



RO72

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December 20, 2000

Mr. Paul Supple  
ARCO Products Company  
P.O. Box 6549  
Moraga, CA 94570

Subject: *Quarterly Groundwater Monitoring and Remediation System Status Report,  
Third Quarter 2000*  
ARCO Station No. 2169  
889 West Grand Avenue  
Oakland, California  
Delta Project No. D000-311

Dear Mr. Supple:

Delta Environmental Consultants, Inc. is submitting the attached report that presents the results of the third quarter 2000 groundwater monitoring program at ARCO Products Company Service Station No. 2169, located at 889 West Grand Avenue, Oakland, California. The monitoring program complies with the Alameda County Health Care Services Agency requirements regarding underground tank investigations.

The interpretations contained in this report represent our professional opinions and are based, in part, on information supplied by the client. These opinions are based on currently available information and are arrived at in accordance with currently accepted hydrogeological and engineering practices at this time and location. Other than this, no warranty is implied or intended.

If you have any questions concerning this project, please contact Steven W. Meeks at (916) 536-2613.

Sincerely,

**DELTA ENVIRONMENTAL CONSULTANTS, INC.**

Trevor L. Atkinson  
Project Engineer

Steven W. Meeks, P.E.  
Project Manager  
California Registered Civil Engineer No. C057461



TLA (Lrp002.311.doc)  
Enclosures

cc: Ms. Susan Hugo – Alameda County Health Care Services Agency

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DELTA ENVIRONMENTAL  
PROTECTION

Providing a Competitive Edge

Date: December 20, 2000

### ARCO QUARTERLY GROUNDWATER MONITORING REPORT

Station No.: 2169 Address: 889 West Grand Avenue, Oakland, California  
ARCO Environmental Engineer/Phone No.: Paul Supple 925-299-8891  
Consulting Co./Contact Person Delta Environmental Consultants, Inc.  
Steven W. Meeks, P.E.  
Consultant Project No.: D000-311  
Primary Agency/Regulatory ID No. Alameda County Health Care Services Agency

#### WORK PERFORMED THIS QUARTER

1. Quarterly monitoring and sampling for third quarter 2000
2. Conducted O & M site visit on September 20, 2000

#### WORK PROPOSED FOR NEXT QUARTER

1. Prepare quarterly monitoring and sampling report for third quarter 2000
2. Conduct quarterly monitoring and sampling for fourth quarter 2000
3. Conduct monthly O & M site visit for remediation system.
4. Perform oversight of UST/line/dispenser upgrade activities in fourth quarter 2000.

#### QUARTERLY MONITORING:

Current Phase of Project	<u>Quarterly Groundwater Monitoring and Operation and Maintenance of Remediation Systems</u>
Frequency of Groundwater Sampling:	<u>Annual (1<sup>st</sup> Quarter): A-3, A-4</u> <u>Semi-annual (1<sup>st</sup>/2<sup>nd</sup> Quarter): A-2, AR-1, AR-2</u> <u>Quarterly: A-1, A-5, A-6, ADR-1, ADR-2</u>
Frequency of Groundwater Monitoring:	<u>Quarterly (groundwater, Monthly SVE and Biosparging)</u>
Is Free Product (FP) Present On-Site:	<u>No</u>
FP Recovered this Quarter:	<u>None</u>
Cumulative FP Recovered to Date:	<u>4.8 gallons, wells ADR-1 and ADR-2</u>
Bulk Soil Removed This Quarter:	<u>None</u>
Bulk Soil Removed to Date:	<u>2,196 cubic yards of TPH impacted soil</u>
Current Remediation Techniques:	<u>SVE and Biosparging systems</u>
Approximate Depth to Groundwater:	<u>11.60 ft.</u>
Groundwater Gradient:	<u>0.003 West-Northwest</u>

**SVE QUARTERLY OPERATION & PERFORMANCE:**

Equipment Inventory:	Therm Tech Model VAC-25, 250 fm, Thermal/Catalytic Oxidizer
Operating Mode:	Catalytic Oxidation
BAAQMD Permit No.:	12119
TPH Conc. at End of Period (lab):	246 ppmv
Benzene Conc. at End of Period (lab):	5.56 ppmv
Flow Rate at End of Period:	108 scfm
Hydrocarbons Destroyed This Period:	82.4 pounds
Hydrocarbons Destroyed to Date:	9,092 pounds
Utility Usage Electric (kWh):	Not Available
Operating Hours This Period:	362 hours
Percent Operational:	16.7%
Operating Hours To Date:	11,062 hours
Unit Maintenance:	Not applicable
Number of Auto Shut Downs:	0
Destruction of Efficiency Permit Requirements:	98.5% (POC >2,000 ppmv); 97% (POC >200 ppmv); 90% (POC <200 ppmv); waived if outlet POC <1.0 lb/day and benzene <0.02 lb/day
Average Percent TPH Conversion:	99%
Average Stack Temperature	700° F
Average Source Flow:	108 scfm
Average Process Flow:	108 scfm
Average Source Vacuum:	10" H <sub>2</sub> O

(SVE data recreated from data provided by IT Corporation.)

**DISCUSSION:**

- Benzene and total petroleum hydrocarbons as gasoline were found in samples collected from A-1, A-5, ADR-1 and ADR-2 ranging from 13 µg/L (A-5) to 2,400 µg/L (A-1) and 120 µg/L (AD-1) to 4,800 µg/L (A-1), respectively.
- Methyl tertiary butyl ether was found in samples collected from A-1, A-6, ADR-1 and ADR-2 ranging from 6 µg/L (A-6) to 34 µg/L (ADR-2).
- The remediation system ran for only 362 hours due to low concentrations and high ground water levels.

**ATTACHMENTS:**

- Table 1 Groundwater Elevation and Analytical Data
- Table 2 Groundwater Flow Direction and Gradient
- Table 3 SVE System Analytical Results
- Table 4 SVE System Monitoring Table
- Figure 1 Groundwater Analytical Summary Map
- Figure 2 Groundwater Elevation Contour Map
- Appendix A Sampling and Analysis Procedures
- Appendix B Historical Data Tables (IT Corporation)
- Appendix C Certified Analytical Reports with Chain-of-Custody Documentation
- Appendix D Field Data Sheet
- Appendix E Soil Vapor Extraction System Laboratory Analytical Results

TABLE 1

## GROUNDWATER ANALYTICAL DATA

ARCO Service Station No. 2169  
889 West Grand Avenue  
Oakland, California

Well Number	Date Sampled	Top of Riser Elevation (ft)	Depth to Groundwater (ft)	Groundwater Elevation (ft)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	TPH as Gasoline (µg/L)	MTBE (µg/L)
AR-1	06/26/00	15.61	11.59	4.02	NA	NA	NA	NA	NA	NA
	07/20/00		12.06	3.55	<0.5	<0.5	<0.5	<1.0	<50	6
	09/19/00		11.89	3.72	<0.5	<0.5	<0.5	<1.0	<50	<3
AR-2	06/26/00	15.28	11.79	3.49	NA	NA	NA	NA	NA	NA
	07/20/00		12.07	3.21	<0.5	<0.5	<0.5	<1.0	<50	<3
	09/19/00		12.08	3.20	<0.5	<0.5	<0.5	<1.0	<50	<3
ADR-1	06/26/00	13.95	10.55	3.40	NA	NA	NA	NA	NA	NA
	07/20/00		10.85	3.10	29	<0.5	0.8	<1.0	180	22
	09/19/00		11.08	2.87	7.4	<0.5	1.2	<1.0	120	22
ADR-2	06/26/00	14.64	11.22	3.42	NA	NA	NA	NA	NA	NA
	07/20/00		11.60	3.04	410	2.5	540	720	12,000	23
	09/19/00		11.81	2.83	530	5	680	740	1,400	34
A-1	06/26/00	14.16	10.75	3.41	NA	NA	NA	NA	NA	NA
	07/20/00		11.01	3.15	1,100	28	12	46	3,900	25
	09/19/00		11.26	2.90	2,400	27	20	57	4,800	32
A-2	06/26/00	14.55	11.27	3.28	NA	NA	NA	NA	NA	NA
	07/20/00		11.52	3.03	<0.5	<0.5	<0.5	<1.0	<50	<3
	09/19/00		11.63	2.92	NS	NS	NS	NS	NS	NS
A-3	06/26/00	15.75	11.98	3.77	NS	NS	NS	NS	NS	NS
	07/20/00		12.21	3.54	NS	NS	NS	NS	NS	NS
	09/19/00		12.50	3.25	NS	NS	NS	NS	NS	NS

TABLE 1

GROUNDWATER ANALYTICAL DATA

ARCO Service Station No. 2169  
889 West Grand Avenue  
Oakland, California

Well Number	Date Sampled	Top of Riser Elevation (ft)	Depth to Groundwater (ft)	Groundwater Elevation (ft)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	TPH as Gasoline (µg/L)	MTBE (µg/L)
A-4	06/26/00	15.25	10.99	4.26	NS	NS	NS	NS	NS	NS
	07/20/00		11.16	4.09	NS	NS	NS	NS	NS	NS
	09/19/00		11.97	3.28	NS	NS	NS	NS	NS	NS
A-5	06/26/00	13.51	10.04	3.47	NA	NA	NA	NA	NA	NA
	07/20/00		10.31	3.20	140	11	<0.5	8.9	730	3
	09/19/00		10.55	2.96	13	<0.5	2.8	1.9	160	<3
A-6	06/26/00	13.51	10.09	3.42	NA	NA	NA	NA	NA	NA
	07/20/00		10.91	2.60	<0.5	<0.5	0.6	2.0	170	6
	09/19/00		11.27	2.24	<0.5	<0.5	<0.5	<1.0	<50	6

TPH = Total Petroleum Hydrocarbons

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

µg/L = Micrograms per liter

NM = Not measured

NC = Not calculated

Note: Please refer to Appendix B for Historical Groundwater Elevation and Analytical Data Tables developed by JT Corporation

TABLE 2

GROUNDWATER FLOW DIRECTION AND GRADIENT

ARCO Service Station No.

<u>Date Measured</u>	<u>Average Flow Direction</u>	<u>Average Hydraulic Gradient</u>
07/20/00	Northwest	0.004
09/19/00	West-Northwest	0.003

Refer to Appendix B - Historical Groundwater Elevation and Analytical Data Tables  
developed by IT Corporation

TABLE 3

**SVE SYSTEM ANALYTICAL RESULTS**

ARCO Service Station No. 2169  
889 West Grand Avenue  
Oakland, California

Sample I.D.	Date	Benzene (ppmv)	Toluene (ppmv)	Ethyl-benzene (ppmv)	Total Xylenes (ppmv)	Purgeable Hydrocarbons (ppmv)	Methane (ppmv)
Influent	09/20/00	5.56	1.0	<0.12	0.88	246	47,000
Effluent	09/20/00	<0.016	<0.013	<0.012	<0.012	<2.4	5,700

ppmv = parts per million by volume

TABLE 4

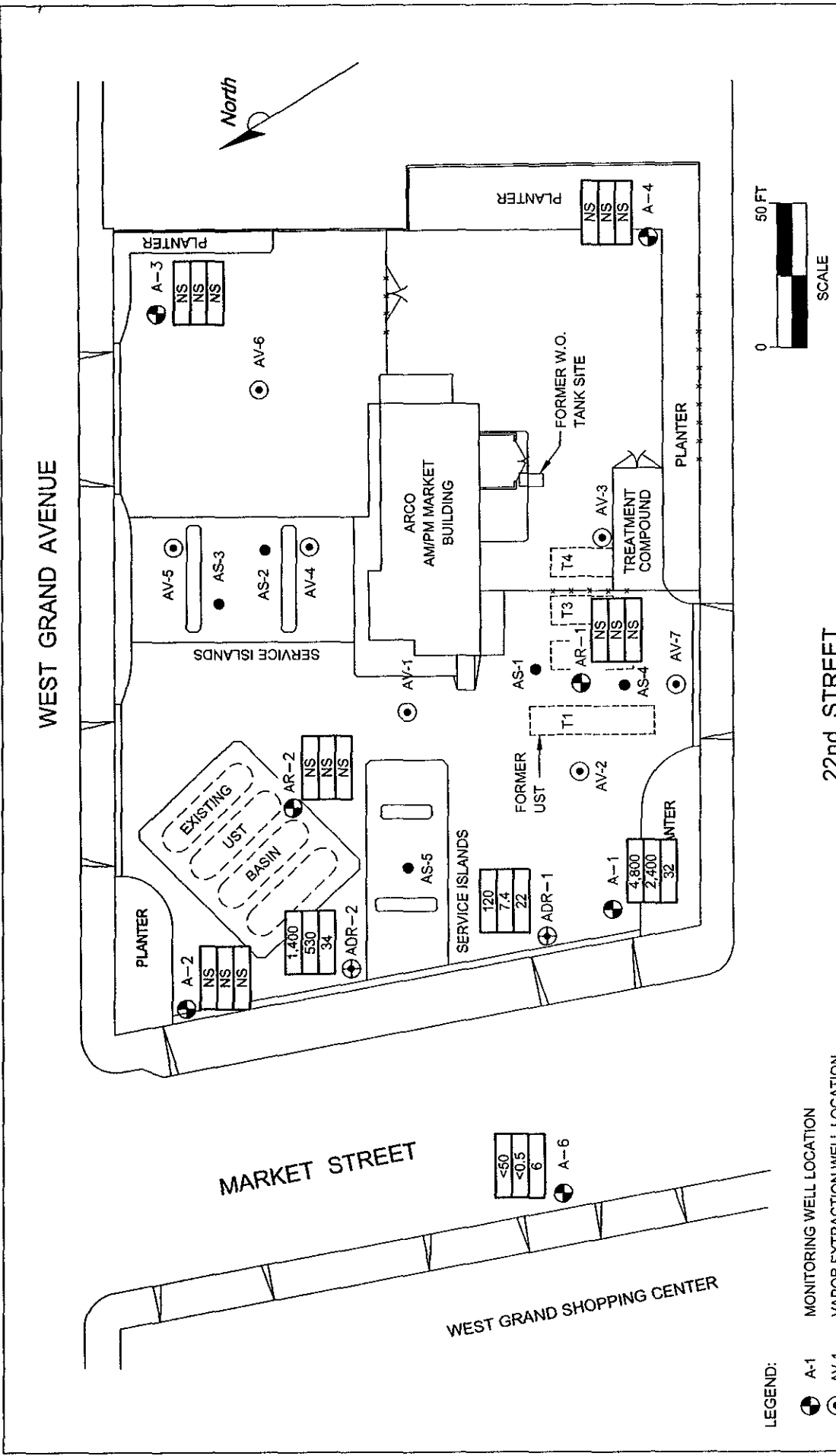
SVE SYSTEM MONITORING TABLE

Arco Service Station No.2169  
 889 West Grand Avenue  
 Oakland, California

Date Sampled	Inlet Flow Rate (ft <sup>3</sup> /min)	Hour Meter Reading	Change in Hours of Operation	TPHg Influent (ppmv)	TPHg Effluent (ppmv)	Benzene Influent (ppmv)	Benzene Effluent (ppmv)	TPHg Extraction Rate (lbs/day)	TPHg Mass Emission (lbs/day)	Benzene Extraction Rate (lbs/day)	Benzene Emission Rate (lbs/day)	Cumulative Volume of Processed Air (cubic feet)	Period TPHg Extraction (lbs)	Cumulative TPHg Extraction (lbs)
12/01/99	43	10,700	673	180	<5.0	0.2	<0.1	2.48	<0.07	0.003	<0.0012	0.00 E+00	NC	9,010
09/20/00	108	11,062	362	246	<2.4	5.56	<0.016	8.45	<0.08	0.191	<0.0005	1.64 E+06	82.4	9,092

TPHg = Total petroleum hydrocarbons as gasoline.  
 ppmv = Parts per million by volume.





**FIGURE 1**  
**GROUND WATER ANALYTICAL SUMMARY**  
**SECOND QUARTER 2000**  
**ARCO SERVICE STATION NO. 2169**  
**889 WEST GRAND AVENUE**  
**OAKLAND, CALIFORNIA**

PROJECT NO.	D000-311	DRAWN BY	TLA 6/30/00
FILE NO.	2169-1	PREPARED BY	TLA
REVISION NO.	1	REVIEWED BY	



22nd STREET

160
T3
<3.0

● A-5

- LEGEND:**
- A-1 MONITORING WELL LOCATION
  - AV-1 VAPOR EXTRACTION WELL LOCATION
  - ⊕ ADR-1 GROUND WATER MONITORING/VAPOR EXTRACTION WELL
  - AS-1 AIR SPARGING WELL LOCATION

<50
<0.5
<3.0

NS NOT SAMPLED

4,800
2,400
32

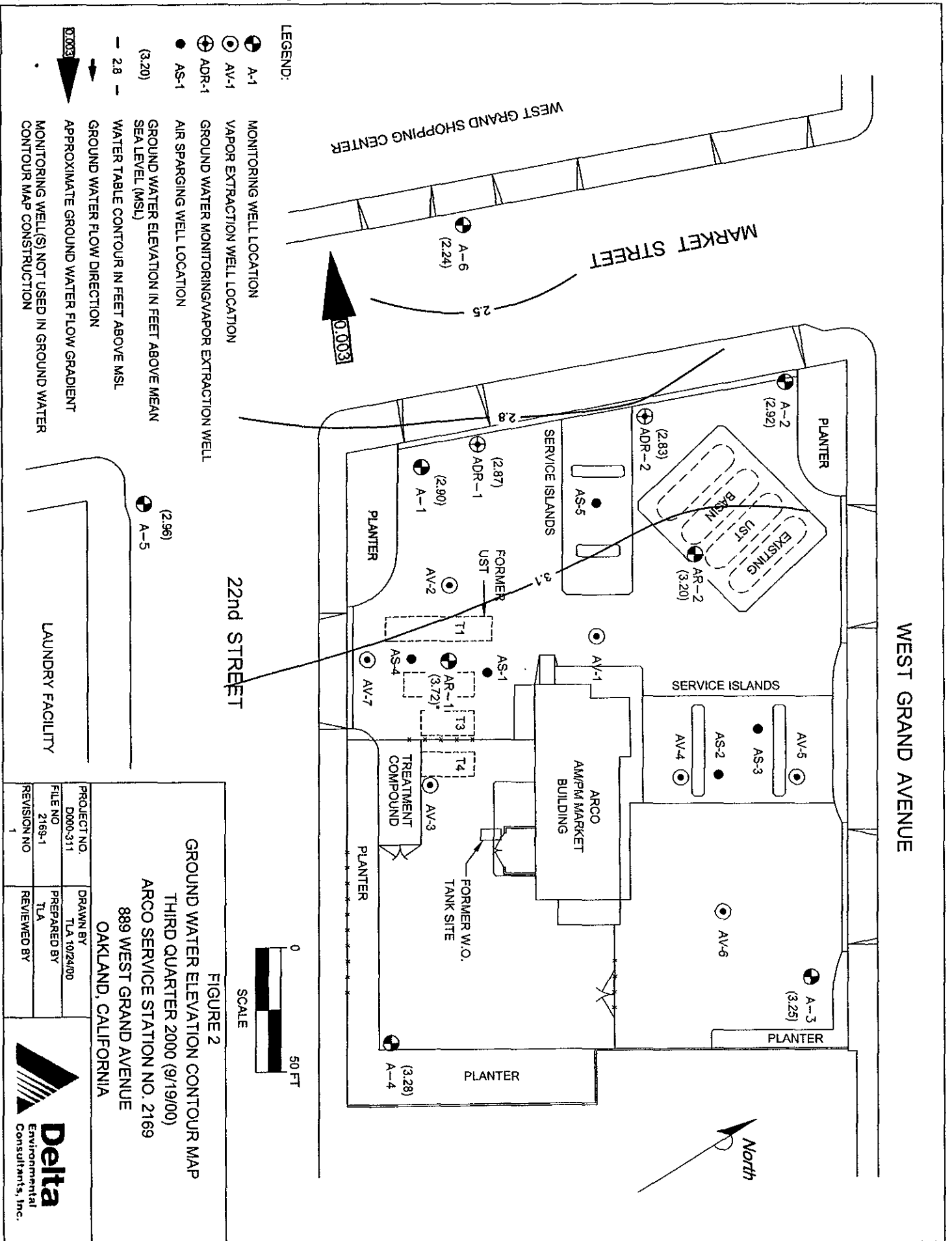
● A-6

<50
<0.5
6

MARKET STREET

WEST GRAND SHOPPING CENTER

LAUNDRY FACILITY



## **APPENDIX A**

### **Sampling and Analysis Procedures**

## **FIELD METHODS AND PROCEDURES**

### **1.0 GROUND WATER AND LIQUID-PHASE HYDROCARBON DEPTH ASSESSMENT**

A water/liquid-phase hydrocarbon (LPH) interface probe was used to assess the thickness of LPH, if present, and a water level indicator was used to measure ground water depth in monitoring wells that did not contain LPH. Depth to ground water was measured from the top of each monitoring well casing. The tip of the water level indicator was subjectively analyzed for LPH sheen. All measurements and physical observations were recorded in the field.

### **2.0 SUBJECTIVE ANALYSIS OF GROUND WATER**

Prior to purging, a water sample was collected from the monitoring well for subjective analysis. The sample was retrieved by gently lowering a clean, disposable bailer to approximately one-half the bailer length past the air/liquid interface. The bailer was then retrieved and the sample contained within the bailer was examined for LPH and the appearance of a LPH sheen.

### **3.0 MONITORING WELL PURGING AND SAMPLING**

Monitoring wells were purged using a centrifugal pump or disposable bailers until pH, temperature, and conductivity of the purge water had stabilized and a minimum of three to four well volumes of water had been removed. Ground water removed from the wells was stored in 55-gallon barrels at the site. The barrels were labeled with corresponding monitoring well numbers and the date of purging. After purging, ground water levels were allowed to stabilize. A ground water sample was then removed from each of the wells using a dedicated disposable bailer. If the well was purged dry, it was allowed to sufficiently recharge and a sample was collected. Samples were collected in air-tight vials, appropriately labeled, and stored on ice from the time of collection through the time of delivery to the laboratory. A chain-of-custody form was completed to document possession of the samples. Ground water samples were transported to the laboratory and analyzed within the EPA-specified holding times for the requested analyses. Purge water will be collected from the storage barrels in a vacuum truck and transported to an appropriate facility for treatment and/or disposal.

If the depth to groundwater was above the top of screens of the monitoring wells, then the wells were purged. Before sampling occurred, a polyvinyl chloride (PVC) bailer, centrifugal pump, low-flow submersible pump, or Teflon bailer was used to purge standing water in the casing and gravel pack from the monitoring well. Monitoring wells were purged according to the protocol previously stated in the first paragraph of this sub-section. In most monitoring wells, the amount of water purged before sampling was greater than or equal to three casing volumes. Some monitoring wells were expected to be evacuated to dryness after removing fewer than three casing volumes. These low-yield monitoring wells were allowed to recharge for up to 24 hours. Samples were obtained as soon as the monitoring wells recharged to a level sufficient for sample collection. If insufficient water recharged after 24 hours, the monitoring well was recorded as dry for the sampling event.

**APPENDIX B**

Historical Data Tables  
IT Corporation

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

**ARCO Service Station 2169**  
**889 West Grand Avenue, Oakland, California**

Well Number	Date Gauged	TOC		Depth to Water (feet)	FP Thickness (feet)	Groundwater Elevation (ft-MSL)		Date Sampled	TPH			Ethylbenzene (µg/L)	Toluene (µg/L)	Benzene (µg/L)	Total Xylenes (µg/L)	MTBE 8021B* (µg/L)	MTBE 8260 (µg/L)	TPH Diesel (µg/L)	Dissolved Oxygen (mg/L)	Purged/Not Purged (P/NP)
		Elevation (ft-MSL)	Depth (feet)			Gasoline (µg/L)	Benzene (µg/L)		Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)									
A-1	03-24-95	14.16	8.10	ND	6.06	ND	1,200	03-24-95	230	39	34	66	--	--	--	--	160			
A-1	06-05-95	14.16	11.13	ND	3.03	ND	1,500	06-05-95	310	27	36	76	--	--	--	--	710			
A-1	08-17-95	14.16	11.71	ND	2.45	ND	1,600	08-18-95	470	35	48	110	120	--	--	--	240			
A-1	12-04-95	14.16	12.28	ND	1.88	ND	1,200	12-04-95	240	17	25	56	--	--	120	--	--	--		
A-1	03-01-96	14.16	8.78	ND	5.38	ND	1,300	03-13-96	300	74	29	73	100	--	--	--	--			
A-1	05-29-96	14.16	9.85	ND	4.31	ND	Not sampled	05-29-96	well sampled semi-annually, during the first and third quarters											
A-1	08-29-96	14.16	11.08	ND	3.08	ND	1,200	08-29-96	320	5.9	25	27	110	--	--	--	--			
A-1	11-21-96	14.16	10.54	ND	3.62	ND	Not sampled	11-21-96	well sampled semi-annually, during the first and third quarters											
A-1	03-26-97	14.16	10.55	ND	3.61	ND	<50	03-26-97	0.8	<0.5	<0.5	<0.5	64	--	--	--	--			
A-1	05-21-97	14.16	11.10	ND	3.06	ND	Not sampled	05-21-97	well sampled semi-annually, during the first and third quarters											
A-1	08-08-97	14.16	11.32	ND	2.84	ND	91	08-08-97	7	<0.5	0.5	3.9	<60	--	--	--	--			
A-1	11-18-97	14.16	3.46	ND	10.70	ND	54	11-18-97	<0.5	<0.5	<0.5	0.6	27	--	--	--	--			
A-1	02-20-98	14.16	7.10	ND	7.06	ND	590	02-23-98	160	22	15	28	70	--	--	--	--			
A-1	05-11-98	14.16	9.87	ND	4.29	ND	280	05-11-98	26	<0.5	0.8	2.3	6	--	--	--	--			
A-1	07-30-98	14.16	10.73	ND	3.43	ND	1,000	07-30-98	210	5	<5	38	<30	--	--	--	--			
A-1	10-08-98	14.16	11.15	ND	3.01	ND	3,100	10-08-98	740	11	<10	24	<60	--	--	--	--			
A-1	02-18-99	14.16	8.00	ND	6.16	ND	510	02-18-99	87	7.1	6.4	13	52	--	--	--	--			
A-1	05-26-99	14.16	10.60	ND	3.56	ND	240	05-26-99	26	<0.5	1.2	6.2	34	--	--	--	--			
A-1	08-23-99	14.16	11.22	ND	2.94	ND	79	08-23-99	3.9	0.6	<0.5	1.7	38	--	--	--	--	0.68	NP	
A-1	10-27-99	14.16	11.37	ND	2.79	ND	110	10-27-99	2.2	<0.5	<0.5	<1	25	--	--	--	--	0.80	NP	
A-1	01-31-00	14.16	9.44	ND	4.72	ND	<50	01-31-00	<0.5	<0.5	<0.5	<1	<3	--	--	--	--	1.0	NP	
A-2	03-24-95	14.55	8.64	ND	5.91	ND	<50	03-24-95	<0.5	<0.5	<0.5	<0.5	<0.5	--	--	--	--			
A-2	06-05-95	14.55	11.72	ND	2.83	ND	<50	06-05-95	<0.5	<0.5	<0.5	<0.5	<0.5	--	--	--	--			
A-2	08-17-95	14.55	12.35	ND	2.20	ND	<50	08-17-95	<0.5	<0.5	<0.5	<0.5	12	--	--	--	--			
A-2	12-04-95	14.55	12.74	ND	1.81	ND	<50	12-04-95	<0.5	<0.5	<0.5	<0.5	<0.5	--	--	--	--			
A-2	03-01-96	14.55	9.34	ND	5.21	ND	<50	03-13-96	<0.5	0.6	<0.5	1.3	<9	--	--	--	--			

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

**ARCO Service Station 2169**  
**889 West Grand Avenue, Oakland, California**

Well Number	Date Gauged	TOC Elevation (ft-MSL)	Depth to Water (feet)	FP Thickness (feet)	Groundwater Elevation (ft-MSL)	Date Sampled	TPH			Ethylbenzene (µg/L)	Total Xylenes (µg/L)	MTBE		TPH Diesel (µg/L)	Dissolved Oxygen (mg/L)	Purged/ Not Purged (P/NP)
							Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)			8021B* (µg/L)	8260 (µg/L)			
A-2	05-29-96	14.55	10.40	ND	4.15	05-29-96	<50	<0.5	<0.5	<0.5	<20	--	--			
A-2	08-29-96	14.55	11.50	ND	3.05	08-29-96	<50	<0.5	<0.5	<39	--	--				
A-2	11-21-96	14.55	11.06	ND	3.49	11-21-96	<50	<0.5	<0.5	<30	--	--				
A-2	03-26-97	14.55	11.12	ND	3.43	03-26-97	<50	<0.5	<0.5	<20	--	--				
A-2	05-21-97	14.55	11.58	ND	2.97	05-21-97	Not sampled: well sampled semi-annually, during the first and third quarters			<20	--					
A-2	08-08-97	14.55	11.82	ND	2.73	08-08-97	<50	<0.5	<0.5	<20	--	--				
A-2	11-18-97	14.55	3.33	ND	11.22	11-18-97	Not sampled: well sampled semi-annually, during the first and third quarters			17	--					
A-2	02-20-98	14.55	7.68	ND	6.87	02-20-98	<50	<0.5	<0.5	<0.5	--	--				
A-2	05-11-98	14.55	10.45	ND	4.10	05-11-98	Not sampled				--					
A-2	07-30-98	14.55	11.23	ND	3.32	07-30-98	Not sampled: well sampled semi-annually, during the first and second quarters				--					
A-2	10-08-98	14.55	11.62	ND	2.93	10-08-98	Not sampled: well sampled semi-annually, during the first and second quarters				--					
A-2	02-18-99	14.55	8.62	ND	5.93	02-18-99	93	<0.5	<0.5	<1	26	--				
A-2	05-26-99	14.55	11.16	ND	3.39	05-26-99	<50	<0.5	<0.5	<0.5	<3	--				
A-2	08-23-99	14.55	11.69	ND	2.86	08-23-99	Not sampled: well sampled semi-annually, during the first and second quarters				--			0.59		
A-2	10-27-99	14.55	11.88	ND	2.67	10-27-99	Not sampled: well sampled semi-annually, during the first and second quarters				--			0.59		
A-2	01-31-00	14.55	10.17	ND	4.38	01-31-00	<50	<0.5	<0.5	<1	<3	--		1.0	NP	
A-3	03-24-95	15.75	8.83	ND	6.92	03-24-95	<50	<0.5	<0.5	<0.5	--	--				
A-3	06-05-95	15.75	12.44	ND	3.31	06-05-95	Not sampled: well sampled annually				--					
A-3	08-17-95	15.75	13.04	ND	2.71	08-17-95	Not sampled: well sampled annually				--					
A-3	12-04-95	15.75	13.57	ND	2.18	12-04-95	Not sampled: well sampled annually				--					
A-3	03-01-96	15.75	9.90	ND	5.85	03-13-96	<50	<0.5	<0.5	<0.5	<3	--				
A-3	05-29-96	15.75	11.08	ND	4.67	05-29-96	Not sampled: well sampled annually				--					
A-3	08-29-96	15.75	12.38	ND	3.37	08-29-96	Not sampled: well sampled annually				--					
A-3	11-21-96	15.75	11.86	ND	3.89	11-21-96	Not sampled: well sampled annually				--					
A-3	03-26-97	15.75	11.81	ND	3.94	03-26-97	<50	<0.5	<0.5	<0.5	<3	--				
A-3	05-21-97	15.75	12.35	ND	3.40	05-21-97	Not sampled: well sampled annually				--					

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

**ARCO Service Station 2169**  
**889 West Grand Avenue, Oakland, California**

Well Number	Date Gauged	TOC		Depth to Water (feet)	FP Thickness (feet)	Groundwater Elevation (ft-MSL)		Date Sampled	TPH		Ethyl-benzene (µg/L)	Toluene (µg/L)	Benzene (µg/L)	Total Xylenes (µg/L)	MTBE 8021B* (µg/L)	MTBE 8260 (µg/L)	TPH Diesel (µg/L)	Dissolved Oxygen (mg/L)	Purged/Not Purged (P/NP)
		Elevation (ft-MSL)	Thickness (feet)			Elevation (ft-MSL)	Elevation (ft-MSL)		Gasoline (µg/L)	Gasoline (µg/L)									
A-3	08-08-97	15.75	ND	12.62	ND	3.13	12.00	08-08-97	Not sampled: well sampled annually										
A-3	11-18-97	15.75	ND	3.75	ND	12.00	7.69	11-18-97	Not sampled: well sampled annually										
A-3	02-20-98	15.75	ND	8.06	ND	7.69	4.56	02-20-98	<50	<0.5	<0.5	<0.5	<3						
A-3	05-11-98	15.75	ND	11.19	ND	4.56	3.70	05-11-98	Not sampled: well sampled annually										
A-3	07-30-98	15.75	ND	12.05	ND	3.70	3.32	07-30-98	Not sampled: well sampled annually										
A-3	10-08-98	15.75	ND	12.43	ND	3.32	6.70	10-08-98	Not sampled: well sampled annually										
A-3	02-18-99	15.75	ND	9.05	ND	6.70	3.82	02-18-99	Not sampled: well sampled annually										
A-3	05-26-99	15.75	ND	11.93	ND	3.82	3.18	05-26-99	<50	<0.5	<0.5	<0.5	<3					0.88	
A-3	08-23-99	15.75	ND	12.57	ND	3.18	3.10	08-23-99	Not sampled: well sampled annually										
A-3	10-27-99	15.75	ND	12.65	ND	3.10	6.20	10-27-99	Not sampled: well sampled annually										
A-3	01-31-00	15.75	ND	9.55	ND	6.20		01-31-00	<50	<0.5	<0.5	<0.5	9					1.0	NP
A-4	03-24-95	15.25	ND	7.20	ND	8.05	3.55	03-24-95	<50	<0.5	<0.5	<0.5							
A-4	06-05-95	15.25	ND	11.70	ND	3.55	2.97	06-05-95	Not sampled: well sampled annually										
A-4	08-17-95	15.25	ND	12.28	ND	2.97	2.62	08-17-95	Not sampled: well sampled annually										
A-4	12-04-95	15.25	ND	12.63	ND	2.62	6.70	12-04-95	Not sampled: well sampled annually										
A-4	03-01-96	15.25	ND	8.55	ND	6.70	4.93	03-13-96	<50	<0.5	<0.5	<0.5	<3						
A-4	05-29-96	15.25	ND	10.32	ND	4.93	3.70	05-29-96	Not sampled: well sampled annually										
A-4	08-29-96	15.25	ND	11.55	ND	3.70	4.42	08-29-96	Not sampled: well sampled annually										
A-4	11-21-96	15.25	ND	10.83	ND	4.42	4.28	11-21-96	Not sampled: well sampled annually										
A-4	03-26-97	15.25	ND	10.97	ND	4.28	3.74	03-26-97	<50	<0.5	<0.5	<0.5	<3						
A-4	05-21-97	15.25	ND	11.51	ND	3.74	3.52	05-21-97	Not sampled: well sampled annually										
A-4	08-08-97	15.25	ND	11.73	ND	3.52	10.88	08-08-97	Not sampled: well sampled annually										
A-4	11-18-97	15.25	ND	4.37	ND	10.88	9.00	11-18-97	Not sampled: well sampled annually										
A-4	02-20-98	15.25	ND	6.25	ND	9.00	4.92	02-20-98	<50	<0.5	<0.5	<0.5	<3						
A-4	05-11-98	15.25	ND	10.33	ND	4.92	4.00	05-11-98	Not sampled: well sampled annually										
A-4	07-30-98	15.25	ND	11.25	ND	4.00		07-30-98	Not sampled: well sampled annually										



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**1995 - Present\*\*\***

**ARCO Service Station 2169**  
**889 West Grand Avenue, Oakland, California**

Well Number	Date Gauged	TOC Elevation (ft-MSL)	Depth to Water (feet)	FP Thickness (feet)	Groundwater Elevation (ft-MSL)	Date Sampled	TPH Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	MTBE 8021B* (µg/L)	MTBE 8260 (µg/L)	TPH Diesel (µg/L)	Dissolved Oxygen (mg/L)	Purged/Not Purged (P/NP)	
A-4	10-08-98	15.25	11.62	ND	3.63	10-08-98	Not sampled: well sampled annually										
A-4	02-18-99	15.25	7.12	ND	8.13	02-18-99	Not sampled: well sampled annually										
A-4	05-26-99	15.25	11.12	ND	4.13	05-26-99	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--			
A-4	08-23-99	15.25	11.62	ND	3.63	08-23-99	Not sampled: well sampled annually										
A-4	10-27-99	15.25	11.74	ND	3.51	10-27-99	Not sampled: well sampled annually										
A-4	01-31-00	15.25	9.45	ND	5.80	01-31-00	<50	<0.5	<0.5	<0.5	<1	4	--	--	1.0	NP	
A-5	03-24-95	13.51	7.40	ND	6.11	03-24-95	3,300	200	310	130	460	--	--	--			
A-5	06-05-95	13.51	10.43	ND	3.08	06-05-95	57,000	2,700	4,600	1,500	6,800	--	--	--			
A-5	08-17-95	13.51	11.15	ND	2.36	08-18-95	34,000	1,600	2,700	1,100	5,100	<28	--	--			
A-5	12-04-95	13.51	11.42	ND	2.09	12-04-95	61	<0.5	<0.5	<0.5	<0.5	--	--	--			
A-5	03-01-96	13.51	8.11	ND	5.40	03-13-96	11,000	860	960	380	1,600	<100	--	--			
A-5	05-29-96	13.51	9.30	ND	4.21	05-29-96	19,000	1,600	1,900	880	3,300	<100	--	--			
A-5	08-29-96	13.51	10.60	ND	2.91	08-29-96	7,700	490	450	260	990	<30	--	--			
A-5	11-21-96	13.51	10.05	ND	3.46	11-21-96	8,000	450	550	340	1,100	<30	--	--			
A-5	03-26-97	13.51	9.87	ND	3.64	03-26-97	3,100	190	140	130	340	<30	--	--			
A-5	05-21-97	13.51	10.25	ND	3.26	05-21-97	16,000	1,500	900	700	2,700	<120	--	--			
A-5	08-08-97	13.51	10.42	ND	3.09	08-08-97	9,000	690	240	440	1,300	<30	--	--			
A-5	11-18-97	13.51	Not surveyed: well inaccessible														
A-5	02-20-98	13.51	Not surveyed: well inaccessible														
A-5	05-11-98	13.51	Not surveyed: well inaccessible														
A-5	07-30-98	13.51	Not surveyed: well inaccessible														
A-5	10-08-98	13.51	Not surveyed: well inaccessible														
A-5	02-18-99	13.51	7.63	ND	5.88	02-18-99	<50	0.8	<0.5	<0.5	1.5	<10	--	--			
A-5	05-26-99	13.51	9.85	ND	3.66	05-26-99	1,700	240	41	110	330	<12	--	--			
A-5	08-23-99	13.51	10.60	ND	2.91	08-23-99	560	65	3	30	52	<6	--	--	0.73	NP	
A-5	10-27-99	13.51	10.72	ND	2.79	10-27-99	480	93	1.0	16	19	<3	--	--	0.65	NP	

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Well Number	Date Gauged	TOC Elevation (ft-MSL)	Depth to Water (feet)	FP Thickness (feet)	Groundwater Elevation (ft-MSL)	Date Sampled	TPH Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	MTBE 8021B* (µg/L)	MTBE 8260 (µg/L)	TPH Diesel (µg/L)	Dissolved Oxygen (mg/L)	Purged/ Not Purged (P/NP)
A-5	01-31-00	13.51	9.37	ND	4.14	01-31-00	Not sampled: well was inaccessible									
A-6	03-24-95	13.51	7.89	ND	5.62	03-24-95	120	<0.5	<1	<0.5	<1.5	--	--	--		
A-6	06-05-95	13.51	10.06	ND	3.45	06-05-95	160	<0.5	<0.6	<0.5	<0.5	--	--	--		
A-6	08-17-95	13.51	11.10	ND	2.41	08-18-95	530	<0.5	<0.5	<2.4	<4.2	6	--	--		
A-6	12-04-95	13.51	11.52	ND	1.99	12-04-95	28,000	1,600	1,800	880	3,600	--	--	--		
A-6	03-01-96	13.51	8.21	ND	5.30	03-13-96	1,400	<3	<15	<7	<10	<20	--	--		
A-6	05-29-96	13.51	9.25	ND	4.26	05-29-96	410	<2	<2	<2	<2	3	--	--		
A-6	08-29-96	13.51	10.52	ND	2.99	08-29-96	80	<0.5	<0.5	<0.5	<0.5	6	--	--		
A-6	11-21-96	13.51	10.54	ND	2.97	11-21-96	62	<0.5	<0.5	<0.5	<0.5	12	--	--		
A-6	03-26-97	13.51	9.93	ND	3.58	03-26-97	110	<0.5	0.8	1	1.4	15	--	--		
A-6	05-21-97	13.51	10.54	ND	2.97	05-21-97	600	0.6	0.6	<2	2.7	<3	--	--		
A-6	08-08-97	13.51	10.77	ND	2.74	08-08-97	850	<0.5	<0.5	6.1	<0.5	<4	--	--		
A-6	11-18-97	13.51	3.41	ND	10.10	11-18-97	690	<1	<1	3	2	7	--	--		
A-6	02-20-98	13.51	6.73	ND	6.78	02-20-98	60	<0.5	0.6	1.3	0.5	4	--	--		
A-6	05-11-98	13.51	9.26	ND	4.25	05-11-98	140	<0.5	0.7	0.6	<0.5	6	--	--		
A-6	07-30-98	13.51	10.12	ND	3.39	07-30-98	910	<2	<2	3	7	34	--	--		
A-6	10-08-98	13.51	10.53	ND	2.98	10-08-98	1,300	<2	4	3	4	21	--	--		
A-6	02-18-99	13.51	7.50	ND	6.01	02-18-99	150	<0.5	<0.5	1.4	1.7	35	--	--		
A-6	05-26-99	13.51	10.00	ND	3.51	05-26-99	100	<0.5	<0.5	<0.5	<0.5	17	--	--		
A-6	08-23-99	13.51	10.70	ND	2.81	08-23-99	98	0.6	<0.5	1.1	4.3	13	--	--	2.42	NP
A-6	10-27-99	13.51	11.00	ND	2.51	10-27-99	<50	<0.5	<0.5	<0.5	<1	7	--	--	13.23	NP
A-6	01-31-00	13.51	9.31	ND	4.20	01-31-00	<50	<0.5	<0.5	<0.5	<1	9	--	--	1.0	NP
AR-1	03-24-95	15.61	7.25	ND	8.36	03-24-95	270	14	0.6	2.5	2.1	--	--	130		
AR-1	06-05-95	15.61	11.37	ND	4.24	06-05-95	190	10	<0.5	0.8	0.5	--	--	580		
AR-1	08-17-95	15.61	12.40	ND	3.21	08-17-95	960	110	12	4.5	150	14	--	<50		

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Well Number	Date Gauged	TOC Elevation (ft-MSL)	Depth to Water (feet)	FP Thickness (feet)	Groundwater Elevation (ft-MSL)	Date Sampled	TPH Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	MTBE 8021B* (µg/L)	MTBE 8260 (µg/L)	TPH Diesel (µg/L)	Dissolved Oxygen (mg/L)	Purged/ Not Purged (P/NP)
AR-1	12-04-95	15.61	12.90	ND	2.71	12-04-95	<50	1.5	<0.5	<0.5	0.8	--	--	--		
AR-1	03-01-96	15.61	8.19	ND	7.42	03-13-96	150	3.8	0.5	1.4	1.3	<3	--	--		
AR-1	05-29-96	15.61	10.41	ND	5.20	05-29-96	Not sampled: well sampled semi-annually, during the first and third quarters									
AR-1	08-29-96	15.61	12.12	ND	3.49	08-29-96	<50	<0.5	<0.5	<0.5	0.8	<3	--	--		
AR-1	11-21-96	15.61	11.52	ND	4.09	11-21-96	Not sampled: well sampled semi-annually, during the first and third quarters									
AR-1	03-26-97	15.61	11.33	ND	4.28	03-26-97	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--		
AR-1	05-21-97	15.61	12.02	ND	3.59	05-21-97	Not sampled: well sampled semi-annually, during the first and third quarters									
AR-1	08-08-97	15.61	12.31	ND	3.30	08-08-97	<50	0.7	<0.5	1	<0.5	<3	--	--		
AR-1	11-18-97	15.61	3.97	ND	11.64	11-18-97	Not sampled: well sampled semi-annually, during the first and third quarters									
AR-1	02-20-98	15.61	6.42	ND	9.19	02-23-98	<200	<2	<2	<2	<2	160	--	--		
AR-1	05-11-98	15.61	10.93	ND	4.68	05-11-98	<50	<0.5	<0.5	<0.5	<0.5	4	--	--		
AR-1	07-30-98	15.61	11.82	ND	3.79	07-30-98	<50	<0.5	<0.5	<0.5	<0.5	6	--	--		
AR-1	10-08-98	15.61	12.24	ND	3.37	10-08-98	<50	<0.5	<0.5	<0.5	<0.5	6	--	--		
AR-1	02-18-99	15.61	7.75	ND	7.86	02-18-99	<50	<0.5	<0.5	<0.5	<1.0	<10	--	--		
AR-1	05-26-99	15.61	11.62	ND	3.99	05-26-99	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--		
AR-1	08-23-99	15.61	9.32	ND	6.29	08-23-99	Not sampled: well sampled semi-annually, during the first and second quarters									
AR-1	10-27-99	15.61	12.14	ND	3.47	10-27-99	Not sampled: well sampled semi-annually, during the first and second quarters									
AR-1	01-31-00	15.61	Not surveyed: well inaccessible													
AR-2	03-24-95	15.28	9.13	ND	6.15	03-24-95	<50	6.2	<0.5	<0.5	0.6	--	--	<50		
AR-2	06-05-95	15.28	12.09	ND	3.19	06-05-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	<50		
AR-2	08-17-95	15.28	12.78	ND	2.50	08-18-95	<50	<0.5	<0.5	<0.5	<0.5	4	--	<50		
AR-2	12-04-95	15.28	11.44	ND	3.84	12-13-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--		
AR-2	03-01-96	15.28	9.83	ND	5.45	03-13-96	190	26	2.6	3.3	13	200	--	--		
AR-2	05-29-96	15.28	10.97	ND	4.31	05-29-96	Not sampled: well sampled semi-annually, during the first and third quarters									
AR-2	08-29-96	15.28	12.20	ND	3.08	08-29-96	<50	<0.5	<0.5	<0.5	<0.5	95	--	--		
AR-2	11-21-96	15.28	11.57	ND	3.71	11-21-96	Not sampled: well sampled semi-annually, during the first and third quarters									

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Well Number	Date Gauged	TOC Elevation (ft-MSL)	Depth to Water (feet)	FP Thickness (feet)	Groundwater Elevation (ft-MSL)	Date Sampled	TPH Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	MTBE 8021B* (µg/L)	MTBE 8260 (µg/L)	TPH Diesel (µg/L)	Dissolved Oxygen (mg/L)	Purged/ Not Purged (P/NP)	
AR-2	03-26-97	15.28	11.60	ND	3.68	03-26-97	<50	<0.5	<0.5	<0.5	<0.5	9	--	--			
AR-2	05-21-97	15.28	12.12	ND	3.16	05-21-97	Not sampled: well sampled semi-annually, during the first and third quarters										
AR-2	08-08-97	15.28	12.35	ND	2.93	08-08-97	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--			
AR-2	11-18-97	15.28	3.48	ND	11.80	11-18-97	Not sampled: well sampled semi-annually, during the first and third quarters										
AR-2	02-20-98	15.28	8.00	ND	7.28	02-20-98	<50	<0.5	<0.5	<0.5	<0.5	43	--	--			
AR-2	05-11-98	15.28	10.97	ND	4.31	05-11-98	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--			
AR-2	07-30-98	15.28	11.76	ND	3.52	07-30-98	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--			
AR-2	10-08-98	15.28	12.17	ND	3.11	10-08-98	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--			
AR-2	02-18-99	15.28	9.17	ND	6.11	02-18-99	<50	<0.5	<0.5	<0.5	<1.0	<10	--	--			
AR-2	05-26-99	15.28	11.72	ND	3.56	05-26-99	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--			
AR-2	08-23-99	15.28	12.31	ND	2.97	08-23-99	Not sampled: well sampled semi-annually, during the first and second quarters										0.61
AR-2	10-27-99	15.28	12.42	ND	2.86	10-27-99	Not sampled: well sampled semi-annually, during the first and second quarters										
AR-2	01-31-00	15.28	10.31	ND	4.97	01-31-00	Not sampled										
ADR-1	03-24-95	13.95	8.04	0.01	** 5.92	03-24-95	Not sampled: well contained floating product										
ADR-1	06-05-95	13.95	11.02	ND	2.93	06-05-95	23,000	310	420	300	1,900	--	--	13,000			
ADR-1	08-17-95	13.95	11.86	ND	2.09	08-18-95	4,400	150	120	95	620	120	--	4,500			
ADR-1	12-04-95	13.95	10.05	ND	3.90	12-13-95	8,800	100	130	120	990	--	--	--			
ADR-1	03-01-96	13.95	8.76	ND	5.19	03-13-96	89,000	370	1,000	840	8,100	<500	--	--			
ADR-1	05-29-96	13.95	9.74	ND	4.21	05-30-96	27,000	230	380	370	2,700	<100	--	--			
ADR-1	08-29-96	13.95	10.77	ND	3.18	08-29-96	5,300	190	58	76	470	85	--	--			
ADR-1	11-21-96	13.95	10.49	ND	3.46	11-21-96	1,900	82	21	32	270	110	--	--			
ADR-1	03-26-97	13.95	10.37	ND	3.58	03-26-97	1,300	260	6	39	27	95	--	--			
ADR-1	05-21-97	13.95	10.90	ND	3.05	05-21-97	2,100	300	18	37	200	79	--	--			
ADR-1	08-08-97	13.95	11.12	ND	2.83	08-08-97	3,900	620	49	110	470	<200	--	--			
ADR-1	11-18-97	13.95	3.47	ND	10.48	11-18-97	18,000	900	140	360	2,700	<60	--	--			
ADR-1	02-20-98	13.95	Not surveyed: well inaccessible														

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

**ARCO Service Station 2169**  
**889 West Grand Avenue, Oakland, California**

Well Number	Date Gauged	TOC Elevation (ft-MSL)	Depth to Water (feet)	FP Thickness (feet)	Groundwater Elevation (ft-MSL)	Date Sampled	TPH			Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	MTBE 8021B* (µg/L)	MTBE 8260 (µg/L)	TPH Diesel (µg/L)	Dissolved Oxygen (mg/L)	Purged/Not Purged (P/NP)	
							Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)								
ADR-1	05-11-98	13.95	Not surveyed: well inaccessible														
ADR-1	07-30-98	13.95	Not surveyed: well inaccessible														
ADR-1	10-08-98	13.95	Not surveyed: well inaccessible														
ADR-1	02-18-99	13.95	7.80	ND	6.15	02-18-99	200	4.4	<0.5	1.3	1.3	43	--	--			
ADR-1	05-26-99	13.95	10.40	ND	3.55	05-26-99	160	10	<0.5	1.7	1.8	43	--	--			
ADR-1	08-23-99	13.95	10.70	ND	3.25	08-23-99	7,400	310	16	210	970	18	--	--	0.37	NP	
ADR-1	10-27-99	13.95	10.82	ND	3.13	10-27-99	5,000	210	6.3	180	490	5	--	--	0.73	NP	
ADR-1	01-31-00	13.95	9.21	ND	4.74	01-31-00	290	3.6	<0.5	1.1	<1	26	--	--	1.0	NP	
ADR-2	03-24-95	14.64	8.41	>3.00	NR[1]	03-24-95	Not sampled: well contained floating product										
ADR-2	06-05-95	14.64	11.45	>3.00	NR[1]	06-05-95	Not sampled: well contained floating product										
ADR-2	08-17-95	14.64	12.10	0.03	** 2.56	08-17-95	Not sampled: well contained floating product										
ADR-2	12-04-95	14.64	10.93	0.03	** 3.73	12-13-95	Not sampled: well contained floating product										
ADR-2	03-01-96	14.64	8.74	ND	5.90	03-13-96	29,000	1,100	1,200	710	3,800	<500	--	--			
ADR-2	05-29-96	14.64	10.43	ND	4.21	05-29-96	33,000	510	500	470	2,300	120	--	--			
ADR-2	08-29-96	14.64	11.64	ND	3.00	08-29-96	8,000	230	180	150	730	53	--	--			
ADR-2	11-21-96	14.64	11.23	ND	3.41	11-21-96	15,000	630	440	390	2,100	75	--	--			
ADR-2	03-26-97	14.64	11.13	ND	3.51	03-26-97	6,100	320	23	180	400	32	--	--			
ADR-2	05-21-97	14.64	11.64	ND	3.00	05-21-97	6,100	380	22	210	320	<30	--	--			
ADR-2	08-08-97	14.64	11.85	ND	2.79	08-08-97	8,400	380	35	230	910	<30	--	--			
ADR-2	11-18-97	14.64	3.33	ND	11.31	11-18-97	11,000	230	29	300	1,200	<60	--	--			
ADR-2	02-20-98	14.64	7.67	ND	6.97	02-20-98	4,700	320	30	130	360	20	--	--			
ADR-2	05-11-98	14.64	10.47	ND	4.17	05-11-98	Not sampled										
ADR-2	07-30-98	14.64	Not surveyed: well inaccessible														
ADR-2	10-08-98	14.64	11.67	ND	2.97	10-08-98	Not sampled										
ADR-2	02-18-99	14.64	Not surveyed: well inaccessible														
ADR-2	05-26-99	14.64	11.02	ND	3.62	05-26-99	5,900	670	5	340	104	16	--	--			

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

**ARCO Service Station 2169**  
**889 West Grand Avenue, Oakland, California**

Well Number	Date Gauged	TOC	Depth	FP	Groundwater	Date Sampled	TPH				Total Xylenes (µg/L)	MTBE 8021B* (µg/L)	MTBE 8260 (µg/L)	TPH Diesel (µg/L)	Dissolved Oxygen (mg/L)	Purged/ Not Purged (P/NP)
		Elevation (ft-MSL)	to Water (feet)	Thickness (feet)	Elevation (ft-MSL)		Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)						
ADR-2	08-23-99	14.64	9.82	ND	4.82	08-23-99	9,100	570	12	410	1,000	28	--	--	0.50	NP
ADR-2	10-27-99	14.64	9.85	Sheen	4.79	10-27-99	Not sampled: sheen present								0.65	NP
ADR-2	01-31-00	14.64	10.15	ND	4.49	01-31-00	7,700	280	3.4	370	390	23	--	--	2.0	NP

TOC: top of casing

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

TPH: total petroleum hydrocarbons, California DHS LUFT Method

BTEX: benzene, toluene, ethylbenzene, total xylenes by EPA method 8021B. (EPA method 8020 prior to 10/27/99).

MTBE: Methyl tert-butyl ether

µg/L: micrograms per liter

mg/L: milligrams per liter

ND: none detected

NR: not reported; data not available or not measurable

--: not analyzed or not applicable

<: denotes concentration not present at or above laboratory detection limit stated to the right.

[1]: well contained more than 3 feet of floating product; exact product thickness and groundwater elevation could not be measured

\*: EPA method 8020 prior to 10/27/99

\*\* : [corrected elevation (Z')] = Z + (h \* 0.73) where: Z = measured elevation, h = floating product thickness, 0.73 = density ratio of oil to water

\*\*\*: For previous historical groundwater elevation data please refer to *Fourth Quarter 1995 Groundwater Monitoring Program Results and Remediation System Performance Evaluation Report, ARCO Service Station 2169,*

*889 West Grand Avenue, Oakland, California, (EMCON, March 4, 1996).*

**Table 2  
Groundwater Flow Direction and Gradient**

**ARCO Service Station 2169  
889 West Grand Avenue, Oakland, California**

<b>Date Measured</b>	<b>Average Flow Direction</b>	<b>Average Hydraulic Gradient</b>
03-24-95	Northwest	0.009
06-05-95	Northwest	0.002
08-17-95	West	0.001
12-04-95	North-Northwest	0.002
03-01-96	Northwest	0.003
05-29-96	Northwest	0.002
08-29-96	West	0.002
11-21-96	West-Northwest	0.002
03-26-97	Northwest	0.002
05-21-97	North-Northwest	0.002
08-08-97	North-Northwest	0.002
11-18-97	North-Northwest	0.003
02-20-98	North	0.013
05-11-98	North	0.03
07-30-98	North	0.002
10-08-98	North-Northwest	0.002
02-18-99	Northwest	0.008
05-26-99	North-Northwest	0.003
08-23-99	Variable	Variable
10-27-99	Variable	Variable
<b>01-31-00</b>	<b>West-Northwest</b>	<b>0.006</b>

**Table 3**  
**Soil Vapor Extraction System**  
**Operational Uptime Information (1998 - present)**  
**Arco Service Station No. 2169**  
**889 West Grand Avenue, Oakland, California**

Date	Meter (hrs.)	Operation (hrs.)	Period Operation				Cumulative Operation			
			Total (days)	Uptime (days)	Downtime (days)	Uptime (%)	Total (days)	Uptime (days)	Downtime (days)	Uptime (%)
04/01/98 <sup>1</sup>	7365.55	6909.60					1399	287.9	1111.1	21%
04/15/98	7365.55	6909.60								
06/22/98	7365.78	6909.83	68	0.0	68.0	0%	1467	287.9	1179.1	20%
08/20/98	7365.78	6909.83	59	0.0	59.0	0%	1526	287.9	1238.1	19%
10/07/98	7366.69	6910.74	48	0.0	48.0	0%	1574	287.9	1286.1	18%
10/08/98	7392.07	6936.12	1	1	0	100%	1575	289.0	1286.0	18%
10/30/98	7752.82	7296.87	22	15.0	7.0	68%	1597	304.0	1293.0	19%
11/18/98	7755.18	7299.23	19	0.1	18.9	1%	1616	304.1	1311.9	19%
11/25/98	7869.69	7413.74	7	4.8	2.2	68%	1623	308.9	1314.1	19%
12/08/98	8182.76	7726.81	13	13.0	0.0	100%	1636	322.0	1314.0	20%
02/05/99	8183.26	7727.31	59	0.0	59.0	0%	1695	322.0	1373.0	19%
03/19/99	8183.56	7727.61	42	0.0	42.0	0%	1737	322.0	1415.0	19%
04/27/99	8183.56	7727.61	39	0.0	39.0	0%	1776	322.0	1454.0	18%
06/21/99	8183.88	7727.93	55	0.0	55.0	0%	1831	322.0	1509.0	18%
06/24/99	8260.48	7804.53	3	3	0	106%	1834	325.2	1508.8	18%
08/19/99	8260.48	7804.53	56	0	56	0%	1890	325.2	1564.8	17%
08/25/99	8360.47	7904.52	6	4	2	69%	1896	329.4	1566.6	17%
09/08/99	8695.25	8239.3	14	14	0	100%	1910	343.3	1566.7	18%
09/09/99	8706.53	8250.58	1	0	1	47%	1911	343.8	1567.2	18%
09/21/99	8994.92	8538.97	12	12	0	100%	1923	355.8	1567.2	19%
10/05/99	9331.19	8875.24	14	14	0	100%	1937	369.8	1567.2	19%
10/19/99	9667.61	9211.66	14	14	0	100%	1951	383.8	1567.2	20%
11/03/99	10026.92	9570.97	15	15	0	100%	1966	398.8	1567.2	20%
11/17/99	10364.01	9908.06	14	14	0	100%	1980	412.8	1567.2	21%
12/01/99	10699.82	10243.87	14	14	0	100%	1994	426.8	1567.2	21%
12/16/99	11059.81	10603.86	15	15	0	100%	2009	441.8	1567.2	22%
01/05/00	11060.05	10604.1	20	0	20	0%	2029	441.8	1587.2	22%

<sup>1</sup> Operational data through 04/01/98 from First Quarter 1998 Quarterly Monitoring Report



**Table 4**  
**Soil Vapor Extraction System**  
**Flow Rates and Analytical Results of Air Samples (1998 - present)**

**Arco Service Station No. 2169**  
**889 West Grand Avenue, Oakland, California**

Date	Sample Location	Vacuum (in. H2O)	Velocity (fpm)	Flowrate <sup>1</sup> (scfm)	Analyses (ppmv)					
					TPHG	Benzene	Toulene	Ethylbenzene	Xylene	MTBE
10/08/98	Influent	21.2	750	35	190	<0.1	<0.1	<0.1	0.2	
	Effluent <sup>2</sup>		3600	274.2	<5	<0.1	<0.1	<0.1	<0.2	
11/18/98	Influent	21	900	42	83	<0.1	0.4	0.4	0.9	
	Effluent		3300	253.4	<5	<0.1	<0.1	<0.1	<0.2	
12/08/98	Influent	25	1100	51	12	<0.1	0.3	<0.1	0.2	<0.8
	Effluent		3100	238.0	6	<0.1	0.3	<0.1	0.2	<0.8
06/21/99	Influent	40	1000	44	20	0.1	0.1	<0.1	<0.2	<0.8
	Effluent		2500	192.0	<5	<0.1	<0.1	<0.1	<0.2	<0.8
08/19/99	Influent	39.2	800	35	180	6.9	0.9	0.15	0.32	5.5
	Effluent		2800	215.0	<2.4	0.05	<0.013	<0.012	0.03	0.13
09/08/99	Influent	50.2	1500	65	71	0.2	0.2	0.2	0.9	1.1
	Effluent		2300	176.6	<5	<0.1	<0.1	<0.1	<0.2	<0.8
10/05/99	Influent	59	1700	71	42	0.3	<0.1	<0.1	0.3	<0.8
	Effluent		2300	176.6	<5	<0.1	0.1	<0.1	<0.2	<0.8
11/03/99	Influent	50	1700	73	240	<0.1	0.2	0.2	3.9	1.3
	Effluent		2200	168.9	<5	<0.1	<0.1	<0.1	<0.2	<0.8
12/01/99	Influent	50.1	1000	43	180	0.2	0.1	<0.1	2.3	<0.8
	Effluent		1250	96.0	<5	<0.1	0.2	<0.1	<0.2	<0.8

<sup>1</sup> Influent Flow Rate, cfm = (Velocity, fpm)(Influent Pipe Area, sq. ft.)(406.8 in.H2O - Vacuum, in.H2O) / (406.8 in.H2O)  
where Influent Pipe Diameter = 3"  
Effluent Flow Rate, cfm = (Velocity, fpm)(Effluent Pipe Area, sq.ft.)/[(460° R + 77° F)/(460° R + Vapor Temp F)]  
where Effluent (after blower) Pipe Diameter = 4"

<sup>2</sup> Dilution air only

**Table 5**  
**Soil Vapor Extraction System**  
**Extraction Rates, Emission Rates, Destruction Efficiency, and Mass Removed**  
**(1998 - present)**

**Arco Service Station No. 2169**  
**889 West Grand Avenue, Oakland, California**

Date End	Extraction Rate from Wellfield <sup>1</sup>		Emission Rate to Atmosphere <sup>2</sup>		Destruction Efficiency <sup>3</sup>		Period Removal <sup>4</sup>		Cumulative Removal	
	TPHG (lbs/day)	Benzene (lbs/day)	TPHG (lbs/day)	Benzene (lbs/day)	TPHG (%)	Benzene (%)	TPHG (lbs)	Benzene (lbs)	TPHG (lbs)	Benzene (lbs)
04/01/98 <sup>5</sup>									8582.1	0
10/08/98	2.4351	0.0	<0.5037	<0.0079	Waived		39.5329	0	8621.6	0
11/18/98	1.2772	0.0	<0.4655	<0.0073	Waived		22.7538	0	8644.4	0
12/08/98	0.2233	0.0	0.5248	<0.0068	Waived		0.0104	0	8644.4	0
06/21/99	0.3251	0.0013	<0.3527	<0.0055	Waived		1.0376	0.0041	8645.4	0.0041
08/19/99	2.3459	0.0702	<0.1896	<0.0031	Waived		42.4964	1.2723	8687.9	1.2763
09/08/99	1.6830	0.0037	<0.3245	<0.0051	Waived		21.0150	0.0462	8708.9	1.3226
10/05/99	1.1005	0.0061	<0.3245	<0.0051	Waived		30.8459	0.1721	8739.8	1.4946
11/03/99	6.4514	0.0021	<0.3104	<0.0048	Waived		187.1967	0.0609	8927.0	1.5555
12/01/99	2.8454	0.0025	<0.1763	<0.0028	Waived		82.5210	0.0716	9009.5	1.6272

<sup>1</sup> Extraction Rate, lbs/day = (Influent Flow, cfm)(Influent conc., ppmv)(g/mole)(60 min/hr)(24 hr/day)(28.3 L/cf) / (10<sup>6</sup>)(24.45 moles/L)(453.6 g/lb)  
where TPHG = 100 g/mole and Benzene = 78.1 g/mole; Influent conc. = 0, if reported as non-detect

<sup>2</sup> Emission Rate, lbs/day = (Effluent Flow, cfm)(Effluent conc., ppmv)(g/mole)(60 min/hr)(24 hr/day)(28.3 L/cf) / (10<sup>6</sup>)(24.45 moles/L)(453.6 g/lb)  
where TPHG = 100 g/mole and Benzene = 78.1 g/mole; Effluent conc. = Method Reporting Limit, if reported as non-detect

<sup>3</sup> Destruction Efficiency, % = (Extraction Rate - Emission Rate)(100) / (Extraction Rate); "Waived"= if TPHG emissions <1.0 lbs/day and Benzene emissions <0.02 lbs/day

<sup>4</sup> Period Removal, lbs = (Extraction Rate)(Uptime)

<sup>5</sup> Operational data through 4/1/98 from First Quarter 1998 Quarterly Monitoring Report

**APPENDIX C**

Certified Analytical Reports  
And  
Chain-of-Custody Documentation

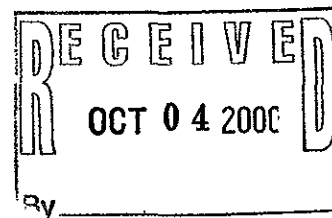


OCT 02 2000

September 25, 2000

Service Request No.: S2002528

Mr. Jay Johnson  
Delta Environmental Consultants  
3164 Gold Camp Dr. Suite 200  
Rancho Cordova, CA 95670



**RE: TO#25998.00/RAT8/2169 OAKLAND**

Dear Mr. Johnson:

Enclosed are the results of the sample(s) submitted to our laboratory on September 20, 2000. All analyses were performed in accordance with our laboratory's quality assurance program. Results are intended to be considered in their entirety and apply to the sample(s) analyzed. Columbia Analytical Services is not responsible for use of less than the complete report. Signature of this CAS Analytical Report confirms that pages 2 through 13, following, have been thoroughly reviewed and approved for release.

Columbia Analytical Services is certified for environmental analyses by the California Department of Health Services (certificate number: 2352, expiration: January 31, 2001).

If you have any questions, please call me at (408) 748-9700.

Respectfully submitted,

Columbia Analytical Services, Inc.

Greg Jordan  
Laboratory Director

**COLUMBIA ANALYTICAL SERVICES, Inc.**

**Acronyms**

<b>A2LA</b>	American Association for Laboratory Accreditation
<b>ASTM</b>	American Society for Testing and Materials
<b>BOD</b>	Biochemical Oxygen Demand
<b>BTEX</b>	Benzene, Toluene, Ethylbenzene, Xylenes
<b>CAM</b>	California Assessment Metals
<b>CARB</b>	California Air Resources Board
<b>CAS Number</b>	Chemical Abstract Service registry Number
<b>CFC</b>	Chlorofluorocarbon
<b>CFU</b>	Colony-Forming Unit
<b>COD</b>	Chemical Oxygen Demand
<b>DEC</b>	Department of Environmental Conservation
<b>DEQ</b>	Department of Environmental Quality
<b>DHS</b>	Department of Health Services
<b>DLCS</b>	Duplicate Laboratory Control Sample
<b>DMS</b>	Duplicate Matrix Spike
<b>DOE</b>	Department of Ecology
<b>DOH</b>	Department of Health
<b>EPA</b>	U. S. Environmental Protection Agency
<b>ELAP</b>	Environmental Laboratory Accreditation Program
<b>GC</b>	Gas Chromatography
<b>GC/MS</b>	Gas Chromatography/Mass Spectrometry
<b>IC</b>	Ion Chromatography
<b>ICB</b>	Initial Calibration Blank sample
<b>ICP</b>	Inductively Coupled Plasma atomic emission spectrometry
<b>ICV</b>	Initial Calibration Verification sample
<b>J</b>	Estimated concentration. The value is less than the MRL, but greater than or equal to the MDL. If the value is equal to the MRL, the result is actually <MRL before rounding.
<b>LCS</b>	Laboratory Control Sample
<b>LUFT</b>	Leaking Underground Fuel Tank
<b>M</b>	Modified
<b>MBAS</b>	Methylene Blue Active Substances
<b>MCL</b>	Maximum Contaminant Level. The highest permissible concentration of a substance allowed in drinking water as established by the U. S. EPA.
<b>MDL</b>	Method Detection Limit
<b>MPN</b>	Most Probable Number
<b>MRL</b>	Method Reporting Limit
<b>MS</b>	Matrix Spike
<b>MTBE</b>	Methyl tert-Butyl Ether
<b>NA</b>	Not Applicable
<b>NAN</b>	Not Analyzed
<b>NC</b>	Not Calculated
<b>NCASI</b>	National Council of the paper industry for Air and Stream Improvement
<b>ND</b>	Not Detected at or above the method reporting/detection limit (MRL/MDL)
<b>NIOSH</b>	National Institute for Occupational Safety and Health
<b>NTU</b>	Nephelometric Turbidity Units
<b>ppb</b>	Parts Per Billion
<b>ppm</b>	Parts Per Million
<b>PQL</b>	Practical Quantitation Limit
<b>QA/QC</b>	Quality Assurance/Quality Control
<b>RCRA</b>	Resource Conservation and Recovery Act
<b>RPD</b>	Relative Percent Difference
<b>SIM</b>	Selected Ion Monitoring
<b>SM</b>	Standard Methods for the Examination of Water and Wastewater, 18th Ed., 1992
<b>STLC</b>	Solubility Threshold Limit Concentration
<b>SW</b>	Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Ed., 1986 and as amended by Updates I, II, IIA, and IIB.
<b>TCLP</b>	Toxicity Characteristic Leaching Procedure
<b>TDS</b>	Total Dissolved Solids
<b>TPH</b>	Total Petroleum Hydrocarbons
<b>tr</b>	Trace level. The concentration of an analyte that is less than the PQL but greater than or equal to the MDL. If the value is equal to the PQL, the result is actually <PQL before rounding.
<b>TRPH</b>	Total Recoverable Petroleum Hydrocarbons
<b>TSS</b>	Total Suspended Solids
<b>TTLIC</b>	Total Threshold Limit Concentration
<b>VOA</b>	Volatile Organic Analyte(s)

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO  
Project: TO#25998.00/RAT8/2169 OAKLAND  
Sample Matrix: Water

Service Request: S2002528  
Date Collected: 9/19/00  
Date Received: 9/20/00

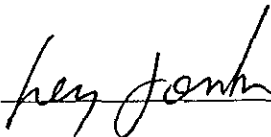
BTEX, MTBE and TPH as Gasoline

Sample Name: ADR-1-11  
Lab Code: S2002528-001  
Test Notes:

Units: ug/L (ppb)  
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	1	NA	9/21/00	120	
Benzene	EPA 5030	8021B	0.5	1	NA	9/21/00	7.4	
Toluene	EPA 5030	8021B	0.5	1	NA	9/21/00	ND	
Ethylbenzene	EPA 5030	8021B	0.5	1	NA	9/21/00	1.2	
Xylenes, Total	EPA 5030	8021B	1	1	NA	9/21/00	ND	
Methyl <i>tert</i> -Butyl Ether	EPA 5030	8021B	3	1	NA	9/21/00	22	

Approved By:



Date: 9/25/00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO  
Project: TO#25998.00/RAT8/2169 OAKLAND  
Sample Matrix: Water

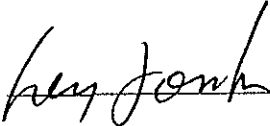
Service Request: S2002528  
Date Collected: 9/19/00  
Date Received: 9/20/00

BTEX, MTBE and TPH as Gasoline

Sample Name: ADR-2-11  
Lab Code: S2002528-002  
Test Notes:

Units: ug/L (ppb)  
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	5	NA	9/21/00	1400	
Benzene	EPA 5030	8021B	0.5	5	NA	9/21/00	530	
Toluene	EPA 5030	8021B	0.5	5	NA	9/21/00	5.0	
Ethylbenzene	EPA 5030	8021B	0.5	5	NA	9/21/00	680	
Xylenes, Total	EPA 5030	8021B	1	5	NA	9/21/00	740	
Methyl <i>tert</i> -Butyl Ether	EPA 5030	8021B	3	5	NA	9/21/00	34	

Approved By: 

Date: 9/25/00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO  
 Project: TO#25998.00/RAT8/2169 OAKLAND  
 Sample Matrix: Water

Service Request: S2002528  
 Date Collected: 9/19/00  
 Date Received: 9/20/00

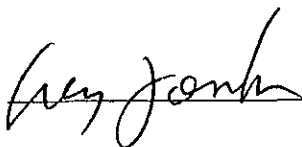
BTEX, MTBE and TPH as Gasoline

Sample Name: A-1-11  
 Lab Code: S2002528-003  
 Test Notes:

Units: ug/L (ppb)  
 Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	1	NA	9/20/00	4800	
Benzene	EPA 5030	8021B	0.5	10	NA	9/21/00	2400	
Toluene	EPA 5030	8021B	0.5	1	NA	9/20/00	27	
Ethylbenzene	EPA 5030	8021B	0.5	1	NA	9/20/00	20	
Xylenes, Total	EPA 5030	8021B	1	1	NA	9/20/00	57	
Methyl <i>tert</i> -Butyl Ether	EPA 5030	8021B	3	1	NA	9/20/00	32	

Approved By:



Date:

9/25/00

1S22/020597p



COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO  
 Project: TO#25998.00/RAT8/2169 OAKLAND  
 Sample Matrix: Water

Service Request: S2002528  
 Date Collected: 9/19/00  
 Date Received: 9/20/00

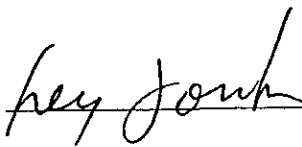
BTEX, MTBE and TPH as Gasoline

Sample Name: A-5-10  
 Lab Code: S2002528-004  
 Test Notes:

Units: ug/L (ppb)  
 Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	1	NA	9/21/00	160	
Benzene	EPA 5030	8021B	0.5	1	NA	9/21/00	13	
Toluene	EPA 5030	8021B	0.5	1	NA	9/21/00	ND	
Ethylbenzene	EPA 5030	8021B	0.5	1	NA	9/21/00	2.8	
Xylenes, Total	EPA 5030	8021B	1	1	NA	9/21/00	1.9	
Methyl <i>tert</i> -Butyl Ether	EPA 5030	8021B	3	1	NA	9/21/00	ND	

Approved By:



Date:

9/25/00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO  
Project: TO#25998.00/RAT8/2169 OAKLAND  
Sample Matrix: Water

Service Request: S2002528  
Date Collected: 9/19/00  
Date Received: 9/20/00

BTEX, MTBE and TPH as Gasoline

Sample Name: A-6-11  
Lab Code: S2002528-005  
Test Notes:

Units: ug/L (ppb)  
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	1	NA	9/20/00	ND	
Benzene	EPA 5030	8021B	0.5	1	NA	9/20/00	ND	
Toluene	EPA 5030	8021B	0.5	1	NA	9/20/00	ND	
Ethylbenzene	EPA 5030	8021B	0.5	1	NA	9/20/00	ND	
Xylenes, Total	EPA 5030	8021B	1	1	NA	9/20/00	ND	
Methyl tert -Butyl Ether	EPA 5030	8021B	3	1	NA	9/20/00	6	

Approved By: Ray Jones Date: 9/25/00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO  
Project: TO#25998.00/RAT8/2169 OAKLAND  
Sample Matrix: Water

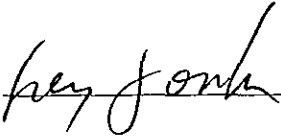
Service Request: S2002528  
Date Collected: 9/19/00  
Date Received: 9/20/00

BTEX, MTBE and TPH as Gasoline

Sample Name: TB  
Lab Code: S2002528-006  
Test Notes:

Units: ug/L (ppb)  
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	1	NA	9/20/00	ND	
Benzene	EPA 5030	8021B	0.5	1	NA	9/20/00	ND	
Toluene	EPA 5030	8021B	0.5	1	NA	9/20/00	ND	
Ethylbenzene	EPA 5030	8021B	0.5	1	NA	9/20/00	ND	
Xylenes, Total	EPA 5030	8021B	1	1	NA	9/20/00	ND	
Methyl tert-Butyl Ether	EPA 5030	8021B	3	1	NA	9/20/00	ND	

Approved By: 

Date: 9/25/00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO  
Project: TO#25998.00/RAT8/2169 OAKLAND  
Sample Matrix: Water

Service Request: S2002528  
Date Collected: NA  
Date Received: NA

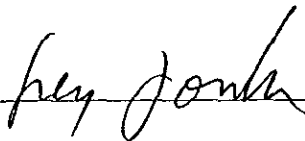
BTEX, MTBE and TPH as Gasoline

Sample Name: Method Blank  
Lab Code: S200920-WB2  
Test Notes:

Units: ug/L (ppb)  
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	1	NA	9/20/00	ND	
Benzene	EPA 5030	8021B	0.5	1	NA	9/20/00	ND	
Toluene	EPA 5030	8021B	0.5	1	NA	9/20/00	ND	
Ethylbenzene	EPA 5030	8021B	0.5	1	NA	9/20/00	ND	
Xylenes, Total	EPA 5030	8021B	1	1	NA	9/20/00	ND	
Methyl tert -Butyl Ether	EPA 5030	8021B	3	1	NA	9/20/00	ND	

Approved By:



Date:

9/25/00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO  
Project: TO#25998.00/RAT8/2169 OAKLAND  
Sample Matrix: Water

Service Request: S2002528  
Date Collected: NA  
Date Received: NA

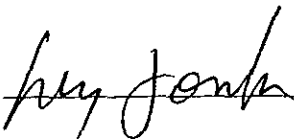
BTEX, MTBE and TPH as Gasoline

Sample Name: Method Blank  
Lab Code: S200920-WB4  
Test Notes:

Units: ug/L (ppb)  
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	EPA 5030	CA/LUFT	50	1	NA	9/21/00	ND	
Benzene	EPA 5030	8021B	0.5	1	NA	9/21/00	ND	
Toluene	EPA 5030	8021B	0.5	1	NA	9/21/00	ND	
Ethylbenzene	EPA 5030	8021B	0.5	1	NA	9/21/00	ND	
Xylenes, Total	EPA 5030	8021B	1	1	NA	9/21/00	ND	
Methyl <i>tert</i> -Butyl Ether	EPA 5030	8021B	3	1	NA	9/21/00	ND	

Approved By:



Date:

9/25/00

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO  
 Project: TO#25998.00/RAT8/2169 OAKLAND  
 Sample Matrix: Water

Service Request: S2002528  
 Date Collected: NA  
 Date Received: NA  
 Date Extracted: NA  
 Date Analyzed: 9/21/00

Matrix Spike/Duplicate Matrix Spike Summary  
 BTEX and TPH as Gasoline

Sample Name: BATCH QC  
 Lab Code: S200920-001MS, S200920-001DMS  
 Test Notes:

Units: ug/L (ppb)  
 Basis: NA

Analyte	Prep Method	Analysis Method	Spike Level		Sample Result	Spike Result		Percent Recovery				Relative Percent Difference
			MRL	MS		DMS	MS	DMS	MS	DMS	CAS Acceptance Limits	
Benzene	EPA 5030	8021B	0.5	25	25	ND	28.8	27.8	115	111	75-135	4
Toluene	EPA 5030	8021B	0.5	25	25	ND	28.1	27.3	112	109	73-136	3
Ethylbenzene	EPA 5030	8021B	0.5	25	25	ND	27.0	26.2	108	105	69-142	3
Gasoline	EPA 5030	CA/LUFT	50	500	500	ND	492	476	98	95	75-135	3

Approved By: *hey joub* Date: \_\_\_\_\_

DMS/020597p

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO  
 Project: TO#25998.00/RAT8/2169 OAKLAND  
 LCS Matrix: Water

Service Request: S2002528  
 Date Collected: NA  
 Date Received: NA  
 Date Extracted: NA  
 Date Analyzed: 9/20/00

Laboratory Control Sample Summary  
 BTEX and TPH as Gasoline

Sample Name: Lab Control Sample  
 Lab Code: S200920-LCS  
 Test Notes:

Units: ug/L (ppb)  
 Basis: NA

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery		Result Notes
						Acceptance Limits		
Benzene	EPA 5030	8021B	25	27.5	110	75-135		
Toluene	EPA 5030	8021B	25	27.1	108	73-136		
Ethylbenzene	EPA 5030	8021B	25	26.0	104	69-142		
Gasoline	EPA 5030	CA/LUFT	500	477	95	75-135		

Approved By: hey jank Date: 9/25/00

LCS#020597p

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO  
 Project: TO#25998.00/RAT8/2169 OAKLAND  
 Sample Matrix: Water

Service Request: S2002528  
 Date Collected: NA  
 Date Received: NA  
 Date Extracted: NA  
 Date Analyzed: NA

Surrogate Recovery Summary  
 BTEX, MTBE and TPH as Gasoline

Prep Method: EPA 5030  
 Analysis Method: 8021B CA/LUFT

Units: PERCENT  
 Basis: NA

Sample Name	Lab Code	Test Notes	Percent Recovery	
			a,a,a-Trifluorotoluene	a,a,a-Trifluorotoluene
ADR-1-11	S2002528-001		109	108
ADR-2-11	S2002528-002		101	100
A-1-11	S2002528-003		109	181 S1
A-5-10	S2002528-004		101	101
A-6-11	S2002528-005		108	102
TB	S2002528-006		107	106
Method Blank	S200920-WB2		105	99
Method Blank	S200920-WB4		103	96
BATCH QC	S200920-001MS		111	112
BATCH QC	S200920-001DMS		108	108
Lab Control Sample	S200920-LCS		101	108

CAS Acceptance Limits: 70-130 70-130

S1 Surrogate recovery out of control limits due to matrix interference.

Approved By: hey joub Date: 9/25/00



ARCO Facility no. <b>2169</b>	City (Facility) <b>OAKLAND</b>	Project manager (Consultant) <b>JAY JOHNSON</b>	Laboratory name <b>Columbia</b>
ARCO engineer <b>Paul Supple</b>	Telephone no. (ARCO)	Telephone no. (Consultant)	Contract number
Consultant name <b>Stratus</b>		Address (Consultant)	

Sample I.D.	Lab no.	Container no.	Matrix			Preservation		Sampling date	Sampling time	BTEX EPA 802	TPH EPA 1602	TPH Modified 8015 Gas Diesel	Oil and Grease 413.1 419.2	TPH EPA 418.1/SM503E	EPA 601/6010	EPA 604/6040	EPA 605/6070	TCLP Metals VOA YOA	CMM Metals EPA 6010/7000 TLC STLC	Lead Org./DHS Lead EPA 7420/7421	
			Soil	Water	Other	Ice	Acid														
<del>ADP-1-11</del>		2		X		X	X	9-19-00		X	X										
ADP-1-11	①	↓		↓		↓	↓		1110		↓										
ADP-2-11	②	↓		↓		↓	↓		1121		↓										
A-1-11	③	↓		↓		↓	↓		1150		↓										
A-5-10	④	↓		↓		↓	↓		1137		↓										
A-6-11	⑤	↓		↓		↓	↓		1201		↓										
TB	⑥	↓		↓		↓	↓		800		↓										

Method of shipment  
**COURIER**

Special detection Limit/reporting

Special QA/QC

Remarks

Lab number

Turnaround time

Priority Rush 1 Business Day

Rush 2 Business Days

Expedited 5 Business Days

Standard 10 Business Days

Condition of sample:		Temperature received: <b>Due: 10/4/00 RU/D3-B</b>	
Relinquished by sampler <b>Ryan Brooks</b>	Date <b>9-20-00</b>	Time <b>1100</b>	Received by <b>Mark Z...</b>
Relinquished by	Date	Time	Received by
Relinquished by	Date	Time	Received by laboratory
			Date
			Time

**APPENDIX D**

**Field Data Sheets**

Page 127



3164 Gold Camp Drive, Suite 200  
 Rancho Cordova, California 95670  
 Direct: (916) 638-2085  
 Fax: (916) 638-8385

Arco Site Address: **889 West Grand Avenue**  
**San Leandro, California**

Arco Site Number: **Arco 2169**  
 Delta Project No.: **D000-311**  
 Delta Project PM: **Steve Meeks**  
 Date Sampled: **09/19/00**

Site Contact & Phone Number: \_\_\_\_\_

Arco Project Manager: **Paul Supple**  
 Site Sampled By: **Doulos**

Water Level Data						Purge Volume Calculations					Sampling Analytes				Sample Record			
Well ID	Time	Depth to Water (feet)	Top of Screen Interval (feet)	Total Depth of Well (feet)	Check if Purge Not Required	Casing Water Column (A)	Well Diameter (inches)	Multiplier Value (B)	Three Casing Volumes (gallons)	Actual Water Purged (gallons)	BTEX (8020) VOA	TPH-g (8015M) VOA	MTBE (8020) VOA	Other	Dissolved Oxygen (mg/L)	Sample Frequency (A, S, Q)	Sample I.D.	Sample Time
A-1	10:58	11.26	9.0	24.5	<input checked="" type="checkbox"/>	13.24	3 inch	1.1	14.6	NP	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	0.80	Q/2,5,8,11	A-1	
A-2	11:04	11.63	10.0	26.2	<input type="checkbox"/>	14.57	3 inch	1.1	16.0	N/A	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NM	S/5,11		
A-3	11:11	12.50	9.0	30.1	<input type="checkbox"/>	17.60	3 inch	1.1	19.4	N/A	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NM	A/11		
A-4	11:18	11.97	8.0	28.4	<input type="checkbox"/>	16.43	3 inch	1.1	18.1	N/A	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NM	A/11		
A-5	11:28	10.55	5.0	30.0	<input checked="" type="checkbox"/>	19.45	2 inch	0.5	9.7	NP	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	0.49	Q/2,5,8,11	A-5	
A-6	11:36	11.27	5.0	28.5	<input type="checkbox"/>	17.23	2 inch	0.5	8.6	7.4	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	5.78	Q/2,5,8,11	A-6	
AR-1	10:40	11.89	8.5	28.0	<input type="checkbox"/>	16.11	6 inch	4.4	70.9	N/A	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NM	S/5,11		
AR-2	10:45	12.08	8.5	29.3	<input type="checkbox"/>	17.22	4 inch	2.0	34.4	N/A	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NM	S/5,11		
ADR-1	10:50	11.08	5.0	21.9	<input checked="" type="checkbox"/>	10.82	4 inch	2.0	21.6	NP	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	0.56	Q/2,5,8,11	ADR-1	
ADR-2	10:54	11.81	5.0	26.3	<input checked="" type="checkbox"/>	14.49	4 inch	2.0	29.0	NP	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	0.71	Q/2,5,8,11	ADR-2	
					<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
					<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
					<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
					<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
					<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
					<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
					<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
					<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
					<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
					<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				

(A)-Casing Water Column: Depth to Bottom - Depth to Water (B)-Multiplier Values: (2" Well: 0.5) (4" Well: 2.0) (6" Well: 4.4)

Sampling Sequence: Annual: A-3, A-4; Semi-Annual: A-2, AR-1, AR-2; Quarterly: A-5, ADR-2, ADR-1, A-6, A-1

Sampling Notes: List depth of Sample on C.O.C. [i.e. MW-1(30)]. Make Sure to Note on C.O.C. "Provide Lowest Reporting Limit Available."  
 If the water level is below the top of the screen, take a grab sample and check box for NO PURGE (NP). If the water level is above the screen, purge as normal.



3164 Gold Camp Drive, Suite 200  
 Rancho Cordova, California 95670  
 Direct: (916) 638-2085  
 Fax: (916) 638-8385

Arco Site Address: **889 West Grand Avenue**  
**San Leandro, California**

Arco Site Number: **Arco 2169**

Delta Project No.: **D000-311**

Arco Project Manager: **Paul Supple**

Delta Project PM: **Steve Meeks**

Site Sampled By: **Doulos**

Date Sampled: **36788**

Site Contact & Phone Number: \_\_\_\_\_

Well ID	Time	Temp °C	pH Units	Sp. Cond.	Gallons	Well ID	Time	Temp °C	pH Units	Sp. Cond.	Gallons	Well ID	Time	Temp °C	pH Units	Sp. Cond.	Gallons
A-1	No Purge					<del>AR-2</del>	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>						
A-2	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	ADR-1	No Purge										
A-3	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>	ADR-2	No Purge										
A-4	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>												
A-5	No Purge																
A-6	11:45				1												
	11:47				2												
	11:48				3												
AR-1	<del></del>	<del></del>	<del></del>	<del></del>	<del></del>												

Notes: NP = NO PURGE

**APPENDIX E**

**Soil Vapor Extraction System Laboratory Analytical Results**



October 4, 2000

Steven Meeks  
Delta Environmental Consultants - Rancho Cordova  
3164 Gold Camp Drive Ste. 200  
Rancho Cordova, CA N/A

RE: ARCO 2169, Oakland, CA/S009287

Dear Steven Meeks

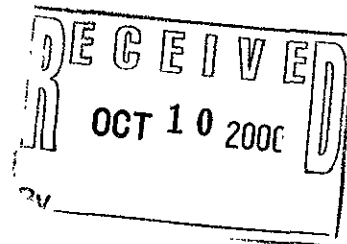
Enclosed are the results of analyses for sample(s) received by the laboratory on September 20, 2000. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Sandra R. Hanson  
Client Services Representative

Lito Diaz  
Laboratory Director

CA ELAP Certificate Number 1624





Delta Environmental Consultants - Rancho Cordova	Project: ARCO 2169, Oakland, CA	Sampled: 9/20/00
3164 Gold Camp Drive Ste. 200	Project Number: N/A	Received: 9/20/00
Rancho Cordova, CA N/A	Project Manager: Steven Meeks	Reported: 10/4/00

**ANALYTICAL REPORT FOR S009287**

Sample Description	Laboratory Sample Number	Sample Matrix	Date Sampled
Eff	S009287-01	Air	9/20/00
Inf	S009287-02	Air	9/20/00





Delta Environmental Consultants - Rancho Cordova 3164 Gold Camp Drive Ste. 200 Rancho Cordova, CA N/A	Project: ARCO 2169, Oakland, CA Project Number: N/A Project Manager: Steven Meeks	Sampled: 9/20/00 Received: 9/20/00 Reported: 10/4/00
---	---	--

**Total Purgeable Hydrocarbons (C6-C12) and BTEX in Air by DHS LUFT  
Sequoia Analytical - Sacramento**

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
				<b><u>S009287-01</u></b>				
<b><u>Eff</u></b>							<b><u>Air</u></b>	
Purgeable Hydrocarbons	0090257	9/22/00	9/22/00		10.0	ND	mg/m <sup>3</sup> Air	
Benzene	"	"	"		0.0500	ND	"	
Toluene	"	"	"		0.0500	ND	"	
Ethylbenzene	"	"	"		0.0500	ND	"	
Xylenes (total)	"	"	"		0.0500	ND	"	
Surrogate: a,a,a-Trifluorotoluene	"	"	"	60.0-140		93.0	%	
				<b><u>S009287-02</u></b>				
<b><u>Inf</u></b>							<b><u>Air</u></b>	
Purgeable Hydrocarbons	0090257	9/22/00	9/22/00		100	1010	mg/m <sup>3</sup> Air	1,D
Benzene	"	"	"		0.500	17.7	"	D
Toluene	"	"	"		0.500	3.77	"	D
Ethylbenzene	"	"	"		0.500	ND	"	D
Xylenes (total)	"	"	"		0.500	3.79	"	D
Surrogate: a,a,a-Trifluorotoluene	"	"	"	60.0-140		90.0	%	







Delta Environmental Consultants - Rancho Cordova 3164 Gold Camp Drive Ste. 200 Rancho Cordova, CA N/A	Project: ARCO 2169, Oakland, CA Project Number: N/A Project Manager: Steven Meeks	Sampled: 9/20/00 Received: 9/20/00 Reported: 10/4/00
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**Total Purgeable Hydrocarbons (C6-C12) and BTEX in Air (ppmv) by DHS LUFT  
Sequoia Analytical - Sacramento**

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
<b>Eff</b>				<b>S009287-01</b>		<b>Air</b>		
Purgeable Hydrocarbons	0090257	9/22/00	9/22/00		2.40	ND	ppmv	
Benzene	"	"	"		0.0160	ND	"	
Toluene	"	"	"		0.0130	ND	"	
Ethylbenzene	"	"	"		0.0120	ND	"	
Xylenes (total)	"	"	"		0.0120	ND	"	
Surrogate: <i>a,a,a-Trifluorotoluene</i>	"	"	"	60.0-140		93.0	%	
<b>Inf</b>				<b>S009287-02</b>		<b>Air</b>		
Purgeable Hydrocarbons	0090257	9/22/00	9/22/00		24.0	246	ppmv	1,D
Benzene	"	"	"		0.160	5.56	"	D
Toluene	"	"	"		0.130	1.00	"	D
Ethylbenzene	"	"	"		0.120	ND	"	D
Xylenes (total)	"	"	"		0.120	0.880	"	D
Surrogate: <i>a,a,a-Trifluorotoluene</i>	"	"	"	60.0-140		90.0	%	





Delta Environmental Consultants - Rancho Cordova 3164 Gold Camp Drive Ste. 200 Rancho Cordova, CA N/A	Project: ARCO 2169, Oakland, CA Project Number: N/A Project Manager: Steven Meeks	Sampled: 9/20/00 Received: 9/20/00 Reported: 10/4/00
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**Miscellaneous Physical/Conventional Chemistry Parameters  
Sequoia Analytical - Walnut Creek**

Analyte	Batch Number	Date Prepared	Date Analyzed	Specific Method	Reporting Limit	Result	Units	Notes*
<u>Eff</u> Methane	0121017	9/22/00	9/22/00	<u>S009287-01</u> ASTMD 3416M	0.23	0.57	<u>Air</u> %	
<u>Inf</u> Methane	0121017	9/22/00	9/22/00	<u>S009287-02</u> ASTMD 3416M	0.23	4.7	<u>Air</u> %	





Delta Environmental Consultants - Rancho Cordova 3164 Gold Camp Drive Ste. 200 Rancho Cordova, CA N/A	Project: ARCO 2169, Oakland, CA Project Number: N/A Project Manager: Steven Meeks	Sampled: 9/20/00 Received: 9/20/00 Reported: 10/4/00
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**Total Purgeable Hydrocarbons (C6-C12) and BTEX in Air by DHS LUFT/Quality Control**  
 Sequoia Analytical - Sacramento

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Reporting Limit Units	Recov. %	RPD Limit	RPD %	Notes*
<b>Batch: 0090257</b>			<b>Date Prepared: 9/22/00</b>			<b>Extraction Method: EPA 5030B (P/T)</b>			
<b>Blank</b>			<b>0090257-BLK1</b>						
Purgeable Hydrocarbons	9/22/00			ND	mg/m <sup>3</sup> Air	10.0			
Benzene	"			ND	"	0.0500			
Toluene	"			ND	"	0.0500			
Ethylbenzene	"			ND	"	0.0500			
Xylenes (total)	"			ND	"	0.0500			
Surrogate: a,a,a-Trifluorotoluene	"	2.00		1.88	"	60.0-140	94.0		
<b>LCS</b>			<b>0090257-BS1</b>						
Benzene	9/22/00	2.00		2.00	mg/m <sup>3</sup> Air	70.0-130	100		
Toluene	"	2.00		1.97	"	70.0-130	98.5		
Ethylbenzene	"	2.00		2.08	"	70.0-130	104		
Xylenes (total)	"	6.00		6.16	"	70.0-130	103		
Surrogate: a,a,a-Trifluorotoluene	"	2.00		2.02	"	60.0-140	101		
<b>LCS Dup</b>			<b>0090257-BSD1</b>						
Benzene	9/22/00	2.00		2.02	mg/m <sup>3</sup> Air	70.0-130	101	25.0	0.995
Toluene	"	2.00		1.98	"	70.0-130	99.0	25.0	0.506
Ethylbenzene	"	2.00		2.08	"	70.0-130	104	25.0	0
Xylenes (total)	"	6.00		6.18	"	70.0-130	103	25.0	0
Surrogate: a,a,a-Trifluorotoluene	"	2.00		2.00	"	60.0-140	100		





Delta Environmental Consultants - Rancho Cordova 3164 Gold Camp Drive Ste. 200 Rancho Cordova, CA N/A	Project: ARCO 2169, Oakland, CA Project Number: N/A Project Manager: Steven Meeks	Sampled: 9/20/00 Received: 9/20/00 Reported: 10/4/00
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**Total Purgeable Hydrocarbons (C6-C12) and BTEX in Air (ppmv) by DHS LUFT/Quality Control  
 Sequoia Analytical - Sacramento**

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
<b>Batch: 0090257</b>	<b>Date Prepared: 9/22/00</b>			<b>Extraction Method: EPA 5030B (P/T)</b>						
<b>Blank</b>	<b>0090257-BLK1</b>									
Purgeable Hydrocarbons	9/22/00			ND	ppmv	2.80				
Benzene	"			ND	"	0.0160				
Toluene	"			ND	"	0.0130				
Ethylbenzene	"			ND	"	0.0120				
Xylenes (total)	"			ND	"	0.0120				
Surrogate: a,a,a-Trifluorotoluene	"	0.00200		0.00188	"	60.0-140	94.0			





Delta Environmental Consultants - Rancho Cordova 3164 Gold Camp Drive Ste. 200 Rancho Cordova, CA N/A	Project: ARCO 2169, Oakland, CA Project Number: N/A Project Manager: Steven Meeks	Sampled: 9/20/00 Received: 9/20/00 Reported: 10/4/00
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**Miscellaneous Physical/Conventional Chemistry Parameters/Quality Control**  
Sequoia Analytical - Walnut Creek

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
<b>Batch: 0121017</b>	<b>Date Prepared: 9/21/00</b>			<b>Extraction Method: General Prep</b>						
<b>Blank</b>	<b>0121017-BLK1</b>									
Methane	9/21/00			ND	%	0.23				
<b>Blank</b>	<b>0121017-BLK2</b>									
Methane	9/22/00			ND	%	0.23				
<b>LCS</b>	<b>0121017-BS1</b>									
Methane	9/21/00	4.51		4.32	%	80-120	95.8			
<b>LCS</b>	<b>0121017-BS2</b>									
Methane	9/22/00	4.51		4.26	%	80-120	94.5			
<b>Duplicate</b>	<b>0121017-DUP1</b>									
Methane	9/21/00		<b>W009496-01</b>	ND	%				30	





Delta Environmental Consultants - Rancho Cordova 3164 Gold Camp Drive Ste. 200 Rancho Cordova, CA N/A	Project: ARCO 2169, Oakland, CA Project Number: N/A Project Manager: Steven Meeks	Sampled: 9/20/00 Received: 9/20/00 Reported: 10/4/00
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**Notes and Definitions**

#	Note
D	Data reported from a dilution.
1	Chromatogram Pattern: Weathered Gasoline C6-C12
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
Recov.	Recovery
RPD	Relative Percent Difference



ARCO Facility no. <i>Arco 2169</i>	City (Facility) <i>Oakland</i>	Project manager (Consultant) <i>Steven Meeks</i>	Laboratory name <i>Squaw</i>
ARCO engineer <i>Paul Supple</i>	Telephone no. (ARCO)	Telephone no. (Consultant) <i>916 536-2613</i>	Contract number
Consultant name <i>Delta Environmental</i>		Address (Consultant) <i>3114 Gold Cap Dr. Suite 200 Rancho Cordova, Ca 95670</i>	

Sample I.D.	Lab no.	Container no.	Matrix			Preservation		Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH EPA 1602/8020/8015	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 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals <input type="checkbox"/> VOAD <input type="checkbox"/> VOAC <input type="checkbox"/>	CAN METALS EPA 810/7000 TLC <input type="checkbox"/> STLC <input type="checkbox"/>	Lead Org./PHS <input type="checkbox"/> Lead EPA 7420/7421 <input type="checkbox"/>	VOC's <input type="checkbox"/> Methane <input type="checkbox"/>	Method of shipment				
			Soil	Water	Other	Ice	Acid																			
<i>EFF</i>		<i>1</i>			<i>X</i>			<i>9-20-00</i>	<i>1000</i>		<input checked="" type="checkbox"/>												<i>80097287-01</i>	<input checked="" type="checkbox"/> *	Special detection Limit/reporting	
<i>Inf</i>		<i>1</i>			<i>X</i>			<i>11</i>	<i>1002</i>		<input checked="" type="checkbox"/>												<i>-02</i>	<input checked="" type="checkbox"/>		
																									Special QA/QC	
																										Remarks
																										<i>* Run g/BTEX 1st and then send methane to w/c lab for analysis as per Steve Meeks.</i>
																										Lab number <i>9/20/00 1630</i> (219)
																										Turnaround time
																										Priority Rush 1 Business Day <input type="checkbox"/>
																										Rush 2 Business Days <input type="checkbox"/>
																										Expedited 5 Business Days <input type="checkbox"/>
																										Standard 10 Business Days <input checked="" type="checkbox"/>

Condition of sample:				Temperature received:			
Relinquished by sampler <i>[Signature]</i>	Date <i>9-20-00</i>	Time <i>1546</i>	Received by <i>Monica Gregesen</i>	Date <i>9/20/00</i>	Time <i>1546</i>		
Relinquished by	Date	Time	Received by	Date	Time		
Relinquished by	Date	Time	Received by	Date	Time		