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2008 ANNUAL PROGRESS REPORT

for

**Former Fairchild Building 20
464 Ellis Street
Middlefield-Ellis-Whisman Study Area
Mountain View, California**

prepared for

Schlumberger Technology Corporation

225 Schlumberger Drive
Sugar Land, TX 77478

June 15, 2009





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submitted to

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Weiss Project No. 363-1883-2-04

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June 15, 2009
Date

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ACRONYMS AND ABBREVIATIONS

106 Order	Administrative Order for Remedial Design and Remedial Action
cm/sec	centimeter per second
DHS	Department of Health Services, California
Fairchild	Fairchild Semiconductor Corporation
ft bgs	feet below ground surface
FSCRD	final source control remedial design
HLA	Harding Lawson Associates
K	hydraulic conductivity
µg/L	micrograms per liter
mg/kg	milligram per kilogram
MEW	Middlefield-Ellis-Whisman
MCLs	maximum contaminant levels
NASA	National Aeronautics and Space Administration
NPL	National Priority List
PRPs	potentially responsible parties
QA/QC	quality analysis and quality control
RAOs	remedial action objective
RGRP	Regional Groundwater Remediation Program
RI/FS	remedial investigation and feasibility study
ROD	Record of Decision
RRWs	regional recovery wells
SCRWs	source control recovery wells
SCVWD	Santa Clara Valley Water District
the Site	464 Ellis Street in Mountain View, California
SVE	Soil Vapor Extraction
Water Board	California Regional Water Quality Control Board, San Francisco Bay Region
Weiss Associates	Weiss
TCE	trichloroethene
USEPA	United States Environmental Protection Agency
VOCs	volatile organic compounds

SUMMARY

This 2008 Annual Progress Report for Fairchild Semiconductor Corporation (Fairchild) former Buildings 20 and 20A (Building 20) located at 464 Ellis Street in Mountain View, California (the Site; Figures 1 and 2) contains a summary of Site activities from January 1 through December 31, 2008, and analytical data for the past five years. This report is submitted in accordance with Section XV of the 1990 Administrative Order for Remedial Design and Remedial Action (106 Order) issued by the United States Environmental Protection Agency (USEPA), Section XI of the Consent Decree entered in Action No. 20275 (N.D. Cal.) in 1992 (Consent Decree) and the USEPA's correspondence prescribing 2004 and future Annual Report contents (USEPA, 2005).

The 464 Ellis Street property does not have an associated groundwater extraction and treatment system. However, nine groundwater extraction wells associated with other systems are located on the property, as follows:

- RAY-1A and RAY-1B1: Two source control recovery wells (SCRWs) associated with the upgradient former Raytheon site, with extracted groundwater treated at the 350 Ellis Street treatment plant.
- REG-4B1 and 65B3: Two regional recovery wells (RRWs), with the extracted groundwater treated by Fairchild System 19, located at 369 Whisman Road.
- DW3-219, DW3-244, DW3-334, DW3-364, and DW3-505R: Five deep aquifer RRWs that have been turned off with USEPA approval.

The operations and monitoring of these extraction wells are reported in the respective annual progress reports for the former Raytheon site (Locus, 2009) and the Regional Groundwater Remediation Program (Weiss, 2009a).

Twelve groundwater monitoring wells are currently used to evaluate the distribution of volatile organic compounds (VOCs) in groundwater at the Building 20 Site. These monitoring wells are sampled annually and water levels are collected semi-annually.

Site activities conducted in compliance with the 106 Order during this reporting period included monitoring of groundwater at Building 20, and submitting an Optimization Evaluation to the USEPA for the Fairchild sites on September 3, 2008.

The VOC concentrations in the Building 20 monitoring wells continue to remain well below historical maximums, and show a long term decreasing trend. VOC concentrations in the monitoring wells and all extraction wells located at the Site are discussed in the MEW Regional Groundwater Remediation Program (RGRP) 2008 Annual Progress Report (Weiss, 2009a).

Request to Change Reporting Requirements for Building 20: Potentially responsible parties (PRPs) requested in last year's Annual Progress Report that further facility-specific reporting for Former Fairchild Building 20 be eliminated (Weiss 2008a). However, this request has not yet been acknowledged by the USEPA. The PRPs are requesting again that the requirement for facility-specific reporting for Former Fairchild Building 20 be discontinued. The rationale for this request is:

1. No potential source areas were identified at former Fairchild Building 20 property during Site investigations.
2. Building 20 does not have an associated groundwater treatment system.
3. There is no facility-specific capture to evaluate.
4. Measured water levels and analytical results from groundwater monitoring wells at the property are reported in the RGRP Annual report.
5. Monitoring results from 2008 continue to indicate that VOC concentrations in groundwater are generally stable to declining.

In summary, the groundwater monitoring data for Building 20 are evaluated in the RGRP report, and this report is redundant with other reports at the MEW Site since all information is covered under Raytheon Facility Specific and RGRP reporting.

1. INTRODUCTION

This 2008 Annual Progress Report contains a summary of Site activities from January 1 through December 31, 2008 at the former Fairchild Semiconductor Corporation (Fairchild) Buildings 20 and 20A previously located at 464 Ellis Street in Mountain View, California (the Site; Figures 1 and 2). This report is submitted in accordance with Section XV of the 1990 Administrative Order for Remedial Design and Remedial Action (106 Order) issued by the United States Environmental Protection Agency (USEPA), Section XI of the Consent Decree entered in Action No. 20275 (N.D. Cal.) in 1992 (Consent Decree) and the USEPA's correspondence prescribing 2004 and future Annual Report contents (USEPA, 2005). Weiss Associates (Weiss) prepared this report on behalf of Schlumberger Technology Corporation, and Geosyntec Consultants (Geosyntec) contributed to the content of this report.

1.1 Site Background

The Building 20 Site is located at 464 Ellis Street, in a light-industrial area in Mountain View California. Building 20 functioned as a silicon wafer production facility for Fairchild Semiconductor Corporation from 1968 to the mid 1980's. The primary constituent of concern at this facility is trichloroethene (TCE) in groundwater from historical underground tanks/piping, sumps and/or surface spills.

The Site is located within the Middlefield-Ellis-Whisman (MEW) area, an approximately ½-square mile area bound by Middlefield Road on the south, Ellis Street on the east, Whisman Road on the west, and Highway 101 on the north. Remedial Investigation and Feasibility Studies (RI/FS) were completed in 1988 (HLA, 1987; Canonie, 1988), with the USEPA issuing a Record of Decision (ROD) in 1989. The ROD and two subsequent Explanations of Significant Differences (ESDs) specify the remedial actions for the MEW area (USEPA, 1989, 1990, 1996).

Remediation within the MEW area includes facility-specific activities by the individual PRPs, (such as this facility specific Site), and a Regional Groundwater Remediation Program (RGRP) that addresses commingled volatile organic chemicals (VOCs) that have migrated beyond the facility-specific areas and cannot be attributed to a single source. The RGRP also compiles and synthesizes all groundwater monitoring data, and presents this information in the RGRP annual report (Weiss, 2009a).

1.2 Local Hydrology

Subsurface geology consists of interbedded sediments ranging in grain size from silty clay to sandy gravel. The water-bearing zones defined at the MEW area are summarized in the following table:

Groundwater Zones	Approximate Depth Interval Below Ground Surface
A ^a	0 to 45 feet
B1 ^b	50 to 75 feet
B2	75 to 110 feet
B3	120 to 160 feet
C	200 to 240 feet
Deep Aquifer	>240 feet

^aNavy and NASA refer to this zone as A1 zone north of Highway 101.

^bNavy and NASA refer to this zone as A2 north of Highway 101.

> = greater than

The upper groundwater zone at the MEW area, defined as the saturated zone above the B/C aquitard, occurs from the top of the saturated zone to a depth of approximately 165 ft bgs south of Highway 101 and generally less than 100 ft bgs north of Highway 101. The B/C aquitard is the major confining layer beneath the MEW area. The upper groundwater zone is subdivided into two units, the A-zone and the B-zone, which are separated by the A/B aquitard. The B aquifer has been further subdivided into three zones. From youngest to oldest, these are the B1-, B2-, and B3-zones, separated by aquitards, designated the B1/B2 aquitard and the B2/B3 aquitard. The lower groundwater zones occur below the B/C aquitard, from about 200 ft bgs. Two lower groundwater zones have been defined: the C-zone and what has been termed the Deep Aquifer (HLA, 1987; Intel, 1987).

The ranges of hydraulic conductivity (K) hydraulic gradient, and Transmissivity of the upper aquifer zone i.e., above the B3/C aquitard, calculated from pumping tests conducted at the MEW Site from 1986 through 2005¹ as presented below:

Water-Bearing Zone	Estimated Hydraulic Conductivity (ft/day)		Approximate Horizontal Gradient (ft/ft)	Saturated Thickness (ft)	Transmissivity (ft ² /day)	
	Low	High			Low	High
A-zone	6	480	0.004	15	44	4,400
B1-zone	20	260	0.003	25	150	2,600
B2-zone	0.4	5	0.002 to 0.005	35	2	230
B3-zone	0.5	5	0.001 to 0.002	40	5	130

Currently and historically, the horizontal component of groundwater flow beneath the Site is generally towards the north during non-pumping and pumping conditions. The Site groundwater

¹ References are Canonic 1986a, 1986b 1987 & 1988, Geomatrix 2004, HLA 1986 & 1987, Locus 1998, PRC 1991, Navy 2005 and Weiss Associates 1995.

gradients and velocities have been locally altered near SCRWs, RRWs, and the Fairchild and Raytheon slurry walls (Weiss 2009a).

The vertical component of groundwater flow is generally upward from the B1- to the A-zone, but is locally downward in some areas of the Site (HLA, 1987). Vertical gradients below the B1-zone are generally upward (Geosyntec et al, 2008).

1.3 Description of Remedy

No potential sources were identified at Fairchild's former Building 20, and the Final Source Control Remedial Design (FSCRD) for the Site was included as part of Raytheon Company's (Raytheon's) FSCRD for its facility at 350 Ellis Street in Mountain View, California. The remediation of soils at the Site was incorporated in the *in-situ* aeration system operated by Raytheon at its 350 Ellis Street facility. A SVE and treatment system started operation on August 7, 1996.

On May 7, 1997, USEPA approved the Soil Closure Confirmation Sampling Report for areas outside Raytheon's slurry wall at 350 Ellis Street and on the adjacent former Fairchild Building 20 Site. The SVE wells and associated piping in the area have since been removed.

Raytheon installed and currently operates two SCRWs, RAY-1A and RAY-1B1, at the 464 Ellis Street property. Extracted groundwater from the two wells is conveyed to Raytheon's groundwater treatment system on their 350 Ellis Street property. Additionally, the MEW RGRP installed one B1-zone (REG-4B1), one B3-zone (65B3), and five C/Deep aquifer regional recovery wells, (RRWs) (DW3-219, DW3-244, DW3-334, DW3-364, and DW3-505R) at the Site. When operating, groundwater from the RRWs is conveyed to Fairchild System 19, located at 369 Whisman Road.

The Remedial Action Objectives (RAOs) for the MEW area are to; (1) protect potential potable water supplies, (2) remediate or control the elevated concentrations of chemicals present in the localized vadose zone soils, and (3) remediate or control the groundwater that contains elevated concentrations of specified chemicals, including discharge of such groundwater into the surface water (Canonie, 1988).

The groundwater cleanup standards are 5 µg/L of TCE for the shallow aquifers and 0.8 µg/L TCE for the C and Deep aquifers. The cleanup levels for the other VOCs of concern listed in the ROD are:

- Chloroform – 100 µg/L;
- 1,1-dichloroethene – 6 µg/L;
- 1,1,1-trichloroethane – 200 µg/L; and,
- Vinyl chloride – 0.5 µg/L.

The MCLs for the following chemicals of concern were not specified in the ROD: 1,2-dichlorobenzene, 1,1-dichloroethane, 1,2-dichloroethene, Freon 113, phenol, and tetrachloroethene (USEPA, 1989).

1.4 Summary of Site Activities and Deliverables

Site activities conducted in compliance with the 106 Order during this reporting period include:

- Collecting semi-annual groundwater elevation measurements in Site monitoring wells on March 27 and November 20;
- Attending the All Parties Meeting on May 14, June 12, June 26, and December 3;
- Distributing the 2007 Annual Progress Report to the United States Environmental Protection Agency (USEPA) and MEW Distribution List parties on June 15;
- Optimization Evaluation, Fairchild sites on September 3, 2008 (Geosyntec et al, 2008);
- Collecting groundwater samples from Site monitoring wells in November;
- Assessing the progress of remedial actions during 2008; and,
- Planning remedial actions for 2009.

Section 2 of this report provides a summary of groundwater extraction and remediation at the Site during the reporting period. Sections 3-7 document additional activities, problems encountered, technical assessment, conclusions and recommendations, and a summary of remedial activities planned for calendar year 2009. Supporting data are presented in Figures 1 and 2, Tables 1 through 3, and Appendices A through C.

2. GROUNDWATER EXTRACTION AND TREATMENT

2.1 Groundwater Extraction Wells

There are no extraction wells associated with the Building 20 Site.

Raytheon SCRWs, RAY-1A and RAY-1B1 at the 464 Ellis Street property are discussed in the Raytheon Annual Report (Locus, 2009). The MEW RGRP RRWs REG-4B1, 65B3, and DW3-219, DW3-244, DW3-334, DW3-364, and DW3-505R are discussed in the RGRP and Fairchild System 19 Annual Reports (Weiss, 2009a and 2009b).

2.2 Groundwater Monitoring Wells

There are currently twelve monitoring wells associated with the Building 20 Site. Four wells are in the A zone, two in the B1 zone, four in the B2 zone, and one each in the B3 and C zones. These wells are sampled annually for VOCs and water levels are measured semi-annually.

2.3 VOC Analytical Results

The 2008 Annual Groundwater Sample Event at the Site was conducted in November 2008. The sampling schedule for wells at this Site is provided in Table 1. A summary of chemical analytic results for the previous five years (through 2008) is provided in Table 2. VOC versus time graphs for Site monitoring wells are included in Appendix B. Appendix C contains the quality analysis and quality control (QA/QC) report and summary tables. The data provided in Table 2 and Appendix B show that for the monitoring wells sampled in 2008, VOC concentrations in groundwater are generally stable to declining.

All results, including TCE isoconcentration contour maps for 2008, are included in the MEW RGRP Annual Progress Report (Weiss, 2009a). Copies of the chain of custody forms and analytic reports for the samples collected during the 2008 Annual Sampling event are located in Appendix G in the MEW RGRP 2008 Annual Progress Report (Weiss, 2009a).

3. OTHER ACTIVITIES

3.1 Optimization Evaluation for Groundwater

In response to a request from USEPA², an Optimization Evaluation Report for the Fairchild Sites in the MEW area was submitted to USEPA September 3, 2008 (Geosyntec et al, 2008). The evaluation considered previous efficiency evaluations at the Site (Northgate, 2007a-c and 2008a-b) and recommended implementing an optimization program for the Fairchild sites in conjunction with similar optimization programs for the RGRP and other facilities. The MEW Companies are awaiting USEPA comments on the Optimization Evaluations prior to implementing the recommended programs.

3.2 Air/ Vapor Intrusion

The MEW companies have completed site investigation and feasibility studies of remedial alternatives to address the vapor intrusion pathway at the Site. A *Draft Supplemental Remedial Investigation (RI) Report for Vapor Intrusion* report (Draft RI; dated August 14, 2006) and a *Draft Supplemental Feasibility Study Report* (Draft FS; dated October 16, 2006) were submitted to the USEPA to evaluate the remedial alternatives available to mitigate the potential vapor intrusion pathway in the MEW area (Locus, 2006a, 2006b). The USEPA provided comments on both reports on November 15, 2007. A *Revised Supplemental Feasibility Study for Vapor Intrusion* was submitted in January 2008 (Locus, 2008a) and a *Revised Supplemental Remedial Investigation* report was submitted to the USEPA in February 2008 (Locus, 2008b). The USEPA issued comments on June 2, 2009, and plans to issue a proposed plan for a ROD amendment in 2009.

3.3 Annual Settlement Survey

An annual settlement survey was performed on December 17, 2008. The purpose of these annual measurements is to evaluate any potential adverse effects on the Site facilities, and whether long-term remedial groundwater extraction could affect soil settlement in the MEW study area. Geosyntec reviewed the historical settlement and water level elevation data and concluded that the measured values of ground elevation change do not appear to be related to groundwater extraction operations. Furthermore, the changes are relatively uniform over a large area, whereas settlement induced stress is typically caused by differential settlement over the scale of a single building footprint. Additional information on the settlement survey can be found in the RGRP 2008 Annual Progress Report (Weiss, 2009a).

² Letter from USEPA to MEW Parties dated 5 June 2008,

4. PROBLEMS ENCOUNTERED

There were no problems related to Building 20 during 2008.

5. TECHNICAL ASSESSMENT

The following assessment of the groundwater remedy performance for Building 20 was made based on the data collected during 2008.

- The Remedy Is Functioning As Intended. Groundwater is being addressed under the Raytheon and RGRP programs. An Annual Remedy Performance Checklist is included in Appendix A.
- VOC Concentrations Are Decreasing. VOC concentrations in monitoring wells at the Site remain stable or are declining. Since 2003, TCE concentrations in well 11C have fluctuated between non-detect and 6.5 µg/L. TCE was detected at 2.0 µg/L in November 2008, indicating that concentrations remain low.

The Raytheon 2008 Annual Progress Report and the MEW RGRP 2008 Annual Progress Report present further discussion of VOC mass removal and hydraulic control at the 464 Ellis Street property (Locus, 2009 and Weiss, 2009a).

6. CONCLUSIONS AND RECOMMENDATIONS

Twelve monitoring wells were used to assess remedial progress in the area. These wells are stable to decreasing. The reader is referred to the Raytheon 2008 Annual Progress Report and the MEW RGRP 2008 Annual Progress Report for further discussion of VOC mass removal and hydraulic control at the Site (Locus, 2009 and Weiss, 2009a).

Request to Change Reporting Requirements for Building 20: Potentially responsible parties (PRPs) requested in last year's Annual Progress Report that further facility-specific reporting for Former Fairchild Building 20 and 20A be eliminated (Weiss, 2008a). However, this request has not yet been acknowledged by the USEPA. The PRPs are requesting again that facility-specific reporting for Former Fairchild Building 20 be deleted. The rationale for this request is:

1. No potential source areas were identified at former Fairchild Building 20 property during Site investigations.
2. Building 20 does not have an associated groundwater treatment system.
3. There is no facility-specific capture to evaluate.
4. Measured water levels and analytical results from groundwater monitoring wells at the property are reported in the RGRP Annual report.
5. Monitoring results from 2008 continue to indicate that VOC concentrations in groundwater are generally stable to declining.

In summary, the groundwater monitoring data are evaluated in the RGRP report, and this report is redundant with other reports at the MEW Site since all information is covered under Raytheon Facility Specific and RGRP reporting.

7. UPCOMING WORK IN 2009 AND PLANNED FUTURE ACTIVITIES

In 2009, the groundwater wells will continue to be monitored in accordance with the Site monitoring and reporting schedule.

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FIGURES

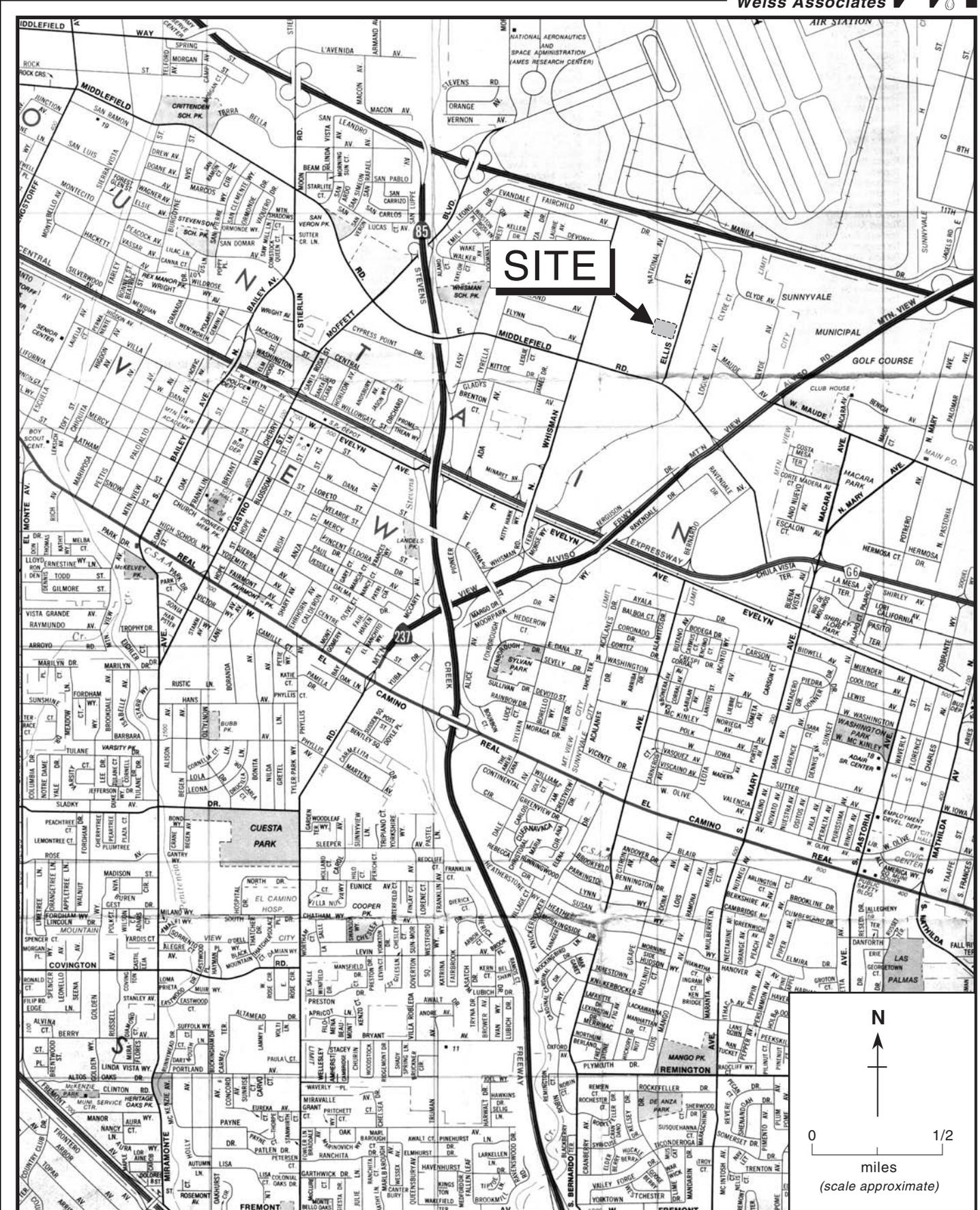


Figure 1. Site Location Map, Former Fairchild Building 20, 464 Ellis Street, Mountain View, California



TABLES

Table 1. 2008 Monitoring and Reporting Schedule, Former Fairchild Building 20, 464 Ellis Street, Mountain View, California

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
153A											1,o	
26A											1,o	
29A											1,o	
99A											1,o	
91B1											1,o	
92B1											1,o	
132B2											1,o	
134B2											1,o	
16B2											1,o	
89B2											1,o	
28B3											1,o	
11C											1,o	
Water Levels			X								X	
Annual Progress Report						X						

Notes and Abbreviations:

All the wells were sampled annually by Fairchild and RGRP

1 = sample analysis by USEPA Method 8010MS for VOCs

o = standard observations, including field analysis for pH, temperature, and conductivity

Table 2. Chemical Analytic Results Summary, January 2004 through December 2008, Former Fairchild Buildings 20 and 20A, 464 Ellis Street, Mountain View, California

Sample Location	Sample Date	Lab/Analytical Method	Chloro-form	1,1-DCA	1,2-DCA	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	Freon 113	Methylene Chloride	PCE	1,1,1-TCA	TCE	Vinyl Chloride	Total VOC's
<----- micrograms per liter (µg/L)----->															
26A	11/09/04	CT/8260	<0.5	2.1	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<0.5	<0.5	<0.5	<0.5	2
26A	11/07/05	CT/8260	<1	1.9	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<0.5	<0.5	<0.5	<0.5	2
26A	11/06/06	CT/8260	<1	2.2	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<0.5	<0.5	0.5	<0.5	3
26A	11/09/07	CT/8260	<1	2.7	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<0.5	<0.5	<0.5	<0.5	3
26A	11/07/08	CT/8260	<1	1.1	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<0.5	<0.5	0.5	<0.5	2
29A	11/09/04	CT/8260	1.4	4.4	<0.5	9.9	<0.5	<0.5	5.5	<20	1.9	70	2	<0.5	95
29A	11/08/05	CT/8260	1.5	6.4	<0.5	12	<0.5	<0.5	6.1	<20	<0.5	80	0.9	<0.5	107
29A	11/06/06	CT/8260	<1	3.3	<0.5	9.2	<0.5	<0.5	3.1	<20	0.9	47	1.9	<0.5	65
29A	11/09/07	CT/8260	<1	4.3	<0.5	8.4	<0.5	<0.5	3.6	<20	0.8	48	1.9	<0.5	67
29A	11/11/08	CT/8260	1.2	6.2	<0.5	11	<0.5	<0.5	4	<20	<0.5	57	1.3	<0.5	81
99A	11/11/04	CT/8260	<3.6	7.6	<3.6	9.8	210	6.2	53	<36	<3.6	16	460	<3.6	763
99A	11/09/05	CT/8260	<6.3	5.7	<3.1	<3.1	190	18	45	<130	<3.1	11	410	<3.1	680
99A	11/07/06	CT/8260	<2.5	3.9	<1.3	6.5	160	1.4	34	<50	<1.3	8.3	300	<1.3	514
99A	11/08/07	CT/8260	<4	3.9	<2	5.2	140	2.9	41	<80	<2	9.5	360	<2	563
99A	11/11/08	CT/8260	<3.3	4.2	<1.7	6.6	150	<1.7	44	<67	<1.7	7.7	350	<1.7	563
153A	11/23/04	CT/8260	<0.5	<0.5	<0.5	1	1.3	<0.5	1	<20	<0.5	1.1	17	<0.5	21
153A	11/08/05	CT/8260	<1	<0.5	<0.5	1	1.2	<0.5	0.8	<20	<0.5	1.1	17	<0.5	21
153A	11/06/06	CT/8260	<1	<0.5	<0.5	1.2	1	<0.5	0.9	<20	<0.5	1.2	16	<0.5	20
153A	11/14/07	CT/8260	<1	<0.5	<0.5	1.1	1.5	<0.5	1.4	<20	<0.5	1.1	20	<0.5	25
153A	11/07/08	CT/8260	<1	<0.5	<0.5	0.7	1.2	<0.5	0.7	<20	<0.5	1	15	<0.5	19
153A (DUP)	11/07/08	CT/8260	<1	<0.5	<0.5	0.8	1.1	<0.5	0.7	<20	<0.5	1	16	<0.5	20
91B1	11/12/04	CT/8260	<0.5	3.9	<0.5	2.8	74	0.7	2.2	<20	<0.5	0.6	120	<0.5	204
91B1	11/09/05	CT/8260	<3.3	3.9	<1.7	<1.7	66	5.3	<1.7	<67	<1.7	<1.7	140	<1.7	215
91B1	11/07/06	CT/8260	<1	2.9	<0.5	2.5	75	0.8	1.3	<20	<0.5	0.6	130	0.5	214
91B1	11/08/07	CT/8260	<1.4	2.7	<0.7	1.3	62	1.7	1	<29	<0.7	<0.7	120	<0.7	189
91B1	11/11/08	CT/8260	<1	3.5	<0.5	2.7	74	0.9	1.7	<20	<0.5	0.6	120	<0.5	203
92B1	11/11/04	CT/8260	<0.5	<0.5	<0.5	0.6	5.7	<0.5	<5	<5	<0.5	0.6	120	<0.5	127

Table 2. Chemical Analytic Results Summary, January 2004 through December 2008, Former Fairchild Buildings 20 and 20A, 464 Ellis Street, Mountain View, California

Sample Location	Sample Date	Lab/Analytical Method	Chloro-form	1,1-DCA	1,2-DCA	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	Freon 113	Methylene Chloride	PCE	1,1,1-TCA	TCE	Vinyl Chloride	Total VOC's
<----- micrograms per liter (µg/L)----->															
92B1	11/08/05	CT/8260	<3.3	<1.7	<1.7	<1.7	4.3	<1.7	<1.7	<67	<1.7	<1.7	110	<1.7	114
92B1	11/07/06	CT/8260	<1.4	<0.7	<0.7	<0.7	4.9	<0.7	<0.7	<29	<0.7	<0.7	100	<0.7	105
92B1	11/08/07	CT/8260	<2	<1	<1	<1	3.8	<1	<1	<40	<1	<1	94	<1	98
92B1	11/18/08	CT/8260	<2	<1	<1	<1	4.8	<1	1.2	<40	<1	<1	98	<1	104
16B2	11/09/04	CT/8260	<0.5	<0.5	<0.5	<0.5	3.4	<0.5	<0.5	<20	<0.5	<0.5	83	<0.5	86
16B2	11/07/05	CT/8260	<1.4	<0.7	<0.7	<0.7	2.9	<0.7	<0.7	<29	<0.7	<0.7	100	<0.7	103
16B2	11/06/06	CT/8260	<1	<0.5	<0.5	<0.5	2.6	<0.5	<0.5	<20	<0.5	<0.5	95	<0.5	98
16B2	11/09/07	CT/8260	<1	<0.5	<0.5	<0.5	2.5	<0.5	<0.5	<20	<0.5	<0.5	78	<0.5	81
16B2	11/11/08	CT/8260	<1	<0.5	<0.5	<0.5	2.9	<0.5	<0.5	<20	<0.5	<0.5	78	<0.5	81
89B2	11/11/04	CT/8260	<0.5	<0.5	<0.5	<0.5	11	<0.5	<5	<5	<0.5	<0.5	0.6	<0.5	12
89B2	11/09/05	CT/8260	<1	<0.5	<0.5	<0.5	21	<0.5	<0.5	<20	<0.5	<0.5	20	<0.5	41
89B2	11/07/06	CT/8260	<1	<0.5	<0.5	<0.5	19	<0.5	<0.5	<20	<0.5	<0.5	25	<0.5	44
89B2	11/08/07	CT/8260	<1	<0.5	<0.5	<0.5	11	<0.5	<0.5	<20	<0.5	<0.5	19	<0.5	30
89B2	11/11/08	CT/8260	<1	<0.5	<0.5	<0.5	8.9	<0.5	<0.5	<20	<0.5	<0.5	18	<0.5	27
132B2	11/11/04	CT/8260	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	<5	<5	<0.5	<0.5	<0.5	<0.5	1
132B2	11/07/05	CT/8260	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<0.5	<0.5	0.5	<0.5	1
132B2	11/07/06	CT/8260	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<0.5	<0.5	<0.5	<0.5	ND
132B2	11/08/07	CT/8260	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<0.5	<0.5	<0.5	<0.5	ND
132B2	11/11/08	CT/8260	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<0.5	<0.5	<0.5	<0.5	ND
134B2	11/09/04	CT/8260	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<0.5	<0.5	<0.5	<0.5	ND
134B2	11/07/05	CT/8260	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<0.5	<0.5	<0.5	<0.5	ND
134B2	11/07/06	CT/8260	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<0.5	<0.5	<0.5	<0.5	ND
134B2	11/09/07	CT/8260	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<0.5	<0.5	<0.5	<0.5	ND
134B2	11/07/08	CT/8260	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<0.5	<0.5	<0.5	<0.5	ND
28B3	11/09/04	CT/8260	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<0.5	<0.5	<0.5	<0.5	ND
28B3	11/07/05	CT/8260	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<0.5	<0.5	<0.5	<0.5	ND
28B3	11/06/06	CT/8260	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<0.5	<0.5	<0.5	<0.5	ND

Table 2. Chemical Analytic Results Summary, January 2004 through December 2008, Former Fairchild Buildings 20 and 20A, 464 Ellis Street, Mountain View, California

Sample Location	Sample Date	Lab/Analytical Method	Chloro-form	1,1-DCA	1,2-DCA	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	Freon 113	Methylene Chloride	PCE	1,1,1-TCA	TCE	Vinyl Chloride	Total VOC's
<----- micrograms per liter (µg/L)----->															
28B3	04/24/08	CT/8260	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<0.5	<0.5	<0.5	<0.5	ND
28B3	11/14/08	CT/8260	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<0.5	<0.5	<0.5	<0.5	ND
11C	03/15/04	CT/8260	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<0.5	<0.5	<0.5	ND
11C (DUP)	03/15/04	CT/8260	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<0.5	<0.5	<0.5	ND
11C	11/11/04	CT/8260	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	<0.5	1	<0.5	1
11C	11/07/05	CT/8260	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<0.5	<0.5	0.7	<0.5	1
11C	11/07/06	CT/8260	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<0.5	<0.5	<0.5	<0.5	ND
11C	11/19/07	CT/8260	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<0.5	<0.5	1.6	<0.5	2
11C	11/14/08	CT/8260	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<0.5	<0.5	2	<0.5	2

Notes and Abbreviations:

< # = analyte not detected above the reported detection limit of "#" µg/L

* = duplicate sample collected on 3/15/04 from well 11C by purging 3 casing volumes prior to sampling (original and other duplicate sample collected by using micropurge sampling technique).

8260 = USEPA Method 8260B for halogenated VOCs, for USEPA Method 8010 list of analytes

CT = Curtis and Tompkins, Berkeley, California

DCA = Dichloroethane

DCE = Dichloroethene

DUP = duplicate sample

ND = no analytes detected above the laboratory detection limit

PCE = Tetrachloroethene

TCA = Trichloroethane

TCE = Trichloroethene

VOCs = volatile organic compounds

Table 3. Monitoring Well Details, Former Fairchild Building 20, 464 Ellis Street, Mountain View, California

Well Details	Date Installed	Zone	TOC Elevation (ft amsl)	Diameter (inches)	Total Well Depth (ft btoc)	Top of Screened Interval (ft btoc)	Bottom of Screened Interval (ft btoc)	Top of Sand Pack (ft btoc)	Bottom of Sand Pack (ft btoc)	Well Type
153A	10/10/91	A	45.72	4	23	13	23	12	25	Mon
26A	02/02/82	A	47.20	2	30	12	30	10	30	Mon
29A	02/02/82	A	46.08	2	30	15	30	10	30	Mon
99A	07/07/86	A	48.33	4	24.5	9.5	24.5	8	29	Mon
91B1	07/07/86	B1	48.44	4	58	48	58	43	60	Mon
92B1	06/06/86	B1	46.99	4	65	55	65	50	68	Mon
132B2	02/11/87	B2	49.21	4	89	79	89	78	91	Mon
134B2	06/17/87	B2	47.24	4	88	83	88	78	90	Mon
16B2	06/06/86	B2	47.18	4	84	79	84	77	87	Mon
89B2	06/06/86	B2	48.43	4	90	80	90	77	92	Mon
28B3	06/06/85	B3	46.85	4	132	122	132	120	134	Mon
11C	06/06/87	C	49.21	4	216	209	214	204	216	Mon

Notes and Abbreviations:

Top of Screened Interval = feet below top-of-casing

Bottom of Screened Interval = feet below top-of-casing

Top of Sand Pack = feet below top-of-casing

Bottom of Sand Pack = feet below top-of-casing

ft = feet

Diameter = inches

Depth = feet below top-of-casing (ft btoc)

TOC Elevation = feet above mean sea level (ft amsl)

Well Type = extraction well (Ext), monitoring well (Mon), piezometer (Pz)

Zone = A, B1, B2, or C water-bearing zone

APPENDIX A

2008 ANNUAL REPORT REMEDY PERFORMANCE CHECKLIST

2008 Annual Report Remedy Performance Checklist

I. GENERAL SITE INFORMATION			
Facility Name: Former Fairchild Facilities, Middlefield-Ellis-Whisman Study Area (MEW Site)			
Facility Address, City, State: 515/545 North Whisman Road and 313 Fairchild Drive (former Bldgs. 1-4) <div style="text-align: center; padding: 5px;"> 369 and 441 North Whisman Road (former Bldgs. 13 and 19 and 23) 401 National Avenue (former Bldg. 9) 644 National Avenue (former Bldg. 18) 464 Ellis Street (former Bldg. 20 and 20A) </div>			
Checklist completion date: June 3, 2009	EPA Site ID: System-1: CAR000164285 System-3: CAD095989778 System-19: CAR000164228		
Site Lead: <input type="checkbox"/> Fund <input checked="" type="checkbox"/> PRP <input type="checkbox"/> State <input type="checkbox"/> State Enforcement <input type="checkbox"/> Federal Facility <input type="checkbox"/> Other: EPA Region IX			
Site Remedy Components (Include Other Reference Documents for More Information, as appropriate):			
<ol style="list-style-type: none"> 1. Three slurry wall enclosures around former Buildings 1-4, Building 9, and Building 19. The slurry walls extend to a depth of about 40 feet below ground surface and are keyed a minimum of two feet into the A2/B1 aquitard. 2. Three treatment systems as detailed below: <p style="margin-left: 20px;">System 1:</p> <ul style="list-style-type: none"> • Three 5,000-pound GAC vessels in series, treatment pad, controls, double-contained groundwater conveyance piping, vaults, electrical distribution, controls and other appurtenances. • Thirteen source control recovery wells (Four wells operated during 2008). • One regional recovery wells (One well operated during 2008). <p style="margin-left: 20px;">System 3:</p> <ul style="list-style-type: none"> • Three 5,000-pound GAC vessels in series, treatment pad, controls, double-contained groundwater conveyance piping, vaults, electrical distribution, controls and other appurtenances. • Seven source control recovery wells (Five wells operated during 2008). • Three regional recovery wells (Two wells operated during 2008). <p style="margin-left: 20px;">System 19:</p> <ul style="list-style-type: none"> • Three 5,000-pound GAC vessels in series, treatment pad, controls, double-contained groundwater conveyance piping, vaults, electrical distribution, controls and other appurtenances. • Fifteen source control recovery wells (Ten operated during 2008). • Seven regional recovery wells (Two operated during 2008). 			
II. CONTACTS			
<u>List important personnel associated with the Site:</u> Name, title, phone number, e-mail address:			
	Name/Title	Phone	E-mail
RP/Facility Representative	Du'Bois (Joe) Ferguson Schlumberger Technology Corporation	281-285-3692	dferguson3@sugar-land.oilfield.slb.com
RP Consultant	John Gallinatti Geosyntec Consultants	510-285-2750	jgallinatti@geosyntec.com
RP Consultant	Tess Byler Weiss Associates	650-968-7000	tb@weiss.com

2008 Annual Report Remedy Performance Checklist

III. O&M COSTS (OPTIONAL)
<p>What is your annual O&M cost total for the reporting year? _____</p> <p>Breakout your annual O&M cost total into the following categories (use either dollars or %):</p> <ul style="list-style-type: none"> • Analytical (e.g., lab costs): _____ • Labor (e.g., site maintenance, sampling): _____ • Materials (e.g., treatment chemicals): _____ • Oversight (e.g., project management): _____ • Utilities (e.g., electric, gas, phone, water): _____ • Reporting (e.g., NPDES, progress): _____ • Other (e.g., capital improvements): _____
<p>Describe unanticipated/unusually high or low O&M costs (go to section [fill in] to recommend optimization methods):</p>
IV. ON-SITE DOCUMENTS AND RECORDS (Check all that apply)
<p> <input checked="" type="checkbox"/> O&M Manual <input checked="" type="checkbox"/> O&M Maintenance Logs <input type="checkbox"/> O&M As-built drawings <input checked="" type="checkbox"/> O&M reports <input checked="" type="checkbox"/> Daily access/Security logs <input checked="" type="checkbox"/> Site-Specific Health & Safety Plan <input checked="" type="checkbox"/> Contingency/Emergency Response Plan <input checked="" type="checkbox"/> O&M/OSHA Training Records <input checked="" type="checkbox"/> Settlement Monument Records <input type="checkbox"/> Gas Generation Records <input checked="" type="checkbox"/> Groundwater monitoring records <input type="checkbox"/> Leachate extraction records <input checked="" type="checkbox"/> Discharge Compliance Records <input type="checkbox"/> Air discharge permit <input checked="" type="checkbox"/> Effluent discharge permit <input checked="" type="checkbox"/> Waste disposal, POTW Permit </p> <p>Are these documents currently readily available? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If no, where are records kept?</p> <p>Documents and records are available at treatment systems and/or on-site office located at, 350 E. Middlefield Road Mountain View, CA</p>
V. INSTITUTIONAL CONTROLS (as applicable)
<p>List institutional controls called for (and from what enforcement document):</p> <p>Signs and other security measures are in place at extraction and treatment points.</p> <p>Status of their implementation:</p> <p>Posted signage (Health & Safety and emergency contact information). Bay Alarm Security System at the site.</p> <p>Where are the ICs documented and/or reported?</p> <p>ICs are being properly implemented and enforced? <input type="checkbox"/> Yes <input type="checkbox"/> No, elaborate below ICs are adequate for site protection? <input type="checkbox"/> Yes <input type="checkbox"/> No, elaborate below</p>
<p>Additional remarks regarding ICs:</p>

2008 Annual Report Remedy Performance Checklist

VI. SIGNIFICANT SITE EVENTS Check all Significant Site events Since the Last Checklist that Affects or May Affect Remedy Performance
<input type="checkbox"/> Community Issues <input type="checkbox"/> Vandalism <input checked="" type="checkbox"/> Maintenance Issues <input type="checkbox"/> Other:
Please elaborate on Significant Site Events: Maintenance issues: System 19: During 2008, the extraction and treatment system operated within the effluent limits established by the site NPDES permit for the entire period. However, the treatment system shut down from July 7-14 for approximately 165 hours without any alarm notification. There was no treatment unit bypass or discharge during the system shut down. Based on communication with Water Board staff on September 30, 2008, any future shut downs greater than 120 hours will be orally reported within five days of shut down, and a written submission within 15 days of shut down. Additional non-routine maintenance issues are reported in Section 2 of the facility-specific 2008 Annual Progress Reports.
VII. REDEVELOPMENT
Is redevelopment on property planned? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If yes, what is planned? Please describe below. Is redevelopment plan complete Yes, date: _____; <input checked="" type="checkbox"/> No ? <input type="checkbox"/> Not Applicable Redevelopment proposal in progress? <input checked="" type="checkbox"/> Yes, elaborate below <input type="checkbox"/> No; If no, is a proposal anticipated? <input type="checkbox"/> Yes <input type="checkbox"/> No
<input type="checkbox"/> Is the redevelopment proposal compatible with remedy performance? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Elaborate on redevelopment proposal and how it affects remedy performance: Planned and ongoing redevelopment in the residential area over the western edge of the MEW A/A1 and B1/A2 zone plume. Planned redevelopment of apartments on Whisman Road; ongoing redevelopment of residential area on Fairchild Drive, west of Whisman Road. Building 18, the 644 National Avenue property has been bought by Carr America National Avenue LLC; redevelopment plans include new buildings and a parking structure. The existing treatment systems and their components (conveyance piping, extraction wells, and monitoring wells) will be maintained or modified as appropriate to accommodate redevelopment.

2008 Annual Report Remedy Performance Checklist

VIII. GROUNDWATER REMEDY (reference isoconcentration, capture zone maps, trend analysis, and other documentation to support analysis)	
<u>Groundwater Quality Data</u>	
List the types of data that are available:	What is the source report?
<u>Potentiometric surface maps, hydrographs</u>	<u>2008 Annual Reports & 5-Year Review</u>
<u>Capture zone maps, isoconcentration maps</u>	
<hr/> <ul style="list-style-type: none"> ■ Contaminant trend(s) tracked during O&M (i.e., temporal analysis of groundwater contaminant trends). ■ Groundwater data tracked with software for temporal analyses. <input type="checkbox"/> Reviewed MNA parameters to ensure health of substrate (e.g., DO, pH, temperature), if appropriate? 	
<u>Groundwater Pump & Treat Extraction Well and Treatment System Data</u>	
List the types of data that are available:	What is the source report?
<u>O&M logs</u>	<u>NPDES Reports</u>
<u>System Influent & Effluent water samples</u>	<u>2008 Annual Reports</u>
<u>VOC mass and groundwater removal graphs, VOC concentration trends</u>	
<ul style="list-style-type: none"> ■ The system is functioning adequately. <input type="checkbox"/> The system has been shut down for significant periods of time in the past year. Please elaborate below. 	
<u>Discharge Data</u>	
List the types of data that are available:	What is the source report?
<u>System performance data such as average flow rates, totalized flow, influent/effluent analyticals, GAC removal efficiencies</u>	<u>NPDES Discharge Reports</u>
<ul style="list-style-type: none"> ■ The system is in compliance with discharge permits. 	
<u>Slurry Wall Data</u>	
List the types of data that are available:	What is the source report?
<u>Water level elevations in select well pairs</u>	<u>2008 Annual Reports & 5-Year Review</u>
<u>Analysis of inward and upward hydraulic gradients</u>	
<hr/> <p>Is slurry wall operating as designed? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If not, what is being done to correct the situation?</p> <p>The slurry walls are operating as designed. However, the ROD specifies that the slurry walls, “maintain inward and upward gradients.” Historically, that has not been the case in the downgradient direction even under maximum historical pumping scenarios. Since 2007, pumping ceased in the lower concentration/higher pumping rate extraction wells within the slurry walls. Gradients have maintained trends consistent with those prior to reduced groundwater extraction rates within the slurry wall. In one case, a change in gradient from inward to outward was observed in the cross-gradient direction in one of the three slurry walls (Buildings 1-4) in May 2008. In August and November, gradient measurements were inward again.</p> <p>The chemical concentration data and potentiometric surface contours continue to demonstrate that the slurry walls are an effective means of impeding VOC migration outside of the slurry walls.</p>	
<u>Elaborate on technical data and/or other comments</u>	

2008 Annual Report Remedy Performance Checklist

IX. AIR MONITORING/VAPOR INTRUSION PATHWAY EVALUATION (Include in Annual Progress Report and reference document)
<p>Walk-throughs/Surveys: N/A</p> <p>No additional air work was conducted at 401 and 644 National Avenue in 2008.</p>
<p>Summary of Results: N/A</p> <p>Problems Encountered: None</p> <p>Recommendations/Next Steps: None</p>
<p>Schedule: All work is coordinated with the USEPA.</p>
X. REMEDY PERFORMANCE ASSESSMENT
A. Groundwater Remedies
<p>What are the remedial goals for groundwater? <input checked="" type="checkbox"/> Plume containment (prevent plume migration); <input checked="" type="checkbox"/> Plume restoration (attain ROD-specific cleanup levels in aquifer); <input type="checkbox"/> Other goals, please explain:</p> <p>The groundwater remedy is hydraulic remediation by extraction and treatment. The Treatment System is reliable and consistent in its operation and mass removal ability, with greater than 95% up-time. The capture zones from the extraction wells provide sufficient overlap to achieve hydraulic control over the plume based on flow net evaluation and converging lines of evidence, including stable lateral extent of TCE exceeding 5 µg/L. Remediation is also demonstrated because concentrations within the TCE plume have continued to decrease in all zones. Groundwater with TCE concentrations exceeding 5 µg/L does not discharge to surface water.</p> <p>Have you done a trend analysis? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No; If Yes, what does it show?</p> <p>(Is it inconclusive due to inadequate data? Are the concentrations increasing or decreasing?) Explain and provide source document reference</p> <p>Concentrations within the core of the TCE plume have continued to decrease in all zones, while the lateral extent of TCE exceeding 5 µg/L has been stable. See Annual Reports for trends in monitoring wells (Appendix D) and the Optimization Evaluation Report (Geosyntec et al., 2008) for change in TCE distribution over time (Figures 4-18 through 4-21).</p> <p>While the lateral extent of TCE concentrations exceeding 5 µg/L has not grown since 1992 and concentrations within TCE plume have generally decreased by an order of magnitude or more, the perimeter extent of TCE concentrations has largely stabilized. Optimization of the remedy may therefore be warranted (Geosyntec et al, 2008).</p>
<p>If plume containment is a remedial goal, check all that apply:</p> <p><input checked="" type="checkbox"/> Plume migration is under control (explain basis below)</p> <p><input type="checkbox"/> Plume migration is not under control (explain basis below)</p> <p><input type="checkbox"/> Insufficient data to determine plume stability (explain below)</p> <p>(Include attachments that substantiate your answers, e.g., reference plume, trend analysis, and capture zone maps in source document)</p>
<p>Elaborate on basis for determining that plume containment goal is being met or not being met:</p> <p>Plume containment goal is met, slurry walls provide physical containment of sources on 369 N. Whisman Road, 401 National Avenue, and 515/545 N. Whisman Road and 313 Fairchild Drive.</p> <p>Groundwater elevation and chemical monitoring results from 2008 demonstrate that the Fairchild extraction wells continue to achieve adequate horizontal and vertical capture based on converging lines of evidence, including graphical flow net analysis and chemical concentration trends. VOC concentrations in groundwater continue to remain well below historical maximums, and generally show long-term decreasing trends.</p>

2008 Annual Report Remedy Performance Checklist

If plume restoration is a cleanup objective, check all that apply:

- Progress is being made toward reaching cleanup levels (explain basis below)
- Progress is not being made toward reaching cleanup levels (explain basis below)
- Insufficient data to determine progress toward restoration goal (explain below)

Elaborate on basis for determining progress or lack of progress toward restoration goal:

The objective is to remediate and control the plume. The groundwater extraction, treatment, and containment systems are functioning as intended and meet the Remedial Action Objectives for the Site. While concentrations within TCE plume have generally decreased by an order of magnitude or more, treatment system influent concentrations have declined and the perimeter extent of TCE concentrations has largely stabilized. Optimization of the remedy may therefore be warranted.

B. Vertical Migration

Have you done an assessment of vertical gradients? Yes No; If Yes, what does it show? (Is it inconclusive due to inadequate data?)

Are the concentrations increasing or decreasing? Explain and provide source document reference

In general, vertical gradients across the B and deeper water-bearing zones are upward. Upward vertical gradients are typical from the B- to A-zone, but downward vertical gradients are observed at a few locations.

Source document reference: 2008 Annual Reports & 5-Year Review

C. Source Control Remedies

What are the remedial goals for source control?

Capture of former source areas is the goal for source control. Cleanup standards are Maximum Contaminant Level (MCLs) in upper groundwater zones; the TCE is 5 µg/L.

Elaborate on basis for determining progress or lack of progress toward these goals:

Capture zone analysis in the 2008 Annual Progress Report indicate plume containment of target capture areas.

XI. PROJECTIONS

Administrative Issues

Dates of next monitoring and sampling events for next annual reporting period: Nov/Dec 2009

A. Groundwater Remedies - Projections for the upcoming year and long-term (Check all that apply)

Remedy Projections for the upcoming year (2009)

- No significant changes projected.
- Groundwater remedy will be converted to monitored natural attenuation. Target date:
 - Groundwater Pump & Treat will be shut down. Target date:
 - Groundwater cleanup standards to be modified. Target date:
 - PRP will request remedy modification. Target date of request:
- Change in the number of monitoring wells. Increasing or decreasing? Target date:
- Change in the number and/or types of analytes being analyzed. Increasing or decreasing? Target date:
- Change in groundwater extraction system. Expansion or **minimization** (i.e., number of extraction wells and/or pumping rate)? Target date:
 - Modification on groundwater treatment? Elaborate below. Target date:
 - Change in discharge location. Target date:
- Other modification(s) anticipated: **Optimization** Elaborate below. Target date: **TBD**

2008 Annual Report Remedy Performance Checklist

<p>Elaborate on Remedy Projections:</p> <p>The RPs for the Former Fairchild Facilities anticipate implementing remediation optimization strategies, pending receipt of and response to EPA comments on the September 3, 2008 Optimization Evaluation Report.</p>
<p><u>Remedy Projections for the long-term</u> (Check all that apply)</p> <p><input type="checkbox"/> No significant changes projected.</p> <p><input type="checkbox"/> Groundwater remedy will be converted to monitored natural attenuation. Target date:</p> <p><input type="checkbox"/> Groundwater Pump & Treat will be shut down. Target date:</p> <p><input type="checkbox"/> Groundwater cleanup standards to be modified. Target date:</p> <p><input type="checkbox"/> PRP will request remedy modification. Target date of request:</p> <p><input type="checkbox"/> Change in the number of monitoring wells. <input type="checkbox"/> Increasing or <input type="checkbox"/> decreasing? Target date:</p> <p><input type="checkbox"/> Change in the number and/or types of analytes being analyzed. <input type="checkbox"/> Increasing or <input type="checkbox"/> decreasing? Target date:</p> <p><input type="checkbox"/> Change in groundwater extraction system. <input type="checkbox"/> Expansion or <input type="checkbox"/> minimization (i.e., number of extraction wells and/or pumping rate)? Target date:</p> <p><input type="checkbox"/> Modification on groundwater treatment? Elaborate below. Target date:</p> <p><input type="checkbox"/> Change in discharge location. Target date:</p> <p><input checked="" type="checkbox"/> Other modification(s) anticipated: <u>Groundwater Feasibility Study</u> Elaborate below. Target date: TBD</p>
<p>Elaborate on Remedy Projections:</p> <p>Minor changes to the EPA's January 15, 2009 Draft Process Framework for a site-wide Groundwater Feasibility Study were proposed January 30, 2009. The PRPs are prepared to implement the modified Framework as soon as the Draft Framework is finalized by EPA .</p>
<p>B. Projections – Slurry Walls (Check all that apply)</p>
<p><u>Remedy Projections for the upcoming year</u></p> <p><input type="checkbox"/> No significant changes projected.</p> <p><input type="checkbox"/> PRP will request remedy modification. Target date of request:</p> <p><input type="checkbox"/> Change in the number of monitoring wells. <input type="checkbox"/> Increasing or <input type="checkbox"/> decreasing? Target date:</p> <p><input checked="" type="checkbox"/> Other modification(s) anticipated: <u>Optimization</u> Elaborate below. Target date: TBD</p>
<p>Elaborate on Remedy Projections:</p> <p>The slurry walls are part of the groundwater remedy. The recommendations of the Optimization Evaluation Report will be implemented upon receipt of, and response to, comments from EPA. In the interim, the system continued to operate per the August 2007 groundwater extraction scheme.</p>
<p><u>Remedy Projections for the long-term</u></p> <p><input type="checkbox"/> No significant changes projected.</p> <p><input type="checkbox"/> PRP will request remedy modification. Target date of request:</p> <p><input type="checkbox"/> Change in the number of monitoring wells. <input type="checkbox"/> Increasing or <input type="checkbox"/> decreasing? Target date:</p> <p><input type="checkbox"/> Other modification(s) anticipated: <u>Groundwater Feasibility Study</u> Elaborate below. Target date: TBD</p>
<p>Elaborate on Remedy Projections:</p> <p>See above. The slurry walls are part of the groundwater remedy.</p>
<p><u>C. Projections – Other Remedial Options Being Reviewed to Enhance Cleanup</u></p> <p>Progress implementing recommendations from last report or Five-Year Review Has optimization study been implemented or scheduled? <input checked="" type="checkbox"/> Yes; <input type="checkbox"/> No; If Yes, please elaborate.</p> <p>An Optimization Evaluation Report was submitted September 2008.</p>

2008 Annual Report Remedy Performance Checklist

XII. ADMINISTRATIVE ISSUES

Check all that apply:

- Explanation of Significant Differences in progress ROD Amendment in progress
 Site in operational and functional ("shake down") period;
 Notice of Intent to Delete in progress Partial site deletion in progress TI Waivers
 Other administrative issues:

Proposed Plan to address vapor intrusion pathway planned for 2009, with ROD amendment to follow.

Date of Next EPA Five-Year Review: **September 30, 2009**

XII. RECOMMENDATIONS

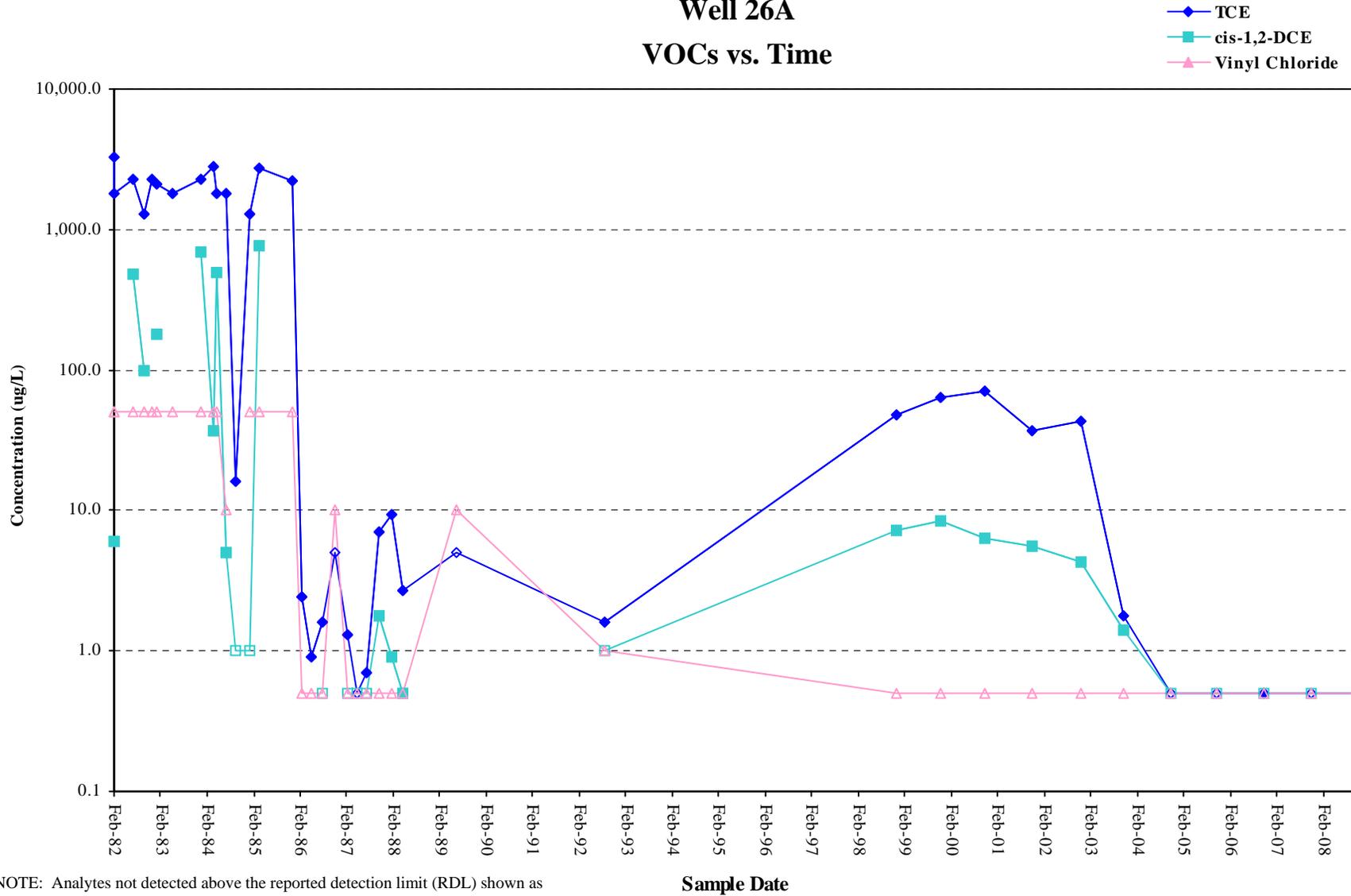
- **Implement optimization strategies for Fairchild systems pending receipt of and response to EPA comments on the Optimization Evaluation Report.**
- **Follow revised groundwater feasibility study framework pending finalization by EPA.**
- **Potentially responsible parties (PRPs) requested in the 2008 Annual Progress Report that USEPA not require further facility-specific reporting for Former Fairchild Building 20 beginning in 2009. However, this request has not yet been acknowledged by the USEPA. The PRPs are requesting again to discontinue additional facility-specific reporting for Former Fairchild Building 20. The rationale for this request is:**
 1. **No potential source areas were identified at former Fairchild Building 20 property during Site investigations.**
 2. **Analytical results for the monitoring wells sampled in 2008 continue to indicate that VOC concentrations in groundwater are generally stable to declining. This is also reported in the RGRP Annual report.**
 3. **Building 20 does not have an associated groundwater treatment system.**
 4. **There is no facility-specific capture to evaluate.**

In summary, the groundwater monitoring data are evaluated in the RGRP report, and this report is redundant with other reports at the MEW Site since all information is covered under Raytheon Facility Specific and RGRP reporting.

APPENDIX B

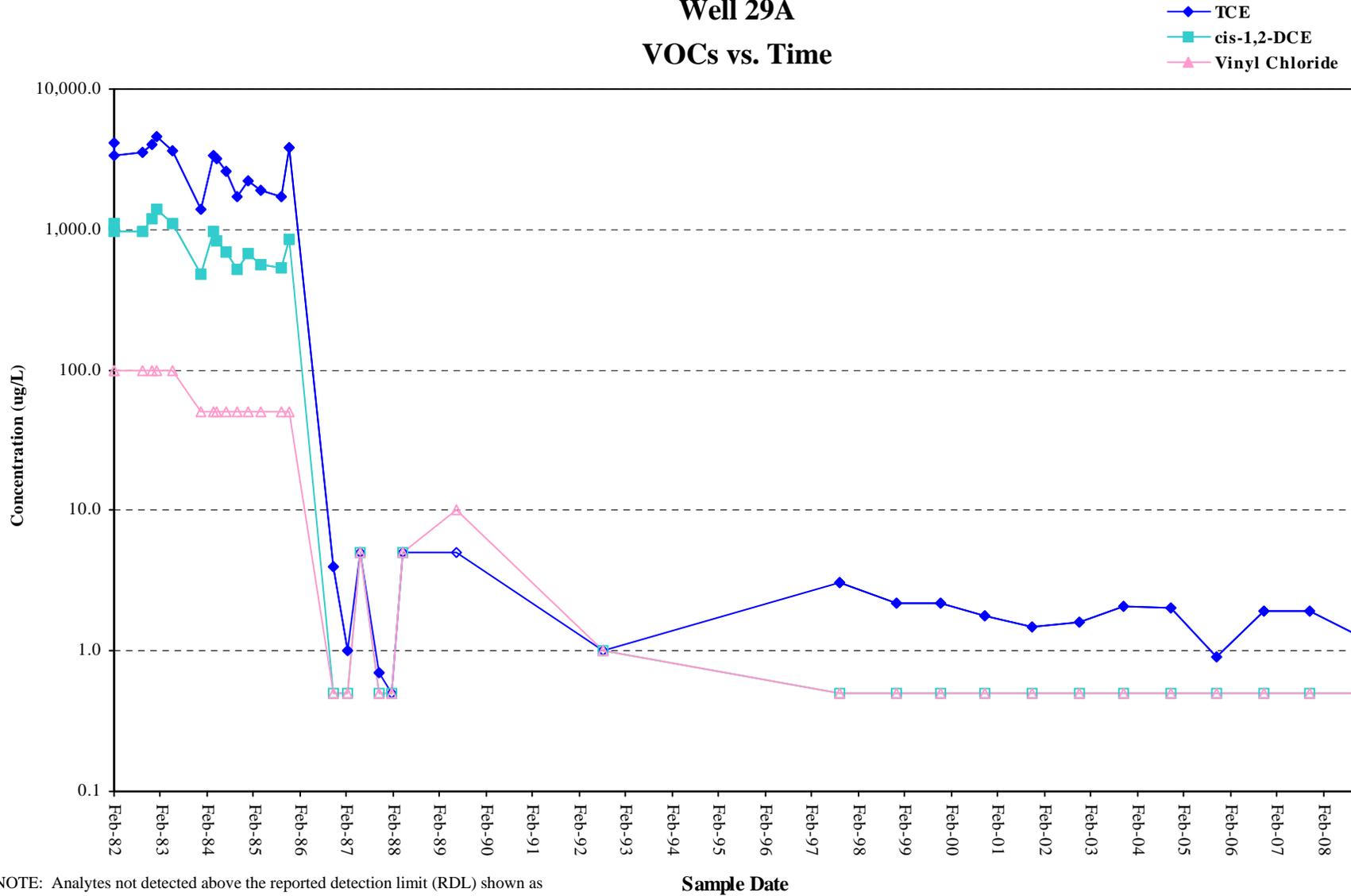
SELECTED VOCS VERSUS TIME GRAPHS

Well 26A VOCs vs. Time



NOTE: Analytes not detected above the reported detection limit (RDL) shown as open chart symbols at the RDL.

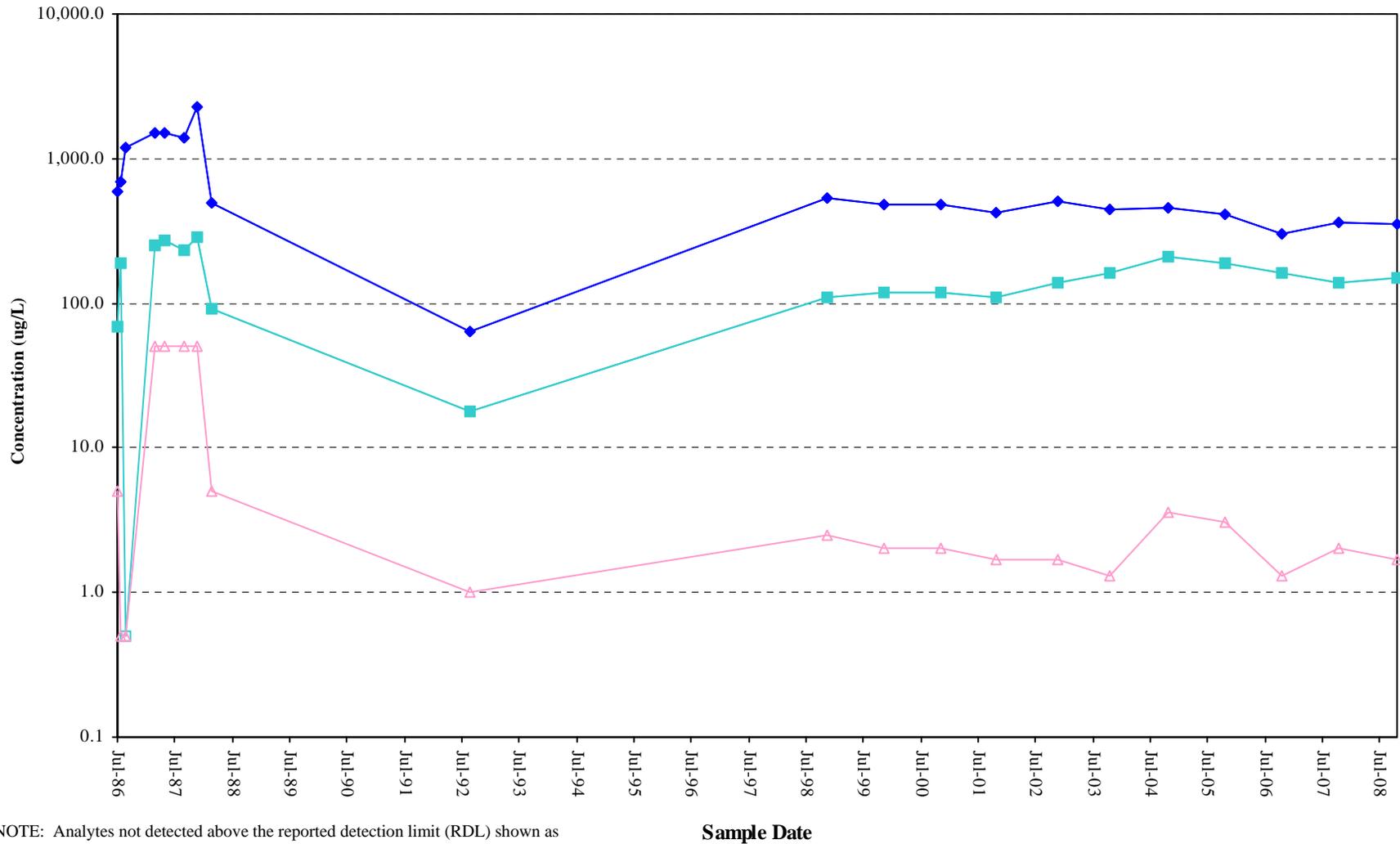
Well 29A VOCs vs. Time



NOTE: Analytes not detected above the reported detection limit (RDL) shown as open chart symbols at the RDL.

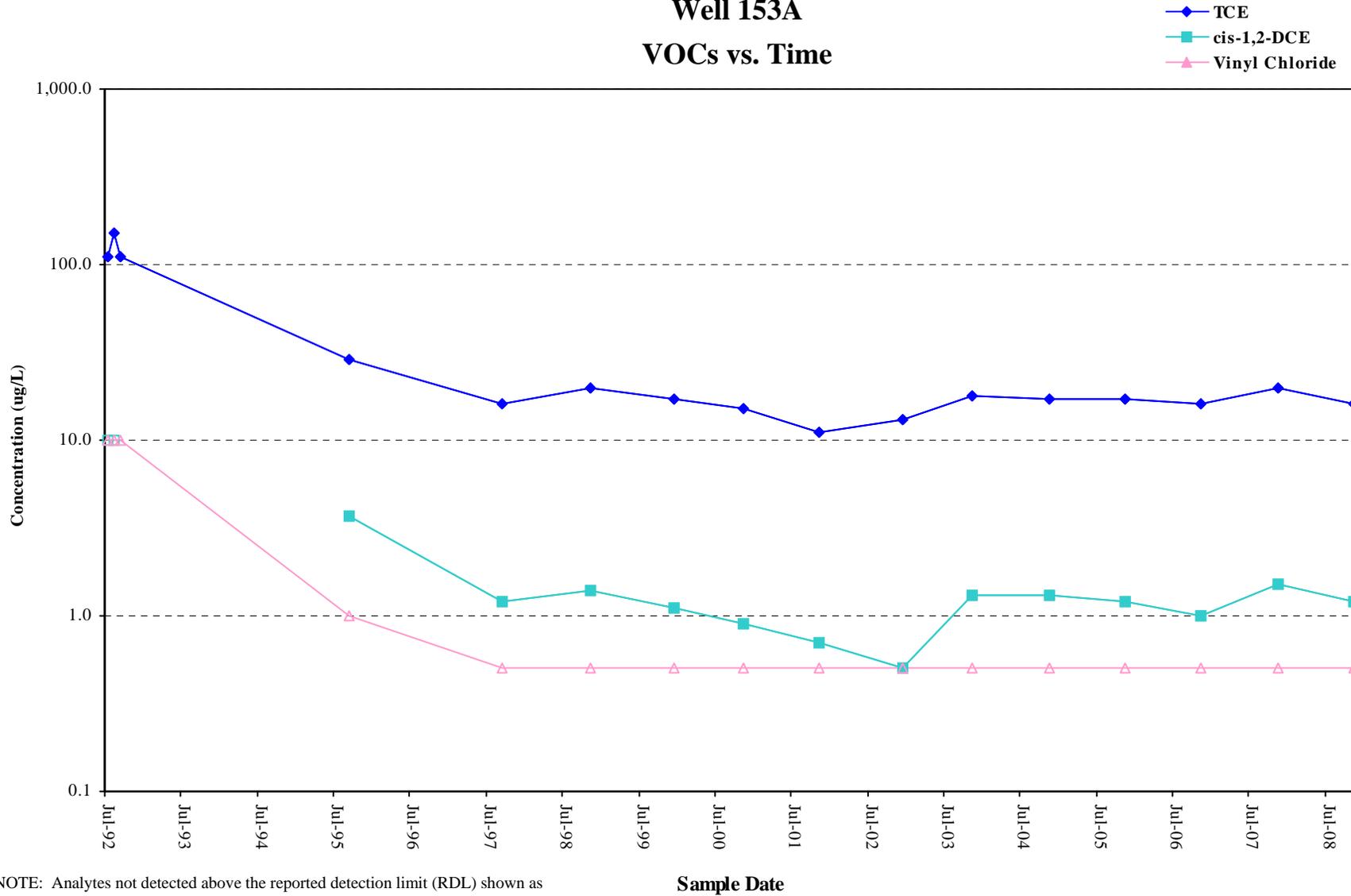
Well 99A VOCs vs. Time

◆ TCE
■ cis-1,2-DCE
▲ Vinyl Chloride



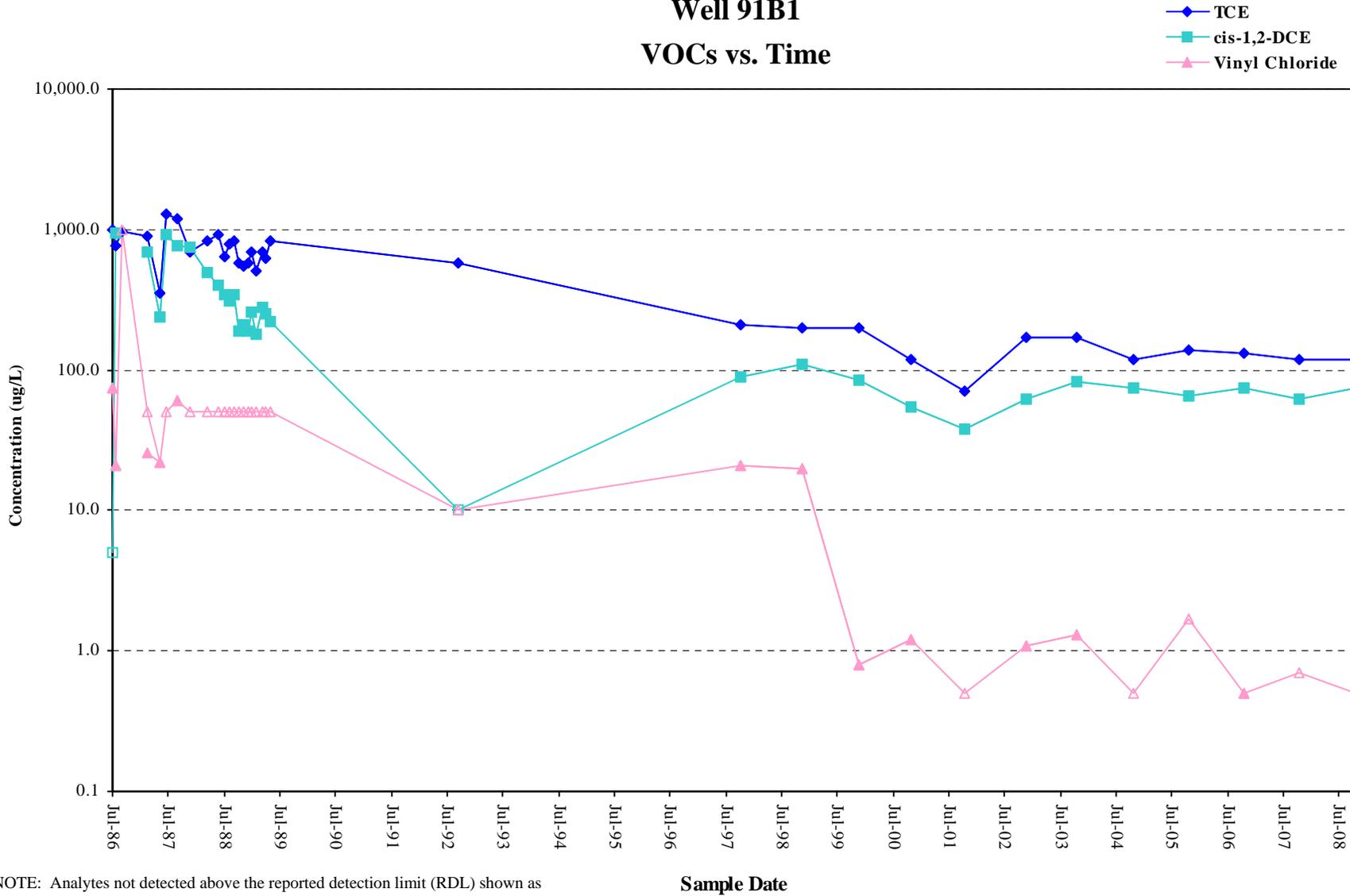
NOTE: Analytes not detected above the reported detection limit (RDL) shown as open chart symbols at the RDL.

Well 153A VOCs vs. Time



NOTE: Analytes not detected above the reported detection limit (RDL) shown as open chart symbols at the RDL.

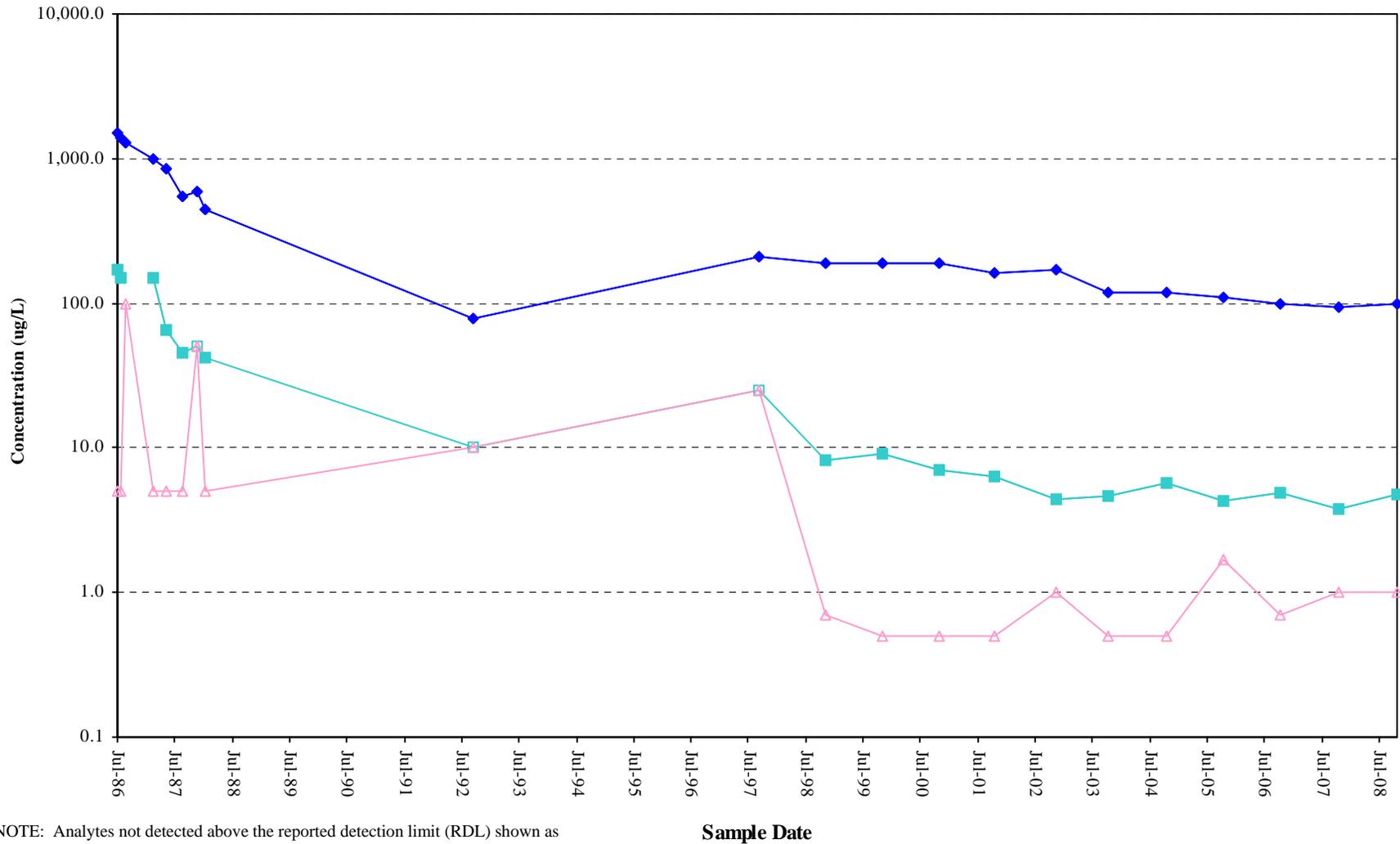
Well 91B1 VOCs vs. Time



NOTE: Analytes not detected above the reported detection limit (RDL) shown as open chart symbols at the RDL.

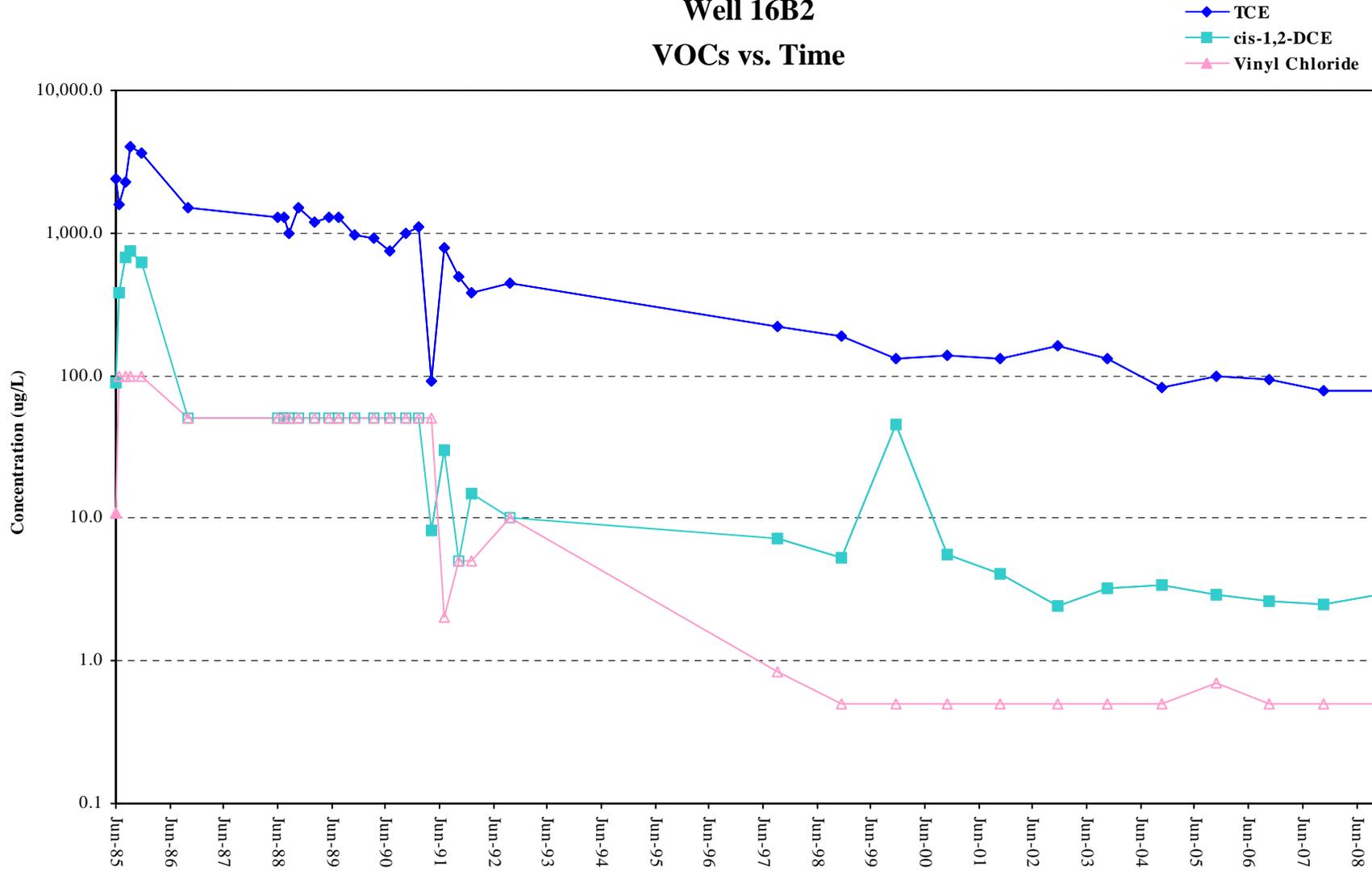
Well 92B1 VOCs vs. Time

◆ TCE
■ cis-1,2-DCE
▲ Vinyl Chloride



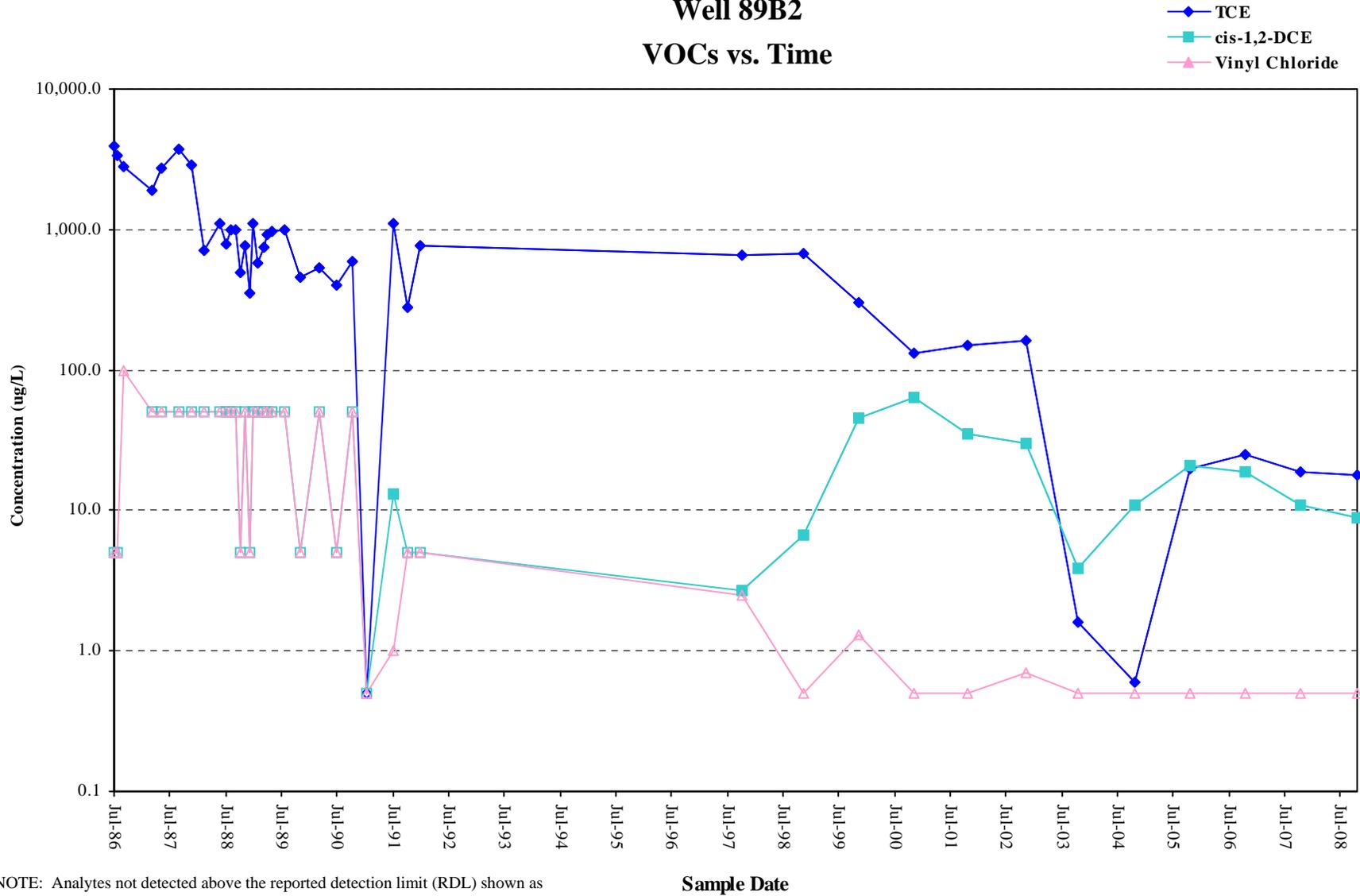
NOTE: Analytes not detected above the reported detection limit (RDL) shown as open chart symbols at the RDL.

Well 16B2 VOCs vs. Time



NOTE: Analytes not detected above the reported detection limit (RDL) shown as open chart symbols at the RDL.

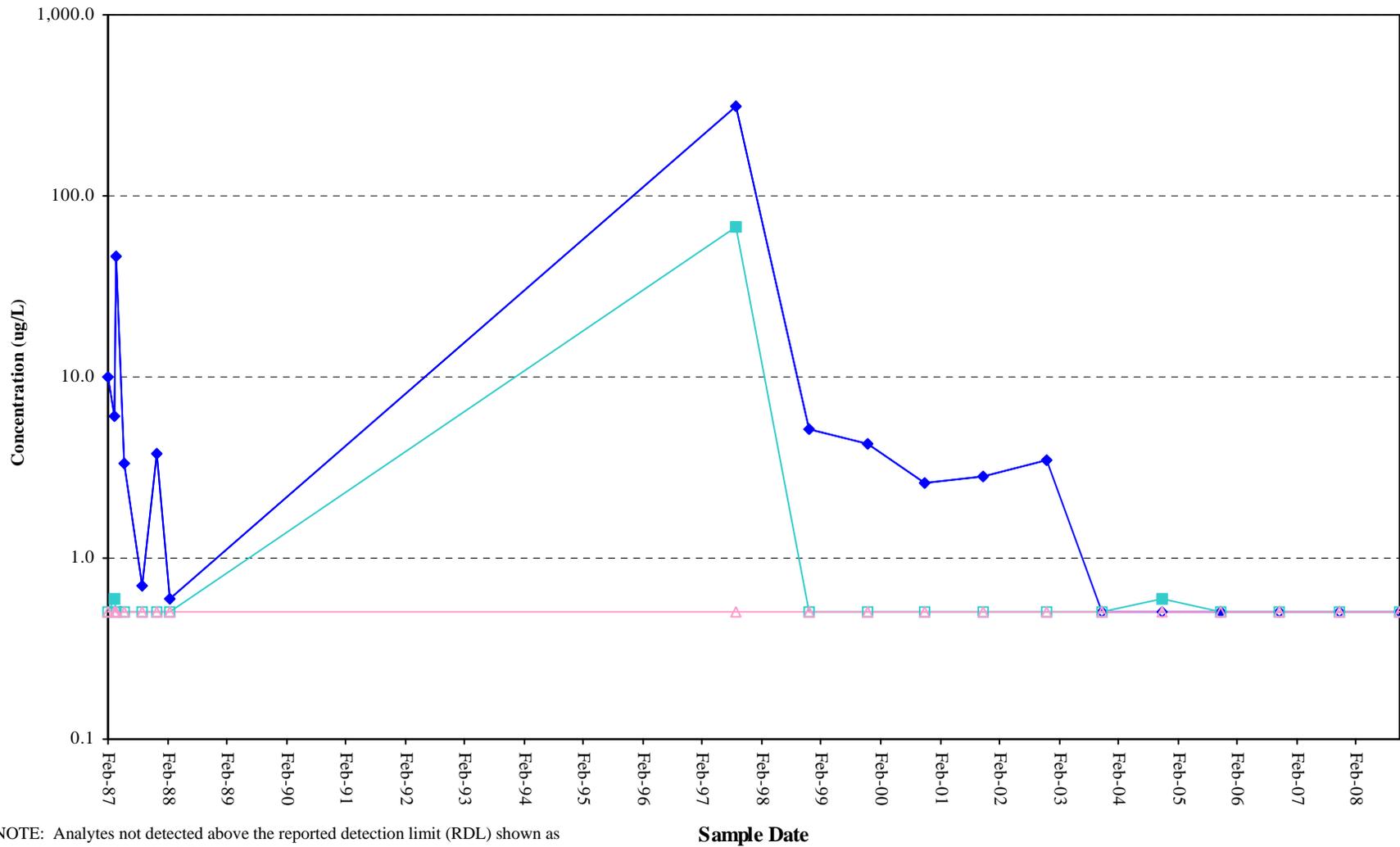
Well 89B2 VOCs vs. Time



NOTE: Analytes not detected above the reported detection limit (RDL) shown as open chart symbols at the RDL.

Well 132B2 VOCs vs. Time

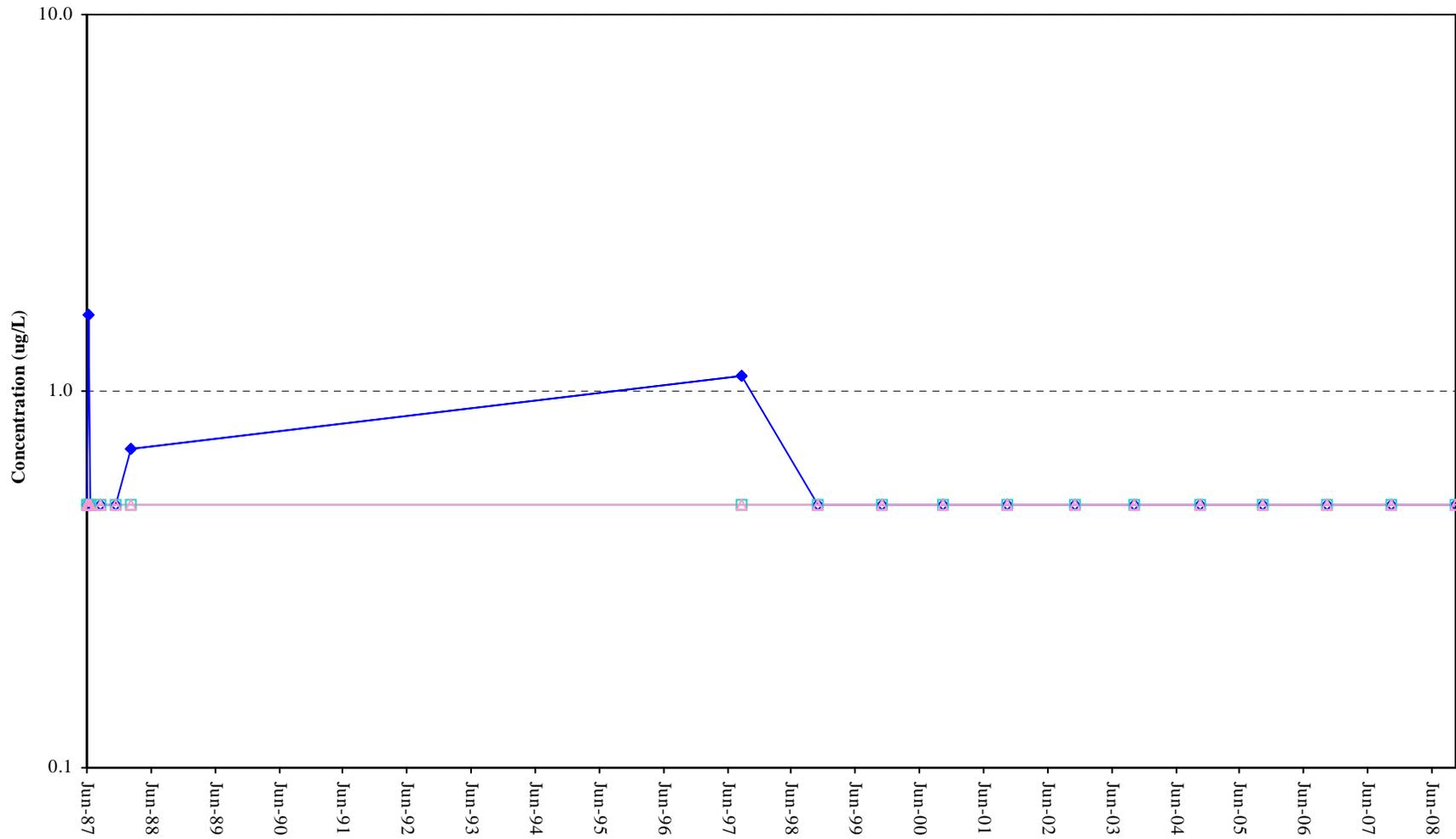
- ◆ TCE
- cis-1,2-DCE
- ▲ Vinyl Chloride



NOTE: Analytes not detected above the reported detection limit (RDL) shown as open chart symbols at the RDL.

Well 134B2 VOCs vs. Time

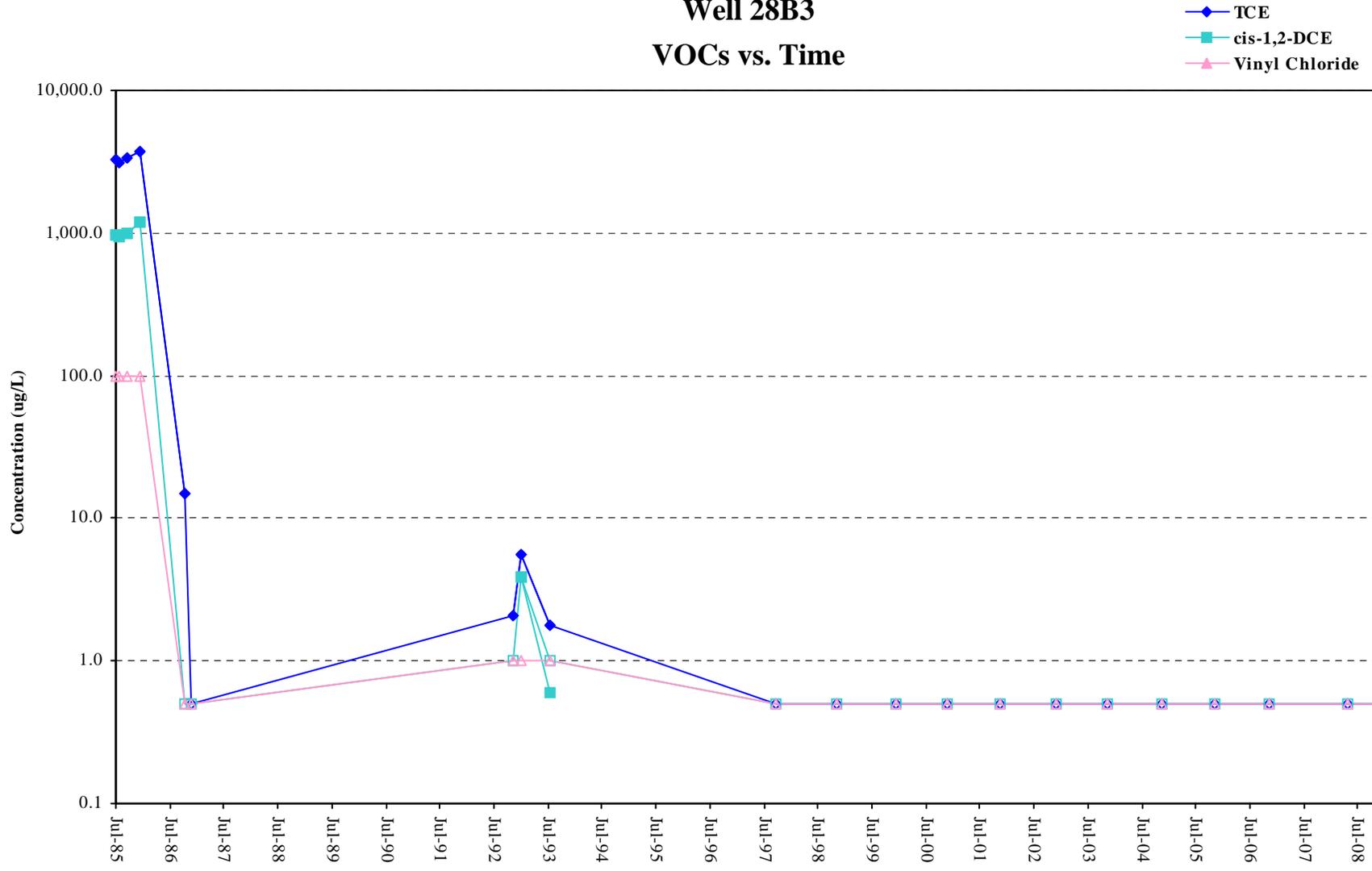
- ◆ TCE
- cis-1,2-DCE
- ▲ Vinyl Chloride



NOTE: Analytes not detected above the reported detection limit (RDL) shown as open chart symbols at the RDL.

Sample Date

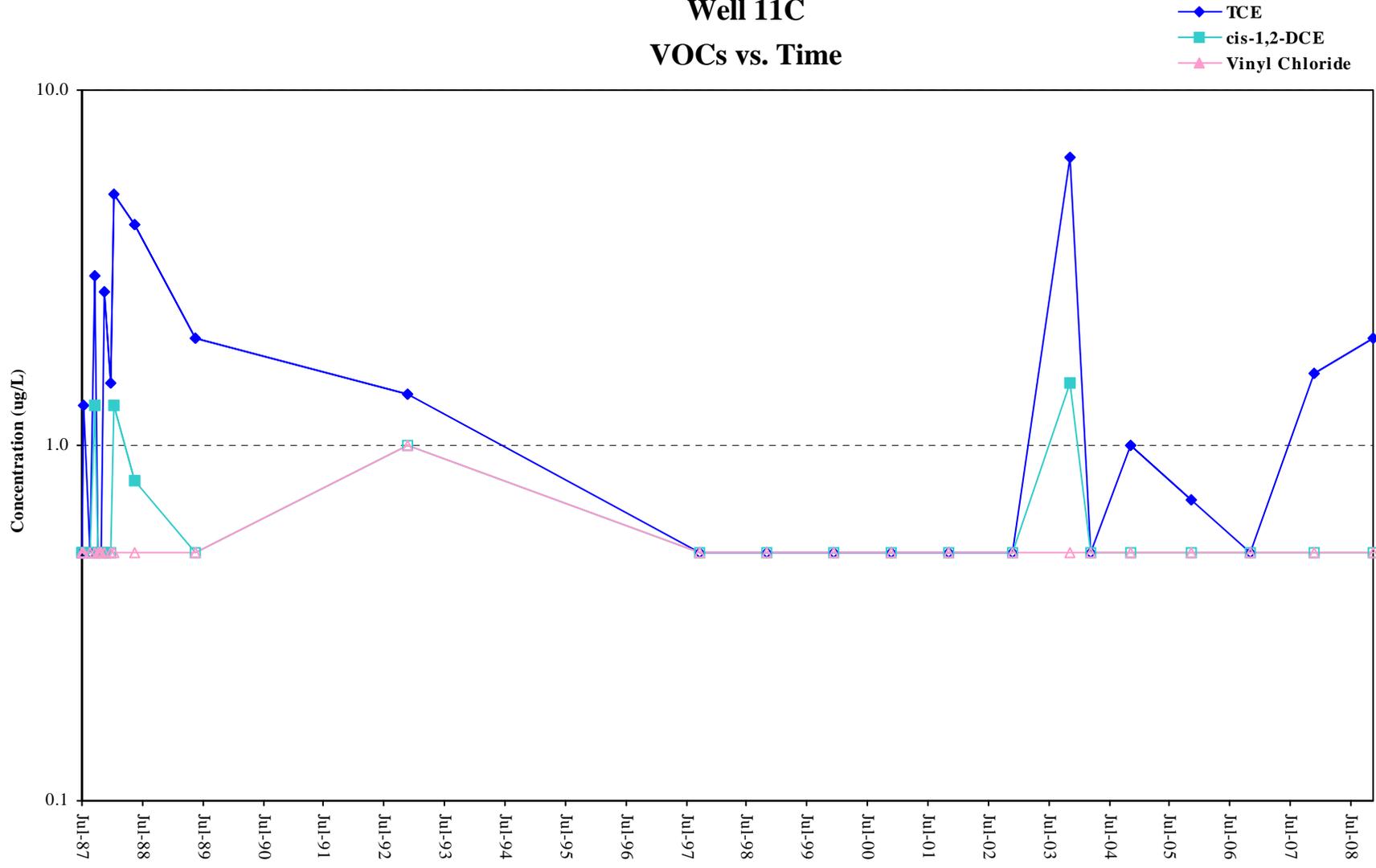
Well 28B3 VOCs vs. Time



NOTE: Analytes not detected above the reported detection limit (RDL) shown as open chart symbols at the RDL.

Sample Date

Well 11C VOCs vs. Time



NOTE: Analytes not detected above the reported detection limit (RDL) shown as open chart symbols at the RDL.

APPENDIX C

QA/QC REPORT, SUMMARY TABLES, AND CRITERIA SELECTED

2008 QA/QC SUMMARY

Annual groundwater samples were collected at Site wells in November 2008. A total of 13 samples were collected from the Site monitoring and extraction wells as a part of MEW Annual Groundwater Sampling Event and analyzed for VOCs by Curtis and Tompkins in Berkeley, California, a state-certified analytical laboratory for VOCs. All samples were collected, stored, transported and managed according to USEPA protocols. Sample temperature and holding times were correctly observed. Tables C-1 and C-2 present a summary of sampling and analysis QA/QC for 2008. Analytical laboratory reports for the groundwater and related QC samples (travel blanks, rinseate/equipment blanks, and field blanks) are presented in Appendix F of the MEW 2008 Annual Progress Report. Appendix G of the MEW 2008 Annual Progress Report summarizes the analytical issues (Table G-2) and the results of the QC samples (Table G-3) for the 2008 annual groundwater sampling event.

Table C-1. Summary of Sampling QA/QC for January through December 2008, Former Fairchild Building 20, 464 Ellis Street, Mountain View, California.

Who performed sampling (Firm name/address/contact/phone):	Weiss Associates 350 East Middlefield Road, Mountain View, CA 94043 Joyce Adams (510) 450-6162
Chain of Custody forms completed for all samples?	YES
Field parameters stabilized prior to taking sample?	YES
Zero headspace in sample containers (applicable to VOCs only)?	YES
Samples preserved according to analytical method?	YES
Required field QA/QC samples taken?	YES

*Explain any "NO" answers:

Table C-2. Summary of Analytical QA/QC for January through December 2008, Former Fairchild Building 20, 464 Ellis Street, Mountain View, California.

Who performed analysis (Lab name/address/contact/phone):	Curtis and Tompkins 2323 Fifth Street Berkeley, CA 94710 Anna Pajarillo (510) 486-0900
Analytical methods (by method number and chemical category): Groundwater Samples ¹ :	13 samples analyzed by USEPA 8260B – Halogenated Volatile Organic Compounds (8010 MS Parameters)
Are the labs state-certified for the above analytical methods?	YES
Analyses performed according to standard methods?	YES
Sample holding times met?	YES
Analytical results reported for all values above MDL?	YES
QA/QC analyses run consistent with analytical methods?	YES
QA/QC results meet all acceptance criteria?	YES ^{1,2}
QA/QC results and acceptance criteria on file?	YES

*Explain any “NO” answers:

1. The Analytic Reports and Chain of Custody forms are located in Appendix F of the *2008 Annual Progress Report for Middlefield-Ellis-Whisman Study Area Regional Groundwater Remediation Program, Mountain View, CA.*

2. Analytical issues for groundwater samples collected during the 2008 annual groundwater sampling event are summarized in Appendix G of the *2008 Annual Progress Report for Middlefield-Ellis-Whisman Study Area Regional Groundwater Remediation Program, Mountain View, CA.*