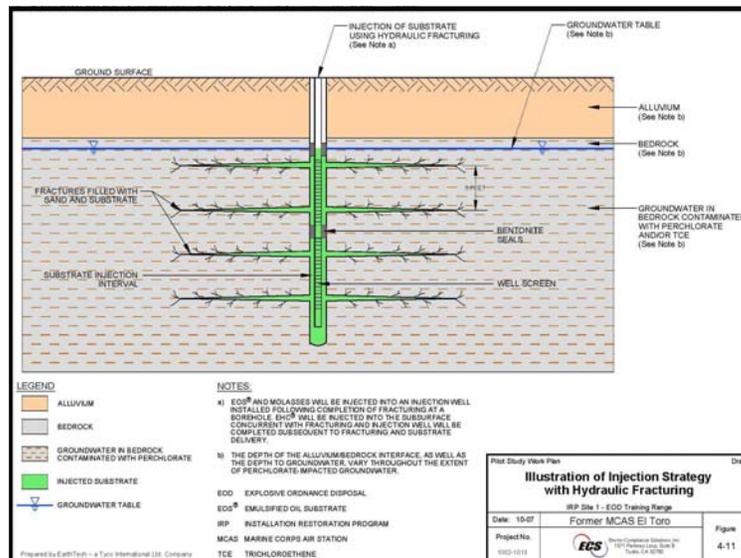
4



## Substrate Emplacement Using Injection Wells

- Injection wells (2-inch diameter) installed with screen intervals of 15 feet
- Known volumes of a slow release substrate (e.g. EOS® or EHC®) mixed with a conservative tracer (sodium bromide) pressure-injected at locations at the Source Area (EOS® at SAI) and at the Station Boundary (EHC® at SBI)
- Groundwater monitoring conducted in these areas to evaluate
  - Subsurface distribution of the injected substrate
  - Changes in geochemical conditions and perchlorate concentrations

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## Substrate Emplacement Using Hydraulic Fracturing

- A bioremediation substrate mixed with a conservative tracer, sodium bromide, and a fluorescent dye would be injected into subsurface using hydraulic fracturing (over-pressurized)
- A slurry mixture containing a proppant (sand) and a viscous fluid (guar gum and water mixture) pressure-injected to create fractures
  - Source Area Fracturing (SAF) Site 1 :
    - EOS® (slow release substrate) injected with a color dye using injection wells
  - Station Boundary Fracturing (SBF) near Site 2 :
    - EHC® (slow release substrate) mixed with the slurry mixture and color dye
- At each location, fractures would be created every 5 feet (vertically) to cover the entire thickness of perchlorate plume
- Depth-discrete groundwater sampling and continuous coring used to identify locations and distribution of fractures
- Monitoring conducted following fracturing and substrate injection to:
  - Assess subsurface distribution of the injected substrate
  - Evaluate the changes in geochemical conditions and perchlorate concentrations.

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