

# PARSONS

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Document Control No. SDV-1212-0037-0002  
Parsons Project No. 640129.00006.749055

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## PROJECT NOTE NO. 64

**SUBJECT: Marine Corps Base (MCB) Camp Pendleton Federal Facilities Agreement (FFA) Meeting (No. 114)**

**DATE HELD: January 15, 2015**

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### Attendees:

Theresa Morley (Naval Facilities Engineering Command Southwest [NAVFAC SW]), Adam Hill (NAVFAC SW), Tracy Sahagun (MCB Camp Pendleton), Luis Ledesma (MCB Camp Pendleton), Tayseer Mahmoud (California [Cal] EPA/Department of Toxic Substances Control [DTSC]), Kimberly Gettmann (DTSC), Sophie di Campalto (San Diego Regional Water Quality Control Board [RWQCB or Water Board]), David Clexton (Tidewater), Donnie Dressler (Tidewater), Steve Griswold (Parsons), Josh Sacker (Parsons), and Lauri Roché (Parsons).

Attendees by teleconference: Martin Hausladen (USEPA), Beatrice Griffey (RWQCB).

### Project Deliverables, FFA Schedule Update and Field Work Status

A meeting was held in Parsons' offices in Pasadena, CA. The purpose of the meeting was to update the FFA Team (Team) on program status. The sign-in sheet and agenda are attached.

Following introductions of attendees, Ms. Morley discussed progress at each of the Installation Restoration (IR) Sites shown on the FFA Schedule, Project Deliverables, and Field Work Status (attached). Agency comments have been received on the items shaded in green on the deliverables spreadsheet, and the items marked as final will be removed on the next version of the spreadsheet.

On the fieldwork spreadsheet, items marked as complete will be removed on the next version. Items shaded in purple are for Department of the Navy (DON) tracking purposes, indicating that the Base Resident Officer in Charge of Construction (ROICC) is receiving payment for work on those sites.

The following items were specifically mentioned during the discussion of the FFA schedule, the deliverables spreadsheet, and the field schedule:

- A final response has been addressed by Navy legal counsel on the 22/23 Area Land Use Control Plan and sent to the FFA Team for review.

- At Site 33, the Removal Action Completion Report will be submitted to the agencies on 16 January.
- The document identified as the Annual Groundwater Monitoring Report for Site 7 (due to the agencies 22 February), is actually an Annual Inspection Report for the site.
- The public comment period for the Proposed Plans for Sites 21 and 1119 will be 27 January to 27 February, and the public meeting will be 10 February.
- Mr. Ledesma noted that the pipeline design is complete for the planned new well in the 22/23 Area, but work is continuing on resolving communication design issues for the well.
- Field work is currently underway at Site 1115; agencies are invited to visit the site.
- New wells were just installed as part of the 22/23 Area Groundwater Monitoring Program.
- Field work is done for Site 150, and data will be presented at the next FFA meeting.
- At Site 1120, the Base is removing structures at the site so there is a delay in field sampling.
- There was some discussion regarding Site 1118. Ms. di Campalto asked why the three subsites are so discontinuous, and Mr. Hill noted that the three sites were formerly in the Underground Storage Tank (UST) program, but chlorinated solvents were found, and the sites were then lumped together. The expectation was that the three subsites would not have much contamination, but Site 21565 will require significant action (as described following the schedule discussion).
- Ms. Griffey asked about Subsites 2664 and 2666, and Mr. Hill noted that 2666 is still administratively open, but he is working with Mr. Patel at NAVFAC to get it closed. At 2664, the DON does not believe there are any significant environmental issues. Ms. Griffey asked about RFA Site 135 to the south of the other two subsites; Mr. Hill said the site was a UST that was transferred into Site 1118, but that he would get back to Ms. Griffey regarding current status.
- Responses to agencies comments are in progress on the Site 62 No Further Action (NFA) Record of Decision (ROD).

There was discussion of Site 1116 (Former Building 1431) before the order shown on the agenda. Ms. Morley showed the figure of soil gas results for this site (attached), and pointed out that the contractor may have used an incorrect attenuation factor for the screening values, resulting in numbers that may be too low. Dr. Gettmann agreed that the screening values looked low relative to the DTSC criteria of using the USEPA indoor air Regional Screening Level (RSL) with an applied default attenuation factor of 0.001. Ms. Morley will further evaluate the data and provide feedback to the Team.

## Site 1118/Subsite 21565

Mr. Hill provided an overview of the removal action planned at Subsite 21565 (also referred to as Site 21565). The presentation used for the last FFA meeting for the site was used to describe the status and plans for the site (attached). The planned action will include two excavations, one on each side of the road. Excavation of the road is not planned due to the presence of multiple utilities, including high pressure gas and communication lines. It has been learned, however, that the Base is planning a Military Construction (MILCON) project to replace a pipeline in the road, so that project will include the associated management of impacted soils. Mr. Hill said that this will partially address potentially impacted soils in the roadway, but complete removal of the contaminated soil under the road will not be possible. He also noted that the Base National Environmental Policy Act Process Automation and Management Support Module (NEPA PAMS) process was effective in notifying all involved parties in advance of the construction project.

Mr. Hausladen asked what kind of supervision the IR program will have on the utility replacement project. Dr. Gettmann noted that trichloroethene (TCE) concentrations are high in soil, so qualified people will be needed to conduct onsite monitoring. Ms. Morley said that NAVFAC is awarding the contract, so it will be possible to incorporate the various safety requirements into the design.

Mr. Hill explained that both IR excavations will be done at the same time, this will be an interim removal, and noted that the MILCON utility replacement will likely occur after the interim removal on both sides of the road.

## 12 Area Site 13 Status

Mr. Griswold provided an overview of site history, including a summary of the Remedial Investigation (RI) Report (2003), the Feasibility Study (FS) Report (2005), a soil excavation (2009), groundwater sampling results from 2010 to 2014, and the recent installation of an air sparging/soil vapor extraction (AS/SVE) system at the site. The primary COPCs at the site are benzene and TCE in groundwater. The chemicals of potential concern (COPCs) have not migrated beyond the immediate site area. The maximum TCE concentration in groundwater has dropped from 10 µg/L to 2.8 µg/L in about a decade (2003 to 2014). The maximum benzene concentration in groundwater has dropped from 11 µg/L to 6.9 µg/L in the same timeframe. Two more rounds of groundwater sampling are planned at the site. The sampling will be carried out in approximately three and six months from now, which will allow for an evaluation of the effectiveness of the AS/SVE system.

Mr. Griswold noted that the site is located within an area of the Base where groundwater is designated as municipal beneficial use in the San Diego RWQCB Basin Plan. However, from a practical standpoint, it would be very unlikely that site groundwater would be used for any purpose. This is because the groundwater contains high total dissolved solids (TDS) (above State standards for drinking water) the yield is very low due to the presence of fine-grained water-bearing materials underlying the site. The site is slightly over a mile from the main drinking water aquifer to the west (i.e., the Santa Margarita River basin). Given the relatively low, and declining,

concentrations of COPCs, the inability to use site groundwater, and the lack of any contaminant migrations, the DON believes it would be sensible for no further action to be taken at the site.

Ms. di Campalto noted that there has been success in applying the low-threat UST criteria to former UST sites in order to get site closures. There was some discussion of the prior soil excavation and the replacement with clean soil at the site. Dr. Gettmann said she would have to review the data for the site, but it sounds like multiple lines of evidence could be used to make the case for site closure.

The site is scheduled for two more rounds of groundwater sampling, at which point the results will be presented to the FFA Team along with recommendations going forward. The Navy asked if soil gas sampling would be required and Dr. Gettmann stated that since the Navy had used the Johnson and Ettinger model to calculate vapor intrusion risk previously, the area of contamination was so limited, and the concentrations so low, the Navy will likely not be required to conduct additional soil gas sampling.

#### Site 1120 RI Fieldwork Progress Report

Mr. Clexton provided a summary of investigations at Site 1120, including the Remedial Investigation that is currently in progress (refer to attached slides). The site has been the subject of a Phase I and Phase II Environmental Site Assessment (ESA) in 2011. As a result, 15 subsites were identified as requiring remedial investigation. These subsites are now being addressed as IR Site 1120. These subsites are located throughout the Stuart Mesa West Agricultural Fields (which are west of Interstate 5), and several of the subsites are also located at the Maintenance Facility Compound (which is east of Interstate 5).

The RI Work Plan was finalized in July 2014, and the Phase I field work was completed in September 2014. Mr. Clexton summarized the data from the Phase I investigation, which showed the presence of pesticides and total petroleum hydrocarbons (TPH) above project screening levels at multiple locations (see presentation slides). Going forward, the Phase II RI field work will focus on defining lateral and vertical extent of contaminants, collecting soil vapor data at areas with the highest TPH concentrations, as applicable, and installing a groundwater monitoring well if soil data indicates the vertical migration of contaminants to within 10 feet of the water table. One subsite (#14) was used as a representative example to show the existing boring locations at the site that require additional delineation, and the proposed new borings to accomplish the required delineation.

Phase II field work is scheduled to proceed in late February 2015, followed by Phase IIa in March 2015, and the Draft RI/FS Report for the site is scheduled for September 2015. There was some discussion of the planned step-out locations at Subsite #14, as shown on Slide 7. Dr. Gettmann asked that two additional step-outs be placed to the east and west of those shown on the slide. Ms. Morley noted that the additional sampling locations would likely be focused more on the road and less on the field. Ms. Griffey asked that the current data be shared with the FFA Team before re-mobilizing so that agreement can be reached on the Phase II approach. Mr. Dressler said that he will transmit the data via email.

### Prioritizing Future Work and Meeting Conclusion

Mr. Hausladen noted that he will be retiring from USEPA in December 2015, and his planned replacement is Judy Wong.

There was discussion regarding which sites or IR program items the various team members considered to be higher priority. There was discussion of the priority criteria, including risk to human health or the environment, and achieving site closures. Ms. Morley mentioned Site 1121 as potentially on the list of sites with a high priority, and also noted that the DON will likely develop a presentation for the next FFA meeting on the subject of prioritization.

The public meeting for Site 21 and 1119 Proposed Plans will be held on February 10 at the Base, and Ms. Griffey, Ms. di Campalto, and Mr. Mahmoud said they will likely attend the meeting.

### Schedule for Next FFA Meeting

The next FFA Meeting is scheduled to be held at MCB Camp Pendleton on May 14, 2015. Meeting was adjourned.

**MCB Camp Pendleton  
114<sup>th</sup> FFA Meeting Agenda**

**Parsons Conference Room  
100 West Walnut Street  
Pasadena, CA 91124**

**January 15<sup>th</sup>, 2015**

- |                    |   |
|--------------------|---|
| <b>0900 – 0915</b> | <b>Welcome and Introductions (Navy)</b>   |
| <b>0915 – 1000</b> | <b>Project Deliverables, FFA Schedule Update and Planned/In Progress Field Work Status (Navy)</b>                                 |
| <b>1000 – 1030</b> | <b>Discussion on Site 1118 Subsite 21565 Removal Action and the Public Meeting and Public Notice for Sites 21 and 1119 (Navy)</b> |
| <b>1030 – 1045</b> | <b>Break</b>  |
| <b>1045 – 1145</b> | <b>12 Area Site 13 – Groundwater Sampling Results, Soil Vapour Extraction System and New Construction (Parsons)</b>               |
| <b>1115 – 1145</b> | <b>Site 1116 soil gas results 14137 NMC, path forward</b>   |
| <b>1145 – 1245</b> | <b>Lunch</b>  |
| <b>1245 – 1330</b> | <b>Progress Report on Phase I Remedial Investigation Field Work for Site 1120</b>   |
| <b>1330 – 1400</b> | <b>Prioritizing Future Work</b>   |
| <b>1430 – 1445</b> | <b>Break</b>  |
| <b>1545 – 1600</b> | <b>Meeting Conclusion and Action Items (Navy)</b>   |

# PARSONS

CLIENT NAVY - FFA Meeting, 114th  
 SUBJECT SIGN IN SHEET

JOB NO. \_\_\_\_\_ SHEET \_\_\_\_\_ OF \_\_\_\_\_  
 BY \_\_\_\_\_ DATE 1/15/15  
 CKD. \_\_\_\_\_ REVISION \_\_\_\_\_

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FFA Schedule for Draft Documents – January 15, 2015

Original schedule was agreed to by all FFA signatories at the May 17, 2011 FFA meeting. Updates are made every four months, prior to the FFA meetings. Dates marked with an asterisk are tentative, based on funding and subject to change. Once funding becomes available for a site, the date will be updated and the asterisk removed. Items in italics represent field work and are not enforceable.

**Site 6 (Site number is for funding purposes only) – 22/23 Area Groundwater**

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This site consists of VOC plumes in the groundwater under the 22 and 23 Areas. Various industrial activities have historically taken place in the 22 and 23 Areas. An RI/FS was completed in January 2011. The Proposed Plan outlined the various alternatives from the FS and proposed the preferred alternative which is a combination of alternatives 2, 3 and 4. Alternative 2 includes Land Use Controls and Long-Term Monitoring, Alternative 3 involves an Alternate Water Supply and Alternative 4 is Source Area Treatment via In-Situ Technologies. A public comment period and public meeting for the Proposed Plan were held in July/August 2011. A Record of Decision has been completed. To evaluate the effectiveness of the remedies proposed for Alternative 4, two pilot studies are in progress and a third planned: a Zero Valent Zinc (ZVZ) Permeable Reactive Barrier for the TCP plume; Enhanced InSitu Bioremediation (EISB) for the TCE plume; and, characterization of the 1,4-dioxane plume. The DoN has finalized work plans for both pilot studies and to test locations to site the replacement production well.

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|--|--------------------|
| – Proposed Plan  | complete           |
| – Geotechnical and Design Information for ZVZ PRB Pilot Study  | complete           |
| – <i>Implementation of ZVZ PRB Pilot Study</i>   | <i>in progress</i> |
| – <b>Record of Decision</b>  | <b>complete</b>    |
| – <b>Well Siting Study Sampling and Analysis Plan</b>  | <b>complete</b>    |
| – <i>Field Work for Well Siting Study</i>  | <i>complete</i>    |
| – Work Plan for Enhanced InSitu Bioremediation (EISB)  | complete           |
| – <i>Field Work for EISB Pilot Study</i>   | <i>in progress</i> |
| – Work Plan to Install Wells and Conduct Groundwater Monitoring  | complete           |
| – <i>Installation of Alternative Water Supply Well</i>   | <i>in progress</i> |
| <b>Land Use Control Implementation Plan</b>  | <b>5/16/2014</b>   |
| – Tech Memo to Implement Alternate Water Supply  | complete           |
| – Baseline LTM Groundwater Monitoring Tech Memo  | complete           |
| – EISB Pilot Study for TCE Report  | 2015*              |
| – ZVZ Pilot Study for TCP Report   | 2015*              |
| – Annual LTM Groundwater Monitoring Report   | 2015*              |
| <b>Extension for Record of Decision requested to incorporate multiple Navy and Marine Corps comments and for Sampling and Analysis Plan to accommodate changes in Navy Quality Assurance Officer</b> |                    |
| <b>LUCIP delayed because the ROD was not signed until February 2014</b>  |                    |

## **\*\*POST ROD Site 7 – Box Canyon Landfill**

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This site is a CAMU situated above an old municipal landfill. This site is post-ROD. The selected remedy was an EvapoTranspiration (ET) cap with land use controls. The site must be fenced and signed. Annual inspections are made in relation to the monitoring systems, cover maintenance, drainage/erosion control, cracks, settlement and movement and vegetation growth. Additionally, groundwater monitoring wells are sampled every year and gas probes are sampled according to the percent of methane in the probe. The groundwater monitoring results and the annual maintenance activities are summarized in annual reports. The methane results are emailed to the FFA team monthly. A Gas Collection and Control System (GCCS) was installed and has reduced methane concentrations to below compliance standards.

- Memo to File for Site 7 (pv panels) complete
- *Field Work for Non Methane Organic Compounds* complete
- Memo To File complete
- Report for Non Methane Organic Compounds complete
- Annual Post Closure Maintenance Report (for CY14) 2/22/2015
- Annual Groundwater Monitoring Report 7/3/2015
- Five Year Review complete

## **12 Area Site 13 – Former Building 1280 and 1283**

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This site is the site of a former UST and has some low level concentrations of VOCs in groundwater. An RI/FS has been completed. Due to an impending construction project through the site, contaminated soil and groundwater were removed from the area to be impacted by construction. A year of groundwater monitoring has been completed and a Project Completion Report is complete. The report recommends further action for the site. An interim action is underway to install a Soil Vapour Extraction system and monitor groundwater for a year.

- Groundwater Monitoring Report complete
- **Project Completion Report for Soil and Groundwater** complete
- *AS/SVE Pilot Study* in progress
- Post SVE Groundwater Monitoring Report 2015\*
- Proposed Plan 2016\*
- Record of Decision 2017\*

**Dates changed as a result of the May 10, 2012 FFA Meeting**

## **Site 21 – 14 Area Surface Area Impoundment**

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This site was a former oxidation pond near a maintenance facility which has some low levels of VOCs in groundwater. A Remedial Investigation has been completed for the site. A pilot study to evaluate the effectiveness of in-situ bioremediation of chlorinated solvents at low concentrations in groundwater is complete. Technical Memorandums reporting on the effectiveness of both phases of the pilot study were finalized and the Feasibility Study is in agency review.

- Pilot Study Tech Memo complete
  - Site 21 Pilot Study Work Plan Addendum complete
  - *Second Phase of Pilot Study Field Work* complete
  - **Feasibility Study** complete
  - **Proposed Plan** 11/15/2014
  - **Record of Decision** 3/9/2015
- Dates were changed as a result of the September 15, 2011 FFA meeting**

### **Site 33 – 52 Area Armory**

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Gun cleaning in the armory contributed to a PCE plume downgradient of the armory. A Remedial Investigation and Feasibility Study have been completed for this site. An Engineering Evaluation/Cost Analysis and a Non-Time Critical Action Memorandum have also been completed. The selected remedy was excavation of the source material, and treatment of groundwater from the site. An interim Removal Action was completed, concentrating on the worst part of the plume. An additional Removal Action was recently completed for the source area. Groundwater monitoring is currently in progress, and EISB injections and soil gas sampling are planned.

- Removal Action Work Plan for plume complete
- *Plume Removal Action (geophysical work started 15 Nov 11)* complete
- Plume Removal Action Completion Report complete
- Removal Action Work Plan for source complete
- *Source Removal Action/EISB Injection* in progress
- Groundwater Monitoring Report 8/27/2014
- SAP Addendum for Soil Gas Monitoring 8/27/2014
- Source Removal Action Completion Report 1/16/2015
- Proposed Plan 2015\*
- Record of Decision 2016\*

### **Site 150 – 21 Area, Location 1**

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This site became an IR site after a discovery investigation conducted based on information gained from a former Marine stationed at Camp Pendleton. During the discovery investigation, one location had vinyl chloride in soil gas that exceeded risk screening criteria. Field work for the Site Inspection has located groundwater contamination. This site is in the Remedial Investigation phase.

- *Site Inspection Field Work* complete
- Site Inspection Report complete
- **Remedial Investigation Work Plan** complete
- ***Field Work for Remedial Investigation*** in progress
- **Remedial Investigation Report** 2015\*
- **Feasibility Study** 2015\*

- Proposed Plan 2016\*
  - Record of Decision 2017\*
- Dates changed (RI added) as a result of the SI field work**

**SITE CLOSED Site 1003 (Site number is for funding purposes only) – Site 1D Soil**

This site was a former burn ash site and has undergone a Remedial Investigation and Feasibility Study for soil only. A ROD was signed documenting the selected remedy consisting of excavation and off-base disposal of contaminated soil. During the remedial action a cell with 90 drums and drum fragments containing liquid and solid chemicals was discovered. The drums were removed but the material in the drums had reached groundwater. A Remedial Action Closure Report (RACR) was completed to close out the soil portion of the site, but the groundwater contamination remains to be addressed. As an interim measure, until funding could be secured for further investigation, 650,000 gallons of the groundwater was pumped from the site, treated and disposed of in the base sanitary sewer system. This lowered the concentrations of contaminants in groundwater, however, additional work is planned under a new site, IR Site 1121 Site 1D Groundwater. This site is for soil only; and was closed through the ROD and the RACR.

- Data Gap Analysis for Groundwater Work Plan complete
- *Data Gap Analysis Field Work* complete
- Data Gap Analysis Report complete

**SITE CLOSED Site 1111 – 26 Area Ash and Debris Disposal Area**

This burn ash site was remediated and four quarters of groundwater monitoring have been completed. The site was revegetated and a report was written summarizing the actions that had been completed to date, and why the site qualified for unrestricted land use. A No Further Action Record of Decision (ROD) was signed on April 19, 2013.

- Proposed Plan for No Further Action complete
- Record of Decision for NFA complete

**Site 1114 – 41 Area Arroyo**

This site was created to investigate the PCE concentrations in one well that used to be associated with IR Site 9 (closed). A Site Inspection was carried out and described low-level concentrations of TPH and vinyl chlorides in soil gas and groundwater. A Remedial Investigation was conducted to validate the findings of the SI and to complete a risk assessment for the site. The EPA did not agree with the proposed NFA, so an interim Removal Action was completed to address elevated concentrations in groundwater. Performance monitoring to examine the effectiveness of the substrate injected during the removal action is underway.

- Remedial Investigation Report complete
- **Engineering Evaluation/Cost Analysis & Action Memorandum** complete

– <b>Removal Action Work Plan</b>	<b>complete</b>
– <b>Removal Action</b>	<b>complete</b>
– <b>Work Plan for Performance Monitoring</b>	<b>complete</b>
– <b>Removal Action Completion Report</b>	<b>complete</b>
– <b>Performance Monitoring</b>	<b>in progress</b>
– Performance Monitoring Report	2015*
– Proposed Plan	2015*
– Record of Decision	2016*
<b>Dates were changed as a result of EPA's disagreement with site closure</b>	
<b>Dates were changed as a result of the Government shutdown</b>	

### **Site 1115 – 13 Area FSSG Lot**

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There are two plumes underneath the parking lot at this site, one shallow and one deep, containing chlorinated solvents and benzene. A pilot study to evaluate the effectiveness of in-situ bioremediation of chlorinated solvents in groundwater was completed. The technology was successful at reducing contaminant concentrations, but the site geology limited its effectiveness. A Technical Memorandum detailing the pilot study is complete. A work plan to collect more data is final and the results have been included in a Remedial Investigation/Feasibility Study. The Feasibility Study identified remedial alternatives for various Target Treatment Zones (TTZs) throughout the site. Pilot studies are currently underway to address the different plumes and contaminants at the site.

– Tech Memo	complete
– <b>Work Plan to collect additional data for site</b>	<b>complete</b>
– <b>Field Work to collect additional data</b>	<b>complete</b>
– <b>Remedial Investigation/Feasibility Study Report</b>	<b>complete</b>
– Pilot Study Work Plan for TTZ-2L and TTZ-2S	complete
– Pilot Study Work Plan for TTZ-1S	complete
– <i>Field Work for TTZ-2L and TTZ-2S Pilot Study</i>	<i>in progress*</i>
– <i>Field Work for TTZ-1S Pilot Study</i>	<i>in progress*</i>
– Pilot Study Report for TTZ-1S	2015*
– Pilot Study Report for TTZ-2L and TTZ-2S	2015*
– Proposed Plan	2016*
– Record of Decision	2017*
<b>Dates were changed as a result of the September 15, 2011 FFA meeting</b>	

### **Site 1116 – 14 Area Groundwater**

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Nine USTs were transferred from the UST Program to the IR Program due to low-levels of chlorinated solvents. A Site Inspection was completed and six of the sites do not warrant further action under the IR Program. The three other sites will be remediated. An Engineering Evaluation/Cost Analysis (EE/CA) and Action Memo has been completed for this site. A Removal Action Work Plan, with a report detailing the results of a limited

investigation to close data gaps as an appendix, is complete. The removal action will address the mainly petroleum sources at the old USTs, along with Dual-Phase Extraction (DPE) at one site and an Enhanced Insitu Bioremediation (EISB) pilot study at another site. The limited investigation that was conducted in 2012 indicated that the TCE plumes at the site are not likely associated with the USTs. Therefore, an additional investigation is in progress to delineate the TCE plumes and to find a source, if possible.

- EE/CA and Action Memorandum (3 subsites – Moving Forward) complete
- Expanded Site Inspection WP (3 subsites – Moving Forward) complete
- *Field Work for Site Inspection* (3 subsites – Moving Forward) complete
- **Expanded Site Inspection Report (3 subsites – Moving Forward) appendix to RAWP**
- **Removal Action Work Plan (RAWP) (3 subsites – Moving Forward) complete**
- ***Interim Removal Action* (3 subsites – Moving Forward) in progress**
- Additional Investigation Work Plan complete
- Performance Monitoring SAP complete
- *Additional Investigation Field work* complete
- *Performance Monitoring Field Work* in progress
- Removal Action Completion Report (3 subsites – Moving Forward) 12/19/2014
- Additional Investigation Report 4/9/2015
- Proposed Plan 2015\*
- Record of Decision 2016\*

**Dates were changed as a result of the September 17, 2012 FFA meeting.**

### **Site 1117 – 15/16 Area Groundwater**

Six USTs were transferred from the UST Program to the IR Program due to low-levels of chlorinated solvents. The agencies have concurred with the Site Inspection Report recommending the site move into the Remedial Investigation phase. A Remedial Investigation is currently in progress.

- *Field Work for Site Inspection* complete
- Site Inspection Report complete
- **Remedial Investigation Work Plan complete**
- ***Remedial Investigation Field Work* in progress**
- **Remedial Investigation Report 2015\***
- Proposed Plan 2015\*
- Record of Decision 2016\*

**Remedial Investigation added based on agency comments on Site Inspection**

### **Site 1118 – 21/26/52 Area Groundwater**

Three USTs were transferred from the UST Program to the IR Program due to low-levels of chlorinated solvents. The Site Inspection report was reviewed by the regulatory agencies and additional work, including a

soil gas investigation, was needed to verify if no further action was appropriate for the subsites. Field work for an Extended Site Inspection Work Plan is complete and a report detailing the findings is with the agencies.

- **Extended Site Inspection (ESI) Work Plan** **complete**
- *Field Work for Site Inspection* *complete*
- Extended Site Inspection Report *complete*
- EE/CA and Action Memo Subsite 21565 *complete*
- **Removal Action Work Plan Subsite 21565** **1/9/2015**
- *Field Work for Subsite 21565 Removal Action* *5/10/2015*
- Removal Action Completion Report Subsite 21565 *2015\**
- ESI Work Plan Addendum Subsite 520400 *2015\**
- *Field Work for Subsite 520400* *2015\**
- Proposed Plan *2016\**
- Record of Decision *2017\**

**Dates changed as a result of document quality issues**

**Dates changed due to delays with regulatory agencies on ESI**

#### **Site 1119 – 26 Area Groundwater**

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This site was created to investigate the source or sources of chlorinated solvents in the 26 Area production wells. Field work for the Remedial Investigation has been completed. TCE had been discovered at two of the wells and further investigation was needed to delineate the extent of contamination and to locate the source. The results of the additional investigation and proposed remedial alternatives were included in the Remedial Investigation/Feasibility Study Report. The preferred alternative has been documented in a Proposed Plan which is currently in agency review.

- *Field Work for Remedial Investigation* *complete*
- **Work Plan Addendum to Delineate Source** **complete**
- ***Additional RI Field Work*** ***complete***
- **RI/FS Report** **complete**
- Proposed Plan *9/12/2014*
- Record of Decision *3/9/2015*
- EISB Pilot Study Work Plan *2015\**
- *EISB Pilot Study* *2015\**
- EISB Pilot Study Report *2016\**

**Dates changed as a result of the Jan 19, 2011 FFA meeting**

#### **Site 62 – Asphalt Batch Plant**

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This site was created when a transformer containing PCBs tipped over and spilled. A Site Inspection was performed, however data was missing and further investigation was needed. An Extended Site Inspection,

including trenching, has been completed. The ESI Report recommended No Further Action at the site and a Proposed Plan has been completed. Currently a Record of Decision is in agency review.

- Extended Site Inspection Work Plan complete
- **Field Work for Extended Site Inspection** **complete**
- **Extended Site Inspection Report** **complete**
- Proposed Plan complete
- Record of Decision 9/10/2014

**Dates changed as a result of the September 17, 2012 meeting**

### **Site 1120 – Stuart Mesa Pesticide Maintenance Areas**

---

This site was created in 2012 to address pesticide contamination due to releases from agricultural maintenance activities. A Phase II Environmental Assessment was completed for this site in support of real estate agreement closure. The Environmental Assessment is analogous to a Site Inspection, so this site entered the Installation Restoration Program at the Remedial Investigation stage. Currently the field work for the Remedial Investigation is in progress.

- Remedial Investigation Work Plan complete
- *Remedial Investigation Field Work* *in progress*
- Remedial Investigation Report 2015\*
- Proposed Plan 2016\*
- Record of Decision 2017\*

### **Site 1121 – Site 1D Groundwater**

---

This site was created in 2012 to differentiate Site 1D groundwater from Site 1D soil, which was closed with a previous remedial action and Record of Decision. There is a plume consisting of elevated concentrations of VOCs, metals, and pesticides. A Remedial Investigation is currently in progress.

- Remedial Investigation Work Plan complete
- **Remedial Investigation Field Work** **in progress**
- Remedial Investigation Report 2015\*
- Proposed Plan 2015\*
- Record of Decision 2016\*

**Dates were changed as a result of the Government shutdown**

### **Site 1122 – Shot Fall Zone**

---

This site was created in 2013 to address lead and Polycyclic Aromatic Hydrocarbon contamination due to overshot from skeet range activities off base. Limited soil samples were collected that indicated elevated

levels of lead, so the site came into the Installation Restoration Program at the Site Inspection stage. The Site Inspection field work was completed and at present the Site Inspection Report is in agency review.

- **Site Inspection Work Plan** **complete**
- *Site Inspection Field Work* *complete*
- **Site Inspection Report** **7/15/2014**
- Proposed Plan 2016\*
- Record of Decision 2017\*

**Dates changed as a result of the Government shutdown**

**Date changed as a result of delays caused by Navy QAO and natural resource issues**

MCB Camp Pendleton Deliverables Spreadsheet

Date: 1/15/15

Item	Document	Contractor	Status	Date Due to Agencies	Agency Comments Due By	Response Received From:		
						EPA	DTSC	RWQCB
1	Extended Site Inspection Report - Site 1118 (21, 26, 52 Area GW)	ECM	FINAL	12/12/13	2/10/14	10-Feb	6-Feb	7-Apr
2	Land Use Control Implementation Plan - 22/23 Area Groundwater	Parsons	Responding to agency comments	5/16/14	7/15/14	9-Jun	14-Jul	21-Jul
4	Baseline LTM Tech Memo 22/23 Area Groundwater	Tidewater	FINAL	6/30/14	8/29/14	NC	20-Aug	15-Oct
5	Annual Groundwater Monitoring Report - Site 7 (Box Canyon)	Trevet	FINAL	7/2/14	9/1/14	NC	14-Aug	10-Sep
6	SI Report for Site 1122 - Shot Fall Zone	AMEC	FINAL	7/15/14	9/15/14	NC	4-Sep	1-Oct
7	EE/CA and Action Memo - Site 1118 (21/26/52 Area Groundwater)	SDVJV	Finalizing	8/7/14	10/6/14	1-Oct	2-Oct	15-Oct
8	Quarterly Groundwater Monitoring Report Site 33 (52 Area Armory)	Trevet	Responding to agency comments	8/27/14	10/27/14	NC	15-Oct	27-Oct
9	SAP Addendum for Soil Gas Sampling Site 33 (52 Area Armory)	Trevet	Finalizing	8/27/14	10/27/14	NC	23-Oct	27-Oct
10	NFA Record of Decision for Site 62 - Asphalt Batch Plant	TriEco	Responding to agency comments	9/10/14	11/10/14	6-Nov	30-Oct	22-Oct
11	Proposed Plan for Site 1119 - 26 Area Groundwater	Tidewater	Finalizing	9/12/14	11/11/14	14-Oct	9-Oct	1-Oct
12	Proposed Plan for Site 21 (14 Area Surface Impoundment)	SDVJV	Finalizing	11/14/14	1/13/15	NC	15-Dec	23-Dec
13	Removal Action Completion Report Site 1116 (14 Area Groundwater)	ECM	With agencies	12/19/14	2/17/15			
14	Removal Action Work Plan Site 1118 - Subsite 21565	Trevet	With agencies	1/9/15	3/10/15			
15	Removal Action Completion Report Site 33 (52 Area Armory)	ECM	With agencies	1/16/15	3/17/15			
16	Annual Post Closure Maintenance Report - Site 7 (Box Canyon)	Trevet	Preparing pre-draft	2/22/15	4/23/15			
17	Record of Decision for Site 21 (14 Area Surface Impoundment)	SDVJV	Preparing pre-draft	3/9/15	5/8/15			
18	Record of Decision for Site 1119 (26 Area Groundwater)	Tidewater	Preparing pre-draft	3/9/15	5/8/15			
19	Additional Investigation Report for Site 1116 (14 Area Groundwater)	TriEco	Preparing pre-draft	4/9/15	6/8/15			

Agencies have commented

MCB Camp Pendleton Fieldwork Spreadsheet

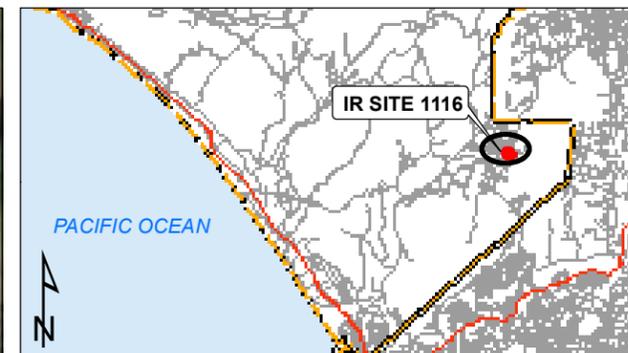
Date: 1/15/15

Item	Field Work	Planned Start Date	Planned Completion Date
1	Field Work for 22/23 Area Groundwater ZVZ Pilot Study	Geochem/sampling Jan 2014 Install new wells May 2014	complete
2	Install Test Well - 22/23 Area GW	February??	
3	EISB Pilot Study - MCAS Pendleton	Injection and three quarters sampled	Jan (4th)
4	22/23 Area LTM Quarterly Sampling	Baseline complete	Jan (1st); Apr (2nd); Jul (3rd); Oct (4th)
5	Removal Action Site 1116	ongoing	2015
6	RI Field Work - Site 1121	1st phase of field work complete; 2nd phase temp wells drilled June 26th; permanent wells drilled/sampled Sep	complete
7	Remedial Investigation - Site 150	soil & soil gas complete, 2nd, 3rd and 4th qtr complete	complete
8	Remedial Investigation - Site 1117	mid Feb and Sep for 2nd round soil gas 2014	complete
9	Site 1114 Performance Monitoring	wells installed/surveyed/developed/sampled	2 years performance monitoring 2015/2016
10	Site 1116 Groundwater Investigation	wells installed/surveyed/developed/sampled	complete
11	Pilot Study Site 1115 TTZ-1S and 1L	8/28 - abandon wells 9/29 start excavation/shoring 12/15 install wells 12/22 develop/sample wells injections (2/15) and (3/19)	sampling 5/1
12	Pilot Study Site 1115 TTZ-2S and 2L	well installation complete, system installation in progress	
13	Install New Wells - 22/23 Area GW	12-Jan-15	23-Jan-15
14	Soil gas & data gap samples Site 1120 RI	February??	
15	Removal Action Site 1118-Bldg 21565	May	
16			
17			

SIOH Bearing

Date: 1/15/15

Item	Document	Contractor	RTCs to agencies	RTC Approved		
				EPA	DTSC	RWQCB
1	Land Use Control Implementation Plan - 22/23 Area Groundwater	Parsons	10/21/2014; addl RTCs 1/13	21-Oct	addl comment 11/13	29-Oct
2	Quarterly Groundwater Monitoring Report Site 33 (52 Area Armory)	Trevet	12/10/2014; addl RTCs 1/13	N/A	11-Dec	14-Jan
3	NFA Record of Decision for Site 62 - Asphalt Batch Plant	TriEco				
4	Proposed Plan for Site 1119 - 26 Area Groundwater	Tidewater	12/11/2014	19-Dec	12-Dec	12-Dec
5	Proposed Plan for Site 21 (14 Area Surface Impoundment)	SDVJV	1/13/2015	N/A	14-Jan	N/A
6						

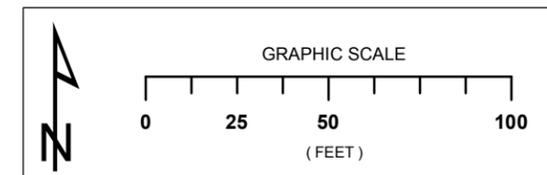


**LEGEND**

- TEMPORARY SOIL GAS WELL LOCATION
- FORMER BUILDING LOCATION, APPROXIMATE
- FORMER UST LOCATION, APPROXIMATE
- PROPOSED MEDICAL CENTER BUILDING

**NOTES:**  
 IR INSTALLATION RESTORATION

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



DEPARTMENT OF THE NAVY  
**NAVFAC SOUTHWEST** SAN DIEGO, CALIFORNIA  
Naval Facilities Engineering Command  
 MARINE CORPS BASE CAMP PENDLETON  
 CAMP PENDLETON, CALIFORNIA

**FIGURE X**  
**FORMER BUILDING 1431**

# Site 1118, Subsite 21565 NTCRA TWO PHASE REMOVAL?

1

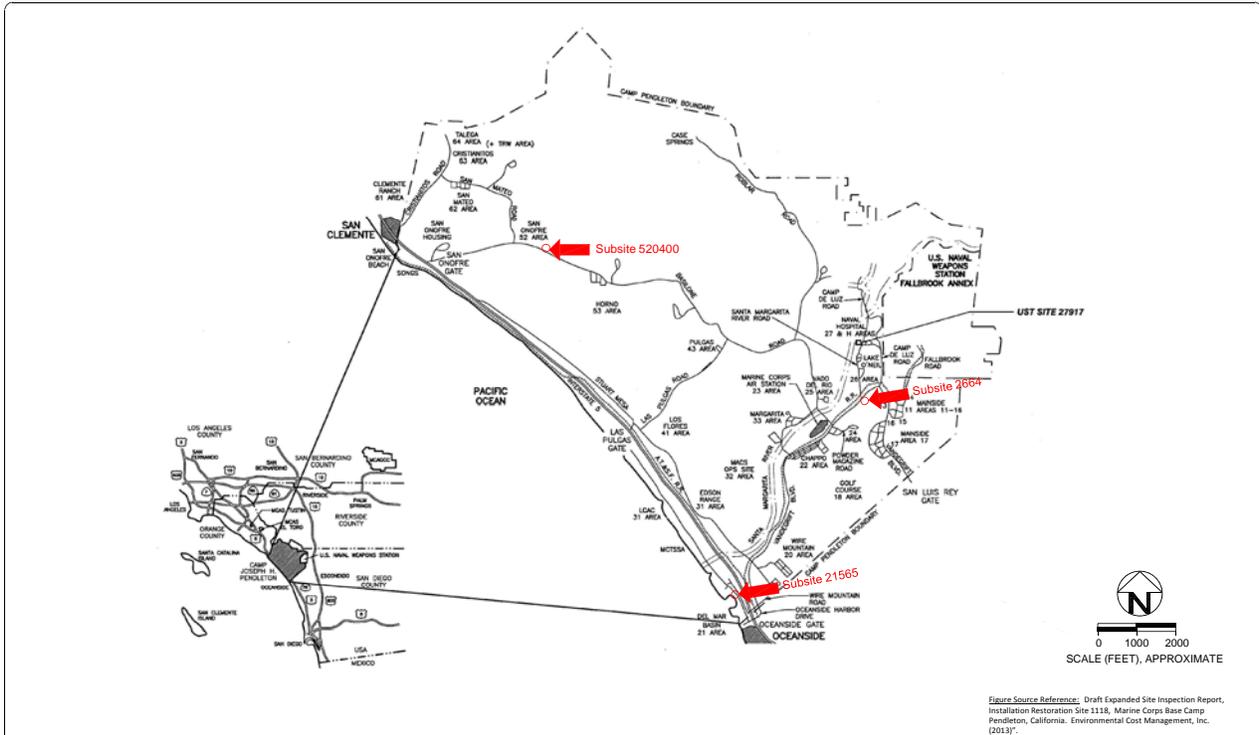


Figure Source Reference: Draft Expanded Site Inspection Report, Installation Restoration Site 1118, Marine Corps Base Camp Pendleton, California. Environmental Cost Management, Inc. (2013)\*.



Figure Source Reference: Draft Expanded Site Inspection Report, Installation Restoration Site 1118, Marine Corps Base Camp Pendleton, California. Environmental Cost Management, Inc. (2013)\*.



United States Marine Corps Base  
Camp Pendleton, California 92055-5008



2840 ADAMS AVENUE  
SAN DIEGO, CA 92118  
PHONE: (619) 295-0278

Site Location Map  
Subsite 21565, Installation Restoration Site 1118

Figure  
3-2-2



**LEGEND**  
Monitoring Well  
Drainage and Discharge System  
(4.20) Groundwater Elevation, feet above mean sea level  
Groundwater Elevation Contour, feet above mean sea level  
Groundwater Flow Direction, May 2013

SITE MAP REFERENCE:  
1. AERIAL IMAGE SOURCE: GOOGLE EARTH © 2011.  
ABBREVIATIONS:  
IR=INSTALLATION RESTORATION  
UST=UNDERGROUND STORAGE TANK

Figure Source Reference: Draft Expanded Site Inspection Report, Installation Restoration Site 1118, Marine Corps Base Camp Pendleton, California. Environmental Cost Management, Inc. (2013)\*.



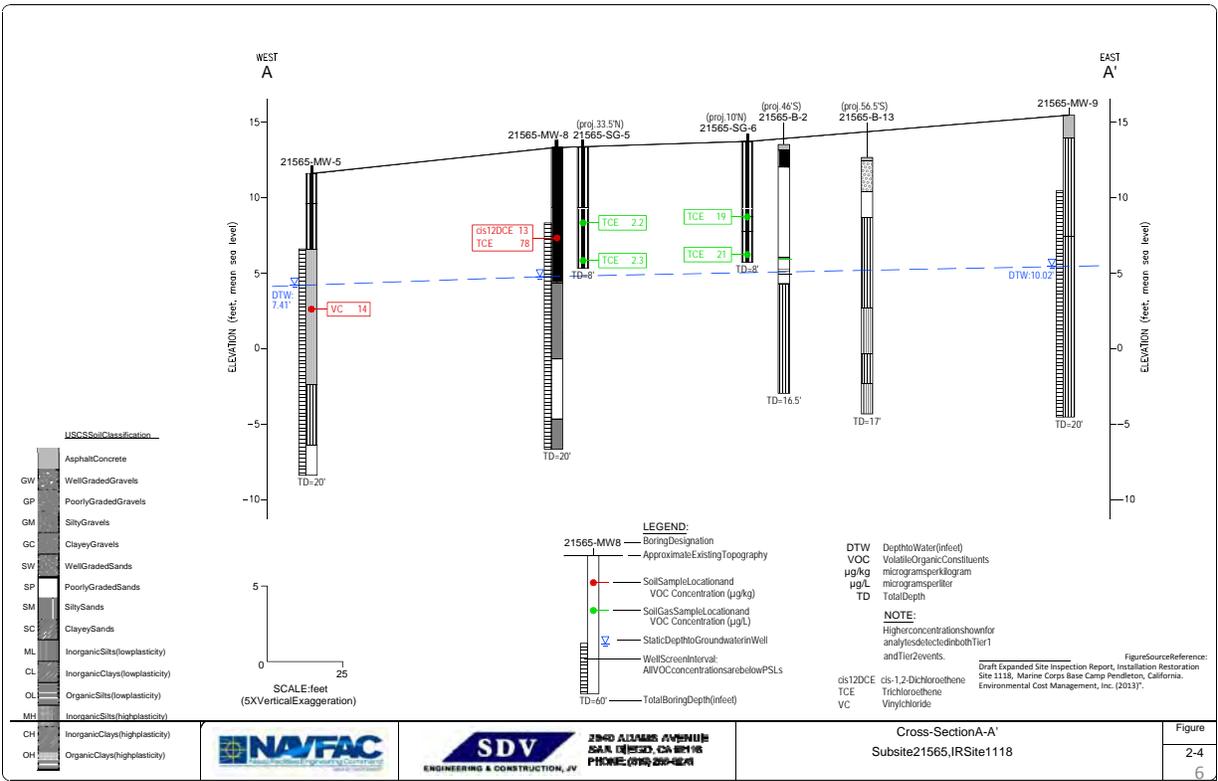
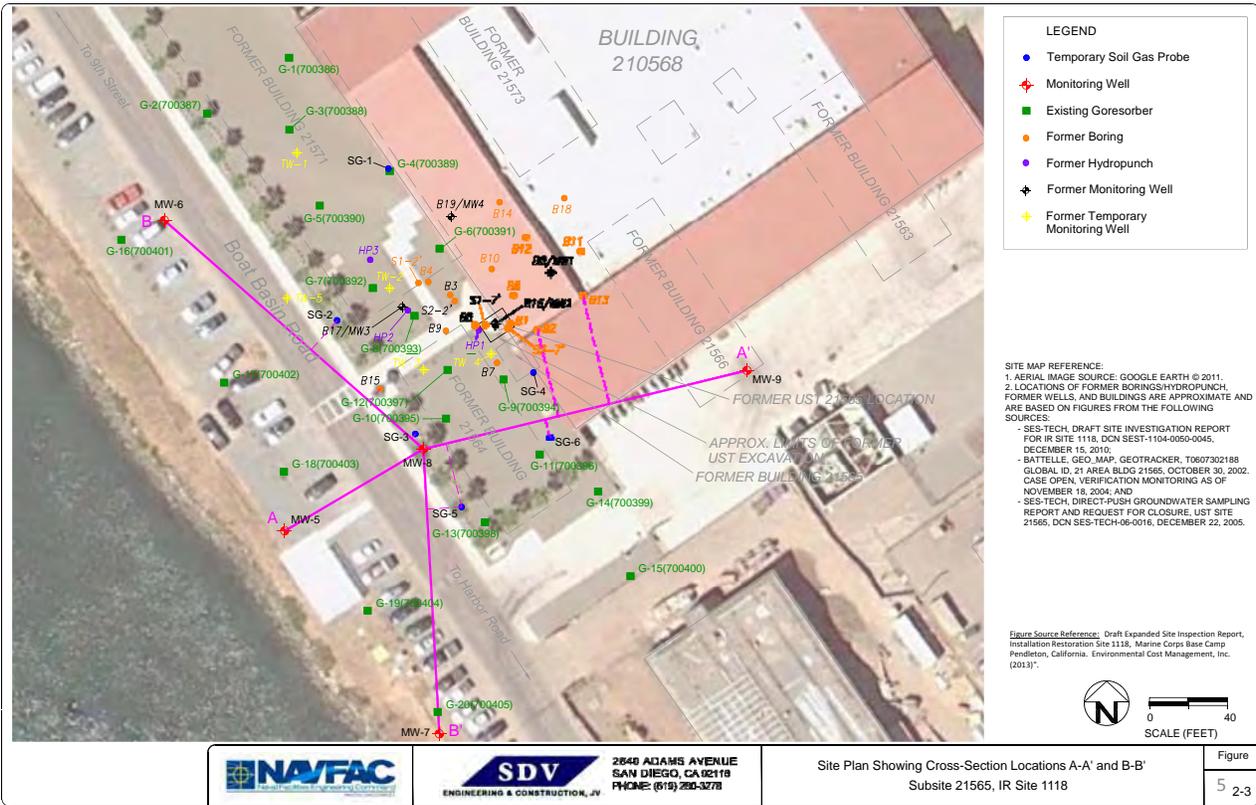
Subsite 21565, IR Site 1118  
Marine Corps Base  
Camp Pendleton, California

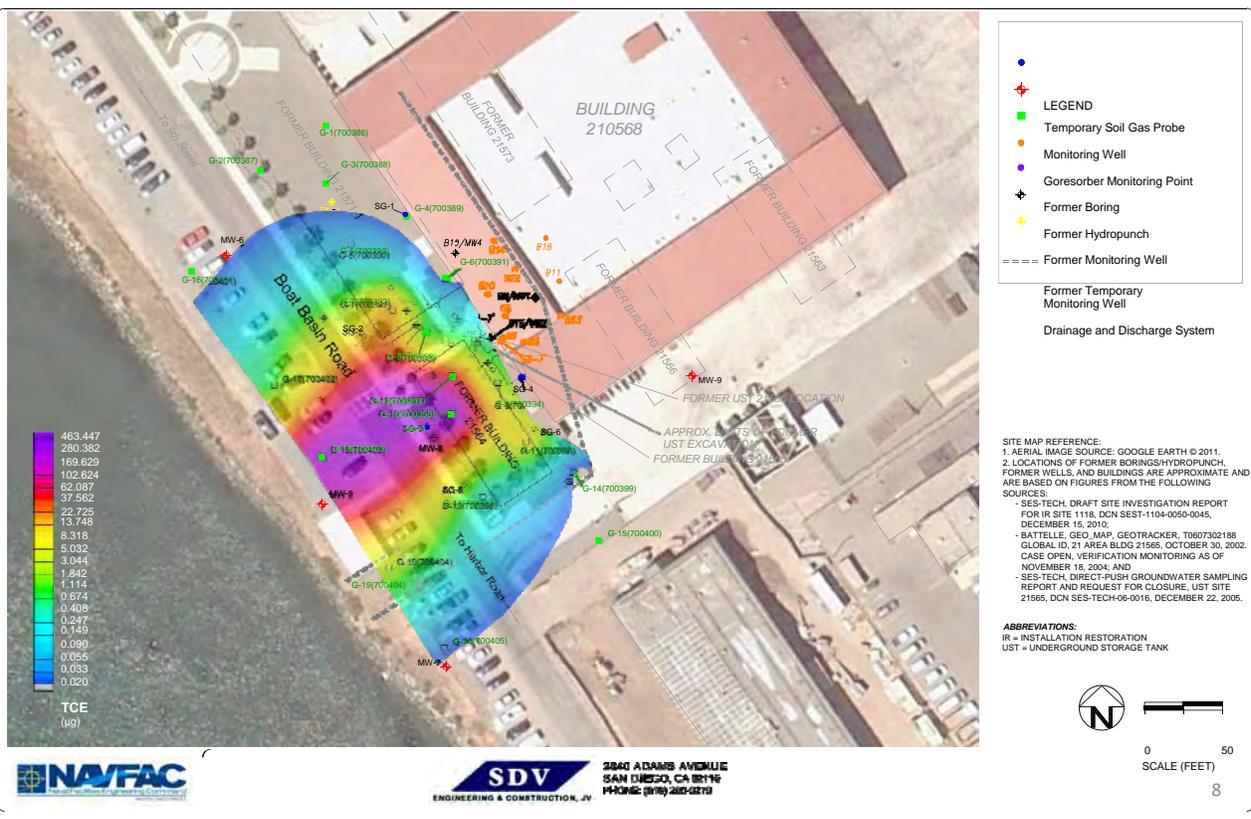
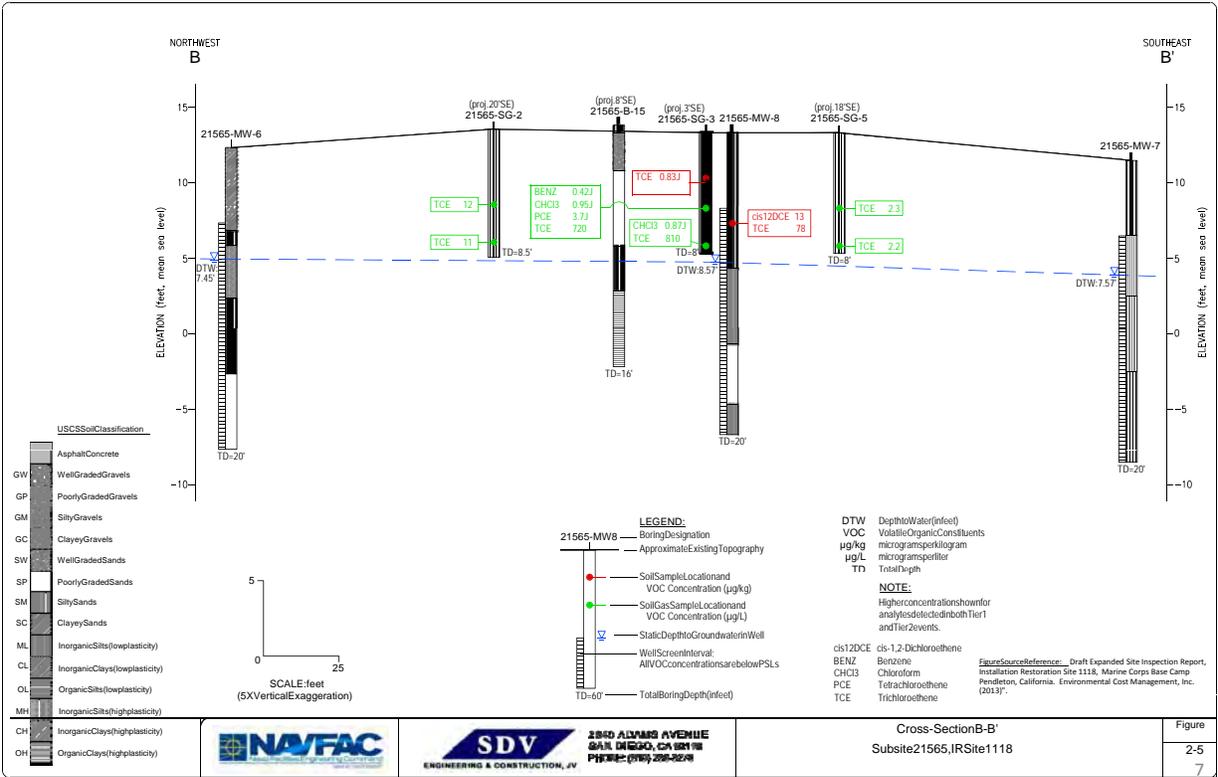


2840 ADAMS AVENUE  
SAN DIEGO, CA 92118  
PHONE: (619) 295-0278

May 2013 Groundwater Elevation Contours  
Subsite 21565, IR Site 1118

Figure  
4-2-6





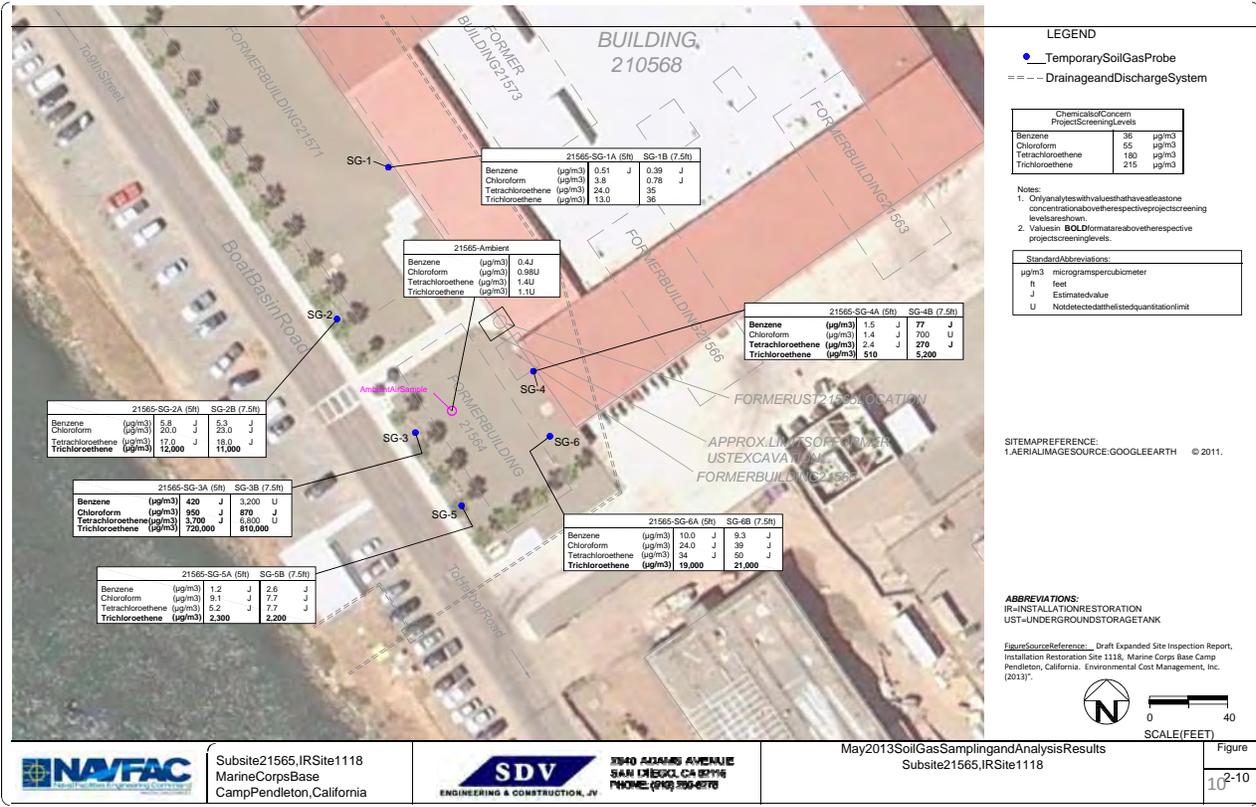
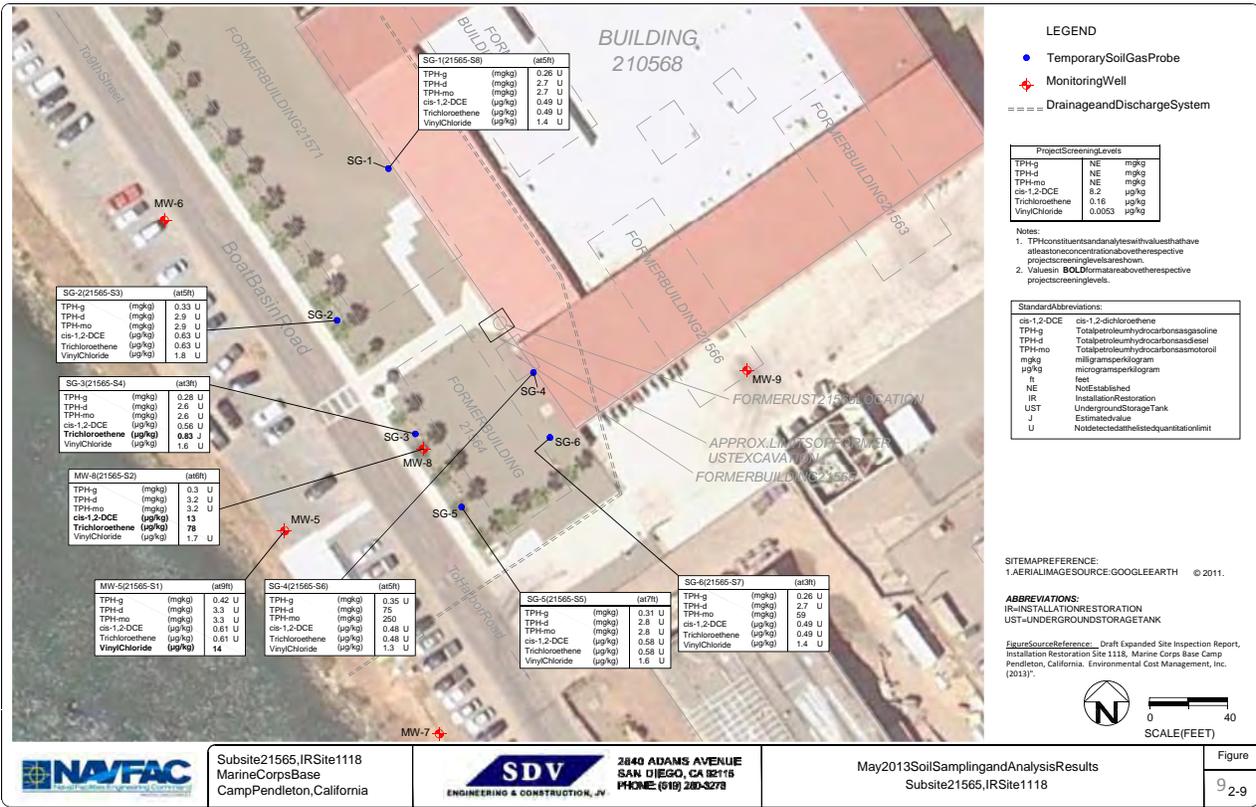
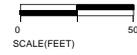


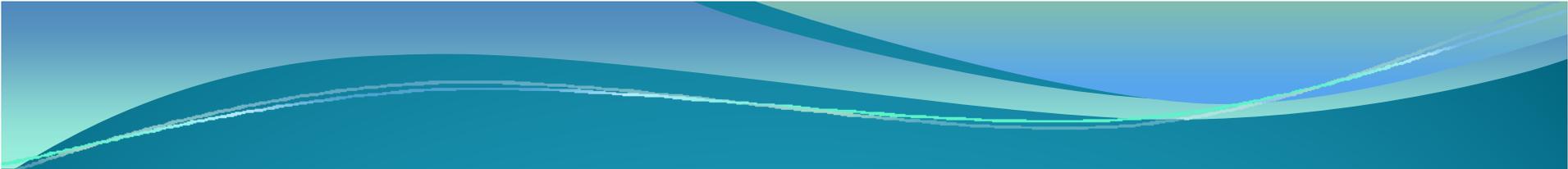






Figure Source: Reference Draft Expanded Site Inspection Report, Installation Restoration Site 114, Marine Corps Base Camp Pendleton, California. Environmental Cost Management, Inc. (2013).





# 12 Area, Site 13

## Site History and Current Status

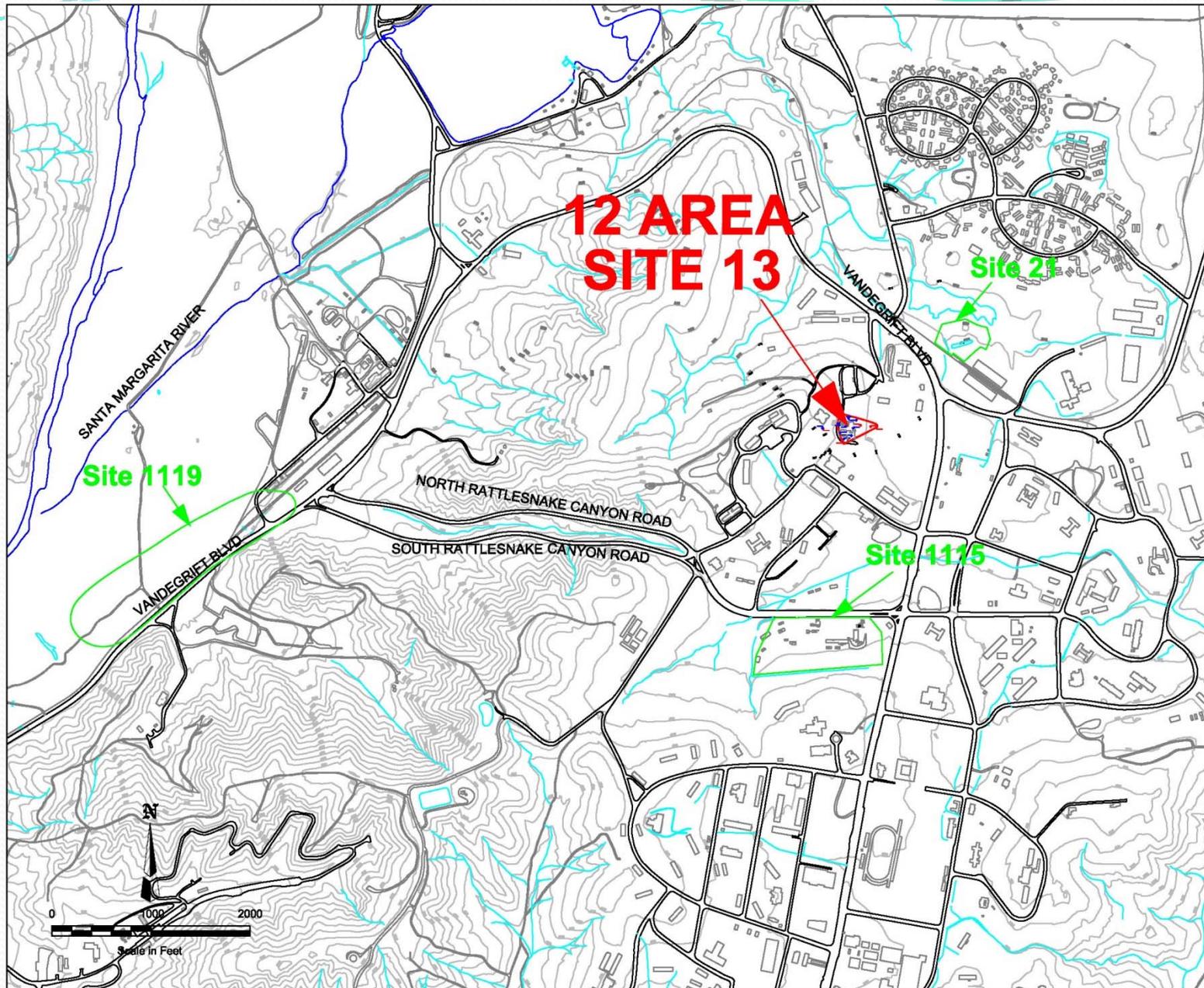
114th FFA Meeting  
January 15, 2015

# 12 Area, Site 13

## Summary of Site History

- pre-2000 - Formerly managed under the Base UST program
- 2000 - Became IR site due to the presence of chlorinated VOCs in groundwater
- 2004 - Remedial Investigation Report
- 2005 - Feasibility Study
- 2006 – Proposed Plan
- 2009 - Soil Excavation
- 2010 to 2011 - Groundwater Monitoring
- 2013 – Project Completion Report
- 2014 - AS/SVE and Groundwater Monitoring

# 12 Area, Site 13

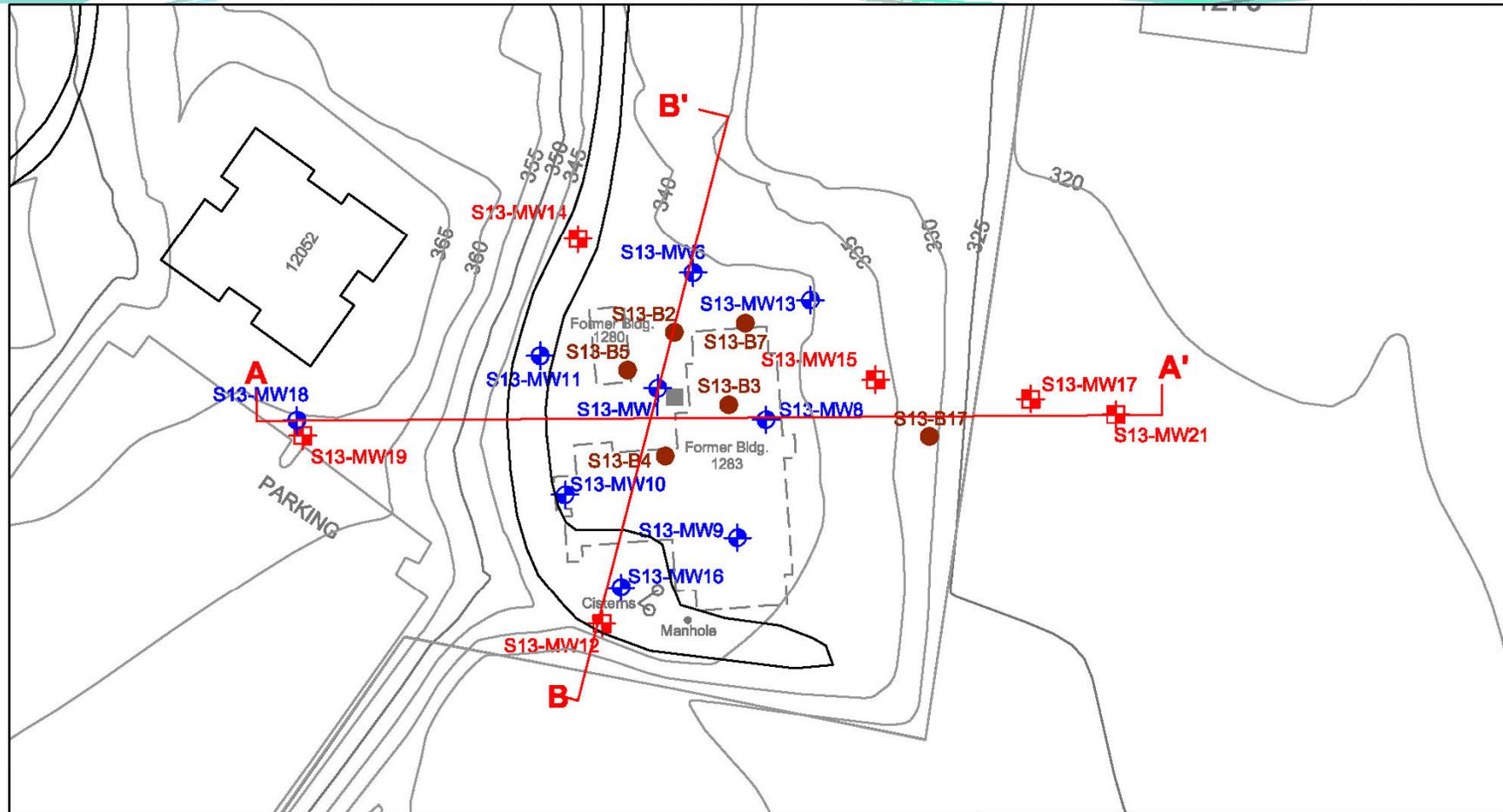


# 12 Area, Site 13

## OU 5 RI Summary (2004)

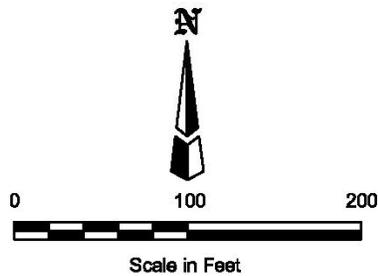
- Shallow zone is perched (approximately 20 feet bgs), with flow toward the east.
- Deeper zone is 60-70 feet bgs, with flow toward the west.
- Groundwater is within the area designated as beneficial use (including municipal and domestic supply), but such use unlikely due to TDS and yield (SWRCB Resolution 88-63).
- COPCs isolated to the site, with no evidence of off-site migration.
- Maximum detection of benzene 11  $\mu\text{g/L}$  (13-MW1)
- Maximum detection of TCE 10  $\mu\text{g/L}$  (13-MW1)

# 12 Area, Site 13



**Legend**

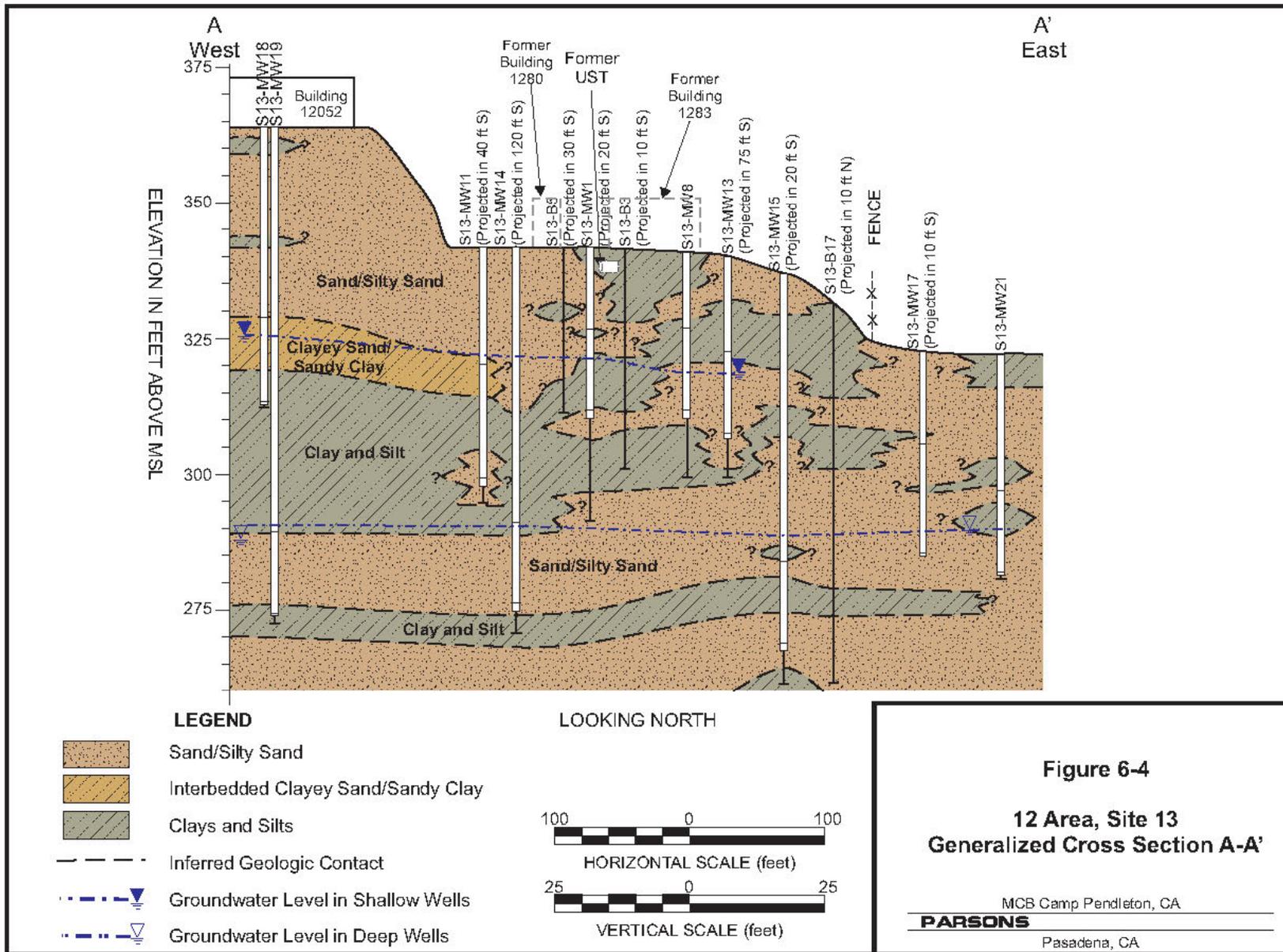
-  Shallow Groundwater Monitoring Well
-  Deep Groundwater Monitoring Well
-  Soil Boring Location (IT, 1996)
-  Cross Section Line



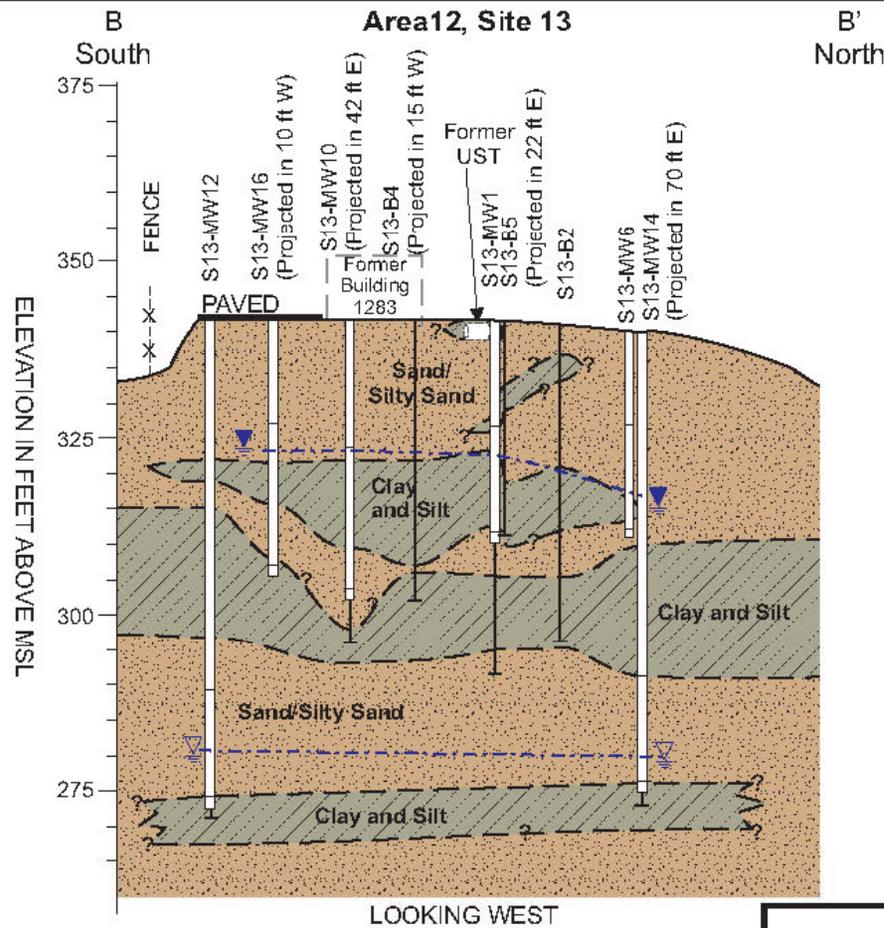
**Figure 6-2**  
**12 Area, Site 13**  
**Groundwater Monitoring**  
**Well Locations**

MCB Camp Pendleton, California  
**PARSONS**  
 Pasadena, CA

# 12 Area, Site 13

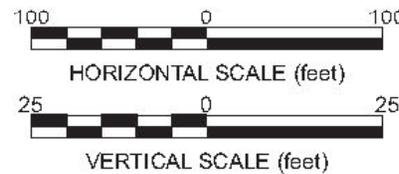


# 12 Area, Site 13



## LEGEND

-  Sand/Silty Sand
-  Clays and Silts
-  Inferred Geologic Contact
-  Groundwater Level in Shallow Wells
-  Groundwater Level in Deep Wells



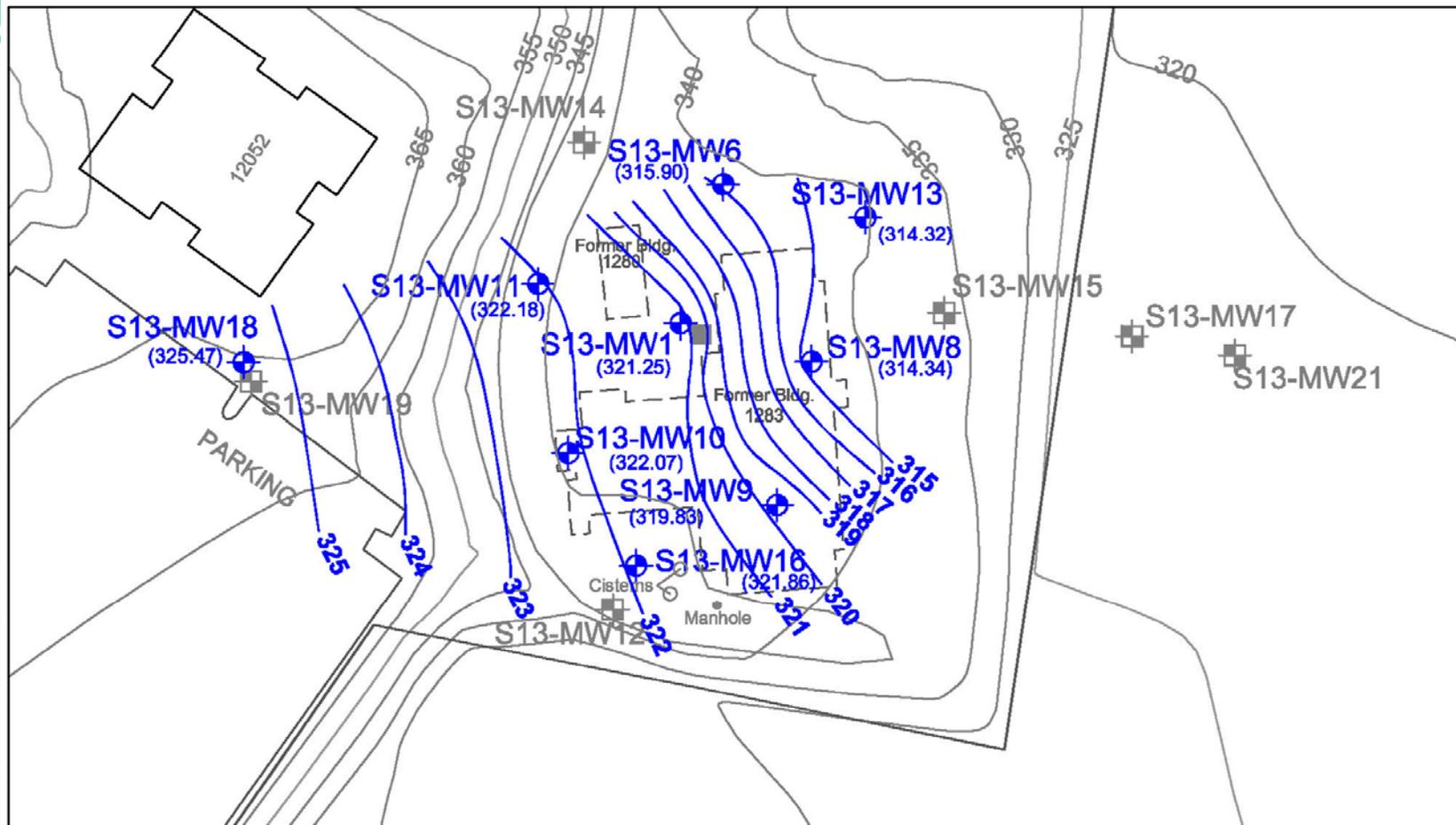
**Figure 6-5**  
**12 Area, Site 13**  
**Generalized Cross Section B-B'**

MCB Camp Pendleton, CA

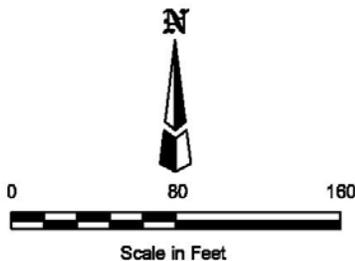
**PARSONS**

Pasadena, CA

# 12 Area, Site 13



- Legend**
-  Shallow Groundwater Monitoring Well
  -  Deep Groundwater Monitoring Well
  -  285 Groundwater Elevation Contour (ft amsl)
  -  (317.14) Groundwater Elevation (ft amsl)



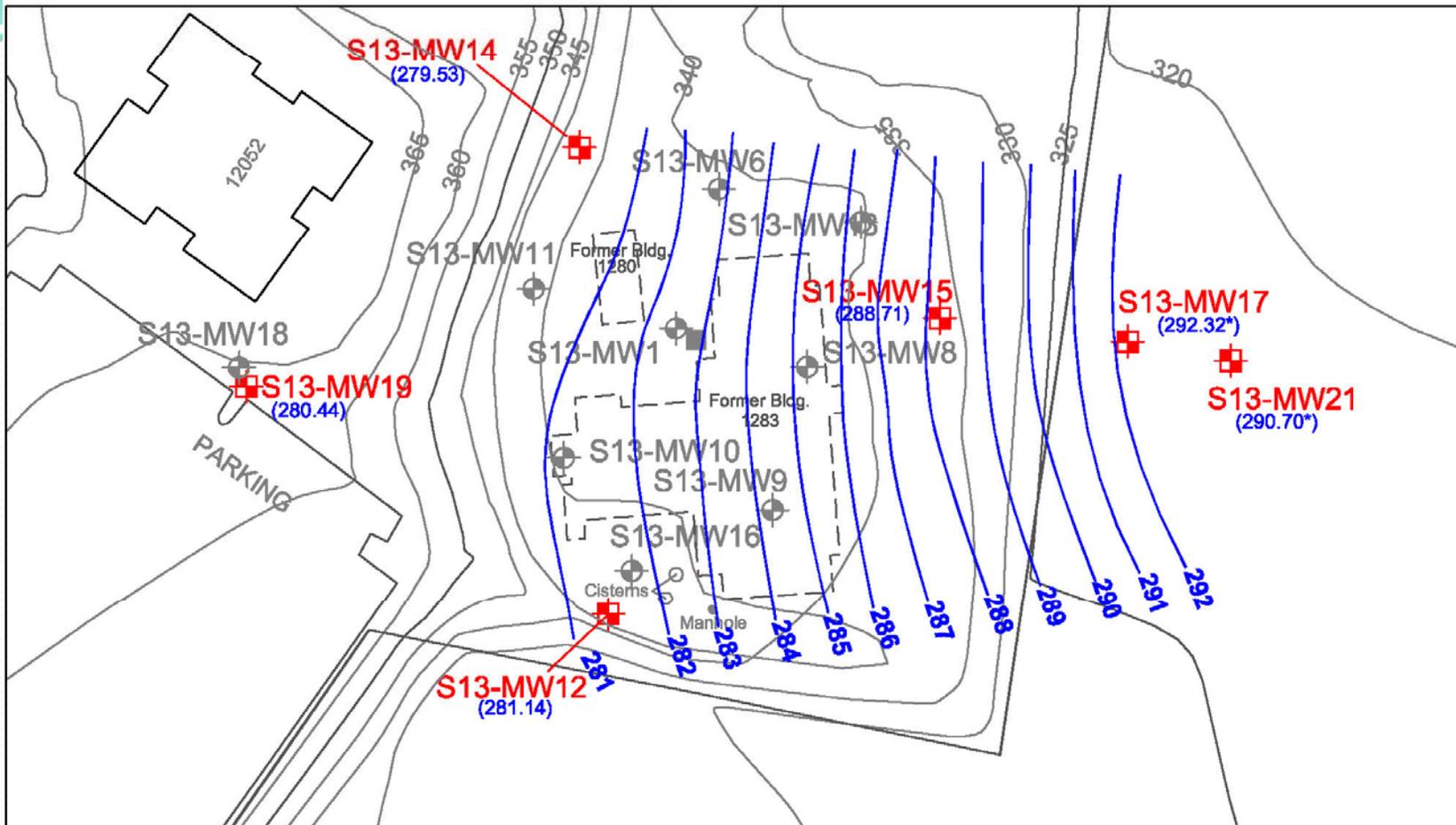
**Figure 6-6**  
**12 Area, Site 13**  
**Perched Groundwater Elevation**  
**March 2003**

MCB Camp Pendleton, California

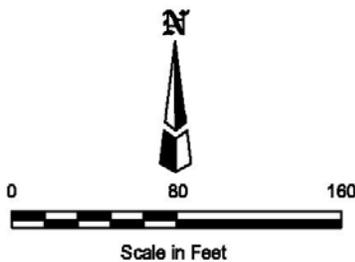
**PARSONS**

Pasadena, CA

# 12 Area, Site 13



- Legend**
- Shallow Groundwater Monitoring Well
  - Deep Groundwater Monitoring Well
  - Groundwater Elevation Contour (ft amsl)
  - Groundwater Elevation (ft amsl)



**Figure 6-7**

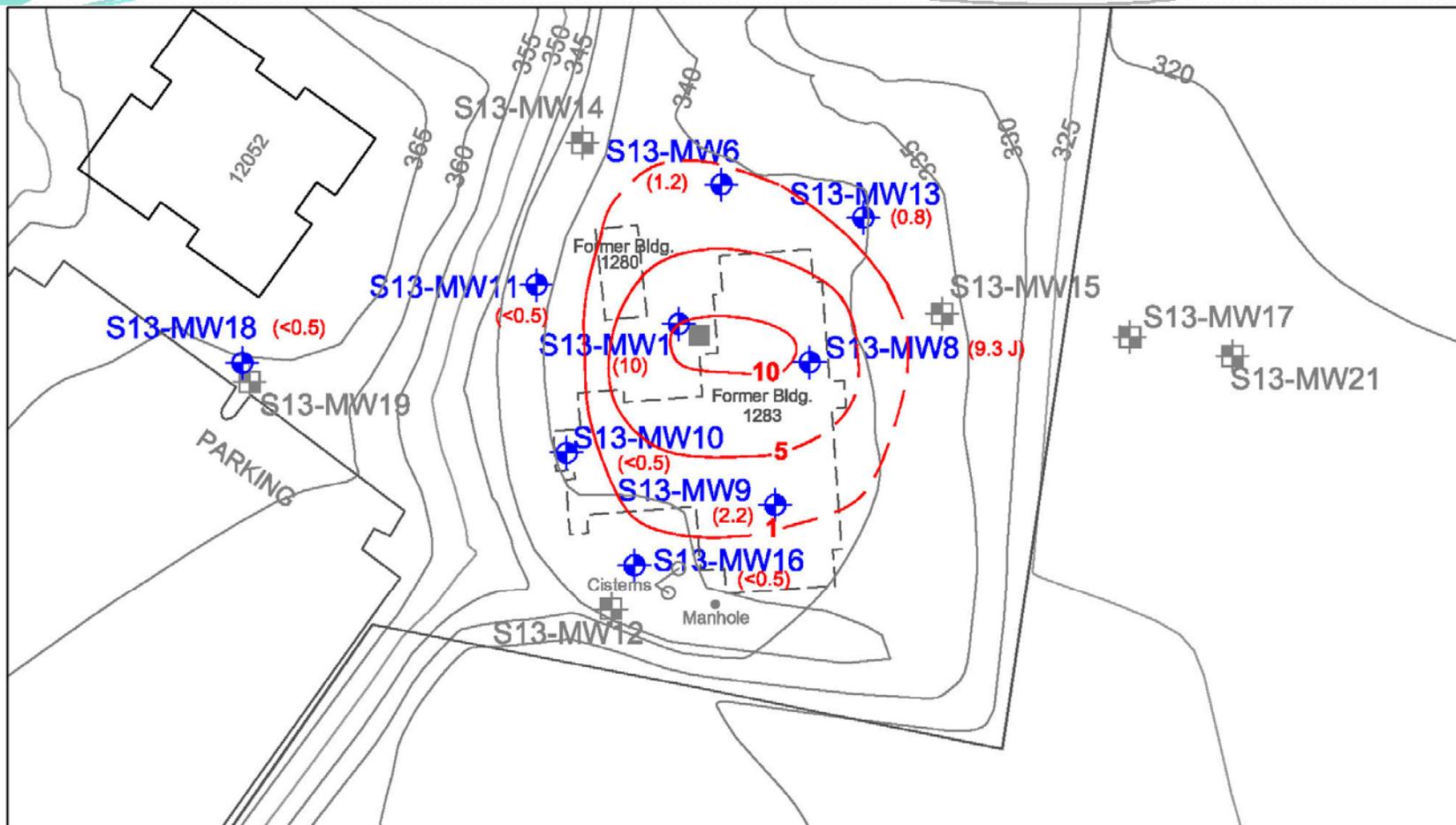
**12 Area, Site 13  
Deep Groundwater Elevation  
March 2003**

MCB Camp Pendleton, California

**PARSONS**

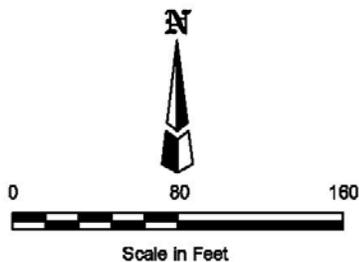
Pasadena, CA

# 12 Area, Site 13



**Legend**

- Shallow Groundwater Monitoring Well
- Deep Groundwater Monitoring Well
- TCE Isoconcentration Contour (µg/L) (dashed where inferred)
- (1.2) TCE Concentration (µg/L)
- (<0.5) Not detected at referenced detection limit



**Figure 6-8**

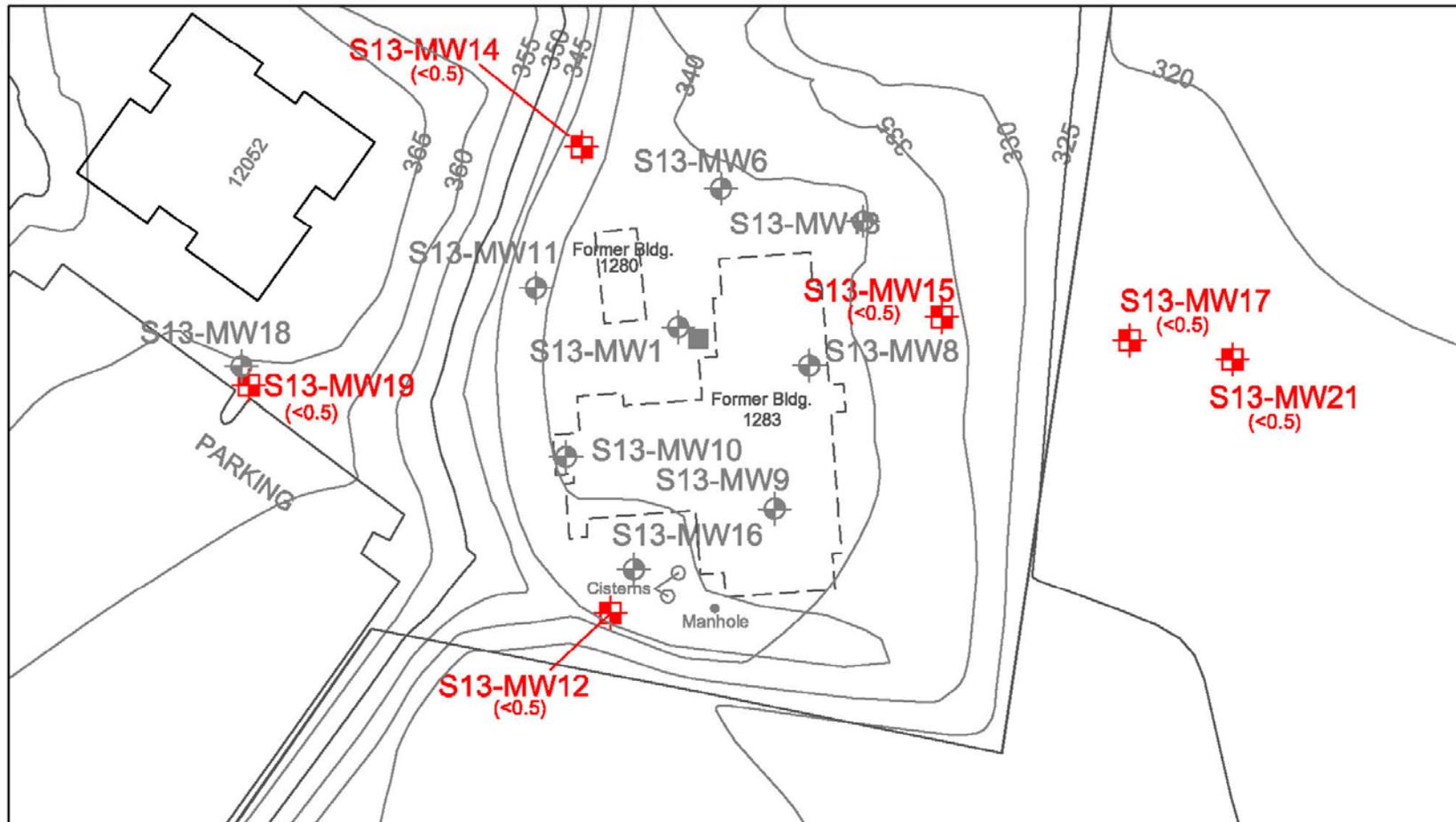
**12 Area, Site 13  
TCE Detected in  
Perched Groundwater  
March 2003**

MCB Camp Pendleton, California

**PARSONS**

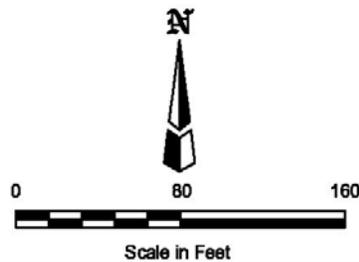
Pasadena, CA

# 12 Area, Site 13



**Legend**

-  Shallow Groundwater Monitoring Well
-  Deep Groundwater Monitoring Well
-  TCE Isoconcentration Contour ( $\mu\text{g/L}$ )
-  TCE Concentration ( $\mu\text{g/L}$ )
-  Not detected at referenced detection limit



**Figure 6-9**

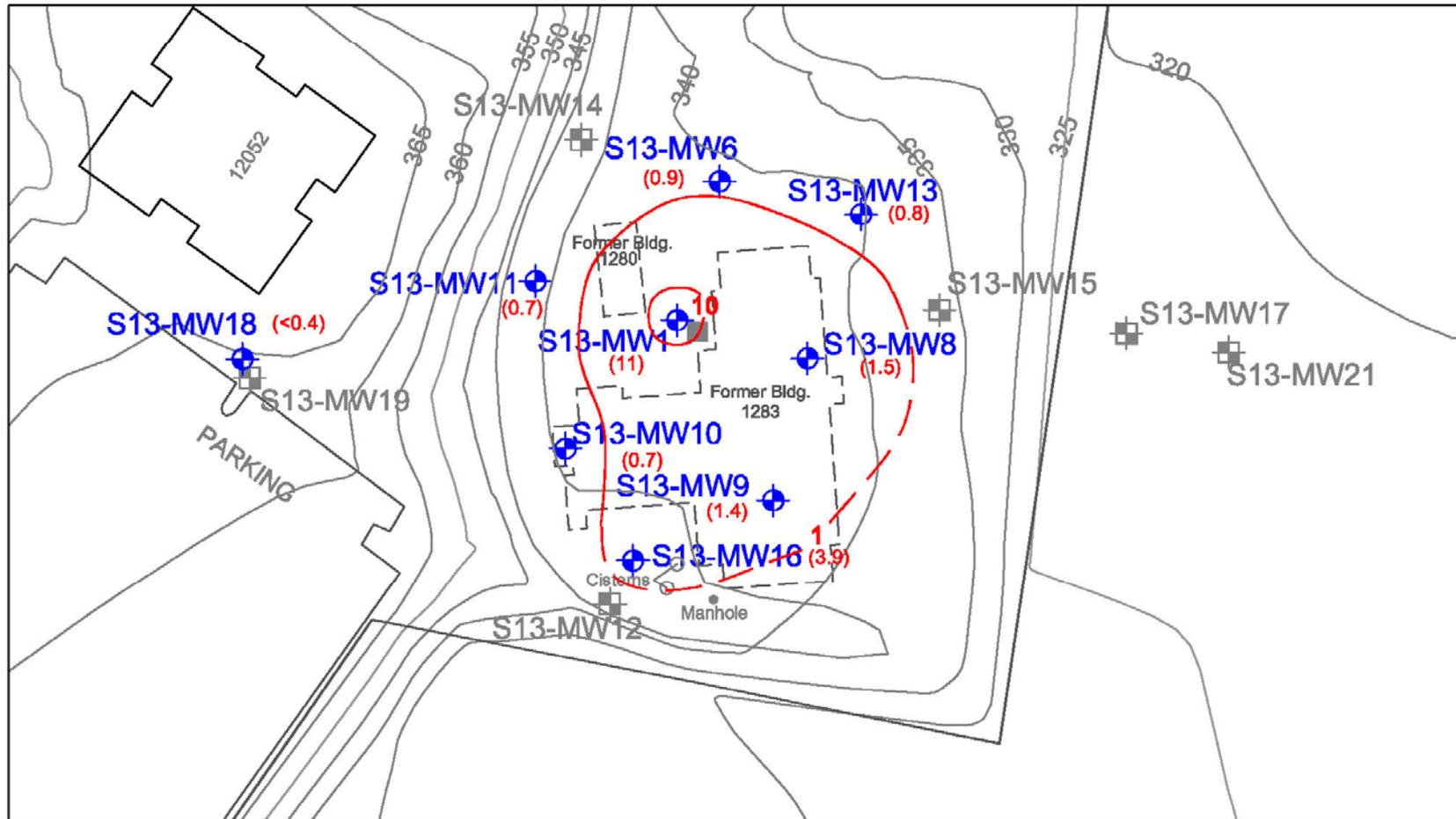
**12 Area, Site 13  
TCE Detected in  
Deep Groundwater  
March 2003**

MCB Camp Pendleton, California

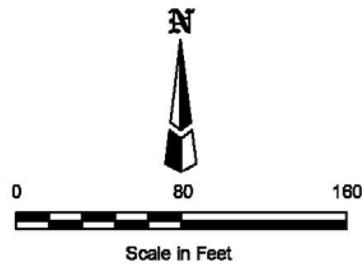
**PARSONS**

Pasadena, CA

# 12 Area, Site 13



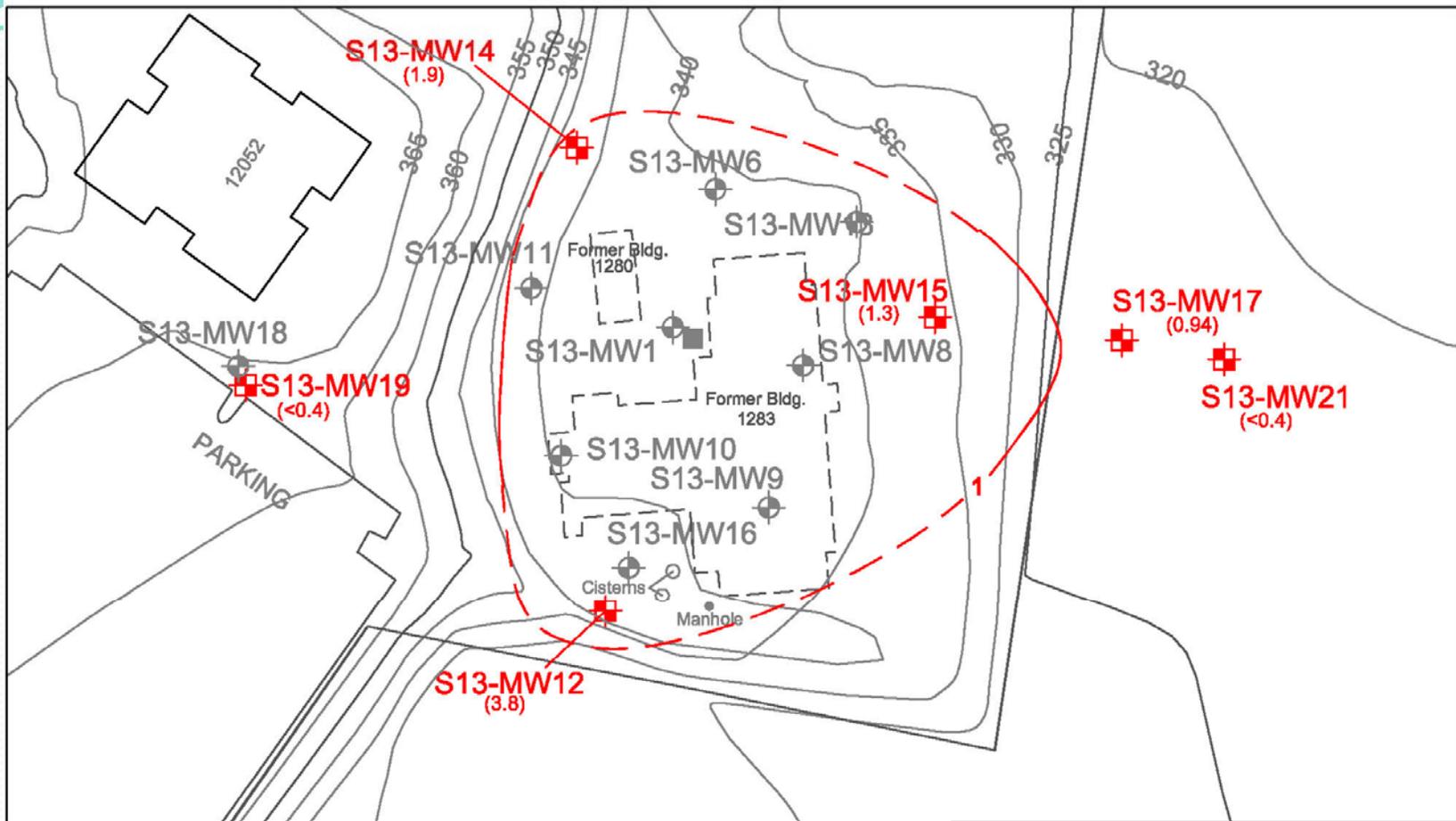
- Legend**
- Shallow Groundwater Monitoring Well
  - Deep Groundwater Monitoring Well
  - 2003 Benzene Isoconcentration Contour (µg/L) (dashed where inferred)
  - 2003 Benzene Concentration (µg/L)
  - Not detected at referenced detection limit
  - Estimated value



**Figure 6-10**  
**12 Area, Site 13**  
**Benzene Detected in**  
**Perched Groundwater**  
**March 2003**

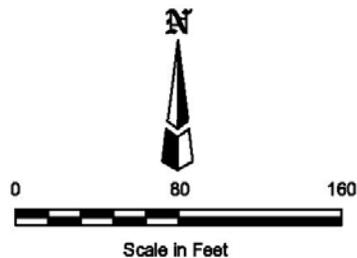
MCB Camp Pendleton, California  
**PARSONS**  
 Pasadena, CA

# 12 Area, Site 13



**Legend**

-  Shallow Groundwater Monitoring Well
-  Deep Groundwater Monitoring Well
-  1 2003 Benzene Isoconcentration Contour (µg/L) (dashed where inferred)
-  (1.2) 2003 Benzene Concentration (µg/L)
-  (<0.4) Not detected at referenced detection limit



**Figure 6-11**

**12 Area, Site 13  
Benzene Detected in  
Deep Groundwater  
March 2003**

MCB Camp Pendleton, California

**PARSONS**

Pasadena, CA

# 12 Area, Site 13

## OU 5 FS (2005) Remedial Action Objectives

- Minimize inhalation/dermal contact/ingestion of contaminated groundwater containing VOCs at concentrations posing a risk to human health.
- Protect the beneficial uses and water-quality objectives of the lower Santa Margarita River basin.

## Remedial Alternatives

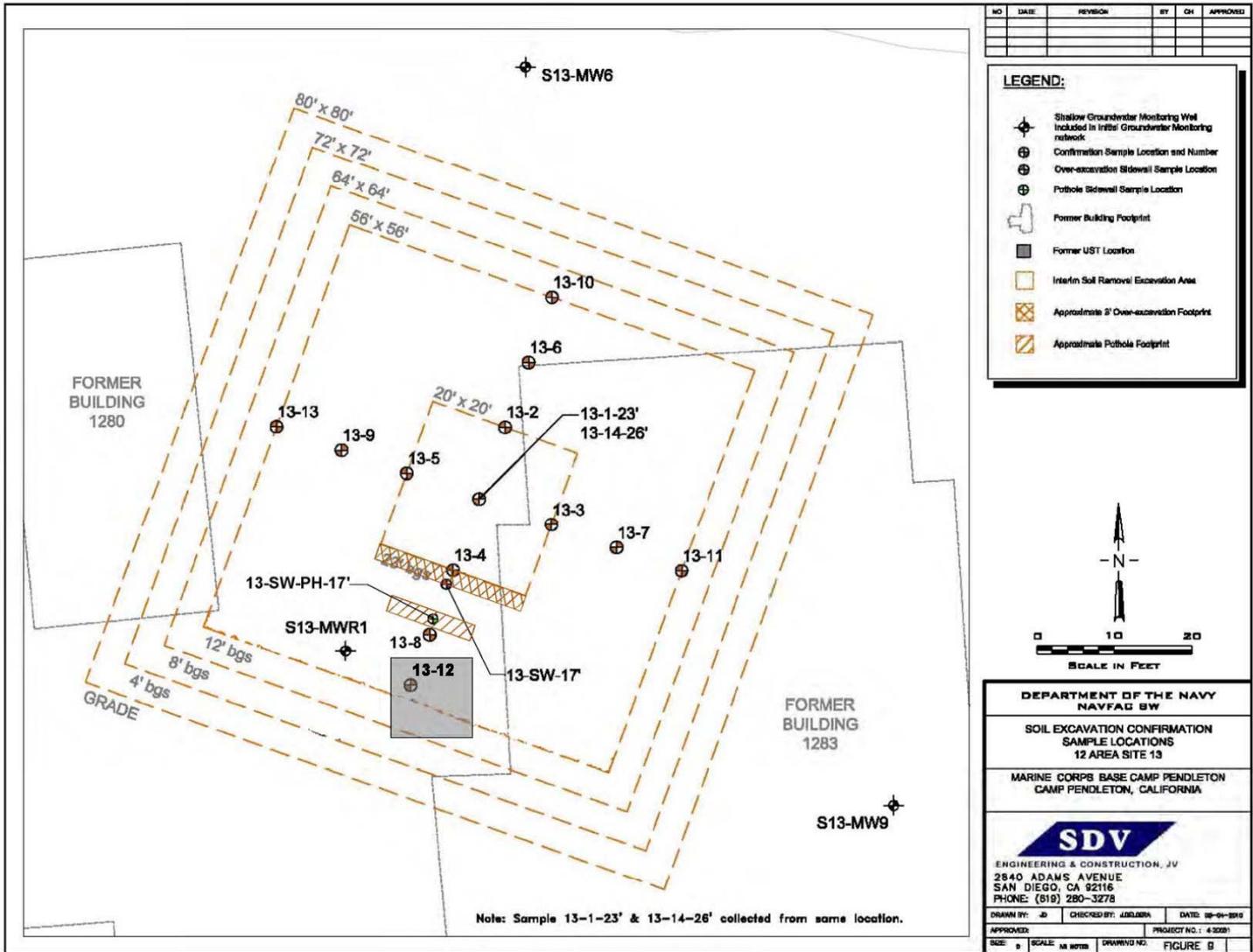
- Alternative 12A-1: No Action
- Alternative 12A-2: Institutional Controls, Long-Term Groundwater Monitoring, and Product Removal
- Alternative 12A-3: Monitored Natural Attenuation with Alternative 12A-2

# 12 Area, Site 13

## Project Completion Report (2013)

- 2009 - 3,600 yards of soil were removed in area to reduce the potential for encountering contaminated soil for a utility replacement project. Excavation was 80 x 80 feet, 26 feet deep, and backfilled with clean soil.

# 12 Area, Site 13



# 12 Area, Site 13

## Project Completion Report (2013) (continued)

- 2010 to 2011 - Quarterly groundwater monitoring conducted from October 2010 to June 2011. Concentrations have remained consistent or declined, with the majority of detections occurring in well S13-MW1R.
- TCE Detected in Perched Groundwater

Well	March 2003	October 2010	December 2010	March 2011	June 2011
13-MW1/1R	10 µg/L	7 µg/L	5.1 µg/L	4.2 µg/L	3.3 µg/L
13-MW8	9.3 µg/L	5.6 µg/L	4.4 µg/L	5.3 µg/L	4.9 µg/L

- No TCE Detected in Deep Groundwater

# 12 Area, Site 13

## Project Completion Report (2013) (continued)

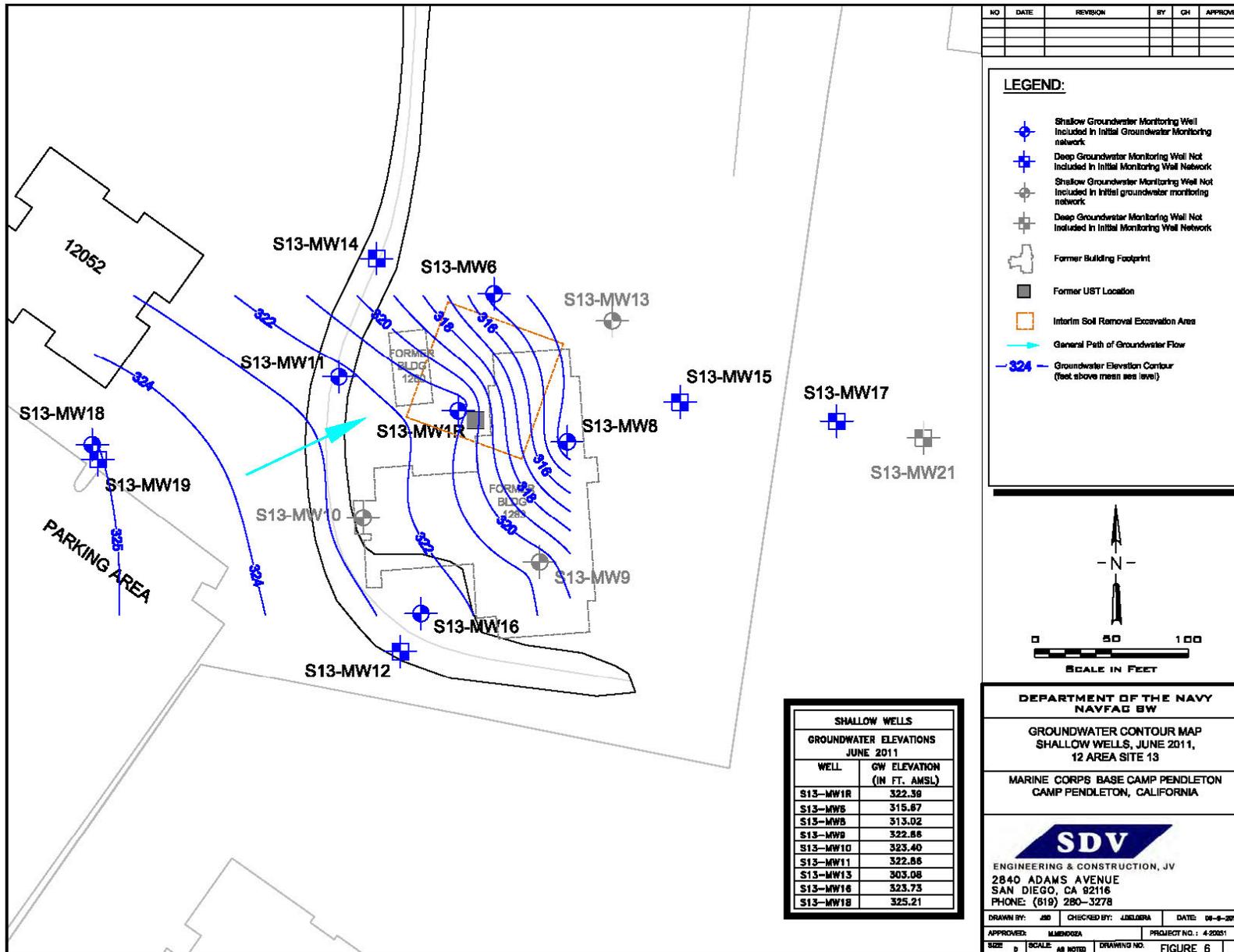
### ➤ Benzene Detected in Perched Groundwater

Well	March 2003	October 2010	December 2010	March 2011	June 2011
13-MW1/1R	11 µg/L	2.6 µg/L	5.3 µg/L	8 µg/L	5.8 µg/L
13-MW8	1.5 µg/L	<0.5 µg/L	<0.5 µg/L	0.49 µg/L	0.31 µg/L
13-MW9	1.4 µg/L	<0.5 µg/L	<0.5 µg/L	<0.5 µg/L	<0.5 µg/L
13-MW16	3.9 µg/L	<0.5 µg/L	<0.5 µg/L	<0.5 µg/L	<0.5 µg/L

### ➤ Benzene Detected in Deep Groundwater

Well	March 2003	October 2010	December 2010	March 2011	June 2011
13-MW12	3.8 µg/L	<0.5 µg/L	<0.5 µg/L	<0.5 µg/L	<0.5 µg/L
13-MW14	1.9 µg/L	<0.5 µg/L	<0.5 µg/L	<0.5 µg/L	<0.5 µg/L
13-MW15	1.3 µg/L	<0.5 µg/L	<0.5 µg/L	<0.5 µg/L	<0.5 µg/L

# 12 Area, Site 13



SHALLOW WELLS	
GROUNDWATER ELEVATIONS	
JUNE 2011	
WELL	GW ELEVATION (IN FT. AMSL)
S13-MW1R	322.39
S13-MW5	315.87
S13-MW8	313.02
S13-MW9	322.88
S13-MW10	323.40
S13-MW11	322.88
S13-MW13	303.08
S13-MW16	323.73
S13-MW18	325.21

NO	DATE	REVISION	BY	CHK	APPROVED

**LEGEND:**

- Shallow Groundwater Monitoring Well Included in Initial Groundwater Monitoring network
- Deep Groundwater Monitoring Well Not Included in Initial Monitoring Well Network
- Shallow Groundwater Monitoring Well Not Included in Initial groundwater monitoring network
- Deep Groundwater Monitoring Well Not Included in Initial Monitoring Well Network
- Former Building Footprint
- Former UST Location
- Interim Soil Removal Excavation Area
- General Path of Groundwater Flow
- Groundwater Elevation Contour (feet above mean sea level)

DEPARTMENT OF THE NAVY  
NAVFAC BW

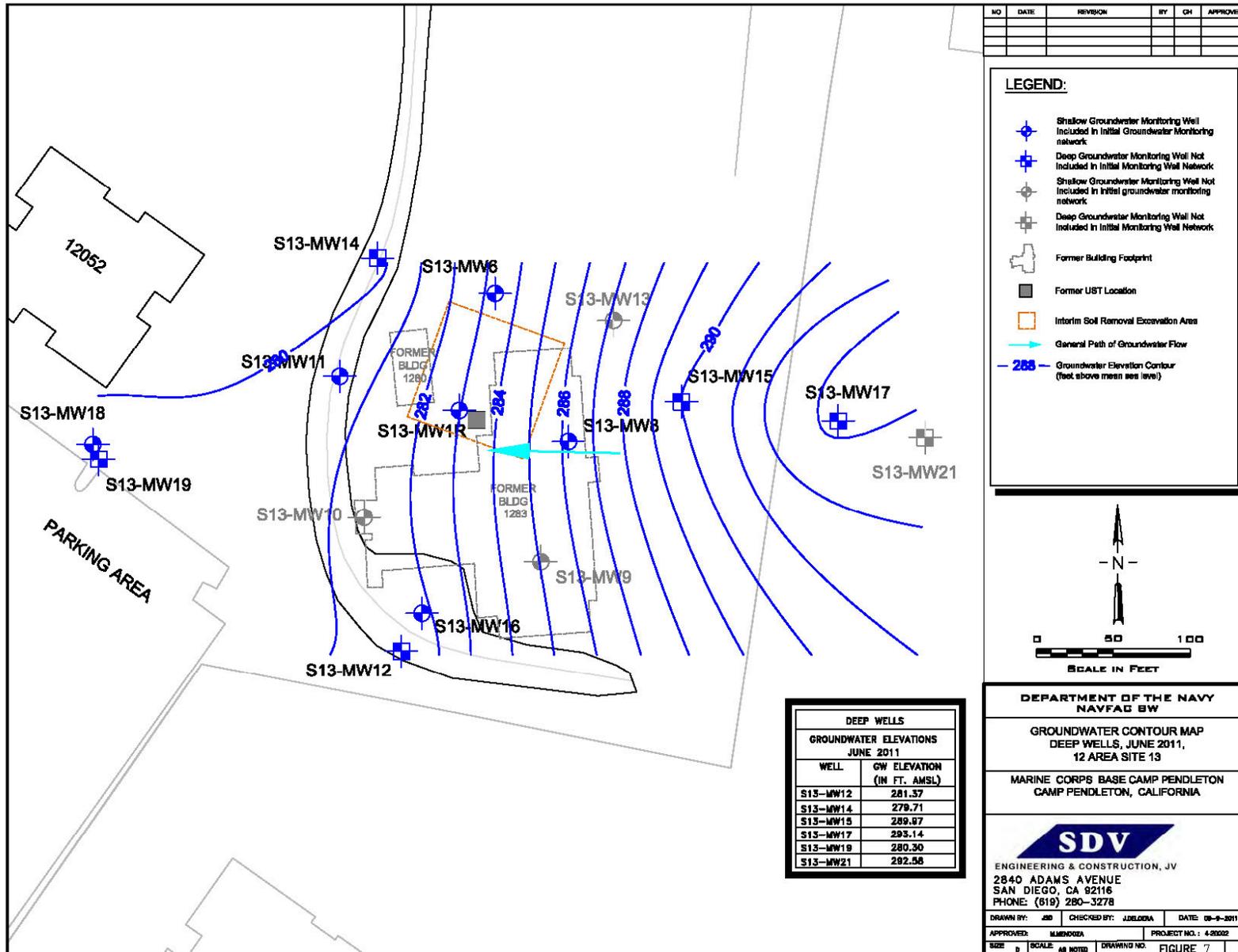
GROUNDWATER CONTOUR MAP  
SHALLOW WELLS, JUNE 2011,  
12 AREA SITE 13

MARINE CORPS BASE CAMP PENDLETON  
CAMP PENDLETON, CALIFORNIA

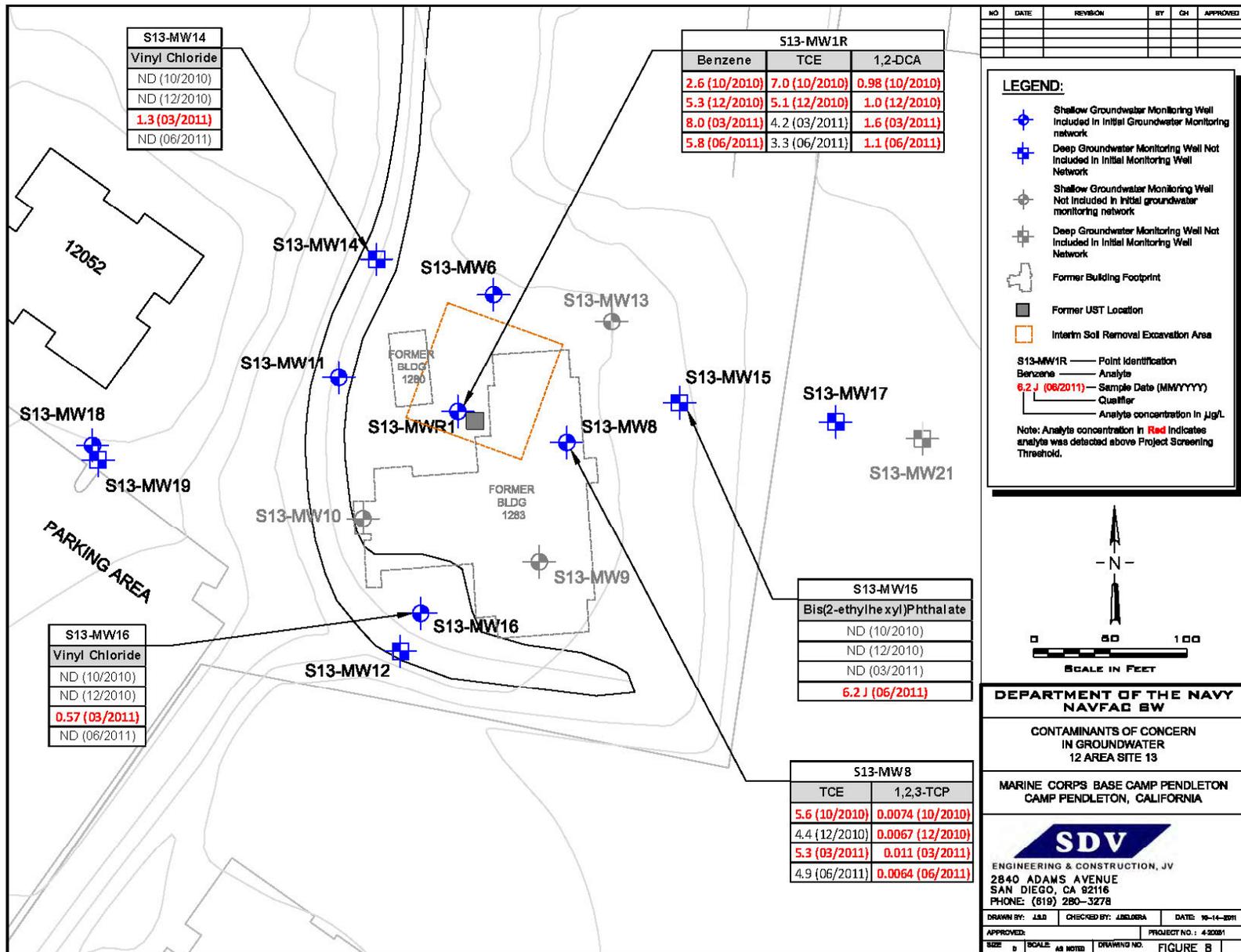
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DRAWN BY: JSD    CHECKED BY: JUDLORA    DATE: 06-08-2011  
APPROVED: M.MEDRIZA    PROJECT NO.: 420251  
SIZE: D    SCALE: AS NOTED    DRAWING NO.: FIGURE 6

# 12 Area, Site 13



# 12 Area, Site 13



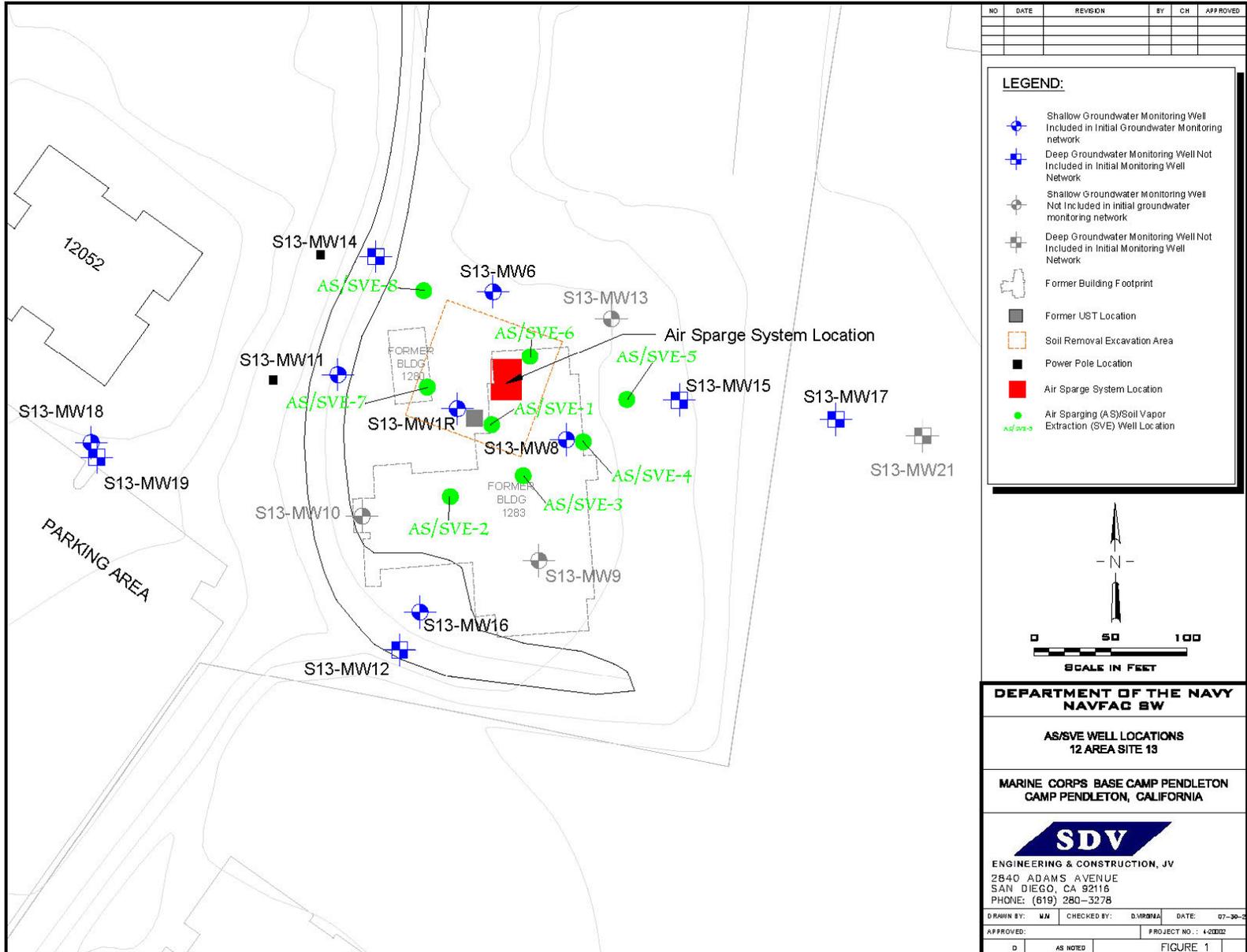
# 12 Area, Site 13

## 2014 AS/SVE System

- Pre-treatment groundwater sampling was performed on August 22, 2014.
- AS/SVE system installation was completed on October 15, 2014.



# 12 Area, Site 13



# 12 Area, Site 13

## **AS/SVE System (continued)**

- System blower and control panel failed during initial startup phase. The blower and control panel were replaced, and continuous operation began on November 18, 2014.
- The AS/SVE system operated continuously from November 18th through December 13th when shutdown occurred due to a faulty sensor. The system was re-started on December 19th after the quarterly groundwater monitoring event was completed.

# 12 Area, Site 13

## AS/SVE System (continued)

- The first groundwater treatment sampling event after system startup was conducted on December 18, 2014.
- Benzene and 1,2-dichloroethane concentrations remain above MCLs at well S13-MWR1, and have increased slightly compared to the pre-treatment results.
- Benzene was detected at a concentration of 6.9 µg/L, and 1,2-dichloroethane at 0.73 µg/L in the sample collected from well S13-MWR1 in December 2014.
- The system has operated continuously from December 19th to the present.
- Two additional rounds of groundwater sampling are planned.

# 12 Area, Site 13

## AS/SVE System (continued)

- TCE Detected in Perched Groundwater

Well	March 2003	Oct. 2010	Dec. 2010	March 2011	June 2011	August 2014	Dec. 2014
13-MW1/1R	10 µg/L	7 µg/L	5.1 µg/L	4.2 µg/L	3.3 µg/L	2.5 µg/L	2.8 µg/L
13-MW8	9.3 µg/L	5.6 µg/L	4.4 µg/L	5.3 µg/L	4.9 µg/L	Not Sampled	Not Sampled

# 12 Area, Site 13

## AS/SVE System (continued)

### ➤ Benzene Detected in Perched Groundwater

Well	March 2003	Oct. 2010	Dec. 2010	March 2011	June 2011	August 2014	Dec. 2014
13-MW1/1R	11 µg/L	2.6 µg/L	5.3 µg/L	8 µg/L	5.8 µg/L	4.1 µg/L	6.9 µg/L
13-MW8	1.5 µg/L	<0.5 µg/L	<0.5 µg/L	0.49 µg/L	0.31 µg/L	Not Sampled	Not Sampled
13-MW9	1.4 µg/L	<0.5 µg/L	<0.5 µg/L	<0.5 µg/L	<0.5 µg/L	<0.2 µg/L	<0.5 µg/L
13-MW16	3.9 µg/L	<0.5 µg/L	<0.5 µg/L	<0.5 µg/L	<0.5 µg/L	<0.2 µg/L	<0.5 µg/L

### ➤ Benzene Detected in Deep Groundwater

Well	March 2003	Oct. 2010	Dec. 2010	March 2011	June 2011	August 2014	Dec. 2014
13-MW12	3.8 µg/L	<0.5 µg/L	<0.5 µg/L	<0.5 µg/L	<0.5 µg/L	Not Sampled	Not Sampled
13-MW14	1.9 µg/L	<0.5 µg/L	<0.5 µg/L	<0.5 µg/L	<0.5 µg/L	<0.2 µg/L	<0.5 µg/L
13-MW15	1.3 µg/L	<0.5 µg/L	<0.5 µg/L	<0.5 µg/L	<0.5 µg/L	<0.2 µg/L	<0.5 µg/L

# Remedial Investigation Update for IR Site 1120, MCB Camp Pendleton, CA

## Presentation Summary

- (1) Background
- (2) Phase I Details
- (3) Future Objectives



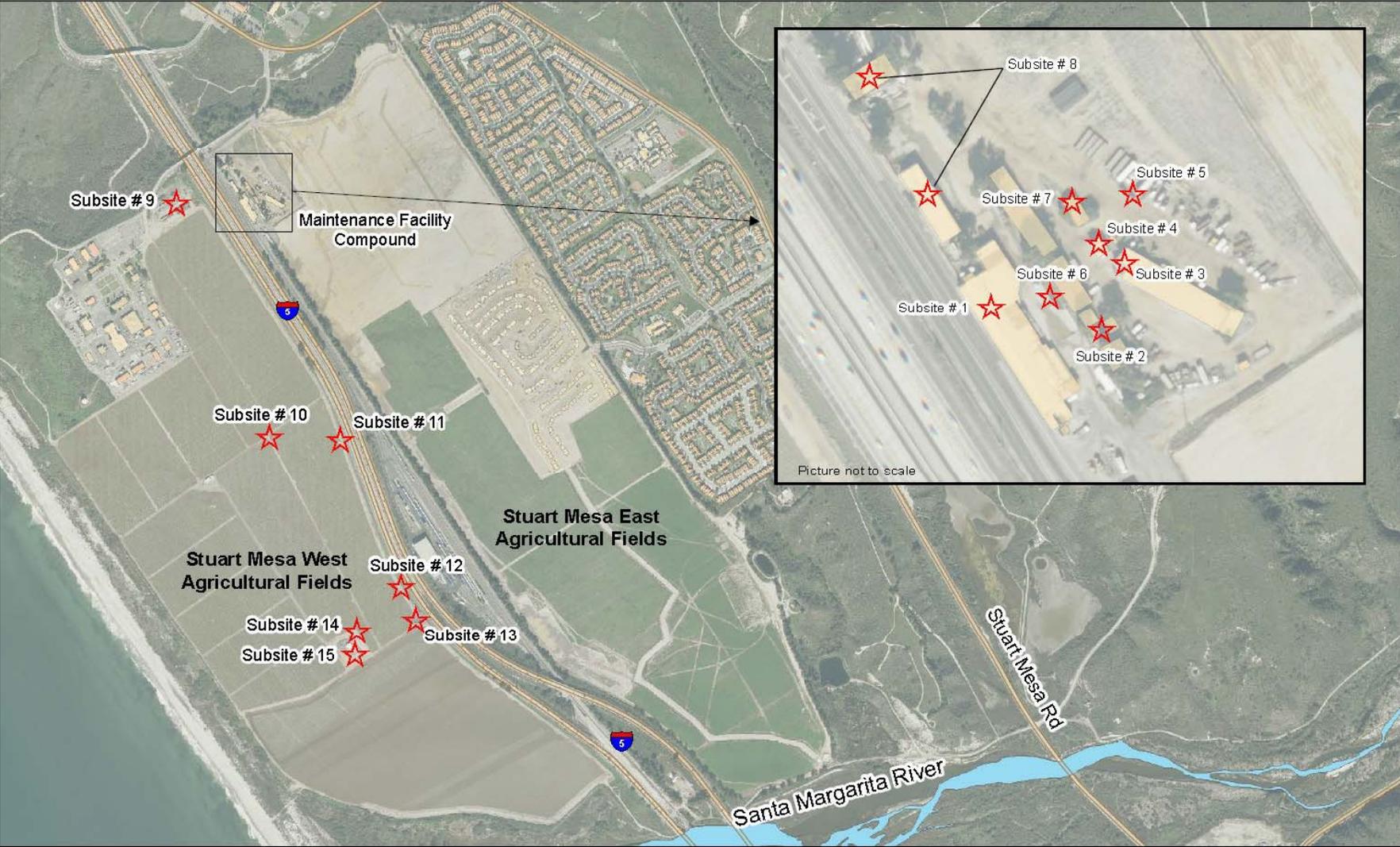


## Site History Highlights



- Stuart Mesa East and West Agricultural Fields (SMEAF and SMWAF) were leased for row crop farming since the 1940s.
- March 2011 – Phase I ESA performed by MCB Camp Pendleton following lease termination in early 2011.
  - a) Several areas of concern identified in locations used by farmers for living quarters; product packing; product, fuel, and chemical storage; and vehicle maintenance.
- August 2011 – Phase II ESA performed by NAVFAC SW.
  - a) Soil sample analyses indicated unauthorized (not legally-applied) fuel and pesticide releases/spills.
  - b) COPCs are petroleum hydrocarbons, OCPs, and chlorinated herbicides.
- The 15 subsites identified as requiring remedial investigation were added to the Installation Restoration Program as IR Site 1120.

# Site History Highlights



## Remedial Investigation Highlights

- Remedial Investigation Work Plan finalized in July 2014.
  - a) Project objectives.
    - i. Delineate the extent of known COPCs in soil at concentrations above the PSLs.
    - ii. Evaluate the presence of COPCs in soil gas and groundwater, if applicable.
    - iii. Conduct a Human Health and Ecological Risk Assessment to estimate risk to potential receptors.
    - iv. Obtain data necessary to support development of remedial alternatives.
- Phase I of remedial investigation activities completed in September 2014.
  - a) Soil samples collected via GeoProbe direct push rig.
    - i. 76 soil borings.
    - ii. 41 surface samples.
    - iii. 345 total soil samples.



## General Information

Analyte	PSL	Number of Samples Above the PSL	Total Number of Samples	Maximum Concentration	Maximum Depth Detected Above PSL (bgs)	Number of Subsites Where Detected Above PSL
Toxaphene	480 µg/kg <sup>1</sup>	130	345	26,000 µg/kg	7.0	15
Dieldrin	33 µg/kg <sup>1</sup>	63	345	1,500 µg/kg	7.0	11
DDD	2,200 µg/kg <sup>1</sup>	1	345	8,500 µg/kg	1.0	1
DDE	1,600 µg/kg <sup>1</sup>	14	345	9,900 µg/kg	2.5	8
DDT	1,900 µg/kg <sup>1</sup>	16	345	19,000 µg/kg	7.0	6
TPH-D	110 mg/kg <sup>2</sup>	10	245	840 mg/kg	7.0	4
TPH-MO	500 mg/kg <sup>2</sup>	3	245	800 mg/kg	2.5	2

PSL = project screening level

DDD = dichlorodiphenyldichloroethane

DDE = dichlorodiphenyldichloroethylene

DDT = dichlorodiphenyltrichloroethane

bgs = below ground surface

TPH-D = total petroleum hydrocarbons as diesel

TPH-MO = total petroleum hydrocarbons as motor oil

mg/kg = milligrams per kilograms

µg/kg = micrograms per kilogram

bgs = below ground surface

1. PSL taken from U.S. EPA Regional Screening Level Resident Soil Table (May 2014).

2. PSL taken from Cal EPA Tier 1 Environmental Screening Level (December 2013).



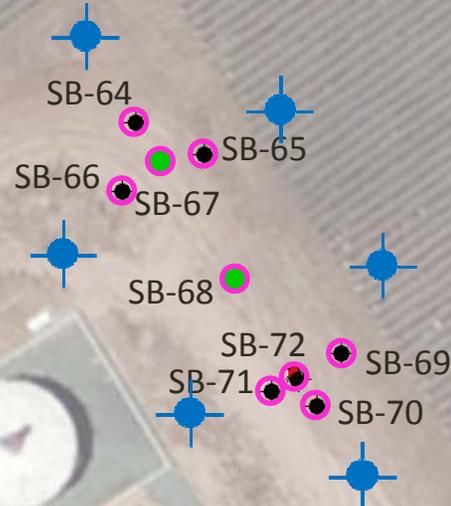
## Future Objectives

- Identify data gaps.
  - a) Phase II remedial investigation drivers.
    - i. Additional soil samples to further define lateral and vertical delineation.
    - ii. Two soil vapor points adjacent to highest TPH-D concentration in each subsite, if applicable.
    - iii. Groundwater well if contamination shown to migrate within 10 feet of water table (estimated to be 40 to 60 feet below grade).
  
- Planned Phase II remedial investigation activities.
  - a) Additional soil borings and samples needed.
    - i. 15 soil borings
    - ii. 91 total soil samples
  - b) Soil vapor monitoring wells.
    - i. 9 soil vapor wells (sample points at 5 and 10 feet bgs)
  - c) Groundwater monitoring wells (Phase IIa).
    - i. TBD following additional soil sampling.



## Example of Phase I Results and Planned Phase II Activities

### Subsite #14



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

- Phase I Soil Boring Requiring Lateral Delineation
- Phase I Soil Boring Requiring Lateral and Vertical Delineation
- Proposed Shallow Soil Sample for Lateral Delineation

## Anticipated Phase II Schedule

### Activity

- Phase II Field Work
- Phase IIa Field Work
- Draft RI/FS

### Schedule

February 2015

March 2015

September 2015



# Final Thoughts

Questions and Comments?

