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

**Progress Report**

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

## Marine Corps Air Station, El Toro

Prepared for

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## ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| µg/L | micrograms per liter |
| °F | degrees Fahrenheit |
| bgs | below ground surface |
| 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 Corps 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 |
| SCAQMD | South Coast Air Quality Management District |
| 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 through the end of August 1999 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. Remediation is 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 1997c), the *draft final Engineering Design Report (EDR) Vadose Zone Remediation at Site 24* (BNI 1998a) and *the draft System Evaluation and Optimization Report (SEOR), IRP Site 24 Vadose Zone Remediation* (Earth Tech 1999b).

This progress report was prepared by Earth Tech, Inc. (Earth Tech) on behalf of the United States Department of the Navy (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.

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 soil vapor extraction (SVE) system, the installation of additional SVE wells, and the continued use of portable SVE systems to remediate areas that are not contiguous with hangars 296 and 297.

Specific objectives for Phase I include

- Installation and operation of SVE wells to accurately evaluate the effective radius of influence (EROI) and provide data regarding the current VOC plume configuration;
- 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 7 May and 17 May, 1999, respectively. The Phase I SVE wells are being used as either active extraction wells or as monitoring wells to evaluate the extent of contamination and effective radius of influence (EROI). In addition, portable SVE systems were used to remediate soils in the vicinity of wells 24SVE13, 24SVE18, 24SVE35 and 24SVE138A. Data collected will be evaluated as described in the draft *SEOR*, and conclusions and recommendations will be presented in subsequent progress reports.

## 2.1 SVE WELL INSTALLATION

Installation of the Phase I SVE wells has been completed as described below.

Five wells were installed in May 1999 using a hollow-stem auger. Eighteen wells were completed in June and July 1999 using a triple-casing percussion hammer drill rig and either 2- or 4-inch schedule 40 polyvinyl chloride (PVC) casing and screen.

The 23 wells installed between May and July 1999 included 15 triple-completions, 3 dual-completions and 5 single-completion wells. This number includes the following three wells not listed in the draft *SEOR:* 24SVE18 located near 24SVE13; 24SVE15 located west of the crash crew area in the vicinity of groundwater monitoring well 24NEW1; and 24SVE154 located near the Agua Chinon Wash. One well, 24SVE43 located within hangar 297 was not installed due to height restrictions. Table A-1 in Appendix A summarizes well installation and completion details, and the locations of the wells are shown on Plate 1 (map pocket).

## 2.2 SVE WELL FIELD MONITORING AND SAMPLING

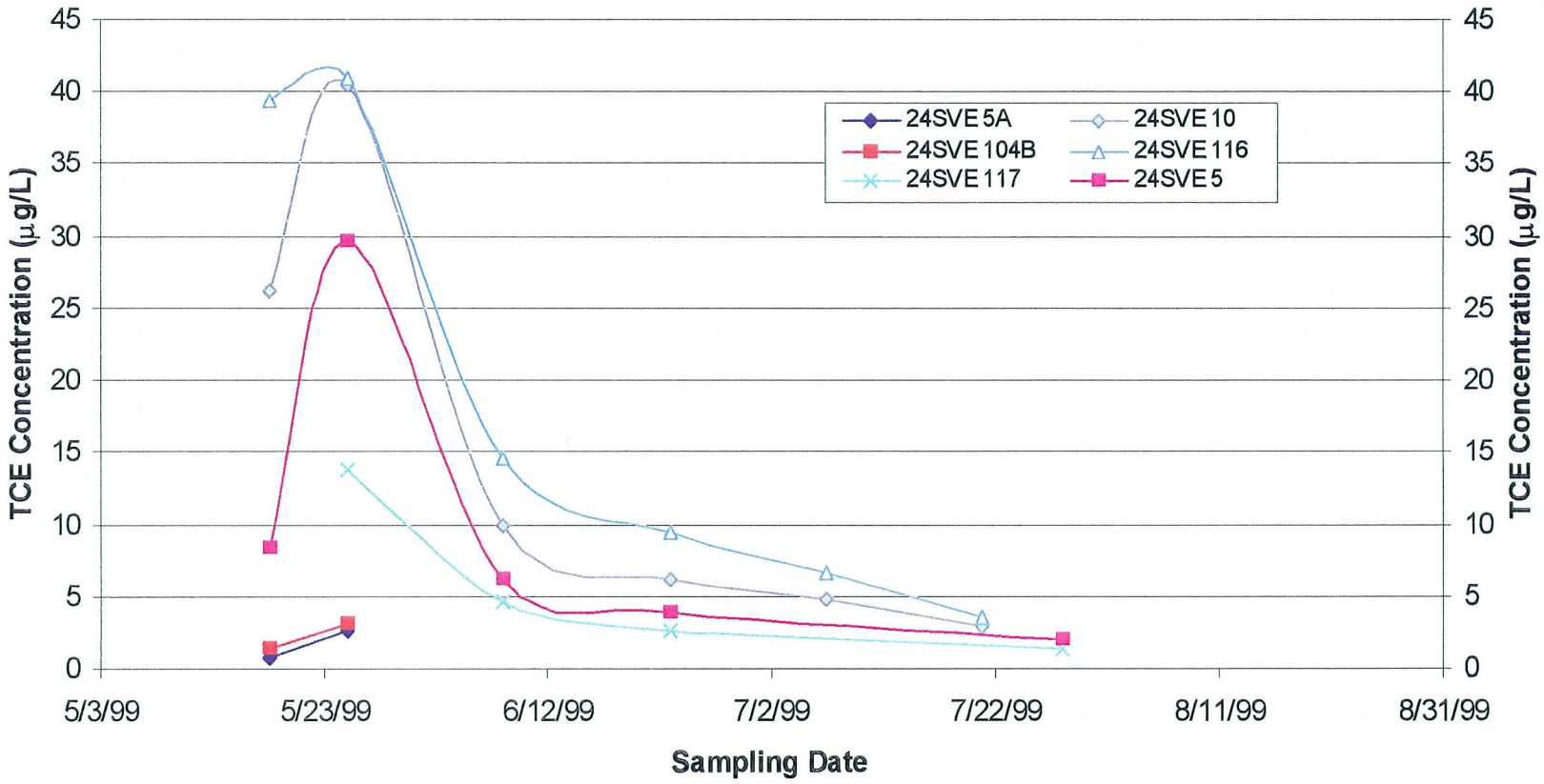
Extraction from wells connected to the central SVE system began on 17 May 1999. Field monitoring of extracted vapor concentrations was conducted using a photoionization detector (PID). In addition to vapor concentration, flowrates and applied vacuum were also monitored. Sampling and monitoring were conducted as described in the draft *Sampling and Analysis Plan* (SAP) (Earth Tech 1999c) and the *SEOR,* with modifications noted on Table A-2 in Appendix A.

Baseline samples from each newly installed SVE well were collected in Tedlar™ bags for fixed-base laboratory analysis, using modified EPA Method TO14. These samples were collected after approximately 24 hours of extraction, as specified in the draft *SEOR.*

Samples for fixed-base analysis were then collected every two weeks from each well where baseline concentrations were above the soil cleanup threshold. The laboratory results were then used as a basis for optimizing 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 sampling and monitoring data collected through the end of August 1999 is presented on Table A-3 in Appendix A. Plots of extracted vapor concentrations are presented on Figures 2-1 through 2-9.

No rebound vapor concentrations were collected during this period; however, rebound vapor concentrations are scheduled to be collected from wells 24SVE10, 24SVE116, 24SVE9, 24SVE106, 24SVE94A, 24SVE128B and 24SVE161 in September.

In addition, vapor extraction from 24SVE89 is scheduled to be discontinued in September after it yields three consecutive samples with extracted vapor concentrations below the cleanup threshold. Rebound sampling will then be conducted 30 days after well deactivation.

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Extracted Vapor Concentrations
from SVE Wells - Group I
Site 24 - Vadose Zone Remediation

| | | |
|---|---|---|
| Date: 9-99 | MCAS, El Toro | Figure 2-1 |
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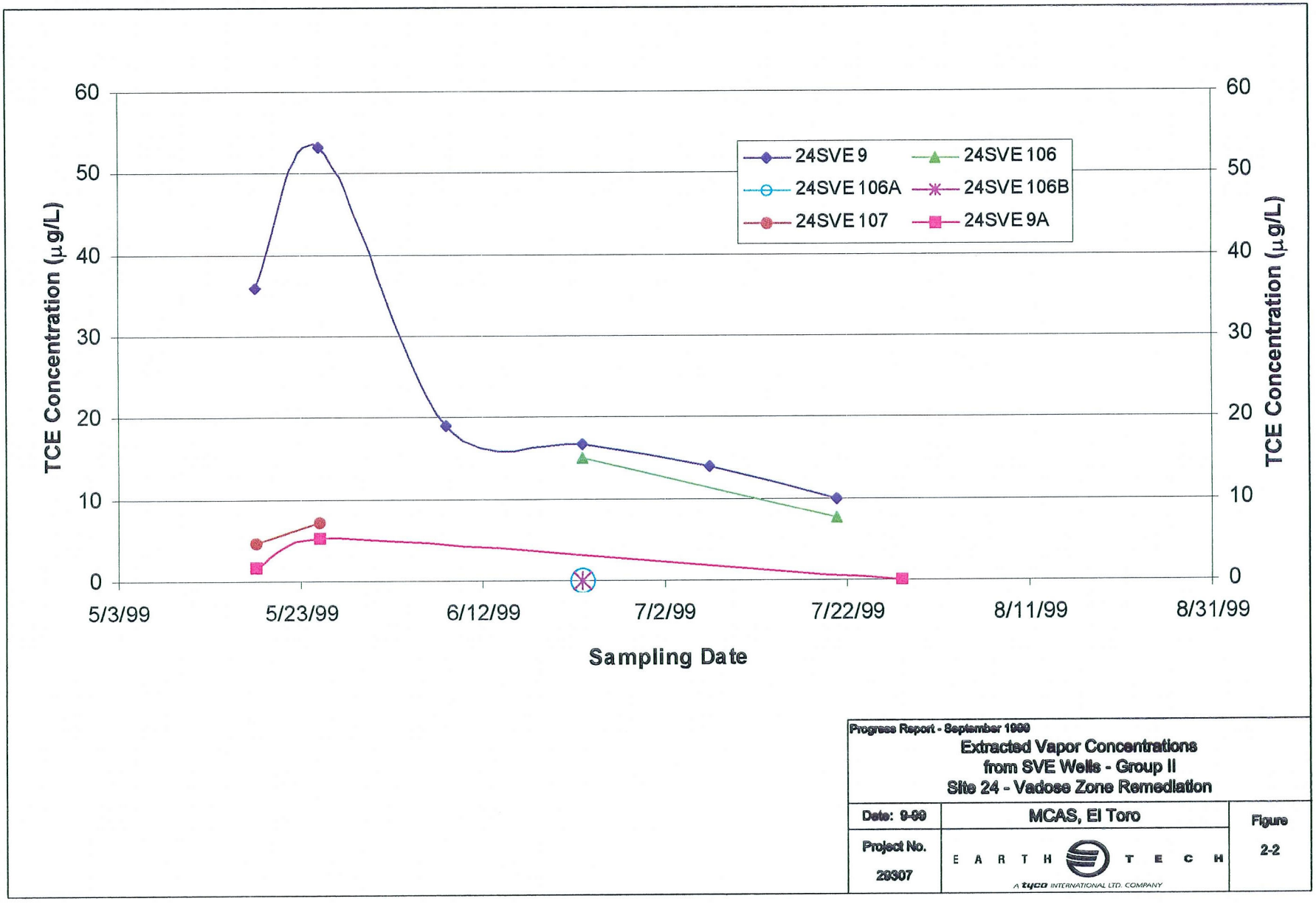


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Extracted Vapor Concentrations
from SVE Wells - Group II
Site 24 - Vadose Zone Remediation

| Date: 9-99 | MCAS, El Toro | Figure |
|---|---|---|
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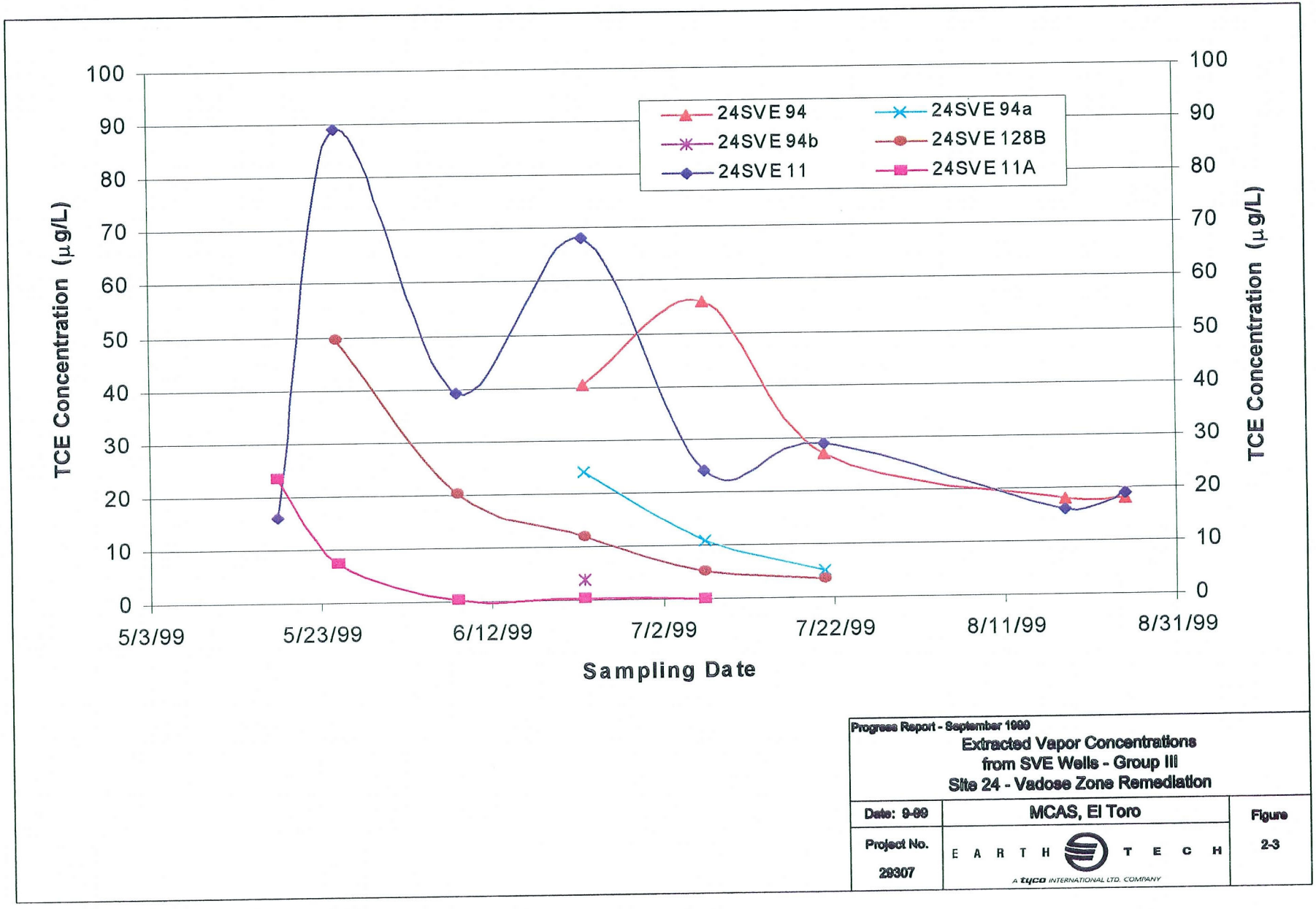


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Extracted Vapor Concentrations
from SVE Wells - Group III
Site 24 - Vadose Zone Remediation

| Date: 9-99 | MCAS, El Toro | Figure 2-3 |
|---|---|---|
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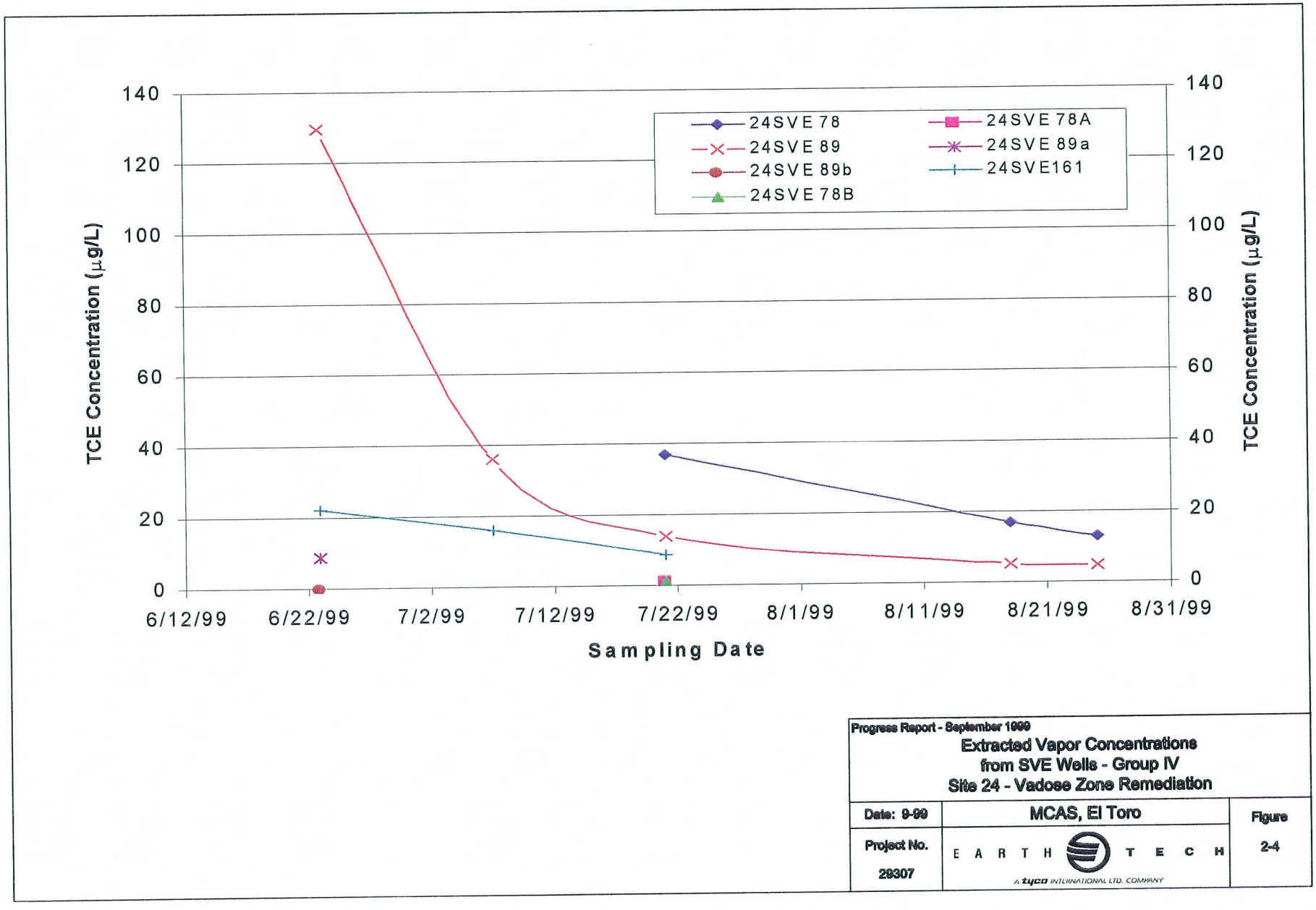


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Extracted Vapor Concentrations
from SVE Wells - Group IV
Site 24 - Vadose Zone Remediation

| Date: 9-99 | MCAS, El Toro | Figure 2-4 |
|---|---|---|
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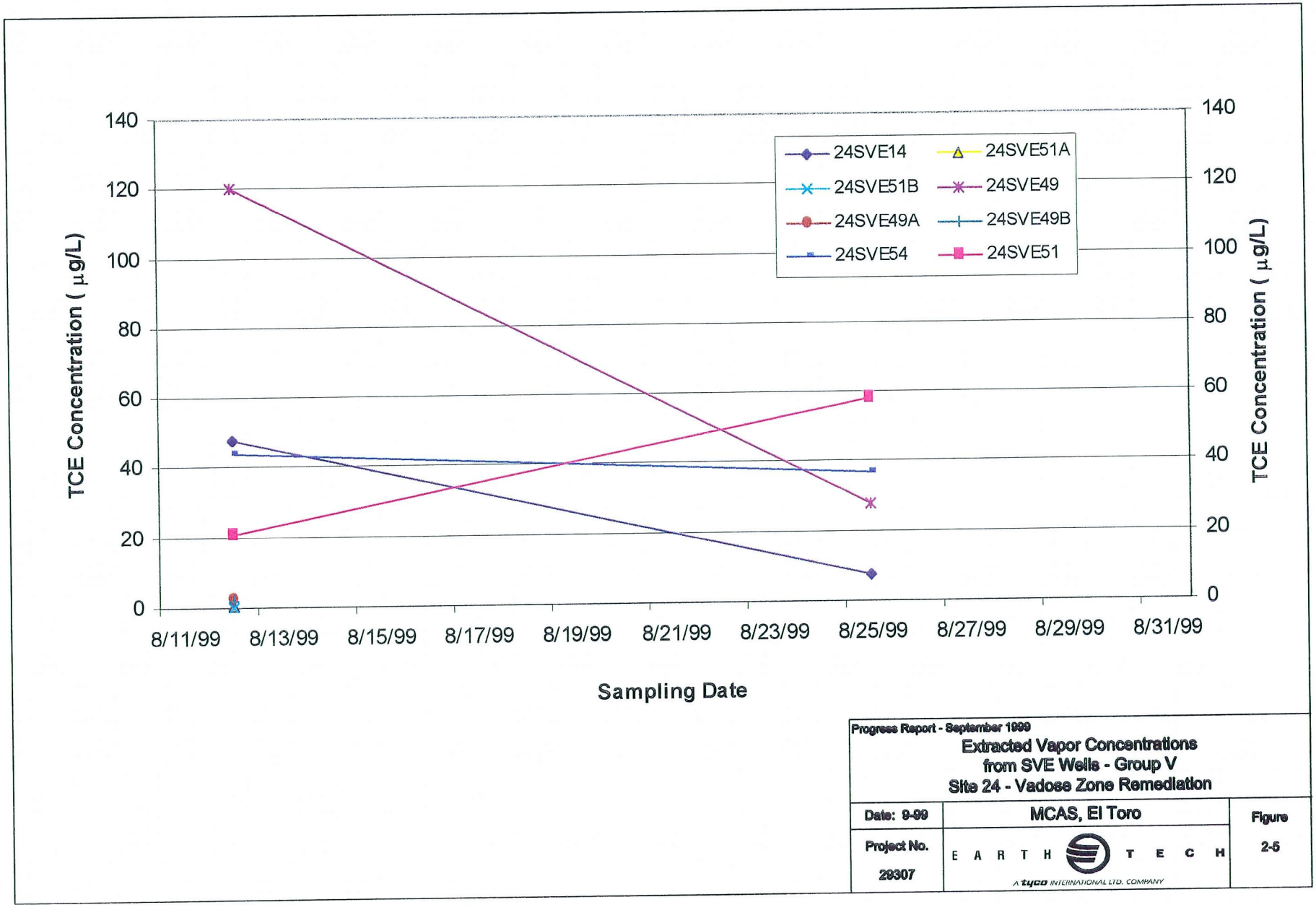


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Extracted Vapor Concentrations
from SVE Wells - Group V
Site 24 - Vadose Zone Remediation

| Date: 9-99 | MCAS, El Toro | Figure 2-5 |
|---|---|---|
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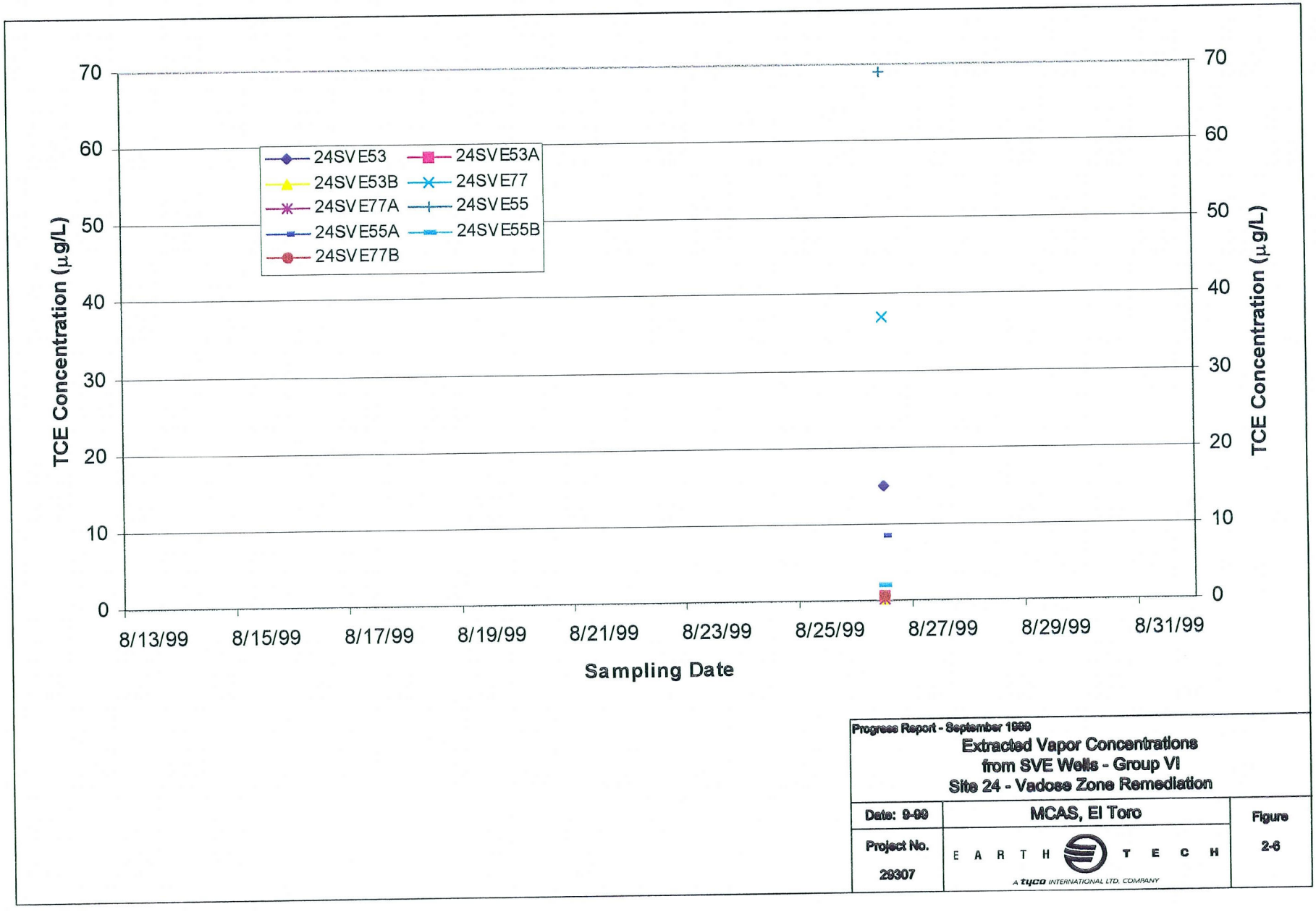


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Extracted Vapor Concentrations
from SVE Wells - Group VI
Site 24 - Vadose Zone Remediation

| Date: 9-99 | MCAS, El Toro | Figure |
|---|---|---|
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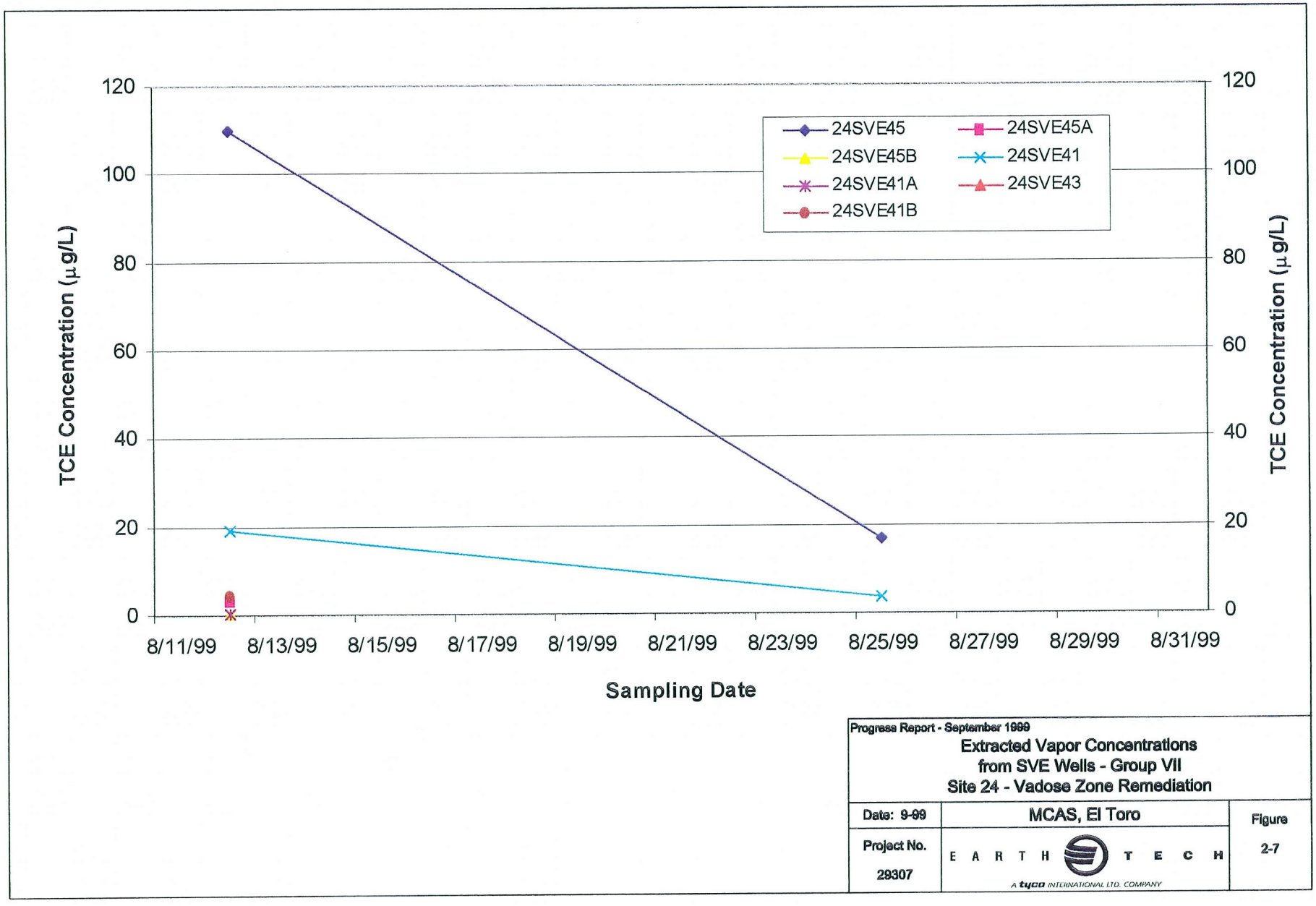


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**Extracted Vapor Concentrations from SVE Wells - Group VII Site 24 - Vadose Zone Remediation**

| Date: 9-99 | MCAS, El Toro | Figure 2-7 |
|---|---|---|
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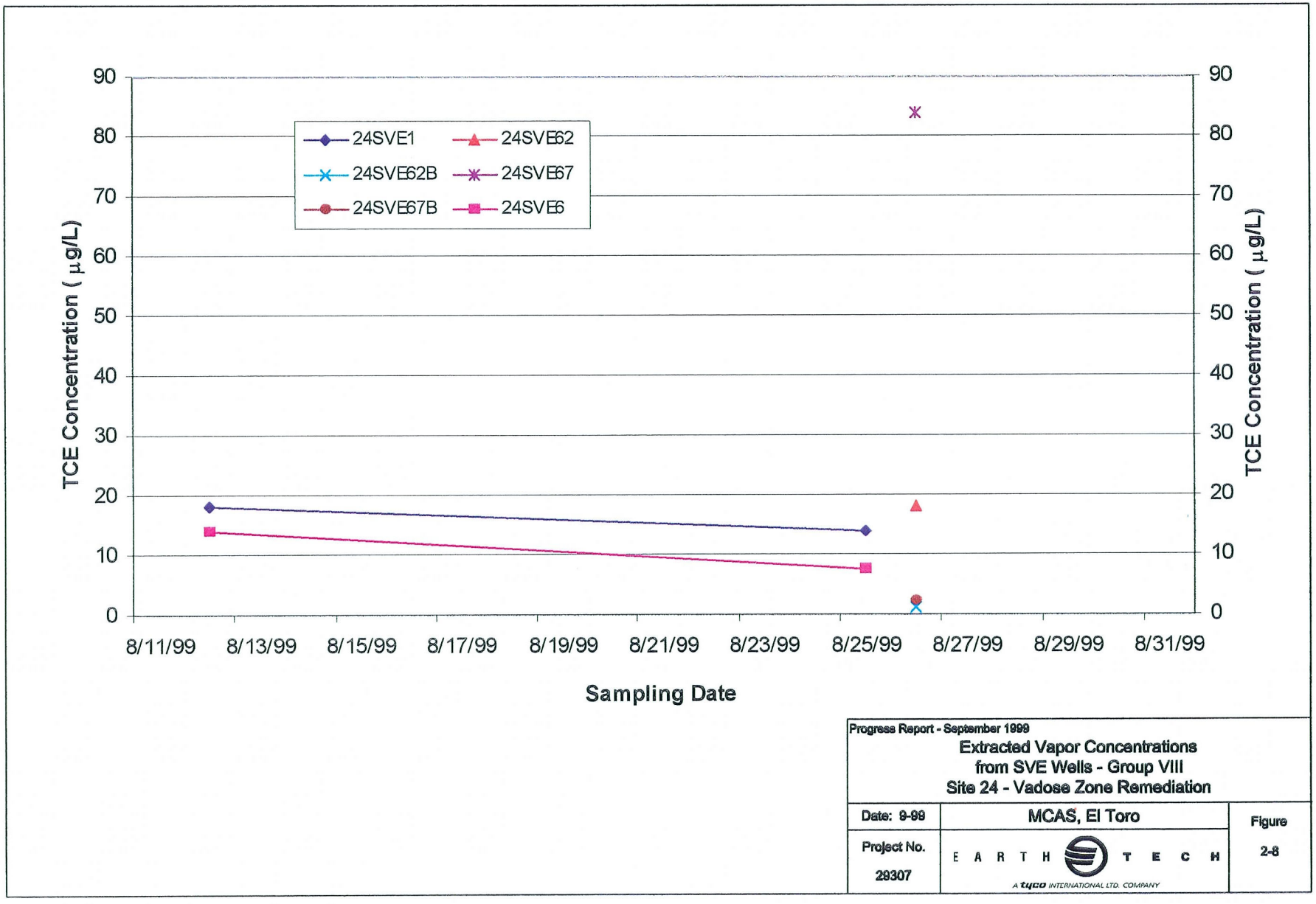


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**Extracted Vapor Concentrations from SVE Wells - Group VIII Site 24 - Vadose Zone Remediation**

| | | |
|---|---|---|
| Date: 9-99 | MCAS, El Toro | Figure 2-8 |
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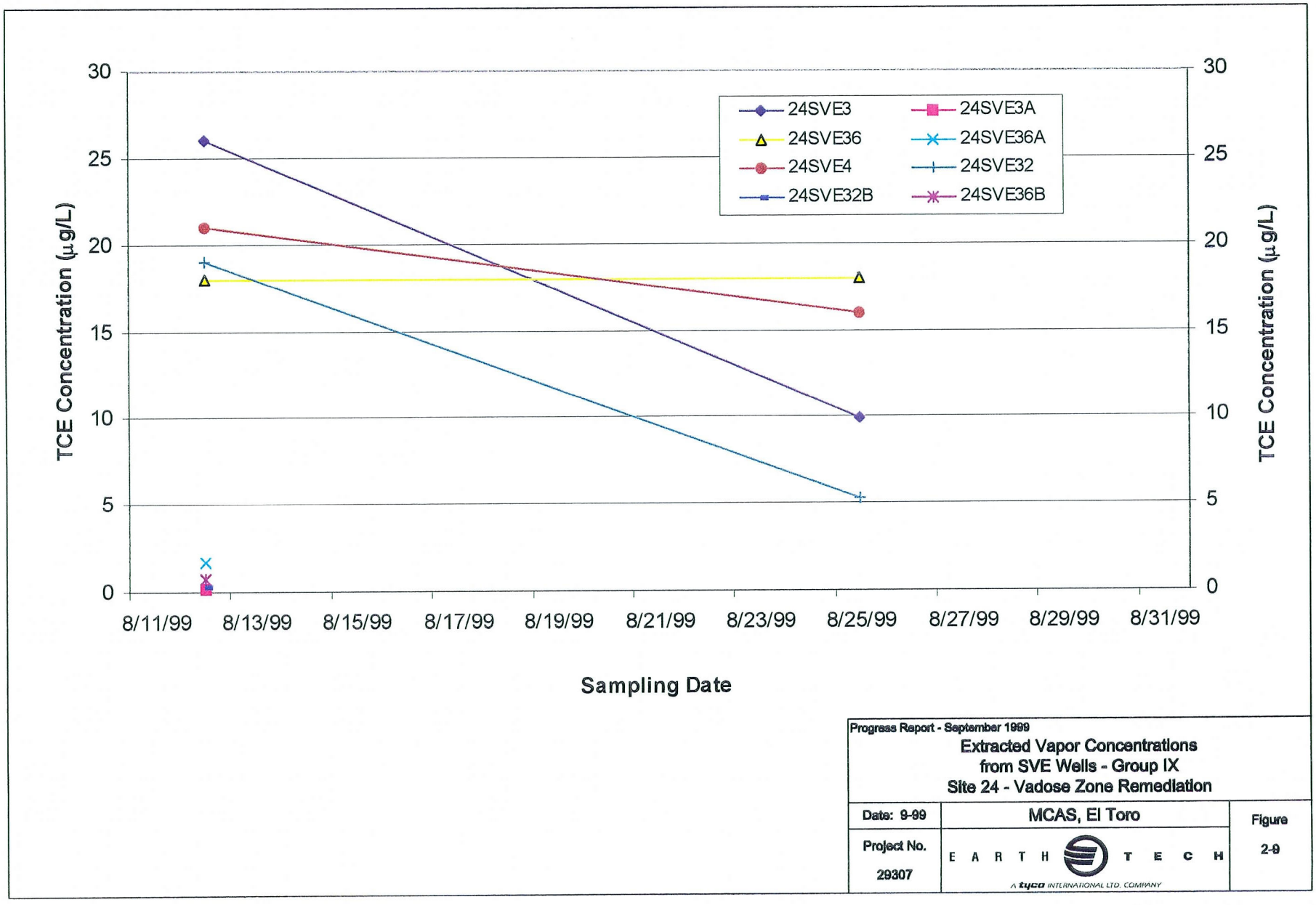


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**Extracted Vapor Concentrations from SVE Wells - Group IX**
**Site 24 - Vadose Zone Remediation**

| Date: 9-99 | MCAS, El Toro | Figure 2-9 |
|---|---|---|
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## 2.3 CENTRAL TREATMENT SYSTEM OPERATIONS

Monitoring of the central treatment system was conducted to assess whether the individual components were operating within their intended range. Monitoring included sampling of 1) the extracted vapor concentrations at the inlet to the lead carbon vessel, 2) between the lead and the second carbon vessel, and 3) at the outlet from the second carbon vessel. Discharges from the treatment system did not exceed the South Coast Air Quality Management District (SCAQMD) emission requirements. In addition, the flowrate, temperature, and relative humidity were recorded on an Operation and Maintenance Data Form (see Figure 5-4 of the *Draft SEOR*).

Tables 2-1, 2-2, and 2-3 summarize results of vapor sampling at the central treatment system. Influent soil vapor concentrations are plotted on Figure 2-10. Table 2-4 presents a summary of the central treatment system monitoring data.

The data indicate that the system has operated as intended with no major unscheduled maintenance events and at an average on-line efficiency of 95 percent. Based on an average total flowrate of 904 standard cubic feet per minute (scfm) and the average laboratory concentrations of the principal contaminants, approximately 220 pounds of VOCs have been removed using the central SVE system since 17 May 1999.

Figure 2-11 shows a plot of the cumulative mass of the principal contaminants removed by the central treatment system. Table 2-5 summarizes the total cumulative mass of principal VOCs removed as a result of pilot testing and current SVE activities at Site 24.

**Table 2-1: Central Treatment System Vapor Sampling Results - Influent**

| 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 | 24 S1 01 VS | 5/17/99 | 23 | 31 | 0.36 | 0.32 |
| | LC007 | 24 S1 02 VS | 5/18/99 | 16 | 21.0 | 0.32 | 0.35 JA |
| | LC023 | 24 S1 03 VS | 5/21/99 | 15 | 21 | ND | ND |
| | LC026 | 24 S1 04 VS | 5/25/99 | 20 | 39 | 0.34 | 0.30 JA |
| | LC027 | 24 S1 04 VSD | 5/25/99 | 20 | 38 | 0.29 | 0.32 JA |
| | LC042 | 24 S1 05 VS | 6/2/99 | 20 | 21 | ND | ND |
| | LC047 | 24 S1 06 VS | 6/8/99 | 14 | 18 | 0.33 | 0.22 JA |
| | LC048 | 24 S1 07 VS | 6/8/99 | 15 | 21 | 0.34 | 0.19 |
| | LC070 | 24 S1 08 VS | 6/15/99 | 11 | 17 | 0.41 | 0.20 |
| | LC071 | 24 S1 09 VS | 6/15/99 | 11 | 16 | 0.38 | 0.20 |
| | LC072 | 24 S1 09 VSD | 6/15/99 | 11 | 17 | 0.39 | 0.25 |
| | LC073 | 24 S1 10 VS | 6/23/99 | 11 | 10 | 0.17 | 0.15 |
| | LC094 | 24 S1 12 VS | 7/7/99 | 12 | 9.7 | ND | 0.14 JA |
| | LC119 | 24 S1 13 VS | 7/21/99 | 7.9 | 6.4 | 0.21 | 0.20 |
| | LC129 | 24 S1 14 VS | 7/28/99 | 10 | 13 | 0.56 | 0.23 |
| | LC144 | 24 S1 15 VS | 8/4/99 | 8.2 | 6.5 | 0.20 | 0.13 |
| | LC181 | 24 S1 16 VS | 8/12/99 | 21 | 3.7 | 0.5 | 0.9 |
| | LC187 | 24 S1 17 VS | 8/18/99 | 16 | 4.1 | 0.36 | 0.63 |
| | LC215 | 24 S1 18 VS | 8/25/99 | 14 | 4.2 | 0.34 | 0.64 |

*Note:*
JA The compound was positively identified, but the quantification is an estimate.
ND not detected

**Table 2-2: Central Treatment System Vapor Sampling Results - Midpoint**

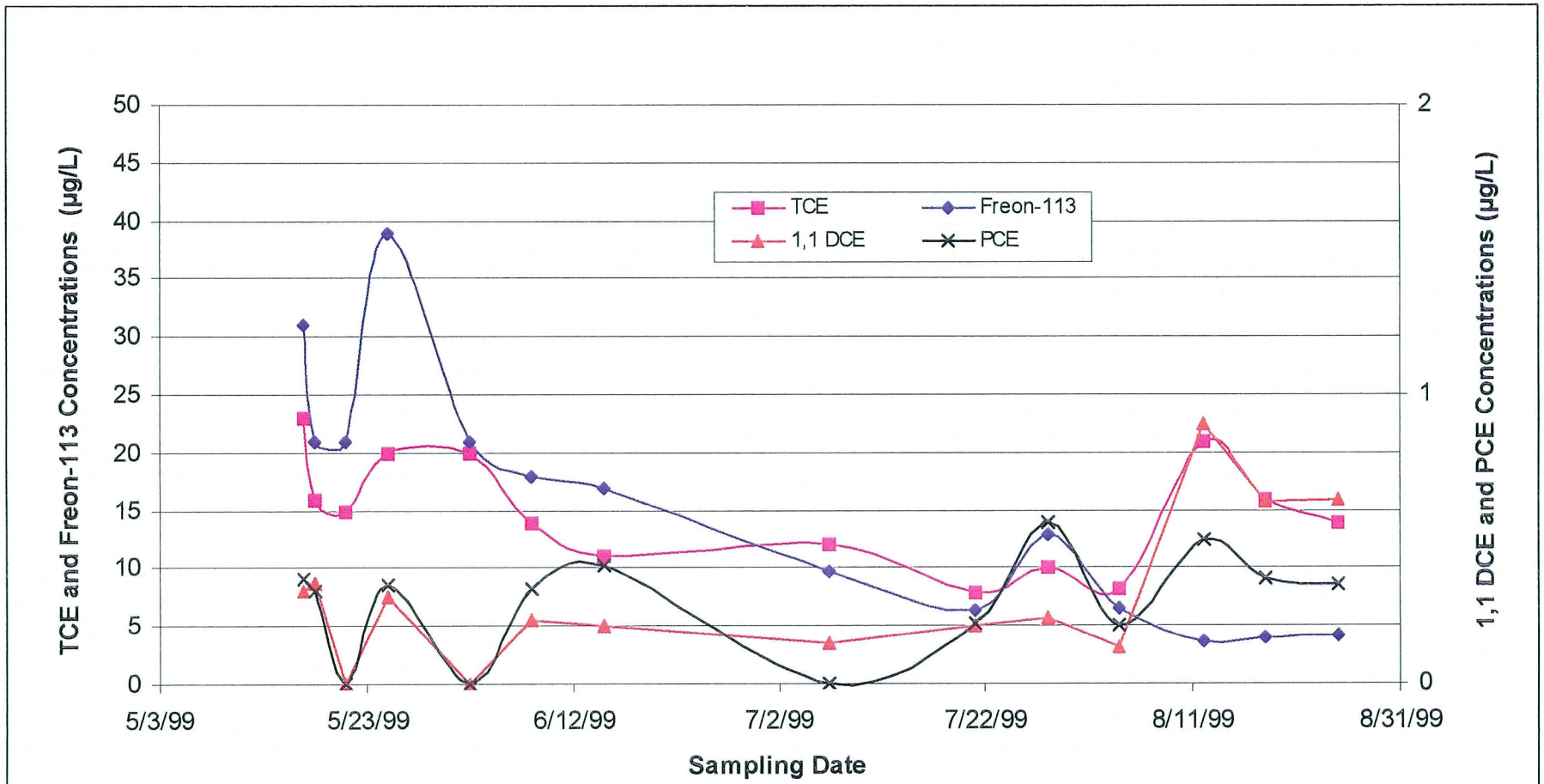
| Sample Location | EPA Sample Number | Sample Identifier | Date | TCE µg/L | Freon 113 µg/L | PCE µg/L | 1,1 DCE µg/L |
|---|---|---|---|---|---|---|---|
| Midpoint | LC002 | 24 S2 01 VS | 5/17/99 | 0.01 | 0.031 | ND | ND |
| | LC005 | 24 S2 02 VS | 5/18/99 | ND | 0.02 | ND | ND |
| | LC025 | 24 S2 03 VS | 5/25/99 | 0.26 | 0.37 | ND | ND |
| | LC049 | 24 S2 05 VS | 6/8/99 | 0.056 | 1.8 | ND | ND |
| | LC050 | 24 S2 06 VS | 6/8/99 | 0.15 | 1.9 | ND | ND |
| | LC068 | 24 S2 07 VS | 6/15/99 | 0.081 | 1.8 | ND | ND |
| | LC069 | 24 S2 08 VS | 6/15/99 | 0.1 | 1.5 | ND | ND |
| | LC095 | 24 S2 09 VS | 7/7/99 | ND | 3.2 | ND | ND |
| | LC145 | 24 S2 10 VS | 8/4/99 | ND | 4.7 *D* | ND | ND |
| | LC147 | 24 S2 10 VSD | 8/4/99 | ND | 4.7 | ND | ND |

*Note:*
D The result was obtained from an analysis of a dilution
ND not detected

**Table 2-3 Central Treatment System Vapor Sampling Results - Effluent**

| Sample Location | EPA Sample Number | Sample Identifier | Date | TCE µg/L | Freon 113 µg/L | PCE µg/L | 1,1 DCE µg/L |
|---|---|---|---|---|---|---|---|
| Effluent | LC003 | 24 S3 01 VS | 5/17/99 | 0.012 | 0.025 | ND | ND |
| | LC004 | 24 S3 02 VS | 5/17/99 | ND | 0.02 | ND | ND |
| | LC006 | 24 S3 03 VS | 5/18/99 | ND | 0.02 | ND | ND |
| | LC019 | 24 S3 04 VS | 5/19/99 | ND | ND | ND | ND |
| | LC020 | 24 S3 05 VS | 5/20/99 | ND | ND | ND | ND |
| | LC021 | 24 S3 05 VSD | 5/20/99 | ND | ND | ND | ND |
| | LC022 | 24 S3 06 VS | 5/21/99 | 0.049 | 0.16 | ND | ND |
| | LC024 | 24 S3 07 VS | 5/25/99 | 0.039 | ND | ND | ND |
| | LC044 | 24 S3 08 VS | 6/2/99 | 0.058 | 0.037 | ND | ND |
| | LC051 | 24 S3 09 VS | 6/8/99 | ND | 0.05 | ND | ND |
| | LC052 | 24 S3 10 VS | 6/8/99 | 0.021 | 0.072 | ND | ND |
| | LC066 | 24 S3 11 VS | 6/15/99 | 0.02 | 0.19 | ND | ND |
| | LC067 | 24 S3 12 VS | 6/15/99 | 0.02 | 0.18 | ND | ND |
| | LC074 | 24 S3 13 VS | 6/23/99 | ND | 7.500 | ND | ND |
| | LC093 | 24 S3 14 VS | 6/29/99 | ND | 0.21 | ND | ND |
| | LC096 | 24 S3 15 VS | 7/7/99 | ND | 0.34 | ND | ND |
| | LC120 | 24 S3 16 VS | 7/21/99 | ND | 0.16 | ND | ND |
| | LC130 | 24 S3 17 VS | 7/28/99 | 0.018 | 0.64 | ND | ND |
| | LC146 | 24 S3 18 VS | 8/4/99 | 0.02 | 0.97 | ND | ND |
| | LC182 | 24 S3 19 VS | 8/12/99 | 0.182 | 0.768 | ND | ND |
| | LC216 | 24 S3 20 VS | 8/25/99 | 0.28 | 0.87 | ND | ND |

*Note:*
ND not detected

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Central Treatment System
Influent Soil Vapor Concentrations
Site 24 - Vadose Zone Remediation

| Date: 9-99 | MCAS, El Toro | Figure |
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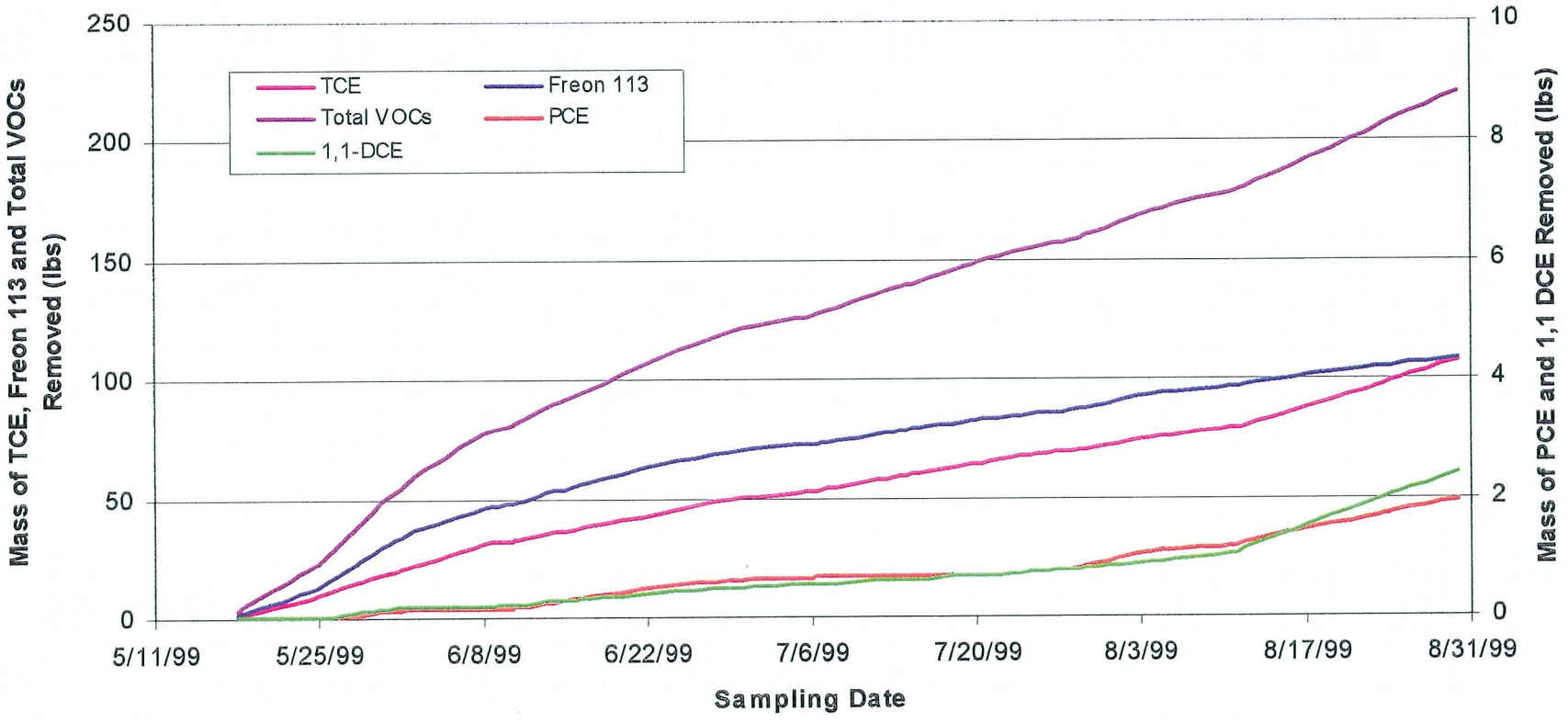
Table 2-4: Summary of Central Treatment System Monitoring Data

| Date | Blower "B" Hours of Operation | Cumulative On-line Efficiency (%) | Total System Flowrate (scfm) | Blower Amperage (AMPS) | Blower "B" Inlet Vacuum (inches of water) | Blower "B" Inlet Temp (°F) | Blower "B" Outlet Temp (°F) | Relative Humidity (%) | Temp at Lead GAC Vessel (F) | Makeup Water Flow Totalizer (gal) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/17/99 04:50 PM | 141.0 | - | 898 | 69 | 106 | 82 | 149 | - | 103 | 48305.0 | 10 wells on-line |
| 5/18/99 09:37 AM | 158.9 | 100 | 915 | 60 | 102 | 80 | 145 | - | 110 | 48305.0 | |
| 5/19/99 09:42 AM | 181.9 | 100 | - | 70 | 103 | 78 | 130 | - | - | 48344.0 | |
| 5/21/99 12:00 PM | 232.2 | 100 | 876 | 60 | 110 | 70 | 140 | 84 | 98 | 48391.0 | |
| 5/24/99 07:52 AM | 300.0 | 100 | 887 | 60 | 110 | 65 | 138 | 81 | 95 | 48391.0 | |
| 5/25/99 08:00 AM | 324.2 | 100 | 970 | 65 | 100 | 66 | 120 | 63.7 | 94 | 48391.0 | 12 wells on-line |
| 5/25/99 05:20 PM | 333.8 | 100 | 838 | 70 | 117 | 74 | 148 | - | 90 | 48402.0 | |
| 5/26/99 07:20 AM | 346.0 | 99 | 843 | 70 | 120 | 74 | 140 | - | 95 | 48402.0 | |
| 5/26/99 02:00 PM | 353.5 | 100 | 833 | 75 | 120 | 80 | 150 | 54 | 100 | | |
| 5/28/99 09:00 AM | 396.7 | 100 | 845 | 75 | 120 | 70 | 145 | 63 | 100 | 48451.0 | |
| 5/31/99 12:30 PM | 470.3 | 99 | 837 | 70 | 118 | 73 | 154 | - | 108 | 48570.0 | |
| 6/01/99 07:20 AM | 490.7 | 100 | 842 | 72 | 120 | 64 | 136 | - | 90 | 48599.0 | 8 wells on-line |
| 6/02/99 08:50 AM | 516.2 | 100 | 841 | 73 | 120 | 63 | 132 | 70 | 93.9 | 48611.0 | |
| 6/04/99 07:30 AM | 563.1 | 100 | 841 | 75 | 120 | 60 | 130 | 70 | 90 | 48644.0 | |
| 6/08/99 09:05 AM | 660.5 | 100 | 815 | 73 | 124 | 65 | 140 | 62.8 | 90 | 48747.0 | |
| 6/10/99 07:30 AM | 682.5 | 96 | 827 | 72.5 | 122 | 66 | 140 | - | 90 | 48780.0 | |
| 6/11/99 07:30 AM | 706.8 | 96 | 817 | 75 | 120 | 65 | 140 | 73 | 95 | 48814.0 | 9 wells on-line |
| 6/14/99 07:05 AM | 778.1 | 96 | 830 | 70 | 121 | 66 | 142 | - | - | 48893.1 | |
| 6/15/99 08:20 AM | 787.8 | 94 | 843 | 75 | 119 | 70 | 134 | 78 | 90 | 48923.0 | |
| 6/17/99 04:16 PM | 843.7 | 95 | 788 | 75 | 120 | 80 | 160 | - | 100 | 49419.0 | |
| 6/23/99 09:00 AM | 980.4 | 95 | 988 | 63 | 89 | 69 | 122 | 63.5 | 97 | 50486.8 | 18 wells on-line |
| 6/23/99 06:30 PM | 988.55 | 95 | 900 | 65 | 100 | 78 | 138 | - | 98 | 50489.3 | Performed scheduled system maintenance. |
| 6/29/99 08:30 AM | 1,123.1 | 96 | 924 | 65 | 100 | 71 | 134 | 66 | 100 | 50743.6 | Cleaned clogged float valve. |
| 7/03/99 11:15 AM | 1,179.5 | 93 | 947 | 65 | 96 | 72 | 94 | - | 79 | 50776.0 | |
| 7/06/99 07:24 AM | 1,207.4 | 90 | 883 | 70 | 113 | 68 | 103 | - | 80 | 50778.0 | |
| 7/07/99 10:15 AM | 1,233.7 | 90 | 857 | 65 | 112 | 78 | 148 | - | 102 | 50784.0 | 10 wells on-line |

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

| Date | Blower "B" Hours of Operation | Cumulative On-line Efficiency (%) | Total System Flowrate (scfm) | Blower Amperage (AMPS) | Blower "B" Inlet Vacuum (inches of water) | Blower "B" Inlet Temp (°F) | Blower "B" Outlet Temp (°F) | Relative Humidity (%) | Temp at Lead GAC Vessel (F) | Makeup Water Flow Totalizer (gal) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 7/13/99 09:00 AM | 1,374.5 | 91 | 800 | 70 | 120 | 82 | 162 | - | 100 | 50789.7 | |
| 7/15/99 09:30 AM | 1,422.0 | 91 | 808 | 70 | 122 | 80 | 158 | - | 94 | 50829.0 | |
| 7/19/99 07:45 AM | 1,516.9 | 92 | 800 | 73 | 130 | 70 | 154 | 84 | 82 | 50903.0 | |
| 7/20/99 07:14 AM | 1,540.4 | 92 | 792 | 74 | 130 | 68 | 150 | 91.6 | 78 | 50923.0 | |
| 7/21/99 09:20 AM | 1,566.5 | 91 | 858 | 70 | 116 | 74 | 148 | - | 110 | 50942.4 | |
| 7/21/99 02:10 PM | 1,571.7 | 92 | 853 | 70 | 112 | 88 | 148 | 59.9 | 94 | 50943.0 | 13 wells on-line |
| 7/23/99 08:23 AM | 1,613.1 | 92 | 854 | 70 | 116 | 70 | 146 | 86.5 | 92 | 50982.0 | |
| 7/26/99 07:20 AM | 1,684.0 | 92 | 819 | 74 | 128 | 70 | 150 | - | 90 | 51029.0 | |
| 7/27/99 08:15 AM | 1,708.0 | 92 | 809 | 74 | 129 | 78 | 148 | - | 88 | 51060.0 | |
| 7/28/99 08:15 AM | 1,732.8 | 93 | 856 | 58 | 116 | 70 | 140 | 73.8 | 88 | 51082.1 | 16 wells on-line |
| 7/30/99 07:40 AM | 1,780.0 | 93 | 822 | 74 | 127 | 68 | 150 | 70 | 90 | 51120.0 | |
| 8/04/99 08:53 AM | 1,901.7 | 93 | 822 | 75 | 126 | 70 | 154 | - | 105 | 51199.0 | |
| 8/11/99 09:45 AM | 2069.7 | 94 | 825 | 72 | 126 | 70 | 154 | - | 104 | 51299.0 | |
| 8/11/99 01:30 PM | 2073.5 | 94 | 1240 | 55 | 44 | 104 | 108 | - | 100 | 51301.0 | 34 wells on-line |
| 8/12/99 10:25 AM | - | 94 | 1220 | 55 | 50 | 94 | 112 | - | 100 | 51368.0 | |
| 8/12/99 03:00 PM | 2098.8 | 94 | 1043 | 60 | 72 | 104 | 130 | - | 106 | 51318.2 | |
| 8/16/99 07:15 AM | 2187.0 | 94 | 1020 | 63 | 86 | 66 | 110 | - | 86 | 51366.0 | |
| 8/18/99 09:00 AM | 2236.6 | 94 | 1010 | 63 | 50 | 80 | 104 | - | 98 | 51401.0 | 18 wells on-line |
| 8/23/99 09:45 AM | 2357.0 | 95 | 910 | 65 | 98 | 84 | 138 | - | 110 | 51470.0 | |
| 8/24/99 09:47 AM | 2381.0 | 95 | 1110 | 60 | 64 | 90 | 124 | - | 103 | 51537.0 | |
| 8/25/99 10:40 AM | 2406.7 | 95 | 913 | 65 | 92 | 100 | 147 | - | 118 | 51558.2 | |
| 8/25/99 01:45 PM | 2409.6 | 95 | 1130 | 60 | 57 | 110 | 132 | - | 110 | 51560.9 | |
| 8/30/99 06:50 AM | 2522.0 | 95 | 1333 | 55 | 43 | 68 | 86 | - | 78 | 51619.0 | 32 wells on-line |

*Notes:*
- = data not collected

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**Cumulative Mass of VOCs Removed by Central SVE System Site 24 - Vadose Zone Remediation**

| Date: 9-99 | MCAS, El Toro | Figure 2-11 |
|---|---|---|
| Project No. 29307 | EARTH TECH — A tyco INTERNATIONAL LTD. COMPANY | |

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Table 2-5: Mass of VOCs Removed During Vadose Remediation at Site 24

| Remediation Phase | Dates | Mass (lbs)[a] | Remarks |
|---|---|---|---|
| Mass of VOCs Removed during Pilot Scale Testing | 4/95 – 5/98 | 1439 | Based on amounts stated in the Draft Final Engineering Design Report (BNI 1998a) |
| Mass of VOCs Removed by Portable SVE Units | 6/98 – 12/98 | 45.5 | Preliminary mass estimates based on data provided by OHM Corporation. |
| Mass of VOCs Removed by Central Treatment System | 5/99 – 8/99 | 220 | |
| Mass of VOCs Removed by Portable SVE Units | 1/99 – 8/99 | 156.8 | Preliminary mass estimates based on data provided by OHM Corporation. |
| | Total | 1861.3 | |

*Note:*
[a]Total mass of VOCs extracted includes TCE, Freon, 1,1 DCE and PCE.

## 2.4 PORTABLE TREATMENT SYSTEMS OPERATIONS

The portable systems were used to extract soil vapor from wells 24SVE15, 24SVE18, and 24SVE138A.

Wells 24SVE35/35A/35B, and 24SVE147A were taken off-line from the portable treatment systems and connected to the central treatment system for vapor extraction in August. In addition, well 24SVE2, which was taken off-line from a portable treatment system in June, was also connected to the central treatment system for vapor extraction in August.

On 26 August 1999 a portable treatment system was used to collect baseline vapor samples from well 24SVE15. Results of the baseline vapor sampling are presented on Table A-3 in Appendix A.

Operational data for the portable SVE systems is summarized on Table 2-6. Figures 2-12, 2-13 and 2-14 present plots of the extracted VOC concentrations from 24SVE2, 24SVE35/35A/35B, 24SVE13, 24SVE18, 24SVE138A and 24SVE147A, respectively.

Table 2-6: Summary of Portable Systems Operational Data

| Extraction Well | Average Flowrate (scfm) | Average System Inlet Vacuum (inches of water) | Dates Operated | Remarks |
|---|---|---|---|---|
| 24SVE2 | 7.6 | 5.9 | 4/21/99 - 6/22/99 | Portable System relocated and connected to 24SVE35 on 6/23/99. Well was connected to the central treatment system on 8/11/99. |
| 24SVE13 | 28 | 96 | 4/27/99 - 7/19/99 | Portable System connected to 24SVE18. |
| 24SVE15 | 65 | 25 | 8/26/99 - | On-line. |
| 24SVE18 | 77 | 11 | 7/19/99 - | Well located within 70 feet of 24SVE13. On-line. |
| 24SVE35 | 75 | 85 | 6/23/99 - 8/06/99 | Well was connected to the central treatment system on 8/11/99. |
| 24SVE35A | 60 | 85 | 6/29/99 - 7/28/99 | Well was connected to the central treatment system on 8/11/99. |
| 24SVE35B | 100 | 85 | 6/29/99 - 7/21/99 | Well was connected to the central treatment system on 8/11/99. |
| 24SVE138A | 91 | 100 | 6/29/99 - | On-line. |
| 24SVE147A | 60 | 98 | 6/16/99 - 6/18/99 | Well has remained off-line. |

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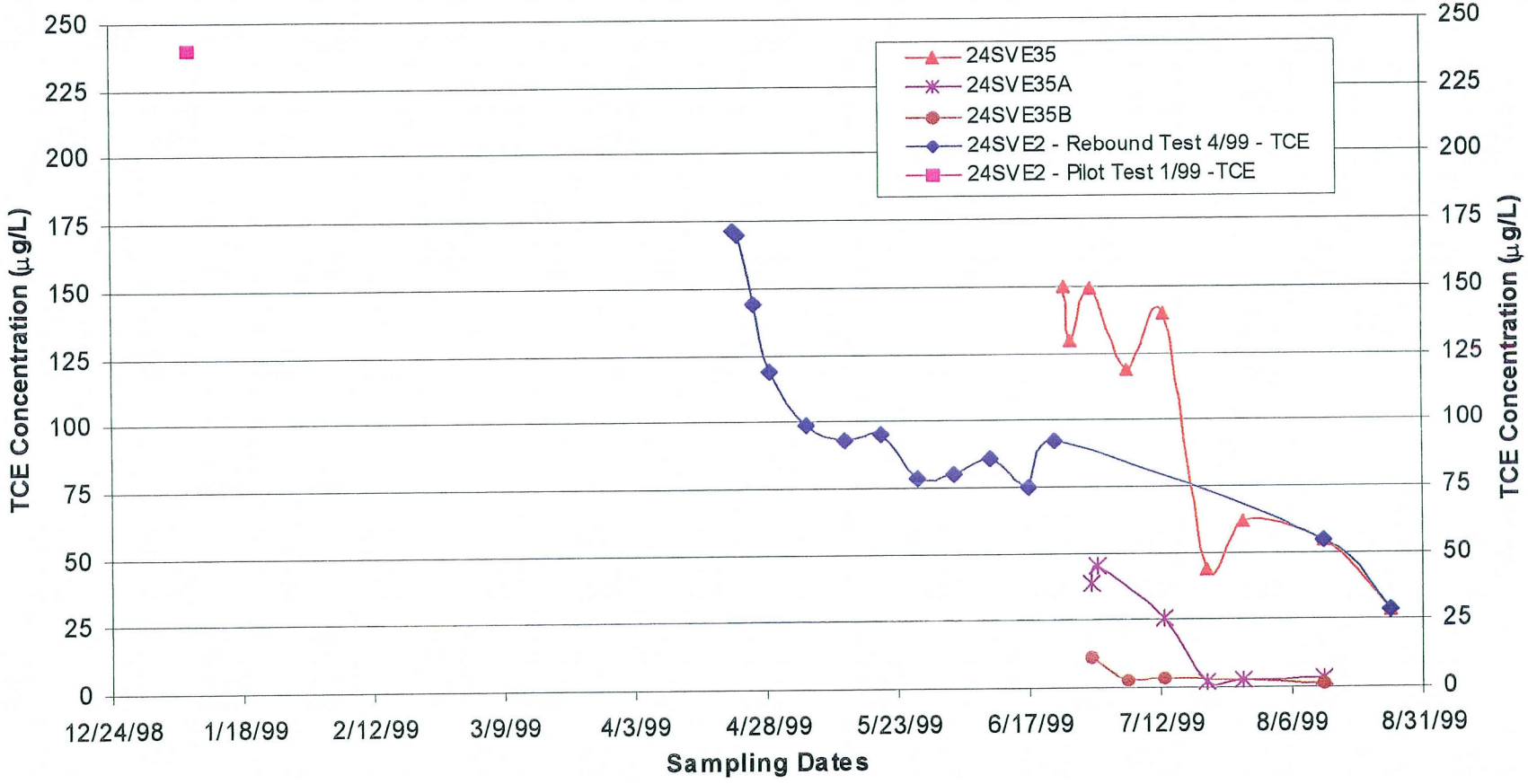


Notes:

In June and July the wells were treated using the mobile treatment units, and starting in August they were switched onto the Central Treatment System.

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Extracted Vapor Concentrations
from 24SVE2 and 24SVE35/35A/35B
Site 24 - Vadose Zone Remediation

| Date: 9-99 | MCAS, El Toro | Figure 2-12 |
|---|---|---|
| Project No. 29307 | EARTH TECH, A tyco INTERNATIONAL LTD. COMPANY | |

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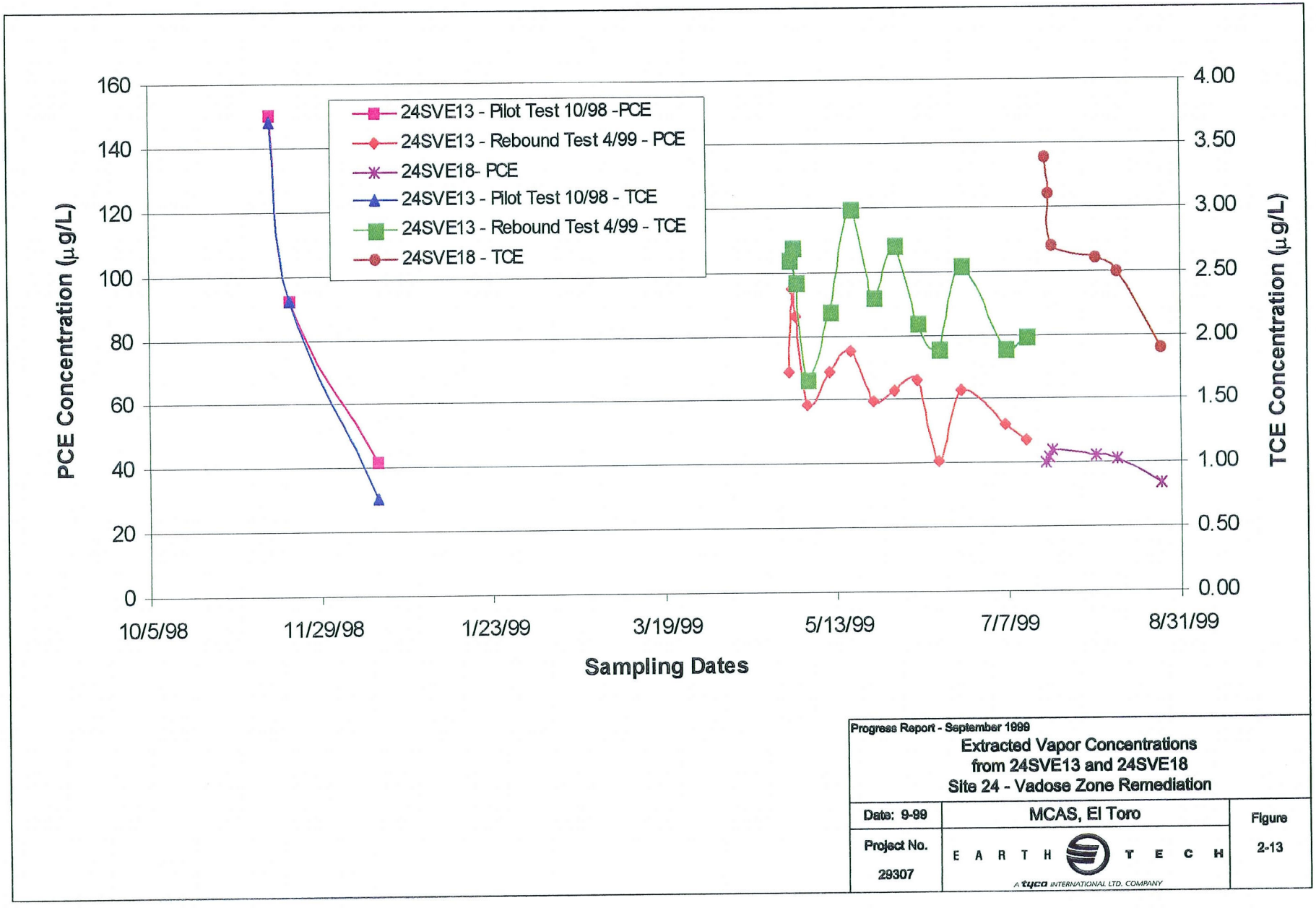


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Extracted Vapor Concentrations
from 24SVE13 and 24SVE18
Site 24 - Vadose Zone Remediation

| Date: 9-99 | MCAS, El Toro | Figure |
|---|---|---|
| Project No. 29307 | EARTH TECH<br>A tyco INTERNATIONAL LTD. COMPANY | 2-13 |

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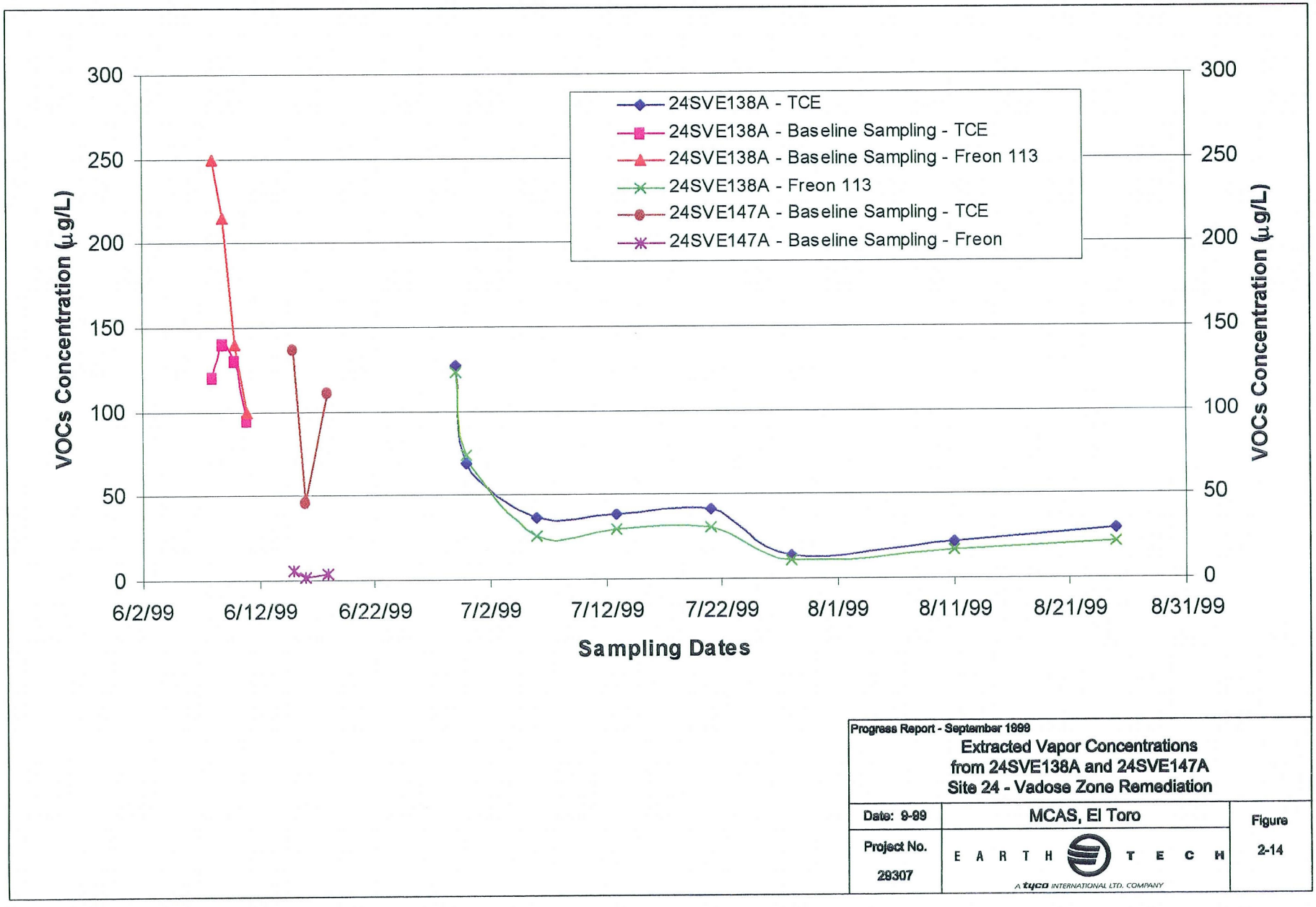


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**Extracted Vapor Concentrations from 24SVE138A and 24SVE147A Site 24 - Vadose Zone Remediation**

| | | |
|---|---|---|
| Date: 9-99 | MCAS, El Toro | Figure 2-14 |
| Project No. 29307 | EARTH TECH, A tyco INTERNATIONAL LTD. COMPANY | |

## 3. PLANNED OPERATIONS AND ACTIVITIES

Activities planned for September 1999 include

- Continuation of SVE at the existing wells and the operation of the central treatment system;
- Evaluation of EROI;
- Continuation of SVE at 24SVE13, 24SVE15, 24SVE18, and 24SVE138A, using portable treatment systems;
- Continuation of rebound testing on the deactivated SVE wells;
- Sampling of all wells in the vicinity of buildings 296 and 297, using a mobile laboratory, the results of which will be used to remap contamination plumes.

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# APPENDIX A

# EXTRACTION WELL INSTALLATION, SAMPLING AND MONITORING DATA

# Appendix A

Table A-1 Phase I SVE Well Installation Summary
Table A-2 Modified Sampling and Monitoring Schedule
Table A-3 Extraction Well Sampling and Monitoring Data Summary
Plate 1 Phase I Vadose Zone Remediation Well Location Map

Table A-1: **Phase I 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 | 45-70 | 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 hangar 296. |
| 24SVE67B | 5/13/99 | 104 | 2 | 17-32 | Shallow | Monitor extraction at 24SVE1 and 24SVE7. |
| 24SVE67 | | | 2 | 75-100 | Deep | |
| 24SVE32B | 6/17/99 | 105 | 4 | 20-40 | Shallow | Concentration and vacuum monitoring; provides EROI data for SVE3 and SVE4. |
| 24SVE32 | | | 2 | 77-102 | Deep | |
| 24SVE35B | 6/10/99 | 105 | 2 | 15-35 | Shallow | Concentration and vacuum monitoring; provides EROI data for SVE2; plume delineation. |
| 24SVE35A | | | 2 | 50-75 | Intermediate | |
| 24SVE35 | | | 2 | 85-105 | Deep | |
| 24SVE36B | 6/29/99 | 105 | 2 | 15-40 | Shallow | Concentration and vacuum monitoring; provides EROI data for SVE2, SVE3, SVE14, and SVE45. |
| 24SVE36A | | | 2 | 45-65 | Intermediate | |
| 24SVE36 | | | 2 | 80-100 | Deep | |
| 24SVE41B | 6/24/99 | 105 | 4 | 20-40 | Shallow | Concentration and vacuum monitoring; provides EROI data for SVE14 and SVE45; plume delineation. |
| 24SVE41A | | | 2 | 55-75 | Intermediate | |
| 24SVE41 | | | 2 | 85-105 | Deep | |
| 24SVE45B | 6/25/99 | 105 | 2 | 20-40 | Shallow | Extraction |
| 24SVE45A | | | 2 | 50-70 | Intermediate | |
| 24SVE45 | | | 2 | 80-100 | Deep | |
| 24SVE49B | 6/23/99 | 105 | 4 | 18-33 | Shallow | Concentration and vacuum monitoring; provides EROI data for SVE14; plume delineation. |
| 24SVE49A | | | 2 | 45-65 | Intermediate | |
| 24SVE49 | | | 2 | 83-103 | Deep | |
| 24SVE51B | 6/22/99 | 105 | 2 | 18-33 | Shallow | Concentration and vacuum monitoring; provides EROI data for SVE14 and SVE54; plume delineation. |
| 24SVE51A | | | 2 | 49-69 | Intermediate | |
| 24SVE51 | | | 2 | 83-103 | Deep | |
| 24SVE53B | 6/14/99 | 105 | 2 | 15-35 | Shallow | Concentration and vacuum monitoring; provides EROI data for SVE3, SVE7, SVE54, and SVE77; plume delineation. |
| 24SVE53A | | | 2 | 45-65 | Intermediate | |
| 24SVE53 | | | 2 | 73-88 | Deep | |
| 24SVE55B | 6/18/99 | 105 | 2 | 15-30 | Shallow | Concentration and vacuum monitoring; provides EROI data for SVE14, SVE54, SVE77, and SVE161. |
| 24SVE55A | | | 2 | 40-70 | Intermediate | |
| 24SVE55 | | | 2 | 80-100 | Deep | |
| 24SVE62B | 6/30/99 | 105 | 2 | 15-40 | Shallow | Concentration and vacuum monitoring; provides EROI data for SVE1. |
| 24SVE62 | | | 2 | 80-105 | Deep | |
| 24SVE77B | 6/15/99 | 105 | 2 | 18-33 | Shallow | Extraction |
| 24SVE77A | | | 2 | 39-54 | Intermediate | |
| 24SVE77 | | | 2 | 75-100 | Deep | |
| 24SVE89B | 6/9/99 | 105 | 2 | 15-35 | Shallow | Concentration and vacuum monitoring; provides EROI data for SVE161. |
| 24SVE89A | | | 2 | 50-75 | Intermediate | |
| 24SVE89 | | | 2 | 80-105 | Deep | |
| 24SVE94B | 6/4/99 | 105 | 2 | 25-45 | Shallow | Concentration and vacuum monitoring; provides EROI data for SVE11; plume delineation. |
| 24SVE94A | | | 2 | 50-70 | Intermediate | |
| 24SVE94 | | | 2 | 75-105 | Deep | |
| 24SVE106B | 6/8/99 | 105 | 2 | 15-40 | Shallow | Concentration and vacuum monitoring; provides EROI data for SVE9, SVE11, and SVE161. |
| 24SVE106A | | | 2 | 45-65 | Intermediate | |
| 24SVE106 | | | 2 | 70-95 | Deep | |
| 24SVE78B | 7/2/99 | 100 | 2 | 20-35 | Shallow | Concentration and vacuum monitoring; provides EROI data for SVE7, SVE77, and |
| 24SVE78A | | | 2 | 45-60 | Intermediate | |

| Well Number | Date Installed | Total Depth (feet bgs) | Well Diameter (inches) | Screen Interval (feet bgs) | Depth Zone | Primary Purpose /Remarks |
|---|---|---|---|---|---|---|
| 24SVE78 | | | 2 | 80-100 | Deep | SVE161; plume delineation |
| 24SVE18 | 7/7/99 | 100 | 4 | 80-100 | Deep | Concentration and vacuum monitoring; provides EROI data for SVE13; plume delineation |
| 24SVE154B | 7/9/99 | 100 | 2 | 15-35 | Shallow | Plume delineation in the vicinity of Agua Chinon Wash |
| 24SVE154A | | | 2 | 45-60 | Intermediate | |
| 24SVE154 | | | 2 | 65-75 | Deep | |
| 24SVE15B | 7/12/99 | 104 | 2 | 15-30 | Shallow | Plume delineation in the crash crew area |
| 24SVE15A | | | 2 | 38-53 | Intermediate | |
| 24SVE15 | | | 2 | 79-104 | Deep | |

*Note*:
bgs = below ground surface
EROI = effective radius of influence

Table A-2: **Modified Sampling and Monitoring Schedule**

| Time | Sample Location(s) | Frequency | Measurements |
|---|---|---|---|
| System startup (Week 1) | S1, S2, S3 | Daily | Flowrates, system vacuum, and system effluent |
| Initial operation period (Week 2 – 4) | S1, S2, S3 | Weekly | VOCs by TO14/ 8021 (Tedlar™ bag) for operational assessment |
| Initial operation period (Week 5 – 8) | S1, S2, S3 | Biweekly | Flowrates, vacuum, vapor concentration |
| Initial operation period (Week 5 – 8) | S1, S3 | Biweekly | VOCs by TO14/ 8021 (Tedlar™ Bag) for operational assessment |
| Initial operation period (Week 5 – 8) | S2 | Monthly | VOCs by TO14/ 8021 (Tedlar™ Bag) for compliance |
| End of initial operation period (Week 15) | Extraction wells | Event I | VOCs in extracted vapors by Method 8021 |
| Phase I operations (Month 2- Month 6) | Treatment system and extraction wells | Biweekly | Flowrates, vacuum, vapor concentration, wellhead vacuum |
| Phase I and Phase II operations | Groundwater monitoring wells | Monthly | Groundwater elevations |
| End of Phase I operations (Month 6) | Extraction wells | Event II | VOCs in extracted vapors by Method 8021 |
| Phase II operations (Month 6- Month 18) | S1,S3 and extraction wells | Biweekly | Flowrates, vacuum, vapor concentration, wellhead vacuum |
| Phase II operations (Month 6- Month 18) | S2 | Monthly | VOCs by TO14/ 8021 (Tedlar™ Bag) for operational assessment |
| Phase II operations (Month 8) | Extraction wells | Event III | VOCs in extracted vapors by Method 8021 |
| Phase II operations (Month 12) | Extraction wells | Event IV | VOCs in extracted vapors by Method 8021 |
| Phase II operations (Month 18) | Extraction wells | Event V | VOCs in extracted vapors by Method 8021 |
| Initial Load of Condensate and Spent Carbon | T-100 and VT100 | Initial load | Waste characterization |

**Table A-3**
**(Page 1 of 3)**

**IRP Site 24 Extraction Well Sampling and Monitoring Data Summary**

| | | Screen Interval (ft) | Wells on-line 5/18/99 | Extracted Vapor Concentrations after 24 Hrs (5/18/99) µg/L | | | | | | | Wells on-line 5/27/99 | Extracted Vapor Concentrations after 7 days (5/25/99) µg/L | | | | | | | Wells on-line 6/2/99 | Extracted Vapor Concentrations (6/2/99) µg/L | | | | | | | Wells on-line 6/8/99 | Extracted Vapor Concentrations (6/8/99) µg/L | | | | | | | Wells on-line 6/23/99 | Extracted Vapor Concentrations (6/23/99) µg/L | | | | | | | Wells on-line 6/29/99 | Extracted Vapor Concentrations (6/29/99) µg/L | | | | | | | Wells on-line 7/7/99 | Extracted Vapor Concentrations (7/7/99) µg/L | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Vacuum (in. H2O) | Flow (scfm) | TCE | Freon 113 | 1,1 DCE | PCE | CCL4 | | Vacuum (in. H2O) | Flow (scfm) | TCE | Freon 113 | 1,1 DCE | CCL4 | PCE | | Vacuum (in. H2O) | Flow (scfm) | TCE | Freon 113 | 1,1 DCE | CCL4 | PCE | | Vacuum (in. H2O) | Flow (scfm) | TCE | Freon 113 | 1,1 DCE | CCL4 | PCE | | Vacuum (in. H2O) | Flow (scfm) | TCE | Freon 113 | 1,1 DCE | CCL4 | PCE | | Vacuum (in. H2O) | Flow (scfm) | TCE | Freon 113 | 1,1 DCE | CCL4 | PCE | | Vacuum (in. H2O) | Flow (scfm) | TCE | Freon 113 | 1,1 DCE | CCL4 | PCE |
| 24SVE10 | Deep | 79-109 | y | 32 | 124.17 | 26 | 23 | 0.4-JA | ND | ND | y | 25 | 125 | 41 | 31.00 | 0.42 | ND | ND | y | 55 | >125 | - | - | - | - | - | y | - | - | 11 | 14 | 0.16 | ND | 0.30 | y | 50.00 | >125 | 6.14 | 11.04 | ND | ND | ND | n | 38 | - | - | - | - | - | - | y | 1.35 | - | 4.80 | 8.5 | 0.1-JA | ND | 0.15 |
| 24SVE104B | Shallow | 25-45 | y | 25 | 300 | 1.4 | 0.69 | ND | ND | ND | y | 16 | 300 | 3.10 | 1.30 | ND | ND | ND | n | 1.5 | - | - | - | - | - | - | n | 1.35 | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | 0.9 | - | - | - | - | - | - | n | 1.2 | - | - | - | - | - | - |
| 24SVE106 | Deep | 70-95 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | y | 50 | >45 | 15.03 | 0.77 | ND | ND | ND | y | 55 | >125 | - | - | - | - | - | y[3] | 72 | >125 | - | - | - | - | - |
| 24SVE106A | Intermediate | 45-65 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | y | 50 | 9 | 0.05 | ND | ND | ND | ND | n | 3 | - | - | - | - | - | - | n | - | - | - | - | - | - | - |
| 24SVE106B | Shallow | 15-40 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | y | 50 | 15 | 0.04 | ND | ND | ND | ND | n | 1.2 | - | - | - | - | - | - | n | - | - | - | - | - | - | - |
| 24SVE107 | Deep | 70-95 | y | >100 | 50 | 4.7 | 66 | ND | ND | ND | y | 90 | 50 | 7.10 | 120-D | .20-JA | ND | 0.16 | n | - | - | - | - | - | - | - | n | 0.15 | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | 0.1 | - | - | - | - | - | - | n | - | - | - | - | - | - | - |
| 24SVE11 | Deep | 79-109 | y | 99 | 20.2 | 16 | 8.5 | ND | ND | ND | y | 80 | 25 | 89 | 27.00 | ND | ND | ND | y | 90 | 25 | - | - | - | - | - | y | 95 | 30 | 39 | 3.30 | ND | ND | ND | y | 45.00 | 9.00 | 68.20 | 2.41 | ND | ND | ND | y | 45 | 9 | - | - | - | - | - | y | 70 | 25 | 24 | 0.46 | ND | ND | ND |
| 24SVE116 | Deep | 75-95 | y | 99 | 119.43 | 39 | 81 | 1.1 | 1.2 | ND | y | 90 | 110 | 41 | 63 | 1.10-JA | ND | 1.20 | y | 110 | 125 | - | - | - | - | - | y | 115 | >125 | 15 | 22 | 0.63-JA | ND | 0.74 | y | 65.00 | 75.00 | 9.50 | 14.07 | 0.37 | 0.09 | 0.56 | y | 75 | 77 | - | - | - | - | - | y | 78 | 84 | 6.70 | 21 | 0.34-JA | ND | 0.59 |
| 24SVE117 | Deep | 73-98 | n | - | - | - | - | - | - | - | y | 90 | 70 | 14 | 330-D | 0.98-JA | 0.76 | 4.4 | y | 110 | 77 | - | - | - | - | - | y | 110 | 88 | 4.60 | 87-D | 0.39 | 0.42 | 2.30 | y | 81.00 | 70.00 | 2.64 | 72.31 | ND | ND | 1.94 | n | - | - | - | - | - | - | - | n | 0.01 | - | - | - | - | - | - |
| 24SVE11A | Intermediate | 43-73 | y | 99 | 20 | 23 | 14 | ND | ND | ND | y | 80 | 25 | 7.50 | 1.00 | ND | ND | ND | y | 90 | 25 | - | - | - | - | - | y | 95 | 25 | 0.55 | ND | ND | ND | ND | y | 45 | 5 | 0.3 | ND | ND | ND | ND | n | 2.5 | - | - | - | - | - | - | n | 3 | - | - | - | - | - | - |
| 24SVE128B | Shallow | 15-40 | n | - | - | - | - | - | - | - | y | 70 | 280 | 50 | 37 | ND | ND | ND | n | - | - | - | - | - | - | - | y | 83 | 308 | 20 | 8.10 | ND | ND | ND | y | 35.00 | 140.00 | 11.85 | 2.84 | ND | ND | ND | y | 39 | 150 | - | - | - | - | - | y | 60 | 224 | 5.30 | 1.6 | ND | ND | ND |
| 24SVE138A | Intermediate | 45-70 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | y[1] | 98 | 70 | 140 | 215.3 | ND | 5.266 | 5.24 | n | - | - | - | - | - | - | - | y[4] | 100 | 85 | 79.74 | 87.70 | ND | 2.50 | 2.57 | y | 100 | 90 | 37 | 26 | ND | 0.69 | 0.77 |
| 24SVE147A | Intermediate | 57-77 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | y[2] | 98 | 60 | 138 | 5.885 | 1.116 | 2.95 | 3.29 | y[3] | 98 | 60 | 111.5 | 4.45 | ND | ND | 2.46 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - |
| 24SVE161 | Deep | 70-95 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | y | 97 | 70 | 50 | 13 | 0.53 | ND | ND | y | 100 | 62 | 32 | 10 | 0.37 | ND | ND | y | 45 | 32 | 22.25 | 21.30 | 0.25 | ND | ND | y | 48 | 30 | - | - | - | - | - | y | 75 | 55 | 16 | 44 D | 0.22-JA | 0.19 | 0.41 |
| 24SVE5 | Deep | 68-88 | y | 95 | 21.25 | 8.5 | 9.1 | 0.45-JA | 0.92 | 0.3 | y | 95 | 25 | 30 | 35.00 | 1.60 | 1.50 | 4.00 | n | 0.7 | - | - | - | - | - | - | y | 120 | 25 | 6.20 | 1.10 | 0.12 | 0.12 | 0.59 | y | 85 | 5 | 3.90 | 0.27 | 0.05 | 0.04 | 0.35 | n | 0.85 | - | - | - | - | - | - | n | 1.15 | - | - | - | - | - | - |
| 24SVE5A | Intermediate | 42-57 | y | 80 | 120 | 0.96 | 0.52 | 0.034 | 0.12 | 0.024 | y | 65 | 120 | 2.70 | 1.90 | 0.09 | 0.08 | 0.31 | n | 1.25 | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | | | | | n | 0.6 | - | - | - | - | - | - | n | 0.75 | - | - | - | - | - | - |
| 24SVE78 | Deep | 80-100 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - |
| 24SVE78A | Intermediate | 45-60 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - |
| 24SVE78B | Shallow | 20-35 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - |
| 24SVE89 | Deep | 80-105 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | y | 35 | 25 | 129.38 | 24.09 | 2.68 | ND | ND | y | 40 | 30 | - | - | - | - | - | y | 70 | 75 | 36 | 7.7 | 0.65 | ND | 0.36 |
| 24SVE89A | Intermediate | 50-75 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | y | 32 | >45 | 8.88 | 1.17 | 0.15 | ND | ND | y | 35 | 100 | - | - | - | - | - | n | 3.5 | - | - | - | - | - | - |
| 24SVE89B | Shallow | 15-35 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | y | 30 | >45 | 0.07 | 0.05 | ND | ND | ND | y | 30 | >125 | - | - | - | - | - | n | 0.6 | - | - | - | - | - | - |
| 24SVE9 | Deep | 81-111 | y | >100 | 22.75 | 36 | 68 | .38-JA | ND | ND | y | 90 | 50 | 53 | 170 | 0.44-JA | ND | ND | y | 110 | 18 | - | - | - | - | - | y | 112 | 14 | 19 | 58 | ND | ND | ND | y | 70.00 | 9.00 | 16.59 | 79.90 | ND | ND | ND | y | 78 | - | - | - | - | - | - | y | 95 | 25 | 14 | 140-D | 0.24-JA | 0.2 | 0.34 |
| 24SVE94 | Deep | 75-105 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | 2.6 | - | - | - | - | - | - | y | 30 | 12.6 | 40.49 | 15.77 | 0.82 | 0.61 | ND | y | 35 | 25 | - | - | - | - | - | y | 55 | 30 | 56 | 18 | 0.50-JA | 0.83 | ND |
| 24SVE94A | Intermediate | 45-65 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | 3.1 | - | - | - | - | - | - | y | 28 | >45 | 24.11 | 14.81 | 0.26 | 0.44 | ND | y | 30 | 70 | - | - | - | - | - | y | 50 | >125 | 11 | 3.7 | 0.068-JA | 0.25 | ND |
| 24SVE94B | Shallow | 15-40 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | 3.2 | - | - | - | - | - | - | y | 25 | >45 | 3.87 | 3.51 | 0.05 | 0.14 | ND | y | 28 | >125 | - | - | - | - | - | n | 5 | - | - | - | - | - | - |
| 24SVE9A | Intermediate | 55-85 | y | >100 | 25 | 1.6 | 2.3 | 0.014-JA | ND | ND | n | 90 | 25 | 5.20 | 11 | ND | ND | ND | n | 0.75 | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | 0.85 | - | - | - | - | - | - | n | 1 | - | - | - | - | - | - |
| 24SVE15 | Deep | 79-104 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - |
| 24SVE15A | Intermediate | 38-53 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - |
| 24SVE15B | Shallow | 15-30 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - |

## IRP Site 24 Extraction Well Sampling and Monitoring Data Summary

| | | Screen Interval (ft) | Wells on-line 7/21/99 | Extracted Vapor Concentrations (7/21/99) µg/L | | | | | | | Wells on-line 7/28/99 | Extracted Vapor Concentrations[6] (7/28/99) µg/L | | | | | | | Wells on line 8/4/99 | Extracted Vapor Concentrations (8/4/99) µg/L | | | | | | | Wells on-line 8/18/99 | Extracted Vapor Concentrations (8/18/99) µg/L | | | | | | | Wells on-line 8/25/99 | Extracted Vapor Concentrations (8/25/99) µg/L | | | | | | | Wells on-line 8/27/99 | Extracted Vapor Concentrations (8/27/99) µg/L | | | | | | | Wells on-line 8/31/99 | Extracted Vapor Concentrations (8/31/99) µg/L | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Vacuum (in. H2O) | Flow (scfm) | TCE | Freon 113 | 1,1 DCE | CCL4 | PCE | | Vacuum (in. H2O) | Flow (scfm) | TCE | Freon 113 | 1,1 DCE | CCL4 | PCE | | Vacuum (in. H2O) | Flow (scfm) | TCE | Freon 113 | 1,1 DCE | CCL4 | PCE | | Vacuum (in. H2O) | Flow (scfm) | TCE | Freon 113 | 1,1 DCE | CCL4 | PCE | | Vacuum (in. H2O) | Flow (scfm) | TCE | Freon 113 | 1,1 DCE | CCL4 | PCE | | Vacuum (in. H2O) | Flow (scfm) | TCE | Freon 113 | 1,1 DCE | CCL4 | PCE | | Vacuum (in. H2O) | Flow (scfm) | TCE | Freon 113 | 1,1 DCE | CCL4 | PCE |
| 24SVE10 | Deep | 79-109 | y | 25 | 130 | 3 | 6.9 | 0.054 | ND | 0.16 | n | 0.45 | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - |
| 24SVE104B | Shallow | 25-45 | n | 0.8 | - | - | - | - | - | - | n | 0.3 | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - |
| 24SVE106 | Deep | 70-95 | y | 50 | 125 | 7.60 | 3.4 | ND | ND | ND | y | 50 | 125 | - | - | - | - | - | y | 50 | 125 | 6.6 | 1.6 | ND | ND | ND | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - |
| 24SVE106A | Intermediate | 45-65 | n | 2 | - | - | - | - | - | - | n | 0 | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - |
| 24SVE106B | Shallow | 15-40 | n | 1.15 | - | - | - | - | - | - | n | 1.1 | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - |
| 24SVE107 | Deep | 70-95 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - |
| 24SVE11 | Deep | 79-109 | y | 60 | 25 | 29 | ND | ND | ND | ND | y | 58 | 25 | - | - | - | - | - | y | 56 | 25 | 20 | ND | ND | ND | ND | y | 70 | 5 | 16 | ND | ND | ND | ND | y | 55 | 10 | 19 | ND | ND | ND | ND | y | - | - | - | - | - | - | - | y | - | - | - | - | - | - | - |
| 24SVE116 | Deep | 75-95 | y | 110 | 210 | 3.60 | 14 | 0.26-JA | ND | 0.48 | y | 105 | 210 | - | - | - | - | - | y | 110 | 220 | 3.6 | 17 | 0.28 | 0.094 | 0.53 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - |
| 24SVE117 | Deep | 73-98 | n | 0.1 | - | - | - | - | - | - | y | 106 | 168 | 1.40 | 45 | ND | ND | 1.3 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - |
| 24SVE11A | Intermediate | 43-73 | n | 3 | - | - | - | - | - | - | y | 58 | 25 | 0.04 | ND | ND | ND | ND | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - |
| 24SVE128B | Shallow | 15-40 | y | 50 | 105 | 3.40 | 1.9 | ND | ND | ND | y | 50 | 105 | - | - | - | - | - | y | 50 | 105 | 2.5 | 1.6 | ND | ND | ND | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - |
| 24SVE138A | Intermediate | 45-70 | y | 100 | 100 | 41.02 | 30.81 | ND | 0.7 | 0.87 | y | 100 | 100 | 13.5 | 11 | 0.1 | 0.2 | 0.3 | y5 | 100 | 105 | 22 | 17 | ND | 0.26 | 0.49 | y5 | 100 | 105 | 22 | 17 | ND | 0.26 | 0.49 | y | 100 | 105 | 29.89 | 21.29 | 0.16 | 0.39 | 0.66 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - |
| 24SVE147A | Intermediate | 57-77 | n | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - |
| 24SVE161 | Deep | 70-95 | y | 60 | 7 | 8.60 | 24 | 0.15 | 0.15 | 0.35 | y | 56 | 56 | - | - | - | - | - | y | 55 | 30 | 7.6 | 27.5 | 0.097 | ND | 0.225 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - |
| 24SVE5 | Deep | 68-88 | n | 0.8 | - | - | - | - | - | - | y | 110 | 25 | 2 | 0.34 | 0.057 | 0.062 | 0.24 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - |
| 24SVE5A | Intermediate | 42-57 | n | 0.55 | - | - | - | - | - | - | n | 0.4 | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - |
| 24SVE78 | Deep | 80-100 | y | 40 | 75 | 37 | 4.8 | 0.76 | ND | ND | y | 40 | 75 | - | - | - | - | - | y | 40 | 80 | 30 | 9.4 | 0.65 | ND | 0.54 | y | 60 | 125 | 17 | 6.1 | 0.38 | ND | 0.41 | y | 50 | 95 | 13 | 3.7 | 0.25 | ND | 0.24 | y | - | - | - | - | - | - | - | y | - | - | - | - | - | - | - |
| 24SVE78A | Intermediate | 45-60 | y | 42 | 25 | 1.20 | 0.093 | ND | ND | 0.062 | y | 45 | 25 | - | - | - | - | - | y | 40 | 25 | 2.6 | 0.43 | ND | ND | 0.075 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - |
| 24SVE78B | Shallow | 20-35 | y | 40 | >125 | 1.10 | 0.039 | ND | ND | 0.32 | y | 32 | >125 | - | - | - | - | - | y | 30 | 125 | 0.74 | 0.55 | ND | ND | 0.28 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - |
| 24SVE89 | Deep | 80-105 | y | 55 | 50 | 14 | 1.7 | 0.25 | ND | 0.23 | y | 55 | 50 | - | - | - | - | - | y | 55 | 55 | 7.7 | 8.6 | 0.11 | ND | 0.13 | y | 65 | 65 | 5.4 | 3.9 | 0.072 | ND | 0.096 | y | 55 | 50 | 4.7 | 1.2 | ND | ND | ND | y | - | - | - | - | - | - | - | y | - | - | - | - | - | - | - |
| 24SVE89A | Intermediate | 50-75 | n | 4 | - | - | - | - | - | - | n | 4 | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - |
| 24SVE89B | Shallow | 15-35 | n | 0.3 | - | - | - | - | - | - | n | 1.2 | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - |
| 24SVE9 | Deep | 81-111 | y | 90 | 12 | 8.75 | 77.5 | ND | ND | ND | y | 87 | 30 | - | - | - | - | - | y | 92 | 30 | 10 | 55 | ND | ND | ND | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - |
| 24SVE94 | Deep | 75-105 | y | 50 | 35 | 27 | 8.4 | ND | ND | ND | y | 50 | 25 | - | - | - | - | - | y | 50 | 25 | 46 | 11 | 0.32 | 0.67 | ND | y | 70 | 25 | 18 | 5.4 | ND | 0.34 | ND | y | 55 | 30 | 18 | 4.3 | ND | 0.2 | ND | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - |
| 24SVE94A | Intermediate | 45-65 | y | 35 | 60 | 5.30 | 2.3 | ND | 0.17 | ND | y | 43 | 115 | - | - | - | - | - | y | 45 | 125 | 4.8 | 2 | 0.028 | 0.12 | ND | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - |
| 24SVE94B | Shallow | 15-40 | n | 5 | - | - | - | - | - | - | n | 0.002 | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - |
| 24SVE9A | Intermediate | 55-85 | n | 1.05 | - | - | - | - | - | - | y | 87 | 45 | 0.05 | ND | ND | ND | ND | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - |
| 24SVE15 | Deep | 79-104 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | y | 25 | 65 | 2.95 | 0.335 | ND | ND | 0.08 | y | 25 | 65 | 3.8 | 0.44 | ND | ND | 0.09 |
| 24SVE15A | Intermediate | 38-53 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | y | - | 60 | 0.012 | 0.035 | ND | ND | ND | y | - | 60 | 0.029 | 0.052 | ND | ND | ND |
| 24SVE15B | Shallow | 15-30 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | y | - | 55 | ND | ND | ND | ND | ND | y | - | 55 | ND | ND | ND | ND | ND |

Notes

Wells 24SVE138A, and 24SVE147A are treated using portable SVE systems.

Bold data indicate concentrations of contaminants are above threshold for the specific contaminant.

JA The analyte was positively identified, but the quantification is an estimate.

D The result was obtained from the analysis of a dilution.

* Wells not on-line 5/18/99. Samples collected from all the wells on 5/25/99.

[1] Well was on-line on 6/8/99. A 24-hr sample was collected on 6/9/99 and is the data reported.

[2] Well was on-line on 6/14/99. A 24-hr sample was collected on 6/15/99 and is the data reported.

[3] Well was on-line and sampled on 6/18/99.

[4] Well was on-line on 6/29/99. A 24-hr sample was collected on 6/30/99 and is the data reported.

[5] Sample not analyzed. Tedlar bag leaked enroute to the lab.

[6] Rebound Sampling

**Table A-3**
**(Page 3 of 3)**

**IRP Site 24 Extraction Well Sampling and Monitoring Data Summary**

| | | Screen Interval (ft) | Wells on-line 6/23/99 | Extracted Vapor Concentrations after 24 Hrs (6/23/99) µg/L | | | | | | | Wells on-line 6/29/99 | Extracted Vapor Concentrations (6/29/99) µg/L | | | | | | | Wells on-line 7/6/99 | Extracted Vapor Concentrations (7/6/99) µg/L | | | | | | | Wells on-line 7/21/99 | Extracted Vapor Concentrations (7/21/99) µg/L | | | | | | | Wells on-line 8/11/99 | Extracted Vapor Concentrations (8/12/99) µg/L | | | | | | | Wells on-line 8/25/99 | Extracted Vapor Concentrations (8/25/99) µg/L | | | | | | | Wells on-line 8/26/99 | Extracted Vapor Concentrations (8/26/99) µg/L | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Vacuum (in. H2O) | Flow (scfm) | TCE | Freon 113 | 1,1 DCE | PCE | CCL4 | | Vacuum (in. H2O) | Flow (scfm) | TCE | Freon 113 | 1,1 DCE | PCE | CCL4 | | Vacuum (in. H2O) | Flow (scfm) | TCE | Freon 113 | 1,1 DCE | PCE | CCL4 | | Vacuum (in. H2O) | Flow (scfm) | TCE | Freon 113 | 1,1 DCE | PCE | CCL4 | | Vacuum (in. H2O) | Flow (scfm) | TCE | Freon 113 | 1,1 DCE | PCE | CCL4 | | Vacuum (in. H2O) | Flow (scfm) | TCE | Freon 113 | 1,1 DCE | PCE | CCL4 | | Vacuum (in. H2O) | Flow (scfm) | TCE | Freon 113 | 1,1 DCE | PCE | CCL4 |
| 24SVE1 | Deep | 91-109 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | y | 30 | 308 | 18 | 5.9 | 2.1 | ND | ND | y | 30 | 330 | 14 | 6.7 | 1.9 | ND | ND | y | - | - | - | - | - | - | - |
| 24SVE14 | Deep | 78-108 | n | - | 60 | - | - | - | - | - | n | - | - | - | - | - | - | - | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | y | 25 | 5 | **48** | 2.4 | 1.3 | 1 | ND | y | 45 | 25 | 7.7 | ND | 0.088 | 0.17 | ND | y | - | - | - | - | - | - | - |
| 24SVE2 | Deep | 80-105 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | y | 34 | 5 | **83** | 7.1 | 4.8 | 2.2 | ND | y | 50 | 12 | **28** | 3.6 | 3.5 | 0.62 | ND | y | - | - | - | - | - | - | - |
| 24SVE2A | Intermediate | 40-70 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | n | - | - | - | - | - | - | - | y | 34 | 25 | 11 | 0.68 | 0.56 | 0.36 | ND | y | 50 | 50 | 1.9 | 0.38 | 0.21 | 0.12 | ND | y | - | - | - | - | - | - | - |
| 24SVE3 | Deep | 80-105 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | n | - | - | - | - | - | - | - | y | 25 | 5 | 26 | ND | 0.34 | 0.38 | ND | y | 45 | 40 | 9.9 | ND | 0.10 | 0.17 | ND | y | - | - | - | - | - | - | - |
| 24SVE32 | Deep | 77-102 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | n | - | - | - | - | - | - | - | y | 30 | 60 | 19 | 0.54 | 0.86 | 0.27 | ND | y | 40 | 105 | 5.3 | 0.19 | 0.19 | ND | ND | y | - | - | - | - | - | - | - |
| 24SVE35 | Deep | 85-105 | y[1] | 85 | 75 | **150** | 10 | 33 | ND | 5.5 | y2 | 65 | 75 | - | - | - | - | - | y | 65 | 75 | 121.295 | 12.15 | 20.62 | 3.38 | 1.34 | y | 65 | 75 | 1.49 | 4.70 | 7.2 | 1.49 | ND | y | 30 | 25 | **55** | 7.5 | 8.7 | 1.6 | ND | y | 50 | 40 | **23** | 3.9 | 5.1 | 0.77 | ND | y | - | - | - | - | - | - | - |
| 24SVE35A | Intermediate | 50-75 | n | - | - | - | - | - | - | - | y | 85 | 60 | **39.2** | 2.06 | 6.18 | 1.45 | ND | y | 85 | 60 | **45.4** | 4.2 | 8.49 | 1.50 | ND | y | 85 | 60 | 2.5 | 0.13 | 0.15 | 0.09 | ND | y | 30 | 10 | 3.6 | 0.84 | 0.35 | 0.22 | ND | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - |
| 24SVE35B | Shallow | 15-35 | n | - | - | - | - | - | - | - | y | 85 | 100 | 11.8 | 0.66 | 0.79 | 0.82 | ND | y | 85 | 100 | 3.26 | 0.45 | 0.33 | 0.23 | ND | n | - | - | - | - | - | - | - | y | 25 | 90 | 1.4 | 0.26 | 0.069 | 0.19 | ND | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - |
| 24SVE36 | Deep | 80-100 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | n | - | - | - | - | - | - | - | y | 26 | 45 | 18 | ND | 0.48 | 0.41 | ND | y | 40 | 85 | 18 | ND | 0.31 | 0.3 | ND | y | - | - | - | - | - | - | - |
| 24SVE36A | Intermediate | 45-65 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | n | - | - | - | - | - | - | - | y | 26 | 0 | 1.7 | ND | ND | 0.16 | ND | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - |
| 24SVE36B | Shallow | 15-40 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | n | - | - | - | - | - | - | - | y | 25 | 55 | 0.76 | ND | ND | 0.11 | ND | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - |
| 24SVE3A | Intermediate | 45-60 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | n | - | - | - | - | - | - | - | y | 25 | 0 | 0.18 | ND | ND | ND | ND | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - |
| 24SVE4 | Deep | 85-105 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | n | - | - | - | - | - | - | - | y | 27 | 60 | 21 | 1.9 | 1.3 | 0.37 | ND | y | 40 | 90 | 16 | 2 | 0.84 | 0.26 | ND | y | - | - | - | - | - | - | - |
| 24SVE41 | Deep | 85-105 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | n | - | - | - | - | - | - | - | y | 25 | 55 | 19 | 0.87 | 0.64 | 0.34 | ND | y | 40 | 100 | 3.6 | 0.49 | 0.27 | 0.08 | ND | y | - | - | - | - | - | - | - |
| 24SVE41A | Intermediate | 55-75 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | n | - | - | - | - | - | - | - | y | 25 | 12 | 0.31 | ND | ND | ND | ND | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - |
| 24SVE41B | Shallow | 20-40 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | n | - | - | - | - | - | - | - | y | 25 | 224 | 4.4 | ND | ND | 0.29 | ND | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - |
| 24SVE45 | Deep | 80-100 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | n | - | - | - | - | - | - | - | y | 25 | 35 | **110** | ND | 1.9 | 1.5 | ND | y | 45 | 65 | 17 | 0.24 | 0.21 | 0.21 | ND | y | - | - | - | - | - | - | - |
| 24SVE45A | Intermediate | 50-70 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | n | - | - | - | - | - | - | - | y | 25 | 25 | 3.4 | ND | ND | 0.099 | ND | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - |
| 24SVE45B | Shallow | 20-40 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | n | - | - | - | - | - | - | - | y | 25 | 85 | 0.5 | ND | ND | 0.043 | ND | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - |
| 24SVE49 | Deep | 83-103 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | n | - | - | - | - | - | - | - | y | 25 | 50 | **120** | 25 | 1.6 | 3.4 | ND | y | 45 | 120 | **28** | 22 | 0.45 | 0.94 | ND | y | - | - | - | - | - | - | - |
| 24SVE49A | Intermediate | 45-65 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | n | - | - | - | - | - | - | - | y | 25 | 12 | 2.5 | 0.047 | ND | 0.12 | ND | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - |
| 24SVE49B | Shallow | 18-33 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | n | - | - | - | - | - | - | - | y | 25 | 330 | 2.1 | ND | ND | 0.19 | ND | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - |
| 24SVE51 | Deep | 83-103 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | n | - | - | - | - | - | - | - | y | 30 | 5 | 21 | 5.6 | ND | 0.52 | ND | y | 35 | 25 | **58** | 33 | 0.55 | 1.2 | ND | y | - | - | - | - | - | - | - |
| 24SVE51A | Intermediate | 49-69 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | n | - | - | - | - | - | - | - | y | 30 | 12 | 0.34 | ND | ND | 0.024 | ND | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - |
| 24SVE51B | Shallow | 18-33 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | n | - | - | - | - | - | - | - | y | 30 | 90 | 0.13 | ND | ND | ND | ND | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - |
| 24SVE54 | Deep | 75-95 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | n | - | - | - | - | - | - | - | y | 30 | 35 | **44** | 1.40 | 0.49 | 0.91 | ND | y | 46 | 35 | **37** | 9.90 | ND | 0.84 | ND | y | - | - | - | - | - | - | - |
| 24SVE6 | Deep | 85-110 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | n | - | - | - | - | - | - | - | y | 30 | 290 | 14 | 0.96 | 0.83 | ND | ND | y | 30 | 280 | 7.5 | 1.6 | 0.61 | ND | ND | y | - | - | - | - | - | - | - |
| 24SVE77 | Deep | 75-100 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | y | 30 | 80 | **37** | 7 | 0.32 | 0.87 | ND | y | - | - | - | - | - | - | - |
| 24SVE77A | Intermediate | 39-54 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | y | 35 | 5 | 0.23 | ND | ND | 0.83 | ND | y | - | - | - | - | - | - | - |
| 24SVE77B | Shallow | 18-33 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | y | 25 | >125 | 0.68 | 0.46 | ND | 0.14 | ND | y | - | - | - | - | - | - | - |
| 24SVE53 | Deep | 73-88 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | y[3] | 20 | - | 15 | ND | 0.17 | 0.28 | ND |
| 24SVE53A | Intermediate | 45-65 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | y[3] | 20 | - | 0.72 | ND | ND | 0.9 | ND |
| 24SVE53B | Shallow | 15-35 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | y[3] | 20 | - | 0.21 | 0.12 | ND | 0.93 | ND |
| 24SVE55 | Deep | 80-100 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | y | 25 | 45 | 69 | 57 | 0.81 | 2.7 | 0.93 |
| 24SVE55A | Intermediate | 40-70 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | y | 25 | 10 | 8.5 | 6 | ND | 0.43 | ND |
| 24SVE55B | Shallow | 15-30 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | y | 20 | 90 | 2 | 2.7 | ND | 0.25 | ND |
| 24SVE62 | Deep | 80-105 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | y | 19 | 25 | 18 | ND | 0.41 | 0.24 | ND |
| 24SVE62B | Shallow | 15-40 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | y | 19 | 5 | 1 | ND | ND | 0.023 | ND |
| 24SVE67 | Deep | 75-100 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | y | 20 | 12.5 | **84** | ND | 1.2 | ND | ND |
| 24SVE67B | Shallow | 17-32 | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | n | - | - | - | - | - | - | - | y | 20 | 30 | 2.1 | 0.062 | ND | 0.067 | ND |
| 24SVE7 | Deep | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 24SVE7A | Intermediate | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Notes

Wells 24SVE35/35A/35B were treated using portable SVE systems in June and July.

Bold data indicate concentrations of contaminants are above threshold for the specific contaminant.

JA The analyte was positively identified, but the quantification is an estimate.

D The result was obtained from the analysis of a dilution.

[1] Well was on-line on 6/23/99. A 24-hr sample was collected on 6/24/99 and is the sample reported.

[2] Well was on-line but not sampled.

[3] Flow measurements could not be taken.

M60050_003955
MCAS EL TORO
SSIC NO. 5090.3.A

# SENSITIVE RECORD

PORTIONS OF THIS RECORD ARE CONSIDERED SENSITIVE AND ARE NOT AVAILABLE FOR PUBLIC VIEWING

PLATE 1 – PHASE I VADOSE ZONE REMEDIATION
WELL LOCATION MAP

FOR ADDITIONAL INFORMATION, CONTACT:

DIANE C. SILVA, RECORDS MANAGER
NAVAL FACILITIES ENGINEERING COMMAND, SOUTHWEST
1220 PACIFIC HIGHWAY
SAN DIEGO, CA 92132

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PRIMARY SOURCE OF MAP INFORMATION
DRAFT FINAL ENGINEERING
DESIGN REPORT (BECHTEL)

## EXPLANATION

24SVE1 — SOIL VAPOR EXTRACTION WELL

24SVE51 — PHASE I SOIL VAPOR EXTRACTION WELL

NORTH

0 110 220

SITE 24, MCAS, EL TORO

PHASE I VADOSE ZONE REMEDIATION
WELL LOCATION MAP

| Date 8-99 | EARTH TECH | Plate 1 |
|---|---|---|
| Project No. 29307 | | |