Comprehensive Long-Term Environmental Action Navy (CLEAN) II
Contract No. N62742-94-D-0048
Contract Task Order No. 0068

Progress Report – June 1999

Vadose Zone Remediation Volatile Organic Compound Source Area Installation Restoration Program Site 24

Marine Corp Air Station, El Toro

Prepared for

Department of the Navy
Commander, Pacific Division
Naval Facilities Engineering Command
San Diego, California 92132-5190

Prepared by

Earth Tech, Inc.
700 Bishop Street, Suite 900
Honolulu, Hawaii 96813

June 1999

FIGURES

TABLES

PAGE NO. ii

THIS PAGE IS INTENTIONALLY LEFT BLANK

ACRONYMS AND ABBREVIATIONS

µg/L	microgram per liter
°F	degrees Fahrenheit
CLEAN	Comprehensive Long-Term Environmental Action Navy
CTO	contract task officer
DON	Department of the Navy
EDR	engineering design report
EPA	Environmental Protection Agency
EROI	effective radius of influence
IRP	installation restoration program
MCAS	Marine Corp Air Station
MCL	maximum contaminant level
OU	operable unit
PACNAVFACENGCOM	Pacific Division, Naval Facilities Engineering Command
PID	photoionization detector
PVC	polyvinyl chloride
ROD	Record of decision
SAP	sampling and analysis plan
scfm	standard cubic feet per minute
SEOR	System Evaluation and Optimization Report
SVE	soil vapor extraction
VOC	volatile organic compound

1. INTRODUCTION

This Progress Report presents results of activities conducted as part of the remediation of the Vadose Zone at the volatile organic compound (VOC) Source Area at installation restoration program (IRP) Site 24 - Marine Corp Air Station (MCAS), El Toro. The progress report describes activities and results for the period from late April to the end of May 1999. Remediation activities described herein are being implemented in accordance with the *Draft Final Interim Record of Decision (ROD) for Operable Unit (OU) 2A- Site 24 VOC Source Area, Vadose Zone* (BNI 1997) and as described in the *Draft Final Engineering Design Report (EDR) Vadose Zone Remediation at Site 24* (BNI, 1998) and *the Draft System Evaluation and Optimization Report (SEOR), IRP Site 24 Vadose Zone Remediation* (Earth Tech 1999A).

This Progress Report was prepared by Earth Tech Inc. on behalf of the United States Department of the Navy's (DON), Southwest Division, Naval Facilities Engineering Command as authorized by the U.S. Navy, Pacific Division, Naval Facilities Engineering Command (PACNAVFACENGCOM) under contract task order (CTO) no. 0068 of the Comprehensive Long-Term Environmental Action Navy (CLEAN) II program, contract number N62742-94-D-0048

1.1 PROJECT OBJECTIVES

The objective of this remedial action is to reduce concentrations of VOCs in the vadose zone to levels that will not cause VOC concentrations in groundwater to exceed the maximum contaminant level (MCL). Phase I of the remedial action was initiated with the startup of the Central SVE System, the installation of additional SVE wells, and the continued use of portable SVE systems to remediate areas that are not contiguous with Hangers 296 and 297.

Specific objectives for Phase I include

- Installation and operation of SVE wells to accurately evaluate the effective radius of influence (EROI).
- The acquisition of operational data required for the selection of SVE well locations that will provide full coverage of the contaminant plume in the vadose zone.
- Continued use of portable SVE Systems for rebound testing of SVE wells and to identify areas within Site 24 where the use of the portable units would be most cost-effective.

2. REMEDIATION SYSTEM OPERATIONS

The installation of the Phase I SVE wells and operation of the Central SVE System began on May 7 and May 17, 1999, respectively. The Phase I SVE wells will be used as either active extraction wells or as monitoring wells to evaluate the extent of contamination and effective radius of influence (EROI). The following sections provide details on activities performed during the operation of the well field and the treatment system. In addition to the activities associated with the Central SVE System, rebound testing at wells 24SVE2 and 24SVE13, using two portable SVE systems was continued. As more data are collected, these data will be evaluated as described in the draft SEOR and key conclusions and recommendations will be presented in subsequent progress reports.

2.1 WELL FIELD ACTIVITIES

This section provides details on well installation and monitoring activities performed during the current reporting period.

2.1.1 SVE Well Installation

Five wells had been installed through the end of May 1999. The initial set of wells were installed using a hollow stem auger. The wells were completed using either 2 or 4-inch schedule 40 polyvinyl chloride (PVC) casings or screen. Table 2-1 summarizes well installation and completion details.

Table 2-1: SVE Well Installation Summary

Well Number	Date Installed	Total Depth (feet bgs)	Well Diameter (inches)	Screen Interval (feet bgs)	Depth Zone	Primary Purpose /Remarks
24SVE138A	5/7/99	71.2	2	44-70	Intermediate	Monitoring well for 24SVE12
24SVE147A	5/7/99	77.75	2	57-77	Intermediate	Monitoring well for 24SVE12
24SVE 117	5/11/99	105	4	73-98	Deep	Monitoring well for 24SVE116 and evaluation of the extent of contamination to the southeast of 24SVE116
24SVE 128B	5/17/99	41	4	15-40	Shallow	Extraction well and evaluation of shallow contamination to the east of Hanger 296
24SVE67B	5/13/99	104	2	17-32	Shallow	Monitoring well to monitor extraction at 24SVE1 and 24SVE7
24SVE67	5/13/99	104	2	75-100	Deep	Monitoring well to monitor extraction at 24SVE1 and 24SVE7

Note:
bgs-below ground surface

2.1.2 SVE Well Field Monitoring and Sampling

Extraction from wells connected to the Central SVE system began on May 17, 1999. Routine monitoring of extracted vapor concentrations, using both a photoionization detector (PID) and samples collected for fixed-base analysis was conducted. In addition to vapor concentration measurements, flowrates and applied vacuum readings from the wells were also monitored. Sampling and monitoring was conducted as described in the draft Sampling and Analysis Plan (SAP) (Earth Tech 1999c) and the SEOR. Following the start of extraction from each well a baseline sample, for fixed base laboratory analysis, was collected after approximately 24 hours. A second sample from each active extraction well was collected one week later. The analytical laboratory

results were then used as a basis for managing and maximizing the mass of VOCs extracted. In general, extraction from SVE wells with baseline concentrations less than 10 µg/L was discontinued following receipt of the preliminary baseline analytical data. A summary of the monitoring and sampling data collected each week through the end of May 1999 is presented in Table 2-2. Plots of the extracted vapor concentrations depicting trends will be provided in subsequent progress reports as more data are collected.

2.2 TREATMENT SYSTEM ACTIVITIES

This section presents results of monitoring and sampling of both the Central SVE system and the portable SVE systems

2.2.1 Central Treatment System Operations

Monitoring of the Central Treatment System was conducted to assess if the individual components were operating within their intended range. Monitoring included sampling of the extracted vapor concentrations at the inlet to the lead carbon vessel between the lead and the second carbon vessel and at the outlet from the second carbon vessel. In addition, the flowrate, temperature and relative humidity were recorded on an Operation and Maintenance Data Form (see Figure 5-4 of Draft SEOR). Results of vapor sampling at the Central Treatment System are summarized on Table 2-3 and plotted on Figure 2-1. A summary of the Central Treatment System monitoring data is presented in Table 2-4. The data indicate that the system has operated as intended with no major unscheduled maintenance events.

2.2.2 Portable Treatment Systems Operations

Extended rebound tests are currently being conducted at 24SVE13 and 24SVE2. The rebound testing at 24SVE2 and 24SVE13 began on 21 April and 26 April 1999, respectively. Vapor samples were conducted every week. Figures 2-2 and 2-3 present plots of the extracted VOC concentrations for each well. On average, the extraction flowrate and applied vacuum at 24SVE2 has been 8 scfm and 60 inches of water, and 29 scfm and 91 inches of water at 24SVE13.

Table 2-2: Site 24 Extraction Well Sampling Monitoring and Sampling Results

Extraction Well 24SVE-	Screen Interval (ft)	Applied Vacuum (in. of Water)	Extraction Flow Rate (SCFM)	TCE Vapor Concentrations After 24 hrs of Extraction (5/18/99) (µg/L)	Other Compounds Detected above 1 µg/L 5/18/99	TCE Vapor Concentrations on 5/25/99 (µg/L)	Other Compounds Detected above 1 µg/L on 5/25/99	Remarks
5A	42–57	65	120	0.84	_	2.66	Freon-113 – 1.85	Well taken offline after 5/26/99
5	68–88	95	25	8.45	Freon-113 - 9.06	**29.58**	Freon-113 – 35.36 1,1 DCE – 1.62 PCE – 4.02 CCl_4 – 1.51	
9A	55–85	90	25	1.59	Freon-113 – 2.25	5.19	Freon-113 – 10.81	Well taken offline after 5/26/99
9	81–111	90	50	**35.9**	Freon-113 – 68.25	**53.24**	Freon-113 – 168.11 1,1 DCE – 0.44 *JA*	
10	79–109	25	125	26.26	Freon-113 – 23.47	**40.55**	Freon-113 – 30.51	
11A	43–73	80	25	123.42	Freon-113 – 13.74	7.54	Freon-113 – 1.05	
11	79–109	80	25	16.04	Freon-113 – 8.54	**89.22**	Freon-113 – 27.29	
104B	25–45	16	300	1.37	_	3.07	Freon-113 – 1.32	Well taken offline after 5/26/99
107	70–95	90	50	4.69	Freon-113 – 65.84	7.15	Freon-113 – 119.61,1 DCE – 0.2 *JA*	Well taken offline after 5/26/99
116	75–95	90	110	**39.42**	Freon-113 – 81.16 1,1 DCE – 1.07 PCE – 1.16	**41.01**	Freon-113 – 63.31 1,1 DCE – 1.1 *JA* PCE – 1.19	
117	73–98	90	70	N.A	N.A	13.86	Freon-113 – 325.9 PCE – 4.41 DCE – 0.98 JA	
128B	15–40	70	280	N.A	N.A	**49.58**	Freon-113 – 37.33	

Notes:
Concentrations in bold text indicate that vapor concentrations are above the soil cleanup threshold.
N.A SVE well not on-line at the time of sampling
JA Compound positively identified, however quantitation is an estimate

Table 2-3: Central Treatment System Vapor Sampling Results

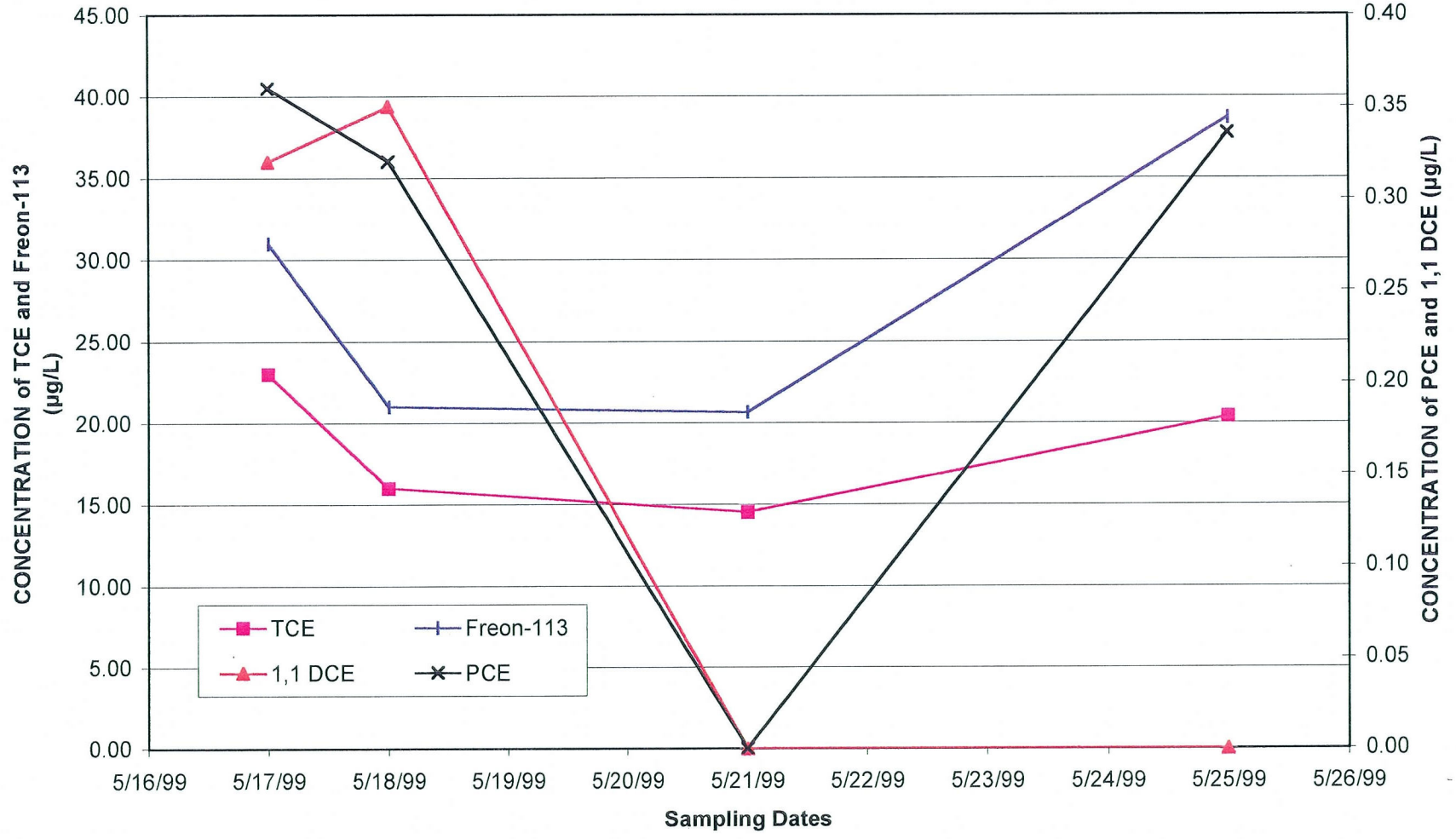
Sample Location	EPA Sample Number	Sample Identifier	Date	TCE µg/L	Freon 113 µg/L	PCE µg/L	1,1 DCE µg/L
Influent	LC001	24S101VS	5/17/99	23	31	0.36	0.32
	LC007	24S102VS	5/18/99	16	21.0	0.32	0.35
	LC023	24S103VS	5/21/99	15	21	ND	ND
	LC026	24S104VS	5/25/99	20.39	38.68	0.34	0.30 *JA*
	LC027	24S104DVS	5/25/99	20.35	38.35	0.29	0.32 *JA*
Midpoint	LC002	24S201VS	5/17/99	0.01	0.031	0.36	0.32
	LC005	24S202VS	5/18/99	ND	21.0	0.32	0.35
	LC025	24S203VS	5/25/99	0.26	20.65	ND	ND
Effluent	LC003	24S301VS	5/17/99	0.01	0.03	ND	ND
	LC004	24S302VS	5/17/99	ND	0.02	ND	ND
	LC006	24S303VS	5/18/99	ND	ND	ND	ND
	LC019	24S304VS	5/19/99	ND	ND	ND	ND
	LC020	24S305VS	5/20/99	ND	ND	ND	ND
	LC021	24S305DVS	5/20/99	ND	ND	ND	ND
	LC022	24S306VS	5/21/99	0.049	0.16	ND	ND
	LC024	24S307VS	5/25/99	0.04	ND	ND	ND

Notes:
ND=Non-detect
JA= Compound positively identified; however, quantitation is an estimate.

Table 2-4: Summary of Central Treatment System Monitoring Data

Date	Hours of Operation	Relative Humidity (%)	Average Flow Rate (SCFM)	Average System Inlet Vacuum (inches of water)	Remarks
5/17/99	141	-	898	102	
5/18/99	158.9	-	915	100	
5/21/99	232.2	84	876	110	
5/24/99	300	81	887	110	
5/25/99	333.8	64	838	117	Reset Temperature Differential Controller
5/26/99	353	54	833	120	
5/28/99	396.7	63	845	120	

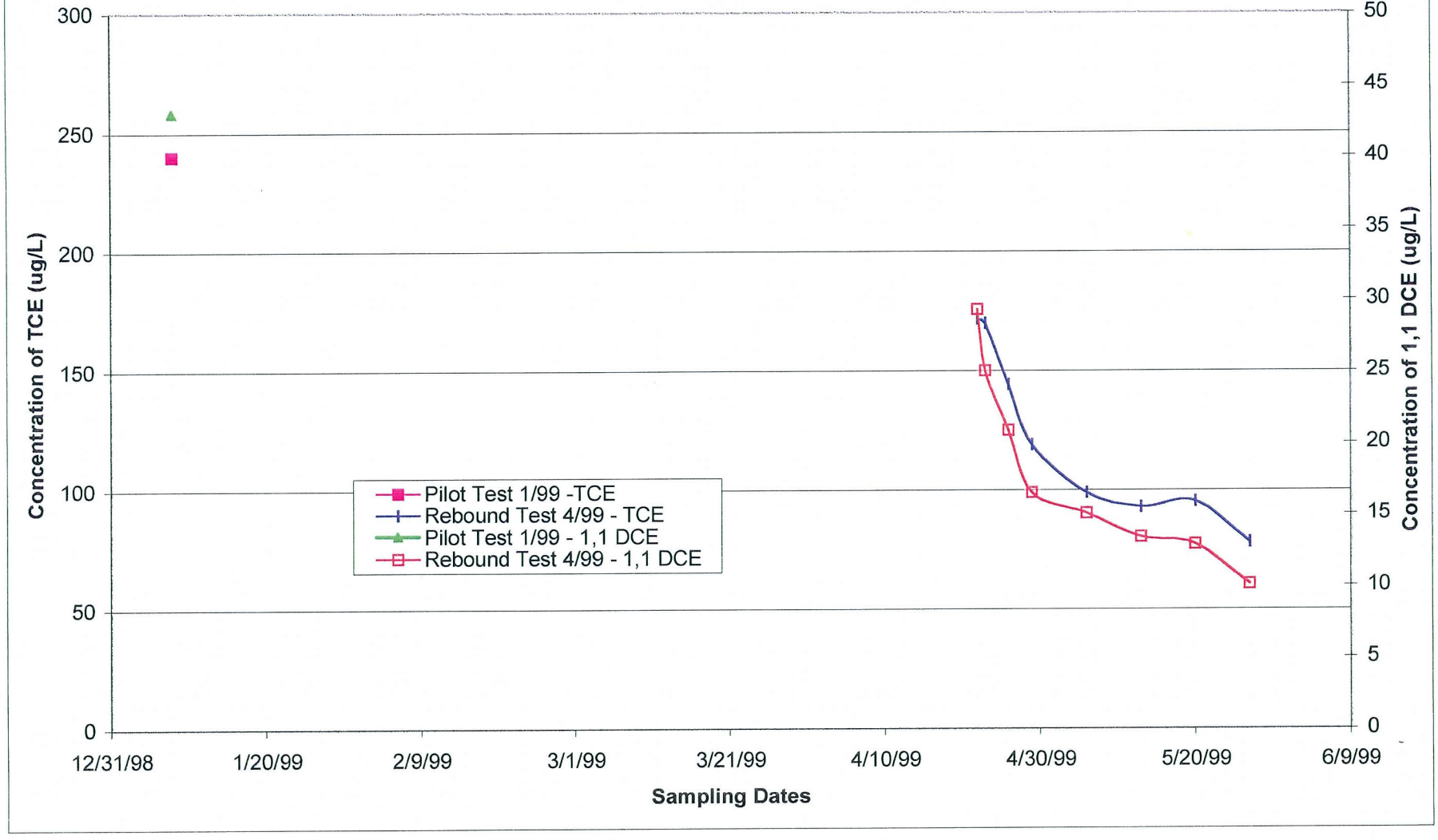
Figure 2-1
IRP Site 24, Vadose Zone Remediation
Central Treatment System
Influent VOC Concentrations



PAGE NO. 2-6

THIS PAGE IS INTENTIONALLY LEFT BLANK

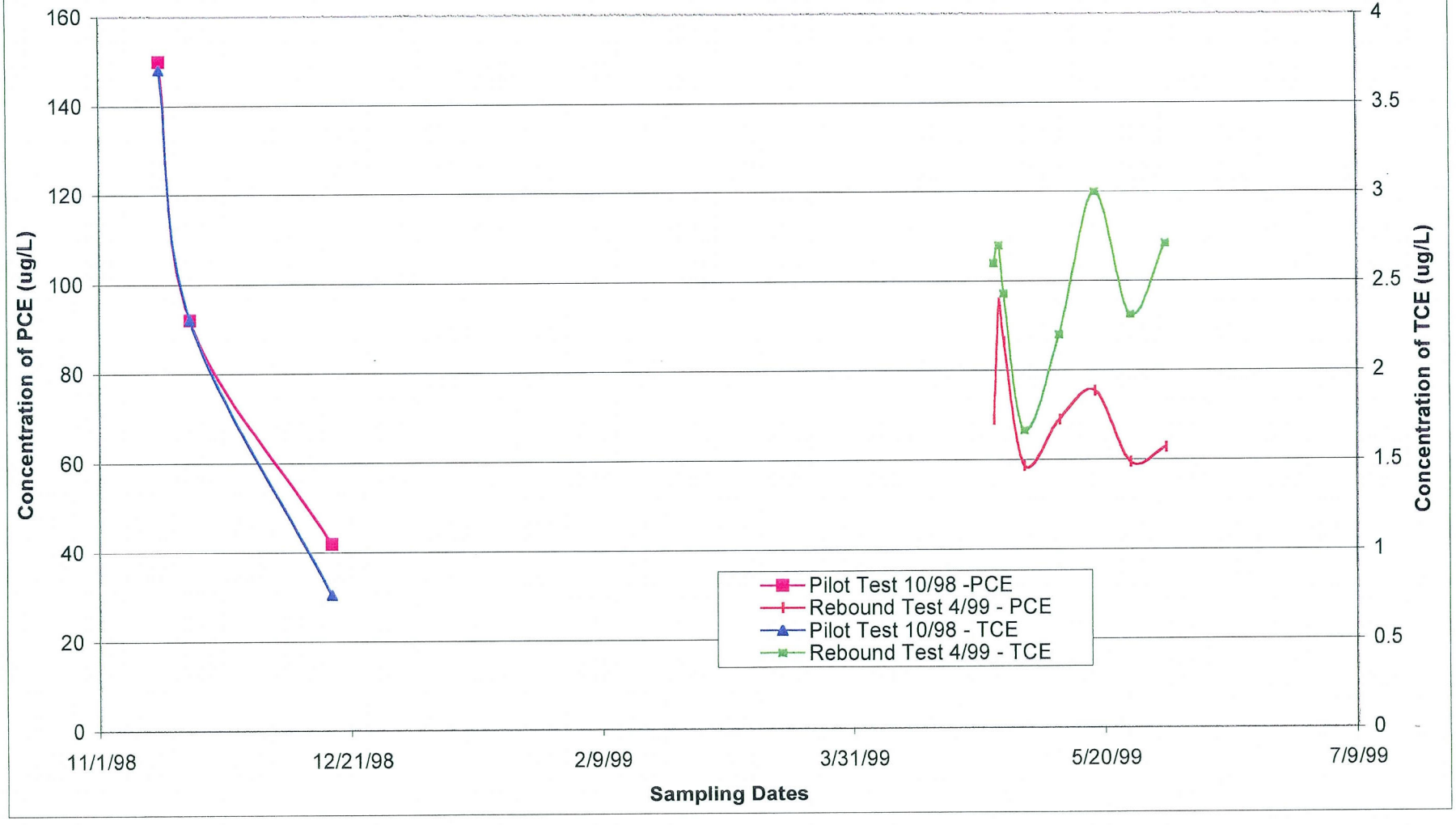
Figure 2-2
IRP SITE 24 Vadose Zone Remediation
Extracted Vapor Concentrations
for 24SVE2



PAGE NO. 2-8

THIS PAGE IS INTENTIONALLY LEFT BLANK

Figure 2-3
IRP SITE 24 Vadose Zone Remediation
Extracted Vapor Concentrations
for 24SVE13



3. PLANNED OPERATIONS AND ACTIVITIES

Activities planned for the next reporting period include

- Continue extraction from the existing SVE wells and the operation of the Central Treatment System
- Continued installation of Phase I SVE wells and vapor conveyance piping connecting the new wells to the Central Treatment System
- Continue rebound testing at 24SVE2 and 24SVE13.

4. REFERENCES

Bechtel National, Inc. (BNI). 1997a. *Draft Final Phase II Vadose Zone Feasibility Study Report Operable Unit (OU) 2A, Site 24.*

———. 1997b. *Draft Final Phase II Vadose Zone Remedial Investigation Report OU 2A, Site 24.*

———. 1997c. *Draft Final Interim Record of Decision (ROD), OU 2A, Site 24 VOC Source Area, Vadose Zone.*

———. 1997d. *Draft Soil Vapor Extraction Pilot Test Summary Report, Site 24 VOC Source Area.*

———. 1997d. *Draft Groundwater Remediation Pilot Test Report, Site 24.*

———. 1998a. *Draft Final Engineering Design Report Vadose Zone Remediation, Site 24.*

———. 1998b. *Draft Final Contingency Plan Vadose Zone Remediation, Site 24.*

Earth Tech, Inc. (Earth Tech). 1999a. *Draft Operation and Maintenance Manual, In Situ Soil Vapor Extraction System.*

———. 1999b. *Draft System Evaluation and Optimization Report, IRP Site 24 Vadose Zone Remediation.*

———. 1999c. *Draft Sampling, Analysis, and Quality Assurance Plan, IRP Site 24 Vadose Zone Remediation.*

OHM Corporation. 1996. *Technical Memorandum, Continuation of CLEAN II Site 24 Soil Vapor Extraction Pilot Test, MCAS, El Toro.*

———. 1999a. *Radius of Influence Data From SVE Pilot Tests at IRP Site 24.*

———. 1999b. *Preliminary Laboratory Data Packages for SVE Pilot Tests at IRP Site 24.*

———. 1999b. *Preliminary Laboratory Data Packages for the Soil Gas Survey at IRP Site 24.*

Southwest Division, Naval Facilities Engineering Command. 1999. Technical Memorandum, Progress Report, Phase I Vadose Zone Remediation Activities, IRP Site 24, MCAS El Toro