CAPE ENVIRONMENTAL MANAGEMENT INC

Check for MTBE in tank (+2 an? and AMW-3; 140 ppb (8015) in 2/98 then ready for closure review

April 13, 1999

Mr. Larry Seto
Senior Hazardous Materials Specialist
Alameda County Department of Environmental Health
1131 Harbor Bay Parkway, #250
Alameda, California 94502-6577

Re: Groundwater Monitoring Report – February 22, 1999 Event and Summary
Alameda Federal Center, 620 Central Avenue, Alameda, California
STID 4655
CAPE Project No. 2403C.024.001 (CAPE-02)

Dear Mr. Seto:

Please find enclosed the groundwater monitoring report for the February 22, 1999 sampling event and summary of the groundwater monitoring activity at the site since 1995. This report has been prepared by Cape Environmental Management, Inc. (CAPE) on behalf of the General Services Administration (GSA) to monitor observed groundwater impacts due to former leaking underground storage tanks.

CAPE and the GSA are requesting site closure based on work performed at the site to date. If you have questions or require additional information, please contact the undersigned at 801.943.4144.

Sincerely,
Cape Environmental Management, Inc.

REGISTERED GEOLOGIST WILLIAM W. MILLAR NO. 6175 EXPIRES: 8-31-00 STATE OF CALIFORNIA

William W. Millar, R.G.
Hydrogeologist

Attachment

cc: James Lew/GSA (9PEC), 450 Golden Gate Ave., San Francisco CA 94102
Ando Merendi/GSA (9PMS), 450 Golden Gate Ave., San Francisco CA 94102
John Hochgurtel/CAPE, 3631 South Harbor Dr., Suite 130, Santa Ana, CA 92704
Project File

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I N C

Groundwater Monitoring Report - February 22, 1999 Event and Summary

Alameda Federal Center
620 Central Avenue
Alameda, California

STID # 4655
CAPE Project No.: 2403C.024.001 (CAPE-02)

prepared for:

General Service Administration, Region 9
450 Golden Gate Avenue
San Francisco, California 94025

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prepared by:

Cape Environmental Management, Inc.
Harbor Corporate Park
3631 South Harbor Boulevard, Suite 130
Santa Ana, California 92704

April 1999

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1.0 INTRODUCTION

On behalf of the General Services Administration (GSA), Cape Environmental Management Inc (CAPE) has performed this Quarterly Groundwater Monitoring – February 22, 1999 - at the Alameda Federal Center, located at 620 Central Avenue, Alameda, California. Figure 1 is a Site Vicinity Map depicting relative location of the project site. The purpose of the monitoring is to assess the extent of possible groundwater contamination due to underground storage tank (UST) releases. Four tanks were previously located at the facility two on the west side of the facility (tanks 1 & 2) and two on the east side of the facility (tanks 3 & 4). The USTs have been removed from the site. Figure 2, 3, and 4 depict the location and orientation of the subject site and monitoring well locations.

This report is also a summary of groundwater monitoring activities at the site for the past four years. Groundwater sampling events took place on May 18, 1995, August 31, 1995, December 8, 1995, March 8, 1996, July 5, 1996, February 18, 1998, August 31, 1998, November 16, 1998, and February 22, 1999. A site visit was made on October 5, 1995 to collect a sample from monitoring well MW-1 for analysis for parameters not analyzed in the sample collected on August 31, 1995. Groundwater monitoring wells MW-1, MW-2R, MW-4, MW-5, and MW-6 were installed to investigate potential groundwater impacts associated with tanks 1 & 2. Following one year of monitoring of these wells sampling of all of the wells except MW-1 was discontinued per agreement with Alameda County Department of Environmental Health. Following the removal of tanks 3 & 4 groundwater monitoring wells AMW-1, AMW-2, and AMW-3 were installed to investigate potential groundwater impacts from these USTs. These wells and well MW-1 have been monitored four times starting in February 1998.

1.1 SITE DESCRIPTION

The site is located in the northwest portion of the City of Alameda, California. The site is approximately 500 feet east of the San Francisco Bay shoreline, and is situated in a relatively flat tidal plain area, which slopes gently towards the bay. The site spans approximately 10 acres with several buildings used for administrative office space and storage functions.

2.0 PROJECT DESCRIPTION

This section describes details of the field and laboratory activities conducted during the groundwater monitoring over the past four years to include groundwater sampling, sample handling, and laboratory analyses.

2.1 GROUNDWATER MONITORING METHODOLOGY

CAPE measured the depth to ground water in all the accessible wells at the site during each site visit. The wells in the monitoring program at the time were purged of approximately 3 well volumes, and groundwater samples were collected

The depth to groundwater and other sampling details for all the wells sampled on February 22, 1999 are provided in Appendix A - Groundwater Purging and Sampling Logs. Water samples were collected on February 22, 1999 from MW-1, AMW-1, AMW-2 and AMW-3 with dedicated disposable 2-inch diameter plastic hand bailers. Sample containers filled from each well included 4 VOA vials, 40 milliliter (ml) glass and 2 amber glass 1-liter container. The containers were labeled, preserved at 4° Celsius, and transferred to the laboratory under chain-of-custody documentation.

2.2 LABORATORY TESTING

Chemical analysis of the groundwater samples collected at the site included the following suite of parameters:

- Hydrocarbon Oil and Grease (O&G) using Test Method SMWW 5520;
- Total petroleum hydrocarbons as diesel (TPHd)(referred to by the laboratory as total extractable hydrocarbons (THE)) using DHS/LUFT procedure EPA Test Method 8015-Modified (diesel);
- Total petroleum hydrocarbons as gasoline (TPHg)(referred to by the laboratory as total volatile hydrocarbons (TVH)) using DHS/LUFT procedure EPA Test Method 8015-Modified (gasoline);
- Benzene, toluene, ethyl benzene, and total xylenes (BTEX) using EPA Test Method 8020; and
- Halogenated volatile organics (HVO) for EPA Test Method 8010.

3.0 GROUNDWATER MONITORING RESULTS

The laboratory chemical test results for groundwater samples collected on February 22, 1999 from monitoring wells MW-1, AMW-1, AMW-2 and AMW-3 are summarized on Table 3.0.1, and 3.0.2.

TPHd levels for samples collected from wells MW-1, AMW-1, AMW-2, and AMW-3 were reported to be 720 micrograms per liter (µg/l), 53 µg/l, ND, and 140 µg/l, respectively. The laboratory also notes that chromatographs of hydrocarbons in the diesel range for all the samples did not resemble the pattern of a diesel standard. Further, the chromatographs for the diesel range hydrocarbons detected in all the samples were heavier hydrocarbons than a diesel standard. The sample collected from AMW-3 showed lighter hydrocarbons than a diesel standard as well. Concentrations of TPHg compounds were below the limit of detection of the method used (ND) for the 4 water samples. BTEX compounds were detected in MW-1 and AMW-1. Ethyl

benzene was detected in the MW-1 sample at 0.68 µg/l. The samples from MW-1 and AMW-1 were reported to contain m,p-xylenes at 0.56 µg/l and 0.6 µg/l, respectively. All other BTEX compounds were ND in the samples collected. Results for all samples for O&G were also ND.

Appendix B presents a copy of the analytical report submitted by the laboratory for the groundwater samples.

Tables summarizing the groundwater sample analytical results from 1995 to the present are presented in Appendix C. The data reported for the samples collected from each well is presented on a different table. A line graph presenting all of the of the TPHd data for all of the wells is also in Appendix C. The line graph was prepared with the following assumption: if the concentration of TPHd was below the detection limit of the method used a concentration one-half of the detection limit or 25 µg/l was used. The other parameters were not analyzed for or detected frequently enough to make graphic presentation useful.

4.0 GROUNDWATER GRADIENT MEASUREMENT

On February 22, 1999 the groundwater gradient was estimated by concurrent sounding of all accessible monitoring points, after the elevations for each well was determined. Depth to static groundwater from each reference point was then reduced to mean sea level elevations and a graphic method was used to establish groundwater gradient and direction. Depth to groundwater and groundwater elevation data is presented in Table 4.0.1. Flow directions and gradients are presented on Figure 5 – Groundwater Gradient Map February 22, 1999. The result of this determination indicate that the groundwater gradient is between 0.001 and 0.005 ft/ft (5.25 to 26 ft/mile) with a flow direction to the south.

These calculations represent the configuration of the shallow groundwater surface at the time of the sounding. It is expected that seasonal fluctuation in water level and corresponding alterations of the current groundwater regime (gradient and direction) may occur in response to local precipitation, landscape irrigation, urban runoff, tidal and other influences.

The groundwater gradient maps for the past nine sampling events at the site are presented in Appendix D. The dominant flow direction is to the south or southwest toward the bay. Table D-1 also in Appendix D presents a summary of the groundwater elevation data for the site. The groundwater elevation data was graphed and the graph is presented in Appendix D, as well. A pattern is apparent in groundwater elevation data. groundwater elevations rise in the winter and spring and drop in the summer and fall This pattern held in 1995 – 1996 monitoring year and in the 1998 – 1999 monitoring year for the wells at the site

5.0 CONCLUSIONS

When the underground storage tanks at the site were removed the potential sources of petroleum hydrocarbon impacts to the soil and groundwater were removed. The diesel concentrations at the site have dropped over the course of the study and are currently very low. The source of the HVOs at the site is unknown, detection and concentrations of these compounds have been inconsistent during the study. If spent solvents were stored in the waste oil tank in the tank 1 & 2 area then this tank was a possible source, but no conclusive evidence is available. This tank has also been removed and with it this possible source.

Groundwater monitoring associated with the tank 1 & 2 area began in 1995 and was discontinued in 1996 with the exception of groundwater monitoring well MW-1. Groundwater monitoring began in the tank 3 & 4 area following removal of the tanks in 1997. Well MW-1 has been included in the monitoring program in 1998 and 1999.

Below is a summary of the reported analytical results for groundwater samples collected in the tanks 1 & 2, and tanks 3 & 4 areas between 1995 and 1999. O&G was detected in the sample collected from MW-1 on March 8, 1996 at 16 mg/l. O&G has been reported as ND in all other groundwater samples collected at the site.

High TPHd (referred to as total extractable petroleum hydrocarbons as diesel or TEPHd in Appendix C Table C-1) concentrations were detected in well MW-1 in 1995 and 1996; however, the analytical results for the past four samples analyzed (1998 and 1999) have been 360 µg/l, 88 µg/l, 230 µg/l and 720 µg/l, respectively. Concentrations of TPHd appear to be decreasing over time in MW-1 (see line graph Appendix C). The sample collected on August 31, 1995 from well MW-2R was reported to contain 140 µg/l, all other analyses were ND. Groundwater monitoring well MW-3 was destroyed during UST removal at the site only one round of sample results are available from May 18, 1995; 92 µg/l TPHd was reported. Samples were collected from MW-4 for four rounds the results were ND except for the 190 µg/l detected in the August 31, 1995 sample. Samples collected on May 18, 1995 and August 31, 1995 were reported to contain 680 µg/l and 230 µg/l, respectively from well TW/MW-5, three subsequent samples have been reported as ND for TPHd. Results for samples collected from well MW-6 also were elevated for TPHd in 1995, but were ND in two rounds in 1996.

The samples collected in the tank 3&4 area have had TPHd concentrations that started high in February 1998 and have been decreasing since then. TPHd in AMW-1 has shown a reduction from 150 µg/l in February 1998 to 53 µg/l in February 1999. TPHd in AMW-2 has ranged from 380 µg/l to ND over the past year. The February 1998 sample from AMW-3 was reported to have a concentration of 17,000 µg/l TPHd, which has dropped to 140 µg/l in the February 1999 sample.

Total extractable petroleum hydrocarbons as motor oil (TEPHmo) was analyzed for in the 1995 and 1996 sampling rounds. TEPHmo was only detected one time in the sample collected from MW-1 on August 31, 1995, the concentration was 1400 µg/l. TEPHmo was not detected in MW-1 in three subsequent rounds of monitoring.

TPHg (referred to as total volatile hydrocarbons or TVH in Appendix C) was ND in all samples collected from the groundwater monitoring wells around tanks 1 & 2. TPHg was detected in the sample collected from groundwater monitoring well AMW-3 at a concentration of 140 µg/l, in three subsequent rounds it was ND. TPHg has been ND in all other groundwater samples collected in the tanks 3 & 4 area.

Benzene has only been detected once in the tank 1 & 2 area in the sample collected on May 18, 1995 from MW-1, the concentrations was 1.1 µg/l. Toluene has not been detected in any of the groundwater samples analyzed from the tank 1 & 2 area to date. Ethyl benzene and total xylenes have been detected twice in the tank 1 & 2 area on May 18, 1995 from MW-1 concentrations were 0.9 µg/l and 1.6 µg/l respectively. In the sample collected on February 22, 1999 from MW-1 the concentrations of ethyl benzene and total xylenes were 0.68 µg/l and 0.56 µg/l, respectively. BTEX compounds have only been detected twice in the tanks 3 & 4 area, benzene was detected at 0.99 µg/l in the sample collected on February 16, 1998 from well AMW-2 and total xylenes were detected at 0.6 µg/l in AMW-1 in the sample from February 22, 1999. In two intervening rounds BTEX compounds have been ND in all samples.

HVOs (volatile halocarbons) have been detected in samples from MW-1 and TW/MW-5 (see Table C-1 and C-5 in Appendix C). The HVOs detected most frequently have been cis-1,2-dichloroethene, and trans-1,2-dichloroethene. The concentration of cis-1,2-dichloroethene has varied from 1 µg/l to 22 µg/l in samples from well MW-1. The trans-1,2-dichloroethene concentrations reported have varied from ND to 5 µg/l in samples collected from MW-1. The only groundwater sample that was not from MW-1 where cis-1,2-dichloroethene has been detected in was collected from TW/MW-5, on March 8, 1996 and the concentration was 1.0 µg/l. Chloroform was detected in the sample collected from TW/MW-5 on May 18, 1995 at 1.0 µg/l and in the sample from MW-1 at 1.0 µg/l collected on the same day. Other HVOs detected in MW-1 have been trichloroethene, and tetra-chloroethene. Detection of these compounds has been sporadic. Concentrations of trichloroethene have ranged from ND to 7 µg/l. And concentrations of tetra-chloroethene have ranged from ND to 2.1 µg/l. All HVOs have been reported as ND in the samples collected from the tanks 3 & 4 area In the November 16, 1998 sampling round, due to an oversight, the EPA 8010 analysis was not performed on the samples collected

Polynuclear aromatic hydrocarbons (PAHs) were analyzed for in groundwater samples collected in the tanks 1 & 2 area in 1995 and 1996 PAHs were only detected in two samples collected on

May 18, 1995 and August 31, 1995 in the TW/MW-5 groundwater monitoring well. The sample collected on May 18, 1995 was reported to contain 7.5 µg/l naphythalene, 8.5 µg/l fluoranthrene, 14 µg/l pyrene, 5.5 µg/l chrysene, and 6.2 µg/l benzo(a)pyrene. The sample collected on August 31, 1995 was reported to contain 14 µg/l bis(2-ethylhexyl)phthalate. In three subsequent rounds of samples collected from the well these compounds were ND (see Table C-5 in Appendix C). PAHs were not part of the groundwater-monitoring program in the tanks 3 & 4 area.

During the February 22, 1999 sampling event depths to groundwater were recorded for each of the groundwater monitoring wells on the site. The wells in the sampling program were purged and sampled. As discussed above, the water samples were analyzed for TPHd, TPHg, O&G, BTEX, and HVO compounds. TPHd concentrations were reported in the samples collected from MW-1, AMW-1 and AMW-3 at 720 µg/l, 53 µg/l, and 140 µg/l respectively. The chromatograph patterns for the diesel range hydrocarbons detected in these samples did not resemble a diesel standard. Also, the patterns for the diesel range hydrocarbons detected in the samples indicated heavier hydrocarbons than a diesel standard. TPHg concentrations for all of the samples collected from the 4 wells were ND. Ethyl benzene and m,p-xylenes were detected in MW-1 at 0.68 µg/l and 0.56 µg/l, respectively. The sample from AMW-1 was reported to contain 0.60 µg/l m,p-xylenes as well. All other BTEX compounds were ND for the samples. O&G concentrations for the samples collected were also ND.

The groundwater gradient for this monitoring event was found to be towards the south. The projected groundwater gradient for the August 1998 monitoring event was to the south and the February 1998 monitoring event was roughly to the west. The gradient maps for all the previous sampling events are presented in Appendix D.

A correlation has been noted between higher water elevations (March 8, 1996, February 18, 1998, and February 22, 1999 events) and higher diesel and HVO concentrations.

6.0 RECOMMENDATIONS

The USTs have been removed from the site and are no longer a potential sources of contamination. TPH concentrations in groundwater samples collected at the site have been decreasing over time. Low levels of volatile organic halocarbons have been detected sporadically at the site over time. The San Francisco Bay is approximately 500 feet from the tank 1 & 2 area and more than 1,000 feet from the tank 3 & 4 area. The groundwater in the area is not used beneficially None of the onsite structures have basements into which the chemicals may leak

The GSA and CAPE are requesting that Alameda County consider closing the site without further action If closure is granted the monitoring wells will be abandoned properly The drummed materials at the site will be hauled to a licensed TSD facility

7.0 CAPE TEAM MEMBERS AND SIGNATURE PAGE

For this project, CAPE Team Members included Mr. William W. Millar, California Professional Registered Geologist and Mr. George R. Fagin CAD Operator. Field activities and report review for this Summary Quarterly Groundwater Monitoring report was performed by William Millar, whose signature, professional registration number, and stamp appear below.

William W. Millar, R.G.
Registration No.: 6175

REGISTERED GEOLOGIST
WILLIAM W. MILLAR
NO. 6175
EXPIRES: 8-31-00
STATE OF CALIFORNIA

4-13-99
Date

TABLE 3.0.1
SUMMARY OF FUEL HYDORCARBONS ANALYTICAL RESULTS
FEBRUARY 22, 1999

Sample ID	Date Sampled	TPHd (µg/l)	TPHg (µg/l)	B (µg/l)	T (µg/l)	E (µg/l)	X (µg/l)	O&G (mg/l)
MW-1	2/22/99	720	ND(50)	ND(0.5)	ND(0.5)	0.68	0.56	ND(5)
AMW-1	2/22/99	53	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	0.60	ND(5)
AMW-2	2/22/99	ND(50)	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(5)
AMW-3	2/22/99	140	ND(50)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND(5)

NOTES:

µg/L-	micrograms per liter.
ND-	not detected at or above Method Detection Limit (MDL).
( )-	number in parenthesis following reported ND result represents MDL.
TPHd-	total petroleum hydrocarbons as diesel, using EPA 8015 modified.
TPHg-	total petroleum hydrocarbons as gasoline, using EPA 8015 modified.
BTEX-	benzene, toluene, ethyl benzene and total xylenes (m-, p-, and o- isomers) using EPA Test Method 8020.
O&G	oil and grease using EPA SM 5520.

TABLE 3.0.2
SUMMARY OF ANALYTICAL RESULTS
VOLATILE ORGANIC HALOCARBON
FEBRUARY 22, 1999

SAMPLE	DATE	VOH's	CONCENTRATION (µg/L)
MW-1	2/22/99	trans-1,2-dichloroethene	2.2
		cis-1, 2-dichloroethene	15
		Tetrachloroethene	1.4
AMW-1	2/22/99		ND
AMW-2	2/22/99		ND
AMW-3	2/22/99		ND

Abbreviations:
µg/L = Micrograms per liter
ND = not detected at or above the method detection limit (MDL)

TABLE 4.0.1
STATIC GROUNDWATER LEVEL MEASUREMENTS
FEBRUARY 22, 1999

Location	Date	Time	SWL(ft)	Casing Elevation(ft)	Water Elevation(ft)
MW-1	2-22-99	1015	3.48	8.19	4.71
MW-4	2-22-99	1020	3.69	8.53	4.84
TW/MW-5	2-22-99	1030	3.44	8.37	4.93
MW-6	2-22-99	1025	3.71	8.61	4.90
AMW-1	2-22-99	0947	3.405	8.73	5.325
AMW-2	2-22-99	0950	3.405	8.84	5.435
AMW-3	2-22-99	0956	3.205	8.53	5.325

NOTES:

Static groundwater level in feet below top of well casing.
Elevations in feet above mean sea level.
NA = not available.

FIGURES

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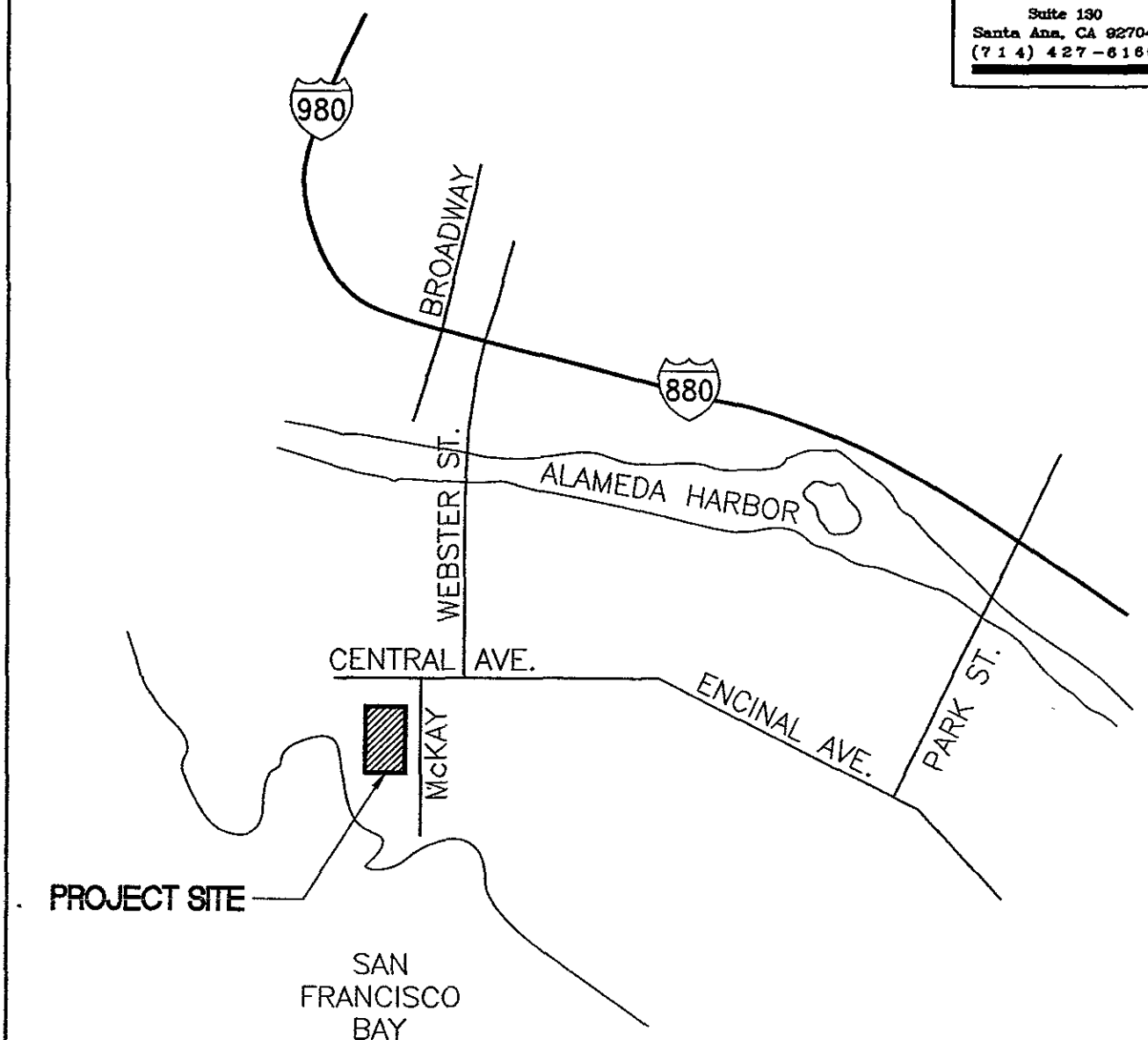

VICINITY MAP

NOT TO SCALE

PROJECT NORTH

SHEET TITLE: FIGURE 1 – SITE VICINITY MAP	CHECKED BY: W W M	PROJECT NUMBER: 2403C 24	
PROJECT TITLE: ALAMEDA FEDERAL CENTER, ALAMEDA, CA	DRAWN BY: G.R.F	DATE: DEC 1998	SHEET: 1

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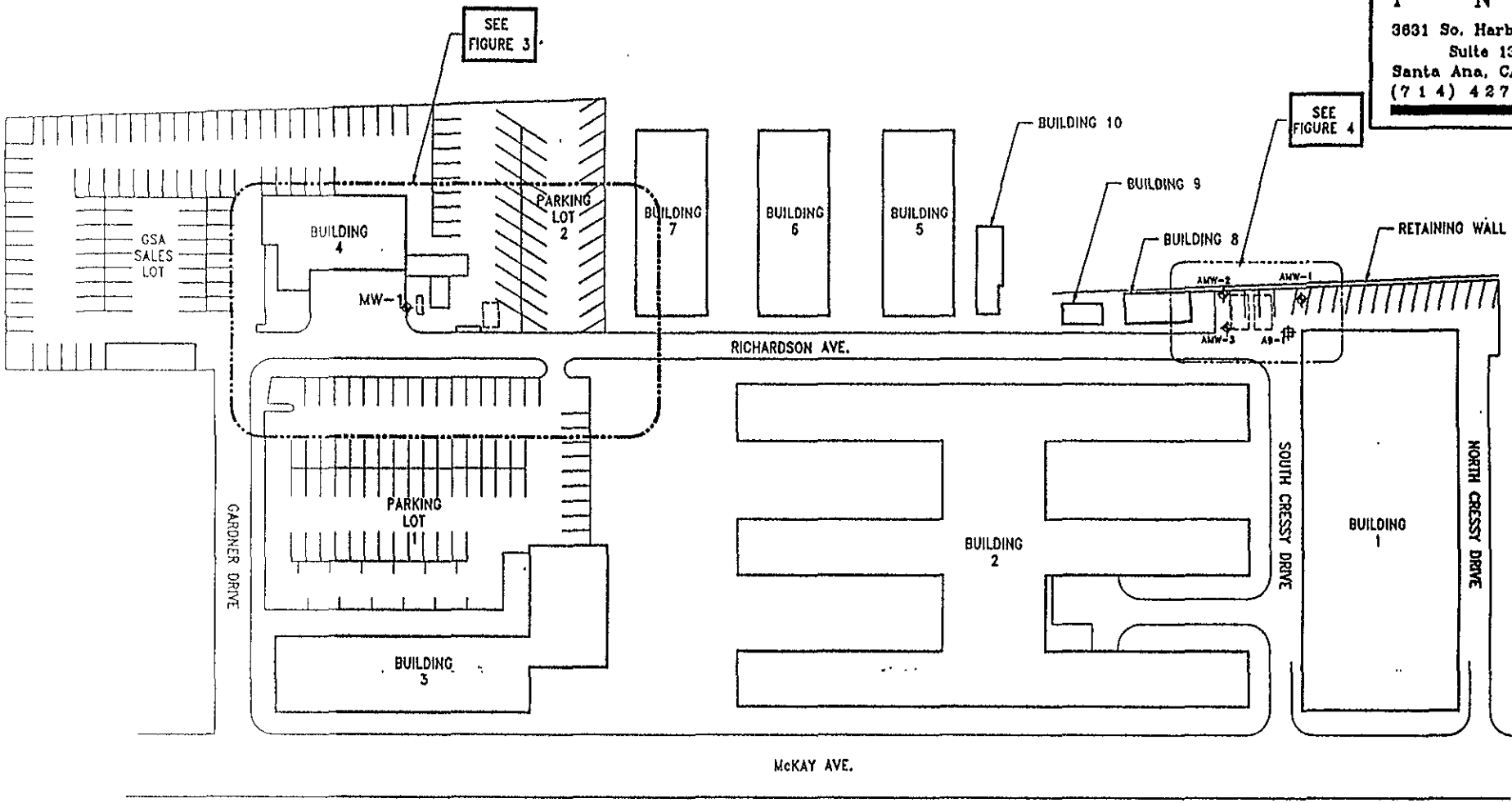

LEGEND

MW-1 ⊕ MONITORING WELL

AB-1 ⊕ SOIL BORING

GRAPHIC SCALE

0 10' 50' 100' 150'

PROJECT NORTH

SHEET TITLE: FIGURE 2 - SITE MAP	CHECKED BY: W.W.M.	PROJECT NUMBER: 2403C.24	
PROJECT TITLE: ALAMEDA FEDERAL CENTER, ALAMEDA, CA	DRAWN BY: G.R.F.	DATE: SEPT. 1998	SHEET: 2 OF 5

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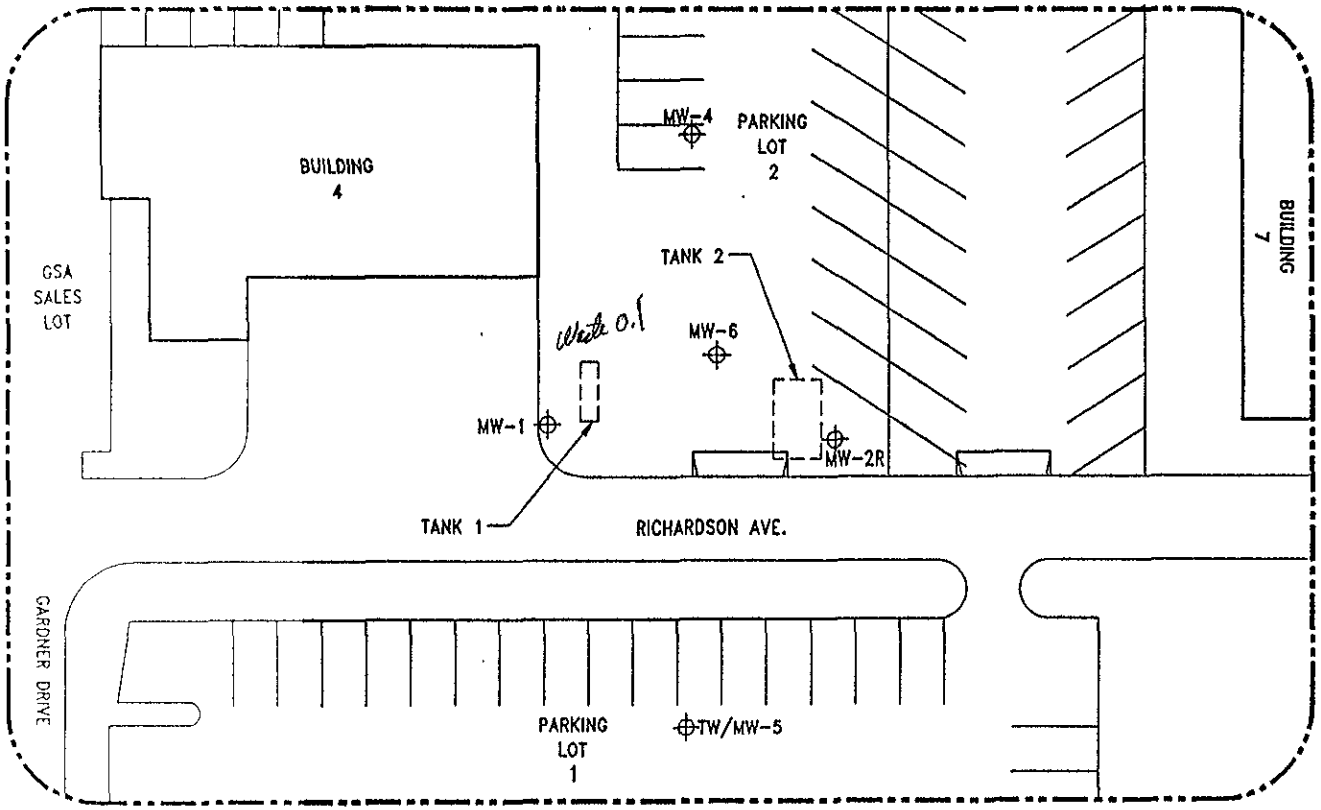

LEGEND

⊕ MW — EXISTING MONITORING WELL

- - - - APPROX. LOCATION OF REMOVED UST's

GRAPHIC SCALE

0 10' 20' 30' 40'

SCALE: 1" = 40'

PROJECT NORTH

SHEET TITLE: FIGURE 3 – TANK 1 & 2 AREA / BORING LOCATIONS	CHECKED BY: W.W.M.	PROJECT NUMBER: 2403C.24	
PROJECT TITLE: ALAMEDA FEDERAL CENTER, ALAMEDA, CA	DRAWN BY: G.R.F.	DATE: SEPT. 1998	SHEET: 3 OF 5

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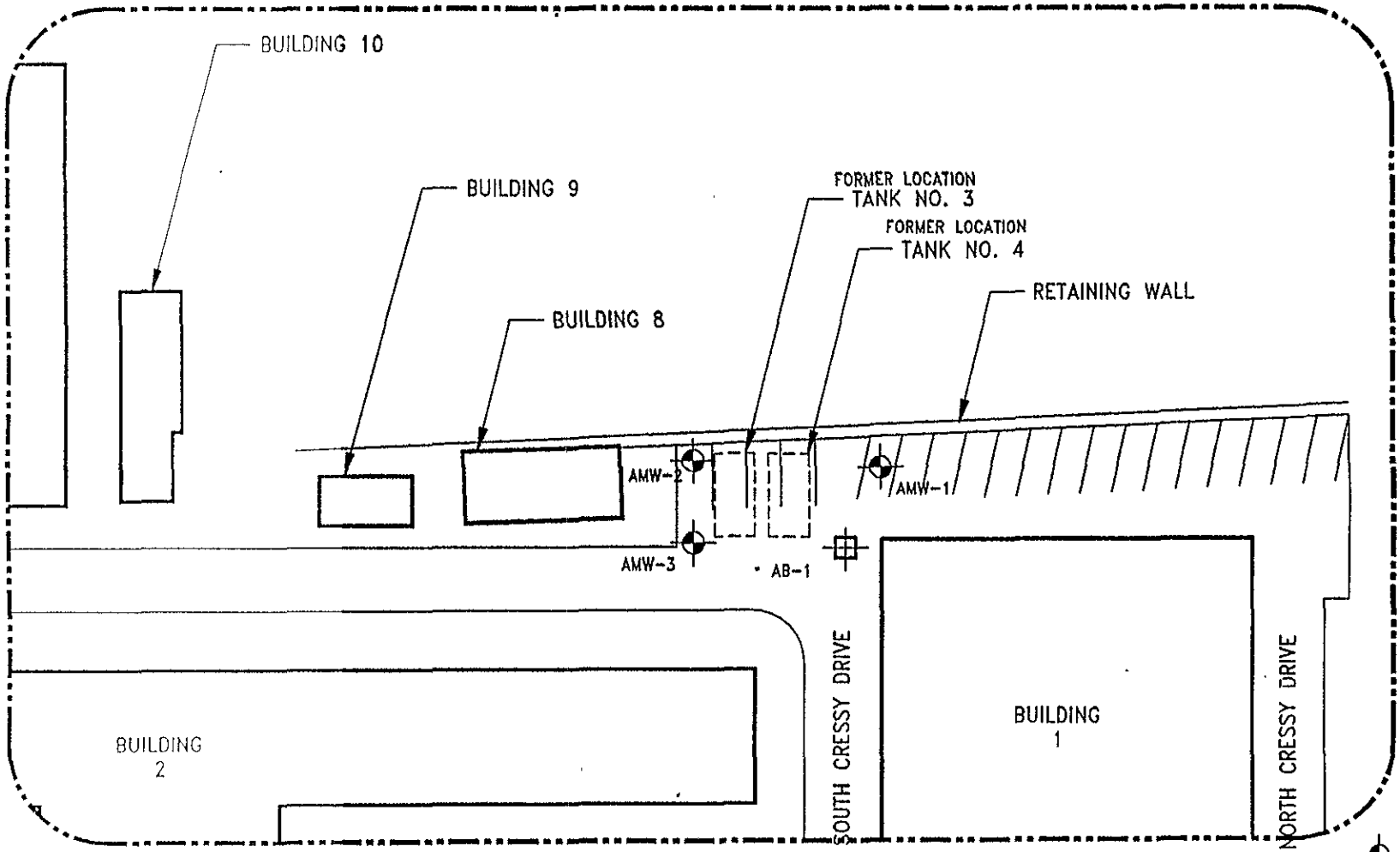


LEGEND

MONITORING WELLS

SOIL BORING

APPROX. LOCATION OF REMOVED UST's

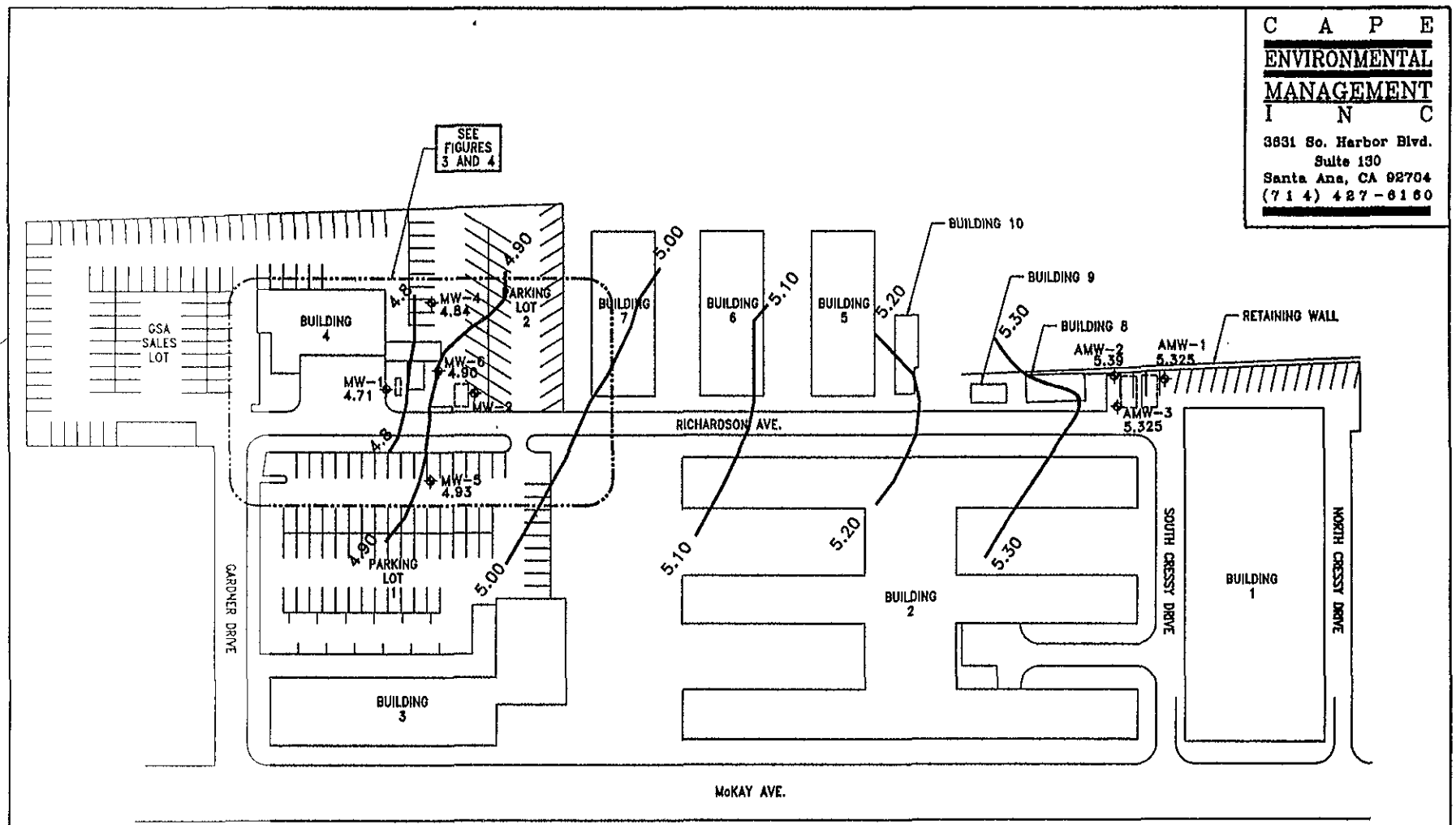
GRAPHIC SCALE

0 10' 20' 30' 40'

SCALE: 1" = 40'

PROJECT NORTH

SHEET TITLE: FIGURE 4 – TANK 3 & 4 AREA / MONITORING WELL LOCATIONS	CHECKED BY: W.W.M.	PROJECT NUMBER: 2403C.24	
PROJECT TITLE: ALAMEDA FEDERAL CENTER, ALAMEDA, CA	DRAWN BY: G.R.F.	DATE: SEPT. 1998	SHEET: 4 OF 5



LEGEND

MW-1 4.71 ◆ EXISTING MONITORING WELL WITH GROUNDWATER LEVEL

5.30 GROUNDWATER CONTOUR GRADIENT

GRAPHIC SCALE

0 50' 100' 150'

PROJECT NORTH

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SHEET TITLE: FIGURE 5 – GROUNDWATER GRADIENT MAP 02-22-99		CHECKED BY: B. Millar	PROJECT NUMBER: 2403C.24.001
PROJECT TITLE: ALAMEDA FEDERAL CENTER, ALAMEDA, CA	DRAWN BY: G. Fagin	DATE: 03-24-99	SHEET: FIG.5

FILE: GW0299F5.dwg

APPENDIX A

GROUNDWATER PURGING AND SAMPLING LOGS
FEBRUARY 22, 1999

JBR Environmental Consultants, Inc.
8160 Highland Drive
Sandy, UT 84093
801.943.4144 fax: 801.942.1852

Groundwater Purging and Sampling Log

Well Number: MW-1

Site: ALAMEDA FEDERAL CENTER Project Number: CAPE-OZ 2403C.024.001

Collector: BILL MCLAIN Date Sampled: 7.27.99

pH/Conductivity meter serial number: 1092/1071760

pH meter calibration: FIELD pH 7.0 & 4.01

Depth to water prior to purging: (84.46) 3.46' ft. Time: 1015

Depth to Bottom of Well: 15' ft. Casing Diameter

Standing Well Volume: 1.96 Gals gallons (inches): 2

Time	Temp (°C)	pH	Conductivity (umhos)	Color	Turbidity	Others	Volume Purged
1505	17	6.85	640 MS	CL	LOW		1G
1508	17	6.64	625	"	"		2G
1510	17	6.50	624	"	"		3G
1512	17	6.40	600	"	"		4G
1513	17	6.34	620	"	"		5G
1516	16	6.40	637	"	"		6G

Depth to water after purging: [illegible] 3.18' Start Purge: 1505 o'clock
End Purge: 1520 o'clock
Purge Duration: 15 minutes
Well volumes purged: 3

Sample Number	Container(s)	Type	Filtered (y/n)	Time	Preservatives	Remarks
MW-1	6	[illegible]	N		ICE/HCl	

Decon Procedures (internal) [illegible]
Decon Procedures (external)

Include other tests, if performed, such as dissolved oxygen, Eh, etc

JBR Environmental Consultants, Inc.
8160 Highland Drive
Sandy, UT 84093
801.943.4144 fax: 801.942.1852

Groundwater Purging and Sampling Log

Well Number: AMW-1

Site: ALAMEDA FEDERAL CENTER Project Number: CAPE-02 240DC.024.001

Collector: BILL MILLAM Date Sampled: 2-27-99

pH/Conductivity meter serial number: 1092 / 107760

pH meter calibration: FIELD pH 7.0 & 4.01 SOLUTIONS

Depth to water prior to purging: ~~3.405'~~ 3.405' ft. Time: 1947

Depth to Bottom of Well: 15 ft. Casing Diameter

Standing Well Volume: 1.97 gallons (inches): 2

6 GALLONS

Time	Temp (°C)	pH	Conductivity (umhos)	Color	Turbidity	Others	Volume Purged
1304	17°	7.37	1170	CLEAR	CLEAR		1G
1308	16°	6.46	1325	"	"		2G
1312	16°	6.35	1260	"	"		3G
1317	15°	6.43	1334	"	"		4G
1322	15°	6.59	1338	"	"		5G
1327	15°	6.62	1338	"	"		6G

Depth to water after purging: [illegible] Start Purge: _____ o'clock

End Purge: _____ o'clock

Purge Duration: _____ minutes

Well volumes purged: _____

Sample Number	Container(s)	Type	Filtered (y/n)	Time	Preservatives	Remarks
AMW-1	6	4 VOAS 2 LIT. PLR	N	1345	ICE / HCL	

Decon Procedures (internal) [illegible]

Decon Procedures (external) _____

Include other tests, if performed, such as dissolved oxygen, Eh etc

JBR Environmental Consultants, Inc.
8160 Highland Drive
Sandy, UT 84093
801.943.4144 fax: 801.942.1852

Groundwater Purging and Sampling Log

Well Number: AMW-2

Site: ALAMEDA FEDERAL CENTER Project Number: CHPE-02 240BC.024.001

Collector: BILL MCLAIN Date Sampled: 2-22-99

pH/Conductivity meter serial number: 1092 / 107760

pH meter calibration: FIELD 7.0 & 4.01 SOLUTIONS

Depth to water prior to purging: (84.450') 3.450 ft. Time: 0950

Depth to Bottom of Well: 15' ft. Casing Diameter

Standing Well Volume: 1.96 gallons (inches): 2

6 Casing

Time	Temp (°C)	pH	Conductivity (umhos)	Color	Turbidity	Others	Volume Purged
1207	15	6.47	1695	CLEAR	CLOUDY		1 G
1210	16	6.40	1698	"	"		2 G
1212	16	6.33	1400	"	"		3 G
1215	15	6.31	1600	TAN	MUD		4 G
1218	15	6.34	1627	"	"		6 G

Depth to water after purging: (85.58) 4.58' Start Purge: 1205 o'clock
End Purge: 1220 o'clock
Purge Duration: 15 minutes
Well volumes purged: 3

Sample Number	Container(s)	Type	Filtered (y/n)	Time	Preservatives	Remarks
AMW-2	6	[illegible]	N		ICE/HCL	

Decon Procedures (internal) [illegible]
Decon Procedures (external)

Include other tests, if performed such as dissolved oxygen, Fh etc

JBR Environmental Consultants, Inc.
8160 Highland Drive
Sandy, UT 84093
801.943.4144 fax: 801.942.1852

Groundwater Purging and Sampling Log

Well Number: AMW-3

Site: ALAMEDA FEDERAL CENTER Project Number: CHPE-02 2408C.024.001

Collector: BILL MILLAR Date Sampled: 2-22-99

pH/Conductivity meter serial number: 1092 / 1071760

pH meter calibration: FIELD pH 7.0 & 4.01

Depth to water prior to purging: (84.20) 3.20' ft. Time: 0956

Depth to Bottom of Well: 15 ft. Casing Diameter

Standing Well Volume: 2.00 gallons (inches): 2

Time	Temp (°C)	pH	Conductivity (umhos)	Color	Turbidity	Others	Volume Purged
1121	16°	6.22	MS 0.10	TAN	MOD		1 GAL
1125	16°	6.31	MS 785	"	"		2 GAL
1129	16°	6.29	MS 758	"	"		3 GAL
1130	16°	6.29	MS 617	"	"		4 GAL
1133	16°	6.24	MS 717	"	"		5 GAL
1136	16°	6.20	MS 635	"	"		6 GAL

Depth to water after purging: (84.23) 3.23' Start Purge: 1120 o'clock
End Purge: 1136 o'clock
Purge Duration: 16 minutes
Well volumes purged: N 3

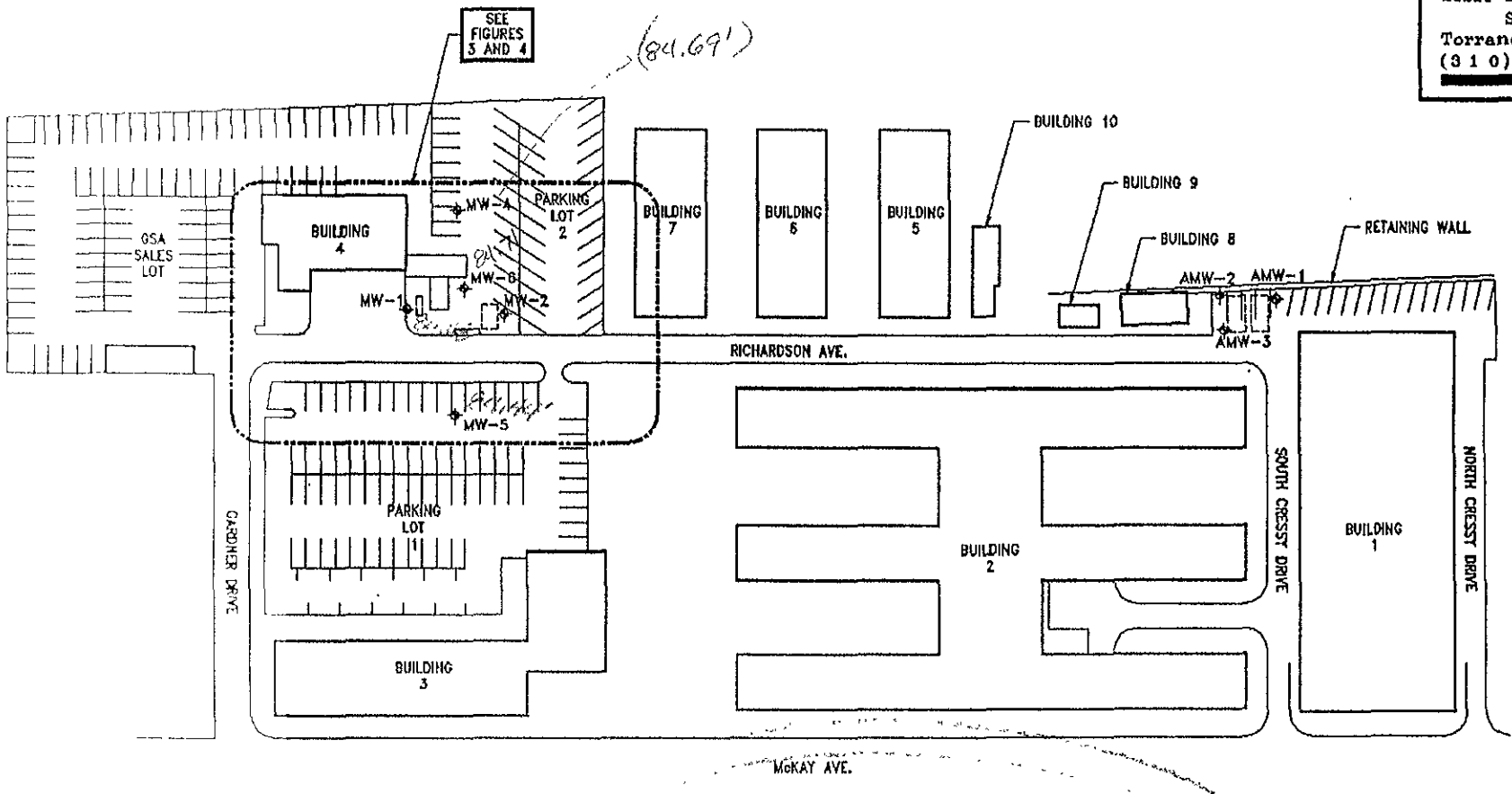
Sample Number	Container(s)	Type	Filtered (y/n)	Time	Preservatives	Remarks
AMW-3	6	40 ml VOA + 1L amber	N	1435	ICE/HCl	

Decon Procedures (internal) DEIONIZED WATER

Decon Procedures (external)

Include other tests, if performed such as dissolved oxygen, Eh, etc

C A P E
ENVIRONMENTAL
MANAGEMENT
I N C
20280 S Vermont Ave.
Suite 250
Torrance, CA 90502
(310) 532-4500



2-22-99

COMMENTS

LEGEND

MW-6 ✦ EXISTING MONITORING WELL

GRAPHIC SCALE

0 10' 50 100' 150

PROJECT NORTH

SHEET TITLE: FIGURE 2 – SITE PLAN		CHECKED BY: B. Millar	PROJECT NUMBER: 2403C.24
PROJECT TITLE: ALAMEDA FEDERAL CENTER, ALAMEDA, CA	DRAWN BY: G. Fagin	DATE: 02-27-98	SHEET: 1 OF 1

APPENDIX B

LABORATORY REPORT
GROUNDWATER SAMPLES
FEBRUARY 22, 1999

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900, Fax (510) 486-0532

A N A L Y T I C A L R E P O R T

Prepared for:

Cape Environmental, Inc.
3631 South Harbor Blvd.
Suite 130
Santa Anna, CA 92704

Date: 16-MAR-99
Lab Job Number: 138081
Project ID: 2403C.024.001
Location: Alameda Fed.

Reviewed by: _____

Reviewed by: _____

CHAIN OF CUSTODY FORM

Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878
2323 Fifth Street
Berkeley, CA 94710
(510) 486-0900 Phone
(510) 486-0532 Fax

C&T LOGIN # 13901

Sampler: Bill McLaren

Project No: CAPE-02 2403C.024.001

Report To: Bill McLaren

Project Name: Alameda Fed. Center

Company: CAPE

Project P.O.: 2403C. 024.001

Telephone: 801/943-4144

Turnaround Time: Normal

Fax: 801/942-1852

Lab Number	Sample ID.	Sampling Date Time	Matrix: Soil	Matrix: Water	Matrix: Waste	# of Containers	Preservative: HCl	Preservative: H_2SO_4	Preservative: HNO_3	Preservative: ICE	Field Notes	Analyses: 8015 Diesel	Analyses: 8015 Gas/BTEX	Analyses: O&G 5520	Analyses: HOU 8010
	MW-1	2-22-99		X		6	X			X		X	X	X	X
	AMW-1	"		X		6	X			X		X	X	X	X
	AMW-2	"		X		6	X			X		X	X	X	X
	AMW-3	"		X		6	X			X		X	X	X	X

Notes:

COOLER RECEIVED: 3.5 °C
RECEIVED BY: Steve

RELINQUISHED BY:

2-22-99 1629 DATE/TIME

DATE/TIME

DATE/TIME

RECEIVED BY:

2-22-99 1625 DATE/TIME

DATE/TIME

DATE/TIME

Signature on this form constitutes a firm Purchase Order for the services requested above

Curtis & Tompkins, Ltd.

TEH-Tot Ext Hydrocarbons

Client: Cape Environmental, Inc.
Project#: 2403C.024.001
Location: Alameda Fed.

Analysis Method: EPA 8015M
Prep Method: EPA 3520

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
138081-001	MW-1	46566	02/22/99	03/02/99	03/05/99	
138081-002	AMW-1	46566	02/22/99	03/02/99	03/05/99	
138081-003	AMW-2	46566	02/22/99	03/02/99	03/05/99	
138081-004	AMW-3	46566	02/22/99	03/02/99	03/05/99	

Matrix: Water

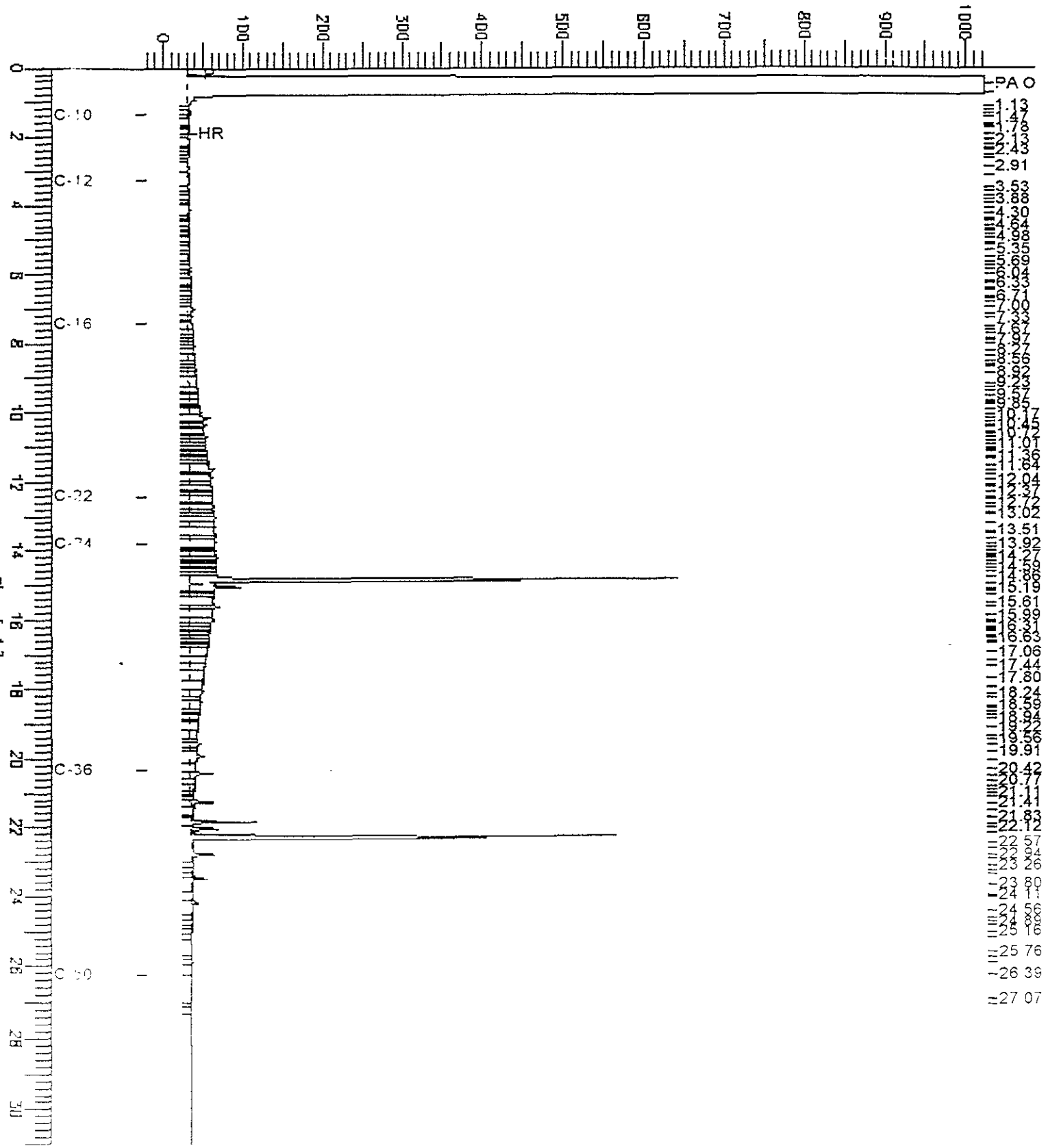
Analyte	Units	138081-001	138081-002	138081-003	138081-004
Diln Fac:		1	1	1	1
Diesel C10-C24	ug/L	720 YH	53 YH	<50	140 YLH
Surrogate					
Hexacosane	%REC	64	67	72	60

Y: Sample exhibits fuel pattern which does not resemble standard
H: Heavier hydrocarbons than indicated standard
L: Lighter hydrocarbons than indicated standard

Chromatogram

Sample Nam . 1[illegible]081-001,46566
FileName : [illegible]:\GC13\CHB\063B029.RAW
ethod [illegible]EH015.MTH
tart Time [illegible].00 min End Time : 31.90 min
cale Fact : [illegible].0 Plot Offset: -22 mV

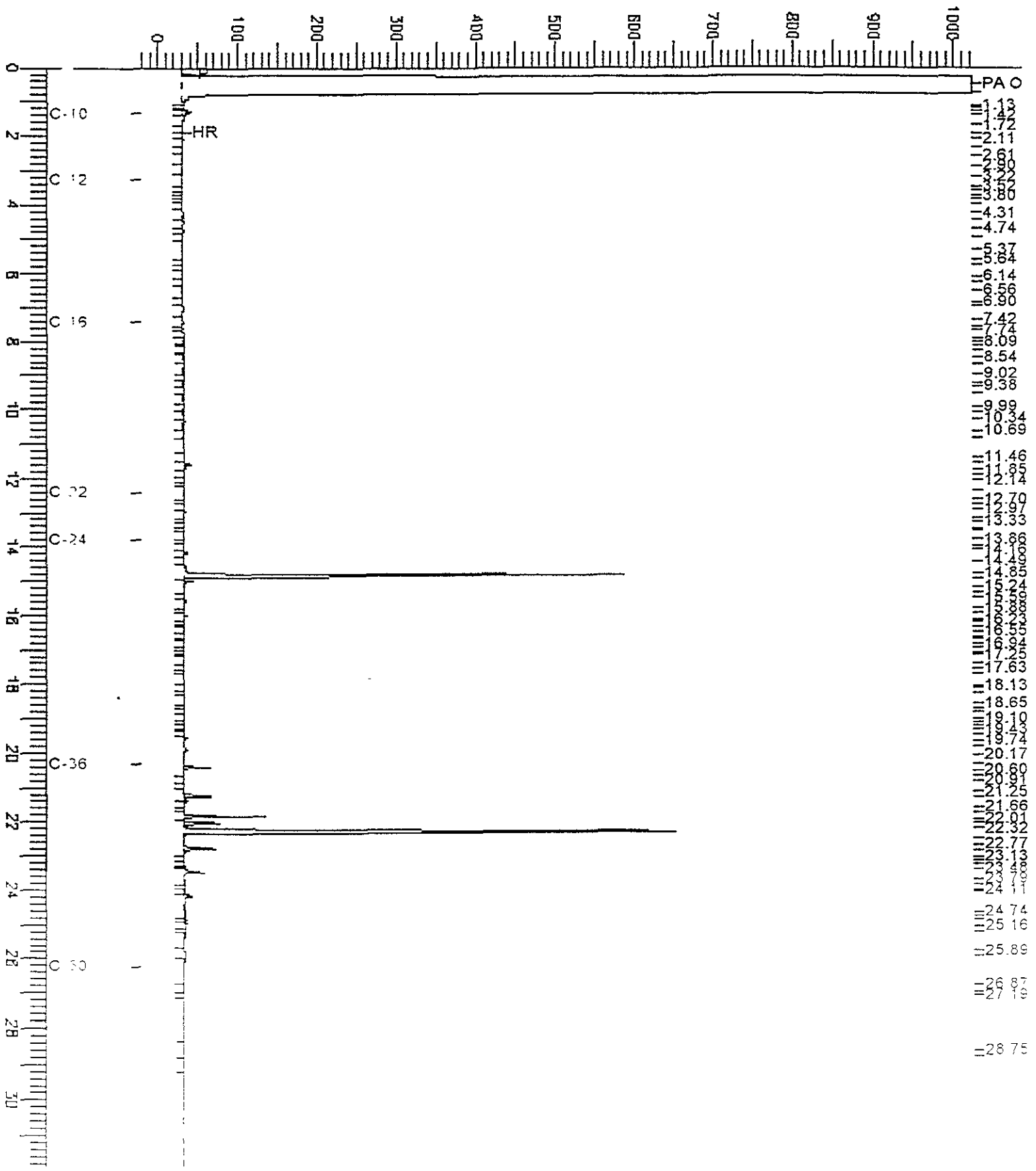
Sample #: 46566 Page 1 of 1
Date : 3/9/99 09:16 AM
Time of Injection: 3/5/99 04:58 PM
Low Point : -22.22 mV High Point : 1024.00 mV
Plot Scale: 1046.2 mV



Chromatogram

Sample Nar : 381-002,46566
FileName : C:\GC13\CHB\063B030.RAW
Method : TEH015.MTH
Start Time : 0.00 min End Time : 31.90 min
Scale Fact : 1.0 Plot Offset: -23 mV

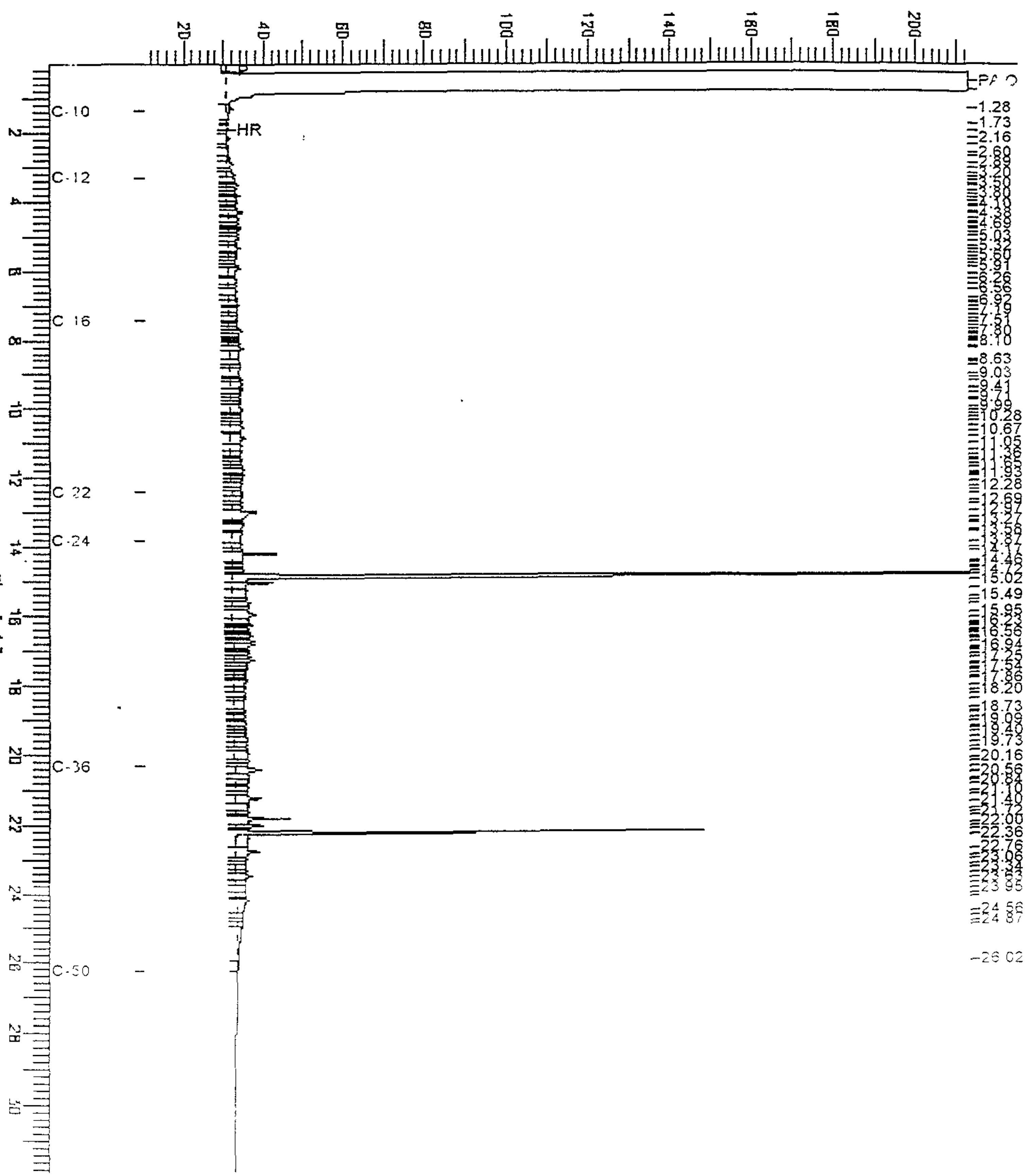
Sample #: 46566
Date : 3/9/99 09:17 AM
Time of Injection: 3/5/99 05:40 PM
Low Point : -22.66 mV High Point : 1024.00 mV
Plot Scale: 1046.7 mV



Chromatogram

ample Nam : : 081-004,46566
ileName : ...GC13\CHB\0638032.RAW
ethod : RTF9015.MTH
Start Time : 0.01 min   End Time : 31.91 min
Scale Fact : .0   Plot Offset: 10 mV

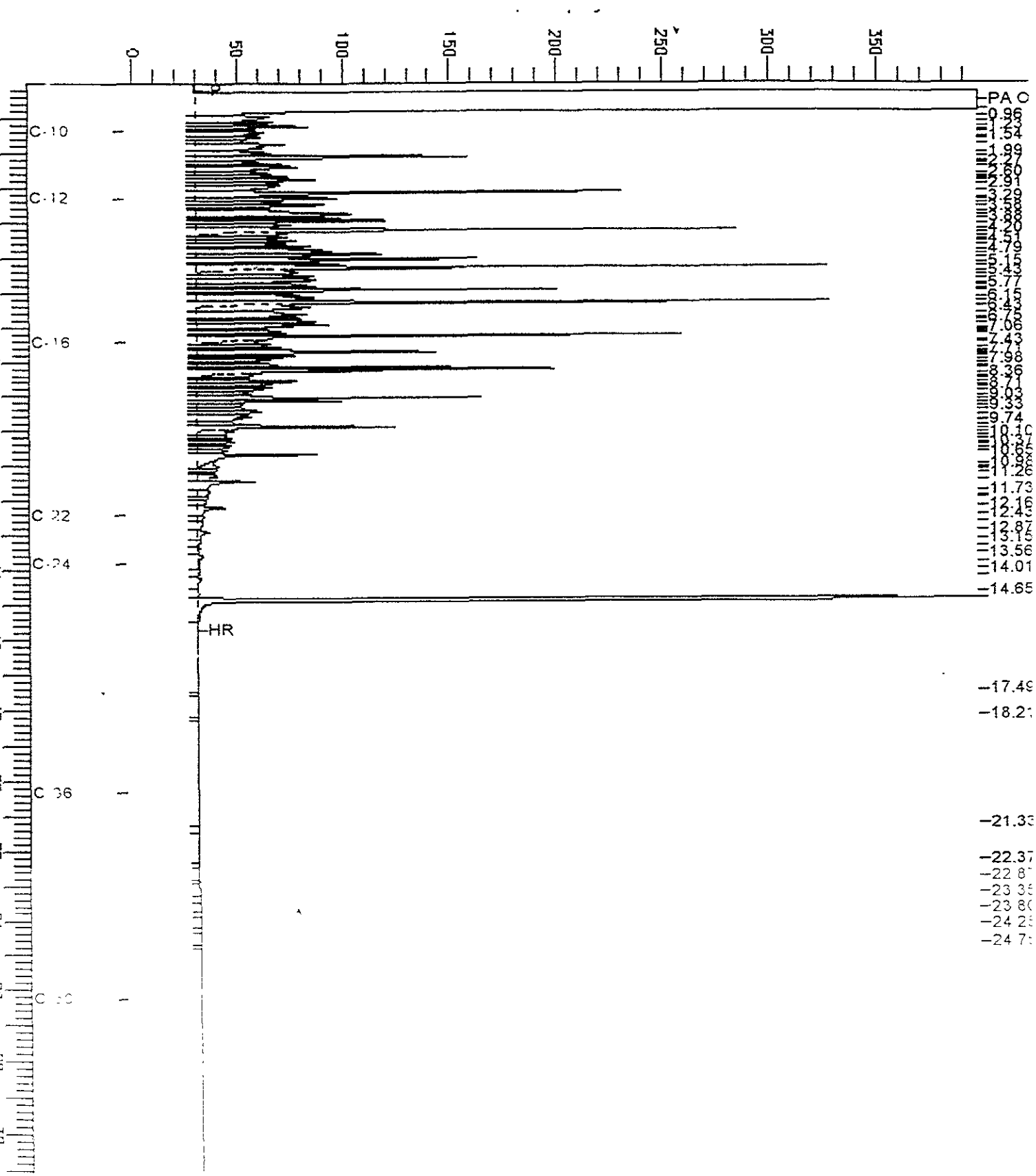
Sample #: 46566
Date : 3/9/99 09:18 AM
Time of Injection: 3/5/99 07:03 PM
Low Point : 10.40 mV   High Point : 213.16 mV
Plot Scale: 202.8 mV



Chromatogram

Sample Nam ,99ws7121,gsl
FileName C13\CHB\0688002.RAW
thod 015.MTH
art Time 1 min End Time : 31.91 min
ale Fact .0 Plot Offset: -5 mV

Sample #: 500mg/l
Date : 3/10/99 08:17 AM
Time of Injection: 3/9/99 08:25 PM
Low Point : -4.71 mV High Point : 397.24 mV
Plot Scale: 402.0 mV



Lab #: 138081 BATCH QC REPORT Curtis & Tompkins, Ltd.

Page 1

TEH-Tot Ext Hydrocarbons			
Client:	Cape Environmental, Inc.	Analysis Method:	EPA 8015M
Project#:	2403C.024.001	Prep Method:	EPA 3520
Location:	Alameda Fed.		

METHOD BLANK			
Matrix:	Water	Prep Date:	03/02/99
Batch#:	46566	Analysis Date:	03/06/99
Units:	ug/L		
Diln Fac:	1		

MB Lab ID: QC91995

Analyte	Result
Diesel C10-C24	<50

Surrogate	%Rec	Recovery Limits
Hexacosane	79	58-128

Lab #: 138081 BATCH QC REPORT Curtis & Tompkins, Ltd.

TEH-Tot Ext Hydrocarbons	
Client: Cape Environmental, Inc.	Analysis Method: EPA 8015M
Project#: 2403C.024.001	Prep Method: EPA 3520
Location: Alameda Fed.	

LABORATORY CONTROL SAMPLE	
Matrix: Water	Prep Date: 03/02/99
Batch#: 46566	Analysis Date: 03/10/99
Units: ug/L	
Diln Fac: 1	

LCS Lab ID: QC91996

Analyte	Result	Spike Added	%Rec #	Limits
Diesel C10-C24	1705	2475	69	50-114
Surrogate	**%Rec**	**Limits**		
Hexacosane	83	58-128		

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits
Spike Recovery: 0 out of 1 outside limits

Lab #: 138081 BATCH QC REPORT Curtis & Tompkins, Ltd. 1

TEH-Tot Ext Hydrocarbons

Client:	Cape Environmental, Inc.	Analysis Method:	EPA 8015M
Project#:	2403C.024.001	Prep Method:	EPA 3520
Location:	Alameda Fed.		

MATRIX SPIKE/MATRIX SPIKE DUPLICATE

Field ID:	ZZZZZZ	Sample Date:	02/24/99
Lab ID:	138202-001	Received Date:	02/26/99
Matrix:	Water	Prep Date:	03/02/99
Batch#:	46566	Analysis Date:	03/10/99
Units:	ug/L		
Diln Fac:	1		

MS Lab ID: QC91997

Analyte	Spike Added	Sample	MS	%Rec #	Limits
Diesel C10-C24	2475	<50	1475	59	51-104

Surrogate	%Rec	Limits
Hexacosane	76	58-128

MSD Lab ID: QC91998

Analyte	Spike Added	MSD	%Rec #	Limits	RPD #	Limit
Diesel C10-C24	2475	1419	57	51-104	4	33

Surrogate	%Rec	Limits
Hexacosane	69	58-128

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits
RPD: 0 out of 1 outside limits
Spike Recovery: 0 out of 2 outside limits

Curtis & Tompkins, Ltd.

TVH-Total Volatile Hydrocarbons

Client: Cape Environmental, Inc.
Project#: 2403C.024.001
Location: Alameda Fed.

Analysis Method: EPA 8015M
Prep Method: EPA 5030

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
138081-001	MW-1	46550	02/22/99	03/02/99	03/02/99	
138081-002	AMW-1	46550	02/22/99	03/02/99	03/02/99	
138081-003	AMW-2	46550	02/22/99	03/03/99	03/03/99	
138081-004	AMW-3	46550	02/22/99	03/03/99	03/03/99	

Matrix: Water

Analyte Diln Fac:	Units	138081-001 1	138081-002 1	138081-003 1	138081-004 1
Gasoline C7-C12	ug/L	<50	<50	<50	<50
Surrogate					
Trifluorotoluene	%REC	92	95	92	82
Bromofluorobenzene	%REC	93	92	91	82

Curtis & Tompkins, Ltd.

BTXE

Client: Cape Environmental, Inc.
Project#: 2403C.024.001
Location: Alameda Fed.

Analysis Method: EPA 8021B
Prep Method: EPA 5030

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
138081-001	MW-1	46550	02/22/99	03/02/99	03/02/99	
138081-002	AMW-1	46550	02/22/99	03/02/99	03/02/99	
138081-003	AMW-2	46550	02/22/99	03/03/99	03/03/99	
138081-004	AMW-3	46550	02/22/99	03/03/99	03/03/99	

Matrix: Water

Analyte Diln Fac:	Units	138081-001 1	138081-002 1	138081-003 1	138081-004 1
Benzene	ug/L	<0.5	<0.5	<0.5	<0.5
Toluene	ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	ug/L	0.68	<0.5	<0.5	<0.5
m,p-Xylenes	ug/L	0.56	0.6	<0.5	<0.5
o-Xylene	ug/L	<0.5	<0.5	<0.5	<0.5
Surrogate					
Trifluorotoluene	%REC	89	90	89	79
Bromofluorobenzene	%REC	92	94	91	82

Lab #: 138081 BATCH QC REPORT Curtis & Tompkins, Ltd.

TVH-Total Volatile Hydrocarbons

Client:	Cape Environmental, Inc.	Analysis Method:	EPA 8015M
Project#:	2403C.024.001	Prep Method:	EPA 5030
Location:	Alameda Fed.		

METHOD BLANK

Matrix:	Water	Prep Date:	03/02/99
Batch#:	46550	Analysis Date:	03/02/99
Units:	ug/L		
Diln Fac:	1		

MB Lab ID: QC91949

Analyte	Result
Gasoline C7-C12	<50

Surrogate	%Rec	Recovery Limits
Trifluorotoluene	88	53-150
Bromofluorobenzene	90	53-149

Lab #: 138081 BATCH QC REPORT Curtis & Tompkins, Ltd.

BTXE	
Client: Cape Environmental, Inc.	Analysis Method: EPA 8021B
Project#: 2403C.024.001	Prep Method: EPA 5030
Location: Alameda Fed.	

METHOD BLANK	
Matrix: Water	Prep Date: 03/02/99
Batch#: 46550	Analysis Date: 03/02/99
Units: ug/L	
Diln Fac: 1	

MB Lab ID: QC91949

Analyte	Result
Benzene	<0.5
Toluene	<0.5
Ethylbenzene	<0.5
m,p-Xylenes	<0.5
o-Xylene	<0.5

Surrogate	%Rec	Recovery Limits
Trifluorotoluene	85	51-143
Bromofluorobenzene	89	37-146

Lab #: 138081 BATCH QC REPORT Curtis & Tompkins, Ltd.

TVH-Total Volatile Hydrocarbons

Client:	Cape Environmental, Inc.	Analysis Method:	EPA 8015M
Project#:	2403C.024.001	Prep Method:	EPA 5030
Location:	Alameda Fed.		

LABORATORY CONTROL SAMPLE

Matrix:	Water	Prep Date:	03/02/99
Batch#:	46550	Analysis Date:	03/02/99
Units:	ug/L		
Diln Fac:	1		

LCS Lab ID: QC91948

Analyte	Result	Spike Added	%Rec #	Limits
Gasoline C7-C12	1768	2000	88	77-117

Surrogate	%Rec	Limits
Trifluorotoluene	101	53-150
Bromofluorobenzene	111	53-149

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits
Spike Recovery: 0 out of 1 outside limits

Lab #: 138081

BATCH QC REPORT

Curtis & Tompkins, Ltd.

BTXE

Client: Cape Environmental, Inc.
Project#: 2403C.024.001
Location: Alameda Fed.

Analysis Method: EPA 8021B
Prep Method: EPA 5030

BLANK SPIKE/BLANK SPIKE DUPLICATE

Matrix: Water
Batch#: 46550
Units: ug/L
Diln Fac: 1

Prep Date: 03/02/99
Analysis Date: 03/02/99

BS Lab ID: QC91950

Analyte	Spike Added	BS	%Rec #	Limits
Benzene	20	18.16	91	65-111
Toluene	20	17.78	89	76-117
Ethylbenzene	20	18.73	94	71-121
m,p-Xylenes	40	37.63	94	80-123
o-Xylene	20	18.43	92	75-127

Surrogate	%Rec	Limits
Trifluorotoluene	89	51-143
Bromofluorobenzene	93	37-146

BSD Lab ID: QC91951

Analyte	Spike Added	BSD	%Rec #	Limits	RPD #	Limit
Benzene	20	17.63	88	65-111	3	10
Toluene	20	17.39	87	76-117	2	10
Ethylbenzene	20	18.17	91	71-121	3	11
m,p-Xylenes	40	36.6	92	80-123	3	10
o-Xylene	20	17.72	89	75-127	4	11

Surrogate	%Rec	Limits
Trifluorotoluene	83	51-143
Bromofluorobenzene	87	37-146

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits
RPD: 0 out of 5 outside limits
Spike Recovery: 0 out of 10 outside limits

Lab #: 138081 BATCH QC REPORT Curtis & Tompkins, Ltd.

TVH-Total Volatile Hydrocarbons

Client:	Cape Environmental, Inc.	Analysis Method:	EPA 8015M
Project#:	2403C.024.001	Prep Method:	EPA 5030
Location:	Alameda Fed.		

MATRIX SPIKE/MATRIX SPIKE DUPLICATE

Field ID:	MW-1	Sample Date:	02/22/99
Lab ID:	138081-001	Received Date:	02/22/99
Matrix:	Water	Prep Date:	03/02/99
Batch#:	46550	Analysis Date:	03/02/99
Units:	ug/L		
Diln Fac:	1		

MS Lab ID: QC91952

Analyte	Spike Added	Sample	MS	%Rec #	Limits
Gasoline C7-C12	2000	<50	1935	97	69-131

Surrogate	%Rec	Limits
Trifluorotoluene	103	53-150
Bromofluorobenzene	115	53-149

MSD Lab ID: QC91953

Analyte	Spike Added	MSD	%Rec #	Limits	RPD #	Limit
Gasoline C7-C12	2000	1937	97	69-131	0	13

Surrogate	%Rec	Limits
Trifluorotoluene	101	53-150
Bromofluorobenzene	113	53-149

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits
RPD: 0 out of 1 outside limits
Spike Recovery: 0 out of 2 outside limits

Curtis & Tompkins Ltd.

Halogenated Volatile Organics
EPA 8010 Analyte List

Client:	Cape Environmental, Inc.	Analysis Method:	EPA 8260A
Project#:	2403C.024.001	Prep Method:	EPA 5030
Location:	Alameda Fed.		

Field ID:	MW-1	Sampled:	02/22/99
Lab ID:	138081-001	Received:	02/22/99
Matrix:	Water	Extracted:	02/23/99
Batch#:	46411	Analyzed:	02/23/99
Units:	ug/L		
Diln Fac:	1		

Analyte	Result	Reporting Limit
Chloromethane	ND	1.0
Vinyl Chloride	ND	1.0
Bromomethane	ND	1.0
Chloroethane	ND	1.0
Trichlorofluoromethane	ND	0.5
Freon 113	ND	1.0
1,1-Dichloroethene	ND	0.5
Methylene Chloride	ND	20
trans-1,2-Dichloroethene	2.2	0.5
1,1-Dichloroethane	ND	0.5
cis-1,2-Dichloroethene	15	0.5
Chloroform	ND	1.0
1,1,1-Trichloroethane	ND	0.5
Carbon Tetrachloride	ND	0.5
1,2-Dichloroethane	ND	0.5
Trichloroethene	ND	0.5
1,2-Dichloropropane	ND	0.5
Bromodichloromethane	ND	0.5
cis-1,3-Dichloropropene	ND	0.5
trans-1,3-Dichloropropene	ND	0.5
1,1,2-Trichloroethane	ND	0.5
Tetrachloroethene	1.4	0.5
Dibromochloromethane	ND	0.5
Chlorobenzene	ND	0.5
Bromoform	ND	0.5
1,1,2,2-Tetrachloroethane	ND	0.5
1,3-Dichlorobenzene	ND	0.5
1,4-Dichlorobenzene	ND	0.5
1,2-Dichlorobenzene	ND	0.5

Surrogate	%Recovery	Recovery Limits
1,2-Dichloroethane-d4	108	76-127
Toluene-d8	98	88-110
Bromofluorobenzene	102	82-118

Curtis & Tompkins Ltd.

Halogenated Volatile Organics
EPA 8010 Analyte List

Client:	Cape Environmental, Inc.	Analysis Method:	EPA 8260A
Project#:	2403C.024.001	Prep Method:	EPA 5030
Location:	Alameda Fed.		

Field ID:	AMW-1	Sampled:	02/22/99
Lab ID:	138081-002	Received:	02/22/99
Matrix:	Water	Extracted:	02/23/99
Batch#:	46411	Analyzed:	02/23/99
Units:	ug/L		
Diln Fac:	1		

Analyte	Result	Reporting Limit
Chloromethane	ND	1.0
Vinyl Chloride	ND	1.0
Bromomethane	ND	1.0
Chloroethane	ND	1.0
Trichlorofluoromethane	ND	0.5
Freon 113	ND	1.0
1,1-Dichloroethene	ND	0.5
Methylene Chloride	ND	20
trans-1,2-Dichloroethene	ND	0.5
1,1-Dichloroethane	ND	0.5
cis-1,2-Dichloroethene	ND	0.5
Chloroform	ND	1.0
1,1,1-Trichloroethane	ND	0.5
Carbon Tetrachloride	ND	0.5
1,2-Dichloroethane	ND	0.5
Trichloroethene	ND	0.5
1,2-Dichloropropane	ND	0.5
Bromodichloromethane	ND	0.5
cis-1,3-Dichloropropene	ND	0.5
trans-1,3-Dichloropropene	ND	0.5
1,1,2-Trichloroethane	ND	0.5
Tetrachloroethene	ND	0.5
Dibromochloromethane	ND	0.5
Chlorobenzene	ND	0.5
Bromoform	ND	0.5
1,1,2,2-Tetrachloroethane	ND	0.5
1,3-Dichlorobenzene	ND	0.5
1,4-Dichlorobenzene	ND	0.5
1,2-Dichlorobenzene	ND	0.5

Surrogate	%Recovery	Recovery Limits
1,2-Dichloroethane-d4	100	76-127
Toluene-d8	99	90-109
Bromofluorobenzene	102	82-118

Curtis & Tompkins Ltd.

Halogenated Volatile Organics
EPA 8010 Analyte List

Client:	Cape Environmental, Inc.	Analysis Method:	EPA 8260A
Project#:	2403C.024.001	Prep Method:	EPA 5030
Location:	Alameda Fed.		

Field ID:	AMW-2	Sampled:	02/22/99
Lab ID:	138081-003	Received:	02/22/99
Matrix:	Water	Extracted:	02/23/99
Batch#:	46411	Analyzed:	02/23/99
Units:	ug/L		
Diln Fac:	1		

Analyte	Result	Reporting Limit
Chloromethane	ND	1.0
Vinyl Chloride	ND	1.0
Bromomethane	ND	1.0
Chloroethane	ND	1.0
Trichlorofluoromethane	ND	0.5
Freon 113	ND	1.0
1,1-Dichloroethene	ND	0.5
Methylene Chloride	ND	20
trans-1,2-Dichloroethene	ND	0.5
1,1-Dichloroethane	ND	0.5
cis-1,2-Dichloroethene	ND	0.5
Chloroform	ND	1.0
1,1,1-Trichloroethane	ND	0.5
Carbon Tetrachloride	ND	0.5
1,2-Dichloroethane	ND	0.5
Trichloroethene	ND	0.5
1,2-Dichloropropane	ND	0.5
Bromodichloromethane	ND	0.5
cis-1,3-Dichloropropene	ND	0.5
trans-1,3-Dichloropropene	ND	0.5
1,1,2-Trichloroethane	ND	0.5
Tetrachloroethene	ND	0.5
Dibromochloromethane	ND	0.5
Chlorobenzene	ND	0.5
Bromoform	ND	0.5
1,1,2,2-Tetrachloroethane	ND	0.5
1,3-Dichlorobenzene	ND	0.5
1,4-Dichlorobenzene	ND	0.5
1,2-Dichlorobenzene	ND	0.5

Surrogate	%Recovery	Recovery Limits
1,2-Dichloroethane-d4	[illegible]	76-127
Toluene-d8	[illegible]	88-110
Bromofluorobenzene	102	82-118

Curtis & Tompkins Ltd.

Halogenated Volatile Organics
EPA 8010 Analyte List

Client:	Cape Environmental, Inc.	Analysis Method:	EPA 8260A
Project#:	2403C.024.001	Prep Method:	EPA 5030
Location:	Alameda Fed.		

Field ID:	AMW-3	Sampled:	02/22/99
Lab ID:	138081-004	Received:	02/22/99
Matrix:	Water	Extracted:	02/23/99
Batch#:	46411	Analyzed:	02/23/99
Units:	ug/L		
Diln Fac:	1		

Analyte	Result	Reporting Limit
Chloromethane	ND	1.0
Vinyl Chloride	ND	1.0
Bromomethane	ND	1.0
Chloroethane	ND	1.0
Trichlorofluoromethane	ND	0.5
Freon 113	ND	1.0
1,1-Dichloroethene	ND	0.5
Methylene Chloride	ND	20
trans-1,2-Dichloroethene	ND	0.5
1,1-Dichloroethane	ND	0.5
cis-1,2-Dichloroethene	ND	0.5
Chloroform	ND	1.0
1,1,1-Trichloroethane	ND	0.5
Carbon Tetrachloride	ND	0.5
1,2-Dichloroethane	ND	0.5
Trichloroethene	ND	0.5
1,2-Dichloropropane	ND	0.5
Bromodichloromethane	ND	0.5
cis-1,3-Dichloropropene	ND	0.5
trans-1,3-Dichloropropene	ND	0.5
1,1,2-Trichloroethane	ND	0.5
Tetrachloroethene	ND	0.5
Dibromochloromethane	ND	0.5
Chlorobenzene	ND	0.5
Bromoform	ND	0.5
1,1,2,2-Tetrachloroethane	ND	0.5
1,3-Dichlorobenzene	ND	0.5
1,4-Dichlorobenzene	ND	0.5
1,2-Dichlorobenzene	ND	0.5

Surrogate	%Recovery	Recovery Limits
1,2-Dichloroethane-d4	106	76-127
Toluene-d8	98	90-109
Bromofluorobenzene	103	82-115

Lab #: 138081 BATCH QC REPORT Curtis & Tompkins Ltd.

Halogenated Volatile Organics
EPA 8010 Analyte List

Client: Cape Environmental, Inc.
Project#: 2403C.024.001
Location: Alameda Fed.

Analysis Method: EPA 8260A
Prep Method: EPA 5030

METHOD BLANK

Matrix: Water
Batch#: 46411
Units: ug/L
Diln Fac: 1

Prep Date: 02/23/99
Analysis Date: 02/23/99

MB Lab ID: QC91410

Analyte	Result	Reporting Limit
Chloromethane	ND	1.0
Vinyl Chloride	ND	1.0
Bromomethane	ND	1.0
Chloroethane	ND	1.0
Trichlorofluoromethane	ND	0.5
Freon 113	ND	1.0
1,1-Dichloroethene	ND	0.5
Methylene Chloride	ND	20
trans-1,2-Dichloroethene	ND	0.5
1,1-Dichloroethane	ND	0.5
cis-1,2-Dichloroethene	ND	0.5
Chloroform	ND	1.0
1,1,1-Trichloroethane	ND	0.5
Carbon Tetrachloride	ND	0.5
1,2-Dichloroethane	ND	0.5
Trichloroethene	ND	0.5
1,2-Dichloropropane	ND	0.5
Bromodichloromethane	ND	0.5
cis-1,3-Dichloropropene	ND	0.5
trans-1,3-Dichloropropene	ND	0.5
1,1,2-Trichloroethane	ND	0.5
Tetrachloroethene	ND	0.5
Dibromochloromethane	ND	0.5
Chlorobenzene	ND	0.5
Bromoform	ND	0.5
1,1,2,2-Tetrachloroethane	ND	0.5
1,3-Dichlorobenzene	ND	0.5
1,4-Dichlorobenzene	ND	0.5
1,2-Dichlorobenzene	ND	0.5

Surrogate	%Rec	Recovery Limits
1,2-Dichloroethane-d4	109	76-127
Toluene-d8	99	90-109
Bromofluorobenzene	103	82-118

Lab #: 138081

BATCH QC REPORT

Curtis & Tompkins, Ltd.

Halogenated Volatile Organics

Client: Cape Environmental, Inc.
Project#: 2403C.024.001
Location: Alameda Fed.

Analysis Method: EPA 8260A
Prep Method: EPA 5030

BLANK SPIKE/BLANK SPIKE DUPLICATE

Matrix: Water
Batch#: 46411
Units: ug/L
Diln Fac: 1

Prep Date: 02/23/99
Analysis Date: 02/23/99

BS Lab ID: QC91408

Analyte	Spike Added	BS	%Rec #	Limits
1,1-Dichloroethene	50	48.61	97	64-139
Trichloroethene	50	49.52	99	72-129
Chlorobenzene	50	49.14	98	77-126

Surrogate	%Rec	Limits
1,2-Dichloroethane-d4	107	76-127
Toluene-d8	100	90-109
Bromofluorobenzene	98	82-118

BSD Lab ID: QC91409

Analyte	Spike Added	BSD	%Rec #	Limits	RPD #	Limit
1,1-Dichloroethene	50	52.94	106	64-139	9	13
Trichloroethene	50	52.74	105	72-129	6	10
Chlorobenzene	50	51.52	103	77-126	5	10

Surrogate	%Rec	Limits
1,2-Dichloroethane-d4	110	76-127
Toluene-d8	99	90-109
Bromofluorobenzene	100	82-118

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits
RPD: 0 out of 3 outside limits
Spike Recovery: 0 out of 6 outside limits

Lab#: 138081
Page 1 of 1

Curtis & Tompkins, Ltd.

Hydrocarbon Oil & Grease

Client: Cape Environmental, Inc.
Project #: 2403C.024.001
Location : Alameda Fed.

Analysis Method: SMWW 17:5520BF
Prep Method: SMWW 17:5520BF

Sample #	Client ID	Batch#	Sampled	Analyzed	Moisture
138081-001	MW-1	46446	22-FEB-99	24-FEB-99	-
138081-002	AMW-1	46446	22-FEB-99	24-FEB-99	-
138081-003	AMW-2	46446	22-FEB-99	24-FEB-99	-
138081-004	AMW-3	46446	22-FEB-99	24-FEB-99	-
QC91542	Method Blank	46446	-	24-FEB-99	-

Analyte: Petroleum Hydrocarbons **Matrix:** Water **Units:** mg/L

Sample #	Client ID	Result	Reporting Limit	Dilution Factor
138081-001	MW-1	ND	5.0	1
138081-002	AMW-1	ND	5.0	1
138081-003	AMW-2	ND	5.0	1
138081-004	AMW-3	ND	5.0	1
QC91542	Method Blank	ND	5.0	1

ND = None Detected at or above Reporting Limit

Lab#: 138081
Page 1 of 1

Curtis & Tompkins, Ltd.

Hydrocarbon Oil & Grease

Client: Cape Environmental, Inc.
Project #: 2403C.024.001
Location : Alameda Fed.

Analysis Method: SMWW 17:5520BF
Prep Method: SMWW 17:5520BF

Sample #	Client ID	Batch#	Sampled	Analyzed	Moisture
QC91543	Blank Spike	46446	-	24-FEB-99	-
QC91544	Blank Spike Duplicate	46446	-	24-FEB-99	-

Analyte: Petroleum Hydrocarbons Matrix: Water Units: mg/L

Sample #	Sample Type	Spike Amt.	Result	%Rec	Limits	%RPD	Limit
QC91543	Blank Spike	154.1	143.2	94	80-120		
QC91544	Blank Spike Duplicate	156.4	146.3	93	80-120	7	20

APPENDIX C

SUMMARY OF ANALYTICAL RESULTS
FROM GROUNDWATER MONITORING
ALAMEDA FEDERAL CENTER
1995 TO 1999

Table C-1
Alameda Federal Center, 620 Central Avenue, Alameda, California
Summary of Analytical Results Groundwater Monitoring Well MW-1

Compounds	Units	Date / Method	5/18/95	8/31/95	10/5/95	12/8/95	3/8/96	7/5/96	2/18/98	8/31/98	11/16/98	2/22/99
O&G	mg/l	SMWW5520	ND	ND	NA	ND	**16**	ND	NA	<5	<5	<5
TEPHd	ug/l	DOHS 8015m	**5500**	**840**	NA	**49**	**13000**	ND *	**360**	**88**	**230**	**720**
TEPHmo	ug/l	DOHS 8015m	ND	**1400**	NA	ND	ND	NA	ND	NA	NA	NA
TVH	ug/l	DOHS 8015m	ND	NA	ND	NA	NA	NA	ND	<50	<50	<50
Benzene	ug/l	EPA 8020	**1.1**	NA	ND	ND	ND	ND	ND	<0.5	<0.5	<0.5
Toluene	ug/l	EPA 8020	ND	NA	ND	ND	ND	ND	ND	<0.5	<0.5	<0.5
Ethy Benzene	ug/l	EPA 8020	**0.9**	NA	ND	ND	ND	ND	ND	<0.5	<0.5	**0.68**
Total Xylenes	ug/l	EPA 8020	**1.6**	NA	ND	ND	ND	ND	ND	<0.5	<0.5	**0.56**
Total Dissolved Solids	mg/l	EPA 160.1	NA	**410**	NA	NA	NA	NA	NA	NA	NA	NA
Volatile Halocarbons		EPA 8010										
cis-1,2-dichloroethene	ug/l		**3**	NA	**7.4**	**5.7**	**1**	**22**	**5.6**	**15**	NA	**15**
trans-1,2-dichloroethene	ug/l		**3**	NA	**3.4**	**2.1**	ND	**5**	ND	**2.0**	NA	**2.2**
trichloroethene	ug/l		**7**	NA	**1.3**	ND	ND	ND	ND	ND	NA	<0.5
tetra-chloroethene	ug/l		**1**	NA	ND	ND	ND	ND	**2.1**	ND	NA	**1.4**
chloroform	ug/l		**1**	NA	ND	ND	ND	ND	ND	ND	NA	<1
Polynuclear Aromatic Hydrocarbons		EPA 8270										
bis(2-ethylhexyl)phthalate	ug/l		NA	ND	NA	ND	ND	ND	NA	NA	NA	NA
naphthalene	ug/l		ND	ND	NA	ND	ND	ND	NA	NA	NA	NA
fluoranthrene	ug/l		ND	ND	NA	ND	ND	ND	NA	NA	NA	NA
pyrene	ug/l		ND	ND	NA	ND	ND	ND	NA	NA	NA	NA
chrysene	ug/l		ND	ND	NA	ND	ND	ND	NA	NA	NA	NA
benzo(a)pyrene	ug/l		ND	ND	NA	ND	ND	ND	NA	NA	NA	NA

Notes

mg/l =milligrams per liter

ug/l = micrograms per liter

ND = not detected at or above the detection limit of the method used

NA = not analyzed

O&G = hydrocarbon oil and grease using test method SMWW5520

TEPH = total extractable petroleum hydrocarbons using California Department of Health Services (DOHS) Method 8015 modified A "d" or "mo" following the reported concentration represents quantities of diesel or motor oil range respectively

TVH = total volatile hydrocarbons as gasoline using California DOHS Method 8015 modified.

* = TEPH analysis for diesel (C12-C22) using silica gel cleanup

Table C-2
Alameda Federal Center, 620 Central Avenue, Alameda, California
Summary of Analytical Results Groundwater Monitoring Well **MW-2R**

Compounds	Units	Date / Method	5/18/95	8/31/95	10/5/95	12/8/95	3/8/96	7/5/96	2/18/98	8/31/98	11/16/98	2/22/99
					Not Sampled			Not Sampled	Not Sampled	Not Sampled	Not Sampled	Not Sampled
O&G	mg/l	SMWW5520	ND	ND		ND	ND					
TEPHd	ug/l	DOHS 8015m	ND	**140**		ND	ND					
TEPHmo	ug/l	DOHS 8015m	ND	ND		NA	NA					
TVH	ug/l	DOHS 8015m	ND	ND		NA	NA					
Benzene	ug/l	EPA 8020	ND	ND		NA	NA					
Toluene	ug/l	EPA 8020	ND	ND		NA	NA					
Ethy Benzene	ug/l	EPA 8020	ND	ND		NA	NA					
Total Xylenes	ug/l	EPA 8020	ND	ND		NA	NA					
Total Dissolved Solids	mg/l	EPA 160.1	NA	**390**		NA	NA					
Volatile Halocarbons		EPA 8010										
cis-1,2-dichloroethene	ug/l		ND	ND		ND	ND					
trans-1,2-dichloroethene	ug/l		ND	ND		ND	ND					
trichloroehtene	ug/l		ND	ND		ND	ND					
tetra-chloroethene	ug/l		ND	ND		ND	ND					
chloroform	ug/l		ND	ND		ND	ND					
Polynuclear Aromatic Hydrocarbons		EPA 8270										
bis(2-ethylhexyl)phthalate	ug/l		ND	ND		ND	ND					
naphthalene	ug/l		ND	ND		ND	ND					
fluoranthrene	ug/l		ND	ND		ND	ND					
pyrene	ug/l		ND	ND		ND	ND					
chrysene	ug/l		ND	ND		ND	ND					
benzo(a)pyrene	ug/l		ND	ND		ND	ND					

Notes

mg/l =milligrams per liter
ug/l = micrograms per liter
ND = not detected at or above the detection limit of the method used
NA = not analyzed
O&G = hydrocarbon oil and grease using test method SMWW5520
TEPH = total extractable petroleum hydrocarbons using California Department of Health Services (DOHS) Method 8015 modified. A "d" or "mo" following the reported concentration represents quantities of diesel or motor oil range respectively.
TVH = total volatile hydrocarbons as gasoline using California DOHS Method 8015 modified.

Table C-3
Alameda Federal Center, 620 Central Avenue, Alameda, California
Summary of Analytical Results Groundwater Monitoring Well MW-3

Compounds	Units	Date / Method	5/18/95	8/31/95	10/5/95	12/8/95	3/8/96	7/5/96	2/18/98	8/31/98	11/16/98	2/22/99
				Not Sampled	Not Sampled	Not Sampled	Not Sampled	Not Sampled	Not Sampled	Not Sampled	Not Sampled	Not Sampled
O&G	mg/l	SMWW5520	ND									
TEPHd	ug/l	DOHS 8015m	**92**									
TEPHmo	ug/l	DOHS 8015m	ND									
TVH	ug/l	DOHS 8015m	ND									
Benzene	ug/l	EPA 8020	ND									
Toluene	ug/l	EPA 8020	ND									
Ethy Benzene	ug/l	EPA 8020	ND									
Total Xylenes	ug/l	EPA 8020	ND									
Total Dissolved Solids	mg/l	EPA 160.1	NA									
Volatile Halocarbons		EPA 8010										
cis-1,2-dichloroethene	ug/l		ND									
trans-1,2-dichloroethene	ug/l		ND									
trichloroehtene	ug/l		ND									
tetra-chloroethene	ug/l		ND									
chloroform	ug/l		ND									
Polynuclear Aromatic Hydrocarbons		EPA 8270										
bis(2-ethylhexyl)phthalate	ug/l		ND									
naphthalene	ug/l		ND									
fluoranthrene	ug/l		ND									
pyrene	ug/l		ND									
chrysene	ug/l		ND									
benzo(a)pyrene	ug/l		ND									

Notes

mg/l =milligrams per liter
ug/l = micrograms per liter
ND = not detected at or above the detection limit of the method used
NA = not analyzed
O&G = hydrocarbon oil and grease using test method SMWW5520
TEPH = total extractable petroleum hydrocarbons using California Department of Health Services (DOHS) Method 8015 modified. A "d" or "mo" following the reported concentration represents quantities of diesel or motor oil range respectively.
TVH = total volatile hydrocarbons as gasoline using California DOHS Method 8015 modified.

Table C-4
Alameda Federal Center, 620 Central Avenue, Alameda, California
Summary of Analytical Results Groundwater Monitoring Well MW-4

Compounds	Units	Date / Method	5/18/95	8/31/95	10/5/95	12/8/95	3/8/96	7/5/96	2/18/98	8/31/98	11/16/98	2/22/99
					Not Sampled			Not Sampled	Not Sampled	Not Sampled	Not Sampled	Not Sampled
O&G	mg/l	SMWW5520	ND	ND		ND	ND					
TEPHd	ug/l	DOHS 8015m	ND	**190**		ND	ND					
TEPHmo	ug/l	DOHS 8015m	ND	ND		NA	NA					
TVH	ug/l	DOHS 8015m	ND	ND		NA	NA					
Benzene	ug/l	EPA 8020	ND	ND		NA	NA					
Toluene	ug/l	EPA 8020	ND	ND		NA	NA					
Ethy Benzene	ug/l	EPA 8020	ND	ND		NA	NA					
Total Xylenes	ug/l	EPA 8020	ND	ND		NA	NA					
Total Dissolved Solids	mg/l	EPA 160.1	NA	**410**		NA	NA					
Volatile Halocarbons		EPA 8010										
cis-1,2-dichloroethene	ug/l		ND	ND		ND	ND					
trans-1,2-dichloroethene	ug/l		ND	ND		ND	ND					
trichloroehtene	ug/l		ND	ND		ND	ND					
tetra-chloroethene	ug/l		ND	ND		ND	ND					
chloroform	ug/l		ND	ND		ND	ND					
Polynuclear Aromatic Hydrocarbons		EPA 8270										
bis(2-ethylhexyl)phthalate	ug/l		ND	ND		ND	ND					
naphthalene	ug/l		ND	ND		ND	ND					
fluoranthrene	ug/l		ND	ND		ND	ND					
pyrene	ug/l		ND	ND		ND	ND					
chrysene	ug/l		ND	ND		ND	ND					
benzo(a)pyrene	ug/l		ND	ND		ND	ND					

Notes

mg/l =milligrams per liter
ug/l = micrograms per liter
ND = not detected at or above the detection limit of the method used
NA = not analyzed
O&G = hydrocarbon oil and grease using test method SMWW5520
TEPH = total extractable petroleum hydrocarbons using California Department of Health Services (DOHS) Method 8015 modified. A "d" or "mo" following the reported concentration represents quantities of diesel or motor oil range respectively.
TVH = total volatile hydrocarbons as gasoline using California DOHS Method 8015 modified.

Table C-5
Alameda Federal Center, 620 Central Avenue, Alameda, California
Summary of Analytical Results Groundwater Monitoring Well **TW/MW-5**

Compounds	Units	Date / Method	5/18/95	8/31/95	10/5/95	12/8/95	3/8/96	7/5/96	2/18/98	8/31/98	11/16/98	2/22/99
					Not Sampled				Not Sampled	Not Sampled	Not Sampled	Not Sampled
O&G	mg/l	SMWW5520	ND	ND		ND	ND	ND				
TEPHd	ug/l	DOHS 8015m	**680**	**230**		ND	ND	ND				
TEPHmo	ug/l	DOHS 8015m	ND	ND		NA	NA	NA				
TVH	ug/l	DOHS 8015m	ND	ND		NA	NA	NA				
Benzene	ug/l	EPA 8020	ND	ND		NA	NA	NA				
Toluene	ug/l	EPA 8020	ND	ND		NA	NA	NA				
Ethy Benzene	ug/l	EPA 8020	ND	ND		NA	NA	NA				
Total Xylenes	ug/l	EPA 8020	ND	ND		NA	NA	NA				
Total Dissolved Solids	mg/l	EPA 160.1	NA	**380**		NA	NA	NA				
Volatile Halocarbons		EPA 8010										
cis-1,2-dichloroethene	ug/l		ND	ND		ND	**1.0**	ND				
trans-1,2-dichloroethene	ug/l		ND	ND		ND	ND	ND				
trichloroehtene	ug/l		ND	ND		ND	ND	ND				
tetra-chloroethene	ug/l		ND	ND		ND	ND	ND				
chloroform	ug/l		**1.0**	ND		ND	ND	ND				
Polynuclear Aromatic Hydrocarbons		EPA 8270										
bis(2-ethylhexyl)phthalate	ug/l		ND	**14**		ND	ND	ND				
naphthalene	ug/l		**7.5**	ND		ND	ND	ND				
fluoranthrene	ug/l		**8.5**	ND		ND	ND	ND				
pyrene	ug/l		**14**	ND		ND	ND	ND				
chrysene	ug/l		**5.5**	ND		ND	ND	ND				
benzo(a)pyrene	ug/l		**6.2**	ND		ND	ND	ND				

Notes

mg/l =milligrams per liter
ug/l = micrograms per liter
ND = not detected at or above the detection limit of the method used
NA = not analyzed
O&G = hydrocarbon oil and grease using test method SMWW5520
TEPH = total extractable petroleum hydrocarbons using California Department of Health Services (DOHS) Method 8015 modified. A "d" or "mo" following the reported concentration represents quantities of diesel or motor oil range respectively.
TVH = total volatile hydrocarbons as gasoline using California DOHS Method 8015 modified.

Table C-6
Alameda Federal Center, 620 Central Avenue, Alameda, California
Summary of Analytical Results Groundwater Monitoring Well MW-6

Compounds	Units	Date / Method	5/18/95	8/31/95	10/5/95	12/8/95	3/8/96	7/5/96	2/18/98	8/31/98	11/16/98	2/22/99
					Not Sampled				Not Sampled	Not Sampled	Not Sampled	Not Sampled
O&G	mg/l	SMWW5520	ND	ND		ND	ND	ND				
TEPHd	ug/l	DOHS 8015m	ND	**370**		**3700**	ND	ND				
TEPHmo	ug/l	DOHS 8015m	ND	ND		NA	NA	NA				
TVH	ug/l	DOHS 8015m	ND	ND		NA	NA	NA				
Benzene	ug/l	EPA 8020	ND	ND		NA	NA	NA				
Toluene	ug/l	EPA 8020	ND	ND		NA	NA	NA				
Ethy Benzene	ug/l	EPA 8020	ND	ND		NA	NA	NA				
Total Xylenes	ug/l	EPA 8020	ND	ND		NA	NA	NA				
Total Dissolved Solids	mg/l	EPA 160.1	NA	**450**		NA	NA	NA				
Volatile Halocarbons		EPA 8010										
cis-1,2-dichloroethene	ug/l		ND	ND		ND	ND	ND				
trans-1,2-dichloroethene	ug/l		ND	ND		ND	ND	ND				
trichloroehtene	ug/l		ND	ND		ND	ND	ND				
tetra-chloroethene	ug/l		ND	ND		ND	ND	ND				
chloroform	ug/l		ND	ND		ND	ND	ND				
Polynuclear Aromatic Hydrocarbons		EPA 8270										
bis(2-ethylhexyl)phthalate	ug/l		ND	ND		ND	ND	ND				
naphthalene	ug/l		ND	ND		ND	ND	ND				
fluoranthrene	ug/l		ND	ND		ND	ND	ND				
pyrene	ug/l		ND	ND		ND	ND	ND				
chrysene	ug/l		ND	ND		ND	ND	ND				
benzo(a)pyrene	ug/l		ND	ND		ND	ND	ND				

Notes

mg/l =milligrams per liter
ug/l = micrograms per liter
ND = not detected at or above the detection limit of the method used
NA = not analyzed
O&G = hydrocarbon oil and grease using test method SMWW5520
TEPH = total extractable petroleum hydrocarbons using California Department of Health Services (DOHS) Method 8015 modified. A "d" or "mo" following the reported concentration represents quantities of diesel or motor oil range respectively.
TVH = total volatile hydrocarbons as gasoline using California DOHS Method 8015 modified.

Table C-7
Alameda Federal Center, 620 Central Avenue, Alameda, California
Summary of Analytical Results Groundwater Monitoring Well **AMW-1**

Compounds	Units	Date / Method	5/18/95 Not Sampled	8/31/95 Not Sampled	10/5/95 Not Sampled	12/8/95 Not Sampled	3/8/96 Not Sampled	7/5/96 Not Sampled	2/16/98	8/31/98	11/16/98	2/22/99
O&G	mg/l	SMWW5520							NA	<5	<5	<5
TEPHd	ug/l	DOHS 8015m							**150**	**63**	**61**	**53**
TEPHmo	ug/l	DOHS 8015m							NA	NA	NA	NA
TVH	ug/l	DOHS 8015m							ND	<50	<50	<50
Benzene	ug/l	EPA 8020							ND	<0.5	<0.5	<0.5
Toluene	ug/l	EPA 8020							ND	<0.5	<0.5	<0.5
Ethy Benzene	ug/l	EPA 8020							ND	<0.5	<0.5	<0.5
Total Xylenes	ug/l	EPA 8020							ND	<0.5	<0.5	**0.6**
Total Dissolved Solids	mg/l	EPA 160.1							NA	NA	NA	NA
Volatile Halocarbons		EPA 8010										
cis-1,2-dichloroethene	ug/l								ND	ND	NA	<0.5
trans-1,2-dichloroethene	ug/l								ND	ND	NA	<0.5
trichloroehtene	ug/l								ND	ND	NA	<0.5
tetra-chloroethene	ug/l								ND	ND	NA	<0.5
chloroform	ug/l								ND	ND	NA	<1
Polynuclear Aromatic Hydrocarbons		EPA 8270										
bis(2-ethylhexyl)phthalate	ug/l								ND	NA	NA	NA
naphthalene	ug/l								ND	NA	NA	NA
fluoranthrene	ug/l								ND	NA	NA	NA
pyrene	ug/l								ND	NA	NA	NA
chrysene	ug/l								ND	NA	NA	NA
benzo(a)pyrene	ug/l								ND	NA	NA	NA

Notes

mg/l =milligrams per liter

ug/l = micrograms per liter

ND = not detected at or above the detection limit of the method used

NA = not analyzed

O&G = hydrocarbon oil and grease using test method SMWW5520

TEPH = total extractable petroleum hydrocarbons using California Department of Health Services (DOHS) Method 8015 modified. A "d" or "mo" following the reported concentration represents quantities of diesel or motor oil range respectively.

TVH = total volatile hydrocarbons as gasoline using California DOHS Method 8015 modified.

Table C-8
Alameda Federal Center, 620 Central Avenue, Alameda, California
Summary of Analytical Results Groundwater Monitoring Well **AMW-2**

Compounds	Units	Date / Method	5/18/95 Not Sampled	8/31/95 Not Sampled	10/5/95 Not Sampled	12/8/95 Not Sampled	3/8/96 Not Sampled	7/5/96 Not Sampled	2/16/98	8/31/98	11/16/98	2/22/99
O&G	mg/l	SMWW5520							NA	<5	<5	<5
TEPHd	ug/l	DOHS 8015m							**380**	<50	**58**	<50
TEPHmo	ug/l	DOHS 8015m							NA	NA	NA	NA
TVH	ug/l	DOHS 8015m							ND	<50	<50	<50
Benzene	ug/l	EPA 8020							**0.99**	<0.5	<0.5	<0.5
Toluene	ug/l	EPA 8020							ND	<0.5	<0.5	<0.5
Ethy Benzene	ug/l	EPA 8020							ND	<0.5	<0.5	<0.5
Total Xylenes	ug/l	EPA 8020							ND	<0.5	<0.5	<0.5
Total Dissolved Solids	mg/l	EPA 160.1							NA	NA	NA	NA
Volatile Halocarbons		EPA 8010										
cis-1,2-dichloroethene	ug/l								ND	ND	NA	<0.5
trans-1,2-dichloroethene	ug/l								ND	ND	NA	<0.5
trichloroehtene	ug/l								ND	ND	NA	<0.5
tetra-chloroethene	ug/l								ND	ND	NA	<0.5
chloroform	ug/l								ND	ND	NA	<1
Polynuclear Aromatic Hydrocarbons		EPA 8270										
bis(2-ethylhexyl)phthalate	ug/l								ND	NA	NA	NA
naphthalene	ug/l								ND	NA	NA	NA
fluoranthrene	ug/l								ND	NA	NA	NA
pyrene	ug/l								ND	NA	NA	NA
chrysene	ug/l								ND	NA	NA	NA
benzo(a)pyrene	ug/l								ND	NA	NA	NA

Notes

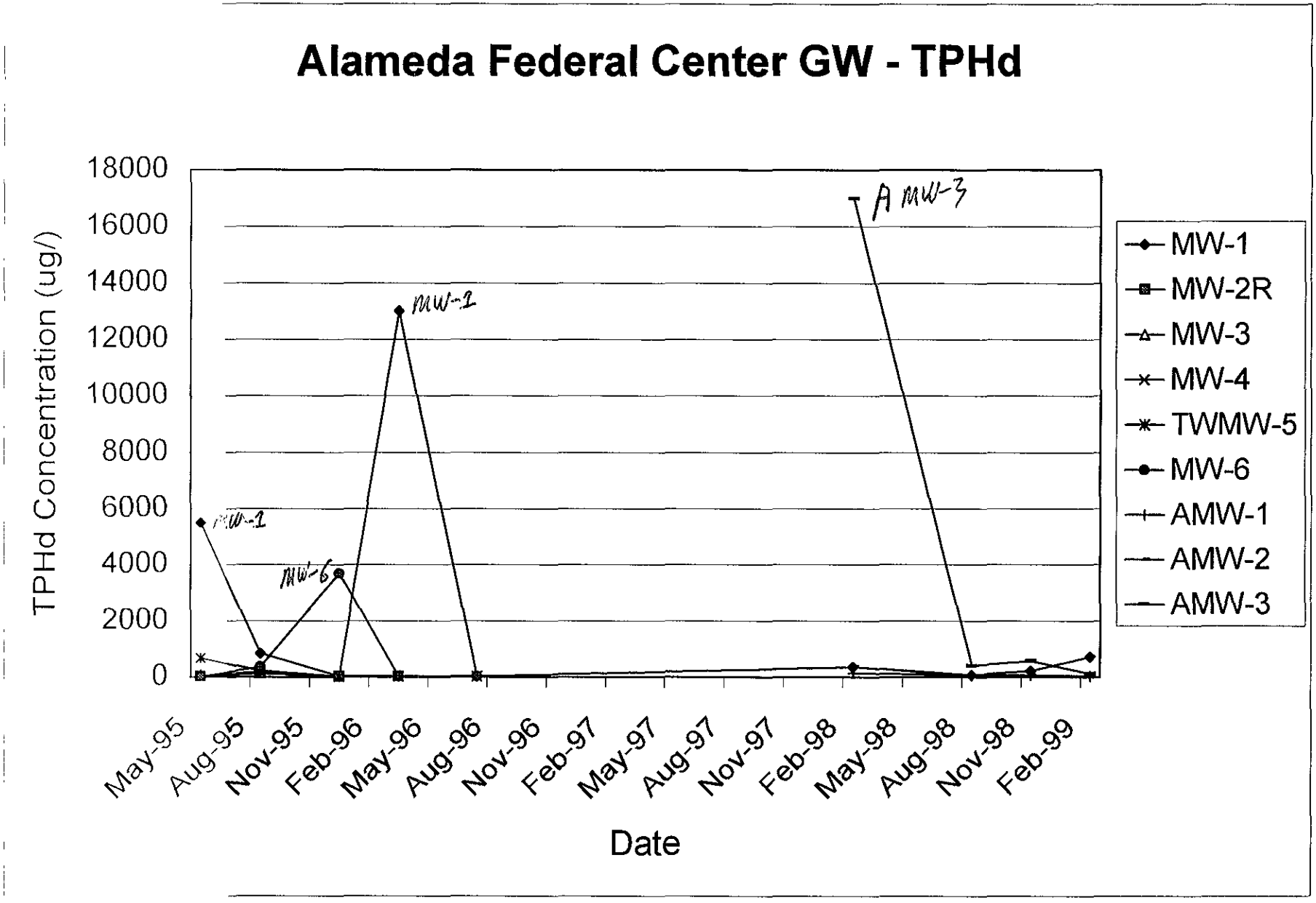
mg/l =milligrams per liter
ug/l = micrograms per liter
ND = not detected at or above the detection limit of the method used
NA = not analyzed
O&G = hydrocarbon oil and grease using test method SMWW5520
TEPH = total extractable petroleum hydrocarbons using California Department of Health Services (DOHS) Method 8015 modified. A "d" or "mo" following the reported concentration represents quantities of diesel or motor oil range respectively.
TVH = total volatile hydrocarbons as gasoline using California DOHS Method 8015 modified.

Table C-9
Alameda Federal Center, 620 Central Avenue, Alameda, California
Summary of Analytical Results Groundwater Monitoring Well **AMW-3**

Compounds	Units	Date / Method	5/18/95 Not Sampled	8/31/95 Not Sampled	10/5/95 Not Sampled	12/8/95 Not Sampled	3/8/96 Not Sampled	7/5/96 Not Sampled	2/16/98	8/31/98	11/16/98	2/22/99
O&G	mg/l	SMWW5520							NA	<5	<5	<5
TEPHd	ug/l	DOHS 8015m							**17000**	**420**	**580**	**140**
TEPHmo	ug/l	DOHS 8015m							NA	NA	NA	NA
TVH	ug/l	DOHS 8015m							**140**	<50	<50	<50
Benzene	ug/l	EPA 8020							ND	<0.5	<0.5	<0.5
Toluene	ug/l	EPA 8020							ND	<0.5	<0.5	<0.5
Ethy Benzene	ug/l	EPA 8020							ND	<0.5	<0.5	<0.5
Total Xylenes	ug/l	EPA 8020							ND	<0.5	<0.5	<0.5
Total Dissolved Solids	mg/l	EPA 160.1							NA	NA	NA	NA
Volatile Halocarbons		EPA 8010										
cis-1,2-dichloroethene	ug/l								ND	ND	NA	<0.5
trans-1,2-dichloroethene	ug/l								ND	ND	NA	<0.5
trichloroehtene	ug/l								ND	ND	NA	<0.5
tetra-chloroethene	ug/l								ND	ND	NA	<0.5
chloroform	ug/l								ND	ND	NA	<1
Polynuclear Aromatic Hydrocarbons		EPA 8270										
bis(2-ethylhexyl)phthalate	ug/l								ND	NA	NA	NA
naphthalene	ug/l								ND	NA	NA	NA
fluoranthrene	ug/l								ND	NA	NA	NA
pyrene	ug/l								ND	NA	NA	NA
chrysene	ug/l								ND	NA	NA	NA
benzo(a)pyrene	ug/l								ND	NA	NA	NA

Notes

mg/l =milligrams per liter
ug/l = micrograms per liter
ND = not detected at or above the detection limit of the method used
NA = not analyzed
O&G = hydrocarbon oil and grease using test method SMWW5520
TEPH = total extractable petroleum hydrocarbons using California Department of Health Services (DOHS) Method 8015 modified. A "d" or "mo" following the reported concentration represents quantities of diesel or motor oil range respectively.
TVH = total volatile hydrocarbons as gasoline using California DOHS Method 8015 modified.

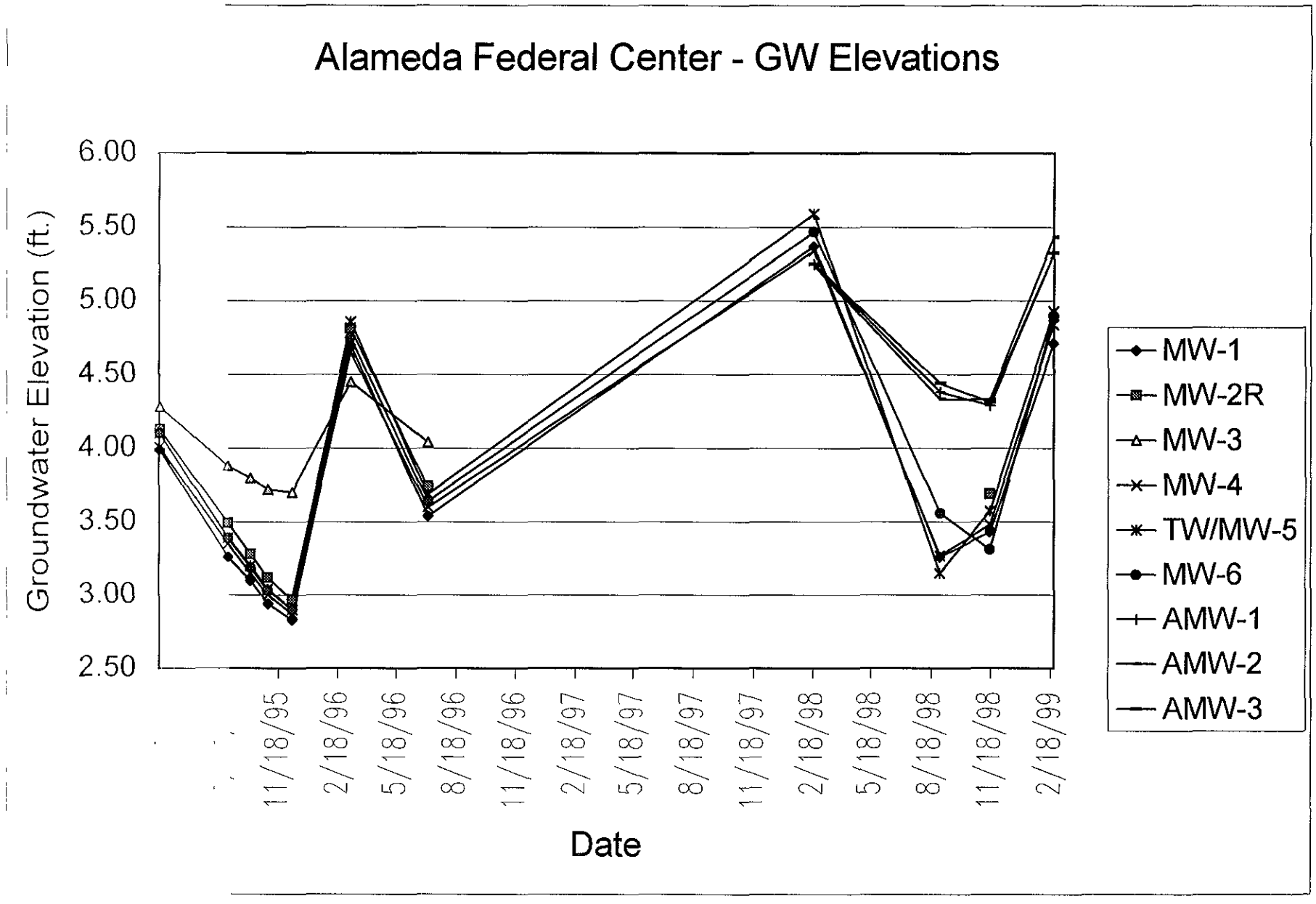

Alameda Federal Center GW - TPHd
TPHd Concentration (ug/)
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
May-95
Aug-95
Nov-95
Feb-96
May-96
Aug-96
Nov-96
Feb-97
May-97
Aug-97
Nov-97
Feb-98
May-98
Aug-98
Nov-98
Feb-99
Date
MW-1
MW-2R
MW-3
MW-4
TWMW-5
MW-6
AMW-1
AMW-2
AMW-3

APPENDIX D

SUMMARY STATIC GROUNDWATER LEVEL
MEARUREMENTS AND GRADIENT MAPS 1995 TO 1999

Table D-1
Alameda Federal Center
Groundwater Elevation Summary 1995 through 1999
(feet above mean sea level)

Well Number	Casing Elevation (ft.)	18-May-95	31-Aug-95	05-Oct-95	01-Nov-95	08-Dec-95	08-Mar-96	05-Jul-96	18-Feb-98	31-Aug-98	16-Nov-98	22-Feb-99
MW-1	8 19	3.99	3.26	3.10	2.94	2.83	4.70	3.54	5.37	3.26	3.43	4.71
MW-2R	8 27	4.13	3.49	3.28	3.12	2.97	4.81	3.74			3.69	
MW-3	9 00	4.28	3.88	3.80	3.72	3.70	4.45	4.04				
MW-4	8.53	4.01	3.35	3.15	3.00	2.87	4.65	3.60	5.34	3.27	3.48	4.84
TW/MW-5	8 37	4.10	3.39	3.20	3.04	2.90	4.86	3.69	5.59	3.15	3.58	4.93
MW-6	8 61	4.10	3.39	3.19	3.03	2.90	4.75	3.64	5.47	3.56	3.31	4.9
AMW-1	8.73								5.25	4.38	4.29	5.325
AMW-2	8 84								5.24	4.33	4.33	5.435
AMW-3	8 53								5.25	4.44	4.31	5.325


Alameda Federal Center - GW Elevations
Groundwater Elevation (ft.)
6.00
5.50
5.00
4.50
4.00
3.50
3.00
2.50
11/18/95
2/18/96
5/18/96
8/18/96
11/18/96
2/18/97
5/18/97
8/18/97
11/18/97
2/18/98
5/18/98
8/18/98
11/18/98
2/18/99
Date
MW-1
MW-2R
MW-3
MW-4
TW/MW-5
MW-6
AMW-1
AMW-2
AMW-3

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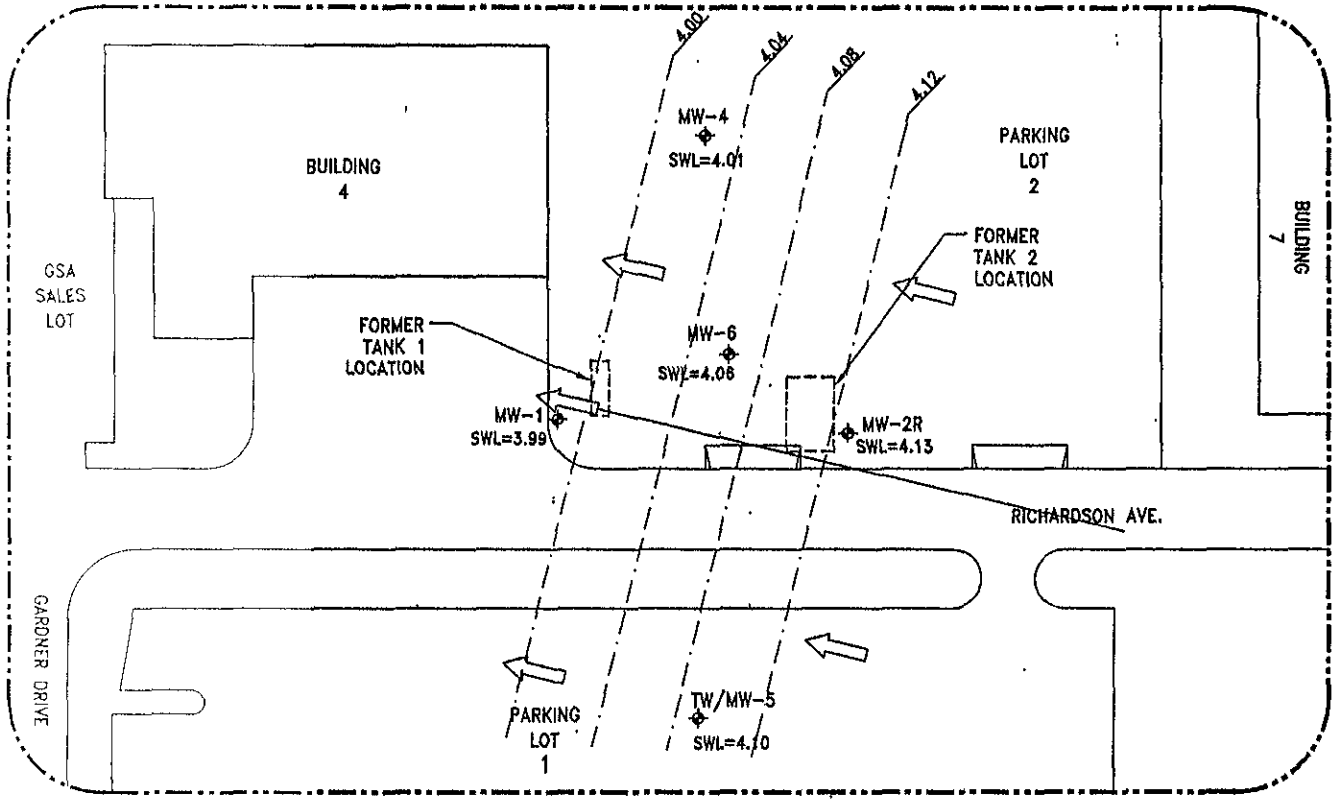


LEGEND

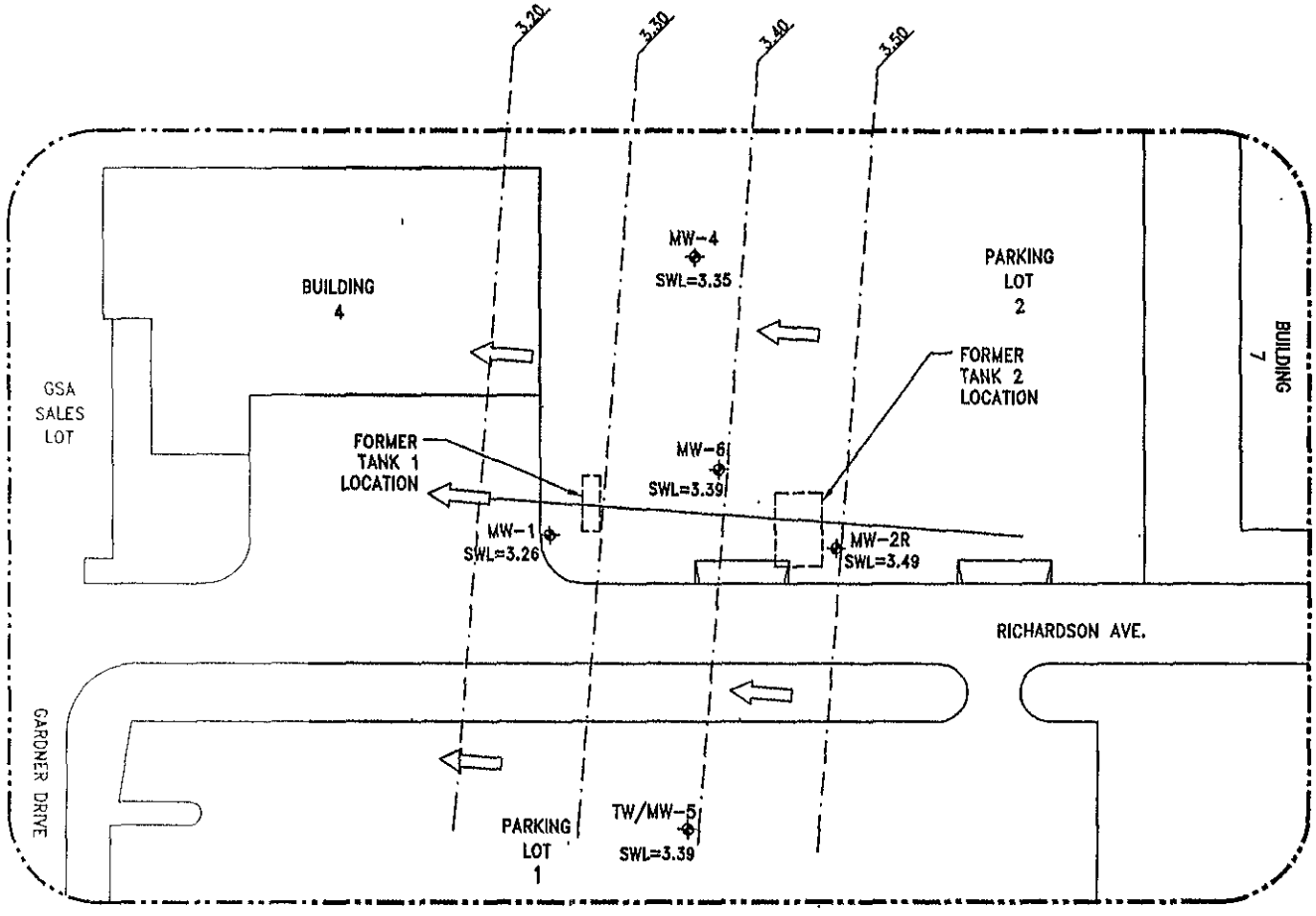
MW	EXISTING MONITORING WELL
	APPROX. LOCATION OF REMOVED UST's
	GROUNDWATER GRADIENT
SWL	STATIC WATER LEVEL ELEVATIONS IN FEET ABOVE MEAN LEVEL
	EQUIPOTENTIAL ELEVATION CONTOUR

GRAPHIC SCALE

PROJECT NORTH

SHEET TITLE: FIGURE D1 – GROUNDWATER GRADIENT MAP 05-18-95	CHECKED BY: B. MILLAR	PROJECT NUMBER: 2403C.24	
PROJECT TITLE: ALAMEDA FEDERAL CENTER, ALAMEDA, CA	DRAWN BY: G. FAGIN	DATE: 03-25-99	SHEET: D1

FILE: GW0895D1.dwg



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LEGEND

MW	EXISTING MONITORING WELL
	APPROX. LOCATION OF REMOVED UST's
	GROUNDWATER GRADIENT
SWL	STATIC WATER LEVEL ELEVATIONS IN FEET ABOVE MEAN LEVEL
	EQUIPOTENTIAL ELEVATION CONTOUR

GRAPHIC SCALE

PROJECT NORTH

SHEET TITLE: FIGURE D2 - GROUNDWATER GRADIENT MAP 08-31-95	CHECKED BY: B. Millar	PROJECT NUMBER: 2403C.24	
PROJECT TITLE: ALAMEDA FEDERAL CENTER, ALAMEDA, CA	DRAWN BY: G. Fagin	DATE: 03-25-99	SHEET: D2

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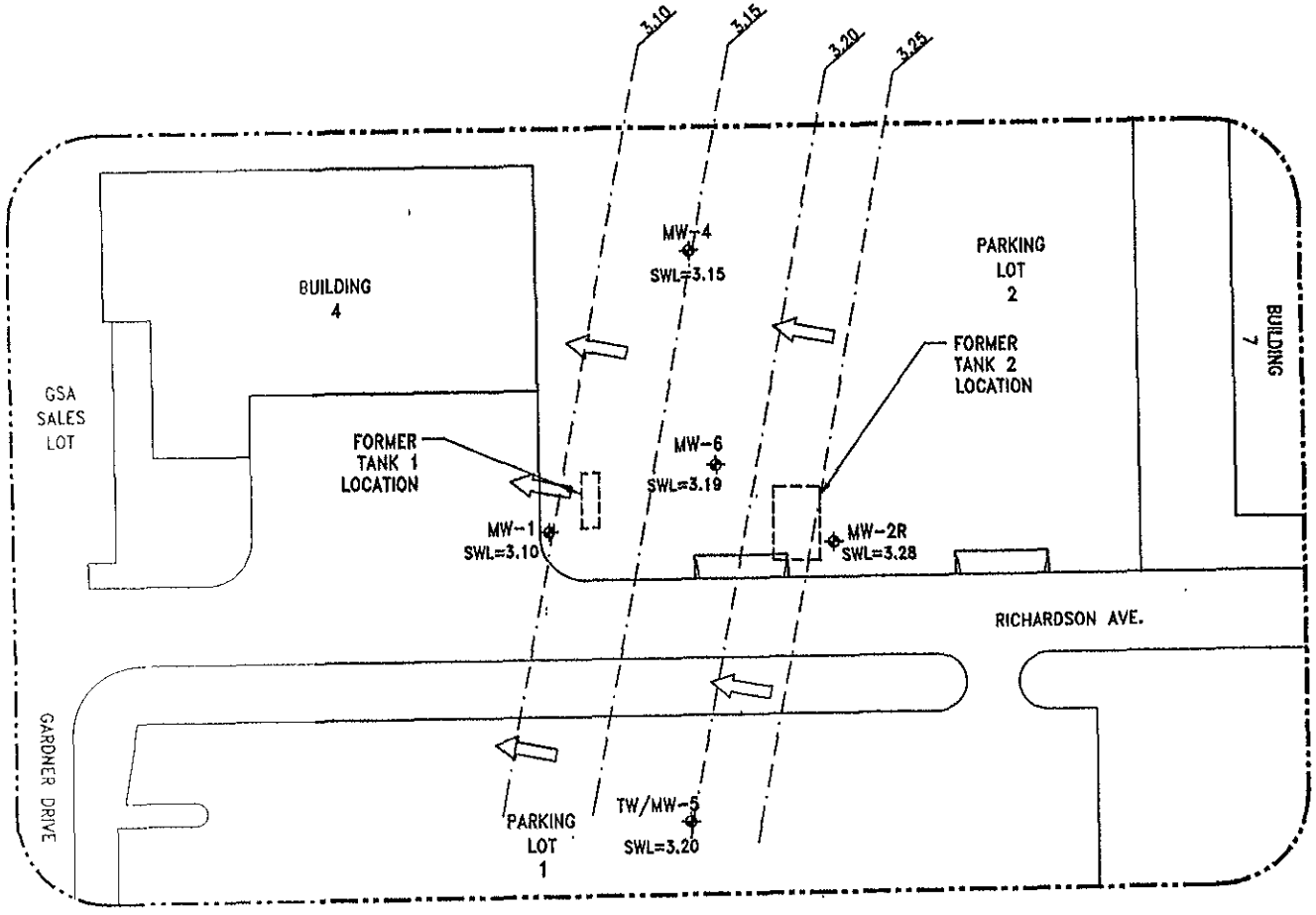

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LEGEND

MW	EXISTING MONITORING WELL
	APPROX. LOCATION OF REMOVED UST's
	GROUNDWATER GRADIENT
SWL	STATIC WATER LEVEL ELEVATIONS IN FEET ABOVE MEAN LEVEL
	EQUIPOTENTIAL ELEVATION CONTOUR

GRAPHIC SCALE

PROJECT NORTH

SHEET TITLE: FIGURE D3 -- GROUNDWATER GRADIENT MAP 10-05-95	CHECKED BY: B. Millar	PROJECT NUMBER: 2403C.24	
PROJECT TITLE: ALAMEDA FEDERAL CENTER, ALAMEDA, CA	DRAWN BY: G. Fagin	DATE: 03-25-99	SHEET: 03

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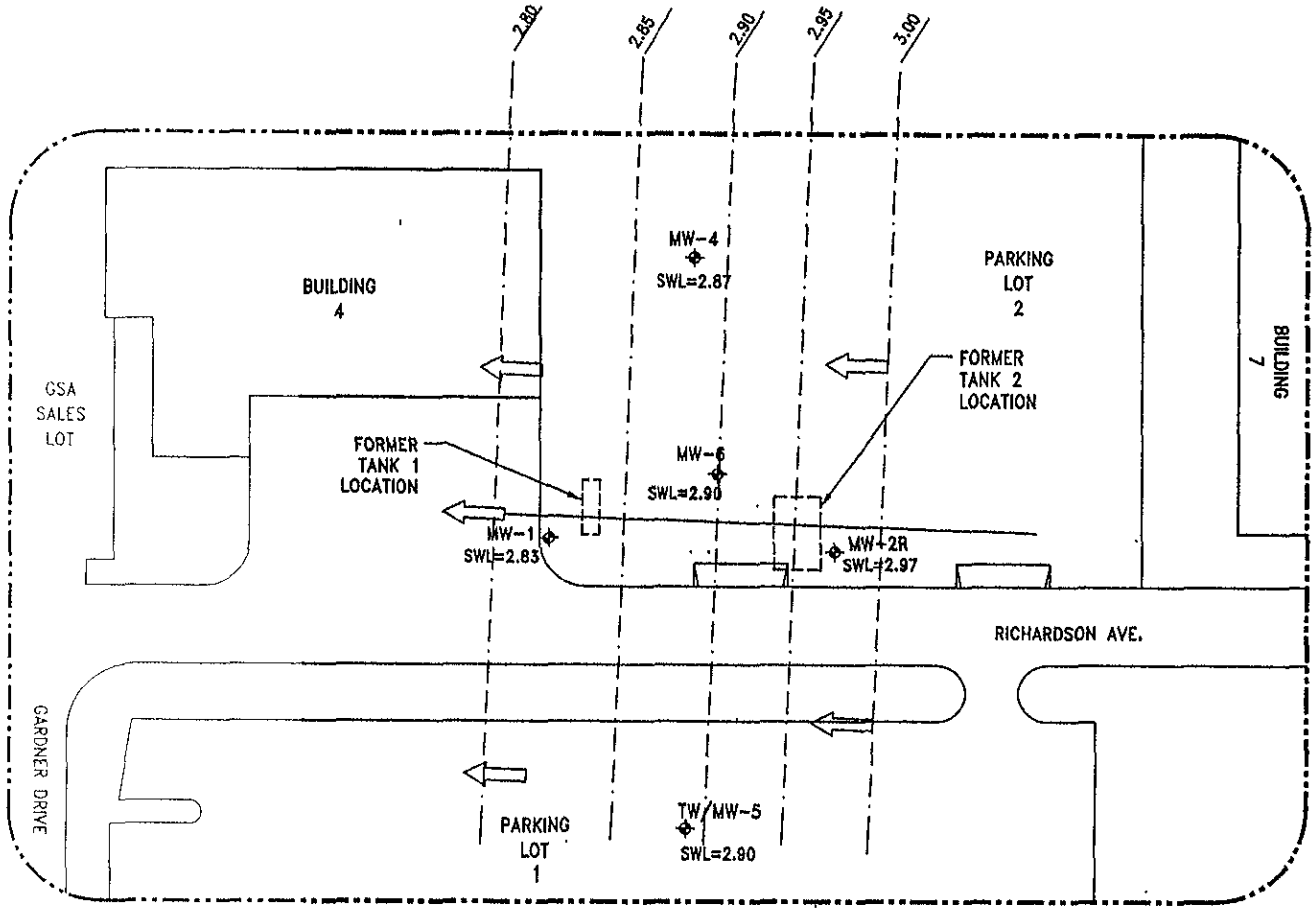

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LEGEND

MW	EXISTING MONITORING WELL
	APPROX. LOCATION OF REMOVED UST's
	GROUNDWATER GRADIENT
SWL	STATIC WATER LEVEL ELEVATIONS IN FEET ABOVE MEAN LEVEL
	EQUIPOTENTIAL ELEVATION CONTOUR

GRAPHIC SCALE

PROJECT NORTH

SHEET TITLE: FIGURE D4 - GROUNDWATER GRADIENT MAP 12-08-95	CHECKED BY: B. Millar	PROJECT NUMBER: 2403C.24	
PROJECT TITLE: ALAMEDA FEDERAL CENTER, ALAMEDA, CA	DRAWN BY: G. Fagin	DATE: 03-25-99	SHEET: D4

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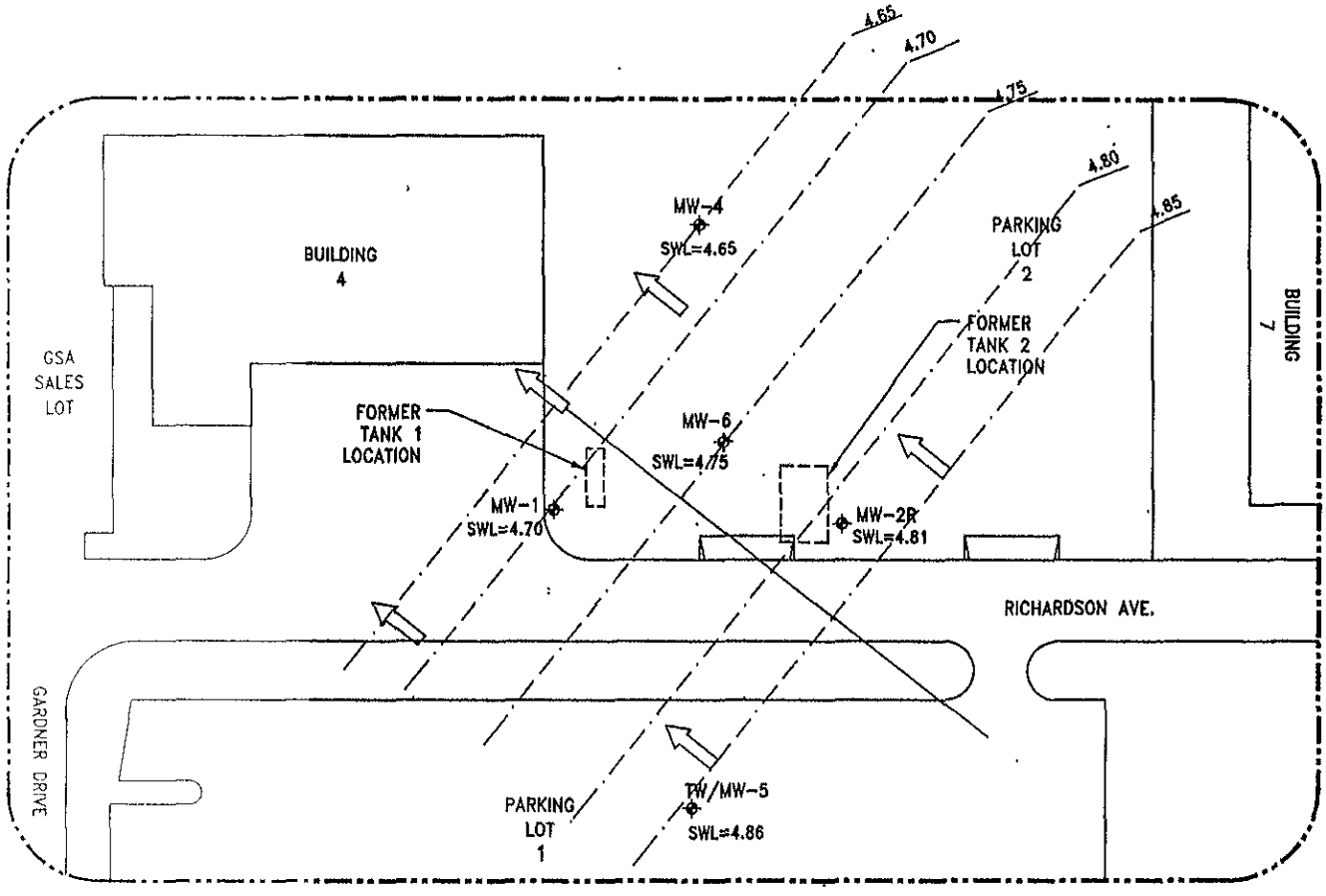

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LEGEND

MW	EXISTING MONITORING WELL
	APPROX. LOCATION OF REMOVED UST's
	GROUNDWATER GRADIENT
SWL	STATIC WATER LEVEL ELEVATIONS IN FEET ABOVE MEAN LEVEL
	EQUIPOTENTIAL ELEVATION CONTOUR

GRAPHIC SCALE

PROJECT NORTH

SHEET TITLE: FIGURE D5 -- GROUNDWATER GRADIENT MAP 03-08-96	CHECKED BY: B. Millar	PROJECT NUMBER: 2403C.24	
PROJECT TITLE: ALAMEDA FEDERAL CENTER, ALAMEDA, CA	DRAWN BY: G. Fagin	DATE: 03-25-99	SHEET: D5

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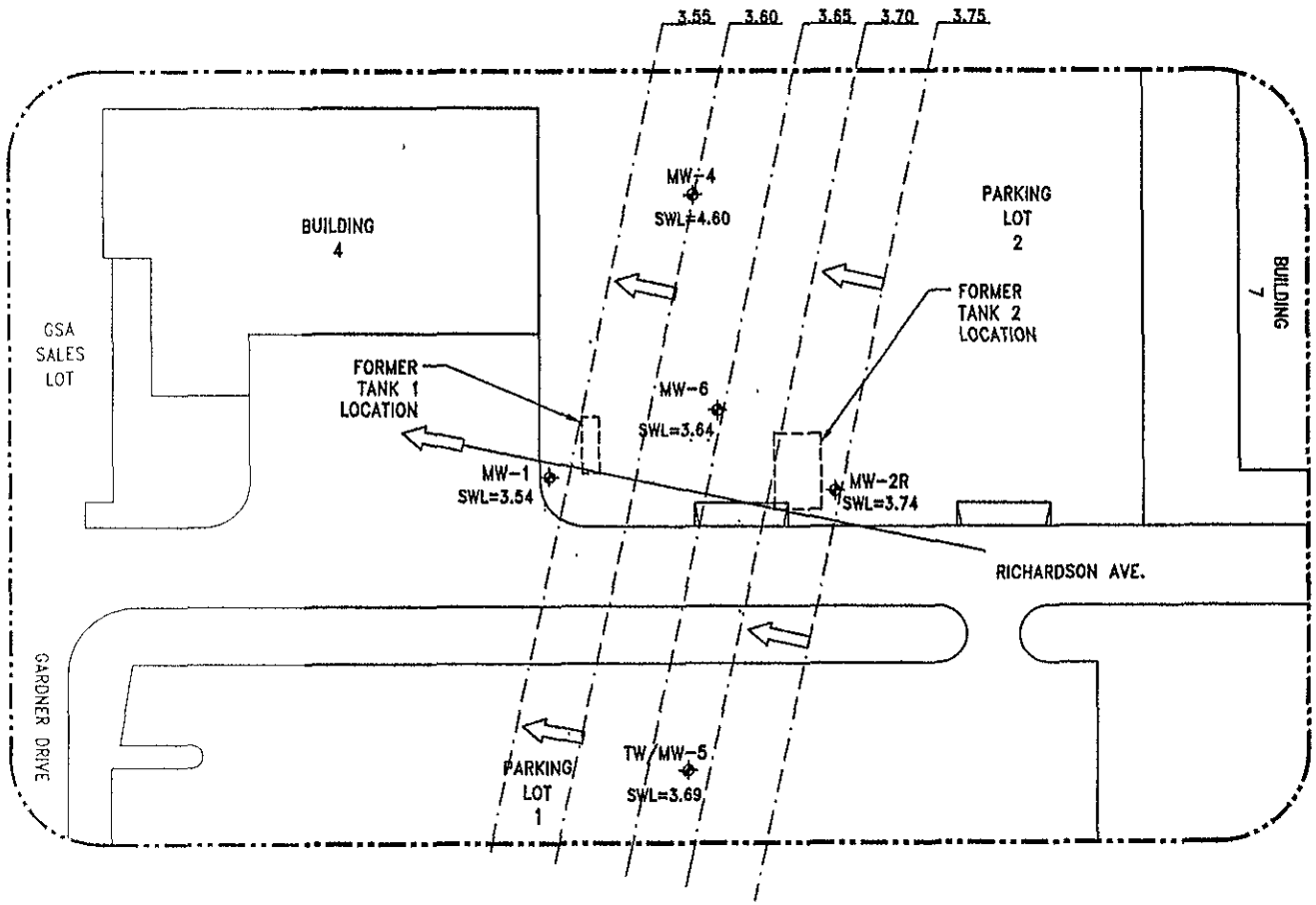

LEGEND

- MW — EXISTING MONITORING WELL
- APPROX. LOCATION OF REMOVED UST's
- GROUNDWATER GRADIENT
- SWL — STATIC WATER LEVEL ELEVATIONS IN FEET ABOVE MEAN LEVEL
- EQUIPOTENTIAL ELEVATION CONTOUR

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GRAPHIC SCALE

PROJECT NORTH

SHEET TITLE: FIGURE D6 - GROUNDWATER GRADIENT MAP (JULY 6, 1998)	CHECKED BY: B. Millar	PROJECT NUMBER: 2403C.24	
PROJECT TITLE: ALAMEDA FEDERAL CENTER, ALAMEDA, CA	DRAWN BY: G. Fagin	DATE: 03-25-99	SHEET: D6

GW659606.dwg

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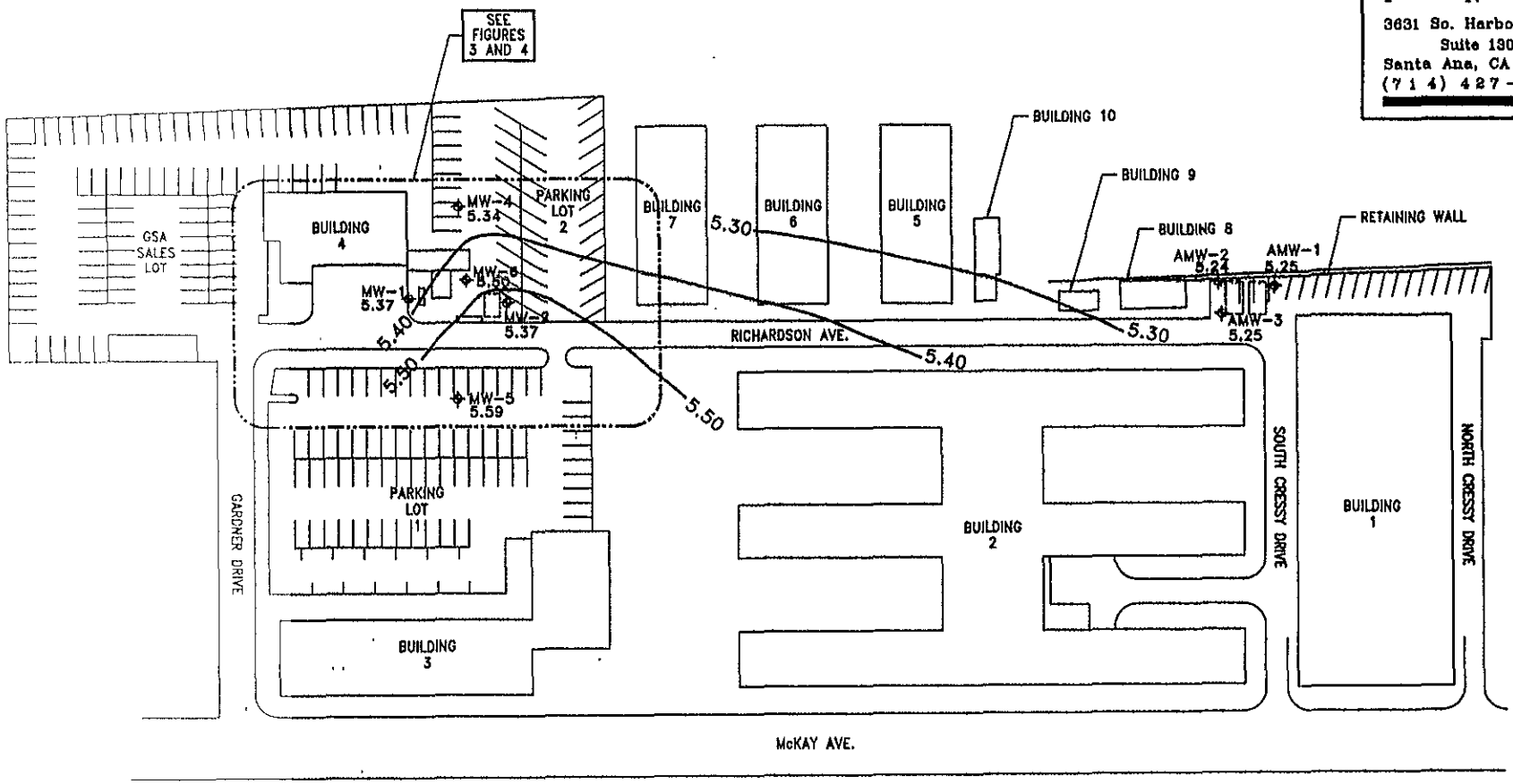

LEGEND

MW-1 5.37 ◆ EXISTING MONITORING WELL WITH GROUNDWATER LEVEL

5.50 GROUNDWATER CONTOUR GRADIENT

GRAPHIC SCALE

0 10' 50' 100' 150'

PROJECT NORTH

SHEET TITLE: FIGURE D7 – GROUNDWATER GRADIENT MAP 2-18-98	CHECKED BY: B. Millar	PROJECT NUMBER: 2403C.24	
PROJECT TITLE: ALAMEDA FEDERAL CENTER, ALAMEDA, CA	DRAWN BY: G. Fagin	DATE: 03-25-99	SHEET: D7

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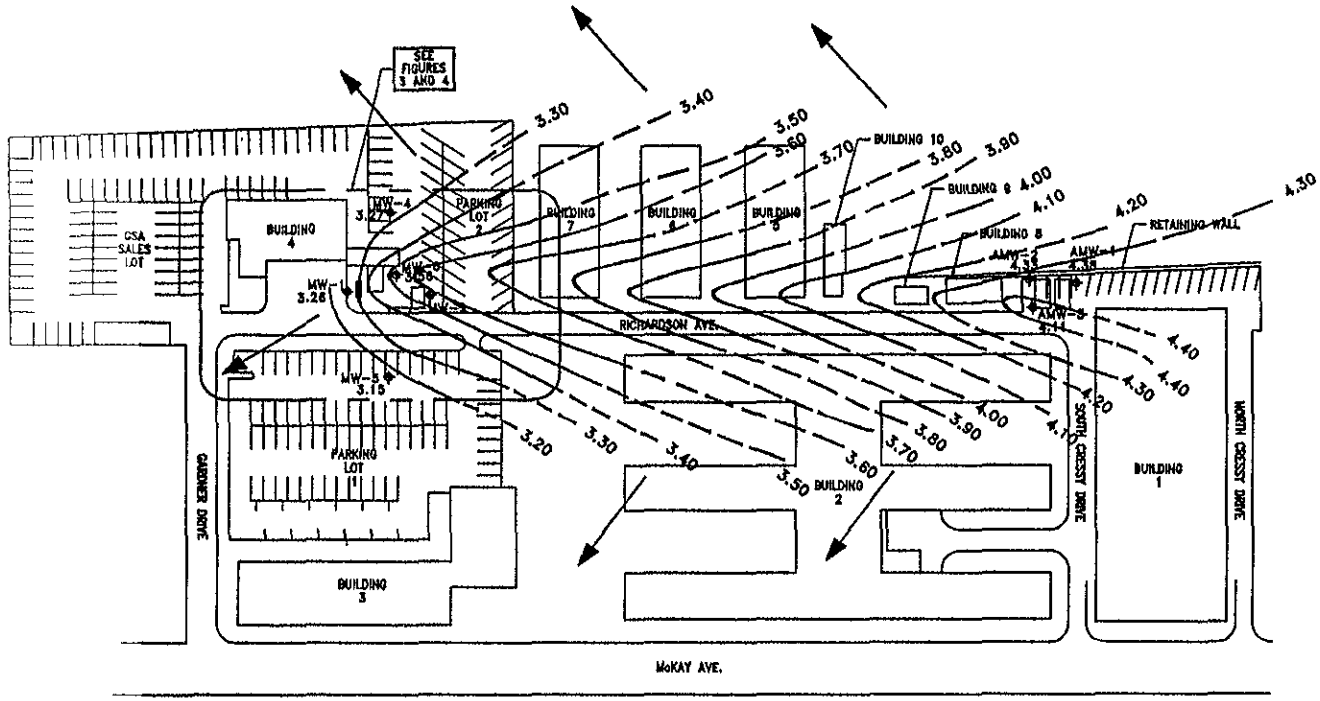

LEGEND

MW-1 3.26 — EXISTING MONITORING WELL WITH GROUNDWATER LEVEL

3.20 — GROUNDWATER CONTOUR GRADIENT

GROUNDWATER DIRECTION

PROJECT NORTH

GRAPHIC SCALE

SHEET TITLE: FIGURE D8 – GROUNDWATER GRADIENT MAP 08-03-98	CHECKED BY: B. Millar	PROJECT NUMBER: 2403C.029.001	
PROJECT TITLE: ALAMEDA FEDERAL CENTER, ALAMEDA, CA	DRAWN BY: G. Fagin	DATE: 03-25-99	SHEET: D8

FILE: GW0398D8.dwg

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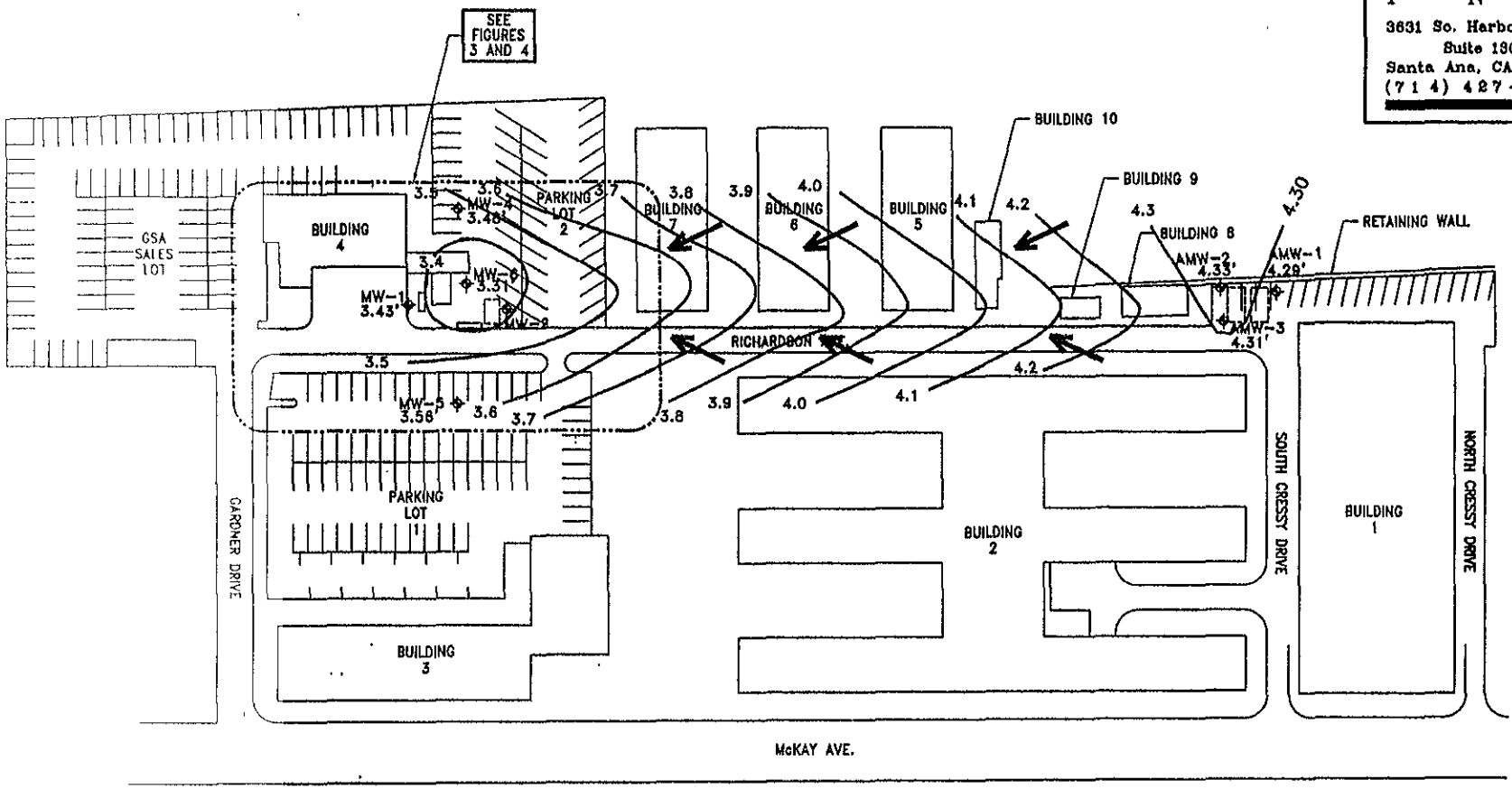

LEGEND

MW-1 3.57' ✦ EXISTING MONITORING WELL WITH GROUNDWATER LEVEL

GRADIENT DIRECTION

4.0 GROUNDWATER ISOCONTOUR LINE

GRAPHIC SCALE

0 10' 50' 100' 150'

PROJECT NORTH

SHEET TITLE: FIGURE D9 – GROUNDWATER GRADIENT MAP 3RD QUARTER 11-16-98	CHECKED BY: B. Millar	PROJECT NUMBER: 2403C.057.001	
PROJECT TITLE: ALAMEDA FEDERAL CENTER, ALAMEDA, CA	DRAWN BY: G. Fagin	DATE: 03-25-99	SHEET: D9

GW1198D9.dwg