



PACIFIC
ENVIRONMENTAL
GROUP, INC.

ENVIRONMENTAL
PROTECTION

97 OCT 17 PM 4: 20

Quarterly Groundwater Monitoring Report Second Quarter 1997

ARCO Service Station 2162
15135 Hesperian Boulevard at Ruth Court
San Leandro, California

Prepared for

Mr. Paul Supple
ARCO Products Company

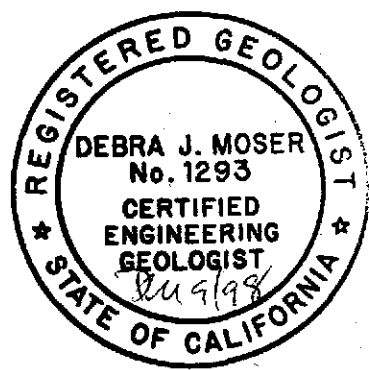
October 6, 1997

Prepared by

Pacific Environmental Group, Inc.
2025 Gateway Place, Suite 440
San Jose, California 95110

Project 330-107.2D

Debra J. Moser
ARCO Program Manager
CEG 1293



Date: October 6, 1997

Quarter: 2Q97

ARCO QUARTERLY GROUNDWATER MONITORING REPORT

Facility No.: 2162 Address: 15135 Hesperian Boulevard at Ruth Court, San Leandro
ARCO Environmental Engineer: Paul Supple
Consulting Co./Contact Person: Pacific Environmental Group, Inc./Gary P. Pestana
Consultant Project No.: 330-107.2D
Primary Agency/Regulatory ID No.: Alameda County Health Care Services Agency

WORK PERFORMED THIS QUARTER (Second - 1997):

1. Submitted first quarter 1997 groundwater monitoring report.
2. Performed second quarter 1997 groundwater monitoring event.
3. Prepared second quarter 1997 groundwater monitoring report.

WORK PROPOSED FOR NEXT QUARTER (Third - 1997):

1. Submit second quarter 1997 groundwater monitoring report.
2. Perform third quarter 1997 groundwater monitoring event.
3. Prepare third quarter 1997 groundwater monitoring report.
4. Perform MtBE confirmation analysis according to EPA Method 8240 on the well containing the highest MtBE result from EPA Method 8020 analysis.

Current Phase of Project:	<u>Monitoring</u>	(Assmnt, Remed., etc.)
Frequency of Groundwater Sampling:	<u>Quarterly</u>	(Quarterly, etc.)
Frequency of Groundwater Monitoring:	<u>Quarterly</u>	(Monthly, etc.)
Is Free Product (FP) Present On-Site:	<u>No</u>	(Yes/No)
FP Recovered this Quarter:	<u>None</u>	(gallons)
Cumulative FP Recovered to Date:	<u>None</u>	(gallons)
Bulk Soil Removed This Quarter:	<u>None</u>	(cubic yards)
Bulk Soil Removed to Date:	<u>None</u>	(cubic yards)
Current Remediation Techniques:	<u>Natural Attenuation</u>	(SVE/Sparge/FP Removal, etc.)
Approximate Depth to Groundwater:	<u>7.52 to 9.00</u>	(Measure Feet)
Groundwater Gradient:	<u>South-southwest</u>	(Direction)
	<u>0.010</u>	(Magnitude)

DISCUSSION:

- TPPH-g and benzene remained slightly above, or below detection limits for all wells.
- MtBE is at a historic high in Well MW-3, and will be confirmed using EPA Method 8240 in the third quarter 1997.
- Please refer to PACIFIC's *Quarterly Groundwater Monitoring Report - Fourth Quarter 1996* for historical groundwater elevation and analytical data.

ATTACHMENTS:

- Table 1 - Groundwater Sampling Schedule
- Table 2 - Groundwater Elevation and Analytical Data
- Figure 1 - Groundwater Elevation Contour Map
- Figure 2 - TPH-g/Benzene Concentration Map
- Attachment A - Field and Laboratory Procedures
- Attachment B - Certified Analytical Report, Chain-of-Custody Documentation, and Field Data Sheets

cc: Mr. John Jang, Regional Water Quality Control Board - S.F. Bay Region
Mr. Mike Bakaldin, City of San Leandro Fire Department, Hazardous
Materials Division
Mr. Scott Seery, Alameda County Health Care Services Agency

Table 1
Groundwater Sampling Schedule

ARCO Service Station 2162
15135 Hesperian Boulevard at Ruth Court
San Leandro, California

Well Number	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Sampling Frequency
MW-1	a	a	a	a	Quarterly
MW-2	a	a	a	a	Quarterly
MW-3	a	a	a	a	Quarterly
MW-4	a	a	a	a	Quarterly

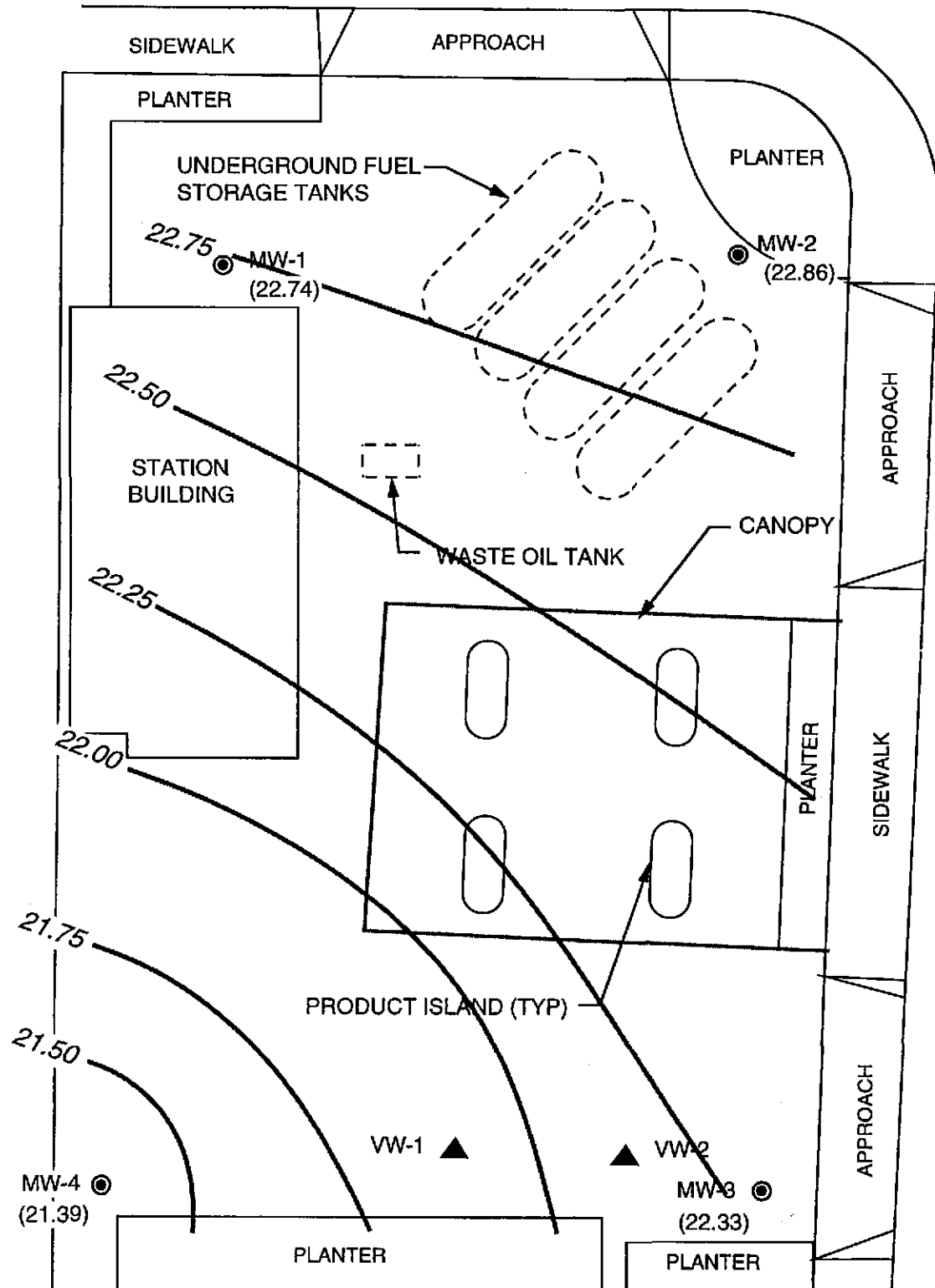
a. Samples analyzed for TPH-g, BTEX compounds, and MtBE according to EPA Methods 8015 (modified) and 8020.

Table 2
Groundwater Elevation and Analytical Data
 Total Purgeable Petroleum Hydrocarbons
 (TPPH as Gasoline, BTEX Compounds, and MtBE)

ARCO Service Station 2162
 15135 Hesperian Boulevard at Ruth Court
 San Leandro, California

Well Number	Date Gauged/ Sampled	Well Elevation (feet, MSL)	Depth to Water (feet, TOC)	Groundwater Elevation (feet, MSL)	TPPH as Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl- benzene (ppb)	Xylenes (ppb)	MtBE (ppb)
MW-1	02/26/96	31.19	7.14	24.05	<50	<0.50	<0.50	<0.50	<0.50	NA
	05/23/96		7.70	23.49	<50	<0.50	<0.50	<0.50	<0.50	NA
	08/21/96		8.75	22.44	210	<0.50	<0.50	<0.50	<0.50	<2.5
	11/20/96		8.62	22.57	91	<0.50	<0.50	<0.50	<0.50	2.6
	04/01/97 †		8.70	22.49	<50	<0.50	<0.50	<0.50	<0.50	<2.5
	06/10/97 †		8.45	22.74	94	<0.50	<0.50	0.68	0.56	6.4
MW-2	02/26/96	30.38	6.41	23.97	770	<0.50	<0.50	45	28	NA
	05/23/96		6.80	23.58	590	0.50	<0.50	35	18	NA
	08/21/96		7.80	22.58	170	<0.50	<0.50	21	6.3	<2.5
	11/20/96		7.73	22.65	88	<0.50	<0.50	7.9	1.1	<2.5
	04/01/97		7.83	22.55	66	<0.50	<0.50	3.6	0.56	33
	06/10/97 †		7.52	22.86	<50	<0.50	<0.50	<0.50	<0.50	<2.5
MW-3	02/26/96	30.30	6.72	23.58	120	5.0	<0.50	<0.50	<0.50	NA
	05/23/96		7.18	23.12	140	12	<0.50	<0.50	<0.50	NA
	08/21/96		8.17	22.13	<50	1.1	<0.50	<0.50	<0.50	130
	11/20/96		8.03	22.27	55	<0.50	<0.50	<0.50	<0.50	59
	04/01/97 †		8.09	22.21	<50	<0.50	<0.50	<0.50	<0.50	180
	06/10/97 †		7.97	22.33	<50	<0.50	<0.50	<0.50	<0.50	1,900
MW-4	02/26/96	30.39	7.59	22.80	110	9.9	<0.50	<0.50	<0.50	NA
	05/23/96		8.22	22.17	69	8.0	<0.50	<0.50	<0.50	NA
	08/21/96		9.28	21.11	<50	6.8	<0.50	<0.50	<0.50	<2.5
	11/20/96		9.12	21.27	95	10	0.59	<0.50	0.52	3.8
	04/01/97		8.45	21.94	73	5.7	<0.50	<0.50	<0.50	<2.5
	06/10/97 †		9.00	21.39	<50	<0.50	<0.50	<0.50	<0.50	<2.5
MtBE	= Methyl tert-butyl ether									
MSL	= Mean sea level									
TOC	= Top of casing									
ppb	= Parts per billion									
NA	= Not analyzed									
†	= Well subject to the no purge protocol. Please refer to Field and Laboratory Procedures (Attachment A) for details.									
<	= Less than the laboratory detection limit stated to the right.									

RUTH COURT



LEGEND

MW-4 ● GROUNDWATER MONITORING WELL LOCATION AND DESIGNATION

VW-1 ▲ SOIL VAPOR EXTRACTION WELL LOCATION AND DESIGNATION

(22.33) GROUNDWATER ELEVATION IN FEET - MSL, 6-10-97

22.5 — GROUNDWATER ELEVATION CONTOUR IN FEET - MSL, 6-10-97



APPROXIMATE DIRECTION OF GROUNDWATER FLOW

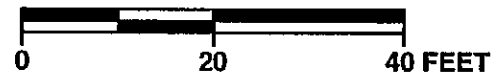
APPROXIMATE GRADIENT = 0.010

SOURCE: MAP BY RESNA



PACIFIC ENVIRONMENTAL GROUP, INC.

SCALE



ARCO SERVICE STATION 2162
15135 Hesperian Boulevard at Ruth Court
San Leandro, California

GROUNDWATER ELEVATION CONTOUR MAP

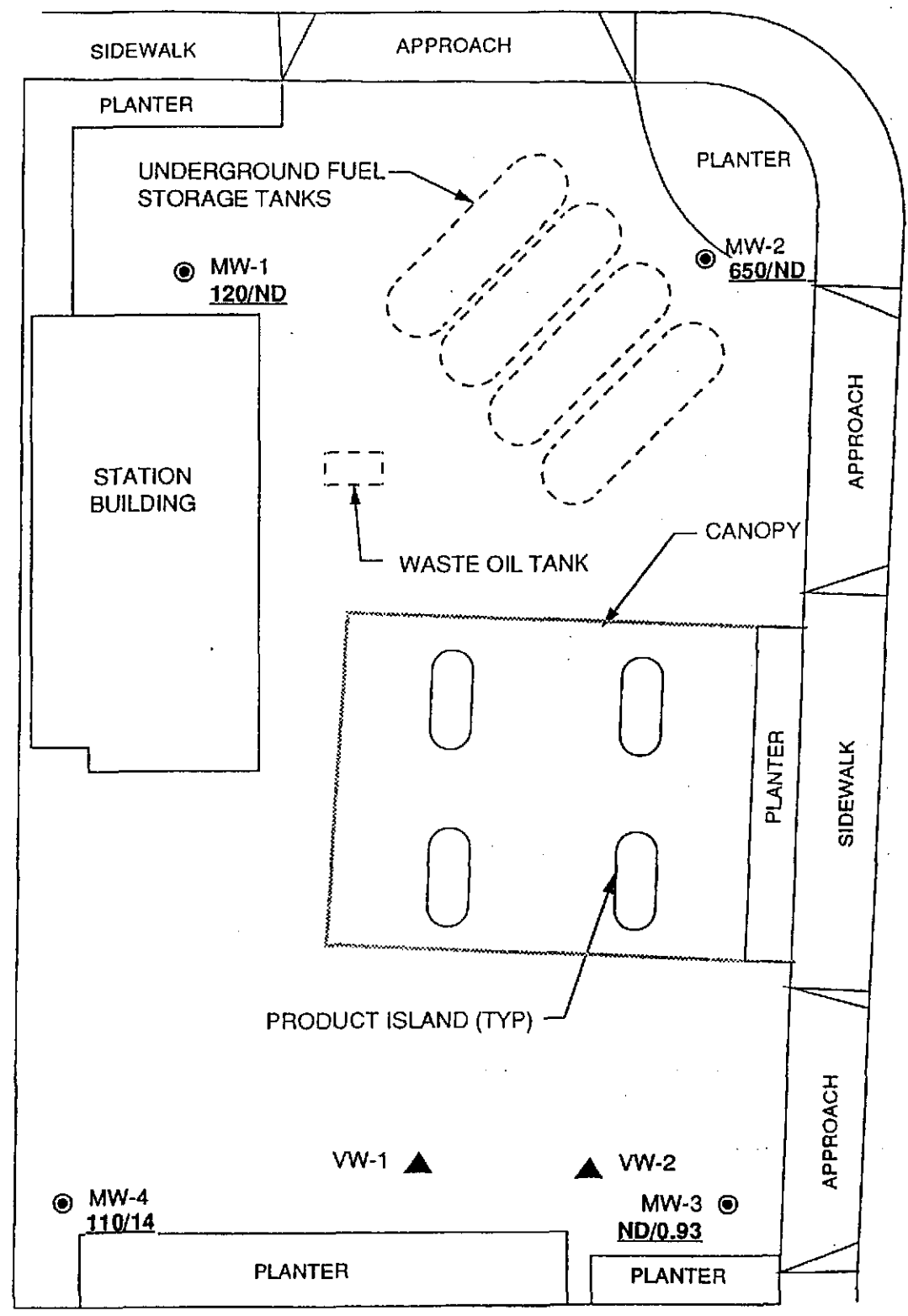
FIGURE:

1

PROJECT:

330-107.2D

RUTH COURT



LEGEND

- MW-4 ● GROUNDWATER MONITORING WELL LOCATION AND DESIGNATION
- VW-1 ▲ SOIL VAPOR EXTRACTION WELL LOCATION AND DESIGNATION
- 110/14 TPH-g/BENZENE CONCENTRATION IN GROUNDWATER, IN PARTS PER BILLION, 2-24-95
- ND NOT DETECTED

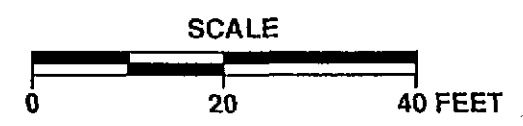


APPROXIMATE DIRECTION OF GROUNDWATER FLOW

SOURCE: MAP BY RESNA



PACIFIC ENVIRONMENTAL GROUP, INC.

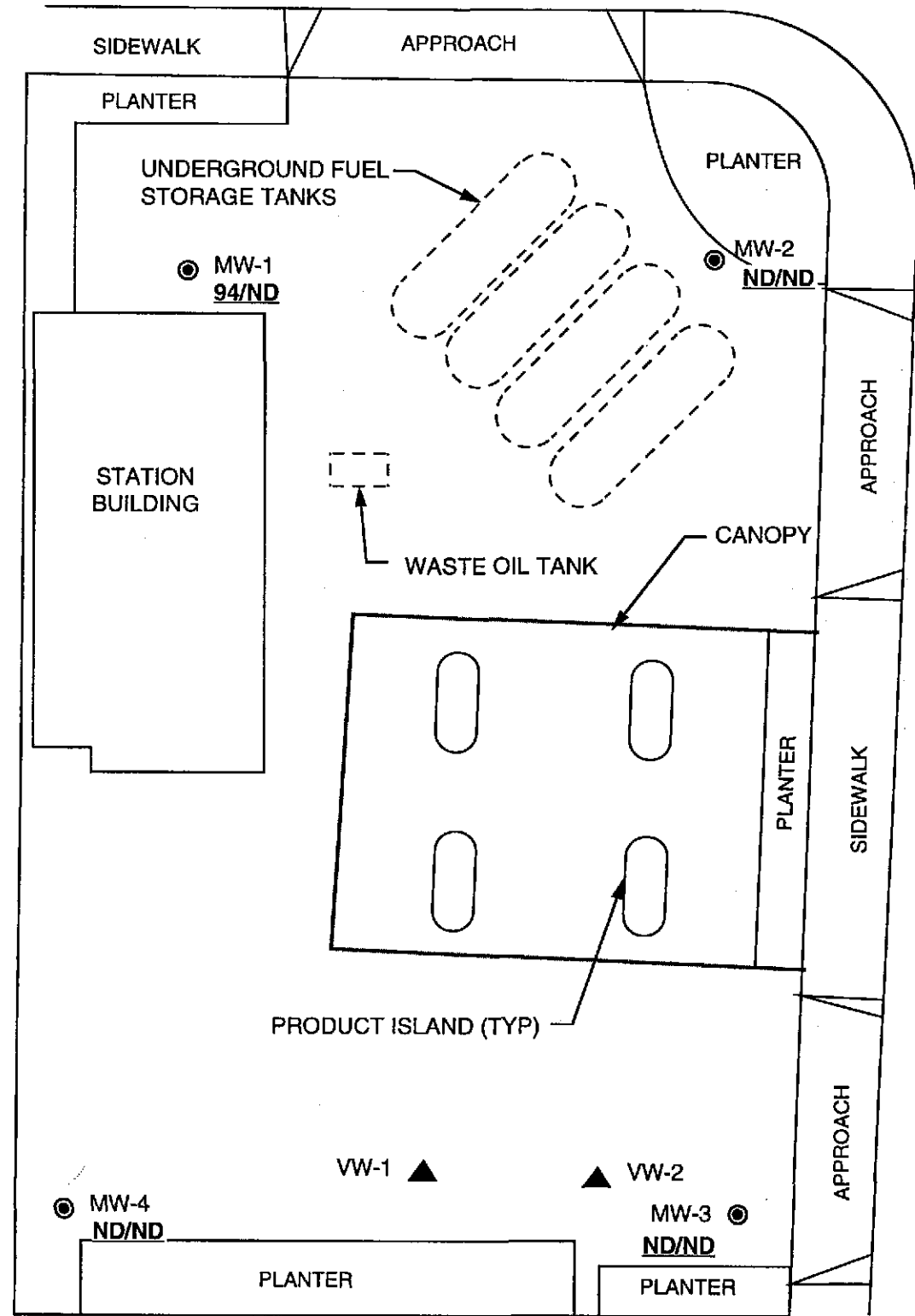


ARCO SERVICE STATION 2162
15135 Hesperian Boulevard at Ruth Court
San Leandro, California

TPH-g/BENZENE CONCENTRATION MAP

FIGURE: 2
PROJECT: 330-107.2B

RUTH COURT



LEGEND

- MW-4 ● GROUNDWATER MONITORING WELL LOCATION AND DESIGNATION
- VW-1 ▲ SOIL VAPOR EXTRACTION WELL LOCATION AND DESIGNATION
- 94/ND TPPH-g/BENZENE CONCENTRATION IN GROUNDWATER, IN PARTS PER BILLION, 6-10-97
- ND NOT DETECTED



APPROXIMATE DIRECTION OF GROUNDWATER FLOW

SOURCE: MAP BY RESNA



PACIFIC ENVIRONMENTAL GROUP, INC.

SCALE



ARCO SERVICE STATION 2162
15135 Hesperian Boulevard at Ruth Court
San Leandro, California

TPPH-g/BENZENE CONCENTRATION MAP

FIGURE:
2
PROJECT:
330-107.2D

ATTACHMENT A
FIELD AND LABORATORY PROCEDURES

ATTACHMENT A

FIELD AND LABORATORY PROCEDURES

Sampling Procedures

The sampling procedure for each well consists first of measuring the water level and then checking for the presence of separate-phase hydrocarbons (SPH), using either an electronic indicator and a clear Teflon[®] bailer or an oil-water interface probe. Wells not containing SPH are then purged of approximately three casing volumes of water (or to dryness) using a centrifugal pump, gas displacement pump, or bailer. Equipment used for the current sampling event is noted on the attached field data sheets. During purging, temperature, pH, and electrical conductivity are monitored in order to document that these parameters are stable prior to collecting samples. After purging, water levels are allowed to partially recover. Groundwater samples are collected using a Teflon[®] bailer, placed into appropriate EPA-approved containers, labeled, logged onto chain-of-custody documents, and transported on ice to a California State-certified laboratory.

ARCO initiated utilization of a case-by-case approach for the implementation of non-purge sampling of monitoring wells impacted by petroleum hydrocarbons, beginning first quarter 1997. The criteria for implementation of non-purge sampling include:

- The screened interval of the well casing is not fully submerged.
- The well is not located within a confined aquifer.
- The well is not being monitored for the first time.
- The site is not being monitored during the confirmation monitoring period, prior to site closure.

Based on the above criteria, prescreening of monitoring wells are performed for each site. Depth to water data obtained on the sampling date is compared to the well construction data, to decide whether the well may be sampled without purging.

Laboratory Procedures

The groundwater samples were analyzed for the presence of total purgeable petroleum hydrocarbons calculated as gasoline, benzene, toluene, ethylbenzene, xylenes, and methyl tert-butyl ether. The analyses were performed according to EPA Methods 8015 (modified) and 8020 utilizing a purge-and-trap extraction technique. Final detection was by gas chromatography using flame- and photo-ionization detectors. The methods of analysis for the groundwater samples are documented in the certified analytical report. The certified analytical report, chain-of-custody documentation, and field data sheets are presented as Attachment B.

ATTACHMENT B

**CERTIFIED ANALYTICAL REPORT,
CHAIN-OF-CUSTODY DOCUMENTATION,
AND FIELD DATA SHEETS**



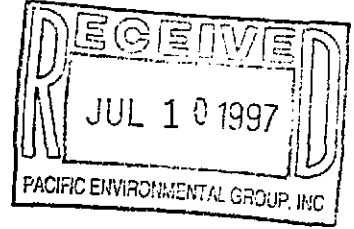
Sequoia Analytical

680 Chesapeake Drive
404 N. Wiget Lane
819 Striker Avenue, Suite 8

Redwood City, CA 94063
Walnut Creek, CA 94598
Sacramento, CA 95834

(415) 364-9600
(510) 988-9600
(916) 921-9600

FAX (415) 364-9233
FAX (510) 988-9673
FAX (916) 921-0100



Pacific Environmental Group
2025 Gateway Place, Suite 440
San Jose, CA 95110
Attention: Shaw Garakani

Project: 330-107.2K/2162, San Leandro

Enclosed are the results from samples received at Sequoia Analytical on June 11, 1997.
The requested analyses are listed below:

<u>SAMPLE #</u>	<u>SAMPLE DESCRIPTION</u>	<u>DATE COLLECTED</u>	<u>TEST METHOD</u>
9706607 -01	LIQUID, MW-1	06/10/97	MTBE_W Methyl t-Butyl Eth
9706607 -01	LIQUID, MW-1	06/10/97	TPHGBW Purgeable TPH/BTEX
9706607 -02	LIQUID, MW-2	06/10/97	MTBE_W Methyl t-Butyl Eth
9706607 -02	LIQUID, MW-2	06/10/97	TPHGBW Purgeable TPH/BTEX
9706607 -03	LIQUID, MW-3	06/10/97	MTBE_W Methyl t-Butyl Eth
9706607 -03	LIQUID, MW-3	06/10/97	TPHGBW Purgeable TPH/BTEX
9706607 -04	LIQUID, MW-4	06/10/97	MTBE_W Methyl t-Butyl Eth
9706607 -04	LIQUID, MW-4	06/10/97	TPHGBW Purgeable TPH/BTEX

Please contact me if you have any questions. In the meantime, thank you for the opportunity to work with you on this project.

Very truly yours,

SEQUOIA ANALYTICAL

JLc

Project Manager

Quality Assurance Department





Pacific Environmental Group 2025 Gateway Place, Suite 440 San Jose, CA 95110	Client Proj. ID: 330-107.2K/2162, San Leandro Sample Descript: MW-1 Matrix: LIQUID Analysis Method: EPA 8020 Lab Number: 9706607-01	Sampled: 06/10/97 Received: 06/11/97 Analyzed: 06/13/97 Reported: 06/22/97
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QC Batch Number: GC061397BTEX17A
Instrument ID: GCHP17

Methyl t-Butyl Ether (MTBE)

Analyte	Detection Limit ug/L	Sample Results ug/L
Methyl t-Butyl Ether	2.5	6.4
Surrogates	Control Limits %	% Recovery
Trifluorotoluene	70 130	85

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210



Tod Granicher
Project Manager





Pacific Environmental Group 2025 Gateway Place, Suite 440 San Jose, CA 95110	Client Proj. ID: 330-107.2K/2162, San Leandro Sample Descript: MW-1 Matrix: LIQUID Analysis Method: 8015Mod/8020 Lab Number: 9706607-01	Sampled: 06/10/97 Received: 06/11/97 Analyzed: 06/13/97 Reported: 06/22/97
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QC Batch Number: GC061397BTEX17A
Instrument ID: GCHP17

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX

Analyte	Detection Limit ug/L	Sample Results ug/L
TPPH as Gas	50	94
Benzene	0.50	N.D.
Toluene	0.50	N.D.
Ethyl Benzene	0.50	0.68
Xylenes (Total)	0.50	0.56
Chromatogram Pattern: Weathered Gas		C6-C12
Surrogates	Control Limits %	% Recovery
Trifluorotoluene	70 130	85

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

TJL

Tod Granicher
Project Manager





Pacific Environmental Group	Client Proj. ID: 330-107.2K/2162, San Leandro	Sampled: 06/10/97
2025 Gateway Place, Suite 440	Sample Descript: MW-2	Received: 06/11/97
San Jose, CA 95110	Matrix: LIQUID	
Attention: Shaw Garakani	Analysis Method: EPA 8020	Analyzed: 06/13/97
	Lab Number: 9706607-02	Reported: 06/22/97

QC Batch Number: GC061397BTEX17A
Instrument ID: GCHP17

Methyl t-Butyl Ether (MTBE)

Analyte	Detection Limit ug/L	Sample Results ug/L
Methyl t-Butyl Ether	2.5	N.D.
Surrogates	Control Limits %	% Recovery
Trifluorotoluene	70 130	78

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

310

Tod Granicher
Project Manager



Pacific Environmental Group
2025 Gateway Place, Suite 440
San Jose, CA 95110

Client Proj. ID: 330-107.2K/2162, San Leandro
Sample Descript: MW-2
Matrix: LIQUID
Analysis Method: 8015Mod/8020
Lab Number: 9706607-02

Sampled: 06/10/97
Received: 06/11/97
Analyzed: 06/13/97
Reported: 06/22/97

QC Batch Number: GC061397BTEX17A
Instrument ID: GCHP17

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX

Analyte	Detection Limit ug/L	Sample Results ug/L
TPPH as Gas	50	N.D.
Benzene	0.50	N.D.
Toluene	0.50	N.D.
Ethyl Benzene	0.50	N.D.
Xylenes (Total)	0.50	N.D.
Chromatogram Pattern:		
Surrogates	Control Limits %	% Recovery
Trifluorotoluene	70 130	78

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

Tod Granicher
Project Manager



Pacific Environmental Group 2025 Gateway Place, Suite 440 San Jose, CA 95110	Client Proj. ID: 330-107.2K/2162, San Leandro Sample Descript: MW-3 Matrix: LIQUID Analysis Method: EPA 8020 Lab Number: 9706607-03	Sampled: 06/10/97 Received: 06/11/97 Analyzed: 06/17/97 Reported: 06/22/97
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QC Batch Number: GC061797BTEX01A
Instrument ID: GCHP01

Methyl t-Butyl Ether (MTBE)

Analyte	Detection Limit ug/L	Sample Results ug/L
Methyl t-Butyl Ether	25	1900
Surrogates	Control Limits %	% Recovery
Trifluorotoluene	70 130	84

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

TJG

Tod Granicher
Project Manager



Pacific Environmental Group 2025 Gateway Place, Suite 440 San Jose, CA 95110	Client Proj. ID: 330-107.2K/2162, San Leandro Sample Descript: MW-3 Matrix: LIQUID Analysis Method: 8015Mod/8020 Lab Number: 9706607-03	Sampled: 06/10/97 Received: 06/11/97 Analyzed: 06/17/97 Reported: 06/22/97
Attention: Shaw Garakani		

QC Batch Number: GC061797BTEX01A
Instrument ID: GCHP01

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX

Analyte	Detection Limit ug/L	Sample Results ug/L
TPPH as Gas	500	N.D.
Benzene	5.0	N.D.
Toluene	5.0	N.D.
Ethyl Benzene	5.0	N.D.
Xylenes (Total)	5.0	N.D.
Chromatogram Pattern:		
Surrogates	Control Limits %	% Recovery
Trifluorotoluene	70 130	84

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210


Tod Granicher
Project Manager



Pacific Environmental Group 2025 Gateway Place, Suite 440 San Jose, CA 95110	Client Proj. ID: 330-107.2K/2162, San Leandro Sample Descript: MW-4 Matrix: LIQUID Analysis Method: EPA 8020 Lab Number: 9706607-04	Sampled: 06/10/97 Received: 06/11/97 Analyzed: 06/16/97 Reported: 06/22/97
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QC Batch Number: GC061697BTEX18A
Instrument ID: GCHP18

Methyl t-Butyl Ether (MTBE)

Analyte	Detection Limit ug/L	Sample Results ug/L
Methyl t-Butyl Ether	2.5	N.D.
Surrogates	Control Limits %	% Recovery
Trifluorotoluene	70 130	95

*Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210



Tod Granicher
Project Manager



Pacific Environmental Group 2025 Gateway Place, Suite 440 San Jose, CA 95110	Client Proj. ID: 330-107.2K/2162, San Leandro Sample Descript: MW-4 Matrix: LIQUID Analysis Method: 8015Mod/8020 Lab Number: 9706607-04	Sampled: 06/10/97 Received: 06/11/97 Analyzed: 06/16/97 Reported: 06/22/97
Attention: Shaw Garakani		


QC Batch Number: GC061697BTEX18A
Instrument ID: GCHP18

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX

Analyte	Detection Limit ug/L	Sample Results ug/L
TPPH as Gas	50	N.D.
Benzene	0.50	N.D.
Toluene	0.50	N.D.
Ethyl Benzene	0.50	N.D.
Xylenes (Total)	0.50	N.D.
Chromatogram Pattern:		
Surrogates	Control Limits %	% Recovery
Trifluorotoluene	70 130	95

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210



Tod Granicher
Project Manager



Sequoia Analytical

680 Chesapeake Drive Redwood City, CA 94063 (415) 364-9600 FAX (415) 364-9233
 404 N. Wiget Lane Walnut Creek, CA 94598 (510) 988-9600 FAX (510) 988-9673
 819 Striker Avenue, Suite 8 Sacramento, CA 95834 (916) 921-9600 FAX (916) 921-0100

Pacific Environmental Group Client Project ID: 330-107.2K/2162, San Leandro
 2025 Gateway Place, Suite 440 Matrix: Liquid
 San Jose, CA 95110
 Attention: Shaw Garakani Work Order #: 9706607 -01-04 Reported: Jul 8, 1997

QUALITY CONTROL DATA REPORT

Analyte:	Benzene	Toluene	Ethyl Benzene	Xylenes	Gas
QC Batch#:	GC061397BTEX17A	GC061397BTEX17A	GC061397BTEX17A	GC061397BTEX17A	GC061397BTEX17A
Analy. Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020	EPA 8015M
Prep. Method:	EPA 5030	EPA 5030	EPA 5030	EPA 5030	EPA 5030
Analyst:	A. Miraftab	A. Miraftab	A. Miraftab	A. Miraftab	A. Miraftab
MS/MSD #:	970613911	970613911	970613911	970613911	970613911
Sample Conc.:	N.D.	N.D.	N.D.	N.D.	N.D.
Prepared Date:	6/13/97	6/13/97	6/13/97	6/13/97	6/13/97
Analyzed Date:	6/13/97	6/13/97	6/13/97	6/13/97	6/13/97
Instrument I.D.#:	GCHP17	GCHP17	GCHP17	GCHP17	GCHP17
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L	60 µg/L
Result:	9.4	9.4	9.4	28	60
MS % Recovery:	94	94	94	93	100
Dup. Result:	9.8	9.7	9.6	29	62
MSD % Recov.:	98	97	96	97	103
RPD:	4.2	3.1	2.1	3.5	3.3
RPD Limit:	0-25	0-25	0-25	0-25	0-25

LCS #:	BLK061397	BLK061397	BLK061397	BLK061397	BLK061397
Prepared Date:	6/13/97	6/13/97	6/13/97	6/13/97	6/13/97
Analyzed Date:	6/13/97	6/13/97	6/13/97	6/13/97	6/13/97
Instrument I.D.#:	GCHP17	GCHP17	GCHP17	GCHP17	GCHP17
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L	60 µg/L
LCS Result:	9.5	9.3	9.4	28	61
LCS % Recov.:	95	93	94	93	102

MS/MSD	60-140	60-140	60-140	60-140	60-140
LCS	70-130	70-130	70-130	70-130	70-130
Control Limits					

Quality Assurance Statement: All standard operating procedures and quality control requirements have been met.

Please Note:

The LCS is a control sample of known, interferent-free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

SEQUOIA ANALYTICAL


 Tod Granicher
 Project Manager

** MS=Matrix Spike, MSD=MS Duplicate, RPD=Relative % Difference

9706607.PPP <1>



Pacific Environmental Group Client Project ID: 330-107.2K/2162, San Leandro
 2025 Gateway Place, Suite 440 Matrix: Liquid
 San Jose, CA 95110
 Attention: Shaw Garakani Work Order #: 9706607-01-04 Reported: Jul 8, 1997

QUALITY CONTROL DATA REPORT

Analyte:	Benzene	Toluene	Ethyl Benzene	Xylenes	Gas
QC Batch#:	GC061697BTEX18A	GC061697BTEX18A	GC061697BTEX18A	GC061697BTEX18A	GC061697BTEX18A
Analy. Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020	EPA 8015M
Prep. Method:	EPA 5030	EPA 5030	EPA 5030	EPA 5030	EPA 5030

Analyst:	A. Porter	A. Porter	A. Porter	A. Porter	A. Porter
MS/MSD #:	970658503	970658503	970658503	970658503	970658503
Sample Conc.:	N.D.	N.D.	N.D.	N.D.	N.D.
Prepared Date:	6/16/97	6/16/97	6/16/97	6/16/97	6/16/97
Analyzed Date:	6/16/97	6/16/97	6/16/97	6/16/97	6/16/97
Instrument I.D.#:	GCHP18	GCHP18	GCHP18	GCHP18	GCHP18
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L	60 µg/L
Result:	7.7	8.9	9.5	29	57
MS % Recovery:	77	89	95	97	95
Dup. Result:	7.5	8.8	9.5	30	56
MSD % Recov.:	75	88	95	100	93
RPD:	2.6	1.1	0.0	3.4	1.8
RPD Limit:	0-25	0-25	0-25	0-25	0-25

LCS #:	BLK061697	BLK061697	BLK061697	BLK061697	BLK061697
Prepared Date:	6/16/97	6/16/97	6/16/97	6/16/97	6/16/97
Analyzed Date:	6/16/97	6/16/97	6/16/97	6/16/97	6/16/97
Instrument I.D.#:	GCHP18	GCHP18	GCHP18	GCHP18	GCHP18
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L	60 µg/L
LCS Result:	7.9	9.2	10	30	58
LCS % Recov.:	79	92	100	100	97

MS/MSD	60-140	60-140	60-140	60-140	60-140
LCS	70-130	70-130	70-130	70-130	70-130
Control Limits					

Quality Assurance Statement: All standard operating procedures and quality control requirements have been met.

Please Note:

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SEQUOIA ANALYTICAL

Signature
 Tod Granicher
 Project Manager

** MS=Matrix Spike, MSD=MS Duplicate, RPD=Relative % Difference

9706607.PPP <2>



Pacific Environmental Group
2025 Gateway Place, Suite 440
San Jose, CA 95110
Attention: Shaw Garakani

Client Project ID: 330-107.2K/2162, San Leandro
Matrix: Liquid

Work Order #: 9706607-01-04

Reported: Jul 8, 1997

QUALITY CONTROL DATA REPORT

Analyte:	Benzene	Toluene	Ethyl Benzene	Xylenes	Gas
QC Batch#:	GC061797BTEX01A	GC061797BTEX01A	GC061797BTEX01A	GC061797BTEX01A	GC061797BTEX01A
Analy. Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020	EPA 8015M
Prep. Method:	EPA 5030	EPA 5030	EPA 5030	EPA 5030	EPA 5030

Analyst:	A. Porter	A. Porter	A. Porter	A. Porter	A. Porter
MS/MSD #:	970663305	970663305	970663305	970663305	970663305
Sample Conc.:	N.D.	N.D.	N.D.	N.D.	N.D.
Prepared Date:	6/17/97	6/17/97	6/17/97	6/17/97	6/17/97
Analyzed Date:	6/17/97	6/17/97	6/17/97	6/17/97	6/17/97
Instrument I.D.#:	GCHP1	GCHP1	GCHP1	GCHP1	GCHP1
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L	60 µg/L
Result:	11	10	10	30	74
MS % Recovery:	110	100	100	100	123
Dup. Result:	10	10	10	30	74
MSD % Recov.:	100	100	100	100	123
RPD:	9.5	0.0	0.0	0.0	0.0
RPD Limit:	0-25	0-25	0-25	0-25	0-25

LCS #:	BLK061797	BLK061797	BLK061797	BLK061797	BLK061797
Prepared Date:	6/17/97	6/17/97	6/17/97	6/17/97	6/17/97
Analyzed Date:	6/17/97	6/17/97	6/17/97	6/17/97	6/17/97
Instrument I.D.#:	GCHP1	GCHP1	GCHP1	GCHP1	GCHP1
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L	60 µg/L
LCS Result:	9.6	9.1	9.1	28	66
LCS % Recov.:	96	91	91	93	110

MS/MSD	60-140	60-140	60-140	60-140	60-140
LCS	70-130	70-130	70-130	70-130	70-130
Control Limits					

Quality Assurance Statement: All standard operating procedures and quality control requirements have been met.

Please Note:

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SEQUOIA ANALYTICAL

Tod Granicher
Project Manager

** MS=Matrix Spike, MSD=MS Duplicate, RPD=Relative % Difference

9706607.PPP <3>



Sequoia
Analytical

680 Chesapeake Drive
404 N. Wiget Lane
819 Striker Avenue, Suite 8

Redwood City, CA 94063
Walnut Creek, CA 94598
Sacramento, CA 95834

(415) 364-9600
(510) 988-9600
(916) 921-9600

FAX (415) 364-9233
FAX (510) 988-9673
FAX (916) 921-0100

Pacific Environmental Group
2025 Gateway Place, Suite 440
San Jose, CA 95110
Attention: Shaw Garakani

Client Proj. ID: 330-107.2K/2162, San Leandro

Received: 06/11/97

Lab Proj. ID: 9706607

Reported: 06/22/97

LABORATORY NARRATIVE

In order to properly interpret this report, it must be reproduced in its entirety. This report contains a total of 15 pages including the laboratory narrative, sample results, quality control, and related documents as required (cover page, COC, raw data, etc.).

SEQUOIA ANALYTICAL



Tod Granicher
Project Manager

SEQUOIA ANALYTICAL SAMPLE RECEIPT LOG

CLIENT NAME: PEG
 REC. BY (PRINT) PHL

WORKORDER: 9706607
 DATE OF LOG-IN: 6/24/97

CIRCLE THE APPROPRIATE RESPONSE

		LAB SAMPLE #	DASH #	CLIENT IDENTIFICATION	CONTAINER DESCRIPTION	SAMPLE MATRIX	DATE SAMP.	REMARKS: CONDITION (ETC.)
1. Custody Seal(s) Present / Absent Intact / Broken*		1	AC	MW-1	VOA (B)	GRAV	06-10-97	
2. Custody Seal #: Put in Remarks Section		2		2				
3. Chain-of-Custody <u>Present</u> / Absent*		3		3				
4. Traffic Reports or Packing List: Present / Absent		4		4				
5. Airbill: Airbill / Sticker Present / Absent								
6. Airbill #:								
7. Sample Tags: <u>Present</u> / Absent								
Sample Tags #s: <u>Listed</u> / Not Listed on Chain-of-Custody								
8. Sample Condition: <u>Intact</u> / Broken* / Leaking*								
9. Does information on custody reports, traffic reports and sample tags agree? <u>Yes</u> / No*								
10. Proper Preservatives used: <u>Yes</u> / No*								
11. Date Rec. at Lab: <u>06-11-97</u>								
12. Time Rec. at Lab: <u>11:35</u>								
13. Temp Rec. at Lab: <u>8°C</u>								

FWD 06-11-97

*If Circled, contact Project Manager and attach record of resolution.

ARCO Products Company

Division of AtlanticRichfieldCompany

330-107.2K Task Order No.

Chain of Custody

ARCO Facility no. 2162

City (Facility) 15135 Hesperian, San Leandro

Project manager (Consultant) Shaw Garakani

ARCO engineer Paul Supple

Telephone no. (ARCO)

Telephone no. (Consultant) 408 441 7500

Fax no. (Consultant) 408 441 7539

Consultant name Pacific Env. Group Inc

Address (Consultant) 2025 GATEWAY PL Suite 440 SAN JOSE CA 95110

Laboratory name

Sequira

Contract number

WA# 21334 00

Method of shipment

Special detection Limit/reporting

Special QA/QC

Remarks

Lab number

4706607

Turnaround time

Priority Rush

1 Business Day

Rush

2 Business Days

Expedited

5 Business Days

Standard

10 Business Days

Sample I.D.	Lab no.	Container no.	Matrix			Preservation		Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH-S/MEDE EPA 1632/8020/8015	TPH Modified 8015 Gas <input type="checkbox"/> Diesel <input type="checkbox"/>	Oil and Grease 413.1 <input type="checkbox"/> 413.2 <input type="checkbox"/>	TPH EPA 418.1/SM503E	EPA 801/8010	EPA 824/8240	EPA 825/8270	TCLP Metals <input type="checkbox"/> VOA <input type="checkbox"/> VOA <input type="checkbox"/>	Semi Metals <input type="checkbox"/> VOA <input type="checkbox"/> VOA <input type="checkbox"/>	CAM Metals EPA 8010/7000 TTLC <input type="checkbox"/> STL <input type="checkbox"/>	Lead Org./DHS <input type="checkbox"/> Lead EPA 7420/7421 <input type="checkbox"/>	
			Soil	Water	Other	Ice	Acid															
✓ MW-1	1	3		X		X	HCl	6/10/97	13:35		X											
✓ MW-2	2	↓		↓		↓	↓	↓	↓		↓											
✓ MW-3	3	↓		↓		↓	↓	↓	↓		↓											
✓ MW-4	4	↓		↓		↓	↓	↓	↓		↓											

Condition of sample:

Temperature received:

Relinquished by sampler Don Waterman

Date 6/10/97 Time 15:20

Received by Kussy Feleonas

Relinquished by Kussy Feleonas

Date 6/11/97 Time 9:30

Received by Steve Tan

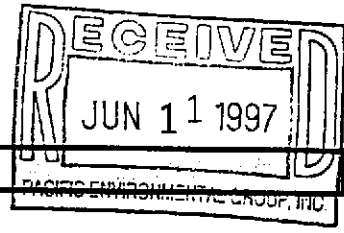
Relinquished by Steve Tan

Date

Received by laboratory

Date 06-11-97

Time 11:35



FIELD SERVICES / O & M REQUEST

SITE INFORMATION FORM

Project #:330-107.2K 1st time visit

Station #:2162 1st 2nd 3rd 4th Date of Request: 2Q

Site Address:15135 Hesperian Blvd. Monthly Ideal Field Date:

San Leandro, California Semi-Monthly

County:Alameda Weekly Budget Hrs. _____

Project Manager:Shaw Garakani One time Event Actual Hrs. 2

Requestor: David Nanstad Other. _____ Mob de Mob 2

Client:Arco Client P.O.C.:Paul Supple Purge Total 0

Prefield contacts:

Field Tasks: For General Description

Second Quarter 1997 groundwater sampling event: DTW/DTL on all wells from TOB/TOC Sample per attached protocol. Please note and repair/replace any damaged J-plugs, locks ect. Call engineer before leaving site.

WA# 21334 00

Comments, remarks, from Field Staff (include problems encountered)

Sample 4 wells, did not purge H₂O levels within 1 foot of top of screen.

Completed by: Don Waters Date: 6/10/97

Checked by: _____

FIELD DATA SHEET

WATER SAMPLE FIELD DATA SHEET

PROJECT No.: 330-107.2K LOCATION: 15135 HESPERIAN RD WELL ID #: MW-1
SAN LEANDRO
 CLIENT/STATION No.: ARW/02162 FIELD TECHNICIAN: Don Waterbaugh

WELL INFORMATION

Depth to Liquid: TOB TOC
 Depth to water: 8.65 TOB 9.45 TOC
 Total depth: 16' TOB TOC
 Date: 6/10/97 Time (2400): 13:16

CASING GAL/ DIAMETER LINEAR FT.
 2 0.17
 3 0.38
 4 0.66
 4.5 0.83
 5 1.02
 6 1.5
 8 2.6

SAMPLE TYPE
 Groundwater
 Duplicate
 Extraction well
 Trip blank
 Field blank
 Equipment blank
 Other;

Probe Type and I.D. #
 Oil/Water interface
 Electronic indicator 31
 Other;

TD - DTW = Gal/Linear x Foot 0.66 = Number of x Casings 3 = Calculated Purge

DATE PURGED: NA START: NA END (2400 hr): PURGED BY:
 DATE SAMPLED: 6/10/97 START: 13:35 END (2400 hr): 13:35 SAMPLED BY: Don

TIME (2400 hr)	VOLUME (gal.)	pH (units)	E.C. (umhos/cm @ 25°C)	TEMPERATURE (°F)	COLOR	TURBIDITY	ODOR
<u>13:35</u>	<u>NA</u>	<u>7.68</u>	<u>800</u>	<u>82.0</u>	<u>Clear</u>	<u>trace</u>	<u>None</u>

Pumped dry Yes / No

FIELD MEASUREMENTS AT TIME OF SAMPLE, AFTER RECHARGE:

DTW: TOB/TOC

PURGING EQUIPMENT/I.D. #

Bailer: NA Airlift Pump:
 Centrifugal Pump: Dedicated:
 Other:

SAMPLING EQUIPMENT/I.D. #

Bailer: 31-1
 Dedicated:
 Other:

SAMP. CNTRL #	DATE	TIME (2400)	No. of Cont.	SIZE	CONTAINER	PRESERVE	ANALYTICAL PARAMETER
<u>MW-1</u>	<u>6/10/97</u>	<u>13:35</u>	<u>3</u>	<u>40ml</u>	<u>VOA</u>	<u>HCL</u>	<u>TPH_g/BTEX/mtc</u>

REMARKS:

SIGNATURE: Don Waterbaugh

WATER SAMPLE FIELD DATA SHEET

PROJECT No.: 330-107.2K LOCATION: 15135 HESPERIAN RD WELL ID #: MMW-2
 CLIENT/STATION No.: ARCO/02162 FIELD TECHNICIAN: SAN LEANDRO DON WATERPAUGH

WELL INFORMATION

Depth to Liquid: TOB TOC
 Depth to water: 7.15 TOB 7.52 TOC
 Total depth: 18 TOB TOC
 Date: 6/10/97 Time (2400): 13:14

Probe Type and I.D. #
 Oil/Water interface
 Electronic indicator 31
 Other;

CASING GAL/LINEAR FT.
 DIAMETER
 2 0.17
 3 0.38
 4 0.66
 4.5 0.83
 5 1.02
 6 1.5
 8 2.6

SAMPLE TYPE
 Groundwater
 Duplicate
 Extraction well
 Trip blank
 Field blank
 Equipment blank
 Other;

TD - DTW = Gal/Linear x Foot 0.66 = Number of x Casings 3 = Calculated Purge

DATE PURGED: NA START: NA END (2400 hr): PURGED BY:
 DATE SAMPLED: 6/10/97 START: 13:50 END (2400 hr): 13:50 SAMPLED BY: DW

TIME (2400 hr)	VOLUME (gal.)	pH (units)	E.C. (umhos/cm @ 25°C)	TEMPERATURE (°F)	COLOR	TURBIDITY	ODOR
<u>13:50</u>	<u>NA</u>	<u>6.96</u>	<u>630</u>	<u>77.2</u>	<u>Clear</u>	<u>Trace</u>	<u>None</u>

Pumped dry Yes / No
 FIELD MEASUREMENTS AT TIME OF SAMPLE, AFTER RECHARGE:
 DTW: TOB/TOC

PURGING EQUIPMENT/I.D. #
 Bailer: Airlift Pump:
 Centrifugal Pump: NA Dedicated:
 Other:

SAMPLING EQUIPMENT/I.D. #
 Bailer: 31-2
 Dedicated:
 Other:

SAMP. CNTRL #	DATE	TIME (2400)	No. of Cont.	SIZE	CONTAINER	PRESERVE	ANALYTICAL PARAMETER
<u>MMW-2</u>	<u>6/10/97</u>	<u>13:50</u>	<u>3</u>	<u>40ml</u>	<u>VOA</u>	<u>HCL</u>	<u>TPH₉/BTEX, Mta</u>

REMARKS:

SIGNATURE: Don Waterpaugh



FIELD DATA SHEET

WATER SAMPLE FIELD DATA SHEET

PROJECT No.: 330-1072K LOCATION: 15135 HESPERIAN RD WELL ID #: MW-3
SAN LEANDRO
 CLIENT/STATION No.: ARW/02162 FIELD TECHNICIAN: DON WATENPAUQU

WELL INFORMATION

Depth to Liquid: TOB TOC
 Depth to water: 8.15 TOB 7.97 TOC
 Total depth: 15 TOB TOC
 Date: 6/10/99 Time (2400): 13:21

Probe Type and I.D. #
 Oil/Water interface
 Electronic indicator 31
 Other:

CASING DIAMETER GAL/LINEAR FT.
 2 0.17
 3 0.38
 4 0.66
 4.5 0.83
 5 1.02
 6 1.5
 8 2.6

SAMPLE TYPE
 Groundwater
 Duplicate
 Extraction well
 Trip blank
 Field blank
 Equipment blank
 Other:

TD - DTW = Gal/Linear 0.66 x Foot = Number of 3 Casings = Calculated Purge

DATE PURGED: NA START: NA END (2400 hr): PURGED BY:
 DATE SAMPLED: 6/10/99 START: 13:45 END (2400 hr): 13:45 SAMPLED BY: DW

TIME (2400 hr)	VOLUME (gal.)	pH (units)	E.C. (umhos/cm @ 25°C)	TEMPERATURE (°F)	COLOR	TURBIDITY	ODOR
13:45	NA	6.95	690	81.0	Clear	Trace	None

Pumped dry Yes / No

FIELD MEASUREMENTS AT TIME OF SAMPLE, AFTER RECHARGE:

DTW: TOB/TOC

PURGING EQUIPMENT/I.D. #

Bailer: NA Airlift Pump:
 Centrifugal Pump: NA Dedicated:
 Other:

SAMPLING EQUIPMENT/I.D. #

Bailer: 31-3
 Dedicated:
 Other:

SAMP. CNTRL #	DATE	TIME (2400)	No. of Cont.	SIZE	CONTAINER	PRESERVE	ANALYTICAL PARAMETER
MW-3	6/10/99	13:45	3	40ml	VOA	HCL	TPH _g /BTEX _{mtg}

REMARKS:

SIGNATURE: Don Watenpaug

FIELD DATA SHEET

WATER SAMPLE FIELD DATA SHEET

PROJECT No.: 330-1072K LOCATION: 15135 HESPERIAN RD WELL ID #: MW-4
 CLIENT/STATION No.: ARCO/02162 FIELD TECHNICIAN: SAN LEANDRO Don Waterman

WELL INFORMATION

Depth to Liquid: --- TOB --- TOC ---
 Depth to water: 9.36 TOB 9.00 TOC ---
 Total depth: 18 TOB --- TOC ---
 Date: 6/10/97 Time (2400): 13:19

Probe Type and I.D. #
 Oil/Water interface
 Electronic indicator 31
 Other: ---

CASING DIAMETER GAL/ LINEAR FT.
 2 --- 0.17
 3 --- 0.38
 4 --- 0.66
 4.5 --- 0.83
 5 --- 1.02
 6 --- 1.5
 8 --- 2.6

SAMPLE TYPE
 Groundwater
 Duplicate
 Extraction well
 Trip blank
 Field blank
 Equipment blank
 Other: ---

TD --- - DTW --- = --- Gal/Linear Foot 0.66 = --- x Casings 3 = Calculated Purge

DATE PURGED: NA START: NA END (2400 hr): --- PURGED BY: ---
 DATE SAMPLED: 6/10/97 START: 14:00 END (2400 hr): 14:00 SAMPLED BY: Don

TIME (2400 hr)	VOLUME (gal.)	pH (units)	E.C. (umhos/cm @ 25°C)	TEMPERATURE (°F)	COLOR	TURBIDITY	ODOR
<u>14:00</u>	<u>NA</u>	<u>6.92</u>	<u>680</u>	<u>78.1</u>	<u>Clear</u>	<u>Trace</u>	<u>None</u>

Pumped dry Yes / No

FIELD MEASUREMENTS AT TIME OF SAMPLE, AFTER RECHARGE:

DTW: --- TOB/TOC ---

PURGING EQUIPMENT/I.D. #

Bailer: NA Airlift Pump: ---
 Centrifugal Pump: --- Dedicated: ---
 Other: ---

SAMPLING EQUIPMENT/I.D. #

Bailer: 31-4
 Dedicated: ---
 Other: ---

Cobalt 0-100
 Clear
 Cloudy
 Yellow
 Brown
 NTU 0-200
 Heavy
 Moderate
 Light
 Trace
 Strong
 Moderate
 Faint
 None

SAMP. CNTRL #	DATE	TIME (2400)	No. of Cont.	SIZE	CONTAINER	PRESERVE	ANALYTICAL PARAMETER
<u>MW-4</u>	<u>6/10/97</u>	<u>14:00</u>	<u>3</u>	<u>40ml</u>	<u>VOA</u>	<u>HCL</u>	<u>TPH, 1,3,5,7,8,10</u>

REMARKS: ---

SIGNATURE: Don Waterman

