Delta
Environmental
Consultants, Inc.

3164 Gold Camp Drive
Suite 200
Rancho Cordova, CA 95670-6021
U.S.A.
916/638-2085
FAX: 916/638-8385

DEC 31 2001

December 21, 2001

R072

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

Subject: *Quarterly Groundwater Monitoring and Remediation System Status Report, Third Quarter 2001*
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 2001 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.

for

Trevor L. Atkinson
Project Engineer

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

REGISTERED PROFESSIONAL ENGINEER
STEVEN WHITTEN MEEKS
C 057461
Exp. 12/31/05
CIVIL
STATE OF CALIFORNIA

12/21/01

TLA (Lrp006.311.doc)
Enclosures

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

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. Performed quarterly monitoring and sampling for third quarter 2001
2. System O&M site visits were performed during the third quarter 2001
3. Prepared and submitted quarterly monitoring and sampling report for second quarter 2001

WORK PROPOSED FOR NEXT QUARTER

1. Prepare and submit quarterly monitoring and sampling report for third quarter 2001
2. Conduct quarterly monitoring and sampling for fourth quarter 2001
3. Conduct monthly O & M site visits for remediation system.

QUARTERLY MONITORING:

Current Phase of Project	Quarterly Groundwater Monitoring and Operation and Maintenance of Remediation Systems
Frequency of Groundwater Sampling:	Annual (1st Quarter): A-3, A-4 Semi-annual (1st/2nd Quarter): A-2, AR-1, AR-2 Quarterly: A-1, A-5, A-6, ADR-1, ADR-2
Frequency of Groundwater Monitoring:	Quarterly (groundwater, Monthly SVE and Biosparging)
Is Free Product (FP) Present On–Site:	No
FP Recovered this Quarter:	None
Cumulative FP Recovered to Date:	4.8 gallons, wells ADR-1 and ADR-2
Bulk Soil Removed This Quarter:	None
Bulk Soil Removed to Date:	2,196 cubic yards of TPH impacted soil
Current Remediation Techniques:	SVE and Biosparging systems
Approximate Depth to Groundwater:	11.73 ft.
Groundwater Gradient:	0.004 Northwest

SVE QUARTERLY OPERATION & PERFORMANCE:

Equipment Inventory:	Therm Tech Model VAC-25, 250 cfm, Thermal/Catalytic Oxidizer
Operating Mode:	Catalytic Oxidation
BAAQMD Permit No.:	12119
TPH Conc. at End of Period (lab):	System did not operate continuously due to low concentrations
Benzene Conc. at End of Period (lab):	System did not operate continuously due to low concentrations
Flow Rate at End of Period:	System did not operate continuously due to low concentrations
Hydrocarbons Destroyed This Period:	System did not operate continuously due to low concentrations
Hydrocarbons Destroyed to Date:	9,144 pounds
Utility Usage Electric (kWh):	Not Available
Operating Hours This Period:	System did not operate continuously due to low concentrations
Percent Operational:	System did not operate continuously due to low concentrations
Operating Hours To Date:	11,426 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% (during temporary startups)
Average Stack Temperature	750° F (during temporary startups)
Average Source Flow:	29 scfm (during temporary startups)
Average Process Flow:	175 scfm (during temporary startups)
Average Source Vacuum:	20" H_2O (during temporary startups)

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

DISCUSSION:

- Benzene and total petroleum hydrocarbons as gasoline were found in samples collected from ADR-1, ADR-2, A-5, and A-6 ranging from 1.4 µg/L (ADR-1) to 370 µg/L (ADR-2) and 110 µg/L (A-5) to 5,300 µg/L (ADR-2), respectively.
- Methyl tertiary butyl ether was found in samples collected from A-1, A-5, A-6, ADR-1 and ADR-2 at concentrations ranging from 2.7 µg/L (A-5) to 60 µg/L (AR-2), respectively.
- The system did not operate during the Second Quarter 2001 (except for temporary 1 hour monthly testing startups).
- The site appears to be undergoing natural attenuation due to the field measurements of methane measured in the remediation system's influent vapor (see Table 3).

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

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
	12/26/00		11.95	3.66	<0.5	<0.5	<0.5	<0.5	<50	<2.5
	3/20/2001[a]		NM	NC	NS	NS	NS	NS	NS	NS
	06/12/01		11.87	3.74	<0.5	<0.5	<0.5	<0.5	<50	17
	09/23/01		12.42	3.19	NS	NS	NS	NS	NS	NS
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
	12/26/00		11.95	3.33	<0.5	<0.5	<0.5	<0.5	<50	<2.5
	03/20/01		10.50	4.78	NS	NS	NS	NS	NS	NS
	06/12/01		11.73	3.55	<0.5	<0.5	<0.5	<0.5	<50	82
	09/23/01		12.43	2.85	NS	NS	NS	NS	NS	NS
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
	12/26/00		10.93	3.02	1.29	<0.5	<0.5	<0.5	<50	14.7
	03/20/01		9.32	4.63	23.4	<0.5	8.71	4.13	225	10.8
	06/12/01		10.65	3.30	23	0.5	13	4.2	250	7.5
	09/23/01		11.25	2.70	1.4	<0.5	<0.5	0.57	<50	2.8
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
	12/26/00		11.52	3.12	26.6	<5.0	21.4	32.5	901	32.8
	03/20/01		10.10	4.54	Sheen	Sheen	Sheen	Sheen	Sheen	Sheen
	06/12/01		11.41	3.23	Sheen	Sheen	Sheen	Sheen	Sheen	Sheen
	09/23/01		11.98	2.66	370	<5.0	550	96	5300	60

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)
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
	12/26/00		10.96	3.2	104	2.85	12.2	9.91	429	18.7
	03/20/01		9.59	4.57	13.9	7.12	13.9	23.2	<500	<25
	06/12/01		10.83	3.33	2.2	<0.5	8.7	9.2	140	25
	09/23/01		11.43	2.73	<0.50	<0.50	<0.50	<0.50	<50	4.5
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
	12/26/00		11.44	3.11	<0.5	<0.5	<0.5	<0.5	<50	<2.5
	03/20/01		10.08	4.47	NS	NS	NS	NS	NS	NS
	06/12/01		11.35	3.2	<0.5	<0.5	<0.5	<0.5	<50	<2.5
	09/23/01		11.92	2.63	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
	12/26/00		12.17	3.58	<0.5	<0.5	<0.5	<0.5	<50	<2.5
	03/20/01		10.70	5.05	NS	NS	NS	NS	NS	NS
	06/12/01		12.09	3.66	NS	NS	NS	NS	NS	NS
	09/23/01		12.65	3.1	NS	NS	NS	NS	NS	NS
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
	12/26/00		11.19	4.06	<0.5	<0.5	<0.5	<0.5	<50	<2.5
	03/20/01		9.81	5.44	NS	NS	NS	NS	NS	NS
	06/12/01		11.12	4.13	NS	NS	NS	NS	NS	NS
	09/23/01		11.63	3.62	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	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	TPH as Gasoline (µg/L)	MTBE (µg/L)
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
	12/26/00		10.37	3.14	465	108	659	1,450	8,120	<250
	03/20/01		8.81	4.7	1110	473	611	1,580	7,990	<250
	06/12/01		10.13	3.38	91	18	35	95	450	<5.0
	09/23/01		10.80	2.71	20	<0.5	5.0	5.0	110	2.7
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
	12/26/00		10.65	2.86	<0.5	<0.5	<0.5	<0.5	56.2	8.17
	03/20/01		8.72	4.79	<0.5	<0.5	<0.5	1.8	216	19.9
	06/12/01		10.80	2.71	0.62	<0.5	<0.5	<0.5	80	15
	09/23/01		10.79	2.72	1.7	1.9	2.3	3.3	450	53

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

NA = Not analyzed

NS = Not sampled

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

[a] Well was covered by stockpiled soil and not accessible

TABLE 2

GROUNDWATER FLOW DIRECTION AND GRADIENT

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

Date Measured	Average Flow Direction	Average Hydraulic Gradient
07/20/00	Northwest	0.004
09/19/00	West-Northwest	0.003
12/26/00	Northwest	0.004
03/20/01	Northwest	0.003
06/12/01	Northwest	0.004
09/23/01	Northwest	0.004

Note: Please refer to Appendix B for 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
Influent	10/23/00	<0.016	<0.013	<0.012	0.104	27.7	NA
Effluent	10/23/00	<0.016	<0.013	<0.012	<0.012	<2.4	NA
Influent	11/07/00	NA	NA	NA	NA	NA	>10,000[a]
Effluent	11/17/01	NA	NA	NA	NA	NA	>10,000[a]
Influent	12/26/00	NA	NA	NA	NA	NA	NM
Effluent	12/26/00	NA	NA	NA	NA	NA	NM
Influent	01/18/01	NA	NA	NA	NA	NA	1,200[a]
Effluent	01/18/01	NA	NA	NA	NA	NA	1,200[a]
Influent	02/06/01	NA	NA	NA	NA	NA	1,100[a]
Effluent	02/06/01	NA	NA	NA	NA	NA	1,100[a]
Influent	3/20/2001[b]	NA	NA	NA	NA	NA	NM
Effluent	3/20/2001[b]	NA	NA	NA	NA	NA	NM
Influent	04/26/01	0.0340	<0.013	<0.012	0.038	2.92	11,000
Effluent	04/26/01	<0.016	<0.013	<0.012	<0.012	<2.8	4,800
Influent	05/30/01	NA	NA	NA	NA	NA	>10,000[a]
Effluent	05/30/01	NA	NA	NA	NA	NA	>10,000[a]
Influent	06/12/01	NA	NA	NA	NA	NA	>10,000[a]
Effluent	06/12/01	NA	NA	NA	NA	NA	>10,000[a]
Influent	07/11/01	NA	NA	NA	NA	NA	>10,000[a]
Effluent	07/11/01	NA	NA	NA	NA	NA	>10,000[a]
Influent	08/01/01	NA	NA	NA	NA	NA	>10,000[a]
Effluent	08/01/01	NA	NA	NA	NA	NA	>10,000[a]
Influent	09/18/01	NA	NA	NA	NA	NA	>10,000[a]
Effluent	09/18/01	NA	NA	NA	NA	NA	>10,000[a]

ppmv = parts per million by volume
NS = Not sampled
NA = Not analyzed
NM = Not measured

[a] Methane reading from field flame ionization dectector reading
[b] System down due to site construction activities

Please refer to Appendix B for Historical System Anallyticals

TABLE 4

SVE SYSTEM MONITORING TABLE

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

Date Sampled	Total Inlet Flow Rate (ft^3/min)	Stack Flow Rate (ft^3/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	72	10,700	673	180	<5.0	0.2	<0.1	2.48	< 0.12	0.003	< 0.002	0.00 E+00	NC	9,010
09/20/00	175	204	11,062	362	246	<2.4	5.56	<0.016	13.74	<0.16	0.012	<0.001	4.42 E+06	122.3	9,132
10/23/00	183	212	11,062	0	27.7	<2.4	<0.016	<0.016	1.62	<0.16	<0.0008	<0.001	4.42 E+06	0	9,132
11/07/00	121	152	11,420	358	NS	NS	NS	NS	NC	NC	NC	NC	7.69 E+06	12.10	9,144
12/26/00[a]	0	0	11,420	0	NS	NS	NS	NS	NC	NC	NC	NC	7.69 E+06	NC	9,144
01/18/01	228	257	11,421	1	0 [b]	0 [b]	NS	NS	0 [b]	0 [b]	NC	NC	7.71 E+06	0	9,144
02/06/01	228	257	11,422	1	0 [b]	0 [b]	NS	NS	0 [b]	0 [b]	NC	NC	7.72 E+06	0	9,144
03/20/01[c]	0	0	11,422	0	NS	NS	NS	NS	NC	NC	NC	NC	7.72 E+06	0	9,144
04/26/01	175	204	11,423	1	2.92	<2.8	0.034	<0.016	0.16	<0.18	0.0017	<0.001	7.74 E+06	0	9,144
05/30/01	175	204	11,423	0	0 [b]	0 [b]	NS	NS	0 [b]	0 [b]	NC	NC	7.74 E+06	0	9,144
06/12/01	175	204	11,423	0	0 [b]	0 [b]	NS	NS	0 [b]	0 [b]	NC	NC	7.74 E+06	0	9,144
07/11/01	191	220	11,423	0	0[b]	0[b]	NS	NS	0 [b]	0 [b]	NC	NC	7.74 E+06	0	9,144
08/01/01	187	216	11,423	0	0[b]	0[b]	NS	NS	0 [b]	0 [b]	NC	NC	7.74 E+06	0	9,144
09/18/01	151	180	11,426	3	0[b]	0[b]	NS	NS	0 [b]	0 [b]	NC	NC	7.78 E+06	0	9,144

TPHg = Total petroleum hydrocarbons as gasoline

ppmv = Parts per million by volume.

NS = Not Sampled

NC= Not Calculated

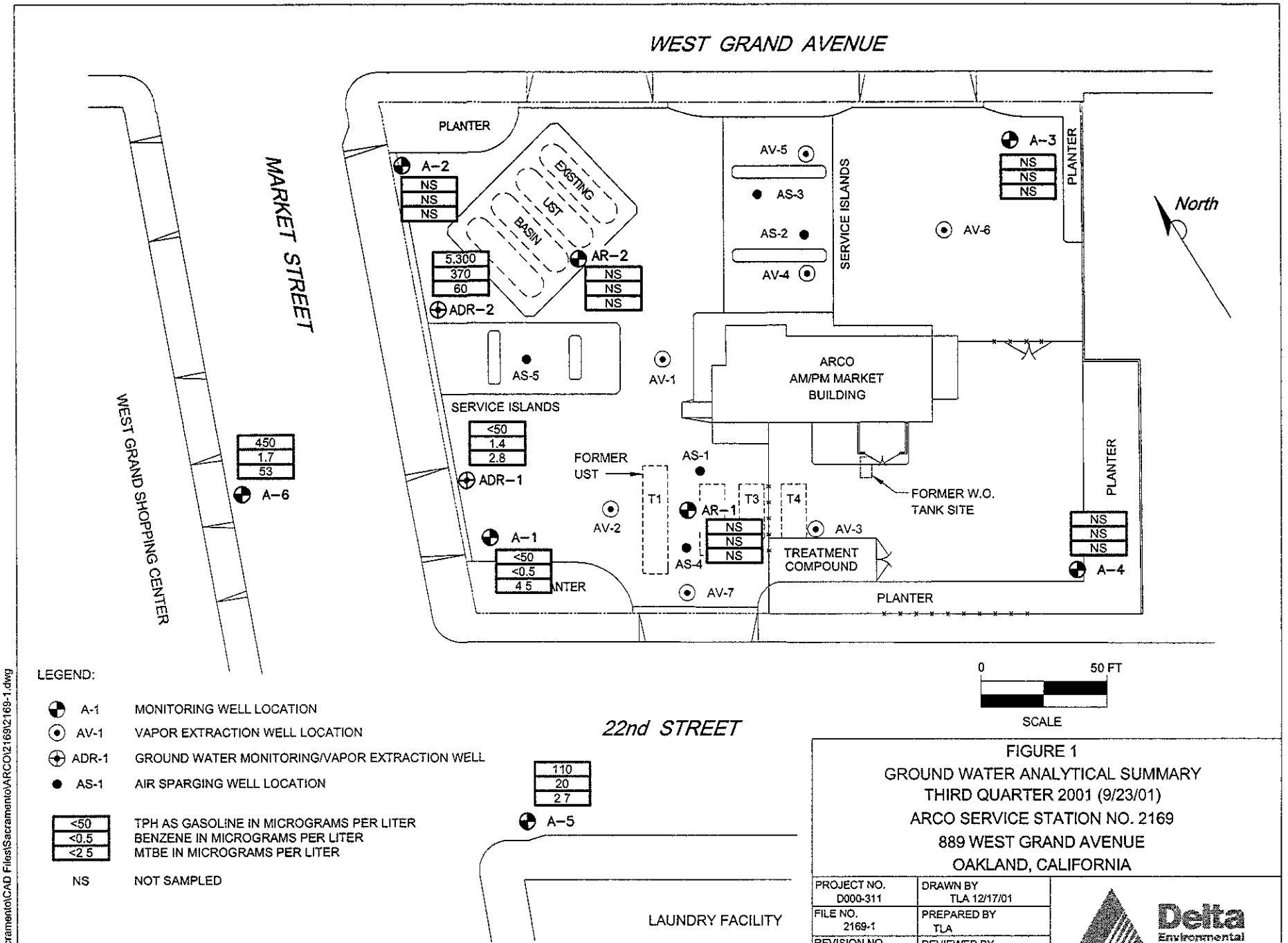
[a] Power interupt-system did not operate

[b] No samples collected, only FID results

[c] System off due to site construction activities

Note. Flow rates, extraction and emmission rates were corrected from 9/20/00 through 02/06/01 due to previous faulty flow readings Hour meters admusted from 4/26/01 through 6/12/01 due to possible mis-reading.

Please refer to Appendix B for historical SVE system data.



LEGEND:

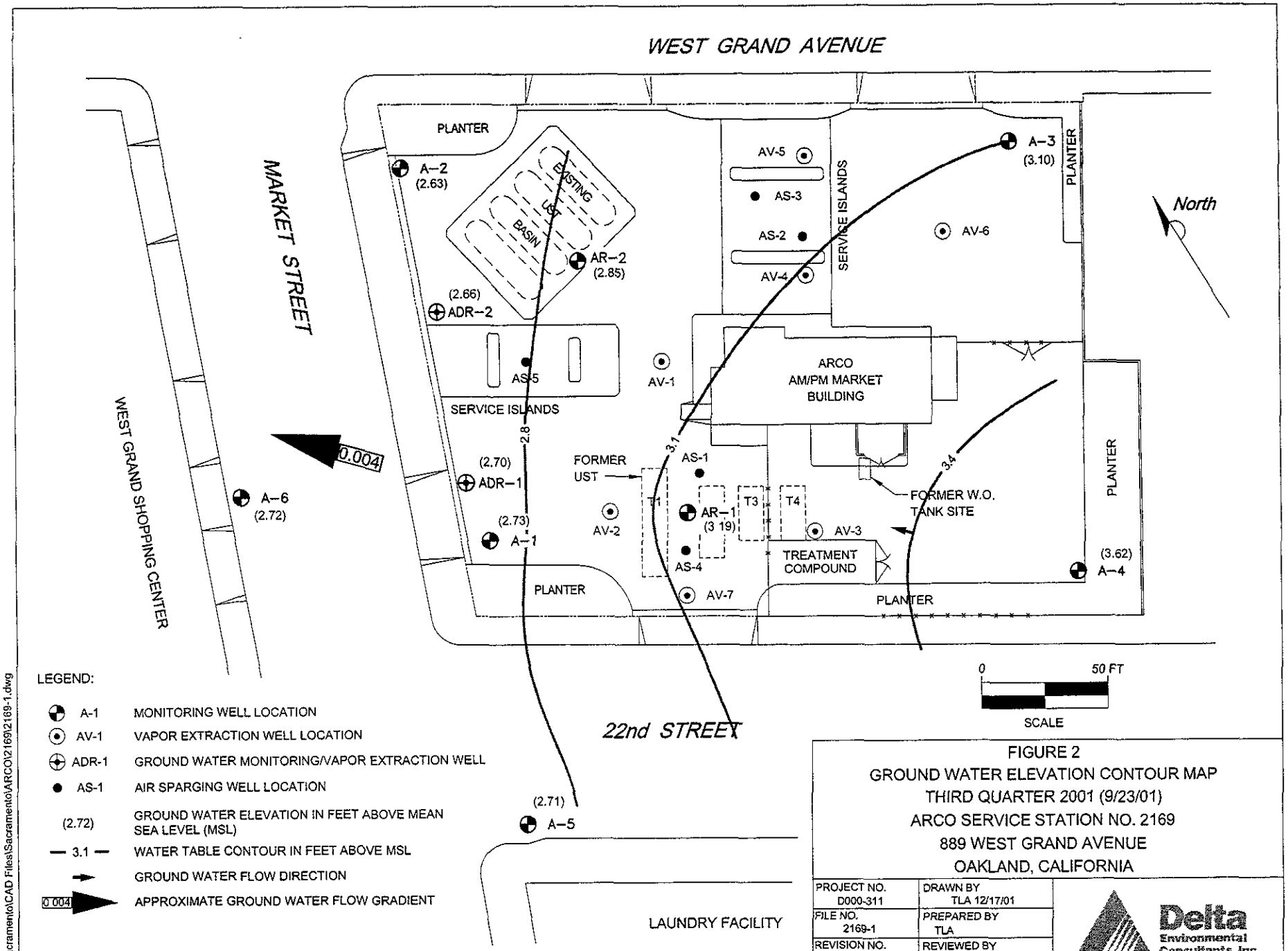
A-1	MONITORING WELL LOCATION
AV-1	VAPOR EXTRACTION WELL LOCATION
ADR-1	GROUND WATER MONITORING/VAPOR EXTRACTION WELL
AS-1	AIR SPARGING WELL LOCATION
<50 <0.5 <2.5	TPH AS GASOLINE IN MICROGRAMS PER LITER BENZENE IN MICROGRAMS PER LITER MTBE IN MICROGRAMS PER LITER
NS	NOT SAMPLED

FIGURE 1
GROUND WATER ANALYTICAL SUMMARY
THIRD QUARTER 2001 (9/23/01)
ARCO SERVICE STATION NO. 2169
889 WEST GRAND AVENUE
OAKLAND, CALIFORNIA

PROJECT NO. D000-311	DRAWN BY TLA 12/17/01
FILE NO. 2169-1	PREPARED BY TLA
REVISION NO 1	REVIEWED BY

Delta Environmental Consultants, Inc.

\\Sacramento\CAD Files\Sacramento\ARCO\2169\2169-1.dwg



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
(2.72)	GROUND WATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL (MSL)
— 3.1 —	WATER TABLE CONTOUR IN FEET ABOVE MSL
→	GROUND WATER FLOW DIRECTION
0.004	APPROXIMATE GROUND WATER FLOW GRADIENT

FIGURE 2
GROUND WATER ELEVATION CONTOUR MAP
THIRD QUARTER 2001 (9/23/01)
ARCO SERVICE STATION NO. 2169
889 WEST GRAND AVENUE
OAKLAND, CALIFORNIA

PROJECT NO. D000-311	DRAWN BY TLA 12/17/01
FILE NO. 2169-1	PREPARED BY TLA
REVISION NO. 1	REVIEWED BY

Delta Environmental Consultants, Inc.

\\Sacramento\CAD Files\Sacramento\ARCO\2169\2169-1.dwg

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

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 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-1	03-24-95	14.16	8.10	ND	6.06	03-24-95	1,200	230	39	34	66	--	--	160		
A-1	06-05-95	14.16	11.13	ND	3.03	06-05-95	1,500	310	27	36	76	--	--	710		
A-1	08-17-95	14.16	11.71	ND	2.45	08-18-95	1,600	470	35	48	110	120	--	240		
A-1	12-04-95	14.16	12.28	ND	1.88	12-04-95	1,200	240	17	25	56	--	120	--		
A-1	03-01-96	14.16	8.78	ND	5.38	03-13-96	1,300	300	74	29	73	100	--	--		
A-1	05-29-96	14.16	9.85	ND	4.31	05-29-96	Not sampled: well sampled semi-annually, during the first and third quarters									
A-1	08-29-96	14.16	11.08	ND	3.08	08-29-96	1,200	320	5.9	25	27	110	--	--		
A-1	11-21-96	14.16	10.54	ND	3.62	11-21-96	Not sampled: well sampled semi-annually, during the first and third quarters									
A-1	03-26-97	14.16	10.55	ND	3.61	03-26-97	<50	0.8	<0.5	<0.5	<0.5	64	--	--		
A-1	05-21-97	14.16	11.10	ND	3.06	05-21-97	Not sampled: well sampled semi-annually, during the first and third quarters									
A-1	08-08-97	14.16	11.32	ND	2.84	08-08-97	91	7	<0.5	0.5	3.9	<60	--	--		
A-1	11-18-97	14.16	3.46	ND	10.70	11-18-97	54	<0.5	<0.5	<0.5	0.6	27	--	--		
A-1	02-20-98	14.16	7.10	ND	7.06	02-23-98	590	160	22	15	28	70	--	--		
A-1	05-11-98	14.16	9.87	ND	4.29	05-11-98	280	26	<0.5	0.8	2.3	6	--	--		
A-1	07-30-98	14.16	10.73	ND	3.43	07-30-98	1,000	210	5	<5	38	<30	--	--		
A-1	10-08-98	14.16	11.15	ND	3.01	10-08-98	3,100	740	11	<10	24	<60	--	--		
A-1	02-18-99	14.16	8.00	ND	6.16	02-18-99	510	87	7.1	6.4	13	52	--	--		
A-1	05-26-99	14.16	10.60	ND	3.56	05-26-99	240	26	<0.5	1.2	6.2	34	--	--		
A-1	08-23-99	14.16	11.22	ND	2.94	08-23-99	79	3.9	0.6	<0.5	1.7	38	--	--	0.68	NP
A-1	10-27-99	14.16	11.37	ND	2.79	10-27-99	110	2.2	<0.5	<0.5	<1	25	--	--	0.80	NP
A-1	01-31-00	14.16	9.44	ND	4.72	01-31-00	<50	<0.5	<0.5	<0.5	<1	<3	--	--	1.0	NP
A-2	03-24-95	14.55	8.64	ND	5.91	03-24-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--		
A-2	06-05-95	14.55	11.72	ND	2.83	06-05-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--		
A-2	08-17-95	14.55	12.35	ND	2.20	08-17-95	<50	<0.5	<0.5	<0.5	<0.5	12	--	--		
A-2	12-04-95	14.55	12.74	ND	1.81	12-04-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--		
A-2	03-01-96	14.55	9.34	ND	5.21	03-13-96	<50	<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 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-2	05-29-96	14.55	10.40	ND	4.15	05-29-96	<50	<0.5	<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	<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	<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	<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									
A-2	08-08-97	14.55	11 82	ND	2.73	08-08-97	<50	<0.5	<0.5	<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									
A-2	02-20-98	14.55	7.68	ND	6.87	02-20-98	<50	<0.5	<0.5	<0.5	<0.5	17	--	--		
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	<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	<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	<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	<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	<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	<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 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-3	08-08-97	15.75	12.62	ND	3.13	08-08-97	Not sampled- well sampled annually									
A-3	11-18-97	15.75	3.75	ND	12.00	11-18-97	Not sampled: well sampled annually									
A-3	02-20-98	15.75	8.06	ND	7.69	02-20-98	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--		
A-3	05-11-98	15.75	11.19	ND	4.56	05-11-98	Not sampled: well sampled annually									
A-3	07-30-98	15.75	12.05	ND	3.70	07-30-98	Not sampled: well sampled annually									
A-3	10-08-98	15.75	12.43	ND	3.32	10-08-98	Not sampled: well sampled annually									
A-3	02-18-99	15.75	9.05	ND	6.70	02-18-99	Not sampled: well sampled annually									
A-3	05-26-99	15.75	11.93	ND	3.82	05-26-99	<50	<0.5	<0.5	<0 5	<0 5	<3	--	--		
A-3	08-23-99	15.75	12 57	ND	3.18	08-23-99	Not sampled: well sampled annually								0.88	
A-3	10-27-99	15.75	12.65	ND	3.10	10-27-99	Not sampled: well sampled annually									
A-3	01-31-00	15.75	9.55	ND	6.20	01-31-00	<50	<0.5	<0.5	<0.5	<1	9	--	--	1.0	NP
A-4	03-24-95	15.25	7.20	ND	8.05	03-24-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--		
A-4	06-05-95	15.25	11.70	ND	3.55	06-05-95	Not sampled: well sampled annually									
A-4	08-17-95	15.25	12.28	ND	2.97	08-17-95	Not sampled- well sampled annually									
A-4	12-04-95	15.25	12.63	ND	2.62	12-04-95	Not sampled: well sampled annually									
A-4	03-01-96	15.25	8.55	ND	6.70	03-13-96	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--		
A-4	05-29-96	15.25	10.32	ND	4.93	05-29-96	Not sampled: well sampled annually									
A-4	08-29-96	15.25	11.55	ND	3.70	08-29-96	Not sampled: well sampled annually									
A-4	11-21-96	15.25	10.83	ND	4.42	11-21-96	Not sampled: well sampled annually									
A-4	03-26-97	15.25	10.97	ND	4.28	03-26-97	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--		
A-4	05-21-97	15 25	11 51	ND	3 74	05-21-97	Not sampled: well sampled annually									
A-4	08-08-97	15.25	11.73	ND	3.52	08-08-97	Not sampled: well sampled annually									
A-4	11-18-97	15.25	4.37	ND	10.88	11-18-97	Not sampled: well sampled annually									
A-4	02-20-98	15.25	6.25	ND	9.00	02-20-98	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--		
A-4	05-11-98	15.25	10.33	ND	4.92	05-11-98	Not sampled: well sampled annually									
A-4	07-30-98	15.25	11.25	ND	4.00	07-30-98	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 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								0.54	
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

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 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		

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 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									

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 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 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)
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 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)
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

Date Measured	Average Flow Direction	Average Hydraulic Gradient
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
01-31-00	**West-Northwest**	**0.006**

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[1]	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%

[1] 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. H20)	Velocity (fpm)	Flowrate[1] (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[2]		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

[1] Influent Flow Rate, cfm = (Velocity, fpm)(Influent Pipe Area, sq. ft.)(406.8 in.H20 - Vacuum, in.H20) / (406.8 in H20)
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"

[2] 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[1]		Emission Rate to Atmosphere[2]		Destruction Efficiency[3]		Period Removal[4]		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[5]									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

[1] Extraction Rate, lbs/day = (Influent Flow, cfm)(Influent conc , ppmv)(g/mole)(60 min/hr)(24 hr/day)(28.3 L/cf) / (10^6)(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

[2] Emission Rate, lbs/day = (Effluent Flow, cfm)(Effluent conc., ppmv)(g/mole)(60 min/hr)(24 hr/day)(28.3 L/cf) / (10^6)(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

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

[4] Period Removal, lbs = (Extraction Rate)(Uptime)

[5] Operational data through 4/1/98 from First Quarter 1998 Quarterly Monitoring Report

APPPENDIX C

Certified Analytical Reports
And
Chain-of-Custody Documentation

Sequoia
Analytical

819 Striker Avenue, Suite 8
Sacramento, CA 95834
(916) 921-9600
FAX (916) 921-0100
www.sequoialabs.com

8 October, 2001

Steven Meeks
Delta Environmental Consultants(Rancho Cordova)
3164 Gold Camp Drive Ste. 200
Rancho Cordova, CA 95670

RE: ARCO 2169, Oakland, CA
Sequoia Report: S109369

Enclosed are the results of analyses for samples received by the laboratory on 09/25/01 09:30. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Ron Chew
Client Services Representative

Lito Diaz
Laboratory Director

CA ELAP Certificate #1624

Sequoia Analytical

819 Striker Avenue, Suite 8
Sacramento, CA 95834
(916) 921-9600
FAX (916) 921-0100
www.sequoialabs.com

Delta Environmental Consultants(Rancho Cordova)	Project: ARCO 2169, Oakland, CA	
3164 Gold Camp Drive Ste. 200	Project Number: N/A	**Reported:**
Rancho Cordova CA, 95670	Project Manager: Steven Meeks	10/08/01 14:00

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
A-1-11	S109369-01	Water	09/23/01 09:22	09/25/01 09:30
A-5-10	S109369-02	Water	09/23/01 09:05	09/25/01 09:30
A-6-10	S109369-03	Water	09/23/01 09:15	09/25/01 09:30
ADR-1-11	S109369-04	Water	09/23/01 09:30	09/25/01 09:30
ADR-2-11	S109369-05	Water	09/23/01 09:40	09/25/01 09:30
TB	S109369-06	Water	09/23/01 06:00	09/25/01 09:30

Sequoia Analytical - Sacramento

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Ron Chew, Client Services Representative

Sequoia Analytical

819 Striker Avenue, Suite 8
Sacramento, CA 95834
(916) 921-9600
FAX (916) 921-0100
www.sequoialabs.com

Delta Environmental Consultants(Rancho Cordova)	Project: ARCO 2169, Oakland, CA	
3164 Gold Camp Drive Ste. 200	Project Number: N/A	**Reported:**
Rancho Cordova CA, 95670	Project Manager: Steven Meeks	10/08/01 14:00

Total Purgeable Hydrocarbon, BTEX and MTBE by DHS LUFT

Sequoia Analytical - Sacramento

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
A-1-11 (S109369-01) Water Sampled: 09/23/01 09:22 Received: 09/25/01 09:30									
Purgeable Hydrocarbons	ND	50	ug/l	1	1100055	10/02/01	10/02/01	DHS LUFT	A-01
Benzene	ND	0.50	"	"	"	"	"	"	A-01
Toluene	ND	0.50	"	"	"	"	"	"	A-01
Ethylbenzene	ND	0.50	"	"	"	"	"	"	A-01
Xylenes (total)	ND	0.50	"	"	"	"	"	"	A-01
Methyl tert-butyl ether	**4.5**	2.5	"	"	"	"	"	"	A-01
Surrogate: a,a,a-Trifluorotoluene		*95.9 %*	*60-140*		"	"	"	"	*A-01*
A-5-10 (S109369-02) Water Sampled: 09/23/01 09:05 Received: 09/25/01 09:30									
Purgeable Hydrocarbons	**110**	50	ug/l	1	1100057	10/02/01	10/02/01	DHS LUFT	
Benzene	**20**	0.50	"	"	"	"	"	"	
Toluene	ND	0.50	"	"	"	"	"	"	
Ethylbenzene	**5.0**	0.50	"	"	"	"	"	"	
Xylenes (total)	**5.0**	0.50	"	"	"	"	"	"	
Methyl tert-butyl ether	**2.7**	2.5	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		*124 %*	*60-140*		"	"	"	"	
A-6-10 (S109369-03) Water Sampled: 09/23/01 09:15 Received: 09/25/01 09:30									
Purgeable Hydrocarbons	**450**	50	ug/l	1	1100055	10/02/01	10/02/01	DHS LUFT	HC-12
Benzene	**1.7**	0.50	"	"	"	"	"	"	
Toluene	**1.9**	0.50	"	"	"	"	"	"	
Ethylbenzene	**2.3**	0.50	"	"	"	"	"	"	
Xylenes (total)	**3.3**	0.50	"	"	"	"	"	"	
Methyl tert-butyl ether	**53**	2.5	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		*106 %*	*60-140*		"	"	"	"	

Sequoia Analytical

819 Striker Avenue, Suite 8
Sacramento, CA 95834
(916) 921-9600
FAX (916) 921-0100
www.sequoialabs.com

Delta Environmental Consultants(Rancho Cordova)	Project: ARCO 2169, Oakland, CA	
3164 Gold Camp Drive Ste. 200	Project Number: N/A	**Reported:**
Rancho Cordova CA, 95670	Project Manager: Steven Meeks	10/08/01 14:00

Total Purgeable Hydrocarbon, BTEX and MTBE by DHS LUFT

Sequoia Analytical - Sacramento

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
ADR-1-11 (S109369-04) Water Sampled: 09/23/01 09:30 Received: 09/25/01 09:30									
Purgeable Hydrocarbons	ND	50	ug/l	1	1100055	10/02/01	10/02/01	DHS LUFT	
Benzene	**1.4**	0.50	"	"	"	"	"	"	
Toluene	ND	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.50	"	"	"	"	"	"	
Xylenes (total)	**0.57**	0.50	"	"	"	"	"	"	
Methyl tert-butyl ether	**2.8**	2.5	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		*96.6 %*		*60-140*		"	"	"	
ADR-2-11 (S109369-05) Water Sampled: 09/23/01 09:40 Received: 09/25/01 09:30									
Purgeable Hydrocarbons	**5300**	500	ug/l	10	1100055	10/02/01	10/02/01	DHS LUFT	
Benzene	**370**	5.0	"	"	"	"	"	"	
Toluene	ND	5.0	"	"	"	"	"	"	
Ethylbenzene	**550**	5.0	"	"	"	"	"	"	
Xylenes (total)	**96**	5.0	"	"	"	"	"	"	
Methyl tert-butyl ether	**60**	25	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		*98.0 %*		*60-140*		"	"	"	
TB (S109369-06) Water Sampled: 09/23/01 06:00 Received: 09/25/01 09:30									
Purgeable Hydrocarbons	ND	50	ug/l	1	1100055	10/02/01	10/02/01	DHS LUFT	
Benzene	ND	0.50	"	"	"	"	"	"	
Toluene	**1.5**	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.50	"	"	"	"	"	"	
Xylenes (total)	**0.86**	0.50	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	2.5	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		*99.7 %*		*60-140*		"	"	"	

Sequoia Analytical

819 Striker Avenue, Suite 8
Sacramento, CA 95834
(916) 921-9600
FAX (916) 921-0100
www.sequoialabs.com

Delta Environmental Consultants(Rancho Cordova)	Project: ARCO 2169, Oakland, CA	
3164 Gold Camp Drive Ste. 200	Project Number: N/A	**Reported:**
Rancho Cordova CA, 95670	Project Manager Steven Meeks	10/08/01 14:00

Total Purgeable Hydrocarbon, BTEX and MTBE by DHS LUFT - Quality Control

Sequoia Analytical - Sacramento

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1100055 - EPA 5030B (P/T)										
Blank (1100055-BLK1)				Prepared & Analyzed: 10/02/01						
Purgeable Hydrocarbons	ND	50	ug/l							
Benzene	ND	0.50	"							
Toluene	ND	0.50	"							
Ethylbenzene	ND	0.50	"							
Xylenes (total)	ND	0.50	"							
Methyl tert-butyl ether	ND	2.5	"							
Surrogate: a,a,a-Trifluorotoluene	*10.2*		"	*10.0*		*102*	*60-140*			
LCS (1100055-BS1)				Prepared & Analyzed: 10/02/01						
Benzene	9.87	0 50	ug/l	10.0		98.7	70-130			
Toluene	9.60	0.50	"	10.0		96 0	70-130			
Ethylbenzene	9.31	0.50	"	10 0		93.1	70-130			
Xylenes (total)	28.0	0.50	"	30.0		93.3	70-130			
Methyl tert-butyl ether	12.1	2.5	"	10.0		121	70-130			
Surrogate: a,a,a-Trifluorotoluene	*8.28*		"	*10.0*		*82.8*	*60-140*			
Matrix Spike (1100055-MS1)		**Source: S109369-06**		Prepared & Analyzed: 10/02/01						
Benzene	9.34	0.50	ug/l	10 0	ND	93.4	60-140			
Toluene	10.2	0.50	"	10.0	1.5	87.0	60-140			
Ethylbenzene	9.17	0.50	"	10.0	ND	91.7	60-140			
Xylenes (total)	28 0	0.50	"	30.0	0 86	90.5	60-140			
Methyl tert-butyl ether	12.5	2.5	"	10.0	ND	125	60-140			
Surrogate: a,a,a-Trifluorotoluene	*10.1*		"	*10.0*		*101*	*60-140*			
Matrix Spike Dup (1100055-MSD1)		**Source: S109369-06**		Prepared & Analyzed: 10/02/01						
Benzene	10.0	0.50	ug/l	10.0	ND	100	60-140	6.83	25	
Toluene	10 8	0.50	"	10.0	1.5	93.0	60-140	5.71	25	
Ethylbenzene	9.72	0.50	"	10.0	ND	97.2	60-140	5.82	25	
Xylenes (total)	29.3	0.50	"	30.0	0 86	94.8	60-140	4.54	25	
Methyl tert-butyl ether	12.7	2.5	"	10.0	ND	127	60-140	1.59	25	
Surrogate: a,a,a-Trifluorotoluene	*10.4*		"	*10.0*		*104*	*60-140*			

Sequoia Analytical

819 Striker Avenue, Suite 8
Sacramento, CA 95834
(916) 921-9600
FAX (916) 921-0100
www.sequoialabs.com

Delta Environmental Consultants(Rancho Cordova)	Project: ARCO 2169, Oakland, CA	
3164 Gold Camp Drive Ste. 200	Project Number: N/A	**Reported:**
Rancho Cordova CA, 95670	Project Manager Steven Meeks	10/08/01 14:00

Total Purgeable Hydrocarbon, BTEX and MTBE by DHS LUFT - Quality Control

Sequoia Analytical - Sacramento

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1100057 - EPA 5030B (P/T)										
Blank (1100057-BLK1)				Prepared & Analyzed: 10/02/01						
Purgeable Hydrocarbons	ND	50	ug/l							
Benzene	ND	0.50	"							
Toluene	ND	0.50	"							
Ethylbenzene	ND	0.50	"							
Xylenes (total)	ND	0.50	"							
Methyl tert-butyl ether	ND	2.5	"							
Surrogate: a,a,a-Trifluorotoluene	*9.47*		"	*10.0*		*94.7*	*60-140*			
LCS (1100057-BS1)				Prepared & Analyzed: 10/02/01						
Benzene	10.7	0.50	ug/l	10.0		107	70-130			
Toluene	10.1	0.50	"	10.0		101	70-130			
Ethylbenzene	10.0	0.50	"	10.0		100	70-130			
Xylenes (total)	30.5	0 50	"	30.0		102	70-130			
Methyl tert-butyl ether	11.3	2.5	"	10.0		113	70-130			
Surrogate: a,a,a-Trifluorotoluene	*11.3*		"	*10.0*		*113*	*60-140*			
Matrix Spike (1100057-MS1)		Source: S109379-02		Prepared: 10/02/01		Analyzed: 10/04/01				
Benzene	10.9	0.50	ug/l	10.0	ND	109	60-140			
Toluene	10.1	0.50	"	10.0	ND	101	60-140			
Ethylbenzene	10.4	0.50	"	10.0	ND	104	60-140			
Xylenes (total)	31.6	0.50	"	30.0	ND	105	60-140			
Methyl tert-butyl ether	11.6	2.5	"	10.0	ND	116	60-140			
Surrogate: a,a,a-Trifluorotoluene	*12.2*		"	*10.0*		*122*	*60-140*			
Matrix Spike Dup (1100057-MSD1)		Source: S109379-02		Prepared & Analyzed: 10/02/01						
Benzene	10.7	0.50	ug/l	10.0	ND	107	60-140	1.85	25	
Toluene	10.2	0.50	"	10.0	ND	102	60-140	0.985	25	
Ethylbenzene	10.3	0.50	"	10.0	ND	103	60-140	0.966	25	
Xylenes (total)	31.7	0 50	"	30.0	ND	106	60-140	0.316	25	
Methyl tert-butyl ether	11.1	2.5	"	10.0	ND	111	60-140	4.41	25	
Surrogate: a,a,a-Trifluorotoluene	*11.2*		"	*10.0*		*112*	*60-140*			

Sequoia Analytical

819 Striker Avenue, Suite 8
Sacramento, CA 95834
(916) 921-9600
FAX (916) 921-0100
www.sequoialabs.com

Delta Environmental Consultants(Rancho Cordova)	Project:	ARCO 2169, Oakland, CA	
3164 Gold Camp Drive Ste. 200	Project Number:	N/A	**Reported:**
Rancho Cordova CA, 95670	Project Manager	Steven Meeks	10/08/01 14:00

Notes and Definitions

A-01	Sample confirmed on alternate column on 10/04/01.
HC-12	Hydrocarbon pattern is present in the requested fuel quantitation range but does not resemble the pattern of the requested fuel.
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

ARCO

Work Authorization No. 599900

Chain of Custody

ARCO Facility No: 2169	City (Facility): Oakland	Project Manager (Consultant): Steve Meeks	Laboratory name: Sequoia
ARCO engineer: Paul Supple	Telephone no. (ARCO):	Telephone no. (Consultant): 6883085	Fax no. (Consultant): 6369385
Company name (Consultant): Delta	Address (Consultant): Rancho Cordova		Contact number:

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8021	BTEX/TPH EPA M602/8021/8015 MTBE	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	BTEX + MTBE EPA 8260	BTEX + Standard Oxygenates EPA 8260	Semi TCLP Metals ☐ VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐			
~~A~~-1-11		2		X		X	X	9-23-01	922		+				S109369-01							
A-5-10									905									-02				
A-6-10									915									-03				
ADR-1-11									930									-04				
ADR-2-11									940									-05				
TB		V		V		V	V	V	600		V							-06				

Special detection Limit/reporting:

Special QA/QC:

Remarks:

Type or Work
- ☐ Dispenser Work
- ☐ Line Job
- ☐ Routine Sampling
- ☐ Site Acquisitions
- ☐ Site Assessment
- ☐ UST Removal
- ☐ UST Replacement
- ☐ Other

Lab number:

Turnaround time
- Priority Rush 1 Business Day ☐
- Rush 2 Business Days ☐
- Expedited 5 Business Days ☐
- Standard 10 Business Days ☒

Method of shipment:

Condition of sample:		Temperature received: 13°C	
Relinquished by sampler: [signature]	Date: 09-25-01	Time: 9130	Received by: Monica Gregson
Relinquished by:	Date:	Time:	Received by: 9/26/01 930
Relinquished by:	Date:	Time:	Received by laboratory: Date: Time:

Distribution: White copy — Laboratory: Canary copy — ARCO Environmental Engineering: Pink copy — Consultant

APPENDIX D

Field Data Sheets

Delta Environmental Consultants, Inc.

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

Site Contact & Phone Number: ____________

Arco Site Address:	889 West Grand Avenue	Arco Site Number:	Arco 2169
	Oakland, California	Delta Project No.:	D000-311
Arco Project Manager:	Paul Supple	Delta Project PM:	Steve Meeks
Site Sampled By:	Stratus	Date Sampled:	09/23/01

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 Freqency (A, S, Q)	Sample I.D.	Sample Time
A-1	8:44	11.43	9.0	24.5	☑	13.07	3 inch	1.1	14.4	NP	☑	☑	☑	☐	0.81	Q/2,5,8,11	A-1	9:22
A-2	8:47	11.92	10.0	26.2	☐	14.28	3 inch	1.1	15.7	N/A	☑	☑	☑	☐	NM	S/5,11		
A-3	8:28	12.65	9.0	30.1	☐	17.45	3 inch	1.1	19.2	N/A	☐	☐	☐	☐	NM	A/11		
A-4	8:51	11.63	8.0	28.4	☐	16.77	3 inch	1.1	18.4	N/A	☐	☐	☐	☐	NM	A/11		
A-5	8:25	10.80	5.0	30.0	☑	19.20	2 inch	0.5	9.6	NP	☑	☑	☑	☐	1.84	Q/2,5,8,11	A-5	9:05
A-6	8:40	10.79	5.0	28.5	☑	17.71	2 inch	0.5	8.9	NP	☑	☑	☑	☐	1.06	Q/2,5,8,11	A-6	9:15
AR-1	8:54	12.42	8.5	NM	☐	N/A	6 inch	4.4	N/A	N/A	☑	☑	☑	☐	NM	S/5,11		
AR-2	8:57	12.43	8.5	29.3	☐	16.87	4 inch	2.0	33.7	N/A	☐	☐	☐	☐	NM	S/5,11		
ADR-1	8:36	11.25	5.0	21.9	☑	10.65	4 inch	2.0	21.3	NP	☑	☑	☑	☐	0.72	Q/2,5,8,11	ADR-1	9:30
ADR-2	8:32	11.98	5.0	26.3	☑	14.32	4 inch	2.0	28.6	NP	☐	☐	☐	☐	1.42	Q/2,5,8,11	ADR-2	9:40
					☐						☐	☐	☐	☐				
					☐						☐	☐	☐	☐				
					☐						☐	☐	☐	☐				
					☐						☐	☐	☐	☐				
					☐						☐	☐	☐	☐				
					☐						☐	☐	☐	☐				
					☐						☐	☐	☐	☐				
					☐						☐	☐	☐	☐				
					☐						☐	☐	☐	☐				
					☐						☐	☐	☐	☐				
					☐						☐	☐	☐	☐				

(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." Original Copies of Field Sampling Sheets are Located in Project File

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.

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

Site Contact & Phone Number: _____

Arco Site Address: 889 West Grand Avenue
Oakland, California
Arco Project Manager: Paul Supple
Site Sampled By: Stratus

Arco Site Number: Arco 2169
Delta Project No.: D000-311
Delta Project PM: Steve Meeks
Date Sampled: 09/23/01

Well ID	Time	Temp °C	pH Units	Sp. Cond.	Gallons	Well ID	Time	Temp °C	pH Units	Sp. Cond.	Gallons	Well ID	Time	Temp °F	pH Units	Sp. Cond.	Gallons
A-1	No Purge Required					AR-2	Not Sampled										
Well ID	Time	Temp °C	pH Units	Sp. Cond.	Gallons	Well ID	Time	Temp °C	pH Units	Sp. Cond.	Gallons	Well ID	Time	Temp °F	pH Units	Sp. Cond.	Gallons
A-2	Not Sampled					ADR-1	No Purge Required										
Well ID	Time	Temp °C	pH Units	Sp. Cond.	Gallons	Well ID	Time	Temp °C	pH Units	Sp. Cond.	Gallons	Well ID	Time	Temp °F	pH Units	Sp. Cond.	Gallons
A-3	*Not Sampled*					*ADR-2*	*No Purge Required*										
Well ID	Time	Temp °C	pH Units	Sp. Cond.	Gallons	Well ID	Time	Temp °F	pH Units	Sp. Cond.	Gallons	Well ID	Time	Temp °F	pH Units	Sp. Cond.	Gallons
A-4	Not Sampled																
Well ID	Time	Temp °C	pH Units	Sp. Cond	Gallons	Well ID	Time	Temp °F	pH Units	Sp. Cond.	Gallons	Well ID	Time	Temp °F	pH Units	Sp. Cond.	Gallons
A-5	No Purge Required																
Well ID	Time	Temp °C	pH Units	Sp. Cond.	Gallons	Well ID	Time	Temp °F	pH Units	Sp. Cond	Gallons	Well ID	Time	Temp °F	pH Units	Sp. Cond.	Gallons
A-6	No Purge Required																
Well ID	Time	Temp °C	pH Units	Sp. Cond.	Gallons	Well ID	Time	Temp °F	pH Units	Sp. Cond.	Gallons	Well ID	Time	Temp °F	pH Units	Sp. Cond.	Gallons
AR-1	Not Sampled																

Notes: NP = NO PURGE

Original Copies of Field Sampling Sheets are Located in Project File