Chevron

Chevron U.S.A. Inc.
2410 Camino Ramon, San Ramon, California • Phone (415) 842-9500
Mail Address: P.O. Box 5004, San Ramon, CA 94583-0804

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Manager, Engineering

May 3, 1990

Mr. Gil Wistar
Alameda County Environmental Health Department
80 Swan Way, Room 200
Oakland, California 94621

Re: Former Chevron Station #9-2582
Dublin, California

Dear Mr. Wistar:

Enclosed is the report documenting groundwater sampling and analysis of the three monitor wells, conducted January 25, 1990. As seen in the report, all groundwater samples had contaminant concentrations below the method detection limits for all analyzed hydrocarbon components.

As you are probably aware, vent well installation (for testing) has recently occured and the actual test will be conducted as soon as logistically possible. Soil samples were taken from the borings during vent well installation and are being analyzed. That data will be included in the vent test results. Based on data derived from the test, a vapor extraction system will be designed and installed.

If you have any questions or require additional information, please contact Robert Foss at (415) 842-9594.

Sincerely,

D. MOLLER

By *Robert Foss*
Robert Foss
Environmental Engineer

Enclosure

cc: Mr. Lester Feldman
California Regional Water Quality Control Board
San Francisco Bay Region
1800 Harrison Street, Suite 700
Oakland, California 94607

WESTERN GEOLOGIC RESOURCES, INC.

2169 E. FRANCISCO BOULEVARD, SUITE B
SAN RAFAEL, CALIFORNIA 94901
415/457-7595 FAX: 415/457-8521

23 April 1990

Robert Foss
Chevron USA
2410 Camino Ramon
San Ramon, California 94583-0804

Re: Quarterly Groundwater Monitoring
Sampled January 1990
Chevron Service Station #92582
Dublin, California
WGR Project #1-124.06

Dear Mr. Foss:

This letter report presents the results of the quarterly groundwater monitoring performed by Western Geologic Resources, Inc. (WGR) at the Chevron Service Station #92582, located at 7420 Dublin Boulevard in Dublin, California (Figures 1 and 2).

GROUNDWATER SAMPLING

On 25 January 1990, WGR staff measured depth-to-water and purged monitor wells EA-1 through EA-3 with the dedicated sampling systems. At least three well-casing volumes of groundwater were evacuated from each monitor well prior to sampling. All groundwater samples were collected according to the WGR standard operating procedure for groundwater sampling included as Attachment A. Depth-to-water measurements and sampling field reports are included as Attachment B.

All purged water was contained in 55-gallon drums and temporarily stored on-site pending analytic results. The groundwater samples and a laboratory-supplied travel blank, consisting of deionized water, were shipped under chain-of-custody to Superior Analytical Laboratory, Inc. (SAL) of San Francisco, California.

GROUNDWATER FLOW

Figure 3 shows the potentiometric surface of shallow groundwater, based on depth-to-water measurements taken on 25 January 1990. Groundwater-elevation data are presented in Table 1.

KLD APR 27 '90

Hydrographs showing groundwater elevations over time are included as Attachment C. Estimated groundwater flow for 25 January 1990 was to the northwest at a gradient of about 0.7%.

ANALYTIC RESULTS

Groundwater samples from monitor wells EA-1 through EA-3 were analyzed for total petroleum hydrocarbons (TPH), aromatic hydrocarbons including benzene, toluene, ethylbenzene and total xylenes (BTEX) and halocarbons by EPA Methods 8015, 8020 and 8010, respectively. Analytic results for past sampling events and this round of sampling are presented in Table 2. The chain-of-custody form, laboratory reports with quality assurance/quality control (QA/QC) documents are included as Attachments D and E, respectively.

COMMENTS

TPH, BTEX and halocarbons were not detected in groundwater samples from any of the monitor wells. The estimated direction of groundwater flow has remained in a northwest direction since the last sampling event in November 1989.

WGR is pleased to provide geologic and environmental consulting services for Chevron and we trust that this report meets your needs. Please call us at (415) 457-7595 if you have any questions.

Sincerely,
Western Geologic Resources, Inc.

Julie A. Noffke
Staff Geologist

Thomas M. Howard
Project Geologist

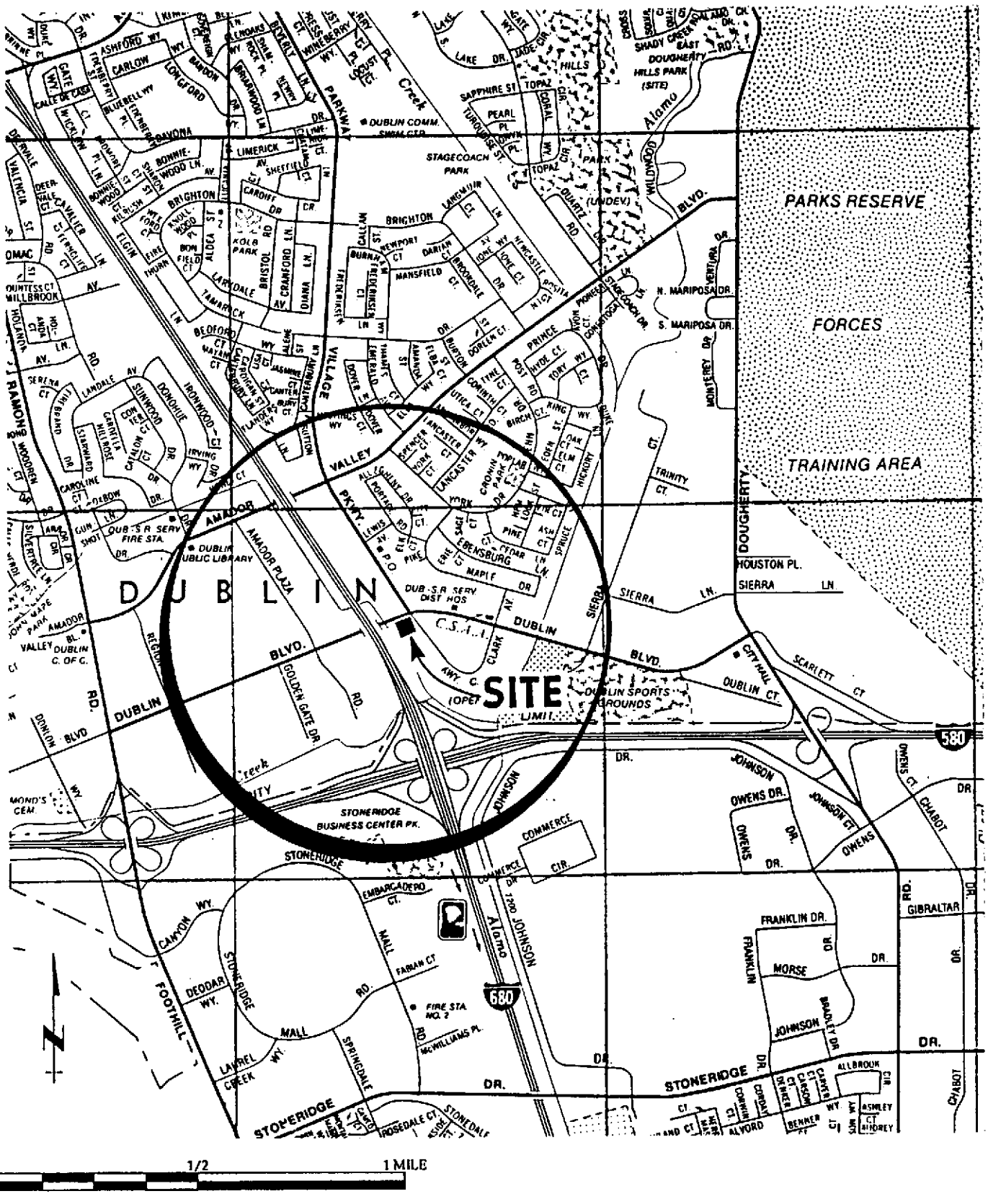
JAN/TMH:vw

124L2MR0.WP

FIGURES

TABLES

ATTACHMENTS

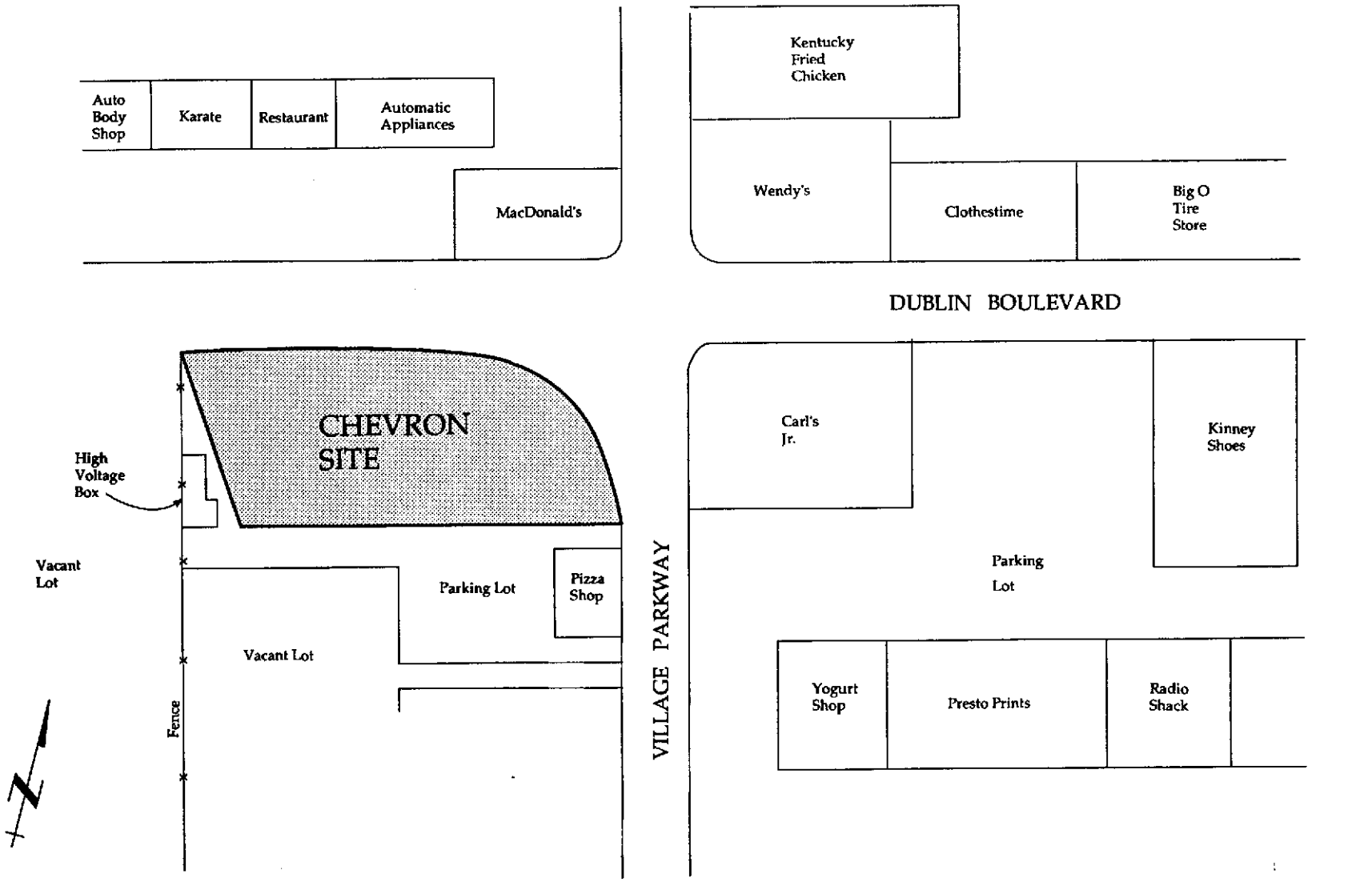


Site Location Map
Chevron Service Station #92582
Dublin, California

FIGURE
1

WESTERN GEOLOGIC RESOURCES, INC.

1-124.06



LEGEND

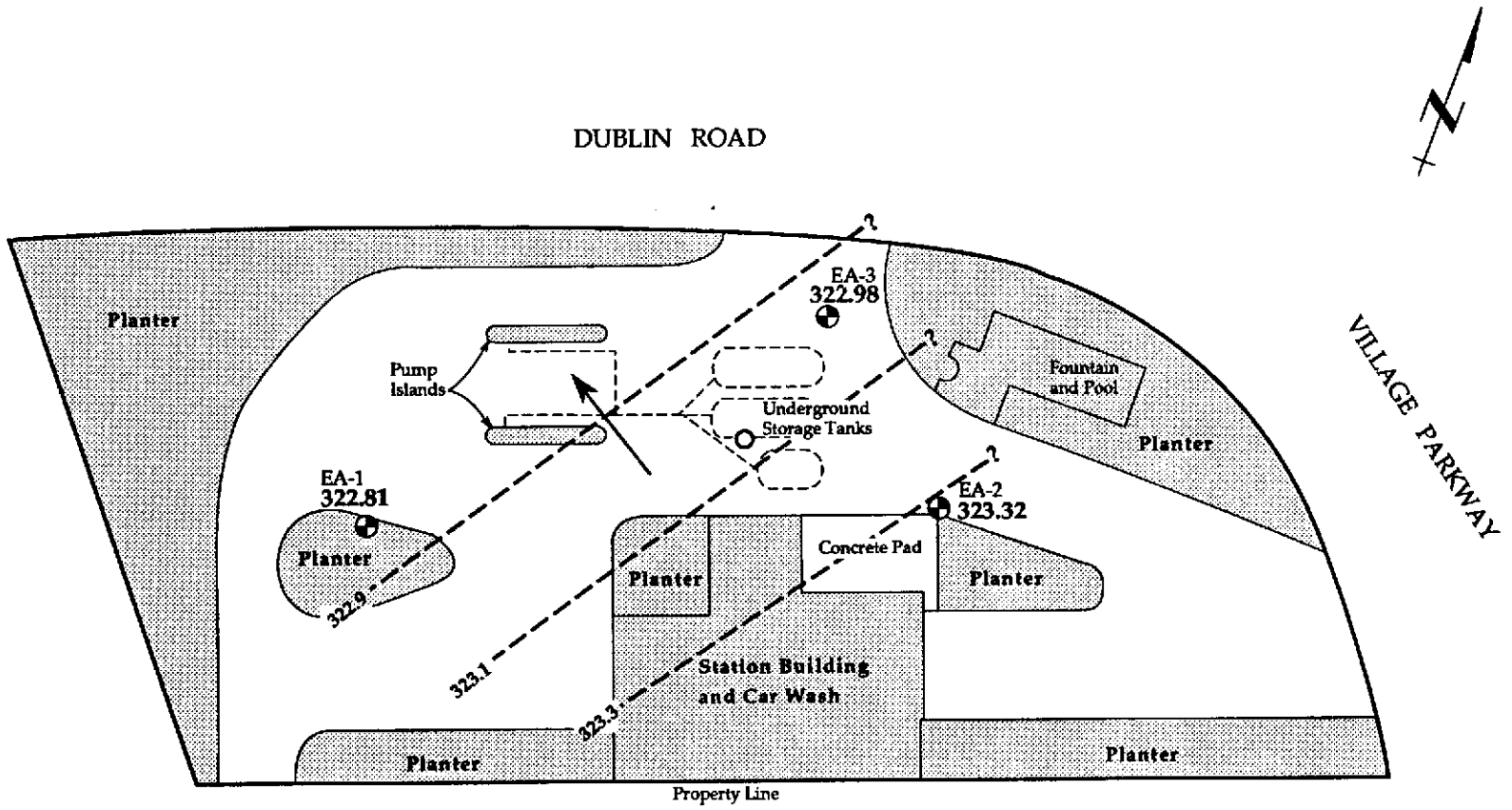
NOT TO SCALE

Vicinity Map
Chevron Service Station #92582, Dublin, California

FIGURE
2

WESTERN GEOLOGIC RESOURCES, INC.

1-124.06



LEGEND

EA-1 322.81	Groundwater Monitor Well and Groundwater Elevation, feet above mean sea level
O	10" Diameter PVC Casing
323.1 ---?	Groundwater Elevation Contour, feet above mean sea level, dashed where inferred, queried where uncertain
→	Groundwater Flow Direction

Potentiometric Surface of Shallow Groundwater
25 January 1990, Chevron Service Station #92582
Dublin, California

FIGURE
3

WESTERN GEOLOGIC RESOURCES, INC.

1-124.06

TABLE 1. Groundwater Elevation Data
Chevron Service Station #92582
Dublin, California
WGR Project #1-124.06

Well ID #	Date	DTW	TOC	Elev-W
		<----------ft---------->		
EA-1	24 Oct 88 *	10.64	333.41	322.77
EA-1	2 Nov 88 *	10.69	333.41	322.72
EA-1	20 Dec 88 *	10.51	333.41	322.90
EA-1	28 Mar 89 *	9.87	333.41	323.54
EA-1	2 Aug 89	10.34	333.41	323.07
EA-1	6 Nov 89	10.65	333.41	322.76
EA-1	25 Jan 90	10.60	333.41	322.81
EA-2	24 Oct 88 *	9.70	332.59	322.89
EA-2	2 Nov 88 *	10.03	332.59	322.56
EA-2	20 Dec 88 *	9.98	332.59	322.61
EA-2	28 Mar 89 *	8.80	332.59	323.79
EA-2	2 Aug 89	9.44	332.59	323.15
EA-2	6 Nov 89	9.53	323.59	323.06
EA-2	25 Jan 90	9.27	323.59	323.32
EA-3	24 Oct 88 *	11.03	333.64	322.61
EA-3	2 Nov 88 *	11.03	333.64	322.61
EA-3	20 Dec 88 *	10.96	333.64	322.68
EA-3	28 Mar 89 *	9.77	333.64	322.87
EA-3	2 Aug 89	10.65	333.64	322.99
EA-3	6 Nov 89	10.78	333.64	322.86
EA-3	25 Jan 90	10.66	333.64	322.98
PVC	2 Aug 89	9.83	---	---
PVC	6 Nov 89	---	---	---
PVC	25 Jan 90	---	---	---

NOTES:

DTW = Depth-to-Water
TOC = Top-of-Casing Elevation
* = Data obtained by EA Engineering, Science and Technology, Inc.
Elev-W = Elevation of Water
PVC = 10" PVC Casing
--- = Not Measured

TABLE 2. Analytic Results: Groundwater
Chevron Station #92582
Dublin, California
WGR Project #1-124.06

Well ID #	Date	Lab	EPA Method	FC	TPPH/TPH	B	T	E	X	1,2-DCA
					<----------ppb---------->					
EA-1	17 Oct 88 *	NA	NA	---	<50.0	<0.5	<0.5	<0.5	<0.5	---
EA-1	20 Dec 88 *	PL	8015/8020	---	<50.0	<0.5	<0.5	<0.5	<0.5	---
EA-1	28 Mar 89 *	PL	8015/8020	---	<250	<0.5	<0.5	<0.5	<0.5	---
EA-1	2 Aug 89	CCAS	8260	---	<50.0	<0.1	<0.1	<0.1	<0.1	<0.1
EA-1	6 Nov 89	SAL	8015/8240	---	<500	<3.0	<5.0	<5.0	<5.0	<5.0
EA-1	25 Jan 90	SAL	8015/8020	---	<50	<0.5	<0.5	<0.5	<0.5	<0.5[1]
EA-2	17 Oct 88 *	NA	NA	---	<50.0	<0.5	<0.5	<0.5	1.2	---
EA-2	20 Dec 88 *	PL	8015/8020	---	<50.0	<0.5	<0.5	<0.5	<0.5	---
EA-2	28 Mar 89 *	PL	8015/8020	---	<250	<2.0	<0.5	<0.5	<0.5	---
EA-2	2 Aug 89	CCAS	8260	---	<50.0	<0.1	<0.1	<0.1	<0.1	<0.1
EA-2	6 Nov 89	SAL	8015/8240	---	<500	<3.0	<5.0	<5.0	<5.0	<5.0
EA-2	25 Jan 90	SAL	8015/8020	---	<50	<0.5	<0.5	<0.5	<0.5	<0.5[1]
EA-3	17 Oct 88 *	NA	NA	---	<50.0	1.8	<0.5	<0.5	3.0	---
EA-3	20 Dec 88 *	PL	8015/8020	Gas	240	90.0	1.2	13.0	3.3	---
EA-3	28 Mar 89 *	PL	8015/8020	Gas	2,300	380.0	130.0	240.0	910.0	---
EA-3	2 Aug 89	CCAS	8260	---	<50.0	<0.1	<0.1	<0.1	<0.1	<0.1
EA-3	6 Nov 89	SAL	8015/8240	---	<500	<3.0	<5.0	<5.0	<5.0	<5.0
EA-3	25 Jan 90	SAL	8015/8020	---	<50	<0.5	<0.5	<0.5	<0.5	<0.5[1]
PVC	2 Aug 89	CCAS	8260	Gas	100,000	8,700	14,000	1,700	17,000	50
PVC-D	2 Aug 89	CCAS	8260	Gas	110,000	9,200	14,000	1,800	13,000	50
PVC	6 Nov 89	---	---	---	---	---	---	---	---	---
PVC	25 Jan 90	---	---	---	---	---	---	---	---	---
EB	28 Mar 89 *	PL	8015/8020	---	<250.0	<0.5	<0.5	<0.5	<0.5	---
TB	28 Jul 89	CCAS	8260	---	<50.0	<0.1	<0.1	<0.1	<0.1	<0.1
TB	6 Nov 89	SAL	8015/8240	---	<500	<3.0	<5.0	<5.0	<5.0	<5.0
TB	25 Jan 90	SAL	8015/8020	---	<50	<0.5	<0.5	<0.5	<0.5	NA

TABLE 2. Analytic Results: Groundwater (continued)
Chevron Station #92582
Dublin, California
WGR Project #1-124.06

NOTES:

FC = Fuel Characterization
TPPH = Total Purgeable Petroleum Hydrocarbons
TPH = Total Petroleum Hydrocarbons
B = Benzene
T = Toluene
E = Ethylbenzene
X = Total Xylenes
1,2-DCA = 1,2-Dichloroethane
ppb = parts-per-billion
PL = Pace Laboratories, Inc.
CCAS = Central Coast Analytical Services
SAL = Superior Analytical Laboratory
* = Sample collected by EA Engineering, Science and Technology, Inc.
D = Duplicate analysis
PVC = 10" PVC casing
EB = Equipment Blank
TB = Travel Blank
Gas = Gasoline
NA = Not Available
--- = Not analyzed/Not Applicable
1 = Analyzed by EPA Method 8010

ATTACHMENT A

SOP-4: GROUNDWATER PURGING AND SAMPLING

STANDARD OPERATING PROCEDURES
RE: GROUNDWATER PURGING AND SAMPLING
SOP-4

Prior to water sampling, each well is purged by evacuating a minimum of three well-casing volumes of groundwater or until the discharge water temperature, conductivity, and pH stabilize. The groundwater sample should be taken when the water level in the well recovers to 80% of its static level.

The sampling equipment used consists of either a teflon bailer or a stainless steel bladder pump with a teflon bladder. If the sampling system is dedicated to the well, then the bailer is made of teflon, but the bladder pump is PVC with a polypropylene bladder. Forty milliliter (ml) glass volatile-organic-analysis (VOA) vials, with teflon septa, are used as sample containers.

The groundwater sample is decanted into each VOA vial in such a manner that there is a meniscus at the top of the vial. The cap is quickly placed over the top of the vial and securely tightened. The VOA vial is then inverted and tapped to see if air bubbles are present. If none are present, the sample is labeled and refrigerated for delivery under chain-of-custody to the laboratory. Label information should include a sample identification number, job identification number, date, time, type of analysis requested, and the sampler's name.

For quality control purposes, a duplicate water sample is collected from each well. This sample is put on hold at the laboratory. A trip blank is prepared at the laboratory and placed in the transport cooler. It remains with the cooler and is analyzed by the laboratory along with the groundwater samples. A field blank is prepared in the field when sampling equipment is not dedicated. The field blank is prepared after a pump or bailer has been steam-cleaned, prior to use in a second well, and is analyzed along with the other samples. The field blank demonstrates the quality of in-field cleaning procedures to prevent cross-contamination.

To minimize the potential for cross-contamination between wells, all the well-development and water-sampling equipment that is not dedicated to a well is steam-cleaned between each well. As a second precautionary measure, wells will be sampled in order of least to highest concentrations as established by previous analyses.

ATTACHMENT B

FIELD FORMS

LIQUID-LEVEL DATA SHEET

Job [illegible] Date [illegible]/90
Job # [illegible] Initials JL FF

WELL	HISTORIC DATA/ DATE: DTW	DTLH	LHT	CURRENT DATA DTW	DTLH	SOUNDED DEPTH ~~LHT~~	METHOD WLP, PB or IP*	TIME	COMMENTS
~~MW-T~~									
~~7~~									
~~8~~									
EA-1				10.60		37.72		938	SOFT BOTTOM
EA-2				9.27		38.33		949	VERY SOFT BOTTOM
EA-3				10.66		33.84		955	

PAGE ______ OF ______

* WLP = Water-Level Probe
PB = Product Bailer
IP = Interface Probe

MEASUREMENTS FROM TOC.

WGR

WATER SAMPLING DATA Well Name EA1 Date 1/25/90 Time 10:02
Job Name Dublin Job Number 1-124.06 Initials JK
WELL DATA: Well type M (M=monitoring well; Describe _____)
Depth to Water 10.60 ft.
Well Depth 37.5 ft. (spec.)
Well Diameter 4 in.

Sounded Depth 37.72 ft.
Date 1/25/90 Time 9:38

EVACUATION: Sampling Equipment:
PVC Bailer: _____ in. Dedicated: Bladder Pump ✓ ;Bailer —
Sampling Port:Number — Rate — gpm. Volume — gal.
Other —
Initial Height of Water in Casing 27.12 ft; Volume 17.7 gal.
Volume To Be Evacuated = 53.1 gal. (initial volume x3 ✓, x4 —)

	Evacuated	Evacuated	Evacuated
Time: Stop	11:21		
Start	10:16		
Total minutes	65		
Amount Evacuated			
Total Evacuated	54 gal.		
Evacuation Rate	.83 gpm.		

Formulas / Conversions
r = well radius in ft
h = ht of water col in ft
vol. of cyl. = $\pi r^2 h$
7.48 gal/ft³
2" casing = 0.163 gal/ft
3" casing = 0.367 gal/ft
4" casing = 0.653 gal/ft
5.3" casing = 0.826 gal/ft
6" casing = 1.47 gal/ft
8" casing = 2.61 gal/ft

Depth to water during pumping 13.01 ft. 10.57 time
Pumped dry? NO After — gal. Recovery rate —
Depth to water for 80% recovery — ft.

CHEMICAL DATA: Temp. Probe # — Ph Probe # — Cond. Probe # —

Time		Temp.	Ph	Cond.
	1			umhos
	2			
	3			
	4			

SAMPLING: Point of collection: PE Hose ✓; End of bailer —; Other —
Samples taken 11:24 time Depth to water 12.68 ft. Refrigerated: yes
Sample description: Water color clear Odor no
Sediment/Foreign matter no

Sample ID no.		Container VOA / other	Preservative $NaHSO_4$/Azide/other	Analysis	Lab
01250-01A	40 ml		HCl	EPA 602/8015	SAL
B	ml		↓	↓	↓
C	ml		NONE	EPA 601	
D	ml		↓	↓	
	ml				
	ml				
	ml				
	ml				

Container codes: P = plastic bottle; C or B = clear/brown glass; Describe

COMMENTS: USED S. DEPTH FOR EVAC QUANTITY

11

WGR

WATER SAMPLING DATA Well Name BA 2 Date 1/25/90 Time 10:05
Job Name Dublin Job Number 1-124.06 Initials JC
WELL DATA: Well type M (M=monitoring well; Describe —)
Depth to Water 9.27 ft.
Well Depth 37.6 ft. (spec.)
Well Diameter 4 in.

Sounded Depth 28.33 ft.
Date 1/25/90 Time 9:49

EVACUATION: Sampling Equipment:
PVC Bailer: — in. Dedicated: Bladder Pump ✓ ;Bailer —
Sampling Port:Number — Rate — gpm. Volume — gal.
Other —
Initial Height of Water in Casing 28.06 ft; Volume 18.4 gal.
Volume To Be Evacuated = 56.9 gal. (initial volume x3 ✓, x4 —)

	Evacuated	Evacuated	Evacuated
Time: Stop	1235		
Start	1041		
Total minutes			
Amount Evacuated			
Total Evacuated	57 gal.		
Evacuation Rate	gpm.		

Formulas / Conversions
r = well radius in ft
h = ht of water col in ft
vol. of col. = $\pi r^2 h$
7.48 gal/ft³
¾" casing = 0.163 gal/ft
2" casing = 0.367 gal/ft
4" casing = 0.653 gal/ft
5.8" casing = 0.826 gal/ft
6" casing = 1.47 gal/ft
8" casing = 2.61 gal/ft

Depth to water during pumping 14.75 ft. 12:17 time
Pumped dry? NO After — gal. Recovery rate —
Depth to water for 80% recovery — ft.

CHEMICAL DATA: Temp. Probe # — Ph Probe # — Cond. Probe # —

Time		°C		umhos
1				
2				
3				
4				

SAMPLING: Point of collection: PE Hose ✓ ; End of bailer — ; Other —
Samples taken 1239 time Depth to water 11.85 ft. Refrigerated: yes
Sample description: Water color clear Odor no
Sediment/Foreign matter no

Sample ID no.			Container (VOA) / other	Preservative NaHSO₄/Azide/other	Analysis	Lab
01250-02A	40	ml		HCl	EPA 602/8015	SAL
B		ml		↓	↓	↓
C		ml		None	EPA 601	
D		ml		↓	↓	
		ml				
		ml				
		ml				
		ml				

Container codes: P = plastic bottle; C or B = clear/brown glass; Describe

COMMENTS: ✱ USED SOUNDED DEPTH FOR EVAC QUANTITY

28 x 7 = 36 − 6 = 30 ; 53 + 6 = 59

EA-3

WGR

WATER SAMPLING DATA Well Name ~~MW-3~~ MPF Date 1-25-90 Time 10:05
Job Name DUBLIN Job Number 1-124.06 Initials MPF
WELL DATA: Well type M (M=monitoring well; Describe _____)
Depth to Water 10.66 ft.
Well Depth 33.5 ft. (spec.)
Well Diameter 4 in.

Sounded Depth 33.84 ft.
Date 1-25-90 Time 455

* see below

EVACUATION: Sampling Equipment:
PVC Bailer: _____ in. Dedicated: Bladder Pump ✓ ;Bailer _____
Sampling Port:Number _____ Rate _____ gpm. Volume _____ gal.
Other _____
Initial Height of Water in Casing 23.18 ft; Volume 15.13 gal.
Volume To Be Evacuated = 45.4 gal. (initial volume x3 ✓, x4 _____)

HH

	Evacuated	Evacuated	Evacuated
Time: Stop	1124		
Start	1036		
Total minutes	48		
Amount Evacuated			
Total Evacuated	46 gal.		
Evacuation Rate	.95 gpm.		

Formulas / Conversions
r = well radius in ft
h = ht of water col in ft
vol. of col. = $\pi r^2 h$
7.48 gal/ft³
2" casing = 0.163 gal/ft
3" casing = 0.367 gal/ft
4" casing = 0.653 gal/ft
4.5" casing = 0.826 gal/ft
6" casing = 1.47 gal/ft
8" casing = 2.61 gal/ft

Depth to water during pumping 15.33 ft. 1106 time MPF ~~2 gal~~ 30 gal.
Pumped dry? NO After _____ gal. Recovery rate _____
Depth to water for 80% recovery _____ ft.

CHEMICAL DATA: Temp. Probe # ____ Ph Probe # ____ Cond.Probe # ____

SAMPLING: Point of collection: PE Hose ✓; End of bailer ___; Other _____.
Samples taken 1124 time Depth to water 15.38 ft. Refrigerated: ✓
Sample description: Water color CLEAR Odor —
Sediment/Foreign matter —

Sample ID no.			Container (VOA) / other	Preservative $NaHSO_4$/Azide/other	Analysis	Lab
01250-03A	40	ml		HCl	EPA 602/8015	SWFEN
B		ml		↓	↓	
C		ml		NONE	EPA 601	
D		ml		↓	↓	
		ml				
		ml				
		ml				
		ml				

Container codes: P = plastic bottle; C or B = clear/brown glass; Describe

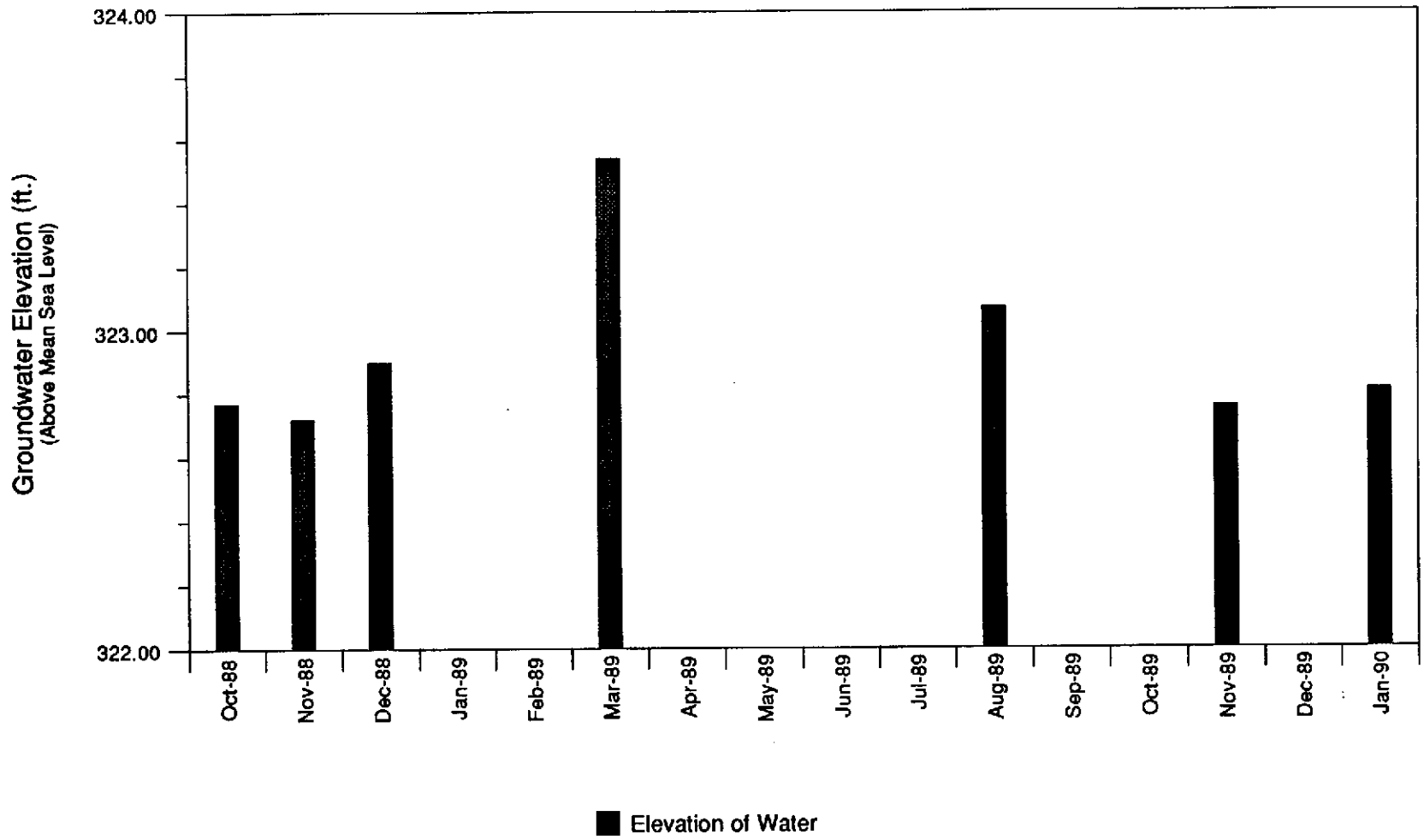
COMMENTS: * USED SOUNDED DEPTHS FOR EVAC QUANTITY - LARGER THAN SPEC DEPTH

ATTACHMENT C

HYDROGRAPHS

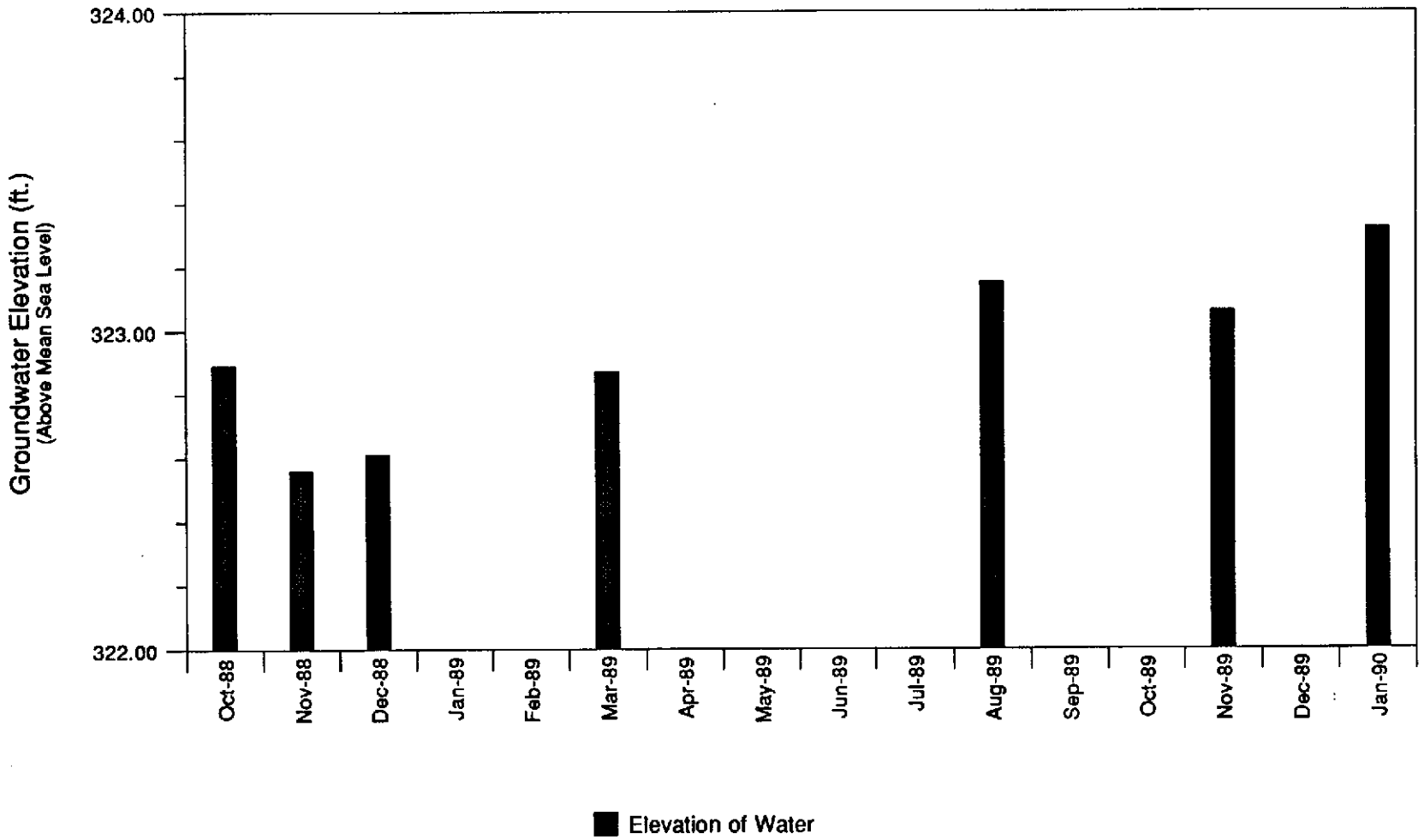
GROUNDWATER MONITOR WELL EA-1

Chevron Service Station #92582 Dublin, California



GROUNDWATER MONITOR WELL EA-2

Chevron Service Station #92582 Dublin, California

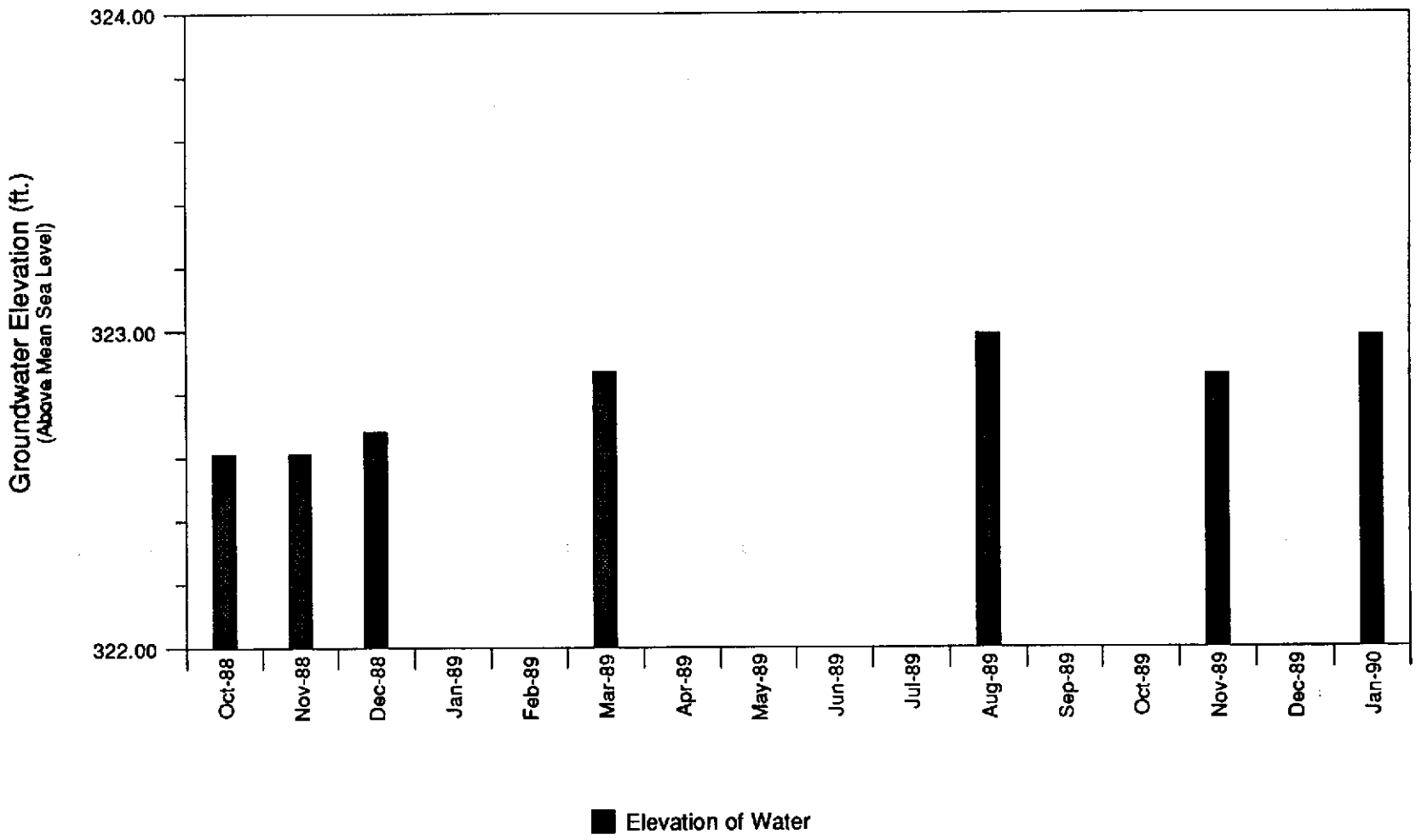


WGR #1-124.06

WESTERN GEOLOGIC RESOURCES, INC.

GROUNDWATER MONITOR WELL EA-3

Chevron Service Station #92582 Dublin, California



WGR #1-124.06

WESTERN GEOLOGIC RESOURCES, INC.

ATTACHMENT D

CHAIN-OF-CUSTODY FORM

10440 9 H

Chain-of-Custody Record

Chevron U.S.A. Inc.
P.O. Box 5004
San Ramon, CA 94583
FAX (415) 842-9591

Chevron Facility Number 9252
Consultant Release Number
Consultant Project Number 1-124.06
Consultant Name WGR Inc
Address Fairway Blvd, San Rafael CA
Fax Number
Project Contact (Name) Lee Otis
(Phone) 457-7555

Chevron Contact (Name) Bob Foss
(Phone) 842-9594
Laboratory Name STL
Contract Number 2612800
Samples Collected by (Name) J Krebs, M Frye
Collection Date 1-25-90
Signature

	Sample Number	Lab Number	Number of Containers	Matrix S = Soil W = Water A = Air C = Charcoal	Type G = Grab C = Composite	Time	Sample Preservation	Iced	Analyses To Be Performed: Modified EPA 8015 Total Petro. Hydrocarb. as Gasoline	Modified EPA 8015 Total Petro. Hydrocarb. as Gasoline + Diesel	503 Oil and Grease	Arom. Volatiles - BTXE Soil: 8020/Wtr.: 602	Arom. Volatiles - BTXE Soil: 8240/Wtr.: 624	Total Lead DHS-Luft	EDB DHS-AB 1803	EPA 601			Remarks
1	01252-01A	C,D	4	W		11:24	Soil	YES											A,B sample for EPA 602/8015 HCl preserved
2	-02A	B,C,D				12:39	Ice only												
3	-03A	B,C,D				11:24													C,D samples for EPA 601 Ice preserved
4	TB	A,B	2				HCl												

Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time
	WGR	1/25/90 1400			
Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time
Relinquished By (Signature)	Organization	Date/Time	Received For Laboratory By (Signature)		Date/Time
					1/25/90 1400

Turn Around Time (Circle Choice)
24 Hrs
48 Hrs
5 Days
(10 Days)

ATTACHMENT E

LABORATORY REPORTS WITH QUALITY ASSURANCE/QUALITY CONTROL DOCUMENTS

SUPERIOR ANALYTICAL LABORATORY, INC.
1555 BURKE. UNIT 1 • SAN FRANCISCO. CA 94124 • PHONE (415) 647-2081

C E R T I F I C A T E O F A N A L Y S I S

LABORATORY NO.: 10440
CLIENT: Western Geologic Resources
CLIENT JOB NO.: 1-124.06

DATE RECEIVED: 01/25/90
DATE REPORTED: 02/09/90

Lab Number	Customer Sample Identification	Date Sampled	Date Analyzed
10440- 1	01250-01 A,B,C,D	01/25/90	02/03/90
10440- 2	01250-02 A,B,C,D	01/25/90	02/03/90
10440- 3	01250-03 A,B,C,D	01/25/90	02/03/90
10440- 4	01250-TB	01/25/90	02/07/90

Laboratory Number:	10440 1	10440 2	10440 3	10440 4
ANALYTE LIST	Amounts/Quantitation Limits (ug/l)			
OIL AND GREASE:	NA	NA	NA	NA
TPH/GASOLINE RANGE:	ND<50	ND<50	ND<50	ND<50
TPH/DIESEL RANGE:	NA	NA	NA	NA
BENZENE:	ND<0.5	ND<0.5	ND<0.5	ND<0.5
TOLUENE:	ND<0.5	ND<0.5	ND<0.5	ND<0.5
ETHYL BENZENE:	ND<0.5	ND<0.5	ND<0.5	ND<0.5
XYLENES:	ND<0.5	ND<0.5	ND<0.5	ND<0.5

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C E R T I F I C A T E O F A N A L Y S I S

ANALYSIS FOR TOTAL PETROLEUM HYDROCARBONS
Diesel by Modified EPA SW-846 Method 8015
Gasoline by Purge and Trap: EPA MEthod 8015/5030
ANALYSIS FOR BENZENE, TOLUENE, ETHYL BENZENE & XYLENES
by EPA SW-846 Methods 5030 and 8020

QA/QC INFORMATION
SET: 10440

NA = ANALYSIS NOT REQUESTED
ND = ANALYSIS NOT DETECTED ABOVE QUANTITATION LIMIT

ug/L = part per billion (ppb)

OIL AND GREASE ANALYSIS By Standard Methods Method 503E:
Duplicate RPD NA
Minimum Detection Limit in Water: 5000ug/L

Modified EPA Method 8015 for Extractable Hydrocarbons:
Minimum Quantitation Limit for Diesel in Water: 1000ug/L
Daily Standard run at 200mg/L; RPD Diesel = NA
MS/MSD Average Recovery = NA: Duplicate RPD = NA

8015/5030 Total Purgable Petroleum Hydrocarbons:
Minimum Quantitation Limit for Gasoline in Water: 500ug/L
Daily Standard run at 2mg/L; RPD Gasoline = <15%
MS/MSD Average Recovery = 101%: Duplicate RPD = 3%

8020/BTXE
Minimum Quantitation Limit in Water: 0.50ug/L
Daily Standard run at 20ug/L; RPD = <15%
MS/MSD Average Recovery = 97%: Duplicate RPD = <4%

Richard Srna, Ph.D.
Laboratory Director

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CERTIFICATE OF ANALYSIS

LABORATORY NO.: 10440-1
CLIENT: Western Geologic Resources
JOB NO.: 1-124.00

DATE SAMPLED: 01/25/90
DATE RECEIVED: 01/25/90
DATE ANALYZED: 02/2/90

EPA SW-846 METHOD 8010
HALOGENATED VOLATILE ORGANICS
SAMPLE: 01250-01

Compound	MDL (ug/L)	RESULTS (ug/l)
Chloromethane	0.5	ND <0.5
Bromomethane	0.5	ND <0.5
Vinyl chloride	1.0	ND <1.0
Dichlorodifluoromethane	0.5	ND <0.5
Chloroethane	0.5	ND <0.5
Methylene chloride	4.0	ND <4.0
Trichlorofluoromethane	0.5	ND <0.5
1,1-Dichloroethene	0.2	ND <0.2
1,1-Dichloroethane	0.5	ND <0.5
trans-1,2-Dichloroethene	0.5	ND <0.5
Chloroform	0.5	ND <0.5
1,2-Dichloroethane	0.5	ND <0.5
1,1,1-Trichloroethane	0.5	ND <0.5
Carbon tetrachloride	0.5	ND <0.5
Bromodichloromethane	0.5	ND <0.5
1,2-Dichloropropane	0.5	ND <0.5
cis-1,3-Dichloropropene	0.5	ND <0.5
Trichloroethylene	0.5	ND <0.5
1,1,2-Trichloroethane	0.5	ND <0.5
trans-1,3-Dichloropropene	0.5	ND <0.5
Dibromochloromethane	0.5	ND <0.5
2-Chloroethylvinyl ether	1.0	ND <1.0
Bromoform	0.5	ND <0.5
Tetrachloroethene		
1,1,2,2-Tetrachloroethane	0.5	ND <0.5
Chlorobenzene	0.5	ND <0.5
1,3-Dichlorobenzene	0.5	ND <0.5
1,2-Dichlorobenzene	0.5	ND <0.5
1,4-Dichlorobenzene	0.5	ND <0.5
1,1,2-Trichlorotrifluoroethane	0.5	ND <0.5

MDL = Method Detection Limit
ug/l = parts per billion (ppb)
QA/QC Summary: Daily Standard RPD = <15%
MS/MSD average recovery = 78%: MS/MSD RPD = < 10%

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CERTIFICATE OF ANALYSIS

LABORATORY NO.: 10440-2
CLIENT: Western Geologic Resources
JOB NO.: 1-124.06

DATE SAMPLED: 01/25/90
DATE RECEIVED: 01/25/90
DATE ANALYZED: 02/2/90

EPA SW-846 METHOD 8010
HALOGENATED VOLATILE ORGANICS
SAMPLE:01250-02

Compound	MDL (ug/L)	RESULTS (ug/l)
Chloromethane	0.5	ND <0.5
Bromomethane	0.5	ND <0.5
Vinyl chloride	1.0	ND <1.0
Dichlorodifluoromethane	0.5	ND <0.5
Chloroethane	0.5	ND <0.5
Methylene chloride	4.0	ND <4.0
Trichlorofluoromethane	0.5	ND <0.5
1,1-Dichloroethene	0.5	ND <0.5
1,1-Dichloroethane	0.5	ND <0.5
trans-1,2-Dichloroethene	0.5	ND <0.5
Chloroform	0.5	ND <0.5
1,2-Dichloroethane	0.5	ND <0.5
1,1,1-Trichloroethane	0.5	ND <0.5
Carbon tetrachloride	0.5	ND <0.5
Bromodichloromethane	0.5	ND <0.5
1,2-Dichloropropane	0.5	ND <0.5
cis-1,3-Dichloropropene	0.5	ND <0.5
Trichloroethylene	0.5	ND <0.5
1,1,2-Trichloroethane	0.5	ND <0.5
trans-1,3-Dichloropropene	0.5	ND <0.5
Dibromochloromethane	0.5	ND <0.5
2-Chloroethylvinyl ether	1.0	ND <1.0
Bromoform	0.5	ND <0.5
Tetrachloroethene	0.5	ND <0.5
1,1,2,2-Tetrachloroethane	0.5	ND <0.5
Chlorobenzene	0.5	ND <0.5
1,3-Dichlorobenzene	0.5	ND <0.5
1,2-Dichlorobenzene	0.5	ND <0.5
1,4-Dichlorobenzene	0.5	ND <0.5
1,1,2-Trichlorotrifluoroethane	0.5	ND <0.5

MDL = Method Detection Limit
ug/l = parts per billion (ppb)
QA/QC Summary: Daily Standard RPD = <15%
MS/MSD average recovery = 78%: MS/MSD RPD =< 10%

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CERTIFICATE OF ANALYSIS

LABORATORY NO.: 10440-3
CLIENT: Western Geologic Resources
JOB NO.: 1-124.00

DATE SAMPLED: 01/25/90
DATE RECEIVED: 01/25/90
DATE ANALYZED: 02/2/90

EPA SW-846 METHOD 8010
HALOGENATED VOLATILE ORGANICS
SAMPLE:01250-03

Compound	MDL (ug/L)	RESULTS (ug/L)
Chloromethane	0.5	ND <0.5
Bromomethane	0.5	ND <0.5
Vinyl chloride	1.0	ND <1.0
Dichlorodifluoromethane	0.5	ND <0.5
Chloroethane	0.5	ND <0.5
Methylene chloride	4.0	ND <4.0
Trichlorofluoromethane	0.5	ND <0.5
1,1-Dichloroethene	0.5	ND <0.5
1,1-Dichloroethane	0.5	ND <0.5
trans-1,2-Dichloroethene	0.5	ND <0.5
Chloroform	0.5	ND <0.5
1,2-Dichloroethane	0.5	ND <0.5
1,1,1-Trichloroethane	0.5	ND <0.5
Carbon tetrachloride	0.5	ND <0.5
Bromodichloromethane	0.5	ND <0.5
1,2-Dichloropropane	0.5	ND <0.5
cis-1,3-Dichloropropene	0.5	ND <0.5
Trichloroethylene	0.5	ND <0.5
1,1,2-Trichloroethane	0.5	ND <0.5
trans-1,3-Dichloropropene	0.5	ND <0.5
Dibromochloromethane	0.5	ND <0.5
2-Chloroethyl vinyl ether	1.0	ND <1.0
Bromoform	0.5	ND <0.5
Tetrachloroethene / 1,1,2,2-Tetrachloroethane	0.5	ND <0.5
Chlorobenzene	0.5	ND <0.5
1,3-Dichlorobenzene	0.5	ND <0.5
1,2-Dichlorobenzene	0.5	ND <0.5
1,4-Dichlorobenzene	0.5	ND <0.5
1,1,2-Trichlorotrifluoroethane	0.5	ND <0.5

MDL = Method Detection Limit
ug/l = parts per billion (ppb)
QA/QC Summary: Daily Standard RPD = 15%
MS/MSD average recovery = 78%: MS/MSD RPD = 10%

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