



3818

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*RW-1 Core Spiked up
+ MW 3 Core*

MW 4 - elevated MTBE, June 9, 2000
Project 803932

Mr. Paul Supple
ARCO Products Company
PO Box 6549
Moraga, California 94570

Re: Quarterly Groundwater Monitoring Results and Remediation System Performance
Evaluation Report, First Quarter 2000, for ARCO Service Station No. 2035,
Located at 1001 San Pablo Avenue, Albany, California

Dear Mr. Supple:

IT Corporation (IT) is submitting the attached report, which presents the results of the first quarter 2000 groundwater monitoring program at ARCO Products Company (ARCO) Service Station No. 2035, located at 1001 San Pablo Avenue, Albany, California. Operation and performance data for the site's soil-vapor extraction system (SVE) and groundwater remediation system are also presented. The monitoring program complies with the Alameda County Health Care Services Agency (ACHCSA) requirements regarding underground tank investigations.

Please call if you have questions.

Sincerely,

IT Corporation

Dan Lescure
Project Manager

Dan Easter, R.G. 5722
Project Geologist

Attachment: Quarterly Groundwater Monitoring Report, First Quarter 2000

cc: Barney Chan, ACHCSA
James A. Lestrangle, Property Owner
Muriel & Emile Turpin, Trustees

Date: June 9, 2000**ARCO QUARTERLY GROUNDWATER MONITORING REPORT**

Station No.: 2035 Address: 1001 San Pablo Avenue, Albany, California
 ARCO Environmental Engineer/Phone No.: Paul Supple /(925) 299-8891
 Consulting Co./Contact Person: IT Corporation/Dan Lescure
 Consultant Project No.: 803932
 Primary Agency/Regulatory ID No.: ACHCSA /Barney Chan

WORK PERFORMED THIS QUARTER (FIRST - 2000):

1. Prepared and submitted semi-annual groundwater monitoring report for fourth quarter 1999.
2. Performed groundwater monitoring and sampling for first quarter 2000.
3. Restarted SVE system and air bubbling system per ARCO's Y2K program on 01/05/00.
4. Continued bubbling air into well RW-1 to introduce dissolved oxygen into the groundwater, thereby enhancing biodegradation of petroleum hydrocarbons in groundwater in the vicinity of the well.
5. Operated SVE system.
6. Renewal of BAAQMD Permit to Operate.
7. Shut down all systems for permit compliance during consultant transfer.

WORK PROPOSED FOR NEXT QUARTER (SECOND - 2000):

1. Prepare and submit groundwater monitoring report for first quarter 2000.
2. Perform semi-annual groundwater monitoring and sampling for second quarter 2000.
3. Continue bubbling air into well RW-1.
4. Operate SVE system, if influent concentrations and mass extraction rate warrants.

MONITORING:

Current Phase of Project: Groundwater Monitoring and Operation and Maintenance of Remediation Systems
SVE and Enhanced Bioremediation

Frequency of Sampling: Annual (2nd quarter): MW-5
Semi-annual (2nd/4th quarter): MW-1 through MW-4, MW-6, RW-1

Frequency of Monitoring: Semi-Annual (groundwater), Monthly (SVE)

Is Floating Product (FP) Present On-site: Yes No

Cumulative FP Recovered to Date: 27.9 gallons, Wells AS-1, AS-2, RW-1, VW-1, VW-2, and VW-7

FP Recovered This Quarter: None

Bulk Soil Removed to Date: 605 cubic yards of TPH impacted soil

Bulk Soil Removed This Quarter: None

Water Wells or Surface Waters, within 2000 ft., impacted by site: None

Current Remediation Techniques: SVE, and Air Bubbling in RW-1

Average Depth to Groundwater: 9.0 feet

Groundwater Flow Direction and Gradient (Average): 0.08 ft/ft toward Northwest

SVE QUARTERLY OPERATION AND PERFORMANCE:

Equipment Inventory:	Therm Tech Model VAC-10 Thermal/Catalytic Oxidizer
Operating Mode:	Catalytic Oxidation
BAAQMD Permit #:	10931
TPH Conc. End of Period (lab):	54 ppmv
Benzene Conc. End of Period (lab):	1.3 ppmv
SVE Flowrate End of Period:	115.2 cfm
Total HC Recovered This Period:	77 pounds
Total HC Recovered to Date:	3,761 pounds
Utility Usage	
Electric (kWh):	Not available
Gas (Therms):	Not available
Operating Hours This Period (SVE):	1079.18 hours
Operating Hours to Date (SVE):	11557.23 hours
Percent Operational (SVE):	57.7%
Operating Hours This Period (GWE):	0.0 hours
Percent Operational (GWE):	0.0%
Unit Maintenance:	Routine monthly maintenance
Number of Auto Shut Downs:	0
Destruction Efficiency Permit Requirement:	98.5% (POC >2,000 ppmv); 97% (POC >200 ppmv); 90% (POC <200 ppmv)
Percent TPH Conversion:	Not calculated
Average Stack Temperature:	763.3°F
Average SVE Source Flow:	67 cfm
Average SVE Process Flow:	113.25 cfm
Average Source Vacuum:	9.8 inches of water

DISCUSSION

- ACHCSA has approved changing monitoring from quarterly to semi-annual (September 3, 1999). Sampling will be conducted during 2nd and 4th quarters.
- ARCO will transfer this project to another consultant. The new consultant will begin providing services during the second quarter 2000.

ATTACHMENTS:

- Table 1 - Historical Groundwater Elevation and Analytical Data, Petroleum Hydrocarbons and Their Constituents
- Table 2 - Groundwater Flow Direction and Gradient
- Table 3 - Operational Uptime Information for the SVE System
- Table 4 - Flow Rates and Analytical Results of Air Samples
- Table 5 - Extraction Rates, Emission Rates, Destruction Efficiency, and Mass Removed
- Figure 1 - Groundwater Analytical Summary Map
- Figure 2 - Groundwater Elevation Contour Map
- Appendix A - Sampling and Analysis Procedures
- Appendix B - Certified Analytical Reports and Chain-of-Custody Documentation
- Appendix C - Field Data Sheets
- Appendix D - Certified Analytical Reports and Chain-of-Custody Documentation for SVE System

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

ARCO Service Station No. 2035
1001 San Pablo Avenue, Albany, California

Well Number	Date Gauged	TOC	Depth	FP	Groundwater	Date Sampled	TPH			Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	MTBE 8021B* (µg/L)	MTBE 8240/8260 (µg/L)	TRPH (µg/L)	Dissolved Oxygen (mg/L)	Purged/Not Purged (P/NP)
		Elevation (ft-MSL)	to Water (feet)	Thickness (feet)	Elevation [1] (ft-MSL)		Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)							
MW-1	03-24-95	41.41	6.21	ND	35.20	03-24-95	8,800	3,600	<50	62	99	--	--	--		
MW-1	05-24-95	41.41	9.37	ND	32.04	05-24-95	4,800	2,000	<20	52	<20	--	--	--		
MW-1	08-22-95	41.41	10.30	ND	31.11	08-22-95	780	310	<2.5	12	<2.5	14	--	--		
MW-1	11-09-95	41.41	12.25	ND	29.16	11-09-95	58	14	<0.5	<0.5	<0.5	--	--	--		
MW-1	02-27-96	41.41	9.08	ND	32.33	02-27-96	2,700	930	12	18	32	51	--	--		
MW-1	04-22-96	41.41	9.11	ND	32.30	04-22-96	2,700	1,000	<10	22	<10	<60	--	--		
MW-1	08-15-96	41.41	10.37	ND	31.04	08-15-96	300	52	<0.5	0.9	<0.5	22	--	--		
MW-1	12-10-96	41.41	8.79	ND	32.62	12-10-96	270	63	0.7	<0.5	1	25	--	--		
MW-1	03-27-97	41.41	9.80	ND	31.61	03-27-97	1,500	610	<5	15	7	56	--	--		
MW-1	05-22-97	41.41	9.65	ND	31.76	05-22-97	110	6	<0.5	<0.5	0.7	10	--	--		
MW-1	09-04-97	41.41	10.22	ND	31.19	09-04-97	180	40	<0.5	1.2	0.5	26	--	--		
MW-1	11-03-97	41.41	10.68	ND	30.73	11-03-97	83	8	<0.5	<0.5	<0.5	13	--	--		
MW-1	02-20-98	41.41	6.92	ND	34.49	02-20-98	1,800	540	7	27	31	46	--	--		
MW-1	05-18-98	41.41	9.28	ND	32.13	05-18-98	4,500	1,300	20	57	20	<60	--	--		
MW-1	08-20-98	41.41	10.05	ND	31.36	08-21-98	530	110	<5	<5	<5	400	--	--		
MW-1	10-20-98	41.41	10.42	ND	30.99	10-20-98	66	9.1	<0.5	<0.5	<0.5	8	--	--		
MW-1	02-16-99	41.41	8.10	ND	33.31	02-16-99	1,200	390	<5	<5	6	45	--	--		
MW-1	05-24-99	41.41	9.53	ND	31.88	05-24-99	1,300	600	3	13	3	26	--	--		
MW-1	08-24-99	41.41	10.03	ND	31.38	08-24-99	100	21	1.3	<0.5	<0.5	8	--	--	0.55 P	
MW-1	11-16-99	41.41	9.80	ND	31.61	11-16-99	99	10	0.6	<0.5	<1	7	--	--	2.1 P	
MW-1	02-01-00	41.41	8.82	ND	32.59	02-02-00	400	93	1.6	3.6	3.7	19	--	--	1.0 P	
MW-2	03-24-95	40.38	6.96	ND	33.42	03-24-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--		
MW-2	05-24-95	40.38	10.02	ND	30.36	05-24-95	Not sampled: well sampled semi-annually, during the first and third quarters									
MW-2	08-22-95	40.38	10.87	ND	29.51	08-22-95	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--		
MW-2	11-09-95	40.38	13.12	ND	27.26	11-09-95	Not sampled: well sampled semi-annually, during the first and third quarters									
MW-2	02-27-96	40.38	10.25	ND	30.13	02-27-96	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--		

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Well Number	Date Gauged	TOC	Depth	FP	Groundwater	Date Sampled	TPH			Ethyl-	Total	MTBE	MTBE	Dissolved Oxygen	Purged/Not Purged (P/NP)		
		Elevation (ft-MSL)	to Water (feet)	Thickness (feet)	Elevation [1] (ft-MSL)		Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	benzene (µg/L)	Xylenes (µg/L)	8021B* (µg/L)	8240/8260 (µg/L)			TRPH (µg/L)	(mg/L)
MW-2	04-22-96	40.38	9.98	ND	30.40	04-22-96	Not sampled: well sampled semi-annually, during the first and third quarters										
MW-2	08-15-96	40.38	11.10	ND	29.28	08-15-96	<50	<0.5	<0.5	<0.5	<0.5	4	--	--			
MW-2	12-10-96	40.38	10.00	ND	30.38	12-10-96	Not sampled: well sampled semi-annually, during the first and third quarters										
MW-2	03-27-97	40.38	10.38	ND	30.00	03-27-97	<50	<0.5	<0.5	<0.5	<0.5	12	--	--			
MW-2	05-22-97	40.38	10.65	ND	29.73	05-22-97	Not sampled: well sampled semi-annually, during the first and third quarters										
MW-2	09-04-97	40.38	10.87	ND	29.51	09-04-97	<50	<0.5	<0.5	<0.5	<0.5	19	--	--			
MW-2	11-03-97	40.38	11.25	ND	29.13	11-03-97	<50	<0.5	<0.5	<0.5	<0.5	18	--	--			
MW-2	02-20-98	40.38	7.69	ND	32.69	02-20-98	<50	0.5	<0.5	<0.5	<0.5	12	--	--			
MW-2	05-18-98	40.38	9.88	ND	30.50	05-18-98	<50	<0.5	<0.5	<0.5	<0.5	10	--	--			
MW-2	08-20-98	40.38	10.62	ND	29.76	08-21-98	<50	<0.5	<0.5	<0.5	<0.5	3	--	--			
MW-2	10-20-98	40.38	11.00	ND	29.38	10-20-98	<50	<0.5	<0.5	<0.5	<0.5	31	--	--			
MW-2	02-16-99	40.38	9.04	ND	31.34	02-16-99	<50	<0.5	<0.5	<0.5	<0.5	13	--	--			
MW-2	05-24-99	40.38	9.90	ND	30.48	05-24-99	<50	0.6	<0.5	<0.5	<0.5	47	--	--			
MW-2	08-24-99	40.38	10.60	ND	29.78	08-24-99	<50	<0.5	<0.5	<0.5	<0.5	20	--	--	0.88 P		
MW-2	11-16-99	40.38	10.45	ND	29.93	11-16-99	<50	<0.5	<0.5	<0.5	<1	<3	--	--	2.5 P		
MW-2	02-01-00	40.38	9.49	ND	30.89	02-02-00	<50	<0.5	<0.5	<0.5	<1	59	--	--	1.0 P		
MW-3	03-24-95	41.44	7.29	ND	34.15	03-24-95	51	0.8	<0.5	2.4	<0.5	--	--	<500			
MW-3	05-24-95	41.44	9.53	ND	31.91	05-24-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	<500			
MW-3	08-22-95	41.44	11.19	ND	30.25	08-22-95	<50	<0.5	<0.5	<0.5	<0.5	79	--	<500			
MW-3	11-09-95	41.44	12.77	ND	28.67	11-09-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	600			
MW-3	02-27-96	41.44	9.41	ND	32.03	02-27-96	120	3.6	<0.5	2.2	3.7	90	--	<0.5			
MW-3	04-22-96	41.44	9.63	ND	31.81	04-22-96	<50	<0.5	<0.5	<0.5	<0.5	90	--	--			
MW-3	08-15-96	41.44	11.12	ND	30.32	08-15-96	<50	<0.5	<0.5	<0.5	<0.5	54	--	--			
MW-3	12-10-96	41.44	10.34	ND	31.10	12-10-96	71	<0.5	<0.5	<0.5	<0.5	130	--	--			
MW-3	03-27-97	41.44	10.28	ND	31.16	03-27-97	<100	<1	<1	<1	<1	170	--	--			
MW-3	05-22-97	41.44	10.40	ND	31.04	05-22-97	<100	<1	<1	<1	<1	95	--	--			

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Well Number	Date Gauged	TOC	Depth	FP	Groundwater	Date Sampled	TPH					Total Xylenes (µg/L)	MTBE 8021B* (µg/L)	MTBE 8240/8260 (µg/L)	TRPH (µg/L)	Dissolved Oxygen (mg/L)	Purged/ Not Purged (P/NP)
		Elevation (ft-MSL)	to Water (feet)	Thickness (feet)	Elevation [1] (ft-MSL)		Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl- benzene (µg/L)							
MW-3	09-04-97	41.44	10.75	ND	30.69	09-04-97	<50	<0.5	<0.5	<0.5	<0.5	37	--	--			
MW-3	11-03-97	41.44	11.44	ND	30.00	11-03-97	<200	<2	<2	<2	<2	130	--	--			
MW-3	02-20-98	41.44	7.48	ND	33.96	02-20-98	<200	<2	5	<2	8	140	--	<0.5			
MW-3	05-18-98	41.44	9.87	ND	31.57	05-18-98	<100	<1	<1	<1	<1	150	--	<0.5			
MW-3	08-20-98	41.44	10.72	ND	30.72	08-21-98	<200	<2	<2	<2	<2	210	--	<0.5			
MW-3	10-20-98	41.44	11.30	ND	30.14	10-20-98	<200	<2	<2	<2	<2	270	--	<0.5			
MW-3	02-16-99	41.44	8.60	ND	32.84	02-16-99	<500	<5	<5	<5	<5	700	--	--			
MW-3	05-24-99	41.44	9.87	ND	31.57	05-24-99	<50	<0.5	<0.5	<0.5	<0.5	150	140	--			
MW-3	08-24-99	41.44	10.83	ND	30.61	08-24-99	<50	<0.5	<0.5	<0.5	<0.5	54	71	--	0.41	P	
MW-3	11-16-99	41.44	10.54	ND	30.90	11-16-99	100	<0.5	3.3	<0.5	<1	500	--	--	6.2	P	
MW-3	02-01-00	41.44	5.69	ND	35.75	02-02-00	18,000	1,000	45	1,500	940	100	--	--	2.12	P	
MW-4	03-24-95	40.33	5.92	ND	34.41	03-24-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--			
MW-4	05-24-95	40.33	9.23	ND	31.10	05-24-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--			
MW-4	08-22-95	40.33	10.61	ND	29.72	08-22-95	<50	<0.5	<0.5	<0.5	<0.5	99	--	--			
MW-4	11-09-95	40.33	11.97	ND	28.36	11-09-95	<50	<0.5	<0.5	<0.5	<0.5	--	89	--			
MW-4	02-27-96	40.33	8.84	ND	31.49	02-27-96	<50	0.8	<0.5	<0.5	<0.5	<3	--	--			
MW-4	04-22-96	40.33	9.15	ND	31.18	04-22-96	Not sampled: well sampled annually, during the first quarter										
MW-4	08-15-96	40.33	10.35	ND	29.98	08-15-96	Not sampled: well sampled annually, during the first quarter										
MW-4	12-10-96	40.33	8.70	ND	31.63	12-10-96	Not sampled: well sampled annually, during the first quarter										
MW-4	03-27-97	40.33	9.75	ND	30.58	03-27-97	<5,000	<50	<50	<50	<50	4,200	--	--			
MW-4	05-22-97	40.33	9.91	ND	30.42	05-22-97	Not sampled: well sampled annually, during the first quarter										
MW-4	09-04-97	40.33	10.25	ND	30.08	09-04-97	Not sampled: well sampled annually, during the first quarter										
MW-4	11-03-97	40.33	10.79	ND	29.54	11-03-97	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--			
MW-4	02-20-98	40.33	6.78	ND	33.55	02-20-98	<2,000	<20	<20	<20	<20	3,300	--	--			
MW-4	05-18-98	40.33	9.26	ND	31.07	05-18-98	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--			
MW-4	08-20-98	40.33	10.10	ND	30.23	08-21-98	<50	<0.5	<0.5	<0.5	<0.5	9	--	--			

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Well Number	Date Gauged	TOC Elevation (ft-MSL)	Depth to Water (feet)	FP Thickness (feet)	Groundwater Elevation [1] (ft-MSL)	Date Sampled	TPH					Total Xylenes (µg/L)	MTBE 8021B* (µg/L)	MTBE 240/8260 (µg/L)	TRPH (µg/L)	Dissolved Oxygen (mg/L)	Purged/ Not Purged (P/NP)
							Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)							
MW-4	10-20-98	40.33	10.43	ND	29.90	10-20-98	<50	<0.5	<0.5	<0.5	<0.5	17	--	--			
MW-4	02-16-99	40.33	8.56	ND	31.77	02-16-99	<500	<5	<5	<5	<5	400	--	--			
MW-4	05-24-99	40.33	9.52	ND	30.81	05-24-99	<50	<0.5	<0.5	<0.5	<0.5	10	7.6	--			
MW-4	08-24-99	40.33	9.99	ND	30.34	08-24-99	<2,500	<25	<25	<25	<25	1,200	1,300	--	0.84	NP	
MW-4	11-16-99	40.33	9.80	ND	30.53	11-16-99	<50	<0.5	<0.5	<0.5	<1	<3	--	--	0.0	NP	
MW-4	02-01-00	40.33	9.11	ND	31.22	02-02-00	<50	<0.5	<0.5	<0.5	<1	1,200	--	--	1.0	NP	
MW-5	03-24-95	41.84	6.23	ND	35.61	03-24-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--			
MW-5	05-24-95	41.84	9.61	ND	32.23	05-24-95	Not sampled: well sampled annually, during the first quarter										
MW-5	08-22-95	41.84	11.12	ND	30.72	08-22-95	Not sampled: well sampled annually, during the first quarter										
MW-5	11-09-95	41.84	12.52	ND	29.32	11-09-95	Not sampled: well sampled annually, during the first quarter										
MW-5	02-27-96	41.84	9.52	ND	32.32	02-27-96	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--			
MW-5	04-22-96	41.84	9.44	ND	32.40	04-22-96	Not sampled: well sampled annually, during the first quarter										
MW-5	08-15-96	41.84	10.83	ND	31.01	08-15-96	Not sampled: well sampled annually, during the first quarter										
MW-5	12-10-96	41.84	9.20	ND	32.64	12-10-96	Not sampled: well sampled annually, during the first quarter										
MW-5	03-27-97	41.84	10.10	ND	31.74	03-27-97	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--			
MW-5	05-22-97	41.84	10.28	ND	31.56	05-22-97	Not sampled: well sampled annually, during the first quarter										
MW-5	09-04-97	41.84	10.73	ND	31.11	09-04-97	Not sampled: well sampled annually, during the first quarter										
MW-5	11-03-97	41.84	11.23	ND	30.61	11-03-97	Not sampled: well sampled annually, during the first quarter										
MW-5	02-20-98	41.84	6.67	ND	35.17	02-20-98	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--			
MW-5	05-18-98	41.84	9.61	ND	32.23	05-18-98	Not sampled: well sampled annually, during the first quarter										
MW-5	08-20-98	41.84	10.58	ND	31.26	08-21-98	Not sampled: well sampled annually, during the first quarter										
MW-5	10-20-98	41.84	10.66	ND	31.18	10-20-98	Not sampled: well sampled annually, during the first quarter										
MW-5	02-16-99	41.84	8.35	ND	33.49	02-16-99	Not sampled										
MW-5	05-24-99	41.84	9.95	ND	31.89	05-24-99	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--			
MW-5	08-24-99	41.84	10.51	ND	31.33	08-24-99	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	0.79	NP	
MW-5	11-16-99	41.84	10.37	ND	31.47	11-16-99	Not sampled: well sampled annually, during the second quarter										

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

ARCO Service Station No. 2035
1001 San Pablo Avenue, Albany, California

Well Number	Date Gauged	TOC Elevation (ft-MSL)	Depth to Water (feet)	FP Thickness (feet)	Groundwater Elevation [1] (ft-MSL)	Date Sampled	TPH					Total Xylenes (µg/L)	MTBE 8021B* (µg/L)	MTBE 8240/8260 (µg/L)	TRPH (µg/L)	Dissolved Oxygen (mg/L)	Purged/ Not Purged (P/NP)
							Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)							
MW-5	02-01-00	41.84	9.35	ND	32.49	02-02-00	<50	<0.5	<0.5	<0.5	<1	<3	--	--	1.0	NP	
MW-6	03-24-95	40.13	9.03	ND	31.10	03-24-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--			
MW-6	05-24-95	40.13	12.45	ND	27.68	05-24-95	Not sampled: well sampled annually, during the first quarter										
MW-6	08-22-95	40.13	13.32	ND	26.81	08-22-95	Not sampled: well sampled annually, during the first quarter										
MW-6	11-09-95	40.13	14.13	ND	26.00	11-09-95	Not sampled: well sampled annually, during the first quarter										
MW-6	02-27-96	40.13	11.86	ND	28.27	02-27-96	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--			
MW-6	04-22-96	40.13	12.35	ND	27.78	04-22-96	Not sampled: well sampled annually, during the first quarter										
MW-6	08-15-96	40.13	13.18	ND	26.95	08-15-96	Not sampled: well sampled annually, during the first quarter										
MW-6	12-10-96	40.13	11.94	ND	28.19	12-10-96	Not sampled: well sampled annually, during the first quarter										
MW-6	03-27-97	40.13	13.10	ND	27.03	03-27-97	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--			
MW-6	05-22-97	40.13	13.00	ND	27.13	05-22-97	Not sampled: well sampled annually, during the first quarter										
MW-6	09-04-97	40.13	13.30	ND	26.83	09-04-97	Not sampled: well sampled annually, during the first quarter										
MW-6	11-03-97	40.13	13.42	ND	26.71	11-03-97	<50	<0.5	<0.5	<0.5	<0.5	19	--	--			
MW-6	02-20-98	40.13	10.57	ND	29.56	02-20-98	<100	<1	<1	<1	<1	95	--	--			
MW-6	05-18-98	40.13	12.64	ND	27.49	05-18-98	<100	<1	<1	<1	<1	180	--	--			
MW-6	08-20-98	40.13	13.13	ND	27.00	08-21-98	<100	<1	<1	<1	<1	180	--	--			
MW-6	10-20-98	40.13	13.48	ND	26.65	10-20-98	<100	<1	<1	<1	<1	180	--	--			
MW-6	02-16-99	40.13	11.92	ND	28.21	02-16-99	<200	<2	<2	<2	<2	200	--	--			
MW-6	05-24-99	40.13	12.80	ND	27.33	05-24-99	<50	<0.5	<0.5	<0.5	<0.5	120	--	--			
MW-6	08-24-99	40.13	13.03	ND	27.10	08-24-99	<50	<0.5	<0.5	<0.5	<0.5	44	--	--	0.46	NP	
MW-6	11-16-99	40.13	12.70	ND	27.43	11-16-99	<50	<0.5	<0.5	<0.5	<1	17	17	--	0.0	NP	
MW-6	02-01-00	40.13	8.61	ND	31.52	02-02-00	<50	<0.5	<0.5	<0.5	<1	6	--	--	1.0	NP	
RW-1	03-24-95	40.33	9.32	0.01	31.02	03-24-95	11,000	560	660	150	1,700	--	--	--			
RW-1	05-24-95	40.33	9.75	0.03	30.60	05-24-95	Not sampled: well contained floating product										
RW-1	08-22-95	40.33	10.86	0.02	29.48	08-22-95	Not sampled: well contained floating product										

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

ARCO Service Station No. 2035
1001 San Pablo Avenue, Albany, California

Well Number	Date Gauged	TOC	Depth	FP	Groundwater	Date Sampled	TPH			Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	MTBE 8021B* (µg/L)	MTBE 8240/8260 (µg/L)	TRPH (µg/L)	Dissolved Oxygen (mg/L)	Purged/Not Purged (P/NP)
		Elevation (ft-MSL)	to Water (feet)	Thickness (feet)	Elevation [1] (ft-MSL)		Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)							
RW-1	11-09-95	40.33	20.61	ND	19.72	11-09-95	1,600	79	46	13	240	--	--	--		
RW-1	02-27-96	40.33	16.56	ND	23.77	02-27-96	210	44	7.5	2.5	24	29	--	--		
RW-1	04-22-96	40.33	9.65	ND	30.68	04-22-96	36,000	7,400	3,700	580	3,400	<300	--	--		
RW-1	08-15-96	40.33	10.60	ND	29.73	08-15-96	1,800	31	38	15	150	<30	--	--		
RW-1	12-10-96	40.33	8.72	ND	31.61	12-10-96	25,000	1,900	1,000	330	3,200	<100	--	--		
RW-1	03-27-97	40.33	10.33	ND	30.00	03-27-97	7,200	1,900	59	95	240	480	--	--		
RW-1	05-22-97	40.33	10.10	ND	30.23	05-22-97	3,000	630	84	45	340	<60	--	--		
RW-1	09-04-97	40.33	10.42	ND	29.91	09-04-97	7,100	120	55	14	160	<60	--	--		
RW-1	11-03-97	40.33	9.10	ND	31.23	11-03-97	<200	14	19	3	19	140	--	--		
RW-1	02-20-98	40.33	7.49	ND	32.84	02-20-98	3,800	1,000	85	64	220	950	--	--		
RW-1	05-18-98	40.33	8.90	ND	31.43	05-18-98	<200	45	<2	2	4	220	--	--		
RW-1	08-20-98	40.33	11.06	ND	29.27	08-21-98	480	200	<2	<2	30	180	--	--		
RW-1	10-20-98	40.33	11.12	ND	29.21	10-20-98	110	36	2.9	<0.5	4.1	5	--	--		
RW-1	02-16-99	40.33	7.70	ND	32.63	02-17-99	250	61	2	2	19	94	--	--		
RW-1	05-24-99	40.33	11.12	ND	29.21	05-24-99	4,500	2,000	7	<2	180	35	--	--		
RW-1	08-24-99	40.33	10.15	ND	30.18	08-24-99	2,600	1,100	6.3	2.3	17	39	--	--	0.52	NP
RW-1	11-16-99	40.33	9.95	ND	30.38	11-16-99	1,200	2,600	16	86	41	140	--	--	1.4	P
RW-1	02-01-00	40.33	11.88	ND	28.45	02-02-00	11,000	980	230	200	1,400	38	--	--	1.0	NP

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

**ARCO Service Station No. 2035
1001 San Pablo Avenue, Albany, California**

Well Number	Date Gauged	TOC Elevation (ft-MSL)	Depth to Water (feet)	FP Thickness (feet)	Groundwater Elevation [1] (ft-MSL)	Date Sampled	TPH Gasoline ($\mu\text{g/L}$)	Benzene ($\mu\text{g/L}$)	Toluene ($\mu\text{g/L}$)	Ethyl-benzene ($\mu\text{g/L}$)	Total Xylenes ($\mu\text{g/L}$)	MTBE 8021B* ($\mu\text{g/L}$)	MTBE 8240/8260 ($\mu\text{g/L}$)	TRPH ($\mu\text{g/L}$)	Dissolved Oxygen (mg/L)	Purged/Not Purged (P/NP)
<p>TOC: top of casing ft-MSL: elevation in feet, relative to mean sea level TPH: total petroleum hydrocarbons as gasoline, California DHS LUFT Method BTEX: benzene, toluene, ethylbenzene, total xylenes by EPA method 8021B. (EPA method 8020 prior to 11/16/99). MTBE: Methyl tert-butyl ether TRPH: total recoverable petroleum hydrocarbons, by EPA method 418.1 $\mu\text{g/L}$: micrograms per liter mg/L: milligrams per liter ND: none detected --: not analyzed or not applicable <: denotes concentration not present at or above laboratory detection limit stated to the right. [1] = Computed by adding correction factor to groundwater elevation. Correction factor = free product thickness times 0.73 (approximate specific gravity of gasoline). *: EPA method 8020 prior to 11/16/99 **: For previous historical groundwater elevation and analytical data please refer to <i>Fourth Quarter 1995 Groundwater Monitoring Program Results and Remediation System Performance Evaluation Report, ARCO Service Station 2035, Albany, California</i>, (EMCON, March 25, 1996).</p>																

Table 2
Groundwater Flow Direction and Gradient

ARCO Service Station No. 2035
1001 San Pablo Avenue, Albany, California

Date Measured	Average Flow Direction	Average Hydraulic Gradient
03-24-95	Northwest	0.037
05-24-95	West-Northwest	0.013
08-22-95	Southwest	0.012
11-09-95	West-Southwest	0.01
02-27-96	Southwest	0.009
04-22-96	West-Southwest	0.014
08-15-96	Southwest	0.011
12-10-96	West-Southwest	0.023
03-27-97	West-Southwest	0.026
05-22-97	West-Southwest	0.024
09-04-97	West	0.019
11-03-97	Southwest	0.038
02-20-98	West	0.031
05-18-98	West	0.02
08-20-98	West	0.02
10-20-98	West	0.02
02-16-99	West	0.03
05-24-99	West-Southwest	0.03
08-24-99	West-Southwest	0.01
11-16-99	West-Southwest	0.02
02-01-00	Northwest	0.08

Table 3
Operational Uptime Information for the
Soil Vapor Extraction System (1997 - present)

ARCO Service Station No. 2035
1001 San Pablo Avenue, Albany, California

Date End	Hr-Meter Arrival	Operating Hours To Date	No. of Days Between Site Visits			Percent Uptime	Cumulative Days (begin 12/93)	
			Total Days	Uptime	Days Down		Total Days	Total Uptime
11/01/97		6873.20					1425	335
12/01/97	11484.46	7211.10	30	14	16	47%	1455	349
01/27/98	11484.46	7211.10	57	0	57	0%	1512	349
08/12/98	11484.46	7211.10	197	0	197	0%	1709	349
09/02/98	11484.69	7211.33	21	0	21	0%	1730	349
10/19/98	12279.71	8006.35	47	33	14	70%	1777	382
11/10/98	12809.36	8536.00	22	22	0	100%	1799	404
01/22/99	12809.36	8536.00	73	0	73	0%	1872	404
02/11/99	12809.53	8536.17	20	0	20	0%	1892	404
04/01/99	12809.64	8536.28	49	0	49	0%	1941	404
06/10/99	12810.03	8536.67	70	0	70	0%	2011	404
06/24/99	13146.19	8872.83	14	14	0	100%	2025	418
08/17/99	13146.19	8872.83	54	0	54	0%	2079	418
09/09/99	13146.76	8873.40	23	0	23	0%	2102	418
09/21/99	13435.42	9162.06	12	12	0	100%	2114	430
10/06/99	13450.28	9176.92	15	1	14	4%	2129	431
10/20/99	13474.88	9201.52	14	1	13	7%	2143	432
11/03/99	13811.70	9538.34	14	14	0	100%	2157	446
11/17/99	14148.06	9874.70	14	14	0	100%	2171	460
12/01/99	14391.11	10117.75	14	10	4	72%	2185	470
12/16/99	14751.38	10478.02	15	15	0	100%	2200	485
01/05/00	14751.41	10478.05	20	0	20	0%	2220	485
01/19/00	15087.10	10813.74	14	14	0	100%	2234	499
02/21/00	15087.15	10813.79	33	0	33	0%	2267	499
03/01/00	15303.43	11030.07	9	9	0	100%	2276	508
03/23/00	15830.59	11557.23	22	22	0	100%	2298	530

Table 4
Soil Vapor Extraction System
Flow Rates and Analytical Results of Air Samples (1997 - present)

Arco Service Station No. 2035
1001 San Pablo Avenue, Albany, California

Date	Sample Location	Vacuum (in. H2O)	Velocity (fpm)	Flowrate ¹ (scfm)	Analyses (ppmv)					
					TPHG	Benzene	Toluene	Ethylbenzene	Xylene	MTBE
12/01/97	Influent			221.4	160	0.6	<0.1	1.6	2.5	
	Effluent				8	<0.1	0.1	<0.1	0.3	
01/27/98	Influent	NA	NA	NA	NA	NA	NA	NA	NA	
	Effluent									
08/12/98	Influent	NA	NA	NA	NA	NA	NA	NA	NA	
	Effluent									
09/02/98	Influent	30	600	27	610	<1	<1	2	3	
	Effluent		1050	92.4	9	<0.1	<0.1	0.1	<0.2	
10/19/98	Influent	20	500	23	64	<0.1	0.7	<0.1	<0.2	
	Effluent		1200	106.5	<5	<0.1	<0.1	<0.1	<0.2	
11/10/98	Influent	20	500	23	8	<0.1	0.1	<0.1	<0.2	
	Effluent		1200	106.5	<5	<0.1	<0.1	<0.1	<0.2	
06/10/99	Influent	35	1500	67	100	0.5	3	<0.1	0.9	<1
	Effluent		975	74.9	<5	<0.1	<0.1	<0.1	<0.2	<1
09/09/99	Influent	15.4	1900	90	<49	0.7	1.1	<0.1	<0.2	33
	Effluent		1200	92.1	<5	<0.1	<0.1	<0.1	<0.2	<0.8
10/06/99	Influent	16	1825	86	240	1	2.9	<0.1	0.7	67
	Effluent		900	69.1	9	<0.1	0.1	0.1	<0.2	<0.8
12/01/99	Influent	11	1900	91	210	0.7	0.8	<0.2	0.2	61
	Effluent		1500	115.2	<5	<0.1	<0.1	<0.1	<0.2	1.4
01/05/00	Influent	9.8	800	38	90	0.4	0.7	0.1	<0.2	33
	Effluent		1450	111.3	<5	<0.1	<0.1	<0.1	<0.2	<0.8
03/01/00	Influent	9.8	2000	96	54	1.3	4.8	1.1	7.2	19
	Effluent		1500	115.2	<5	<0.1	<0.1	<0.1	<0.2	<0.8

¹ 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"

Table 5
Soil Vapor Extraction System
Extraction Rates, Emission Rates, Destruction Efficiency, and Mass Removed
(1997 - present)

ARCO Service Station No. 2035
1001 San Pablo Avenue, Albany, 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)
12/01/97	13.02	0.0381	0.6508	<0.0064	95%	NC	0.000	0.000	3023	251
09/02/98	6.11	0.0000	0.3057	<0.0027	95%	NC	135	0.000	3157	251
10/19/98	0.549	0.0000	<0.1956	<0.0031	NC	NC	0.000	0.000	3157	251
11/10/98	0.069	0.0000	<0.1956	<0.0031	NC	NC	0.000	0.000	3157	251
06/10/99	2.47	0.0097	<0.1375	<0.0021	94%	NC	34.7	0.135	3192	251
09/09/99	0.0000	0.0180	<0.1693	<0.0026	NC	NC	0.000	0.217	3192	251
10/06/99	7.59	0.0247	0.2285	<0.0020	97%	92%	316	1.03	3509	252
12/01/99	7.00	0.0182	<0.2116	<0.0033	97%	82%	176	0.458	3685	252
01/05/00	1.27	0.0044	<0.2046	<0.0032	NC	NC	18	0.062	3702	252
03/01/00	1.90	0.0357	<0.2116	<0.0033	NC	NC	59	1.11	3761	254

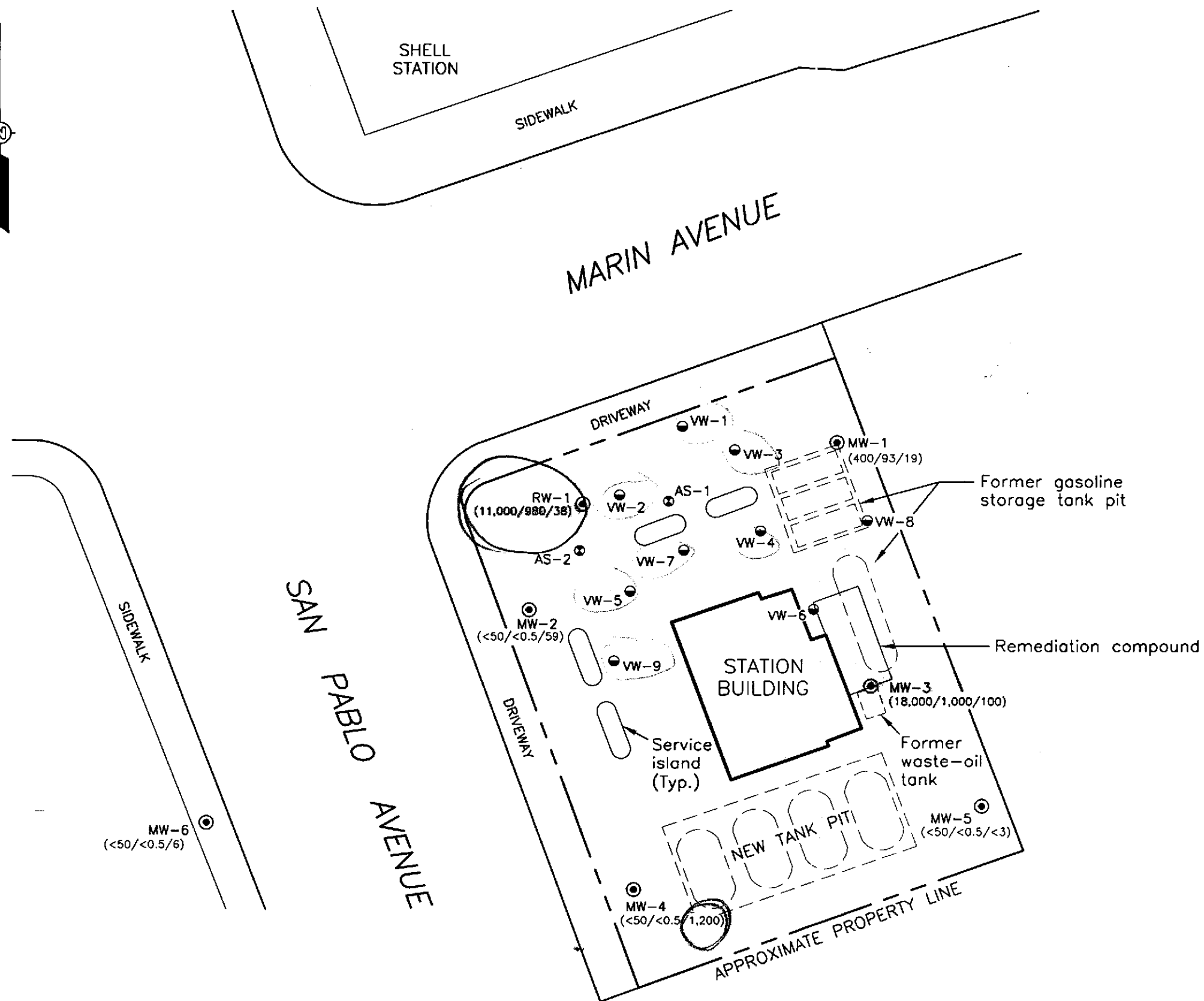
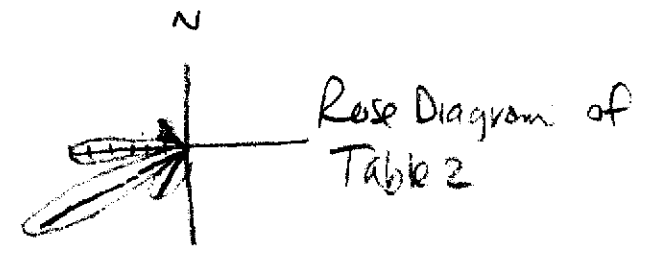
¹ Extraction Rate, lbs/day = (Influent Flow, cfm)(Influent conc., ppmv)(g/mole)(60 min/hr)(24 hr/day)(28.3 L/cf) / (10⁶)(24.45 moles/L)(453.6 g/lb)
where TPHG = 100 g/mole and Benzene = 78.1 g/mole; Influent conc. = 0, if reported as non-detect

² Emission Rate, lbs/day = (Effluent Flow, cfm)(Effluent conc., ppmv)(g/mole)(60 min/hr)(24 hr/day)(28.3 L/cf) / (10⁶)(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

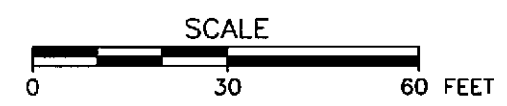
³ Destruction Efficiency, % = (Extraction Rate - Emission Rate)(100) / (Extraction Rate); NC = Not Calculated due to non-detection.

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

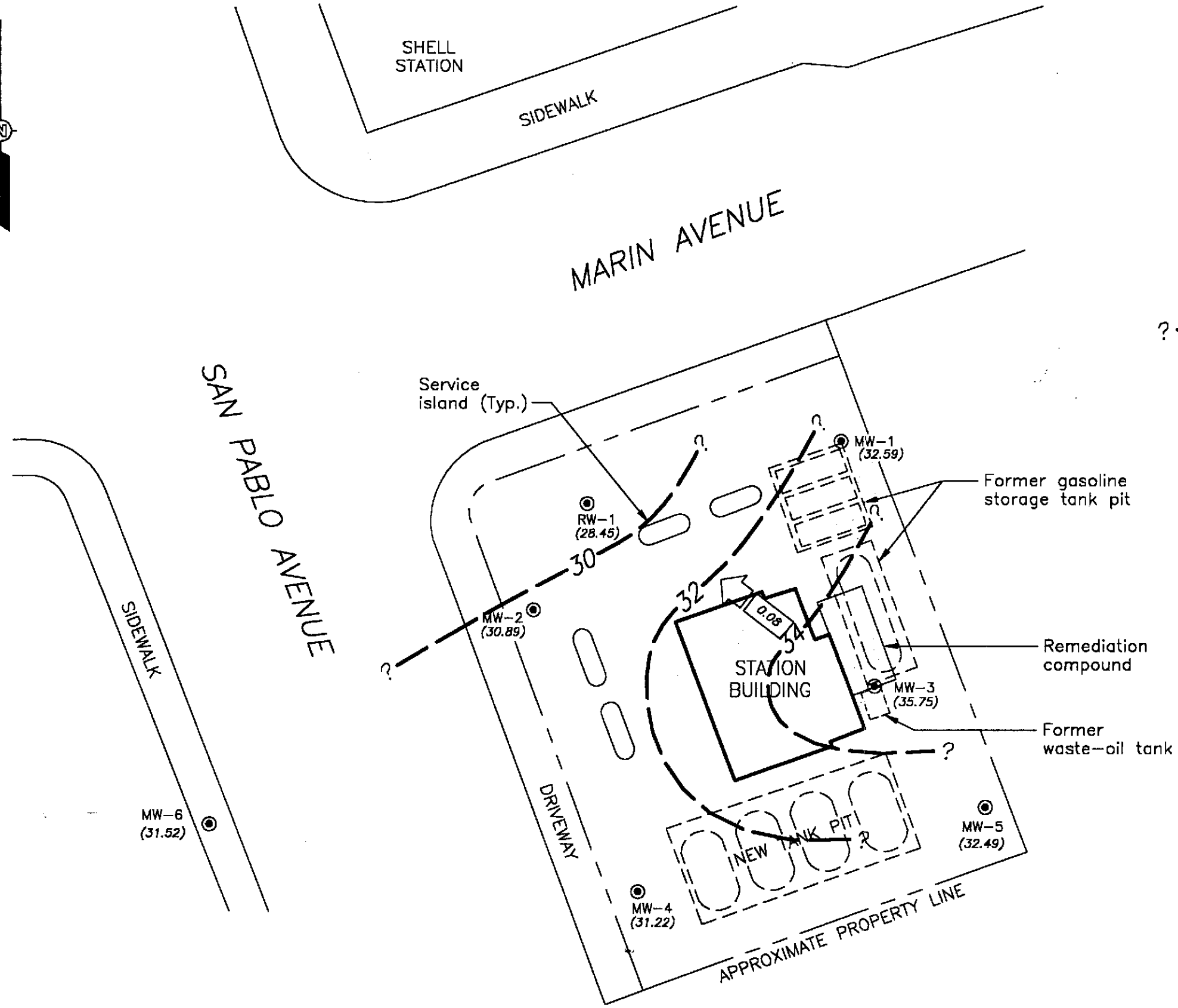
PROJECT NUMBER 803932
 DRAWN BY K. Black 4-4-00



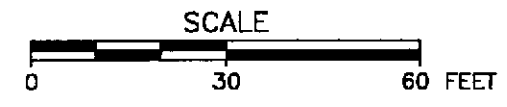
- EXPLANATION
- ⊙ Groundwater monitoring well
 - Vapor extraction well
 - ⊛ Air sparge well
 - (400/93/19) Concentration of total petroleum hydrocarbons as gasoline (TPHG), benzene, and MTBE in groundwater (ug/L); samples collected 2/2/00
 - < Not detected at or above the indicated laboratory detection limit



	ARCO PRODUCTS COMPANY SERVICE STATION 2035
	FIGURE 1 GROUNDWATER ANALYTICAL SUMMARY FIRST QUARTER 2000 1001 SAN PABLO AVENUE ALBANY, CALIFORNIA



- EXPLANATION
- Groundwater monitoring well
 - (32.59) Groundwater elevation (Ft.-MSL); measured 2/1/00
 - ? - - - Groundwater elevation contour (Ft.-MSL)
 - ← Approximate direction of groundwater flow showing gradient



	ARCO PRODUCTS COMPANY SERVICE STATION 2035
<p align="center"> FIGURE 2 GROUNDWATER ELEVATION CONTOURS FIRST QUARTER 2000 1001 SAN PABLO AVENUE ALBANY, CALIFORNIA </p>	

APPENDIX A
SAMPLING AND ANALYSIS PROCEDURES

APPENDIX A

SAMPLING AND ANALYSIS PROCEDURES

The sampling and analysis procedures for water quality monitoring programs are contained in this appendix. The procedures provided for consistent and reproducible sampling methods, proper application of analytical methods, and accurate and precise analytical results. Finally, these procedures provided guidelines so that the overall objectives of the monitoring program were achieved.

The following documents have been used as guidelines for developing these procedures:

- Procedures Manual for Groundwater Monitoring at Solid Waste Disposal Facilities, Environmental Protection Agency (EPA)-530/SW-611, August 1977
- Resource Conservation and Recovery Act (RCRA) Groundwater Monitoring Technical Enforcement Guidance Document, Office of Solid Waste and Emergency Response (OSWER) 9950.1, September 1986
- Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, EPA SW-846, 3rd edition, November 1986
- Methods for Organic Chemical Analysis of Municipal and Industrial Waste Water, EPA-600/4-82-057, July 1982
- Methods for Organic Chemical Analysis of Water and Wastes, EPA-600/4-79-020, revised March 1983
- Leaking Underground Fuel Tank (LUFT) Field Manual, California State Water Resources Control Board, revised October 1989

Sample Collection

Sample collection procedures include equipment cleaning, water level and total well depth measurements, and well purging and sampling.

Equipment Cleaning

Before the sampling event was started, equipment that was used to sample groundwater was disassembled and cleaned with detergent water and then rinsed with deionized water. During field sampling, equipment surfaces that were placed in the well or came into contact with groundwater during field sampling were steam cleaned with deionized water before the next well was purged or sampled.

Water Level, Floating Hydrocarbon, and Total Well Depth Measurements

Before purging and sampling occurred, the depth to water, floating hydrocarbon thickness and total well depth were measured using an oil/water interface measuring system. The oil/water interface measuring system consists of a probe that emits a continuous audible tone when immersed in a nonconductive fluid, such as oil or gasoline and an intermittent tone when immersed in a conductive fluid, such as water. The floating hydrocarbon thickness and water level were measured by lowering the probe into the well. Liquid levels were recorded relative to the tone emitted at the groundwater surface. The sonic probe was decontaminated by being rinsed with deionized water or steam cleaned after each use. A bottom-filling, clear Teflon[®] bailer was used to verify floating hydrocarbon thickness measurements of less than 0.02 foot. Alternatively, an electric sounder and a bottom-filling Teflon bailer may have been used to record floating hydrocarbon thickness and depth to water.

The electric sounder is a transistorized instrument that uses a reel-mounted, two-conductor, coaxial cable that connects the control panel to the sensor. Cable markings are stamped at 1-foot intervals. The water level was measured by lowering the sensor into the monitoring well. A low-current circuit was completed when the sensor contacted the water, which served as an electrolyte. The current was amplified and fed into an indicator light and audible buzzer, signaling when water had been contacted. A sensitivity control compensated for highly saline or conductive water. The electric sounder was decontaminated by being rinsed with deionized water after each use. The bailer was lowered to a point just below the liquid level, retrieved, and observed for floating hydrocarbon.

Liquid measurements were recorded to the nearest 0.01 foot on the depth to water/floating product survey form. The groundwater elevation at each monitoring well was calculated by subtracting the measured depth to water from the surveyed elevation of the top of the well casing. (Every attempt was made to measure depth to water for all wells on the same day.) Total well depth was then measured by lowering the sensor to the bottom of the well. Total well depth, used to calculate purge volumes and to determine whether the well screen was partially obstructed by silt, was recorded to the nearest 0.1 foot on the depth to water/floating product survey form.

Well Purging

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 presented in Figure A-1. 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.

Groundwater purged from the monitoring wells was transported in a 500-gallon water trailer, 55-gallon drum, or a 325-gallon truck-mounted tank to IT's San Jose or Sacramento office location for temporary storage. IT arranged for transport and disposal of the purged groundwater through Integrated Waste Stream Management, Inc.

Field measurements of pH, specific conductance, and temperature were recorded in a waterproof field logbook. Figure A-2 shows an example of the water sample field data sheet on which field data are recorded. Field data sheets were reviewed for completeness by the sampling coordinator after the sampling event was completed.

The pH, specific conductance, and temperature meter were calibrated each day before field activities were begun. The calibration was checked once each day to verify meter performance. Field meter calibrations were recorded on the water sample field data sheet.

Well Sampling

A Teflon bailer was the only equipment acceptable for well sampling. When samples for volatile organic analysis were being collected, the flow of groundwater from the bailer was regulated to minimize turbulence and aeration. Glass bottles of at least 40-milliliters volume and fitted with Teflon-lined septa were used in sampling for volatile organics. These bottles were filled completely to prevent air from remaining in the bottle. A positive meniscus formed when the bottle was completely full. A convex Teflon septum was placed over the positive meniscus to eliminate air. After the bottle was capped, it was inverted and tapped to verify that it contained no air bubbles. The sample containers for other parameters were filled, filtered as required, and capped.

When required, dissolved concentrations of metals were determined using appropriate field filtration techniques. The sample was filtered by emptying the contents of the Teflon bailer into a pressure transfer vessel. A disposable 0.45-micron acrylic copolymer filter was threaded onto the transfer vessel at the discharge point, and the vessel was sealed. Pressure was applied to the vessel with a hand pump and the filtrate directed into the appropriate containers. Each filter was used once and discarded.

Sample Preservation and Handling

The following section specifies sample containers, preservation methods, and sample handling procedures.

Sample Containers and Preservation

Sample containers vary with each type of analytical parameter. Container types and materials were selected to be nonreactive with the particular analytical parameter tested.

Sample Handling

Sample containers were labeled immediately prior to sample collection. Samples were kept cool with cold packs until received by the laboratory. At the time of sampling, each sample was logged on an ARCO chain-of-custody record that accompanied the sample to the laboratory.

Samples that required overnight storage prior to shipping to the laboratory were kept cool (4° C) in a refrigerator. The refrigerator was kept in a warehouse, which was locked when not occupied by an IT employee. A sample/refrigerator log was kept to record the date and time that samples were placed into and removed from the refrigerator.

Samples were transferred from IT to an ARCO-approved laboratory by courier or taken directly to the laboratory by the environmental sampler. Sample shipments from IT to laboratories performing the selected analyses routinely occurred within 24 hours of sample collection.

Sample Documentation

The following procedures were used during sampling and analysis to provide chain-of-custody control during sample handling from collection through storage. Sample documentation included the use of the following:

- Water sample field data sheets to document sampling activities in the field
- Labels to identify individual samples
- Chain-of-custody record sheets for documenting possession and transfer of samples
- Laboratory analysis request sheets for documenting analyses to be performed

Field Logbook

In the field, the sampler recorded the following information on the water sample field data sheet (see Figure A-2) for each sample collected:

- Project number
- Client's name
- Location
- Name of sampler
- Date and time
- Well accessibility and integrity
- Pertinent well data (e.g., casing diameter, depth to water, well depth)
- Calculated and actual purge volumes
- Purging equipment used
- Sampling equipment used
- Appearance of each sample (e.g., color, turbidity, sediment)
- Results of field analyses (temperature, pH, specific conductance)
- General comments

The water sample field data sheet was signed by the sampler and reviewed by the sampling coordinator.

Labels

Sample labels contained the following information:

- Project number
- Sample number (i.e., well designation)
- Sample depth
- Sampler's initials
- Date and time of collection
- Type of preservation used (if any)

Sampling and Analysis Chain-of-Custody Record

The ARCO chain-of-custody record initiated at the time of sampling contained, at a minimum, the sample designation (including the depth at which the sample was collected), sample type, analytical request, date of sampling, and the name of the sampler. The record sheet was signed, timed, and dated by the sampler when transferring the samples. The number of custodians in the chain of possession was minimized. A copy of the ARCO chain-of-custody record was returned to IT with the analytical results.

Groundwater Sampling and Analysis Request Form

A groundwater sampling and analysis request form (see Figure A-3) was used to communicate to the environmental sampler the requirements of the monitoring event. At a minimum, the groundwater sampling and analysis request form included the following information:

- Date scheduled
- Site-specific instructions
- Specific analytical parameters
- Well number
- Well specifications (expected total depth, depth of water, and product thickness)

MONITORING WELL PURGING PROTOCOL

MEASURE AND RECORD DEPTH TO WATER AND WELL TOTAL DEPTH

CHECK FOR FLOATING PRODUCT

YES

MEASURE AND DOCUMENT FLOATING PRODUCT THICKNESS. DO NOT SAMPLE WELL FOR DISSOLVED CONSTITUENTS.

NO

CALCULATE PURGE VOLUME BY USING THE FOLLOWING EQUATION:

$$P = \pi r^2 h \times 7.48 \times 3$$

where:

P = calculated purge volume (gallons)

$\pi = 3.14$

r = radius of well casing in feet

h = height of water column in feet

WELL EVACUATED TO PRACTICAL LIMITS OF DRYNESS BEFORE REMOVING CALCULATED PURGE VOLUME

EVACUATE WATER FROM WELL EQUAL TO THE CALCULATED PURGE VOLUME WHILE MONITORING GROUNDWATER STABILIZATION INDICATOR PARAMETERS (pH, CONDUCTIVITY, TEMPERATURE) AT INTERVALS OF ONE CASING VOLUME.

NO

FINAL TWO SETS OF GROUNDWATER STABILIZATION INDICATOR PARAMETER MEASUREMENTS MEET THE FOLLOWING CRITERIA:

pH = ± 0.1 pH units

COND. = $\pm 10\%$

TEMP. = ± 1.0 °F

YES

WELL PURGING CRITERIA MET; PROCEED TO WELL SAMPLING.

NO

CONTINUE PURGING; EVACUATE ADDITIONAL CASING VOLUME OF WATER, MONITORING INDICATOR PARAMETERS FOR STABILITY.

YES

WELL RECHARGES TO A LEVEL SUFFICIENT FOR SAMPLE COLLECTION WITHIN 24 HOURS OF EVACUATION TO DRYNESS.

YES

FIELD TEST FIRST RECHARGE WATER FOR INDICATOR PARAMETERS, THEN PROCEED TO WELL SAMPLING.

NO

RECORD WELL AS DRY FOR PURPOSES OF SAMPLING.

MONITORING WELL PURGING PROTOCOL

FIGURE
A-1

WATER SAMPLE FIELD DATA SHEET

PROJECT NO : _____
 PURGED BY : _____
 SAMPLED BY : _____

SAMPLE ID : _____
 CLIENT NAME : _____
 LOCATION : _____

TYPE: Groundwater _____ Surface Water _____ Leachate _____ Other _____

CASING DIAMETER (inches): 2 _____ 3 _____ 4 _____ 4.5 _____ 6 _____ Other _____

CASING ELEVATION (feet/MSL) : _____ VOLUME IN CASING (gal.) : _____
 DEPTH OF WELL (feet) : _____ CALCULATED PURGE (gal.) : _____
 DEPTH OF WATER (feet) : _____ ACTUAL PURGE VOL. (gal.) : _____

DATE PURGED : _____ END PURGE : _____
 DATE SAMPLED : _____ SAMPLING TIME : _____

TIME (2400 HR)	VOLUME (gal.)	pH (units)	E.C. (umhos/cm@25°C)	TEMPERATURE (°F)	TURBIDITY (visual/NTU)	TIME (2400 HR)
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____

OTHER: _____ ODOR: _____
(COBALT 0-100) (NTU 0-200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1) : _____

PURGING EQUIPMENT

SAMPLING EQUIPMENT

_____ 2" Bladder Pump _____ Bailer (Teflon)
 _____ Centrifugal Pump _____ Bailer (PVC)
 _____ Submersible Pump _____ Bailer (Stainless Steel)
 _____ Well Wizard™ _____ Dedicated
 Other: _____

_____ 2" Bladder Pump _____ Bailer (Teflon)
 _____ Bomb Sampler _____ Bailer (Stainless Steel)
 _____ Dipper _____ Submersible Pump
 _____ Well Wizard™ _____ Dedicated
 Other: _____

WELL INTEGRITY: _____ LOCK: _____

REMARKS: _____

pH, E.C., Temp. Meter Calibration: Date: _____ Time: _____ Meter Serial No.: _____
 E.C. 1000 _____ / _____ pH 7 _____ / _____ pH 10 _____ / _____ pH 4 _____ / _____
 Temperature °F _____

SIGNATURE: _____ REVIEWED BY: _____ PAGE _____ OF _____

**IT - SACRAMENTO
GROUNDWATER SAMPLING AND ANALYSIS REQUEST FORM**

PROJECT NAME :

SCHEDULED DATE :

SPECIAL INSTRUCTIONS / CONSIDERATIONS :

Project Authorization: _____
EMCON Project No.: _____
OWT Project No.: _____
Task Code: _____
Originals To: _____
cc: _____

Well Lock Number (s)

CHECK BOX TO AUTHORIZE DATA ENTRY

Site Contact: _____
Name Phone #

Well Number or Source	Casing Diameter (inches)	Casing Length (feet)	Depth to Water (feet)	ANAYSES REQUESTED

Laboratory and Lab QC Istructions:



SAMPLING AND ANALYSIS REQUEST FORM

**FIGURE
A-3**

APPENDIX B
CERTIFIED ANALYTICAL REPORTS,
AND CHAIN-OF-CUSTODY DOCUMENTATION



February 11, 2000

Service Request No.: S2000409

Mr. Glen Vanderveen,
IT/EMCON
2201 Broadway, Suite 101
Oakland, CA 94612

RE: TO#24118.00/RAT8/2035 ALBANY

Dear Mr. Vanderveen:

Enclosed are the results of the sample(s) submitted to our laboratory on February 3, 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).

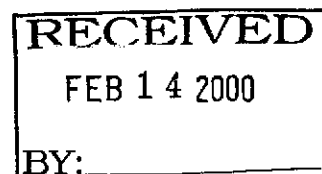
If you have any questions, please call me at (408) 748-9700.

Respectfully submitted,

Columbia Analytical Services, Inc.

Bernadette Troncales
Project Chemist

Greg Jordan
Laboratory Director



COLUMBIA ANALYTICAL SERVICES, Inc.**Acronyms**

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

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: TO#24118.00/RAT8/2035 ALBANY
Sample Matrix: Water

Service Request: S2000409
Date Collected: 02/02/00
Date Received: 02/03/00

BTEX, MTBE and TPH as Gasoline

Sample Name: MW-6(25)
Lab Code: S2000409-001
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	02/06/00	ND	
Benzene	EPA 5030	8021B	0.5	1	NA	02/06/00	ND	
Toluene	EPA 5030	8021B	0.5	1	NA	02/06/00	ND	
Ethylbenzene	EPA 5030	8021B	0.5	1	NA	02/06/00	ND	
Xylenes, Total	EPA 5030	8021B	1	1	NA	02/06/00	ND	
Methyl <i>tert</i> -Butyl Ether	EPA 5030	8021B	3	1	NA	02/06/00	6	

Approved By: _____

[Handwritten Signature]

Date: _____

02/11/00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: TO#24118.00/RAT8/2035 ALBANY
Sample Matrix: Water

Service Request: S2000409
Date Collected: 02/02/00
Date Received: 02/03/00

BTEX, MTBE and TPH as Gasoline

Sample Name: MW-3(34)
Lab Code: S2000409-002
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	10	NA	02/07/00	18000	
Benzene	EPA 5030	8021B	0.5	10	NA	02/07/00	1000	
Toluene	EPA 5030	8021B	0.5	10	NA	02/07/00	45	
Ethylbenzene	EPA 5030	8021B	0.5	10	NA	02/07/00	1500	
Xylenes, Total	EPA 5030	8021B	1	10	NA	02/07/00	940	
Methyl <i>tert</i> -Butyl Ether	EPA 5030	8021B	3	10	NA	02/07/00	100	

Approved By: _____

PT

Date: _____

02/11/00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: TO#24118.00/RAT8/2035 ALBANY
Sample Matrix: Water

Service Request: S2000409
Date Collected: 02/02/00
Date Received: 02/03/00

BTEX, MTBE and TPH as Gasoline

Sample Name: MW-2(29)
Lab Code: S2000409-003
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	02/06/00	ND	
Benzene	EPA 5030	8021B	0.5	1	NA	02/06/00	ND	
Toluene	EPA 5030	8021B	0.5	1	NA	02/06/00	ND	
Ethylbenzene	EPA 5030	8021B	0.5	1	NA	02/06/00	ND	
Xylenes, Total	EPA 5030	8021B	1	1	NA	02/06/00	ND	
Methyl <i>tert</i> -Butyl Ether	EPA 5030	8021B	3	1	NA	02/06/00	59	

Approved By: _____



Date: _____

02/11/00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: TO#24118.00/RAT8/2035 ALBANY
Sample Matrix: Water

Service Request: S2000409
Date Collected: 02/02/00
Date Received: 02/03/00

BTEX, MTBE and TPH as Gasoline

Sample Name: MW-4(25)
Lab Code: S2000409-004
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	02/06/00	ND	
Benzene	EPA 5030	8021B	0.5	1	NA	02/06/00	ND	
Toluene	EPA 5030	8021B	0.5	1	NA	02/06/00	ND	
Ethylbenzene	EPA 5030	8021B	0.5	1	NA	02/06/00	ND	
Xylenes, Total	EPA 5030	8021B	1	1	NA	02/06/00	ND	
Methyl <i>tert</i> -Butyl Ether	EPA 5030	8021B	3	10	NA	02/07/00	1200	

Approved By: _____



Date: _____



COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
 Project: TO#24118.00/RAT8/2035 ALBANY
 Sample Matrix: Water

Service Request: S2000409
 Date Collected: 02/02/00
 Date Received: 02/03/00

BTEX, MTBE and TPH as Gasoline

Sample Name: MW-1(30)
 Lab Code: S2000409-005
 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	02/06/00	400	
Benzene	EPA 5030	8021B	0.5	1	NA	02/06/00	93	
Toluene	EPA 5030	8021B	0.5	1	NA	02/06/00	1.6	
Ethylbenzene	EPA 5030	8021B	0.5	1	NA	02/06/00	3.6	
Xylenes, Total	EPA 5030	8021B	1	1	NA	02/06/00	3.7	
Methyl tert-Butyl Ether	EPA 5030	8021B	3	1	NA	02/06/00	19	

Approved By: _____

Date: _____

02/11/00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: TO#24118.00/RAT8/2035 ALBANY
Sample Matrix: Water

Service Request: S2000409
Date Collected: 02/02/00
Date Received: 02/03/00

BTEX, MTBE and TPH as Gasoline

Sample Name: RW-1(25)
Lab Code: S2000409-006
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	5	NA	02/07/00	11000	
Benzene	EPA 5030	8021B	0.5	5	NA	02/07/00	980	
Toluene	EPA 5030	8021B	0.5	5	NA	02/07/00	230	
Ethylbenzene	EPA 5030	8021B	0.5	5	NA	02/07/00	200	
Xylenes, Total	EPA 5030	8021B	1	5	NA	02/07/00	1400	
Methyl <i>tert</i> -Butyl Ether	EPA 5030	8021B	3	5	NA	02/07/00	38	

Approved By: _____



Date: _____

02/11/00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
 Project: TO#24118.00/RAT8/2035 ALBANY
 Sample Matrix: Water

Service Request: S2000409
 Date Collected: 02/02/00
 Date Received: 02/03/00

BTEX, MTBE and TPH as Gasoline

Sample Name: MW-5(25)
 Lab Code: S2000409-007
 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	02/06/00	ND	
Benzene	EPA 5030	8021B	0.5	1	NA	02/06/00	ND	
Toluene	EPA 5030	8021B	0.5	1	NA	02/06/00	ND	
Ethylbenzene	EPA 5030	8021B	0.5	1	NA	02/06/00	ND	
Xylenes, Total	EPA 5030	8021B	1	1	NA	02/06/00	ND	
Methyl <i>tert</i> -Butyl Ether	EPA 5030	8021B	3	1	NA	02/06/00	ND	

Approved By: _____

RT

Date: _____

02/11/00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: TO#24118.00/RAT8/2035 ALBANY
Sample Matrix: Water

Service Request: S2000409
Date Collected: NA
Date Received: NA

BTEX, MTBE and TPH as Gasoline

Sample Name: Method Blank
Lab Code: S200205-WB1
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	02/05/00	ND	
Benzene	EPA 5030	8021B	0.5	1	NA	02/05/00	ND	
Toluene	EPA 5030	8021B	0.5	1	NA	02/05/00	ND	
Ethylbenzene	EPA 5030	8021B	0.5	1	NA	02/05/00	ND	
Xylenes, Total	EPA 5030	8021B	1	1	NA	02/05/00	ND	
Methyl <i>tert</i> -Butyl Ether	EPA 5030	8021B	3	1	NA	02/05/00	ND	

Approved By: _____

PT

Date: _____

02/11/00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: TO#24118.00/RAT8/2035 ALBANY
Sample Matrix: Water

Service Request: S2000409
Date Collected: NA
Date Received: NA

BTEX, MTBE and TPH as Gasoline

Sample Name: Method Blank
Lab Code: S200207-WB1
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	02/07/00	ND	
Benzene	EPA 5030	8021B	0.5	1	NA	02/07/00	ND	
Toluene	EPA 5030	8021B	0.5	1	NA	02/07/00	ND	
Ethylbenzene	EPA 5030	8021B	0.5	1	NA	02/07/00	ND	
Xylenes, Total	EPA 5030	8021B	1	1	NA	02/07/00	ND	
Methyl <i>tert</i> -Butyl Ether	EPA 5030	8021B	3	1	NA	02/07/00	ND	

Approved By: _____

BT

Date: _____

02/11/00

ARCO Facility no. <u>2035</u>	City (Facility) <u>Albany</u>	Project manager (Consultant) <u>Glenn Vander Veen</u>
ARCO engineer <u>Paul Supple</u>	Telephone no. (ARCO)	Telephone no. (Consultant) <u>(409) 453-7300</u>
Consultant name <u>Emcon/IT</u>	Address (Consultant) <u>1921 Ringwood Ave. San Jose, CA 95131</u>	
		Fax no. (Consultant) <u>(408) 437-9526</u>

Laboratory name
CAS

Contract number

Sample I.D.	Lab no.	Container no.	Matrix			Preservation		Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH 603/TPH/EPA 1602/6020/8015	TPH Modified 8015 Gas Diesel	Oil and Grease 413.1 413.2	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals VOA VOA	Semi Metals VOA VOA	CAM Metals EPA 6010/7000 TTLC STLC	Lead Org./DHS Lead EPA 7420/7421
			Soil	Water	Other	Ice	Acid														
<u>mw-6 (25')</u>		<u>①</u>		X		X	<u>HCl</u>	<u>2-2-00</u>	<u>1300</u>		X										
<u>mw-3 (34')</u>		<u>②</u>		X		X	<u>HCl</u>	<u> </u>	<u>1120</u>		X										
<u>mw-2 (29')</u>		<u>③</u>		X		X	<u>HCl</u>	<u> </u>	<u>1225</u>		X										
<u>mw-4 (25')</u>		<u>④</u>		X		X	<u>HCl</u>	<u> </u>	<u>1045</u>		X										
<u>mw-1 (30')</u>		<u>⑤</u>		X		X	<u>HCl</u>	<u> </u>	<u>1145</u>		X										
<u>RW-1 (25')</u>		<u>⑥</u>		X		X	<u>HCl</u>	<u> </u>	<u>1245</u>		X										
<u>mw-5 (25')</u>		<u>⑦</u>		X		X	<u>↓</u>	<u>↓</u>	<u>1025</u>		X										

Method of shipment
Sampler will deliver

Special detection Limit/reporting
Lowest possible.

Special QA/QC
AS Normal.

Remarks
RAT-8
2-40 mL Hcl
VOAS

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: <u>Due: 2/17/00 RU103-U</u>
Relinquished by sampler <u>[Signature]</u>	Date <u>2-2-00</u> Time <u>5:30</u>
Relinquished by	Received by <u>Brian Fuller</u> <u>2/3/00 12:15 pm</u>
Relinquished by	Received by laboratory
Date	Time
Date	Time

APPENDIX C
FIELD DATA SHEETS

**FIELD REPORT
DEPTH TO WATER / FLOATING PRODUCT SURVEY**

PROJECT # : 803932

STATION ADDRESS : 101 San Pablo Avenue, Albany

DATE : 2/1/00

ARCO STATION # : 2035

FIELD TECHNICIAN : John Fernandez

DAY : Tuesday

DTW Order	WELL ID	Well Box Seal Condition	Type Of Well Box	Well Box Secure	Lock Number	Type Or Well Cap	FIRST DEPTH TO WATER (feet)	SECOND DEPTH TO WATER (feet)	DEPTH TO FLOATING PRODUCT (feet)	FLOATING PRODUCT THICKNESS (feet)	WELL TOTAL DEPTH (feet)	COMMENTS
1	MW-5	OK	15/16"	Y	ARCO	LWC	9.35	9.35	N/D	N/R	24.78	
2	MW-6	OK	15/16"	Y	ARCO	LWC	8.61	8.61	↓	↓	24.1	
3	MW-3	OK	15/16"	Y	ARCO	LWC	5.69	5.69	↓	↓	32.8	
4	MW-4	OK	15/16"	Y	ARCO	LWC	9.11	9.11	↓	↓	25.12	
5	MW-2	OK	15/16"	Y	ARCO	LWC	9.49	9.49	↓	↓	28.78	
6	MW-1	OK	15/16"	Y		LWC	8.82	8.82	↓	↓	29.32	
7	RW-1	OK	3/4"	Y	None	LWC	11.88	11.88	↓	↓	24.92	

SURVEY POINTS ARE TOP OF WELL CASINGS

RECEIVED
MAR 23 2000
BY: _____

WATER SAMPLE FIELD DATA SHEET

Rev. 1/97



OWT

PROJECT NO: 803932
 PURGED BY: J. FERNANDEZ
 SAMPLED BY: J. FERNANDEZ

SAMPLE ID: MW-1 (30')
 CLIENT NAME: ARCO # 2035
 LOCATION: ALBANY CA

TYPE: Groundwater Surface Water _____ Leachate _____ Other _____
 CASING DIAMETER (inches): 2 _____ 3 _____ 4 4.5 _____ 6 _____ Other _____

CASING ELEVATION (feet/MSL): N/A VOLUME IN CASING (gal.): 13.4
 DEPTH OF WELL (feet): 29.32 CALCULATED PURGE (gal.): 40.1
 DEPTH OF WATER (feet): 8.82 ACTUAL PURGE VOL. (gal.): 40.5

DATE PURGED: 2-2-00 END PURGE: 1140
 DATE SAMPLED: 2-2-00 SAMPLING TIME: 1145

TIME (2400 HR)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm@25°C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
<u>1130</u>	<u>13.4</u>	<u>709</u>	<u>7602</u>	<u>61.9</u>	<u>Cloudy</u>	<u>low</u>
<u>1135</u>	<u>26.8</u>	<u>705</u>	<u>8015</u>	<u>63.5</u>	↓	↓
<u>1140</u>	<u>40.5</u>	<u>709</u>	<u>8121</u>	<u>64.1</u>	↓	↓
					↓	↓

OTHER: D.O. 1 ODOR: NO N/A N/A
(COBALT 0-100) (NTU 0-200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): N/A

PURGING EQUIPMENT

SAMPLING EQUIPMENT

2" Bladder Pump _____ Bailer (Teflon)
 Centrifugal Pump _____ Bailer (PVC)
 _____ Submersible Pump _____ Bailer (Stainless Steel)
 _____ Well Wizard[®] _____ Dedicated
 Other: _____

_____ 2" Bladder Pump _____ Bailer (Teflon)
 _____ Bomb Sampler _____ Bailer (Stainless Steel)
 _____ Dipper _____ Submersible Pump
 _____ Well Wizard[®] _____ Dedicated
 Other: DISPOSABLE TEFLON Bailer

WELL INTEGRITY: good LOCK: lwc

REMARKS: ALL SAMPLES TAKEN

pH, E.C., Temp. Meter Calibration: Date: See MW-5 Time: _____ Meter Serial No.: 87M
 E.C. 1000 _____ pH 7 _____ pH 10 _____ pH 4 _____

Temperature °F _____
 SIGNATURE: J. Fernandez REVIEWED BY: M.J. PAGE 1 OF 7

WATER SAMPLE FIELD DATA SHEET

Rev. 1/97



EMCON

PROJECT NO: 803932
 PURGED BY: John Fernandez
 SAMPLED BY: John Fernandez

SAMPLE ID: MW-2 (29')
 CLIENT NAME: ARCO #2035
 LOCATION: Albany, California

TYPE: Groundwater Surface Water _____ Leachate _____ Other _____
 CASING DIAMETER (inches): 2 _____ 3 _____ 4 4.5 _____ 6 _____ Other _____

CASING ELEVATION (feet/MSL): N/A VOLUME IN CASING (gal.): 12.6
 DEPTH OF WELL (feet): 29.78 CALCULATED PURGE (gal.): 37.8
 DEPTH OF WATER (feet): 9.49 ACTUAL PURGE VOL. (gal.): 38

DATE PURGED: 2/1/00 END PURGE: 1220
 DATE SAMPLED: 2/1/00 SAMPLING TIME: 1225

TIME (2400 HR)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm@25°C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
<u>1200</u>	<u>12.6</u>	<u>7.17</u>	<u>7830</u>	<u>62.9</u>	<u>Cloudy</u>	<u>low</u>
<u>1210</u>	<u>29.2</u>	<u>7.10</u>	<u>7896</u>	<u>63.4</u>	↓	↓
<u>1220</u>	<u>38</u>	<u>7.06</u>	<u>7721</u>	<u>63.6</u>	↓	↓

OTHER: Dissolved Oxygen= 1 ODOR: NO N/A N/A
(COBALT 0-100) (NTU 0-200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): N/A

PURGING EQUIPMENT	SAMPLING EQUIPMENT
<input type="checkbox"/> 2" Bladder Pump	<input type="checkbox"/> 2" Bladder Pump
<input checked="" type="checkbox"/> Centrifugal Pump	<input type="checkbox"/> Bomb Sampler
<input type="checkbox"/> Submersible Pump	<input type="checkbox"/> Dipper
<input type="checkbox"/> Well Wizard [®]	<input type="checkbox"/> Well Wizard [®]
Other: _____	Other: <u>Disposable Teflon Bailer</u>

WELL INTEGRITY: Good LOCK: LWC

REMARKS: All samples taken

pH, E.C., Temp. Meter Calibration: Date: See MW-5 Time: _____ Meter Serial No.: 87M
 E.C. 1000 1 pH 7 1 pH 10 1 pH 4 1

Temperature °F _____
 SIGNATURE: John Fernandez REVIEWED BY: MSM PAGE 2 OF 7

WATER SAMPLE FIELD DATA SHEET

Rev. 1/97



EMCON

PROJECT NO: 803932
 PURGED BY: J. FERNANDEZ
 SAMPLED BY: J. FERNANDEZ

SAMPLE ID: MW-3 (34')
 CLIENT NAME: ARCO # 2035
 LOCATION: ALBANY GA.

TYPE: Groundwater Surface Water _____ Leachate _____ Other _____
 CASING DIAMETER (inches): 2 _____ 3 _____ 4 4.5 _____ 6 _____ Other _____

CASING ELEVATION (feet/MSL): N/A VOLUME IN CASING (gal.): 17.7
 DEPTH OF WELL (feet): 32.8 CALCULATED PURGE (gal.): 53.1
 DEPTH OF WATER (feet): 5.69 ACTUAL PURGE VOL. (gal.): 53.5

DATE PURGED: 2-2-00 END PURGE: 1115
 DATE SAMPLED: 2-2-00 SAMPLING TIME: 1120

TIME (2400 HR)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm@25°C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
<u>1050</u>	<u>17.7</u>	<u>7.02</u>	<u>1032</u>	<u>60.1</u>	<u>Cloudy</u>	<u>low</u>
<u>1100</u>	<u>35.7</u>	<u>7.08</u>	<u>1001</u>	<u>60.5</u>	<u>clear</u>	<u>clear</u>
<u>1115</u>	<u>53.5</u>	<u>7.10</u>	<u>1003</u>	<u>60.9</u>	<u>clear</u>	<u>clear</u>

OTHER: D.O. 2.12 ODOR: Slight N/A
(COBALT 0-100) N/A
(NTU 0-200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): N/A

PURGING EQUIPMENT

SAMPLING EQUIPMENT

<input type="checkbox"/> 2" Bladder Pump	<input type="checkbox"/> Bailer (Teflon)	<input type="checkbox"/> 2" Bladder Pump	<input type="checkbox"/> Bailer (Teflon)
<input checked="" type="checkbox"/> Centrifugal Pump	<input type="checkbox"/> Bailer (PVC)	<input type="checkbox"/> Bomb Sampler	<input type="checkbox"/> Bailer (Stainless Steel)
<input type="checkbox"/> Submersible Pump	<input type="checkbox"/> Bailer (Stainless Steel)	<input type="checkbox"/> Dipper	<input type="checkbox"/> Submersible Pump
<input type="checkbox"/> Well Wizard [®]	<input type="checkbox"/> Dedicated	<input type="checkbox"/> Well Wizard [®]	<input type="checkbox"/> Dedicated
Other: _____		Other: <u>Disposable Teflon Bailer</u>	

WELL INTEGRITY: good LOCK: lwc

REMARKS: All samples taken. Slight smell of toluene or something like that

pH, E.C., Temp. Meter Calibration: Date: See MW-5 Time: _____ Meter Serial No.: 87M
 E.C. 1000 / pH 7 / pH 10 / pH 4 /

Temperature °F _____
 SIGNATURE: J. Fernandez REVIEWED BY: M.A. PAGE 3 OF 7



WATER SAMPLE FIELD DATA SHEET

Rev. 1/97

OWT

PROJECT NO: 803932
PURGED BY: J. FERNANDEZ
SAMPLED BY: J. FERNANDEZ

SAMPLE ID: MW-4 (25')
CLIENT NAME: ARCO # 2035
LOCATION: ALBANY, CA

TYPE: Groundwater _____ Surface Water _____ Leachate _____ Other _____
CASING DIAMETER (inches): 2 _____ 3 _____ 4 4.5 _____ 6 _____ Other _____

CASING ELEVATION (feet/MSL): N/A VOLUME IN CASING (gal.): 10.45 N/A
DEPTH OF WELL (feet): 25.12 CALCULATED PURGE (gal.): 31.37
DEPTH OF WATER (feet): 9.11 ACTUAL PURGE VOL. (gal.): 31.5

DATE PURGED: 2-2-00 END PURGE: N/A
DATE SAMPLED: 2-2-00 SAMPLING TIME: 1045

TIME (2400 HR)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm@25°C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
<u>1045</u>	<u>grab</u>	<u>6.87</u>	<u>4390</u>	<u>60.9</u>	<u>clear</u>	<u>clear</u>

OTHER: D.O. = 1 ODOR: NO N/A N/A
(COBALT 0-100) (NTU 0-200)
FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): N/A

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
<input checked="" type="checkbox"/> 2" Bladder Pump	<input checked="" type="checkbox"/> Bailer (Teflon)	<input type="checkbox"/> 2" Bladder Pump	<input type="checkbox"/> Bailer (Teflon)
<input type="checkbox"/> Centrifugal Pump	<input type="checkbox"/> Bailer (PVC)	<input type="checkbox"/> Bomb Sampler	<input type="checkbox"/> Bailer (Stainless Steel)
<input type="checkbox"/> Submersible Pump	<input type="checkbox"/> Bailer (Stainless Steel)	<input type="checkbox"/> Dipper	<input type="checkbox"/> Submersible Pump
<input type="checkbox"/> Well Wizard	<input type="checkbox"/> Dedicated	<input type="checkbox"/> Well Wizard	<input type="checkbox"/> Dedicated
Other: _____		Other: <u>DISPOSABLE TEFLON BAILER</u>	

WELL INTEGRITY: good LOCK: W/C

REMARKS: ALL SAMPLES TAKEN

pH, E.C., Temp. Meter Calibration: Date: See MW-5 Time: _____ Meter Serial No.: 87M
E.C. 1000 _____ pH 7 _____ pH 10 _____ pH 4 _____

Temperature °F _____
SIGNATURE: J. Fernandez REVIEWED BY: [Signature] PAGE 4 OF 7

WATER SAMPLE FIELD DATA SHEET

Rev. 1/97



EMCON

PROJECT NO: 803932
PURGED BY: John Fernandez
SAMPLED BY: John Fernandez

SAMPLE ID: MW-5(25')
CLIENT NAME: ARCO #2035
LOCATION: Albany, California

TYPE: Groundwater X Surface Water _____ Leachate _____ Other _____
CASING DIAMETER (inches): 2 _____ 3 _____ 4 X 4.5 _____ 6 _____ Other _____

CASING ELEVATION (feet/MSL): N/A VOLUME IN CASING (gal.): 10 NR
DEPTH OF WELL (feet): 24.78 CALCULATED PURGE (gal.): 30.2
DEPTH OF WATER (feet): 9.35 ACTUAL PURGE VOL. (gal.): 30.5 ✓

DATE PURGED: 2/1/00 END PURGE: N/A
DATE SAMPLED: 2/1/00 SAMPLING TIME: 1025

TIME (2400 HR)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm@25°C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
<u>1025</u>	<u>grab</u>	<u>6.19</u>	<u>6064</u>	<u>60.1</u>	<u>clear</u>	<u>clear</u>
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____

OTHER: Dissolved Oxygen= 1 ODOR: no N/A N/A
(COBALT 0-100) (NTU 0-200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): N/A

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
<u>N/A</u> 2" Bladder Pump	<u>N/A</u> Bailer (Teflon)	_____ 2" Bladder Pump	_____ Bailer (Teflon)
_____ Centrifugal Pump	_____ Bailer (PVC)	_____ Bomb Sampler	_____ Bailer (Stainless Steel)
_____ Submersible Pump	_____ Bailer (Stainless Steel)	_____ Dipper	_____ Submersible Pump
_____ Well Wizard [®]	_____ Dedicated	_____ Well Wizard [®]	_____ Dedicated
Other: _____		Other: <u>Disposable Teflon Bailer</u>	

WELL INTEGRITY: good LOCK: LWC

REMARKS: All samples taken

pH, E.C., Temp. Meter Calibration: Date: 2-2-00 Time: 0910 Meter Serial No.: 87M
E.C. 1000 1024 / 1000 pH 7 782 / 700 pH 10 1086 / 1000 pH 4 498 / 400

Temperature °F 52.7
SIGNATURE: [Signature] REVIEWED BY: [Signature] PAGE 5 OF 7

WATER SAMPLE FIELD DATA SHEET

Rev. 1/97



EMCON

PROJECT NO: 803932
PURGED BY: John Fernandez
SAMPLED BY: John Fernandez

SAMPLE ID: MW-6(25')
CLIENT NAME: ARCO #2035
LOCATION: Albany, California

TYPE: Groundwater X Surface Water _____ Leachate _____ Other _____
CASING DIAMETER (inches): 2 X 3 _____ 4 X 4.5 _____ 6 _____ Other _____

CASING ELEVATION (feet/MSL): N/A VOLUME IN CASING (gal.): 2.5
DEPTH OF WELL (feet): 24.1 CALCULATED PURGE (gal.): 7.6
DEPTH OF WATER (feet): 8.6 ACTUAL PURGE VOL. (gal.): 8

DATE PURGED: 2/1/00 END PURGE: _____
DATE SAMPLED: 2/1/00 SAMPLING TIME: 1300

TIME (2400 HR)	VOLUME (gal)	pH (units)	E.C. (µmhos/cm@25°C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
<u>1255</u>	<u>grab</u>	<u>7.34</u>	<u>7553</u>	<u>62.2</u>	<u>clear</u>	<u>clear</u>
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____

OTHER: Dissolved Oxygen= 1 ODOR: NO N/A N/A
(COBALT 0-100) (NTU 0-200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): N/A

~~**PURGING EQUIPMENT**~~ ~~**SAMPLING EQUIPMENT**~~
~~_____ 2" Bladder Pump _____ Bailer (Teflon)~~ ~~_____ 2" Bladder Pump _____ Bailer (Teflon)~~
~~_____ Centrifugal Pump _____ Bailer (PVC)~~ ~~_____ Bomb Sampler _____ Bailer (Stainless Steel)~~
~~_____ Submersible Pump _____ Bailer (Stainless Steel)~~ ~~_____ Dipper _____ Submersible Pump~~
~~_____ Well Wizard[®] _____ Dedicated~~ ~~_____ Well Wizard[®] _____ Dedicated~~
Other: _____ Other: Disposable Teflon Bailer

WELL INTEGRITY: good LOCK: LWC

REMARKS: All samples taken

pH, E.C., Temp. Meter Calibration: Date: See MW-5 Time: _____ Meter Serial No.: 87m
E.C. 1000 / pH 7 / pH 10 / pH 4 /

Temperature °F _____
SIGNATURE: John E. Fernandez REVIEWED BY: [Signature] PAGE 6 OF 7

WATER SAMPLE FIELD DATA SHEET

Rev. 1/97



OWT

PROJECT NO: 803932
 PURGED BY: J. FERNANDEZ
 SAMPLED BY: J. FERNANDEZ

SAMPLE ID: RW-1 (25')
 CLIENT NAME: ARCO # 2035
 LOCATION: ALBANY, CA

TYPE: Groundwater Surface Water _____ Leachate _____ Other _____
 CASING DIAMETER (inches): 2 _____ 3 _____ 4 _____ 4.5 _____ 6 Other _____

CASING ELEVATION (feet/MSL): N/A VOLUME IN CASING (gal.): 19.1
 DEPTH OF WELL (feet): 24.9 CALCULATED PURGE (gal.): 57.4
 DEPTH OF WATER (feet): 11.88 ACTUAL PURGE VOL. (gal.): 57.5

DATE PURGED: 2-2-00 END PURGE: N/A
 DATE SAMPLED: 2-2-00 SAMPLING TIME: 1245

TIME (2400 HR)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm@25°C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
<u>1245</u>	<u>grab</u>	<u>7.39</u>	<u>1070</u>	<u>62.5</u>	<u>clear</u>	<u>clear</u>

OTHER: D.O. 1 ODOR: NO N/A N/A
(COBALT 0-100) (NTU 0-200)
 FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): N/A

PURGING EQUIPMENT

N/A
 _____ 2" Bladder Pump _____ Bailer (Teflon)
 _____ Centrifugal Pump _____ Bailer (PVC)
 _____ Submersible Pump _____ Bailer (Stainless Steel)
 _____ Well Wizard[®] _____ Dedicated
 Other: _____

SAMPLING EQUIPMENT

_____ 2" Bladder Pump _____ Bailer (Teflon)
 _____ Bomb Sampler _____ Bailer (Stainless Steel)
 _____ Dipper _____ Submersible Pump
 _____ Well Wizard[®] _____ Dedicated
 Other: DISPOSABLE TEFLON BAIER

WELL INTEGRITY: good LOCK: Vault

REMARKS: All samples taken

pH, E.C., Temp. Meter Calibration: Date: See MW-5 Time: _____ Meter Serial No.: 87M
 E.C. 1000 _____ pH 7 _____ pH 10 _____ pH 4 _____
 Temperature °F _____

SIGNATURE: J. Fernandez REVIEWED BY: M.A. PAGE 7 OF 7

ARCO Products Company

Division of AtlanticRichfieldCompany

Task Order No. 24118.00

Chain of Custody

ARCO Facility no. 2035 City (Facility) Albany Project manager (Consultant) Glenn Vander Veen
 ARCO engineer Jaul Supple Telephone no. (ARCO) Telephone no. (Consultant) (409) 453-7300 Fax no. (Consultant) (408) 437-9526
 Consultant name EMCON/IT Address (Consultant) 1921 Ringwood Ave. San Jose, CA. 95131

Laboratory name
CAS
Contract number

Sample I.D.	Lab no.	Container no.	Matrix			Preservation		Sampling date	Sampling time	BTEX EPA 802	BTEX/TPH EPA 1631 EPA 1632	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/SM50E	EPA 601/8010	EPA 62/6240	EPA 65/8270	TCPL Metals <input type="checkbox"/> VOA <input type="checkbox"/> VOA <input type="checkbox"/>	Semi Metals <input type="checkbox"/> VOA <input type="checkbox"/> VOA <input type="checkbox"/>	CAN Metals EPA 601/7000 TLC <input type="checkbox"/> STLC <input type="checkbox"/>	Lead Org/DHS Lead EPA 7420/421 <input type="checkbox"/>				
			Soil	Water	Other	Ice	Acid																		
<u>mw-6 (25')</u>				<u>X</u>		<u>X</u>	<u>HCL</u>	<u>2-2-00</u>	<u>1300</u>		<u>X</u>														
<u>mw-3 (34')</u>				<u>X</u>		<u>X</u>	<u>HCL</u>		<u>1120</u>		<u>X</u>														
<u>mw-2 (29')</u>				<u>X</u>		<u>X</u>	<u>HCL</u>		<u>1225</u>		<u>X</u>														
<u>mw-4 (25')</u>				<u>X</u>		<u>X</u>	<u>HCL</u>		<u>1045</u>		<u>X</u>														
<u>mw-1 (30')</u>				<u>X</u>		<u>X</u>	<u>HCL</u>		<u>1145</u>		<u>X</u>														
<u>RW-1 (25')</u>				<u>X</u>		<u>X</u>	<u>HCL</u>		<u>1245</u>		<u>X</u>														
<u>MW-5 (25')</u>								<u>∨</u>	<u>1025</u>																

Method of shipment
Sampler will deliver

Special detection Limit/reporting
Lowest possible.

Special QA/QC
As Normal.

Remarks
RAT-8
2-40 ml HCL
VOAs

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: _____

Relinquished by sampler [Signature] Date 2-2-00 Time 5:30 Received by Bria Fuller Date 2/3/00 Time 12:15 pm

Relinquished by _____ Date _____ Time _____ Received by _____

Relinquished by _____ Date _____ Time _____ Received by laboratory _____ Date _____ Time _____

APPENDIX D

**CERTIFIED ANALYTICAL REPORTS,
AND CHAIN-OF-CUSTODY DOCUMENTATION
FOR SOIL-VAPOR EXTRACTION SYSTEM**



January 7, 2000

Service Request No.: S2000033

Mr. Glen Vanderveen
IT/EMCON
2201 Broadway, Suite 101
Oakland, CA 94612

RE: TO#24057.00/RAT8/2035 ALBANY

Dear Mr. Vanderveen:

Enclosed are the results of the sample(s) submitted to our laboratory on January 5, 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 14, 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).

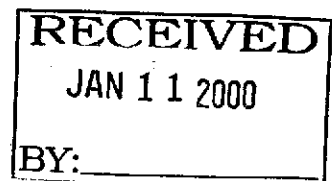
If you have any questions, please call me at (408) 748-9700.

Respectfully submitted,

Columbia Analytical Services, Inc.

Bernadette Troncales
Project Chemist

Greg Jordan
Laboratory Director



COLUMBIA ANALYTICAL SERVICES, Inc.

Acronyms

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

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: TO#24057.00/RAT8/2035 ALBANY
Sample Matrix: Air

Service Request: S2000033
Date Collected: 1/5/00
Date Received: 1/5/00

BTEX and Total Volatile Hydrocarbons

Sample Name: I-1
Lab Code: S2000033-001
Test Notes:

Units: mg/m3
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Benzene	NONE	8021B	0.4	1	NA	1/5/00	1.3	
Toluene	NONE	8021B	0.4	1	NA	1/5/00	2.6	
Ethylbenzene	NONE	8021B	0.5	1	NA	1/5/00	0.6	
Xylenes, Total	NONE	8021B	0.9	1	NA	1/5/00	ND	
Total Volatile Hydrocarbons:								
C1 - C5	NONE	8015M	12	1	NA	1/5/00	740	
C6 - C12	NONE	8015M	20	1	NA	1/5/00	370	
TPH as Gasoline*	NONE	8015M	20	1	NA	1/5/00	370	
Methyl tert-Butyl Ether	NONE	8021B	3	1	NA	1/5/00	120	

* TPH as gasoline is defined as C6 (benzene) through C12 (dodecane) and uses a molecular weight of 100 to calculate the ppmv.

Approved By: _____



Date: _____

01/07/00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: TO#24057.00/RAT8/2035 ALBANY
Sample Matrix: Air

Service Request: S2000033
Date Collected: 1/5/00
Date Received: 1/5/00

BTEX and Total Volatile Hydrocarbons

Sample Name: I-1
Lab Code: S2000033-001
Test Notes:

Units: ppmV
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Benzene	NONE	8021B	0.1	1	NA	1/5/00	0.4	
Toluene	NONE	8021B	0.1	1	NA	1/5/00	0.7	
Ethylbenzene	NONE	8021B	0.1	1	NA	1/5/00	0.1	
Xylenes, Total	NONE	8021B	0.2	1	NA	1/5/00	ND	
Total Volatile Hydrocarbons:								
C1 - C5	NONE	8015M	5	1	NA	1/5/00	310	
C6 - C12	NONE	8015M	5	1	NA	1/5/00	90	
TPH as Gasoline*	NONE	8015M	5	1	NA	1/5/00	90	
Methyl tert-Butyl Ether	NONE	8021B	0.8	1	NA	1/5/00	33	

* TPH as gasoline is defined as C6 (benzene) through C12 (dodecane) and uses a molecular weight of 100 to calculate the ppmv.

Approved By: _____ Date: 01/07/00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: TO#24057.00/RAT8/2035 ALBANY
Sample Matrix: Air

Service Request: S2000033
Date Collected: 1/5/00
Date Received: 1/5/00

BTEX and Total Volatile Hydrocarbons

Sample Name: E-1 Units: mg/m3
Lab Code: S2000033-002 Basis: NA
Test Notes:

Table with 9 columns: Analyte, Prep Method, Analysis Method, MRL, Dilution Factor, Date Extracted, Date Analyzed, Result, Result Notes. Rows include Benzene, Toluene, Ethylbenzene, Xylenes, Total, Total Volatile Hydrocarbons (C1-C5, C6-C12), TPH as Gasoline*, and Methyl tert-Butyl Ether.

* TPH as gasoline is defined as C6 (benzene) through C12 (dodecane) and uses a molecular weight of 100 to calculate the ppmv.

Approved By: [Signature] Date: 01/07/00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
 Project: TO#24057.00/RAT8/2035 ALBANY
 Sample Matrix: Air

Service Request: S2000033
 Date Collected: 1/5/00
 Date Received: 1/5/00


BTEX and Total Volatile Hydrocarbons

Sample Name: E-1
 Lab Code: S2000033-002
 Test Notes:

Units: ppmV
 Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Benzene	NONE	8021B	0.1	1	NA	1/6/00	ND	
Toluene	NONE	8021B	0.1	1	NA	1/6/00	ND	
Ethylbenzene	NONE	8021B	0.1	1	NA	1/6/00	ND	
Xylenes, Total	NONE	8021B	0.2	1	NA	1/6/00	ND	
Total Volatile Hydrocarbons:								
C1 - C5	NONE	8015M	5	1	NA	1/6/00	ND	
C6 - C12	NONE	8015M	5	1	NA	1/6/00	ND	
TPH as Gasoline*	NONE	8015M	5	1	NA	1/6/00	ND	
Methyl tert-Butyl Ether	NONE	8021B	0.8	1	NA	1/6/00	ND	

* TPH as gasoline is defined as C6 (benzene) through C12 (dodecane) and uses a molecular weight of 100 to calculate the ppmv.

Approved By:  Date: 01/07/00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: TO#24057.00/RAT8/2035 ALBANY
Sample Matrix: Air

Service Request: S2000033
Date Collected: NA
Date Received: NA


BTEX and Total Volatile Hydrocarbons

Sample Name: Method Blank
Lab Code: S200105-VB2
Test Notes:

Units: mg/m3
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Benzene	NONE	8021B	0.4	1	NA	1/5/00	ND	
Toluene	NONE	8021B	0.4	1	NA	1/5/00	ND	
Ethylbenzene	NONE	8021B	0.5	1	NA	1/5/00	ND	
Xylenes, Total	NONE	8021B	0.9	1	NA	1/5/00	ND	
Total Volatile Hydrocarbons:								
C1 - C5	NONE	8015M	12	1	NA	1/5/00	ND	
C6 - C12	NONE	8015M	20	1	NA	1/5/00	ND	
TPH as Gasoline*	NONE	8015M	20	1	NA	1/5/00	ND	
Methyl tert-Butyl Ether	NONE	8021B	3	1	NA	1/5/00	ND	

* TPH as gasoline is defined as C6 (benzene) through C12 (dodecane) and uses a molecular weight of 100 to calculate the ppmv.

Approved By:  Date: 01/07/00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: TO#24057.00/RAT8/2035 ALBANY
Sample Matrix: Air

Service Request: S2000033
Date Collected: NA
Date Received: NA

BTEX and Total Volatile Hydrocarbons

Sample Name: Method Blank
Lab Code: S200105-VB2
Test Notes:

Units: ppmV
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Benzene	NONE	8021B	0.1	1	NA	1/5/00	ND	
Toluene	NONE	8021B	0.1	1	NA	1/5/00	ND	
Ethylbenzene	NONE	8021B	0.1	1	NA	1/5/00	ND	
Xylenes, Total	NONE	8021B	0.2	1	NA	1/5/00	ND	
Total Volatile Hydrocarbons:								
C1 - C5	NONE	8015M	5	1	NA	1/5/00	ND	
C6 - C12	NONE	8015M	5	1	NA	1/5/00	ND	
TPH as Gasoline*	NONE	8015M	5	1	NA	1/5/00	ND	
Methyl tert-Butyl Ether	NONE	8021B	1.4	1	NA	1/5/00	ND	

* TPH as gasoline is defined as C6 (benzene) through C12 (dodecane) and uses a molecular weight of 100 to calculate the ppmv.

Approved By: _____

Date: 01/10/00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: TO#24057.00/RAT8/2035 ALBANY
Sample Matrix: Air

Service Request: S2000033
Date Collected: NA
Date Received: NA

BTEX and Total Volatile Hydrocarbons

Sample Name: Method Blank **Units:** mg/m3
Lab Code: S200106-VB1 **Basis:** NA
Test Notes:

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Benzene	NONE	8021B	0.4	1	NA	1/6/00	ND	
Toluene	NONE	8021B	0.4	1	NA	1/6/00	ND	
Ethylbenzene	NONE	8021B	0.5	1	NA	1/6/00	ND	
Xylenes, Total	NONE	8021B	0.9	1	NA	1/6/00	ND	
Total Volatile Hydrocarbons:								
C1 - C5	NONE	8015M	12	1	NA	1/6/00	ND	
C6 - C12	NONE	8015M	20	1	NA	1/6/00	ND	
TPH as Gasoline*	NONE	8015M	20	1	NA	1/6/00	ND	
Methyl tert-Butyl Ether	NONE	8021B	3	1	NA	1/6/00	ND	

* TPH as gasoline is defined as C6 (benzene) through C12 (dodecane) and uses a molecular weight of 100 to calculate the ppmv.

Approved By: _____ *MS* Date: *01/07/00*

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: TO#24057.00/RAT8/2035 ALBANY
Sample Matrix: Air

Service Request: S2000033
Date Collected: NA
Date Received: NA

BTEX and Total Volatile Hydrocarbons

Sample Name: Method Blank
Lab Code: S200106-VB1
Test Notes:

Units: ppmV
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Benzene	NONE	8021B	0.1	1	NA	1/6/00	ND	
Toluene	NONE	8021B	0.1	1	NA	1/6/00	ND	
Ethylbenzene	NONE	8021B	0.1	1	NA	1/6/00	ND	
Xylenes, Total	NONE	8021B	0.2	1	NA	1/6/00	ND	
Total Volatile Hydrocarbons:								
C1 - C5	NONE	8015M	5	1	NA	1/6/00	ND	
C6 - C12	NONE	8015M	5	1	NA	1/6/00	ND	
TPH as Gasoline*	NONE	8015M	5	1	NA	1/6/00	ND	
Methyl tert-Butyl Ether	NONE	8021B	0.8	1	NA	1/6/00	ND	

* TPH as gasoline is defined as C6 (benzene) through C12 (dodecane) and uses a molecular weight of 100 to calculate the ppmv.

Approved By: _____

ht

Date: _____

01/07/00

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
 Project: TO#24057.00/RAT8/2035 ALBANY
 Sample Matrix: Air

Service Request: S2000033
 Date Collected: 1/5/00
 Date Received: 1/5/00
 Date Extracted: NA
 Date Analyzed: 1/6/00

Duplicate Summary
 BTEX and Total Volatile Hydrocarbons

Sample Name: I-1 Units: mg/m3
 Lab Code: S2000033-001DUP Basis: NA
 Test Notes:

Analyte	Prep Method	Analysis Method	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference	Result Notes
Benzene	NONE	8021B	0.4	1.0	1.0	1.0	<1	
Toluene	NONE	8021B	0.4	7.7	7.9	7.8	3	
Ethylbenzene	NONE	8021B	0.5	2.2	2.7	2.5	20	
Xylenes, Total	NONE	8021B	0.9	7.7	7.7	7.7	<1	
Total Volatile Hydrocarbons								
C1 - C5	NONE	8015M	12	700	660	680	6	
C6 - C12	NONE	8015M	20	980	1000	990	2	
TPH as Gasoline*	NONE	8015M	20	980	1000	990	2	
Methyl tert-Butyl Ether	NONE	8021B	3	6	6	6	<1	

Approved By: _____

[Handwritten Signature]

Date: _____

01/07/00

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
 Project: TO#24057.00/RAT8/2035 ALBANY
 Sample Matrix: Air

Service Request: S2000033
 Date Collected: 1/5/00
 Date Received: 1/5/00
 Date Extracted: NA
 Date Analyzed: 1/6/00

Duplicate Summary
 BTEX and Total Volatile Hydrocarbons

Sample Name: I-1
 Lab Code: S2000033-001DUP
 Test Notes:

Units: ppmV
 Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference	Result Notes
Benzene	NONE	8021B	0.1	0.3	0.3	0.3	<1	
Toluene	NONE	8021B	0.1	2.0	2.1	2.1	5	
Ethylbenzene	NONE	8021B	0.1	0.5	0.6	0.6	9	
Xylenes, Total	NONE	8021B	0.2	1.8	1.8	1.8	<1	
Total Volatile Hydrocarbons								
C1 - C5	NONE	8015M	5	295	278	287	6	
C6 - C12	NONE	8015M	5	240	244	242	2	
TPH as Gasoline*	NONE	8015M	5	240	240	240	2	
Methyl tert-Butyl Ether	NONE	8021B	0.8	1.5	1.5	1.5	2	

Approved By: _____

PT

Date: _____

01/07/00

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: TO#24057.00/RAT8/2035 ALBANY
LCS Matrix: Air

Service Request: S2000033
Date Collected: NA
Date Received: NA
Date Extracted: NA
Date Analyzed: 1/6/00

Laboratory Control Sample Summary
BTEX and TPH as Gasoline

Sample Name: Lab Control Sample
Lab Code: S200105-LCS
Test Notes:

Units: mg/m3
Basis: NA

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Benzene	NONE	8021B	24	17	71	60-140	
Toluene	NONE	8021B	24	20	83	60-140	
Ethylbenzene	NONE	8021B	24	22	92	60-140	
Gasoline	NONE	8015M	210	290	138	60-140	

Approved By: _____



Date: _____

01/07/00

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: TO#24057.00/RAT8/2035 ALBANY
LCS Matrix: Air

Service Request: S2000033
Date Collected: NA
Date Received: NA
Date Extracted: NA
Date Analyzed: 1/6/00

Laboratory Control Sample Summary
 BTEX and TPH as Gasoline

Sample Name: Lab Control Sample
Lab Code: S200105-LCS
Test Notes:

Units: ppmV
Basis: NA

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS	Result Notes
						Percent Recovery Acceptance Limits	
Benzene	NONE	8021B	7.5	5.3	71	60-140	
Toluene	NONE	8021B	6.4	5.3	83	60-140	
Ethylbenzene	NONE	8021B	5.5	5.1	93	60-140	
Gasoline	NONE	8015M	51	71	139	60-140	

Approved By: _____

[Handwritten Signature]

Date: _____

01/07/00

ARCO Facility no. 2035	City (Facility) Albany CA	Project manager (Consultant) Glen Vanderveen
ARCO engineer Paul Supple	Telephone no. (ARCO)	Telephone no. (Consultant)
Consultant name EMION IT	Address (Consultant)	
		Fax no. (Consultant)

Laboratory name
CAS

Contract number

Sample I.D.	Lab no.	Container no.	Matrix			Preservation		Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH/VMTSE EPA M602/8020/8015	TPH Modified 8015 Gas <input type="checkbox"/> Diesel <input type="checkbox"/>	Oil and Grease 413.1 <input type="checkbox"/> 413.2 <input type="checkbox"/>	TPH EPA 418.1/SM503E	EPA 801/8010	EPA 824/8240	EPA 825/8270	TCMP Metals <input type="checkbox"/> VOA <input type="checkbox"/> VOA <input type="checkbox"/>	Semi Metals <input type="checkbox"/> VOA <input type="checkbox"/> VOA <input type="checkbox"/>	CAM Metals EPA 601/7000 TTLC <input type="checkbox"/> STLC <input type="checkbox"/>	Lead Org./OHS <input type="checkbox"/> Lead EPA 7420/7421 <input type="checkbox"/>	
			Soil	Water	Other	Ice	Acid															
I-1		1	①		AIR		1/5/00	1230		X												
I-1		1	②		V		1/5/00	1215		X												

Method of shipment
TECH

Special detection Limit/reporting
PPMV

Special QA/QC

Remarks
Ret 8

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: **Due: 1/6/00**

Relinquished by sampler Lisee Reilly	Date 1-5-00 Time 1337	Received by Joseph Machado CAS Date 1/5/00 Time 1337
Relinquished by	Date _____ Time _____	Received by _____ Date _____ Time _____
Relinquished by	Date _____ Time _____	Received by laboratory _____ Date _____ Time _____



March 2, 2000

Service Request No.: S2000762

Mr Lee Dooley
IT Corporation
1921 Ringwood Ave.
San José, CA 95131

RE: 2035 Albany/TO#25521.00/RAT#8

Dear Mr Dooley:

Enclosed are the results of the sample(s) submitted to our laboratory on March 1, 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 12, following, have been thoroughly reviewed and approved for release.

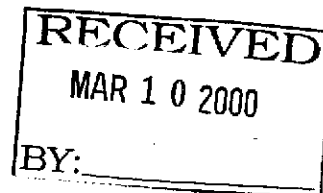
Columbia Analytical Services is certified for environmental analyses by the California Department of Health Services (certificate number: 2352, expiration: January 31, 2001).

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

Respectfully submitted,

Columbia Analytical Services, Inc.

Lori Tyler
Project Chemist



COLUMBIA ANALYTICAL SERVICES, Inc.

Acronyms

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

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: TO#25521.00/RAT8/2035 ALBANY
Sample Matrix: Air

Service Request: S2000762
Date Collected: 3/1/00
Date Received: 3/1/00

BTEX and Total Volatile Hydrocarbons

Sample Name: I-1
Lab Code: S2000762-001
Test Notes:

Units: mg/m3
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Benzene	NONE	8021B	0.4	1	NA	3/2/00	4.3	
Toluene	NONE	8021B	0.4	1	NA	3/2/00	18	
Ethylbenzene	NONE	8021B	0.5	1	NA	3/2/00	4.9	
Xylenes, Total	NONE	8021B	0.9	1	NA	3/2/00	31	
Total Volatile Hydrocarbons:								
C1 - C5	NONE	8015M	12	1	NA	3/2/00	150	
C6 - C12	NONE	8015M	20	1	NA	3/2/00	220	
TPH as Gasoline*	NONE	8015M	20	1	NA	3/2/00	220	
Methyl tert-Butyl Ether	NONE	8021B	3	1	NA	3/2/00	68	

* TPH as gasoline is defined as C6 (benzene) through C12 (dodecane) and uses a molecular weight of 100 to calculate the ppmv.

Approved By: _____



Date: 3-2-00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: TO#25521.00/RAT8/2035 ALBANY
Sample Matrix: Air

Service Request: S2000762
Date Collected: 3/1/00
Date Received: 3/1/00

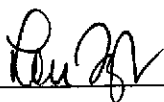
BTEX and Total Volatile Hydrocarbons

Sample Name: I-1
Lab Code: S2000762-001
Test Notes:

Units: ppmV
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Benzene	NONE	8021B	0.1	1	NA	3/2/00	1.3	
Toluene	NONE	8021B	0.1	1	NA	3/2/00	4.8	
Ethylbenzene	NONE	8021B	0.1	1	NA	3/2/00	1.1	
Xylenes, Total	NONE	8021B	0.2	1	NA	3/2/00	7.2	
Total Volatile Hydrocarbons:								
C1 - C5	NONE	8015M	5	1	NA	3/2/00	63	
C6 - C12	NONE	8015M	5	1	NA	3/2/00	54	
TPH as Gasoline*	NONE	8015M	5	1	NA	3/2/00	54	
Methyl tert-Butyl Ether	NONE	8021B	0.8	1	NA	3/2/00	19	

* TPH as gasoline is defined as C6 (benzene) through C12 (dodecane) and uses a molecular weight of 100 to calculate the ppmv.

Approved By:  Date: 3-2-00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
 Project: TO#25521.00/RAT8/2035 ALBANY
 Sample Matrix: Air

Service Request: S2000762
 Date Collected: 3/1/00
 Date Received: 3/1/00

BTEX and Total Volatile Hydrocarbons

Sample Name: E-1
 Lab Code: S2000762-002
 Test Notes:

Units: mg/m3
 Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Benzene	NONE	8021B	0.4	1	NA	3/2/00	ND	
Toluene	NONE	8021B	0.4	1	NA	3/2/00	ND	
Ethylbenzene	NONE	8021B	0.5	1	NA	3/2/00	ND	
Xylenes, Total	NONE	8021B	0.9	1	NA	3/2/00	ND	
Total Volatile Hydrocarbons:								
C1 - C5	NONE	8015M	12	1	NA	3/2/00	ND	
C6 - C12	NONE	8015M	20	1	NA	3/2/00	ND	
TPH as Gasoline*	NONE	8015M	20	1	NA	3/2/00	ND	
Methyl tert-Butyl Ether	NONE	8021B	3	1	NA	3/2/00	ND	

* TPH as gasoline is defined as C6 (benzene) through C12 (dodecane) and uses a molecular weight of 100 to calculate the ppmv.

Approved By: *Ren Ziv* Date: 3-2-00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: TO#25521.00/RAT8/2035 ALBANY
Sample Matrix: Air

Service Request: S2000762
Date Collected: 3/1/00
Date Received: 3/1/00

BTEX and Total Volatile Hydrocarbons

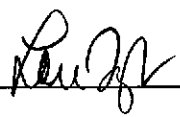
Sample Name: E-1
Lab Code: S2000762-002
Test Notes:

Units: ppmV
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Benzene	NONE	8021B	0.1	1	NA	3/2/00	ND	
Toluene	NONE	8021B	0.1	1	NA	3/2/00	ND	
Ethylbenzene	NONE	8021B	0.1	1	NA	3/2/00	ND	
Xylenes, Total	NONE	8021B	0.2	1	NA	3/2/00	ND	
Total Volatile Hydrocarbons:								
C1 - C5	NONE	8015M	5	1	NA	3/2/00	ND	
C6 - C12	NONE	8015M	5	1	NA	3/2/00	ND	
TPH as Gasoline*	NONE	8015M	5	1	NA	3/2/00	ND	
Methyl tert-Butyl Ether	NONE	8021B	0.8	1	NA	3/2/00	ND	

* TPH as gasoline is defined as C6 (benzene) through C12 (dodecane) and uses a molecular weight of 100 to calculate the ppmv.

Approved By: _____



Date: 3-2-00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: TO#25521.00/RAT8/2035 ALBANY
Sample Matrix: Air

Service Request: S2000762
Date Collected: NA
Date Received: NA

BTEX and Total Volatile Hydrocarbons

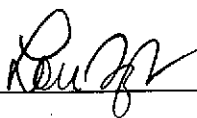
Sample Name: Method Blank
Lab Code: S200302-VB1
Test Notes:

Units: ppmV
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Benzene	NONE	8021B	0.1	1	NA	3/2/00	ND	
Toluene	NONE	8021B	0.1	1	NA	3/2/00	ND	
Ethylbenzene	NONE	8021B	0.1	1	NA	3/2/00	ND	
Xylenes, Total	NONE	8021B	0.2	1	NA	3/2/00	ND	
Total Volatile Hydrocarbons:								
C1 - C5	NONE	8015M	5	1	NA	3/2/00	ND	
C6 - C12	NONE	8015M	5	1	NA	3/2/00	ND	
TPH as Gasoline*	NONE	8015M	5	1	NA	3/2/00	ND	
Methyl tert-Butyl Ether	NONE	8021B	1.4	1	NA	3/2/00	ND	

• TPH as gasoline is defined as C6 (benzene) through C12 (dodecane) and uses a molecular weight of 100 to calculate the ppmv.

Approved By: _____



Date: _____

3-2-00

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: TO#25521.00/RAT8/2035 ALBANY
Sample Matrix: Air

Service Request: S2000762
Date Collected: 3/1/00
Date Received: 3/1/00
Date Extracted: NA
Date Analyzed: 3/2/00

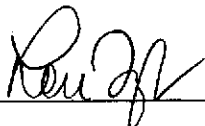
Duplicate Summary
 BTEX and Total Volatile Hydrocarbons

Sample Name: I-1
 Lab Code: s2000762-001DUP
 Test Notes:

Units: mg/m3
 Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference	Result Notes
Benzene	NONE	8021B	0.4	4.3	4.5	4.4	5	
Toluene	NONE	8021B	0.4	18	19	19	5	
Ethylbenzene	NONE	8021B	0.5	4.9	5.1	5.0	4	
Xylenes, Total	NONE	8021B	0.9	31	31	31	<1	
Total Volatile Hydrocarbons								
C1 - C5	NONE	8015M	12	150	140	150	7	
C6 - C12	NONE	8015M	20	220	210	220	5	
TPH as Gasoline*	NONE	8015M	20	220	210	220	5	
Methyl tert-Butyl Ether	NONE	8021B	3	68	94	81	32	

Approved By: _____



Date: _____

3-2-00

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: TO#25521.00/RAT8/2035 ALBANY
Sample Matrix: Air

Service Request: S2000762
Date Collected: 3/1/00
Date Received: 3/1/00
Date Extracted: NA
Date Analyzed: 3/2/00

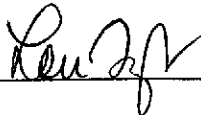
Duplicate Summary
 BTEX and Total Volatile Hydrocarbons

Sample Name: I-1
 Lab Code: s2000762-001DUP
 Test Notes:

Units: ppmV
 Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference	Result Notes
Benzene	NONE	8021B	0.1	1.3	1.4	1.4	7	
Toluene	NONE	8021B	0.1	4.8	5.0	4.9	4	
Ethylbenzene	NONE	8021B	0.1	1.1	1.2	1.2	8	
Xylenes, Total	NONE	8021B	0.2	7.2	7.2	7.2	<1	
Total Volatile Hydrocarbons								
C1 - C5	NONE	8015M	5	63	59	61	7	
C6 - C12	NONE	8015M	5	54	51	53	6	
TPH as Gasoline*	NONE	8015M	5	54	51	53	6	
Methyl tert-Butyl Ether	NONE	8021B	0.8	19	26	23	30	

Approved By: _____



Date: 3-2-00

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: TO#25521.00/RAT8/2035 ALBANY
LCS Matrix: Air

Service Request: S2000762
Date Collected: NA
Date Received: NA
Date Extracted: NA
Date Analyzed: 3/2/00

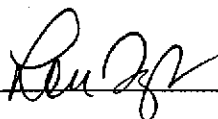
Laboratory Control Sample Summary
 BTEX and TPH as Gasoline

Sample Name: Lab Control Sample
Lab Code: S200302-LCS
Test Notes:

Units: mg/m3
Basis: NA

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS	Result Notes
						Percent Recovery Acceptance Limits	
Benzene	NONE	8021B	24	23	96	60-140	
Toluene	NONE	8021B	24	26	108	60-140	
Ethylbenzene	NONE	8021B	24	23	96	60-140	
Gasoline	NONE	8015M	210	244	116	60-140	

Approved By: _____



Date: 3-2-00

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: TO#25521.00/RAT8/2035 ALBANY
LCS Matrix: Air

Service Request: S2000762
Date Collected: NA
Date Received: NA
Date Extracted: NA
Date Analyzed: 3/2/00

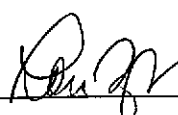
Laboratory Control Sample Summary
 BTEX and TPH as Gasoline

Sample Name: Lab Control Sample
Lab Code: S200302-LCS
Test Notes:

Units: ppmV
Basis: NA

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS	Result Notes
						Percent Recovery Acceptance Limits	
Benzene	NONE	8021B	7.5	7.2	96	60-140	
Toluene	NONE	8021B	6.4	6.9	108	60-140	
Ethylbenzene	NONE	8021B	5.5	5.3	96	60-140	
Gasoline	NONE	8015M	51	60	118	60-140	

Approved By: _____



Date: _____

3-2-00

ARCO Facility no. 2035	City (Facility) Albany-Outland	Project manager (Consultant) Lee Dooley
ARCO engineer Paul Supple	Telephone no. (ARCO)	Telephone no. (Consultant)
Consultant name IT		Fax no. (Consultant)
Address (Consultant) 52000762		

Laboratory name **CAS**
Contract number

Sample I.D.	Lab no.	Container no.	Matrix			Preservation		Sampling date	Sampling time	BTEX EPA 8020	BTEX/TPH EPA M802/8020/8015	TPH Modified 8015 Gas Diesel	Oil and Grease 413.1 413.2	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals VOA VOA	Semi Metals EPA 8010/7000 TTLC STLC	Lead Org./DHS Lead EPA 7420/7421	Method of shipment
			Soil	Water	Other	Ice	Acid														
I-1	①	1			Air			3/1/00	1200		X										Techn
E-1	②	1			Air			3/1/00	1150		X										PPMV

Method of shipment **Techn**

Special detection Limit/reporting **PPMV**

Special QA/QC

Remarks **Rat 8**
Due: 3/2/00

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:
Relinquished by sampler Luzle Palm	Date 3-1-2000 Time 1405
Relinquished by	Received by Joseph Hachado CAS Date 3/1/00 Time 1405
Relinquished by	Received by laboratory
	Date
	Time