



February 20, 2003

Ms. Eya Chu *DH*
Hazardous Materials Specialist
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Re: Fourth Quarter 2002 Groundwater Monitoring Report
ARCO Service Station #6148
5131 Shattuck Avenue
Oakland, California *94609*
URS Project #38486133

Dear Ms. Chu:

On behalf of Atlantic Richfield Company (ARCO-an affiliated company of the Group Environmental Management Company), URS Corporation (URS) is submitting the *Fourth Quarter 2002 Groundwater Monitoring Report* for the ARCO Service Station #6148, located at 5131 Shattuck Avenue, Oakland, California.

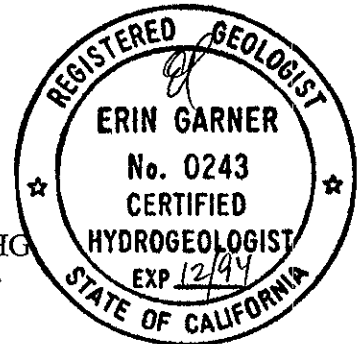
If you have any questions regarding this submission, please call at (510) 874-3280.

Sincerely,

URS CORPORATION

Scott Robinson
Project Manager

Erin Garner, CHG
Project Director



Enclosure: Fourth Quarter 2002 Groundwater Monitoring Report

cc: Mr. Paul Supple, ARCO, PO Box 6549, Moraga, CA 94570



Atlantic Richfield Company
(a BP affiliated company)

P.O. Box 6549
Moraga, California 94570
Phone: (925) 299-8891
Fax: (925) 299-8872

February 20, 2003

Re: Fourth Quarter 2002 Groundwater Monitoring Report
ARCO Station 6148
5131 Shattuck Avenue
Oakland, CA

I declare, that to the best of my knowledge at the present time, that the information and/or recommendations contained in the attached document are true and correct.

Submitted by:

Paul Supple
Environmental Business Manager

Date: February 20, 2003
Quarter: 4Q02

ATLANTIC RICHFIELD COMPANY QUARTERLY GROUNDWATER MONITORING REPORT

Former Facility No.: 6148 Address: 5131 Shattuck Avenue, Oakland, California
Atlantic Richfield Co. Environmental Engineer: Paul Supple
Consulting Co./Contact Person: URS Corporation / Scott Robinson
Consultant Project No.: 38486133
Primary Agency: ACHCSA

WORK PERFORMED THIS QUARTER (Fourth – 2002):

1. Performed fourth quarter 2002 groundwater monitoring event on November 27, 2002.
2. Prepared third quarter 2002 groundwater monitoring report.

WORK PROPOSED FOR NEXT QUARTER (First – 2003):

1. Perform first quarter 2002 groundwater monitoring event.
2. Prepare and submit fourth quarter 2002 groundwater monitoring report.

Current Phase of Project: GW monitoring/sampling
Frequency of Groundwater Sampling: Quarterly : MW-1, MW-2, MW-3, & MW-5
Semi-Annually (1st/3rd Quarter): Well MW-4
Annually (1st Quarter): MW-6 & MW-7
Frequency of Groundwater Monitoring: Quarterly
Is Free Product (FP) Present On-Site: No
Current Remediation Techniques: SVE, Air-Sparge and Air-Bubbling Systems (non-operational), ORC

Bulk Soil Removed to Date: 560 cubic yards
Approximate Depth to Groundwater: 14.07 (MW-6) to 17.69 (MW-3) feet
Groundwater Gradient (direction): Southwest
Groundwater Gradient (magnitude): 0.015 feet per foot

DISCUSSION:

TPH-g was detected in two of the three wells sampled this quarter at concentrations of 340 µg/L in MW-2 and 470 µg/L in MW-3. Benzene was detected in MW-2 at a concentration of 22 µg/L. MTBE was detected in MW-1 at a concentration of 1.7 µg/L. Well MW-5 was not sampled due to an ORC sock wedged in the well.

RECOMMENDATIONS:

We recommend reducing the sampling frequency on the following wells from quarterly to semi-annually due to the consistently low to non-detect values for the constituents of concern: MW-2, MW-3, and MW-5. Due to consistently stable detections, we further recommend changing well MW-1 from quarterly to annual sampling and well MW-4 from semi-annual to annual sampling. All wells would continue to be gauged quarterly.

ATTACHMENTS:

- Table 1 – Groundwater Elevation and Analytical Data
- Table 2 – Groundwater Flow Direction and Gradient
- Figure 1 – Groundwater Elevation Contour and Analytical Summary Map – November 27, 2002
- Attachment A – Field Procedures and Field Data Sheets
- Attachment B – Laboratory Procedures, Certified Analytical Reports, and Chain-of-Custody Records
- Attachment C – Historic Groundwater Data
- Attachment D – EDCC and EDF/Geowell Submittal Confirmation

Table 1
Groundwater Elevation and Analytical Data
 ARCO Service Station No. 6148
 5131 Shattuck Avenue
 Oakland, California

Well Number	Date Sampled	Top of Riser Elevation (ft)	Depth to Groundwater (ft)	Groundwater Elevation (ft)	TPH as Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	Dissolved Oxygen (mg/L)
MW-1	06/21/00	107.80	17.49	90.31	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<1.0	ND<3.0	NA
	09/20/00		17.64	90.16	ND<50	ND<0.5	0.677	ND<0.5	0.969	ND<2.5	NA
	12/22/00		16.87	90.93	186	5.38	0.522	9.52	30.2	8.91	NA
	03/26/01		16.60	91.20	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	9.1	NA
	05/30/01		17.10	90.70	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	NA
	09/23/01		17.53	90.27	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	6.7	NA
	12/28/01		15.57	92.23	ND<50	2.7	ND<0.5	ND<0.5	ND<0.5	20	NA
	03/21/02		15.57	92.23	NS	NS	NS	NS	NS	NS	NA
	04/17/02		16.25	91.55	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	NA
	08/19/02		17.69	90.11	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	NA
	11/27/02		17.45	90.35	ND <50	ND <0.50	1.8	0.65	3.5	1.7	1.0
MW-2	06/21/00	107.28	17.19	90.09	69	ND<0.5	ND<0.5	ND<0.5	ND<1.0	12	NA
	09/20/00		17.31	89.97	ND<50	0.964	ND<0.5	ND<0.5	ND<.05	5.05	NA
	12/22/00		16.58	90.70	2,140	174	60.2	118	438	123	NA
	03/26/01		16.45	90.83	8,490	333	148	495	1,660	ND<250	NA
	05/30/01		16.83	90.45	4,700	200	71	260	780	43	NA
	09/23/01		17.30	89.98	160	5.9	1.8	0.80	41	14	NA
	12/28/01		15.38	91.90	1,800	54	ND<5.0	ND<5.0	240	30	NA
	03/21/02		15.36	91.92	NS	NS	NS	NS	NS	NS	NA
	04/17/02		16.01	91.27	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	10	NA
	08/19/02		17.53	89.75	170 ¹	22	0.92	14	26	ND<2.5	NA
	11/27/02		17.21	90.07	340	22	0.68	13	26	ND<0.50	1.6

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 ARCO Service Station No. 6148
 5131 Shattuck Avenue
 Oakland, California

Well Number	Date Sampled	Top of Riser Elevation (ft)	Depth to Groundwater (ft)	Groundwater Elevation (ft)	TPH as Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	Dissolved Oxygen (mg/L)
MW-3	06/21/00	107.61	17.52	90.09	200	ND<0.5	ND<0.5	ND<0.5	2.1	24	NA
	09/20/00		17.61	90.00	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	20	NA
	12/22/00		16.85	90.76	227	4.73	1.06	2.58	5.22	27.3	NA
	03/26/01		16.79	90.82	287	6.29	1.58	6.47	12.1	24.2	NA
	05/30/01		17.11	90.50	500	10	ND<0.5	7.00	16	20	NA
	09/23/01		17.57	90.04	400	6.4	0.74	ND<0.5	0.62	22	NA
	12/28/01		15.41	92.20	270	2.5	2.4	ND<0.5	2.3	9.2	NA
	03/21/02		15.58	92.03	NS	NS	NS	NS	NS	NS	NA
	04/17/02		16.25	91.36	360	2.5	0.72	ND<0.5	ND<0.5	12	NA
	08/19/02		17.66	89.95	750 ²	11	2.1	ND<0.5	2.4	14	NA
	11/27/02		17.69	89.92	470	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	1.1
MW-4	06/21/00	106.71	16.00	90.71	1,400	5.3	7.3	36	85	4	NA
	09/20/00		16.03	90.68	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	NA
	12/22/00		NM	NC	NS	NS	NS	NS	NS	NS	NA
	03/26/01		15.05	91.66	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	NA
	05/30/01		15.62	91.09	NS	NS	NS	NS	NS	NS	NA
	09/23/01		16.07	90.64	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	NA
	12/28/01		13.68	93.03	NS	NS	NS	NS	NS	NS	NA
	03/21/02		14.04	92.67	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	NA
	04/17/02		14.78	91.93	NS	NS	NS	NS	NS	NS	NA
	08/19/02		16.18	90.53	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	NA
	11/27/02		15.89	90.82	NS	NS	NS	NS	NS	NS	NS

Table 1
Groundwater Elevation and Analytical Data
 ARCO Service Station No. 6148
 5131 Shattuck Avenue
 Oakland, California

Well Number	Date Sampled	Top of Riser Elevation (ft)	Depth to Groundwater (ft)	Groundwater Elevation (ft)	TPH as Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	Dissolved Oxygen (mg/L)	
MW-5	06/21/00	106.60	16.52	90.08	67	ND<0.5	ND<0.5	ND<0.5	ND<1.0	10	NA	
	09/20/00		16.34	90.26	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	3.48	NA	
	12/22/00		15.58	91.02	341	11.5	2.53	4.02	6.25	146	NA	
	03/26/00		15.45	91.15	767	12.4	ND<5.0	ND<5.0	ND<5.0	163	NA	
	05/30/01		15.77	90.83	110	2.3	ND<0.5	ND<0.5	0.81	72	NA	
	09/23/01		16.16	90.44	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	NA	
	12/28/01		14.09	92.51	240	2.8	1.9	ND<0.5	2.6	48	NA	
	03/21/02		14.43	92.17	NS	ND<0.5	ND<0.5	ND<0.5	ND<0.5	NS	NA	
	04/17/02		14.96	91.64	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	NA	
	08/19/02		16.34	90.26	NS ³	NS ³	NS ³	NS ³	NS ³	NS ³	NS ³	NS
	11/27/02		NM ³	NM ³	NS ³	NS ³	NS ³	NS ³	NS ³	NS ³	NS ³	NS
MW-6	06/21/00	105.13	13.91	91.22	NS	NS	NS	NS	NS	NS	NA	
	09/20/00		14.03	91.10	NS	NS	NS	NS	NS	NS	NA	
	12/22/00		NM	NC	NS	NS	NS	NS	NS	NS	NA	
	03/26/01		12.59	92.54	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	NA	
	05/30/01		13.40	91.73	NS	NS	NS	NS	NS	NS	NA	
	09/23/01		13.49	91.64	NS	NS	NS	NS	NS	NS	NA	
	12/28/01		12.07	93.06	NS	NS	NS	NS	NS	NS	NA	
	03/21/02		11.79	93.34	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	NA	
	04/17/02		12.45	92.68	NS	NS	NS	NS	NS	NS	NA	
	08/19/02		13.96	91.17	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	NA	
	11/27/02		14.07	91.06	NS	NS	NS	NS	NS	NS	NS	

Table 1
Groundwater Elevation and Analytical Data
 ARCO Service Station No. 6148
 5131 Shattuck Avenue
 Oakland, California

Well Number	Date Sampled	Top of Riser Elevation (ft)	Depth to Groundwater (ft)	Groundwater Elevation (ft)	TPH as Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	Dissolved Oxygen (mg/L)
MW-7	06/21/00	107.05	14.57	92.48	NS	NS	NS	NS	NS	NS	NA
	09/20/00		14.58	92.47	NS	NS	NS	NS	NS	NS	NA
	12/22/00		13.21	93.84	NS	NS	NS	NS	NS	NS	NA
	03/26/01		13.18	93.87	71.4	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	NA
	05/30/01		13.80	93.25	NS	NS	NS	NS	NS	NS	NA
	09/23/01		14.27	92.78	NS	NS	NS	NS	NS	NS	NA
	12/28/01		12.24	94.81	NS	NS	NS	NS	NS	NS	NA
	03/21/02		12.16	94.89	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	NA
	04/17/02		13.08	93.97	NS	NS	NS	NS	NS	NS	NA
	08/19/02		14.73	92.32	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	NA
	11/27/02		14.76	92.29	NS	NS	NS	NS	NS	NS	NS

TPH = Total Petroleum Hydrocarbons

MTBE = Methyl tertiary butyl ether analyzed by EPA Method 8021B unless otherwise noted

µg/L = Micrograms per liter

µg/l = Milligrams per liter

NA = Not available

NM = Not measured

NC = Not calculated

NS = Not Sampled

ND< = Not detected at or above specified laboratory detection limit

1 = Hydrocarbon pattern is present in the requested fuel quantitation range but does not resemble the pattern of the requested fuel

2 = Chromatogram Pattern: Gasoline C6-C10

3 = Well MW-5 not sampled due to ORC sock wedged in well.

Source: The data within this table collected prior to August 2002 was provided to URS by Group Environmental Management Company and their previous consultants. URS has not verified the accuracy of this information.

Table 2
Groundwater Flow Direction and Gradient

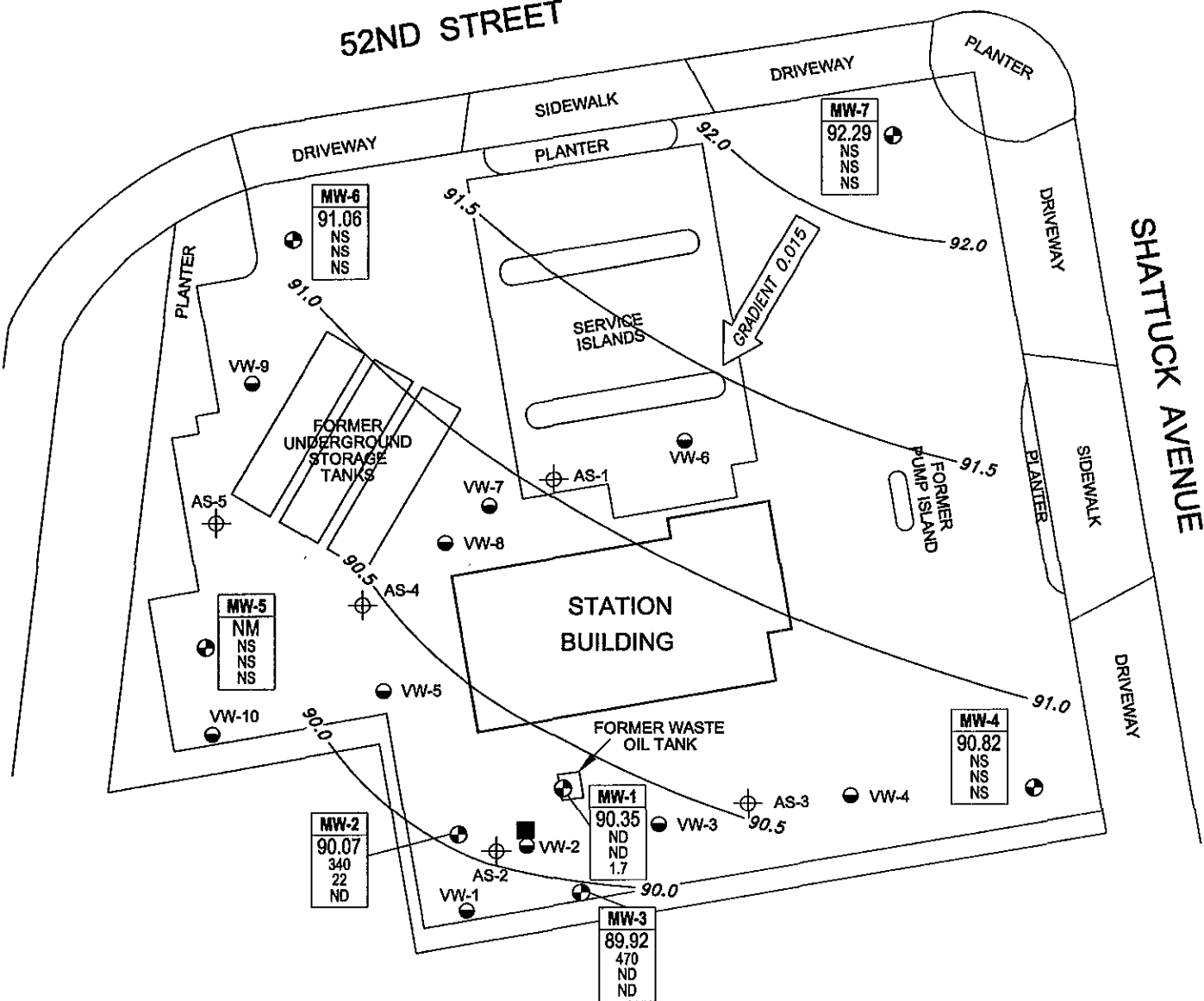
ARCO Service Station #6148
5131 Shattuck Avenue
Oakland, California

Date Measured	Average Flow Direction	Average Hydraulic Gradient
06/21/00	South-Southwest	0.02
09/20/00	South-Southwest	0.017
12/22/00	South-Southwest	0.022
03/26/01	South-Southwest	0.020
05/30/01	South-Southwest	0.020
09/23/01	South-Southwest	0.019
12/28/01	Southwest	0.019
03/21/02	Southwest	0.019
04/17/02	Southwest	0.017
08/19/02	Southwest	0.016
11/27/02	Southwest	0.015

Source: The data within this table collected prior to August 2002 was provided to URS by Group Environmental Management Company and their previous consultants. URS has not verified the accuracy of this information.

52ND STREET

SHATTUCK AVENUE

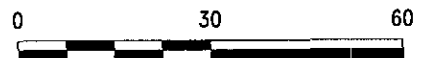


LEGEND:

- MW-1 MONITORING WELL LOCATION
 - AS-2 AIR SPARGING WELL
 - VW-1 SOIL VAPOR EXTRACTION WELL LOCATION
 - DESTROYED WELL LOCATION
- | Well | WELL DESIGNATION |
|---------|--|
| ELEV | GROUNDWATER ELEVATION (FT/MSL) |
| TPH-g | CONCENTRATION OF TOTAL PETROLEUM HYDROCARBONS AS GASOLINE, BENZENE, AND MTBE IN GROUNDWATER IN |
| Benzene | |
| MTBE | |
- NM NOT MEASURED
 - ND NOT DETECTED AT OR ABOVE LABORATORY REPORTING LIMITS
 - NS NOT SAMPLED
- 92.0 — GROUNDWATER ELEVATION CONTOUR (FT/MSL)
- 0.015 APPROXIMATE GROUNDWATER FLOW DIRECTION AND GRADIENT (FEET/FOOT)



NORTH



SCALE IN FEET

NOTE: SITE MAP ADAPTED FROM IT CORPORATION FIGURES. SITE DIMENSIONS AND FACILITY LOCATIONS NOT VERIFIED.

X:\env\wv\asia\BP_GEM\Sites\Scott_Robinson\Paul_Supple\6148\Reports\Monitoring\Qtr_3_2002\Drawings\GWEC-AS_8-18.dwg



Project No. 38465989
 ARCO Service Station 6148
 5131 Shattuck Avenue
 Oakland, California

**GROUNDWATER ELEVATION CONTOUR
 AND ANALYTICAL SUMMARY MAP**
 Fourth Quarter 2002 (November 27, 2002)

FIGURE
 1

ATTACHMENT A
FIELD PROCEDURES AND FIELD DATA SHEETS

FIELD PROCEDURES

Sampling Procedures

The sampling procedure for each well consists first of measuring the water level and depth to bottom, and checking for the presence of free phase petroleum product (free product), using either an electronic indicator and a clear Teflon™ bailer or an oil-water interface probe.

Wells not containing free product are purged approximately three casing volumes of water (or until dewatered) using a centrifugal pump, gas displacement pump, or bailer. Equipment and purging method used for the current sampling event is noted on the attached field data sheets. During purging, temperature, pH, and electrical conductivity are monitored to document that these parameters are stable prior to collecting samples. After purging, water levels are allowed to partially (approximately 80%) recover. Groundwater samples (both purge and no purge) are collected using a Teflon bailer, placed into appropriate Environmental Protection Agency- (EPA) approved containers, labeled, logged onto chain-of-custody records, and transported on ice to a California State-certified laboratory. Wells with free product are not sampled and free product is removed according to California Code of Regulation, Title 23, Div. 3, Chap. 16, Section 2655, UST Regulations.

ARCO / BP WELL MONITORING DATA SHEET

BTS #: <u>02-1127-MW2</u>	Station # <u>6148</u>
Sampler: <u>MDN</u>	Date: <u>11/27/02</u>
Well I.D.: <u>MW-1</u>	Well Diameter: 2 3 <u>4</u> 6 8
Total Well Depth: <u>25-70</u>	Depth to Water: <u>17.45</u>
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: <u>PVC</u> Grade	D.O. Meter (if req'd): <u>YSI</u> HACH

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius ² * 0.163

Purge Method: Bailer Sampling Method: Bailer
~~Disposable Bailer~~ ~~Disposable Bailer~~
~~Middleburg~~ ~~Extraction Port~~
~~Electric Submersible~~ Other: _____
~~Extraction Pump~~
 Other: _____

Top of Screen: NP @ 11.5 If well is listed as a no-purge, confirm that water level is below the top of screen. Otherwise, the well must be purged.

1 Case Volume (Gals.)	x <u>No Purge</u>	Gals.
Specified Volumes	Calculated Volume	

Time	Temp (°F)	pH	Conductivity (mS or μ S)	Gals. Removed	Observations
<u>12-12</u>	<u>68.1</u>	<u>6.7</u>	<u>475</u>	<u>0</u>	<u>Clear</u>

Did well dewater? Yes No Gallons actually evacuated: 0

Sampling Time: 12-12 Sampling Date: 11/27/02

Sample I.D.: MW-1 Laboratory: Pacc Sequoia Other _____

Analyzed for: TPH-G BTEX MTBE TPH-D Other: _____

D.O. (if req'd):	Pre-purge:	$\frac{mg}{L}$	Post-purge:	<u>1.0</u>	$\frac{mg}{L}$
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:		mV

ARCO / BP WELL MONITORING DATA SHEET

BTS #: 09-1127-MW2	Station # 6148
Sampler: MDN	Date: 11/27/02
Well I.D.: MW-2	Well Diameter: 2 3 <u>4</u> 6 8
Total Well Depth: 25.50	Depth to Water: 17.21
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: <u>PVC</u> Grade	D.O. Meter (if req'd): <u>YSI</u> HACH

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius ² * 0.163

Purge Method: ~~Bailer~~ ~~Disposable Bailer~~ ~~Middleburg~~ ~~Electric Submersible Extraction Pump~~ Other: _____

Sampling Method: Bailer ~~Disposable Bailer~~ Extraction Port Other: _____

Top of Screen: NPD 12 ft If well is listed as a no-purge, confirm that water level is below the top of screen. Otherwise, the well must be purged.

1 Case Volume (Gals.)	X	<u>8 No Purge</u>	Gals.
		Specified Volumes	Calculated Volume

Time	Temp (°F)	pH	Conductivity (mS or μ S)	Gals. Removed	Observations
1724	68.8	6.6	451	0	clear w/ yellow tint, black particles

Did well dewater? Yes No

Gallons actually evacuated: 0

Sampling Time: 1724 Sampling Date: 11/27/02

Sample I.D.: MW-2 Laboratory: Pace Sequoia Other: _____

Analyzed for: TPH-C BTEX MTBE TPH-D Other: _____

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	1.6	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:		mV

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ARCO / BP WELL MONITORING DATA SHEET

BTS #: <u>09-1127-MW 2</u>	Station # <u>6148</u>
Sampler: <u>MDN</u>	Date: <u>11/27/02</u>
Well I.D.: <u>MW 3</u>	Well Diameter: 2 3 <u>4</u> 6 8
Total Well Depth: <u>25.90</u>	Depth to Water: <u>17.69</u>
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: <u>PVC</u> Grade	D.O. Meter (if req'd): <u>YSI</u> HACH

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius ² * 0.163

Purge Method: Bailer Sampling Method: Bailer
~~Disposable Bailer~~ ~~Disposable Bailer~~
~~Middleburg~~ Extraction Port
~~Electric Submersible~~ Other: _____
~~Extraction Pump~~
Other: _____

Top of Screen: MPE 10 ft If well is listed as a no-purge, confirm that water level is below the top of screen. Otherwise, the well must be purged.

<u>1</u> Case Volume (Gals.)	x <u>2</u> No Purge	=	<u>2</u> Gals.
	Specified Volumes		Calculated Volume

Time	Temp (°F)	pH	Conductivity (mS or µS)	Gals. Removed	Observations
<u>1240</u>	<u>67.8</u>	<u>6.6</u>	<u>596</u>	<u>0</u>	<u>Light brown/yellow, odor,</u>

Did well dewater? Yes No Gallons actually evacuated: 0
Sampling Time: 1240 Sampling Date: 11/27/02
Sample I.D.: MW 3 Laboratory: Pace Sequoia Other _____

Analyzed for: TPH-G BTEX MTBE TPH-D Other: _____

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	<u>1.1</u>	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:		mV

(5)

ARCO / BP WELL MONITORING DATA SHEET

BTS #: <i>DB-1127-MN2</i>	Station # <i>6148</i>
Sampler: <i>MDU</i>	Date: <i>11/27/02</i>
Well I.D.: <i>MW-5</i>	Well Diameter: 2 3 <u>4</u> 6 8
Total Well Depth:	Depth to Water:
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: <u>PVC</u> Grade	D.O. Meter (if req'd): <u>YSI</u> HACH

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius ² * 0.163

Purge Method: Bailer Sampling Method: Bailer
 Disposable Bailer *Disposable Bailer
 Middleburg Extraction Port
 Electric Submersible Other: _____
 Extraction Pump
 Other: _____

Top of Screen: _____ If well is listed as a no-purge, confirm that water level is below the top of screen. Otherwise, the well must be purged.

_____	X	<u>3</u>	=	_____	Gals.
1 Case Volume (Gals.)		Specified Volumes		Calculated Volume	

Time	Temp (°F)	pH	Conductivity (mS or µS)	Gals. Removed	Observations
	<i>ORL</i>	<i>stuck</i>	<i>10 well</i>	<i>No Sample</i>	<i>or Gauge</i>
	<i>ORL</i>	<i>9.5</i>	<i>10 ft</i>	<i>Rope</i>	<i>broken</i>

Did well dewater? Yes No Gallons actually evacuated: _____

Sampling Time: _____ Sampling Date: *11/27/02*

Sample I.D.: *MW-5* Laboratory: Pace Sequoia Other: _____

Analyzed for: TPH-G BTEX MTBE TPH-D Other: _____

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV



Chain of Custody Record

Project Name 021127-1112

BP BU/GEM CO Portfolio: _____

BP Laboratory Contract Number: _____

Date: 11/27/02

Requested Due Date (mm/dd/yy) _____

On-site Time:	Temp:
Off-site Time:	Temp:
Sky Conditions:	
Meteorological Events:	
Wind Speed:	Direction:

Client To:	BP/GEM Facility No.:	Consultant/Contractor: URS
Name: SEQUOIA	BP/GEM Facility Address: 5131 Shattuck Ave, OAKLAND, CA	Address: 500 12th St., Ste. 200
Address: 885 Jarvis Dr. Morgan Hill, CA 95037	Site ID No. ARCO 6148	Oakland, CA 94609-4014
	Site Lat/Long:	e-mail EDD: syed_rehan@urscorp.com
	California Global ID #: T0600100103	Consultant/Contractor Project No.: J5-00006148.01 00427
PM: Latonya Pelt	BP/GEM PM Contact: PAUL SUPPLE	Consultant Tele/Fax: 510-874-1735/510-874-3268
/Fax: 408-776-9600 / 408-782-6308	Address:	Consultant/Contractor PM: Scott Robinson
Report Type & QC Level: Send EDF Reports		Invoice to: Consultant/Contractor or <u>BP/GEM</u> (Circle one)
GEM Account No.:	Tele/Fax:	BP/GEM Work Release No: INTRIM -50769

Bottle Order No.	Sample Description	Time	Matrix				Laboratory No.	No. of containers	Preservatives				Requested Analysis						Sample Point Lat/Long and Comments
			Soil/Solid	Water/Liquid	Sediments	Air			Unpreserved	H ₂ SO ₄	HNO ₃	HCl	TPHQ / BTEX (8015 / 8021)	TPH -D (8015)	MTBE (8021)	MTBE, TAME, ETBE, DIPE, TBA (8260)	1,2-DCA & EDB (8260)		
1	FW-1	1212	X				3				X	X							
2	FW-2	1224	X				↓				X	X							
3	FW-3	1240	X				↓				X	X							
4																			
5																			
6																			
7																			
8																			
9																			
0																			

Relinquished By: <u>Michael Nobata</u>	Affiliation: <u>URS</u>	Date: <u>12/3/02</u>	Time: <u>1328</u>	Accepted By: <u>[Signature]</u>	Affiliation: <u>URS</u>	Date: <u>12/3/02</u>	Time: <u>1328</u>
Relinquished Company: <u>Blaine Tech</u>							
Relinquished Date:							
Relinquished Method:							
Relinquished Tracking No:							

Special Instructions: Address Invoice to BP/GEM but send to URS for approval

Body Seals In Place Yes No Temperature Blank Yes No Cooler Temperature on Receipt °F/C Trip Blank Yes No

BP GEM OIL COMPANY TYPE A BILL OF LADING

SOURCE RECORD BILL OF LADING FOR NON-HAZARDOUS PURGEWATER RECOVERED FROM GROUNDWATER WELLS AT BP GEM OIL COMPANY FACILITIES IN THE STATE OF CALIFORNIA. THE NON-HAZARDOUS PURGE- WATER WHICH HAS BEEN RECOVERED FROM GROUND- WATER WELLS IS COLLECTED BY THE CONTRACTOR, MADE UP INTO LOADS OF APPROPRIATE SIZE AND HAULED BY DILLARD ENVIRONMENTAL TO THE ALTAMONT LANDFILL AND RESOURCE RECOVERY FACILITY IN LIVERMORE, CALIFORNIA.

The contractor performing this work is BLAINE TECH SERVICES, INC. (BTS), 1680 Rogers Avenue, San Jose, CA 95112 (phone [408] 573-0555). Blaine Tech Services, Inc. is authorized by BP GEM OIL COMPANY to recover, collect, apportion into loads the Non-Hazardous Well Purgewater that is drawn from wells at the BP GEM Oil Company facility indicated below and deliver that purgewater to BTS. Transport routing of the Non-Hazardous Well Purgewater may be direct from one BP GEM facility to the designated destination point; from one BP GEM facility to the designated destination point via another BP GEM facility; from a BP GEM facility to the designated destination point via the contractor's facility, or any combination thereof. The Non-Hazardous Well Purgewater is and remains the property of BP GEM Oil Company.

This Source Record BILL OF LADING was initiated to cover the recovery of Non-Hazardous Well Purgewater from wells at the BP GEM Oil Company facility described below:

6148

Station #

5731 Shattuck Ave Oakland

Station Address

Total Gallons Collected From Groundwater Monitoring Wells:

added equip. 2
rinse water _____

any other adjustments _____

TOTAL GALS. RECOVERED 5

loaded onto BTS vehicle # 47

BTS event #

time date

02-1127-MW2

1245 11 / 27 / 02

signature Ul

REC'D AT

time date

BTS

1700 11 / 27 / 02

unloaded by

signature Ul

ATTACHMENT B

**LABORATORY PROCEDURES,
CERTIFIED ANALYTICAL REPORTS,
AND CHAIN-OF-CUSTODY RECORDS**

LABORATORY PROCEDURES

Laboratory Procedures

The groundwater samples were analyzed for the presence of the chemicals mentioned in the chain of custody using standard EPA methods. The methods of analysis for the groundwater samples are documented in the certified analytical report. The certified analytical reports and chain-of-custody record are presented in this attachment. The analytical data provided by the laboratory approved by Group Environmental Management Company have been reviewed and verified by that laboratory.



23 December, 2002

Scott Robinson
URS Corporation
500 12th Street, Suite 100
Oakland, CA 94607

RE: ARCO #6148, Oakland, Ca
Sequoia Work Order: MLL0088

Enclosed are the results of analyses for samples received by the laboratory on 12/03/02 14:50. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Latonya Pelt
Project Manager
CA ELAP Certificate #1210



URS Corporation
500 12th Street, Suite 100
Oakland CA, 94607

Project: ARCO #6148, Oakland, Ca
Project Number: ARCO #6148, Oakland, CA
Project Manager: Scott Robinson

MLL0088
Reported:
12/23/02 12:43

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-1	MLL0088-01	Water	11/27/02 12:12	12/03/02 14:50
MW-2	MLL0088-02	Water	11/27/02 12:24	12/03/02 14:50
MW-3	MLL0088-03	Water	11/27/02 12:40	12/03/02 14:50

There were no custody seals that were received with this project.

URS Corporation
 500 12th Street, Suite 100
 Oakland CA, 94607

 Project: ARCO #6148, Oakland, Ca
 Project Number: ARCO #6148, Oakland, CA
 Project Manager: Scott Robinson

 MLL0088
Reported:
 12/23/02 12:43

Volatile Organic Compounds by EPA Method 8260B
Sequoia Analytical - Morgan Hill

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-1 (MLL0088-01) Water Sampled: 11/27/02 12:12 Received: 12/03/02 14:50									
Methyl tert-butyl ether	1.7	0.50	ug/l	1	2L13033	12/11/02	12/11/02	EPA 8260B	
Benzene	ND	0.50	"	"	"	"	"	"	
Toluene	1.8	0.50	"	"	"	"	"	"	
Ethylbenzene	0.65	0.50	"	"	"	"	"	"	
Xylenes (total)	3.5	0.50	"	"	"	"	"	"	
Gasoline Range Organics (C6-C10)	ND	50	"	"	"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>		106 %	78-129	"	"	"	"	"	
MW-2 (MLL0088-02) Water Sampled: 11/27/02 12:24 Received: 12/03/02 14:50 A-01									
Methyl tert-butyl ether	ND	0.50	ug/l	1	2L10015	12/10/02	12/11/02	EPA 8260B	O-09
Benzene	22	0.50	"	"	"	"	"	"	
Toluene	0.68	0.50	"	"	"	"	"	"	
Ethylbenzene	13	0.50	"	"	"	"	"	"	
Xylenes (total)	26	0.50	"	"	"	"	"	"	
Gasoline Range Organics (C6-C10)	340	50	"	"	"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>		88.6 %	78-129	"	"	"	"	"	
MW-3 (MLL0088-03) Water Sampled: 11/27/02 12:40 Received: 12/03/02 14:50 A-01									
Methyl tert-butyl ether	ND	0.50	ug/l	1	2L10015	12/10/02	12/11/02	EPA 8260B	O-09
Benzene	ND	0.50	"	"	"	"	"	"	
Toluene	ND	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.50	"	"	"	"	"	"	
Gasoline Range Organics (C6-C10)	470	50	"	"	"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>		89.2 %	78-129	"	"	"	"	"	



URS Corporation 500 12th Street, Suite 100 Oakland CA, 94607	Project: ARCO #6148, Oakland, Ca Project Number: ARCO #6148, Oakland, CA Project Manager: Scott Robinson	MLL0088 Reported: 12/23/02 12:43
--	--	---

**Volatile Organic Compounds by EPA Method 8260B - Quality Control
Sequoia Analytical - Morgan Hill**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	Limit	RPD	RPD Limit	Notes
Batch 2L10015 - EPA 5035										
Blank (2L10015-BLK1) Prepared & Analyzed: 12/10/02										
Methyl tert-butyl ether	ND	0.50	ug/l							
Benzene	ND	0.50	"							
Toluene	ND	0.50	"							
Ethylbenzene	ND	0.50	"							
Xylenes (total)	ND	0.50	"							
Gasoline Range Organics (C6-C10)	ND	50	"							
<i>Surrogate: 1,2-Dichloroethane-d4</i>	4.34		"	5.00		86.8	78-129			
Laboratory Control Sample (2L10015-BS1) Prepared & Analyzed: 12/10/02										
Methyl tert-butyl ether	11.6	0.50	ug/l	10.0		116	63-137			
Benzene	10.4	0.50	"	10.0		104	78-124			
Toluene	9.77	0.50	"	10.0		97.7	78-129			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	4.49		"	5.00		89.8	78-129			
Laboratory Control Sample (2L10015-BS2) Prepared & Analyzed: 12/10/02										
Methyl tert-butyl ether	10.0	0.50	ug/l	8.40		119	63-137			
Benzene	5.29	0.50	"	5.28		100	78-124			
Toluene	33.0	0.50	"	31.8		104	78-129			
Gasoline Range Organics (C6-C10)	444	50	"	440		101	70-113			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	4.20		"	5.00		84.0	78-129			
Laboratory Control Sample Dup (2L10015-BSD1) Prepared & Analyzed: 12/10/02										
Methyl tert-butyl ether	12.0	0.50	ug/l	10.0		120	63-137	3.39	13	
Benzene	9.98	0.50	"	10.0		99.8	78-124	4.12	12	
Toluene	9.51	0.50	"	10.0		95.1	78-129	2.70	10	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	4.35		"	5.00		87.0	78-129			
Laboratory Control Sample Dup (2L10015-BSD2) Prepared & Analyzed: 12/10/02										
Methyl tert-butyl ether	10.6	0.50	ug/l	8.40		126	63-137	5.83	13	
Benzene	5.15	0.50	"	5.28		97.5	78-124	2.68	12	

Sequoia Analytical - Morgan Hill

The results in this report apply to the samples analyzed in accordance with the chain of custody document. Unless otherwise stated, results are reported on a wet weight basis. This analytical report must be reproduced in its entirety.

URS Corporation
 500 12th Street, Suite 100
 Oakland CA, 94607

 Project: ARCO #6148, Oakland, Ca
 Project Number: ARCO #6148, Oakland, CA
 Project Manager: Scott Robinson

 MLL0088
Reported:
 12/23/02 12:43

Volatile Organic Compounds by EPA Method 8260B - Quality Control
Sequoia Analytical - Morgan Hill

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2L10015 - EPA 5035										
Laboratory Control Sample Dup (2L10015-BSD2)				Prepared & Analyzed: 12/10/02						
Toluene	29.5	0.50	ug/l	31.8		92.8	78-129	11.2	10	QR-02
Gasoline Range Organics (C6-C10)	481	50	"	440		109	70-113	8.00	9	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>4.60</i>		<i>"</i>	<i>5.00</i>		<i>92.0</i>	<i>78-129</i>			

Batch 2L13033 - EPA 5035

Blank (2L13033-BLK1)				Prepared & Analyzed: 12/11/02						
Methyl tert-butyl ether	ND	0.50	ug/l							
Benzene	ND	0.50	"							
Toluene	ND	0.50	"							
Ethylbenzene	ND	0.50	"							
Xylenes (total)	ND	0.50	"							
Gasoline Range Organics (C6-C10)	ND	50	"							
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>5.07</i>		<i>"</i>	<i>5.00</i>		<i>101</i>	<i>78-129</i>			

Laboratory Control Sample (2L13033-BS1)				Prepared & Analyzed: 12/11/02						
Methyl tert-butyl ether	10.4	0.50	ug/l	10.0		104	63-137			
Benzene	10.6	0.50	"	10.0		106	78-124			
Toluene	9.24	0.50	"	10.0		92.4	78-129			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>5.08</i>		<i>"</i>	<i>5.00</i>		<i>102</i>	<i>78-129</i>			

Laboratory Control Sample Dup (2L13033-BSD1)				Prepared: 12/11/02 Analyzed: 12/12/02						
Methyl tert-butyl ether	10.3	0.50	ug/l	10.0		103	63-137	0.966	13	
Benzene	10.8	0.50	"	10.0		108	78-124	1.87	12	
Toluene	9.25	0.50	"	10.0		92.5	78-129	0.108	10	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>5.06</i>		<i>"</i>	<i>5.00</i>		<i>101</i>	<i>78-129</i>			



URS Corporation
500 12th Street, Suite 100
Oakland CA, 94607

Project: ARCO #6148, Oakland, Ca
Project Number: ARCO #6148, Oakland, CA
Project Manager: Scott Robinson

MLL0088
Reported:
12/23/02 12:43

Notes and Definitions

- A-01 Vinyl chloride exceeds the CCC criteria for the continuing calibration. All target compounds pass the individual compound criteria for the continuing calibration.
- O-09 The result was reported with a possible high bias due to the continuing calibration verification falling outside acceptance criteria.
- QR-02 The RPD result exceeded the control limits; however, both percent recoveries were acceptable. Sample results for the QC batch were accepted based on percent recoveries and completeness of QC data.
- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference



Chain of Custody Record

M22088

Project Name 021127-M220
 BP BU/GEM CO Portfolio: _____
 BP Laboratory Contract Number: _____

On-site Time:	Temp:
Off-site Time:	Temp:
Sky Conditions:	
Meteorological Events:	
Wind Speed:	Direction:

Date: 11/27/02 Requested Due Date (mm/dd/yy) _____

Send To:	BP/GEM Facility No.:	Consultant/Contractor: URS
Lab Names: SEQUOIA	BP/GEM Facility Address: 5131 Shattuck Ave, OAKLAND, CA	Address: 500 12th St., Ste. 200
Lab Address: 885 Jarvis Dr. Morgan Hill, CA 95037	Site ID No. ARCO 6148	Oakland, CA 94609-4014
	Site Lat/Long:	e-mail: EDD: sved_rehan@urscorp.com
	California Global ID #: T0600100103	Consultant/Contractor Project No.: 35-00006148.01 00427
Lab PM: Latonya Peit	BP/GEM PM Contact: PAUL SUPPLE	Consultant Tele/Fax: 510-874-1735/510-874-3268
Tele/Fax: 408-776-9600 / 408-782-6308	Address:	Consultant/Contractor PM: Scott Robinson
Report Type & QC Level: Send EDF Reports		Invoice to: Consultant/Contractor or (BP/GEM) (circle one)
BP/GEM Account No.:	Tele/Fax:	BP/GEM Work Release No: INTRIM -50769

Item No.	Sample Description	Time	Matrix			Laboratory No.	No. of containers	Preservatives			Requested Analysis					Sample Point Lat/Long and Comments
			Soil/Solid	Water/Liquid	Sediments Air			Unpreserved	H ₂ SO ₄	HNO ₃	HCl	TPH-G/RIEX (8015/8021)	TPH-D (8015)	MTBE (8021)	MTBE, TAME, ETBE (DIPR, TDA) (8260)	
1	MW-1	12-12	X			01	W				X	X				
2	MW-2	12-24	X			02	✓				X	X				
3	MW-3	12-20	X			03	✓				X	X				
4																
5																
6																
7																
8																
9																
10																

Sampler's Name:	Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
Michael Nurokata	<i>[Signature]</i>	12/3/02	1328	<i>[Signature]</i>	12/5/02	1328
	<i>[Signature]</i>	12/3/02	1450	<i>[Signature]</i>	12/3/02	1450

Instructions: Address Invoice to BP/GEM but send to URS for approval

Place Yes No Temperature Blank Yes No Cooler Temperature on Receipt °F/C Trip Blank Yes No

SEQUOIA ANALYTICAL SAMPLE RECEIPT LOG

CLIENT NAME: URS
 REC. BY (PRINT) TL
 WORKORDER: MLL0088

DATE Received at Lab: 12/3/02
 TIME Received at Lab: 1450
 LOGIN DATE: 12-4-02

Drinking water for regulatory purposes: YES NO
 Wastewater for regulatory purposes: YES NO

CIRCLE THE APPROPRIATE RESPONSE	LAB SAMPLE #	#	CLIENT ID	CONTAINER DESCRIPTION	SAMPLE MATRIX	DATE SAMPLED	REMARKS: CONDITION (ETC.)
1. Custody Seal(s) = Present / <input checked="" type="radio"/> Absent Intact / Broken*	1		MW-1	(3) Vocs HD	(L)	11/27/02	
2. Chain-of-Custody Present / Absent*	2		MW-2	↓	↓	↓	
3. Traffic Reports or Packing List Present / <input checked="" type="radio"/> Absent	3		MW-3				
4. Airbill: Airbill / Sticker Present / <input checked="" type="radio"/> Absent							
5. Airbill #:							
6. Sample Labels: <input checked="" type="radio"/> Present / Absent							
7. Sample IDs: <input checked="" type="radio"/> Listed / Not Listed on Chain-of-Custody							
8. Sample Condition: <input checked="" type="radio"/> Intact / Broken* / Leaking*							
9. Does information on custody reports, traffic reports and sample labels agree? <input checked="" type="radio"/> Yes / No*							
10. Sample received within hold time: <input checked="" type="radio"/> Yes / No*							
11. Proper Preservatives used: <input checked="" type="radio"/> Yes / No*							
12. Temp Rec. at Lab: <u>4°C</u> (Acceptance range for samples requiring thermal pres.: ±2°C) <input checked="" type="radio"/> Yes / No**							
**Exception (if any):							

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

ATTACHMENT C

HISTORIC GROUNDWATER DATA

Table 1
Historical Groundwater Elevation and Analytical Data
Petroleum Hydrocarbons and Their Constituents
1995 - Present**

ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Well Number	Date Gauged/ Sampled	Top of Casing Elevation (ft-MSL)	Depth to Water (feet)	FP Thickness (feet)	Groundwater Elevation (ft-MSL)	TPH Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl- benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	TRPH (mg/L)	Dissolved Oxygen (mg/L)	Purged/ Not Purged (P/NP)	
MW-1	03-20-95	108.03	15.75	ND	92.28	830	140	5	41	110	--	--			
MW-1	06-06-95	108.03	17.68	ND	90.35	210	30	<0.5	7.3	16	--	--			
MW-1	08-24-95	107.80	17.45	ND	90.35	Not sampled: well was inaccessible due to construction									
MW-1	11-16-95	107.80	17.64	ND	90.16	<50	5.6	<0.5	1.4	1.2	55	--	--		
MW-1	02-27-96	107.80	15.21	ND	92.59	1,400	240	88	44	110	200	--	--		
MW-1	05-15-96	107.80	17.53	ND	90.27	Not sampled: well sampled semi-annually, during the first and third quarter									
MW-1	08-14-96	107.80	17.15	ND	90.65	98	18	<0.5	1.9	1	45	--	--		
MW-1	11-11-96	107.80	17.78	ND	90.02	Not sampled: well sampled semi-annually, during the first and third quarter									
MW-1	03-25-97	107.80	17.68	ND	90.12	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--		
MW-1	05-15-97	107.80	17.91	ND	89.89	Not sampled: well sampled semi-annually, during the first and third quarter									
MW-1	10-26-97	107.80	18.85	ND	88.95	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--		
MW-1	11-10-97	107.80	18.10	ND	89.70	<50	<0.5	<0.5	<0.5	<0.5	4	--	--		
MW-1	02-13-98	107.80	13.15	ND	94.65	<100	8.4	<1	<1	14	130	--	--		
MW-1	05-12-98	107.80	12.30	ND	95.50	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--		
MW-1	07-28-98	107.80	17.04	ND	90.76	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--		
MW-1	10-28-98	107.80	18.10	ND	89.70	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--		
MW-1	02-12-99	107.80	15.84	ND	91.96	72	<0.5	<0.5	<0.5	<0.5	23	--	--		
MW-1	06-03-99	107.80	17.62	ND	90.18	890	33	1.5	12	2.8	250	--	1.44	NP	
MW-1	10-26-99	107.80	16.92	ND	90.88	<50	<0.5	<0.5	<0.5	<1	9	--	9.58	NP	
MW-1	02-02-00	107.80	15.70	ND	92.10	<50	<0.5	<0.5	<0.5	<1	<3	--	8.9	NP	
MW-2	03-20-95	107.43	15.50	ND#	91.93	Not sampled: floating product entered well during purging									
MW-2	06-06-95	107.43	17.43	ND	90.00	1,200	60	21	35	140	--	--			
MW-2	08-24-95	107.28	17.22	ND	90.06	Not sampled: well was inaccessible due to construction									
MW-2	11-16-95	107.28	17.36	ND	89.92	360	45	1.3	7.1	7.5	210	--	--		
MW-2	02-27-96	107.28	14.82	ND	92.46	8,900	1,400	980	150	550	940	--	--		
MW-2	05-15-96	107.28	17.40	ND	89.88	480	82	48	8	48	87	--	--		

Table 1
Historical Groundwater Elevation and Analytical Data
Petroleum Hydrocarbons and Their Constituents
1995 - Present**

ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Well Number	Date Gauged/ Sampled	Top of Casing Elevation (ft-MSL)	Depth to Water (feet)	FP Thickness (feet)	Groundwater Elevation (ft-MSL)	TPH Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl- benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	TRPH (mg/L)	Dissolved Oxygen (mg/L)	Purged/ Not Purged (P/NP)
MW-2	08-14-96	107.28	17.00	ND	90.28	130	22	4	2	9	120	--		
MW-2	11-11-96	107.28	17.55	ND	89.73	1,200	150	120	21	160	110	--		
MW-2	03-25-97	107.28	17.32	ND	89.96	670	23	58	13	120	28	--		
MW-2	05-15-97	107.28	17.61	ND	89.67	<50	<0.5	<0.5	<0.5	<0.5	23	--		
MW-2	10-26-97	107.28	18.43	ND	88.85	<50	<0.5	<0.5	<0.5	<0.5	<3	--		
MW-2	11-10-97	107.28	17.84	ND	89.44	<100	<1	<1	<1	1	74	--		
MW-2	02-13-98	107.28	12.75	ND	94.53	220	9.5	3.9	3.7	48	84	--		
MW-2	05-12-98	107.28	17.02	ND	90.26	3,900	210	280	86	910	35	--		
MW-2	07-28-98	107.28	17.30	ND	89.98	<50	<0.5	<0.5	<0.5	<0.5	<3	--		
MW-2	10-28-98	107.28	17.80	ND	89.48	170	17	<0.5	1.7	5.0	24	--		
MW-2	02-12-99	107.28	15.55	ND	91.73	12,000	620	95	490	2,200	270	--		
MW-2	06-03-99	107.28	17.31	ND	89.97	<50	<0.5	<0.5	<0.5	1.1	8	--	2.53	NP
MW-2	10-26-99	107.28	16.58	ND	90.70	<50	1.0	<0.5	<0.5	3	<3	--	8.17	NP
MW-2	02-02-00	107.28	15.30	ND	91.98	<50	<0.5	<0.5	<0.5	<1	<3	--	9.1	NP
MW-3	03-20-95	107.77	15.60	ND	92.17	29,000	880	190	760	2,000	--	16		
MW-3	06-06-95	107.77	17.54	ND	90.23	22,000	450	54	380	1,300	--	7.1		
MW-3	08-24-95	107.61	17.42	ND	90.19	Not sampled: well was inaccessible due to construction								
MW-3	11-16-95	107.61	17.58	ND	90.03	13,000	210	<20	320	1,000	790	8.3		
MW-3	02-27-96	107.61	15.03	ND	92.58	9,700	94	15	290	720	430	10		
MW-3	05-15-96	107.61	17.35	ND	90.26	5,600	66	12	37	67	230	--		
MW-3	08-14-96	107.61	17.10	ND	90.51	830	17	<1*	8	7	110	--		
MW-3	11-11-96	107.61	17.73	ND	89.88	500	28	3	12	13	150	--		
MW-3	03-25-97	107.61	17.99	ND	89.62	<50	<0.5	<0.5	<0.5	<0.5	94	--		
MW-3	05-15-97	107.61	17.84	ND	89.77	<50	<0.5	<0.5	<0.5	<0.5	65	--		
MW-3	10-26-97	107.61	18.50	ND	89.11	220	4	<1	<1	<1	160	--		
MW-3	11-10-97	107.61	18.00	ND	89.61	350	8	<2	3	3	230	--		

Table 1
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Petroleum Hydrocarbons and Their Constituents
1995 - Present**

ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Well Number	Date Gauged/ Sampled	Top of Casing Elevation (ft-MSL)	Depth to Water (feet)	FP Thickness (feet)	Groundwater Elevation (ft-MSL)	TPH Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl- benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	TRPH (mg/L)	Dissolved Oxygen (mg/L)	Purged/ Not Purged (P/NP)
MW-3	02-13-98	107.61	13.00	ND	94.61	<50	1.3	<0.5	<0.5	1	21	--		
MW-3	05-12-98	107.61	17.20	ND	90.41	120	<0.5	<0.5	<0.5	<0.9	71	--		
MW-3	07-28-98	107.61	17.46	ND	90.15	<50	1.4	<0.5	<0.5	<0.5	52	--		
MW-3	10-28-98	107.61	18.00	ND	89.61	170	<0.5	<0.5	<0.5	0.7	35	--		
MW-3	02-12-99	107.61	15.76	ND	91.85	120	2.0	0.6	<0.5	1.3	37	--		
MW-3	06-03-99	107.61	Well inaccessible: Surveyed well VW-1 as an alternative -----											
MW-3	10-26-99	107.61	16.69	ND	90.92	630	14	0.7	13	2	38	--	1.24	NP
MW-3	02-02-00	107.61	15.65	ND	91.96	290	18	0.5	45	56	46	--	0.4	NP
MW-4	03-20-95	106.58	13.85	ND	92.73	88	1	<0.5	<0.5	0.7	--	--		
MW-4	06-06-95	106.58	15.70	ND	90.88	<50	<0.5	<0.5	<0.5	<0.5	--	--		
MW-4	08-24-95	106.71	15.86	ND	90.85	Not sampled: well was inaccessible due to construction								
MW-4	11-16-95	106.71	16.10	ND	90.61	<50	<0.5	<0.5	<0.5	<0.5	6	--		
MW-4	02-27-96	106.71	13.72	ND	92.99	<50	<0.5	<0.5	<0.5	<0.5	10	--		
MW-4	05-15-96	106.71	15.90	ND	90.81	Not sampled: well sampled semi-annually, during the first and third quarter								
MW-4	08-14-96	106.71	15.68	ND	91.03	<50	<0.5	<0.5	<0.5	<0.5	<3	--		
MW-4	11-11-96	106.71	16.19	ND	90.52	Not sampled: well sampled semi-annually, during the first and third quarter								
MW-4	03-25-97	106.71	16.10	ND	90.61	<50	<0.5	<0.5	<0.5	<0.5	<3	--		
MW-4	05-15-97	106.71	16.38	ND	90.33	Not sampled: well sampled semi-annually, during the first and third quarter								
MW-4	10-26-97	106.71	17.78	ND	88.93	<50	<0.5	<0.5	<0.5	<0.5	<3	--		
MW-4	11-10-97	106.71	16.43	ND	90.28	Not sampled: well sampled semi-annually, during the first and third quarter								
MW-4	02-13-98	106.71	13.05	ND	93.66	<50	1.3	0.7	<0.5	2.3	19	--		
MW-4	05-12-98	106.71	15.69	ND	91.02	Not sampled: well sampled semi-annually, during the first and third quarter								
MW-4	07-28-98	106.71	15.93	ND	90.78	<50	<0.5	<0.5	<0.5	<0.5	<3	--		
MW-4	10-28-98	106.71	16.40	ND	90.31	Not sampled: well sampled semi-annually, during the first and third quarter								
MW-4	02-12-99	106.71	14.13	ND	92.58	<50	<0.5	<0.5	<0.5	<0.5	<3	--		
MW-4	06-03-99	106.71	16.00	ND	90.71	Not sampled: well sampled semi-annually, during the first and third quarter								

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Historical Groundwater Elevation and Analytical Data
Petroleum Hydrocarbons and Their Constituents
1995 - Present**

ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Well Number	Date Gauged/ Sampled	Top of Casing Elevation (ft-MSL)	Depth to Water (feet)	FP Thickness (feet)	Groundwater Elevation (ft-MSL)	TPH Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl- benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	TRPH (mg/L)	Dissolved Oxygen (mg/L)	Purged/ Not Purged (P/NP)
MW-4	10-26-99	106.71	15.76	ND	90.95	Not sampled: well sampled semi-annually, during the first and third qtr.							1.72	
MW-4	02-02-00	106.71	14.32	ND	92.39	<50	<0.5	<0.5	<0.5	<1	<3	--	0.7	NP
MW-5	03-20-95	106.68	14.92	ND	91.76	21,000	6,900	450	800	1,300	--	--		
MW-5	06-06-95	106.68	16.61	ND	90.07	6,500	1,700	<20	120	69	--	--		
MW-5	08-24-95	106.60	16.47	ND	90.13	Not sampled: well was inaccessible due to construction								
MW-5	11-16-95	106.60	16.69	ND	89.91	1,800	470	<5	17	5	1,000	--		
MW-5	02-27-96	106.60	14.35	ND	92.25	10,000	1,000	71	690	1,000	440/450*	--		
MW-5	05-15-96	106.60	16.58	ND	90.02	3,400	350	6	72	20	220	--		
MW-5	08-14-96	106.60	17.26	ND	89.34	2,100	130	2.7	47	4.7	220	--		
MW-5	11-11-96	106.60	16.62	ND	89.98	1,200	31	1	8	2	130	--		
MW-5	03-25-97	106.60	16.38	ND	90.22	<50	<0.5	<0.5	<0.5	<0.5	5	--		
MW-5	05-15-97	106.60	16.54	ND	90.06	<50	<0.5	<0.5	<0.5	<0.5	<3	--		
MW-5	10-26-97	106.60	17.60	ND	89.00	<50	<0.5	<0.5	<0.5	<0.5	7	--		
MW-5	11-10-97	106.60	16.78	ND	89.82	<50	<0.5	<0.5	<0.5	<0.5	24	--		
MW-5	02-13-98	106.60	12.21	ND	94.39	11,200	51	<10	<10	<10	2,000	--		
MW-5	05-12-98	106.60	NR	ND	NR	Not sampled: well inaccessible								
MW-5	07-28-98	106.60	16.47	ND	90.13	<50	<0.5	<0.5	<0.5	<0.5	<3	--		
MW-5	10-28-98	106.60	16.80	ND	89.80	<50	0.8	<0.5	<0.5	<0.5	99	--		
MW-5	02-12-99	106.60	14.88	ND	91.72	<1,000	<10	<10	<10	<10	1,100	--		
MW-5	06-03-99	106.60	16.65	ND	89.95	290	10	<0.5	<0.5	0.6	200	--	2.45	NP
MW-5	10-26-99	106.60	16.10	ND	90.50	<50	<0.5	<0.5	<0.5	<1	11	--	NM	NP
MW-5	02-02-00	106.60	14.65	ND	91.95	<50	<0.5	<0.5	<0.5	<1	39	--	8.6	NP
MW-6	03-20-95	105.16	12.13	ND	93.03	<50	<0.5	<0.5	<0.5	<0.5	--	--		
MW-6	06-06-95	105.16	13.95	ND	91.21	<50	<0.5	<0.5	<0.5	<0.5	--	--		
MW-6	08-24-95	105.13	14.07	ND	91.06	<50	<0.5	<0.5	<0.5	<0.5	<3	--		

Table 1
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Petroleum Hydrocarbons and Their Constituents
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ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Well Number	Date Gauged/ Sampled	Top of Casing Elevation (ft-MSL)	Depth to Water (feet)	FP Thickness (feet)	Groundwater Elevation (ft-MSL)	TPH Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl- benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	TRPH (mg/L)	Dissolved Oxygen (mg/L)	Purged/ Not Purged (P/NP)
MW-6	11-16-95	105.13	14.34	ND	90.79	<60	<0.5	<0.5	<0.5	<0.5	--	--		
MW-6	02-27-96	105.13	12.00	ND	93.13	<50	<0.5	<0.5	<0.5	<0.5	<3	--		
MW-6	05-15-96	105.13	14.10	ND	91.03	Not sampled: well sampled annually, during the first quarter								
MW-6	08-14-96	105.13	13.70	ND	91.43	Not sampled: well sampled annually, during the first quarter								
MW-6	11-11-96	105.13	14.11	ND	91.02	Not sampled: well sampled annually, during the first quarter								
MW-6	03-25-97	105.13	14.15	ND	90.98	<50	<0.5	<0.5	<0.5	<0.5	<3	--		
MW-6	05-15-97	105.13	14.44	ND	90.69	Not sampled: well sampled annually, during the first quarter								
MW-6	10-26-97	105.13	16.02	ND	89.11	Not sampled: well sampled annually, during the first quarter								
MW-6	11-10-97	105.13	14.52	ND	90.61	Not sampled: well sampled annually, during the first quarter								
MW-6	02-13-98	105.13	10.06	ND	95.07	<50	<0.5	<0.5	<0.5	<0.5	8	--		
MW-6	05-12-98	105.13	13.75	ND	91.38	Not sampled: well sampled annually, during the first quarter								
MW-6	07-28-98	105.13	14.06	ND	91.07	Not sampled: well sampled annually, during the first quarter								
MW-6	10-28-98	105.13	14.71	ND	90.42	Not sampled: well sampled annually, during the first quarter								
MW-6	02-12-99	105.13	12.22	ND	92.91	<100	<1	<1	<1	<1	110	--		
MW-6	06-03-99	105.13	13.95	ND	91.18	Not sampled: well sampled annually, during the first quarter								
MW-6	10-26-99	105.13	14.06	ND	91.07	Not sampled: well sampled annually, during the first quarter								
MW-6	02-02-00	105.13	12.03	ND	93.10	<50	<0.5	<0.5	<0.5	<1	<3	--	3.94 1.2	NP
MW-7	03-20-95	107.08	12.32	ND	94.76	<50	<0.5	<0.5	<0.5	<0.5	--	--		
MW-7	06-06-95	107.08	14.59	ND	92.49	Not sampled: well sampled semi-annually, during the first and third quarters								
MW-7	08-24-95	107.05	14.64	ND	92.41	<50	<0.5	<0.5	<0.5	<0.5	<3	--		
MW-7	11-16-95	107.05	15.30	ND	91.75	Not sampled: well sampled semi-annually, during the first and third quarters								
MW-7	02-27-96	107.05	12.24	ND	94.81	<50	<0.5	<0.5	<0.5	<0.5	<3	--		
MW-7	05-15-96	107.05	14.65	ND	92.40	Not sampled: well sampled annually, during the first quarter								
MW-7	08-14-96	107.05	14.35	ND	92.70	Not sampled: well sampled annually, during the first quarter								
MW-7	11-11-96	107.05	14.92	ND	92.13	Not sampled: well sampled annually, during the first quarter								
MW-7	03-25-97	107.05	14.80	ND	92.25	<50	<0.5	<0.5	<0.5	<0.5	<3	--		

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5131 Shattuck Avenue, Oakland, California**

Well Number	Date Gauged/ Sampled	Top of Casing Elevation (ft-MSL)	Depth to Water (feet)	FP Thickness (feet)	Groundwater Elevation (ft-MSL)	TPH Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl- benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	TRPH (mg/L)	Dissolved Oxygen (mg/L)	Purged/ Not Purged (P/NP)
MW-7	05-15-97	107.05	15.27	ND	91.78	Not sampled: well sampled annually, during the first quarter								
MW-7	10-26-97	107.05	16.68	ND	90.37	Not sampled: well sampled annually, during the first quarter								
MW-7	11-10-97	107.05	15.37	ND	91.68	Not sampled: well sampled annually, during the first quarter								
MW-7	02-13-98	107.05	10.80	ND	96.25	<50	<0.5	<0.5	<0.5	<0.5	<3	--		
MW-7	05-12-98	107.05	14.32	ND	92.73	Not sampled: well sampled annually, during the first quarter								
MW-7	07-28-98	107.05	14.79	ND	92.26	Not sampled: well sampled annually, during the first quarter								
MW-7	10-28-98	107.05	15.57	ND	91.48	Not sampled: well sampled annually, during the first quarter								
MW-7	02-12-99	107.05	12.46	ND	94.59	<50	<0.5	<0.5	<0.5	<0.5	<3	--		
MW-7	06-03-99	107.05	14.53	ND	92.52	Not sampled: well sampled annually, during the first quarter								
MW-7	10-26-99	107.05	14.74	ND	92.31	Not sampled: well sampled annually, during the first quarter								
MW-7	02-02-00	107.05	12.57	ND	94.48	<50	<0.5	<0.5	<0.5	<1	<3	--	1.97 0.7	NP
VW-1	06-03-99	NR	17.51	ND	NR	420	2.3	0.6	2.0	2.2	74	--	1.28	P

ft-MSL: elevation in feet, relative to mean sea level

TPH: total petroleum hydrocarbons as gasoline, California DHS LUFT Method

BTEX: Benzene, toluene, ethylbenzene, total xylenes by EPA method 8021B. (EPA method 8020 prior to 10/26/99)

MTBE: Methyl tert-butyl ether by EPA method 8021B. (EPA method 8020 prior to 10/26/99).

TRPH: total recoverable petroleum hydrocarbons

µg/L: micrograms per liter

mg/L: milligrams per liter

NR: not reported, data not available

ND: none detected

#: floating product entered the well during purging

--: not analyzed or not applicable

*: confirmed by EPA 8240

** : For previous historical groundwater elevation and analytical data please refer to *Fourth Quarter 1995 Groundwater Monitoring Program Results and Remediation System Performance Evaluation Report, ARCO Service Station 6148, Oakland, California*, (EMCON, March 4, 1996).

ATTACHMENT D

EDCC REPORT AND EDF/GEOWELL SUBMITTAL CONFIRMATION

Error Summary Log

02/05/03

EDF 1.2i All files present in deliverable.

Laboratory:	Sequoia Analytical Laboratories, Inc., Morgan Hill, CA
Project Name:	ARCO #6148, Oakland, Ca
Work Order Number:	MLL0088
Global ID:	T0600100103
Lab Report Number:	MLL0088122420020717

EDFSAMP: Error Summary Log

02/05/03

Error type	Logcode	Projname	Npdlwo	Sampid	Matrix
There are no errors in this data file					

EDFTEST: Error Summary Log

02/05/03

Error type	Labsampid	Qccode	Anmcode	Exmcode	Anadate	Run number
There are no errors in this data file					//	0

EDFRES: Error Summary Log

02/05/03

Error type	Labsampid	Qccode	Matrix	Anmcode	Pvccode	Anadate	Run number	Parlabel
Warning: extra parameter	MLL008801	CS	W	8260+OX	PR	12/11/02	1	GROC6C10
Warning: extra parameter	MLL008801	CS	W	8260+OX	PR	12/11/02	1	XYLENES
Warning: extra parameter	MLL008802	CS	W	8260+OX	PR	12/11/02	1	GROC6C10
Warning: extra parameter	MLL008802	CS	W	8260+OX	PR	12/11/02	1	XYLENES
Warning: extra parameter	MLL008803	CS	W	8260+OX	PR	12/11/02	1	GROC6C10
Warning: extra parameter	MLL008803	CS	W	8260+OX	PR	12/11/02	1	XYLENES
Warning: extra parameter	2L10015BLK1	LB1	WQ	8260+OX	PR	12/10/02	1	GROC6C10
Warning: extra parameter	2L10015BLK1	LB1	WQ	8260+OX	PR	12/10/02	1	XYLENES
Warning: extra parameter	2L10015BS2	BS2	WQ	8260+OX	PR	12/10/02	1	GROC6C10
Warning: extra parameter	2L10015BSD2	BD2	WQ	8260+OX	PR	12/10/02	1	GROC6C10
Warning: extra parameter	2L13033BLK1	LB1	WQ	8260+OX	PR	12/11/02	1	GROC6C10
Warning: extra parameter	2L13033BLK1	LB1	WQ	8260+OX	PR	12/11/02	1	XYLENES

EDFQC: Error Summary Log

02/05/03

Error type	Labioccti	Anmcode	Parlabel	Qccode	Labqcid
There are no errors in this data files					

EDFCL: Error Summary Log

02/05/03

Error type	Clevdate	Anmcode	Exmcode	Parlabel	Cicode
There are no errors in this data file	//				

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Confirmation Number: 3840687334

Date/Time of Submittal: 2/5/2003 11:03:08 AM

Facility Global ID: T0600100103

Facility Name: ARCO

Submittal Title: FOURTH QUARTER QMR FOR SITE 6148

Submittal Type: Additional Information Report

Logged in as URSCORP-OAKLAND (CONTRACTOR)

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UPLOADING A GEO_WELL FILE

**Processing is complete. No errors were found!
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<u>Submittal Title:</u>	Fourth Quarter 02 Ground Water Monitoring for site 6148
<u>Submittal Date/Time:</u>	2/5/2003 11:08:20 AM
<u>Confirmation Number:</u>	3354435563

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