Final
91st Restoration Advisory Board (RAB) Meeting Minutes
FORMER MARINE CORPS AIR STATION (MCAS) TUSTIN

Meeting Location: Tustin Senior Center, Tustin, California
Meeting Date/Time: 01 December 2010/7:08 PM – 8:47 PM
Minutes Prepared by: Matt Brookshire, CDM Federal Programs Corporation (CDM)

Attachment:

1. Presentation: Update on Operable Unit (OU)-4B Pilot Study.

WELCOME/INTRODUCTIONS/AGENDA REVIEW:

Mr. Jim Callian, the Base Realignment and Closure (BRAC) Environmental Coordinator (BEC) and Navy RAB Co-Chairman, welcomed everyone and introduced the RAB community Co-Chairman, Mr. Don Zweifel. Self-introductions were performed for those in attendance. A total of 18 attendees were at the RAB meeting.

GENERAL ANNOUNCEMENTS

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

- Mr. Callian reminded everyone to sign-in for tonight's RAB meeting. A sign-in sheet requesting everyone's email addresses is also being circulated. Since the next official RAB meeting will not be held until May 2011, the Navy will be sending out an email update in February 2011. If you do not have an email address, please list your mailing address and the Navy will send the February 2011 update to you in the mail.
- Mr. Zweifel stated that tonight was the 91st RAB meeting and that the former MCAS El Toro recently had its 100th RAB meeting. Both are significant milestones and show the communities commitment to the RAB.
- Mr. Zweifel stated that Dr. Robert Kopecky (RAB Member) had contacted him and has an excused absence from tonight's meeting. Mr. Callian added that Ms. Susan Reynolds (RAB Member) had contacted him and she also has an excused absence for tonight's meeting. Mr. Ram Peddada (Department of Toxic Substances Control [DTSC]) could not attend tonight's meeting due to a conflict with another Public Meeting. Mr. Dave Murchison from DTSC is here in attendance, representing DTSC. Mr. Murchison stated that Mr. Peddada sends his apologies for not being able to attend tonight's RAB meeting.
- Mr. Zweifel stated that Dr. Kopecky had noted that the South Coast Community College District has some remediation concerns and would like Mr. Matt Suarez (RAB Member) to address these concerns. Mr. Suarez stated that Dr. Kopecky had not contacted him and did not know what specific concerns he had. Mr. Callian reminded the RAB that only Navy remediation related topics would be addressed at the RAB meetings.

- Mr. Suarez requested the Navy to update the RAB on the Finding of Suitability for Transfer (FOST) #9. Mr. Callian stated that the Navy is not ready at this time to discuss FOST #9. Ms. Kaleena Johnson (Environ) asked what the process is for the FOST. Mr. Callian stated the Navy is responding to DTSC comments, and upon reaching agreement with DTSC, a draft final FOST will be submitted, any additional comments will be addressed and then the FOST will be finalized. Ms Johnson asked what the public review period is for the FOST. Mr. Callian indicated that there is no public review for FOSTs. After a FOST is finalized, the land described in the FOST becomes available for transfer. Mr. Suarez asked what the delay is, because the RAB had expected to see FOST #9 in October 2010. Mr. Callian stated the Navy and DTSC are working on language regarding land use issues and institutional controls (ICs).
- Mr. Callian reviewed the RAB meeting agenda for the evening's meeting; no changes to the agenda were suggested by the RAB.
- Mr. Callian requested approval from the RAB members and Mr. Zweifel on the 15 September 2010 RAB Draft Meeting Minutes. Mr. Zweifel requested input/comments from RAB members. Several RAB members stated they had no comments. Ms. Mary Lynn Norby (RAB Member) stated that she was not at the last RAB meeting and therefore would not provide any input on the Meeting Minutes. The Minutes were approved without any changes. Mr. Callian stated the Minutes would be finalized and uploaded to the BRAC website.
- Mr. Callian presented slides listing key Navy and Regulatory Agency contacts; RAB points of contact; the locations and hours of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Administrative Record (AR) File; the locations and hours of the Information Repository (IR); and environmental and reuse/redevelopment websites.
- Mr. Callian discussed that the next former MCAS Tustin RAB meeting is scheduled for 18 May 2011 and will be held from 7pm to about 8:30pm. He also stated that the RAB mailer would be distributed a few weeks prior to the meeting, and if anyone had any trouble in receiving the mailer, they should contact him. Mr. Zweifel stated that he had a concern with postponing the next RAB meeting until May 2011. Mr. Callian reminded the RAB that at the last RAB meeting (September 2010) he had given a presentation on upcoming documents for review and reducing the number of RAB meetings in 2011 from four to two and that the RAB had agreed with this approach.
- Mr. Callian stated that at the next RAB meeting (May 2011) we would hold the Community Co-Chair election. Nominations for the position can be made tonight, sent to Mr. Callian, or could be provided at the next in-person RAB meeting. The last election was held on 06 August 2008.

ENVIRONMENTAL STATUS UPDATE

Mr. Callian provided an overview of the Environmental Status Update.

- The Environmental Status Update is incorporated into the PowerPoint presentation and in the handouts. Mr. Callian noted that several new acronyms have been added to the Environmental Status Update and the acronyms can be found on the last page.

- OU-1A and -1B: Both OU-1A and -1B are on similar tracks, so monitoring and reporting are performed on the same schedule. Since the last RAB meeting, the following reports have been submitted: the 2nd Quarter Groundwater Progress Monitoring Report (PMR) (September 2010) and the Final 2009 Annual OU-1A and -1B Groundwater Performance Evaluation Report (PER) (November 2010). PERs are annual documents wherein the Navy provides optimization of the monitoring systems. On-going operation and maintenance (O&M) activities include biweekly, monthly, and quarterly inspections; quarterly effluent sampling for Orange County Sanitation District (OCSD) for discharge permit requirements; quarterly groundwater monitoring and reporting; and annual system optimization. In December 2010, the Navy will issue the 3rd Quarter 2010 Groundwater PMR.
- OU-3: This is Installation Restoration Program (IRP) Site 1. No reports have been submitted since June 2010. The Navy is continuing O&M activities at this site. In December 2010, the Navy will issue the Final 2009 Annual Long-Term Monitoring Report that will be issued as replacement pages. In March 2011, the Navy will submit the Draft 2010 Annual Long-Term Monitoring Report.
- OU-4B: This includes three Moderate Concentration Sites (IRP-5S[a], IRP-6, and the Mingled Plumes Area [MPA]) and three Low Concentration Sites (IRP-11, IRP-13W, and Miscellaneous Major Spill [MMS]-04). In October 2010, the Navy submitted the Final 2009 Annual Groundwater Monitoring Report and the Final First Quarter 2010 Data Summary Report. In November 2010, the Navy submitted the Final Second Quarter 2010 Data Summary Report. The presentation later tonight will be on the pilot study being conducted at the three moderate concentration sites. As part of pilot testing, the Navy will be injecting substances into the groundwater to lower the contamination concentrations. Six reports to be submitted in 2011 are: the Draft 2010 Annual Groundwater Monitoring Report (January 2011); the Draft Pre-Design Summary Report (February 2011); the Draft Remedial Action Completion Report (RACR) for MMS-04 (March 2011); the Final Pre-Design Summary Report (April 2011); the Draft Remedial Design/Redial Action (RD/RA) Work Plan for Low Concentration Sites IRP-11 and -13W (May 2011); and the Final 2010 Annual Groundwater Monitoring Report (May 2011). Mr. Callian noted that for MMS-04, one year of groundwater monitoring was performed with concentrations well below the cleanup goal, so per the Final Record of Decision (ROD) the site is being recommended for no further action.
- Methyl Tert-Butyl Ether (MTBE) Plume (Underground Storage Tank [UST] Site 222): In October 2010, the Navy submitted the 2nd Quarter 2010 Groundwater Monitoring Data Summary. In November 2010, the Navy submitted the Final 2009 Petroleum Corrective Action Plan (PCAP) Annual Report that included the annual system optimization evaluation. On-going O&M activities include quarterly groundwater monitoring and quarterly effluent sampling for OCSD permit requirements. In December 2010, the Navy will submit the 3rd Quarter 2010 Groundwater Monitoring Data Summary. In April 2011, the Navy will submit the Draft 2010 PCAP Annual Report.

Mr. Zweifel asked what a miscellaneous major spill is. Mr. Callian stated that in this case, it was a name given to one of the OU-4B Low Concentration Sites that is being addressed through the CERCLA process. Mr. Zweifel asked if it has more than one contaminant. Mr. Callian indicated that for this site, the only contaminant is trichloroethene (TCE).

Mr. Zweifel asked when the OCSD issued the Navy a permit for UST Site 222. Mr. Callian stated that the permit was issued prior to the Navy discharging clean treated groundwater from the system into the sewer. Mr. Zweifel asked if the groundwater is treated then why does the Navy have to monitor the effluent. Mr. Callian stated that the permit has specific requirements that the Navy must meet concerning monitoring effluent concentrations, to assure that contaminants are not discharged into the sewer. The effluent has been well below all discharge requirements of the permit.

Mr. Harry Takach (PSEC) asked if the groundwater reports discussed in the Environmental Status Update would be on the BRAC website. Mr. Callian stated that they are not placed on the website and stated that copies of the documents can be reviewed at the AR File at MCAS El Toro. Mr. Murchison stated that once a report goes final, it could be viewed on the DTSC EnviroStor website. Ms. Norby asked where the documents could be reviewed prior to them becoming final. Ms. Content Arnold (Navy Lead Remedial Project Manager [RPM]) stated the draft and final versions could be found at the Navy's IR, and the AR File. Mr. Zweifel asked if the documents could be provided on compact disk. Mr. Callian stated that he would take that into consideration.

Ms. Johnson (Environ) stated for UST Site 222 that the Navy was possibly considering a separate remedy for the second water-bearing zone (WBZ); is there any update on this? Mr. Callian stated the Navy is exploring a number of options to achieve site closure. Ms. Johnson asked if the evaluation of the options could be provided in a report. Mr. Callian stated the Navy would continue to work with the RWQCB to implement the Final PCAP and ultimately achieve site closure.

REGULATORY AGENCY UPDATE

Mr. Dave Murchison (DTSC)

Mr. Murchison provided an overview of the documents that DTSC had recently reviewed. These documents include the 2nd Quarter Groundwater 2010 PMR for OU-1A and -1B, the First Quarter 2010 Data Summary Report for OU-4B, the 1st Quarter 2010 Groundwater Monitoring Data Summary for UST Site 222, and the Final 2009 Annual Groundwater Monitoring Report for OU-4B.

Mr. Callian stated that one could obtain access to the groundwater documents from the Community Co-chair, as he is responsible for disseminating information to the other RAB members. Mr. Suarez asked Mr. Murchison about an update for FOST #9. Mr. Murchison stated that he could not provide an answer on that question because he is not involved with that document. Mr. Callian reiterated that the Navy is still working through some issues on FOST #9 with DTSC.

PRESENTATION: OU-4B PILOT STUDY UPDATE

Mr. Sean McGoey (Navy Project Manager) initiated the presentation by introducing himself and the Navy's contractor, Ms. Rebecca Lesher of Oneida Tribal Integrated Enterprises (OTIE), who will give the presentation.

A summary of the presentation included:

- Mr. McGoey stated that the Navy had provided a presentation in May 2010 on the OU-4B pre-remedial design pilot study. The pilot study was conducted between July and October 2010 (Slide 1). Mr. McGoey then turned the presentation over to Ms. Lesher. Ms. Lesher reminded the RAB that she had attended the May 2010 RAB meeting to present the goals of the pilot study.
- Slide 2 provided a brief outline of the presentation and the project schedule.
- Slide 3 presented the remedy overview which included a discussion of the ROD, and the following remedial action objectives: 1) to protect human health by limiting use of shallow groundwater exceeding health-protective levels and 2) to reduce concentrations of contaminants of concern (COCs) in groundwater to health-protective levels. Chemical-specific cleanup goals are Federal Maximum Contaminant Levels (MCLs): 5 micrograms per liter (µg/L) for TCE at all OU-4B sites and 6 µg/L for 1,1-dichloroethene (DCE) at IRP-6.
- Slide 4 showed locations for the Low Concentration Sites (IRP-11, IRP-13W, and MMS-04) and for the Moderate Concentration Sites (IRP-5S[a], IRP–6, and the MPA).
- Slide 5 shows the remedies selected in the Final ROD. The remedy selected for the Low Concentration Sites is Alternative 2: ICs, which includes preventing extraction and use of groundwater, monitoring, and 5-year reviews, as appropriate. The remedy selected for the Moderate Concentration Sites is Alternative 4: In-situ bioremediation (ISB)/monitored natural attenuation (MNA) and ICs, which includes ISB to achieve remedial goals, MNA as necessary to track concentrations until remedial goals are met, and ICs to prevent extraction and use of groundwater.
- Slide 6, Ms. Lesher indicated that the objectives of the pilot study for the Low Concentrations Sites are to evaluate sufficiency of the current monitoring well networks and to install wells as necessary, to provide sufficient monitoring well networks at each of the sites.
- Slide 7 presented results for the first WBZ at IRP-11. The current three monitoring wells provide a sufficient monitoring network. Two Hydropunch™ samples collected in July 2010 confirmed that TCE concentrations have decreased. The extent of the TCE plume will be refined.
- Slide 8 presented results for the first WBZ at IRP-13W. The current four monitoring wells provide a sufficient monitoring network. TCE concentrations are generally just above the remediation goal of 5 µg/L.
- Slide 9 presented results for the first WBZ at MMS-04. This Site has one well. One year of quarterly monitoring indicates TCE concentrations are well below the remedial goal for TCE. Based on the ROD, no further action will be requested. A RACR is currently being prepared for this Site.
- Slide 10, Pilot Study objectives for the Moderate Concentration Sites are to 1) evaluate the sufficiency of the current monitoring well networks and install wells as necessary, to provide sufficient monitoring well networks at the sites , 2) evaluate ISB parameters for the RD, and 3) perform baseline monitoring to evaluate current geochemical conditions.

- Slide 11 presented activities for the first WBZ at IRP-5S(a). One new upgradient well was installed, one new well was installed in support of pilot testing, and two Hydropunch™ samples were collected to supplement plume delineation.
- Slide 12 presents results obtained for IRP-5Sa that were consistent with previous data and plume delineation. Injection of sodium lactate, which acts like a sugar for the bacteria, with dehalococcoides (DHC) into five injection wells occurred on 22 July 2010 and resulted in a radius of influence (ROI) of approximately 10 feet. Concentrations of daughter products of TCE were seen to increase slightly within the ROI. DHC is the only known bacteria that completely break down TCE and its daughter products to non-toxic compounds.
- Slide 13 presented the monitoring well network at the MPA. A total of 10 Hydropunch™ samples were collected in the first WBZ and 1sample was collected in the second WBZ to update plume delineations. One new well was installed on the eastern flank of the plume and three new wells were installed to supplement the network for the pilot test locations.
- Slide 14 presented the first location of the pilot study at the MPA. Sodium lactate with no bioaugmentation was injected into five borings on 21 July 2010: results indicated an ROI of less than 10 feet. The low native DHC population limited the reductive dechlorination for this application, but did provide evidence that DHC is naturally occurring at this location.
- Slide 15 presented the second location at the MPA. Emulsified vegetable oil (EVO) with no bioaugmentation was injected into five borings on 21 July 2010; results indicated an ROI of approximately 5 feet. The results indicated that a barrier type application appears to be effective. EVO provides a food source for DHC bacteria over a much longer period of time.
- Slide 16 presented the monitoring well network for IRP-6. Two new wells were installed to supplement the monitoring well network (at upgradient and in-plume locations).
- Slide 17,EVO and DHC were injected into 13 borings on 26, 27, and 28 July 2010; results indicated an ROI of 15 to 20 feet. At the end of the pilot study, groundwater samples were collected from the second WBZ and results showed no migration of contamination from the first WBZ into the second WBZ.
- Slide 18, presented the results of the ISB pilot study in a graphical format. The results indicate that concentrations of TCE and 1,1-DCE decreased, with an increase in daughter product concentrations; DHC populations also increased. Genetic testing indicated the presence of a vinyl chloride reductase functional gene, which indicates that the DHC population will reduce the vinyl chloride to innocuous by-products. These data show that the pilot study approach will work for a larger scale implementation for site remediation.
- Slides 19, 20, and 21 presented photos from the fieldwork. Slide 19 presented the track-mounted direct-push rig used for hydropunch sampling and monitoring well installation. Slide 20 presented equipment being used to inject EVO with bioaugmentation. Slide 21 presented the actual injections and associated equipment at IRP-6.
- Slide 22, provided an overall summary of the pilot study. Sufficient monitoring well networks exist at the sites. Need to reevaluate each of the plume extents based on new/recent groundwater data. The RD will be completed using the results of the pilot study; results indicate that injecting EVO with bioaugmentation appears to be effective in completely degrading the COCs and daughter products to innocuous compounds.

- Slide 23, presented the schedule for the project. The Draft Pre-Design Summary Report is scheduled for February 2011, the Draft MMS-04 RACR is scheduled for March 2011, the Draft RD/RA Work Plan for Low Concentration Sites is scheduled for May 2011, and the Draft RD/RA Work Plan for the Moderate Concentration Sites is scheduled for July 2011.
- Slide 24 presented the acronyms for the presentation.

Mr. Suarez asked why not inject both EVO and sodium lactate. Ms. Lesher stated the EVO already contains some sodium lactate and that EVO is most effective over the long term.

Mr. Todd Schmieder (community member) asked how many injections would be expected in the RA. Ms. Lesher stated that the number could be one injection at each site, but more likely more than one would be needed. The RD will evaluate the number of anticipated injections. Mr. Schmieder asked what the duration of an injection is. Ms. Lesher stated that they could typically do a grid of five injections in one day.

Mr. Chris Crompton (RAB Member) asked why the method detection limits, on Slide 17, seem to vary in the results tables. Ms. Lesher stated that what are presented are actually the reporting limits. The lab sometimes has to dilute samples, which affects the reporting limits. The data presented are draft and will be fully validated prior to being presented in a report. Mr. Callian noted that J-flagged data indicate concentrations between the reporting limit and the method detection limit. When a concentration is below the method detection limit then the concentration is reported as non-detected. Mr. Murchison stated that the Regulatory Agencies wanted to know detected concentrations, even if they are estimated. If a report has lots of non-detects with reporting limits close to the remedial action objectives, the regulators would comment on this as a concern.

Ms. Norby (RAB Member) asked if the groundwater contamination shown in Slide 8 is under the homes located at that site. Mr. Callian stated that the answer is yes, but ICs are in place and risk assessments have been performed that indicate the groundwater contamination should not affect the residents. Ms. Arnold stated this area was transferred as an early transfer parcel under a Finding of Suitability for Early Transfer (FOSET). DTSC reviewed the FOSET and agreed with the document. Ms. Norby asked if the homeowners assume the responsibilities of this contamination. Mr. West stated that Lennar was given the deed to this parcel and they provide the information to the homebuyers.

Ms. Norby asked if on Slide 12, the contamination is only in the first WBZ. Ms. Lesher indicated that it was only in the first WBZ.

Ms. Norby asked if the wells on Slide 13 are located within the Hangar. Ms. Lesher stated they are and that they drilled through the concrete floor to install the wells. The well vaults are flush-mounted with the floor, and would not impede any uses for the hangar.

MEETING SUMMARY AND CLOSING COMMENTS

In closing, Mr. Callian stated the next meeting is scheduled for 18 May 2011 and asked for possible topics for that meeting.

Mr. Suarez suggested a presentation on FOST #9. Mr. Zweifel stated that perhaps a sub-committee should be held to discuss FOST #9 and asked if anyone was interested in participating. Mr. Suarez stated that he would like to see the information first, and then decide about further evaluation such as a subcommittee meeting.

Mr. Zweifel stated that he would like all the RAB members to receive copies of Navy documents. Mr. Callian stated that he, the RAB Community Co-Chair, is responsible for disseminating documents to the RAB members. Mr. Suarez asked if an email could be sent to the RAB members when FOST #9 becomes available for public review. Mr. Callian stated that he could provide an email when the FOST is ready.

Mr. Callian recommended that a potential future topic could be an update on OU-4B or OU-3 based upon the timing of documents becoming available for public review.

Mr. Jerry Kirchgessner (RAB Member) asked if Mr. Matt West (RAB Member) could give an update on reuse issues of former MCAS Tustin. Mr. Callian stated that only Navy related cleanup topics will be addressed at the RAB Meeting and suggested speaking to Mr. West outside of the meeting for the requested information.

Mr. Callian thanked everyone for attending tonight's RAB meeting and noted the Navy's continued appreciation for the RAB Members commitment.

The 91st Tustin RAB Meeting was adjourned at 8:47pm.

LIST OF HANDOUTS PROVIDED AT THE MEETING

- 01 December 2010 Former MCAS Tustin RAB Meeting Agenda
- RAB Meeting Schedule
- Former MCAS Tustin - Where to Get More Information
- Environmental Websites
- MCAS Tustin Environmental Program Status
- Presentation Slides: Update on Operable Unit (OU)-4B Pilot Study
- Former MCAS Tustin RAB Mission Statement
- Former MCAS Tustin RAB Fact Sheet/Membership Application
- Former MCAS Tustin Mailing List Coupon

Copies of the meeting minutes and handouts provided at the 15 September 2010 RAB meeting are available at the CERCLA IR for former MCAS Tustin located at the University of California, Irvine, Main Library, Government Publications Section. Library hours are 8am to 7pm Monday through Thursday, 8am to 5pm Friday and Saturday, and 1pm to 5pm on Sunday. It is recommended that people call the library for confirmation of these hours as they may be modified during final exam and holiday periods. The Government Publications Section may be reached at (949) 824-7362. In addition, copies of the meeting minutes and handouts are also available at the CERCLA 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] 859-6014) between 9am and 1pm Monday through Thursday.

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

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INTERNET SITES

Navy and Marine Corps Internet Access

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

Department of Defense – Technical Information Center Home Page Web Site:

http://www.dtic.mil/dtic

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

Cal/EPA:

Homepage: www.calepa.ca.gov

Department of Toxic Substances Control: 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 Regional Water Quality Control Board: www.waterboards.ca.gov/santaana

Additional Websites: Reuse and Redevelopment

Orange County Great Park: www.ocgp.org

Great Park Conservancy: www.orangecountygreatpark.org

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December 2010

ENVIRONMENTAL PROGRAM STATUS
FORMR MARINE CORPS AIR STATION TUSTIN

Operable Unit 1A (Installation Restoration Program [IRP] Site 13 South – 1,2,3- Trichloropropane [TCP] plume)

Carve-Out: **CO-5**

Brief Project History:

- 2002: Time Critical Removal Action (hydraulic containment)
- 2004: Final Record of Decision (ROD): Selected remedy includes:
  - → Hydraulic containment of 1,2,3-TCP-impacted groundwater;
  - → Construction, operation, and maintenance of groundwater extraction and treatment system; and
  - → Institutional controls.

  Hot-spot soil excavation also conducted to enhance groundwater remedy.
- 2007: Began Final Remedial Design and Remedial Action Implementation
- December 2007: Treatment system operational
- July 2008: 1st Quarter 2008 Groundwater Progress Monitoring Report (PMR)
- October 2008: 2nd Quarter 2008 Groundwater PMR
- December 2008: Final Interim-Remedial Action Completion Report (I-RACR); the main purpose of the I-RACR is to document that the remedy was constructed per the Final Remedial Design
- December 2008: 3rd Quarter 2008 Groundwater PMR
- July 2009: 1st Quarter 2009 Groundwater Monitoring Data Summary
- September 2009: Final Long-Term Operation and Maintenance Plan (OMP)
- October 2009: 2nd Quarter 2009 Groundwater Monitoring Data Summary
- December 2009: 3rd Quarter 2009 Groundwater Monitoring Data Summary
- February 2010: Final 2008 Annual OU-1A and -1B Performance Evaluation Report (PER)
- February 2010: Final Operating Properly and Successfully (OPS) Report
  - → Obtained U.S. EPA OPS determination in December 2009
- June 2010: Draft 2009 Annual OU-1A and -1B PER
- July 2010: 1st Quarter Groundwater 2010 Groundwater PMR
- September 2010: 2nd Quarter 2010 Groundwater PMR
- November 2010: Final 2009 Annual OU-1A and -1B PER

Next steps:

- On-going operation and maintenance (O&M) activities
  - → Biweekly, monthly and quarterly inspections;
  - → Quarterly effluent sampling for Orange County Sanitation District (OCSD) discharge permit requirements; and
  - → Quarterly groundwater monitoring and reporting; data used to
    - Track system performance
    - Annually evaluate and optimize system performance
  - → Annual system optimization evaluation included in the 2009 Annual PER

- **December 2010: Issue 3rd Quarter 2010 Groundwater PMR**

December 2010

ENVIRONMENTAL PROGRAM STATUS
FORMER MARINE CORPS AIR STATION TUSTIN

Operable Unit 1B (IRP Sites 3 and 12 – Trichloroethene [TCE] plumes)

Carve-Outs: CO-5 and CO-6

Brief Project History:

- 2004: Final ROD: Selected remedy includes:
  - → Hydraulic containment of volatile organic compound (VOC)-impacted groundwater;
  - → Construction, operation, and maintenance of groundwater extraction and treatment system; and
  - → Institutional Controls.

  Hot-spot soil excavation also conducted to enhance groundwater remedy
- 2007: Began Final Remedial Design and Remedial Action Implementation
- January 2008: Treatment system became operational
- July 2008: 1st Quarter 2008 Groundwater PMR
- October 2008: 2nd Quarter 2008 Groundwater PMR
- December 2008: Final I-RACR
- December 2008: 3rd Quarter 2008 Groundwater PMR
- July 2009: 1st Quarter 2009 Groundwater PMR
- September 2009: Final Long-Term OMP
- October 2009: 2nd Quarter 2009 Groundwater PMR
- December 2009: 3rd Quarter 2009 Groundwater PMR
- February 2010: Final 2008 Annual OU-1A and -1B PER
- February 2010: Final OPS Report
  - → Obtained U.S. EPA OPS determination in December 2009
- June 2010: Draft 2009 Annual OU-1A and -1B PER
- July 2010: 1st Quarter 2010 Groundwater PER
- September 2010: 2nd Quarter 2010 Groundwater PER
- November 2010: Final 2009 Annual OU-1A and -1B PER

Next steps:

- On-going O&M activities.
  - → Biweekly, monthly, and quarterly inspections;
  - → Quarterly effluent sampling for OCSD discharge permit requirements; and
  - → Quarterly groundwater monitoring and reporting; data used to
    - Track system performance
    - Annually evaluate and optimize system performance
  - → Annual system optimization evaluation included in the 2009 Annual PER

- **December 2010: Issue 3rd Quarter 2010 Groundwater PMR**

December 2010

ENVIRONMENTAL PROGRAM STATUS
FORMER MARINE CORPS AIR STATION TUSTIN

Operable Unit 3 ***(IRP Site 1– Moffett Trenches Landfill)***

Carve-Out: **CO-10 – PARCEL TRANSFERRED IN 2006**

Brief Project History:

- December 2001: Final ROD
- May 2003: Final OMP
- November 2003: Final OPS Report
    - Obtained U.S. EPA OPS determination in March 2004
- October 2006: Final First Five-Year Review
- On-going O&M activities
- January 2010: Final 2008 Annual Groundwater Monitoring Report
- June 2010: Draft 2009 Annual Groundwater Monitoring Report

Next steps:

- Continue O&M activities
- **December 2010: Issue Draft Final 2009 Annual Long-Term Monitoring Report (Replacement Pages)**
- **March 2011: Issue Draft 2010 Annual Long-Term Monitoring Report**

December 2010

ENVIRONMENTAL PROGRAM STATUS
FORMER MARINE CORPS AIR STATION TUSTIN

***Operable Unit 4B* Moderate Concentration Sites (IRP-5S[a], IRP-6, and the Mingled Plumes Area [MPA]) and Low Concentration Sites (IRP-11, IRP-13W, and Miscellaneous Major Spill [MMS-04])**

Carve-Outs: **CO-2, CO-5, and CO-9**

Brief Project History:

- 2000: Draft OU-4 Focused Feasibility Study (FS) Report
- 2004: Final OU-4 Tech Memo for 2003 shallow groundwater investigation
- 2005-2006: Groundwater Monitoring
- 2007: IRP-6 and MPA Supplemental Investigation field activities
- September 2008: Final Tech Memo Supplemental Investigation at IRP-6 and MPA
- October 2008: Final FS Report
- February 2009: Proposed Plan. Public comment period: February 04-March 06, 2009
- May 2009: Final Work Plan for Groundwater Monitoring at OU-4B Sites
- August 2009: Installed additional wells at the MPA, MMS-04, IRP-11, and IRP-13W in accordance with the Final June 2009 Work Plan
- January 2010: 3rd Quarter 2009 Data Summary Report
- January 2010: Final ROD
- April 2010: Replacement Pages for the Final ROD, including final signature sheet
- July 2010: Final Pre-Design Pilot Study Work Plan
- July to October 2010: Pre-Design Pilot Study Implementation
- October 2010: Final 2009 Annual Groundwater Monitoring Report
- October 2010: Final First Quarter 2010 Data Summary Report
- November 2010: Final Second Quarter 2010 Data Summary Report

Next steps:

- **January 2011: Issue Draft 2010 Annual Groundwater Monitoring Report (three quarters of data)**
- **February 2011: Issue Draft Pre-Design Summary Report**
- **March 2011: Issue Draft RACR for MMS-04**
- **April 2011: Issue Final Pre-Design Summary Report**
- **May 2011: Issue Draft Remedial Design/Remedial Action Work Plan (Low Concentration sites IRP-11 & -13W)**
- **May 2011: Issue Final 2010 Annual Groundwater Monitoring Report**

December 2010

ENVIRONMENTAL PROGRAM STATUS
FORMER MARINE CORPS AIR STATION TUSTIN

MTBE Plume (UST Site 222)

Carve-Outs: ***CO-5***

Brief Project History:

- 2001: Interim Petroleum Corrective Action Program (PCAP) plan implemented
- 2006: Final Soil Closure Report
- 2006: Interim PCAP Addendum No. 2 – Revised Cleanup Goals: 1st WBZ: 300 micrograms per liter (ug/L), 2nd WBZ: 44 ug/L, and 3rd WBZ: 13 ug/L.
- 2007: Final PCAP
- 2007/2008: Implement Final PCAP; Additional monitoring and extraction wells installed. Air Sparging/Soil Vapor Extraction (AS/SVE) initiated in March 2008.
- September 2008: AS/SVE system shutdown for rebound monitoring per Final PCAP requirements
- December 2008: 1st and 2nd Quarter 2008 Groundwater PMR
- April 2009: 3rd Quarter 2008 Groundwater PMR
- May 2009: Draft Final Annual 2007 PCAP Progress Report
- July 2009: Draft Annual 2008 PCAP Annual Report
- August 2009: 1st Quarter 2009 Groundwater Monitoring Data Summary
- September 2009: 2nd Quarter 2009 Groundwater Monitoring Data Summary
- September 2009: Final Annual 2007 PCAP Annual Report
- October 2009: Final/Replacement Pages for the Annual 2008 PCAP Annual Report
- January 2010: 3rd Quarter 2009 Groundwater Monitoring Data Summary
- June 2010: Draft 2009 PCAP Annual Report
- August 2010: 1st Quarter 2010 Groundwater Monitoring Data Summary
- October 2010: 2nd Quarter 2010 Groundwater Monitoring Data Summary
- November 2010: Final 2009 PCAP Annual Report
  → Includes Annual system optimization evaluation

Next steps:

- On-going O&M activities:
  - Quarterly groundwater monitoring and reporting
  - Data used to track and optimize system performance, and to support Final PCAP Closure Report
- Quarterly effluent sampling for OCSD permit requirements

- **December 2010: Issue 3rd Quarter 2010 Groundwater Monitoring Data Summary**
- **April 2011: Issue Draft 2010 PCAP Annual Report**

December 2010

ENVIRONMENTAL PROGRAM STATUS
FORMER MARINE CORPS AIR STATION TUSTIN

FOST Summary

FOST #1 signed August 29, 2001	**Parcels 3, 21, 38, 39 and portions of 40**
FOST #2 signed September 28, 2001	**Parcels 4-8, 10-12, 14, 25, 26, 30-33, 37, 42 and portions of 40 and 41**
FOST #3 signed April 22, 2002	**Parcels 23, 29, 34, 35 and 36, and portions of 1, 16, 17, 24, 27, 28, 40 and 41**
FOST #4 signed September 26, 2002	**Portions of 24 (PS clean area in CO-5)**
FOST #5 signed December 17, 2002	**COs 8 and 11**
FOST #6 signed September 29, 2004	**CO-10 and portion of CO-5**
FOST #7 signed May 20, 2005	**COs 3 and 7 and portion of CO-5**
FOST #8 signed February 2006	**COs 1 and 4**

FOSL Summary

FOSL #2 signed February 28, 2002	**COs 1 thru 4**
FOSL #3 signed April 26, 2002	**COs 5 thru 11**

Acronyms

AS/SVE	Air Sparge/Soil Vapor Extraction	MNA	Monitored Natural Attenuation	PS	Public Sale Parcel
AST	Aboveground Storage Tank	MPA	Mingled Plumes Area	RAP	Remedial Action Plan
AOC	Area of Concern	MTBE	Methyl tert butyl ether	RCRA	Resource Conservation and Recovery Act
BCT	BRAC Cleanup Team (Navy, EPA, Cal EPA)	O&M	Operation and Maintenance	ROD	Record of Decision
CO	Carve-Out area	OCSD	Orange County Sanitation District	TCE	Tricholoroethene
DCE	Dichloroethene	OMP	Operations and Maintenance Plan	TCP	1,2,3-Trichloropropane
FOSL	Finding of Suitability to Lease	OPS	Operating Properly and Successfully	ug/L	Micrograms per liter
FOST	Finding of Suitability to Transfer	OU	Operable Unit	WBZ	Water-Bearing Zone
I-RACR	Interim-Remedial Action Completion Report	PCAP	Petroleum Corrective Action Program		
IRP	Installation Restoration Program	PER	Performance Evaluation Report		
MMS	Miscellaneous Major Spill	PMR	Performance Monitoring Report		

Welcome

Update on Operable Unit (OU)-4B Pilot Study

Former Marine Corps Air Station (MCAS) Tustin, California Restoration Advisory Board (RAB) Meeting

December 1, 2010

Rebecca Lesher, PG, AIS-TN&A JV

Presentation Outline

- **Remedy Overview**
- **Pre-Remedial Design Pilot Study**
  - **Objectives**
  - **Low Concentration Sites**
  - **Moderate Concentration Sites**
  - **Preliminary Results**
- **Summary**
- **Schedule**

Remedy Overview

- **Record of Decision (ROD) finalized April 2010**

Remedial Action Objectives (RAOs):

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

Remediation Goals (RGs):

- **Trichloroethene (TCE) – 5 µg/L**
- **1,1-Dichloroethene (DCE) – 6 µg/L (for Installation Restoration Program [IRP]-6)**

Site Locations

Low Concentration Sites
IRP-11
IRP-13W
MMS-04

Moderate Concentration Sites
IRP-5S(a)
IRP-6
MPA

Legend

- Low Concentration Sites
- Moderate Concentration Sites
- Former MCAS Boundary
- Navy Property
- Approximate extent of 1,1-DCE in groundwater exceeding 6 ug/l
- Approximate extent of TCE in groundwater exceeding 5 ug/l

1,1-dichloroethene (DCE)
IRP – Installation Restoration Program
MMS – Miscellaneous Major Spill
RG – Remedial Goal
TCE – trichloroethene
ug/l – micrograms per liter

N

0 250 500 1,000
Feet

Plumes depicted as shown in Pre-Remedial Design Work Plan (AIS-TN&A JV, 2010)

Final Record of Decision

Selected Remedies

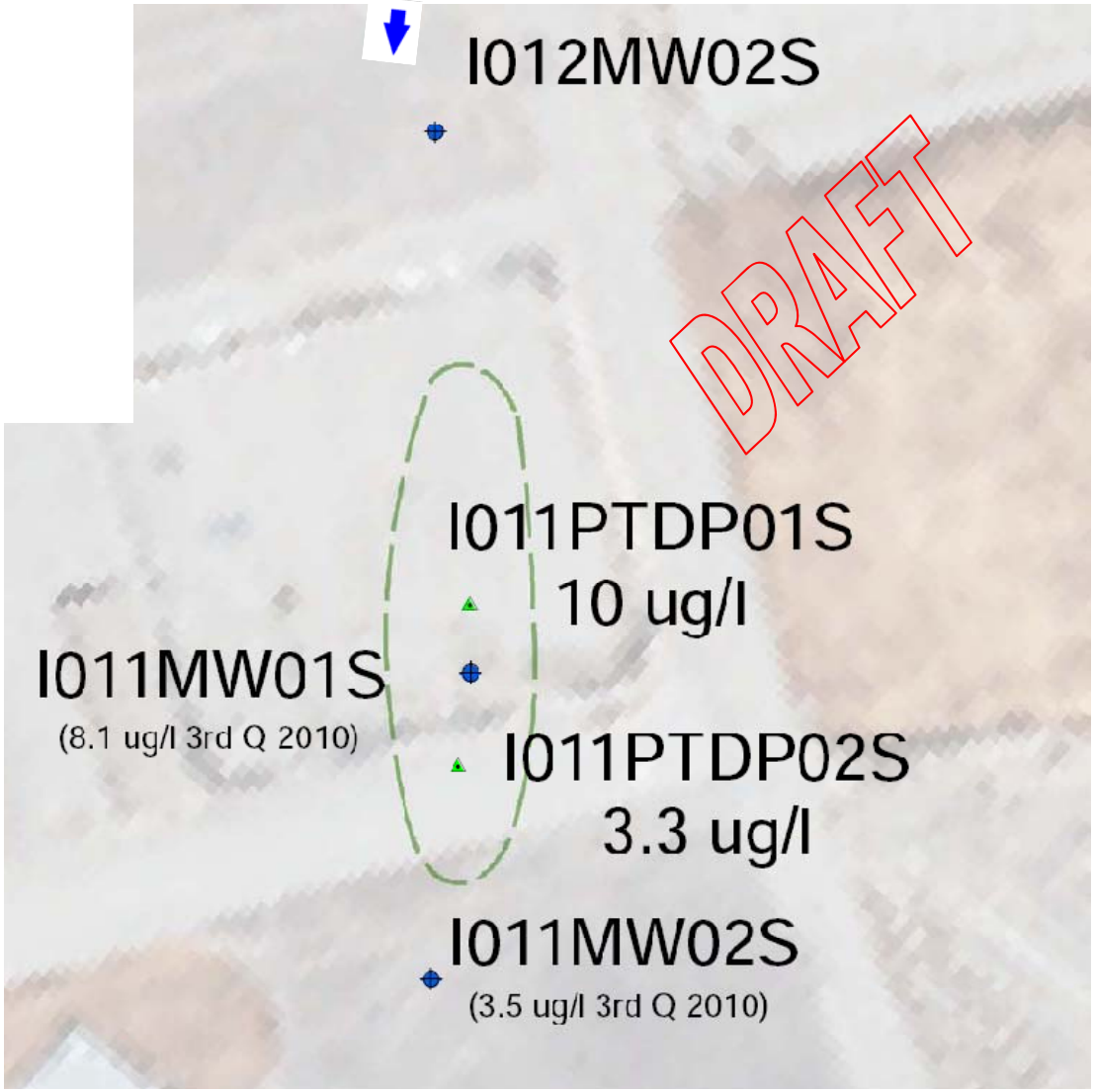
- Low Concentration Sites (IRP-11, IRP-13W, MMS-04)
  - Alternative 2: Institutional Controls (ICs)
    - Used to prevent extraction and use of groundwater
    - Monitoring and 5-year reviews, as appropriate
- Moderate Concentration Sites (IRP-5S[a], IRP-6, the MPA)
  - Alternative 4: In-situ Bioremediation (ISB)/Monitored Natural Attenuation (MNA)/ICs
    - ISB used to achieve RGs
    - If necessary, MNA would be used to track concentrations until the RGs are met
    - ICs used to prevent extraction and use of groundwater

Pre-Remedial Design Pilot Study

Objectives for Low Concentration Sites

- Evaluate sufficiency of the current monitoring well networks
- Install wells necessary to provide sufficient monitoring at each site

IRP-11 – First Water Bearing Zone



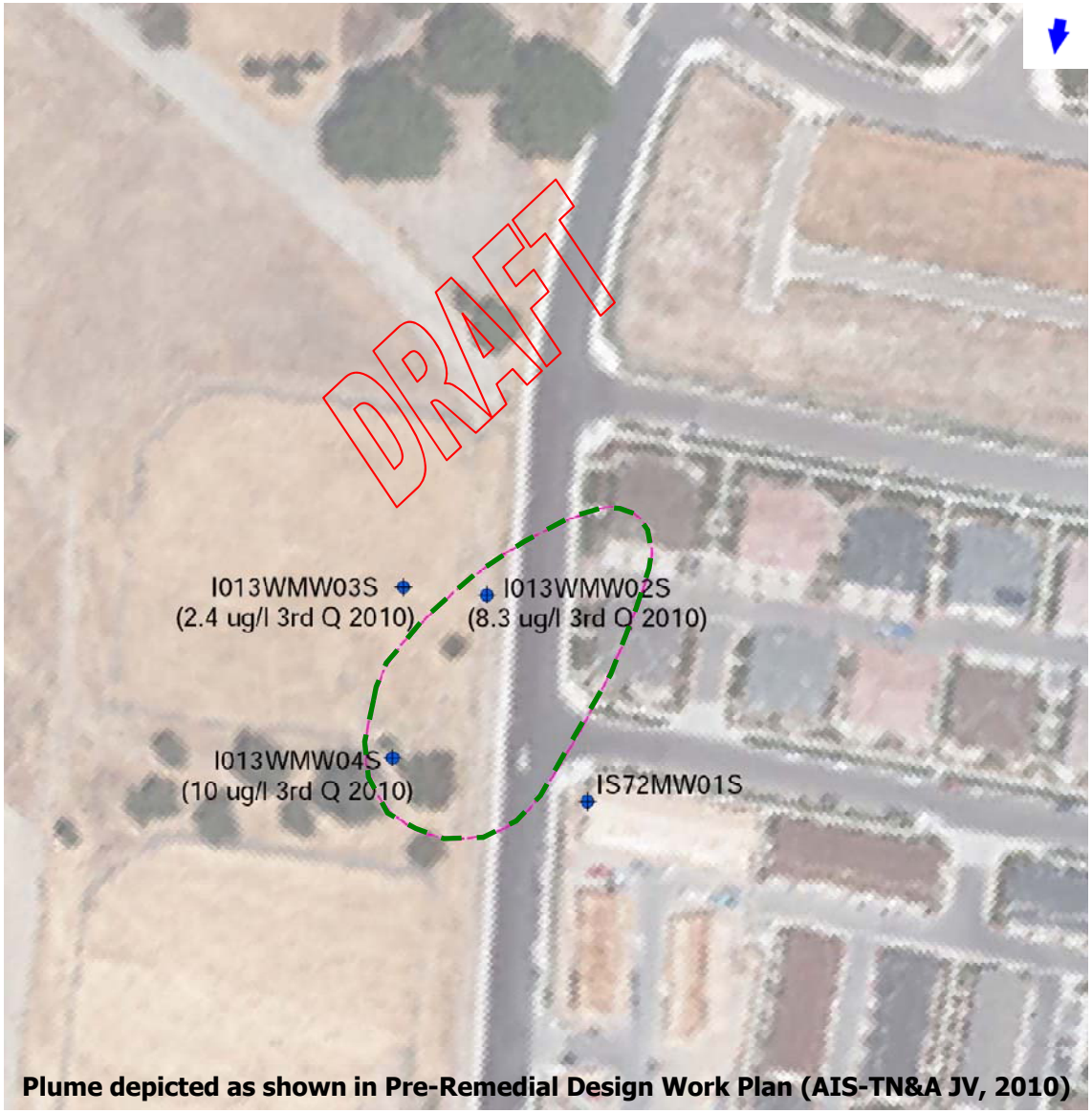
- **Three groundwater monitoring wells provides sufficient monitoring network**
- **Two Hydropunch™ samples collected in July 2010 confirmed that extent of TCE in groundwater has decreased**
- **Refine approximate extent of plume as appropriate**

Legend

- Hydropunch
- Monitoring Well
- Approximate extent of TCE in groundwater exceeding 5 ug/l
- Approximate direction of groundwater flow, July 2010

Plume depicted as shown in Pre-Remedial Design Work Plan (AIS-TN&A JV, 2010)

IRP-13W – First Water Bearing Zone

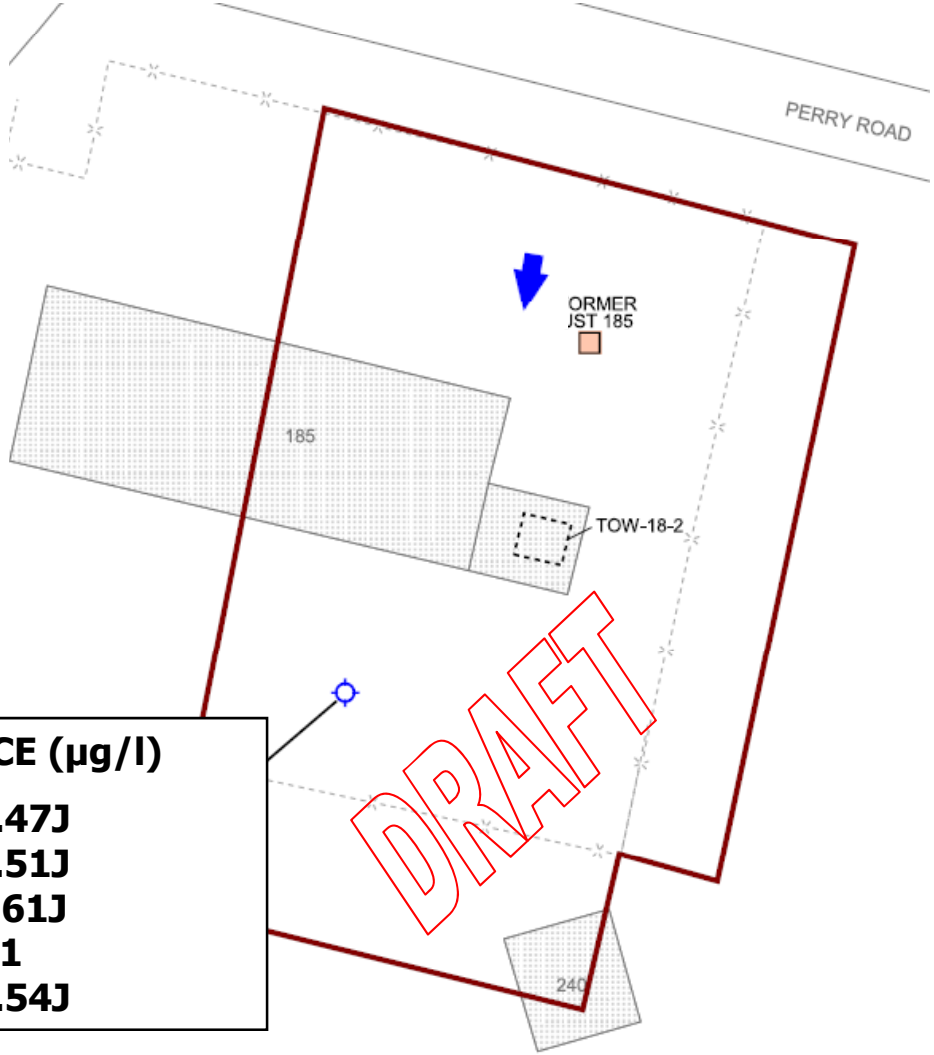


Plume depicted as shown in Pre-Remedial Design Work Plan (AIS-TN&A JV, 2010)

- **Four groundwater monitoring wells provide sufficient monitoring network**
- **TCE concentrations are generally just above the RG of 5 µg/L**

MMS-04 – First Water Bearing Zone

- One well installed at prior location of RG exceedence
- One year (four quarterly monitoring events) indicates TCE concentrations are well below the RG of 5 µg/L
- RAOs have been achieved and a Remedial Action Completion Report is in progress



LEGEND

GROUNDWATER MONITORING WELL

APPROXIMATE GROUNDWATER FLOW DIRECTION (JULY 2010)

Note:
J – estimated concentration
No plume drawn here

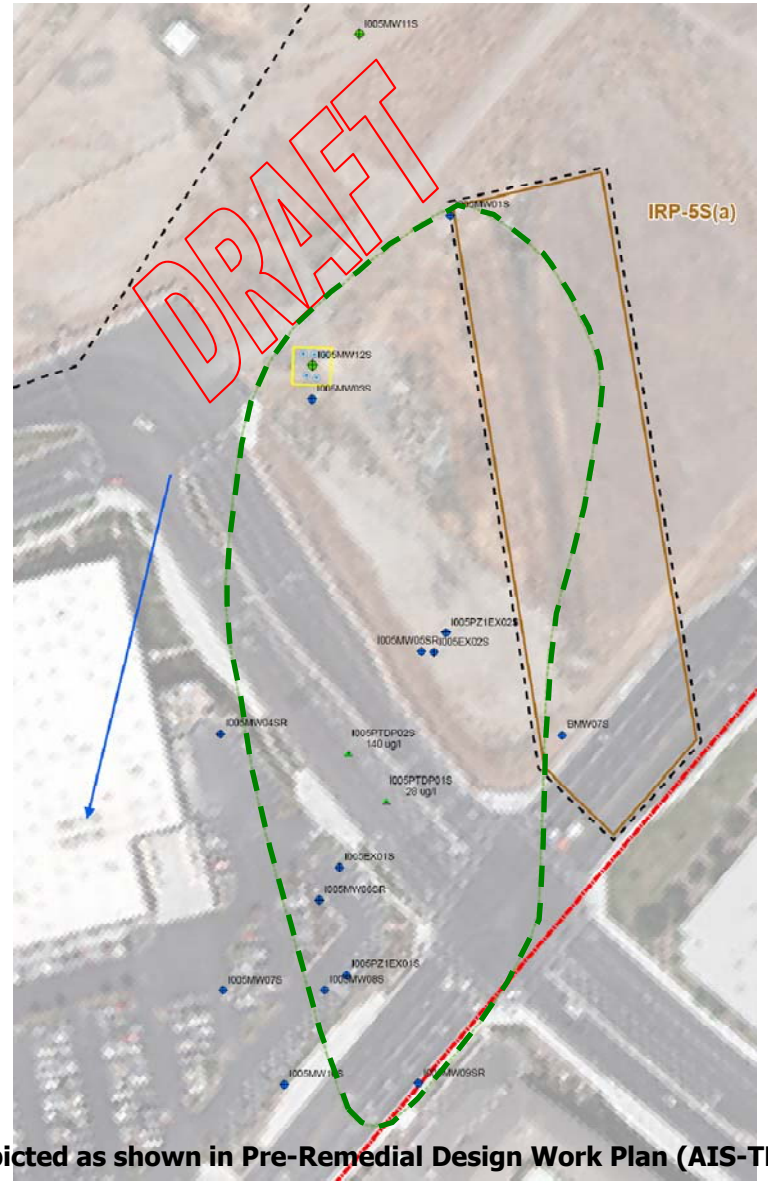
MM4MW01S	TCE (µg/l)
3rd Q09	0.47J
4th Q09	0.51J
1st Q10	0.61J
2nd Q10	2.1
3rd Q10	0.54J

Pre-Remedial Design Pilot Study

Objectives for Moderate Concentration Sites

- Evaluate sufficiency of the current monitoring well networks
- Install wells necessary to provide sufficient monitoring at each site
- Evaluate the following remedial design (RD) parameters for ISB
  - Radius of influence (ROI)
  - Need for bioaugmentation
  - Effectiveness of different injection patterns/geometries
- Baseline monitoring for MNA parameters at upgradient, in-plume, and downgradient locations to evaluate current geochemical conditions

IRP-5S(a) - First Water Bearing Zone



- **One new upgradient well installed**
- **One new well installed in support of pilot testing**
- **Two Hydropunch™ samples collected to supplement plume delineation. Results were consistent with previous data and plume delineation**

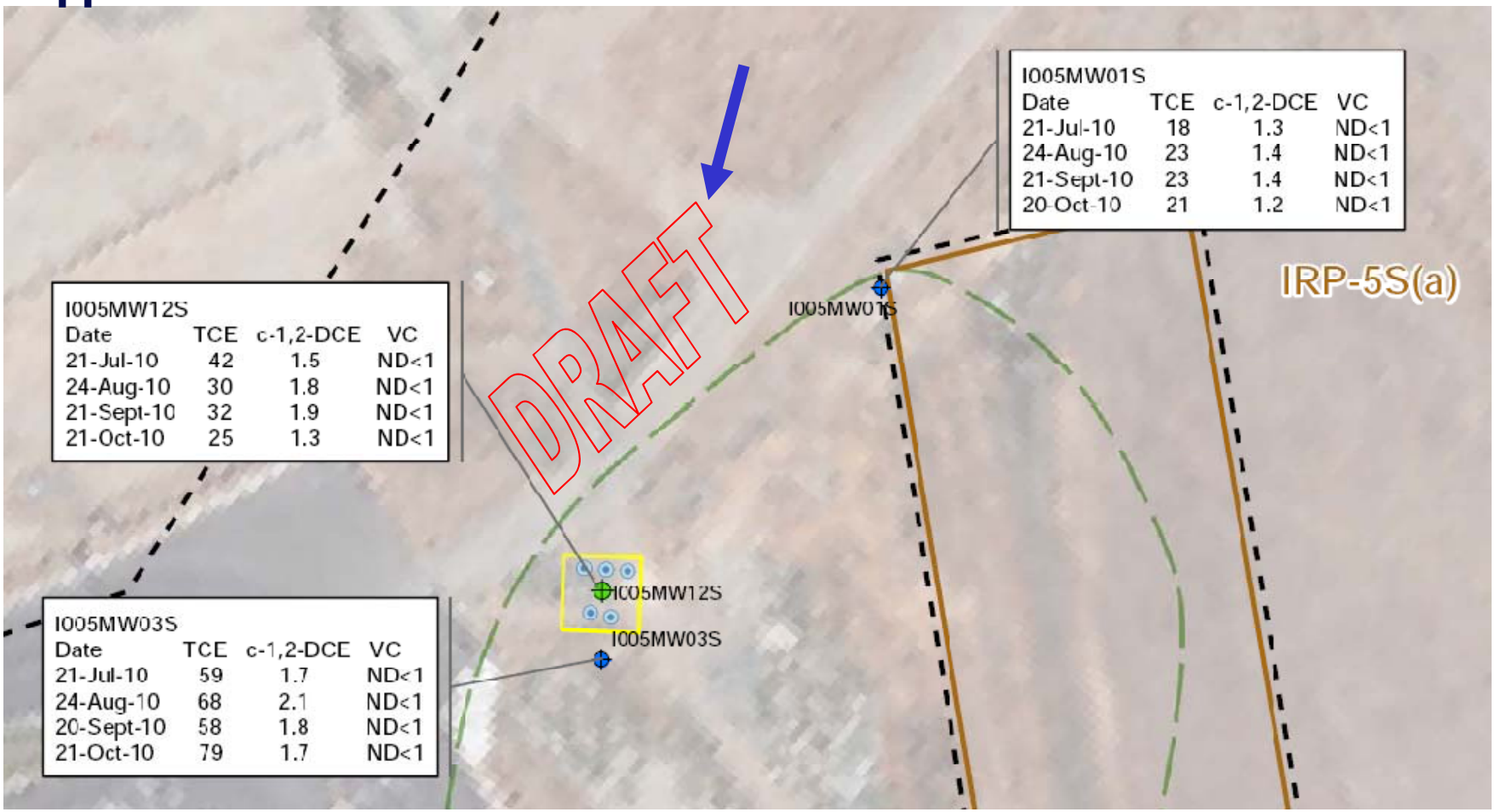
Legend

- Hydropunch
- Injection location July 22, 2010
- Monitoring Well Installed July 2010
- Monitoring Well
- Approx. Dir. GW Flow, July 2010
- Moderate Concentration IRP Site
- Pilot Test Area (Sodium lactate & DHC)
- Navy Property
- Approximate extent of TCE in groundwater exceeding 5 ug/l
- Former MCAS Boundary

Plume depicted as shown in Pre-Remedial Design Work Plan (AIS-TN&A JV, 2010)

IRP-5S(a) - First Water Bearing Zone

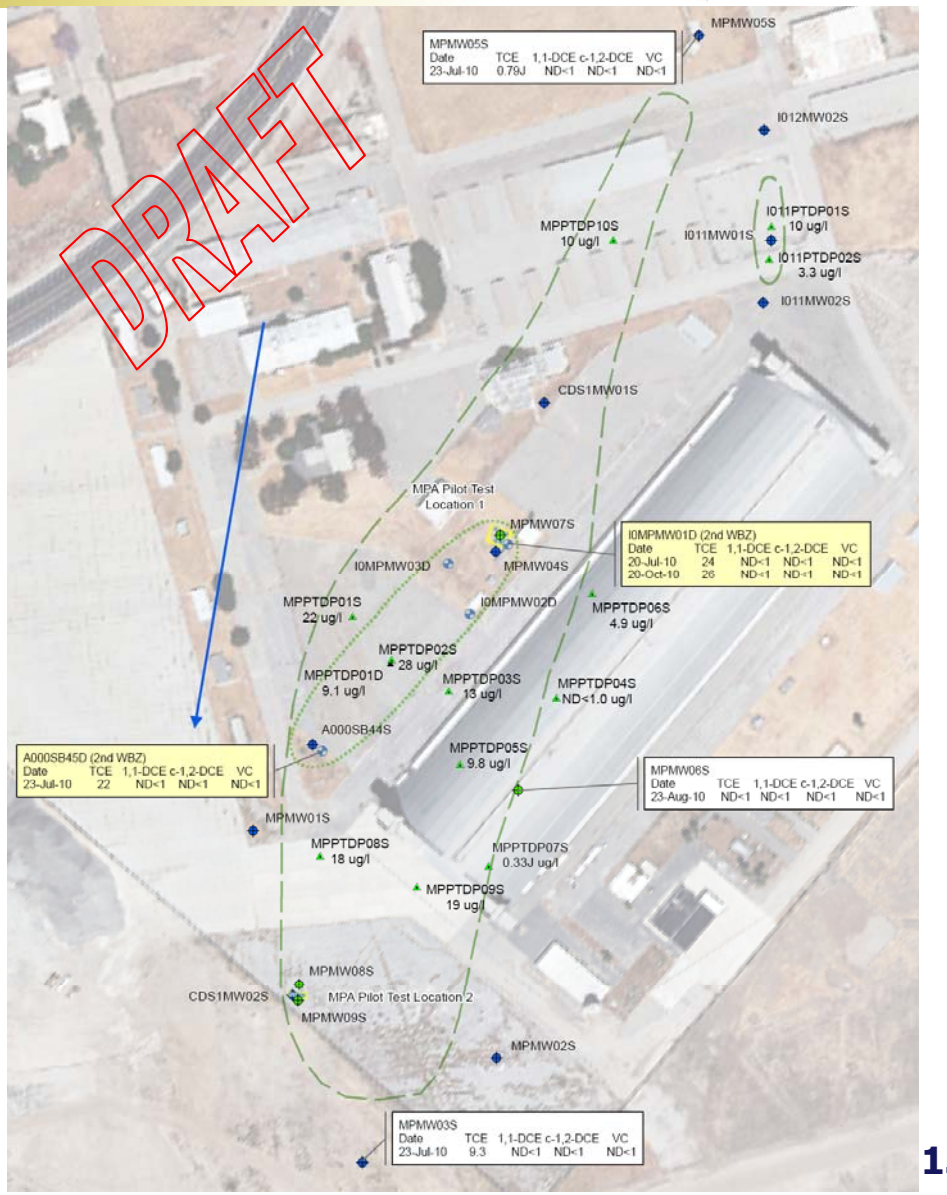
- **Injection of sodium lactate with dehalococcoides (DHC) into five borings on July 22, 2010**
- **Approximate ROI of 10 feet**



Plume depicted as shown in Pre-Remedial Design Work Plan (AIS-TN&A JV, 2010)

MPA Monitoring Well Network

- **10 Hydropunch™ samples from the 1st water bearing zone (WBZ) and 1 Hydropunch™ sample from 2nd WBZ to update plume delineation and assist in well location**
- **One additional cross-gradient well along eastern flank to supplement 1st WBZ network**
- **1st and 2nd WBZ monitoring well networks are sufficient, with 12 and 4 wells, respectively**

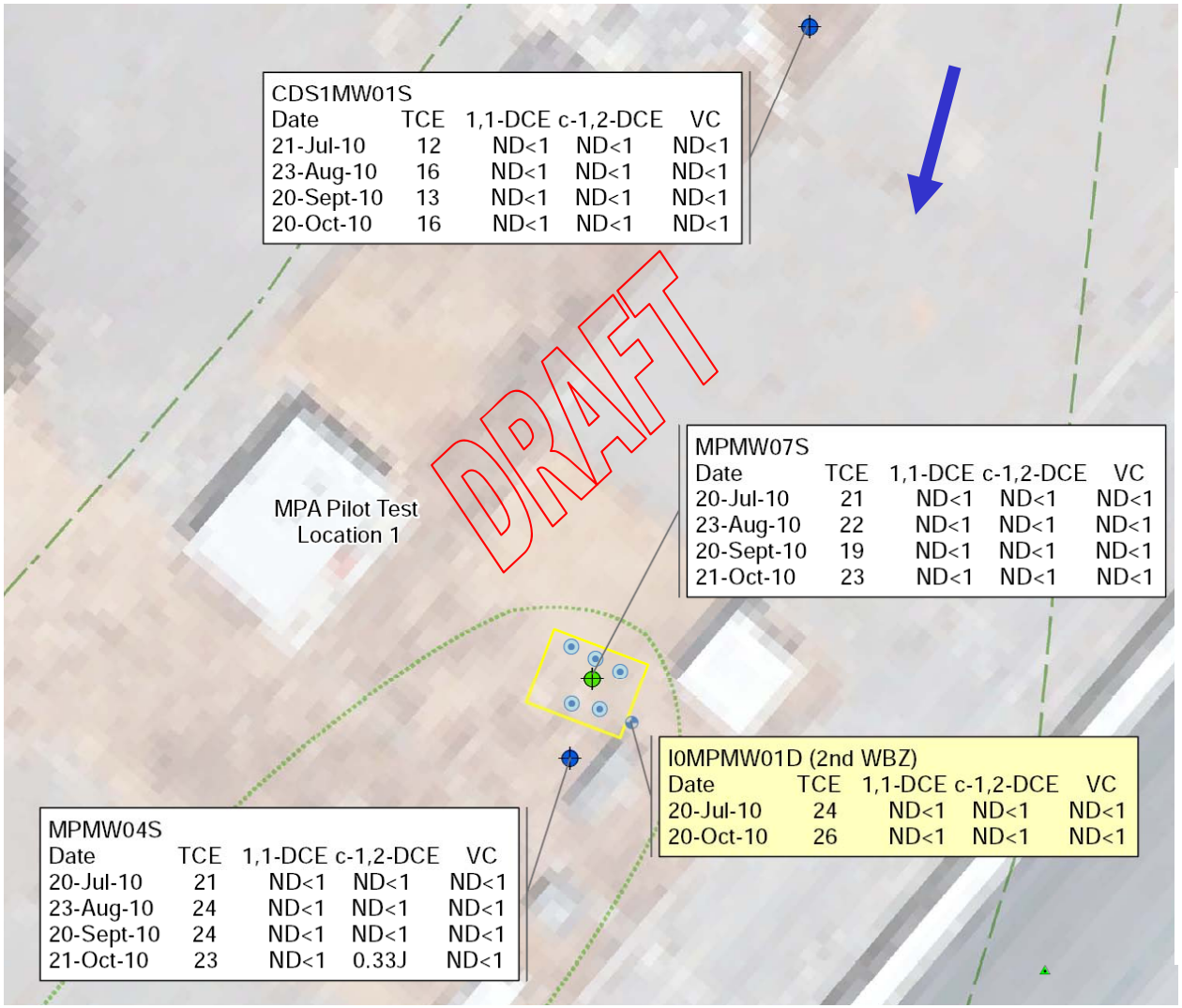


Legend

- 1st WBZ hydropunch
- 2nd WBZ hydropunch
- Injection location, July 20-22, 2010
- Monitoring Well (1st WBZ) Installed July 2010
- Monitoring Well (1st WBZ)
- Monitoring Well (2nd WBZ)
- Approx. Dir. GW Flow, July 2010
- Pilot Test Area
- Approximate extent of TCE in groundwater exceeding 5 ug/l, 1st WBZ
- Approximate extent of TCE in groundwater exceeding 5 ug/l, 2nd WBZ

Plume depicted as shown in Pre-Remedial Design Work Plan (AIS-TN&A JV, 2010)

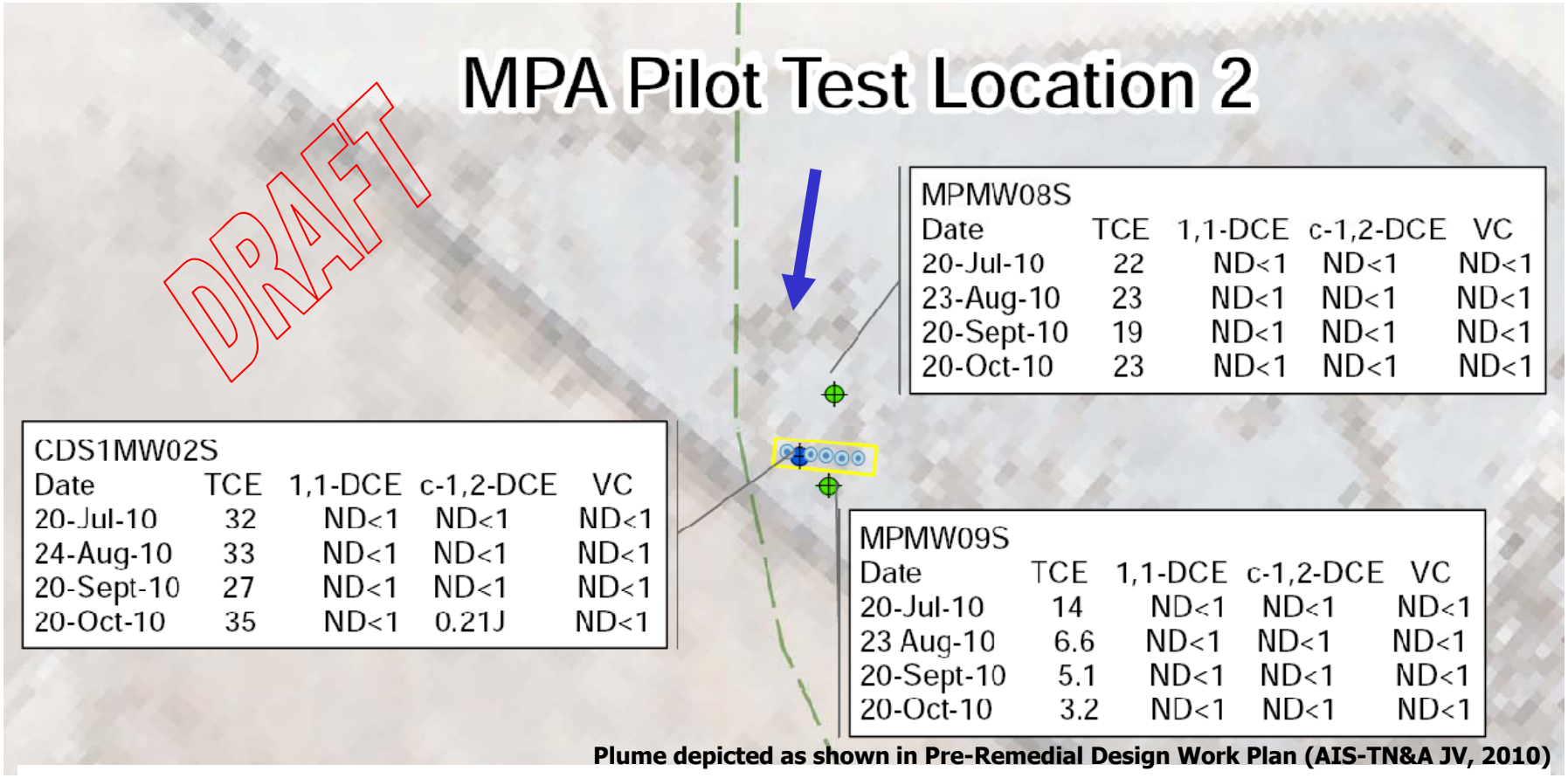
MPA Location 1 Pilot Study



- **Injection of sodium lactate (no bioaugmentation) into five borings on July 21, 2010**
- **ROI less than 10 feet in northern section of the MPA**
- **Low native DHC population limited reductive dechlorination**

Plume depicted as shown in Pre-Remedial Design Work Plan (AIS-TN&A JV, 2010)

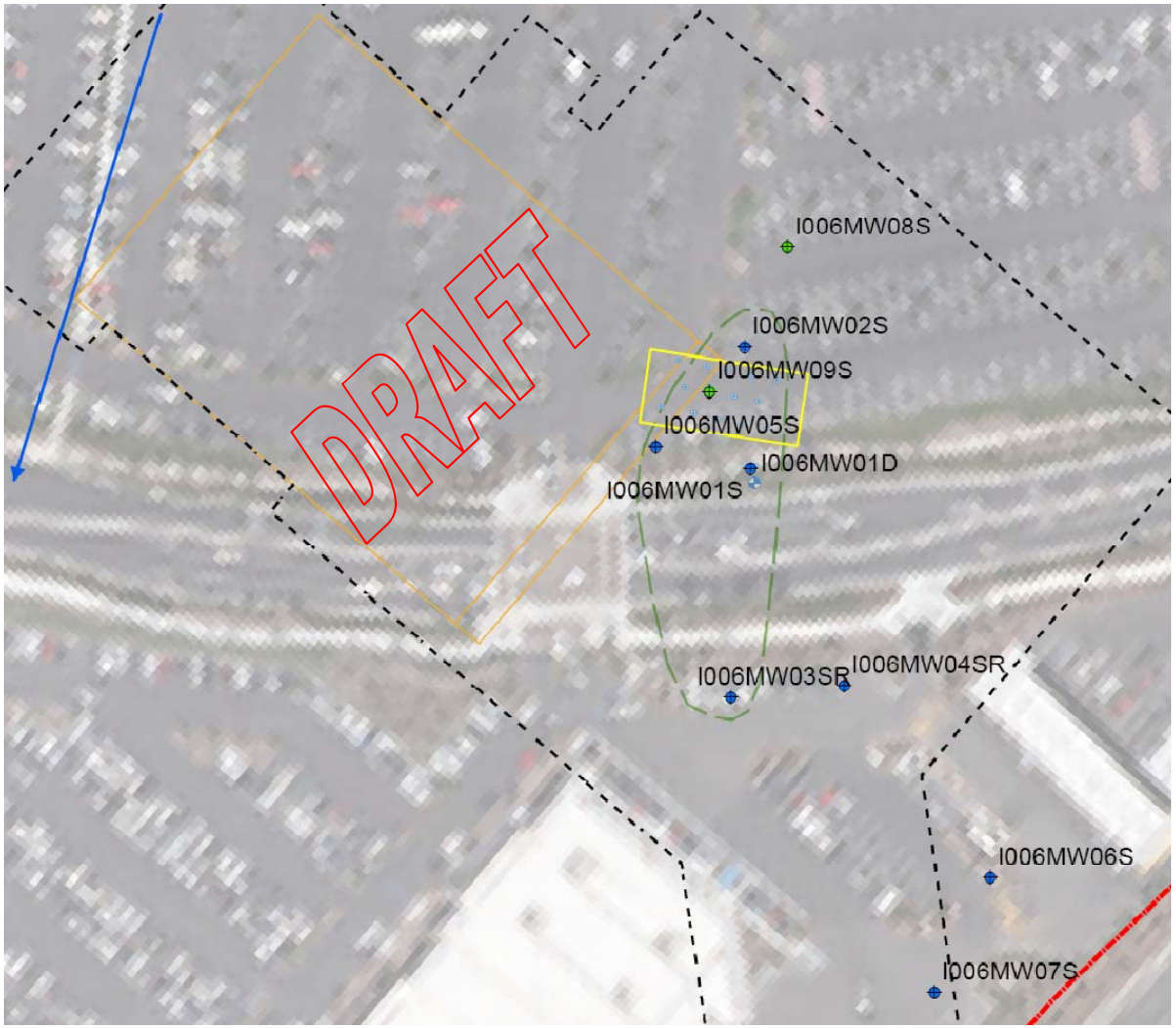
MPA Location 2 Pilot Study



Plume depicted as shown in Pre-Remedial Design Work Plan (AIS-TN&A JV, 2010)

- **Injection of emulsified vegetable oil (EVO) with no bioaugmentation into five borings in a barrier-type application on July 21, 2010**
- **ROI approximately 5 feet**
- **Barrier-type application appears to be effective**

IRP-6 Monitoring Well Network

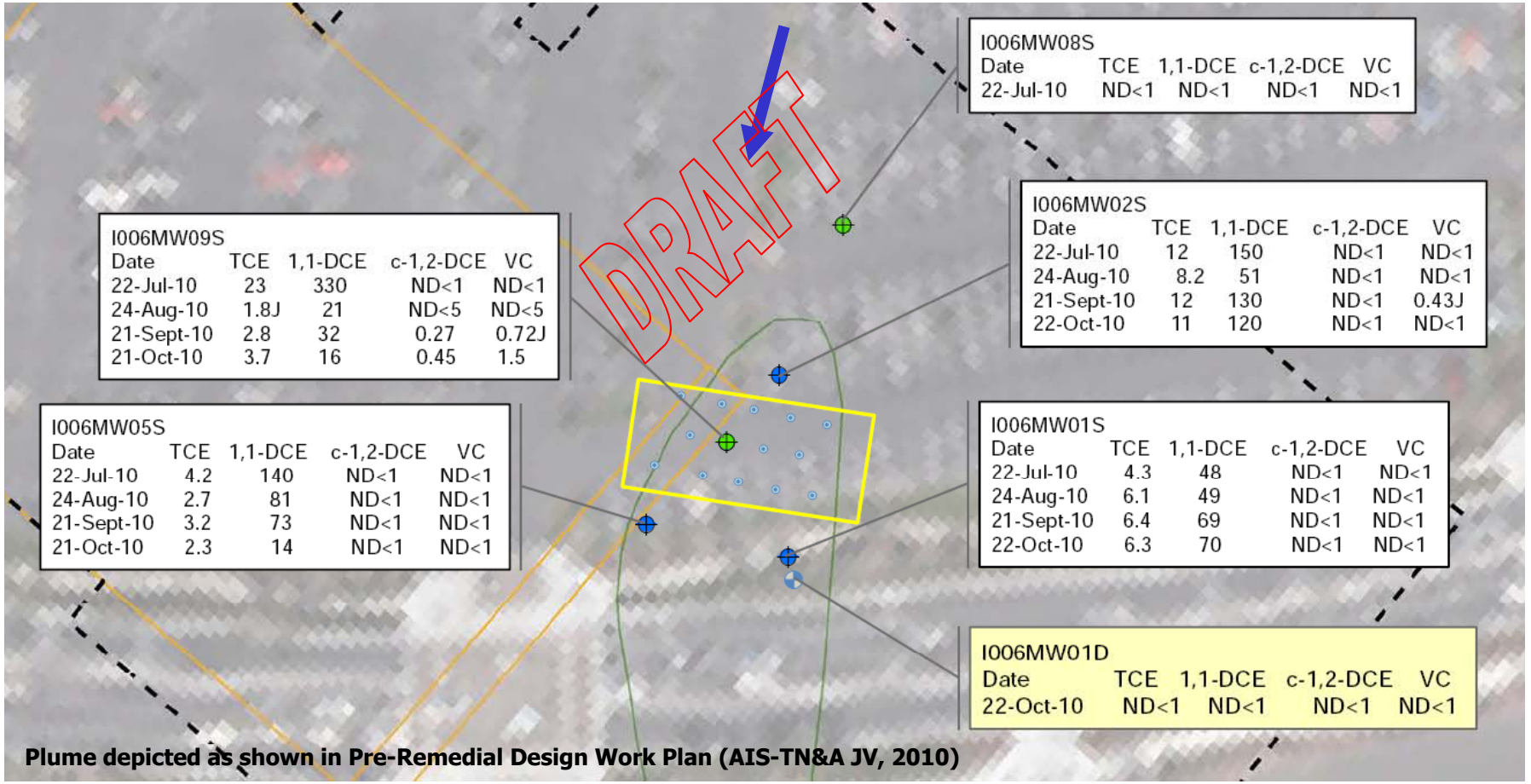


- **New upgradient well installed to complete monitoring network**
- **Additional in-plume well installed in support of pilot testing**
- **Refine approximate extent of plume, as appropriate**

Plume depicted as shown in Pre-Remedial Design Work Plan (AIS-TN&A JV, 2010)

IRP-6 Pilot Study

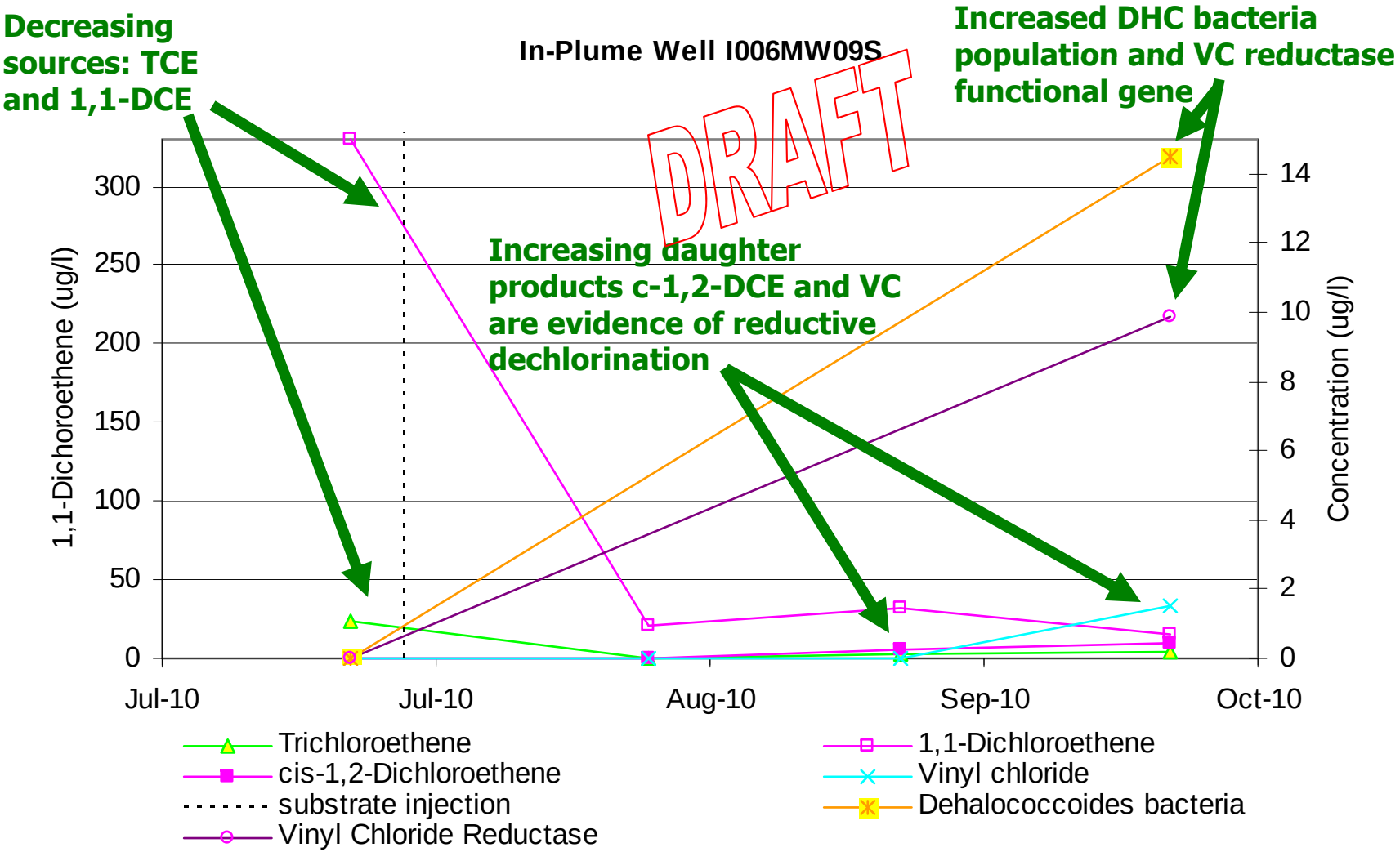
- **Injection of EVO and DHC bacteria into 13 borings on July 26-28, 2010**
- **ROI between 15 and 20 feet (distance between injection points)**



Plume depicted as shown in Pre-Remedial Design Work Plan (AIS-TN&A JV, 2010)

Note: c-1,2-DCE = cis-1,2-dichloroethene VC = vinyl chloride

IRP-6 ISB Pilot Study



Well Installation

Track-mounted direct push rig:

- Hydropunch sampling
- Well installation

EVO Injection with Bioaugmentation

EVO w/DHC Injection at IRP-6

Summary

- Sufficient monitoring well networks at each of the low and moderate concentration sites
- Need to reevaluate each of the plume extents based on new/recent groundwater data
- Complete the Remedial Design based on the pilot test results
  - Enhanced ISB using EVO with bioaugmentation appears to be effective option to complete degradation of COCs and daughter products

Schedule

➢ Draft Pre-Design Summary Report	February 2011
➢ Draft MMS-04 Remedial Action Completion Report	March 2011
➢ Draft RD/RA Work Plan for Low Concentration Sites	May 2011
➢ Draft RD/RA Work Plan for Moderate Concentration Sites	July 2011

Acronyms

1,1-DCE – 1,1-dichloroethene
C-1,2-DCE – cis-1,2-dichloroethene
COC – chemical of concern
DHC – dehalococcoides bacteria
EVO – emulsified vegetable oil
ICs – institutional controls
IRP – installation restoration program
ISB – In-situ bioremediation
MCAS – Marine Corps Air Station
mg/l – milligrams per liter
MMS – miscellaneous major spill
MNA – monitored natural attenuation
MPA – mingled plumes area
OU – Operable Unit
RAB – Restoration Advisory Board
RAO – remedial action objective
ROD – Record of Decision
ROI – radius of influence
RG – remediation goal
TCE - trichloroethene
µg/L – micrograms per liter
VC – vinyl chloride
WBZ – water bearing zone