Final

Record of Decision for Solid Waste Management Units 2, 5, 7, and 18

Former Naval Weapons Station Seal Beach Detachment Concord Inland Area Concord, California

July 16, 2010

Prepared by:
Department of the Navy
Base Realignment and Closure
Program Management Office West
San Diego, California

Prepared under:
Naval Facilities Engineering Command
Contract Number N62473-07-D-3213
Contract Task Order 0033

CHAD-3213-0033-0019

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ACRONYMS AND ABBREVIATIONS

§	Section
µg/L	Microgram per liter
$\mu g/m^3$	Microgram per cubic meter
ARAR	Applicable or relevant and appropriate requirement
BRAC	Base Realignment and Closure
Cal. Code Regs.	California Code of Regulations
CDHS	California Department of Health Services
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	Chemical of concern
COPEC	Chemical of potential ecological concern
DCE	cis-1,2-dichloroethene
DTSC	Department of Toxic Substances Control
EPA	U.S. Environmental Protection Agency
FFA	Federal Facility Agreement
FS	Feasibility Study
GRA	General response action
HHRA	Human health risk assessment
HQ	Hazard quotient
IC	Institutional control
IR	Installation Restoration
LUC	Land use control
MCL	Maximum contaminant level
MNA	Monitored natural attenuation
MOA	Memorandum of agreement
NAVWPNSTA	Naval Weapons Station
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
O&M	Operation and maintenance

PCE	Tetrachloroethene
PRG	Preliminary remediation goals
RAB	Restoration Advisory Board
RAO	Remedial action objective
RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
RFACS	RFA Confirmation Study
RD	Remedial design
RI	Remedial Investigation
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act
SLERA	Screening-level ecological risk assessment
SVE	Soil vapor extraction
SWMU	Solid Waste Management Unit
TCE	Trichloroethene
tit.	Title
UST	Underground storage tank
VOC	Volatile organic compound
Water Board	San Francisco Bay Regional Water Quality Control Board

1.0 DECLARATION

This Record of Decision (ROD) presents the remedy selected by the Navy and the U.S. Environmental Protection Agency (EPA) for Solid Waste Management Units (SWMU) 2, 5, 7, and 18 at the Inland Area at Former Naval Weapons Station Seal Beach Detachment Concord (NAVWPNSTA Concord) in Concord, California. Former NAVWPNSTA Seal Beach Detachment Concord was included on the National Priorities List (NPL) in 1994 (EPA ID: CA7170024528). The remedy was selected in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986 (Title 42 *United States Code* Section [§] 9601, et seq.) and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (Title 40 *Code of Federal Regulations* Part 300). The State of California concurs with the selected remedy. The decision documented in this ROD is based on and relies on the Administrative Record file (Attachment D). Information that is not specifically summarized in this ROD or its references but that is contained in the Administrative Record[1] has been considered and is relevant to the selection of the remedy at SWMUs 2, 5, 7, and 18.

The remedy selected in this ROD is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment. The Navy provides funding for site remediation at Former NAVWPNSTA Concord. The Federal Facility Agreement (FFA) for Former NAVWPNSTA Concord documents how the Navy intends to meet and implement the requirements of CERCLA in partnership with EPA, the California Environmental Protection Agency's Department of Toxic Substances Control (DTSC), and the San Francisco Bay Regional Water Quality Control Board (Water Board).

Environmental investigations began at SWMUs 2, 5, 7, and 18 in 1992, when DTSC conducted a Resource Conservation and Recovery Act (RCRA) Facility Assessment (RFA) to evaluate the potential release of hazardous substances from 49 SWMUs, including SWMUs 2, 5, 7, and 18. The Navy completed a Draft Final Remedial Investigation (RI) Report in 2004 and a Final Feasibility Study (FS) Report in 2008. This ROD documents the final remedy for SWMUs 2, 5, 7, and 18 and does not include or affect any other sites at the facility.

1.1 SELECTED REMEDY

The selected remedial action addresses chlorinated volatile organic compounds (VOCs) (tetrachloroethene [PCE], trichloroethene [TCE], and cis-1,2-dichloroethene [DCE]) in groundwater, and PCE in soil gas. The remedy consists of air sparging to address chlorinated solvents in groundwater and soil vapor extraction (SVE) to remove PCE in soil gas. Land Use Controls (LUCs), in the form of Institutional Controls (ICs), will remain in place until the

[1] **Bold blue text** identifies detailed site information available in the Administrative Record and listed in the References Table (Attachment C). This ROD is also available on CD, whereby **bold blue text** serves as a hyperlink to reference information. To the extent there may be any inconsistencies between the reference information attached to this ROD via hyperlinks and the information in the basic ROD itself, the language in the basic ROD controls.

remedial action objectives (RAOs) are achieved; the ICs will restrict residential use of the property and use of the groundwater.

The selected remedial action is protective of human health and the environment, complies with federal and state statutes and regulations that are applicable or relevant and appropriate to the remedial action, and is cost-effective. The selected remedial action uses solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable and satisfies the statutory preference for remedies that employ treatment that reduces the toxicity, mobility, or volume of hazardous substances, pollutants or contaminants as a principal element. No hazardous substances, pollutants, or contaminants will remain on site above levels that allow for unrestricted use and unlimited exposure when the remedy is complete. The effectiveness of the remedial actions for SWMUs sites will be reviewed at a minimum of 5-year intervals until the RAOs are achieved. The purpose of the Five Year Review is to verify that the remedy continues to adequately protect human health and the environment and is achieving cleanup goals while the contaminants are present at the SWMUs site. Once RAOs and cleanup goals are achieved, the LUCs will be lifted, allowing for unrestricted use of the site and Five Year Reviews will not be conducted. The first Five Year Review will be submitted 5-years after initiating the remedial action (finalization of the LUC-RD).

1.2 DATA CERTIFICATION CHECKLIST

The following information is included in Section 2.0 of this ROD. Additional information can be found in the Administrative Record file for this site.

- A list of chemicals of concern (COC) and their concentrations (Sections 2.3 and 2.5).
- A description of baseline risk represented by the COCs (Section 2.5).
- The remediation goals established for COCs and the basis for these goals (Sections 2.5 and 2.7).
- A discussion of principal threat wastes (Section 2.6).
- Current and reasonably anticipated future land use assumptions and current and potential future beneficial uses of groundwater (Section 2.4).
- The potential land and groundwater use that will be available at the site based on the expected outcome of the selected remedy (Section 2.9.3).
- Estimated capital, annual operation and maintenance (O&M), and total present-worth costs; discount rate; and the number of years over which the remedy cost estimate is projected (Table 4).

- Key factors that led to selecting the remedy (for example, a description of how the selected remedy ranked with respect to the balancing and modifying criteria, highlighting criteria key to the remedy selection) (Section 2.9.1).

1.3 AUTHORIZING SIGNATURES

This signature sheet documents the Navy's and EPA's co-selection of the remedy in this ROD. This signature sheet also documents the State of California's (DTSC and Water Board) concurrence with this ROD. The parties may sign this sheet in counterparts.

KA Stewart — 5/21/2010

Ms. Kathryn A Stewart, P.E. — Date
Base Realignment and Closure (BRAC) Environmental Coordinator
BRAC Program Management Office West
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Federal Facilities and Site Cleanup Branch Assistant Director
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Donn Diebert P.E. — Date
Supervising Hazardous Substances Engineer Sacramento Office Brownfields and Environmental Restoration Program
California Environmental Protection Agency
Department of Toxic Substances Control

_____ — _____

Mr. Bruce H. Wolfe — Date
Executive Officer
San Francisco Bay Regional Water Quality Control Board

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for 6-30-10

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Mr. Bruce H. Wolfe Date
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Department of Toxic Substances Control

Bruce H. Wolfe 5/13/10
Mr. Bruce H. Wolfe Date
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San Francisco Bay Regional Water Quality Control Board

2.0 DECISION SUMMARY

2.1 SITE DESCRIPTION AND HISTORY

Former NAVWPNSTA Concord is located in north-central Contra Costa County, in Concord, California (Figure 1). Throughout its history and into the 1990s, Former NAVWPNSTA Concord was a major port for naval munitions trans-shipment and storage. Historically, Former NAVWPNSTA Concord consisted of two primary areas separated by Los Medanos Hills: the Inland Area, which is approximately 5,200 acres, and the Tidal Area, which is approximately 7,700 acres. The Inland Area was used primarily for ammunition storage, but also included facilities for maintenance, administration, and housing. The majority of the Inland Area was acquired by the Navy in 1944, when the Navy's operations in the Tidal Area necessitated more storage and administration capacity.

Because past naval operations left hazardous substances on site, NAVWPNSTA Concord (EPA ID: CA7170024528) was included on the NPL in 1994 pursuant to CERCLA as amended by SARA. In 1999, the Inland Area was placed in a reduced operational status and in November 2005, the Defense Base Closure and Realignment Commission recommended that the Inland Area, with the exceptions noted below, be operationally closed and eventually transferred from federal ownership. Closure at Former NAVWPNSTA Concord involves environmental remediation and activities to make the property available for nondefense use. As a result of federal screening efforts, two existing housing areas, located on approximately 59 acres in the Inland Area, were transferred from the Navy to the U.S. Coast Guard in 2007. On September 30, 2008, the Tidal Area and approximately 115 acres of the Inland Area were transferred from the Navy to the Department of the Army to remain an active Army installation.

SWMUs 2, 5, 7, and 18$_{(1)}$ (SWMUs site) are located in the Inland Area on gently sloping terrain between the hills to the east and Seal Creek to the west (Figure 2). The area is developed with industrial buildings, paved parking areas, and railroad tracks. **SWMU 2**$_{(2)}$ consists of Building IA-7, which was constructed in the mid-1940s as a fire station for the Inland Area. **SWMU 5**$_{(3)}$ consists of Building IA-12, a locomotive repair shop, and Building 269, the locomotive and railcar steam-cleaning facility. **SWMU 7**$_{(4)}$ consists of Buildings IA-15 and IA-16. The eastern portion of Building IA-15 housed a metals shop, a machine shop, a welding shop, a forge shop, offices, and a tool storage area. The western portion of Building IA-15 housed an automotive repair shop. Building IA-16 was a paint shop where maintenance crews staged painting jobs for the facility. **SWMU 18**$_{(5)}$ consists of Building IA-51 and a former locomotive turntable that was used as a steam-cleaning facility.

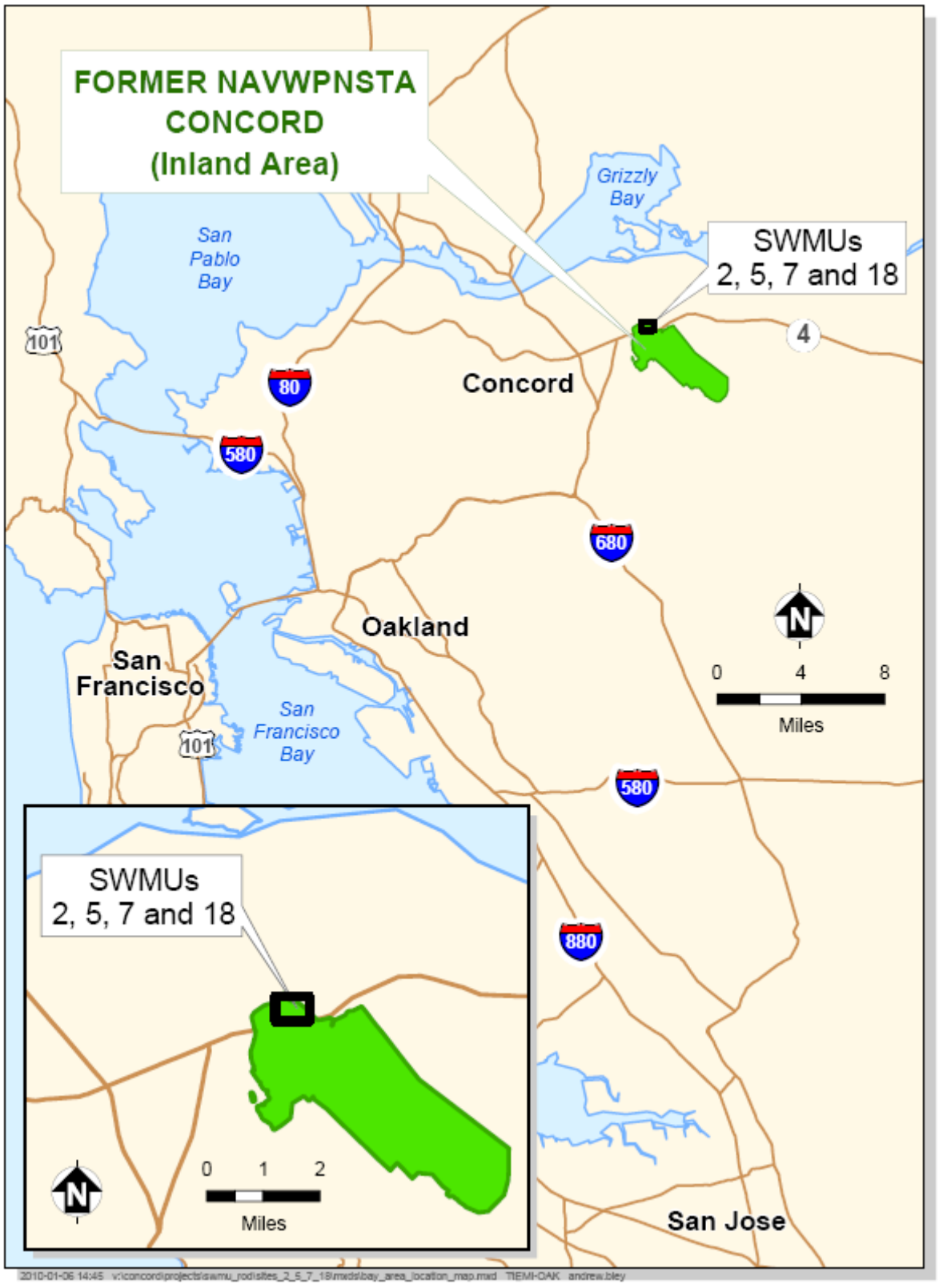


Figure 1. Facility Location

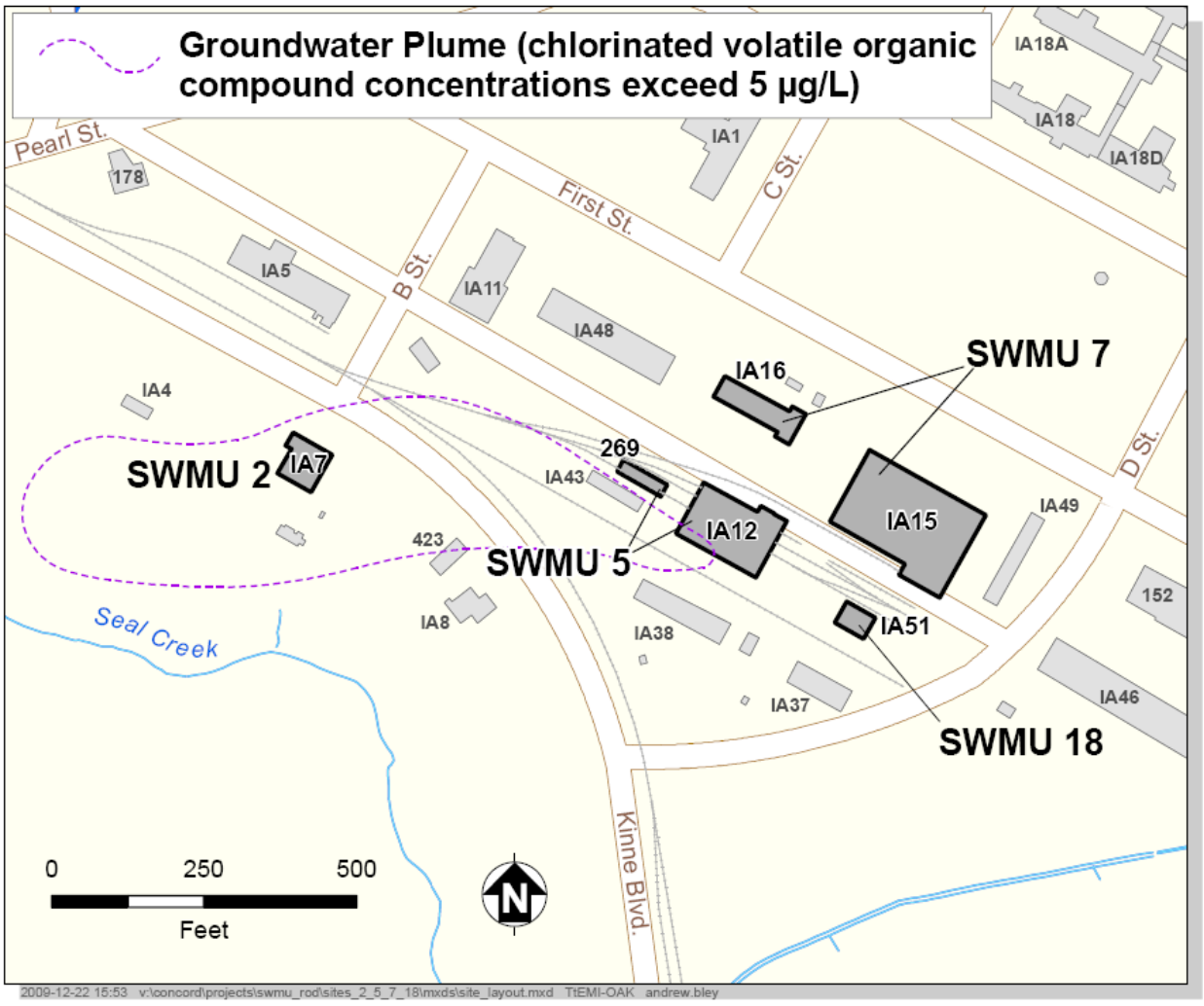


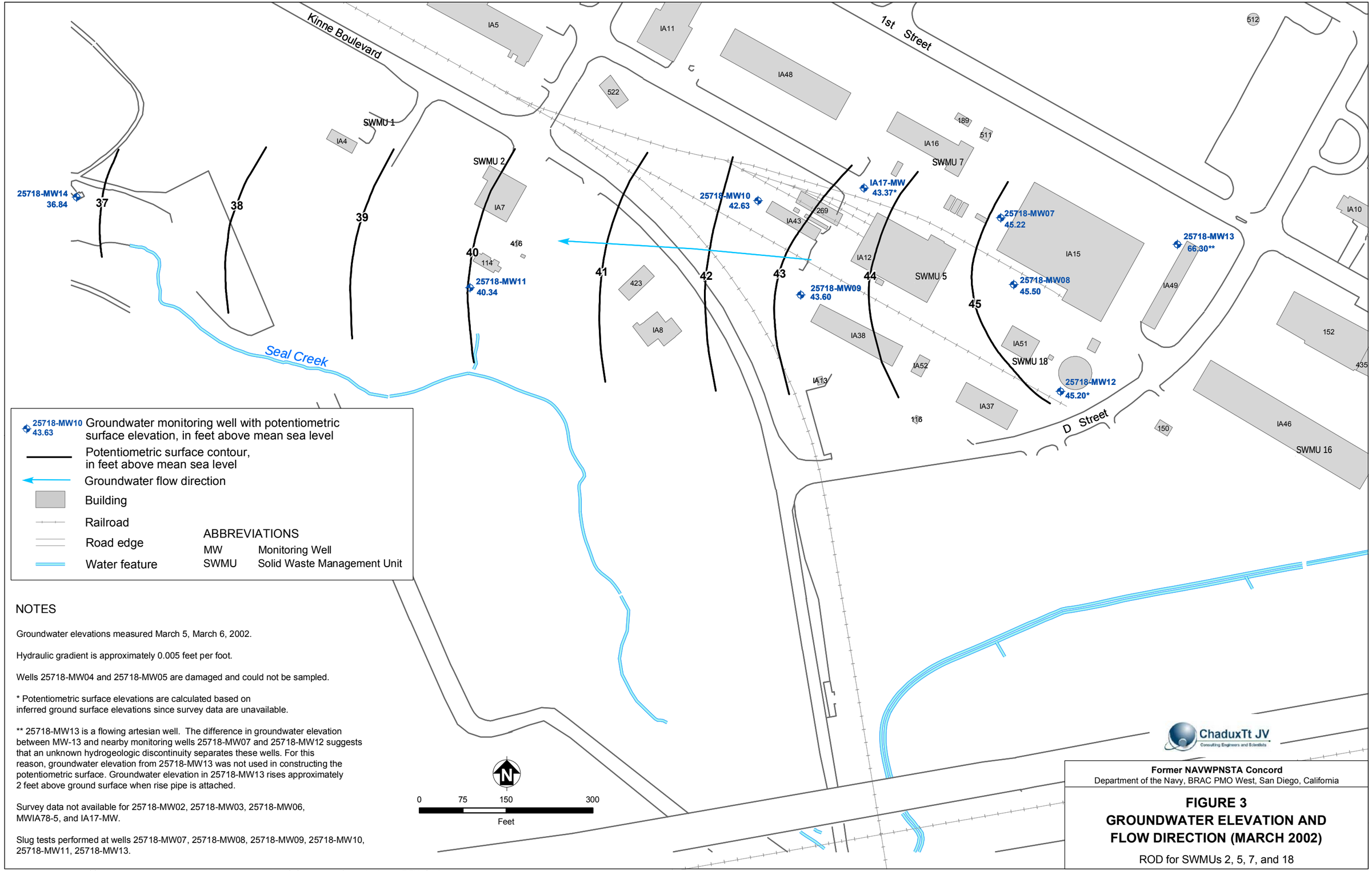
Figure 2. SWMUs Site Detail

2.2 SITE CHARACTERISTICS

Soils in the north-central portion of Former NAVWPNSTA Concord (where SWMUs 2, 5, 7, and 18 are found) consist largely of clay-rich alluvium derived from the nearby hills. Intercalated layers of well-sorted (poorly graded), silty sands to pebbly alluvium in the vicinity of Seal Creek are most likely derived from upstream areas. Soils in the central and western portions of the site toward Seal Creek tend to be coarser at shallower depths but are graded comparatively finer than soils in the north-central area. Soil consistency becomes stiff to very stiff with depth in both areas. This **lithology** (6) is consistent with the **regional geology** (7).

The **depth to groundwater**(8) measured during the RI ranged from 6.36 feet to 16.63 feet below ground surface. Groundwater elevation ranges from approximately 45 feet above mean sea level in the eastern part of the site to 37 feet above mean sea level in the western part of the site. Groundwater generally flows westward under an average hydraulic gradient of 0.005 foot per foot (Figure 3). Local variations in direction of groundwater flow occur because of manmade structures and natural variations in local surface and subsurface features. Three hydrogeologic cross-sections were developed using available data to illustrate subsurface conditions; these cross-sections are presented on Figures 4 through 7. Figure 4 depicts the locations of these cross-sections. The cross-sections (Figures 5 through 7) show the upper 5 to 10 feet of site materials generally consist of finer materials such as clays and silts that grade to coarser sandy silts and sands with depth in the central and eastern portions of the SWMUs site.

The **SWMUs site ecology**(9) is limited to those plant and animal species adapted to the industrial environment. The SWMUs site consists of active industrial areas where most of the ground surface is paved; however, some unpaved areas exist. The unpaved areas are mostly bare ground, though non-native annual grasses are present in some areas. No threatened or endangered species are known to inhabit the SWMUs site.



NOTES

Groundwater elevations measured March 5, March 6, 2002.

Hydraulic gradient is approximately 0.005 feet per foot.

Wells 25718-MW04 and 25718-MW05 are damaged and could not be sampled.

* Potentiometric surface elevations are calculated based on inferred ground surface elevations since survey data are unavailable.

** 25718-MW13 is a flowing artesian well. The difference in groundwater elevation between MW-13 and nearby monitoring wells 25718-MW07 and 25718-MW12 suggests that an unknown hydrogeologic discontinuity separates these wells. For this reason, groundwater elevation from 25718-MW13 was not used in constructing the potentiometric surface. Groundwater elevation in 25718-MW13 rises approximately 2 feet above ground surface when rise pipe is attached.

Survey data not available for 25718-MW02, 25718-MW03, 25718-MW06, MWIA78-5, and IA17-MW.

Slug tests performed at wells 25718-MW07, 25718-MW08, 25718-MW09, 25718-MW10, 25718-MW11, 25718-MW13.

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FIGURE 3
GROUNDWATER ELEVATION AND FLOW DIRECTION (MARCH 2002)

ROD for SWMUs 2, 5, 7, and 18

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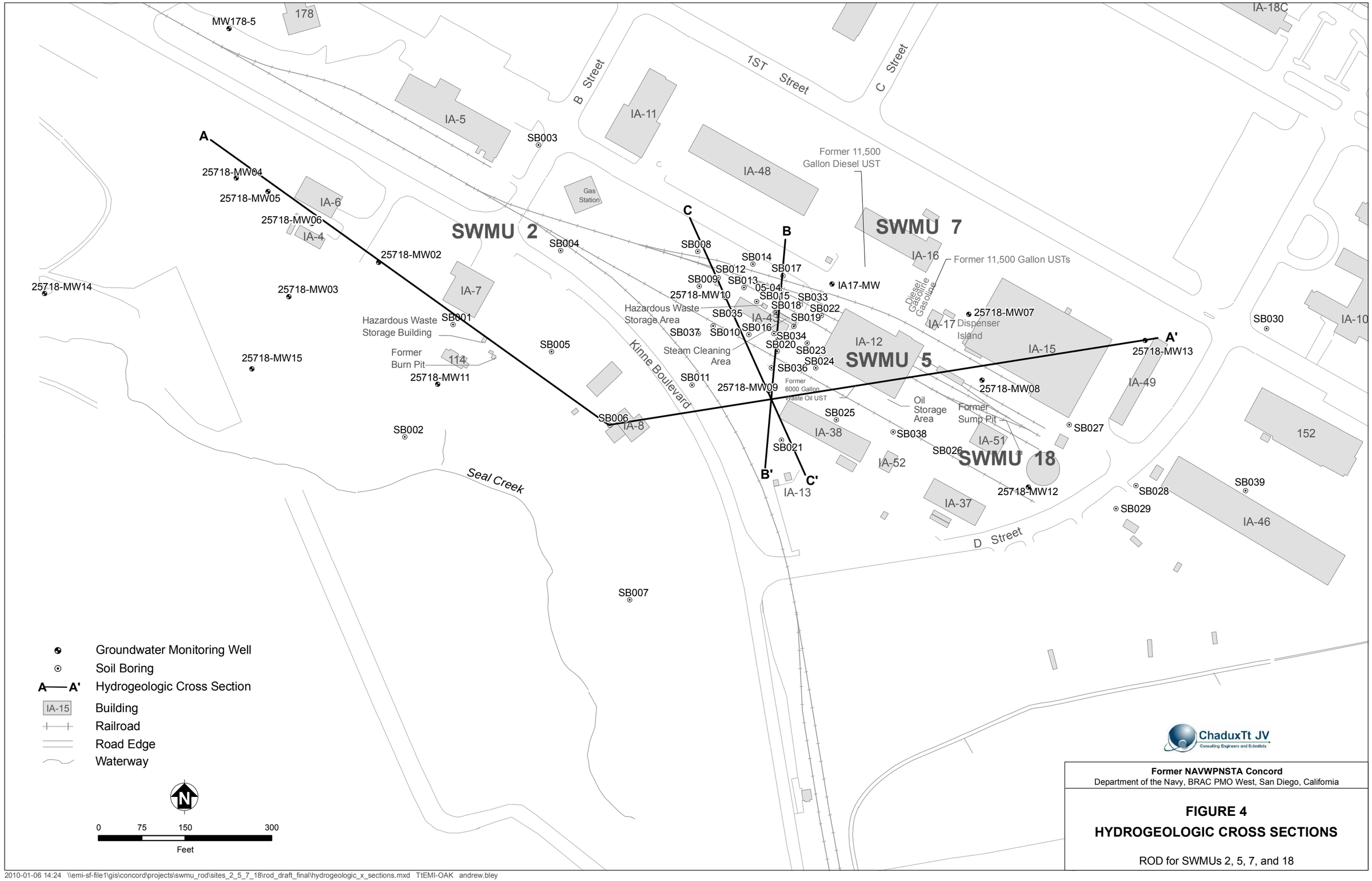

ChaduxTt JV
Consulting Engineers and Scientists

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FIGURE 4
HYDROGEOLOGIC CROSS SECTIONS

ROD for SWMUs 2, 5, 7, and 18

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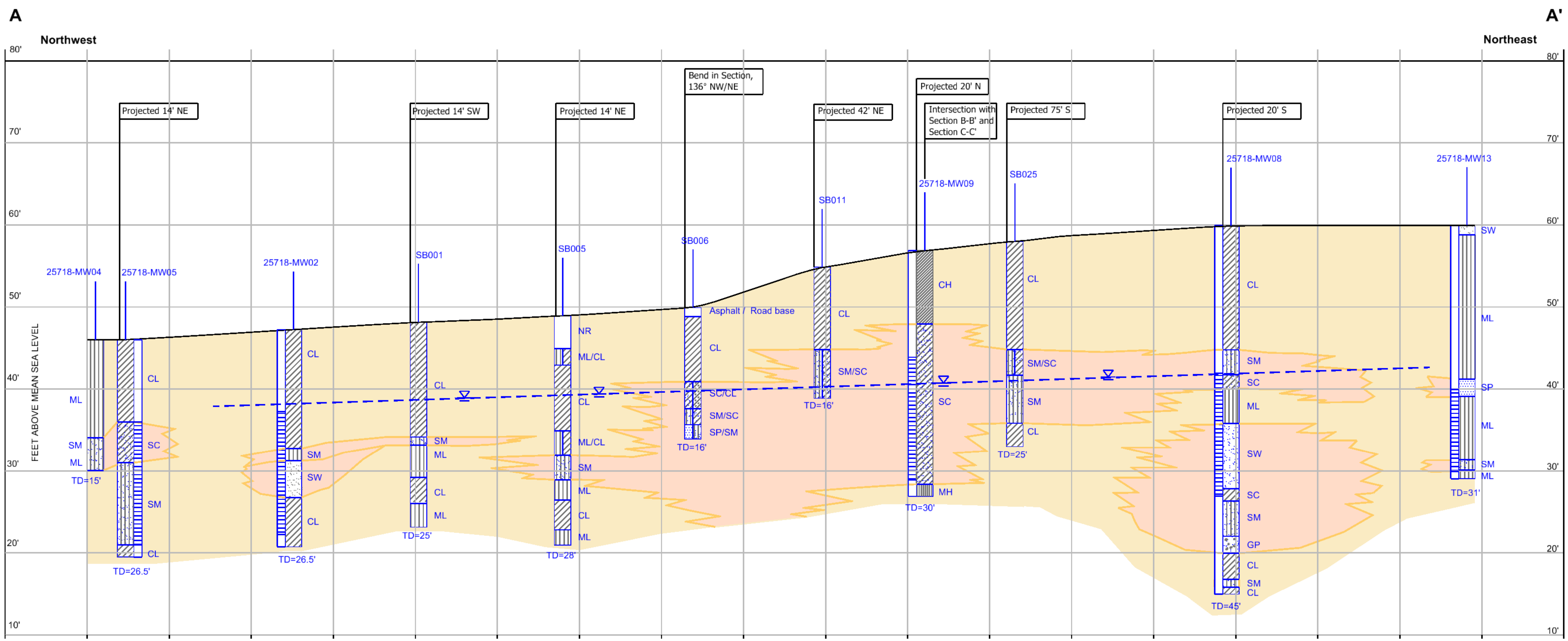

LEGEND

NR	No Recovery
TD	Total Depth
	Groundwater Level
	Screened Interval

LITHOLOGY

- CH = Inorganic clays of high plasticity, fat clays.
- CL = Inorganic clays of low to medium plasticity, gravely clays, sandy clays, silty clays, lean clays.
- GP = Poorly graded gravels, gravel-sand mixtures, little or no fines.
- MH = Inorganic silts, micaceous or diatomaceous fine sand or silty soils.
- ML = Inorganic silts and very fine sands, rock flour, silty or clayey fine sands with slight plasticity.
- SC = Clayey sands, sand-clay mixtures.
- SM = Silty sands, sand-silt mixtures.
- SP = Poorly graded sands, gravelly sands, little or no fines.
- SW = Well-graded sands, gravelly sands, little or no fines.
- Silts and clays
- Sands with silts and clays

NOTES:

Groundwater level information is projected from data presented in Figure 15 "Site Potentiometric Surface Map SWMUS 2, 5, 7, and 18 Remedial Investigation (March 2002)."

Ground surface elevations of soil borings are approximated.

Boring hole widths have been exaggerated to show soil structure.

This hydrogeologic cross-section is based on interpretation of borings. Actual conditions may vary.

VERTICAL SCALE: 1"=12'

10'

VERTICAL SCALE EXAGGERATED 5X

0

0 50

HORIZONTAL SCALE: 1"=60'

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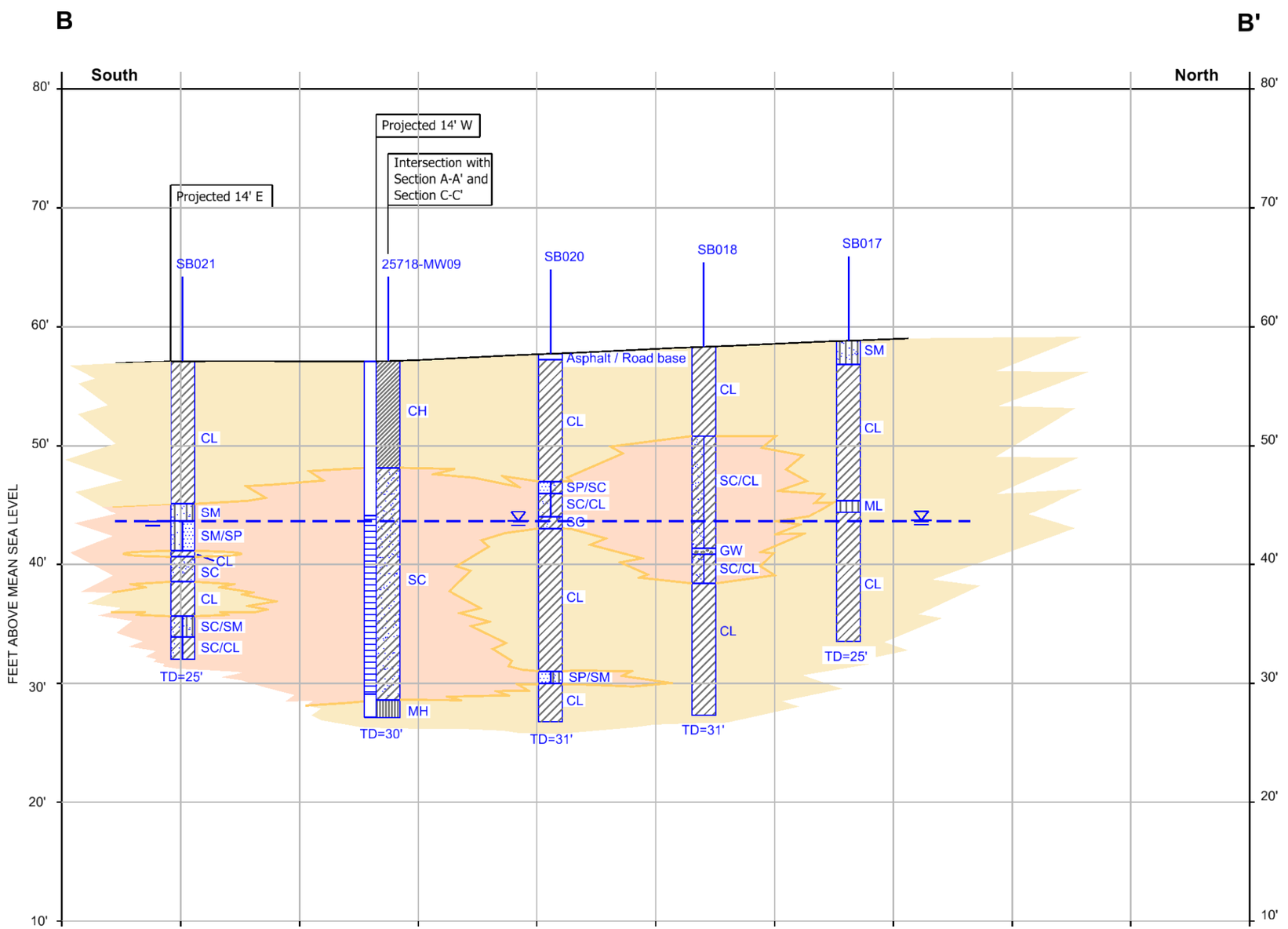
FIGURE 5
HYDROGEOLOGIC CROSS SECTION A-A'

ROD for SWMUs 2, 5, 7, and 18



LEGEND

TD Total Depth

Groundwater Level

Screened Interval

LITHOLOGY

CH = Inorganic clays of high plasticity, fat clays.

CL = Inorganic clays of low to medium plasticity, gravely clays, sandy clays, silty clays, lean clays.

GW = Well-graded gravels, gravel-sand mixtures, little or no fines.

MH = Inorganic silts, micaceous or diatomaceous fine sand or silty soils.

ML = Inorganic silts and very fine sands, rock flour, silty or clayey fine sands with slight plasticity.

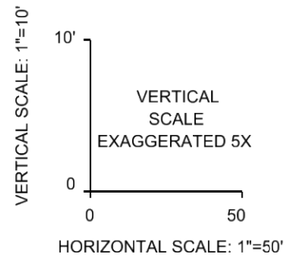
SC = Clayey sands, sand-clay mixtures.

SM = Silty sands, sand-silt mixtures.

SP = Poorly graded sands, gravelly sands, little or no fines.

Silts and clays

Sands with silts and clays



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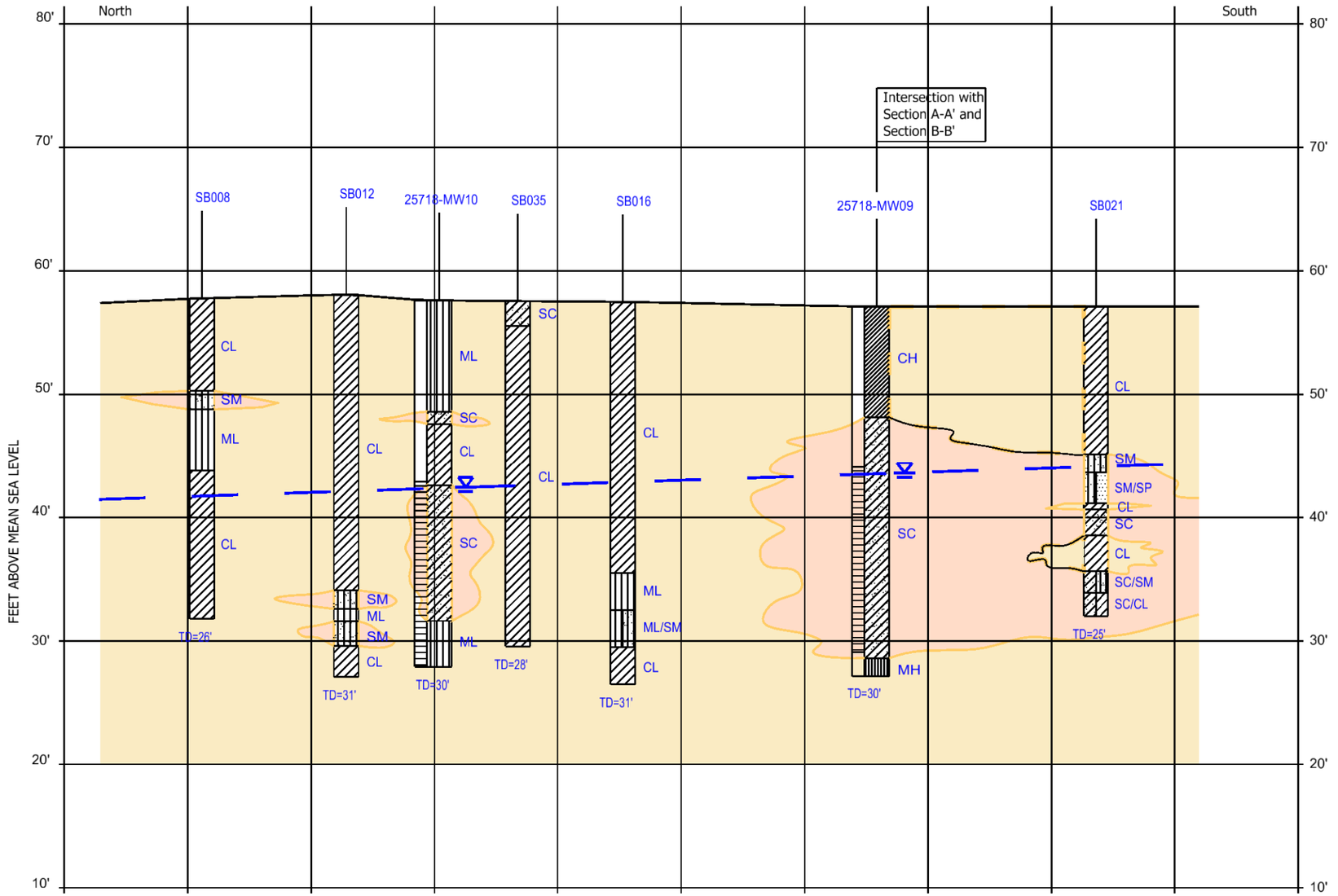
Former NAVWPNSTA Concord

Department of the Navy, BRAC PMO West, San Diego, California

FIGURE 6
HYDROGEOLOGIC CROSS SECTION B-B'

ROD for SWMUs 2, 5, 7, and 18



LEGEND

TD Total Depth

Groundwater Level

Screened Interval

LITHOLOGY

CH = Inorganic clays of high plasticity, fat clays.

CL = Inorganic clays of low to medium plasticity, gravely clays, sandy clays, silty clays, lean clays.

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SM = Silty sands, sand-silt mixtures.

SP = Poorly graded sands, gravelly sands, little or no fines.

Silts and clays

Sands with silts and clays

Note:
Groundwater elevations measured in wells MW-9 and MW-10 on March 5 and 6, 2002.

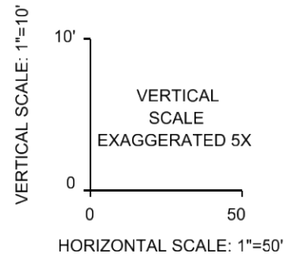

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FIGURE 7
HYDROGEOLOGIC CROSS SECTION C-C'

ROD for SWMUs 2, 5, 7, and 18

2.3 PREVIOUS INVESTIGATIONS

A complete assessment of contamination and risk at the SWMUs site is provided in the Draft Final RI Report for SWMUs 2, 5, 7, and 18, which includes a human health risk assessment (HHRA) and a screening-level ecological risk assessment (SLERA). The Draft Final RI serves as the **Final RI**[10] per Section 10.9 of the FFA because EPA accepted the Draft Final RI without any revisions. The Final FS Report summarized the results of the RI and provides the basis for the ROD. Table 1 summarizes the previous studies and investigations conducted at the SWMUs site.

TABLE 1. PREVIOUS INVESTIGATIONS

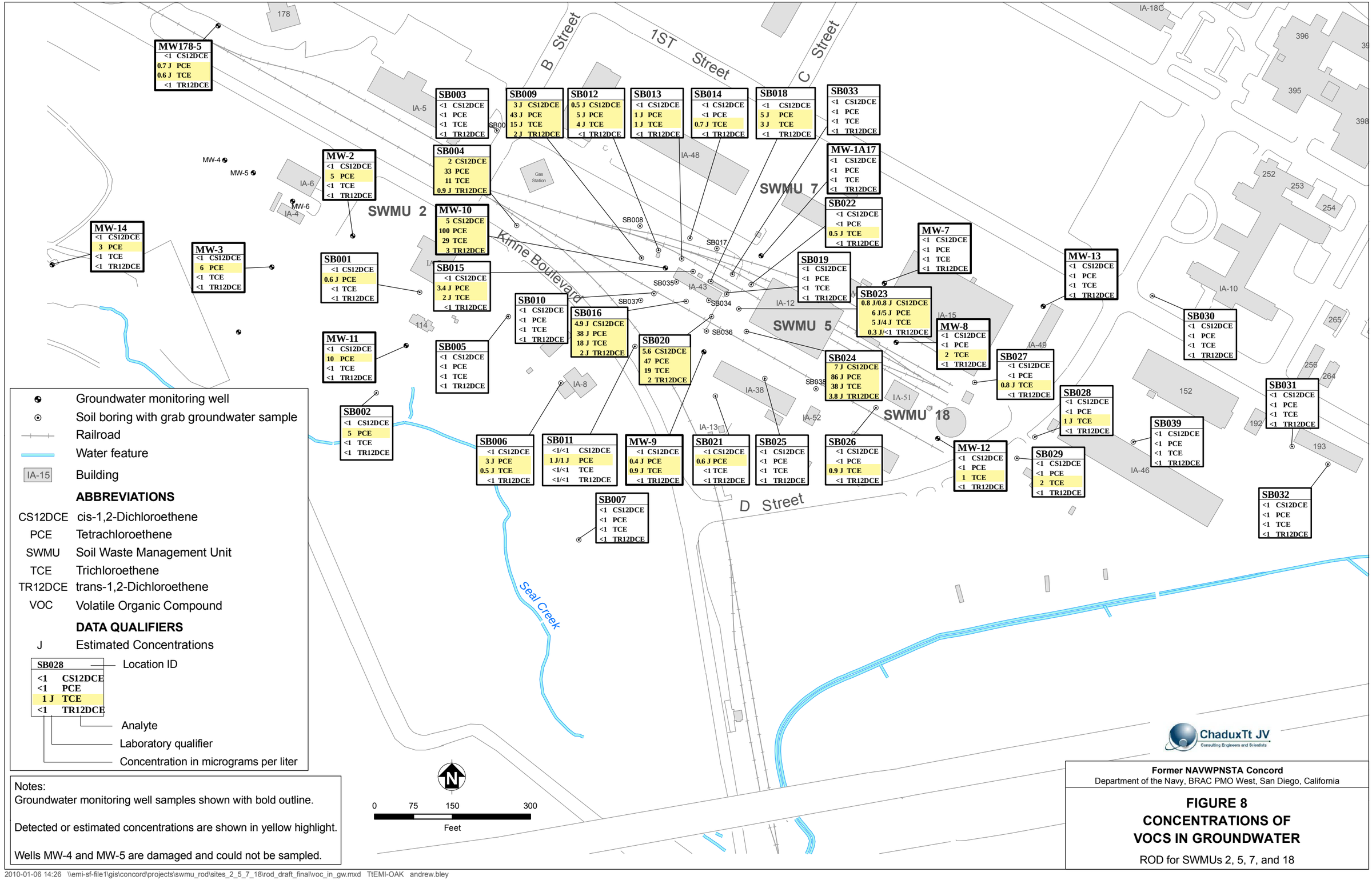
Previous Document	Date	Investigation Activities
RCRA Facilities Assessment (RFA)	1992	The RFA evaluated the potential release of hazardous substances at 49 SWMUs, including SWMUs 2, 5, 7, and 18. The RFA was based on record searches, interviews, and site inspections. The RFA report concluded that SWMUs 2, 5, and 18 were high priorities for further investigation because they had documented releases. Releases were suspected at SWMU 7, but not documented, so the site was a lower priority for investigation.
RFA Confirmation Study (RFACS)	1996	The RFACS further evaluated the RFA's findings for 24 SWMUs, including SWMUs 2, 5, 7, and 18. The RFACS included collection of soil and groundwater samples at the SWMUs site and recommended that SWMUs 2, 5, 7, and 18 be further evaluated per a CERCLA investigation.
Remedial Investigation (RI)	2004	The SWMUs site was further characterized based on soil and grab groundwater samples collected in additional locations, samples from existing monitoring wells, an aquifer slug test, and a soil gas survey. The focus of the RI was to (1) define the nature and extent of volatile organic compounds (VOCs) consistently detected at concentrations exceeding groundwater screening criteria in monitoring wells at the site, (2) define the nature and extent of VOCs consistently detected at concentrations exceeding screening criteria in soil gas, (3) investigate the source of VOCs, and (4) adequately define the nature and extent of VOC-affected soil, if encountered. Based on the **conclusions of the RI**[11], a focused FS was recommended to evaluate remedial alternatives for chlorinated VOCs, including specifically PCE, TCE, and DCE in groundwater, and PCE in soil gas.
Air Sparging and Soil Vapor Extraction (SVE) Pilot Test	2007	An air sparging and SVE **pilot test**[12] was conducted to assess the ability of air sparging to remediate the chlorinated VOC plume at the SWMUs site, to obtain design information for the full-scale system, if air sparging were ultimately selected), and to evaluate whether SVE is effective at removing soil gas from the subsurface. The pilot test indicated that the chlorinated VOC plume was fairly stable and that air sparging could reduce chlorinated VOC concentrations to below screening levels within a reasonable timeframe. Air sparging was determined to be a viable alternative based on the effectiveness of the air sparging pilot test system in distributing air in the subsurface and the reduction in chlorinated VOCs in groundwater. The pilot test also determined SVE may be effective in extracting soil gas on a limited basis, such as near the former underground storage tank (UST) at SWMU 5, where buildings and utilities limit ex situ actions.
Feasibility Study (FS)	2008	The results of the RI and pilot test were used to identify, screen, and evaluate remedial alternatives in the FS. The remedial alternatives evaluated were (1) no action, (2) air sparging, (3) enhanced bioremediation, and (4) groundwater pump and treat. Each alternative (except for Alternative 1, no action) included (1) SVE to remove contaminants in soil gas in the source area near Building IA-12 (2) a restriction on residential use of the property and use of the groundwater until the **remedial action objectives**[13] are achieved. Alternatives 2 though 4 were split into "A" and "B" alternatives. The "A" alternatives included treatment of the area where PCE concentrations exceed 5 µg/L (See Figure 3). The "B" alternatives included treatment where PCE concentrations exceed 10 micrograms per liter (µg/L) and **monitored natural attenuation**[14] for the remainder of the plume (where PCE concentrations exceed 5 µg/L).

Previous Document	Date	Investigation Activities
Proposed Plan	2008	The Proposed Plan invited the public to review and comment on the preferred alternative for the chlorinated VOC contamination in groundwater and soil gas at SWMUs 2, 5, 7, and 18 prior to selection of the final remedy. A public meeting held in October 2008, provided an additional opportunity for the public to learn about the Proposed Plan and provide comments.

Notes:

* The documents listed are available in the Administrative Record and provide detailed information used to support remedy selection at the SWMUs site.

Industrial activities at the SWMUs site resulted in elevated concentrations of chlorinated VOCs in groundwater and soil gas (Figures 8 and 9). The data suggest that the former waste oil tank at SWMU 5 is the principal and only significant source of these chlorinated VOCs. Based on the results of previous investigations, the source and extent of the chlorinated VOC contamination in groundwater and soil gas have been well characterized. VOCs were detected in soil at only two of 158 locations; detected concentrations were near the laboratory detection limit and well below soil screening levels (Figure 10). Concentrations in groundwater at some locations were reduced as a result of the air sparging and SVE pilot study (Figure 11).



Groundwater monitoring well

Soil boring with grab groundwater sample

Railroad

Water feature

IA-15 Building

ABBREVIATIONS

CS12DCE	cis-1,2-Dichloroethene
PCE	Tetrachloroethene
SWMU	Soil Waste Management Unit
TCE	Trichloroethene
TR12DCE	trans-1,2-Dichloroethene
VOC	Volatile Organic Compound

DATA QUALIFIERS

J	Estimated Concentrations

SB028
<1 CS12DCE
<1 PCE
1 J TCE
<1 TR12DCE

- Location ID
- Analyte
- Laboratory qualifier
- Concentration in micrograms per liter

Notes:
Groundwater monitoring well samples shown with bold outline.

Detected or estimated concentrations are shown in yellow highlight.

Wells MW-4 and MW-5 are damaged and could not be sampled.

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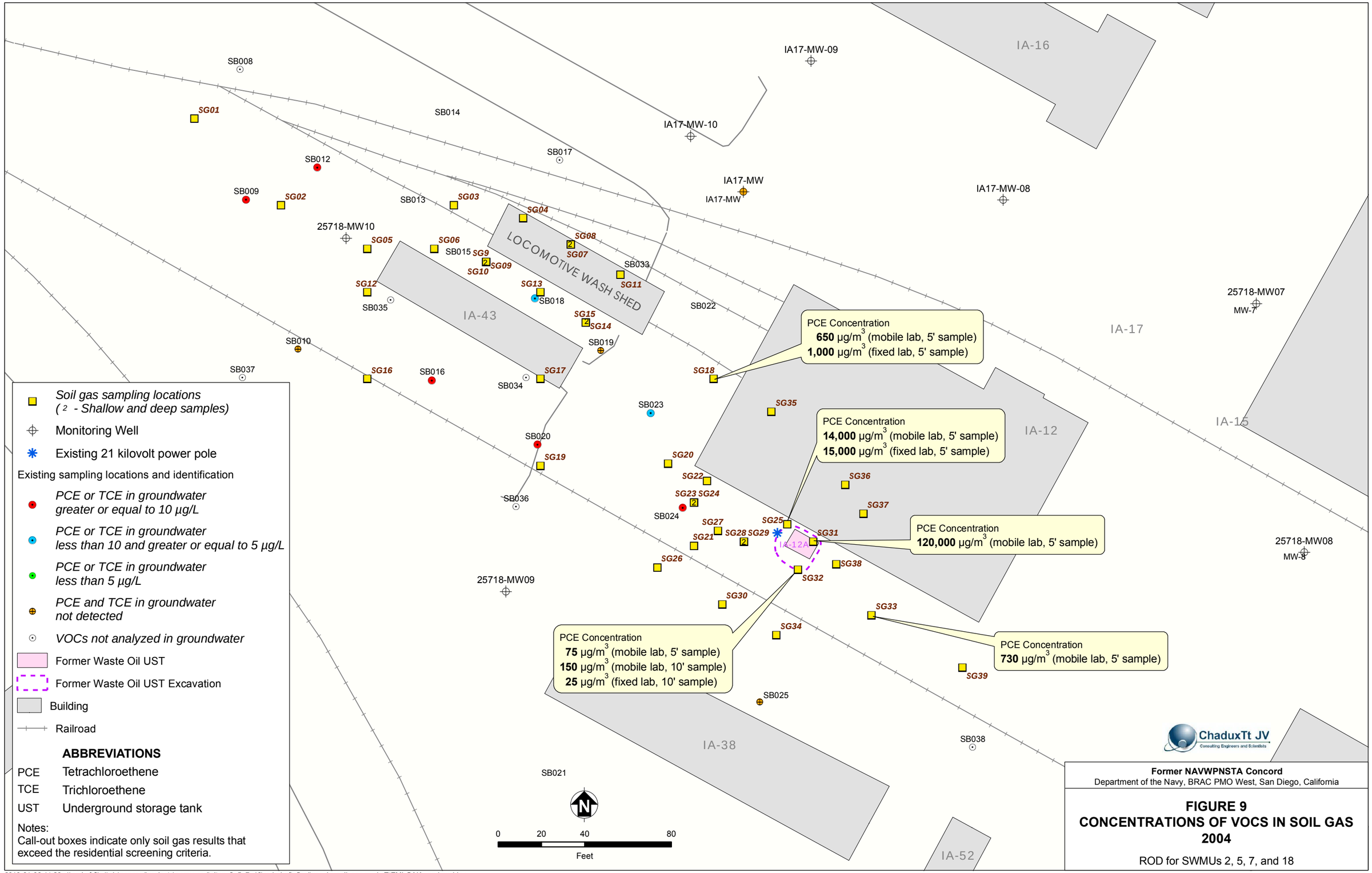
FIGURE 8
CONCENTRATIONS OF VOCS IN GROUNDWATER

ROD for SWMUs 2, 5, 7, and 18



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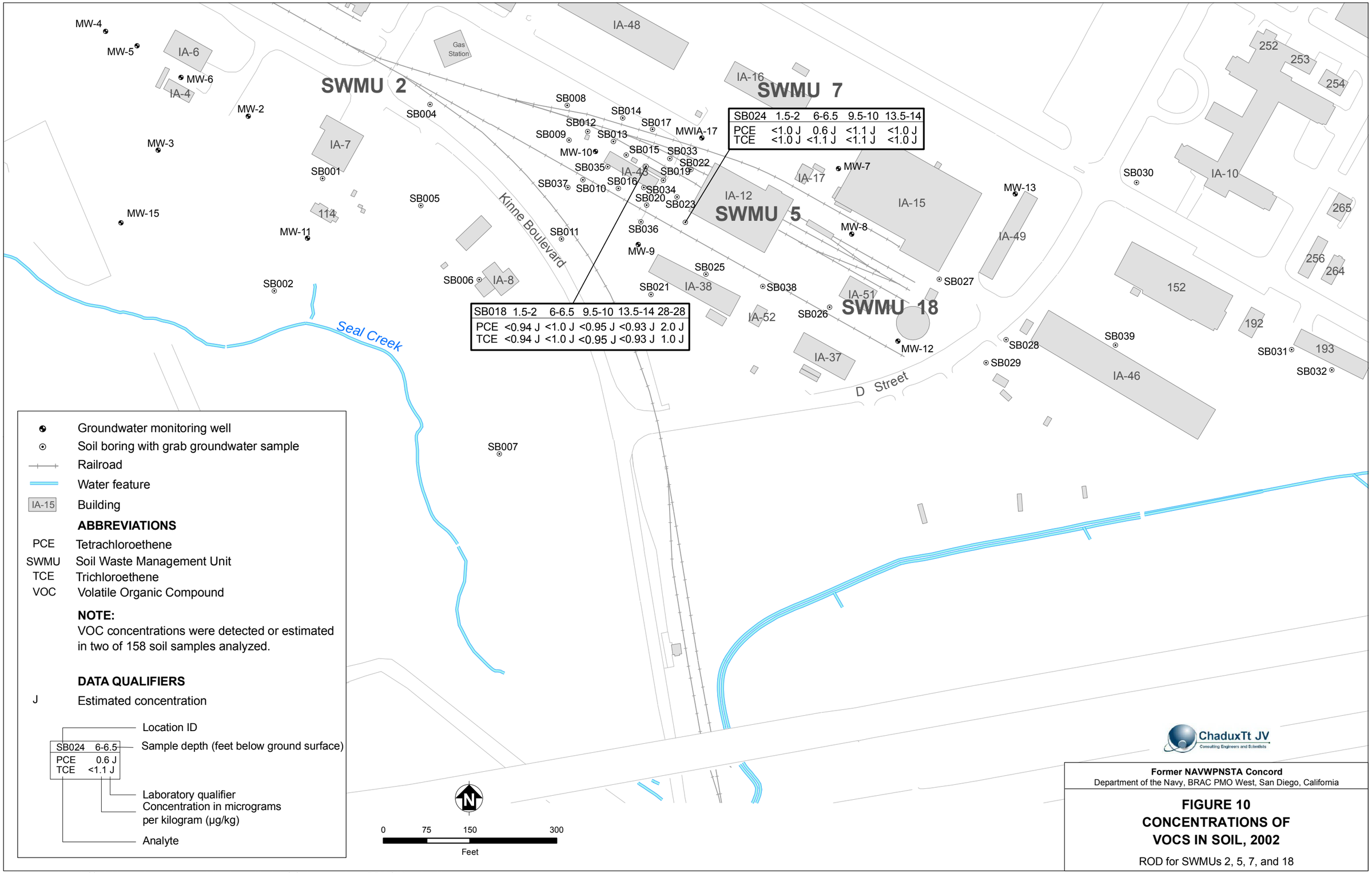

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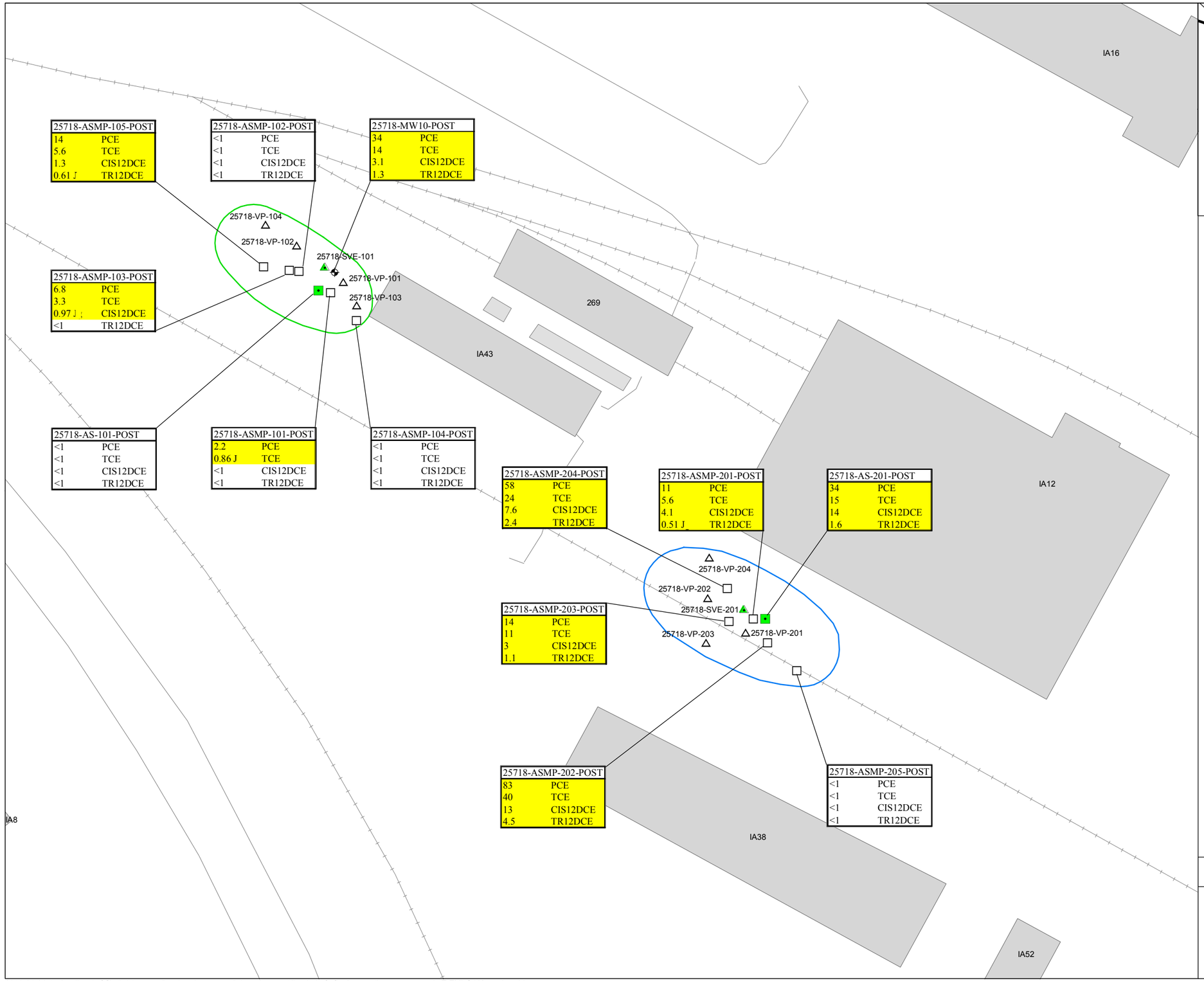
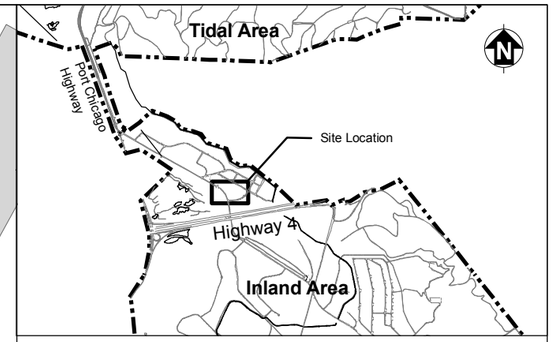


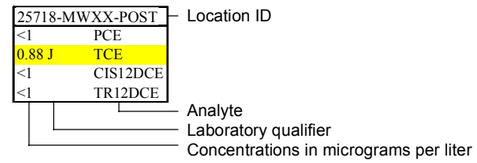


- Air Sparge Well
- Soil Vapor Extraction
- Air Sparge Monitoring Point
- Vapor Monitoring Point
- Groundwater Monitoring Well
- Approximate Location of Downgradient AS/SVE Pilot Test (Location 1)
- Approximate Location of Source Area AS/SVE Pilot Test (Location 2)
- Railroad

ABBREVIATIONS:

CIS12DCE	cis-1,2-Dichloroethene
J	Estimated Concentration
PCE	Perchloroethene
POST	Post-test sampling event
SWMU	Solid Waste Management Unit
TCE	Trichloroethene
TR12DCE	trans-1,2 Dichloroethene
VOC	Volatile Organic Compund

NOTE:
Detected concentrations are highlighted.



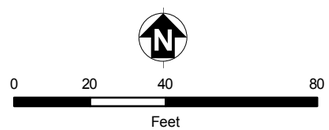


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FIGURE 11
POST-PILOT TEST GROUNDWATER ANALYTICAL RESULTS, 2000

ROD for SWMUs 2, 5, 7, and 18

2.4 CURRENT AND POTENTIAL FUTURE SITE USES

The SWMUs site is located in an area designated for industrial use; however, the industrial activity in the area currently consists of storage of a locomotive in Building IA-12 and operation of the railroad lines. The preferred reuse plan for the base, which was approved by the Concord City Council in January 2009, designates the property where the SWMUs site is located as "community facilities;" however, the plan has not yet undergone environmental review and is subject to change.

2.5 SUMMARY OF SITE RISKS

Chlorinated VOCs are the primary contaminants at the SWMUs site. Petroleum-based VOCs are also present at the SWMUs site, but to a much lesser extent than chlorinated VOCs. The chlorinated VOC contamination occurs mainly in groundwater over a wide area of SWMUs 2 and 5 and is suspected to have originated from the former waste oil tank west of Building IA-12 at SWMU 5. Based on the site conceptual model (Figure 12), the primary fate and transport mechanisms for chlorinated VOCs include volatilization and migration of contaminants via infiltration and percolation into groundwater.

The RI for the SWMUs site, completed between 2002 and 2004, included collection of soil, groundwater, and soil gas samples. As part of the RI, analytical results for these samples were evaluated in a qualitative HHRA and SLERA. The results of the HHRA and SLERA are summarized in Sections 2.5.1 and 2.5.2.

2.5.1 Human Health Risk Assessment

A qualitative HHRA was completed as part of the RI for the SWMUs site to evaluate whether chemicals in soil, groundwater, and soil gas at the site are present at concentrations that may be associated with health effects under current and potential future land uses. The HHRA was qualitative because it compared site concentrations with conservative, non-site-specific risk-based screening concentrations, rather than quantifying site-specific health risks. The HHRA consisted of four overall steps: (1) identification of potential receptors and exposure pathways, (2) selection of screening concentrations based on the receptors and exposure pathways identified as potentially complete, (3) comparison of maximum site concentrations to the selected screening concentrations, and (4) additional site-specific evaluation of soil gas sample results that exceeded screening concentrations.

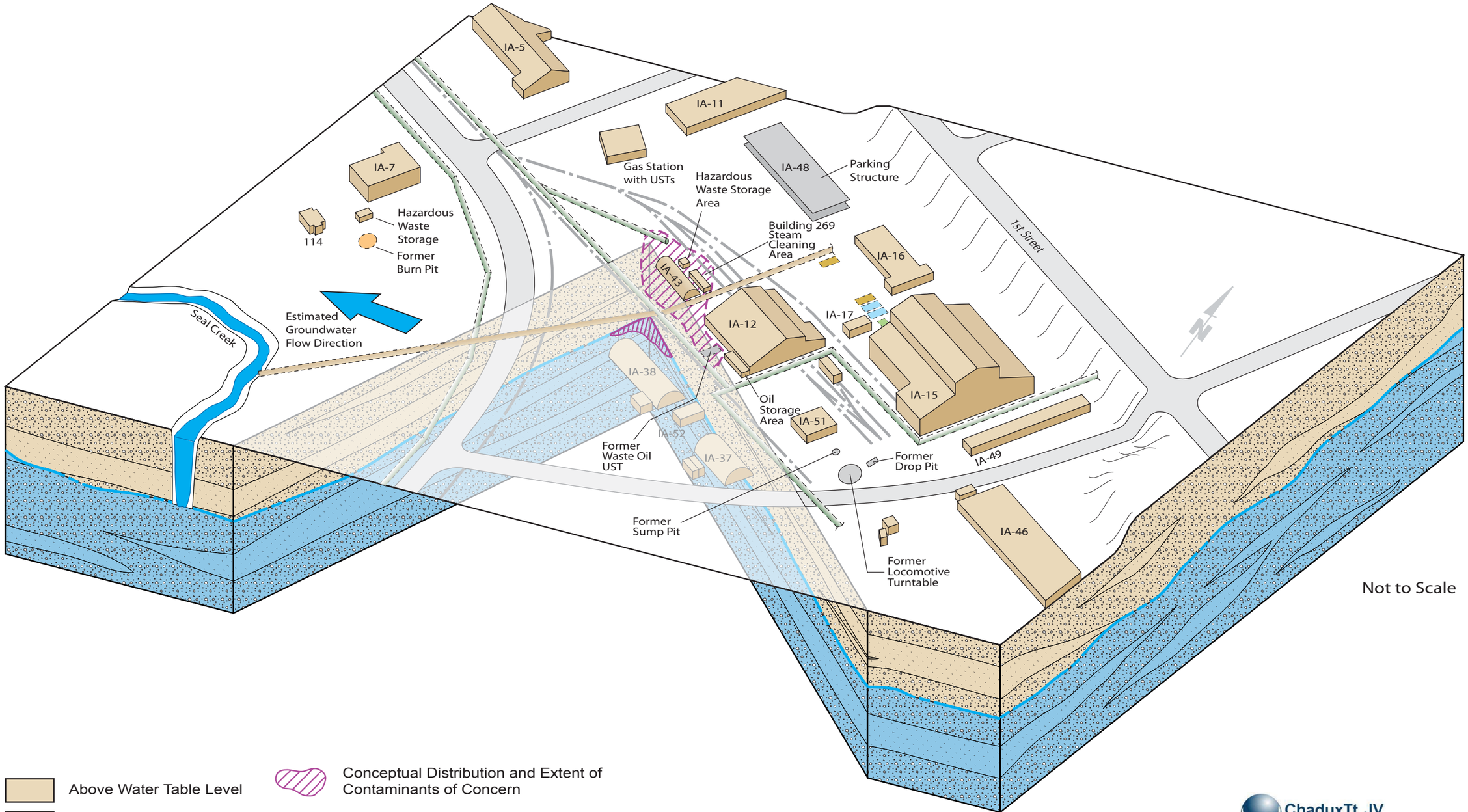

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FIGURE 12
SITE CONCEPTUAL MODEL

ROD for SWMUs 2, 5, 7, and 18

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Based on the current use of the SWMUs site (industrial), industrial workers were identified as a potentially exposed population (that is, a potential receptor). As discussed in Section 2.4, reuse plans for the SWMUs site have not been completed. Although the site is unlikely to be developed for residential use, a hypothetical future residential receptor was also evaluated in the HHRA. A residential land use scenario generally represents the greatest potential for exposure to site chemicals and is evaluated to provide additional information to support risk management decisions for a site.

VOCs were detected in soil, groundwater, and soil gas samples collected during the RI. Multiple **exposure pathways**(15), including ingestion, dermal contact, and inhalation, were identified as potentially complete for industrial and residential receptors for exposure to VOCs in these media.

Although groundwater at the SWMUs site is not currently used as a source of drinking water, it is designated as a potentially suitable source for municipal and domestic water supply (by the Water Board and based on federal groundwater beneficial use criteria). Therefore, the HHRA evaluated exposure pathways associated with residential use of groundwater (that is, ingestion, dermal contact, and inhalation).

The qualitative HHRA used federal and state residential **screening concentrations**(16) to evaluate whether site concentrations may be associated with health effects. Residential exposure-based screening concentrations were used because these concentrations represent concentrations for unrestricted land use and, hence, are protective of all potential exposures. The screening concentrations included:

- Soil – EPA Region 9 preliminary remediation goals (PRG) for residential soil.
- Groundwater – Indirect exposure: Water Board groundwater screening levels for residential exposure to vapors that migrate to indoor air and EPA groundwater screening levels for residential exposure to vapors that migrate to indoor air. Direct exposure: California Department of Health Services (CDHS) maximum contaminant levels (MCL) and EPA Region 9 tap water PRGs.
- Soil gas – Water Board soil gas screening levels for residential exposure to subsurface vapors that migrate to indoor air.

2.5.1.1 Results of Qualitative HHRA

The qualitative HHRA compared maximum concentrations of chemicals detected in soil, groundwater, and soil gas with the screening concentrations identified above. These **screening level comparisons**(17) are summarized below.

Soil

Chlorinated and petroleum-based VOCs were detected in site soil samples. Maximum concentrations did not exceed EPA Region 9 PRGs for residential soil for any chemicals and are not a health concern.

Groundwater

Chlorinated and petroleum-based VOCs were detected in site groundwater samples. Maximum concentrations were compared with both indirect exposure screening levels for residential vapor intrusion exposure and with direct exposure screening levels for residential household use. Maximum concentrations exceeded EPA screening levels for vapor intrusion for two chemicals: PCE and TCE. Concentrations of all other chemicals were below screening levels for vapor intrusion.

Maximum concentrations of three chemicals exceeded the California-promulgated drinking water standards, or MCLs, for the evaluation of direct exposure to groundwater: PCE, TCE, and DCE. Therefore, PCE, TCE, and DCE were considered health concerns. Maximum concentrations for benzene, bromodichloromethane, and 1,2-dichloroethane exceeded EPA tap water PRGs; however, concentrations of these chemicals did not exceed MCLs and were not considered health concerns.

Soil Gas

Chlorinated and petroleum-based VOCs were detected in site soil gas samples. The HHRA compared maximum concentrations of chlorinated and petroleum-based VOCs measured in soil gas with Water Board residential soil gas screening concentrations for vapor intrusion. Three chemicals exceeded screening criteria for vapor intrusion: PCE, TCE, and DCE. A site-specific evaluation of vapor intrusion risks was conducted as described in the following section.

2.5.1.2 Site-Specific Evaluation of Vapor Intrusion Risks

The HHRA included an evaluation of site-specific health risks associated with vapor intrusion exposure to PCE, TCE, and DCE because measured concentrations in soil gas exceeded Water Board soil gas screening levels for vapor intrusion at several sample locations. Water Board screening concentrations for soil gas are based on conservative, "worst-case" assumptions, including a shallow source of vapors and highly permeable sandy soils in the unsaturated zone (above the water table). A site-specific evaluation allows for incorporation of site-specific information, such as the soil type, to refine health risk estimates.

The DTSC-modified version of the Johnson and Ettinger vapor intrusion model was used to estimate vapor inhalation risks associated with PCE, TCE, and DCE in soil gas that migrates through the less-permeable clay soils at the SWMUs sites. The model's default assumption is that the soil type in the vadose zone consists of highly permeable sand. The vadose zone at the

site, however, consists of silty clay, which is less permeable than sand. The model was adjusted to account for this site-specific soil type. The estimated risks are summarized below.

The **site-specific vapor intrusion evaluation**(18) indicated that significant incremental risks (3.9×10^{-6}) are associated only with potential exposure to chlorinated VOCs (primarily PCE) in indoor air under a future residential land-use scenario. Incremental risk is the site-related risk of developing cancer over a lifetime of potential exposure to carcinogens. The chlorinated VOC-related incremental risks for a future residential land-use scenario are primarily associated with concentrations of PCE in soil gas measured at two locations (SG25 and SG31) located immediately adjacent to the former underground storage tank (UST) at SWMU 5 (Figure 9). For a current industrial land use scenario, incremental risks associated with vapor intrusion exposure to chlorinated VOCs are all less than 1×10^{-6} (and are therefore considered acceptable).

The site-specific vapor intrusion evaluation also indicated that noncancer hazard quotients (HQ) associated with potential exposure to chlorinated VOCs in indoor air are less than 1 (adverse health effects are not expected) under both future residential and industrial land-use scenarios. The HQ is a measure of potential systemic health effects from exposure to noncarcinogenic chemicals or carcinogenic chemicals that are associated with noncarcinogenic effects.

2.5.2 Ecological Risk Assessment

A SLERA was conducted to assess the potential risks to ecological receptors associated with exposure to chemicals of potential ecological concern (COPEC), in this case VOCs, in soil and groundwater at the SWMUs site. The SLERA consisted of Steps 1 and 2 of the Navy ecological risk assessment process. In Step 1 (problem formulation), the environmental setting, chemical fate and transport, ecotoxicity and potential receptors, and complete exposure pathways were considered to develop an **ecological conceptual site model**(19) and **assessment and measurement endpoints**(20). Potentially complete exposure pathways were identified for both lower trophic level (for example, plants and terrestrial and aquatic invertebrates) and upper trophic level (such as mice and fish) terrestrial and aquatic receptors based on chemicals in soil and groundwater.

In Step 2, concentrations of chemicals in soil and groundwater were compared with ecotoxicity benchmarks to characterize the potential for chemicals to pose risk to ecological receptors. Based on these **ecological benchmark comparisons**(21), it was determined that none of the COPECs pose unacceptable risk to ecological receptors at the SWMUs site. Although some **uncertainty**(22) was associated with the risk characterization, adequate information was available to evaluate the potential risk to receptors from COPECs using a screening-level approach.

2.5.3 Basis for Response Action

The response action selected in this ROD is necessary to protect the public health, welfare, or the environment from actual or potential releases of hazardous substances into the environment. The

response action specifically addresses human health because no unacceptable risk for ecological receptors was identified in the SLERA. The Navy, in partnership with EPA, DTSC, and the Water Board, considered all pertinent factors in accordance with CERCLA and the NCP remedy selection criteria and concluded that remedial action is necessary to clean up groundwater and soil gas at the SWMUs site. This decision was made because:

- Groundwater at the site is designated as potentially suitable for municipal and domestic water supply
- Concentrations of PCE, TCE, and DCE in groundwater exceed the California MCLs, which are health-protective drinking water standards for public water systems
- Concentrations of PCE in soil gas could pose unacceptable risk to potential future residential receptors via indoor air inhalation
- Contaminated groundwater could migrate off site

The concentrations of COCs for groundwater and soil gas that require a response action are summarized in Table 2.

TABLE 2. CHEMICALS OF CONCERN IN GROUNDWATER AND SOIL GAS REQUIRING A RESPONSE ACTION

Exposure Scenario	Chemical of Concern	Maximum Detected Concentration	Remediation Goal
Groundwater (µg/L)			
Residential	PCE	100	5
	TCE	38	5
	DCE	7	6
Soil Gas (µg/m^3)			
Residential – Vapor Intrusion	PCE	120,000	4,286*

Notes:

* The remediation goal for soil gas is based on site-specific assumptions and corresponds to a 1.0 x 10^{-6} excess cancer risk.

µg/L = Microgram per liter

µg/m^3 = Microgram per cubic meter

Figure 13 shows the areas of the SWMUs site where the remedial action for groundwater and soil gas would occur.

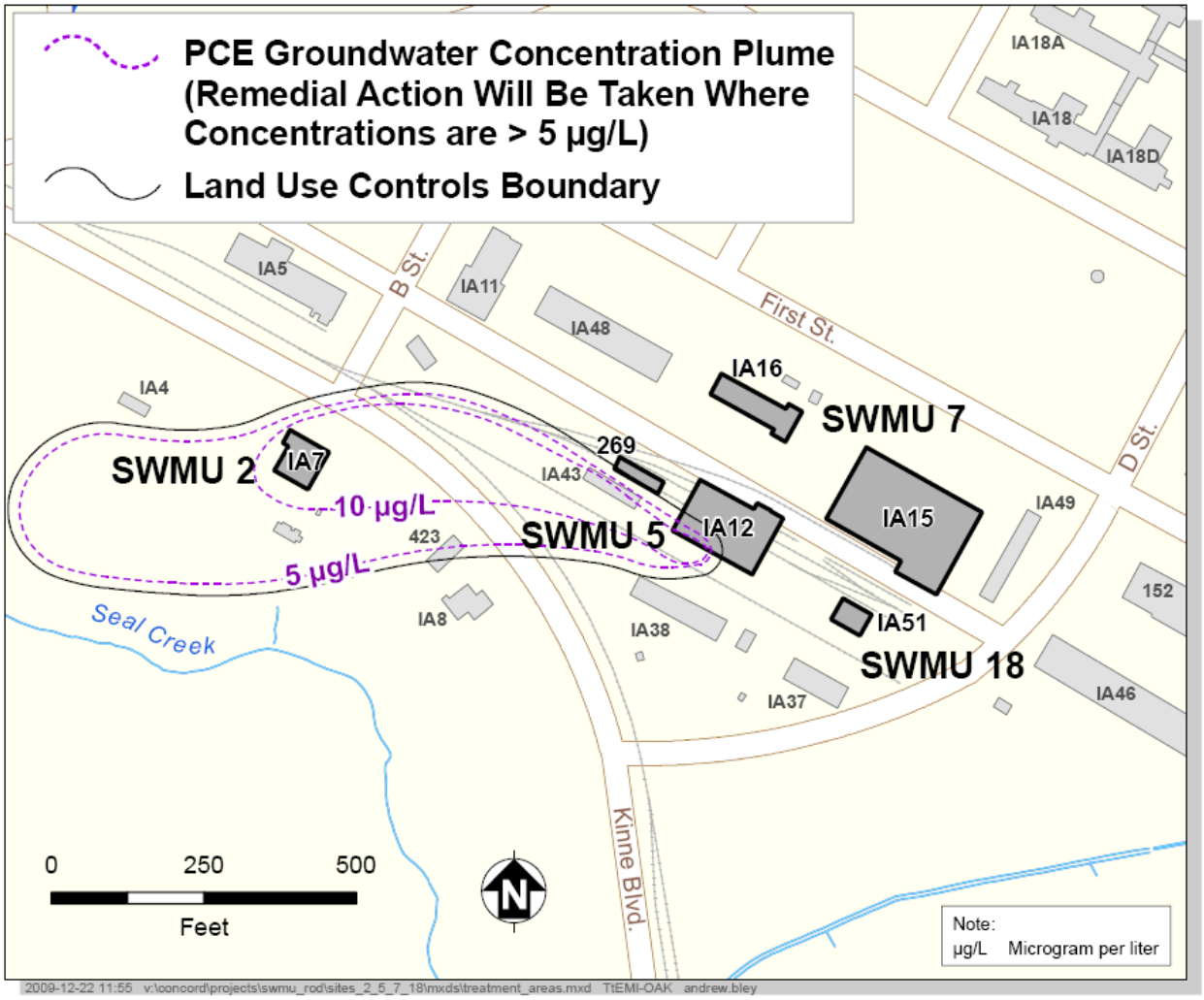

Figure 13. PCE Concentrations at SWMUs 2, 5, 7, and 18

2.6 PRINCIPAL THREAT WASTE

Although a remedial response action is necessary (Section 2.5.3), no wastes at SWMUs 2, 5, 7, and 18 constitute a "principal threat." Principal threat wastes are hazardous or highly toxic source materials that result in ongoing contamination to surrounding media, generally cannot be reliably contained, or present a significant risk to human health or the environment should exposure occur. Although elevated concentrations of chlorinated VOCs are present in groundwater and soil gas, the potential risks do not suggest there is a principal threat waste in groundwater and soil gas at the SWMUs site. Contaminated groundwater is not generally considered to be source material unless it has the potential to be extremely mobile. Chlorinated VOCs in groundwater at the SWMUs site appear to be relatively stable, rather than highly mobile. Therefore, chlorinated VOCs (specifically, PCE, TCE, and DCE) in groundwater at the SWMUs site are not considered a principal threat waste.

2.7 REMEDIAL ACTION OBJECTIVES

RAOs are established based on attainment of regulatory requirements, standards, and guidance; contaminated media; COCs; potential receptors and exposure scenarios; and human health and ecological risks. Ultimately, the success of a remedial action is measured by its ability to meet the RAOs. The RAOs for the SWMUs site were developed in conjunction with the regulatory agencies and are listed below by medium.

1. Prevent potential future indoor intrusion of vapors that contain PCE at concentrations that exceed the residential inhalation criteria developed in the RI Report.

2. Prevent domestic use of groundwater containing PCE, TCE, and DCE at concentrations that exceed California MCLs.

3. Prevent off-site migration of contaminated groundwater and control risk to humans from other non-drinking water pathways.

4. Restore groundwater at the SWMUs site to concentrations less than California MCLs for DCE, TCE and PCE.

The remediation goals for SWMUs 2, 5, 7, and 18 are listed in Table 3.

TABLE 3. REMEDIATION GOALS FOR GROUNDWATER AND SOIL GAS

Exposure Scenario	Chemical of Concern	Remediation Goal	Remedial Goal Basis
Groundwater (µg/L)			
Residential	PCE	5	California MCL
	TCE	5	California MCL
	DCE	6	California MCL
Soil Gas (µg/m^3)			
Residential – Vapor Intrusion	PCE	4,286[a]	Site-Specific

Notes:

a The remediation goal for soil gas will be applied only to the source area (the area of former waste oil UST near Building IA-12), where concentrations previously detected in soil gas have exceeded screening criteria. (Soil gas detections are shown in Figure 9.)

µg/L = Microgram per liter

µg/m^3 = Microgram per cubic meter

2.8 DESCRIPTION AND EVALUATION OF REMEDIAL ALTERNATIVES

Preliminary screening of **general response actions (GRA)**(23) and process options was completed in the FS Report to refine the remedy selection process to address contamination in groundwater and soil gas. Four GRAs were identified to achieve RAOs: no action; LUCs, monitored natural attenuation (MNA), and active remediation. Remedial technologies and response actions were evaluated with respect to implementability, effectiveness, and relative cost (high, moderate, and low) in a preliminary screening. Detailed cost analysis was not performed as part of this preliminary screening. Four basic remedial alternatives were developed based on the technologies and process options retained (no action; air sparging; enhanced bioremediation; and pump and treat) for a detailed comparative analysis in accordance with the NCP.

2.8.1 Description of Remedial Alternatives

Table 4 provides the major components, details, and cost of each remedial alternative identified for groundwater and soil gas.

TABLE 4. REMEDIAL ALTERNATIVES

Remedial Alternative	Components	Details	Cost
1: No Action *No action for contaminated groundwater and soil gas and no restriction of site use.*	▪ None; existing conditions would remain	▪ No action ▪ Evaluation of no action alternative is required by the NCP	No cost

TABLE 4. REMEDIAL ALTERNATIVES (CONTINUED)

Remedial Alternative	Components	Details	Cost
2A: Air Sparging *Air Sparging where PCE concentrations are >5 µg/L.*	▪ Air Sparging ▪ SVE ▪ LUCs	▪ Air sparging would be implemented where PCE concentrations in groundwater exceed 5 µg/L. ▪ SVE system would prevent migration of contaminated vapors into Building IA-12. ▪ Restriction of residential use of the property and use of the groundwater until RAOs are achieved.	Capital Cost: $2.3 million Total O&M Cost: $0.9 million **Present-Worth Cost: $3.2 million**(24) Discount Rate: 1.9% Timeframe: 4 years
2B: Air Sparging and MNA *Air Sparging where PCE concentrations are >10 µg/L and MNA for remainder of plume.*	▪ Air Sparging ▪ MNA ▪ SVE ▪ LUCs	▪ Air sparging would be implemented where PCE concentrations in groundwater exceed 10 µg/L. ▪ MNA would be implemented for the remainder of the plume where PCE concentrations are >5 µg/L. ▪ SVE system would prevent migration of contaminated vapors into Building IA-12. ▪ Restriction of residential use of the property and use of the groundwater until RAOs are achieved.	Capital Cost: $1.0 million Total O&M Cost: $1.5 million **Present-Worth Cost: $2.5 million**(25) Discount Rate: 2.8% Timeframe: 10 years
3A: Enhanced Bioremediation *Enhanced bioremediation where PCE concentrations are >5 µg/L.*	▪ Enhanced Bioremediation ▪ SVE ▪ LUCs	▪ Enhanced bioremediation would be implemented where PCE concentrations in groundwater exceed 5 µg/L. ▪ SVE system would prevent migration of contaminated vapors into Building IA-12. ▪ Restriction of residential use of the property and use of the groundwater until RAOs are achieved.	Capital Cost: $1.3 million Total O&M Cost: $0.8 million **Present-Worth Cost: $2.1 million**(26) Discount Rate: 2.1% Timeframe: 5 years
3B: Enhanced Bioremediation and MNA *Enhanced bioremediation where PCE concentrations are >10 µg/L and MNA for remainder of plume.*	▪ Enhanced Bioremediation ▪ MNA ▪ SVE ▪ LUCs	▪ Enhanced bioremediation would be implemented where PCE concentrations in groundwater exceed 10 µg/L. ▪ MNA would be implemented for the remainder of the plume where PCE concentrations are >5 µg/L. ▪ SVE system would prevent migration of contaminated vapors into Building IA-12. ▪ Restriction of residential use of the property and use of the groundwater until RAOs are achieved.	Capital Cost: $0.7 million Total O&M Cost: $1.1 million **Present-Worth Cost: $1.8 million**(27) Discount Rate: 2.8% Timeframe: 10 years
4A: Groundwater Pump and Treat *Extract and treat groundwater where PCE concentrations are >5 µg/L.*	▪ Groundwater extraction and treatment ▪ SVE ▪ LUCs	▪ Extraction and treatment of groundwater would be implemented where PCE concentrations exceed 5 µg/L. ▪ SVE system would prevent migration of contaminated vapors into Building IA-12. ▪ Restriction of residential use of the property and use of the groundwater until RAOs are achieved.	Capital Cost: $0.8 million Total O&M Cost: $4.4 million **Present-Worth Cost: $5.2 million**(28) Discount Rate: 3.4% Timeframe: 20 years
4B: Groundwater Pump and Treat and MNA *Extract and treat groundwater where PCE concentrations are >10 µg/L and MNA for remainder of plume.*	▪ Groundwater extraction and treatment ▪ MNA ▪ SVE ▪ LUCs	▪ Extraction and treatment of groundwater would be implemented where PCE concentrations exceed 10 µg/L. ▪ MNA would be implemented for the remainder of the plume where PCE concentrations are >5 µg/L. ▪ SVE system would prevent migration of contaminated vapors into Building IA-12. ▪ Restriction of residential use of the property and use of the groundwater until RAOs are achieved.	Capital Cost: $0.6 million Total O&M Cost: $3.2 million **Present-Worth Cost: $3.8 million**(29) Discount Rate: 3.4% Timeframe: 20 years

2.8.2 Comparative Analysis of Alternatives

A comparative analysis of alternatives with respect to the **nine evaluation criteria**$_{(30)}$ was completed and is presented in Table 5 and described below. The no-action alternative (Alternative 1) is included in the FS for comparison purposes per the NCP.

TABLE 5. REMEDIAL ALTERNATIVE RANKING

Criterion	Primary Remedial Goal: Reduce PCE Concentration to Below MCL for Drinking Water					
	Alternative 2A	**Alternative 2B**	**Alternative 3A**	**Alternative 3B**	**Alternative 4A**	**Alternative 4B**
	Air Sparging	**Air Sparging and Monitored Natural Attenuation**	**Enhanced Bioremediation**	**Enhanced Bioremediation and Monitored Natural Attenuation**	**Pump and Treat**	**Pump and Treat and Monitored Natural Attenuation**
(1) Overall Protection of Human Health and the Environment						
Average Protectiveness	***5***	***5***	***5***	***5***	***5***	***5***
(2) Compliance with ARARs (1 indicates least compliant and 5 is most compliant)						
Chemical Location and Action Specific ARARs	***5***	***5***	***5***	***5***	***5***	***5***
(3) Long-Term Effectiveness and Permanence (1 indicates least effective and 5 is most effective)						
Average Long-Term Effectiveness	***5***	***4.7***	***5***	***4.7***	***4.3***	***4.3***
(4) Reduction of Toxicity, Mobility, or Volume through Treatment (1 indicates least reduction and 5 is most reduction)						
Average Reduction Through Treatment	***4.8***	***4.6***	***4.8***	***4.6***	***4.6***	***4.4***
(5) Short-Term Effectiveness (1 is least effective and 5 is most effective)						
Average Short Term Effectiveness	***5***	***4.7***	***4.7***	***4.3***	***4***	***4***
(6) Implementability (1 indicates least implementable and 5 is most implementable)						
Average Implementability	***3.8***	***3.8***	***4***	***4***	***3.2***	***3.2***
(7) Cost (1 is most expensive and 5 is least expensive)						
Present Worth Cost	***3***	***4***	***4***	***5***	***1***	***2***
(8) State Acceptance						
Acceptance	***PP***	***PP***	***PP***	***PP***	***PP***	***PP***
(9) Community Acceptance						
Acceptance	***NC***	***NC***	***NC***	***NC***	***NC***	***NC***
Overall Score	**32.1**	**31. 8**	**33.0**	**32.6**	**27.1**	**27.9**

Notes:

NC No significant public comments requiring a revision to the preferred alternative were received.
PP State acceptance of the selected remedy is documented in the Proposed Plan and ROD.

Threshold Criteria

Overall Protection of Human Health and the Environment

Alternative 1, the no action alternative, would not be protective of human health. All of the action alternatives (2A, 2B, 3A, 3B, 4A, and 4B) would protect human health by reducing contaminant concentrations in groundwater and soil gas to below remedial goals for domestic use (groundwater) and residential indoor air (soil gas). Furthermore, LUCs would be implemented to protect human health during remediation. Thus, these alternatives were all ranked equally based on this criterion, as shown in Table 5. No unacceptable ecological risks have been identified at the SWMUs site; therefore, none of the alternatives are intended to mitigate risks to the environment.

Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

CERCLA § 121(d)(1) states that remedial actions at CERCLA sites must attain (or the decision document must justify the waiver of) any federal or more stringent state environmental standards, requirements, criteria, or limitations that are determined to be legally applicable or relevant and appropriate. Chemical-specific ARARs are health- or risk-based numerical values or methods that, when applied to site-specific conditions, establish the acceptable amount or concentration of a chemical that may be found in, or discharged to, the environment. Location-specific ARARs are restrictions on the concentrations of hazardous substances or on conducting activities solely because they are in specific locations. Specific locations include floodplains, wetlands, historic places, and sensitive ecosystems or habitats. Action-specific ARARs are technology- or activity-based requirements or limitations for remedial activities. These requirements are triggered by the particular remedial activities conducted at the site. Alternative 1 would not comply with ARARs. All of the action alternatives (2A, 2B, 3A, 3B, 4A, and 4B) would comply with the ARARs identified in Attachment A of this report. Thus, these alternatives were all ranked equally based on this criterion.

Primary Balancing Criteria

Long-Term Effectiveness and Permanence

Alternative 1 would not provide long-term effectiveness and permanence for groundwater at the SWMUs site. All of the action alternatives (2A, 2B, 3A, 3B, 4A, and 4B) would provide a remedy with long-term effectiveness and permanence by actively treating contamination to reach remedial goals. However, alternatives that would require a long time to meet remedial goals (such as Alternatives 4A and 4B) would rely on property restrictions (up to 20 years) to prevent exposure of humans to contaminated groundwater and soil gas until treatment is complete. Although LUCs would be implemented during remediation to protect human health, the effectiveness of LUCs is less certain than the effectiveness of more rapid remediation. Therefore, alternatives that require longer-term LUCs received a lower ranking. However, the certainty of LUCs could instead have been addressed as an aspect of the ranking with respect to implementability (below).

Reduction in Toxicity, Mobility, or Volume through Treatment. Alternative 1 would eventually reduce the mobility, toxicity, and volume of contamination through natural degradation processes; however, the time required is 75 years. All of the action alternatives (2A, 2B, 3A, 3B, 4A, and 4B) would reduce the mobility, toxicity, and volume of groundwater and soil gas contamination through active treatment. However, the alternatives that incorporate treatment of the entire plume (the "A" subalternatives) would remove more contamination. In addition, the pump-and-treat alternatives (4A and 4B) would create treatment residuals (byproducts of the treatment process) whereas the other action alternatives would not. These differences are reflected in the rankings in Table 5.

Short-Term Effectiveness

Alternative 1 would not create new risks to the community or the environment because no action would be taken. Emissions would be minimal from the action alternatives (2A, 2B, 3A, 3B, 4A, and 4B); thus, no significant risk is associated with construction or implementation of the remedy for any of these alternatives. However, there is a substantial difference among the action alternatives in the time required to meet the remedial goals; alternatives that would require longer time frames to remediate the site received lower rankings. These differences are reflected in the rankings in Table 5.

Implementability

Alternative 1 would be easy to implement because it requires no action. All of the remedial alternatives that treat groundwater and soil gas are implementable. The bioremediation alternatives (3A and 3B) are the simplest to implement because they involve no pumping systems or networks of piping and create no emissions or effluents. However, the aerobic conditions and substantial sulfate concentrations at the site would require collection of site-specific data during the remedy design phase to select an appropriate substrate for injection into the subsurface. This additional sample collection and evaluation complicate the remedy. Air sparging and SVE are implementable and commonly used technologies. The pump-and-treat alternatives (4A and 4B) are the only alternatives that involve management of an effluent and are therefore more complex to implement. These differences are reflected in the rankings in Table 5.

Cost. The costs for the alternatives were ranked from least to most expensive as follows: Alternative 1 (No cost); Alternative 3B ($1.8 million); Alternative 3A ($2.1 million); Alternative 2B ($2.5 million); Alternative 2A ($3.2 million); Alternative 4B ($3.8 million); and Alternative 4A ($5.2 million).

Modifying Criteria

State Acceptance. State involvement has been solicited throughout the CERCLA process. The Navy, EPA, DTSC, and the Water Board coordinated on all major documents and investigative activities associated with the SWMUs site, including the RI and FS. Based on these reviews and discussions of key documents, the state supports the selected remedy. The State of California's acceptance of the Navy's selected remedial alternative is documented in the Proposed Plan and ROD.

Community Acceptance. Community acceptance was evaluated based on comments received on the Proposed Plan, which was presented to the community and discussed during a public meeting on October 22, 2008. Comments were also gathered during the public comment period from October 7 through November 6, 2008. Attachment B, the responsiveness summary, addresses the public's comments and concerns about the preferred remedial alternative for the SWMUs site presented in the Proposed Plan. No significant public comments that would warrant a revision to the preferred alternative were received. The preferred alternative presented in the Proposed Plan consisted of air sparging, SVE, and enhanced bioremediation; however, the selected remedy presented in this ROD was modified after the Proposed Plan to include only air sparging and SVE. This change to the selected remedy is discussed in more detail in Section 2.9.4. EPA guidance identifies this change as significant and that could have been reasonably anticipated based on the information available to the public. In accordance with the EPA guidance, which states that "additional public notice or comment on this type of change is not required," no additional public notice or comment will be sought..

2.9 SELECTED REMEDY

2.9.1 Rationale for Selected Remedy

As indicated in Table 5, air sparging (Alternatives 2A and 2B) and bioremedation (Alternatives 3A and 3B) ranked the highest in the comparative analysis of remedial alternatives. Although air sparging ranked slightly lower than bioremediation, air sparging is a proven technology that was demonstrated in a pilot study to be effective at reducing concentrations of VOCs in groundwater at the SWMUs site. The time to remediate the site through air sparging is also expected to be shorter than the time for bioremediation. Therefore, air sparging (Alternative 2A) was selected as the remedial action for the SWMUs site. The remedy will meet the RAOs by treating the chlorinated solvents at the site through air sparging and SVE.

2.9.2 Description of Selected Remedy

The selected remedy is Alternative 2A, which consists of air sparging and SVE. Under this remedy, air is injected into the saturated zone to strip VOCs from the groundwater. An SVE system will be used to prevent the migration and accumulation of vapors into Building IA-12. Figure 13 shows the area of treatment for Alternative 2A. Groundwater would be treated until concentrations of the COCs are reduced to below remedial goals.

Alternative 2A is expected to require 4 years to complete, which includes 2 years for treatment followed by 2 years of groundwater monitoring. This estimate is based on typical remediation times required for air sparging and the results of the pilot test. The cost of the selected remedy is expected to be $3.2 million.

An SVE system will prevent migration of sparged vapors into Building IA-12; additional SVE will not be necessary to capture the sparged vapors throughout the treatment area. The concentrations of VOCs emitted during air sparging are expected to be significantly less (by more than an order of magnitude) than the 1 pound per day limit set by the Bay Area Air Quality

Management District, based on the results of the air sparging pilot test. Therefore, collection and treatment of the sparged vapors are not necessary.

The selected remedy was chosen to meet the remedial goals in a timely, efficient, and cost-effective manner. The Navy will conduct monitoring to ensure the remedy effectively reduces contaminant concentrations in soil gas and groundwater to acceptable levels and will make adjustments as needed based on the monitoring results.

ICs(31), will be implemented to prevent exposure to areas where potential unacceptable risk is posed by COCs in groundwater and indoor air. The primary fate and transport mechanisms for chlorinated VOCs are volatilization and migration of contaminants via infiltration and percolation into groundwater. There is potential risk to future residents from inhalation of indoor air and domestic use of groundwater. The ICs will be implemented for the area where concentrations of PCE exceed 5 micrograms per liter (µg/L) (Figure 13). The ICs will be in place until the RAOs are achieved and are in compliance with Navy-EPA LUC principles (as described in a Department of Defense memorandum dated January 16, 2004: *Comprehensive Environmental Response, Compensation, and Liability Act ROD and Post-ROD Policy, Attachment 1 — Principles and Procedures for Specifying, Monitoring, and Enforcement of Land Use Controls and Other post-ROD Actions*).

ICs are legal and administrative mechanisms used to implement land use restrictions to limit exposure of future landowners or users of the property to hazardous substances present on the property and to ensure the integrity of the remedial action. ICs are required on a property where the selected remedial cleanup levels result in contamination remaining at the property above levels that allow for unlimited use and unrestricted exposure. ICs will be maintained until the concentrations of hazardous substances in soil and groundwater are at levels that allow for unrestricted use and exposure. Implementation of ICs includes requirements for monitoring, inspections, and reporting to ensure compliance with land use or activity restrictions.

The Navy has determined that it will rely on proprietary controls in the form of environmental restrictive covenants as provided in the "Memorandum of Agreement between the United States Department of the Navy and the California Department of Toxic Substances Control" and attached covenant models (the "Navy/DTSC MOA").

More specifically, land use and activity restrictions will be incorporated into two separate legal instruments as provided in the Navy/DTSC MOA:

1. Restrictive covenants included in Quitclaim Deeds from the Navy to the property recipient.
2. Restrictive covenants included in one or more "Covenant to Restrict Use of Property" entered into by the Navy and DTSC as provided in the Navy/DTSC MOA and consistent with the substantive provisions of California Code of Regulations (Cal. Code Regs.) Title (tit.) 22 § 67391.1.

The "Covenant(s) to Restrict Use of Property" will incorporate the land use restrictions into environmental restrictive covenants that run with the land and that are enforceable by DTSC against future transferees. The Quitclaim Deed(s) will include the identical land use and activity restrictions in environmental restrictive covenants that run with the land and that will be enforceable by the Navy against future transferees.

The IC performance objectives include the prohibition on residential use of the property. ICs are necessary to protect against indoor vapor intrusion near the former waste oil tank. The SWMUs site is located in an industrial area, but the preferred reuse plan for the base designates the area where the SWMUs site is located as "community facilities." However, this plan has not been finalized and is subject to change. The ICs will prohibit use of the property for residences, hospitals for humans, schools for persons under 21 years of age, day care facilities for children, and playgrounds. These restrictions will remain in place until soil vapors in the area of the former waste oil UST have been fully remediated to concentrations that alleviate the risks of exposure through vapor intrusion to indoor air.

The IC objectives also include the prohibition on use of groundwater until RAOs are achieved. The ICs will prohibit all extraction and use of groundwater from the contaminated plume.

In addition, the restrictions will also prevent use of the site that would jeopardize the integrity of the air sparging and SVE systems. ICs will remain in place as long as contamination remains at the site above levels that allow for unlimited use and unrestricted exposure.

A LUC remedial design (RD) will be prepared as the land use component of the remedial design and in accordance with the schedule set forth in the FFA. The LUC RD will include additional details regarding implementation, maintenance, and periodic inspections of LUCs and will contain the activity restrictions in the "Covenant(s) to Restrict Use of Property" and Deed(s). The LUC RD shall identify the roles of local, state, and federal government in administering the LUC RD.

The Navy is responsible for implementing, monitoring, reporting on, maintaining, and enforcing ICs. Although the Navy may later transfer the procedural responsibilities for enforcement of land use restrictions to another party by contract, property transfer agreement, or through other means, the Navy will retain ultimate responsibility for the integrity of the remedy. The Navy shall not modify or terminate LUCs, implementation actions, or modify land use without approval by EPA and DTSC. The Navy shall seek prior concurrence before any anticipated action that may disrupt the effectiveness of the LUCs or any action that may alter or negate the need for LUCs. The LUCs will be removed once RAOs have been achieved and remediation is complete.

2.9.3 Expected Outcomes of the Selected Remedy

The selected remedy is expected to achieve remediation goals by actively treating chlorinated VOCs in groundwater and soil gas and reducing the mass and concentrations of these contaminants to levels that do not pose an unacceptable risk to human health through the

ingestion or inhalation exposure pathways. Groundwater will be monitored for chlorinated VOCs and their breakdown products (including vinyl chloride) while treatment is implemented to ensure the remedial goals are met. Temporary LUCs will be put in place to prohibit use of the groundwater and residential use of the property where there is the potential for exposure that could result in unacceptable risk from the vapor intrusion pathway until remedial goals are met. Once remedial goals have been achieved, the site will be suitable for unrestricted use.

2.9.4 Statutory Determinations

In accordance with the NCP, the selected remedy meets the following statutory determinations.

- **Protection of Human Health and the Environment** – The selected remedy will protect human health through in-place treatment of contaminated groundwater and soil gas, which will prevent exposure to VOCs via ingestion of groundwater and inhalation of indoor air for potential future residents.

- **Compliance with ARARs** –The remedial alternative selected by the Navy will meet all chemical-, location-, and action-specific ARARs. The ARARs that will be met by the preferred alternatives are summarized in Attachment A.

- **Cost-Effectiveness** – The selected remedy is cost effective. It will provide overall protectiveness proportional to the cost.

- **Use of Permanent Solution and Alternative Treatment Technologies or Resource Recovery Technologies to the Maximum Extent Practicable** – The Navy has determined that the selected remedy represents the maximum extent practicable to which permanent solutions and alternative treatment technologies can be used in a cost-effective manner. Based on the evaluation of all the alternatives that were considered protective of human health and the environment and that complied with ARARs, the selected remedy will provide the best balance of tradeoffs among long-term effectiveness and permanence, implementability, short-term effectiveness, and cost. The selected remedy is expected to be permanent and effective for unrestricted land use.

- **Preference for Treatment as a Principal Element** – The selected remedy satisfies the statutory preference for treatment as a principal element of the remedy; that is, it reduces the toxicity, mobility, or volume of hazardous substances, pollutants, or contaminants as a principal element through treatment.

- **Five-Year Review Requirements** –The effectiveness of the remedial actions for SWMUs sites will be reviewed at a minimum of 5-year intervals until the RAOs are achieved. The purpose of the Five Year Review is to verify that the remedy continues to adequately protect human health and the environment and is achieving cleanup goals while the contaminants are present at the SWMUs site. Once RAOs and cleanup goals are achieved, the LUCs will be lifted, allowing for unrestricted use of the site and Five Year Reviews will not be conducted. The first Five Year Review will be submitted 5-years after initiating the remedial action (finalization of the LUC-RD).

2.9.5 Documentation of Significant Changes from Preferred Alternative Presented in the Proposed Plan

The preferred alternative presented in the Proposed Plan for the SWMUs site combined the remedial elements of Alternative 2B (air sparging and MNA) and a modified Alternative 3A (enhanced bioremediation). As shown in Table 5, the alternatives that incorporate air sparging (Alternatives 2A and 2B) and bioremediation (Alternatives 3A and 3B) all ranked highly when they were evaluated against the nine evaluation criteria. Furthermore, the differences in the overall scores for these four alternatives were not dissimilar enough to serve as a basis for selecting one alternative over the other. Therefore, the preferred alternative presented in the Proposed Plan included air sparging and enhanced bioremediation. After further evaluation, the Navy changed the selected remedy to Alternative 2A (air sparging) because the two technologies (air sparging and bioremediation) in the preferred alternative, though similarly ranked, may not effectively treat the contamination in the groundwater when used sequentially or in combination. Bioremediation and air sparging are competing technologies in that air sparging increases oxygen levels in the subsurface, while bioremediation relies on an oxygen-deficient environment. These rival approaches could impair the remediation, potentially reducing the effectiveness of the remedy and increasing the time required to achieve the RAOs. Therefore, air sparging (Alternative 2A) was chosen as the selected remedy.

2.10 COMMUNITY PARTICIPATION

Community participation at Former NAVWPNSTA Concord includes a Restoration Advisory Board (RAB), public meetings, public information repositories, newsletters and fact sheets, public notices, and an Installation Restoration (IR) Program website. The 2007 Community Involvement Plan Update for Former NAVWPNSTA Concord provides detailed information on community participation for the IR Program and documents interests, issues, and concerns raised by the community regarding ongoing investigation and cleanup activities at Former NAVWPNSTA Concord.

RAB meetings are held the first Wednesday of every month on a bimonthly basis and are open to the public to provide opportunity for public comment and input. Documents and relevant information relied on in the remedy selection process are made available for public review in the information repository listed below or on the **IR Program website, www.bracpmo.navy.mil**[(32)].

Concord Public Library
2900 Salvio Street
Concord, California 94519
Phone: (925) 646-5455

For access to the Administrative Record or additional information on the IR Program, contact:

Ms. Kathryn A Stewart
BRAC Environmental Coordinator
BRAC Program Management Office West
Navy Caretaker Site Office
1 Avenue of the Palms, Suite 161
Treasure Island
San Francisco, CA 94130-1807
415.743.4715

In accordance with CERCLA §§ 113 and 117, the Navy provided a public comment period from October 7, 2008, to November 6, 2008, for the proposed remedial action described in the Proposed Plan for SWMUs 2, 5, 7, and 18. A public meeting to present the Proposed Plan was held from 6:30 to 8:30 p.m. on October 22, 2008. Public notice of the meeting and availability of documents appeared in the *Contra Costa Times* on October 12, 2008.

3.0 RESPONSIVENESS SUMMARY

The responsiveness summary is the third component of a ROD; its purpose is to summarize information about the views of the public and support agency on both the remedial alternatives and general concerns about the site submitted during the public comment period. The Responsiveness Summary documents in the public record how public comments were integrated into the decision-making process.

The participants in the public meeting, held on October 22, 2008, included community members, RAB members, and representatives of the Navy and EPA. Questions and concerns received during the meeting were addressed at the meeting and are documented in the **meeting transcript**$_{(33)}$. Responses to comments provided at the meeting and received during the public comment period by the Navy are included in the responsiveness summary (**Attachment B**).

ATTACHMENT A
APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

Federal and State Chemical-Specific[a] Applicable or Relevant and Appropriate Requirements
Record of Decision for Solid Waste Management Units 2,5, 7 and 18,
Former Naval Weapons Station Seal Beach Detachment Concord Inland Area, California

Requirement	Prerequisite	Citation[b]	ARAR Determination	Comments
GENERATION OF WASTE				
Federal				
Resource Conservation and Recovery Act (Title 42 U.S.C. Chapter 82, §§ 6901-6991[i])[c]				
Defines RCRA hazardous waste. A solid waste is characterized as toxic, based on TCLP, if the waste exceeds the TCLP maximum concentrations.	Waste	Cal. Code Regs. tit. 22, §§ 66261.21, 66261.22(a)(1), 66261.23, 66261.24(a)(1), and 66261.100	Applicable	These regulations are applicable to activities that generate waste to determine if the waste is hazardous. The Navy will generate waste in the construction of new groundwater wells. The Navy will determine whether the waste meets the definition of RCRA hazardous waste when it is generated.
GROUNDWATER				
Federal				
Safe Drinking Water Act (42 U.S.C., Chapter 6A, § 300[f] through 300[j]-26)[c]				
National primary drinking water standards are health-based standards for public water systems (MCLs).	Public water system	40 C.F.R. § 141.61(a) and (c)	Relevant and Appropriate	These drinking water standards are applicable at the tap for the end users of regulated public water supply systems; therefore, they are not applicable requirements for the groundwater at SWMUs 2, 5, 7and 18. These requirements are relevant and appropriate for groundwater that is a potential source of drinking water. The federal MCLs for PCE and TCE are relevant and appropriate ARARs for the groundwater at SWMUs 2, 5, 7 and 18.

Federal and State Chemical-Specific[a] Applicable or Relevant and Appropriate Requirements
Record of Decision for Solid Waste Management Units 2, 5, 7 and 18,
Former Naval Weapons Station Seal Beach Detachment Concord Inland Area, California (Continued)

Requirement	Prerequisite	Citation[b]	ARAR Determination	Comments
State				
Cal/EPA Department of Toxic Substances Control[c]				
State MCL list	Source of drinking water	Cal. Code Regs. tit. 22, §§ 64431 and 64444	Relevant and Appropriate	These drinking water standards are applicable at the tap for the end users of regulated public water supply systems; therefore, they are not applicable requirements for the groundwater at SWMUs 2, 5, 7, and 18. These requirements are relevant and appropriate for groundwater that is a potential source of drinking water. The state MCL for DCE is more stringent than the federal MCL for DCE and therefore the state MCL is a relevant and appropriate ARAR for the groundwater at SWMUs 2, 5, 7 and 18.

Notes:

a Many action-specific ARARs contain chemical-specific limitations that are addressed in the action-specific ARAR tables.

b Only the substantive provisions of the requirements cited in this table are ARARs.

c Statutes and policies, and their citations, are provided as headings to identify general categories of ARARs for the convenience of the reader; listing the statutes and policies does not indicate that the Navy accepts the entire statutes or policies as ARARs. Specific ARARs are addressed in the table below each general heading; only substantive requirements of the specific citations are considered ARARs.

§§ Sections
ARAR Applicable or relevant and appropriate requirement
Cal. Code Regs. California Code of Regulations
Ca/EPA California Environmental Protection Agency
DCE cis-1,2-Dichloroethene
MCL Maximum contaminant level
PCE Tetrachloroethene
RCRA Resource Conservation and Recovery Act
SWMU Solid waste management unit
TCE Trichloroethene
TCLP Toxicity characteristic leaching procedure
tit Title
U.S.C. United States Code

Federal and State Action-Specific Applicable or Relevant and Appropriate Requirements
Record of Decision for Solid Waste Management Units 2, 5, 7 And 18,
Former Naval Weapons Station Seal Beach Detachment Concord Inland Area, California

Action	Requirement	Prerequisite	Citation	ARAR Determination	Comments
GENERATION OF WASTE					
Federal					
Resource Conservation and Recovery Act (Title 42 U.S.C., Chapter 82, §§ 6901-6991[i])[a]					
On-site generation of waste	Person who generates waste shall determine if the waste is a hazardous waste.	Generator of waste	Cal. Code Regs. tit. 22, §§ 66262.10(a), and 66262.11	Applicable	These regulations are applicable to any operation that generates waste. The Navy will generate waste in the construction of new groundwater wells. The Navy will determine whether the waste is RCRA hazardous waste when it is generated.
On-site generation of waste	Requirements for analyzing waste for determining whether waste is hazardous.	Generator of waste	Cal. Code Regs. tit. 22, § 66264.13(a) and (b)	Applicable	These regulations are applicable to any operation that generates waste. The Navy will generate waste in the construction of new groundwater wells. The Navy will determine whether the waste is RCRA hazardous waste when it is generated.
State					
California Fish and Game Code[a]					
Discharge to waters of the state	Prohibits the passage of enumerated substances or materials into waters of the state deleterious to fish, plant life, or birds.	Discharge of one or more of the enumerated substances to waters of the state	California Fish and Game Code Section 5650(a)	Relevant and Appropriate	The substantive requirements of California Fish & Game Code § 5650(a) are ARARs.

Federal and State Action-Specific Applicable or Relevant and Appropriate Requirements
Record of Decision for Solid Waste Management Units 2, 5, 7 and 18,
Former Naval Weapons Station Seal Beach Detachment Concord Inland Area, California (Continued)

Action	Requirement	Prerequisite	Citation	ARAR Determination	Comments
AIR SPARGING					
Federal					
Safe Drinking Water Act (42 U.S.C. § 300[f]–300[j]-26) [a]					
Underground injection	The UIC program prohibits injection activities that allow movement of contaminants into underground sources of drinking water that may result in violations of MCLs or adversely affect health.	The UIC program prohibits injection activities that allow movement of contaminants into underground sources of drinking water that may result in violations of MCLs or adversely affect health.	40 CFR 144.12(b) and (c)(1),excluding the reporting requirements in 144.12(b) and144.12(c)(1)	Relevant and Appropriate	These requirements are ARARs for the injection associated with air sparging. The Navy will monitor the groundwater in conjunction with the operation of these groundwater treatments to ensure that contaminants will not move into other underground sources of drinking water.
Clean Air Act (42 U.S.C. § 7401 et seq.) [a]					
Soil vapor extraction	Requirement to use best available control technology for new or modified emission sources.	Emission from new source or increase in emission from a modified source, which has the potential to emit 10 pounds or more per day precursor organic compounds, non-precursor organic compounds, nitrogen oxide, sulfur dioxide, $PM_{10,}$ or carbon monoxide.	BAAQMD Regulation 2-2-301	Relevant and Appropriate	This requirement is an ARAR for soil vapor extraction.

Federal and State Action-Specific Applicable or Relevant and Appropriate Requirements
Record of Decision for Solid Waste Management Units 2, 5, 7 and 18,
Former Naval Weapons Station Seal Beach Detachment Concord Inland Area, California (Continued)

Action	Requirement	Prerequisite	Citation	ARAR Determination	Comments
MONITORED NATURAL ATTENUATION					
Federal					
Resource Conservation and Recovery Act (Title 42 U.S.C., Chapter 82, §§ 6901-6991[i])[a]					
Monitor groundwater	Contaminants of concern are the waste constituents, reaction products, and hazardous constituents that are reasonably expected to be in or derived from the waste contained in the regulated unit.	RCRA hazardous waste management unit	Cal. Code Regs. tit. 22, § 66264.93	Relevant and Appropriate	These requirements are applicable to RCRA hazardous waste facilities and there are no RCRA hazardous waste facilities at SWMUs 2, 5, 7 and 18. However, the Navy has determined that they are relevant and appropriate to the monitoring component of the groundwater response action.
Monitor groundwater	The owner or operator shall establish a groundwater monitoring system for each regulated unit and include a sufficient number of monitoring points installed at appropriate locations and depths to yield groundwater samples from the uppermost aquifer that represents the quality of groundwater passing the point of compliance.	RCRA hazardous waste management unit	Cal. Code Regs. tit. 22, § 66264.97(b)(1)(A), (b)(1)(B), (b)(1)(C), (b)(1)(D)(1), and (b)(1)(D)(2)	Relevant and Appropriate	These requirements are applicable to RCRA hazardous waste facilities and there are no RCRA hazardous waste facilities at SWMUs 2, 5, 7 and 18. However, the Navy has determined that they are relevant and appropriate to the monitoring component of the groundwater response action.

Federal and State Action-Specific Applicable or Relevant and Appropriate Requirements
Record of Decision for Solid Waste Management Units 2, 5, 7 and 18,
Former Naval Weapons Station Seal Beach Detachment Concord Inland Area, California (Continued)

Action	Requirement	Prerequisite	Citation	ARAR Determination	Comments
Resource Conservation and Recovery Act (Title 42 U.S.C., Chapter 82, §§ 6901-6991[i])[a] (Continued)					
Monitor groundwater	Requirements for monitoring well construction and sampling intervals.	RCRA hazardous waste management unit	Cal. Code Regs. tit. 22, § 66264.97(b)(4), (5), (6), and (7)	Relevant and Appropriate	These requirements are applicable to RCRA hazardous waste facilities and there are no RCRA hazardous waste facilities at SWMUs 2, 5, 7 and 18. However, the Navy has determined that they are relevant and appropriate to the monitoring component of the groundwater response action.
Monitor groundwater	Requirements for groundwater sample collection.	RCRA hazardous waste management unit	Cal. Code Regs. tit. 22, § 66264.97(e)(6), (e)(12)(A), (e)(12)(B), (e)(13), and (e)(15)	Relevant and Appropriate	These requirements are applicable to RCRA hazardous waste facilities and there are no RCRA hazardous waste facilities at SWMUs 2, 5, 7 and 18. However, the Navy has determined that they are relevant and appropriate to the monitoring component of the groundwater response action.

Federal and State Action-Specific Applicable or Relevant and Appropriate Requirements
Record of Decision for Solid Waste Management Units 2, 5, 7 and 18,
Former Naval Weapons Station Seal Beach Detachment Concord Inland Area, California (Continued)

Action	Requirement	Prerequisite	Citation	ARAR Determination	Comments
Resource Conservation and Recovery Act (Title 42 U.S.C., Chapter 82, §§ 6901-6991[i])[a] (Continued)					
Monitor groundwater	In conjunction with corrective action measures, the owner or operator shall establish and implement a water quality monitoring program to demonstrate the effectiveness of the corrective action program. The program shall be effective in determining compliance and in determining the success of the corrective action measures.	Corrective action for groundwater at RCRA hazardous waste management unit	Cal. Code Regs. tit. 22, § 66264.100(d)	Relevant and Appropriate	These requirements are applicable to RCRA hazardous waste facilities and there are no RCRA hazardous waste facilities at SWMUs 2, 5, 7 and 18. However, the Navy has determined that they are relevant and appropriate to the monitoring component of the groundwater response action.
Monitor groundwater	After corrective action measures terminate, the owner or operator must continue corrective action monitoring until compliance with remediation goals for a period of 1 year is demonstrated.	Corrective action for groundwater at a RCRA hazardous waste management unit	Cal. Code Regs. tit. 22, § 66264.100(g)(1)	Relevant and Appropriate	These requirements are applicable to RCRA hazardous waste facilities and there are no RCRA hazardous waste facilities at SWMUs 2, 5, 7 and 18. However, the Navy has determined that they are relevant and appropriate to the monitoring component of the groundwater response action.

Federal and State Action-Specific Applicable or Relevant and Appropriate Requirements
Record of Decision for Solid Waste Management Units 2, 5, 7 and 18,
Former Naval Weapons Station Seal Beach Detachment Concord Inland Area, California (Continued)

Action	Requirement	Prerequisite	Citation	ARAR Determination	Comments
INSTITUTIONAL CONTROLS					
California Department of Toxic Substances Control Institutional Control Regulations[a]					
Institutional control implementation	A land use covenant imposing appropriate limitations on land use shall be executed and recorded when facility closure, corrective action, remedial or removal action, or other response actions are undertaken and hazardous materials, hazardous wastes or constituents, or hazardous substances will remain at the property at levels which are not suitable for unrestricted use of the land.	Property transfer by federal government to a non-federal entity	Cal. Code Regs. tit. 22, § 67391.1	Relevant and Appropriate	The requirements of this section are relevant and appropriate requirements for ICs which will be in place until the remedial action objectives are achieved. EPA agrees that the substantive portions of the regulations referenced are ARARs. EPA specifically considers sections (a), (d), and (e) of Cal. Code Regs. tit. 22 § 67391.1, to be ARARs for this ROD. DTSC's position is that all of the state regulation is an ARAR.

Notes:

a	Statutes and policies, and their citations, are provided as headings to identify general categories of ARARs for the convenience of the reader; listing the statutes and policies does not indicate that the Navy accepts the entire statutes or policies as ARARs. Specific ARARs follow each general heading, and only substantive requirements of the specific citations are considered ARARs.
§	Section
§§	Sections
ARAR	Applicable or relevant and appropriate requirement
Cal. Code Regs.	California Code of Regulations
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
RCRA	Resource Conservation and Recovery Act
tit.	Title
UIC	Underground injection control
U.S.C.	United States Code

ATTACHMENT B
RESPONSIVENESS SUMMARY

Proposed Plan for SWMUs 2, 5, 7, and 18, Former NAVWPNSTA Concord Inland Area, Concord, California		
Written Comments Received by Edi Birsan on October 14, 2008 via e-mail		
Comment Number	**Comment**	**Response**
1	Proposed favored remedial plan a. There are two components one that is 5 years and the other is 10 years, does this mean that the whole site needs to be closed for the 10 year period? b. What was the exact reason behind the favorable choice of the preferred plan rather than the faster option combination? c. What were the weighting of the factors for time vs money?	a. The preferred alternative presented in the proposed plan was expected to require approximately 5 years to complete, and during that time industrial use might have been permitted. The selected remedy, presented in the record of decision (ROD) was modified to Alternative 2A (air sparging), which is expected to take 4 years to complete; industrial use might be permitted during that time. b. The preferred alternative presented in the proposed plan was chosen because bioremediation rated well in the evaluation of alternatives in the feasibility study. However, the preferred alternative was changed to Alternative 2A (air sparging) in the ROD. Bioremediation and air sparging are competing technologies because air sparging injects ambient air into the ground, which increases oxygen levels, while bioremediation of the site contaminants works best in a low-oxygen environment. These rival approaches could impair the remediation, potentially reducing the effectiveness of the remedy, and increasing the time required for completion. Therefore, the selected remedy is limited to air sparging (Alternative 2A). c. Time and cost were equally weighted in the ranking of alternatives, along with other factors, such as effectiveness and ease of implementation.
2	All plans Can there be any kind of construction/use during this work period of 5-10-20-75 years?	Industrial use of the site, including construction activities, might be permitted during remediation because no human health risk is associated with such use. However, some areas may have restricted access for a limited time to maintain the integrity of the remediation systems.
3	No Action I am confused here where the cost says -0- Does the area need to be fenced off while nature does its thing? Fences last 30 years? so three sets are needed? Fences and signs need to be maintained/should there not be a cost? Even though there is no remedial action, does there still need to be monitoring say every 5 years to make sure that nature is cooperating with the navy's plan. If the cost of testing every	The no action alternative was included for comparison because it is required by the National Oil and Hazardous Substances Pollution Contingency Plan and provides a baseline that can be used to measure the alternatives. Under the no action alternative, no effort would be made to contain, remove, monitor, or treat the contamination at the site. In addition, no efforts would be made to prevent exposure to on-site contamination through fencing, signs, or other methods. Therefore, there is no cost associated with this alternative. The no action alternative would not meet the remedial action objectives and, therefore, is not considered a viable remedy for the site.

Proposed Plan for SWMUs 2, 5, 7, and 18, Former NAVWPNSTA Concord Inland Area, Concord, California		
Written Comments Received by Edi Birsan on October 14, 2008 via e-mail		
Comment Number	**Comment**	**Response**
3 (continued)	5 years is One Hundred Thousand dollars (is this a proper estimate) then 15 tests over 75 years would be 1.5 million dollars.	
4	If there is a nearby adjacent use of a Fireman's training area, is there any additional dangers to the air sparging for proximity to open flames, or water spray causing solvents of the PCE/TCE/DCE into the water sprays and making things worse?	The volatile organic compounds (VOCs) will be emitted at low concentrations and the VOCs will diffuse rapidly when they reach open air. Furthermore, the chlorinated solvents are not highly flammable, which is one of the properties that make them useful for applications such as cleaning metal machinery. Potential safety issues with respect to any use of the property or groundwater will be considered during remediation and will be included in the remedial design documents.

Proposed Plan for SWMUs 2, 5, 7, and 18, Former NAVWPNSTA Concord Inland Area, Concord, California		
Spoken Comments by Edi Birsan received at the public meeting held October 22, 2008		
Comment Number	**Comment**	**Response**
1	My comment is the preferred plans are 2B and 3A, I guess. 2B takes ten years, and the other one takes five. From my perspective in the community, considering the cost is not that so far off, I would like to see both plans completed within five years, not ten. [Refer to the transcript of the public meeting beginning on page 20 for the complete comment.]	Alternative 2A is the selected remedy for the SWMUs site instead of the preferred alternative presented in the proposed plan. The selected remedy is expected to require approximately 4 years to complete. Under the selected remedy, air sparging would be implemented throughout the groundwater plume to achieve the remedial action objectives faster than relying on bioremediation or monitored natural attenuation.
2	I've also submitted comments about whether the possible use concurrent with this project, whether the flames from a fire college or testing is going to affect it or whether the water that would be used to put things out —— whether that affects it and whether there that represents any kind of additional risk that we don't know about. [Refer to the transcript of the public meeting beginning on page 21 for the complete comment.]	Industrial use of the site may be permitted during remediation because no human health risk is associated with such use. However, some areas may have restricted access for a limited time to maintain the integrity of the remediation systems. Please also see the response above to written comment 4.

Proposed Plan for SWMUs 2, 5, 7, and 18, Former NAVWPNSTA Concord Inland Area, Concord, California		
Spoken Comments by Dale Varady received at the public meeting held October 22, 2008		
Comment Number	**Comment**	**Response**
1	I represent the Office of the Sheriff. Our interest is that we're doing a public benefit conveyance request for this specific area for a police and fire training facility. And when you talked about it being cleaned to residential—use standards, I'm assuming that at some point then it could be used for that purpose. Am I understanding it correctly, that it's being cleaned to that particular standard?	The remediation is being conducted to support unrestricted land use in the future, which includes residential use. However, the eventual use of the site has not been identified and the site may continue to be used for industrial purposes.
2	The other hypothetical question I have is that my understanding is that if in fact we were successful with a public conveyance for this area and it meets with the City of Concord's use of that land as well, it could still be used or occupied for the type of facility that we're suggesting for a police and fire training facility while this cleanup is going on?	The Navy will work with the Local Reuse Authority, which is the Concord City Council, regarding the potential beneficial use or potential redevelopment. The area can be used for industrial purposes without any remedial action and during the remedial action because the contaminants do not pose an unacceptable risk to industrial workers. The cleanup is intended to treat contamination that poses a risk to hypothetical future residents; therefore, the only restricted use of the site is for residential use. Once the remedial action is complete, there will be no restrictions on the use of the area.

Proposed Plan for SWMUs 2, 5, 7, and 18, Former NAVWPNSTA Concord Inland Area, Concord, California		
Spoken Comment by Katherine Dano-Luttjohan received at the public meeting held October 22, 2008		
Comment Number	**Comment**	**Response**
1	Have you done this kind of work on the rest of the inland area? Are you just now starting on public comment on this kind of problem or issue here?	This is the first Proposed Plan prepared by the Base Realignment and Closure (BRAC) Program Management Office West team for the Inland Area. There are other Inland Area sites that have completed the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process and are closed; however, this site is the first at the Former NAVWPNSTA Concord Inland Area under the BRAC program.

Proposed Plan for SWMUs 2, 5, 7, and 18, Former NAVWPNSTA Concord Inland Area, Concord, California		
Written Comments by Sheriff Warren E. Rupf received November 3, 2008 via e-mail		
Comment Number	**Comment**	**Response**
1	As staff discussed at the meeting, The Office of the Sheriff and the Contra Costa County Fire Protection District are in the process of working with the Local Reuse Authority for the purpose of submitting a Public Benefit Conveyance (PBC) for property located at the "Administrative Area", to be used as a Joint Law Enforcement and Fire Emergency Responder Complex. The area best suited for our project includes the area identified as Units 2, 5, 7, and 18. We were pleased to learn during your presentation that our proposed use of this area and the Navy's clean-up efforts can co-exist at the site with minimal disruption to either party. If we are successful with our PBC application we would like to have further discussions with the Navy about the location of the extraction equipment on the site and would request the piping for the injection wells placed underground.	Please see the response to comment 2 from Dale Varady. Specific details on the location of equipment and effects on the use of the site will be identified in the remedial design.

Proposed Plan for SWMUs 2, 5, 7, and 18, Former NAVWPNSTA Concord Inland Area, Concord, California		
Written Comments by Michael F. McGowan, Arc Ecology, received by e-mail on November 6, 2008		
Comment Number	**Comment**	**Response**
1	On page 3 the paragraph under "Remedial Investigation" is a little confusing because it states that groundwater and soil gas at SWMU 5 contained chlorinated solvents but that the soil was not significantly contaminated. How is it possible that the soil would not be impacted? Is this statement an argument that soil excavation is not needed but groundwater treatment and soil gas extraction alone will be adequate remediation for the chlorinated solvents? If so, for clarity please make this argument in a separate paragraph from one which presents the argument that the waste oil tank in SWMU 5 was the source of the contamination.	The suspected source of the contamination, an underground storage tank (UST) installed in the 1970s, was removed, along with 35 cubic yards of contaminated soil, in 1994. During the remedial investigation, concentrations of chemicals in the existing soil at the site were compared with the U.S, Environmental Protection Agency (EPA) residential preliminary remediation goals (PRGs) as part of the human health risk assessment. None of the chemicals detected in soil, including chlorinated solvents, exceeded the PRGs and were not considered health concerns, as described in Section 2.5.1.1. Therefore, no remedial action for soil is necessary.
2	On page 4 the last bullet item under "Air Sparging…Pilot Test" states that vapor treatment is not necessary because the total amount of chlorinated solvents would be less than the threshold established by regulations. Isn't it the concentration of solvent vapors in air that makes them dangerous, not the total amount that would be collected over time? Please clarify.	The Bay Area Air Quality Management District's Regulation 8, Organic Compounds, Rule 47, which is intended to limit emissions of organic compounds from contaminated groundwater and soil, provides an exemption for operations such as air stripping and soil vapor extraction systems, like those proposed for the SWMUs site, if the systems produce total emissions of less than 1 pound per day of benzene, vinyl chloride, tetrachloroethene, methylene chloride, and trichloroethene. The concentration of solvent vapors in air is directly proportional to the mass released, so implicitly this rule considers the relative risk of these releases. Furthermore, the emissions of chlorinated solvents via air sparging will be spread out over a relatively large area (1.9 acres) and will dissipate rapidly as the volatile constituents mix with open air; thus, these emissions will not pose an unacceptable risk. However, as necessary, a soil vapor extraction system will be used to prevent the accumulation of vapors in Building IA-12 that could pose a potential human health risk to building occupants.
3	The last sentence in the same bullet item states that collection and treatment would be required to prevent vapors from accumulating to a dangerous concentration in buildings. This contradicts the first sentence in the bullet item. Was it intended to say that the concentration of solvent vapors in open air	The collection and treatment of vapors will not be necessary where the vapors mix with open air and disperse, as discussed in response to Arc Ecology comment 2. However, as necessary, a soil vapor extraction system will be used to prevent the accumulation of vapors in Building IA-12 that could pose a potential human health risk to building occupants.

Proposed Plan for SWMUs 2, 5, 7, and 18, Former NAVWPNSTA Concord Inland Area, Concord, California		
Written Comments by Michael F. McGowan, Arc Ecology, received by e-mail on November 6, 2008		
Comment Number	**Comment**	**Response**
3 (continued)	was not high enough to require extraction and treatment but extraction and treatment still would be required to prevent vapors from accumulating in buildings to dangerous concentrations? Please explain.	
4	On page 5 the second bullet item mentions a site-specific inhalation criterion for PCE concentration in air and it also mentions the remedial goal for soil gas of 4.286 micrograms per cubic meter. Are these two criteria the same? Are there assumptions used to get from the soil gas concentration to the indoor air concentration? Please provide more details to clarify the relationship between soil gas concentration and indoor air concentration.	The site-specific inhalation criterion is the same as the remedial goal. The remedial goal of 4,286 micrograms per cubic meter in soil gas corresponds to the indoor air concentration under a residential scenario that results in a 1.0E-6 excess cancer risk (considered acceptable) calculated using the Johnson and Ettinger model and site-specific conditions. The model's default assumption is that the soil type in the vadose zone consists of highly permeable sand, but the vadose zone at the site actually consists of silty clay, which is less permeable than sand; therefore, the model was adjusted to account for this site-specific soil type, as described in Section 2.5.1.2 of the ROD.
5	On page 11 the preferred alternative is given as a combination of Alternatives 2B and Modified 3A. This seems like a good choice among the alternatives in terms of remediation. However, there is something left out of the preferred alternative that could be relevant to future development of the property. The description of the individual alternatives estimates the duration in years before remedial objectives are achieved. What is the predicted duration before the remediation will be complete for this combination 2B/3A alternative?	Alternative 2A is the selected remedy for the SWMUs site. The expected duration of the selected remedy is approximately 4 years. Please see the response to written Comment 1 from Mr. Edi Birsan.
6	On page 11 it states that there will be a restriction on residential use of the property and groundwater until the remedial action objectives are achieved. What are the restrictions? Please specify.	No residential use of the property or domestic or municipal use of groundwater will be permitted until remedial action objectives are achieved.

Proposed Plan for SWMUs 2, 5, 7, and 18, Former NAVWPNSTA Concord Inland Area, Concord, California		
Written Comments by Michael F. McGowan, Arc Ecology, received by e-mail on November 6, 2008		
Comment Number	**Comment**	**Response**
7	We endorse the use of in situ treatment as much as possible to be cost-effective and avoid the production of secondary wastes. How will operation and maintenance of monitoring be guaranteed if the property is transferred before remediation is complete?	Operation and maintenance responsibilities would be part of the property transfer agreement.

ATTACHMENT C
REFERENCES

(Reference documents provided on CD only)

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
1	**SWMUs 2, 5, 7, and 18**	Section 2.1	Draft Final Remedial Investigation, Solid Waste Management Units 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Section 2.5.2. Tetra Tech EM Inc. (Tetra Tech). June 14, 2004.
2	**SWMU 2**	Section 2.1	Draft Final Remedial Investigation, Solid Waste Management Units 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Section 2.5.2.1. Tetra Tech. June 14, 2004.
3	**SWMU 5**	Section 2.1	Draft Final Remedial Investigation, Solid Waste Management Units 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Section 2.5.2.2. Tetra Tech. June 14, 2004.
4	**SWMU 7**	Section 2.1	Draft Final Remedial Investigation, Solid Waste Management Units 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Section 2.5.2.3. Tetra Tech. June 14, 2004.
5	**SWMU 18**	Section 2.1	Draft Final Remedial Investigation, Solid Waste Management Units 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Section 2.5.2.4. Tetra Tech. June 14, 2004.
6	**lithology**	Section 2.2	Draft Final Remedial Investigation, Solid Waste Management Units 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Section 4.1.1. Tetra Tech. June 14, 2004.
7	**regional geology**	Section 2.2	Draft Final Remedial Investigation, Solid Waste Management Units 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Section 2.8.1. Tetra Tech. June 14, 2004.
8	**depth to groundwater**	Section 2.2	Draft Final Remedial Investigation, Solid Waste Management Units 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Section 4.1.2. Tetra Tech. June 14, 2004.
9	**SWMUs site ecology**	Section 2.2	Draft Final Remedial Investigation, Solid Waste Management Units 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Section 7.0, pages 53 - 54. Tetra Tech. June 14, 2004.
10	**Final RI**	Section 2.3	"Responses To Agency Comments On Draft Final Remedial Investigation Report Solid Waste Management Units 2,5,7 And 18 Naval Weapons Station Seal Beach, Detachment Concord, Concord, California." Navy. November 1, 2004.
11	**conclusions of the RI**	Table 1	Draft Final Remedial Investigation, Solid Waste Management Units 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Section 9.2. Tetra Tech. June 14, 2004.
12	**pilot test**	Table 1	Final Technical Memorandum, Results of Air Sparging and Soil Vapor Extraction Pilot Test at SWMUs 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Section 1.0, third paragraph and Section 6.0. Tetra Tech. October 5, 2007.
13	**remedial action objectives**	Table 1	Final Feasibility Study Report for Solid Waste Management Units 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Sections 8.1, 8.1.1, 8.1.2, and 8.1.3. Tetra Tech. March 20, 2008.
14	**monitored natural attenuation**	Table 1	Final Feasibility Study Report for Solid Waste Management Units 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Section 8.5.2.2, Pages 54 - 55 under "Monitored Natural Attenuation". Tetra Tech. March 20, 2008.

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
15	exposure pathways	Section 2.5.1	Draft Final Remedial Investigation, Solid Waste Management Units 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Section 6.3. Tetra Tech. June 14, 2004.
16	screening concentrations	Section 2.5.1	Draft Final Remedial Investigation, Solid Waste Management Units 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Sections 6.4.1, 6.4.2, and 6.4.3. Tetra Tech. June 14, 2004.
17	screening level comparisons	Section 2.5.1.1	Draft Final Remedial Investigation, Solid Waste Management Units 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Tables 14, 15, 18, and 19. Tetra Tech. June 14, 2004.
18	site-specific vapor intrusion evaluation	Section 2.5.1.2	Draft Final Remedial Investigation, Solid Waste Management Units 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Section 6.5, last 2 paragraphs on page 51 through end of section. Tetra Tech. June 14, 2004.
19	ecological conceptual site model	Section 2.5.2	Draft Final Remedial Investigation, Solid Waste Management Units 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Figure 24. Tetra Tech. June 14, 2004.
20	assessment and measurement endpoints	Section 2.5.2	Draft Final Remedial Investigation, Solid Waste Management Units 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Section 7.1, pages 56-57. Tetra Tech. June 14, 2004.
21	ecological benchmark comparisons	Section 2.5.2	Draft Final Remedial Investigation, Solid Waste Management Units 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Section 7.2 through 7.5. Tetra Tech. June 14, 2004.
22	uncertainty	Section 2.5.2	Draft Final Remedial Investigation, Solid Waste Management Units 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Section 7.6. Tetra Tech. June 14, 2004.
23	General Response Actions (GRA)	Section 2.8	Final Feasibility Study Report for Solid Waste Management Units 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Section 8.3. Tetra Tech. March 20, 2008.
24	Present-Worth Cost: $3.2 million	Table 4	Final Feasibility Study Report for Solid Waste Management Units 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Appendix B, Table B-2. Tetra Tech. March 20, 2008.
25	Present-Worth Cost: $2.5 million	Table 4	Final Feasibility Study Report for Solid Waste Management Units 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Appendix B, Table B-3. Tetra Tech. March 20, 2008.
26	Present-Worth Cost: $2.1 million	Table 4	Final Feasibility Study Report for Solid Waste Management Units 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Appendix B, Table B-4. Tetra Tech. March 20, 2008.
27	Present-Worth Cost: $1.8 million	Table 4	Final Feasibility Study Report for Solid Waste Management Units 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Appendix B, Table B-5. Tetra Tech. March 20, 2008.
28	Present-Worth Cost: $5.2 million	Table 4	Final Feasibility Study Report for Solid Waste Management Units 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Appendix B, Table B-6. Tetra Tech. March 20, 2008.

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
29	**Present-Worth Cost: $3.8 million**	Table 4	Final Feasibility Study Report for Solid Waste Management Units 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Appendix B, Table B-7. Tetra Tech. March 20, 2008.
30	**nine evaluation criteria**	Section 2.8.2	Final Feasibility Study Report for Solid Waste Management Units 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Section 7.0, last paragraph on p.38 through end of section, and Table 12. Tetra Tech. March 20, 2008.
31	**ICs**	Section 2.9.2	Final Feasibility Study Report for Solid Waste Management Units 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Section 8.5.2.2, Paragraphs 1-4 under "Institutional Controls". Tetra Tech. March 20, 2008.
32	**IR Program website**	Section 2.10	http://www.bracpmo.navy.mil/
33	**meeting transcript**	Section 3.0	Public Meeting for Solid Waste Management Units 2, 5, 7, and 18. Reporter's Transcript. October 22, 2008.

[1] Bold blue text indicates hyperlinks available on the reference CD detailed site information contained in the publicly available Administrative Record.

For access to information contained in the Administrative Record for Former Naval Weapons Station Seal Beach Detachment Concord, please contact:

Ms. Diane Silva
Administrative Records Coordinator
Naval Facilities Engineering Command, Southwest
1220 Pacific Highway, FISC Building 1, 3rd Floor
San Diego, CA 92132-5190
Telephone: (619) 532-3676

Please call in advance for an appointment Monday through Friday between 8:30 a.m. and 4:30 p.m.

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
1	SWMUs 2, 5, 7, and 18	Section 2.1	Draft Final Remedial Investigation, Solid Waste Management Units 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Section 2.5.2. Tetra Tech EM Inc. (Tetra Tech). June 14, 2004.

Since 1998, when the interviews were conducted, the level of activity in the Inland Area has been vastly reduced, and many structures are no longer used. In 2003, Mr. Amado Andal provided information on past site operations. Figure 3 is based on information provided by Mr. Andal and in the draft environmental baseline survey (CDM Federal Programs Corporation 2003). Figure 3 lists the names and former uses of nearly all buildings in the industrial portion of the Inland Area of Naval Weapons Station SBD Concord.

In general, the buildings at the site remain almost unchanged from when the facility was first opened in the mid-1940s. Changes to the area include demolition of the locomotive turntable and steam cleaning station southeast of and inside Building IA-51 and construction of a Steam Cleaning Pad known as Building 269. In 1998, the Locomotive/Heavy Equipment Shop (Building IA-12) and the Public Works/Combined Shops (Building IA-15) still operated for their original intended purposes; however, the levels of activity in these shops greatly diminished over the past 10 to 15 years, and the buildings are not significantly used at present (Pieper 1998).

According to Naval Weapons Station SBD Concord personnel, chemicals used in the Operations Area were purchased from suppliers in bulk in 55-gallon drums from the early 1940s through the late 1960s in accordance with military specifications. During this period, chemicals were used directly from the drum or were transferred to smaller containers. The types of chemicals used in the Operations Area included paint, paint solvents, automotive and machine cutting coolants, solvents for parts cleaning, and oils and lubricants for machine and automotive maintenance. Wastes generated at these locations included paint, spent paint and machine solvents, waste oil, and oily sludge (Pieper 1998).

In the mid-1970s, Naval Weapons Station SBD Concord began purchasing commercially available chemicals. Most chemicals were purchased in smaller containers and were used directly from the supply containers. Chemicals needed in larger quantities were purchased in 55-gallon drums from commercial suppliers and were also used directly from the supply containers. Except for automotive antifreeze, there were no significant changes in the types of materials purchased. Glycol-based coolants were phased out of use in the late 1970s or early 1980s (Pieper 1998).

2.5.2 SWMUs 1, 2, 5, 7, 16, and 18

Operations at SWMUs 2, 5, 7, and 18 are the primary areas under consideration and each is discussed below. Operations at SWMU 1 and 16 are discussed separately in Section 2.5.2.5. SWMU 1 is discussed because it is downgradient from the site, and monitoring wells within this SWMU were used to assess the potential downgradient extent of TPH and VOCs. SWMU 16 is discussed because it is upgradient of the other SWMUs and contaminated soils were discovered and remediated at SWMU 16. Section 2.6 discusses previous investigations conducted at each SWMU in detail.

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
2	SWMU 2	Section 2.1	Draft Final Remedial Investigation, Solid Waste Management Units 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Section 2.5.2.1. Tetra Tech. June 14, 2004.

2.5.2.1 SWMU 2 – Building IA-7

SWMU 2 is located at Naval Weapons Station SBD Concord fire department. SWMU 2 consists of Building IA-7, which was constructed in the mid-1940s as a fire station for the Inland Area. Fire department personnel indicate that outdoor burning of "red rags" was conducted routinely within a drum (Pieper 1988). The rags, which contained oils and solvents, were handled separately due to the risk of spontaneous combustion. Fire logs from 1965 indicate the transport of the red rags from Building IA-38. The rags were burned when they wore out.

Fuel oil and napalm were burned in a shallow pit area located south of the fire station (Figure 2) as part of the fire-fighting training activities conducted between 1969 and 1973. Extinguisher chemicals used included potassium chloride, sodium chloride, ammonium phosphate, and potassium carbonate. Between 1969 and 1973, residues of these chemicals were reported to have been scraped off the ground and disposed of in the bed of Seal Creek just south of the fire station.

Since 1973, practice burns were conducted in shallow metal pans at Building IA-7. Chemical residues remaining in the pans were disposed of at approved sites as reported in the Resource Conservation and Recovery Act (RCRA) facility assessment (RFA) report (DTSC 1992). The description of reported burning and disposal activities in the RFA report is limited, and the Navy has not discovered additional specific information. Investigation of the general SWMU area was conducted in 1997 during the RFACS (PRC 1997) as summarized in Section 2.6 of this report. The area was sampled, but significant contamination related to the alleged burning and disposal activities were not discovered (PRC 1997).

A satellite hazardous waste storage area located south of Building IA-7 (Figure 2) consists of a metal shed that temporarily houses 55-gallon drums until they are moved to the hazardous waste storage facility at Building 433.

2.5.2.2 SWMU 5 – Buildings IA-12 and 269

SWMU 5 consists of Buildings IA-12 and 269. Building IA-12 was constructed in the mid-1940s and is the main industrial complex of Naval Weapons Station SBD Concord (Figure 2). The building is no longer used for any industrial activity. The building housed the locomotive repair shop where approximately 1,100 pieces of railway, automotive, construction, and weight-handling equipment were maintained. During the 1998 site visit, this building was used for locomotive repair. Aboveground oil supply tanks are located on the south side of the building, and a waste oil sump was located at the northwest end of the subgrade corridor (PRC 1997). In 2002 and 2003, the building was steam cleaned and equipment was removed.

Battery maintenance and recharging was conducted at the northeast corner of Building IA-12 until 1992. Batteries were stored in a satellite accumulation point on the north side of Building IA-12. Approximately 49 automotive batteries were recycled annually. Approximately 24 locomotive batteries were also recycled at this location prior to 1997. Battery acids were drained and sent to Mare Island Naval Shipyard for recycling. Battery casings were rinsed and

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
3	SWMU 5	Section 2.1	Draft Final Remedial Investigation, Solid Waste Management Units 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Section 2.5.2.2. Tetra Tech. June 14, 2004.

SWMU 2 is located at Naval Weapons Station SBD Concord fire department. SWMU 2 consists of Building IA-7, which was constructed in the mid-1940s as a fire station for the Inland Area. Fire department personnel indicate that outdoor burning of "red rags" was conducted routinely within a drum (Pieper 1988). The rags, which contained oils and solvents, were handled separately due to the risk of spontaneous combustion. Fire logs from 1965 indicate the transport of the red rags from Building IA-38. The rags were burned when they wore out.

Fuel oil and napalm were burned in a shallow pit area located south of the fire station (Figure 2) as part of the fire-fighting training activities conducted between 1969 and 1973. Extinguisher chemicals used included potassium chloride, sodium chloride, ammonium phosphate, and potassium carbonate. Between 1969 and 1973, residues of these chemicals were reported to have been scraped off the ground and disposed of in the bed of Seal Creek just south of the fire station.

Since 1973, practice burns were conducted in shallow metal pans at Building IA-7. Chemical residues remaining in the pans were disposed of at approved sites as reported in the Resource Conservation and Recovery Act (RCRA) facility assessment (RFA) report (DTSC 1992). The description of reported burning and disposal activities in the RFA report is limited, and the Navy has not discovered additional specific information. Investigation of the general SWMU area was conducted in 1997 during the RFACS (PRC 1997) as summarized in Section 2.6 of this report. The area was sampled, but significant contamination related to the alleged burning and disposal activities were not discovered (PRC 1997).

A satellite hazardous waste storage area located south of Building IA-7 (Figure 2) consists of a metal shed that temporarily houses 55-gallon drums until they are moved to the hazardous waste storage facility at Building 433.

2.5.2.2 SWMU 5 – Buildings IA-12 and 269

SWMU 5 consists of Buildings IA-12 and 269. Building IA-12 was constructed in the mid-1940s and is the main industrial complex of Naval Weapons Station SBD Concord (Figure 2). The building is no longer used for any industrial activity. The building housed the locomotive repair shop where approximately 1,100 pieces of railway, automotive, construction, and weight-handling equipment were maintained. During the 1998 site visit, this building was used for locomotive repair. Aboveground oil supply tanks are located on the south side of the building, and a waste oil sump was located at the northwest end of the subgrade corridor (PRC 1997). In 2002 and 2003, the building was steam cleaned and equipment was removed.

Battery maintenance and recharging was conducted at the northeast corner of Building IA-12 until 1992. Batteries were stored in a satellite accumulation point on the north side of Building IA-12. Approximately 49 automotive batteries were recycled annually. Approximately 24 locomotive batteries were also recycled at this location prior to 1997. Battery acids were drained and sent to Mare Island Naval Shipyard for recycling. Battery casings were rinsed and

neutralized prior to recycling. A grease and sand trap is located along the northwest interior wall of Building IA-12.

A 6,000-gallon capacity waste oil UST installed in the mid-1970s was used to store waste oil generated from locomotives. The UST was removed from the south side of Building IA-12 on November 4, 1994, as part of the RCRA closure. This UST was located between the existing oil tank containment area on the western end of the building and the dock on the eastern end of the building. Inspection of the tank at the time of its removal indicated no visible leakage. Six soil samples were collected from the tank excavation, and total recoverable petroleum hydrocarbons as motor oil were detected at a maximum concentration of 230 milligrams per kilogram (mg/kg). As a result, 35 cubic yards of contaminated soil was excavated for off-site disposal. VOCs; polynuclear aromatic hydrocarbons; TPH-d; and benzene, toluene, ethylbenzene, and total xylenes were not detected. Case closure approval for the UST removal was obtained from the DTSC in March 1995 (PRC 1997).

Waste was generated and accumulated at various locations around Building IA-12. Stained asphalt was observed at various locations along the northeast and southeast walls of Building IA-12.

Building 269, the locomotive and rail car steam cleaning facility, is located approximately 60 feet west of Building IA-12. Navy records indicate that the steam cleaning area was constructed in 1976 to collect oily wastes for processing through an oil-water separator located about 5 feet west of the steam cleaning area. The present configuration of the steam cleaning pad was constructed in 1995. According to Naval Weapons Station SBD Concord personnel, the 1995 construction work involved repair of the cracked concrete pad and the installation of a cover that complies with current facility storm water permit provisions. The oil-water separator was a single-walled, 6-inch-thick concrete sump with a 200-gallon capacity measuring about 4 feet wide, 9 feet long, and 7 feet deep. The oil-water separator was also known as Sump Container No. IA-12B. A contractor removed the sump contents annually and cleaned the sump. The oil-water separator was inspected biannually. Water from the oil-water separator discharged to the sanitary sewer (PRC 1997).

2.5.2.3 SWMU 7 – Buildings IA-15 and IA-16

SWMU 7 consists of Buildings IA-15 and IA-16. According to a 1944 floor plan, Building IA-15 included a metals shop, machine shop, weld shop, forge shop, offices, and tool storage area in the east portion of the building and an automotive repair shop at the western end. The building configuration and activities remain unchanged at the present time. Sanitary sinks are located in both the weld and forge shops. A sump is located in the southeast corner of the automotive shop. This sump has been backfilled.

Building IA-16 was the paint shop where maintenance crews staged painting jobs for Naval Weapons Station SBD Concord. By the early 1940s, a crew of approximately 20 painters worked in this building. By 1960, the crew at the paint shop had been reduced to three painters responsible for touch-up, repair, and minor interior finishing work. Much of the paint used was oil-based. Furthermore, much of the exterior paint was lead-based. Before 1970s, all waste paint, thinners, and cans were likely disposed of in the Tidal Area Landfill (Installation

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
4	SWMU 7	Section 2.1	Draft Final Remedial Investigation, Solid Waste Management Units 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Section 2.5.2.3. Tetra Tech. June 14, 2004.

A 6,000-gallon capacity waste oil UST installed in the mid-1970s was used to store waste oil generated from locomotives. The UST was removed from the south side of Building IA-12 on November 4, 1994, as part of the RCRA closure. This UST was located between the existing oil tank containment area on the western end of the building and the dock on the eastern end of the building. Inspection of the tank at the time of its removal indicated no visible leakage. Six soil samples were collected from the tank excavation, and total recoverable petroleum hydrocarbons as motor oil were detected at a maximum concentration of 230 milligrams per kilogram (mg/kg). As a result, 35 cubic yards of contaminated soil was excavated for off-site disposal. VOCs; polynuclear aromatic hydrocarbons; TPH-d; and benzene, toluene, ethylbenzene, and total xylenes were not detected. Case closure approval for the UST removal was obtained from the DTSC in March 1995 (PRC 1997).

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Restoration Site 1). Paint usage was estimated at 700 gallons per year, generating approximately three drums of solid waste per year. Major finishing projects are now performed by contractors who are also responsible for the cleanup and disposal of their materials.

A paint shop, storage shed, and paint locker are located northeast of Building IA-16. A satellite accumulation area for waste paints and thinners is located near the storage shed northeast of the building. Empty paint cans are allowed to dry and then are disposed of as nonhazardous waste at a municipal trash bin.

Four 11,500-gallon USTs were located beneath the paved area between Buildings IA-16 and IA-12, two gasoline USTs and two diesel USTs. Three of the USTs are located adjacent to the southeast corner of Building IA-16 (northwest corner of Building IA-17), and the fourth was located off the northwest corner of Building IA-12 (south of Building IA-16). In January 1999, the four USTs were removed; a formal report detailing the tank removals was issued in September 1999 (Niccum 1999). Based on observations and confirmation sampling, all contamination was removed at three of the four tanks, however, a small amount of visibly stained soil was left in place at one tank that formerly contained diesel fuel. Access to the residual soil was obstructed by utilities, a railroad track, and the building foundation of Building IA-12 (Niccum 1999).

2.5.2.4 SWMU 18 – Building IA-51 and Locomotive Turntable

SWMU 18 consists of Building IA-51 and a locomotive turntable. Building IA-51 was constructed in the 1940s and is located in the main industrial complex. Railroad tracks run east to west along the north and south sides of the building. The railroad tracks are currently used primarily as holding areas for several boxcars. A 40-foot-long splash wall is located approximately 20 feet east of the building.

The building was used as a steam cleaning facility for locomotives, trucks, and other vehicles, and as tire maintenance shop. The steam cleaning facility was deactivated in the mid-1970s when the steam cleaning facility at Building 269 west of Building IA-12 became operational. Oily waste generated by the steam cleaning operations drained directly into a sump (Container No. IA-51). The oil was pumped out by a contractor, and the sump was periodically cleaned by the contractor. The former sump was installed in 1945, 12 feet east of the splash wall. The sump is made of concrete 6 inches thick and had a capacity of 40 gallons. Sump Container No. IA-51was filled with concrete when the steam-cleaning unit was deactivated.

Before the early 1960s, a zinc chromate rust inhibitor was added to motor antifreeze and waste antifreeze was disposed of by a contractor. After the early 1960s, the antifreeze, which was believed to be free of chromates, was typically discharged to the ground and into storm drains. According to the 1997 RFACS, chromates were detected in Seal Creek in 1978 (PRC 1997). The SWMU 18 sump evidently drained to the storm drain system, which in turn drained to Seal Creek. The location of existing storm drains and the discharge location to Seal Creek is illustrated on Figure 7. SWMU 18 was the suspected source of the chromates detected in Seal Creek. The source of this information is not referenced in the DTSC RFA report (DTSC 1992),

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
5	SWMU 18	Section 2.1	Draft Final Remedial Investigation, Solid Waste Management Units 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Section 2.5.2.4. Tetra Tech. June 14, 2004.

A paint shop, storage shed, and paint locker are located northeast of Building IA-16. A satellite accumulation area for waste paints and thinners is located near the storage shed northeast of the building. Empty paint cans are allowed to dry and then are disposed of as nonhazardous waste at a municipal trash bin.

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and additional information regarding the location of samples and concentrations detected has not been identified. When it was discovered that the new antifreeze contained zinc chromate, the type of antifreeze was changed, and biodegradable rust and scale inhibitor was added.

Aerial photographs show that a turntable for locomotives approximately 44 feet in diameter existed 100 feet east of Building IA-51 until at least 1969. A semicircular crack in the asphalt indicates where the turntable was located. The turntable is not present in the 1976 aerial photograph. Although the exact nature of activities occurring in the vicinity of the former turntable is not evident from the aerial photograph, base personnel who work at Building IA-51 say that an incinerator used to destroy classified documents was present in the excavation for the former turntable in 1976. A drop pit (another sump) to collect steam-cleaning water was formerly located 10 feet north of the turntable. The drop pit was destroyed when the turntable was demolished.

2.5.2.5 SWMUs 1 and 16

The area of Building IA-6 was designated as SWMU 1 during the RFA (DTSC 1992). Building IA-6 was constructed in the 1940s and housed three steam boilers: two powered by natural gas and one powered by diesel fuel oil. USTs located south of Building IA-6 were removed in 1989, and Building IA-6 was demolished in the late 1990s. Six groundwater-monitoring wells, MW-1 through MW-6, were installed at SWMU 1 (Figure 4) in conjunction with the removal of the USTs. In April 1998, Reidel Environmental Services (Reidel) of Richmond, California, installed MW-1 immediately west (downgradient) of the former USTs. In July 1989, Reidel installed MW-2 and MW-3 west and south of the former USTs, respectively. In September 1990, PRC of San Francisco, California, installed MW-4, and in September 1993, Furgo West Inc. of Ventura, California, installed MW-5 and MW-6 (Cal, Inc. 1996). The monitoring wells were installed to evaluate the lateral and vertical extent of petroleum hydrocarbons in groundwater. MW-2, MW-3, and MW-6 are accessible at the present time. Naval Weapons Station SBD Concord hired Cal, Inc., to excavate contaminated soil surrounding the former USTs, and MW-1 was abandoned as a result of the excavation. MW-4 and MW-5 have been filled with unknown materials and are presently unusable.

SWMU 16, which is located by Building IA-46, consists of a public works maintenance storage building and a storage shed where pesticides were mixed prior to application. Pesticides were detected in soil at the former pesticide storage building at concentrations considered to pose a potential threat to human health. As a result, the Navy conducted an interim RCRA corrective action at the area that consisted of excavating pesticide-contaminated soil and disposing of the soil off site at an appropriately permitted landfill. Confirmation soil samples were collected from the base of the excavation and at the excavation perimeter. A closure report was prepared (CH2M Hill 1997), and the area was recommended for no further action (PRC 1997).

2.5.3 Areas Upgradient from SWMUs 2, 5, 7, and 18

Buildings located hydraulically upgradient (east) from the SWMU site were assessed to evaluate their potential contribution to groundwater contamination. The information summarized below

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
6	lithology	Section 2.2	Draft Final Remedial Investigation, Solid Waste Management Units 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Section 4.1.1. Tetra Tech. June 14, 2004.

This section describes the results of the site-specific physical characterization, analytical sampling results, and results of the aquifer slug tests conducted at the site.

4.1 RESULTS OF SITE-SPECIFIC PHYSICAL CHARACTERIZATION

The following subsections discuss the site geology and groundwater flow and hydraulic gradients at the site based on the results of the site-specific physical characterization.

4.1.1 Site Geology

Each soil boring installed at the site was logged in accordance with the USCS to provide adequate and consistent descriptions of soil encountered. Appendix B presents the lithologic logs for the soil boring logs. The soil borings were advanced to just below the groundwater table, and depths ranged from 16 feet bgs in SB011 to 58 feet bgs in SB030. The depth of the groundwater at the time of drilling is indicated on the lithologic logs. Groundwater samples were collected at least 1 foot below the depth of the groundwater indicated on the water quality data sheets, presented in Appendix C. Up to 3 feet of fill material was encountered in some borings. The fill material encountered consisted of a heterogeneous mixture of sand, silt, clay, and gravel, with sparse organic debris.

Soils in the north-central portion of Naval Weapons Station SBD Concord consist largely of clay-rich alluvium derived from the nearby hills. Intercalated layers of well-sorted (poorly graded), silty sands to pebbly alluvium were encountered in the vicinity of Seal Creek and are most likely derived from upstream areas. Soils in the central and western portions of the site toward Seal Creek tend to be coarser at shallower depths but are graded comparatively finer than soils in the north-central area. In both areas, soil consistency became stiff to very stiff with depth, and in some cases, auger refusal occurred. These lithologic conditions are consistent with the regional geology.

Three hydrogeologic cross sections were developed using available data to illustrate subsurface conditions at the site. Figure 8 depicts the locations of these three cross sections, and Figures 9 through 11, respectively, show cross sections A-A', B-B', and C-C'. Cross Section A-A' is oriented east to west to correspond approximately to the predominant direction of groundwater flow, and Cross Sections B-B' and C-C' illustrate cross-gradient hydrogeologic conditions. As the cross sections show, the upper 5 to 10 feet of site materials generally consists of finer materials such as clays and silts that grade to coarser sandy silts and sands with depth in the central and eastern portions of the site. As described in the boring logs, the upper-most native soils consist of inorganic clays of low to medium plasticity that grade to sandy and silty clays with depth. Interbedded lenses of coarser, sandier materials occur with depth and are 1 foot to several feet thick. Coarser, sandier material becomes less evident towards the northwest. Zones of black clayey material were encountered in several borings, indicating the presence of organic material deposited during sedimentation. In general, soil color ranged from black to brown and

tan, depending on the amount of organic material within the soils and on the geochemical environment.

4.1.2 Groundwater Flow and Hydraulic Gradients

Water levels were measured in existing monitoring wells at the site on February 11, 2002, and on March 5 and 6, 2002. Water level elevations for the monitoring wells are based on the 1929 National Geodetic Vertical Datum. As Table 5 shows, the static depths to groundwater measured on March 5 and 6, 2002, ranged from 6.36 feet bgs in MW-14 to 16.63 feet bgs in MWIA-17. The water level in monitoring well MW-13, an artesian well, was above the ground surface.

Figures 12 through 15 show the potentiometric surface contours generated from the groundwater level data collected on February 5, 1999; April 30, 1999; July 27, 1999; and March 5, 2002, respectively. As indicated on Figures 12 through 15, groundwater generally flows westward under an average hydraulic gradient of 0.005 foot per foot. Based on groundwater levels collected in monitoring wells at the site, the groundwater elevation ranges from approximately 45 feet above msl in the eastern part of the site to approximately 37 feet above msl in the western part of the site. Local variations in groundwater-flow direction occur because of manmade structures and natural variations in local surface and subsurface features.

The water level measurement from monitoring well MW-13 was not used to generate the potentiometric surface map because the water level in this well most likely represents a different water-bearing zone that should not be compared to the water table aquifer.

4.2 Analytical Results

The following subsections discuss the analytical results of the most recent soil and groundwater sampling for the RI activities conducted in February and March 2002 and the soil gas sampling conducted in January and April 2004. The soil sampling depths ranged from approximately 2 to 14 feet bgs. Soil and groundwater samples were analyzed for one or more of the following: TPH extractables and purgeables (EPA Method 8015), VOCs (EPA Method 8260B), and natural attenuation parameters, including metals (EPA Methods 300.0 and 200.7). Tables 1 and 6, respectively, present a complete list of analytical methods used and a list of each analytical method used for each sample.

PCE and TCE are the VOCs with the highest detectable concentrations at the site and are therefore the primary focus of the discussion regarding VOC analytical results presented in this RI report. Additionally, cis- and trans-1,2-DCE, which often develop as a result of the degradation of PCE and TCE, are included in the discussion of analytical results for VOCs.

Analytical results for TPH and VOCs in soil and groundwater are summarized in Sections 4.2.1 and 4.2.2, respectively, and soil gas analytical results for VOCs are summarized in Section 4.2.3. Groundwater samples were also analyzed for natural attenuation parameters (see Section 4.2.2.3). Concentrations of these compounds detected below the laboratory method reporting limit are

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
7	regional geology	Section 2.2	Draft Final Remedial Investigation, Solid Waste Management Units 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Section 2.8.1. Tetra Tech. June 14, 2004.

2.8.1 Regional Geology

Naval Weapons Station SBD Concord is located in the Sacramento-San Joaquin Delta area of the great Valley Geologic Province. The regional geologic features include several northwest-trending fault systems that divide Contra Costa County into large tectonic blocks. Broad lowlands are underlain by thick, unconsolidated, Pleistocene-aged alluvial sediments eroded from up-thrown blocks. The Concord and Clayton Faults are two major faults known to exist in the vicinity of Naval Weapons Station SBD Concord. The Concord Fault passes approximately 2 miles south of Naval Weapons Station SBD Concord and is classified as an active, right-lateral, strike-slip fault. The Clayton Fault lies at the base of Los Medanos Hills as it passes through Naval Weapons Station SBD Concord. The Clayton Fault is classified as active or potentially active (PRC 1997).

The surficial geology of the Inland Area consists of two alluvial areas. The first area comprises alluvial deposits derived from erosion of the geologic units of the Los Medanos Hills. The second consists of alluvial deposits associated with the low and gently sloping hills to the southwest. The Seal Creek drainage area separates these two geologic areas (PRC 1997). The site is located on the northeast side of Seal Creek in the Inland Area.

Alluvium in the Inland Area consists of beds of sandy, silty, and clayey soils. Silty soils appear to predominate. An approximately 3-foot-thick layer of dark brown or gray, clayey soil generally overlies the alluvium throughout the region (PRC 1997).

2.8.2 Regional Hydrology

The Diablo Range intercoastal highlands include both smooth rolling hills and relatively rugged mountains, ranging in elevation from 100 feet above mean seal level (msl) along the San Francisco Bay to 3,849 feet above msl at Mount Diablo. The intermountain valleys and San Francisco Bay consist of flood plains and low terraces, with gently rolling fans and old terrace remnants adjacent to the uplands. Naval Weapons Station SBD Concord lies about 10 miles west of the confluence of the Sacramento and San Joaquin Rivers. This confluence forms the Delta region, which contains over 600 miles of interconnected and meandering tidal waterways. Drainage from Naval Weapons Station SBD Concord is exclusively into Suisun Bay.

Locally, the Naval Weapons Station SBD Concord lies within the Mount Diablo/Seal Creek Watershed, which drains an area of about 36 square miles. This watershed is bounded to the south by the northern peak of Mount Diablo and to the north by Suisun Bay. Streams that drain the watershed have their headwaters on the slopes of Mount Diablo and flow through Mount Diablo Creek through Clayton Valley and Naval Weapons Station SBD Concord to Hastings Slough in the tidal waters of Suisun Bay. Mount Diablo Creek becomes Seal Creek after entering Naval Weapons Station SBD Concord (PRC 1997). Suisan Bay is approximately 4 miles downstream from the site.

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
8	depth to groundwater	Section 2.2	Draft Final Remedial Investigation, Solid Waste Management Units 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Section 4.1.2. Tetra Tech. June 14, 2004.

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Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
9	SWMUs site ecology	Section 2.2	Draft Final Remedial Investigation, Solid Waste Management Units 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Section 7.0, pages 53 - 54. Tetra Tech. June 14, 2004.

conservative thresholds for adverse ecological effects were identified during the evaluation of ecological effects. Finally, the potential risks to selected assessment endpoints associated with the site were conservatively estimated during the risk characterization phase.

In accordance with EPA guidance (EPA 1997), after this assessment is complete, risk managers should determine which of the following descriptions apply to the information gathered on preliminary risks associated with exposure to COPECs:

- Adequate to conclude that ecological risks are negligible; therefore, no remediation is necessary
- Inadequate to make a decision; therefore, a site-specific baseline ecological risk assessment should be conducted to refine risk estimates and reduce uncertainty associated with the SLERA
- Adequate to indicate a potential for adverse ecological effects; therefore, a site-specific baseline ERA should be conducted to refine risk estimates and reduce uncertainty associated with the SLERA

The primary goal of the problem formulation phase is to develop an ecological CSM and to identify the following:

- Environmental setting and chemicals known or suspected to exist at the site
- Chemical fate and transport mechanisms that might occur at the site
- Mechanisms of ecotoxicity associated with chemicals and likely categories of receptors that could be affected
- Complete exposure pathways that might exist at the site
  (Note: A complete exposure pathway exists when the chemical can be traced or expected to travel from the source to a receptor)
- Selection of assessment and measurement endpoints to focus the assessment

Information on ecological resources at Naval Weapons Station SBD Concord was obtained from previous ecological surveys conducted for the Inland Area (Downard and others 1999) and site observations. The site consists of active industrial areas with no significant ecological habitat. Most of the ground surface at the site is paved; however, some unpaved areas exist. These areas are predominately bare ground, although some non-native annual grasses are present. No surface water is present except sheet runoff during storm events. No special status plants or animals are known to occur at the site.

Seal Creek is an ephemeral creek located approximately 300 feet southwest of SWMU 2. No fish or aquatic invertebrate surveys have been conducted at Seal Creek. Because Seal Creek is a

natural stream that flows during much of the winter, the creek may support both fish and aquatic invertebrate communities. Fish and aquatic invertebrates are assumed to be present within Seal Creek for this SLERA because it is a conservative and realistic assumption.

As noted in the Section 7.1, there is no pathway for exposure of animals to groundwater in the immediate vicinity of the site. The only potential exposure pathway for ecological receptors to groundwater contamination is through discharge from groundwater to Seal Creek, which is at least several hundred feet from any significant groundwater contamination.

Groundwater and soil data collected from the site as part of the RI were used to support the SLERA. Because most of the site is paved, ecological receptors are not exposed to soil at most of the site. Because ecological receptors are exposed primarily to surface soil, all VOCs detected in surface soil were included as soil COPECs; benzene and toluene are the only two VOCs detected in surface soil. All VOCs detected in groundwater were considered groundwater COPECs. Table 20 lists groundwater COPECs for the site.

The entire area near the former waste oil tank is paved. Because soil gas samples with detectible VOCs were collected from paved areas, there is no complete pathway for exposure of ecological receptors to VOC-contaminated soil gas.

The following subsections discuss the ecological CSM, risk to plants, risk to terrestrial invertebrates, risk to herbivorous mammals, risk to fish and aquatic invertebrates, uncertainties related to the SLERA, and SLERA summary and conclusions.

7.1 ECOLOGICAL CONCEPTUAL SITE MODEL

All organic chemicals detected in groundwater were considered COPECs and potentially available to ecological receptors. Toluene and xylene, the only organic chemicals detected in on-site surface soil, were the only COPECs for soil.

Site conditions and physical and chemical properties of the COPECs were evaluated to develop an ecological CSM. Physical fate processes of concern include transport to surface water and volatilization to air. Potentially complete exposure pathways to ecological receptors were evaluated based on the fate and transport processes associated with each COPEC. A COPEC must be able to travel from the source to the representative receptor and must be taken up by the receptor through one or more exposure routes for an exposure pathway to be considered complete. Thus, these pathways present the greatest potential risk of adverse effects to receptors of concern. The CSM for ecological receptors at the site is based on site media, potential transport pathways, assessment endpoints for the site, and measurement endpoints associated with the assessment endpoints.

Figure 24 presents the CSM for ecological receptors, which is described below, including site-specific assumptions on potential transport mechanisms used to establish the presence or absence of complete exposure pathways at the site.

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
10	Final RI	Section 2.3	"Responses To Agency Comments On Draft Final Remedial Investigation Report Solid Waste Management Units 2,5,7 And 18 Naval Weapons Station Seal Beach, Detachment Concord, Concord, California." Navy. November 1, 2004.

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND SOUTHWEST
INTEGRATED PRODUCT TEAM WEST
2001 JUNIPERO SERRA BOULEVARD, SUITE 600
DALY CITY, CALIFORNIA 94014-1976

IN REPLY REFER TO

Ser 05/170
November 1, 2004

Mr. Phillip A. Ramsey
U.S. Environmental Protection Agency
Region IX
75 Hawthorne Street
San Francisco, CA 94105

Re: RESPONSES TO AGENCY COMMENTS ON DRAFT FINAL REMEDIAL INVESTIGATION REPORT SOLID WASTE MANAGEMENT UNITS 2, 5, 7 AND 18 NAVAL WEAPONS STATION SEAL BEACH, DETACHMENT CONCORD, CONCORD, CALIFORNIA

Dear Mr. Ramsey,

On June 14, 2004, the Navy submitted to the U.S. Environmental Protection Agency (EPA) a document entitled "Draft Final Remedial Investigation, Solid Waste Management Units 2, 5, 7, and 18, Naval Weapons Station Seal Beach, Detachment Concord, Concord, California." The EPA, as well as state regulatory agencies, reviewed and provided comments on this document, which is a primary document under the Federal Facility Agreement (FFA) for the Concord detachment. Since EPA has not disputed the draft final document, it now serves as the final document per Section 10.9 of the FFA.

The purpose of this letter is to transmit for your information and records the Navy's responses to the comments we received on the draft final remedial investigation report.

If you have any questions regarding the enclosed responses to comments, please contact Mr. Tony Tactay, the Navy's Remedial Project Manager for this project, at (650) 746-7455 or Internet e-mail tony.tactay@navy.mil.

Sincerely,

Stephen F. Tyahla, P.E., CHMM
Lead Remedial Project Manager

Enclosure
Copy to:
U.S. Environmental Protection Agency, Region 9 (Attn: Sonce de Vries)
National Oceanic and Atmospheric Administration (Attn: Denise Klimas)

Re: RESPONSES TO AGENCY COMMENTS ON DRAFT FINAL REMEDIAL INVESTIGATION REPORT SOLID WASTE MANAGEMENT UNITS 2, 5, 7 AND 18 NAVAL WEAPONS STATION SEAL BEACH, DETACHMENT CONCORD, CONCORD, CALIFORNIA

Copy to (continued):
California Department of Toxic Substances Control, Region 1 (Attn: James Pinasco)
California Regional Water Quality Control Board, SFBAY (Attn: Laurent Meillier)
U.S. Fish and Wildlife Services (Attn: Beckye Stanton)
California Department of Fish and Game (Attn: Frank Gray)
Tech Law, Inc. (Attn: Jennifer Hollingsworth)
Agency for Toxic Substances and Disease Registry (Attn: Libby Vianu)
Agency for Toxic Substances and Disease Registry (Attn: CDR Susan Neurath)
NWS Seal Beach, N45WS (Attn: Margaret Wallerstein)
Restoration Advisory Board (RAB) Co-Chair (Attn: Ms. Mary Lou Williams)
RAB Member Chris Boyer
RAB Member Kevin Cornish
RAB Member Gregory Glaser
RAB Member David Griffith
RAB Member Ed McGee
RAB Member Mario Menesini
RAB Member Julie Nelson
RAB Member Ray O'Brien
RAB Member Igor O. Skaredoff
EFD Southwest (3) (Diane Silva- Admin Record/IR/Base copy)
Weston Solutions (Attn: Claudette Altamirano)
Naval Weapons Station Seal Beach (Attn: Gregg Smith)
TtEMI San Francisco (Attn: Joanna Canepa)
TtEMI (Attn: John Bosche)
EFA West (Attn: Tony Tactay)

RESPONSES TO AGENCY COMMENTS
DRAFT FINAL REMEDIAL INVESTIGATION
SOLID WASTE MANAGEMENT UNITS 2, 5, 7 AND 18
NAVAL WEAPONS STATION SEAL BEACH, DETACHMENT CONCORD
CONCORD, CALIFORNIA
November 1, 2004

The U.S. Environmental Protection Agency (EPA), the San Francisco Bay Regional Water Quality Control Board (RWQCB), the State of California Department of Toxic Substances Control (DTSC), and Mr. Igor Skaredoff of the Restoration Advisory Board (RAB) for Naval Weapons Station Seal Beach, Detachment Concord (NWSSBD Concord) reviewed and prepared comments on the U.S. Department of the Navy document, "Draft Final Remedial Investigation, Solid Waste Management Units 2, 5, 7, and 18, Naval Weapons Station Seal Beach, Detachment Concord, Concord, California," dated June 14, 2004.

The remedial investigation (RI) is considered a primary document under the Federal Facilities Agreement (FFA). Draft final primary documents are subject to a 30-day review period, after which the EPA agrees to either invoke dispute resolution or the document becomes final by default. EPA has informed the Navy that it does not intend to invoke dispute resolution; however, EPA issued comments in a letter of August 28, 2004. RWQCB issued comments in its letter of August 12, 2004, and Mr. Skaredoff submitted comments to the Navy in his letter of June 18, 2004. DTSC provided comments on the draft final RI via e-mail on September 10, 2001.

This document presents Navy responses to each of the agency comments received. The Navy does not plan to reissue a final RI report, but will consider incorporation of the comments into the Feasibility Study as described below.

COMMENTS BY EPA

EPA Comment 1

Based upon review of the SWMUs Draft Final RI Report, U.S. EPA has identified a few issues that the Navy should consider as it moves into the Feasibility Study phase. In providing additional comments on the SWMUs Draft Final RI, U.S. EPA is not invoking informal dispute with the Navy on these issues; however, U.S. EPA does ask that the Navy consider these comments and recommendations in order to benefit the overall site investigation and provide better long-term monitoring and reporting capabilities.

***Figures 19 and 20*: The Navy is requested to provide more detailed isocontours for VOCs detected at the SWMUs sites (i.e., illustrate 1, 5, 10, 50, and 100 ug/l iso-contours). Individual maps to reflect tetrachloroethylene (PCE), trichloroethylene (TCE), and total VOCs should be made for each sampling event, in order to delineate concentration changes over time. U.S. EPA has provided an example of a more detailed 'plume map' for PCE (see Enclosure).**

Navy Response: The Navy will consider EPA's recommendations for presentation of data on volatile organic compounds (VOC) in the FS report.

EPA Comment 2 **Based upon groundwater data collected to date and as indicated on U.S. EPA's sample 'plume map', areas with groundwater data gaps appear to exist. While the Navy has made no recommendations for additional groundwater monitoring locations, U.S. EPA recommends that the Navy install additional groundwater monitoring wells to better characterize and monitoring the extent of groundwater contamination at the following locations:**

A. U.S. EPA recommends that the Navy install an additional monitoring well at soil boring/groundwater grab location SB024. This groundwater grab location is adjacent to the Bldg IA-12 waste-oil tank that appears to be the primary source of groundwater contamination detected at the SWMUs sites and represents an area with the second to highest VOC concentrations detected in groundwater. The Navy should install a well at this location to monitor VOC concentrations at the primary source area and to monitor potential future remedial action impacts.

B. U.S. EPA recommends that the Navy install an additional monitoring well near soil boring/groundwater grab location SB004. This location is approximately mid-point between permanent monitoring wells MW-10 and MW-02, and would be valuable in monitoring VOC concentration changes and potential future remedial action impacts.

C. Lastly, U.S. EPA recommends that the Navy install an additional monitoring well down-gradient to monitoring well MW-11, where VOC concentrations greater that (drinking water) maximum contaminant levels (MCLs) have been detected. This new monitoring well should be installed to assess the lateral extent of groundwater contamination, which down-gradient of MW-11 is unknown.

Navy Response: The Navy appreciates US EPA recommendations and agrees that the installation of additional monitoring wells would provide useful information. However, the FS work was contracted in 2002 concurrently with the RI and the Navy does not want the well installation to delay the FS and possibly cause the expiration of the funding. The Navy intends to pursue the suggested well installations after the FS is completed since funding in fiscal year 2005 has been already been allocated to other high priority sites. The suggested wells will be installed prior to or concurrent with implementation of the selected remedy.

COMMENTS BY THE RWQCB

RWQCB General Comment 1

Staff notes that soil gas sampling took place solely in the vicinity of the SWMU 5 area. As groundwater VOCs (Volatile Organic Carbons) detections were found above MCLs (Maximum Contaminant Levels) at monitoring wells located away from SWMU 5 (MW- 2, 3 & 11), these areas need to be also analyzed. This presents a critical data gap, see our letter to the Navy dated July 31st 2003 which recommended including these areas in the soil gas characterization plan.

Navy Response:

It is the Navy's opinion that data from wells MW-2, MW-3, and MW-11 do not suggest contamination local to that area. Monitoring wells MW-2, MW-3, and MW-11 are all downgradient of Solid Waste Management Unit (SWMU) 5 and well MW-10, and the low concentrations of tetrachloroethene detected in samples from these wells are consistent with contaminant migration from an upgradient source. The Navy does not suspect other unidentified sources for the following reasons:

(1) Relatively uniform concentrations have been detected over a broad area, including these wells.

(2) There are no known or suspected historical activities that would discharge VOCs to groundwater in the immediate vicinity of these wells.

(3) A known source of VOCs is located directly upgradient of these wells.

For these reasons, the Navy does not believe there is a data gap, as RWQCB suggested.

The Navy provided a similar response to RWQCB's July 2003 comment in the October 6, 2003, draft final sampling and analysis plan (see Appendix A, Navy response to RWQCB comment No. 4).

After the response to RWQCB comments and the draft final sampling and analysis plan had been issued, no additional comments were received from RWQCB. As a result, on November 25, 2003, Mr. Tony Tactay of the Navy sent an e-mail message to RWQCB indicating that additional agency comments had not been received after the draft final sampling and analysis plan had been issued and that the field work as described in the plan was scheduled to start.

The RWQCB provided the following response to Mr. Tactay's e-mail on November 26, 2003: "Board Staff does not have any additional comments on the mentioned document (Draft Final Addendum # 01 SAP SWMU Sites 2, 5, 7, and 18)." Based on this response, the Navy considered the sampling and analysis plan approved by RWQCB in its entirety and the Navy responses to comments acceptable to RWQCB.

RWQCB General Comment 2	**Water Board staff is concerned that some of the areas (such as the bed of Seal Creek, shallow burning pit at SWMU 2) could have been used for disposal of emergent chemicals. Please analyze for these substances.**
Navy Response:	The Navy has investigated the area of SWMU 2 and has not found evidence of significant spillage, disposal, or burning. The Navy is unaware of any credible source of information that would suggest any specific location where former disposal or spillage of materials potentially occurred in the vicinity of SWMU 2, except for the areas already investigated. Therefore, additional mobilization of a field investigation to search for emergent chemicals at unknown locations is not necessary or warranted.
RWQCB General Comment 3	**Please provide isoconcentration lines in figures (19 and 20) showing detections of VOCs (PCE and TCE) in groundwater at the site to include non-detects and regulatory screening criteria (5 ppb) contours. Board staff requires this information so as to determine if further work is necessary.**
Navy Response:	Isoconcentration maps using a 10 parts per billion (ppb) contour have been provided on Figures 19 and 20; data points on those figures are color coded to indicate a variety of concentrations of less than and greater than 5 ppb. The Navy decided to minimize the number of isoconcentration contours presented in the report because isoconcentration contours for low concentrations may be highly interpretive and generalized. Since the EPA, RWQCB, and DTSC have requested additional presentation of isoconcentration contours. The Navy will include additional contours in the draft FS phase.
RWQCB General Comment 4	**Please indicate if priority metals (As, Be, Cd, Cr, Cu, Pb, Hg, Ni, Sb, Se, Ag, Tl and Zn) and associated wastes products (pesticides, DDT, PCBs) are present in groundwater in the vicinity of the former wastes oil tank.**
Navy Response:	During the 1997 Resource Conservation and Recovery Act (RCRA) facility assessment confirmation study, samples collected at SWMU 5 were analyzed for metals, but no wells were located immediately downgradient of the former waste oil tank. Most metals were not detected during three quarters of analysis of groundwater samples collected from well MW-10 (located downgradient of the waste oil tank). Table 1 presents the results of the analysis for metals from quarterly groundwater samples in Well 10. Samples have not been analyzed for pesticides in the vicinity of the waste oil tank; however, pesticides are not normally analyzed for waste oil underground storage tanks (USTs). Groundwater samples also have not been analyzed for polychlorinated biphenyls (PCBs) at the site.
RWQCB General Comment 5	**Review the proposed site conceptual model with the calculated site-specific hydraulic conductivity ranging between 3 and 4 feet per day. Water Board staff calculated that since the 1994 removal of the purported source of**

contamination (waste oil tank located at SWMU), the leading edge of the VOC plume has only moved 656 feet.

Navy Response: The fate and transport evaluation in the FS report will consider the apparent distance that the plume has traveled. However, the removal date of the former UST does not necessarily coincide with the start of leakage from the tank.

RWQCB General Comment 6 **Compare the hydraulic conductivity values derived from the slug tests at the sites against published values for silty sands the predominant lithology encountered.**

Navy Response: Table 16 of the RI presents the hydraulic conductivities based on slug test results from each well and the expected range of hydraulic conductivities based on published values for the soil types encountered in the saturated interval of each well. As shown on Table 16, silty sands are not the predominant lithology.

RWQCB General Comment 7 **In order for Board staff to verify if final residual concentrations of any pollutants are appropriate, we recommend documented verification that the site will not be used for residential purposes.**

Navy Response: The RI assumes that the site will continue to be used for industrial purposes or that institutional controls will be necessary to prohibit residential occupancy at locations where there are threats to indoor air quality. The possibility of residential occupancy will be more fully considered in preparing the FS and record of decision.

RWQCB Specific Comment 1 ***Executive Summary, p ES-1-5:*** **Please provide Water Board staff the indoor air screening concentration results for the VOCs detected. Evaluate the magnitude of these concentrations against residential and industrial regulatory criteria.**

Navy Response: The executive summary provides a concise summary only. The executive summary indicates that the residential screening criteria are exceeded. The comparisons of concentrations in soil gas and soil with screening criteria are presented in Section 6.4.3 of the report.

RWQCB Specific Comment 2 ***Executive Summary, p ES-1-5:*** **Briefly state the site use scenario applied at the site.**

Navy Response: The executive summary states that there are no plans to develop the site for residential use.

RWQCB Specific Comment 3 ***Section 2.8.2, Regional Hydrology, p 18:*** **List the surface and groundwater beneficial uses as per the 1995 San Francisco Bay Basin Plan as follows:**

Surface Water: Agricultural, industrial, municipal, industrial process supply, spawning, warm freshwater habitat, wildlife habitat.

Groundwater: Municipal and domestic water supply, industrial water supply, agricultural water supply, industrial process water supply, freshwater replenishment.

Navy Response: Section 2.8.3 of the draft RI discusses the basin plan and potential municipal and domestic water supply. The uses of surface water were not included in the report because the investigation focused on groundwater. However, both surface water in Seal Creek and groundwater at the site and in the immediate vicinity are considered to be of sufficient quality to be useful as potential resources for all beneficial uses listed in the above comment. The above beneficial uses will be identified in the draft FS.

RWQCB Specific Comment 4 ***Section 2.8.2, Regional Hydrology, p 18:*** **Describe the uses of all supply wells found in the vicinity (within 1 mile) of the SWMU sites. Provide analytical results for any SWMU chemicals of concern detected at these water supply locations.**

Navy Response: The use of all supply wells is described in Section 2.8.2 of the RI. The Navy does not have access to analytical data from off-site wells.

The Kinne Boulevard wells on Navy property were sampled in 1986 and again in 1992. The 1986 analytical suite included volatile organic compounds (VOC), semivolatile organic compounds (SVOC), and metals. Toluene was found in samples from well CA-113 at 1.5 micrograms per liter (µg/L) and in the samples from well CA-115 at 0.22 µg/L. Phthalates were found in samples from all three wells. The VOCs were assumed to have been associated with lubricating oil from the turbine pump shafts in the wells. Detected chemicals were not considered contaminants of concern (PRC 1994).

The wells were sampled again in 1992. This round of sampling did not detect VOCs, SVOCs, or petroleum hydrocarbons (PRC 1994). The Kinne Boulevard wells were abandoned as described in the RI.

RWQCB Specific Comment 5 ***Section 3.3.3, Soil Gas Sample Location, p 25:*** **Please explain in the text the basis for the 50 percent RPD (relative percent difference) benchmark and how it is applied to compare results obtained in the field to the fixed laboratory analysis.**

Navy Response: The 50 percent relative percent difference (RPD) benchmark was established as the project criterion in the sampling and analysis plan. The text already states the following:

> *Of the seven samples submitted to the stationary laboratory for confirmation analysis, only samples 324SG018 and 324SG025 contained detectable concentrations of PCE and TCE. The highest RPD calculated for PCE or TCE was 42 percent, which indicates a high degree of comparability between the results submitted by the stationary and mobile laboratories.*

RWQCB Specific Comment 6 ***Section 4.1.2, Groundwater Flow and Hydraulic Gradient, p 29:*** **Please provide a groundwater potentiometric map for the 2004 sampling session.**

Navy Response: Groundwater samples were not collected in 2004. The potentiometric surface map for 2002 is presented on Figure 15.

RWQCB Specific Comment 7 ***Section 4.1.2, Groundwater Flow and Hydraulic Gradient, p 29:*** **In the text please mention the average site groundwater depth (as referenced to mean sea level in feet).**

Navy Response: The range of static depths to groundwater as well as the range in groundwater elevations referenced to sea level are presented in Section 4.1.2 and are indicated on Table 5. In addition, potentiometric surface maps are presented on Figures 12 through 15. Groundwater elevation data are referenced to the 1929 National Geodetic Vertical Datum (1929 NGVD).

RWQCB Specific Comment 8 ***Section 4.2.2.1, Volatile Organic Compounds in Groundwater, p 32:*** **List the detection limits and the screening criteria in the tables and text provided.**

The use of the term "ND" requires comparison with the detection limit to assess any potential impacts to groundwater.

Navy Response: Detection limits are generally not presented in the data summary tables because they vary and the information requested would unnecessarily clutter the tables and figures. Please see the analytical test reports in Appendix A for detection limits. Please see Tables 19 and 20 for a list of screening values.

RWQCB Specific Comment 9

Section 4.2.2.3, Natural Attenuation Parameters for Groundwater, p 34: **The data so far collected do not support that reductive dechlorination is occurring at the site. This is further supported by the absence of degradation daughter products such as Cis/ Trans DCE (Dichloroethene) and vinyl chloride. Please include this observation in the text.**

Navy Response:

Section 4.2.2.3 states that reductive dechlorination is unlikely to occur under existing conditions at the site and the absence of degradation products supports this statement, as noted by RWQCB.

RWQCB Specific Comment 10

Section 4.2.3, Soil Gas Sample Results, p 35: Mention that while the RWQCB screening criteria used in this section are valid for shallow soil gas they do not show what risks exist from indoor air inhalation.

Navy Response:

The RWQCB screening criteria were developed using the Johnson and Ettinger vapor transport model to evaluate soil gas concentrations that might pose unacceptable risk from indoor air inhalation. The screening levels are used as a first evaluation point to consider risks associated with inhalation of indoor air under a residential scenario. The risk evaluation was carried to the next level, as described in Section 6 of the RI, because soil gas at the site was detected at concentrations that exceed the residential screening criteria. Although the risk screening criteria discussed in Section 4 are not intended to predict risk, the evaluation in Section 6 is intended to fulfill that function.

RWQCB Specific Comment 11

Section 4.2.3, Soil Gas Sample Results, p 35: Please show the variations in soil gas concentrations with depth and their concentrations closer to the surface.

Navy Response:

All analytical results for soil gas are presented in Tables 14 and 15. A summary of the results is also presented on Figure 23. Not many locations were sampled at two depths and there were relatively few soil gas detections at the site. There are insufficient data to draw meaningful conclusions on the variation of VOCs in soil gas with depth.

RWQCB Specific Comment 12

Section 6.4.3, Soil Gas Screening Levels, p 50: In the text please define incremental risk and hazard quotient. Describe how they differ.

Navy Response: For chemicals determined to pose carcinogenic risk, incremental risk is defined as the whole lifetime risk associated with the chemical that exceeds the background risk of cancer.

The health impacts for exposure to noncarcinogenic chemicals are expressed as a hazard quotient. The hazard quotient is the ratio of the average daily dose to the reference dose. EPA defines the reference dose for ingestion and inhalation intakes of many chemicals. The reference dose represents a level that is believed to be safe for members of the general population. Exposure at this level will result in a hazard quotient of 1.0.

RWQCB Specific Comment 13 ***Section 7.0, Screening Level Ecological Risk Assessment, p 54:*** **Please discuss the field data that was utilized in determining that significant groundwater contamination is "at least several hundred feet away" from Seal Creek. Water Board staff observed that a detection in groundwater above the drinking water toxicity value for PCE (tetrachloroethene; 5 ppb) was found 144 (MW-11) feet from the creek.**

Navy Response: The direction of groundwater flow at well MW-11 is west or slightly north of west. Seal Creek is 140 to 150 feet south of well MW-11. Therefore, groundwater at well MW-11 would travel several hundred feet before it discharges to Seal Creek.

RWQCB Editorial Comment 1 ***Figure 23, Soil Gas Results:*** **This figure is confusing due to the lack of numerical detection values for soil gas detections at a set of monitoring locations. Please revise the figure. If the figure after revision still has missing values state if the data was missing because soil gas was non detect for the contaminant of concern sampled.**

Navy Response: All detections of tetrachloroethene in soil gas that exceed residential screening criteria are posted on the figure along with all soil gas sampling locations. Please see Tables 14 and 15 for a complete list of soil detections and the associated screening criteria.

RWQCB Editorial Comment 2 **There needs to be clarity and consistency in naming the buildings. For example, some buildings are mapped with IA designation whereas in the text they might be referred with a building number.**

Navy Response: Comment noted.

COMMENTS BY IGOR SKAREDOFF, RAB MEMBER

Comment 1 **Since significant amounts of VOC's were found in the plume downgradient of Building IA 12 and since the report suggests that the source is upstream of the sampling zone, it seems prudent to go ahead and investigate upgradient to find the actual source, as there may be even higher concentrations in the upgradient areas.**

Navy Response: Based on a considerable amount of data that has been generated from soil sampling, groundwater sampling, and soil gas sampling, the waste oil UST is considered the source of VOC contamination at the site. Investigations over a wide area upgradient of the former UST do not suggest the presence of other significant sources.

Comment 2 **The report suggests that the source may be an Underground Storage tank site. If this is the suspicion, then the UST program and the data from this study should be integrated to find the true extent of this contamination and to provide the best information base upon which to make decisions on the most appropriate way to proceed.**

After all, the goal is to do the bests thing for the site, based on the best combination of data available.

The key consideration is not whether this is a "UST problem" or a one that belongs to "this program" but is to make the smartest and best choice on what to do about the contamination. I suggest that use this broader approach in our decision-making about this site.

Navy Response: Although the source of VOCs appears to be a waste oil UST, the VOCs detected are contaminants under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). As such, they must be investigated under the Navy's Installation Restoration Program (IRP), with EPA acting as the lead regulatory agency. Remediation of the site will continue under the IRP with EPA oversight. Although there are other USTs (that did not store or leak waste oil), they are not included in the Navy's IRP. The Navy recognizes the overlap between the UST program and the IRP and strives to make the best choices, as suggested by the reviewer. In the case of the SWMU investigation, the Navy deliberately collected petroleum hydrocarbon data under the IRP to further the site characterization and cleanup goals of the UST program. The goals and activities of these two programs has been combined in the past at the site and will be again in the future, when possible, for environmental protection and cost minimization.

COMMENTS BY THE DTSC

DTSC Comment 1 **Additional delineation of ground water contamination down gradient of monitoring wells 2, 3 and 11 may be beneficial in designing treatment options. These monitoring wells produced ground water sample above the maximum contaminant levels.**

Navy Response: Please see response to RWQCB general comment 1.

DTSC Comment 2 **Figures 19 and 20 each provide a single iso-contour to depict concentrations for PCE and TCE greater then 10 ug/l. Please expand the number of iso-contours to provide a more detailed presentation of PCE and TCE concentrations.**

Navy Response: Please see response to EPA comment 1.

DTSC Comment 3 **Additional soil gas sampling near monitoring wells 2, 3 and 11 may be beneficial in delineating volatile organic compound source areas.**

Navy Response: Please see response to RWQCB general comment 1.

REFERENCES

PRC Environmental Management, Inc. (PRC). 1994. "Naval Weapons Station Concord, Inland Area, Kinne Boulevard Wells, Well Closure Field Work Plan, Final Revised." May 19.

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
11	conclusions of the RI	Table 1	Draft Final Remedial Investigation, Solid Waste Management Units 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Section 9.2. Tetra Tech. June 14, 2004.

9.1.4 Screening Level Ecological Risk Assessment Results

The SLERA examined whether chemical concentrations in soil and groundwater pose risk to ecological receptors. Based on the fact that chemical concentrations in soil and groundwater are well below levels associated with ecological effects, the level of risk to ecological receptors at the site is considered minimal.

9.2 CONCLUSIONS

This RI was conducted under the IRP regulated by CERCLA. For this reason, the focus of this RI was evaluating the nature and extent of VOCs in soil, groundwater, and soil gas at the site. Samples were collected for TPH analysis during field activities associated with this RI at the request of the RWQCB for future use in other studies. Conclusions derived from this RI focus on the evaluation of VOC constituents at the site. Conclusions from this RI are summarized below:

- Significant unidentified areas of VOC-impacted soil at the site do not appear to exist, and no apparent data gaps were identified.
- VOC concentrations in soil and groundwater have remained relatively consistent at the site over time.
- The source of VOCs detected in groundwater at SWMU 2 appears to be associated with a location upgradient of the site.
- The qualitative HHRA indicates that COPC maximum concentrations in groundwater exceed agency threshold levels of concern. Concentrations of cis-1,2-DCE; PCE; and TCE exceeded the MCLs for drinking water. Concentrations of 1,2-dichloroethane (DCA); benzene; bromodichloromethane, chloroform, PCE; and TCE exceeded EPA Region 9 tap water PRGs. No COPC maximum concentration in soil exceeded the residential PRG, and no COPC maximum concentration in groundwater exceeded the indirect exposure screening levels.
- COPECs in soil and groundwater at the site pose minimal risk to ecological receptors.
- The qualitative HHRA, along with additional evaluation using the DTSC-modified Johnson and Ettinger vapor transport model and site-specific input parameters and assumptions, indicates that significant incremental risks (defined as greater than 1E-06) are associated only with potential exposure to PCE in indoor air under a future residential land-use scenario. The potential PCE-related incremental risks are driven by soil gas concentrations measured at two locations (SG25 and SG31) located immediately adjacent to the former waste oil UST; however, incremental risks associated with potential exposure to VOCs in indoor air are all less than 1E-06

(and considered insignificant) under a future industrial land-use scenario. Finally, hazard quotients associated with potential exposure to VOCs in indoor air are less than 1 (and considered insignificant) under both future residential and industrial land-use scenarios.

9.3 RECOMMENDATIONS

The site is not currently used as a source of drinking water; however, because groundwater contaminant concentrations at the site exceed agency threshold levels of concern for drinking water, a focused FS is recommended.

Based on the qualitative HHRA, contaminant concentrations in soil and groundwater at the site are below published health-protective values developed considering direct exposure to soil and indirect exposure (by volatilization to air) to VOCs in groundwater.

There are no plans for development of the site for residential purposes in the future, and no significant incremental risks or hazard quotients were identified based on soil gas modeling results based on site-specific input parameters and the assumption of future industrial land use; however, because VOCs in soil gas may induce risk to human health exceeding the excess cancer risk threshold of 1E–06, a focused FS is recommended to evaluate remedial alternatives such as institutional controls and active remediation technologies.

Based on the SLERA, observed contaminant concentrations in soil and groundwater at the site pose minimal risk to ecological receptors.

Groundwater monitoring on an annual basis is recommended. This monitoring frequency is considered sufficient based on the relatively stable nature of VOC concentrations in groundwater over time and the relatively low levels of groundwater contaminants at the site. Monitoring wells MW-4 and MW-5 are damaged and should be abandoned.

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
12	pilot test	Table 1	Final Technical Memorandum, Results of Air Sparging and Soil Vapor Extraction Pilot Test at SWMUs 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Section 1.0, third paragraph and Section 6.0. Tetra Tech. October 5, 2007.

1.0 INTRODUCTION

The purpose of this document is to summarize the results of the air sparge (AS) and soil vapor extraction (SVE) pilot test. The pilot test was conducted by the Department of the Navy (Navy) at solid waste management unit (SWMU) sites 2, 5, 7, and 18 on Naval Weapons Station Seal Beach Detachment Concord (NAVWPNSTA Det Concord), in Concord, California. This site is subsequently referred to as the "SWMUs site."

Chlorinated solvents are present in the groundwater at concentrations exceeding screening criteria at the SWMUs site. A complete description of the SWMUs site and the background for the AS/SVE pilot study is available in the Work Plan for this project, entitled "Final Sampling and Analysis Plan [SAP] for Pilot Test of Air Sparging and Soil Vapor Extraction at SWMU Sites 2, 5, 7, and 18" (SulTech 2007).

The objective of the AS/SVE pilot test was to assess the ability of air sparging to remediate the chlorinated solvent plume at the SWMU sites and to obtain design information for the full-scale system, if air sparging is ultimately chosen as the remedial technology for the SWMU sites. An SVE system was included in the pilot test to collect vapors mobilized by the AS system; however, the need for vapor collection at the site has not been thoroughly evaluated at this time. The field testing of AS/SVE was conducted from February 23 to March 15, 2007. The results of the pilot test are documented in this Technical Memorandum and will be incorporated into a Revised Draft Final Feasibility Study (FS) Report for the SWMUs site.

Following this introduction, Section 2.0 of this memorandum describes the wells installed and the equipment used for the AS/SVE pilot test. Section 3.0 describes the baseline groundwater sampling that was conducted to further delineate the groundwater contamination and the results of the pre-test groundwater samples. Section 4.0 contains a description of the pilot test operations at both AS/SVE locations. The pilot test operations include an SVE-only test, an AS-only test, and a combined AS/SVE test. Section 5.0 presents the results of groundwater sampling completed after the pilot tests. The conclusions from the pilot test and recommendations for further evaluation in the FS Report are summarized in Section 6.0. Section 7.0 lists the references cited in this document.

The borehole logs and well completion forms for each of the new wells installed for the pilot test are included as Appendix A. Appendix B is a photographic log of activities and equipment used during the pilot test. Equipment specifications are included in Appendix C. The analytical data from the groundwater and vapor samples are included in Appendix D.

This pilot test is part of ongoing investigations by the Navy in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act to address the existing groundwater contamination at the SWMUs site.

well. In addition, concentrations of chlorinated hydrocarbons in ASMP-105 (located 25 feet from AS-101) increased after the pilot test. Therefore, the comparison of baseline and post-test groundwater samples show that the AS/SVE pilot test was able to reduce the concentration of chlorinated hydrocarbons within a ROI of at least 15 feet from the AS well.

At Location 2, concentrations of chlorinated hydrocarbons decreased significantly in AS-201 and in ASMP-201 (located 5 feet from the AS well). The comparison of chlorinated hydrocarbon concentrations between baseline and post-test samples at Location 2 are shown on Figures 42 through 45. Chlorinated hydrocarbons were not detected in ASMP-205 either prior to or following the testing. It is likely that this well is located upgradient and outside of the VOC plume. Concentrations of PCE and TCE also decreased in ASMP-202 and ASMP-204 (located 10 and 20 feet from AS-201); therefore, the influence of AS may extend up to 20 feet from the injection point. However, concentrations in well ASMP-203 (located 15 feet from AS-201) remained constant for PCE (14 µg/L) and slightly increased for TCE (from a baseline concentration of 9.3 µg/L to 11 µg/L after the pilot test). The air flow in the subsurface may have followed preferential pathways to largely bypass groundwater near ASMP-203. Overall, the comparison of groundwater samples before and after the pilot test shows that the AS/SVE system was able to reduce the concentration of chlorinated hydrocarbons within a ROI of at least 10 feet of the AS point.

6.0 CONCLUSIONS AND RECOMMENDATIONS

The AS/SVE pilot test was successful in evaluating the technology at SWMUs 2, 5, 7, and 18 and collecting design parameters for a full-scale system. The major conclusions and recommendations from the pilot test are summarized below:

Conclusions

- The baseline groundwater investigation indicates the PCE and TCE plumes are relatively stable and have not changed significantly from past evaluations.
- The pilot test at both locations demonstrated the ability to decrease the concentration of chlorinated hydrocarbons in the groundwater in a relatively short period of time (less than a week at each location). Thus, it appears AS is capable of reducing VOC concentrations at the site to below maximum contaminant levels within a reasonable operational timeframe.
- At Location 1, the concentrations of PCE, TCE, cis-1,2-DCE, and trans-1,2-DCE decreased in wells within 15 feet of the AS well. At Location 2, the concentrations decreased in wells within 10 feet of the AS well, but the system may have affected concentrations as far as 20 feet from the injection point.
- Based on the DO concentrations, induced pressure in saturated zone wells, and the helium tracer test, the AS system at Location 1 had a ROI of at least 15 feet. Therefore, the AS wells in this area should be spaced approximately 25 feet apart.

- The AS system at Location 2 had a smaller ROI than Location 1. The helium tracer tests, induced pressure measurements, and DO concentrations indicate the AS well had a ROI of at least 5 feet, but may have had some effect on the saturated zone up to 25 feet from the well. The AS wells in this area should be conservatively placed only about 10 to 15 feet apart in the final design to assure sufficient sparge well coverage in this area. This estimated ROI and well spacing is based on the demonstrated radius of airflow in the subsurface (shown by the helium tracer tests and DO measurements) because it is a more conservative estimate of the influence of the AS system; however, groundwater samples collected before and after the pilot test indicate that the AS system reduced chemical concentrations in wells up to 20 feet from AS-201.

- The flowrate achieved by the SVE system at both locations was very low (less than 0.5 scfm at Location 1 and less than 2 scfm at Location 2) because of the low permeability of the soils (a typical SVE system operates at 10 to 50 scfm). The SVE ROI at both locations was less than 5 feet, which would require over 600 SVE wells to adequately cover the PCE plume). There did not appear to be a significant pneumatic connection between the saturated zone and the vadose zone wells at Location 1. In addition, the low mass removal rates and low recovery of helium during the helium tracer tests indicate that the SVE systems at both locations had limited effectiveness at capturing the sparged vapors.

Recommendations

The pilot test demonstrated that AS is a viable technology for this site, based on the effectiveness of the AS system in distributing air in the subsurface and the reduction in VOCs in groundwater. However, if vapor collection and treatment is required for a full-scale system, the design of the SVE system will need to include substantial modification from the pilot system to effectively capture the sparged vapors. Possible solutions that could be considered include using a horizontal SVE system, or constructing the SVE system deeper in order to have more contact with the more permeable soils near the saturated zone.

Overall, the AS well spacing throughout the PCE and TCE plume should change based on subsurface conditions – closer in the source area and spaced further apart downgradient. The total number of AS wells required to treat concentrations of PCE greater than 10 µg/L (shown on Figure 6) is estimated to be between 70 and 160 wells.

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
13	remedial action objectives	Table 1	Final Feasibility Study Report for Solid Waste Management Units 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Sections 8.1, 8.1.1, 8.1.2, and 8.1.3. Tetra Tech. March 20, 2008.

8.1 REMEDIAL ACTION OBJECTIVES

The RAOs to prevent exposures to future residents at the SWMUs site are as follows:

- Prevent potential future indoor intrusion of vapors that contain PCE at concentrations that exceed the residential inhalation criteria developed in the RI Report (Tetra Tech 2004a).
- Prevent domestic use of groundwater containing PCE, TCE, and cis-1,2-DCE at concentrations that exceed California MCLs.
- Prevent the off-site migration of contaminated groundwater and control risk to humans from other non-drinking water pathways.

The RAOs also consider potential ARARs. Development of these RAOs, including a discussion of the exposure pathways, COCs, and remedial goals, is presented in the following sections.

8.1.1 Exposure Pathways

With unrestricted land use, chlorinated hydrocarbon VOCs present in groundwater at the SWMUs site pose a potential risk to future residents through the following pathways:

- Domestic use of groundwater (ingestion, dermal contact, and inhalation)
- Inhalation of indoor vapors

PCE in soil gas also poses a potential risk to future residents through inhalation of indoor vapors. No unacceptable ecological risks were identified for the SWMUs site.

8.1.2 Chemicals of Concern

The risk assessment identified potential risks at the SWMU site from both domestic groundwater consumption and indoor vapor inhalation under the future residential use scenario. The COCs and associated exposure pathways that apply are marked with an "X" in the following table.

COC	Exposure Pathway	
	Groundwater Domestic Use	Indoor Vapor Inhalation
PCE	X	X
TCE	X	Not applicable
cis 1,2-DCE	X	Not applicable

TCE and cis-1,2-DCE are not considered COCs for the indoor vapor inhalation pathway because the concentrations of these two contaminants were an order of magnitude lower in soil gas than that of PCE. Further, the risk assessment indicated that these two contaminants are not present at

concentrations that present an unacceptable risk. Vinyl chloride could be produced as a degradation product of PCE, TCE, and cis-1,2-DCE if biologically mediated reductive dechlorination were to take place within the groundwater at the SWMUs site. Vinyl chloride has not been detected in any groundwater samples collected to date at the SWMUs site. In addition, groundwater within the SWMUs site contains DO at concentrations of 0.9 to 8.0 mg/L. Reductive dechlorination typically does not occur in groundwater with concentrations of DO exceeding 0.5 mg/L (Wiedemeier and others 1996). Therefore, vinyl chloride is not likely to be produced at the SWMUs site under current conditions and is not considered a COC.

8.1.3 Remedial Goals

The soil gas remedial goals to protect inhalation of indoor air under a future residential exposure pathway are presented in the following table.

COC	Soil Gas Remedial Goals to Protect Indoor Air Pathway ($\mu g/m^3$)
PCE	4,286 [a]

Notes:
a Based on an exposure scenario of adult/child resident in a one-story residence at the SWMUs site (Tetra Tech 2004a).

The remedial goal for soil gas of 4,286 $\mu g/m^3$ for PCE for inhalation of indoor air under residential exposure scenario assumptions corresponds to a 1.0E-6 excess cancer risk based on the input of site-specific conditions to the Johnson and Ettinger model. The residential exposure scenario consists of an adult or child resident living in a small, one-story building with a concrete slab foundation (Tetra Tech 2004a). This remedial goal will be applied within the source area (the area of the former waste oil UST near Building IA-12), where concentrations in soil gas have exceeded screening criteria.

The remedial goals for the domestic use and inhalation of indoor air exposure pathways for groundwater are presented in the following table.

COC	Target Groundwater Concentrations to Protect the Indoor Air Pathway		Remedial Goals for Domestic Use of Groundwater (µg/L)[c]	Selected Remedial Goals for Groundwater (µg/L)
	Water Board ESL to Protect Indoor Air[a] (µg/L)	EPA Guidance for Indoor Air[b] (µg/L)		
PCE	520	5	5	**5**
TCE	2,100	5	5	**5**
cis-1,2-DCE	20,000	210	6	**6**

Notes:
a Based on environmental screening levels (ESLs) (Water Board 2003).
b Based on EPA. 2002a. "OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils." November. Cited values are from Table 2c for 1E-06 risk and are based on the assumption that the indoor air attenuation factor = 0.001 and partitioning across the water table obeys Henry's law.
c Based on California state MCLs.

The remedial goals for domestic use of groundwater are the California MCLs for PCE, TCE, and cis-1,2-DCE. Two sets of target groundwater concentrations to protect the indoor air pathway are presented above. The Water Board ESLs represent concentrations in groundwater that are protective of indoor air for residential land use (Water Board 2003). Groundwater ESLs to address potential vapor intrusion were developed for coarse-grained, high-permeability and fine-grained, low-permeability soils. Based on the fine-grained soils that are present in the vadose zone at the SWMUs site, the ESLs for low-permeability zone soils are applied. Target concentrations for groundwater from EPA guidance are also presented (EPA 2002a). These EPA values are based on 10^{-6} risk and assume that the indoor air attenuation factor is 0.001 and that partitioning across the water table obeys Henry's law. The target concentrations for groundwater to protect indoor air are less than or equal to the remedial goals for domestic use of groundwater. Therefore, the remedial goals for domestic use of groundwater are also protective of the indoor air pathway and were selected as the remedial goals.

8.2 POTENTIAL APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

CERCLA § 121(d)(l) requires response actions attain (or the decision document must justify the waiver of) ARARs, which include environmental regulations, standards, or criteria, promulgated under federal or more stringent state laws. An ARAR may be either applicable or relevant and appropriate, but not both. The NCP (40 CFR Part 300) defines applicable and relevant and appropriate as follows.

Applicable requirements means those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at a CERCLA site.

Relevant and appropriate requirements means those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that, while not ''applicable'' to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site, address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well suited to the particular site.

CERCLA § 121(e) exempts any response action conducted entirely on site from having to obtain a federal, state, or local permit when the action is carried out in compliance with § 121. In addition, on-site actions need only comply with the substantive aspects of ARARs, not with the corresponding administrative procedures, such as administrative reviews and record-keeping requirements. Off-site actions must comply with all legally applicable requirements, both substantive and administrative.

The identification of ARARs is based on a number of site-specific factors, including potential response actions, chemicals and compounds found at the site, physical characteristics of the site, and the location of the site. ARARs are usually divided into three categories: chemical-specific, location-specific, and action-specific.

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
14	monitored natural attenuation	Table 1	Final Feasibility Study Report for Solid Waste Management Units 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Section 8.5.2.2, Pages 54 - 55 under "Monitored Natural Attenuation". Tetra Tech. March 20, 2008.

long-term ICs to prohibit extraction and use of groundwater may be appropriate for those remediation alternatives.

All ICs listed in Table 11, except for administrative orders, will be retained for consideration in the remedial alternatives.

Engineering Controls

ECs reduce or eliminate potential exposures of humans and wildlife to contamination by preventing contact with contaminated media. The most common methods to control vapor from entering a building are by installing a vapor barrier beneath the building or a ventilation system to remove vapors from beneath the building.

Vapor barriers are a passive approach typically employed during construction. They consist of installing the vapor barrier (6-mil polyethylene or equivalent), sealing plumbing penetrations, mixing floor slab concrete with superplasticizers, reinforcing the slab at reentrant corners, and properly curing and loading the slab.

Ventilation systems typically include a subslab depressurization system. This active approach uses a depressurization fan to lower the pressure below the slab. This negative pressure creates a sink for VOCs beneath the building, and the vapors are collected using the fan in perforated piping in the slab. The fan extracts air from below the slab and diverts it to ambient air.

Vapor barriers and subslab depressurization systems were eliminated for existing buildings because of the technical impracticability of installation. The requirement for vapor barriers or subslab depressurization systems for new buildings would be implemented by an IC; this option may be considered in the LUC RD, if necessary.

Monitored Natural Attenuation

This response action involves natural subsurface processes such as dilution, volatilization, biodegradation, adsorption, and chemical reactions with subsurface materials that reduce contaminant concentrations to acceptable levels. This option usually requires modeling and evaluation of contaminant degradation rates and pathways and predicting contaminant concentrations at downgradient receptor points, especially when the plume is still expanding and migrating. The primary objective of site modeling is to demonstrate that natural processes of contaminant degradation will reduce contaminant concentrations to below regulatory standards or risk-based levels before potential exposure pathways are completed. In addition, long-term monitoring must be conducted throughout the process to confirm that degradation is proceeding at rates consistent with meeting the remedial goals.

An evaluation of the time required for MNA to reduce VOC concentrations below remedial goals was conducted using the BIOPLUME III model (Appendix A). Approximately 75 years would be required for MNA to achieve remedial goals. MNA was therefore eliminated as a single remedial approach; however, MNA may be effective in treating residual contamination. Further modeling demonstrated that concentrations less than 10 µg/L of PCE in groundwater would be reduced to the remedial goal within 10 years. Therefore, MNA was retained for use in conjunction with other remedial technologies that reduce the concentration of contaminants in groundwater.

8.5.2.3 Active Soil Gas Remediation

Two technologies were considered during the preliminary screening process for soil gas remediation in the source area (area of the former waste oil UST near Building IA-12). These two technologies, which are discussed below, are excavation with off-site disposal and SVE.

Excavation with Off-site Disposal

Under this approach, contaminated soil that may be the source of the chlorinated hydrocarbons in soil gas near Building IA-12 is excavated and transported to permitted off-site treatment or disposal facilities. Excavation and off-site disposal is a well-proven and common method for cleaning up hazardous waste sites. Contaminated soil was excavated from the former tank pit during removal of the former waste oil UST, but the excavation could not be continued beneath the existing power pole or beneath Building IA-12. Excavation with off-site disposal was therefore eliminated because excavation of soil beneath Building IA-12 is not implementable.

Soil Vapor Extraction

SVE is an in-situ technology that reduces concentrations of volatile contaminants in the vadose zone and, to a lesser degree, may remove volatile components from the groundwater. A vacuum is applied to wells near the contaminant source, which causes volatile constituents to be stripped from the soil into vapors and drawn to the wells. The extracted vapor can then be treated (if necessary) at the surface to remove the volatile constituents. SVE would be able to remove PCE in soil gas that exceed the remedial goals within the area of the former waste oil tank, including beneath Building IA-12, and was retained for consideration.

8.5.2.4 Active Groundwater Remediation

This section presents the technologies that were considered during the preliminary screening process as primary options for active cleanup of contaminated groundwater. The primary technologies discussed below include pump and treat, AS, biosparging, in situ chemical oxidation (ISCO), thermal treatment (steam flushing), a passive treatment wall, enhanced in situ bioremediation, and zero-valent iron (ZVI) injection.

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
15	exposure pathways	Section 2.5.1	Draft Final Remedial Investigation, Solid Waste Management Units 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Section 6.3. Tetra Tech. June 14, 2004.

Tables 7 through 9, respectively, summarize the TPH and VOC analytical results and statistical summary for soil samples, and Tables 10 through 12, respectively, summarize the TPH and VOC analytical results and statistical summary for groundwater samples. Table 13 summarizes the analytical results for groundwater samples analyzed for natural attenuation parameters. All data quality objectives were met for data that was used in the HHRA.

Soil and groundwater samples collected by LFR Levine-Fricke (LFR) as part of the RI process during the February and March 2002 sampling events were analyzed for TPH and VOC constituents as well as natural attenuation parameters. Daily field blanks were collected during the sampling event for data quality assessment. As shown in Table 17, the source and equipment water field blanks collected during the February 20, 2002, sampling event contained VOCs at concentrations ranging from 0.6 to 60 µg/L. VOC concentrations of 0.4 to 3 µg/L were reported for the two groundwater field samples collected on February 20, 2002, from SB005 and SB006. The February 20 field blanks were the only field blanks collected that contained detectible VOC concentrations. It should be noted that neither PCE nor TCE was detected in the source water and equipment field blanks, but PCE and TCE were detected at low concentrations (3 and 0.5 µg/L) in the grab groundwater sample from SB006. The detection of PCE and TCE in the sample from SB006 is consistent with expectations for detections of potential contaminants at the site. To be consistent with EPA data validation protocol, however, groundwater results from samples collected on February 20, 2002, were rejected for not meeting QC criteria (EPA 1994c).

6.2 IDENTIFY MAXIMUM CONCENTRATION OF EACH CHEMICAL DETECTED IN SOIL, GROUNDWATER, AND SOIL GAS

Tables 9, 12, 14, and 15 summarize all detected chemicals and/or their maximum concentrations for soil, groundwater and soil gas, excluding results for the water samples collected on February 20, 2002.

6.3 IDENTIFY COMPLETE EXPOSURE PATHWAYS

EPA and DTSC human health risk guidance documents were used to identify relevant exposure pathways. The exposure pathways consist of four necessary elements (EPA 1989):

- Source and mechanism of chemical release
- Retention or transport medium (or media in cases involving media transfer)
- Point of potential human contact with the contaminated medium
- Exposure route (for example, ingestion) at the exposure point

A pathway is considered "complete" only if these four conditions are applicable.

The potential exposure pathways and routes evaluated include the following:

- Incidental ingestion of soil
- Direct dermal contact with soil
- Inhalation of particulate emissions from soil
- Inhalation of vapors in indoor air (derived from soil gas or groundwater)
- Ingestion of groundwater
- Dermal contact with groundwater

The exposure pathways identified above are considered complete and were evaluated qualitatively for the potentially exposed populations and land-use scenarios identified. The currently known and identified affected media are soil, groundwater, and soil gas. The exposure routes are defined as the physical ways in which chemicals may enter the human body (for example, through ingestion, inhalation, and dermal absorption).

Groundwater at the site is not currently used as a drinking water source; therefore, no current pathway exists for human ingestion of groundwater or dermal contact with groundwater. Although groundwater at the site is not currently used as a source of drinking water, groundwater data were conservatively screened against drinking water criteria following guidance in the basin plan (RWQCB 1995) and amendments (RWQCB 2000). The basin plan and amendments define all subsurface waters as potential sources for municipal and residential uses.

6.4 PERFORM A SCREENING EVALUATION

Screening values were selected that accurately and conservatively represent each complete exposure pathway. The site is currently used for military purposes. To date, no redevelopment plans have been proposed, and it is highly unlikely that the site will ever be developed for residential housing; therefore, the current site use also represents future site use. Screening levels for soil, groundwater, and soil gas are discussed below.

6.4.1 Soil Screening Levels

For soil, residential PRGs were used as the screening criteria (EPA 2002a). Residential PRGs were selected instead of industrial PRGs to evaluate unrestricted land use under the most conservative land use scenario. Table 18 summarizes the maximum concentrations of contaminants detected in soil and the PRGs used for the HHRA.

6.4.2 Groundwater Screening Levels

For indirect exposure to groundwater contamination, residential groundwater screening levels for protection of indoor air quality (RWQCB 2003) were selected. Table 19 summarizes the maximum concentrations of contaminants detected in groundwater and indirect exposure to

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
16	screening concentrations	Section 2.5.1	Draft Final Remedial Investigation, Solid Waste Management Units 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Sections 6.4.1, 6.4.2, and 6.4.3. Tetra Tech. June 14, 2004.

- Incidental ingestion of soil
- Direct dermal contact with soil
- Inhalation of particulate emissions from soil
- Inhalation of vapors in indoor air (derived from soil gas or groundwater)
- Ingestion of groundwater
- Dermal contact with groundwater

The exposure pathways identified above are considered complete and were evaluated qualitatively for the potentially exposed populations and land-use scenarios identified. The currently known and identified affected media are soil, groundwater, and soil gas. The exposure routes are defined as the physical ways in which chemicals may enter the human body (for example, through ingestion, inhalation, and dermal absorption).

Groundwater at the site is not currently used as a drinking water source; therefore, no current pathway exists for human ingestion of groundwater or dermal contact with groundwater. Although groundwater at the site is not currently used as a source of drinking water, groundwater data were conservatively screened against drinking water criteria following guidance in the basin plan (RWQCB 1995) and amendments (RWQCB 2000). The basin plan and amendments define all subsurface waters as potential sources for municipal and residential uses.

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6.4.1 Soil Screening Levels

For soil, residential PRGs were used as the screening criteria (EPA 2002a). Residential PRGs were selected instead of industrial PRGs to evaluate unrestricted land use under the most conservative land use scenario. Table 18 summarizes the maximum concentrations of contaminants detected in soil and the PRGs used for the HHRA.

6.4.2 Groundwater Screening Levels

For indirect exposure to groundwater contamination, residential groundwater screening levels for protection of indoor air quality (RWQCB 2003) were selected. Table 19 summarizes the maximum concentrations of contaminants detected in groundwater and indirect exposure to

groundwater screening levels used for the HHRA. These screening values were developed using the Johnson and Ettinger vapor transport model (Johnson and Ettinger 1991). This model considers both diffusive and convective flow of subsurface vapors into buildings. This model typically overestimates vapor migration and is considered to be protective of human health. No maximum detected groundwater contaminant concentration exceeded its indirect exposure screening criterion.

For ingestion of and dermal contact with groundwater, the California-promulgated drinking water standards (referred to as MCLs) (California Department of Health Services 2000) and residential tap water PRGs (California Department of Health Services 2000 and EPA 2002a) were used. Table 19 summarizes the groundwater MCLs and tap water PRGs used for the HHRA. MCLs are the enforced drinking water standards. Tap water PRGs are human health risk-based goals for domestic water. Domestic water at the site is currently municipally supplied; therefore, there is no current pathway for ingestion of or dermal contact with groundwater.

6.4.3 Soil Gas Screening Levels

For indirect exposure to contaminants in soil gas, residential soil gas screening levels for protection of indoor air quality (RWQCB 2003) were selected. These screening values were developed using the Johnson and Ettinger vapor transport model (Johnson and Ettinger 1991). This model considers both diffusive and convective flow of soil gas vapors into buildings. As is frequently the case with indirect exposure to vapors from groundwater, this model typically overestimates vapor migration from soil gas to indoor air and is therefore considered protective of human health. All concentrations of contaminants detected in soil gas at concentrations exceeding the screening criteria are presented in Figure 23. The soil gas screening levels are presented in Tables 14 and 15 are used for the HHRA.

As noted in Tables 14 and 15, cis-1,2-DCE; TCE; and PCE were detected in soil gas samples collected at four locations at maximum concentrations exceeding residential soil gas screening levels as follows:

- SG18 – PCE (1,000 $\mu g/m^3$)
- SG25 – TCE (2,400 $\mu g/m^3$) and PCE (15,000 $\mu g/m^3$)
- SG31 – cis-1,2-DCE (8,100 $\mu g/m^3$); TCE (19,000 $\mu g/m^3$); and PCE (120,000 $\mu g/m^3$)
- SG33 – PCE (730 $\mu g/m^3$)

The residential soil gas screening levels were developed by RWQCB using the Johnson and Ettinger vapor transport model assuming that the vadose zone consists of highly permeable sand (RWQCB 2003). In fact, the vadose zone at the site consists of silty-clay, which is less permeable than sand (see Figure 9 through 11). The maximum detected soil gas concentrations of cis-1,2-DCE; TCE; and PCE were further evaluated using the Johnson and Ettinger vapor transport model, site-specific input parameters, and the model-specific assumptions summarized below.

- Depth below grade to bottom of enclosed space floor (LF), 15 centimeters (cm). It was assumed that all future construction was slab-on-grade.
- Soil gas sampling depth below grade (LS), 152.4 cm. This is the Johnson and Ettinger model's default assumption. It is also the depth from which all but one of the soil gas samples considered in this analysis were collected. (Note: The step-out sample from SG38 was collected from 6.5 feet bgs.)
- Vadose zone USCS soil type – As noted in Figures 9 through 11, the soil type within the vadose zone at the site is primarily silty clay. For the purpose of this evaluation, the impact of considering the vadose zone USCS soil type as either silty clay or clay was evaluated. It was determined that the assumption of clay as the vadose zone USCS soil type produced slightly higher (more conservative) risk and hazard results (see Appendix F); therefore, for remaining soil gas modeling, it was assumed that the vadose zone USCS soil type was clay.
- Vadose zone soil dry bulk density, total porosity, and water-filled porosity values for clay were obtained from the model's lookup tables.

Appendix F summarizes the soil gas vapor transport evaluation calculations.

As shown in the table below, the estimated incremental risk from vapor intrusion to indoor air exceeded 1E-06 for TCE (1.6E-06) and PCE (2.8E-05); cis-1,2-DCE is not considered a potential carcinogen, and the hazard quotients for all three compounds are less than 0.1.

INCREMENTAL RISKS AND HAZARD QUOTIENTS ASSOCIATED WITH MAXIMUM DETECTED SOIL GAS CONCENTRATIONS

Compound	Maximum Detected Soil Gas Concentration ($\mu g/m^3$)	Incremental Risk	Hazard Quotient
cis-1,2-DCE	8,100	Not applicable	2.1E-02
TCE	19,000	1.6E-06	3.0E-03
PCE	120,000	2.8E-05	3.1E-01

Based on maximum detected soil gas concentrations, incremental risks associated with TCE and PCE were further evaluated (see Section 6.5). Cis-1,2-DCE presents no incremental risk and an insignificant hazard quotient under site-specific conditions.

6.5 SCREENING RESULTS

The results of the qualitative HHRA screening indicate that maximum concentrations of COPCs do not exceed residential PRGs. In addition, COPC maximum concentrations in groundwater samples did not exceed the indoor air inhalation exposure screening levels.

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
17	screening level comparisons	Section 2.5.1.1	Draft Final Remedial Investigation, Solid Waste Management Units 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Tables 14, 15, 18, and 19. Tetra Tech. June 14, 2004.

TABLE 14

SOIL GAS RESULTS FROM MOBILE LABORATORY
REMEDIAL INVESTIGATION FOR SOLID WASTE MANAGEMENT UNITS 2, 5, 7, AND 18
NAVAL WEAPONS STATION SEAL BEACH DETACHMENT CONCORD

SAMPLE ID	RWQCB Screening Level (See Note 3)	Ambient Blank	324SG01	324SG02	324SG03	324SG04	324SG05	324SG06	324SG07	324SG08	324SG09	324SG10	324SG11	324SG12	324SG13	324SG14	324SG15	324SG16	324SG17	324SG17	324SG18	324SG19	324SG20	324SG21
SAMPLE DEPTH			5	5	5	5	5	5	5	10	5	10	5	5	5	5	10	5	5	5 duplicate	5	5	5	5
Benzene	84	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromoform		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromomethane		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloromethane		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trans-1,2-Dichloroethene	15,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cis-1,3-Dichloropropene		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trans-1,3-Dichloropropene		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	410	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	650	ND	ND	ND
Toluene	83,000	ND	220	180	ND	130	290	ND	ND	110	90	160	58	220	90	53	130	70	ND	ND	ND	180	200	230
1,1,1-Trichloroethane		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	1,200	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Xylenes	21,000	ND	240	180	70	97	210	60	ND	81	75	100	58	230	100	85	86	65	ND	ND	100	170	220	210
Carbon Disulfide		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Styrene		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cis-1,2-Dichloroethene	7,300	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

TABLE 14 (Continued)

SOIL GAS RESULTS FROM MOBILE LABORATORY
REMEDIAL INVESTIGATION FOR SOLID WASTE MANAGEMENT UNITS 2, 5, 7, AND 18
NAVAL WEAPONS STATION SEAL BEACH DETACHMENT CONCORD

SAMPLE ID	324SG22	324SG23	324SG23	324SG24	324SG25	324SG25	324SG26	324SG27	324SG28	324SG29	324SG30	324SG31	324SG32	324SG32	324SG33	324SG34	324SG34	Method Blank	Method Blank	Method Blank	Method Blank
SAMPLE DEPTH	5	5	5 duplicate	10	5	5 summa duplicate sample	5	5	5	10	5	5	5	10	5	5	5 duplicate				
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromoform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,100	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	ND	ND	ND	ND	12,000	14,000	ND	ND	ND	ND	ND	120,000	75	150	730	ND	ND	ND	ND	ND	ND
Toluene	180	160	150	210	ND	ND	160	130	120	130	170	180	80	65	180	51	85	160	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	ND	ND	ND	ND	2,400	2,200	ND	ND	ND	ND	ND	19,000	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Xylenes	170	160	160	170	ND	ND	150	130	80	60	130	180	89	83	70	ND	100	170	ND	ND	ND
Carbon Disulfide	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Styrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	650	ND	ND	ND	ND	ND	8,100	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:
1. All results reported in micrograms per cubic meter.
2. The detection limits vary for each constituent. Detection limits are presented in Appendix A-3.
3. From Interim Final July 2003 SFBRWQCB screening levels for evaluation of indoor air impacts from shallow soil gas in sandy soil. Screening level is for "Lowest Residential" exposure scenario
4. Blue highlight dentotes constituent detection.
5. Yellow highlight denotes concentration exceeding RWQCB screening level

RWQCB San Francisco Bay Regional Water Quality Control Board

TABLE 15

SOIL GAS RESULTS FROM STATIONARY LABORATORY
SOLID WASTE MANAGEMENT UNITS 2, 5, 7, AND 18 REMEDIAL INVESTIGATION
NAVAL WEAPONS STATION SEAL BEACH DETACHMENT CONCORD

SAMPLE ID	RWQCB Screening Level (See Note 3)	324SG04	324SG05	324SG09	324SG18	324SG21	324SG25	324SG32	324SG35	324SG36	324SG37	324SG37 (field dup.)	324SG37 (lab dup.)	324SG38	324SG39
SAMPLE DEPTH		5	5	5	5	5	5	10	5	5	5	5	5	6.5	5
Freon 12	None Available	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Freon 114	None Available	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	31	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromomethane	1,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	2,900	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Freon 11	None Available	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	42,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Freon 113	None Available	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	2,400	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	1,500	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichoroethene	7,300	ND	ND	ND	ND	ND	550	ND	ND	15	5.4	ND	ND	ND	ND
Chloroform	460	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	46,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	58	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	84	2.9	3.0	ND	ND	11	ND	4.2	2.6	3.2	3.6	ND	ND	3.9	2.9
1,2-Dichloroethane	120	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	1,200	ND	ND	ND	68	ND	2,200	ND	ND	26	7.1	ND	ND	12	ND
1,2-Dichloropropane	240	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	150	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	83,000	12	11	6.0	ND	25	ND	9.5	15	14	17	9.2	8.5	19	12
trans-1,3-Dichloropropene	None Available	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	150	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	410	ND	ND	ND	1,000	ND	15,000	25	ND	40	17	6.8	6.9	67	ND
1,2-Dibromoethane (EDB)	34	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	13,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethyl Benzene	2,200	ND	ND	ND	ND	4.0	ND	4.3	5.4	5.2	5.4	3.8	4.1	6.5	6.1
m,p-Xylene	None Available	8.8	7.8	5.2	ND	15	ND	18	25	21	25	16	17	27	26
o-Xylene	None Available	ND	ND	ND	ND	5.3	ND	6.8	9.6	7.3	8.4	5.5	5.4	9.1	8.1
Total Xylenes	21,000	8.8	7.8	5.2	ND	20.3	ND	24.8	34.6	28.3	33.4	21.5	22.4	36.1	34.1
Styrene	210,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	42	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	None Available	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	None Available	7.2	ND	ND	ND	ND	ND	6.2	8.2	5.6	7.6	7.0	6.5	6.8	7.4
1,3-Dichlorobenzene	670	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	220	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
alpha-Chlorotoluene	None Available	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

TABLE 15 (Continued)

SOIL GAS RESULTS FROM STATIONARY LABORATORY
SOLID WASTE MANAGEMENT UNITS 2, 5, 7, AND 18 REMEDIAL INVESTIGATION
NAVAL WEAPONS STATION SEAL BEACH DETACHMENT CONCORD

SAMPLE ID	RWQCB Screening Level (See Note 3)	324SG04	324SG05	324SG09	324SG18	324SG21	324SG25	324SG32	324SG35	324SG36	324SG37	324SG37 (field dup.)	324SG37 (lab dup.)	324SG38	324SG39
SAMPLE DEPTH		5	5	5	5	5	5	10	5	5	5	5	5	6.5	5
1,2-Dichlorobenzene	42,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Butadiene	None Available	ND	ND	ND	ND	ND	ND	3.2	ND	4.4	2.0	ND	ND	ND	2.1
Hexane	None Available	ND	3.4	ND	ND	5.1	ND	3.5	2.7	3.0	ND	ND	ND	ND	ND
Cyclohexane	None Available	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.0
Heptane	None Available	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	15
Bromodichloromethane	66	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane	90	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cumene	None Available	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Propylbenzene	None Available	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloromethane	1,400	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	42,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorobutadiene	None Available	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	73,000	180	370	19	11	700	ND	39	16	45	37	19	19	46	44
Carbon Disulfide	None Available	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	41
2-Propanol	None Available	ND	ND	ND	ND	24	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	15,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Acetate	None Available	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Butanone (Methyl Ethyl Ketone)	None Available	25	46	ND	ND	73	ND	ND	ND	11	ND	ND	ND	11	11
Tetrahydrofuran	None Available	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dioxane	None Available	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Methyl-2-pentanone	None Available	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Hexanone	None Available	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromoform	None Available	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Ethyltoluene	None Available	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethanol	None Available	ND	7.5	ND	ND	12	ND	ND	28.0	9.2	55	38	40	42	38
Methyl tert-butyl ether	9,400	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:
1. All results reported in micrograms per cubic meter.
2. The detection limits vary for each constituent. Detection limits are presented in Appendix A-3.
3. From Interim Final July 2003 SFBRWQCB screening levels for evaluation of indoor air impacts from shallow soil gas in sandy soil. Screening level is for "Lowest Residential" exposure scenario
4. Blue highlight dentotes constituent detection.

RWQCB San Francisco Bay Regional Water Quality Control Board

TABLE 18

COMPARISON OF MAXIMUM DETECTED CONCENTRATIONS IN SOIL WITH RESIDENTIAL PRELIMINARY REMEDIAL GOALS SOLID WASTE MANAGEMENT UNITS 2, 5, 7, AND 18 REMEDIAL INVESTIGATION NAVAL WEAPONS STATION SEAL BEACH DETACHMENT CONCORD

Analyte	Maximum Detection (mg/kg)	Sample Location	Sample Depth (ft)	Sample Date	Residential Screening Value [a] (mg/kg)	Greater than Screen
1,2,4-Trimethylbenzene	21.1	SB020	6.5	2/22/02	52	No
1,3,5-Trimethylbenzene	5.7	SB020	6.5	2/22/02	21	No
4-Methyl-2-Pentanone	0.003	SB008	6.0	2/2102	790	No
Bis(2-ethylhexl)phthalate	8.8	MW-9	10.5	2/1/99	35	No
Ethylbenzene	0.0006	SB023	6.0	2/22/02	8.9	No
Isopropylbenzene	0.8	SB020	6.5	2/22/02	140	No
M,P-Xylenes	0.42	SB020	6.0	2/22/02	270	No
Naphthalene	2.8	SB020	6.5	2/22/02	56	No
Phenol	0.096	MW-08	5.5	1/27/99	37000	No
P-Isopropyltoluene [b]	7.5	SB020	6.5	2/22/02	520	No
sec-Butylbenzene	5.7	SB020	6.5	2/22/02	220	No
PCE	0.002	SB018	28	2/25/02	1.5	No
Toluene	0.26	SB020	6.0	2/22/02	520	No
TCE	0.001	SB018	28	2/25/02	0.0053	No

Notes:

a United States Environmental Protection Agency, Region IX, "Preliminary Remedial Goals," October 2002

mg/kg Milligram per kilogram

PCE Tetrachloroethene

TCE Trichloroethene

TABLE 19

COMPARISON OF MAXIMUM DETECTED CONCENTRATIONS IN GROUNDWATER WITH SCREENING LEVELS FOR PROTECTION OF HUMAN HEALTH SOLID WASTE MANAGEMENT UNITS 2, 5, 7, AND 18 REMEDIAL INVESTIGATION NAVAL WEAPONS STATION SEAL BEACH DETACHMENT CONCORD

Analyte	Maximum Detection 2002 Sampling Event (µg/L)	Sample Location(s)	Indoor Air Screening Value [a] (µg/L)	MCL [b] (µg/L)	EPA 2002 Guidance for Indoor Air [c] (µg/L)	2002 Tap Water PRG Value [d] (µg/L)
1,2,4-Trimethylbenzene [e]	2	SB001	5,800 [e]	1.0 [e]	24	12
1,3,5-Trimethylbenzene [e]	0.6	SB001	5,800 [e]	1.0 [e]	25	12
4-Methyl-2-Pentanone	0.9	SB006	NA	NA	NA	NA
Benzene	0.5	SB001 & SB003	5,800	1.0	5.0 [f]	**0.34**
Bromodichloromethane	1	SB001	2,600	NA	2.1	**0.18**
Carbon Disulfide	0.3	SB022	NA	NA	560	1,000
Chlorodibromomethane [e]	0.9	SB001	5,800 [e]	1.0 [e]	3.2	**0.18**
Chloroform	1	SB001	7,900	NA	80	6.2
1,1-DCE	1	MW-09	200	6.0	190	340
1,2-DCA	0.4	MW-09	4,700	0.5	5.0 [f]	**0.12**
1,2-DCE –cis	7	SB024	130,000	**6.0**	210	61
1,2-DCE –trans	4	SB024	150,000	10	180	120
Ethylbenzene	1	SB001 & SB003	170,000	680	700	2.9
MTBE [g]	0.9	SB013	490,000	5	120,000	6.2
Naphthalene	0.5	SB011	31,000	NA	150	NA
p-Isopropyltoluene [h]	0.6	SB001	530,000 [h]	150 [h]	NA	120
PCE	100	MW-10	3,200	**5.0**	**5.0** [f]	**0.66**
TCE	38	SB024	1,300	**5.0**	**5.0** [f]	**0.028**
Toluene	9	SB001	530,000	150	1500	120
m,p-Xylenes	6	SB001	160,000	1750	22,000	210

Notes: bold = maximum concentration is greater than value

a San Francisco Regional Water Quality Control Board. "Risk-Based Screening Levels for Impacted Soil and Groundwater." December 2001. Values are for fine-grained soils.

b California Department of Health Services, "Drinking Water Standards, Primary Maximum Contaminant Levels (MCLs) and Lead and Copper Action Levels," February 19, 2002 (CDHS website).

c United States Environmental Protection Agency (EPA). "OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils." November 29. Cited values are from Table 2b for $1x10^{-6}$ risk.

d EPA, Region IX, "Preliminary Remedial Goals," October 2002. California modified PRGs are listed where available.

e Benzene used as surrogate for residential screen and MCL criteria.

f OSWER guidance default value is the federal MCL when the MCL is higher than that calculated using the indoor air model.

g The MCL criteria listed for MTBE is the secondary MCL, which is lower than the primary MCL of 13 µg/L.

h Toluene used as surrogate for residential screen and MCL criteria.

DCA Dichloroethane
DCE Dichloroethene
MCL Maximum contaminant level
µg/L Micrograms per liter
NA None available
ND Not detected
PCE Tetrachloroethene
PRG Preliminary remedial goal
TCE Trichloroethene

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
18	site-specific vapor intrusion evaluation	Section 2.5.1.2	Draft Final Remedial Investigation, Solid Waste Management Units 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Section 6.5, last 2 paragraphs on page 51 through end of section. Tetra Tech. June 14, 2004.

for benzene; bromodichloromethane; chloroform, 1,2-DCA; PCE; and TCE were also exceeded. Although the site is not currently used as a source of drinking water, a conservative screening against drinking water criteria was performed following guidance in the basin plan (RWQCB 1995) and amendments (RWQCB 2000) described in Section 2.8.3.

The results of the qualitative HHRA indicate that groundwater contaminant concentrations exceed agency threshold levels of concern for drinking water. Residual contaminant concentrations in soil and groundwater samples are below published health-protective values developed considering direct exposure to soil and indirect exposure to VOCs in groundwater.

For calculating potential incremental risks and hazard quotients, the Johnson and Ettinger vapor transport model assumes the presence of a residential building measuring 10 by 10 meter (approximately 33 by 33 feet); therefore, the indoor air quality within this residential building is unlikely contain only VOCs migrating into the building from the maximum detected soil gas sampling location. Instead, indoor air concentrations are likely the cumulative result of VOCs migrating from soil gas beneath the entire building footprint.

In order to assess the incremental risks and hazard quotients associated with soil gas beneath a residential building, a box was drawn around soil gas sampling locations close to the former waste oil UST and surrounding the two locations (SG25 and SG31) at which the highest soil gas concentrations were detected. This box measures about 33 by 46 feet and encompasses eight soil gas sampling locations (SG25, SG28, SG29, SG31, SG32, SG36, SG37, and SG38). The table below summarizes sample-specific soil gas concentrations and overall detection frequencies and arithmetic average concentrations (calculated assuming a value equal to one-half the detection limit for nondetect results reported as "U") for TCE and PCE.

SAMPLE-SPECIFIC SOIL-GAS CONCENTRATIONS AND OVERALL DETECTION FREQUENCIES AND ARITHMETIC AVERAGE SOIL GAS CONCENTRATIONS

Soil Gas Sampling Location	TCE ($\mu g/m^3$)	PCE ($\mu g/m^3$)
34SG25	2,400 (M)	15,000 (S)
34SG28	50 U (M)	50 U (M)
34SG29	50 U (M)	50 U (M)
34SG31	19,000 (M)	120,000 (M)
34SG32	50 U (M)	75 (M)
34SG36	26.2 (S)	40.7 (S)
34SG37	7.1 (S)	16.6 (S)
34SG38	12.6 (S)	66.9 (S)
Detection Frequency	5/8 (62.5 percent)	6/8 (75 percent)
Arithmetic Average Concentration	2,690	16,906

Notes: M Analyzed by mobile laboratory S Analyzed by stationary laboratory U Not detected

Based on the arithmetic average soil gas concentrations, the incremental risk for PCE (3.9E-06) exceeds 1E-06, while the incremental risk for TCE (2.2E-07) is less than 1E-06 (see Appendix F, Tables F-5 and F-6).

Back-calculating from the PCE results ([16,906 µg/m^3 x 1E-06]/3.9E-06) indicates that a PCE soil gas concentration of 4,286 µg/m^3 is associated with an incremental risk of 1E-06. PCE was detected at concentrations exceeding this concentration only at sampling locations SG25 and SG31. Coincidentally, the maximum detected concentrations of cis-1,2-DCE and TCE were also measured at these same locations.

Finally, incremental risk associated with potential exposure to PCE in indoor air was further evaluated assuming future industrial rather than residential land use. Industrial land-use calculations were performed using EPA's SG-ADV model modified to reflect DTSC's toxicity factor values (EPA 2003; DTSC 2003). The same model assumptions used to assess residential risk were applied for the industrial risk assessment with the exceptions listed below.

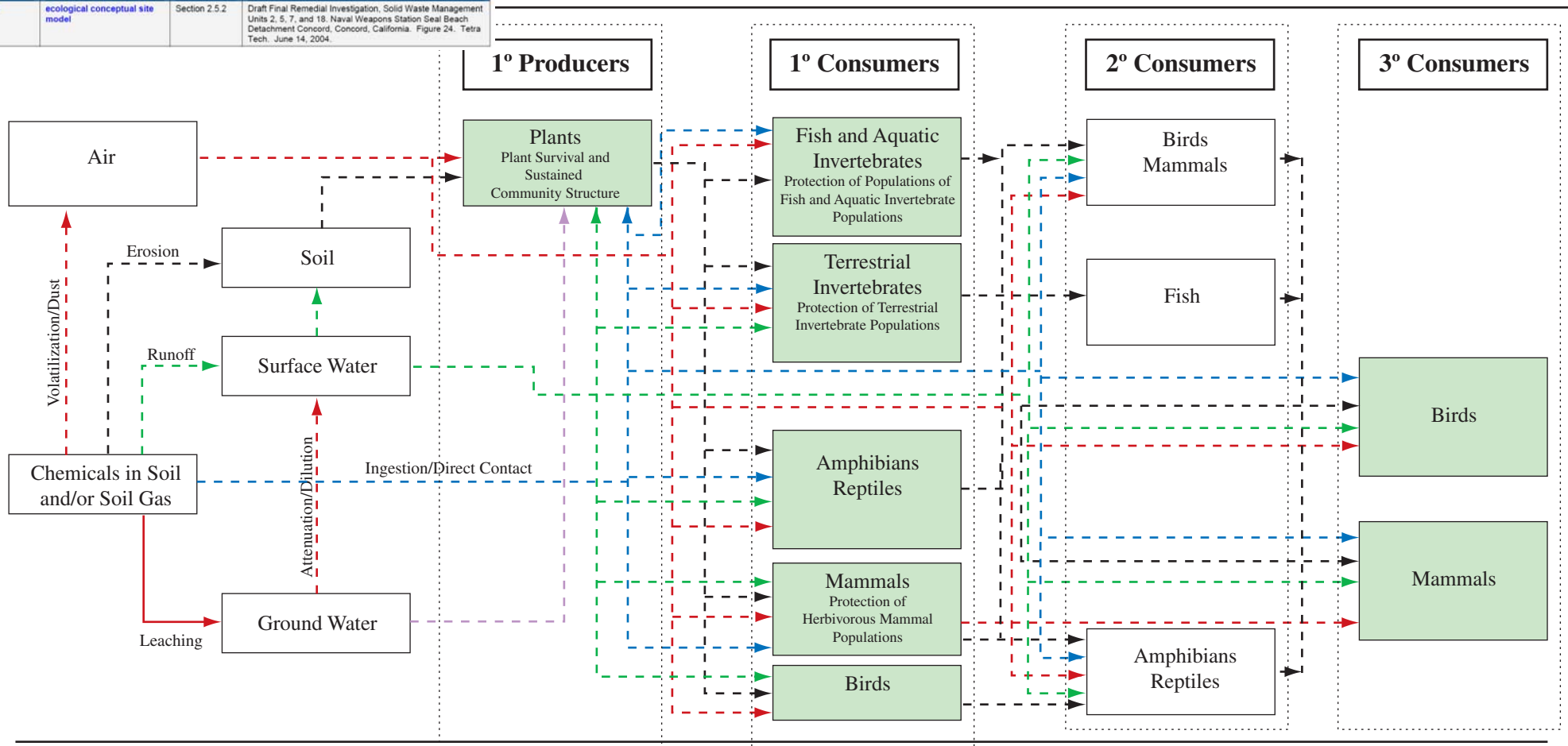
- Averaging time for noncarcinogens was modified from 30 to 25 years.
- Exposure duration was modified from 30 to 25 years.
- Exposure frequency was modified from 350 to 250 days per year.
- The commercial building footprint was modified to 1,056 by 1,056 centimeter (cm) and a ceiling height of 244 cm (Michigan Department of Environmental Quality [MDEQ] 2001).
- Indoor air exchange rate was increased from 0.45 per hour to 2 per hour (MDEQ 2001).
- As shown in Appendix F, using an average PCE soil gas concentration of 16,906 µg/m^3, the incremental risk associated with potential exposure to PCE under a future industrial scenario is 3.5E-08. This result does not exceed the target risk of 1E-06.

7.0 SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT

A SLERA was conducted to assess the potential risks to ecological receptors associated with exposure to chemicals of potential ecological concern (COPEC) in soil and groundwater at the site. All work related to this SLERA was conducted in accordance with guidance from the EPA (EPA 1997) and the Navy (Navy 1999).

This screening-level approach used conservative assumptions and available scientific literature to evaluate ecological risk in an approach consistent with steps 1 and 2 of the eight-step process described in EPA guidance (EPA 1997). The SLERA has four primary phases: (1) problem formulation, (2) exposure estimation, (3) evaluation of ecological effects, and (4) risk characterization. An ecological CSM was developed for exposure pathways at the site, and assessment and measurement endpoints were selected during the problem formulation phase.

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
19	ecological conceptual site model	Section 2.5.2	Draft Final Remedial Investigation, Solid Waste Management Units 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Figure 24. Tetra Tech. June 14, 2004.



DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND

ENGINEERING FIELD ACTIVITY WEST

DALY CITY, CALIFORNIA

NAVAL WEAPONS STATION SEAL BEACH, DETACHMENT CONCORD

FIGURE 24
ECOLOGICAL SITE CONCEPTUAL MODEL
SWMUs 2,5,7, AND 18 REMEDIAL INVESTIGATION

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
20	assessment and measurement endpoints	Section 2.5.2	Draft Final Remedial Investigation, Solid Waste Management Units 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Section 7.1, pages 56-57. Tetra Tech. June 14, 2004.

food for higher trophic-level consumers; therefore, adverse effects on the fish and aquatic invertebrate community could reduce the amount of food available to higher trophic-level consumers. The health of the community was considered an ecological value to be protected.

- **Sufficient rates of survival, growth, and reproduction to protect terrestrial invertebrate populations.** The terrestrial invertebrate community forms the basis of the food chain at the site, and adverse effects on the invertebrate community could reduce the amount of food available to higher trophic-level consumers. The health of the community was considered an ecological value to be protected.

- Sufficient rates of survival, growth, and reproduction to protect populations of herbivorous mammal populations typical to the area. Herbivorous mammals provide a major source of food for higher trophic-level consumers. Adverse effects on the populations of these primary consumers could reduce the amount of food available to higher trophic-level consumers. Protection of populations of herbivorous mammals was considered an ecological value to be protected.

Assessment endpoints are usually not amenable to direct measurement; therefore, measurement endpoints related to the assessment endpoints were identified. EPA defines a measurement endpoint as "a measurable ecological characteristic that is related to the valued characteristic chosen as the assessment endpoint and is a measure of biological effects (such as mortality, reproduction, or growth)" (EPA 1997). Measurement endpoints can include measures of exposure or effect and are frequently numerical expressions of observations. The measurement endpoint correlates directly with the assessment endpoint and was based on available literature regarding toxicity mechanisms.

The measurement endpoints were selected based on the species or communities potentially present at the site, the adequacy of the information on the endpoint based on literature research, and the ability of the endpoint to suggest information about the related assessment endpoints. The measurement endpoints summarized below were selected.

- **For plants, comparison of COPEC concentrations in surface soil to toxicity benchmarks for plants.** COPEC concentrations in soil were compared with Oak Ridge National Laboratory (ORNL) benchmarks for plants (Efroymson and others 1997a). When no benchmark was available, effects on plants were evaluated qualitatively based on available toxicological literature.

- **For terrestrial invertebrates, comparison of COPEC concentrations in surface soil to toxicity benchmarks for invertebrates.** COPEC concentrations in soil were compared with ORNL benchmarks for effects on invertebrates in soil and litter and heterotrophic processes (Efroymson and others 1997b). Any benchmark exceeded indicated potential risk to terrestrial invertebrates.

- **For herbivorous small mammals, comparison of COPEC concentrations in surface soil to toxicity benchmarks for mice.** Mice and ground squirrels may occur on the portions of the site that are not paved; therefore, COPEC concentrations in soil were compared with toxicity benchmarks for mice. No food-chain modeling was conducted because site COPECs are not expected to accumulate in plants. COPECs that lack existing benchmarks were evaluated qualitatively.

- For fish and aquatic invertebrates, comparison of COPEC concentrations in groundwater to toxicity benchmarks for fish and aquatic invertebrates. COPEC concentrations in groundwater were compared with EPA and RWQCB benchmarks for aquatic biota (RWQCB 2001; EPA 1993; Suter and Tsao 1996). When COPEC concentrations in groundwater exceeded benchmarks, potential risk to fish and aquatic invertebrates is indicated. If COPEC concentrations in groundwater are below benchmarks, groundwater was considered protective of fish and aquatic invertebrates.

Risks to each measurement endpoint are discussed in Sections 7.2 through 7.5 below.

7.2 RISK TO PLANTS

The effect of chemicals on plant populations was evaluated using the following lines of evidence:

- Comparison of COPEC concentrations in surface soil that exceed background concentrations to ORNL toxicity-based benchmarks for plants

- Qualitative evaluation of toxicity based on a review of primary literature

Toluene and xylene were the only two VOCs detected in on-site surface soil. The maximum concentration of toluene in surface soil was 0.003 mg/kg, which is well below the ORNL plant screening value of 200 mg/kg (Efroymoson and others 1997a). Because no ORNL screening values are available for xylenes, the risk from xylenes to plants was evaluated qualitatively.

Little information was found in the literature to allow sufficient evaluation of the effects of xylenes on plants (ATSDR 1995b). In surface soils, the major fate process for xylenes is volatilization to air. Of the little that does not volatilize to air or leach into soil, photo-induced oxidation is a significant transformation process for xylenes. The maximum concentration of xylenes in site surface soil was 0.001 mg/kg. Effects on beet roots were observed from beets exposed to 500 parts per million xylene (Allen and others 1961). Because the maximum concentration of xylenes measured in surface soil at the site is well below effects levels reported in the literature, risk posed to plants from xylenes in surface soil at the site was considered minimal.

7.3 RISK TO TERRESTRIAL INVERTEBRATES

The effect of chemicals on terrestrial invertebrate populations was evaluated using the following lines of evidence:

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
21	ecological benchmark comparisons	Section 2.5.2	Draft Final Remedial Investigation, Solid Waste Management Units 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Section 7.2 through 7.5. Tetra Tech. June 14, 2004.

were compared with toxicity benchmarks for mice. No food-chain modeling was conducted because site COPECs are not expected to accumulate in plants. COPECs that lack existing benchmarks were evaluated qualitatively.

- For fish and aquatic invertebrates, comparison of COPEC concentrations in groundwater to toxicity benchmarks for fish and aquatic invertebrates. COPEC concentrations in groundwater were compared with EPA and RWQCB benchmarks for aquatic biota (RWQCB 2001; EPA 1993; Suter and Tsao 1996). When COPEC concentrations in groundwater exceeded benchmarks, potential risk to fish and aquatic invertebrates is indicated. If COPEC concentrations in groundwater are below benchmarks, groundwater was considered protective of fish and aquatic invertebrates.

Risks to each measurement endpoint are discussed in Sections 7.2 through 7.5 below.

7.2 RISK TO PLANTS

The effect of chemicals on plant populations was evaluated using the following lines of evidence:

- Comparison of COPEC concentrations in surface soil that exceed background concentrations to ORNL toxicity-based benchmarks for plants
- Qualitative evaluation of toxicity based on a review of primary literature

Toluene and xylene were the only two VOCs detected in on-site surface soil. The maximum concentration of toluene in surface soil was 0.003 mg/kg, which is well below the ORNL plant screening value of 200 mg/kg (Efroymoson and others 1997a). Because no ORNL screening values are available for xylenes, the risk from xylenes to plants was evaluated qualitatively.

Little information was found in the literature to allow sufficient evaluation of the effects of xylenes on plants (ATSDR 1995b). In surface soils, the major fate process for xylenes is volatilization to air. Of the little that does not volatilize to air or leach into soil, photo-induced oxidation is a significant transformation process for xylenes. The maximum concentration of xylenes in site surface soil was 0.001 mg/kg. Effects on beet roots were observed from beets exposed to 500 parts per million xylene (Allen and others 1961). Because the maximum concentration of xylenes measured in surface soil at the site is well below effects levels reported in the literature, risk posed to plants from xylenes in surface soil at the site was considered minimal.

7.3 RISK TO TERRESTRIAL INVERTEBRATES

The effect of chemicals on terrestrial invertebrate populations was evaluated using the following lines of evidence:

- Comparison of COPEC concentrations in surface soil that exceed background concentrations to ORNL toxicity-based benchmarks for terrestrial invertebrates
- Qualitative evaluation of toxicity based on a review of primary literature

The maximum concentration for each soil COPEC was compared with toxicological benchmarks for effects on soil and litter invertebrates and heterotrophic processes to identify the chemicals that may pose risk to invertebrates (Efroymson and others 1997b). Benchmarks that were exceeded indicate potential risk to invertebrates.

The maximum concentration of toluene in surface soil was 0.003 mg/kg, which is well below the ORNL lowest observed effects concentration screening value of 200 mg/kg trinitrotoluene (Efroymoson and others 1997). No ORNL screening values are available for xylenes. In addition, no information was found on the effects of xylenes on terrestrial invertebrates in EPA's ECOTOX database or other sources. Xylenes rapidly volatilize in surface soils; therefore, no chronic exposures are expected to terrestrial invertebrates.

Because the maximum toluene concentration detected is below effects levels reported in the literature, toluene is considered to pose minimal risk to terrestrial invertebrates at the site. No toxicological information is available in the literature to sufficiently evaluate the effects of xylenes on terrestrial invertebrates; therefore, any response actions taken at the site should be based on more complete estimates of risk that have been obtained for higher level organisms.

7.4 Risk to Herbivorous Mammals

Toluene and xylenes were the only two VOCs detected in on-site surface soil. The maximum concentration of toluene in surface soil was 0.003 mg/kg. No reproductive effects were observed in mice exposed to 26 mg/kg per day of toluene during a critical life stage (Sample and others 1996). The maximum concentration of xylenes in surface soil was 0.001 mg/kg. In a study where mice were exposed to xylenes during a critical life stage, no effects were observed at a dose of 2.1 mg/kg per day (Sample and others 1996).

Because maximum concentrations of toluene and xylenes at the site are well below effects levels for small herbivorous mammals, risk to herbivorous mammals from toluene and xylenes is considered minimal.

7.5 Risk to Fish and Aquatic Invertebrates

All organic chemicals detected in groundwater at the site were evaluated as COPECs for fish and aquatic invertebrates. COPEC data were compared with available benchmarks from the ecotoxicological literature to identify chemicals that may pose unacceptable risk to fish and aquatic invertebrates. COPEC concentrations were therefore compared with lowest observed effects levels for aquatic organisms developed by EPA and RWQCB (EPA 1993; RWQCB 2001; Suter and Tsao 1996). Table 20 summarizes the results of this comparison.

Because concentrations of COPECs in Seal Creek have not been measured, the maximum concentration of a COPEC detected in groundwater was used as a conservative estimate of surface water concentrations in Seal Creek. This estimate is highly conservative for three reasons. First, the maximum concentration is unlikely to occur at the surface because the general trend of COPEC concentrations in groundwater shows a decrease downgradient, toward Seal Creek. Second, groundwater migration and dilution would likely reduce the COPEC concentrations measured in surface water relative to groundwater. Third, measurable concentrations of COPECs in surface water are likely to be reduced compared to groundwater concentrations because of the volatility of the COPECs.

COPECs were considered to pose potential risk if the maximum concentration at the site exceeded the toxicity benchmarks. All COPEC concentrations were well below toxicity benchmarks for protection of fish and aquatic invertebrates; therefore, the level of risk posed to ecological receptors from COPECs in groundwater at the site is considered minimal.

7.6 UNCERTAINTIES

Uncertainty plays an important role in risk-based decision-making and is therefore incorporated explicitly into risk characterization. Identifying known sources of uncertainty is more useful than using conservative default assumptions because potential error is made more explicit in the risk management process (Suter 1993).

The following three sources of uncertainty in ERAs are described by Suter (1993):

- Mistakes in execution of assessment activities (errors such as incorrect measurements, data recording errors, and computational errors)
- Imperfect knowledge of factors that could be known (ignorance about some aspect of the ecosystem that may be relevant, such as assumptions used in dose models, practical constraints on the ability to measure pertinent factors, and lack of knowledge on toxicological effects of all chemicals on all species)
- Inherent randomness (stochasticity in physical or biological processes that may affect assumptions or actual risk, such as variations in population parameters or rainfall patterns)

Ecological risk assessment is based on assumptions and extrapolations. Many of the assumptions in the SLERA process are conservative and result in overestimated site-specific risk, but the assumptions are important to ensure that no COPECs are dismissed when they actually may pose adverse ecological risk. Major uncertainties and conservative assumptions used in this SLERA are summarized below.

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
22	uncertainty	Section 2.5.2	Draft Final Remedial Investigation, Solid Waste Management Units 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Section 7.6. Tetra Tech. June 14, 2004.

surface water concentrations in Seal Creek. This estimate is highly conservative for three reasons. First, the maximum concentration is unlikely to occur at the surface because the general trend of COPEC concentrations in groundwater shows a decrease downgradient, toward Seal Creek. Second, groundwater migration and dilution would likely reduce the COPEC concentrations measured in surface water relative to groundwater. Third, measurable concentrations of COPECs in surface water are likely to be reduced compared to groundwater concentrations because of the volatility of the COPECs.

COPECs were considered to pose potential risk if the maximum concentration at the site exceeded the toxicity benchmarks. All COPEC concentrations were well below toxicity benchmarks for protection of fish and aquatic invertebrates; therefore, the level of risk posed to ecological receptors from COPECs in groundwater at the site is considered minimal.

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Uncertainty plays an important role in risk-based decision-making and is therefore incorporated explicitly into risk characterization. Identifying known sources of uncertainty is more useful than using conservative default assumptions because potential error is made more explicit in the risk management process (Suter 1993).

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- Inherent randomness (stochasticity in physical or biological processes that may affect assumptions or actual risk, such as variations in population parameters or rainfall patterns)

Ecological risk assessment is based on assumptions and extrapolations. Many of the assumptions in the SLERA process are conservative and result in overestimated site-specific risk, but the assumptions are important to ensure that no COPECs are dismissed when they actually may pose adverse ecological risk. Major uncertainties and conservative assumptions used in this SLERA are summarized below.

- **Habitat.** The site consists of paved industrial facilities that provide minimal habitat for ecological receptors. Use of the maximum concentration of chemicals in groundwater at the site to estimate risk to fish and aquatic invertebrates in Seal Creek likely greatly overestimates exposure risks. Concentrations of VOCs detected in wells near Seal Creek are well below the maximum concentrations of COPECs detected, which are centered around Building 269.
- **Sampling Data.** Data collected from the site must be used to evaluate conditions over the entire site; all parameters measured are therefore only estimates, with associated error. Groundwater and soil analytical data were used to characterize risk at the site. The sample size was adequate to evaluate risk posed by groundwater and soil COPECs.
- **Use of Screening Values.** An approach that compares site-specific bulk chemistry concentrations with generic screening values was used to indicate potential adverse effects. Screening values were not developed using site-specific taxa. In addition, some contaminants could not be evaluated because screening values are not available.

7.7 SUMMARY AND CONCLUSIONS

Despite the sources of uncertainty described in Section 7.6, adequate information was available to evaluate the potential risk to receptors from COPECs at the site using a screening-level approach. The results of the SLERA are summarized below.

- No significant risk to plants, terrestrial invertebrates, or herbivorous mammals is expected from soil COPECs at the site.
- No significant risk to fish and aquatic invertebrates is expected from groundwater COPECs at the site.
- No further action is recommended to characterize ecological risk at the site.

8.0 DATA QUALITY ASSESSMENT

Once the sampling data were collected and validated, a DQA was conducted to assess whether the data met the DQOs. The DQA process involves the application of statistical tools to identify the following information:

- Whether the data meet the DQO requirements and the assumptions under which the DQOs were prepared
- Whether the total study error of the data is small enough to allow decision-makers to use the data to support a decision

Data validation is a systematic process for reviewing and qualifying data against a set of criteria to provide assurance that the data are adequate for their intended use. This validation was

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
23	General Response Actions (GRA)	Section 2.8	Final Feasibility Study Report for Solid Waste Management Units 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Section 8.3. Tetra Tech. March 20, 2008.

8.3 GENERAL RESPONSE ACTIONS

GRAs are broad classes of responses or remedial actions intended to meet the RAOs. The following four GRAs were identified to achieve the RAOs for the SWMUs site:

- **No Action** – Under the no-action alternative, no remedial measures will be taken at the site.
- **Land Use Controls (LUCs)** – LUCs include institutional controls (ICs) and engineering controls (ECs). ICs are non-engineered instruments such as administrative or legal controls that minimize the potential for human exposure to contamination by limiting land or resource use. ECs reduce or eliminate potential exposures of humans and wildlife to contamination by preventing contact with contaminated media.
- **MNA** – This technology involves natural subsurface processes such as dilution, volatilization, biodegradation, adsorption, and chemical reactions with subsurface materials that are allowed to reduce contaminant concentrations to acceptable levels. Monitoring is required to confirm that the processes are reducing contaminant concentrations.
- **Active Remediation** – This category encompasses engineering instruments that reduce or eliminate the potential exposures of human receptors to contamination by reducing contaminant toxicity, volume, or mobility through treatment or by excavating and disposing of contaminants off site.

8.4 VOLUMES OF CONTAMINATED MEDIA

The volume of contaminated groundwater was calculated based on the concentration contour of 5 µg/L of PCE, which is the remedial goal for PCE, and the concentration contour of 10 µg/L of PCE (shown on Figure 18). The estimated area of contaminated groundwater that exceeds 5 µg/L is 233,480 square feet, and the estimated area of contaminated groundwater exceeding 10 µg/L is 85,800 square feet. The volume of contaminated groundwater was calculated using the following formula:

$$V_{gw} = 7.48\, A\, T\, n$$

where:

V_{gw} = the volume of contaminated groundwater in gallons

A = the area of the contamination based on domestic remedial goals in square feet

T = the thickness of the contaminated groundwater in feet

n = the effective porosity of the aquifer

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
24	**Present-Worth Cost: $3.2 million**	Table 4	Final Feasibility Study Report for Solid Waste Management Units 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Appendix B, Table B-2. Tetra Tech. March 20, 2008.

TABLE B-2: ALTERNATIVE 2A: AIR SPARGING, TOTAL REMEDIAL COST
Feasibility Study Report for SWMUs 2, 5, 7, and 18, Naval Weapons Station Seal Beach Detachment Concord, Concord, California

COST ESTIMATE SUMMARY

Site: SWMUs 2, 5, 7, and 18
Location: Naval Weapons Station Seal Beach, Detachment Concord
Phase: Feasibility Study
Base Year: 2004
Date: October 18, 2007

Description: Treatment of vadose zone in source area near Building IA-12 using soil vapor extraction. In situ treatment of contaminated groundwater by air sparging. Quarterly groundwater monitoring for 2 years following active treatment. Total remedial timeframe is 4 years.

DESCRIPTION	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Notes
CAPITAL COSTS[3]:							
Startup Costs							
Other Direct Costs	1.00	LS	25449.05	31079.37	12837.13	**$69,366**	
Source Area Vadose Zone							
Soil Vapor Extraction (7 SVE wells installed to 12 ft bgs with 5-ft screens)							
Direct-Push Rig, Truck-Mounted, Nonhydraulic includes Labor, Sampling, and Decontamination	3.00	DAY	248.99	0.00	0.00	$747	
Mobilize/Demobilize Direct-Push Rig and Crew	3.00	DAY	829.96	0.00	0.00	$2,490	
Furnish 55-Gallon Drum for Drill Cuttings	4.00	EA	114.10	0.00	0.00	$456	
Organic Vapor Analyzer Rental, per Day	3.00	DAY	165.99	0.00	0.00	$498	
1 HP, 230V, 98 SCFM, Vapor Recovery System	1.00	EA	5,686.86	1,302.80	0.00	$6,990	
Field Technician	40.00	HR	0.00	73.97	0.00	$2,959	
2" PVC, Schedule 40, Well Casing	50.00	LF	1.73	8.48	11.53	$1,087	
2" PVC, Schedule 40, Well Screen	35.00	LF	4.00	10.94	14.87	$1,043	
2" PVC, Well Plug	7.00	EA	8.43	12.72	17.29	$269	
2" Screen, Filter Pack	70.00	LF	4.50	7.21	9.80	$1,506	
2" Well, Portland Cement Grout	20.00	LF	1.67	0.00	0.00	$33	
2" Well, Bentonite Seal	7.00	EA	13.37	28.62	38.91	$566	
2" PVC, Schedule 80, Connection Piping	175.00	LF	1.28	9.22	0.00	$1,838	
2" PVC, Schedule 80, Tee	7.00	EA	18.41	0.00	0.00	$129	
2" PVC, Schedule 80, 90 Degree, Elbow	7.00	EA	5.01	0.00	0.00	$35	
2" PVC, Sch 80, Ball Valve	7.00	EA	128.70	0.00	0.00	$901	
2" Steel, 0-300 PSI Pressure Gauge	7.00	EA	33.66	86.76	0.00	$843	
SUBTOTAL						**$22,390**	
Installation of Groundwater Monitoring Wells (18 wells to 27 ft bgs with 10 ft screens)							
Direct-Push Rig, Truck-Mounted, Nonhydraulic, Includes Labor, Sampling, and Decontamination	6.00	DAY	248.99	0.00	0.00	$1,494	
Mobilize/Demobilize Direct-Push Rig and Crew	6.00	DAY	829.96	0.00	0.00	$4,980	
Organic Vapor Analyzer Rental, per Day	6.00	DAY	165.99	0.00	0.00	$996	
Volatile Organic Analysis (SW 5035/SW 8260B), Soil Analysis	36.00	EA	296.90	0.00	0.00	$10,688	
Field Technician	180.00	HR	0.00	73.97	0.00	$13,315	
2" PVC, Schedule 40, Well Casing	306.00	LF	1.63	7.80	9.52	$5,799	
2" PVC, Schedule 40, Well Screen	180.00	LF	3.77	10.06	12.29	$4,702	
2" PVC, Well Plug	18.00	EA	7.94	11.70	14.29	$611	
Split Spoon Sampling	108.00	LF	0.00	33.43	40.82	$8,019	
Furnish 55 Gallon Drum for Drill Cuttings and Development Water	27.00	EA	114.10	0.00	0.00	$3,081	
2" Screen, Filter Pack	216.00	LF	4.23	6.63	8.10	$4,095	
2" Well, Portland Cement Grout	252.00	LF	1.58	0.00	0.00	$398	
2" Well, Bentonite Seal	18.00	EA	12.59	26.33	32.14	$1,279	
SUBTOTAL						**$59,456**	
Air Sparging (410 wells installed to 29 ft bgs)							
Organic Vapor Analyzer Rental, per Day	153	DAY	165.99	0.00	0.00	$25,426	
Direct-Push Rig, Truck-Mounted, Nonhydraulic, includes Labor, Sampling, and Decontamination	195	DAY	248.99	0.00	0.00	$48,448	
Mobilize/Demobilize Direct-Push Rig and Crew	195	DAY	829.96	0.00	0.00	$161,494	
Air Sparge System, Blower 163 SCFM, 15 HP, 15 PSI, base, intake filter, silencer, pulleys, belt, and belt guard.	14	EA	17296.18	0.00	0.00	$238,687	
Field Technician	2,451	HR	0.00	73.97	0.00	$181,287	
2" PVC, Schedule 40, Well Casing	10,992	LF	1.63	7.80	9.52	$208,293	
2" PVC, Schedule 40, Well Screen	814	LF	3.77	10.06	12.29	$21,267	
2" PVC, Well Plug	410	EA	7.94	11.70	14.29	$13,911	
Furnish 55-Gallon Drum for Drill Cuttings and Development Water	624	EA	114.10	0.00	0.00	$71,171	
2" Screen, Filter Pack	1,628	LF	4.23	6.63	8.10	$30,874	
2" Well, Portland Cement Grout	9,770	LF	1.58	0.00	0.00	$15,437	
2" Well, Bentonite Seal	410	EA	12.59	26.33	32.14	$29,135	
2" PVC, Schedule 80, Connection Piping	6,107	LF	1.21	8.48	0.00	$59,172	
4" PVC, Schedule 80, Manifold Piping	4,071	LF	3.61	18.26	0.00	$89,033	
2" PVC, Schedule 80, Tee	410	EA	17.34	0.00	0.00	$7,109	
2" PVC, Schedule 80, 90 Degree, Elbow	410	EA	4.71	0.00	0.00	$1,931	
4" x 2" Reducer, PVC Schedule 80	410	EA	50.79	0.00	0.00	$20,824	
2" PVC, Sch 80, Ball Valve	410	EA	121.19	0.00	0.00	$49,688	
2" Steel, 0-300 PSI Pressure Gauge	410	EA	33.66	86.76	0.00	$49,372	
SUBTOTAL						**$1,322,560**	
Overhead Electrical Distribution							
1/0 ACSR Conductor	1908.00	LF	0.31	1.61	0.07	$3,797	
1/C #2 Aluminum, Bare, Wire	796.00	LF	0.23	1.55	0.07	$1,473	
40' Class 3 Treated Power Pole	4.00	EA	458.57	907.33	61.07	$5,708	
Straight-line Structure, 5 KV Pole Top	2.00	EA	156.66	817.63	55.03	$2,059	
Terminal Structure, 5 KV Pole Top	2.00	EA	1770.67	3102.52	208.81	$10,164	
5 KV, 3/0, Shielded Cable, Copper	120.00	LF	3.85	3.99	0.27	$973	
5 KV, 1/0 to 4/0 Conductor, Terminations and Splicing	6.00	EA	683.44	619.29	0.00	$7,816	
4" Rigid Steel Conduit	40.00	LF	13.54	24.95	0.00	$1,540	
SUBTOTAL						**$33,529**	

TABLE B-2: ALTERNATIVE 2A: AIR SPARGING, TOTAL REMEDIAL COST (CONTINUED)
Feasibility Study Report for SWMUs 2, 5, 7, and 18, Naval Weapons Station Seal Beach Detachment Concord, Concord, California

COST ESTIMATE SUMMARY

Site: SWMUs 2, 5, 7, and 18
Location: Naval Weapons Station Seal Beach, Detachment Concord
Phase: Feasibility Study
Base Year: 2004
Date: October 18, 2007

Description: Treatment of vadose zone in source area near Building IA-12 using soil vapor extraction. In situ treatment of contaminated groundwater by air sparging. Quarterly groundwater monitoring for 2 years following active treatment. Total remedial timeframe is 4 years.

DESCRIPTION	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Notes
Residual Waste Management (Soil)							
T&D of Debris to a Class I Facility, Assuming RCRA Stabilization for Lead	0.00	TON	0.00	192.91	0.00	$0	
T&D of Debris to a Class I Facility, Assuming Cal-Hazardous Material	0.00	TON	0.00	80.21	0.00	$0	
T&D of Debris to a Class II Facility	376.00	TON	0.00	55.20	0.00	$20,755	
TCLP (RCRA) (EPA 1311), Soil Analysis	2.00	EA	821.93	0.00	0.00	$1,644	
SUBTOTAL						**$22,399**	
SUBTOTAL						$1,529,700	
Contingency		25%				$382,425	10% scope + 15% bid
SUBTOTAL						**$1,912,124**	
Professional Labor Management[a]							
Design and Work Plan		8.00%				$152,970	
Project Management Labor Cost		2.00%				$38,242	
Planning Documents Labor Cost		2.00%				$38,242	
Construction Oversight Labor Cost		2.50%				$47,803	
Reporting Labor Cost		0.25%				$4,780	
As-Built Drawings Labor Cost		0.25%				$4,780	
Public Notice Labor Cost		0.04%				$765	
Site Closure Activities Labor Cost		0.00%				$0	
Permitting Labor Cost		2.50%				$47,803	
SUBTOTAL						$335,387	
TOTAL CAPITAL COST IN 2007 DOLLARS						**$2,247,511**	
OPERATIONS AND MAINTENANCE COSTS[a]:							
Air Sparging (Years 1 and 2)							active treatment
Staff Engineer	100.00	HR	0.00	110.21	0.00	$11,021	
Field Technician	520.00	HR	0.00	73.97	0.00	$38,464	
Electrical Charge	1140000.00	KWH	0.10	0.00	0.00	$114,000	
SUBTOTAL						**$163,486**	
Source Area Soil Vapor Extraction (Years 1 and 2)							active treatment
Staff Engineer	120.00	HR	0.00	110.21	0.00	$13,225	
Field Technician	280.00	HR	0.00	73.97	0.00	$20,712	
Electrical Charge	7000.00	KWH	0.10	0.00	0.00	$700	
SUBTOTAL						**$34,637**	
Source Area Soil Vapor Sampling (Year 2)							
Field Technician	40.00	HR	0	73.97	0	$2,959	
Monitoring Gas Vents	4.00	EA	0.00	34.38	0.00	$138	
Tentative ID Compunds, GC/MS, Air (30/5041/8260B - TO-14), Air Analysis	5.00	EA	236.47	0.00	0.00	$1,182	
SUBTOTAL						**$4,279**	
Quarterly Groundwater Monitoring (Years 3 and 4)							22 wells sampled quarterly
Disposable Materials per Sample	100.00	EA	12.14	0.00	0.00	$1,214	includes 2 QC and 1 equipment rinsate
Decontamination Materials per Sample	100.00	EA	10.84	0.00	0.00	$1,084	per sampling event
Nylon Tubing, 1/4" Outside Diameter	2140.00	LF	0.63	0.00	0.00	$1,348	
Water Level Indicator, Manual, Polyethylene Tape, 100' Cable, Weekly Rental	5.00	WK	95.45	0.00	0.00	$477	
Flow Through Monitor, Weekly Rental	5.00	WK	323.68	0.00	0.00	$1,618	
Water Quality Parameter Testing Device	5.00	WK	344.33	0.00	0.00	$1,722	
Nitrogen/Nitrite/Nitrate (EPA 300.0/SM 4110B, Water Analysis	100.00	EA	47.87	0.00	0.00	$4,787	
Acidity/Alkalinity (EPA 305.1/310.1), Water Analysis	100.00	EA	37.11	0.00	0.00	$3,711	
Volatile Organic Analysis (EPA 624), Water Analysis	100.00	EA	296.90	0.00	0.00	$29,690	
Sulfate (EPA 300.0), Water Analysis	100.00	EA	27.94	0.00	0.00	$2,794	
Sulfide (EPA 376.1), Water Analysis	100.00	EA	40.89	0.00	0.00	$4,089	
Ferrous Iron (S.M. 3500 Fe - D)	100.00	EA	129.55	0.00	0.00	$12,955	
4" Submersible Pump Rental, Week	5.00	WK	329.12	0.00	0.00	$1,646	
Car or Van Mileage Charge	900.00	MI	0.52	0.00	0.00	$468	
Project Manager	10.00	HR	0.00	184.67	0.00	$1,847	
Project Engineer	45.00	HR	0.00	117.91	0.00	$5,306	
Project Scientist	520.00	HR	0.00	112.13	0.00	$58,307	
Staff Scientist	120.00	HR	0.00	91.94	0.00	$11,033	
Field Technician	230.00	HR	0.00	73.97	0.00	$17,013	
Word Processing/Clerical	65.00	HR	0.00	58.31	0.00	$3,790	
Draftsman/CADD	55.00	HR	0.00	76.46	0.00	$4,205	
SUBTOTAL						**$169,103**	
ANNUAL SUBTOTAL (Year 1) including 25% contingency						**$247,653**	
ANNUAL SUBTOTAL (Year 2) including 25% contingency						**$253,002**	
ANNUAL SUBTOTAL (Years 3 and 4) including 25% contingency						**$211,379**	
PERIODIC COSTS[a]:	**Year**						
Well Abandonment	2	417.00	LS		98.05	$40,887	
Well Abandonment	4	18.00	EA		417.75	$7,520	
Close-out Report	4	1.00	EA		21553.13	$21,553	Closeout report
SUBTOTAL						$69,959	
Contingency		25%				$17,490	10% scope + 15% bid
SUBTOTAL						**$87,449**	

TABLE B-2: ALTERNATIVE 2A: AIR SPARGING, TOTAL REMEDIAL COST (CONTINUED)
Feasibility Study Report for SWMUs 2, 5, 7, and 18, Naval Weapons Station Seal Beach Detachment Concord, Concord, California

COST ESTIMATE SUMMARY

Site: SWMUs 2, 5, 7, and 18
Location: Naval Weapons Station Seal Beach, Detachment Concord
Phase: Feasibility Study
Base Year: 2004
Date: October 18, 2007

Description: Treatment of vadose zone in source area near Building IA-12 using soil vapor extraction. In situ treatment of contaminated groundwater by air sparging. Quarterly groundwater monitoring for 2 years following active treatment. Total remedial timeframe is 4 years.

DESCRIPTION	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Notes
PRESENT VALUE ANALYSES:							
Cost Type	**Yearb**	**Total Cost 2004**		**Total Cost 2007c**	**Future Value 2.0%**	**Net Present Value 4.4%**	**Notes**
Capital Cost	1	$2,247,511		$2,294,709	$2,317,542	$2,268,179	Year 0 capital construction
O&M	2	$247,653		$252,854	$260,477	$244,185	Year 1 monitoring
O&M and Periodic Cost	3	$304,110		$310,496	$326,255	$292,958	Year 2 monitoring and well abandonment
O&M	4	$211,379		$215,818	$231,306	$198,946	Year 3 monitoring
O&M and Periodic Cost	5	$247,719		$252,921	$276,494	$227,790	Year 4 monitoring, well abandonment, and closeout report
		$3,258,372		**$3,326,798**	**$3,412,075**	**$3,232,059**	
TOTAL PRESENT VALUE OF ALTERNATIVE 2A						**$3,232,059**	

Notes:

a Costs provided by RACER 2004 (Earth Tech 2004).

b Years identified in cost estimate summary refer to O&M years, with capital construction occuring in year 0; however, project years were used for net present value calculations. Capital construction would occur in year 1 of the project, with O&M years 1 through 10 corresponding to project years 2 through 11.

c Updated to 2007 dollars by applying escalation factor (1.0210) from RACER 2006 (Earth Tech 2006).

Sources:

Earth Tech. 2004. "Remedial Action Cost Engineering and Requirements™ System Parametric Cost-Estimating Software for Remediation and Restoration Projects." RACER™ Version 6.0.0.

Earth Tech. 2006. "Remedial Action Cost Engineering and Requirements™ System Parametric Cost-Estimating Software for Remediation and Restoration Projects." RACER™ Version 8.1.

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
25	Present-Worth Cost: $2.5 million	Table 4	Final Feasibility Study Report for Solid Waste Management Units 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Appendix B, Table B-3. Tetra Tech. March 20, 2008.

TABLE B-3: ALTERNATIVE 2B: AIR SPARGING AND MONITORED NATURAL ATTENUATION, TOTAL REMEDIAL COST
Feasibility Study Report for SWMUs 2, 5, 7, and 18, Naval Weapons Station Seal Beach Detachment Concord, Concord, California

COST ESTIMATE SUMMARY

Site: SWMUs 2, 5, 7, and 18
Location: Naval Weapons Station Seal Beach, Detachment Concord
Phase: Feasibility Study
Base Year: 2004
Date: October 18, 2007

Description: Treatment of vadose zone in source area near Building IA-12 using soil vapor extraction. In situ treatment of contaminated groundwater by air sparging where PCE concentrations exceed 10 µg/L. MNA for remainder of groundwater plume for 10 years. Quarterly groundwater monitoring for 2 years following active treatment, annual monitoring for 6 years. Total remedial timeframe is 10 years.

DESCRIPTION	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Notes
CAPITAL COSTS[a]:							
Start-up Costs							
Other Direct Costs	1.00	LS	25449.05	31079.37	12837.13	**$69,366**	
Source Area Vadose Zone							
Soil Vapor Extraction (7 SVE wells installed to 12 ft bgs with 5-ft screens)							
Direct-Push Rig, Truck-Mounted, Nonhydraulic, includes Labor, and Sampling Decontamination	3.00	DAY	248.99	0.00	0.00	$747	
Mobilize/Demobilize Direct-Push Rig and Crew	3.00	DAY	829.96	0.00	0.00	$2,490	
Furnish 55-Gallon Drum for Drill Cuttings	4.00	EA	114.10	0.00	0.00	$456	
Organic Vapor Analyzer Rental, per Day	3.00	DAY	165.99	0.00	0.00	$498	
1 HP, 230V, 98 SCFM, Vapor Recovery System	1.00	EA	5,686.86	1,302.80	0.00	$6,990	
Field Technician	40.00	HR	0.00	73.97	0.00	$2,959	
2" PVC, Schedule 40, Well Casing	50.00	LF	1.73	8.48	11.53	$1,087	
2" PVC, Schedule 40, Well Screen	35.00	LF	4.00	10.94	14.87	$1,043	
2" PVC, Well Plug	7.00	EA	8.43	12.72	17.29	$269	
2" Screen, Filter Pack	70.00	LF	4.50	7.21	9.80	$1,506	
2" Well, Portland Cement Grout	20.00	LF	1.67	0.00	0.00	$33	
2" Well, Bentonite Seal	7.00	EA	13.37	28.62	38.91	$566	
2" PVC, Schedule 80, Connection Piping	175.00	LF	1.28	9.22	0.00	$1,838	
2" PVC, Schedule 80, Tee	7.00	EA	18.41	0.00	0.00	$129	
2" PVC, Schedule 80, 90 Degree, Elbow	7.00	EA	5.01	0.00	0.00	$35	
2" PVC, Sch 80, Ball Valve	7.00	EA	128.70	0.00	0.00	$901	
2" Steel, 0-300 PSI Pressure Gauge	7.00	EA	33.66	86.76	0.00	$843	
SUBTOTAL						**$22,390**	
Installation of Groundwater Monitoring Wells (18 wells to 27 ft bgs with 10-ft screens)							
Direct-Push Rig, Truck-Mounted, Nonhydraulic, includes Labor, Sampling, and Decontamination	6.00	DAY	248.99	0.00	0.00	$1,494	
Mobilize/Demobilize Direct-Push Rig and Crew	6.00	DAY	829.96	0.00	0.00	$4,980	
Organic Vapor Analyzer Rental, per Day	6.00	DAY	165.99	0.00	0.00	$996	
Volatile Organic Analysis (SW 5035/SW 8260B), Soil Analysis	36.00	EA	296.90	0.00	0.00	$10,688	
Field Technician	180.00	HR	0.00	73.97	0.00	$13,315	
2" PVC, Schedule 40, Well Casing	306.00	LF	1.63	7.80	9.52	$5,799	
2" PVC, Schedule 40, Well Screen	180.00	LF	3.77	10.06	12.29	$4,702	
2" PVC, Well Plug	18.00	EA	7.94	11.70	14.29	$611	
Split Spoon Sampling	108.00	LF	0.00	33.43	40.82	$8,019	
Furnish 55-Gallon Drum for Drill Cuttings and Development Water	27.00	EA	114.10	0.00	0.00	$3,081	
2" Screen, Filter Pack	216.00	LF	4.23	6.63	8.10	$4,095	
2" Well, Portland Cement Grout	252.00	LF	1.58	0.00	0.00	$398	
2" Well, Bentonite Seal	18.00	EA	12.59	26.33	32.14	$1,279	
SUBTOTAL						**$59,456**	
Air Sparging (160 wells installed to 29 ft bgs)							
Organic Vapor Analyzer Rental, per Day	60	DAY	165.99	0.00	0.00	$9,949	
Direct-Push Rig, Truck-Mounted, Nonhydraulic, includes Labor, Sampling, and Decontamination	76	DAY	248.99	0.00	0.00	$18,958	
Mobilize/Demobilize Direct-Push Rig and Crew	76	DAY	829.96	0.00	0.00	$63,193	
Air Sparge System, Blower 163 SCFM, 15 HP, 15 PSI, base, intake filter, silencer, pulleys, belt, belt guard.	5	EA	17296.18	0.00	0.00	$93,399	
Field Technician	959	HR	0.00	73.97	0.00	$70,938	
2" PVC, Schedule 40, Well Casing	4,301	LF	1.63	7.80	9.52	$81,506	
2" PVC, Schedule 40, Well Screen	319	LF	3.77	10.06	12.29	$8,322	
2" PVC, Well Plug	160	EA	7.94	11.70	14.29	$5,429	
Furnish 55 Gallon Drum for Drill Cuttings & Development Water	244	EA	114.10	0.00	0.00	$27,850	
2" Screen, Filter Pack	637	LF	4.23	6.63	8.10	$12,081	
2" Well, Portland Cement Grout	3,823	LF	1.58	0.00	0.00	$6,041	
2" Well, Bentonite Seal	160	EA	12.59	26.33	32.14	$11,370	
2" PVC, Schedule 80, Connection Piping	2,390	LF	1.21	8.48	0.00	$23,154	
4" PVC, Schedule 80, Manifold Piping	1,593	LF	3.61	18.26	0.00	$34,839	
2" PVC, Schedule 80, Tee	160	EA	17.34	0.00	0.00	$2,774	
2" PVC, Schedule 80, 90 Degree, Elbow	160	EA	4.71	0.00	0.00	$754	
4" x 2" Reducer, PVC Schedule 80	160	EA	50.79	0.00	0.00	$8,126	
2" PVC, Sch 80, Ball Valve	160	EA	121.19	0.00	0.00	$19,390	
2" Steel, 0-300 PSI Pressure Gauge	160	EA	33.66	86.76	0.00	$19,267	
SUBTOTAL						**$517,341**	
Overhead Electrical Distribution							
1/0 ACSR Conductor	1908.00	LF	0.31	1.61	0.07	$3,797	
1/C #2 Aluminum, Bare, Wire	796.00	LF	0.23	1.55	0.07	$1,473	
40' Class 3 Treated Power Pole	4.00	EA	458.57	907.33	61.07	$5,708	
Straight-line Structure, 5 KV Pole Top	2.00	EA	156.66	817.63	55.03	$2,059	
Terminal Structure, 5 KV Pole Top	2.00	EA	1770.67	3102.52	208.81	$10,164	
5 KV, 3/0, Shielded Cable, Copper	120.00	LF	3.85	3.99	0.27	$973	
5 KV, 1/0 to 4/0 Conductor, Terminations and Splicing	6.00	EA	683.44	619.29	0.00	$7,816	
4" Rigid Steel Conduit	40.00	LF	13.54	24.95	0.00	$1,540	
SUBTOTAL						**$33,529**	

TABLE B-3: ALTERNATIVE 2B: AIR SPARGING AND MONITORED NATURAL ATTENUATION, TOTAL REMEDIAL COST (CONTINUED)
Feasibility Study Report for SWMUs 2, 5, 7, and 18, Naval Weapons Station Seal Beach Detachment Concord, Concord, California

COST ESTIMATE SUMMARY

Site: SWMUs 2, 5, 7, and 18
Location: Naval Weapons Station Seal Beach, Detachment Concord
Phase: Feasibility Study
Base Year: 2004
Date: October 18, 2007

Description: Treatment of vadose zone in source area near Building IA-12 using soil vapor extraction. In situ treatment of contaminated groundwater by air sparging where PCE concentrations exceed 10 µg/L. MNA for remainder of groundwater plume for 10 years. Quarterly groundwater monitoring for 2 years following active treatment, annual monitoring for 6 years. Total remedial timeframe is 10 years.

DESCRIPTION	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Notes
Residual Waste Management (Soil)							
T&D of Debris to a Class I Facility, Assuming RCRA Stabilization for Lead	0.00	TON	0.00	192.91	0.00	$0	
T&D of Debris to a Class I Facility, Assuming Cal-Hazardous Material	0.00	TON	0.00	80.21	0.00	$0	
T&D of Debris to a Class II Facility	188.00	TON	0.00	55.20	0.00	$10,378	
TCLP (RCRA) (EPA 1311), Soil Analysis	2.00	EA	821.93	0.00	0.00	$1,644	
SUBTOTAL						**$12,021**	
SUBTOTAL						$714,103	
Contingency		25%				$178,526	10% scope + 15% bid
SUBTOTAL						**$892,629**	
Professional Labor Management [a]							
Design and Work Plan		15.00%				$133,894	
Project Management Labor Cost		2.00%				$17,853	
Planning Documents Labor Cost		2.00%				$17,853	
Construction Oversight Labor Cost		2.50%				$22,316	
Reporting Labor Cost		0.25%				$2,232	
As-Built Drawings Labor Cost		0.25%				$2,232	
Public Notice Labor Cost		0.04%				$357	
Site Closure Activities Labor Cost		0.00%				$0	
Permitting Labor Cost		2.50%				$22,316	
SUBTOTAL						$219,051	
TOTAL CAPITAL COST IN 2007 DOLLARS						**$1,111,680**	
OPERATIONS AND MAINTENANCE COSTS [a]:							
Air Sparging (Years 1 and 2)							active treatment
Staff Engineer	50.00	HR	0.00	110.21	0.00	$5,511	
Field Technician	310.00	HR	0.00	73.97	0.00	$22,931	
Electrical Charge	450000.00	KWH	0.10	0.00	0.00	$45,000	
SUBTOTAL						**$73,441**	
Source Area Soil Vapor Extraction (Years 1 and 2)							active treatment
Staff Engineer	120.00	HR	0.00	110.21	0.00	$13,225	
Field Technician	280.00	HR	0.00	73.97	0.00	$20,712	
Electrical Charge	7000.00	KWH	0.10	0.00	0.00	$ 700	
SUBTOTAL						**$34,637**	
Source Area Soil Vapor Sampling (Year 2)							
Field Technician	40.00	HR	0	73.97	0	$2,959	
Monitoring Gas Vents	4.00	EA	0.00	34.38	0.00	$138	
Tentative ID Compunds, GC/MS, Air (30/5041/8260B - TO-14), Air Analysis	5.00	EA	236.47	0.00	0.00	$1,182	
SUBTOTAL						**$4,279**	
Quarterly Groundwater Monitoring (Years 1 and 2)							22 wells samples quarterly
Disposable Materials per Sample	100.00	EA	12.14	0.00	0.00	$1,214	includes 2 QC and 1 equipment rinsate
Decontamination Materials per Sample	100.00	EA	10.84	0.00	0.00	$1,084	per sampling event
Nylon Tubing, 1/4" Outside Diameter	2140.00	LF	0.63	0.00	0.00	$1,348	
Water Level Indicator, Manual, Polyethylene Tape, 100' Cable, Weekly Rental	5.00	WK	95.45	0.00	0.00	$477	
Flow Through Monitor, Weekly Rental	5.00	WK	323.68	0.00	0.00	$1,618	
Water Quality Parameter Testing Device	5.00	WK	344.33	0.00	0.00	$1,722	
Nitrogen/Nitrite/Nitrate (EPA 300.0/SM 4110B, Water Analysis	100.00	EA	47.87	0.00	0.00	$4,787	
Acidity/Alkalinity (EPA 305.1/310.1), Water Analysis	100.00	EA	37.11	0.00	0.00	$3,711	
Volatile Organic Analysis (EPA 624), Water Analysis	100.00	EA	296.90	0.00	0.00	$29,690	
Sulfate (EPA 300.0), Water Analysis	100.00	EA	27.94	0.00	0.00	$2,794	
Sulfide (EPA 376.1), Water Analysis	100.00	EA	40.89	0.00	0.00	$4,089	
Ferrous Iron (S.M. 3500 Fe - D)	100.00	EA	129.55	0.00	0.00	$12,955	
4" Submersible Pump Rental, Week	5.00	WK	329.12	0.00	0.00	$1,646	
Car or Van Mileage Charge	900.00	MI	0.52	0.00	0.00	$468	
Project Manager	10.00	HR	0.00	184.67	0.00	$1,847	
Project Engineer	45.00	HR	0.00	117.91	0.00	$5,306	
Project Scientist	520.00	HR	0.00	112.13	0.00	$58,307	
Staff Scientist	120.00	HR	0.00	91.94	0.00	$11,033	
Field Technician	230.00	HR	0.00	73.97	0.00	$17,013	
Word Processing/Clerical	65.00	HR	0.00	58.31	0.00	$3,790	
Draftsman/CADD	55.00	HR	0.00	76.46	0.00	$4,205	
SUBTOTAL						**$169,103**	

TABLE B-3: ALTERNATIVE 2B: AIR SPARGING AND MONITORED NATURAL ATTENUATION, TOTAL REMEDIAL COST (CONTINUED)
Feasibility Study Report for SWMUs 2, 5, 7, and 18, Naval Weapons Station Seal Beach Detachment Concord, Concord, California

COST ESTIMATE SUMMARY

Site: SWMUs 2, 5, 7, and 18
Location: Naval Weapons Station Seal Beach, Detachment Concord
Phase: Feasibility Study
Base Year: 2004
Date: October 18, 2007

Description: Treatment of vadose zone in source area near Building IA-12 using soil vapor extraction. In situ treatment of contaminated groundwater by air sparging where PCE concentrations exceed 10 µg/L. MNA for remainder of groundwater plume for 10 years. Quarterly groundwater monitoring for 2 years following active treatment, annual monitoring for 6 years. Total remedial timeframe is 10 years.

DESCRIPTION	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Notes
Quarterly Groundwater Monitoring (Quarterly Sampling, Years 3 and 4)							22 wells sampled quarterly
Disposable Materials per Sample	100.00	EA	12.14	0.00	0.00	$1,214	includes 2 QC and 1 equipment rinsate
Decontamination Materials per Sample	100.00	EA	10.84	0.00	0.00	$1,084	per sampling event
Nylon Tubing, 1/4" Outside Diameter	2140.00	LF	0.63	0.00	0.00	$1,348	
Water Level Indicator, Manual, Polyethylene Tape, 100' Cable, Weekly Rental	5.00	WK	95.45	0.00	0.00	$477	
Flow Through Monitor, Weekly Rental	5.00	WK	323.68	0.00	0.00	$1,618	
Water Quality Parameter Testing Device	5.00	WK	344.33	0.00	0.00	$1,722	
Nitrogen/Nitrite/Nitrate (EPA 300.0/SM 4110B, Water Analysis	100.00	EA	47.87	0.00	0.00	$4,787	
Acidity/Alkalinity (EPA 305.1/310.1), Water Analysis	100.00	EA	37.11	0.00	0.00	$3,711	
Volatile Organic Analysis (EPA 624), Water Analysis	100.00	EA	296.90	0.00	0.00	$29,690	
Sulfate (EPA 300.0), Water Analysis	100.00	EA	27.94	0.00	0.00	$2,794	
Sulfide (EPA 376.1), Water Analysis	100.00	EA	40.89	0.00	0.00	$4,089	
Ferrous Iron (S.M. 3500 Fe - D)	100.00	EA	129.55	0.00	0.00	$12,955	
4" Submersible Pump Rental, Week	5.00	WK	329.12	0.00	0.00	$1,646	
Car or Van Mileage Charge	900.00	MI	0.52	0.00	0.00	$468	
Project Manager	10.00	HR	0.00	184.67	0.00	$1,847	
Project Engineer	45.00	HR	0.00	117.91	0.00	$5,306	
Project Scientist	520.00	HR	0.00	112.13	0.00	$58,307	
Staff Scientist	120.00	HR	0.00	91.94	0.00	$11,033	
Field Technician	230.00	HR	0.00	73.97	0.00	$17,013	
Word Processing/Clerical	65.00	HR	0.00	58.31	0.00	$3,790	
Draftsman/CADD	55.00	HR	0.00	76.46	0.00	$4,205	
SUBTOTAL						**$169,103**	
Annual Groundwater Monitoring (Years 5 through 10)[a]							22 wells sampled annually
Disposable Materials per Sample	25.00	EA	12.14	0.00	0.00	$304	includes 2 QC and 1 equipment rinsate
Decontamination Materials per Sample	25.00	EA	10.84	0.00	0.00	$271	per sampling event
Nylon Tubing, 1/4" Outside Diameter	534.00	LF	0.63	0.00	0.00	$336	
Water Level Indicator, Manual, Polyethylene Tape, 100' Cable, Weekly Rental	2.00	WK	95.45	0.00	0.00	$191	
Flow Through Monitor, Weekly Rental	2.00	WK	323.68	0.00	0.00	$647	
Water Quality Parameter Testing Device	2.00	WK	344.33	0.00	0.00	$689	
Nitrogen/Nitrite/Nitrate (EPA 300.0/SM 4110B, Water Analysis	25.00	EA	47.87	0.00	0.00	$1,197	
Acidity/Alkalinity (EPA 305.1/310.1), Water Analysis	25.00	EA	37.11	0.00	0.00	$928	
Volatile Organic Analysis (EPA 624), Water Analysis	25.00	EA	296.90	0.00	0.00	$7,423	
Sulfate (EPA 300.0), Water Analysis	25.00	EA	27.94	0.00	0.00	$699	
Sulfide (EPA 376.1), Water Analysis	25.00	EA	40.89	0.00	0.00	$1,022	
Ferrous Iron (S.M. 3500 Fe - D)	25.00	EA	129.55	0.00	0.00	$3,239	
4" Submersible Pump Rental, Week	2.00	WK	329.12	0.00	0.00	$658	
Car or Van Mileage Charge	225.00	MI	0.52	0.00	0.00	$117	
Project Manager	6.00	HR	0.00	184.67	0.00	$1,108	
Project Engineer	8.00	HR	0.00	117.91	0.00	$943	
Project Scientist	115.00	HR	0.00	112.13	0.00	$12,895	
Staff Scientist	20.00	HR	0.00	91.94	0.00	$1,839	
Field Technician	45.00	HR	0.00	73.97	0.00	$3,329	
Word Processing/Clerical	15.00	HR	0.00	58.31	0.00	$875	
Draftsman/CADD	15.00	HR	0.00	76.46	0.00	$1,147	
SUBTOTAL						**$39,854**	
ANNUAL SUBTOTAL (Year 1) including 25% contingency						**$346,476**	
ANNUAL SUBTOTAL (Year 2) including 25% contingency						**$351,825**	
ANNUAL SUBTOTAL (Years 3 and 4) including 25% contingency						**$211,379**	
ANNUAL SUBTOTAL (Years 5 to 10) including 25% contingency						**$49,818**	
PERIODIC COSTS[a]:	**Year**						
Well Abandonment	2	417.00	LS		98.05	$40,887	
Well Abandonment	10	18.00	EA		417.75	$7,520	
Closeout Report	10	1.00	EA		21553.13	$21,553	Closeout report
SUBTOTAL						$69,959	
Contingency		25%				$17,490	10% scope + 15% bid
SUBTOTAL						**$87,449**	

TABLE B-3: ALTERNATIVE 2B: AIR SPARGING AND MONITORED NATURAL ATTENUATION, TOTAL REMEDIAL COST (CONTINUED)
Feasibility Study Report for SWMUs 2, 5, 7, and 18, Naval Weapons Station Seal Beach Detachment Concord, Concord, California

COST ESTIMATE SUMMARY

Site: SWMUs 2, 5, 7, and 18
Location: Naval Weapons Station Seal Beach, Detachment Concord
Phase: Feasibility Study
Base Year: 2004
Date: October 18, 2007

Description: Treatment of vadose zone in source area near Building IA-12 using soil vapor extraction. In situ treatment of contaminated groundwater by air sparging where PCE concentrations exceed 10 µg/L. MNA for remainder of groundwater plume for 10 years. Quarterly groundwater monitoring for 2 years following active treatment, annual monitoring for 6 years. Total remedial timeframe is 10 years.

DESCRIPTION	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Notes

PRESENT VALUE ANALYSES:

Cost Type	Yearb	Total Cost 2004	Total Cost 2007c	Future Value 2.0%	Net Present Value 4.4%	Notes
Capital Cost	1	$1,111,680	$1,135,025	$1,146,319	$1,121,903	Year 0 capital construction
O&M	2	$346,476	$353,752	$364,418	$341,624	Year 1 monitoring
O&M and Periodic Cost	3	$402,933	$411,395	$432,274	$388,158	Year 2 monitoring and well abandonment
O&M	4	$211,379	$215,818	$231,306	$198,946	Year 3 monitoring
O&M	5	$211,379	$215,818	$235,932	$194,373	Year 4 monitoring
O&M	6	$49,818	$50,864	$56,717	$44,757	Year 5 monitoring
O&M	7	$49,818	$50,864	$57,851	$43,728	Year 6 monitoring
O&M	8	$49,818	$50,864	$59,008	$42,723	Year 7 monitoring
O&M	9	$49,818	$50,864	$60,189	$41,741	Year 8 monitoring
O&M	10	$49,818	$50,864	$61,392	$40,781	Year 9 monitoring
O&M and Periodic Cost	11	$86,159	$87,968	$108,300	$68,908	Year 10 monitoring, well abandonment and closeout report
		$2,619,096	**$2,674,097**	**$2,813,707**	**$2,527,642**	

TOTAL PRESENT VALUE OF ALTERNATIVE 2B **$2,527,642**

Notes:

a Costs provided by RACER 2004 (Earth Tech 2004).

b Years identified in cost estimate summary refer to O&M years, with capital construction occuring in year 0; however, project years were used for net present value calculations. Capital construction would occur in year 1 of the project, with O&M years 1 through 10 corresponding to project years 2 through 11.

c Updated to 2007 dollars by applying escalation factor (1.0210) from RACER 2006 (Earth Tech 2006).

Sources:

Earth Tech. 2004. "Remedial Action Cost Engineering and Requirements™ System Parametric Cost-Estimating Software for Remediation and Restoration Projects." RACER™ Version 6.0.0.

Earth Tech. 2006. "Remedial Action Cost Engineering and Requirements™ System Parametric Cost-Estimating Software for Remediation and Restoration Projects." RACER™ Version 8.1.

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
26	Present-Worth Cost: $2.1 million	Table 4	Final Feasibility Study Report for Solid Waste Management Units 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Appendix B, Table B-4. Tetra Tech. March 20, 2008.

TABLE B-4: ALTERNATIVE 3A: ENHANCED BIOREMEDIATION, TOTAL REMEDIAL COST
Feasibility Study Report for SWMUs 2, 5, 7, and 18, Naval Weapons Station Seal Beach Detachment Concord, Concord, California

COST ESTIMATE SUMMARY

Site: SWMUs 2, 5, 7, and 18
Location: Naval Weapons Station Seal Beach, Detachment Concord
Phase: Feasibility Study
Base Year: 2004
Date: October 18, 2007

Description: Treatment of vadose zone using soil vapor extraction. Addition of hydrogen-releasing compounds™ (HRC) to contaminated groundwater (entire plume) in two injections over 3 years. Quarterly groundwater monitoring during first 2 years of active treatment, semiannual monitoring for 3 years thereafter. Total remedial timeframe is 5 years.

DESCRIPTION	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Notes
CAPITAL COSTS[a]:							
Startup Costs							
Other Direct Costs	1.00	LS	25449.05	31079.37	12837.13	**$69,366**	
Source Area Vadose Zone							
Soil Vapor Extraction (7 SVE wells installed to 12 ft bgs with 5-ft screens)							
Direct-Push Rig, Truck-Mounted, Nonhydraulic, includes Labor, Sampling, and Decontamination	3.00	DAY	248.99	0.00	0.00	$747	
Mobilize/Demobilize Direct-Push Rig and Crew	3.00	DAY	829.96	0.00	0.00	$2,490	
Furnish 55-Gallon Drum for Drill Cuttings	4.00	EA	114.10	0.00	0.00	$456	
Organic Vapor Analyzer Rental, per Day	3.00	DAY	165.99	0.00	0.00	$498	
1 HP, 230V, 98 SCFM, Vapor Recovery System	1.00	EA	5,686.86	1,302.80	0.00	$6,990	
Field Technician	40.00	HR	0.00	73.97	0.00	$2,959	
2" PVC, Schedule 40, Well Casing	50.00	LF	1.73	8.48	11.53	$1,087	
2" PVC, Schedule 40, Well Screen	35.00	LF	4.00	10.94	14.87	$1,043	
2" PVC, Well Plug	7.00	EA	8.43	12.72	17.29	$269	
2" Screen, Filter Pack	70.00	LF	4.50	7.21	9.80	$1,506	
2" Well, Portland Cement Grout	20.00	LF	1.67	0.00	0.00	$33	
2" Well, Bentonite Seal	7.00	EA	13.37	28.62	38.91	$566	
2" PVC, Schedule 80, Connection Piping	175.00	LF	1.28	9.22	0.00	$1,838	
2" PVC, Schedule 80, Tee	7.00	EA	18.41	0.00	0.00	$129	
2" PVC, Schedule 80, 90 Degree, Elbow	7.00	EA	5.01	0.00	0.00	$35	
2" PVC, Sch 80, Ball Valve	7.00	EA	128.70	0.00	0.00	$901	
2" Steel, 0-300 PSI Pressure Gauge	7.00	EA	33.66	86.76	0.00	$843	
SUBTOTAL						**$22,390**	
Installation of Groundwater Monitoring Wells (18 wells to 27 ft bgs with 10-ft screens)							
Direct-Push Rig, Truck-Mounted, Nonhydraulic, includes Labor, Sampling, and Decontamination	6.00	DAY	248.99	0.00	0.00	$1,494	
Mobilize/Demobilize Direct-Push Rig and Crew	6.00	DAY	829.96	0.00	0.00	$4,980	
Organic Vapor Analyzer Rental, per Day	6.00	DAY	165.99	0.00	0.00	$996	
Volatile Organic Analysis (SW 5035/SW 8260B), Soil Analysis	36.00	EA	296.90	0.00	0.00	$10,688	
Field Technician	180.00	HR	0.00	73.97	0.00	$13,315	
2" PVC, Schedule 40, Well Casing	306.00	LF	1.63	7.80	9.52	$5,799	
2" PVC, Schedule 40, Well Screen	180.00	LF	3.77	10.06	12.29	$4,702	
2" PVC, Well Plug	18.00	EA	7.94	11.70	14.29	$611	
Split Spoon Sampling	108.00	LF	0.00	33.43	40.82	$8,019	
Furnish 55 Gallon Drum for Drill Cuttings & Development Water	27.00	EA	114.10	0.00	0.00	$3,081	
2" Screen, Filter Pack	216.00	LF	4.23	6.63	8.10	$4,095	
2" Well, Portland Cement Grout	252.00	LF	1.58	0.00	0.00	$398	
2" Well, Bentonite Seal	18.00	EA	12.59	26.33	32.14	$1,279	
SUBTOTAL						**$59,456**	
HRC Injection and Materials[b]							
Pilot Test							
Work Plan						$10,000	
HRC material	420.00	LB	5.75	0.00	0.00	$2,415	
Shipping and Sales Tax	420.00	LB	0.64	0.00	0.00	$268	
Mobilization[c]	1.00	LS	0.00	0.00	0.00	$600	
Drill Rig[c]	1.00	DAY	0.00	0.00	1750.00	$1,750	
Injection Pump[c]	1.00	DAY	0.00	0.00	325.00	$325	
Borehole Abandonment[c]	75.00	LF	0.00	0.00	1.00	$75	Upper 15 feet will be abandoned
Steam Cleaner[c]	1.00	DAY	0.00	0.00	95.00	$95	
Staff Scientist[a]	78.00	HR	0.00	91.94	0.00	$7,171	

TABLE B-4: ALTERNATIVE 3A: ENHANCED BIOREMEDIATION, TOTAL REMEDIAL COST (CONTINUED)
Feasibility Study Report for SWMUs 2, 5, 7, and 18, Naval Weapons Station Seal Beach Detachment Concord, Concord, California

COST ESTIMATE SUMMARY

Site: SWMUs 2, 5, 7, and 18
Location: Naval Weapons Station Seal Beach, Detachment Concord
Phase: Feasibility Study
Base Year: 2004
Date: October 18, 2007

Description: Treatment of vadose zone using soil vapor extraction. Addition of hydrogen-releasing compounds™ (HRC) to contaminated groundwater (entire plume) in two injections over 3 years. Quarterly groundwater monitoring during first 2 years of active treatment, semiannual monitoring for 3 years thereafter. Total remedial timeframe is 5 years.

DESCRIPTION	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Notes
Pilot Test Groundwater Monitoring[a]							3 wells sampled quarterly
RSK175 analysis for dissolved gases	14.00	EA	97.83	0.00	0.00	$1,370	
Disposable Materials per Sample	14.00	EA	10.76	0.00	0.00	$151	
Decontamination Materials per Sample	14.00	EA	9.68	0.00	0.00	$136	
Nylon Tubing, 1/4" Outside Diameter	325.00	LF	0.56	0.00	0.00	$182	
Water Level Indicator, Manual, Polyethylene Tape, 100' Cable, Weekly Rental	14.00	WK	88.82	0.00	0.00	$1,243	
Flow Through Monitor, Weekly Rental	4.00	WK	301.20	0.00	0.00	$1,205	
Water Quality Parameter Testing Device	4.00	WK	307.24	0.00	0.00	$1,229	
Nitrogen/Nitrite/Nitrate (EPA 300.0/SM 4110B, Water Analysis	14.00	EA	55.69	0.00	0.00	$780	
Acidity/Alkalinity (EPA 305.1/310.1), Water Analysis	14.00	EA	38.58	0.00	0.00	$540	
Volatile Organic Analysis (EPA 624), Water Analysis	14.00	EA	276.27	0.00	0.00	$3,868	
Chloride (EPA 300), Water Analysis	14.00	EA	28.41	0.00	0.00	$398	
Sulfate (EPA 300.0), Water Analysis	14.00	EA	28.94	0.00	0.00	$405	
Sulfide (EPA 376.1), Water Analysis	14.00	EA	49.10	0.00	0.00	$687	
Ferrous Iron (S.M. 3500 Fe - D)	14.00	EA	146.31	0.00	0.00	$2,048	
55 Gallon 17C Closed Head Steel Drum	4.00	EA	91.19	0.00	0.00	$365	
4" Submersible Pump Rental, Day	4.00	DAY	103.31	0.00	0.00	$413	
Car or Van Mileage Charge	400.00	MI	0.48	0.00	0.00	$192	
Project Scientist	63.00	HR	0.00	88.09	0.00	$5,549	
Field Technician	71.00	HR	0.00	73.97	0.00	$5,252	
Word Processing/Clerical	7.00	HR	0.00	48.72	0.00	$341	
Draftsman/CADD	7.00	HR	0.00	75.50	0.00	$528	
Primary Treatment							
HRC material	41827.00	LB	5.75	0.00	0.00	$240,505	
Shipping and Sales Tax	41827.00	LB	0.64	0.00	0.00	$26,718	
Mobilization[c]	1.00	LS	0.00	0.00	0.00	$600	
Drill Rig[c]	62.00	DAY	0.00	0.00	1750.00	$108,500	Drilling 240 feet per day
Injection Pump[c]	62.00	DAY	0.00	0.00	325.00	$20,150	
Borehole Abandonment[c]	7594.00	LF	0.00	0.00	1.00	$7,594	Only upper 15 feet will be abandoned
Steam Cleaner[c]	62.00	DAY	0.00	0.00	95.00	$5,890	
Hand Auger[c]	3.00	DAY	0.00	0.00	750.00	$2,250	Assumes 8 cores per day
Local Travel for Hand Auger Crew[c]	3.00	DAY	0.00	150.00	0.00	$450	
Concrete Coring[c]	3.00	DAY	0.00	0.00	1100.00	$3,300	Assumes 8 cores per day
Local Travel for Concrete Coring Crew[c]	3.00	DAY	0.00	150.00	0.00	$450	
Car or Van Mileage Charge[a]	11000.00	MI	0.48	0.00	0.00	$5,280	
Followup Treatment (50% Retreat, If Necessary)							
HRC material	20913.50	LB	5.75	0.00	0.00	$120,253	
Shipping and Sales Tax	20913.50	LB	0.64	0.00	0.00	$13,359	
Mobilization[c]	1.00	LS	0.00	0.00	0.00	$600	
Drill Rig[c]	30.00	DAY	0.00	0.00	1750.00	$52,500	Drilling 240 feet per day
Injection Pump[c]	30.00	DAY	0.00	0.00	325.00	$9,750	
Borehole Abandonment[c]	3797.00	LF	0.00	0.00	1.00	$3,797	Only upper 15 feet will be abandoned
Steam Cleaner[c]	23.00	DAY	0.00	0.00	95.00	$2,185	
Hand Auger[c]	1.00	DAY	0.00	0.00	750.00	$750	Assumes 8 cores per day
Local Travel for Hand Auger Crew[c]	1.00	DAY	0.00	150.00	0.00	$150	
Concrete Coring[c]	1.00	DAY	0.00	0.00	1100.00	$1,100	Assumes 8 cores per day
Local Travel for Concrete Coring Crew[c]	1.00	DAY	0.00	150.00	0.00	$150	
Car or Van Mileage Charge[a]	5500.00	MI	0.48	0.00	0.00	$2,640	
SUBTOTAL all HRC Material and Injections						**$678,502**	
SUBTOTAL						$829,714	
Contingency		25%				$207,428	10% scope + 15% bid
SUBTOTAL						**$1,037,142**	
Professional Labor Management[a]							
Design and Work Plan		10.00%				$103,714	
Project Management Labor Cost		2.50%				$25,929	
Planning Documents Labor Cost		2.50%				$25,929	
Construction Oversight Labor Cost		2.75%				$28,521	
Reporting Labor Cost		0.35%				$3,630	
As-Built Drawings Labor Cost		0.35%				$3,630	
Public Notice Labor Cost		0.08%				$830	
Site Closure Activities Labor Cost		0.00%				$0	
Permitting Labor Cost		5.00%				$51,857	
SUBTOTAL						**$244,040**	
TOTAL CAPITAL COST IN 2007 DOLLARS						**$1,281,181**	

TABLE B-4: ALTERNATIVE 3A: ENHANCED BIOREMEDIATION, TOTAL REMEDIAL COST (CONTINUED)
Feasibility Study Report for SWMUs 2, 5, 7, and 18, Naval Weapons Station Seal Beach Detachment Concord, Concord, California

COST ESTIMATE SUMMARY

Site: SWMUs 2, 5, 7, and 18
Location: Naval Weapons Station Seal Beach, Detachment Concord
Phase: Feasibility Study
Base Year: 2004
Date: October 18, 2007

Description: Treatment of vadose zone using soil vapor extraction. Addition of hydrogen-releasing compounds™ (HRC) to contaminated groundwater (entire plume) in two injections over 3 years. Quarterly groundwater monitoring during first 2 years of active treatment, semiannual monitoring for 3 years thereafter. Total remedial timeframe is 5 years.

DESCRIPTION	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Notes
OPERATIONS AND MAINTENANCE COSTS[a]:							
Source Area Soil Vapor Extraction (Year 1)							active treatment
Staff Engineer	120.00	HR	0.00	110.21	0.00	$13,225	
Field Technician	280.00	HR	0.00	73.97	0.00	$20,712	
Electrical Charge	7000.00	KWH	0.10	0.00	0.00	$ 700	
SUBTOTAL						**$34,637**	
Source Area Soil Vapor Sampling (Year 1)							
Field Technician	40.00	HR	0	73.97	0	$2,959	
Monitoring Gas Vents	4.00	EA	0.00	34.38	0.00	$138	
Tentative ID Compunds, GC/MS, Air (30/5041/8260B - TO-14), Air Analysis	5.00	EA	236.47	0.00	0.00	$1,182	
SUBTOTAL						**$4,279**	
Quarterly Groundwater Monitoring (Years 1 and 2)							22 wells sampled quarterly
Disposable Materials per Sample	100.00	EA	12.14	0.00	0.00	$1,214	includes 2 QC and 1 equipment rinsate
Decontamination Materials per Sample	100.00	EA	10.84	0.00	0.00	$1,084	per sampling event
Nylon Tubing, 1/4" Outside Diameter	2140.00	LF	0.63	0.00	0.00	$1,348	
Water Level Indicator, Manual, Polyethylene Tape, 100' Cable, Weekly Rental	5.00	WK	95.45	0.00	0.00	$477	
Flow Through Monitor, Weekly Rental	5.00	WK	323.68	0.00	0.00	$1,618	
Water Quality Parameter Testing Device	5.00	WK	344.33	0.00	0.00	$1,722	
Nitrogen/Nitrite/Nitrate (EPA 300.0/SM 4110B, Water Analysis	100.00	EA	47.87	0.00	0.00	$4,787	
Acidity/Alkalinity (EPA 305.1/310.1), Water Analysis	100.00	EA	37.11	0.00	0.00	$3,711	
Volatile Organic Analysis (EPA 624), Water Analysis	100.00	EA	296.90	0.00	0.00	$29,690	
Sulfate (EPA 300.0), Water Analysis	100.00	EA	27.94	0.00	0.00	$2,794	
Sulfide (EPA 376.1), Water Analysis	100.00	EA	40.89	0.00	0.00	$4,089	
Ferrous Iron (S.M. 3500 Fe - D)	100.00	EA	129.55	0.00	0.00	$12,955	
4" Submersible Pump Rental, Week	5.00	WK	329.12	0.00	0.00	$1,646	
Car or Van Mileage Charge	900.00	MI	0.52	0.00	0.00	$468	
Project Manager	10.00	HR	0.00	184.67	0.00	$1,847	
Project Engineer	45.00	HR	0.00	117.91	0.00	$5,306	
Project Scientist	520.00	HR	0.00	112.13	0.00	$58,307	
Staff Scientist	120.00	HR	0.00	91.94	0.00	$11,033	
Field Technician	230.00	HR	0.00	73.97	0.00	$17,013	
Word Processing/Clerical	65.00	HR	0.00	58.31	0.00	$3,790	
Draftsman/CADD	55.00	HR	0.00	76.46	0.00	$4,205	
SUBTOTAL						**$169,103**	
Semiannual Groundwater Monitoring (Years 3, 4, and 5)							22 wells sampled semiannually
Disposable Materials per Sample	50.00	EA	12.14	0.00	0.00	$607	includes 2 QC and 1 equipment rinsate
Decontamination Materials per Sample	50.00	EA	10.84	0.00	0.00	$542	per sampling event
Nylon Tubing, 1/4" Outside Diameter	1068.00	LF	0.63	0.00	0.00	$673	
Water Level Indicator, Manual, Polyethylene Tape, 100' Cable, Weekly Rental	3.00	WK	95.45	0.00	0.00	$286	
Flow Through Monitor, Weekly Rental	3.00	WK	323.68	0.00	0.00	$971	
Water Quality Parameter Testing Device	3.00	WK	344.33	0.00	0.00	$1,033	
Nitrogen/Nitrite/Nitrate (EPA 300.0/SM 4110B, Water Analysis	50.00	EA	47.87	0.00	0.00	$2,394	
Acidity/Alkalinity (EPA 305.1/310.1), Water Analysis	50.00	EA	37.11	0.00	0.00	$1,856	
Volatile Organic Analysis (EPA 624), Water Analysis	50.00	EA	296.90	0.00	0.00	$14,845	
Sulfate (EPA 300.0), Water Analysis	50.00	EA	27.94	0.00	0.00	$1,397	
Sulfide (EPA 376.1), Water Analysis	50.00	EA	40.89	0.00	0.00	$2,045	
Ferrous Iron (S.M. 3500 Fe - D)	50.00	EA	129.55	0.00	0.00	$6,478	
4" Submersible Pump Rental, Week	3.00	WK	329.12	0.00	0.00	$987	
Car or Van Mileage Charge	450.00	MI	0.52	0.00	0.00	$234	
Project Manager	8.00	HR	0.00	184.67	0.00	$1,477	
Project Engineer	24.00	HR	0.00	117.91	0.00	$2,830	
Project Scientist	260.00	HR	0.00	112.13	0.00	$29,153	
Staff Scientist	55.00	HR	0.00	91.94	0.00	$5,057	
Field Technician	100.00	HR	0.00	73.97	0.00	$7,397	
Word Processing/Clerical	35.00	HR	0.00	58.31	0.00	$2,041	
Draftsman/CADD	32.00	HR	0.00	76.46	0.00	$2,447	
SUBTOTAL						**$84,748**	
ANNUAL SUBTOTAL (Year 1) including 25% contingency						**$260,023**	
ANNUAL SUBTOTAL (Year 2) including 25% contingency						**$211,379**	
ANNUAL SUBTOTAL (Years 3, 4 and 5) including 25% contingency						**$105,935**	

TABLE B-4: ALTERNATIVE 3A: ENHANCED BIOREMEDIATION, TOTAL REMEDIAL COST (CONTINUED)
Feasibility Study Report for SWMUs 2, 5, 7, and 18, Naval Weapons Station Seal Beach Detachment Concord, Concord, California

COST ESTIMATE SUMMARY

Site: SWMUs 2, 5, 7, and 18
Location: Naval Weapons Station Seal Beach, Detachment Concord
Phase: Feasibility Study
Base Year: 2004
Date: October 18, 2007

Description: Treatment of vadose zone using soil vapor extraction. Addition of hydrogen-releasing compounds™ (HRC) to contaminated groundwater (entire plume) in two injections over 3 years. Quarterly groundwater monitoring during first 2 years of active treatment, semiannual monitoring for 3 years thereafter. Total remedial timeframe is 5 years.

DESCRIPTION		Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Notes
PERIODIC COSTS[a]:	**Year**							
Well Abandonment	5	16.00	EA		417.75		$6,684	
Closeout Report	5	1.00	EA		47928.91		$47,929	
Contingency		25%					$11,982	
SUBTOTAL							**$66,595**	

PRESENT VALUE ANALYSES:

Cost Type	Year	Total Cost 2004 dollars	Total Cost 2007 dollarsd	Future Value 2.0%	Net Present Value 4.4%	Notes
Capital Cost	1	$1,281,181	$1,308,086	$1,321,102	$1,292,963	Year 0 capital construction
O&M	2	$260,023	$265,483	$273,488	$256,382	Year 1 monitoring
O&M	3	$211,379	$215,818	$226,771	$203,627	Year 2 monitoring
O&M	4	$105,935	$108,160	$115,922	$99,704	Year 3 monitoring
O&M	5	$105,935	$108,160	$118,240	$97,412	Year 4 monitoring
O&M and Periodic Cost	6	$172,530	$176,153	$196,423	$155,003	year 5 monitoring, well abandonment, and closeout report
		$2,136,983	**$2,181,860**	**$2,251,946**	**$2,105,091**	

TOTAL PRESENT VALUE OF ALTERNATIVE 3A **$2,105,091**

Notes:

a Costs provided by RACER 2004 (Earth Tech 2004).

b Vendor quote from Dave Reilly at Regenesis, Inc., (949) 366-8001 x 125, on December 13, 2004.

c Vendor quote from Derrik M. Sandberg at ResonantSonic Internation, (530) 668-2424, on December 13, 2004.

d Years identified in cost estimate summary refer to O&M years, with capital construction occuring in year 0; however, project years were used for net present value calculations. Capital construction would occur in year 1 of the project, with O&M years 1 through 5 corresponding to project years 2 through 6.

e Updated to 2007 dollars by applying escalation factor (1.0210) from RACER 2006 (Earth Tech 2006).

Sources:

Earth Tech. 2004. "Remedial Action Cost Engineering and Requirements™ System Parametric Cost-Estimating Software for Remediation and Restoration Projects." RACER™ Version 6.0.0.
Earth Tech. 2006. "Remedial Action Cost Engineering and Requirements™ System Parametric Cost-Estimating Software for Remediation and Restoration Projects." RACER™ Version 8.1.

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
27	**Present-Worth Cost: $1.8 million**	Table 4	Final Feasibility Study Report for Solid Waste Management Units 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Appendix B, Table B-5. Tetra Tech. March 20, 2008.

TABLE B-5: ALTERNATIVE 3B: ENHANCED BIOREMEDIATION AND MONITORED NATURAL ATTENUATION, TOTAL REMEDIAL COST
Feasibility Study Report for SWMUs 2, 5, 7, and 18, Naval Weapons Station Seal Beach Detachment Concord, Concord, California

COST ESTIMATE SUMMARY

Site: SWMUs 2, 5, 7, and 18
Location: Naval Weapons Station Seal Beach, Detachment Concord
Phase: Feasibility Study
Base Year: 2004
Date: October 18, 2007

Description: Treatment of vadose zone using soil vapor extraction. Addition of hydrogen-releasing compounds™ (HRC) to contaminated groundwater (main portion of plume) in two injections over three years where PCE concentrations exceed 10 µg/L. MNA for remainder of the plume for 10 years. Quarterly groundwater monitoring during first 2 years of active treatment, semi-annual monitoring for 3 years, annual monitoring for 5 years. Total remedial timeframe is 10 years.

DESCRIPTION	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Notes
CAPITAL COSTS:							
Startup Costs							
Other Direct Costs	1.00	LS	25449.05	31079.37	12837.13	**$69,366**	
Source Area Vadose Zone							
Soil Vapor Extraction (7 SVE wells installed to 12 ft bgs with 5-ft screens)							
Direct-Push Rig, Truck-Mounted, Nonhydraulic, includes Labor, Sampling, and Decontamination	3.00	DAY	248.99	0.00	0.00	$747	
Mobilize/Demobilize Direct-Push Rig and Crew	3.00	DAY	829.96	0.00	0.00	$2,490	
Furnish 55-Gallon Drum for Drill Cuttings	4.00	EA	114.10	0.00	0.00	$456	
Organic Vapor Analyzer Rental, per Day	3.00	DAY	165.99	0.00	0.00	$498	
1 HP, 230V, 98 SCFM, Vapor Recovery System	1.00	EA	5,686.86	1,302.80	0.00	$6,990	
Field Technician	40.00	HR	0.00	73.97	0.00	$2,959	
2" PVC, Schedule 40, Well Casing	50.00	LF	1.73	8.48	11.53	$1,087	
2" PVC, Schedule 40, Well Screen	35.00	LF	4.00	10.94	14.87	$1,043	
2" PVC, Well Plug	7.00	EA	8.43	12.72	17.29	$269	
2" Screen, Filter Pack	70.00	LF	4.50	7.21	9.80	$1,506	
2" Well, Portland Cement Grout	20.00	LF	1.67	0.00	0.00	$33	
2" Well, Bentonite Seal	7.00	EA	13.37	28.62	38.91	$566	
2" PVC, Schedule 80, Connection Piping	175.00	LF	1.28	9.22	0.00	$1,838	
2" PVC, Schedule 80, Tee	7.00	EA	18.41	0.00	0.00	$129	
2" PVC, Schedule 80, 90 Degree, Elbow	7.00	EA	5.01	0.00	0.00	$35	
2" PVC, Sch 80, Ball Valve	7.00	EA	128.70	0.00	0.00	$901	
2" Steel, 0-300 PSI Pressure Gauge	7.00	EA	33.66	86.76	0.00	$843	
SUBTOTAL						**$22,390**	
Installation of Groundwater Monitoring Wells (18 wells to 27 ft bgs with 10-ft screens)							
Direct-Push Rig, Truck-Mounted, Nonhydraulic, includes Labor, Sampling, and Decontamination	6.00	DAY	248.99	0.00	0.00	$1,494	
Mobilize/Demobilize Direct-Push Rig and Crew	6.00	DAY	829.96	0.00	0.00	$4,980	
Organic Vapor Analyzer Rental, per Day	6.00	DAY	165.99	0.00	0.00	$996	
Volatile Organic Analysis (SW 5035/SW 8260B), Soil Analysis	36.00	EA	296.90	0.00	0.00	$10,688	
Field Technician	180.00	HR	0.00	73.97	0.00	$13,315	
2" PVC, Schedule 40, Well Casing	306.00	LF	1.63	7.80	9.52	$5,799	
2" PVC, Schedule 40, Well Screen	180.00	LF	3.77	10.06	12.29	$4,702	
2" PVC, Well Plug	18.00	EA	7.94	11.70	14.29	$611	
Split Spoon Sampling	108.00	LF	0.00	33.43	40.82	$8,019	
Furnish 55 Gallon Drum for Drill Cuttings & Development Water	27.00	EA	114.10	0.00	0.00	$3,081	
2" Screen, Filter Pack	216.00	LF	4.23	6.63	8.10	$4,095	
2" Well, Portland Cement Grout	252.00	LF	1.58	0.00	0.00	$398	
2" Well, Bentonite Seal	18.00	EA	12.59	26.33	32.14	$1,279	
SUBTOTAL						**$59,456**	
HRC Injection and Materials[b]							
Pilot Test							
Work Plan						$10,000	
HRC material	420.00	LB	5.00	0.00	0.00	$2,100	
Shipping and Sales Tax	420.00	LB	0.45	0.00	0.00	$187	
Mobilization[c]	1.00	LS	0.00	0.00	0.00	$600	
Drill Rig[c]	1.00	DAY	0.00	0.00	1750.00	$1,750	
Injection Pump[c]	1.00	DAY	0.00	0.00	325.00	$325	
Borehole Abandonment[c]	75.00	LF	0.00	0.00	1.00	$75	Upper 5 feet will be abandoned
Steam Cleaner[c]	1.00	DAY	0.00	0.00	95.00	$95	
Staff Scientist[a]	78.00	HR	0.00	93.94	0.00	$7,327	

TABLE B-5: ALTERNATIVE 3B: ENHANCED BIOREMEDIATION AND MONITORED NATURAL ATTENUATION, TOTAL REMEDIAL COST (CONTINUED)
Feasibility Study Report for SWMUs 2, 5, 7, and 18, Naval Weapons Station Seal Beach Detachment Concord, Concord, California

COST ESTIMATE SUMMARY

Site: SWMUs 2, 5, 7, and 18
Location: Naval Weapons Station Seal Beach, Detachment Concord
Phase: Feasibility Study
Base Year: 2004
Date: October 18, 2007

Description: Treatment of vadose zone using soil vapor extraction. Addition of hydrogen-releasing compounds™ (HRC) to contaminated groundwater (main portion of plume) in two injections over three years where PCE concentrations exceed 10 µg/L. MNA for remainder of the plume for 10 years. Quarterly groundwater monitoring during first 2 years of active treatment, semi-annual monitoring for 3 years, annual monitoring for 5 years. Total remedial timeframe is 10 years.

DESCRIPTION	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Notes
Pilot Test Groundwater Monitoring[a]							3 wells sampled quarterly
RSK175 analysis for dissolved gases	14.00	EA	97.83	0.00	0.00	$1,370	
Disposable Materials per Sample	14.00	EA	10.76	0.00	0.00	$151	
Decontamination Materials per Sample	14.00	EA	9.68	0.00	0.00	$136	
Nylon Tubing, 1/4" Outside Diameter	325.00	LF	0.56	0.00	0.00	$182	
Water Level Indicator, Manual, Polyethylene Tape, 100' Cable, Weekly Rental	14.00	WK	88.82	0.00	0.00	$1,243	
Flow Through Monitor, Weekly Rental	4.00	WK	301.20	0.00	0.00	$1,205	
Water Quality Parameter Testing Device	4.00	WK	307.24	0.00	0.00	$1,229	
Nitrogen/Nitrite/Nitrate (EPA 300.0/SM 4110B, Water Analysis	14.00	EA	55.69	0.00	0.00	$780	
Acidity/Alkalinity (EPA 305.1/310.1), Water Analysis	14.00	EA	38.58	0.00	0.00	$540	
Volatile Organic Analysis (EPA 624), Water Analysis	14.00	EA	276.27	0.00	0.00	$3,868	
Chloride (EPA 300), Water Analysis	14.00	EA	28.41	0.00	0.00	$398	
Sulfate (EPA 300.0), Water Analysis	14.00	EA	28.94	0.00	0.00	$405	
Sulfide (EPA 376.1), Water Analysis	14.00	EA	49.10	0.00	0.00	$687	
Ferrous Iron (S.M. 3500 Fe - D)	14.00	EA	146.31	0.00	0.00	$2,048	
55-Gallon 17C Closed Head Steel Drum	4.00	EA	91.19	0.00	0.00	$365	
4" Submersible Pump Rental, Day	4.00	DAY	103.31	0.00	0.00	$413	
Car or Van Mileage Charge	400.00	MI	0.48	0.00	0.00	$192	
Project Scientist	63.00	HR	0.00	4.15	0.00	$262	
Field Technician	71.00	HR	0.00	58.79	0.00	$4,174	
Word Processing/Clerical	7.00	HR	0.00	48.72	0.00	$341	
Draftsman/CADD	7.00	HR	0.00	75.50	0.00	$528	
Primary Treatment							
HRC material	18000.00	LB	5.75	0.00	0.00	$103,500	
Shipping and Sales Tax	18000.00	LB	0.64	0.00	0.00	$11,498	
Mobilization[c]	1.00	LS	0.00	0.00	0.00	$600	
Drill Rig[c]	20.00	DAY	0.00	0.00	1750.00	$35,000	Drilling 240 feet per day
Injection Pump[c]	20.00	DAY	0.00	0.00	325.00	$6,500	
Borehole Abandonment[c]	3300.00	LF	0.00	0.00	1.00	$3,300	Only upper 15 feet will be abandoned
Steam Cleaner[c]	20.00	DAY	0.00	0.00	95.00	$1,900	
Hand Auger[c]	3.00	DAY	0.00	0.00	750.00	$2,250	Assumes 8 cores per day
Local Travel for Hand Auger Crew[c]	3.00	DAY	0.00	150.00	0.00	$450	
Concrete Coring[c]	3.00	DAY	0.00	0.00	1100.00	$3,300	Assumes 8 cores per day
Local Travel for Concrete Coring Crew[c]	3.00	DAY	0.00	150.00	0.00	$450	
Car or Van Mileage Charge[a]	6000.00	MI	0.48	0.00	0.00	$2,880	
Followup Treatment (50% Retreat, If Necessary)							
HRC material	9000.00	LB	5.75	0.00	0.00	$51,750	
Shipping and Sales Tax	9000.00	LB	0.64	0.00	0.00	$5,749	
Mobilization[c]	1.00	LS	0.00	0.00	0.00	$600	
Drill Rig[c]	10.00	DAY	0.00	0.00	1750.00	$17,500	Drilling 200 feet per day
Injection Pump[c]	10.00	DAY	0.00	0.00	325.00	$3,250	
Borehole Abandonment[c]	1650.00	LF	0.00	0.00	1.00	$1,650	Only upper 15 feet will be abandoned
Steam Cleaner[c]	10.00	DAY	0.00	0.00	95.00	$950	
Hand Auger[c]	1.00	DAY	0.00	0.00	750.00	$750	Assumes 8 cores per day
Local Travel for Hand Auger Crew[c]	1.00	DAY	0.00	150.00	0.00	$150	
Concrete Coring[c]	1.00	DAY	0.00	0.00	1100.00	$1,100	Assumes 8 cores per day
Local Travel for Concrete Coring Crew[c]	1.00	DAY	0.00	150.00	0.00	$150	
Car or Van Mileage Charge[a]	3000.00	MI	0.48	0.00	0.00	$1,440	
SUBTOTAL all HRC Material and Injections						**$299,643**	
SUBTOTAL						$450,854	
Contingency		25%				$112,713	10% scope + 15% bid
SUBTOTAL						**$563,567**	
Professional Labor Management[a]							
Design and Work Plan		20.00%				$112,713	
Project Management Labor Cost		2.50%				$14,089	
Planning Documents Labor Cost		2.50%				$14,089	
Construction Oversight Labor Cost		2.75%				$15,498	
Reporting Labor Cost		0.35%				$1,972	
As-Built Drawings Labor Cost		0.35%				$1,972	
Public Notice Labor Cost		0.08%				$451	
Site Closure Activities Labor Cost		0.00%				$0	
Permitting Labor Cost		5.00%				$28,178	
SUBTOTAL						**$188,964**	
TOTAL CAPITAL COST IN 2007 DOLLARS						**$752,532**	

TABLE B-5: ALTERNATIVE 3B: ENHANCED BIOREMEDIATION AND MONITORED NATURAL ATTENUATION, TOTAL REMEDIAL COST (CONTINUED)
Feasibility Study Report for SWMUs 2, 5, 7, and 18, Naval Weapons Station Seal Beach Detachment Concord, Concord, California

COST ESTIMATE SUMMARY

Site: SWMUs 2, 5, 7, and 18
Location: Naval Weapons Station Seal Beach, Detachment Concord
Phase: Feasibility Study
Base Year: 2004
Date: October 18, 2007

Description: Treatment of vadose zone using soil vapor extraction. Addition of hydrogen-releasing compounds™ (HRC) to contaminated groundwater (main portion of plume) in two injections over three years where PCE concentrations exceed 10 µg/L. MNA for remainder of the plume for 10 years. Quarterly groundwater monitoring during first 2 years of active treatment, semi-annual monitoring for 3 years, annual monitoring for 5 years. Total remedial timeframe is 10 years.

DESCRIPTION	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Notes
OPERATIONS AND MAINTENANCE COSTS:							
Source Area Soil Vapor Extraction (Year 1)							active treatment
Staff Engineer	120.00	HR	0.00	110.21	0.00	$13,225	
Field Technician	280.00	HR	0.00	73.97	0.00	$20,712	
Electrical Charge	7000.00	KWH	0.10	0.00	0.00	$700	
SUBTOTAL						**$34,637**	
Source Area Soil Vapor Sampling (Year 1)							
Field Technician	40.00	HR	0	73.97	0	$2,959	
Monitoring Gas Vents	4.00	EA	0.00	34.38	0.00	$138	
Tentative ID Compunds, GC/MS, Air (30/5041/8260B - TO-14), Air Analysis	5.00	EA	236.47	0.00	0.00	$1,182	
SUBTOTAL						**$4,279**	
Quarterly Groundwater Monitoring (Years 1 and 2)							22 wells samples quarterly
Disposable Materials per Sample	100.00	EA	12.14	0.00	0.00	$1,214	includes 2 QC and 1 equipment rinsate
Decontamination Materials per Sample	100.00	EA	10.84	0.00	0.00	$1,084	per sampling event
Nylon Tubing, 1/4" Outside Diameter	2140.00	LF	0.63	0.00	0.00	$1,348	
Water Level Indicator, Manual, Polyethylene Tape, 100' Cable, Weekly Rental	5.00	WK	95.45	0.00	0.00	$477	
Flow Through Monitor, Weekly Rental	5.00	WK	323.68	0.00	0.00	$1,618	
Water Quality Parameter Testing Device	5.00	WK	344.33	0.00	0.00	$1,722	
Nitrogen/Nitrite/Nitrate (EPA 300.0/SM 4110B, Water Analysis	100.00	EA	47.87	0.00	0.00	$4,787	
Acidity/Alkalinity (EPA 305.1/310.1), Water Analysis	100.00	EA	37.11	0.00	0.00	$3,711	
Volatile Organic Analysis (EPA 624), Water Analysis	100.00	EA	296.90	0.00	0.00	$29,690	
Sulfate (EPA 300.0), Water Analysis	100.00	EA	27.94	0.00	0.00	$2,794	
Sulfide (EPA 376.1), Water Analysis	100.00	EA	40.89	0.00	0.00	$4,089	
Ferrous Iron (S.M. 3500 Fe - D)	100.00	EA	129.55	0.00	0.00	$12,955	
4" Submersible Pump Rental, Week	5.00	WK	329.12	0.00	0.00	$1,646	
Car or Van Mileage Charge	900.00	MI	0.52	0.00	0.00	$468	
Project Manager	10.00	HR	0.00	184.67	0.00	$1,847	
Project Engineer	45.00	HR	0.00	117.91	0.00	$5,306	
Project Scientist	520.00	HR	0.00	112.13	0.00	$58,307	
Staff Scientist	120.00	HR	0.00	91.94	0.00	$11,033	
Field Technician	230.00	HR	0.00	73.97	0.00	$17,013	
Word Processing/Clerical	65.00	HR	0.00	58.31	0.00	$3,790	
Draftsman/CADD	55.00	HR	0.00	76.46	0.00	$4,205	
SUBTOTAL						**$169,103**	
Semiannual Groundwater Monitoring (Years 3, 4 and 5)							22 wells sampled semiannually
Disposable Materials per Sample	50.00	EA	12.14	0.00	0.00	$607	includes 2 QC and 1 equipment rinsate
Decontamination Materials per Sample	50.00	EA	10.84	0.00	0.00	$542	per sampling event
Nylon Tubing, 1/4" Outside Diameter	1068.00	LF	0.63	0.00	0.00	$673	
Water Level Indicator, Manual, Polyethylene Tape, 100' Cable, Weekly Rental	3.00	WK	95.45	0.00	0.00	$286	
Flow Through Monitor, Weekly Rental	3.00	WK	323.68	0.00	0.00	$971	
Water Quality Parameter Testing Device	3.00	WK	344.33	0.00	0.00	$1,033	
Nitrogen/Nitrite/Nitrate (EPA 300.0/SM 4110B, Water Analysis	50.00	EA	47.87	0.00	0.00	$2,394	
Acidity/Alkalinity (EPA 305.1/310.1), Water Analysis	50.00	EA	37.11	0.00	0.00	$1,856	
Volatile Organic Analysis (EPA 624), Water Analysis	50.00	EA	296.90	0.00	0.00	$14,845	
Sulfate (EPA 300.0), Water Analysis	50.00	EA	27.94	0.00	0.00	$1,397	
Sulfide (EPA 376.1), Water Analysis	50.00	EA	40.89	0.00	0.00	$2,045	
Ferrous Iron (S.M. 3500 Fe - D)	50.00	EA	129.55	0.00	0.00	$6,478	
4" Submersible Pump Rental, Week	3.00	WK	329.12	0.00	0.00	$987	
Car or Van Mileage Charge	450.00	MI	0.52	0.00	0.00	$234	
Project Manager	8.00	HR	0.00	184.67	0.00	$1,477	
Project Engineer	24.00	HR	0.00	117.91	0.00	$2,830	
Project Scientist	260.00	HR	0.00	112.13	0.00	$29,153	
Staff Scientist	55.00	HR	0.00	91.94	0.00	$5,057	
Field Technician	100.00	HR	0.00	73.97	0.00	$7,397	
Word Processing/Clerical	35.00	HR	0.00	58.31	0.00	$2,041	
Draftsman/CADD	32.00	HR	0.00	76.46	0.00	$2,447	
SUBTOTAL						**$84,748**	

TABLE B-5: ALTERNATIVE 3B: ENHANCED BIOREMEDIATION AND MONITORED NATURAL ATTENUATION, TOTAL REMEDIAL COST (CONTINUED)
Feasibility Study Report for SWMUs 2, 5, 7, and 18, Naval Weapons Station Seal Beach Detachment Concord, Concord, California

COST ESTIMATE SUMMARY

Site: SWMUs 2, 5, 7, and 18
Location: Naval Weapons Station Seal Beach, Detachment Concord
Phase: Feasibility Study
Base Year: 2004
Date: October 18, 2007

Description: Treatment of vadose zone using soil vapor extraction. Addition of hydrogen-releasing compounds™ (HRC) to contaminated groundwater (main portion of plume) in two injections over three years where PCE concentrations exceed 10 µg/L. MNA for remainder of the plume for 10 years. Quarterly groundwater monitoring during first 2 years of active treatment, semi-annual monitoring for 3 years, annual monitoring for 5 years. Total remedial timeframe is 10 years.

DESCRIPTION	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Cost	Notes
Annual Groundwater Monitoring (Years 6 through 10)[a]							22 wells sampled annually
Disposable Materials per Sample	25.00	EA	12.14	0.00	0.00	$304	includes 2 QC and 1 equipment rinsate
Decontamination Materials per Sample	25.00	EA	10.84	0.00	0.00	$271	per sampling event
Nylon Tubing, 1/4" Outside Diameter	534.00	LF	0.63	0.00	0.00	$336	
Water Level Indicator, Manual, Polyethylene Tape, 100' Cable, Weekly Rental	2.00	WK	95.45	0.00	0.00	$191	
Flow Through Monitor, Weekly Rental	2.00	WK	323.68	0.00	0.00	$647	
Water Quality Parameter Testing Device	2.00	WK	344.33	0.00	0.00	$689	
Nitrogen/Nitrite/Nitrate (EPA 300.0/SM 4110B, Water Analysis	25.00	EA	47.87	0.00	0.00	$1,197	
Acidity/Alkalinity (EPA 305.1/310.1), Water Analysis	25.00	EA	37.11	0.00	0.00	$928	
Volatile Organic Analysis (EPA 624), Water Analysis	25.00	EA	296.90	0.00	0.00	$7,423	
Sulfate (EPA 300.0), Water Analysis	25.00	EA	27.94	0.00	0.00	$699	
Sulfide (EPA 376.1), Water Analysis	25.00	EA	40.89	0.00	0.00	$1,022	
Ferrous Iron (S.M. 3500 Fe - D)	25.00	EA	129.55	0.00	0.00	$3,239	
4" Submersible Pump Rental, Week	2.00	WK	329.12	0.00	0.00	$658	
Car or Van Mileage Charge	225.00	MI	0.52	0.00	0.00	$117	
Project Manager	6.00	HR	0.00	184.67	0.00	$1,108	
Project Engineer	8.00	HR	0.00	117.91	0.00	$943	
Project Scientist	115.00	HR	0.00	112.13	0.00	$12,895	
Staff Scientist	20.00	HR	0.00	91.94	0.00	$1,839	
Field Technician	45.00	HR	0.00	73.97	0.00	$3,329	
Word Processing/Clerical	15.00	HR	0.00	58.31	0.00	$875	
Draftsman/CADD	15.00	HR	0.00	76.46	0.00	$1,147	
SUBTOTAL						**$39,854**	
ANNUAL SUBTOTAL (Year 1) including 25% contingency						**$260,023**	
ANNUAL SUBTOTAL (Year 2) including 25% contingency						**$211,379**	
ANNUAL SUBTOTAL (Years 3, 4 and 5) including 25% contingency						**$105,935**	
ANNUAL SUBTOTAL (Years 6 through 10) including 25% contingency						**$49,818**	
PERIODIC COSTS:	**Year**						
Five-Year Review Report	5-10	1.00	EA	20710.05		$20,710	End of year 5
Contingency		0.25				$5,178	10% scope + 15% bid
SUBTOTAL						**$25,888**	
Well Abandonment	10	18.00	EA	417.75		$7,520	
Closeout Report	10	1.00	EA	47928.91		$47,929	
Contingency		25%				$11,982	
SUBTOTAL						**$67,431**	

PRESENT VALUE ANALYSES:

Cost Type	Yeard	Total Cost 2004 dollars	Total Cost 2007 dollarse	Future Value 2.0%	Net Present Value 4.4%	Notes
Capital Cost	1	$752,532	$768,335	$775,980	$759,452	Year 0 capital construction
O&M	2	$260,023	$265,483	$273,488	$256,382	Year 1 monitoring
O&M	3	$211,379	$215,818	$226,771	$203,627	Year 2 monitoring
O&M	4	$105,935	$108,160	$115,922	$99,704	Year 3 monitoring
O&M	5	$105,935	$108,160	$118,240	$97,412	Year 4 monitoring
O&M and Periodic Cost	6	$131,823	$134,591	$150,078	$118,430	Year 5 monitoring and 5-year review
O&M	7	$49,818	$50,864	$57,851	$43,728	Year 6 monitoring
O&M	8	$49,818	$50,864	$59,008	$42,723	Year 7 monitoring
O&M	9	$49,818	$50,864	$60,189	$41,741	Year 8 monitoring
O&M	10	$49,818	$50,864	$61,392	$40,781	Year 9 monitoring
O&M and Periodic Cost	11	$117,249	$119,711	$147,379	$93,774	Year 10 monitoring, well abandonment, and closeout report
		$1,884,146	**$1,923,714**	**$2,046,298**	**$1,797,754**	

TOTAL PRESENT VALUE OF ALTERNATIVE 3B **$1,797,754**

Notes:
a Costs provided by RACER 2004 (Earth Tech 2004).
b Vendor quote from Dave Reilly at Regenesis, Inc., (949) 366-8001 x 125, on December 13, 2004.
c Vendor quote from Derrik M. Sandberg at ResonantSonic Internation, (530) 668-2424, on December 13, 2004.
d Years identified in cost estimate summary refer to O&M years, with capital construction occuring in year 0; however, project years were used for net present value calculations. Capital construction would occur in year 1 of the project, with O&M years 1 through 10 corresponding to project years 2 through 11.
e Updated to 2007 dollars by applying escalation factor (1.0210) from RACER 2006 (Earth Tech 2006).

Sources:
Earth Tech. 2004. "Remedial Action Cost Engineering and Requirements™ System Parametric Cost-Estimating Software for Remediation and Restoration Projects." RACER™ Version 6.0.0.
Earth Tech. 2006. "Remedial Action Cost Engineering and Requirements™ System Parametric Cost-Estimating Software for Remediation and Restoration Projects." RACER™ Version 8.1.

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
28	**Present-Worth Cost: $5.2 million**	Table 4	Final Feasibility Study Report for Solid Waste Management Units 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Appendix B, Table B-6. Tetra Tech. March 20, 2008.

TABLE B-6: ALTERNATIVE 4A: PUMP AND TREAT, TOTAL REMEDIAL COST
Feasibility Study Report for SWMUs 2, 5, 7, and 18, Naval Weapons Station Seal Beach Detachment Concord, Concord, California

COST ESTIMATE SUMMARY

Site: SWMUs 2, 5, 7, and 18
Location: Naval Weapons Station Seal Beach, Detachment Concord
Phase: Feasibility Study
Base Year: 2004
Date: October 18, 2007

Description: Treatment of vadose zone using soil vapor extraction. Pump and treat of contaminated groundwater (entire plume) by air stripping processes. Quarterly groundwater montitoring during first 2 years of active treatment. Semi-annual groundwater monitoring for 3 years, annual monitoring for 15 years. Total remedial timeframe is 20 years.

DESCRIPTION	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Costa	Notes
CAPITAL COSTS[a]:							
Startup Costs							
Other Direct Costs	1.00	LS	25449.05	31079.37	12837.13	**$69,366**	
Source Area Vadose Zone							
Soil Vapor Extraction (7 SVE wells installed to 12 ft bgs with 5-ft screens)							
Direct-Push Rig, Truck-Mounted, Nonhydraulic, includes Labor, Sampling, and Decontamination	3.00	DAY	248.99	0.00	0.00	$747	
Mobilize/Demobilize Direct-Push Rig and Cre	3.00	DAY	829.96	0.00	0.00	$2,490	
Furnish 55 Gallon Drum for Drill Cuttings	4.00	EA	114.10	0.00	0.00	$456	
Organic Vapor Analyzer Rental, per Day	3.00	DAY	165.99	0.00	0.00	$498	
1 HP, 230V, 98 SCFM, Vapor Recovery System	1.00	EA	5,686.86	1,302.80	0.00	$6,990	
Field Technician	40.00	HR	0.00	73.97	0.00	$2,959	
2" PVC, Schedule 40, Well Casing	50.00	LF	1.73	8.48	11.53	$1,087	
2" PVC, Schedule 40, Well Screen	35.00	LF	4.00	10.94	14.87	$1,043	
2" PVC, Well Plug	7.00	EA	8.43	12.72	17.29	$269	
2" Screen, Filter Pack	70.00	LF	4.50	7.21	9.80	$1,506	
2" Well, Portland Cement Grout	20.00	LF	1.67	0.00	0.00	$33	
2" Well, Bentonite Seal	7.00	EA	13.37	28.62	38.91	$566	
2" PVC, Schedule 80, Connection Piping	175.00	LF	1.28	9.22	0.00	$1,838	
2" PVC, Schedule 80, Tee	7.00	EA	18.41	0.00	0.00	$129	
2" PVC, Schedule 80, 90 Degree, Elbow	7.00	EA	5.01	0.00	0.00	$35	
2" PVC, Sch 80, Ball Valve	7.00	EA	128.70	0.00	0.00	$901	
2" Steel, 0-300 PSI Pressure Gauge	7.00	EA	33.66	86.76	0.00	$843	
SUBTOTAL						**$22,390**	
Installation of Groundwater Monitoring Wells (18 wells to 27 ft bgs with 10-ft screens)							
Direct-Push Rig, Truck-Mounted, Nonhydraulic, Includes Labor, Sampling, and Decontamination	6.00	DAY	248.99	0.00	0.00	$1,494	
Mobilize/Demobilize Direct-Push Rig and Cre	6.00	DAY	829.96	0.00	0.00	$4,980	
Organic Vapor Analyzer Rental, per Day	6.00	DAY	165.99	0.00	0.00	$996	
Volatile Organic Analysis (SW 5035/SW 8260B), Soil Analysis	36.00	EA	296.90	0.00	0.00	$10,688	
Field Technician	180.00	HR	0.00	73.97	0.00	$13,315	
2" PVC, Schedule 40, Well Casing	306.00	LF	1.63	7.80	9.52	$5,799	
2" PVC, Schedule 40, Well Screen	180.00	LF	3.77	10.06	12.29	$4,702	
2" PVC, Well Plug	18.00	EA	7.94	11.70	14.29	$611	
Split Spoon Sampling	108.00	LF	0.00	33.43	40.82	$8,019	
Furnish 55-Gallon Drum for Drill Cuttings Development Water	27.00	EA	114.10	0.00	0.00	$3,081	
2" Screen, Filter Pack	216.00	LF	4.23	6.63	8.10	$4,095	
2" Well, Portland Cement Grout	252.00	LF	1.58	0.00	0.00	$398	
2" Well, Bentonite Seal	18.00	EA	12.59	26.33	32.14	$1,279	
SUBTOTAL						**$59,456**	
Groundwater Extraction Wells							
Demolish Bituminous Pavement with Air Equipment	3.20	CY	0.00	84.62	11.48	$308	
Organic Vapor Analyzer Rental, per Day	36.00	DAY	165.99	0.00	0.00	$5,976	
Direct-Push Rig, Truck-Mounted, Nonhydraulic, includes Labor, Sampling, and Decontamination	36.00	DAY	248.99	0.00	0.00	$8,964	
Mobilize Direct-Push Rig and Crew	36.00	DAY	829.96	0.00	0.00	$29,879	
Demobilize Direct-Push Rig and Crew	36.00	DAY	829.96	0.00	0.00	$29,879	
5,000-Gallon Single-Wall Steel Aboveground Tank	1.00	EA	6801.61	3585.30	250.83	$10,638	
Field Technician	91.00	HR	0.00	73.97	0.00	$6,731	
6" PVC, Schedule 40, Well Casing	240.00	LF	5.69	11.23	13.72	$7,354	
2" Pitless Adapter	16.00	EA	274.68	0.00	22.92	$4,762	
6" PVC, Schedule 40, Well Screen	144.00	LF	12.95	18.72	22.86	$7,852	
6" PVC, Well Plug	16.00	EA	87.22	29.25	35.72	$2,435	
4" Submersible Pump, 0.3-7 GPM, Head <=140', 1/3 hp, w/ controls	16.00	EA	2723.92	0.00	0.00	$43,583	
Air Stripping Unit, 50 GPM	1.00	EA	30000.00	0.00	0.00	$30,000	
Split Spoon Sample, 2" x 24", During Drilling	39.00	EA	59.25	0.00	0.00	$2,311	
Furnish 55-Gallon Drum for Drill Cuttings and Development Water	54.00	EA	114.10	0.00	0.00	$6,161	
Well Development Equipment Rental (weekly)	16.00	WK	344.33	0.00	0.00	$5,509	
6" Screen, Filter Pack	144.00	LF	10.84	16.97	20.72	$6,988	
6" Well, Portland Cement Grout	11.00	LF	13.41	0.00	0.00	$148	
6" Well, Bentonite Seal	16.00	EA	50.34	105.31	128.58	$4,548	
Restricted Area, Well Protection (with Four Posts and Explosionproof Receptacle)	16.00	EA	772.45	870.86	3.47	$26,348	
1" PVC, Schedule 80, Connection Piping	2000.00	LF	0.53	6.13	0.00	$13,320	
SUBTOTAL						**$253,692**	

TABLE B-6: ALTERNATIVE 4A: PUMP AND TREAT, TOTAL REMEDIAL COST (CONTINUED)
Feasibility Study Report for SWMUs 2, 5, 7, and 18, Naval Weapons Station Seal Beach Detachment Concord, Concord, California

COST ESTIMATE SUMMARY

Site: SWMUs 2, 5, 7, and 18
Location: Naval Weapons Station Seal Beach, Detachment Concord
Phase: Feasibility Study
Base Year: 2004
Date: October 18, 2007

Description: Treatment of vadose zone using soil vapor extraction. Pump and treat of contaminated groundwater (entire plume) by air stripping processes. Quarterly groundwater montitoring during first 2 years of active treatment. Semi-annual groundwater monitoring for 3 years, annual monitoring for 15 years. Total remedial timeframe is 20 years.

DESCRIPTION	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Costa	Notes
Overhead Electrical Distribution							
1/0 ACSR Conductor	1908.00	LF	0.31	1.61	0.07	$3,797	
1/C #2 Aluminum, Bare, Wire	796.00	LF	0.23	1.55	0.07	$1,473	
40' Class 3 Treated Power Pole	4.00	EA	458.57	907.33	61.07	$5,708	
Straight-line Structure, 5 KV Pole Top	2.00	EA	156.66	817.63	55.03	$2,059	
Terminal Structure, 5 KV Pole Top	2.00	EA	1770.67	3102.52	208.81	$10,164	
5 KV, 3/0, Shielded Cable, Copper	120.00	LF	3.85	3.99	0.27	$973	
5 KV, 1/0 to 4/0 Conductor, Terminations and Splicing	6.00	EA	683.44	619.29	0.00	$7,816	
4" Rigid Steel Conduit	40.00	LF	13.54	24.95	0.00	$1,540	
SUBTOTAL						**$33,529**	
Pipeline to Golf Course Reservoir (9 months)							
Cat 215, 1.0 CY, Soil, Shallow, Trenching	277.78		0.00	1.72	1.07	$775	
Backfill with Excavated Material	375.00		0.50	8.76	1.36	$3,983	
Delivered and Dumped, Backfill with Stone	27.78		38.02	1.94	1.50	$1,152	
Spread Dumped Borrow and Compact with Roller	27.78		0.00	0.56	0.46	$28	
4" PVC, Schedule 40, Connection Piping	1000.00		5.01	26.47	0.00	$31,480	
SUBTOTAL						**$37,418**	
Discharge to Publicly Owned Treatment Works (3 months in winter)							
Medium Brush, Medium Trees, Clear, Grub, Haul	1.00	ACRE	0.00	10222.02	3939.59	$14,162	
Cat 225, 1.5 CY, Soil/Sand, Trenching	112.00	CY	0.00	1.12	0.72	$206	
950, 3.00 CY, Backfill with Excavated Material	110.00	CY	0.00	1.41	0.89	$253	
Seeding, Vegetative Cover	1.00	ACRE	4719.13	209.36	72.45	$5,001	
6" PVC Pipe Sanitary	200.00	LF	3.43	11.92	2.50	$3,570	
Class II Industrial User Connection Fee	1.00	EA	4300.00	0.00	0.00	$4,300	
SUBTOTAL						**$27,492**	
Residual Waste Management (Soil)							
T&D of Debris to a Class I Facility, Assuming RCRA Stabilization for Lead	0.00	TON	0.00	192.91	0.00	$0	
T&D of Debris to a Class I Facility, Assuming Cal-Hazardous Material	0.00	TON	0.00	80.21	0.00	$0	
T&D of Debris to a Class II Facility	263.00	TON	0.00	55.20	0.00	$14,518	
TCLP (RCRA) (EPA 1311), Soil Analysis	2.00	EA	821.93	0.00	0.00	$1,644	
SUBTOTAL						**$16,161**	
SUBTOTAL						$519,503	
Contingency		25%				$129,876	10% scope + 15% bid
SUBTOTAL						$649,379	
Professional Labor Management [a]							
Design and Work Plan		15.00%				$97,407	
Project Management Labor Cost		2.50%				$16,234	
Planning Documents Labor Cost		2.50%				$16,234	
Construction Oversight Labor Cost		2.75%				$17,858	
Reporting Labor Cost		0.35%				$2,273	
As-Built Drawings Labor Cost		0.35%				$2,273	
Public Notice Labor Cost		0.08%				$520	
Site Closure Activities Labor Cost		0.00%				$0	
Permitting Labor Cost		5.00%				$32,469	
SUBTOTAL						**$185,268**	
TOTAL CAPITAL COST IN 2007 DOLLARS						**$834,646**	

TABLE B-6: ALTERNATIVE 4A: PUMP AND TREAT, TOTAL REMEDIAL COST (CONTINUED)
Feasibility Study Report for SWMUs 2, 5, 7, and 18, Naval Weapons Station Seal Beach Detachment Concord, Concord, California

COST ESTIMATE SUMMARY

Site: SWMUs 2, 5, 7, and 18
Location: Naval Weapons Station Seal Beach, Detachment Concord
Phase: Feasibility Study
Base Year: 2004
Date: October 18, 2007

Description: Treatment of vadose zone using soil vapor extraction. Pump and treat of contaminated groundwater (entire plume) by air stripping processes. Quarterly groundwater montitoring during first 2 years of active treatment. Semi-annual groundwater monitoring for 3 years, annual monitoring for 15 years. Total remedial timeframe is 20 years.

DESCRIPTION	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Costa	Notes
OPERATIONS AND MAINTENANCE COSTS[a]:							
Source Area Soil Vapor Extraction (Year 1)							active treatment
Staff Engineer	120.00	HR	0.00	110.21	0.00	$13,225	
Field Technician	280.00	HR	0.00	73.97	0.00	$20,712	
Electrical Charge	7000.00	KWH	0.10	0.00	0.00	$700	
SUBTOTAL						**$34,637**	
Source Area Soil Vapor Sampling (Year 1)							
Field Technician	40.00	HR	0	73.97	0	$2,959	
Monitoring Gas Vents	4.00	EA	0.00	34.38	0.00	$138	
Tentative ID Compunds, GC/MS, Air (30/5041/8260B - TO-14), Air Analysis	5.00	EA	236.47	0.00	0.00	$1,182	
SUBTOTAL						**$4,279**	
Groundwater Extraction Wells (Years 1 through 20)							
Staff Engineer	51.00	HR	0.00	110.21	0.00	$5,621	
Field Technician	255.00	HR	0.00	73.97	0.00	$18,862	
Electrical Charge	5866.00	KWH	0.08	0.00	0.00	$469	
SUBTOTAL						**$24,952**	
Air Stripping (Years 1 through 20)							
Staff Engineer	30.00	HR	0.00	110.21	0.00	$3,306	
Field Technician	149.00	HR	0.00	73.97	0.00	$11,022	
Electrical Charge	34667.00	KWH	0.08	0.00	0.00	$2,773	
SUBTOTAL						**$17,101**	
Discharge to Publicly Owned Treatment Works (Years 1 through 20)							
Wastewater Disposal Fee	5256.00	KGAL	20.00	0.00	0.00	$105,120	
Staff Engineer	5.00	HR	0.00	110.21	0.00	$551	
Field Technician	24.00	HR	0.00	73.97	0.00	$1,775	
Electrical Charge	1640.00	KWH	0.09	0.00	0.00	$148	
Class II Industrial User Connection Fee	1.00	EA	4300.00	0.00	0.00	$4,300	
SUBTOTAL						**$111,894**	
Quarterly Groundwater Monitoring (Years 1 and 2)							22 wells sampled quarterly
Disposable Materials per Sample	100.00	EA	12.14	0.00	0.00	$1,214	includes 2 QC and 1 equipment rinsate
Decontamination Materials per Sample	100.00	EA	10.84	0.00	0.00	$1,084	per sampling event
Nylon Tubing, 1/4" Outside Diameter	2140.00	LF	0.63	0.00	0.00	$1,348	
Water Level Indicator, Manual, Polyethylene Tape, 100' Cable, Weekly Rental	5.00	WK	95.45	0.00	0.00	$477	
Flow Through Monitor, Weekly Rental	5.00	WK	323.68	0.00	0.00	$1,618	
Water Quality Parameter Testing Device	5.00	WK	344.33	0.00	0.00	$1,722	
Nitrogen/Nitrite/Nitrate (EPA 300.0/SM 4110B, Water Analysis	100.00	EA	47.87	0.00	0.00	$4,787	
Acidity/Alkalinity (EPA 305.1/310.1), Water Analysis	100.00	EA	37.11	0.00	0.00	$3,711	
Volatile Organic Analysis (EPA 624), Water Analysis	100.00	EA	296.90	0.00	0.00	$29,690	
Sulfate (EPA 300.0), Water Analysis	100.00	EA	27.94	0.00	0.00	$2,794	
Sulfide (EPA 376.1), Water Analysis	100.00	EA	40.89	0.00	0.00	$4,089	
Ferrous Iron (S.M. 3500 Fe - D)	100.00	EA	129.55	0.00	0.00	$12,955	
4" Submersible Pump Rental, Week	5.00	WK	329.12	0.00	0.00	$1,646	
SUBTOTAL						**$67,135**	
Semiannual Groundwater Monitoring (Years 3, 4, and 5)							22 wells sampled semiannually
Disposable Materials per Sample	50.00	EA	12.14	0.00	0.00	$607	includes 2 QC and 1 equipment rinsate
Decontamination Materials per Sample	50.00	EA	10.84	0.00	0.00	$542	per sampling event
Nylon Tubing, 1/4" Outside Diameter	1068.00	LF	0.63	0.00	0.00	$673	
Water Level Indicator, Manual, Polyethylene Tape, 100' Cable, Weekly Rental	3.00	WK	95.45	0.00	0.00	$286	
Flow Through Monitor, Weekly Rental	3.00	WK	323.68	0.00	0.00	$971	
Water Quality Parameter Testing Device	3.00	WK	344.33	0.00	0.00	$1,033	
Nitrogen/Nitrite/Nitrate (EPA 300.0/SM 4110B, Water Analysis	50.00	EA	47.87	0.00	0.00	$2,394	
Acidity/Alkalinity (EPA 305.1/310.1), Water Analysis	50.00	EA	37.11	0.00	0.00	$1,856	
Volatile Organic Analysis (EPA 624), Water Analysis	50.00	EA	296.90	0.00	0.00	$14,845	
Sulfate (EPA 300.0), Water Analysis	50.00	EA	27.94	0.00	0.00	$1,397	
Sulfide (EPA 376.1), Water Analysis	50.00	EA	40.89	0.00	0.00	$2,045	
Ferrous Iron (S.M. 3500 Fe - D)	50.00	EA	129.55	0.00	0.00	$6,478	
4" Submersible Pump Rental, Week	3.00	WK	329.12	0.00	0.00	$987	
SUBTOTAL						**$34,113**	

TABLE B-6: ALTERNATIVE 4A: PUMP AND TREAT, TOTAL REMEDIAL COST (CONTINUED)
Feasibility Study Report for SWMUs 2, 5, 7, and 18, Naval Weapons Station Seal Beach Detachment Concord, Concord, California

COST ESTIMATE SUMMARY

Site: SWMUs 2, 5, 7, and 18
Location: Naval Weapons Station Seal Beach, Detachment Concord
Phase: Feasibility Study
Base Year: 2004
Date: October 18, 2007

Description: Treatment of vadose zone using soil vapor extraction. Pump and treat of contaminated groundwater (entire plume) by air stripping processes. Quarterly groundwater montitoring during first 2 years of active treatment. Semi-annual groundwater monitoring for 3 years, annual monitoring for 15 years. Total remedial timeframe is 20 years.

DESCRIPTION	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Costa	Notes
Annual Groundwater Monitoring (Years 6 through 20)							22 wells sampled annually
Disposable Materials per Sample	25.00	EA	12.14	0.00	0.00	$304	includes 2 QC and 1 equipment rinsate
Decontamination Materials per Sample	25.00	EA	10.84	0.00	0.00	$271	per sampling event
Nylon Tubing, 1/4" Outside Diameter	534.00	LF	0.63	0.00	0.00	$336	
Water Level Indicator, Manual, Polyethylene Tape, 100' Cable, Weekly Rental	2.00	WK	95.45	0.00	0.00	$191	
Flow Through Monitor, Weekly Rental	2.00	WK	323.68	0.00	0.00	$647	
Water Quality Parameter Testing Device	2.00	WK	344.33	0.00	0.00	$689	
Nitrogen/Nitrite/Nitrate (EPA 300.0/SM 4110B, Water Analysis	25.00	EA	47.87	0.00	0.00	$1,197	
Acidity/Alkalinity (EPA 305.1/310.1), Water Analysis	25.00	EA	37.11	0.00	0.00	$928	
Volatile Organic Analysis (EPA 624), Water Analysis	25.00	EA	296.90	0.00	0.00	$7,423	
Sulfate (EPA 300.0), Water Analysis	25.00	EA	27.94	0.00	0.00	$699	
Sulfide (EPA 376.1), Water Analysis	25.00	EA	40.89	0.00	0.00	$1,022	
Ferrous Iron (S.M. 3500 Fe - D)	25.00	EA	129.55	0.00	0.00	$3,239	
4" Submersible Pump Rental, Week	2.00	WK	329.12	0.00	0.00	$658	
SUBTOTAL						**$17,603**	
Quarterly Surface Water Monitoring (Year 1)							
Glass Coliwasas, Disposable, 7/8" x 42", 200 ml, Case of 12	1.00	EA	121.96	0.00	0.00	$122	
Cyanide (EPA 335.2), Water Analysis	5.00	EA	76.79	0.00	0.00	$384	
Oil and Grease (EPA 413.2), Water Analysis	5.00	EA	89.07	0.00	0.00	$445	
Volatile Organic Analysis (EPA 624), Water Analysis	5.00	EA	296.90	0.00	0.00	$1,485	
TAL Metals (EPA 6010/7000s), Water, Water Analysis	5.00	EA	469.10	0.00	0.00	$2,346	
Mercury, Cold Vapor (EPA 245.1), Water Analysis	5.00	EA	64.78	0.00	0.00	$324	
SUBTOTAL						**$5,105**	
Annual Surface Water Monitoring (Years 2 though 20)							
Glass Coliwasas, Disposable, 7/8" x 42", 200 ml, Case of 12	1.00	EA	121.96	0.00	0.00	$122	
Cyanide (EPA 335.2), Water Analysis	2.00	EA	76.79	0.00	0.00	$154	
Oil And Grease (EPA 413.2), Water Analysis	2.00	EA	89.07	0.00	0.00	$178	
Volatile Organic Analysis (EPA 624), Water Analysis	2.00	EA	296.90	0.00	0.00	$594	
TAL Metals (EPA 6010/7000s), Water, Water Analysis	2.00	EA	469.10	0.00	0.00	$938	
Mercury, Cold Vapor (EPA 245.1), Water Analysis	2.00	EA	64.78	0.00	0.00	$130	
SUBTOTAL						**$2,115**	
General Monitoring (Years 1 and 2)							
Car or Van Mileage Charge	900.00	MI	0.52	0.00	0.00	$468	
Project Manager	4.00	HR	0.00	184.67	0.00	$739	
Project Engineer	30.00	HR	0.00	117.91	0.00	$3,537	
Project Scientist	382.00	HR	0.00	112.13	0.00	$42,833	
Staff Scientist	80.00	HR	0.00	91.94	0.00	$7,355	
Field Technician	170.00	HR	0.00	73.97	0.00	$12,575	
Word Processing/Clerical	50.00	HR	0.00	58.31	0.00	$2,915	
Draftsman/CADD	46.00	HR	0.00	76.46	0.00	$3,517	
SUBTOTAL						**$73,939**	
General Monitoring (Years 3, 4, and 5)							
Car or Van Mileage Charge	450.00	MI	0.52	0.00	0.00	$234	
Project Manager	4.00	HR	0.00	184.67	0.00	$739	
Project Engineer	15.00	HR	0.00	117.91	0.00	$1,769	
Project Scientist	205.00	HR	0.00	112.13	0.00	$22,986	
Staff Scientist	40.00	HR	0.00	91.94	0.00	$3,678	
Field Technician	85.00	HR	0.00	73.97	0.00	$6,287	
Word Processing/Clerical	25.00	HR	0.00	58.31	0.00	$1,458	
Draftsman/CADD	23.00	HR	0.00	76.46	0.00	$1,759	
SUBTOTAL						**$38,909**	
General Monitoring (Years 6 though 20)							
Car or Van Mileage Charge	225.00	MI	0.52	0.00	0.00	$117	
Project Manager	4.00	HR	0.00	184.67	0.00	$739	
Project Engineer	8.00	HR	0.00	117.91	0.00	$943	
Project Scientist	115.00	HR	0.00	112.13	0.00	$12,895	
Staff Scientist	20.00	HR	0.00	91.94	0.00	$1,839	
Field Technician	45.00	HR	0.00	73.97	0.00	$3,329	
Word Processing/Clerical	15.00	HR	0.00	58.31	0.00	$875	
Draftsman/CADD	15.00	HR	0.00	76.46	0.00	$1,147	
SUBTOTAL						**$21,883**	

TABLE B-6: ALTERNATIVE 4A: PUMP AND TREAT, TOTAL REMEDIAL COST (CONTINUED)
Feasibility Study Report for SWMUs 2, 5, 7, and 18, Naval Weapons Station Seal Beach Detachment Concord, Concord, California

COST ESTIMATE SUMMARY

Site: SWMUs 2, 5, 7, and 18
Location: Naval Weapons Station Seal Beach, Detachment Concord
Phase: Feasibility Study
Base Year: 2004
Date: October 18, 2007

Description: Treatment of vadose zone using soil vapor extraction. Pump and treat of contaminated groundwater (entire plume) by air stripping processes. Quarterly groundwater montitoring during first 2 years of active treatment. Semi-annual groundwater monitoring for 3 years, annual monitoring for 15 years. Total remedial timeframe is 20 years.

DESCRIPTION		Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Costa	Notes
ANNUAL SUBTOTAL (Year 1) including 25% contingency							**$423,803**	
ANNUAL SUBTOTAL (Year 2) including 25% contingency							**$371,421**	
ANNUAL SUBTOTAL (Years 3, 4 and 5) including 25% contingency							**$286,355**	
ANNUAL SUBTOTAL (Years 6 through 20) including 25% contingency							**$244,435**	
PERIODIC COSTS[a]:	**Year**							
Five-Year Review Report	5-15	3.00	EA		20,710.05		$62,130	End of years 5, 10, 15
Contingency		25%					$15,533	10% scope + 15% bid
SUBTOTAL							**$77,663**	
Closeout Report	20	1.00	EA		21,553.00		$21,553	Closeout Report
Well Abandonment	20	18.00	EA		417.75		$7,520	
Contingency		25%					$7,268	10% scope + 15% bid
SUBTOTAL							**$36,341**	

PRESENT VALUE ANALYSES:

Cost Type	Yearb	Total Cost 2004 dollars	Total Cost dollarsc	2007	Future Value 2.0%	Net Present Value 4.4%	Notes
Capital Cost	1	$834,646	$852,174		$860,653	$842,322	Year 0 capital construction
O&M	2	$423,803	$432,703		$445,748	$417,868	Year 1 monitoring
O&M	3	$371,421	$379,221		$398,467	$357,801	Year 2 monitoring
O&M	4	$286,355	$292,368		$313,351	$269,513	Year 3 monitoring
O&M	5	$286,355	$292,368		$319,618	$263,317	Year 4 monitoring
O&M and Periodic Cost	6	$312,242	$318,800		$355,483	$280,521	Year 5 monitoring and 5-year review
O&M	7	$244,435	$249,568		$283,851	$214,554	Year 6 monitoring
O&M	8	$244,435	$249,568		$289,528	$209,622	Year 7 monitoring
O&M	9	$244,435	$249,568		$295,318	$204,803	Year 8 monitoring
O&M	10	$244,435	$249,568		$301,225	$200,095	Year 9 monitoring
O&M and Periodic Cost	11	$270,322	$275,999		$339,789	$216,199	Year 10 monitoring and 5-year review
O&M	12	$244,435	$249,568		$313,394	$191,001	Year 11 monitoring
O&M	13	$244,435	$249,568		$319,662	$186,610	Year 12 monitoring
O&M	14	$244,435	$249,568		$326,055	$182,320	Year 13 monitoring
O&M	15	$244,435	$249,568		$332,576	$178,129	Year 14 monitoring
O&M and Periodic Cost	16	$270,322	$275,999		$375,155	$192,465	Year 15 monitoring and 5-year review
O&M	17	$244,435	$249,568		$346,012	$170,033	Year 16 monitoring
O&M	18	$244,435	$249,568		$352,933	$166,124	Year 17 monitoring
O&M	19	$244,435	$249,568		$359,991	$162,305	Year 18 monitoring
O&M	20	$244,435	$249,568		$367,191	$158,574	Year 19 monitoring
O&M and Periodic Cost	21	$280,775	$286,672		$430,218	$177,962	Year 20 monitoring and closeout report
		$6,269,459	**$6,401,118**		**$7,726,217**	**$5,242,138**	

TOTAL PRESENT VALUE OF ALTERNATIVE 4A **$5,242,138**

Notes:

a Costs provided by RACER 2004 (Earth Tech 2004).

b Years identified in cost estimate summary refer to O&M years, with capital construction occuring in year 0; however, project years were used for net present value calculations. Capital construction would occur in year 1 of the project, with O&M years 1 through 20 corresponding to project years 2 through 21.

c Updated to 2007 dollars by applying escalation factor (1.0210) from RACER 2006 (Earth Tech 2006).

Sources:

Earth Tech. 2004. "Remedial Action Cost Engineering and Requirements™ System Parametric Cost-Estimating Software for Remediation and Restoration Projects." RACER™ Version 6.0.0.

Earth Tech. 2006. "Remedial Action Cost Engineering and Requirements™ System Parametric Cost-Estimating Software for Remediation and Restoration Projects." RACER™ Version 8.1.

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
29	Present-Worth Cost: $3.8 million	Table 4	Final Feasibility Study Report for Solid Waste Management Units 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Appendix B, Table B-7. Tetra Tech. March 20, 2008.

TABLE B-7: ALTERNATIVE 4B: PUMP AND TREAT AND MONITORED NATURAL ATTENUATION, TOTAL REMEDIAL COST
Feasibility Study Report for SWMUs 2, 5, 7, and 18, Naval Weapons Station Seal Beach Detachment Concord, Concord, California

COST ESTIMATE SUMMARY

Site: SWMUs 2, 5, 7, and 18
Location: Naval Weapons Station Seal Beach, Detachment Concord
Phase: Feasibility Study
Base Year: 2004
Date: October 18, 2007

Description: Treatment of vadose zone using soil vapor extraction. Pump and treat of contaminated groundwater (entire plume) by air stripping processes where PCE concentrations exceed 10 ug/L; MNA for remainder of the plume. Quarterly groundwater montitoring during first 2 years of active treatment. Semiannual groundwater sampling for 3 years, annual sampling for 15 years. Total remedial timeframe is 20 years.

DESCRIPTION	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Costa	Notes
CAPITAL COSTS[a]:							
Startup Costs							
Other Direct Costs	1.00	LS	25449.05	31079.37	12837.13	**$69,366**	
Source Area Vadose Zone							
Soil Vapor Extraction (7 SVE wells installed to 12 ft bgs with 5-ft screens)							
Direct-Push Rig, Truck-Mounted, Nonhydraulic, includes Labor, Sampling, and Decontamination	3.00	DAY	248.99	0.00	0.00	$747	
Mobilize/Demobilize Direct-Push Rig and Cre	3.00	DAY	829.96	0.00	0.00	$2,490	
Furnish 55-Gallon Drum for Drill Cuttings	4.00	EA	114.10	0.00	0.00	$456	
Organic Vapor Analyzer Rental, per Day	3.00	DAY	165.99	0.00	0.00	$498	
1 HP, 230V, 98 SCFM, Vapor Recovery System	1.00	EA	5,686.86	1,302.80	0.00	$6,990	
Field Technician	40.00	HR	0.00	73.97	0.00	$2,959	
2" PVC, Schedule 40, Well Casing	50.00	LF	1.73	8.48	11.53	$1,087	
2" PVC, Schedule 40, Well Screen	35.00	LF	4.00	10.94	14.87	$1,043	
2" PVC, Well Plug	7.00	EA	8.43	12.72	17.29	$269	
2" Screen, Filter Pack	70.00	LF	4.50	7.21	9.80	$1,506	
2" Well, Portland Cement Grout	20.00	LF	1.67	0.00	0.00	$33	
2" Well, Bentonite Seal	7.00	EA	13.37	28.62	38.91	$566	
2" PVC, Schedule 80, Connection Piping	175.00	LF	1.28	9.22	0.00	$1,838	
2" PVC, Schedule 80, Tee	7.00	EA	18.41	0.00	0.00	$129	
2" PVC, Schedule 80, 90 Degree, Elbow	7.00	EA	5.01	0.00	0.00	$35	
2" PVC, Sch 80, Ball Valve	7.00	EA	128.70	0.00	0.00	$901	
2" Steel, 0-300 PSI Pressure Gauge	7.00	EA	33.66	86.76	0.00	$843	
SUBTOTAL						**$22,390**	
Installation of Groundwater Monitoring Wells (18 wells to 27 ft bgs with 10-ft screens)							
Direct-Push Rig, Truck-Mounted, Nonhydraulic, includes Labor, Sampling, and Decontamination	6.00	DAY	248.99	0.00	0.00	$1,494	
Mobilize/Demobilize Direct-Push Rig and Cre	6.00	DAY	829.96	0.00	0.00	$4,980	
Organic Vapor Analyzer Rental, per Day	6.00	DAY	165.99	0.00	0.00	$996	
Volatile Organic Analysis (SW 5035/SW 8260B), Soil Analysis	36.00	EA	296.90	0.00	0.00	$10,688	
Field Technician	180.00	HR	0.00	73.97	0.00	$13,315	
2" PVC, Schedule 40, Well Casing	306.00	LF	1.63	7.80	9.52	$5,799	
2" PVC, Schedule 40, Well Screen	180.00	LF	3.77	10.06	12.29	$4,702	
2" PVC, Well Plug	18.00	EA	7.94	11.70	14.29	$611	
Split Spoon Sampling	108.00	LF	0.00	33.43	40.82	$8,019	
Furnish 55 Gallon Drum for Drill Cuttings and Development Water	27.00	EA	114.10	0.00	0.00	$3,081	
2" Screen, Filter Pack	216.00	LF	4.23	6.63	8.10	$4,095	
2" Well, Portland Cement Grout	252.00	LF	1.58	0.00	0.00	$398	
2" Well, Bentonite Seal	18.00	EA	12.59	26.33	32.14	$1,279	
SUBTOTAL						**$59,456**	
Groundwater Extraction Wells							
Demolish Bituminous Pavement with Air Equipment	3.20	CY	0.00	84.62	11.48	$308	
Organic Vapor Analyzer Rental, per Day	16.00	DAY	165.99	0.00	0.00	$2,656	
Direct-Push Rig, Truck-Mounted, Nonhydraulic, includes Labor, Sampling, and Decontamination	16.00	DAY	248.99	0.00	0.00	$3,984	
Mobilize Direct-Push Rig and Crew	16.00	DAY	829.96	0.00	0.00	$13,279	
Demobilize Direct-Push Rig and Crew	16.00	DAY	829.96	0.00	0.00	$13,279	
5,000-Gallon Single-Wall Steel Aboveground Tank	1.00	EA	6801.61	3585.30	250.83	$10,638	
Field Technician	40.00	HR	0.00	73.97	0.00	$2,959	
6" PVC, Schedule 40, Well Casing	105.00	LF	5.69	11.23	13.72	$3,217	
2" Pitless Adapter	7.00	EA	274.68	0.00	22.92	$2,083	
6" PVC, Schedule 40, Well Screen	63.00	LF	12.95	18.72	22.86	$3,435	
6" PVC, Well Plug	7.00	EA	87.22	29.25	35.72	$1,065	
4" Submersible Pump, 0.3-7 GPM, Head <=140', 1/3 hp, w/ controls	7.00	EA	2723.92	0.00	0.00	$19,067	
Air Stripping Unit, 50 GPM	1.00	EA	30000.00	0.00	0.00	$30,000	
Split Spoon Sample, 2" x 24", During Drilling	17.00	EA	59.25	0.00	0.00	$1,007	
Furnish 55-Gallon Drum for Drill Cuttings and Development Water	24.00	EA	114.10	0.00	0.00	$2,738	
Well Development Equipment Rental (weekly)	7.00	WK	344.33	0.00	0.00	$2,410	
6" Screen, Filter Pack	63.00	LF	10.84	16.97	20.72	$3,057	
6" Well, Portland Cement Grout	14.00	LF	13.41	0.00	0.00	$188	
6" Well, Bentonite Seal	7.00	EA	50.34	105.31	128.58	$1,990	
Restricted Area, Well Protection (with Four Posts and Explosionproof Receptacle)	7.00	EA	772.45	870.86	3.47	$11,527	
1" PVC, Schedule 80, Connection Piping	880.00	LF	0.53	6.13	0.00	$5,861	
SUBTOTAL						**$134,750**	

TABLE B-7: ALTERNATIVE 4B: PUMP AND TREAT AND MONITORED NATURAL ATTENUATION, TOTAL REMEDIAL COST (CONTINUED)
Feasibility Study Report for SWMUs 2, 5, 7, and 18, Naval Weapons Station Seal Beach Detachment Concord, Concord, California

COST ESTIMATE SUMMARY

Site: SWMUs 2, 5, 7, and 18
Location: Naval Weapons Station Seal Beach, Detachment Concord
Phase: Feasibility Study
Base Year: 2004
Date: October 18, 2007

Description: Treatment of vadose zone using soil vapor extraction. Pump and treat of contaminated groundwater (entire plume) by air stripping processes where PCE concentrations exceed 10 ug/L; MNA for remainder of the plume. Quarterly groundwater montitoring during first 2 years of active treatment. Semiannual groundwater sampling for 3 years, annual sampling for 15 years. Total remedial timeframe is 20 years.

DESCRIPTION	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Costa	Notes
Overhead Electrical Distribution							
1/0 ACSR Conductor	1908.00	LF	0.31	1.61	0.07	$3,797	
1/C #2 Aluminum, Bare, Wire	796.00	LF	0.23	1.55	0.07	$1,473	
40' Class 3 Treated Power Pole	4.00	EA	458.57	907.33	61.07	$5,708	
Straight-line Structure, 5 KV Pole Top	2.00	EA	156.66	817.63	55.03	$2,059	
Terminal Structure, 5 KV Pole Top	2.00	EA	1770.67	3102.52	208.81	$10,164	
5 KV, 3/0, Shielded Cable, Copper	120.00	LF	3.85	3.99	0.27	$973	
5 KV, 1/0 to 4/0 Conductor, Terminations & Splicing	6.00	EA	683.44	619.29	0.00	$7,816	
4" Rigid Steel Conduit	40.00	LF	13.54	24.95	0.00	$1,540	
SUBTOTAL						**$33,529**	
Pipeline to Golf Course Reservoir (9 months)							
Cat 215, 1.0 CY, Soil, Shallow, Trenching	277.78		0.00	1.72	1.07	$775	
Backfill with Excavated Material	375.00		0.50	8.76	1.36	$3,983	
Delivered and Dumped, Backfill with Stone	27.78		38.02	1.94	1.50	$1,152	
Spread Dumped Borrow and Compact with Roller	27.78		0.00	0.56	0.46	$28	
4" PVC, Schedule 40, Connection Piping	1000.00		5.01	26.47	0.00	$31,480	
SUBTOTAL						**$37,418**	
Discharge to Publicly Owned Treatment Works (3 months in winter)							
Medium Brush, Medium Trees, Clear, Grub, Haul	1.00	ACRE	0.00	10222.02	3939.59	$14,162	
Cat 225, 1.5 CY, Soil/Sand, Trenching	112.00	CY	0.00	1.12	0.72	$206	
950, 3.00 CY, Backfill with Excavated Material	110.00	CY	0.00	1.41	0.89	$253	
Seeding, Vegetative Cover	1.00	ACRE	4719.13	209.36	72.45	$5,001	
6" PVC Pipe Sanitary	200.00	LF	3.43	11.92	2.50	$3,570	
Class II Industrial User Connection Fee	1.00	EA	4300.00	0.00	0.00	$4,300	
SUBTOTAL						**$27,492**	
Residual Waste Management (Soil)							
T&D of Debris to a Class I Facility, Assuming RCRA Stabilization for Lead	0.00	TON	0.00	192.91	0.00	$0	
T&D of Debris to a Class I Facility, Assuming Cal-Hazardous Material	0.00	TON	0.00	80.21	0.00	$0	
T&D of Debris to a Class II Facility	263.00	TON	0.00	55.20	0.00	$14,518	
TCLP (RCRA) (EPA 1311), Soil Analysis	2.00	EA	821.93	0.00	0.00	$1,644	
SUBTOTAL						**$16,161**	
SUBTOTAL						$400,561	
Contingency		25%				$100,140	10% scope + 15% bid
SUBTOTAL						$500,702	
Professional Labor Management [a]							
Design and Work Plan		20.00%				$100,140	
Project Management Labor Cost		2.50%				$12,518	
Planning Documents Labor Cost		2.50%				$12,518	
Construction Oversight Labor Cost		2.75%				$13,769	
Reporting Labor Cost		0.35%				$1,752	
As-Built Drawings Labor Cost		0.35%				$1,752	
Public Notice Labor Cost		0.08%				$401	
Site Closure Activities Labor Cost		0.00%				$0	
Permitting Labor Cost		5.00%				$25,035	
SUBTOTAL						**$167,885**	
TOTAL CAPITAL COST IN 2007 DOLLARS						**$668,587**	

TABLE B-7: ALTERNATIVE 4B: PUMP AND TREAT AND MONITORED NATURAL ATTENUATION, TOTAL REMEDIAL COST (CONTINUED)
Feasibility Study Report for SWMUs 2, 5, 7, and 18, Naval Weapons Station Seal Beach Detachment Concord, Concord, California

COST ESTIMATE SUMMARY

Site: SWMUs 2, 5, 7, and 18
Location: Naval Weapons Station Seal Beach, Detachment Concord
Phase: Feasibility Study
Base Year: 2004
Date: October 18, 2007

Description: Treatment of vadose zone using soil vapor extraction. Pump and treat of contaminated groundwater (entire plume) by air stripping processes where PCE concentrations exceed 10 ug/L; MNA for remainder of the plume. Quarterly groundwater montitoring during first 2 years of active treatment. Semiannual groundwater sampling for 3 years, annual sampling for 15 years. Total remedial timeframe is 20 years.

DESCRIPTION	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Costa	Notes
OPERATIONS AND MAINTENANCE COSTS[a]:							
Source Area Soil Vapor Extraction (Year 1)							active treatment
Staff Engineer	120.00	HR	0.00	110.21	0.00	$13,225	
Field Technician	280.00	HR	0.00	73.97	0.00	$20,712	
Electrical Charge	7000.00	KWH	0.10	0.00	0.00	$700	
SUBTOTAL						**$34,637**	
Source Area Soil Vapor Sampling (Year 1)							
Field Technician	40.00	HR	0	73.97	0	$2,959	
Monitoring Gas Vents	4.00	EA	0.00	34.38	0.00	$138	
Tentative ID Compunds, GC/MS, Air (30/5041/8260B - TO-14), Air Analysis	5.00	EA	236.47	0.00	0.00	$1,182	
SUBTOTA						**$4,279**	
Groundwater Extraction Wells (Years 1 through 20)							
Staff Engineer	40.00	HR	0.00	110.21	0.00	$4,408	
Field Technician	220.00	HR	0.00	73.97	0.00	$16,273	
Electrical Charge	2566.00	KWH	0.08	0.00	0.00	$205	
SUBTOTAL						**$20,887**	
Air Stripping (Years 1 thorugh 20)							
Staff Engineer	30.00	HR	0.00	110.21	0.00	$3,306	
Field Technician	149.00	HR	0.00	73.97	0.00	$11,022	
Electrical Charge	34667.00	KWH	0.08	0.00	0.00	$2,773	
SUBTOTAL						**$17,101**	
Discharge to Publicly Owned Treatment Works (Years 1 through 20)							
Wastewater Disposal Fee	2299.50	KGAL	20.00	0.00	0.00	$45,990	
Staff Engineer	5.00	HR	0.00	110.21	0.00	$551	
Field Technician	24.00	HR	0.00	73.97	0.00	$1,775	
Electrical Charge	1640.00	KWH	0.09	0.00	0.00	$148	
Class II Industrial User Connection Fee	1.00	EA	4300.00	0.00	0.00	$4,300	
SUBTOTAL						**$52,764**	
Quarterly Groundwater Monitoring (Years 1 and 2)							22 wells sampled quarterly
Disposable Materials per Sample	100.00	EA	12.14	0.00	0.00	$1,214	includes 2 QC and 1 equipment rinsate
Decontamination Materials per Sample	100.00	EA	10.84	0.00	0.00	$1,084	per sampling event
Nylon Tubing, 1/4" Outside Diameter	2140.00	LF	0.63	0.00	0.00	$1,348	
Water Level Indicator, Manual, Polyethylene Tape, 100' Cable, and Weekly Rental	5.00	WK	95.45	0.00	0.00	$477	
Flow Through Monitor, Weekly Rental	5.00	WK	323.68	0.00	0.00	$1,618	
Water Quality Parameter Testing Device	5.00	WK	344.33	0.00	0.00	$1,722	
Nitrogen/Nitrite/Nitrate (EPA 300.0/SM 4110B, Water Analysis	100.00	EA	47.87	0.00	0.00	$4,787	
Acidity/Alkalinity (EPA 305.1/310.1), Water Analysis	100.00	EA	37.11	0.00	0.00	$3,711	
Volatile Organic Analysis (EPA 624), Water Analysis	100.00	EA	296.90	0.00	0.00	$29,690	
Sulfate (EPA 300.0), Water Analysis	100.00	EA	27.94	0.00	0.00	$2,794	
Sulfide (EPA 376.1), Water Analysis	100.00	EA	40.89	0.00	0.00	$4,089	
Ferrous Iron (S.M. 3500 Fe - D)	100.00	EA	129.55	0.00	0.00	$12,955	
4" Submersible Pump Rental, Week	5.00	WK	329.12	0.00	0.00	$1,646	
SUBTOTAL						**$67,135**	
Semiannual Groundwater Monitoring (Years 3, 4, and 5)							22 wells sampled semi-annually
Disposable Materials per Sample	50.00	EA	12.14	0.00	0.00	$607	includes 2 QC and 1 equipment rinsate
Decontamination Materials per Sample	50.00	EA	10.84	0.00	0.00	$542	per sampling event
Nylon Tubing, 1/4" Outside Diameter	1068.00	LF	0.63	0.00	0.00	$673	
Water Level Indicator, Manual, Polyethylene Tape, 100' Cable, Weekly Rental	3.00	WK	95.45	0.00	0.00	$286	
Flow Through Monitor, Weekly Rental	3.00	WK	323.68	0.00	0.00	$971	
Water Quality Parameter Testing Device	3.00	WK	344.33	0.00	0.00	$1,033	
Nitrogen/Nitrite/Nitrate (EPA 300.0/SM 4110B, Water Analysis	50.00	EA	47.87	0.00	0.00	$2,394	
Acidity/Alkalinity (EPA 305.1/310.1), Water Analysis	50.00	EA	37.11	0.00	0.00	$1,856	
Volatile Organic Analysis (EPA 624), Water Analysis	50.00	EA	296.90	0.00	0.00	$14,845	
Sulfate (EPA 300.0), Water Analysis	50.00	EA	27.94	0.00	0.00	$1,397	
Sulfide (EPA 376.1), Water Analysis	50.00	EA	40.89	0.00	0.00	$2,045	
Ferrous Iron (S.M. 3500 Fe - D)	50.00	EA	129.55	0.00	0.00	$6,478	
4" Submersible Pump Rental, Week	3.00	WK	329.12	0.00	0.00	$987	
SUBTOTAL						**$34,113**	

TABLE B-7: ALTERNATIVE 4B: PUMP AND TREAT AND MONITORED NATURAL ATTENUATION, TOTAL REMEDIAL COST (CONTINUED)
Feasibility Study Report for SWMUs 2, 5, 7, and 18, Naval Weapons Station Seal Beach Detachment Concord, Concord, California

COST ESTIMATE SUMMARY

Site: SWMUs 2, 5, 7, and 18
Location: Naval Weapons Station Seal Beach, Detachment Concord
Phase: Feasibility Study
Base Year: 2004
Date: October 18, 2007

Description: Treatment of vadose zone using soil vapor extraction. Pump and treat of contaminated groundwater (entire plume) by air stripping processes where PCE concentrations exceed 10 ug/L; MNA for remainder of the plume. Quarterly groundwater montitoring during first 2 years of active treatment. Semiannual groundwater sampling for 3 years, annual sampling for 15 years. Total remedial timeframe is 20 years.

DESCRIPTION	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Costa	Notes
Annual Groundwater Monitoring (Years 6 through 20)							22 wells sampled annually
Disposable Materials per Sample	25.00	EA	12.14	0.00	0.00	$304	includes 2 QC and 1 equipment rinsate
Decontamination Materials per Sample	25.00	EA	10.84	0.00	0.00	$271	per sampling event
Nylon Tubing, 1/4" Outside Diameter	534.00	LF	0.63	0.00	0.00	$336	
Water Level Indicator, Manual, Polyethylene Tape, 100' Cable, Weekly Rental	2.00	WK	95.45	0.00	0.00	$191	
Flow Through Monitor, Weekly Rental	2.00	WK	323.68	0.00	0.00	$647	
Water Quality Parameter Testing Device	2.00	WK	344.33	0.00	0.00	$689	
Nitrogen/Nitrite/Nitrate (EPA 300.0/SM 4110B, Water Analysis	25.00	EA	47.87	0.00	0.00	$1,197	
Acidity/Alkalinity (EPA 305.1/310.1), Water Analysis	25.00	EA	37.11	0.00	0.00	$928	
Volatile Organic Analysis (EPA 624), Water Analysis	25.00	EA	296.90	0.00	0.00	$7,423	
Sulfate (EPA 300.0), Water Analysis	25.00	EA	27.94	0.00	0.00	$699	
Sulfide (EPA 376.1), Water Analysis	25.00	EA	40.89	0.00	0.00	$1,022	
Ferrous Iron (S.M. 3500 Fe - D)	25.00	EA	129.55	0.00	0.00	$3,239	
4" Submersible Pump Rental, Week	2.00	WK	329.12	0.00	0.00	$658	
SUBTOTAL						**$17,603**	
Quarterly Surface Water Monitoring (Year 1)							
Glass Coliwasas, Disposable, 7/8" x 42", 200 ml, Case of 12	1.00	EA	121.96	0.00	0.00	$122	
Cyanide (EPA 335.2), Water Analysis	5.00	EA	76.79	0.00	0.00	$384	
Oil And Grease (EPA 413.2), Water Analysis	5.00	EA	89.07	0.00	0.00	$445	
Volatile Organic Analysis (EPA 624), Water Analysis	5.00	EA	296.90	0.00	0.00	$1,485	
TAL Metals (EPA 6010/7000s), Water, Water Analysis	5.00	EA	469.10	0.00	0.00	$2,346	
Mercury, Cold Vapor (EPA 245.1), Water Analysis	5.00	EA	64.78	0.00	0.00	$324	
SUBTOTAL						**$5,105**	
Annual Surface Water Monitoring (Years 2 though 20)							
Glass Coliwasas, Disposable, 7/8" x 42", 200 ml, Case of 12	1.00	EA	121.96	0.00	0.00	$122	
Cyanide (EPA 335.2), Water Analysis	2.00	EA	76.79	0.00	0.00	$154	
Oil And Grease (EPA 413.2), Water Analysis	2.00	EA	89.07	0.00	0.00	$178	
Volatile Organic Analysis (EPA 624), Water Analysis	2.00	EA	296.90	0.00	0.00	$594	
TAL Metals (EPA 6010/7000s), Water, Water Analysis	2.00	EA	469.10	0.00	0.00	$938	
Mercury, Cold Vapor (EPA 245.1), Water Analysis	2.00	EA	64.78	0.00	0.00	$130	
SUBTOTAL						**$2,115**	
General Monitoring (Years 1 and 2)							
Car or Van Mileage Charge	900.00	MI	0.52	0.00	0.00	$468	
Project Manager	4.00	HR	0.00	184.67	0.00	$739	
Project Engineer	30.00	HR	0.00	117.91	0.00	$3,537	
Project Scientist	382.00	HR	0.00	112.13	0.00	$42,833	
Staff Scientist	80.00	HR	0.00	91.94	0.00	$7,355	
Field Technician	170.00	HR	0.00	73.97	0.00	$12,575	
Word Processing/Clerical	50.00	HR	0.00	58.31	0.00	$2,915	
Draftsman/CADD	46.00	HR	0.00	76.46	0.00	$3,517	
SUBTOTAL						**$73,939**	
General Monitoring (Years 3, 4, and 5)							
Car or Van Mileage Charge	450.00	MI	0.52	0.00	0.00	$234	
Project Manager	4.00	HR	0.00	184.67	0.00	$739	
Project Engineer	15.00	HR	0.00	117.91	0.00	$1,769	
Project Scientist	205.00	HR	0.00	112.13	0.00	$22,986	
Staff Scientist	40.00	HR	0.00	91.94	0.00	$3,678	
Field Technician	85.00	HR	0.00	73.97	0.00	$6,287	
Word Processing/Clerical	25.00	HR	0.00	58.31	0.00	$1,458	
Draftsman/CADD	23.00	HR	0.00	76.46	0.00	$1,759	
SUBTOTAL						**$38,909**	
General Monitoring (Years 6 though 20)							
Car or Van Mileage Charge	225.00	MI	0.52	0.00	0.00	$117	
Project Manager	4.00	HR	0.00	184.67	0.00	$739	
Project Engineer	8.00	HR	0.00	117.91	0.00	$943	
Project Scientist	115.00	HR	0.00	112.13	0.00	$12,895	
Staff Scientist	20.00	HR	0.00	91.94	0.00	$1,839	
Field Technician	45.00	HR	0.00	73.97	0.00	$3,329	
Word Processing/Clerical	15.00	HR	0.00	58.31	0.00	$875	
Draftsman/CADD	15.00	HR	0.00	76.46	0.00	$1,147	
SUBTOTAL						**$21,883**	

TABLE B-7: ALTERNATIVE 4B: PUMP AND TREAT AND MONITORED NATURAL ATTENUATION, TOTAL REMEDIAL COST (CONTINUED)
Feasibility Study Report for SWMUs 2, 5, 7, and 18, Naval Weapons Station Seal Beach Detachment Concord, Concord, California

COST ESTIMATE SUMMARY

Site: SWMUs 2, 5, 7, and 18
Location: Naval Weapons Station Seal Beach, Detachment Concord
Phase: Feasibility Study
Base Year: 2004
Date: October 18, 2007

Description: Treatment of vadose zone using soil vapor extraction. Pump and treat of contaminated groundwater (entire plume) by air stripping processes where PCE concentrations exceed 10 ug/L; MNA for remainder of the plume. Quarterly groundwater montitoring during first 2 years of active treatment. Semiannual groundwater sampling for 3 years, annual sampling for 15 years. Total remedial timeframe is 20 years.

DESCRIPTION	Quantity	Unit of Measure	Material Unit Cost	Labor Unit Cost	Equipment Unit Cost	Extended Costa	Notes
ANNUAL SUBTOTAL (Year 1) includes 25% contingency						**$344,809**	
ANNUAL SUBTOTAL (Year 2) includes 25% contingency						**$292,427**	
ANNUAL SUBTOTAL (Years 3, 4 and 5) includes 25% contingency						**$207,361**	
ANNUAL SUBTOTAL (Years 6 through 20) includes 25% contingency						**$165,441**	
PERIODIC COSTS[a]:	**Year**						
Five-Year Review Report	5-15	3.00	EA	20,710.05		$62,130	End of years 5, 10, 15
Contingency		0.25				$15,533	10% scope + 15% bid
SUBTOTAL						**$77,663**	
Closeout Report	20	1.00	EA	21,553.00		$21,553	Closeout report
Well Abandonment	20	18.00	EA	417.75		$7,520	
Contingency		25%				$5,388	10% scope + 15% bid
SUBTOTAL						**$34,461**	

PRESENT VALUE ANALYSES:

Cost Type	Yearb	Total Cost 2004 dollars	Total Cost 2007 dollarsc	Future Value 2.0%	Net Present Value 4.4%	Notes
Capital Cost	1	$668,587	$682,627	$689,420	$674,735	Year 0 capital construction
O&M	2	$344,809	$352,050	$362,664	$339,980	Year 1 monitoring
O&M	3	$292,427	$298,568	$313,721	$281,704	Year 2 monitoring
O&M	4	$207,361	$211,715	$226,910	$195,165	Year 3 monitoring
O&M	5	$207,361	$211,715	$231,448	$190,678	Year 4 monitoring
O&M and Periodic Cost	6	$233,248	$238,147	$265,549	$209,552	Year 5 monitoring and 5-year review
O&M	7	$165,441	$168,915	$192,118	$145,216	Year 6 monitoring
O&M	8	$165,441	$168,915	$195,961	$141,878	Year 7 monitoring
O&M	9	$165,441	$168,915	$199,880	$138,617	Year 8 monitoring
O&M	10	$165,441	$168,915	$203,878	$135,430	Year 9 monitoring
O&M and Periodic Cost	11	$191,328	$195,346	$240,495	$153,021	Year 10 monitoring and 5-year review
O&M	12	$165,441	$168,915	$212,114	$129,275	Year 11 monitoring
O&M	13	$165,441	$168,915	$216,357	$126,303	Year 12 monitoring
O&M	14	$165,441	$168,915	$220,684	$123,400	Year 13 monitoring
O&M	15	$165,441	$168,915	$225,097	$120,563	Year 14 monitoring
O&M and Periodic Cost	16	$191,328	$195,346	$265,526	$136,223	Year 15 monitoring and 5-year review
O&M	17	$165,441	$168,915	$234,191	$115,083	Year 16 monitoring
O&M	18	$165,441	$168,915	$238,875	$112,438	Year 17 monitoring
O&M	19	$165,441	$168,915	$243,653	$109,853	Year 18 monitoring
O&M	20	$165,441	$168,915	$248,526	$107,328	Year 19 monitoring
O&M and Periodic Cost	21	$199,901	$204,099	$306,299	$126,702	Year 20 monitoring and closeout report
		$4,521,638	**$4,616,593**	**$5,533,366**	**$3,813,144**	

TOTAL PRESENT VALUE OF ALTERNATIVE 4B **$3,813,144**

Notes:

a Costs provided by RACER 2004 (Earth Tech 2004).

b Years identified in cost estimate summary refer to O&M years, with capital construction occuring in year 0; however, project years were used for net present value calculations. Capital construction would occur in year 1 of the project, with O&M years 1 through 20 corresponding to project years 2 through 21.

c Updated to 2007 dollars by applying escalation factor (1.0210) from RACER 2006 (Earth Tech 2006).

Sources:

Earth Tech. 2004. "Remedial Action Cost Engineering and Requirements™ System Parametric Cost-Estimating Software for Remediation and Restoration Projects." RACER™ Version 6.0.0.

Earth Tech. 2006. "Remedial Action Cost Engineering and Requirements™ System Parametric Cost-Estimating Software for Remediation and Restoration Projects." RACER™ Version 8.1.

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
30	nine evaluation criteria	Section 2.8.2	Final Feasibility Study Report for Solid Waste Management Units 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Section 7.0, last paragraph on p.38 through end of section, and Table 12. Tetra Tech. March 20, 2008.

The FS approach includes the following basic steps:

- Develop RAOs that identify contaminants and media of concern, exposure pathways, and remedial goals. RAOs are developed on the basis of ARARs and the results of the HHRA and ERA.
- Develop GRAs for each medium to address the RAOs. Consider containment, treatment, removal, or other actions singly or in combination in developing GRAs.
- Identify the volume of each affected medium of concern.
- Identify and screen technologies for each GRA to eliminate technologies that technically cannot be implemented or are not cost-effective.
- Identify and screen process options for each technology.
- Assemble retained process options into alternatives and screen the alternatives.
- Conduct a detailed evaluation and comparative analysis of the remaining alternatives identified in the NCP, Title 40 CFR § 300.430(e)(9).

RAOs and remedial goals were developed for the FS based on the information presented in the RI Report and the ARARs. Although remedial goals may be established for soil based on planned reuse, the Navy prefers to evaluate site cleanup based on unrestricted reuse, when feasible. This FS therefore established remedial goals based on residential exposure scenario assumptions for unrestricted reuse.

RAOs can be achieved either by reducing concentrations of the chemicals of concern (COC) or by eliminating the exposure pathways. This FS evaluation includes remedial alternatives that encompass both approaches.

Each remedial alternative is evaluated individually in the last step of the FS process described in the previous list, and then all the remedial alternatives are evaluated together according to the nine criteria described in the bulleted list that follows. This analysis identifies the relative advantages and disadvantages of each alternative. The first two criteria relate directly to the statutory requirements each remedial alternative must meet and are categorized as threshold criteria. The next five criteria are the primary balancing criteria and are the basis for the preliminary selection of the remedy. Together, these first seven criteria are considered the evaluation criteria. The remaining two criteria, state and community acceptance, are modifying criteria that are applied after comments are received on the proposed alternatives from state agencies and the public.

Threshold Criteria

- Overall protection of human health and the environment – Describes how each alternative protects human health and the environment and indicates how each hazardous substance source is to be eliminated, reduced, or controlled.

- Compliance with ARARs – Assesses the compliance of an alternative with all chemical-specific, action-specific, and location-specific ARARs.

Evaluation Criteria

- Long-term effectiveness and permanence – Examines the protection of human health and the environment after construction and implementation of the remedial alternative. This criterion addresses the long-term adequacy, reliability, and permanence of the remedial alternative. Components of this analysis include the following:

  - The expected long-term reduction in risk posed by the site
  - The level of effort needed to maintain the remedy and monitor the area for changes in site conditions

- Reduction of toxicity, mobility, and volume through treatment – Examines the effectiveness of the remedial alternative in reducing the toxicity, mobility, and volume of contaminants through treatment. The following factors are considered:

  - The amount of hazardous materials destroyed or treated
  - The degree of expected reduction in toxicity, mobility, or volume
  - The degree to which the benefits of the remedial alternative are irreversible
  - The types and quantities of treatment residuals that remain after treatment

- Short-term effectiveness – Examines the protection of community and worker health, as well as protection of the environment during construction and implementation of the remedial alternative. The following factors are considered:

  - Protection of the community during the remedial alternative, including the effects of potential releases from the site, transportation of contaminated materials, and air-quality impacts from on-site treatment
  - Protection of workers during the remedial alternative
  - Environmental impacts of the remedial alternative
  - Time required to achieve RAOs

- Implementability – Considers the technical and administrative feasibility of each alternative as well as the availability of the resources required. Factors considered in assessing this criterion include construction and operation and maintenance (O&M) of the remedial alternative; required approvals and permits from regulatory agencies; availability of required off-site treatment or disposal services; and availability of necessary equipment, materials, personnel, and time for implementation.

- Cost – Involves development and evaluation of the capital cost of construction, equipment, land, buildings, engineering services, and project administration as well as O&M costs for labor, spare parts, materials, and administration activities. The present worth of each alternative is calculated using a discount rate in this FS Report. The level of detail employed in developing these estimates is considered appropriate for making choices among alternatives, but the estimates are not intended for use in detailed budgetary planning. The expected accuracy ranges for development of costs for detailed analysis alternative phase of the FS are –30 to +50 percent (EPA 1988).

- State acceptance – Identifies the state's preferences or concerns about alternatives. This criterion will be evaluated after comments have been received on this FS Report.

- Community acceptance – Identifies the community's preferences or concerns about alternatives. This criterion will be evaluated after comments have been received on this FS Report.

Two other criteria are mentioned in the NCP for evaluating each alternative:

- Cost-effectiveness, where costs are compared with overall effectiveness for proportionality. Overall effectiveness comprises long-term effectiveness and permanence, reduction of toxicity, mobility, and volume through treatment, and short-term effectiveness.

- Use of permanent solutions and alternative treatment technologies, or resource recovery technologies to the maximum extent possible, with an emphasis on long-term effectiveness, and reduction of toxicity, mobility, and volume through treatment, and a preference for treatment and bias against off-site disposal.

8.0 FEASIBILITY STUDY EVALUATION

This section describes the development and analysis of remedial alternatives for groundwater and soil gas at the SWMUs site. Section 8.1 discusses RAOs. Section 8.2 identifies potential ARARs, and Section 8.3 discusses the GRAs. Section 8.4 identifies the volumes of contaminated groundwater. Section 8.5 presents the preliminary screening of technologies and response actions. Section 8.6 presents the proposed remedial alternatives. Section 8.7 presents a detailed analysis of the remedial alternatives, and Section 8.8 presents a comparative analysis of remedial alternatives for the SWMUs site.

TABLE 12: REMEDIAL ALTERNATIVE RANKING
Feasibility Study Report for SWMUs 2, 5, 7, and 18, Naval Weapons Station Seal Beach Detachment Concord, Concord, California

Criterion	Primary Remedial Goal: Reduce PCE Concentration to Below MCL for Drinking Water					
	Alternative 2A	**Alternative 2B**	**Alternative 3A**	**Alternative 3B**	**Alternative 4A**	**Alternative 4B**
	Air Sparging	**Air Sparging and Monitored Natural Attenuation**	**Enhanced Bioremediation**	**Enhanced Bioremediation and Monitored Natural Attenuation**	**Pump and Treat**	**Pump and Treat and Monitored Natural Attenuation**
Description	*AS will be conducted within entire 5-µg/L PCE plume contour.*	*AS will be conducted within the 10-µg/L PCE plume contour. MNA will be conducted in the remainder of the plume.*	*Enhanced bioremediation will be conducted within entire 5 µg/L-PCE plume contour.*	*Enhanced bioremediation will be conducted within the 10-µg/L PCE plume contour. MNA will be conducted in the remainder of the plume.*	*Pump and treat will be conducted within entire 5-µg/L PCE plume contour.*	*Pump and treat will be conducted within the 10-µg/L PCE plume contour. MNA will be conducted in the remainder of the plume.*
(1) Overall Protection of Human Health and the Environment (1 indicates least protective and 5 being most protective)						
Domestic use of groundwater[1]	5	5	5	5	5	5
Inhalation of indoor vapors[1]	5	5	5	5	5	5
Average Protectiveness	***5***	***5***	***5***	***5***	***5***	***5***
(2) Compliance with ARARs (1 indicates least compliant and 5 being most compliant)						
Chemical Location and Action Specific ARARs	***5***	***5***	***5***	***5***	***5***	***5***
(3) Long-Term Effectiveness and Permanence (1 indicates least effective and 5 being most effective)						
Magnitude of residual risk from groundwater after completion of treatment	5	5	5	5	5	5
Magnitude of residual risk related to inhalation of indoor vapors after completion of treatment	5	5	5	5	5	5
Adequacy and reliability of controls imposed related to the treatment	5	4	5	4	3	3
Average Long-Term Effectiveness	***5***	***4.7***	***5***	***4.7***	***4.3***	***4.3***
(4) Reduction of Toxicity, Mobility, or Volume through Treatment (1 indicates least reduction and 5 being most reduction)						
Degree of expected reduction in toxicity of the impacted groundwater due to the implementation of remedial alternative	5	5	5	5	5	5
Degree of expected reduction in mobility of the chemicals of concern in groundwater due to the implementation of remedial alternative	5	5	5	5	5	5
Amount of hazardous materials destroyed or treated in groundwater	5	4	5	4	5	4
Types and quantities of treatment residuals that remain after treatment (5 indicates no residuals and 1 indicates significant residuals)	4	4	4	4	3	3
Average Reduction Through Treatment	***4.8***	***4.6***	***4.8***	***4.6***	***4.6***	***4.4***

TABLE 12: REMEDIAL ALTERNATIVE RANKING (CONTINUED)
Feasibility Study Report for SWMUs 2, 5, 7, and 18, Naval Weapons Station Seal Beach Detachment Concord, Concord, California

Criterion	Primary Remedial Goal: Reduce PCE Concentration to Below MCL for Drinking Water					
	Alternative 2A	**Alternative 2B**	**Alternative 3A**	**Alternative 3B**	**Alternative 4A**	**Alternative 4B**
	Air Sparging	**Air Sparging and Monitored Natural Attenuation**	**Enhanced Bioremediation**	**Enhanced Bioremediation and Monitored Natural Attenuation**	**Pump and Treat**	**Pump and Treat and Monitored Natural Attenuation**
Description	*AS will be conducted within entire 5-µg/L PCE plume contour.*	*AS will be conducted within the 10-µg/L PCE plume contour. MNA will be conducted in the remainder of the plume.*	*Enhanced bioremediation will be conducted within entire 5 µg/L-PCE plume contour.*	*Enhanced bioremediation will be conducted within the 10-µg/L PCE plume contour. MNA will be conducted in the remainder of the plume.*	*Pump and treat will be conducted within entire 5-µg/L PCE plume contour.*	*Pump and treat will be conducted within the 10-µg/L PCE plume contour. MNA will be conducted in the remainder of the plume.*
(5) Short-Term Effectiveness (1 being least effective and 5 being most effective)						
Community Protection	5	5	5	5	5	5
Environmental Impacts	5	5	5	5	5	5
Time Until Action Complete	5	4	4	3	2	2
Average Short Term Effectiveness	***5***	***4.7***	***4.7***	***4.3***	***4***	***4***
(6) Implementability (1 being least implementable and 5 being most implementable)						
Ability to Construct and Operate	4	4	3	3	4	4
Ease of Doing More Action if Needed	3	3	4	4	3	3
Ability to Obtain Approvals and Coordinate with other Agencies	4	4	5	5	2	2
Availability of Services and Capacities	4	4	4	4	4	4
Average Implementability	***3.8***	***3.8***	***4***	***4***	***3.2***	***3.2***
(7) Cost (1 being most expensive and 5 being least expensive)						
Present Worth Cost	***3***	***4***	***4***	***5***	***1***	***2***
(8) State Acceptance (1 being least acceptable and 5 being most acceptable)						
Acceptance	*	*	*	*	*	*
(9) Community Acceptance (1 being least acceptable and 5 being most acceptable)						
Acceptance	*	*	*	*	*	*
Overall Score	**32.1**	**31. 8**	**33.0**	**32.6**	**27.1**	**27.9**

Notes:

1 All active remedial alternatives will have land use controls to restrict use of structures and domestic groundwater until remedial goals are achieved.
* Ranking for this criterion will be evaluated based on state and community input during the Proposed Plan phase.

µg/L Microgram per liter
AS Air sparging
MNA Monitored natural attenuation
PCE Tetrachloroethene

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
31	ICs	Section 2.9.2	Final Feasibility Study Report for Solid Waste Management Units 2, 5, 7, and 18. Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Section 8.5.2.2, Paragraphs 1-4 under "Institutional Controls". Tetra Tech. March 20, 2008.

No action implies that no remedial action will be conducted on site. Under the no-action alternative, VOCs in groundwater and soil gas would be left as is without implementing any LUCs, containment, removal, treatment, or other mitigating actions. This response action would not be effective in reducing potential risks to human health that may result from future exposures to groundwater under unrestricted land use. No cost is associated with this option because no action is taken. The NCP requires that the no-action response be included among the alternatives evaluated in every FS (Title 40 CFR § 300.430[e][6]). The no-action alternative provides a baseline for comparison to the other remedial response actions.

8.5.2.2 Land Use Controls

LUCs include ICs and ECs. These are discussed separately below.

Institutional Controls

ICs are non-engineering measures, usually legal or physical, to limit potential exposure to a site or medium of concern. Specific ICs are briefly described in Table 11. Often, ICs are more effective if they are layered or implemented in series. Layering means using different categories of ICs concurrently to enhance the protectiveness of the remedy. Implementation of ICs in series may be applied to ensure both short- and long-term effectiveness of the remedy. Because the ICs may be layered or implemented in series, ICs will be discussed collectively in this FS, rather than discussing each IC as a separate technology or process option.

Land use restrictions at the SWMUs site will include development of a land use control remedial design (LUC RD) as part of the final remedial design for the site. The LUC RD will explain how the ICs are established, documented, maintained, and managed. More specifically, the LUC RD will describe the boundaries of the site, the objectives of the controls, the restrictions, the required frequency for inspections, the entities responsible for carrying out the monitoring and inspection, the methods for certifying compliance, and the procedures for notifying the state and EPA in the event of a failure to comply with the restriction.

Short-term ICs (5 years duration or less) may be necessary to protect against indoor vapor intrusion near the former waste oil tank. These restrictions may need to remain in place until soil vapors in the area of the former waste oil UST have been fully remediated to concentrations that alleviate the risks of exposure through vapor intrusion to indoor air. Short-term ICs may also be needed to restrict residential development in a larger area, to include the general vicinity of Buildings IA-12 and IA-43 (Figure 21). However, long-term ICs should not be required if treatment of soil gas and groundwater is implemented in this area, as is planned under each of the active remediation alternatives, and is completed in less than 5 years.

Short-term ICs to prohibit extraction and use of groundwater from the contaminated plume may be necessary if the remedial goals for groundwater will be achieved within less than 5 years. If active remediation is expected to take more than 5 years before remedial goals are achieved, long-term ICs to prohibit extraction and use of groundwater may be appropriate for those remediation alternatives.

All ICs listed in Table 11, except for administrative orders, will be retained for consideration in the remedial alternatives.

Engineering Controls

ECs reduce or eliminate potential exposures of humans and wildlife to contamination by preventing contact with contaminated media. The most common methods to control vapor from entering a building are by installing a vapor barrier beneath the building or a ventilation system to remove vapors from beneath the building.

Vapor barriers are a passive approach typically employed during construction. They consist of installing the vapor barrier (6-mil polyethylene or equivalent), sealing plumbing penetrations, mixing floor slab concrete with superplasticizers, reinforcing the slab at reentrant corners, and properly curing and loading the slab.

Ventilation systems typically include a subslab depressurization system. This active approach uses a depressurization fan to lower the pressure below the slab. This negative pressure creates a sink for VOCs beneath the building, and the vapors are collected using the fan in perforated piping in the slab. The fan extracts air from below the slab and diverts it to ambient air.

Vapor barriers and subslab depressurization systems were eliminated for existing buildings because of the technical impracticability of installation. The requirement for vapor barriers or subslab depressurization systems for new buildings would be implemented by an IC; this option may be considered in the LUC RD, if necessary.

Monitored Natural Attenuation

This response action involves natural subsurface processes such as dilution, volatilization, biodegradation, adsorption, and chemical reactions with subsurface materials that reduce contaminant concentrations to acceptable levels. This option usually requires modeling and evaluation of contaminant degradation rates and pathways and predicting contaminant concentrations at downgradient receptor points, especially when the plume is still expanding and migrating. The primary objective of site modeling is to demonstrate that natural processes of contaminant degradation will reduce contaminant concentrations to below regulatory standards or risk-based levels before potential exposure pathways are completed. In addition, long-term monitoring must be conducted throughout the process to confirm that degradation is proceeding at rates consistent with meeting the remedial goals.

Item	Reference or Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record[1]
33	meeting transcript	Section 3.0	Public Meeting for Solid Waste Management Units 2, 5, 7, and 18. Reporter's Transcript. October 22, 2008.

PUBLIC MEETING FOR

SOLID WASTE MANAGEMENT UNITS 2, 5, 7, 18

PROPOSED PLAN

REPORTER'S TRANSCRIPT OF MEETING

OCTOBER 22, 2008

Concord Senior Center, Dianda Room
John Baldwin Park
2727 Paradise Circle
Concord, California

Reported by Christine M. Niccoli, RPR, C.S.R. No. 4569

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CERTIFIED SHORTHAND REPORTERS SERVING THE BAY AREA

ATTENDEES

PRESENTERS:
DARREN NEWTON - United States Navy Base Realignment and Closure (BRAC) Environmental Coordinator
CHARLES L. PERRY - United States Navy Project Manager

REGULATORS, U.S. NAVY:
TARA NAJJAR - United States Navy
PHILLIP RAMSEY - U.S. EPA

PUBLIC AUDIENCE:
WAYNE AKIYAMA - Shaw Environmental and Infrastructure, Inc.
EDI BIRSAN - RAB member, Concord resident
KATHERINE DANO-LUTTJOHANN - Concord resident
RICH GRACE - Contra Costa County Fire Protection District
KATIE HENRY - Tetra Tech EMI
CAROLYN HUNTER - Tetra Tech EMI
PAT HOWLETT - Concord resident
BEV MARSHALL - Concord resident
DALE VARADY - Contra Costa County Sheriff's Office

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---oOo---

MR. NEWTON: So I want to thank everybody for coming this evening's public meeting on the Solid Waste Management Units 2, 5, 7 -- 2, 5, 7, and 18 Proposed Plan.

My name is Darren Newton. I'm the Navy's BRAC environmental coordinator for the former Naval Weapons Station Concord inland area.

And the agenda is as follows. The agenda's over there on the side table. We'll have a presentation of . . . oh, here it is. It's a review of the public comment process by myself. I'll go over that in a second.

And then we're going to have an overview of the Navy's installation restoration program on Concord, and then there will be a Proposed Plan summary. Mr. Charles Perry, he's the lead remedial project manager for the pro- -- the program. He will be giving that presentation.

Then we will go over how to review the public comment process, and that will be after Charles's portion, and then we will take public comments.

So the reason that we're having this meeting

this evening is to receive public comments on the Proposed Plan. There are also commenter sheets. So there's commenter sheets that are over there on the side table. And Miss Carolyn Hunter will also be able to assist you later on this evening if you need some help.

But I will provide an overview of the environmental program.

So please hold all your questions or comments till the formal comment period of the meeting. The Navy will not address your public comments here tonight. But they will be addressed in a Responsiveness Summary that's in what's called a Record of Decision.

And we are on the record this evening.

Go to the next slide.

MS. HUNTER: Okay.

MR. NEWTON: So the installation program for former Naval Weapons Station Concord is managed by the BRAC -- that's Base Realignment and Closure -- Program Management Office West with support of the naval engineering -- Naval Facilities Engineering Command, and that's all out of San Diego. And the BRAC PMO reports to the Assistant Secretary of the Navy, and that is out of the headquarters office.

So the purpose of the Navy's IR program is to identify and investigate and assess, characterize, and

remediate hazardous substances on the former facility. So to reduce -- it's also to reduce the risk to human health and the environment from past waste disposal operations and hazardous material spills.

And we want to be consistent with the CERCLA, which is Comprehensive Environmental Response, Compensation, and Liability Act, and that's all towards moving the goal of site closure. And we also call this the CERCLA process, which there's a sign over there that brings us into the CERCLA process, and I'll get to that in a moment.

Next one.

So it's important for us to understand where we are in the CERCLA process and what it all means.

Currently we're in the Proposed Plan portion of CERCLA, which is the remedy selection; but prior to getting there we go through the preliminary assessment and site inspection, and that's usually the discovery phase. From there we go into the Remedial Investigation/Feasibility Study phase which is identifying . . .

MR. RAMSEY: Characterization.

MR. NEWTON: Yeah, identifying characterizations as well as any risks associated with that. And then from there, identifying remedial

responses that could be potential for the site.

The Proposed Plan is where we identify the proposed remedies what we're here to talk about this evening, and that will be reported in a Record of Decision, which is signed by the Navy as well as the regulatory agencies. And the regulatory agencies, your counterpart part here this evening, is Mr. Phil Ramsey with U.S. EPA.

After the Record of Decision, we will go to the remedial design; and if we look at our float chart over there on the side, remedial design is how it's all going to be implemented; and then after that we do the action, which is the little truck over there, and then we have site complete or site closure.

Next slide.

So at a glance, there are 29 IR sites listed in the -- in the program. Naval Weapons Concord -- Naval Weapons Station Concord is listed on the NPL. It's the National Properties List.

And U.S. EPA is the lead regulatory agency. The Navy is the lead agency who leads federal agencies. U.S. EPA is the lead regulatory agency.

And we coordinate with U.S. EPA and the California Department of Toxic Substances Control as well as the Water -- the Regional Water Quality Control

Board, which is your San Francisco Bay Regional Water Quality Control Board, throughout the entire restoration process. Those folks aren't here, but their contact information is in your Proposed Plan, and that is on page . . .

MR. RAMSEY: I always remember you guys being listed in that, but . . .

MR. NEWTON: Are they not on here?

MR. RAMSEY: I think it's basically the Navy is always identifying on these fact sheets.

MR. NEWTON: They are.

MR. RAMSEY: Yeah.

MR. NEWTON: Contact information is -- it will come up in the presentation later on.

We also have a -- what's called a Federal Facilities Agreement, or an FFA, that exists between the Navy and the regulatory agencies, and that's the structure by which we operate. That's the guidance document that we operate under, and that contains the site management plan, or an SMP, and that's submittals of milestones for all the IR sites here, and it's updated annually.

So the current phase, which is the Proposed Plan, is -- provides for community involvement. It also summarizes the effort to date, and it proposes the

remedial action.

So right now we're in the proposed -- we haven't actually selected the remedy. What we're at for now is public comment on our proposed remedy. And once we get public comment on that remedy, we will evaluate those comments and incorporate those comments into a Responsiveness Summary and provide responses to those comments, and that will eventually be put in a Record of Decision which will finalize our decision.

So now Mr. Charles Perry, who's the lead RPM, he'll now present a summary of the Proposed Plan for the SWMU sites.

MR. PERRY: Excuse me.

PRESENTATION

BY CHARLES PERRY:

Hi. As Darren mentioned, my name's Charles Perry. I'm the lead RPM for Concord, and I'll be going over major components of the Proposed Plan.

So Naval Weapons Station Concord is located in the north central portion of Contra Costa County, and it's located about 30 miles northeast of San Francisco.

And as I am fairly new to this project, I will be looking at notes a lot. So sorry.

So next slide.

Overview. At this time, we're going over the

main elements of the presentation, briefly discuss the locations of the SWMUs, why remediation is needed, summarize previous investigations, the human health and ecological risk assessment findings, briefly talk about the remedial alternatives considered and evaluated during this FS process.

In addition, I'll go over the process and criteria used in the comparison and evaluation of the remedial alternatives and summarize the elements of the preferred remedial alternative. And finally, I'll outline ste- -- next steps in the remedy selection process and go over how to provide comments and obtain additional information about the SWMU sites.

So location. They are located in the inland area of Naval Weapons Station Concord and, as it mentions here, southwest of First Street and northeast of Seal Creek.

Okay. Why remediation is needed. While groundwater at the site is not used for drinking water and the water supply system of the area is provided by the Contra Costa Water District, the groundwater at the site is designated by the San Francisco Regional Water Quality Control Board as a potential municipal and domestic water supply.

So concentrations of our chemicals of concern,

which are chlorinated solvents, exceed the federal and California maximum contaminate levels, or MCLs. So additionally, concentrations of tetrachloroethene, which is PCE, in soil gas poses an unacceptable risk to potential and future residents.

So we did a human health risk assessment, or HHRA, and identified unacceptable risks due to residential exposure to our chemicals of concern in both concentrations in soil gas and groundwater.

So therefore, remedial action is needed to reduce the concentrations of the chlorinated -- the solvents in groundwater and soil gas to acceptable or safe levels, such as the MCLs in groundwater and risk-based remedial goals in soil vapor, and to prevent off-site migration of contaminated groundwater and also to control unacceptable risk to humans from other nondrinking pathways.

So several investigations have been conducted at sites since 1992. In 1992 the departments -- the Department of Toxic Substances Control, or DTSC, conducted a RCRA Facilities Assessment, or RFA. So they did this to evaluate the potential release of hazardous substances from 49 solid waste management units, or SWMUs, as we like to call them. These included 2, 5, 7, and 18, which we're looking at today.

In 1996 the Navy completed a RFA Confirmation Study to further evaluate the findings of DTSC's RFA report.

Welcome.

After the RFA confirmation study, the Navy conducted follow-up CERCLA investigations of the SWMU sites. The purpose of the follow-up investigations was to confirm the presence, concentrations, and potential sources of contaminants in soil, soil gas, and groundwater as well as to evaluate the need for additional investigations or abatement activities.

From 2002 to 2004, the Navy conducted a remedial investigation under CERCLA at the SWMU sites. The RI activities included soil, soil gas, and groundwater investigations. The activity -- The RI activities and findings were presented in the RI report which was finalized in November 2004.

In 2007 the Navy conducted a feasibility study, or FS activities. The FS included soil vapor extraction and air sparging pilot test. The soil -- the soil vapor extraction and air sparging, or SVE, findings that -- were documented in a technical memorandum dated October 2007; and the FS activities, data, and findings are documented in the final FS report dated March 2008.

So the risk assessments: Both human health

risk assessment, or HHRA, and a screening level ecological risk assessment, or SLERA, were conducted during the remedial investigation phase. The HHRA was conducted to evaluate the likelihood that chemicals of potential concern at the SWMU site would cause adverse cancer or noncancer effects in exposed humans.

The HHRA considered current and potential future site uses. The future use of SWMUs -- of the SWMU site is unknown. As a result, the residential scenario was used because it represents the most conservative future-use scenario and would allow for unrestricted use at the site.

The results of the HHRA indicated that no unacceptable risk was posed to humans from soil ingestion or dermal exposure. Dermal exposure basically means through skin contact.

Concentrations of dichloroethene, or DCE, tetrachloroethene, or PCE, and trichloroethane, or TCE, in soil gas, however, exceeded the screening criteria for indoor air quality; and PCE poses an unacceptable risk for residentials [sic] receptors via indoor air inhalation.

So the maximum detected concentrations of DCE, PCE, and TCE in groundwater exceeded the federal- and California-promulgated drinking-water standards.

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Although a SWMU site is not currently used as a source of drinking water, as I mentioned earlier, groundwater at the site is designated as potentially suitable for municipal and domestic water supply. And the HHRA confirmed the DCE, PCE, and TCE in groundwater pose unacceptable risks for future residential receptors via the use of that domestic water supply.

So the screening level ecological risk assessment, or SLERA, is an evaluation of the likelihood that plants or animals exposed to chemicals of potential ecological concern at a site would cause adverse effects. The SLERA considered risk to plants, soil invertebrates, mammals, fish, and aquatic invertebrates.

The screening-level approach used conservative assumptions and available scientific literature to evaluate the ecological risk in accordance with U.S. EPA guidance. The SLERA concluded that exposure to chemicals at a SWMU site would not cause harmful effects in plants and animals.

So here [Slide 14] are remedial alternatives. We looked at multiple technologies and process options, and these were all considered during the feasibility study. The four implementable remedial technologies were refined into the remedial alternatives.

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The remedial alternatives range from no action to extensive cleanup of contamination in soil gas and groundwater. The remedial alternatives evaluated in the FS are (1) no action, (2) air sparging, (3) enhanced bioremediation, and (4) groundwater pump and treat.

Alternatives 2 through 4 use different technologies to treat chlorinated solvents in groundwater. Each all alternative is split into "A" and "B" technologies -- or alternatives. The "A" alternative treats the area where PCE concentrations exceeded 5 micrograms per liter, and we'll show that in the next slide. The "B" alternatives include treatment where PCE concentrations exceed 10 micrograms per liter.

The remainder of the plume where PCE concentrations exceed the 5 micrograms per liter would be addressed with monitored natural attenuation, or MNA.

For each alternative, treatment would continue until cleanup goals for chlorinated solvents are met in the treatment area. For MNA, groundwater monitoring would continue until the cleanup goals for chlorinated solvents are met.

So here [Slide 15] is the plume in our treatment area. The areas of treatment and the lateral extent of groundwater contamination are shown here. These are the concentrations where PCE exceeds the drinking-water standards, which is the federal and California MCL of 5 micrograms per liter. So you see the 5-microgram outline and the 10-microgram-per-liter outline.

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So here we have -- the evaluation criteria is shown on this slide [16]. The NCP, or National Contingency Plan, criteria were used to evaluate and select the preferred remedial alternative for the remedy in the feasibility study. The remedial alternatives were compared, using the applicable NCP criteria, to identify the alternative that most effective -- effectively meets the remedial action objectives.

The eighth criterion, state acceptance, is documented in this Proposed Plan. The ninth criterion, community acceptance, is -- is why we're here for this meeting today on the Proposed Plan. For this reason, the Navy encourages the public to comment on this Proposed Plan.

The "Detailed Analysis of the Remedial Alternatives" can be found in the Final Feasibility Study Report, copies of which are located in the Administrative Record as well as the information repository, which is the Concord public library.

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The preferred remedial alternative was developed during discussions between the Navy, U.S. EPA, and other regulatory agencies. The Navy proposes an alternative that combines remedial elements of Alternative 2B and modified Alternative 3A.

The concentrations of PC- -- let's see. The preferred remedial alternative combines air sparging and soil vapor extraction where concentrations of PCE exceed 10 micrograms per liter with enhanced bioremediation in the remainder of the plume where chlorinated solvent concentrations exceed 5 micrograms per liter. Air sparging and enhanced bioremediation both received similar high rankings in comparison of the alternatives.

The Navy will conduct monitoring to ensure the remed- -- remedy effectively reduces contaminate concentrations in soil gas and groundwater to acceptable levels and the alternative performs in accordance with guidelines that will be established in the SWMUs site Record of Decision and remedial design.

There will also be a restriction on residential use of the property and use of the groundwater until the remedial action objectives are met.

Based on the information available at this time, the Navy, EPA, and DTSC and the Water Board

support the preferred alternative to be protective of human health for future potential residential use and to support unrestricted land use. The preferred remedial alternative may be modified in response to public comments or new information.

So what's next: The public comment period is from October 7th to November 6th, 2008. A draft Record of Decision will be submitted in March of 2009.

So after this meeting and during the public comment period from October 7th to November 6th -- and the big point here is no later than November 6th you need to get comments in by then. Please provide your comments to Darren at the address shown here, BRAC Program Management Office West, 1455 Frazee Road, Suite 900, San Diego, California 92108. I want to get this whole address out for the record.

You may also submit your comments electronically to Darren Newton, darren.newton@navy.mil.

And here [Slide 20] are your project contacts listed here, and those are in the presentations on the side [indicating].

And with that . . . Wait, I've got one more slide, the information repository.

So as mentioned before, we have an information

repository, and it's been established at the Concord public library to provide access to technical reports and other Installation Restoration Program information, and these all support the remedial action alternatives decision.

So either here at the Concord Public Library, or you can contact the Administrative Record file, which is in San Diego, and Diane Silva's information is located on the page.

And that is it.

MR. NEWTON: Okay. Thank you, Charles.

MR. PERRY: Thank you.

MR. NEWTON: Before we go into the public comment period, a public -- public comment period, I do want to take note for the record the project contacts. Again, I am Darren Newton, the BRAC environmental coordinator.

But we also have Mr. Phillip Ramsey, the U.S. EPA project manager. He's here with us this evening. That's him right there [indicating].

Jim Pinasco is with the Department of Toxic Substances Control. He's the project manager, and his contact information is listed on this slide as well as Mr. Alan Friedman. He's with the Water Board, San Francisco Bay Regional Water Quality Control Board. He

is our project manager.

All their contact information is right there. So if you do have any questions, please contact them as well.

Okay. So this is the formal comment portion of the meeting. And this meeting -- The purpose of this meeting is to obtain public comments on the Proposed Plan. The Navy will not be responding to your comments this evening. The purpose of this meeting is to obtain public comments so that we can$reviewwhat the community is thinking as part of our NCP nine criteria on what our preferred remedy is, which is 2A [sic] and 3 . . .

MR. PERRY: And 3B.

MR. NEWTON: . . . 3B, and that is --

MR. RAMSEY: Modified.

MR. NEWTON: -- modified, and that is within your Proposed Plan here. There's some on the side table over there.

There are a couple of ways that you can provide comments. You can provide them this evening orally. We have a stenographer who will take down your public comments. We will then be addressing those in a Responsiveness Summary that will be included in the Record of Decision.

We also have a comment sheet that my name is

clearly on, and it's addressed to me. We also have an E-mail address that, as Charles said earlier, it is also on the comment sheet. It's also on the Proposed Plan. So any of those options are open to you right now.

And we have a pretty small group here this evening. So again, to accommodate everybody, we limit our comments to a couple minutes. But if you'd wish to submit your comments, again, as Charles said earlier, by November 6.

Thank you all very much, and we will open it to up to public comments on the Proposed Plan for the SWMU Sites 2, 5, 17 [sic] and 18.

Carolyn, do you want to . . . ?

MS. HUNTER: Do I want to . . . ?

MR. NEWTON: Okay. Well, if -- I think I can call on folks because we have such a large group here.

We'd like you to state your name for the record so we can get it all down.

MR. BIRSAN: Name is Edi Birsan. My comment is the preferred plans are 2B and 3A, I guess. 2B takes ten years, and the other one takes five.

From my perspective in the community, considering the cost is not that so far off, I would like to see both plans completed within five years, not ten. Ten years is a long time in Navy land. It also is

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a long time for cost acce- -- accelerate. It also means that unrestricted use is ten years out rather than five years out.

So I think in the community interest, the communit- -- from my perspective, I would like it done within five years, the smallest period of time. And the cost doesn't seem to be that outrageously different if I understand what this does.

That was my comment there.

I've also submitted comments about whether the possible use concurrent with this project, whether the flames from a fire college or testing is going to affect it or whether the water that would be used to put things out -- whether that affects it and whether there -- that represents any kind of additional --

MR. RAMSEY: Risk.

MR. BIRSAN: -- plan -- risk that we don't know about.

Those are my two basic questions -- well, comment and a question.

MR. NEWTON: Okay. Thank you for your comment.

Do we have any more comments? Are there any further comments?

MS. DANO-LUTTJOHANN: How about questions? Are

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we allowed --? Are you allowed to ask --? Do you know what I mean?

MR. RAMSEY: The public can, absolutely. I didn't know that -- if the Navy was -- I was kind of wanting to --

MS. DANO-LUTTJOHANN: -- while you were doing your presentation.

MR. RAMSEY: -- check with us.

MS. DANO-LUTTJOHANN: I kind of had questions about exactly where this is. I mean, I know you have it on the Navy property, but kind of in relationship to where it is in Concord.

MR. BIRSAN: Or you don't have it on -- Do you have it on the slide?

MR. PERRY: Bring in the slides.

MR. RAMSEY: That's the -- that's the best? Get the base -- yeah.

MR. NEWTON: So we have the base map. So we have the tidal area. And we have Route 4 that goes across and then this inland area, and it's within this administration area. Next two. And so this is the administration area. This is gray grounds up in over here.

MS. DANO-LUTTJOHANN: Okay.

MR. NEWTON: And this is that industrial

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region. The park's across -- Here's the park --

MR. BIRSAN: If you're used to this, it's up there.

MS. DANO-LUTTJOHANN: Okay. Thank you. That helps.

MR. RAMSEY: And the important thing is this Building IA -- IA12, I mean, if you want to point out the one building site 'cause you do have all these heavy equipment, the locomotive shops. These are the buildings you see from Highway 4 in the admin. area. It's the obviously big workshops, and Building IA12 is the one railroad locomotive facility, had the doors that the rail cars could ride right inside, and they had lube pits underneath the floors.

But it had a waste oil tank, and the waste oil tank has been determined to be the source of the groundwater contamination. And -- and so it creates this -- this plume that goes downstream from that source area.

MS. DANO-LUTTJOHANN: Thank you very much.

MR. NEWTON: Do you have any -- any other comments on the Proposed Plan?

Thank you.

Any other questions? comments?

Yes. Could you state your name for the record.

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MR. VARADY: Dale Varady, V-a-r-a-d-y. I represent the Office of the Sheriff.

Our interest is that we're doing a public benefit conveyance request for this specific area for a police and fire training facility. And when -- when you talked about it being cleaned to residential-use standards, I'm assuming that -- that at some point then it could be used for that purpose.

Am I understanding it correctly, that it's being cleaned to that particular standard?

MR. PERRY: Yes.

MR. RAMSEY: It will be. The groundwater right now is a potential for off-gassing, and these volatiles can move up into the surface and into an indoor air space; and a residential house would be the primary concern, not industrial. These shops are -- big doors open, and they have actually tested soil gas underneath the buildings right now.

So if they were to be raised and put residential -- kind of a long-term restrictions that would preclude residential reuse of this industrial site --

MR. VARADY: Correct.

MR. RAMSEY: -- until the groundwater's cleaned out. The fact is, the groundwater will be cleaned up

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and this site may still, you know, eventually just maintain as industrial reuse site.

MR. VARADY: And that's just for the plume area you've identified?

MR. RAMSEY: Yeah, 'cause this is the area -- where you have the plume is -- you have these volatile chemicals, and they can leave the groundwater and move into the vadose zone, move into the air spaces. So that's why there's an indoor air risk associated with these contaminants in the groundwater for a residential, residential sites in particular.

At sites where you have the work on San Gabriel Valley, a big section of Los Angeles County, you have these groundwater plumes, and you have houses on top of these plumes that can be a real problem for indoor air. Industry is not typically as big a concern.

MR. VARADY: Right. Yeah, our --

MR. NEWTON: It's on page 4 of the Proposed Plan. It's under the "Human Health Risk Assessment" portion.

And what we're doing is we're evaluating a potential future use of unrestricted. And so it would be cleaned up. The groundwater proposed remedy is for unrestricted use of groundwater.

And right now while the groundwater is not

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being used as a domestic source of drinking water, it is listed as a ben- -- as a potential drinking-water source. So we are cleaning it up to the potential drinking-water source.

MR. BIRSAN: That could be regardless of what you do on top.

MR. VARADY: The -- the other hypothetical question I have is that my understanding is that if in fact we were successful with a public conveyance for this area and it meets with the City of Concord's use of that land as well, it could still be used or occupied for the type of facility that we're suggesting for a police and fire training facility while this cleanup is going on?

MR. NEWTON: Well, no reuse plan has been submitted to the Navy at this time. We would again work with the LRA for potential beneficial use or potential redevelopment. We would be working with folks on that.

So again, since there has been no reuse plan submitted to the Navy, I can't answer you that -- the question this evening. But what we can do is work with the LRA in the future.

But if you'd like to submit your comments in writing, it might be helpful for us to respond to it in the Responsiveness Summary for the Record of Decision.

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MR. VARADY: Okay.

MR. NEWTON: Okay?

Any more questions or comments in the back? We have another hour and a half.

MS. HUNTER: I guess --

MR. BIRSAN: I'll just --

MR. NEWTON: Any -- another question?

MR. BIRSAN: Edi Birsan, just to add on to I think what he's implying, your plans call for building a home station and a vapor capture station or something? I mean, you have these little pictures of what it looks like in the -- in the -- in here. I have no idea how big these things are or these things here [indicating], all right. I have no idea because --

MR. PERRY: It can depend. But, you know, a good assumption would be about the size of a Conex box.

MR. BIRSAN: All right, 20-foot container or 40-foot container?

MR. PERRY: Yeah.

MR. BIRSAN: Okay. And I think your question is -- is one of those are there [sic], can you guys be whizzing around with your --

MR. VARADY: Well --

MR. BIRSAN: -- fire trucks?

MR. VARADY: -- can there be any use of it.

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MR. BIRSAN: Can there be any use, or this whole plume area has to be fenced off?

MR. RAMSEY: No, no.

MR. PERRY: When we move down, you know, once we get through this stage of the process through the Proposed Plan and we get, you know --

MR. BIRSAN: Right.

MR. PERRY: -- acceptance of this remedial alternative, as you mentioned, the process, we go to the remedial design; and when we're doing the work plan for this, then, you know, we'll actually have more information on what exactly --

MR. RAMSEY: When it was -- that's spelled out that they can u- -- of the people running around, these pumping stations.

MR. NEWTON: But again, we don't have any reuse plans.

MR. RAMSEY: But it's independent -- But what the -- what the Navy will still be doing anyway is when they have to put an infrastructure, it's piping basically, and the piping -- you can't put piping across the Kinney Boulevard at the base. They are going to have to do things to accommodate the traffic, I imagine, working around the railroads for that matter as well. But it's not very difficult to do.

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And the other aspect of this remedy is actually as the Navy described, there's two different components of this remedy. One is the air sparging that requires these -- physical piping to both pump the air into the aquifer into the -- into the wa- -- saturated zone and then the recovery extraction pumps as well to pull the air out of the soils. That requires a physical infrastructure.

The enhanced bioremediation is -- actually may be more an injection-based where you come out and inject this material into the aquifer.

So you have to go out there with the equipment to do the injections, but then that's it. Then you pull back.

But there is always the need for groundwater actions that can take a lot more than a lot of soils-type cleanup actions take. The need to have access and all these kind of -- kind of basic things still have to occur here and including maintaining the roadway and things. So . . . It's very doable at this site, frankly, so . . .

MR. NEWTON: Yes.

MS. HOWLETT: I would like to apologize for interrupting. I have to leave.

He [indicating Mr. Birsan] told us -- I'm a

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member of the -- of the committee that has just finished its work, and so we will be watching every step that you take. But he told us about the meeting tonight, and I had to stop by on my way to somewhere else I have to go to just to find out what was happening.

You will be hearing from us, no question.

MR. PERRY: Okay.

MS. HOWLETT: Right?

MR. BIRSAN: Yeah.

MR. PERRY: Okay.

MS. HOWLETT: Thank you very much. This is -- this is -- Thank you. This is very interesting. We are just looking at the other part of it, the part that I think you're interested in, right, over your back fence maybe?

Look forward to seeing you all, and I think the session out there is great. Bye-bye.

MR. NEWTON: Thank you for coming.

You have another question in the back?

MS. DANO-LUTTJOHANN: Yes. You've only got, like, I guess, four sites here. Have you done this kind of work on the rest of the inland area? Are you just now starting on public comment on this kind of problem or issue here?

MR. NEWTON: This is the first Proposed Plan

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that --

MS. DANO-LUTTJOHANN: Okay.

MR. NEWTON: -- the BRAC organization is doing for the inland area. There are other sites that are closed on the inland side, but this is the first one that's in our BRAC program. And --

MS. DANO-LUTTJOHANN: "Closed." I'm sorry. What does that mean exactly?

MR. PERRY: If you see the process board up here, you know, as you move through the process when you get to the very end where you see --

MS. DANO-LUTTJOHANN: Yeah.

MR. PERRY: -- that done, that's basically the closed area.

But there are other sites. We have sites that have been closed and gone through the process, but we also have other sites that are in the remedial investigation stage/feasibility study phase. So there -- there is other -- plenty of other work that's going on.

MR. BIRSAN: This is the first one that's gotten to public comments point?

MR. PERRY: To the -- Yes, to the Proposed Plan stage.

MR. RAMSEY: No. For not -- That's not only

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the first, but it's the -- it's the most recent anyway. We've other Proposed Plan for Concord. In fact --

MR. NEWTON: Right, but --

MR. RAMSEY: -- here we are today for this one to recognize.

MR. NEWTON: For BRAC, for the Base Realignment and Closure, since the facility is being closed and BRAC is taking over the inland side to go through remedy closure to property transfer, this is the first one that we've entered into. So it's part of our organization.

As Phillip Ramsey just indicated, there are other sites that have been closed and gone through process, but this is first for us.

MS. DANO-LUTTJOHANN: Okay. Thank you.

MR. RAMSEY: And if the public needs, the Navy has finished the schedules for this year, and so we do have now what's the -- what's the calendar for all the individual projects.

So if you folks live, like, in the Dana Estates or curious what's happening with the bunkers and now is the Site 22, that we are now in a feasibility study. They will actually be having a Proposed Plan less than a year, I believe, really. Twenty-two we're working on a feasibility study right now.

MS. MARSHALL: You're talking about bunker

city?
MR. RAMSEY: The bunker city for -- that's above the Site 22 and we're actually also working on now that we're just doing the remedial investigation for the other five magazine groups that are on the north side of the valley there.
MS. MARSHALL: Oh, next to it.
MR. RAMSEY: Yes. The results -- the results are the Proposed Plan for Site 22A could be at least a year out.
MR. NEWTON: And what Phil's talking about here is for Site 22, which is the large magazine area that's on the -- the south side of Concord. We're currently here in the feasibility study stage, and the next stage would be a proposed plan. And so we are currently here on that.
For the lar- -- For the other magazine groups, the ones that go to the center of the -- of the property, those are called Site 22A, and those are Groups 2 through 6. Those are currently in the remedial investigation stage, and they will enter into the feasibility study and then will go to the Proposed Plan. But there is some work that needs to be done prior to that.
MS. DANO-LUTTJOHANN: The schedule's out on

your Web site? Is it . . . ?
MR. NEWTON: No, it is not.
MS. DANO-LUTTJOHANN: Oh, okay.
MR. BIRSAN: I'm on the RAB, and I've been putting out the information for the city council and to the C.A.C. meetings and wherever.
MS. DANO-LUTTJOHANN: Is the RAB meetings here or at the police station?
MR. BIRSAN: It's not in the police station anymore. It's here.
MR. RAMSEY: We have actually been meeting in this room, in fact.
MS. DANO-LUTTJOHANN: Okay.
MR. PERRY: It depends on the schedule --
MR. RAMSEY: It does, yeah.
MR. PERRY: -- of -- of those rooms' availability.
So yes, we will be at the police station when we can --
MS. DANO-LUTTJOHANN: How --?
MR. PERRY: -- or it will be here.
MS. DANO-LUTTJOHANN: How's the best way to find out where they are?
MR. NEWTON: Do you know these people?
MR. BIRSAN: You could always shoot me an

E-mail. You can shoot him an E-mail.
MS. DANO-LUTTJOHANN: It should be on the -- it should be --
MR. NEWTON: I --
MS. DANO-LUTTJOHANN: It probably should be --
MR. NEWTON: I am your report contact for that. The next RAB meeting -- The RAB meets every other month.
MS. DANO-LUTTJOHANN: Okay.
MR. NEWTON: It meets every month, every other for the tidal area for the inland.
MS. DANO-LUTTJOHANN: Right.
MR. NEWTON: The next RAB meeting is --
MS. HUNTER: February.
MR. NEWTON: -- December.
MS. HUNTER: December. The -- December 3rd and that will be at the police station.
MR. RAMSEY: Yeah, that's right, 'cause the November is going to be the army's --
MS. DANO-LUTTJOHANN: Is that the inland --?
MS. HUNTER: The inland area.
MS. DANO-LUTTJOHANN: December 3rd. Thank you.
MR. NEWTON: And if you'd like, just send me an E-mail. I'd be more than happy to get that out. And I

will submit that schedule as soon as it becomes available.
But again, it is based on availability from the police department. And if it's not the police department, typically here. And if it's not here, it's . . . I think we go to Edi's house.
MR. BIRSAN: Bring your own popcorn.
MS. DANO-LUTTJOHANN: Thank you.
MR. NEWTON: Do you have any other questions or comments while we're here?
Well, we do have -- the Proposed Plan is on the side table. The public comment period is until the 6th of November.
The Proposed Plan, I encourage you to review through it if you can and provide comments on the comment sheets for this evening, or shoot them as an E-mail. And we will be responding to them in the Responsiveness Summary, and that will be incorporated into the Record of Decision.
And the Record of Decision, as Charles said earlier, is due out in March as a draft.
MR. PERRY: Yes.
MR. NEWTON: And that will go to the regulatory agencies as well as the RAB, and the regulatory agencies will review the remedy that we're proposing. And then

once finalized, we will then go into the next stage of CERCLA, which is the remedial design, and then we will try to implement our action. We will implement our action.

MR. RAMSEY: That's right.

MR. NEWTON: And I think the --

MR. RAMSEY: Scratch the "try" out.

MR. NEWTON: Scratch the "try" out.

MR. RAMSEY: Yeah.

MR. NEWTON: We will implement the action, and the schedule for that is . . .

MR. PERRY: Off the top of my head, I don't know. But it's coming up this -- this year. The remedial design can take a few months to work through and review cycles for it. So it will be a few months out.

MR. RAMSEY: Yeah.

MR. NEWTON: And that's the process.

MR. RAMSEY: The ROD's a challenge, actually. But yeah.

MR. PERRY: Yeah, ROD too.

MR. NEWTON: So we're very excited that everybody came this evening. Thank you very much for coming to the public meeting for the SWMU sites.

Again, if you have additional comments --

MR. BIRSAN: I will see you guys around.

MR. NEWTON: Thank you very much.

MR. BIRSAN: Look forward to the minutes.

MR. NEWTON: Okay.

MS. ATTENDEE: It's ten after.

MR. NEWTON: The public comment period is from 6:30 to 8:30, so we will stay in this room until 8:30. If you have additional comments or questions, we will go back onto the record. But in the lack of questions or comments, we will go off the record; and if somebody has a question or comment, just starts back up again. So we will go off the record until there's another comment.

We're off the record.

(Whereupon, a recess is taken from 7:11 p.m. to 8:30 p.m.)

MR. NEWTON: Okay. We are back on the record. It is now 8:30. And there are no more public comments, so we will be concluding this evening's public comment period as well as the proposed meeting -- the Proposed Plan meeting for the SWMU sites at the Conklin in- -- Concord inland area. Thank you all for attending.

We are off the record.

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CERTIFICATE OF REPORTER

I, CHRISTINE M. NICCOLI, Certified Shorthand Reporter of the State of California, do hereby certify that the foregoing meeting was reported by me stenographically to the best of my ability at the time and place aforementioned.

IN WITNESS WHEREOF, I have hereunto set my hand this 3rd day of November 2008.

CHRISTINE M. NICCOLI, C.S.R. NO. 4869

ATTACHMENT D
ADMINISTRATIVE RECORD

(Administrative Record provided on CD only)

CONCORD NWS

DRAFT ENVIRONMENTAL RESTORATION RECORD INDEX - UPDATE (SORTED BY RECORD DATE/RECORD NUMBER)

DOCUMENTS RELATED TO SWMUs 1, 2, 5, 7, 16 AND 18

UIC No. / Rec. No. Doc. Control No. Record Type Contr./Guid. No. Approx. # Pages	Prc. Date Record Date CTO No. EPA Cat. #	Author Affil. Author Recipient Affil. Recipient	Subject	Classification	Sites	Location SWDIV Box No(s) CD No.	FRC Accession No. FRC Warehouse FRC Box No(s)
N60036 / 000499 NONE REPORT NONE 147	04-06-2000 **06-01-1992** NONE 00.0	DTSC - BERKELEY, CA U.S. EPA - SAN FRANCISCO, CA	RESOURCE CONSERVATION AND RECOVERY ACT (RCRA) FACILITY ASSESSMENT	ADMIN RECORD	BLDG 00035 BLDG 00081 BLDG 00087 BLDG 00093 BLDG 00097 BLDG 00109 BLDG 00174 BLDG 00177 BLDG 00178 BLDG 00188 BLDG 00193 BLDG 00263 BLDG 00267 BLDG 00350 BLDG 00429 BLDG A-10 BLDG A-22 BLDG A-29 BLDG A-3 BLDG E-61 BLDG IA-10 BLDG IA-12 BLDG IA-15 BLDG IA-16 BLDG IA-20 BLDG IA-21 BLDG IA-22 BLDG IA-24	FRC - PERRIS IMAGED CONC_006	181-09-0009 BOX 0021 30099762 SAN

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					UST 06LC98		
					UST E-111		

UIC No. / Rec. No. Doc. Control No. Record Type Contr./Guid. No. Approx. # Pages	Prc. Date Record Date CTO No. EPA Cat. #	Author Affil. Author Recipient Affil. Recipient	Subject	Classification	Sites	Location SWDIV Box No(s) CD No.	FRC Accession No. FRC Warehouse FRC Box No(s)
N60036 / 000426 NONE MINUTES NONE 8	04-06-2000 **05-11-1994** NONE 00.0	NWS CONCORD, CA VARIOUS AGENCIES	SUMMARY OF 11 MAY 1994 SITE VISIT TO SOLID WASTE MANAGEMENT UNITS (SWMU) {INCLUDES ATTACHMENTS}	ADMIN RECORD INFO REPOSITORY	BLDG 00079 BLDG 00081 BLDG 00087 BLDG 00093 BLDG 00097 BLDG 00174 BLDG 00178 BLDG 00350 BLDG 07SH5 BLDG 7SH14 BLDG A-29 BLDG E-108 BLDG IA-12 BLDG IA-16 BLDG IA-20 BLDG IA-24 BLDG IA-25 BLDG IA-27 BLDG IA-41 BLDG IA-46 BLDG IA-50 BLDG IA-51 BLDG IA-55 BLDG IA-56 BLDG IA-6 BLDG IA-7 SWMU 00001 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00008 SWMU 00012 SWMU 00013 SWMU 00014 SWMU 00015	FRC - PERRIS IMAGED CONC_008	181-09-0009 BOX 0019 30099762 SAN

UIC No. / Rec. No. Doc. Control No. Record Type Contr./Guid. No. Approx. # Pages	Prc. Date Record Date CTO No. EPA Cat. #	Author Affil. Author Recipient Affil. Recipient	Subject	Classification	Sites	Location SWDIV Box No(s) CD No.	FRC Accession No. FRC Warehouse FRC Box No(s)
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					SWMU 00054		
					UST 06LC98		
					UST E-111		

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N60036 / 000447 NONE REPORT N62474-88-D-5086 533	04-06-2000 **12-05-1994** 00283 00.0	PRC ENVIRONMENTAL MANAGEMENT, INC. SOOTKOOS, B. NAVFAC - EFA WEST YEE, R.	DRAFT FINAL FIELD SAMPLING PLAN, SOLID WASTE MANAGEMENT UNIT SITE INVESTIGATION, VOLUMES I AND II OF II (SEE AR # 446 - EFAW TRANSMITTAL LETTER)	ADMIN RECORD INFO REPOSITORY	BLDG 00079 BLDG 00081 BLDG 00093 BLDG 00097 BLDG 00174 BLDG 00350 BLDG 07SH5 BLDG 1A-6 BLDG 1A-7 BLDG 7SH14 BLDG A-29 BLDG E-108 BLDG IA -25 BLDG IA-12 BLDG IA-16 BLDG IA-24 BLDG IA-27 BLDG IA-41 BLDG IA-46 BLDG IA-50 BLDG IA-51 BLDG IA-55 BLDG IA-56 SWMU 00001 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00012 SWMU 00013 SWMU 00014 SWMU 00015 SWMU 00016 SWMU 00017 SWMU 00018 SWMU 00020	FRC - PERRIS IMAGED CONC_004	181-09-0009 BOX 0020 30099762 SAN

UIC No. / Rec. No. Doc. Control No. Record Type Contr./Guid. No. Approx. # Pages	Prc. Date Record Date CTO No. EPA Cat. #	Author Affil. Author Recipient Affil. Recipient	Subject	Classification	Sites	Location SWDIV Box No(s) CD No.	FRC Accession No. FRC Warehouse FRC Box No(s)
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N60036 / 000449 NONE REPORT N62474-88-D-5086 195	04-06-2000 **12-05-1994** 00283 00.0	PRC ENVIRONMENTAL MANAGEMENT, INC. SOOTKOOS, B. NWS CONCORD, CA YEE, R.	DRAFT FINAL HEALTH AND SAFETY PLAN, SOLID WASTE MANAGEMENT UNIT SITE INVESTIGATION (SEE AR # 446 - EFAW TRANSMITTAL LETTER)	ADMIN RECORD INFO REPOSITORY	BLDG 00079 BLDG 00081 BLDG 00087 BLDG 00093 BLDG 00097 BLDG 00174 BLDG 00350 BLDG 7SH14 BLDG 7SH5 BLDG A-29 BLDG E-108 BLDG IA-12 BLDG IA-16 BLDG IA-24 BLDG IA-25 BLDG IA-27 BLDG IA-41 BLDG IA-46 BLDG IA-50 BLDG IA-51 BLDG IA-55 BLDG IA-56 BLDG IA-6 BLDG IA-7 SWMU 00001 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00012 SWMU 00013 SWMU 00014 SWMU 00015 SWMU 00016 SWMU 00017 SWMU 00018	FRC - PERRIS IMAGED CONC_004	181-09-0009 BOX 0020 30099762 SAI

UIC No. / Rec. No. Doc. Control No. Record Type Contr./Guid. No. Approx. # Pages	Prc. Date Record Date CTO No. EPA Cat. #	Author Affil. Author Recipient Affil. Recipient	Subject	Classification	Sites	Location SWDIV Box No(s) CD No.	FRC Accession No. FRC Warehouse FRC Box No(s)	
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N60036 / 001749 EFAW SER 09ER4RY/L5040 CORRESPONDENC NONE 1	07-22-2008 **01-11-1995** NONE	NAVFAC - EFA WEST YEE, R. NWS CONCORD, CA COMMANDING OFFICER	LETTER OF NOTIFICATION THAT THE CONTAMINATED SOIL AROUND THE UNDERGROUND STORAGE TANK WILL BE REMOVED WITH THE STATION FUNDS, AND THE INVESTIGATION WILL CONTINUE UNDER THE INSTALLATION RESTORATION PROGRAM	ADMIN RECORD BASE	BLDG IA-16 SWMU 00001	FRC - PERRIS IMAGED CONC_014	181-09-0009 30099762 SAN	BOX 0052

UIC No. / Rec. No. Doc. Control No. Record Type Contr./Guid. No. Approx. # Pages	Prc. Date Record Date CTO No. EPA Cat. #	Author Affil. Author Recipient Affil. Recipient	Subject	Classification	Sites	Location SWDIV Box No(s) CD No.	FRC Accession No. FRC Warehouse FRC Box No(s)
N60036 / 001706 NONE MINUTES NONE 29	07-21-2008 **07-18-1995** NONE	NAVFAC - EFA WEST VARIOUS AGENCIES	18 JULY 1995 REMEDIAL PROJECT MANAGERS MEETING MINUTES (INCLUDES AGENDA, ATTENDEE LIST, AND VARIOUS HANDOUT MATERIALS)	ADMIN RECORD BASE	BLDG 00081 BLDG 00420 BLDG 7SH5 BLDG IA-46 BLDG IA-6 RASS 1 RASS 4 SITE 00001 SITE 00002 SITE 00011 SITE 00017 SITE 00022 SWMU 00001 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00012 SWMU 00013 SWMU 00014 SWMU 00015 SWMU 00016 SWMU 00017 SWMU 00018 SWMU 00020 SWMU 00022 SWMU 00023 SWMU 00024 SWMU 00025 SWMU 00037 SWMU 00040 SWMU 00044 SWMU 00050 SWMU 00051 SWMU 00052 SWMU 00053	FRC - PERRIS IMAGED CONC_014	181-09-0009 BOX 0051 30099762 SAI

UIC No. / Rec. No. Doc. Control No. Record Type Contr./Guid. No. Approx. # Pages	Prc. Date Record Date CTO No. EPA Cat. #	Author Affil. Author Recipient Affil. Recipient	Subject	Classification	Sites	Location SWDIV Box No(s) CD No.	FRC Accession No. FRC Warehouse FRC Box No(s)
					SWMU 00054 UST A-3A UST E-111 WELL MW-03 WELL MW-1 WELL MW-2		

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N60036 / 001705 NONE MINUTES NONE 56	07-21-2008 **09-08-1995** NONE	NAVFAC - EFA WEST VARIOUS AGENCIES	08 SEPTEMBER 1995 REMEDIAL PROJECT MANAGERS MEETING MINUTES (INCLUDES AGENDA, ATTENDEE LIST, AND VARIOUS HANDOUT MATERIALS; ALSO INCLUDES REPLACEMENT PAGES: 3 & 9)	ADMIN RECORD BASE	BLDG 00040 BLDG 00108 BLDG 00174 BLDG 07SH5 BLDG E-108 BLDG E-1111 BLDG IA-16 BLDG IA-20 BLDG IA-24 BLDG IA-24A BLDG IA-36 BLDG IA-55 BLDG IA-57 RASS 1 RASS 2 RASS 3 RASS 4 SITE 00013 SITE 00016 SITE 00017 SITE 00018 SITE 00022 SITE 00024A SITE 00027 SWMU 00001 SWMU 00002 SWMU 00007 SWMU 00012 SWMU 00016 SWMU 00018 SWMU 00037 SWMU 00050 SWMU 00052 WELL MW-1 WELL MW-10	FRC - PERRIS IMAGED CONC_014	181-09-0009 BOX 0051 30099762 SAI

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					WELL MW-12 WELL MW-2		
N60036 / 001710 NONE MINUTES NONE 55	07-21-2008 **12-12-1995** NONE	NAVFAC - EFA WEST VARIOUS AGENCIES	12 DECEMBER 1995 REMEDIAL PROJECT MANAGERS MEETING MINUTES (INCLUDES AGENDA, ATTENDEE LIST, AND VARIOUS HANDOUT MATERIALS) {PORTION OF THE DOCUMENT IS SENSITIVE}	ADMIN RECORD BASE SENSITIVE	BLDG A-29 BLDG IA-16 RASS 1 RASS 3 RASS 4 SITE 00001 SITE 00002 SITE 00009 SITE 00011 SITE 00013 SITE 00016 SITE 00024A SWMU 00001 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00016 SWMU 00018 SWMU 00037 SWMU 00040 SWMU 00050 UST A-3A UST E-111	FRC - PERRIS IMAGED CONC_014	181-09-0009 30099762 SAN BOX 0051
N60036 / 000488 EFAW SER 1841.5/6113 CORRESPONDENC NONE 2	04-06-2000 **03-04-1996** NONE 00.0	NWS CONCORD, CA SOOHOO, R. DTSC - SACRAMENTO, CA PINASCO, J.	CORRECTIVE ACTIONS PLAN FOR SOLID WASTE MANAGEMENT UNITS (SWMU) [SEE AR # 489 - CORRECTION TO RESPONSE ACTION DATE]	ADMIN RECORD INFO REPOSITORY	SWMU 00013 SWMU 00016 SWMU 00040	FRC - PERRIS IMAGED CONC_005	181-09-0009 30099762 SAN BOX 0021

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N60036 / 000489 EFAW SER 1841.5/6136 CORRESPONDENC NONE 1	04-06-2000 **03-05-1996** NONE 00.0	NWS CONCORD, CA SOOHOO, R. DTSC - SACRAMENTO, CA PINASCO, J.	CORRECTION TO THE RESPONSE ACTION DATE FOR SOLID WASTE MANAGEMENT UNIT (SWMU) [SEE AR # 488 - CORRECTIVE ACTIONS PLAN]	ADMIN RECORD INFO REPOSITORY	SWMU 00013 SWMU 00016 SWMU 00040	FRC - PERRIS IMAGED CONC_005	181-09-0009 BOX 0021 30099762 SAN
N60036 / 001752 EFAW SER 1841.5/6137 CORRESPONDENC NONE 1	07-22-2008 **03-07-1996** NONE	NAVFAC - EFA WEST SOOHOO, R. PRC ENVIRONMENTAL MANAGEMENT, INC. BOSCHE, J.	LETTER REQUESTING COPIES OF THE DRAFT ACTION MEMORANDUM ON A COMPUTER DISK, HARD COPIES OF THE SITE PLANS AND CHEMICAL DATA, AND THE EXCAVATION LIMIT SITE PLAN	ADMIN RECORD BASE	SITE 00016 SWMU 00013 SWMU 00016 SWMU 00040	FRC - PERRIS IMAGED CONC_014	181-09-0009 BOX 0052 30099762 SAN
N60036 / 000508 EFAW SER 1841.5/6183 REPORT NONE 26	04-06-2000 **04-17-1996** NONE 00.0	NAVFAC - EFA WEST SOOHOO, R. DTSC - SACRAMENTO, CA PINASCO, J.	RESOURCE CONSERVATION RECOVERY ACT (RCRA) CORRECTIVE ACTION WORK PLAN FOR SOLID WASTE MANAGEMENT UNITS (SWMU) (INCLUDES TRANSMITTAL LETTER DATED 17 APRIL 1996)	ADMIN RECORD	SWMU 00013 SWMU 00016 SWMU 00040	FRC - PERRIS IMAGED CONC_005	181-09-0009 BOX 0021 30099762 SAN
N60036 / 000509 FILE NO. 2119.1142 (SFG) CORRESPONDENC NONE 37	04-06-2000 **04-29-1996** NONE 00.0	CRWQCB - OAKLAND, CA GLADSTONE, S. DTSC - SACRAMENTO, CA PINASCO, J.	COMMENTS ON 1) RESOURCE CONSERVATION RECOVERY ACT (RCRA) CORRECTIVE ACTION WORK PLAN FOR SOLID WASTE MANAGEMENT UNITS (SWMU), AND 2) PROPOSAL FOR PLAN AND ANIMAL SURVEYS FOR THE LITIGATION AREA SITES [SEE AR # 508 - RCRA CORRECTIVE ACTION WP]	ADMIN RECORD	SWMU 00013 SWMU 00016 SWMU 00040	FRC - PERRIS IMAGED CONC_005	181-09-0009 BOX 0021 30099762 SAN
N60036 / 000513 NONE CORRESPONDENC NONE 1	04-06-2000 **05-10-1996** NONE 00.0	U.S. EPA - SAN FRANCISCO, CA SMITH, B. NAVFAC - EFA WEST SOOHOO, R.	COMMENTS ON RESOURCE CONSERVATION RECOVER ACT (RCRA) CORRECTIVE ACTION WORK PLAN FOR THE SOLID WASTE MANAGEMENT UNITS (SWMU) [SEE AR # 508 - RCRA CORRECTIVE ACTION WP FOR SWMU]	ADMIN RECORD	SWMU 00013 SWMU 00016 SWMU 00040	FRC - PERRIS IMAGED CONC_005	181-09-0009 BOX 0021 30099762 SAN

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N60036 / 000515 NONE CORRESPONDENC NONE 2	04-06-2000 **05-20-1996** NONE 00.0	DTSC - SACRAMENTO, CA PINASCO, J. NAVFAC - EFA WEST SOOHOO, R.	REVIEW AND NO COMMENTS ON RESOURCE CONSERVATION RECOVERY ACT (RCRA) CORRECTIVE ACTION WORK PLAN (CAP) FOR SOLID WASTE MANAGEMENT UNITS [SEE AR # 508 - RCRA CORRECTIVE ACTION WP]	ADMIN RECORD	SWMU 00013 SWMU 00016 SWMU 00040	FRC - PERRIS IMAGED CONC_005	181-09-0009 BOX 0021 30099762 SAN

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N60036 / 000238 NONE REPORT N62474-88-D-5086 89	06-10-2008 **06-01-1996** NONE	PRC ENVIRONMENTAL MANAGEMENT, INC. SOOTKOOS, B. NWS CONCORD, CA SOOHOO, R.	INSTALLATION MANAGEMENT PLAN	ADMIN RECORD	SITE 00001 SITE 00002 SITE 00003 SITE 00004 SITE 00005 SITE 00006 SITE 00007 SITE 00008 SITE 00009 SITE 00010 SITE 00011 SITE 00012 SITE 00013 SITE 00014 SITE 00015 SITE 00016 SITE 00017 SITE 00018 SITE 00019 SITE 00020 SITE 00021 SITE 00022 SITE 00023A SITE 00023B SITE 00024A SITE 00024B SITE 00025 SITE 00026 SITE 00027 SITE 00028 SWMU 00001 UST 000001 UST 000002	FRC - PERRIS IMAGED CONC_013	181-09-0009 BOX 0010 30099762 SAI

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N60036 / 000520 NONE REPORT NONE 185	04-06-2000 **08-01-1996** NONE 00.0	CH2M HILL NAVY PUBLIC WORKS CENTER	FIELD WORK PLAN (WP) FOR RESOURCE CONSERVATION AND RECOVERY ACT (RCRA) CORRECTIVE ACTION OF SOLID WASTE MANAGEMENT UNITS AND VARIOUS SEPTIC TANKS	ADMIN RECORD INFO REPOSITORY	SWMU 00013 SWMU 00016 SWMU 00040	FRC - PERRIS IMAGED CONC_006	181-09-0009 BOX 0021 30099762 SAN
N60036 / 001792 NONE MINUTES NONE 28	07-22-2008 **04-20-1998** NONE	NAVFAC - EFA WEST VARIOUS AGENCIES	20 APRIL 1998 REMEDIAL PROJECT MANAGERS MEETING MINUTES (INCLUDES AGENDA AND VARIOUS HANDOUTS)	ADMIN RECORD BASE	SITE 00013 SITE 00017 SITE 00022 SITE 00029 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_014	181-09-0009 BOX 0052 30099762 SAN
N60036 / 000569 EFAW SER 1012.1/8135 CORRESPONDENC NONE 2	04-06-2000 **05-08-1998** NONE 00.0	NAVFAC - EFA WEST SANTANA, R. VARIOUS AGENCIES	TRANSMITTAL OF THE DRAFT SITE INVESTIGATION WORK PLAN (W/OUT ENCLOSURE) [SEE AR # 570 - DRAFT WORK PLAN]	ADMIN RECORD	SITE 00029 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_006	181-09-0009 BOX 0024 30099762 SAN
N60036 / 000570 NONE REPORT N62474-94-D-7609 109	04-06-2000 **05-08-1998** 00192 00.0	TETRA TECH EM INC. BOSCHE, J. NAVFAC - EFA WEST	DRAFT SITE INVESTIGATION WORK PLAN [SEE AR # 569 - EFAW TRANSMITTAL LETTER]	ADMIN RECORD	SITE 00029 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_006	181-09-0009 BOX 0024 30099762 SAN
N60036 / 000608 NONE CORRESPONDENC NONE 2	04-06-2000 **07-09-1998** NONE 00.0	U.S. EPA - SAN FRANCISCO, CA MOUTOUX, N. NAVFAC - EFA WEST SANTANA, R.	COMMENTS ON THE DRAFT SITE INVESTIGATION WORK PLAN [SEE AR # 570 - DRAFT WORK PLAN]	ADMIN RECORD	SITE 00029 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_006	181-09-0009 BOX 0025 30099762 SAN

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N60036 / 001795 NONE MINUTES NONE 11	07-22-2008 **07-14-1998** NONE	NAVFAC - EFA WEST VARIOUS AGENCIES	14 JULY 1998 REMEDIAL PROJECT MANAGERS MEETING MINUTES (INCLUDES AGENDA AND VARIOUS HANDOUT MATERIALS)	ADMIN RECORD BASE	SITE 00001 SITE 00017 SITE 00022 SITE 00029 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018 TIDAL AREA	FRC - PERRIS IMAGED CONC_014	181-09-0009 BOX 0052 30099762 SAN
N60036 / 000617 NONE REPORT N62474-94-D-7609 113	04-06-2000 **08-07-1998** 00192 00.0	TETRA TECH EM INC. BOSCHE, J. NAVFAC - EFA WEST WONG, W.	DRAFT FINAL SITE INVESTIGATION WORK PLAN [SEE AR # 618 - EFAW TRANSMITTAL LETTER]	ADMIN RECORD	SITE 00029 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_006	181-09-0009 BOX 0025 30099762 SAN
N60036 / 000618 EFAW SER 1012.1/8048 CORRESPONDENC NONE 3	04-06-2000 **08-07-1998** NONE 00.0	NAVFAC - EFA WEST WONG, W. VARIOUS AGENCIES	TRANSMITTAL OF THE DRAFT FINAL SITE INVESTIGATION WORK PLAN [SEE AR # 617 - DRAFT FINAL WORK PLAN]	ADMIN RECORD	SITE 00029 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_006	181-09-0009 BOX 0025 30099762 SAN
N60036 / 000660 NONE REPORT N62474-94-D-7609 84	04-06-2000 **01-12-1999** 00256 00.0	LEVINE-FRICKE RECON KEATING, B. TETRA TECH	FINAL SUPPLEMENTAL SITE-SPECIFIC HEALTH AND SAFETY PLAN	ADMIN RECORD	SITE 00029 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_007	181-09-0009 BOX 0027 30099762 SAN

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N60036 / 001798 NONE MINUTES NONE 12	07-22-2008 **08-25-1999** NONE	NAVFAC - EFA WEST VARIOUS AGENCIES	25 AUGUST 1999 REMEDIAL PROJECT MANAGERS MEETING MINUTES (INCLUDES AGENDA AND VARIOUS HANDOUT MATERIALS)	ADMIN RECORD BASE	SITE 00001 SITE 00002 SITE 00009 SITE 00011 SITE 00017 SITE 00022 SITE 00023 SITE 00027 SITE 00029 SITE 00030 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_014	181-09-0009 BOX 0052 30099762 SAN
N60036 / 001800 NONE MINUTES NONE 6	07-22-2008 **10-20-1999** NONE	NAVFAC - EFA WEST VARIOUS AGENCIES	20 OCTOBER 1999 REMEDIAL PROJECT MANAGERS MEETING MINUTES (INCLUDES AGENDA)	ADMIN RECORD BASE	BLDG 00178 BLDG E-111 BLDG IA-25 SITE 00001 SITE 00002 SITE 00009 SITE 00011 SITE 00029 SITE 00030 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018 UST A-16 UST E-103 UST E-108	FRC - PERRIS IMAGED CONC_014	181-09-0009 BOX 0052 30099762 SAN

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N60036 / 000699 EFAW SER 052S/2110 MINUTES NONE 6	04-18-2000 **03-02-2000** NONE	NAVFAC - EFA WEST RIVERA, G. RAB MEMBERS	TRANSMITTAL OF 25 JANUARY 2000 DRAFT REMEDIAL PROJECT MANAGERS MEETING MINUTES (W/ ENCLOSURE)	ADMIN RECORD	AOC 00001 BLDG IA-25 SITE 00029 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_007	181-09-0009 BOX 0027 30099762 SAN
N60036 / 001372 EFAW SER 052GAR/5230 CORRESPONDENC NONE 2	04-19-2006 **05-31-2000** NONE	NAVFAC - EFA WEST RIVERA, G. VARIOUS AGENCIES	TRANSMITTAL OF 1) DRAFT FIELD SAMPLING PLAN, AND 2) DRAFT QUALITY ASSURANCE PROJECT PLAN, REMEDIAL INVESTIGATION FOR GROUNDWATER, SOLID WASTE MANAGEMENT UNITS (W/OUT ENCLOSURES) [SEE AR #1373 - ENCLOSURE 1, AND AR #1374 - ENCLOSURE 2]	ADMIN RECORD	SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_005	181-09-0009 BOX 0039 30099762 SAN
N60036 / 001373 NONE REPORT N62474-94-D-7609 209	04-19-2006 **05-31-2000** 00324	TETRA TECH EM INC. NAVFAC - EFA WEST RIVERA, G.	DRAFT FIELD SAMPLING PLAN, REMEDIAL INVESTIGATION FOR GROUNDWATER, SOLID WASTE MANAGEMENT UNITS [SEE AR # 1372 - EFAW TRANSMITTAL LETTER]	ADMIN RECORD	SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_005	181-09-0009 BOX 0039 30099762 SAN
N60036 / 001374 NONE REPORT N62474-94-D-7609 56	04-19-2006 **05-31-2000** 00324	TETRA TECH EM INC. NAVFAC - EFA WEST RIVERA, G.	DRAFT QUALITY ASSURANCE PROJECT PLAN, REMEDIAL INVESTIGATION FOR GROUNDWATER, SOLID WASTE MANAGEMENT UNITS [SEE AR # 1372 - EFAW TRANSMITTAL LETTER]	ADMIN RECORD	SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_005	181-09-0009 BOX 0039 30099762 SAN
N60036 / 000031 NONE CORRESPONDENC NONE 23	03-13-2001 **07-20-2000** NONE	U.S. EPA - SAN FRANCISCO, CA BLANK, R. NAVFAC - EFA WEST RIVERA, G.	COMMENTS ON THE DRAFT FIELD SAMPLING PLAN REMEDIAL INVESTIGATION FOR GROUNDWATER, SOLID WASTE MANAGEMENT UNITS, AND DRAFT QUALITY ASSURANCE PROJECT PLAN, RI FOR GROUNDWATER, SOLID WASTE MANAGEMENT UNITS	ADMIN RECORD INFO REPOSITORY	SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_004	181-09-0009 BOX 0001 30099762 SAN

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N60036 / 000702 EFAW SER 052GAR/5090 MINUTES NONE 6	11-02-2000 **07-22-2000** NONE	NAVFAC - EFA WEST RIVERA, G. VARIOUS AGENCIES	TRANSMITTAL OF 20 JUNE 2000 REMEDIAL PROJECT MANAGERS MEETING MINUTES (W/ ENCLOSURE)	ADMIN RECORD INFO REPOSITORY	SITE 00013 SITE 00027 SITE 00029 SWMU 00001 UST E-111	FRC - PERRIS IMAGED CONC_007	181-09-0009 BOX 0027 30099762 SAN
N60036 / 000872 FILE NO. 2119.1142 (CEV) CORRESPONDENC NONE 2	04-07-2003 **08-29-2000** NONE	CRWQCB - OAKLAND, CA VILLACORTA, C. NAVFAC - EFA WEST RIVERA, G.	COMMENTS ON THE DRAFT FIELD SAMPLING PLAN, REMEDIAL INVESTIGATION FOR GROUNDWATER, SOLID WASTE MANAGEMENT UNITS [SEE AR # 1373 - DRAFT FIELD SAMPLING PLAN]	ADMIN RECORD INFO REPOSITORY	SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_007	181-09-0009 BOX 0031 30099762 SAN
N60036 / 000713 DS.0324.15672 REPORT N62474-94-D-7609 255	07-11-2001 **01-23-2001** 00324	TETRA TECH EM INC. BOSCHE, J. NAVFAC - EFA WEST	DRAFT FINAL FIELD SAMPLING PLAN REMEDIAL INVESTIGATION FOR GROUNDWATER [SEE AR # 934 - DRAFT ADDENDUM, AR # 943 - DRAFT ADDENDUM, AR # 1012 - DRAFT FINAL ADDENDUM, AND AR # 767 - ADDENDUM]	ADMIN RECORD INFO REPOSITORY	SWMU 00001 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_007	181-09-0009 BOX 0028 30099762 SAN
N60036 / 000714 DS.0324.15677 REPORT N62474-94-D-7609 84	07-11-2001 **01-23-2001** 00324	TETRA TECH EM INC. SWANSON, G. NAVFAC - EFA WEST	DRAFT FINAL QUALITY ASSURANCE PROJECT PLAN REMEDIAL INVESTIGATION FOR GROUNDWATER [SEE AR # 943 - DRAFT ADDENDUM, AR # 1012 - DRAFT FINAL ADDENDUM, AND AR # 767 - ADDENDUM]	ADMIN RECORD INFO REPOSITORY	SWMU 00001 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_007	181-09-0009 BOX 0028 30099762 SAN
N60036 / 000710 NONE CORRESPONDENC NONE 13	07-11-2001 **03-13-2001** NONE	U.S. EPA - SAN FRANCISCO, CA BLANK, R. NAVFAC - EFA WEST RIVERA, G.	COMMENTS ON DRAFT FINAL FIELD SAMPLING PLAN AND QUALITY ASSURANCE PROJECT PLAN, REMEDIAL INVESTIGATION FOR GROUNDWATER [SEE AR # 713 - DRAFT FINAL FIELD SAMPLING PLAN, AND AR # 714 - DRAFT FINAL QUALITY ASSURANCE PROJECT PLAN]	ADMIN RECORD INFO REPOSITORY	SWMU 00001 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_007	181-09-0009 BOX 0027 30099762 SAN

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N60036 / 000873 FILE NO. 2119.1142 (NLF) CORRESPONDENC NONE 2	04-07-2003 **03-14-2001** NONE	CRWQCB - OAKLAND, CA FEGER, N. NAVFAC - EFA WEST RIVERA, G.	COMMENTS ON THE DRAFT FINAL FIELD SAMPLING PLAN, REMEDIAL INVESTIGATION FOR GROUNDWATER SOLID WASTE MANAGEMENT UNITS [SEE AR # 1373 - DRAFT FIELD SAMPLING PLAN]	ADMIN RECORD INFO REPOSITORY	SWMU 00001 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_007	181-09-0009 BOX 0031 30099762 SAN
N60036 / 000729 EFAW SER 052GAR/5230 & TC.0324.10939 CORRESPONDENC NONE 23	10-29-2001 **08-25-2001** NONE	NAVFAC - EFA WEST RIVERA, G. VARIOUS AGENCIES	RESPONSE TO COMMENTS ON THE DRAFT FINAL FIELD SAMPLING AND QUALITY ASSURANCE PROJECT PLANS FOR REMEDIAL INVESTIGATION OF GROUNDWATER AT SOLID WASTE MANAGEMENT UNITS [SEE AR # 710 - COMMENTS]	ADMIN RECORD INFO REPOSITORY	SWMU 00001 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_007	181-09-0009 BOX 0028 30099762 SAN
N60036 / 000772 EFAW SER 052GAR/5230 MINUTES NONE 5	02-21-2002 **11-07-2001** NONE	NAVFAC - EFA WEST RIVERA, G. VARIOUS AGENCIES	TRANSMITTAL OF 01 OCTOBER 2001 REMEDIAL PROJECT MANAGERS MEETING MINUTES ON SOLID WASTE MANAGEMENT UNITS (W/ ENCLOSURE)	ADMIN RECORD	SWMU 00001 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_007	181-09-0009 BOX 0029 30099762 SAN
N60036 / 000767 TC.0324.11272 CORRESPONDENC NONE 7	02-21-2002 **11-08-2001** NONE	TETRA TECH EM INC. BOSCHE, J. NAVFAC - EFA WEST RIVERA, G.	ADDENDUM TO DRAFT FINAL FIELD SAMPLING PLAN AND QUALITY ASSURANCE PROJECT PLAN REMEDIAL INVESTIGATION FOR GROUNDWATER [SEE AR # 713 - DRAFT FINAL FIELD SAMPLING PLAN AND AR # 714 - DRAFT FINAL QUALITY ASSURANCE PROJECT PLAN]	ADMIN RECORD INFO REPOSITORY	SWMU 00001 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018 TIDAL AREA	FRC - PERRIS IMAGED CONC_007	181-09-0009 BOX 0029 30099762 SAN
N60036 / 000773 EFAW SER 052GAR/5090 MINUTES NONE 6	02-21-2002 **11-13-2001** NONE	NAVFAC - EFA WEST RIVERA, G. VARIOUS AGENCIES	TRANSMITTAL OF 23 OCTOBER 2001 REMEDIAL PROJECT MANAGERS MEETING MINUTES (W/ ENCLOSURE) [SEE AR # 774 - REVISED MEETING MINUTES]	ADMIN RECORD	AOC 00001 SITE 00001 SITE 00013 SITE 00017 SITE 00029 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018 TIDAL AREA	FRC - PERRIS IMAGED CONC_008	181-09-0009 BOX 0029 30099762 SAN

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N60036 / 000774 EFAW SER 052GAR/5090 CORRESPONDENC NONE 6	02-21-2002 **11-30-2001** NONE	NAVFAC - EFA WEST RIVERA, G. VARIOUS AGENCIES	TRANSMITTAL OF REVISED 23 OCTOBER 2001 REMEDIAL PROJECT MANAGERS (RPM) MEETING MINUTES (W/ ENCLOSURE) [SEE AR # 773 - 23 OCTOBER 2001 MEETING MINUTES]	ADMIN RECORD	AOC 00001 BLDG IA-25 SITE 00001 SITE 00013 SITE 00017 SITE 00029 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018 TIDAL AREA	FRC - PERRIS IMAGED CONC_008	181-09-0009 BOX 0029 30099762 SAN
N60036 / 000752 FILE NO.: 2119.1058 (LMM) CORRESPONDENC NONE 3	02-21-2002 **12-07-2001** NONE	CRWQCB - OAKLAND, CA MEILLIER, L. NAVFAC - EFA WEST RIVERA, G.	COMMENTS ON THE ADDENDUM TO THE DRAFT FINAL FIELD SAMPLING PLAN (SP) AND QUALITY ASSURANCE PROJECT PLAN (QAPP) REMEDIAL INVESTIGATION FOR GROUNDWATER [SEE AR # 767 - ADDENDUM]	ADMIN RECORD INFO REPOSITORY	SWMU 00001 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018 WELL 000007 WELL 000009 WELL 000011 WELL 000013	FRC - PERRIS IMAGED CONC_007	181-09-0009 BOX 0029 30099762 SAN
N60036 / 000818 TC.0032.11436 MINUTES N62474-94-D-7609 32	06-25-2002 **01-07-2002** 00032	TETRA TECH EM INC. NAVFAC - WESTERN DIVISION	07 JANUARY 2002 FINAL RESTORATION ADVISORY BOARD MEETING MINUTES [SEE AR # 797 - EFAW TRANSMITTAL LETTER]	ADMIN RECORD	AOC 00001 SITE 00002 SITE 00009 SITE 00011 SITE 00013 SITE 00017 SITE 00022 SITE 00027 SITE 00030 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_009	181-09-0009 BOX 0030 30099762 SAN

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N60036 / 000758 NONE CORRESPONDENC NONE 2	02-21-2002 **01-15-2002** NONE	U.S. EPA - SAN FRANCISCO, CA RAMSEY, P. NAVFAC - EFA WEST RIVERA, G.	REVIEW AND CONDITIONAL APPROVAL OF THE ADDENDUM TO THE DRAFT FINAL FIELD SAMPLING PLAN AND QUALITY ASSURANCE PROJECT PLAN, REMEDIAL INVESTIGATION FOR GROUNDWATER [SEE AR # 767 - ADDENDUM]	ADMIN RECORD INFO REPOSITORY	BLDG 1A-46 SWMU 00001 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00016 SWMU 00018	FRC - PERRIS IMAGED CONC_007	181-09-0009 BOX 0029 30099762 SAN
N60036 / 000786 EFAW SER 052GAR/025 CORRESPONDENC NONE 11	06-24-2002 **06-17-2002** NONE	NAVFAC - EFA WEST RIVERA, G. VARIOUS AGENCIES	TRANSMITTAL OF DRAFT AMENDMENT TO THE SITE MANAGEMENT PLAN (W/ ENCLOSURE) {ORIGINAL SITE MANAGEMENT PLAN WAS NOT SUBMITTED TO THE ADMINISTRATIVE RECORDS}	ADMIN RECORD	AOC 00001 BLDG IA-25 SITE 00001 SITE 00002 SITE 00003 SITE 00004 SITE 00005 SITE 00006 SITE 00009 SITE 00011 SITE 00013 SITE 00017 SITE 00022 SITE 00025 SITE 00026 SITE 00027 SITE 00028 SITE 00029 SITE 00030 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018 TIDAL AREA	FRC - PERRIS IMAGED CONC_008	181-09-0009 BOX 0029 30099762 SAN

UIC No. / Rec. No. Doc. Control No. Record Type Contr./Guid. No. Approx. # Pages	Prc. Date Record Date CTO No. EPA Cat. #	Author Affil. Author Recipient Affil. Recipient	Subject	Classification	Sites	Location SWDIV Box No(s) CD No.	FRC Accession No. FRC Warehouse FRC Box No(s)
N60036 / 000815 FILE NO.: 2119.1058 (LMM) CORRESPONDENC NONE 5	06-25-2002 **06-25-2002** NONE	CRWQCB - OAKLAND, CA MEILLIER, L. NAVFAC - EFA WEST RIVERA, G.	COMMENTS ON GUIDELINES AND PROCEDURES FOR CONDUCTING AQUIFER SLUG TESTING, REMEDIAL INVESTIGATION FOR GROUNDWATER, TASK 1.4.5 AT SWMU SITES {PORTION OF THE MAILING LIST IS SENSITIVE}	ADMIN RECORD SENSITIVE	SWMU 00001 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_007	181-09-0009 BOX 0030 30099762 SAN
N60036 / 000838 EFAW SER 052GAR/035 CORRESPONDENC NONE 13	10-15-2002 **08-16-2002** NONE	NAVFAC - EFA WEST RIVERA, G. VARIOUS AGENCIES	TRANSMITTAL OF DRAFT FINAL AMENDMENT TO SITE MANAGEMENT PLAN (SMP) AND RESPONSE TO AGENCY COMMENTS ON DRAFT AMENDMENT TO SITE MANAGEMENT PLAN (W/ENCLOSURES)	ADMIN RECORD	AOC 00001 SITE 00001 SITE 00002 SITE 00003 SITE 00004 SITE 00005 SITE 00006 SITE 00009 SITE 00011 SITE 00013 SITE 00017 SITE 00022 SITE 00025 SITE 00026 SITE 00027 SITE 00028 SITE 00029 SITE 00030 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_009	181-09-0009 BOX 0030 30099762 SAN
N60036 / 000881 EFAW SER 052GAR/046 CORRESPONDENC NONE 3	04-07-2003 **10-18-2002** NONE	NAVFAC - EFA WEST RIVERA, G. VARIOUS AGENCIES	TRANSMITTAL OF THE DRAFT REMEDIAL INVESTIGATION REPORT FOR SOLID WASTE MANAGEMENT UNITS (W/OUT ENCLOSURE) [SEE AR # 894 - DRAFT REMEDIAL INVESTIGATION REPORT]	ADMIN RECORD INFO REPOSITORY	SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_005	181-09-0009 BOX 0031 30099762 SAN

UIC No. / Rec. No. Doc. Control No. Record Type Contr./Guid. No. Approx. # Pages	Prc. Date Record Date CTO No. EPA Cat. #	Author Affil. Author Recipient Affil. Recipient	Subject	Classification	Sites	Location SWDIV Box No(s) CD No.	FRC Accession No. FRC Warehouse FRC Box No(s)
N60036 / 000894 DS.0324.17168 REPORT N62474-94-D-7609 385	04-07-2003 **10-18-2002** 00324	TETRA TECH EM INC. BOSCHE, J. NAVFAC - EFA WEST	DRAFT REMEDIAL INVESTIGATION FOR SOLID WASTE MANAGEMENT UNITS [SEE AR # 881 - EFAW TRANSMITTAL LETTER]	ADMIN RECORD INFO REPOSITORY	SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_005	181-09-0009 BOX 0031 30099762 SAN
N60036 / 000883 FILE NO. 2119.1058 (LM) CORRESPONDENC NONE 5	04-07-2003 **11-13-2002** NONE	CRWQCB - OAKLAND, CA MEILLIER, L. NAVFAC - EFA WEST RIVERA, G.	COMMENTS ON THE DRAFT REMEDIAL INVESTIGATION REPORT FOR SOLID WASTE MANAGEMENT UNITS [SEE AR # 894 - DRAFT REMEDIAL INVESTIGATION REPORT]	ADMIN RECORD INFO REPOSITORY	SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_005	181-09-0009 BOX 0031 30099762 SAN
N60036 / 000890 NONE CORRESPONDENC NONE 12	04-07-2003 **11-21-2002** NONE	U.S. EPA - SAN FRANCISCO, CA RAMSEY, P. NAVFAC - EFA WEST RIVERA, G.	APPROVAL OF THE REVISED DRAFT FINAL AMENDMENT TO THE SITE MANAGEMENT PLAN (W/ ENCLOSURE) [SEE AR # 889 - EFAW TRANSMITTAL LETTER]	ADMIN RECORD INFO REPOSITORY	AOC 00001 BLDG 1A-25 SITE 00001 SITE 00002 SITE 00003 SITE 00004 SITE 00006 SITE 00009 SITE 00011 SITE 00013 SITE 00017 SITE 00022 SITE 00025 SITE 00026 SITE 00027 SITE 00028 SITE 00029 SITE 00030 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_011	181-09-0009 BOX 0031 30099762 SAN

UIC No. / Rec. No. Doc. Control No. Record Type Contr./Guid. No. Approx. # Pages	Prc. Date Record Date CTO No. EPA Cat. #	Author Affil. Author Recipient Affil. Recipient	Subject	Classification	Sites	Location SWDIV Box No(s) CD No.	FRC Accession No. FRC Warehouse FRC Box No(s)
N60036 / 000892 NONE CORRESPONDENC NONE 10	04-07-2003 **12-17-2002** NONE	U.S. EPA - SAN FRANCISCO, CA RAMSEY, P. NAVFAC - EFA WEST RIVERA, G.	COMMENTS ON THE DRAFT REMEDIAL INVESTIGATION REPORT FOR SOLID WASTE MANAGEMENT UNITS [SEE AR # 894 - DRAFT REMEDIAL INVESTIGATION]	ADMIN RECORD INFO REPOSITORY	SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_005	181-09-0009 BOX 0031 30099762 SAN
N60036 / 000906 NONE FACT SHEET NONE 8	04-08-2003 **01-01-2003** NONE	NWS SEAL BEACH, CA SMITH, G. NAVFAC - EFA WEST TACTAY, T.	FACT SHEET: STATUS OF THE TIDAL AREA LANDFILL, RESTORATION ADVISORY BOARD, UPDATE OF THE COMMUNITY RELATIONS PLAN AND ONGOING INVESTIGATIONS	ADMIN RECORD INFO REPOSITORY	SITE 00001 SITE 00002 SITE 00003 SITE 00004 SITE 00005 SITE 00006 SITE 00009 SITE 00011 SITE 00013 SITE 00017 SITE 00022 SITE 00025 SITE 00026 SITE 00028 SITE 00029 SITE 00030 SITE 00031 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_009	181-09-0009 BOX 0031 30099762 SAN
N60036 / 000916 NONE CORRESPONDENC NONE 3	04-08-2003 **02-14-2003** NONE	NAVFAC - EFA WEST TYAHLA, S. VARIOUS AGENCIES	TRANSMITTAL OF RESPONSE TO AGENCY COMMENTS ON THE DRAFT REMEDIAL INVESTIGATION FOR SOLID WASTE MANAGEMENT UNITS (W/OUT ENCLOSURE) [SEE AR # 917 - RESPONSE TO COMMENTS]	ADMIN RECORD INFO REPOSITORY	SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_005	181-09-0009 BOX 0031 30099762 SAN

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N60036 / 000917 TC.0324.11852 CORRESPONDENC N62474-94-D-7609 30	04-08-2003 **03-14-2003** 00324	TETRA TECH EM INC. NAVFAC - EFA WEST	RESPONSE TO COMMENTS ON THE DRAFT REMEDIAL INVESTIGATION FOR SOLID WASTE MANAGEMENT UNITS [SEE AR # 892 - COMMENTS ON THE DRAFT REMEDIAL INVESTIGATION, AR # 894 - DRAFT REMEDIAL INVESTIGATION, AND AR # 916 - EFAW TRANSMITTAL LETTER]	ADMIN RECORD INFO REPOSITORY	SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_005	181-09-0009 BOX 0031 30099762 SAN
N60036 / 000926 NONE CORRESPONDENC NONE 3	08-05-2003 **04-15-2003** NONE	U.S. EPA - SAN FRANCISCO, CA RAMSEY, P. NAVFAC - EFA WEST TYAHLA, S.	COMMENTS ON THE RESPONSE TO COMMENTS ON THE DRAFT REMEDIAL INVESTIGATION FOR SOLID WASTE MANAGEMENT UNITS [SEE AR # 894 - DRAFT REMEDIAL INVESTIGATION]	ADMIN RECORD BASE INFO REPOSITORY	SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_005	181-09-0009 BOX 0031 30099762 SAN
N60036 / 000929 NONE CORRESPONDENC NONE 4	08-05-2003 **04-30-2003** NONE	NAVFAC - EFA WEST TYAHLA, S. U.S. EPA - SAN FRANCISCO, CA SHUTZ, M.	RESPONSE TO THE REQUEST REGARDING PERCHLORATE SAMPLING AT SITE 13/17 AND TRANSMITTAL OF DRAFT ADDENDUM SAMPLING AND ANALYSIS PLAN, ADDITIONAL GROUNDWATER INVESTIGATION (W/OUT ENCLOSURES)	ADMIN RECORD BASE INFO REPOSITORY	SWMU 00001 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_009	181-09-0009 BOX 0031 30099762 SAN
N60036 / 000934 GSA.0121.00001&GS -10F-0076K CORRESPONDENC N62474-03-F-4032 38	08-05-2003 **04-30-2003** NONE	TETRA TECH EM INC. WILSON, P. NAVFAC - EFA WEST TYAHLA, S.	DRAFT ADDENDUM SAMPLING AND ANALYSIS PLAN (FIELD SAMPLING PLAN AND QUALITY ASSURANCE PROJECT PLAN), ADDITIONAL GROUNDWATER INVESTIGATION [SEE AR # 929 - EFAW TRANSMITTAL LETTER, AR # 713 - DRAFT FINAL FIELD SAMPLING PLAN, AND AR # 714 - DRAFT FINAL QAPP]	ADMIN RECORD INFO REPOSITORY	SITE 00013 SITE 00022 SWMU 00001 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_007	181-09-0009 BOX 0031 30099762 SAN
N60036 / 000936 FILE NO.: 2119.1058 (LM) CORRESPONDENC NONE 6	08-05-2003 **05-16-2003** NONE	CRWQCB - OAKLAND, CA MEILLIER, L. NAVFAC - EFA WEST TYAHLA, S.	COMMENTS ON THE DRAFT ADDENDUM SAMPLING AND ANALYSIS PLAN, ADDITIONAL GROUNDWATER INVESTIGATION {PORTION OF THE MAILING LIST IS SENSITIVE} [SEE AR # 934 - DRAFT ADDENDUM]	ADMIN RECORD BASE INFO REPOSITORY SENSITIVE	SITE 00013 SITE 00022 SWMU 00001 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_009	181-09-0009 BOX 0031 30099762 SAN

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N60036 / 000938 NONE CORRESPONDENC NONE 2	08-05-2003 **05-21-2003** NONE	U.S. EPA - SAN FRANCISCO, CA RAMSEY, P. NAVFAC - EFA WEST TYAHLA, S.	CONDITIONAL APPROVAL OF THE DRAFT ADDENDUM SAMPLING AND ANALYSIS PLAN (FIELD SAMPLING PLAN AND QUALITY ASSURANCE PROJECT PLAN) ADDITIONAL GROUNDWATER INVESTIGATION [SEE AR # 934 - DRAFT ADDENDUM]	ADMIN RECORD BASE INFO REPOSITORY	SITE 00013 SITE 00022 SWMU 00001 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_009	181-09-0009 BOX 0031 30099762 SAI

UIC No. / Rec. No. Doc. Control No. Record Type Contr./Guid. No. Approx. # Pages	Prc. Date Record Date CTO No. EPA Cat. #	Author Affil. Author Recipient Affil. Recipient	Subject	Classification	Sites	Location SWDIV Box No(s) CD No.	FRC Accession No. FRC Warehouse FRC Box No(s)
N60036 / 000978 NONE REPORT N68711-00-D-0004 1355	08-06-2003 **05-27-2003** DO 007	CDM FEDERAL PROGRAMS CORP. CHICHAKLI, R. NAVFAC - EFA WEST	DRAFT ENVIRONMENTAL BASELINE SURVEY, ADMINISTRATIVE AND RUNWAY AREAS [SEE AR # 977 - EFAW TRANSMITTAL LETTER]	ADMIN RECORD INFO REPOSITORY	AREA E-98 BLDG 00122 BLDG 00139 BLDG 00140 BLDG 00141 BLDG 00142 BLDG 00143 BLDG 00144 BLDG 00147 BLDG 00150 BLDG 00152 BLDG 00155 BLDG 00156 BLDG 00159 BLDG 00161 BLDG 00178 BLDG 00179 BLDG 00180 BLDG 00185 BLDG 00186 BLDG 00187 BLDG 00189 BLDG 00190 BLDG 00193 BLDG 00197 BLDG 00200 BLDG 00201 BLDG 00202 BLDG 00203 BLDG 00204 BLDG 00205 BLDG 00206 BLDG 00207 BLDG 00208 BLDG 00209	FRC - PERRIS IMAGED CONC_009	181-09-0009 BOX 0032 30099762 SAN

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					BLDG 00210		
					BLDG 00211		
					BLDG 00212		
					BLDG 00213		
					BLDG 00214		
					BLDG 00215		
					BLDG 00216		
					BLDG 00221		
					BLDG 00222		
					BLDG 00223		
					BLDG 00244		
					BLDG 00245-A		
					BLDG 00245-B		
					BLDG 00245-C		
					BLDG 00245-D		
					BLDG 00245-E		
					BLDG 00245-F		
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					BLDG 00264		
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					BLDG 00395		
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					BLDG 00397		
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					IA 0018A		

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					IA 0018B IA 0018C IA 0018D PARCEL A PARCEL B PARCEL C PARCEL D PARCEL E PARCEL F PARCEL G PARCEL H PARCEL I SITE 00024B SWMU 00001 SWMU 00002 SWMU 00007 SWMU 00018		
N60036 / 000942 NONE CORRESPONDENC NONE 3	08-06-2003 **06-06-2003** NONE	NAVFAC - EFA WEST TYAHLA, S. VARIOUS AGENCIES	TRANSMITTAL OF THE DRAFT ADDENDUM, SAMPLING AND ANALYSIS PLAN (FIELD SAMPLING PLAN AND QUALITY ASSURANCE PROJECT PLAN), SOIL GAS INVESTIGATION AT SOLID WASTE MANAGEMENT UNITS (W/OUT ENCLOSURE) [SEE AR # 943 - DRAFT ADDENDUM]	ADMIN RECORD BASE INFO REPOSITORY	SWMU 00001 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_007	181-09-0009 30099762 SAI BOX 0032
N60036 / 000943 DS.0324.17817 CORRESPONDENC N62474-94-D-7609 41	08-06-2003 **06-06-2003** 00324	TETRA TECH EM INC. BOSCHE, J. NAVFAC - EFA WEST TYAHLA, S.	DRAFT ADDENDUM SAMPLING AND ANALYSIS PLAN (FIELD SAMPLING PLAN AND QUALITY ASSURANCE PROJECT PLAN) SOIL GAS INVESTIGATION AT SOLID WASTE MANAGEMENT UNITS	ADMIN RECORD BASE INFO REPOSITORY	SWMU 00001 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_007	181-09-0009 30099762 SAI BOX 0032

UIC No. / Rec. No. Doc. Control No. Record Type Contr./Guid. No. Approx. # Pages	Prc. Date Record Date CTO No. EPA Cat. #	Author Affil. Author Recipient Affil. Recipient	Subject	Classification	Sites	Location SWDIV Box No(s) CD No.	FRC Accession No. FRC Warehouse FRC Box No(s)
N60036 / 000946 NONE CORRESPONDENC NONE 4	08-06-2003 **06-16-2003** NONE	NAVFAC - EFA WEST TYAHLA, S. VARIOUS AGENCIES	TRANSMITTAL OF RESPONSE TO COMMENTS ON THE DRAFT ADDENDUM SAMPLING AND ANALYSIS PLAN, ADDITIONAL GROUNDWATER INVESTIGATION (W/OUT ENCLOSURE) [SEE AR # 947 - RESPONSE TO COMMENTS]	ADMIN RECORD BASE INFO REPOSITORY	SITE 00013 SITE 00022 SWMU 00001 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_009	181-09-0009 BOX 0032 30099762 SAN
N60036 / 000947 GSA.0121.00002 CORRESPONDENC GS-10F-0016K 61	08-06-2003 **06-16-2003** 00121	TETRA TECH EM INC. NAVFAC - EFA WEST	RESPONSE TO COMMENTS ON THE DRAFT ADDENDUM SAMPLING AND ANALYSIS PLAN, ADDITIONAL GROUNDWATER INVESTIGATION [SEE AR # 946 - EFAW TRANSMITTAL LETTER]	ADMIN RECORD BASE INFO REPOSITORY	SITE 00013 SITE 00022 SWMU 00001 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_009	181-09-0009 BOX 0032 30099762 SAN
N60036 / 001019 GSA.0129.00001 MINUTES NONE 4	11-20-2003 **07-23-2003** NONE	NWS CONCORD, CA VARIOUS AGENCIES	23 JULY 2003 FINAL REMEDIAL PROJECT MANAGERS MEETING MINUTES ON SOLID WASTE MANAGEMENT UNIT (SWMU) SITES SUPPLEMENTAL SAMPLING AND ANALYSIS PLAN [SEE AR # 1018 - EFAW TRANSMITTAL LETTER]	ADMIN RECORD BASE INFO REPOSITORY	SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_009	181-09-0009 BOX 0033 30099762 SAN

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N60036 / 001097 TC.A010.10147 REPORT N68711-00-D-0005 215	10-07-2004 **09-01-2003** DO 010	TETRA TECH EM INC. NAVFAC - EFA WEST TYAHLA, S.	SEPTEMBER 2003 RESTORATION ADVISORY BOARD (RAB) ORIENTATION PACKET {PORTIONS OF THE DOCUMENT ARE SENSITIVE} [SEE AR #1098 - EFAW TRANSMITTAL LETTER]	ADMIN RECORD BASE INFO REPOSITORY SENSITIVE	AOC 00001 BLDG IA-24 BLDG IA-25 SITE 00001 SITE 00002 SITE 00003 SITE 00004 SITE 00005 SITE 00006 SITE 00009 SITE 00011 SITE 00013 SITE 00017 SITE 00022 SITE 00025 SITE 00026 SITE 00027 SITE 00028 SITE 00029 SITE 00030 SITE 00031 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_009	181-09-0009 BOX 0034 30099762 SAN
N60036 / 001003 NONE REPORT NONE 19	11-18-2003 **10-01-2003** NONE	PM STRAUSS & ASSOCIATES STRAUSS, P. NAVFAC - EFA WEST	DRAFT REPORT FOR SOLID WASTE MANAGEMENT UNITS	ADMIN RECORD BASE INFO REPOSITORY	SITE 00017 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_011	181-09-0009 BOX 0033 30099762 SAN

UIC No. / Rec. No. Doc. Control No. Record Type Contr./Guid. No. Approx. # Pages	Prc. Date Record Date CTO No. EPA Cat. #	Author Affil. Author Recipient Affil. Recipient	Subject	Classification	Sites	Location SWDIV Box No(s) CD No.	FRC Accession No. FRC Warehouse FRC Box No(s)
N60036 / 001011 NONE CORRESPONDENC NONE 3	11-20-2003 **10-06-2003** NONE	NAVFAC - EFA WEST TYAHLA, S. VARIOUS AGENCIES	TRANSMITTAL OF DRAFT FINAL ADDENDUM 01, SAMPLING AND ANALYSIS PLAN (FIELD SAMPLING PLAN AND QUALITY ASSURANCE PROJECT PLAN) SOIL GAS INVESTIGATION (W/OUT ENCLOSURE) [SEE AR # 1012 - DRAFT FINAL ADDENDUM 01]	ADMIN RECORD BASE INFO REPOSITORY	SWMU 00001 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_007	181-09-0009 BOX 0033 30099762 SAI
N60036 / 001012 GSA.0129.0002 & GS-10F-0076K CORRESPONDENC N62474-03-F-4037 108	11-20-2003 **10-07-2003** NONE	TETRA TECH EM INC. BOSCHE, J. NAVFAC - EFA WEST	DRAFT FINAL ADDENDUM 1, SAMPLING AND ANALYSIS PLAN (FIELD SAMPLING PLAN AND QUALITY ASSURANCE PROJECT PLAN) SOIL GAS INVESTIGATION	ADMIN RECORD BASE INFO REPOSITORY	SWMU 00001 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_007	181-09-0009 BOX 0033 30099762 SAI
N60036 / 001018 NONE CORRESPONDENC NONE 3	11-20-2003 **10-29-2003** NONE	NAVFAC - EFA WEST TYAHLA, S. VARIOUS AGENCIES	TRANSMITTAL OF 23 JULY 2003 FINAL REMEDIAL PROJECT MANAGERS MEETING MINUTES ON SOLID WASTE MANAGEMENT UNIT (SWMU) SITES SUPPLEMENTAL SAMPLING AND ANALYSIS PLAN (W/OUT ENCLOSURE) [SEE AR # 1019 - MEETING MINUTES]	ADMIN RECORD BASE INFO REPOSITORY	SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_009	181-09-0009 BOX 0033 30099762 SAI

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N60036 / 001079 NONE REPORT NONE 46	06-01-2004 **12-01-2003** NONE	PM STRAUSS & ASSOCIATES STRAUSS, P. NAVFAC - EFA WEST TYAHLA, S.	FINAL REPORT: SOLD WASTE MANAGEMENT UNITS, INLAND AREA	ADMIN RECORD BASE INFO REPOSITORY	BLDG IA-12 BLDG IA-15 BLDG IA-16 BLDG IA-24 BLDG IA-24A BLDG IA-24B BLDG IA-43 BLDG IA-51 BLDG IA-55 BLDG IA-7 SITE 00013 SITE 00017 SITE 00022 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018 UST IA-24A UST IA-55	FRC - PERRIS IMAGED CONC_007	181-09-0009 BOX 0034 30099762 SAN
N60036 / 001198 IPTW SER 05/316 CORRESPONDENC NONE 3	04-14-2005 **01-26-2004** NONE	NAVFAC - IPT WEST TACTAY, A. U.S. EPA - SAN FRANCISCO, CA RAMSEY, P.	TRANSMITTAL OF 20 OCTOBER 2004 FINAL REMEDIAL PROJECT MANAGERS (RPM) MEETING MINUTES FOR SOLID WASTE MANAGEMENT UNITS (SWMU) SITES (W/O ENCLOSURE) [LETTER RECEIVED IN THE ADMINISTRATIVE RECORDS W/OUT ENCLOSURE]	ADMIN RECORD BASE INFO REPOSITORY	SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_011	181-09-0009 BOX 0036 30099762 SAN
N60036 / 001090 GSA.0129.0004 REPORT N62474-03-F-4037 609	07-08-2004 **06-14-2004** DO 10F-0076K	TETRA TECH EM INC. BOSCHE, J. NAVFAC - EFA WEST	DRAFT FINAL REMEDIAL INVESTIGATION SOLID WASTE MANAGEMENT UNITS [SEE AR # 1147 - EFAW TRANSMITTAL LETTER]	ADMIN RECORD BASE INFO REPOSITORY	SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_005	181-09-0009 BOX 0034 30099762 SAN

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N60036 / 001133 NONE CORRESPONDENC NONE 4	11-02-2004 **08-26-2004** NONE	U.S. EPA - SAN FRANCISCO, CA RAMSEY, P. NAVFAC - EFA WEST TYAHLA, S.	COMMENTS ON THE DRAFT FINAL REMEDIAL INVESTIGATION SOLID WASTE MANAGEMENT UNITS DATED 14 JUNE 2004, AND DRAFT FINAL REMEDIAL INVESTIGATION ADDENDUM REPORT FOR TAYLOR BOULEVARD BRIDGE DATED 24 JUNE 2004	ADMIN RECORD BASE INFO REPOSITORY	SITE 00030 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_005	181-09-0009 BOX 0035 30099762 SAN
N60036 / 001154 EFAW SER 05/170 CORRESPONDENC NONE 3	01-24-2005 **11-01-2004** NONE	NAVFAC - IPT WEST TYAHLA, S. U.S. EPA - SAN FRANCISCO, CA RAMSEY, P.	TRANSMITTAL OF THE RESPONSE TO COMMENTS ON DRAFT FINAL REMEDIAL INVESTIGATION REPORT, SOLID WASTE MANAGEMENT UNITS (W/OUT ENCLOSURE) [SEE AR # 1155 - RESPONSE TO COMMENTS]	ADMIN RECORD BASE INFO REPOSITORY	SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_005	181-09-0009 BOX 0035 30099762 SAN
N60036 / 001155 NONE CORRESPONDENC NONE 12	01-24-2005 **11-01-2004** NONE	NAVFAC - EFA WEST VARIOUS AGENCIES	RESPONSE TO COMMENTS ON THE DRAFT FINAL REMEDIAL INVESTIGATION REPORT, SOLID WASTE MANAGEMENT UNITS [SEE AR # 1090 - DRAFT FINAL REMEDIAL INVESTIGATION REPORT, AND AR # 1154 - EFAW TRANSMITTAL LETTER]	ADMIN RECORD BASE INFO REPOSITORY	SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_005	181-09-0009 BOX 0035 30099762 SAN
N60036 / 001158 IPTW SER 05/273 CORRESPONDENC NONE 3	01-24-2005 **12-24-2004** NONE	NAVFAC - IPT WEST TYAHLA, S. U.S. EPA - SAN FRANCISCO, CA RAMSEY, P.	TRANSMITTAL OF DRAFT FEASIBILITY STUDY, SOLID WASTE MANAGEMENT UNITS (W/OUT ENCLOSURE) [SEE AR # 1159 - DRAFT FEASIBILITY STUDY]	ADMIN RECORD BASE INFO REPOSITORY	SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_009	181-09-0009 BOX 0035 30099762 SAN
N60036 / 001159 GSA.0129.006 & 10F-0076K REPORT N62474-03-F-4037 178	01-24-2005 **12-24-2004** NONE	TETRA TECH EM INC. BOSCHE, J. NAVFAC - EFA WEST	DRAFT FEASIBILITY STUDY, SOLID WASTE MANAGEMENT UNITS [SEE AR #1158 - IPTW TRANSMITTAL LETTER]	ADMIN RECORD BASE	INLAND AREA SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_009	181-09-0009 BOX 0035 30099762 SAN

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N60036 / 001190 NONE CORRESPONDENC NONE 6	04-14-2005 **02-23-2005** NONE	CA DEPARTMENT OF FISH AND GAME STANTON, B. DTSC - SACRAMENTO, CA PINASCO, J.	COMMENTS ON THE DRAFT FEASIBILITY STUDY OF SOLID WASTE MANAGEMENT UNITS (SWMU) [SEE AR # 1159 - DRAFT FEASIBILITY STUDY]	ADMIN RECORD BASE INFO REPOSITORY	SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_009	181-09-0009 BOX 0036 30099762 SAN
N60036 / 001206 NONE CORRESPONDENC NONE 4	04-13-2005 **02-25-2005** NONE	CLEARWATER REVIVAL COMPANY NAVFAC - EFA WEST	REVIEW AND COMMENTS ON THE FEASIBILITY STUDY (FS), SOLID WASTE MANAGEMENT UNITS [SEE AR # 1159 - DRAFT FEASIBILITY STUDY]	ADMIN RECORD BASE INFO REPOSITORY	SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_011	181-09-0009 BOX 0036 30099762 SAN
N60036 / 001193 NONE CORRESPONDENC NONE 6	04-14-2005 **03-03-2005** NONE	U.S. EPA - SAN FRANCISCO, CA RAMSEY, P. NAVFAC - IPT WEST TACTAY, T.	COMMENTS ON THE DRAFT FEASIBILITY STUDY OF SOLD WASTE MANAGEMENT UNITS [SEE AR # 1159 - DRAFT FEASIBILITY STUDY]	ADMIN RECORD BASE INFO REPOSITORY	SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_009	181-09-0009 BOX 0036 30099762 SAN
N60036 / 001194 NONE CORRESPONDENC NONE 13	04-14-2005 **03-09-2005** NONE	DEPARTMENT OF FISH AND GAME - SACRAMENTO, CA GRAY, F. DTSC - SACRAMENTO, CA PINASCO, J.	APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARAR) FOR NON-TIDAL AREA SITES	ADMIN RECORD BASE INFO REPOSITORY	SITE 00013 SITE 00017 SITE 00022 SITE 00027 SITE 00029 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_011	181-09-0009 BOX 0036 30099762 SAN
N60036 / 001195 FILE NO.: 2119.1058 (LM) CORRESPONDENC NONE 6	04-14-2005 **03-17-2005** NONE	CRWQCB - OAKLAND, CA MEILLIER, L. NAVFAC - IPT WEST CATE, R.	COMMENTS ON THE FEASIBILITY STUDY FOR SOLID WASTE MANAGEMENT UNITS [SEE AR # 1159 - DRAFT FEASIBILITY STUDY]	ADMIN RECORD BASE INFO REPOSITORY	SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_009	181-09-0009 BOX 0036 30099762 SAN

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N60036 / 001354 GSA.0129.007 AND GS-10F-0076K REPORT N62474-03-F-4037 217	03-23-2006 **04-22-2005** NONE	TETRA TECH EM INC. BOSCHE, J. NAVFAC - IPT WEST	DRAFT FINAL FEASIBILITY STUDY, SOLID WASTE MANAGEMENT UNITS [SEE AR # 1355 - IPT WEST TRANSMITTAL LETTER]	ADMIN RECORD BASE INFO REPOSITORY	SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_009	181-09-0009 BOX 0039 30099762 SAN
N60036 / 001355 IPTW SER 05/495 CORRESPONDENC NONE 3	03-23-2006 **04-22-2005** NONE	NAVFAC - IPT WEST TYAHLA, S. U.S. EPA - SAN FRANCISCO, CA RAMSEY, P.	TRANSMITTAL OF DRAFT FINAL FEASIBILITY STUDY, SOLID WASTE MANAGEMENT UNITS (W/OUT ENCLOSURE) [SEE AR #1354 - DRAFT FINAL FEASIBILITY STUDY]	ADMIN RECORD BASE INFO REPOSITORY	SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_009	181-09-0009 BOX 0039 30099762 SAN
N60036 / 001274 NONE CORRESPONDENC NONE 2	08-23-2005 **05-25-2005** NONE	U.S. EPA - SAN FRANCISCO, CA RAMSEY, P. NAVFAC - EFA WEST TYAHLA, S.	REVIEW, COMMENTS AND INVOCATION OF INFORMAL DISPUTE ON THE DRAFT FINAL FEASIBILITY STUDY SOLID WASTE MANAGEMENT UNITS [SEE AR # 1354 - DRAFT FINAL FEASIBILITY STUDY]	ADMIN RECORD BASE INFO REPOSITORY	SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_009	181-09-0009 BOX 0037 30099762 SAN
N60036 / 001369 BRAC SER BPMOW.JTD/0273 CORRESPONDENC NONE 3	04-19-2006 **03-23-2006** NONE	BRAC PMO WEST DUNAWAY, J. U.S. EPA - SAN FRANCISCO, CA RAMSEY, P.	EXTENSION REQUEST FOR THE DELIVERY OF THE DRAFT TREATABILITY STUDY WORK PLAN FOR SOLID WASTE MANAGEMENT UNITS (SWMU)	ADMIN RECORD BASE INFO REPOSITORY	SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_011	181-09-0009 BOX 0039 30099762 SAN
N60036 / 001376 NONE CORRESPONDENC NONE 1	05-05-2006 **03-30-2006** NONE	U.S. EPA - SAN FRANCISCO, CA RAMSEY, P. BRAC PMO WEST DUNAWAY, J.	APPROVAL OF THE EXTENSION REQUEST FOR SOLID WASTE MANAGEMENT UNITS (SWMU) TREATABILITY STUDY WORK PLAN	ADMIN RECORD BASE INFO REPOSITORY	SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_011	181-09-0009 BOX 0040 30099762 SAN

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N60036 / 001416 DS.B121.20425 MINUTES NONE 20	06-20-2006 **06-01-2006** NONE	TETRA TECH EM INC. HUNTER, C. U.S. EPA - SAN FRANCISCO, CA RAMSEY, P.	04 APRIL 2006 FINAL REMEDIAL PROJECT MANAGER (RPM) MEETING MINUTES (INCLUDES LIST OF ATTENDEES, AGENDA, DOCUMENT TRACKING SHEETS AND FIELD WORK SCHEDULE)	ADMIN RECORD BASE INFO REPOSITORY	SITE 00001 SITE 00013 SITE 00022 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_011	181-09-0009 BOX 0040 30099762 SAN
N60036 / 001418 BRAC SER BPMOW.RCW/0529 CORRESPONDENC NONE 17	06-20-2006 **06-15-2006** NONE	BRAC PMO WEST WEISSENBORN, R. U.S. EPA - SAN FRANCISCO, CA RAMSEY, P.	SITE MANAGEMENT PLAN FOR INLAND AREA	ADMIN RECORD BASE INFO REPOSITORY	SITE 00013 SITE 00027 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_011	181-09-0009 BOX 0040 30099762 SAN
N60036 / 001424 DS.B111.20131 MINUTES NONE 32	07-31-2006 **06-29-2006** NONE	TETRA TECH EM INC. HUNTER, C. RAB MEMBERS	05 APRIL 2006 FINAL RESTORATION ADVISORY BOARD (RAB) MEETING MINUTES (INCLUDES LIST OF ATTENDEES, AGENDA AND VARIOUS HANDOUT MATERIALS)	ADMIN RECORD BASE INFO REPOSITORY	SITE 00001 SITE 00002 SITE 00009 SITE 00011 SITE 00022 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018 TIDAL AREA	FRC - PERRIS IMAGED CONC_011	181-09-0009 BOX 0041 30099762 SAN
N60036 / 001452 DS.B111.20819 MINUTES NONE 47	09-28-2006 **07-05-2006** NONE	TETRA TECH EM INC. RAB MEMBERS	05 JULY 2006 RESTORATION ADVISORY BOARD (RAB) FINAL MEETING MINUTES (INCLUDES LIST OF ATTENDEES, AGENDA, AND VARIOUS HANDOUTS)	ADMIN RECORD BASE INFO REPOSITORY	SITE 00001 SITE 00022 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018 TIDAL AREA	FRC - PERRIS IMAGED CONC_011	181-09-0009 BOX 0041 30099762 SAN

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N60036 / 001430 TC.B121.12325 MINUTES NONE 48	07-31-2006 **07-18-2006** NONE	TETRA TECH EM INC. HUNTER, C. RAB MEMBERS	07 JUNE 2006 FINAL RESTORATION ADVISORY BOARD (RAB) MEETING MINUTES (INCLUDES LIST OF ATTENDEES, AGENDA AND VARIOUS HANDOUT MATERIALS) {PORTION OF ATTACHMENT A IS SENSITIVE}	ADMIN RECORD BASE INFO REPOSITORY SENSITIVE	SITE 00001 SITE 00002 SITE 00009 SITE 00011 SWMU 00002 SWMU 00007 SWMU 00018 TIDAL AREA	FRC - PERRIS IMAGED CONC_011	181-09-0009 BOX 0041 30099762 SAN
N60036 / 001429 DS.B121.20427 MINUTES NONE 22	07-31-2006 **07-21-2006** NONE	TETRA TECH EM INC. HUNTER, C. U.S. EPA - SAN FRANCISCO, CA RAMSEY, P.	07 JUNE 2006 FINAL REMEDIAL PROJECT MANAGER (RPM) MEETING MINUTES (INCLUDES LIST OF ATTENDEES, AGENDA AND VARIOUS HANDOUT MATERIALS)	ADMIN RECORD BASE INFO REPOSITORY	BLDG IA-1 SITE 00002 SITE 00009 SITE 00011 SITE 00022 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018 TIDAL AREA	FRC - PERRIS IMAGED CONC_011	181-09-0009 BOX 0041 30099762 SAN

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N60036 / 001444 NONE MINUTES NONE 22	09-20-2006 **08-02-2006** NONE	BRAC PMO WEST VARIOUS AGENCIES	02 AUGUST 2006 FINAL REMEDIAL PROJECT MANAGER (RPM) MEETING MINUTES (INCLUDES LIST OF ATTENDEES, AGENDA AND VARIOUS HANDOUT MATERIALS)	ADMIN RECORD BASE INFO REPOSITORY	BLDG 00081 BLDG 00093 BLDG 00097 BLDG IA-1 INLAND AREA SITE 00001 SITE 00002 SITE 00009 SITE 00011 SITE 00013 SITE 00022 SITE 00027 SITE 00029 SITE 00030 SITE 00031 SITE 0023A SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018 TIDAL AREA	FRC - PERRIS IMAGED CONC_011	181-09-0009 BOX 0041 30099762 SAN
N60036 / 001451 BRAC SER BPMOW.WED/0710 CORRESPONDENC NONE 3	09-28-2006 **08-14-2006** NONE	BRAC PMO WEST WEISSENBORN, R. U.S. EPA - SAN FRANCISCO, CA RAMSEY, P.	FEDERAL FACILITY AGREEMENT (FFA) SCHEDULE EXTENSION REQUEST FOR SOLID WASTE MANAGEMENT UNITS (SWMU), PILOT STUDY WORK PLAN	ADMIN RECORD BASE INFO REPOSITORY	SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_011	181-09-0009 BOX 0041 30099762 SAN
N60036 / 001470 BRAC SER BPMOW.WED\0817 CORRESPONDENC NONE 4	12-06-2006 **09-29-2006** NONE	BRAC PMO WEST WEISSENBORN, R. U.S. EPA - SAN FRANCISCO, CA RAMSEY, P.	TRANSMITTAL OF DRAFT SAMPLING AND ANALYSIS PLAN (SAP) [FIELD SAMPLING PLAN/QUALITY ASSURANCE PROJECT PLAN (FSP/QAPP)] FOR PILOT TEST OF AIR SPARGING AND SOIL VAPOR EXTRACTION (AS/SVE) [W/OUT ENCLOSURE] {SEE AR #1471 - DRAFT SAP}	ADMIN RECORD BASE INFO REPOSITORY	SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_002	181-09-0009 BOX 0041 30099762 SAN

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N60036 / 001471 DS.B133.20683 REPORT N68711-03-D-5104 181	12-06-2006 **09-29-2006** 00133	SULTECH HOCH, K. BRAC PMO WEST	DRAFT SAMPLING AND ANALYSIS PLAN (FIELD SAMPLING PLAN/QUALITY ASSURANCE PROJECT PLAN) FOR PILOT TEST OF AIR SPARGING AND SOIL VAPOR EXTRACTION {CD COPY ENCLOSED} [SEE AR #1470 - BRAC PMO WEST TRANSMITTAL LETTER]	ADMIN RECORD BASE INFO REPOSITORY	SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_002	181-09-0009 BOX 0041 30099762 SAN
N60036 / 001473 BRAC SER BPMOW.WD\0189 CORRESPONDENC NONE 2	12-11-2006 **12-08-2006** NONE	BRAC PMO WEST WEISSENBORN, R. U.S. EPA - SAN FRANCISCO, CA RAMSEY, P.	FEDERAL FACILITY AGREEMENT (FFA) SCHEDULE EXTENSION REQUEST FOR SOLID WASTE MANAGEMENT UNITS (SWMU) AND TREATABILITY STUDY WORK PLAN (WP)	ADMIN RECORD BASE INFO REPOSITORY	SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_011	181-09-0009 BOX 0041 30099762 SAN
N60036 / 000080 BRAC SER BPMOW.WED/0276 CORRESPONDENC NONE 4	02-02-2007 **01-26-2007** NONE	BRAC PMO WEST WEISSENBORN, R. U.S. EPA - SAN FRANCISCO, CA RAMSEY, P.	TRANSMITTAL OF FINAL SAMPLING AND ANALYSIS PLAN (SAP) [FIELD SAMPLING PLAN/QUALITY ASSURANCE PROJECT PLAN (FSP/QAPP)] FOR PILOT TEST OF AIR SPARGING AND SOIL VAPOR EXTRACTION (AS/SVE) [W/OUT ENCLOSURE] {SEE AR #81 - FINAL SAP}	ADMIN RECORD BASE INFO REPOSITORY	SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_001	181-09-0009 BOX 0003 30099762 SAN
N60036 / 000081 DS.B133.20685 REPORT N68711-03-D-5104 295	02-02-2007 **01-26-2007** 00133	SULTECH SWANSON, G. BRAC PMO WEST	FINAL SAMPLING AND ANALYSIS PLAN (SAP) [FIELD SAMPLING PLAN/QUALITY ASSURANCE PROJECT PLAN (FSP/QAPP)] FOR PILOT TEST OF AIR SPARGING AND SOIL VAPOR EXTRACTION (AS/SVE) [SEE AR #80 - BRAC PMO WEST TRANSMITTAL LETTER]	ADMIN RECORD BASE INFO REPOSITORY	SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_001	181-09-0009 BOX 0003 30099762 SAN
N60036 / 001594 TC-C310-12405 MINUTES NONE 54	03-06-2008 **02-07-2007** NONE	TETRA TECH EM INC. RAB MEMBERS	07 FEBRUARY 2007 FINAL RESTORATION ADVISORY BOARD (RAB) MEETING MINUTES (INCLUDES LIST OF ATTENDEES, AGENDA, AND VARIOUS HANDOUTS) [PORTION OF ATTACHMENT A IS SENSITIVE]	ADMIN RECORD BASE INFO REPOSITORY SENSITIVE	SITE 00022A SITE 00029 SWMU 00002 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_013	181-09-0009 BOX 0046 30099762 SAN

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N60036 / 001481 TC.C310.12401 MINUTES NONE 23	03-13-2007 **03-02-2007** NONE	TETRA TECH EM INC. HUNTER, C. RAB MEMBERS	10 JANUARY 2007 FINAL RESTORATION ADVISORY BOARD (RAB) MEETING MINUTES (INCLUDES LIST OF ATTENDEES, AGENDA, AND VARIOUS HANDOUTS)	ADMIN RECORD BASE INFO REPOSITORY	SITE 00001 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018 TIDAL AREA	FRC - PERRIS IMAGED CONC_011	181-09-0009 BOX 0043 30099762 SAN
N60036 / 001483 NONE MINUTES NONE 22	03-13-2007 **03-03-2007** NONE	TETRA TECH EM INC. HUNTER, C. U.S. EPA - SAN FRANCISCO, CA RAMSEY, P.	REVISED 01 NOVEMBER 2006 REMEDIAL PROJECT MANAGER (RPM) FINAL MEETING MINUTES (INCLUDES LIST OF ATTENDEES, AGENDA AND VARIOUS HANDOUT MATERIALS) [SEE AR #85 - ORIGINAL RPM FINAL MEETING MINUTES]	ADMIN RECORD BASE INFO REPOSITORY	BLDG IA-1 SITE 00001 SITE 00002 SITE 00009 SITE 00011 SITE 00022 SITE 00030 SITE 0022A SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018 TIDAL AREA	FRC - PERRIS IMAGED CONC_011	181-09-0009 BOX 0043 30099762 SAN
N60036 / 001493 DS.B147.21303 MINUTES NONE 15	05-22-2007 **03-07-2007** NONE	TETRA TECH EM INC. HUNTER, C. U.S. EPA - SAN FRANCISCO, CA RAMSEY, P.	07 MARCH 2007 FINAL REMEDIAL PROJECT MANAGERS (RPM) MEETING MINUTES, INLAND AREA (INCLUDES LIST OF ATTENDEES, AGENDA, AND VARIOUS HANDOUTS)	ADMIN RECORD BASE INFO REPOSITORY	BLDG IA-1 INLAND AREA SITE 00022 SITE 00027 SITE 00029 SITE 0022A SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_011	181-09-0009 BOX 0043 30099762 SAN

UIC No. / Rec. No. Doc. Control No. Record Type Contr./Guid. No. Approx. # Pages	Prc. Date Record Date CTO No. EPA Cat. #	Author Affil. Author Recipient Affil. Recipient	Subject	Classification	Sites	Location SWDIV Box No(s) CD No.	FRC Accession No. FRC Warehouse FRC Box No(s)
N60036 / 000105 SULT.5104.0111.000 6 MINUTES NONE 34	08-06-2007 **05-02-2007** NONE	SULTECH RAB MEMBERS	02 MAY 2007 FINAL RESTORATION ADVISORY BOARD (RAB) MEETING MINUTES (INCLUDES LIST OF ATTENDEES, AGENDA, AND VARIOUS HANDOUTS) {PORTIONS OF THE DOCUMENT ARE SENSITIVE}	ADMIN RECORD BASE INFO REPOSITORY SENSITIVE	SITE 00027 SITE 00029 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_001	181-09-0009 BOX 0004 30099762 SAN
N60036 / 000160 NONE FACT SHEET NONE 12	10-26-2007 **07-01-2007** NONE	BRAC PMO WEST VARIOUS AGENCIES	FACT SHEET: ENVIRONMENTAL RESTORATION PROGRAM - ACTIVITIES IN THE INLAND AREA	ADMIN RECORD BASE INFO REPOSITORY	BLDG IA-20 BLDG IA-25 SITE 00013 SITE 00014 SITE 00015 SITE 00016 SITE 00017 SITE 00018 SITE 00019 SITE 00020 SITE 00021 SITE 00022 SITE 00027 SITE 00029 SITE 0022A SITE 0023A SITE 0023B SITE 0024A SITE 0024B SWMU 00002 SWMU 00003 SWMU 00005 SWMU 00007 SWMU 00018 SWMU 0018D	FRC - PERRIS IMAGED CONC_005	181-09-0009 BOX 0007 30099762 SAN

UIC No. / Rec. No. Doc. Control No. Record Type Contr./Guid. No. Approx. # Pages	Prc. Date Record Date CTO No. EPA Cat. #	Author Affil. Author Recipient Affil. Recipient	Subject	Classification	Sites	Location SWDIV Box No(s) CD No.	FRC Accession No. FRC Warehouse FRC Box No(s)
N60036 / 000127 BRAC SER BPMOW.WED/0671 CORRESPONDENC NONE 3	09-24-2007 **07-10-2007** NONE	BRAC PMO WEST NEWTON, D. U.S. EPA - SAN FRANCISCO, CA RAMSEY, P.	TRANSMITTAL OF THE DRAFT TECHNICAL MEMORANDUM RESULTS OF AIR SPARGING AND SOIL VAPOR EXTRACTION PILOT TEST AT SOLID WASTE MANAGEMENT UNIT (SWMU) SITES (W/OUT ENCLOSURE) [SEE AR # 1500 - TECHNICAL MEMORANDUM RESULTS]	ADMIN RECORD BASE INFO REPOSITORY	SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_005	181-09-0009 BOX 0004 30099762 SAN
N60036 / 001640 SULT.5104.0147.000 3 MINUTES N68711-03-D-5104 16	05-15-2008 **07-11-2007** 00147	SULTECH NAVFAC - SOUTHWEST	11 JULY 2007 FINAL MEETING MINUTES, INLAND AREA REMEDIAL PROJECT MANAGER (RPM) {INCLUDES LIST OF ATTENDEES, FINAL AGENDA, AND VARIOUS HANDOUTS) (CD COPY ENCLOSED)	ADMIN RECORD BASE INFO REPOSITORY	SITE 00013 SITE 00027 SITE 00029 SITE 0022A SITE 0023A SITE 0024A SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_013	181-09-0009 BOX 0049 30099762 SAN

UIC No. / Rec. No. Doc. Control No. Record Type Contr./Guid. No. Approx. # Pages	Prc. Date Record Date CTO No. EPA Cat. #	Author Affil. Author Recipient Affil. Recipient	Subject	Classification	Sites	Location SWDIV Box No(s) CD No.	FRC Accession No. FRC Warehouse FRC Box No(s)
N60036 / 000145 NONE REPORT N62472-02-D-1300 7259	10-02-2007 **08-01-2007** NONE	MALCOLM PIRNIE, INC. BENNETT, J. NAVFAC - SOUTHWEST	FINAL PRELIMINARY ASSESSMENT, MILITARY MUNITIONS RESPONSE PROGRAM (MMRP) [INCLUDES CD COPY OF APPENDIX B AND PRELIMINARY RESPONSE TO COMMENTS ON THE DRAFT FINAL PRELIMINARY MILITARY MUNITIONS RESPONSE] {***SEE COMMENTS}	ADMIN RECORD BASE INFO REPOSITORY	BLDG 00079 BLDG 00081 BLDG 00082 BLDG 00083 BLDG 00086 BLDG 00087 BLDG 00088 BLDG 00089 BLDG 00093 BLDG 00097 BLDG 00114 BLDG 00174 BLDG 00178 BLDG 00185 BLDG 00186 BLDG 00193 BLDG 00252 BLDG 00269 BLDG 00351 BLDG 00395 BLDG 00398 BLDG 00433 BLDG 7SH14 BLDG A-29 BLDG E-108 BLDG E-85 BLDG IA-10 BLDG IA-11 BLDG IA-12 BLDG IA-15 BLDG IA-16 BLDG IA-17 BLDG IA-18 BLDG IA-20 BLDG IA-24	FRC - PERRIS IMAGED CONC_012	181-09-0009 BOX 0005 30099762 SAI BOX 0006

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					BLDG IA-25		
					BLDG IA-27		
					BLDG IA-37		
					BLDG IA-38		
					BLDG IA-4		
					BLDG IA-41		
					BLDG IA43		
					BLDG IA-46		
					BLDG IA-48		
					BLDG IA-49		
					BLDG IA-50		
					BLDG IA-51		
					BLDG IA-52		
					BLDG IA-55		
					BLDG IA-56		
					BLDG IA-6		
					BLDG IA-7		
					PARCEL 00572		
					PARCEL 00573		
					PARCEL 00574		
					PARCEL 00575		
					PARCEL 00576		
					PARCEL 00581		
					PARCEL 05790		
					SITE 00001		
					SITE 00002		
					SITE 00003		
					SITE 00004		
					SITE 00005		
					SITE 00006		
					SITE 00008		
					SITE 00009		
					SITE 00013		
					SITE 00014		
					SITE 00016		

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					SITE 00017		
					SITE 00019		
					SITE 00021		
					SITE 00022		
					SITE 00025		
					SITE 00026		
					SITE 00027		
					SITE 00029		
					SITE 0023A		
					SITE 0023B		
					SITE 0024A		
					SITE 0024B		
					SWMU 00001		
					SWMU 00002		
					SWMU 00005		
					SWMU 00007		
					SWMU 00008		
					SWMU 00012		
					SWMU 00013		
					SWMU 00014		
					SWMU 00015		
					SWMU 00016		
					SWMU 00017		
					SWMU 00018		
					SWMU 00020		
					SWMU 00022		
					SWMU 00023		
					SWMU 00024		
					SWMU 00026		
					SWMU 00030		
					SWMU 00033		
					SWMU 00037		
					SWMU 00040		
					SWMU 00044		
					SWMU 00046		

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					SWMU 00050		
					SWMU 00051		
					SWMU 00052		
					SWMU 00053		
					SWMU 00054		
					UST 000001		
					UST 000002		
					UST 000003		
					UST 000004		
					UST 00350A		
					UST 00350B		
					WELL 000001		
					WELL 000002		
					WELL 000003		
					WELL 000004		
					WELL 000005		
					WELL 000006		
					WELL 000007		
					WELL 000008		
					WELL 000009		
					WELL 000010		
					WELL 000011		
					WELL 000014		
					WELL 0178-5		
					WELL FTW-1		
					WELL FTW-2		
					WELL FTW-3		
					WELL FTW-4		
					WELL FTW-5		
					WELL IA17		
					WELL RDW-1		
					WELL RDW-2		
					WELL RDW-3		
					WELL RDW-4		
					WELL RDW-5		

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					WELL RDW-6 WELL RDW-7 WELL TLW-1 WELL TLW-2 WELL TLW-3 WELL TLW-4 WELL TLW-5 WELL TLW-6 WELL TLW-7 WELL UC-01 WELL UC-02 WELL UC-03 WELL UC-04 WELL UC-05 WELL WHW-1 WELL WHW-2 WELL WHW-3 WELL WHW-4		
N60036 / 000462 BRAC SER BPMOW.SK/0871 CORRESPONDENC NONE 3	06-25-2008 **09-27-2007** NONE	BRAC PMO WEST NEWTON, D. U.S. EPA - SAN FRANCISCO, CA RAMSEY, P.	TRANSMITTAL OF REPLACEMENT PAGES CONVERTING DRAFT DATED 10 JULY 2007 TO FINAL TECHNICAL MEMORANDUM RESULTS OF AIR SPARGING AND SOIL VAPOR EXTRACTION PILOT TEST AT SOLID WASTE MANAGEMENT UNITS (W/ OUT ENCLOSURE) [SEE COMMENTS.]	ADMIN RECORD BASE INFO REPOSITORY	SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_006	181-09-0009 BOX 0020 30099762 SAN

UIC No. / Rec. No. Doc. Control No. Record Type Contr./Guid. No. Approx. # Pages	Prc. Date Record Date CTO No. EPA Cat. #	Author Affil. Author Recipient Affil. Recipient	Subject	Classification	Sites	Location SWDIV Box No(s) CD No.	FRC Accession No. FRC Warehouse FRC Box No(s)
N60036 / 001500 TTEM.0055.FZN2.0002 & TTEM.0055.FZN2.0002.R1 REPORT N62467-04-D-0055 249	09-24-2007 **10-05-2007** FZN2	TETRA TECH EM INC. SWANSON, G. BRAC PMO WEST	FINAL TECHNICAL MEMORANDUM RESULTS OF AIR SPARGING AND SOIL VAPOR EXTRACTION PILOT TEST AT SOLID WASTE MANAGEMENT UNITS (SWMU) [INCLUDES REPLACEMENT PAGES CONVERTING DRAFT DATED 10 JULY 2007 TO FINAL] {CD COPY ENCLOSED} (SEE COMMENTS.)	ADMIN RECORD BASE INFO REPOSITORY	BLDG IA-12 BLDG IA-17 BLDG IA-6 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018 WELL 000002 WELL 000003 WELL 000006 WELL 000007 WELL 000008 WELL 000009 WELL 000010 WELL 000011 WELL 000012 WELL 000014 WELL 000015	FRC - PERRIS IMAGED CONC_006	181-09-0009 BOX 0043 30099762 SAN
N60036 / 001597 BRAC SER BPMOW.DN/0021 & SULT-5104-0147-0086 CORRESPONDENC NONE 18	03-06-2008 **10-09-2007** NONE	BRAC PMO WEST NEWTON, D. U.S. EPA - SAN FRANCISCO, CA RAMSEY, P.	TRANSMITTAL OF FINAL INLAND AREA AMENDED SITE MANAGEMENT PLAN FISCAL YEAR 2008 UPDATE DATED 09 OCTOBER 2007 (W/ENCLOSURE) [CD COPY ENCLOSED] {PORTION OF MAILING LIST IS SENSITIVE} [SEE COMMENTS]	ADMIN RECORD BASE INFO REPOSITORY SENSITIVE	SITE 00013 SITE 00022 SITE 00022A SITE 00027 SITE 00029 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_013	181-09-0009 BOX 0046 30099762 SAN

UIC No. / Rec. No. Doc. Control No. Record Type Contr./Guid. No. Approx. # Pages	Prc. Date Record Date CTO No. EPA Cat. #	Author Affil. Author Recipient Affil. Recipient	Subject	Classification	Sites	Location SWDIV Box No(s) CD No.	FRC Accession No. FRC Warehouse FRC Box No(s)
N60036 / 001641 SULT.5104.0111.0011 MINUTES N68711-03-D-5104 42	05-15-2008 **11-07-2007** 00111	SULTECH RAB MEMBERS	07 NOVEMBER 2007 FINAL RESTORATION ADVISORY BOARD MEETING MINUTES, INLAND AREA {INCLUDES LIST OF ATTENDEES, FINAL AGENDA, AND VARIOUS HANDOUTS) (CD COPY ENCLOSED) {PORTION OF ATTENDEES' LIST IS SENSITIVE}	ADMIN RECORD BASE INFO REPOSITORY	BLDG IA-20 BLDG IA-25 BLDG IA-36 SITE 00022 SITE 00027 SITE 00029 SITE 0022A SITE 0023A SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_013	181-09-0009 30099762 SAN BOX 0049
N60036 / 001642 SULT.5104.0147.0008 MINUTES N68711-03-D-5104 21	05-15-2008 **11-07-2007** 00147	SULTECH NAVFAC - SOUTHWEST	07 NOVEMBER 2007 FINAL MEETING MINUTES, INLAND AREA REMEDIAL PROJECT MANAGER (RPM) {INCLUDES LIST OF ATTENDEES, FINAL AGENDA, AND VARIOUS HANDOUTS) (CD COPY ENCLOSED)	ADMIN RECORD BASE INFO REPOSITORY	BLDG IA-1 SITE 00022 SITE 00027 SITE 00029 SITE 0022A SITE 0023A SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_013	181-09-0009 30099762 SAN BOX 0049
N60036 / 001634 TTEM.0055.FZN3.0055 MINUTES N62467-04-D-0055 37	05-05-2008 **02-06-2008** FZN3	TETRA TECH EM INC. NAVFAC - SOUTHWEST	06 FEBRUARY 2008 FINAL RESTORATION ADVISORY BOARD (RAB) MEETING MINUTES, INLAND AREA ENVIRONMENTAL RESTORATION PROGRAM (CD COPY ENCLOSED) {INCLUDES LIST OF ATTENDEES, FINAL AGENDA, AND VARIOUS HANDOUTS)	ADMIN RECORD BASE INFO REPOSITORY	SITE 00022 SITE 00027 SITE 0022A SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_013	181-09-0009 30099762 SAN BOX 0049

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N60036 / 001629 BRAC SER BPMOW.SK/0264 CORRESPONDENC NONE 3	05-02-2008 **02-19-2008** NONE	BRAC PMO WEST NEWTON, D. U.S. EPA - SAN FRANCISCO, CA RAMSEY, P.	TRANSMITTAL OF THE REVISED DRAFT FINAL FEASIBILITY STUDY REPORT (W/OUT ENCLOSURE) [SEE AR # 1630 - FINAL FEASIBILITY STUDY] {REVISED DRAFT FINAL FEASIBILITY STUDY DATED 19 FEBRUARY 2008 WAS CONVERTED TO FINAL}	ADMIN RECORD BASE INFO REPOSITORY	SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_010	181-09-0009 BOX 0048 30099762 SAN
N60036 / 001630 TTEM.0055.FZN2.0005.R1 REPORT N62467-04-D-0055 269	05-02-2008 **03-20-2008** FZN2	TETRA TECH EM INC. SWANSON, G. BRAC PMO WEST	FINAL FEASIBILITY STUDY REPORT FOR SOLID WASTE MANAGEMENT UNITS (SWMU) (CD COPY ENCLOSED) {INCLUDES REPLACEMENT PAGES CONVERTING THE DRAFT DATED 18 FEBRUARY 2008 TO FINAL AND ANALYTICAL DATA} [***SEE COMMENTS]	ADMIN RECORD BASE INFO REPOSITORY	SWMU 00001 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00016 SWMU 00018	FRC - PERRIS IMAGED CONC_010	181-09-0009 BOX 0048 30099762 SAN BOX 0049
N60036 / 001631 BRAC SER BPMOW.SK\0347 CORRESPONDENC NONE 3	05-02-2008 **03-20-2008** NONE	BRAC PMO WEST NEWTON, D. U.S. EPA - SAN FRANCISCO, CA RAMSEY, P.	TRANSMITTAL OF REPLACEMENT PAGES CONVERTING THE REVISED DRAFT FINAL DATED 19 FEBRUARY 2008 TO THE FINAL FEASIBILITY STUDY REPORT FOR SOLID WASTE MANAGEMENT UNITES (SWMU) (W/OUT ENCLOSURE) [SEE AR # 1630 - FINAL FEASIBILITY STUDY REPORT]	ADMIN RECORD BASE INFO REPOSITORY	SWMU 00001 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00016 SWMU 00018	FRC - PERRIS IMAGED CONC_010	181-09-0009 BOX 0049 30099762 SAN

UIC No. / Rec. No. Doc. Control No. Record Type Contr./Guid. No. Approx. # Pages	Prc. Date Record Date CTO No. EPA Cat. #	Author Affil. Author Recipient Affil. Recipient	Subject	Classification	Sites	Location SWDIV Box No(s) CD No.	FRC Accession No. FRC Warehouse FRC Box No(s)
N60036 / 001651 SULT.5104.0147.0014 MINUTES N68711-03-D-5104 18	07-16-2008 **04-02-2008** 00147	SULTECH NAVFAC - SOUTHWEST	02 APRIL 2008 FINAL MEETING MINUTES, INLAND AREA REMEDIAL PROJECT MANAGERS (RPM) MEETING (INCLUDES LIST OF ATTENDEES, AGENDA, AND VARIOUS HANDOUTS) [CD COPY ENCLOSED]	ADMIN RECORD BASE INFO REPOSITORY	BLDG 00081 BLDG 00087 BLDG 00093 BLDG 00097 BLDG 00263 BLDG IA-1 BLDG IA-100 BLDG IA-25 BLDG IA-27 SITE 00013 SITE 00022 SITE 00027 SITE 00029 SITE 0022A SITE 0023A SITE 0024A SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_014	181-09-0009 BOX 0049 30099762 SAN
N60036 / 001652 TTEM.0055.FZN3.0057 MINUTES N62467-04-D-0055 25	07-16-2008 **04-02-2008** FZN3	TETRA TECH EM INC. RAB MEMBERS	02 APRIL 2008 FINAL MEETING MINUTES, RESTORATION ADVISORY BOARD (RAB), INLAND AREA ENVIRONMENTAL RESTORATION PROGRAM (INCLUDES LIST OF ATTENDEES, AGENDA, RPM UPDATE, AND VARIOUS HANDOUTS) [CD COPY ENCLOSED]	ADMIN RECORD BASE INFO REPOSITORY SENSITIVE	BLDG IA-20 BLDG IA-25 SITE 00022 SITE 00027 SITE 00029 SITE 0023A SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_014	181-09-0009 BOX 0049 30099762 SAN

UIC No. / Rec. No. Doc. Control No. Record Type Contr./Guid. No. Approx. # Pages	Prc. Date Record Date CTO No. EPA Cat. #	Author Affil. Author Recipient Affil. Recipient	Subject	Classification	Sites	Location SWDIV Box No(s) CD No.	FRC Accession No. FRC Warehouse FRC Box No(s)
N60036 / 001857 NONE CORRESPONDENC NONE 2	02-05-2009 **04-29-2008** NONE	U.S. EPA - SAN FRANCISCO, CA RAMSEY, P. BRAC PMO WEST KOSOWSKI, S.	REVIEW AND ACCEPTANCE OF THE REVISED DRAFT FINAL FEASIBILITY STUDY REPORT FOR SOLID WASTE MANAGEMENT UNITS (SWMU)	ADMIN RECORD BASE INFO REPOSITORY	BLDG IA-12 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	NAVFAC SOUTHWEST - BLDG. 1	
N60036 / 001821 SULT.5104.0147.006 1 MINUTES N68711-03-D-5104 19	08-22-2008 **06-04-2008** 00147	SULTECH NAVFAC - SOUTHWEST	04 JUNE 2008 FINAL MEETING MINUTES, INLAND AREA REMEDIAL PROJECT MANAGER (RPM) MEETING (INCLUDES LIST OF ATTENDEES, 04 JUNE 2008 FINAL AGENDA, AND VARIOUS HANDOUTS) [CD COPY ENCLOSED]	ADMIN RECORD BASE INFO REPOSITORY	BLDG IA-100 SITE 00013 SITE 00022 SITE 00027 SITE 00029 SITE 0022A SITE 0023A SITE 0024A SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_015	181-09-0009 BOX 0053 30099762 SAN
N60036 / 000107 BRAC SER BPMOW.DN/0507 CORRESPONDENC NONE 2	10-29-2008 **06-15-2008** NONE	BRAC PMO WEST NEWTON, D. U.S. EPA - SAN FRANCISCO, CA RAMSEY, P.	TRANSMITTAL OF THE INTERNAL WORKING DRAFT AMENDMENT TO THE SITE MANAGEMENT PLAN (SMP) SCHEDULE, INLAND AREA SITES (W/OUT ENCLOSURE)	ADMIN RECORD BASE INFO REPOSITORY	INLAND AREA SITE 00027 SITE 00029 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	NAVFAC SOUTHWEST - BLDG. 1	
N60036 / 000132 SULT.5104.0147.008 6 REPORT N68711-03-D-5104 10	10-29-2008 **06-15-2008** 00147	SULTECH BRAC PMO WEST	INTERNAL WORKING DRAFT AMENDMENT TO THE SITE MANAGEMENT PLAN (SMP) SCHEDULE, INLAND AREA SITES (CD COPY ENCLOSED)	SITE FILE	SITE 00013 SITE 00022 SITE 00027 SITE 00029 SITE 0022A SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	NAVFAC SOUTHWEST - BLDG. 1	

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N60036 / 001286 BRAC SER BPMOW.SK/0551 CORRESPONDENC NONE 3	07-08-2008 **07-03-2008** NONE	BRAC PMO WEST NEWTON, D. U.S. EPA - SAN FRANCISCO, CA RAMSEY, P.	TRANSMITTAL OF THE DRAFT PROPOSED PLAN, INLAND AREA (W/OUT ENCLOSURE) [SEE AR # 1353 - DRAFT PROPOSED PLAN, INLAND AREA]	ADMIN RECORD BASE INFO REPOSITORY	SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_014	181-09-0009 BOX 0037 30099762 SAN
N60036 / 001353 CHAD.3213.0033.00(2 REPORT N62473-07-D-3213 23	07-08-2008 **07-03-2008** 00033	CHADUXTT BRAC PMO WEST	DRAFT PROPOSED PLAN, INLAND AREA (CD COPY ENCLOSED) [SEE AR # 1286 - BRAC PMO WEST TRANSMITTAL LETTER]	ADMIN RECORD BASE INFO REPOSITORY	BLDG 00269 BLDG IA-12 BLDG IA-15 BLDG IA-16 BLDG IA-51 BLDG IA-7 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	FRC - PERRIS IMAGED CONC_014	181-09-0009 BOX 0039 30099762 SAN
N60036 / 001859 NONE CORRESPONDENC NONE 3	02-05-2009 **07-15-2008** NONE	U.S. EPA - SAN FRANCISCO, CA RAMSEY, P. BRAC PMO WEST NEWTON, D.	REVIEW AND COMMENTS ON THE INTERNAL WORKING DRAFT AMENDMENT TO THE SITE MANAGEMENT PLAN (SMP) SCHEDULE, INLAND AREA SITES	ADMIN RECORD BASE INFO REPOSITORY	SITE 00013 SITE 00027 SITE 00029 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	NAVFAC SOUTHWEST - BLDG. 1	
N60036 / 000436 BRAC SER BPMOW.SK/0821 CORRESPONDENC NONE 2	11-04-2008 **09-08-2008** NONE	BRAC PMO WEST NEWTON, D. U.S. EPA - SAN FRANCISCO, CA RAMSEY, P.	TRANSMITTAL OF THE DRAFT FINAL PROPOSED PLAN (PP) FOR SWMU SITES, INLAND AREA (W/OUT ENCLOSURE)	ADMIN RECORD BASE INFO REPOSITORY	SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	NAVFAC SOUTHWEST - BLDG. 1	

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N60036 / 000175 SULT.5104.0147.008 5 REPORT N68711-03-D-5104 10	10-29-2008 **09-15-2008** 00147	SULTECH BRAC PMO WEST	FINAL AMENDMENT TO THE SITE MANAGEMENT PLAN (SMP) SCHEDULE, INLAND AREA SITES (CD COPY ENCLOSED)	ADMIN RECORD BASE INFO REPOSITORY	SITE 00013 SITE 00022 SITE 00027 SITE 00029 SITE 0022A SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	NAVFAC SOUTHWEST - BLDG. 1	
N60036 / 000106 CHAD.3213.0033.00 2 REPORT N62473-07-D-3213 19	10-23-2008 **10-01-2008** 00033	CHADUXTT JV BRAC PMO WEST	FINAL PROPOSED PLAN (PP), INLAND AREA (INCLUDES FACT SHEET) [CD COPY ENCLOSED]	ADMIN RECORD BASE INFO REPOSITORY	BLDG 269 BLDG IA-12 BLDG IA-15 BLDG IA-16 BLDG IA-51 BLDG IA-7 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018 UST IA-12	NAVFAC SOUTHWEST - BLDG. 1	
N60036 / 000448 CHAD-3213-0033- 0006 REPORT N62473-07-D-3213 20	11-04-2008 **10-01-2008** CTO 0033	CHADUXTT JV BRAC PMO WEST	DRAFT FINAL PROPOSED PLAN (PP), INLAND AREA (INCLUDES FACT SHEET) [CD COPY ENCLOSED]	BASE SITE FILE	BLDG 00269 BLDG IA-12 BLDG IA-15 BLDG IA-16 BLDG IA-51 BLDG IA-7 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	NAVFAC SOUTHWEST - BLDG. 1	

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N60036 / 001916 TTEM-0055-FZN3-0063 MINUTES N62467-04-D-0055 31	07-08-2009 **10-01-2008** CTO FZN3	TETRA TECH EM, INC. RAB MEMBERS	01 OCTOBER 2008 FINAL MEETING MINUTES RESTORATION ADVISORY BOARD (RAB) INLAND AREA ENVIRONMENTAL RESTORATION PROGRAM (INCLUDES LIST OF ATTENDEES, AGENDA, VARIOUS HANDOUTS, AND CD COPY) [PORTION OF THE LIST OF ATTENDEES LIST IS SENSITIVE]	ADMIN RECORD BASE INFO REPOSITORY SENSITIVE	BLDG IA-20 BLDG IA-27 BLDG IA-36 SITE 00022A SITE 00023A SITE 00024A SITE 00027 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	NAVFAC SOUTHWEST - BLDG. 1	
N60036 / 001923 SULT-5104-0147-0020 MINUTES N68711-03-D-5104 19	07-08-2009 **10-01-2008** CTO 0147	SULTECH BRAC PMO WEST	01 OCTOBER 2008 FINAL MEETING MINUTES INLAND AREA REMEDIAL PROJECT MANAGER (RPM) MEETING (INCLUDES LIST OF ATTENDEES, AGENDA, VARIOUS HANDOUTS, AND CD COPY)	ADMIN RECORD BASE INFO REPOSITORY	SITE 00022A SITE 00024 SITE 00027 SITE 00029 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	NAVFAC SOUTHWEST - BLDG. 1	
N60036 / 000077 BRAC SER BPMOW.SK/0881 CORRESPONDENC NONE 2	10-23-2008 **10-02-2008** NONE	BRAC PMO WEST NEWTON, D. U.S. EPA - SAN FRANCISCO, CA RAMSEY, P.	TRANSMITTAL OF THE FINAL PROPOSED PLAN (PP), INLAND AREA (W/OUT ENCLOSURE) [SEE RECORD # 106 - FINAL PP]	ADMIN RECORD BASE INFO REPOSITORY	INLAND AREA SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	NAVFAC SOUTHWEST - BLDG. 1	
N60036 / 001881 NONE CORRESPONDENC NONE 1	02-06-2009 **11-02-2008** NONE	COUNTY OF CONTRA COSTA OFFICE OF THE SHERIFF RUPF, W. BRAC PMO WEST NEWTON, D.	LETTER IN RESPONSE TO THE 22 OCTOBER 2008 PRESENTATION ON THE PROPOSED PLAN FOR REMEDIATION OF CHLORINATES SOLVENT IN THE GROUNDWATER AND SOIL GAS	ADMIN RECORD BASE INFO REPOSITORY	BLDG IA-7 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	NAVFAC SOUTHWEST - BLDG. 1	

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N60036 / 001880 NONE CORRESPONDENC NONE 2	02-06-2009 **11-03-2008** NONE	CONTRA COSTA COUNTY FIRE PROTECTION DISTRICT - PLEASANT HILL, CA GRACE, R. BRAC PMO WEST NEWTON, D.	REVIEW AND COMMENTS ON THE FINAL PROPOSED PLAN (PP), INLAND AREA	ADMIN RECORD BASE INFO REPOSITORY	BLDG IA-7 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	NAVFAC SOUTHWEST - BLDG. 1	
N60036 / 001924 SULT-5104-0147-0022 MINUTES N68711-03-D-5104 22	07-08-2009 **12-02-2008** CTO 0147	SULTECH BRAC PMO WEST	02 DECEMBER 2008 FINAL MEETING MINUTES INLAND AREA REMEDIAL PROJECT MANAGER (RPM) MEETING (INCLUDES LIST OF ATTENDEES, AGENDA, VARIOUS HANDOUTS, AND CD COPY)	ADMIN RECORD BASE INFO REPOSITORY	SITE 00022 SITE 00022A SITE 00023A SITE 00024A SITE 00027 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	NAVFAC SOUTHWEST - BLDG. 1	
N60036 / 001917 TTEM-0055-FZN3-0064 MINUTES N62467-04-D-0055 33	07-08-2009 **02-04-2009** CTO FZN3	TETRA TECH EM, INC. RAB MEMBERS	04 FEBRUARY 2009 FINAL MEETING MINUTES RESTORATION ADVISORY BOARD (RAB) INLAND AREA ENVIRONMENTAL RESTORATION PROGRAM (INCLUDES LIST OF ATTENDEES, AGENDA, VARIOUS HANDOUTS, AND CD COPY)	ADMIN RECORD BASE INFO REPOSITORY SENSITIVE	SITE 00013 SITE 00022 SITE 00022A SITE 00023A SITE 00027 SITE 00029 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	NAVFAC SOUTHWEST - BLDG. 1	

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N60036 / 001918 TTEM-0055-FZN3-0065 MINUTES N62467-04-D-0055 19	07-08-2009 **02-04-2009** CTO FZN3	TETRA TECH EM, INC. BRAC PMO WEST	04 FEBRUARY 2009 FINAL MEETING MINUTES INLAND AREA REMEDIAL PROJECT MANAGER (RPM) MEETING (INCLUDES LIST OF ATTENDEES, AGENDA, VARIOUS HANDOUTS, AND CD COPY)	ADMIN RECORD BASE INFO REPOSITORY	BLDG 00081 BLDG 00087 BLDG 00093 BLDG 00097 SITE 00022 SITE 00022A SITE 00023A SITE 00024A SITE 00027 SITE 00029 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	NAVFAC SOUTHWEST - BLDG. 1	
N60036 / 001903 BRAC SER BPMOW.DAS/0164 CORRESPONDENC NONE 2	05-11-2009 **03-27-2009** NONE	BRAC PMO WEST HILL, J. U.S. EPA - SAN FRANCISCO, CA RAMSEY, P.	TRANSMITTAL OF THE DRAFT RECORD OF DECISION (ROD) FOR SOLID WASTE MANAGEMENT UNITS (SWMU) [W/OUT ENCLOSURE]	ADMIN RECORD BASE INFO REPOSITORY	SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	NAVFAC SOUTHWEST - BLDG. 1	
N60036 / 001904 CHAD-3213-0033-0014 REPORT N62473-07-D-3213 150	05-11-2009 **03-27-2009** CTO 0033	CHADUXTT BRAC PMO WEST	DRAFT RECORD OF DECISION (ROD) FOR SOLID WASTE MANAGEMENT UNITS (SWMU) [CD COPY ENCLOSED] {CONTAINS SENSITIVE MAPS}	ADMIN RECORD BASE INFO REPOSITORY SENSITIVE	SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	NAVFAC SOUTHWEST - BLDG. 1	

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N60036 / 001919 TTEM-0055-FZN3-0067 MINUTES N62467-04-D-0055 19	07-08-2009 **04-01-2009** CTO FZN3	TETRA TECH EM, INC. BRAC PMO WEST	01 APRIL 2009 FINAL MEETING MINUTES INLAND AREA REMEDIAL PROJECT MANAGER (RPM) MEETING (INCLUDES LIST OF ATTENDEES, AGENDA, VARIOUS HANDOUTS, AND CD COPY)	ADMIN RECORD BASE INFO REPOSITORY	BLDG 00081 BLDG 00087 BLDG 00093 BLDG 00097 SITE 00022 SITE 00022A SITE 00024A SITE 00027 SITE 00029 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	NAVFAC SOUTHWEST - BLDG. 1	
N60036 / 001920 TTEM-0055-FZN3-0088 MINUTES N62467-04-D-0055 66	07-08-2009 **04-01-2009** CTO FZN3	TETRA TECH EM, INC. RAB MEMBERS	01 APRIL 2009 FINAL MEETING MINUTES RESTORATION ADVISORY BOARD (RAB) INLAND AREA ENVIRONMENTAL RESTORATION PROGRAM (INCLUDES LIST OF ATTENDEES, AGENDA, VARIOUS HANDOUTS, AND CD COPY) [PORTION OF THE LIST OF ATTENDEES LIST IS SENSITIVE]	ADMIN RECORD BASE INFO REPOSITORY SENSITIVE	SITE 00013 SITE 00022 SITE 00022A SITE 00029 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	NAVFAC SOUTHWEST - BLDG. 1	
N60036 / 001942 NONE CORRESPONDENC NONE 1	07-31-2009 **04-16-2009** NONE	U.S. EPA - SAN FRANCISCO, CA RAMSEY, P. NAVFAC - SOUTHWEST PERRY, C.	REQUEST FOR ELECTRONIC VERSION OF PROPOSED PLAN FOR SWMU'S	ADMIN RECORD BASE INFO REPOSITORY	SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	NAVFAC SOUTHWEST - BLDG. 1	
N60036 / 001943 NONE CORRESPONDENC NONE 1	07-31-2009 **04-16-2009** NONE	TETRA TECH EM, INC. HENRY, K. U.S. EPA - SAN FRANCISCO, CA RAMSEY, P.	RESPONSE TO REQUEST FOR ELECTRONIC VERSION OF PROPOSED PLAN FOR SWMU'S	ADMIN RECORD BASE INFO REPOSITORY	SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	NAVFAC SOUTHWEST - BLDG. 1	

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N60036 / 001944 NONE CORRESPONDENC NONE 1	07-31-2009 **04-16-2009** NONE	U.S. EPA - SAN FRANCISCO, CA RAMSEY, P. TETRA TECH EM, INC. HENRY, K.	ACKNOWLEDGEMENT OF RECEIPT OF ELECTRONIC VERSION OF PROPOSED PLAN FOR SWMU'S	ADMIN RECORD BASE INFO REPOSITORY	SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	NAVFAC SOUTHWEST - BLDG. 1	
N60036 / 001945 NONE CORRESPONDENC NONE 1	07-31-2009 **05-28-2009** NONE	U.S. EPA - SAN FRANCISCO, CA RAMSEY, P. BRAC PMO WEST SILVEIRA, D.	REQUEST FOR EXTENSION TO COMPLETE REVIEW OF DRAFT RECORD OF DECISION (ROD) FOR SOLID WASTE MANAGEMENT UNITS	ADMIN RECORD BASE INFO REPOSITORY	SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	NAVFAC SOUTHWEST - BLDG. 1	
N60036 / 001946 NONE CORRESPONDENC NONE 1	07-31-2009 **05-29-2009** NONE	CRWQCB - OAKLAND, CA FRIEDMAN, A. BRAC PMO WEST SILVEIRA, D.	REVIEW OF AND CONCURRENCE WITH THE DRAFT RECORD OF DECISION (ROD) FOR SOLID WASTE MANAGEMENT UNITS (SWMU)	ADMIN RECORD BASE INFO REPOSITORY	SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	NAVFAC SOUTHWEST - BLDG. 1	
N60036 / 001956 TTEM-0055-FZN3-0090 MINUTES N62467-04-D-0055 52	09-08-2009 **06-03-2009** CTO FZN3	TETRA TECH EM, INC. RAB MEMBERS	03 JUNE 2009 FINAL RESTORATION ADVISORY BOARD (RAB) MEETING MINUTES, INLAND AREA ENVIRONMENTAL RESTORATION PROGRAM (INCLUDES LIST OF ATTENDEES, AGENDA, VARIOUS HANDOUTS, AND CD COPY) [PORTION OF THE LIST OF ATTENDEES IS SENSITIVE]	ADMIN RECORD BASE INFO REPOSITORY SENSITIVE	SITE 00022 SITE 00027 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	NAVFAC SOUTHWEST - BLDG. 1	
N60036 / 001957 TTEM-0055-FZN3-0092 MINUTES N62467-04-D-0055 23	09-08-2009 **06-03-2009** CTO FZN3	TETRA TECH EM, INC. BRAC PMO WEST	03 JUNE 2009 FINAL INLAND AREA REMEDIAL PROJECT MANAGER (RPM) MEETING MINUTES (INCLUDES LIST OF ATTENDEES, AGENDA, VARIOUS HANDOUTS, AND CD COPY)	ADMIN RECORD BASE INFO REPOSITORY	BLDG 00087 BLDG 00097 BLDG IA-1 SITE 00023A SITE 00027 SITE 00029 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	NAVFAC SOUTHWEST - BLDG. 1	

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N60036 / 001910 NONE CORRESPONDENC NONE 1	06-17-2009 **06-11-2009** NONE	U.S. EPA - SAN FRANCISCO, CA RAMSEY, P. BRAC PMO WEST SILVEIRA, D.	REQUEST FOR SECOND EXTENSION TO COMPLETE REVIEW OF DRAFT RECORD OF DECISION (ROD) FOR SOLID WASTE MANAGEMENT UNITS [CD COPY ENCLOSED]	ADMIN RECORD BASE INFO REPOSITORY	SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	NAVFAC SOUTHWEST - BLDG. 1	
N60036 / 001921 BRAC SER BPMOW.LKB/0367 CORRESPONDENC NONE 2	07-08-2009 **06-15-2009** NONE	BRAC PMO WEST HILL, J. U.S. EPA - SAN FRANCISCO, CA RAMSEY, P.	TRANSMITTAL OF THE DRAFT AMENDMENT TO THE SITE MANAGEMENT PLAN (SMP) SCHEDULE - INLAND AREA SITES (W/OUT ENCLOSURE)	ADMIN RECORD BASE INFO REPOSITORY	SITE 00022A SITE 00027 SITE 00029 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	NAVFAC SOUTHWEST - BLDG. 1	
N60036 / 001922 TTEM-0055-FZN3-0084 REPORT N62467-04-D-0055 15	07-08-2009 **06-15-2009** CTO FZN3	TETRA TECH EM, INC. BRAC PMO WEST	DRAFT AMENDMENT TO THE SITE MANAGEMENT PLAN (SMP) SCHEDULE - INLAND AREA SITES (CD COPY ENCLOSED)	ADMIN RECORD BASE INFO REPOSITORY	SITE 00013 SITE 00022 SITE 00022A SITE 00027 SITE 00029 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	NAVFAC SOUTHWEST - BLDG. 1	
N60036 / 001911 NONE CORRESPONDENC NONE 1	06-17-2009 **06-16-2009** NONE	U.S. EPA - SAN FRANCISCO, CA RAMSEY, P. BRAC PMO WEST HILL, J.	RESPONSE TO APPROVAL OF REQUEST FOR SECOND EXTENSION TO COMPLETE REVIEW OF DRAFT RECORD OF DECISION (ROD) FOR SOLID WASTE MANAGEMENT UNITS [CD COPY ENCLOSED]	ADMIN RECORD BASE INFO REPOSITORY	SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	NAVFAC SOUTHWEST - BLDG. 1	
N60036 / 001947 NONE CORRESPONDENC NONE 1	07-31-2009 **06-16-2009** NONE	BRAC PMO WEST HILL, J. U.S. EPA - SAN FRANCISCO, CA RAMSEY, P.	APPROVAL OF REQUEST FOR SECOND EXTENSION TO COMPLETE REVIEW OF DRAFT RECORD OF DECISION (ROD) FOR SOLID WASTE MANAGEMENT UNITS (SWMU)	ADMIN RECORD BASE INFO REPOSITORY	SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	NAVFAC SOUTHWEST - BLDG. 1	

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N60036 / 001948 NONE CORRESPONDENC NONE 2	07-31-2009 **07-13-2009** NONE	U.S. EPA - SAN FRANCISCO, CA RAMSEY, P. BRAC PMO WEST HILL, J.	REQUEST FOR THIRD EXTENSION TO COMPLETE REVIEW OF DRAFT RECORD OF DECISION (ROD) FOR SOLID WASTE MANAGEMENT UNITS	ADMIN RECORD BASE INFO REPOSITORY	SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	NAVFAC SOUTHWEST - BLDG. 1	
N60036 / 001949 NONE CORRESPONDENC NONE 2	07-31-2009 **07-13-2009** NONE	BRAC PMO WEST STEWART, K. U.S. EPA - SAN FRANCISCO, CA RAMSEY, P.	APPROVAL OF REQUEST FOR THIRD EXTENSION TO COMPLETE REVIEW OF DRAFT RECORD OF DECISION (ROD) FOR SOLID WASTE MANAGEMENT UNITS	ADMIN RECORD BASE INFO REPOSITORY	SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	NAVFAC SOUTHWEST - BLDG. 1	
N60036 / 001926 NONE CORRESPONDENC NONE 1	07-28-2009 **07-27-2009** NONE	U.S. EPA - SAN FRANCISCO, CA RAMSEY, P. BRAC PMO WEST STEWART, K.	REQUEST FOR FOURTH EXTENSION TO COMPLETE REVIEW OF DRAFT RECORD OF DECISION (ROD) FOR SOLID WASTE MANAGEMENT UNITS (SWMU)	ADMIN RECORD BASE INFO REPOSITORY	SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	NAVFAC SOUTHWEST - BLDG. 1	
N60036 / 001927 NONE CORRESPONDENC NONE 2	07-28-2009 **07-27-2009** NONE	BRAC PMO WEST STEWART, K. U.S. EPA - SAN FRANCISCO, CA RAMSEY, P.	APPROVAL OF REQUEST FOR FOURTH EXTENSION TO COMPLETE REVIEW OF DRAFT RECORD OF DECISION (ROD) FOR SOLID WASTE MANAGEMENT UNITS (SWMU)	ADMIN RECORD BASE INFO REPOSITORY	SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	NAVFAC SOUTHWEST - BLDG. 1	
N60036 / 001955 BRAC SER BPMOW.CLP/0566 CORRESPONDENC NONE 17	09-08-2009 **08-14-2009** NONE	BRAC PMO WEST STEWART, K. U.S. EPA - SAN FRANCISCO, CA RAMSEY, P.	TRANSMITTAL OF THE DRAFT FINAL INLAND AREA AMENDED SITE MANAGEMENT PLAN (SMP) FISCAL YEAR 2010 UPDATE (W/ENCLOSURE)	ADMIN RECORD BASE INFO REPOSITORY	SITE 00013 SITE 00022 SITE 00027 SITE 00029 SWMU 00002 SWMU 00005 SWMU 00007 SWMU 00018	NAVFAC SOUTHWEST - BLDG. 1	

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Total Estimated Record Page Count: 15,379

Total - Administrative Records: 164

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No Keywords
Sites=SWMU 00001;SWMU 00002;SWMU 00005;SWMU 00007;SWMU 00016;SWMU 00018
No Classification