



January 28, 1999
Project 20805-132.006

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

ARCO QUARTERLY STATUS REPORT

Station No.: 6041 Address: 7249 Village Parkway, Dublin, California
Pinnacle Project No. 20805-132.006
ARCO Environmental Engineer/Phone No.: Paul Supple / (925) 299-8891
Pinnacle Project Manager/Phone No.: Glen VanderVeen / (925) 977-9020
Primary Agency/Regulatory ID No.: Alameda County Health Care Services Agency (ACHCSA)

WORK PERFORMED THIS QUARTER (FOURTH - 1998):

1. Prepared and submitted quarterly groundwater monitoring report for third quarter 1998.
2. No environmental work was conducted at the site during the fourth quarter 1998.

WORK PROPOSED FOR NEXT QUARTER (FIRST - 1999):

1. Prepare and submit quarterly status report for fourth quarter 1998.
2. Perform semi-annual groundwater monitoring and sampling for the first quarter 1999.

If you have any questions regarding this report, please call.

Sincerely,

Pinnacle

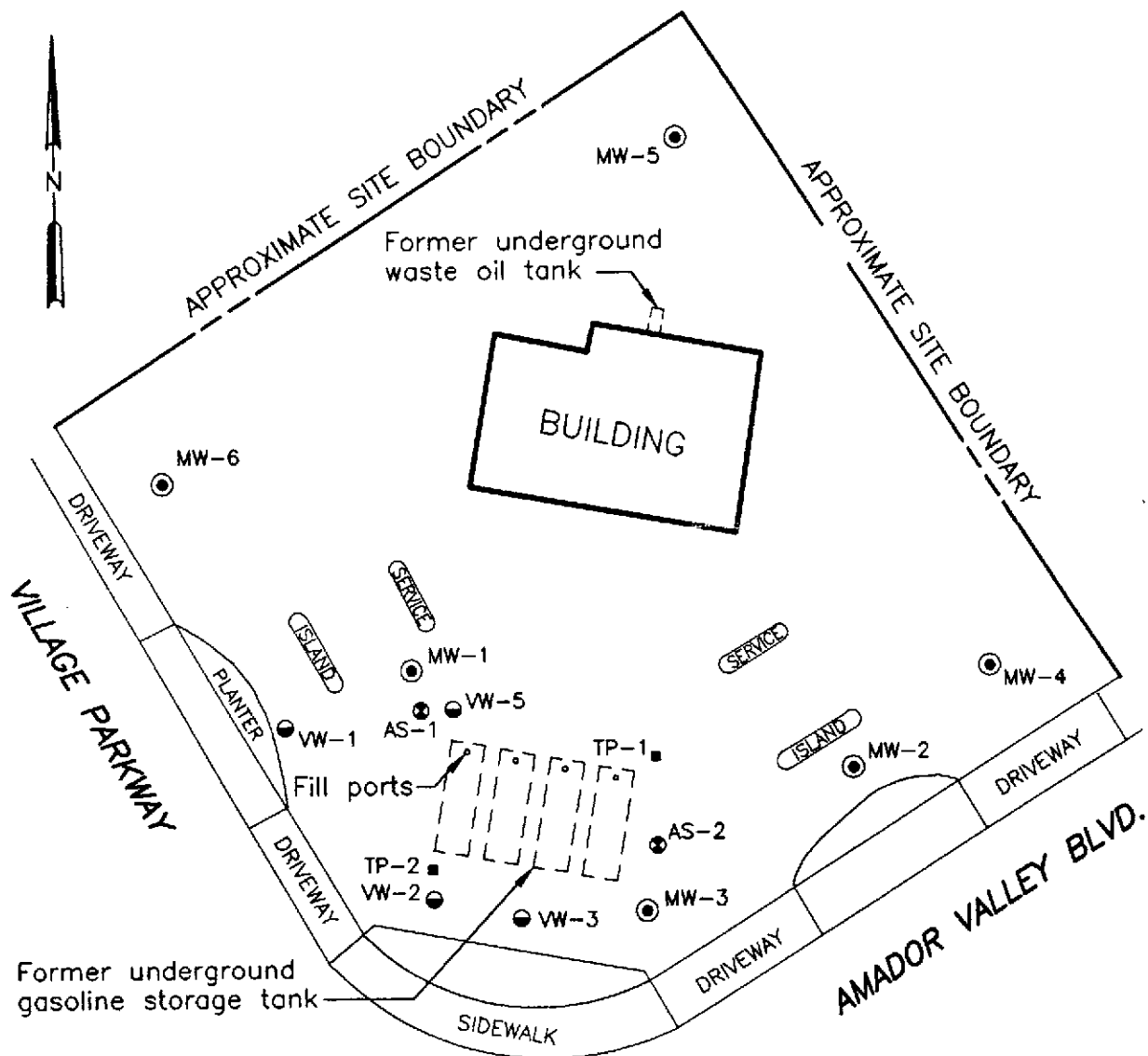


Glen VanderVeen
Project Manager

Attachment: Figure 1 - Site Plan

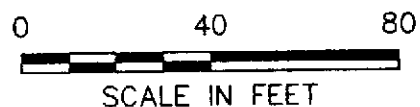
cc: Eva Chu, ACHCSA





EXPLANATION

- Groundwater monitoring well
- Tank pit observation well
- Vapor extraction well
- ⊙ Air sparge well

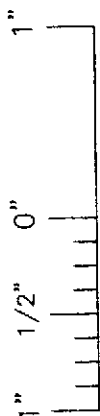


Pinnacle
ENVIRONMENTAL SOLUTIONS
A DIVISION OF EMCON

DATE OCT. 1998
DWN KAB
APP
REV
PROJECT NO.
20805-132.006

FIGURE 1
ARCO PRODUCTS COMPANY
SERVICE STATION 6041, 7249 VILLAGE PKWY
DUBLIN, CALIFORNIA
SITE PLAN

IMAGE Files: <No Images>
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Dimscale: 40 Ltscale: 40 Pellscale: 0
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99 JAN -5 AM 9:22

December 30, 1998
Project 20805-132.006

Should we chase mtBE prime

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

Re: Quarterly Groundwater Monitoring Report, Third Quarter 1998, for ARCO Service Station
No. 6041, located at 7249 Village Parkway, Dublin, California

Dear Mr. Supple:

Pinnacle Environmental Solutions, a division of EMCON (Pinnacle), is submitting the attached report which presents the results of the third quarter 1998 groundwater monitoring program at ARCO Products Company (ARCO) Service Station No. 6041, located at 7249 Village Parkway, Dublin, California. The monitoring program complies with the Alameda County Health Care Services Agency requirements regarding underground tank investigations.


LIMITATIONS

No monitoring event is thorough enough to describe all geologic and hydrogeologic conditions of interest at a given site. If conditions have not been identified during the monitoring event, results should not be construed as a guarantee of the absence of such conditions at the site, but rather as the product of the scope and limitations of work performed during the monitoring event.

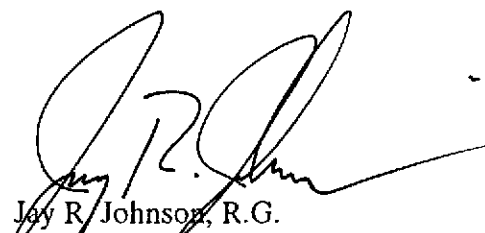
Please call if you have questions.

Sincerely,

Pinnacle


Glen VanderVeen
Project Manager

G.V.


Jay R. Johnson, R.G.
Senior Project Supervisor

Attachment: Quarterly Groundwater Monitoring Report, Third Quarter 1998

cc: Eva Chu, ACHCSA



December 30, 1998

ARCO QUARTERLY GROUNDWATER MONITORING REPORT

Station No.: 6041 Address: 7249 Village Parkway, Dublin, California
Pinnacle Project No. 20805-132.006
ARCO Environmental Engineer/Phone No.: Paul Supple /(925) 299-8891
Pinnacle Project Manager/Phone No.: Glen VanderVeen/(925) 977-9020
Primary Agency/Regulatory ID No.: ACHCSA /Eva Chu

WORK PERFORMED THIS QUARTER (THIRD - 1998):

1. Prepared and submitted status report for second quarter 1998.
2. Performed semi-annual groundwater monitoring and sampling for third quarter 1998.

WORK PROPOSED FOR NEXT QUARTER (FOURTH - 1998):

1. Prepare and submit semi-annual groundwater monitoring report for third quarter 1998.
2. No environmental work is scheduled for the site during the fourth quarter 1998.

MONITORING:

Current Phase of Project:	Monitoring
Frequency of Groundwater Sampling	Semi-annual (1st/3rd quarter): MW-1, MW-2, MW-3
Frequency of Groundwater Monitoring	Semi-annual
Is Floating Product (FP) Present On-site:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Bulk Soil Removed to Date :	15 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:	None
Average Depth to Groundwater:	8.3 feet
Groundwater Gradient (Average):	0.01 ft/ft toward Northwest

ATTACHMENTS:

- Table 1 - Historical Groundwater Elevation and Analytical Data (Petroleum Hydrocarbons and Their Constituents)
- Table 2 - Historical Groundwater Elevation Data (UNOCAL, BP and Shell Stations)
- 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

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

ARCO Service Station 6041
7249 Village Parkway, Dublin, California

Well Designation	Water Level Field Date	Top of Casing Elevation ft-MSL	Depth to Water feet	Groundwater Elevation ft-MSL	Floating Product Thickness feet	Groundwater Flow Direction MWN	Hydraulic Gradient ft/ft	Water Sample Field Date	TPHG LUFT Method µg/L	Benzene EPA 8020 µg/L	Toluene EPA 8020 µg/L	Ethylbenzene EPA 8020 µg/L	Total Xylenes EPA 8020 µg/L	MTBE EPA 8020 µg/L	MTBE EPA 8240 µg/L
MW-1	02-15-95	336.56	8.53	328.03	ND	NR	NR	02-15-95	820	15	<1	5.2	1.4	--	--
MW-1	05-24-95	336.56	9.00	327.56	ND	ESE	0.002	05-24-95	640	12	<1	7.3	<1	--	--
MW-1	08-25-95	336.56	10.30	326.26	ND	NW	0.006	08-25-95	780	2	<1	2	2	2500	--
MW-1	11-28-95	336.56	11.01	325.55	ND	N	0.006	11-28-95	570	2.2	<0.5	1.4	0.9	--	--
MW-1	02-26-96	336.56	7.35	329.21	ND	E	0.012	03-13-96	1100	28	<7	13	7	3400	--
MW-1	05-23-96	336.56	8.73	327.83	ND	FG	FG	05-23-96	560	8.5	<1	1.1	<1	3900	--
MW-1	08-23-96	336.56	10.25	326.31	ND	FG	FG	08-23-96	860	<1	<1	<4	2	5600	--
MW-1	03-21-97	336.56	9.35	327.21	ND	SSE	0.005	03-21-97	520	12	<0.5	2.7	1.5	6200	--
MW-1	08-20-97	336.56	10.75	325.81	ND	SSW	0.001	08-20-97	<5000	<50	<50	<50	<50	7400	--
MW-1	11-21-97	336.56	11.10	325.46	ND	SSW	0.002	11-21-97	<5000	<50	<50	<50	<50	8500	--
MW-1	02-12-98	336.56	7.05	329.51	ND	E	0.024	02-12-98	210	<0.5	<0.5	<0.5	<0.5	8900	--
MW-1	07-31-98	336.56	10.04	326.52	ND	NW	0.01	07-31-98	<20000	<200	<200	<200	<200	18000	--
MW-2	02-15-95	334.80	6.75	328.05	ND	NR	NR	02-15-95	730	110	1.7	25	66	--	--
MW-2	05-24-95	334.80	6.88	327.92	ND	ESE	0.002	05-24-95	370	110	<1	17	1.9	--	--
MW-2	08-25-95	334.80	7.91	326.89	ND	NW	0.006	08-25-95	150	6	<1	<1	<1	2700	--
MW-2	11-28-95	334.80	9.06	325.74	ND	N	0.006	11-28-95	<50	<0.5	<0.5	<0.5	0.8	--	--
MW-2	02-26-96	334.80	6.65	328.15	ND	E	0.012	03-13-96	350	66	<0.5	11	1.7	<3	--
MW-2	05-23-96	334.80	6.90	327.90	ND	FG	FG	05-23-96	540	140	<2.5	13	<2.5	4600	--
MW-2	08-23-96	334.80	8.45	326.35	ND	FG	FG	08-23-96	180	0.8	2	0.7	2.6	4000	--
MW-2	03-21-97	334.80	7.28	327.52	ND	SSE	0.005	03-21-97	410	90	<1	14	4	3500	--
MW-2	08-20-97	334.80	8.87	325.93	ND	SSW	0.001	08-20-97	<5000	<50	<50	<50	<50	3100	--
MW-2	11-21-97	334.80	9.28	325.52	ND	SSW	0.002	11-21-97	<2000	<20	<20	<20	<20	2600	--
MW-2	02-12-98	334.80	5.90	328.90	ND	E	0.024	02-12-98	310	54	<0.5	6.2	1.1	3500	--
MW-2	07-31-98	334.80	8.12	326.68	ND	NW	0.01	07-31-98	6100	52	220	110	1100	7700	--

Table 1
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Petroleum Hydrocarbons and Their Constituents
1995 - Present*

ARCO Service Station 6041
7249 Village Parkway, Dublin, California

Well Designation	Water Level Field Date	Top of Casing Elevation ft-MSL	Depth to Water feet	Groundwater Elevation ft-MSL	Floating Product Thickness feet	Groundwater Flow Direction MWN	Hydraulic Gradient ft/ft	Water Sample Field Date	TPHIG LUFT Method µg/L	Benzene EPA 8020 µg/L	Toluene EPA 8020 µg/L	Ethylbenzene EPA 8020 µg/L	Total Xylenes EPA 8020 µg/L	MTBE EPA 8020 µg/L	MTBE EPA 8240 µg/L
MW-3	02-15-95	335.53	8.55	326.98	ND	NR	NR	02-15-95	100	14	<0.5	6.3	<0.5	--	--
MW-3	05-24-95	335.53	8.17	327.36	ND	ESE	0.002	05-24-95	110	8	<0.5	2.7	<0.5	--	--
MW-3	08-25-95	335.53	9.27	326.26	ND	NW	0.006	08-25-95	210	3.6	<0.5	2.9	0.6	20000	--
MW-3	11-28-95	335.53	9.91	325.62	ND	N	0.006	11-28-95	81	1.5	<0.5	1.4	<0.5	--	15000
MW-3	02-26-96	335.53	8.42	327.11	ND	E	0.012	03-13-96	16000	1600	1200	300	2000	9500	--
MW-3	05-23-96	335.53	7.70	327.83	ND	FG	FG	05-23-96	6500	690	<10	120	14	8600	--
MW-3	08-23-96	335.53	9.25	326.28	ND	FG	FG	08-23-96	1700	85	2.1	61	5.3	11000	--
MW-3	03-21-97	335.53	8.72	326.81	ND	SSE	0.005	03-21-97	100	2	<1	1	<1	6600	--
MW-3	08-20-97	335.53	9.73	325.80	ND	SSW	0.001	08-20-97	<5000	<50	<50	<50	<50	7700	--
MW-3	11-21-97	335.53	10.10	325.43	ND	SSW	0.002	11-21-97	<5000	<50	<50	<50	<50	9700	--
MW-3	02-12-98	335.53	6.68	328.85	ND	E	0.024	02-12-98	110	11	<0.5	<0.5	1.9	10000	--
MW-3	07-31-98	335.53	7.98	327.55	ND	NW	0.01	07-31-98	<10000	<100	<100	<100	<100	13000	--
MW-4	02-15-95	334.22	7.85	326.37	ND	NR	NR	02-15-95	<50	<0.5	<0.5	<0.5	<0.5	--	--
MW-4	05-24-95	334.22	6.68	327.54	ND	ESE	0.002	05-24-95	Not sampled: well sampled semi-annually, during the first and third quarters						
MW-4	08-25-95	334.22	6.93	327.29	ND	NW	0.006	08-25-95	<50	<0.5	<0.5	<0.5	<0.5	<3	--
MW-4	11-28-95	334.22	8.21	326.01	ND	N	0.006	11-28-95	Not sampled: well sampled semi-annually, during the first and third quarters						
MW-4	02-26-96	334.22	6.65	327.57	ND	E	0.012	03-13-96	<50	<0.5	<0.5	<0.5	<0.5	<3	--
MW-4	05-23-96	334.22	6.47	327.75	ND	FG	FG	05-23-96	Not sampled: well sampled semi-annually, during the first and third quarters						
MW-4	08-23-96	334.22	7.66	326.56	ND	FG	FG	08-23-96	Not sampled: well not part of sampling program						
MW-4	03-21-97	334.22	6.84	327.38	ND	SSE	0.005	03-21-97	Not sampled: well not part of sampling program						
MW-4	08-20-97	334.22	8.32	325.90	ND	SSW	0.001	08-20-97	Not sampled: well not part of sampling program						
MW-4	11-21-97	334.22	8.65	325.57	ND	SSW	0.002	11-21-97	Not sampled: well not part of sampling program						
MW-4	02-12-98	334.22	6.35	327.87	ND	E	0.024	02-12-98	Not sampled: well not part of sampling program						
MW-4	07-31-98	334.22	6.84	327.38	ND	NW	0.01	07-31-98	Not sampled: well not part of sampling program						

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Well Designation	Water Level Field Date	Top of Casing Elevation ft-MSL	Depth to Water feet	Groundwater Elevation ft-MSL	Floating Product Thickness feet	Groundwater Flow Direction MWN	Hydraulic Gradient ft/ft	Water Sample Field Date	TPHG LUFT Method µg/L	Benzene EPA 8020 µg/L	Toluene EPA 8020 µg/L	Ethylbenzene EPA 8020 µg/L	Total Xylenes EPA 8020 µg/L	MTBE EPA 8020 µg/L	MTBE EPA 8240 µg/L
MW-5	02-15-95	335.87	7.80	328.07	ND	NR	NR	02-15-95	<50	<0.5	<0.5	<0.5	<0.5	--	--
MW-5	05-24-95	335.87	8.10	327.77	ND	ESE	0.002	05-24-95	Not sampled: well sampled annually, during the first quarter						
MW-5	08-25-95	335.87	9.43	326.44	ND	NW	0.006	08-25-95	Not sampled: well sampled annually, during the first quarter						
MW-5	11-28-95	335.87	10.12	325.75	ND	N	0.006	11-28-95	Not sampled: well sampled annually, during the first quarter						
MW-5	02-26-96	335.87	6.73	329.14	ND	E	0.012	03-13-96	<50	<0.5	<0.5	<0.5	<0.5	<3	--
MW-5	05-23-96	335.87	7.87	328.00	ND	FG	FG	05-23-96	Not sampled: well sampled annually, during the first quarter						
MW-5	08-23-96	335.87	9.46	326.41	ND	FG	FG	08-23-96	Not sampled: well not part of sampling program						
MW-5	03-21-97	335.87	8.23	327.64	ND	SSE	0.005	03-21-97	Not sampled: well not part of sampling program						
MW-5	08-20-97	335.87	9.92	325.95	ND	SSW	0.001	08-20-97	Not sampled: well not part of sampling program						
MW-5	11-21-97	335.87	10.18	325.69	ND	SSW	0.002	11-21-97	Not sampled: well not part of sampling program						
MW-5	02-12-98	335.87	6.45	329.42	ND	E	0.024	02-12-98	Not sampled: well not part of sampling program						
MW-5	07-31-98	335.87	8.98	326.89	ND	NW	0.01	07-31-98	Not sampled: well not part of sampling program						
MW-6	02-15-95	335.84	7.81	328.03	ND	NR	NR	02-15-95	<50	<0.5	<0.5	<0.5	<0.5	--	--
MW-6	05-24-95	335.84	8.35	327.49	ND	ESE	0.002	05-24-95	Not sampled: well sampled annually, during the first quarter						
MW-6	08-25-95	335.84	9.71	326.13	ND	NW	0.006	08-25-95	Not sampled: well sampled annually, during the first quarter						
MW-6	11-28-95	335.84	10.28	325.56	ND	N	0.006	11-28-95	Not sampled: well sampled annually, during the first quarter						
MW-6	02-26-96	335.84	6.60	329.24	ND	E	0.012	03-13-96	<50	<0.5	<0.5	<0.5	<0.5	<3	--
MW-6	05-23-96	335.84	8.05	327.79	ND	FG	FG	05-23-96	Not sampled: well sampled annually, during the first quarter						
MW-6	08-23-96	335.84	9.58	326.26	ND	FG	FG	08-23-96	Not sampled: well not part of sampling program						
MW-6	03-21-97	335.84	8.59	327.45	ND	SSE	0.005	03-21-97	Not sampled: well not part of sampling program						
MW-6	08-20-97	335.84	9.98	325.86	ND	SSW	0.001	08-20-97	Not sampled: well not part of sampling program						
MW-6	11-21-97	335.84	10.51	325.53	ND	SSW	0.002	11-21-97	Not sampled: well not part of sampling program						
MW-6	02-12-98	335.84	3.15	332.69	ND	E	0.024	02-12-98	Not sampled: well not part of sampling program						
MW-6	07-31-98	335.84	9.29	326.55	ND	NW	0.01	07-31-98	Not sampled: well not part of sampling program						

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

ARCO Service Station 6041
7249 Village Parkway, Dublin, California

Well Designation	Water Level Field Date	Top of Casing Elevation ft-MSL	Depth to Water feet	Groundwater Elevation ft-MSL	Floating Product Thickness feet	Groundwater Flow Direction MWN	Hydraulic Gradient ft/ft	Water Sample Field Date	TPHG LUFT Method µg/L	Benzene EPA 8020 µg/L	Toluene EPA 8020 µg/L	Ethylbenzene EPA 8020 µg/L	Total Xylenes EPA 8020 µg/L	MTBE EPA 8020 µg/L	MTBE EPA 8240 µg/L
VW-2	03-21-97	NR	8.22	NR	ND	SSE	0.005	03-21-97	150	3.9	<0.5	<0.5	0.6	270	--
VW-2	08-20-97	NR	9.16	NR	ND	SSW	0.001	08-20-97	Not sampled; well not part of sampling program						
VW-2	11-21-97	NR	8.27	NR	ND	SSW	0.002	11-21-97	<200	3	<2	<2	<2	180	--
VW-2	02-12-98	NR	6.65	NR	ND	E	0.024	02-12-98	200	19	<0.5	0.6	<0.5	2200	--
VW-2	07-31-98	NR	7.01	NR	ND	NW	0.01	07-31-98	Not sampled; well not part of sampling program						

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

MWN: ground-water flow direction and gradient apply to the entire monitoring well network

ft/ft: foot per foot

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

µg/L: micrograms per liter

EPA: United States Environmental Protection Agency

MTBE: Methyl-tert-butyl ether

ND: none detected

NR: not reported; data not available or not measurable

NW: Northwest

--: not analyzed or not applicable

*: For previous historical groundwater elevation and analytical data please refer to *Fourth Quarter 1995 Groundwater Monitoring Program Results, ARCO Service Station 6041, Dublin, California*, (EMCON, February 26, 1996).

Table 2
Historical Groundwater Elevation Data

BP Station 1116, 7197 Village Parkway
Former Shell Station, 7194 Amador Valley Boulevard
UNOCAL Station, 7375 Amador Valley Boulevard

Well Desig- nation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Ground- Water Elevation ft-MSL	Comments
BP Station 1116					
MW-1	02-11-94	335.17	8.72	326.45	
MW-1	10-04-94	335.17	9.66	325.51	
MW-1	11-18-94	335.17	Not surveyed		
MW-1	02-15-95	335.17	6.56	328.61	
MW-1	05-24-95	335.17	6.80	328.37	
MW-1	08-25-95	335.17	8.61	326.56	
MW-1	11-28-95	335.17	9.54	325.63	
MW-1	02-26-96	335.17	Not surveyed		
MW-1	05-23-96	335.17	7.13	328.04	
MW-1	08-23-96	335.17	6.71	328.46	
MW-1	12-02-96	335.17	8.58	326.59	
MW-1	03-21-97	335.17	Not surveyed		
MW-1	08-22-97	335.17	8.80	326.37	
MW-1	11-21-97	335.17	Not surveyed		
MW-1	02-12-98	335.17	4.40	330.77	
MW-1	07-31-98	335.17	Not surveyed		
MW-2	02-11-94	334.58	8.10	326.48	
MW-2	10-04-94	334.58	9.27	325.31	
MW-2	11-18-94	334.58	Not surveyed		
MW-2	02-15-95	334.58	5.97	328.61	
MW-2	05-24-95	334.58	6.50	328.08	
MW-2	08-25-95	334.58	8.30	326.28	
MW-2	11-28-95	334.58	9.05	325.53	
MW-2	02-26-96	334.58	Not surveyed		
MW-2	05-23-96	334.58	6.95	327.63	
MW-2	08-23-96	334.58	6.53	328.05	
MW-2	12-02-96	334.58	8.40	326.18	
MW-2	03-21-97	334.58	Not surveyed		
MW-2	08-22-97	334.58	8.55	326.03	
MW-2	11-21-97	334.58	Not surveyed		
MW-2	02-12-98	334.58	4.10	330.48	
MW-2	07-31-98	334.58	Not surveyed		
MW-3	02-11-94	335.13	8.60	326.53	
MW-3	10-04-94	335.13	9.81	325.32	
MW-3	11-18-94	335.13	Not surveyed		
MW-3	02-15-95	335.13	6.61	328.52	
MW-3	05-24-95	335.13	6.83	328.30	
MW-3	08-25-95	335.13	8.84	326.29	
MW-3	11-28-95	335.13	8.57	326.56	
MW-3	02-26-96	335.13	Not surveyed		
MW-3	05-23-96	335.13	7.26	327.87	
MW-3	08-23-96	335.13	6.84	328.29	
MW-3	12-02-96	335.13	8.61	326.52	
MW-3	03-21-97	335.13	Not surveyed		
MW-3	08-22-97	335.13	8.97	326.16	
MW-3	11-21-97	335.13	Not surveyed		

Table 2
Historical Groundwater Elevation Data

BP Station 1116, 7197 Village Parkway
Former Shell Station, 7194 Amador Valley Boulevard
UNOCAL Station, 7375 Amador Valley Boulevard

Well Desig- nation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Ground- Water Elevation ft-MSL	Comments
MW-3	02-12-98	335.13	4.22	330.91	
MW-3	07-31-98	335.13	Not surveyed		
AW-4	02-11-94	333.41	6.84	326.57	
AW-4	10-04-94	333.41	8.04	325.37	
AW-4	11-18-94	333.41	6.80	326.61	
AW-4	02-15-95	333.41	4.91	328.50	
AW-4	05-24-95	333.41	5.32	328.09	
AW-4	08-25-95	333.41	7.22	326.19	
AW-4	11-28-95	333.41	7.81	325.60	
AW-4	02-26-96	333.41	Not surveyed		
AW-4	05-23-96	333.41	5.17	328.24	
AW-4	08-23-96	333.41	4.73	328.68	
AW-4	12-02-96	333.41	6.43	326.98	
AW-4	03-21-97	333.41	Not surveyed		
AW-4	08-22-97	333.41	Not surveyed		
AW-4	11-21-97	333.41	Not surveyed		
AW-4	02-12-98	333.41	3.99	329.42	
AW-4	07-31-98	333.41	Not surveyed		
AW-5	02-11-94	334.81	8.20	326.61	
AW-5	10-04-94	334.81	8.70	326.11	
AW-5	11-18-94	334.81	8.20	326.61	
AW-5	02-15-95	334.81	6.65	328.16	
AW-5	05-24-95	334.81	7.27	327.54	
AW-5	08-25-95	334.81	8.52	326.29	
AW-5	11-28-95	334.81	9.32	325.49	
AW-5	02-26-96	334.81	7.13	327.68	
AW-5	05-23-96	334.81	8.58	326.23	
AW-5	08-23-96	334.81	8.18	326.63	
AW-5	12-02-96	334.81	7.90	326.91	
AW-5	03-21-97	334.81	Not surveyed		
AW-5	08-22-97	334.81	10.27	324.54	
AW-5	11-21-97	334.81	Not surveyed		
AW-5	02-12-98	334.81	7.57	327.24	
AW-5	07-31-98	334.81	Not surveyed		
AW-6	02-11-94	334.90	8.04	326.86	
AW-6	10-04-94	334.90	9.33	325.57	
AW-6	11-18-94	334.90	7.17	327.73	
AW-6	02-15-95	334.90	6.19	328.71	
AW-6	05-24-95	334.90	6.87	328.03	
AW-6	08-25-95	334.90	8.29	326.61	
AW-6	11-28-95	334.90	9.20	325.70	
AW-6	02-26-96	334.90	5.78	329.12	
AW-6	05-23-96	334.90	6.94	327.96	
AW-6	08-23-96	334.90	6.50	328.40	
AW-6	12-02-96	334.90	8.46	326.44	
AW-6	03-21-97	334.90	Not surveyed		
AW-6	08-22-97	334.90	8.58	326.32	

Table 2
Historical Groundwater Elevation Data

BP Station 1116, 7197 Village Parkway
Former Shell Station, 7194 Amador Valley Boulevard
UNOCAL Station, 7375 Amador Valley Boulevard

Well Designation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Ground- Water Elevation ft-MSL	Comments
AW-6	11-21-97	334.90	Not surveyed		
AW-6	02-12-98	334.90	5.07	329.83	
AW-6	07-31-98	334.90	Not surveyed		

Former Shell Station

MW-1	02-11-94	334.83	8.62	326.21	
MW-1	08-25-94	334.83	9.24	325.59	
MW-1	11-23-94	334.83	8.74	326.09	
MW-1	02-15-95	334.83	6.84	327.99	
MW-1	05-24-95	334.83	7.91	326.92	
MW-1	08-25-95	334.83	8.11	326.72	
MW-1	11-28-95	334.83	Not surveyed: not scheduled for monitoring		
MW-1	02-26-96	334.83	5.60	329.23	
MW-1	05-23-96	334.83	Not surveyed: not scheduled for monitoring		
MW-1	08-23-96	334.83	8.23	326.60	
MW-1	Well not surveyed since the 3rd Quarter 1996, per Blaine Tech Services				
MW-2	02-11-94	336.96	11.04	325.92	
MW-2	08-25-94	336.96	11.29	325.67	
MW-2	11-23-94	336.96	10.92	326.04	
MW-2	02-15-95	336.96	8.90	328.06	
MW-2	05-24-95	336.96	10.02	326.94	
MW-2	08-25-95	336.96	10.24	326.72	
MW-2	11-28-95	336.96	Not surveyed: not scheduled for monitoring		
MW-2	02-26-96	336.96	7.54	329.42	
MW-2	05-23-96	336.96	Not surveyed: not scheduled for monitoring		
MW-2	08-23-96	336.96	10.29	326.67	
MW-2	Well not surveyed since the 3rd Quarter 1996, per Blaine Tech Services				
MW-3	02-11-94	336.93	10.68	326.25	
MW-3	08-25-94	336.93	11.30	325.63	
MW-3	11-23-94	336.93	10.48	326.45	
MW-3	02-15-95	336.93	8.35	328.58	
MW-3	05-24-95	336.93	9.67	327.26	
MW-3	08-25-95	336.93	9.36	327.57	
MW-3	11-28-95	336.93	Not surveyed: not scheduled for monitoring		
MW-3	02-26-96	336.93	7.04	329.89	
MW-3	05-23-96	336.93	Not surveyed: not scheduled for monitoring		
MW-3	08-23-96	336.93	10.00	326.93	
MW-3	Well not surveyed since the 3rd Quarter 1996, per Blaine Tech Services				
MW-4	02-11-94	337.14	10.71	326.43	
MW-4	08-25-94	337.14	10.84	326.30	
MW-4	11-23-94	337.14	10.78	326.36	
MW-4	02-15-95	337.14	9.49	327.65	
MW-4	05-24-95	337.14	10.73	326.41	
MW-4	08-25-95	337.14	10.22	326.92	
MW-4	11-28-95	337.14	Not surveyed: not scheduled for monitoring		
MW-4	02-26-96	337.14	7.52	329.62	

Table 2
Historical Groundwater Elevation Data

BP Station 1116, 7197 Village Parkway
Former Shell Station, 7194 Amador Valley Boulevard
UNOCAL Station, 7375 Amador Valley Boulevard

Well Designation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Ground- Water Elevation ft-MSL	Comments
MW-4	05-23-96	337.14	Not surveyed: not scheduled for monitoring		
MW-4	08-23-96	337.14	9.84	327.30	
MW-4	Well not surveyed since the 3rd Quarter 1996, per Blaine Tech Services				
MW-5	02-11-94	334.96	8.97	325.99	
MW-5	08-25-94	334.96	9.19	325.77	
MW-5	11-23-94	334.96	8.78	326.18	
MW-5	02-15-95	334.96	6.88	328.08	
MW-5	05-24-95	334.96	8.04	326.92	
MW-5	08-25-95	334.96	8.34	326.62	
MW-5	Well removed from survey program, per Blaine Tech Services				
MW-6	02-11-94	335.42	9.02	326.40	
MW-6	08-25-94	335.42	9.79	325.63	
MW-6	11-23-94	335.42	9.20	326.22	
MW-6	02-15-95	335.42	7.36	328.06	
MW-6	05-24-95	335.42	8.80	326.62	
MW-6	08-25-95	335.42	8.50	326.92	
MW-6	11-28-95	335.42	Not surveyed: not scheduled for monitoring		
MW-6	02-26-96	335.42	5.94	329.48	
MW-6	05-23-96	335.42	Not surveyed: not scheduled for monitoring		
MW-6	08-23-96	335.42	8.88	326.54	
MW-6	Well not surveyed since the 3rd Quarter 1996, per Blaine Tech Services				
MW-7	02-11-94	333.23	6.12	327.11	
MW-7	08-25-94	333.23	6.76	326.47	
MW-7	11-23-94	333.23	6.75	326.48	
MW-7	02-15-95	333.23	5.40	327.83	
MW-7	05-24-95	333.23	6.82	326.41	
MW-7	08-25-95	333.23	6.46	326.77	
MW-7	Well removed from survey program, per Blaine Tech Services				
MW-8	02-11-94	335.80	8.80	327.00	
MW-8	08-25-94	335.80	9.52	326.28	
MW-8	11-23-94	335.80	9.08	326.72	
MW-8	02-15-95	335.80	6.67	329.13	
MW-8	05-24-95	335.80	7.56	328.24	
MW-8	08-25-95	335.80	8.60	327.20	
MW-8	Well removed from survey program, per Blaine Tech Services				
MW-9	02-11-94	334.57	8.88	325.69	
MW-9	08-25-94	334.57	8.79	325.78	
MW-9	11-23-94	334.57	8.65	325.92	
MW-9	02-15-95	334.57	7.36	327.21	
MW-9	05-24-95	334.57	7.75	326.82	
MW-9	08-25-95	334.57	7.90	326.67	
MW-9	Well removed from survey program, per Blaine Tech Services				
MW-11	02-11-94	334.20	8.21	325.99	
MW-11	08-25-94	334.20	8.68	325.52	

Table 2
Historical Groundwater Elevation Data

BP Station 1116, 7197 Village Parkway
Former Shell Station, 7194 Amador Valley Boulevard
UNOCAL Station, 7375 Amador Valley Boulevard

Well Designation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Ground- Water Elevation ft-MSL	Comments
MW-11	11-23-94	334.20	8.27	325.93	
MW-11	02-15-95	334.20	6.46	327.74	
MW-11	05-24-95	334.20	7.69	326.51	
MW-11	08-25-95	334.20	7.70	326.50	
MW-11	Well removed from survey program, per Blaine Tech Services				
MW-12	02-11-94	332.53	7.18	325.35	
MW-12	08-25-94	332.53	7.24	325.29	
MW-12	11-23-94	332.53	7.16	325.37	
MW-12	02-15-95	332.53	5.16	327.37	
MW-12	05-24-95	332.53	6.95	325.58	
MW-12	08-25-95	332.53	5.63	326.90	
MW-12	Well removed from survey program, per Blaine Tech Services				
MW-13	02-11-94	335.64	9.12	326.52	
MW-13	08-25-94	335.64	9.32	326.32	
MW-13	11-23-94	335.64	9.37	326.27	
MW-13	02-15-95	335.64	8.42	327.22	
MW-13	05-24-95	335.64	9.90	325.74	
MW-13	08-25-95	335.64	8.32	327.32	
MW-13	11-28-95	335.64	Not surveyed: not scheduled for monitoring		
MW-13	02-26-96	335.64	5.76	329.88	
MW-13	05-23-96	335.64	Not surveyed: not scheduled for monitoring		
MW-13	08-23-96	335.64	8.66	326.98	
MW-13	Well not surveyed since the 3rd Quarter 1996, per Blaine Tech Services				
RW-1	08-25-94	336.19	10.56	325.63	
RW-1	11-23-94	336.19	10.07	326.12	
RW-1	02-15-95	336.19	8.20	327.99	
RW-1	05-24-95	336.19	9.66	326.53	
RW-1	08-25-95	336.19	9.37	326.82	
RW-1	Well removed from survey program, per Blaine Tech Services				

UNOCAL Station

MW-1	02-11-94	336.07	9.72	326.35	
MW-1	05-17-94	336.07	9.26	326.81	
MW-1	08-25-94	336.07	10.58	325.49	
MW-1	11-18-94	336.07	9.69	326.38	
MW-1	02-17-95	336.07	7.80	328.27	
MW-1	05-24-95	336.07	8.98	327.09	
MW-1	08-25-95	336.07	9.68	326.39	
MW-1	11-28-95	336.07	10.45	325.62	
MW-1	02-26-96	336.07	6.45	329.62	
MW-1	05-23-96	336.07	Not surveyed: not scheduled for monitoring		
MW-1	08-23-96	336.07	Not surveyed: not scheduled for monitoring		
MW-1	11-22-96	336.07	Not surveyed: not scheduled for monitoring		
MW-1	02-12-97	336.07	Not surveyed: not scheduled for monitoring		
MW-1	11-21-97	336.07	Not surveyed: Site closed, well destroyed		

Table 2
Historical Groundwater Elevation Data

BP Station 1116, 7197 Village Parkway
Former Shell Station, 7194 Amador Valley Boulevard
UNOCAL Station, 7375 Amador Valley Boulevard

Well Designation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Ground- Water Elevation ft-MSL	Comments
MW-2	02-11-94	336.78	9.85	326.93	
MW-2	05-17-94	336.78	9.31	327.47	
MW-2	08-25-94	336.78	10.75	326.03	
MW-2	11-18-94	336.78	9.95	326.83	
MW-2	02-17-95	336.78	7.58	329.20	
MW-2	05-24-95	336.78	8.33	328.45	
MW-2	08-25-95	336.78	9.76	327.02	
MW-2	11-28-95	336.78	10.65	326.13	
MW-2	02-26-96	336.78	6.39	330.39	
MW-2	05-23-96	336.78	Not surveyed: not scheduled for monitoring		
MW-2	08-23-96	336.78	Not surveyed: not scheduled for monitoring		
MW-2	11-22-96	336.78	Not surveyed: not scheduled for monitoring		
MW-2	02-12-97	336.78	Not surveyed: not scheduled for monitoring		
MW-2	11-21-97	336.78	Not surveyed: Site closed, well destroyed		
MW-3	02-11-94	336.98	10.01	326.97	
MW-3	05-17-94	336.98	9.49	327.49	
MW-3	08-25-94	336.98	10.93	326.05	
MW-3	11-18-94	336.98	10.15	326.83	
MW-3	02-17-95	336.98	7.62	329.36	
MW-3	05-24-95	336.98	8.26	328.72	
MW-3	08-25-95	336.98	10.03	326.95	
MW-3	11-28-95	336.98	10.85	326.13	
MW-3	02-26-96	336.98	6.39	330.59	
MW-3	05-23-96	336.98	Not surveyed: not scheduled for monitoring		
MW-3	08-23-96	336.98	Not surveyed: not scheduled for monitoring		
MW-3	11-22-96	336.98	Not surveyed: not scheduled for monitoring		
MW-3	02-12-97	336.98	Not surveyed: not scheduled for monitoring		
MW-3	11-21-97	336.98	Not surveyed: Site closed, well destroyed		
MW-4	02-11-94	336.43	10.10	326.33	
MW-4	05-17-94	336.43	9.63	326.80	
MW-4	08-25-94	336.43	10.94	325.49	
MW-4	11-18-94	336.43	10.10	326.33	
MW-4	02-17-95	336.43	8.12	328.31	
MW-4	05-24-95	336.43	8.68	327.75	
MW-4	08-25-95	336.43	10.08	326.35	
MW-4	11-28-95	336.43	10.81	325.62	
MW-4	02-26-96	336.43	6.75	329.68	
MW-4	05-23-96	336.43	Not surveyed: not scheduled for monitoring		
MW-4	08-23-96	336.43	Not surveyed: not scheduled for monitoring		
MW-4	11-22-96	336.43	Not surveyed: not scheduled for monitoring		
MW-4	02-12-97	336.43	Not surveyed: not scheduled for monitoring		
MW-4	11-21-97	336.43	Not surveyed: Site closed, well destroyed		
MW-5	02-11-94	335.96	10.08	325.88	
MW-5	05-17-94	335.96	9.24	326.72	
MW-5	08-25-94	335.96	10.43	325.53	
MW-5	11-18-94	335.96	10.09	325.87	
MW-5	02-17-95	335.96	7.76	328.20	

Table 2
Historical Groundwater Elevation Data

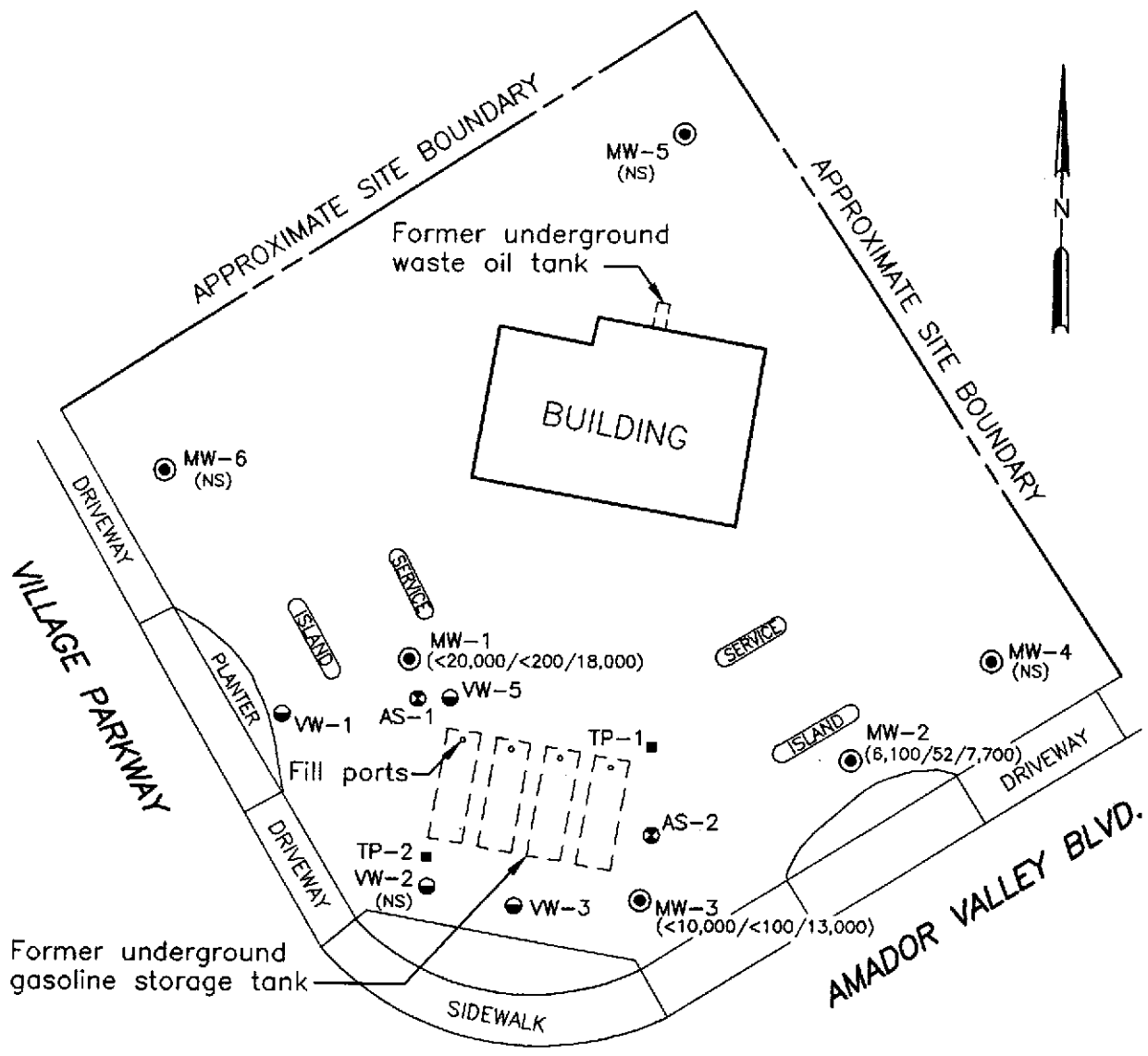
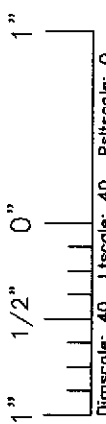
BP Station 1116, 7197 Village Parkway
Former Shell Station, 7194 Amador Valley Boulevard
UNOCAL Station, 7375 Amador Valley Boulevard

Well Designation	Water Level Field Date	TOC	Depth	Ground-	Comments
		Elevation	to Water	Water Elevation	
		ft-MSL	feet	ft-MSL	
MW-5	05-24-95	335.96	7.98	327.98	
MW-5	08-25-95	335.96	9.57	326.39	
MW-5	11-28-95	335.96	10.33	325.63	
MW-5	02-26-96	335.96	7.15	328.81	
MW-5	05-23-96	335.96	8.65	327.31	
MW-5	08-23-96	335.96	10.02	325.94	
MW-5	11-22-96	335.96	10.16	325.80	
MW-5	02-12-97	335.96	7.18	328.78	
MW-5	11-21-97	335.96 Not surveyed; Site closed, well destroyed			

TOC: top of casing

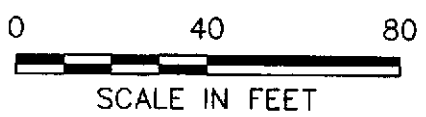
ft-MSL: elevation in feet, relative to mean sea level

IMAGE Files: <No Images>
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EXPLANATION

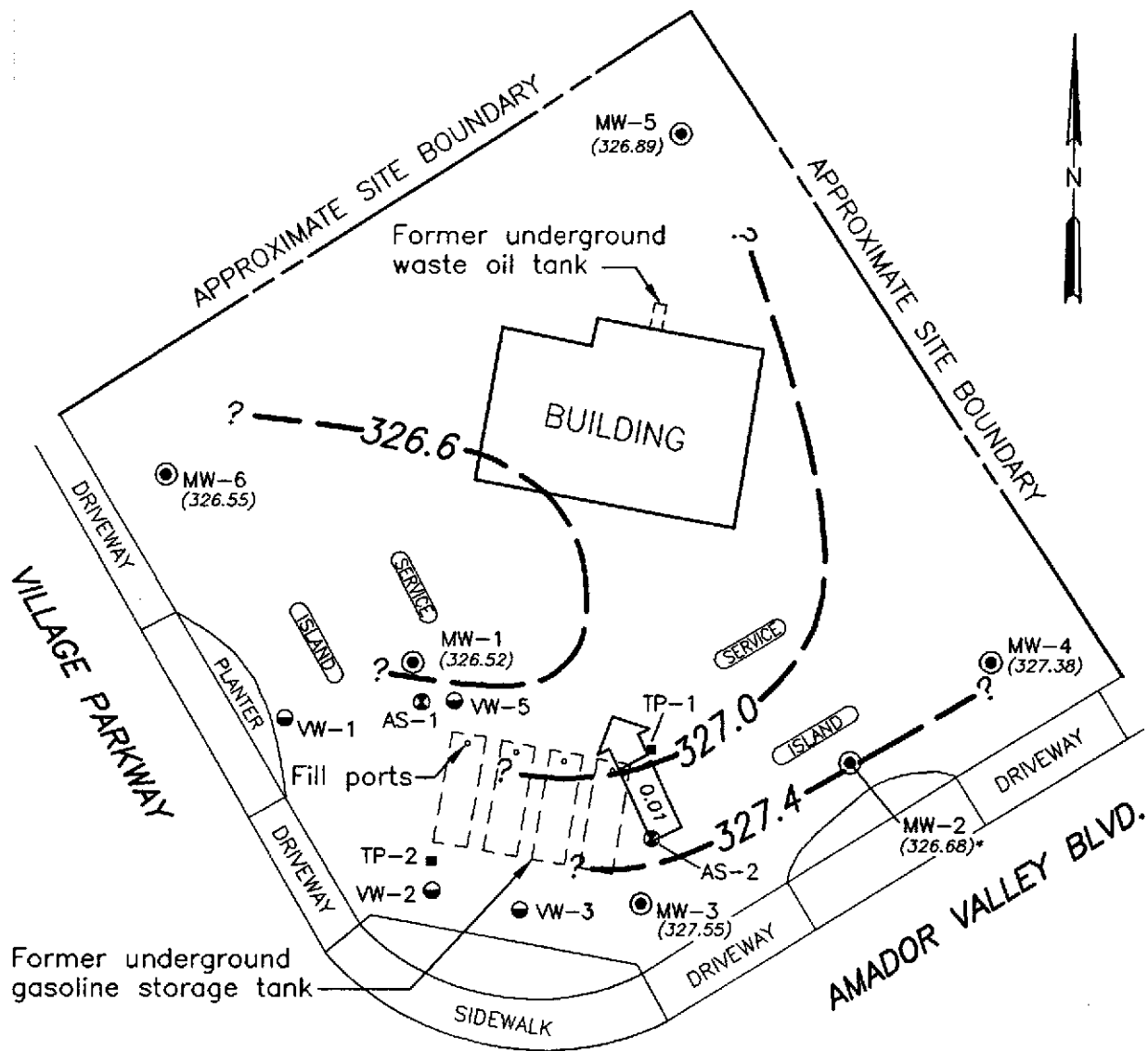
- Groundwater monitoring well (6,100/52/7,700) Concentration of total petroleum hydrocarbons as gasoline (TPHG), benzene, and MTBE in groundwater (ug/L); samples collected 7/31/98
- Tank pit observation well
- Vapor extraction well
- ⊙ Air sparge well
- < Not detected at or above the indicated laboratory detection limit



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DATE NOV. 1998
 DWN KAB
 APP
 REV
 PROJECT NO.
 20805-132.006

FIGURE 1
 ARCO PRODUCTS COMPANY
 SERVICE STATION 6041, 7249 VILLAGE PKWY
 DUBLIN, CALIFORNIA
GROUNDWATER ANALYTICAL SUMMARY
THIRD QUARTER 1998



EXPLANATION

- Groundwater monitoring well
- Tank pit observation well
- Vapor extraction well
- Air sparge well
- ← Approx. direction of groundwater flow showing gradient
- Groundwater elevation contour (Ft.-MSL)
- (326.52) Groundwater elevation (Ft.-MSL); measured 7/31/98
- * Not used to construct contours

0 40 80
SCALE IN FEET

Pinnacle

ENVIRONMENTAL SOLUTIONS
A DIVISION OF EMCON

DATE NOV. 1998
DWN KAB
APP
REV
PROJECT NO.
20805-132.006

FIGURE 2
ARCO PRODUCTS COMPANY
SERVICE STATION 6041, 7249 VILLAGE PKWY
DUBLIN, CALIFORNIA
GROUNDWATER ELEVATION CONTOURS
THIRD QUARTER 1998

IMAGE Files: <No Images>

XREF Files: <No Xrefs>

Dimstyle: 40 Ltscale: 0 Ptscale: 0 SANJOSE/CADD: N:\DWG\PINACL\6041\GWC.DWG Thu, 10/Dec/98 10:40am lblack

1" 1/2" 0" 1"

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 EMCON's San Jose or Sacramento office location for temporary storage. EMCON 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 EMCON 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 EMCON to an ARCO-approved laboratory by courier or taken directly to the laboratory by the environmental sampler. Sample shipments from EMCON 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 EMCON 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)



OWT

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:

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

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. = $\pm 1.0^\circ\text{F}$

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.



EMCON

MONITORING WELL PURGING PROTOCOL

FIGURE

A-1



OWT

WATER SAMPLE FIELD DATA SHEET

Rev. 5/96

PROJECT NO: _____

SAMPLE ID: _____

PURGED BY: _____

CLIENT NAME: _____

SAMPLED BY: _____

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. (µmhos/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

_____ 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: _____

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 _____



EMCON

WATER SAMPLE FIELD DATA SHEET

FIGURE

A-2



EMCON - 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 Instructions:



EMCON

SAMPLING AND ANALYSIS REQUEST FORM

FIGURE

A-3

APPENDIX B

CERTIFIED ANALYTICAL REPORTS, AND CHAIN OF CUSTODY DOCUMENTATION



August 18, 1998

Service Request No.: S9802046

Glen Vanderveen
PINNACLE
144 A Mayhew Wy.
Walnut Creek, CA 94596

RE: 20805-132.006/22312.00/RAT8/6041 DUBLIN

Dear Mr. Vanderveen:

The following pages contain analytical results for sample(s) received by the laboratory on August 5, 1998. Results of sample analyses are followed by Appendix A which contains sample custody documentation and quality assurance deliverables requested for this project. The work requested has been assigned the Service Request No. listed above. To help expedite our service, please refer to this number when contacting the laboratory.

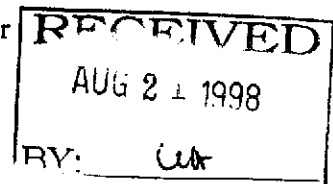
Analytical results were produced by procedures consistent with Columbia Analytical Services' (CAS) Quality Assurance Manual (with any deviations noted). Signature of this CAS Analytical Report below confirms that pages 2 through 10, following, have been thoroughly reviewed and approved for release in accord with CAS Standard Operating Procedure ADM-DatRev3.

Please feel welcome to contact me should you have questions or further needs.

Sincerely,

Steven L. Green
Project Chemist

Greg Anderson
Regional QA Coordinator



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)

ACRONLST.DOC 7/14/95

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: 20805-132.006/22312.00/RAT8/6041 DUBLIN
Sample Matrix: Water

Service Request: S9802046
Date Collected: 7/31/98
Date Received: 8/5/98

BTEX, MTBE and TPH as Gasoline

Sample Name: MW-2(13)
Lab Code: S9802046-001
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	100	NA	8/13/98	6100	
Benzene	EPA 5030	8020	0.5	100	NA	8/13/98	52	
Toluene	EPA 5030	8020	0.5	100	NA	8/13/98	220	
Ethylbenzene	EPA 5030	8020	0.5	100	NA	8/13/98	110	
Xylenes, Total	EPA 5030	8020	0.5	100	NA	8/13/98	1100	
Methyl <i>tert</i> -Butyl Ether	EPA 5030	8020	3	100	NA	8/13/98	7700	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: 20805-132.006/22312.00/RAT8/6041 DUBLIN
Sample Matrix: Water

Service Request: S9802046
Date Collected: 7/31/98
Date Received: 8/5/98

BTEX, MTBE and TPH as Gasoline

Sample Name: MW-I(16)
Lab Code: S9802046-002
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	400	NA	8/13/98	<20000	C1
Benzene	EPA 5030	8020	0.5	400	NA	8/13/98	<200	C1
Toluene	EPA 5030	8020	0.5	400	NA	8/13/98	<200	C1
Ethylbenzene	EPA 5030	8020	0.5	400	NA	8/13/98	<200	C1
Xylenes, Total	EPA 5030	8020	0.5	400	NA	8/13/98	<200	C1
Methyl <i>tert</i> -Butyl Ether	EPA 5030	8020	3	400	NA	8/13/98	18000	

C1 The MRL was elevated due to high analyte concentration requiring sample dilution.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: 20805-132.006/22312.00/RAT8/6041 DUBLIN
Sample Matrix: Water

Service Request: S9802046
Date Collected: 7/31/98
Date Received: 8/5/98

BTEX, MTBE and TPH as Gasoline

Sample Name: MW-3(13)
Lab Code: S9802046-003
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	200	NA	8/13/98	<10000	C1
Benzene	EPA 5030	8020	0.5	200	NA	8/13/98	<100	C1
Toluene	EPA 5030	8020	0.5	200	NA	8/13/98	<100	C1
Ethylbenzene	EPA 5030	8020	0.5	200	NA	8/13/98	<100	C1
Xylenes, Total	EPA 5030	8020	0.5	200	NA	8/13/98	<100	C1
Methyl <i>tert</i> -Butyl Ether	EPA 5030	8020	3	200	NA	8/13/98	13000	

C1 The MRL was elevated due to high analyte concentration requiring sample dilution.

COLUMBIA ANALYTICAL SERVICES, INC.**Analytical Report**

Client: ARCO Products Company
Project: 20805-132.006/22312.00/RAT8/6041 DUBLIN
Sample Matrix: Water

Service Request: S9802046
Date Collected: NA
Date Received: NA

BTEX, MTBE and TPH as Gasoline

Sample Name: Method Blank
Lab Code: S980812-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	8/12/98	ND	
Benzene	EPA 5030	8020	0.5	1	NA	8/12/98	ND	
Toluene	EPA 5030	8020	0.5	1	NA	8/12/98	ND	
Ethylbenzene	EPA 5030	8020	0.5	1	NA	8/12/98	ND	
Xylenes, Total	EPA 5030	8020	0.5	1	NA	8/12/98	ND	
Methyl <i>tert</i> -Butyl Ether	EPA 5030	8020	3	1	NA	8/12/98	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: 20805-132.006/22312.00/RAT8/6041 DUBLIN
Sample Matrix: Water

Service Request: S9802046
Date Collected: NA
Date Received: NA
Date Extracted: NA
Date Analyzed: NA

Surrogate Recovery Summary
BTEX, MTBE and TPH as Gasoline

Prep Method: EPA 5030
Analysis Method: 8020 CA/LUFT

Units: PERCENT
Basis: NA

Sample Name	Lab Code	Test Notes	Percent Recovery	
			4-Bromofluorobenzene	a,a,a-Trifluorotoluene
MW-2(13)	S9802046-001		99	99
MW-1(16)	S9802046-002		101	87
MW-3(13)	S9802046-003		101	87
BATCH QC	S9802045-002MS		96	96
BATCH QC	S9802045-002DMS		94	97
Method Blank	S980812-WB1		101	89

CAS Acceptance Limits: 69-116 69-116

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: 20805-132.006/22312.00/RAT8/6041 DUBLIN
Sample Matrix Water

Service Request: S9802046
Date Collected: NA
Date Received: NA
Date Extracted: NA
Date Analyzed: 8/13/98

Matrix Spike/Duplicate Matrix Spike Summary
TPH as Gasoline

Sample Name: BATCH QC
Lab Code: S9802045-002MS, S9802045-002DMS
Test Notes:

Units: ug/L (ppb)
Basis: NA

Analyte	Prep Method	Analysis Method	Percent Recovery										Result Notes
			Spike Level			Sample Result	Spike Result				CAS	Relative	
											Acceptance	Percent	
											Limits	Difference	
MRL	MS	DMS	MS	DMS	MS	DMS	MS	DMS	MS	DMS	Acceptance Limits	Relative Percent Difference	
Gasoline	EPA 5030	CA/LUFT	50	250	250	ND	250	230	100	92	75-135	8	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: 20805-132.006/22312.00/RAT8/6041 DUBLIN

Service Request: S9802046
Date Analyzed: 8/12/98

Initial Calibration Verification (ICV) Summary
BTEX, MTBE and TPH as Gasoline

Sample Name: ICV
Lab Code: ICV1
Test Notes:

Units: ug/L (ppb)
Basis: NA

ICV Source:

Analyte	Prep Method	Analysis Method	True Value	Result	CAS	Percent Recovery	Result Notes
					Percent Recovery Acceptance Limits		
TPH as Gasoline	EPA 5030	CA/LUFT	250	230	90-110	92	
Benzene	EPA 5030	8020	25	26	85-115	104	
Toluene	EPA 5030	8020	25	24	85-115	96	
Ethylbenzene	EPA 5030	8020	25	24	85-115	96	
Xylenes, Total	EPA 5030	8020	75	81	85-115	108	
Methyl <i>tert</i> -Butyl Ether	EPA 5030	8020	25	25	85-115	100	

Division of Atlantic/Richfield Company

Task Order No.

223/2.00

59802046

Chain of Custody

[illegible]

DUE! 8/18

DUE! 8/18

APPENDIX C
FIELD DATA SHEETS

FIELD REPORT
DEPTH TO WATER / FLOATING PRODUCT SURVEY

PROJECT # : 21775-244.003

STATION ADDRESS : 7249 Village Parkway, Dublin

DATE : 7/31/98

ARCO STATION # : 6041

FIELD TECHNICIAN : Brice Hendricks

DAY : Friday

DTW Order	WELL ID	Well Box Seal	Well Lid Secure	Gasket Present	Lock Number	Type Of 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-4	✓	15/16	YES	ARCO	LWC	6.84	6.84	ND	—	14.6	
2	MW-5	✓	15/16	YES	ARCO	LWC	8.98	8.98			17.5	
3	MW-6	✓	15/16	YES	ARCO	LWC	9.29	9.29			15.9	Crushed 4" cap
4	VW-2	✓	15/16	yes	Arco	LWC	7.01	9.29 7.01			9.3	
5	MW-2	✓	15/16	YES	ARCO	LWC	8.12	8.12			14.2	2.96 / 19.8°C
6	MW-1	✓	15/16	YES	ARCO	LWC	10.04	10.04			17.6	2.43 / 19.6°C
7	MW-3		15/16	YES	ARCO	LWC	7.98	7.98	↓	↓	14.8	2.54 / 19.9°C

SURVEY POINTS ARE TOP OF WELL CASINGS



Rev. 1/97

SAMPLE ID: MW-1 (lc)

CLIENT NAME: Arco Goyal

LOCATION: Dublin

Surface Water

Leachate

Other

CASING DIAMETER (inches): 2

3

4

4.5

+

Other

CASING ELEVATION (feet/MSL):

VOLUME IN CASING (gal.): 42

DEPTH OF WELL (feet):

CALCULATED PURGE (gal): 14.7

DEPTH TO WATER (feet) :

ACTUAL PURGE VOL (gal.): 15.0

DATE PURGED :

END PURGE :

DATE SAMPLED:

SAMPLING TIME :

OTHER: _____ ODOR: Slight

(COBALT 3-100) (NTU 0-200)

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

PURGING EQUIPMENT

<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"/> Submersible Pump	<input type="checkbox"/> Bailer (Stainless Steel)
<input type="checkbox"/> Well Wizard®	<input type="checkbox"/> Dedicated

Other:

SAMPLING EQUIPMENT

<input type="checkbox"/> 2" Bladder Pump	<input checked="" type="checkbox"/> Bailer (Teflon)
<input type="checkbox"/> Bomb Sampler	<input type="checkbox"/> Bailer (Stainless Steel)
<input type="checkbox"/> Dipper	<input type="checkbox"/> Submersible Pump
<input type="checkbox"/> Well Wizard®	<input type="checkbox"/> Dedicated

Other:

WELL INTEGRITY:

LOCK:

REMARKS:

pH, E.C., Temp. Meter Calibration:

Date: _____

See MW-2

Time:

Measuring Serial No.:

E.C. 1000

pH 7

pH 10

pH 4

Temperature °F

SIGNATURE:

REVIEWED BY:

PAGE

OF 2



WATER SAMPLE FIELD DATA SHEET

Rev. 1/97

OWT

PROJECT NO: 21775-244.003
PURGED BY: B. Hendricks
SAMPLED BY: J

SAMPLE ID: MW-2 (13')
CLIENT NAME: Arco 6041
LOCATION: Dublin

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

CASING ELEVATION (feet/MSL): — VOLUME IN CASING (gal.): 3.9
DEPTH OF WELL (feet): 14.2 CALCULATED PURGE (gal.): 11.9
DEPTH TO WATER (feet): 8.2 ACTUAL PURGE VOL (gal.): 12.0

DATE PURGED: 7/31/98 END PURGE: 1356
DATE SAMPLED: J SAMPLING TIME: 1407

TIME (2400 HR)	VOLUME (gal.)	pH (units)	E.C. (umhos/cm @ 25°C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1349	4.0	6.85	1815	74.3	Brown	High
1353	8.0	6.92	3372	73.8	Grey	J
1356	12.0	6.88	3908	71.5	J	J

OTHER: / ODOR: none
COBALT D-1001 / NTU D-200 /

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

PURGING EQUIPMENT

☐ 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:

WELL INTEGRITY: Good 15/16" LOCK:

REMARKS:

pH, E.C., Temp. Meter Calibration: Date: 7/31/98 Time: 1332 Meter Serial No.:
E.C. 1000 1403, 1413 pH 7 7.04, 7.02 pH 10 9.85, 10.00 pH 4 3.94, 4.00
Temperature °F 82.5

SIGNATURE: BH REVIEWED BY: SHA PAGE 2 OF 3



OWT

WATER SAMPLE FIELD DATA SHEET

Rev. 1/97

PROJECT NO: 21775-244.003
 PURGED BY: B. Hendricks
 SAMPLED BY: ✓

SAMPLE ID: MW-3(13)
 CLIENT NAME: Arco 6041
 LOCATION: Dublin

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

CASING ELEVATION (feet/MSL): VOLUME IN CASING (gal.): 4.4
 DEPTH OF WELL (feet): 14.8 CALCULATED PURGE (gal.): 13.4
 DEPTH TO WATER (feet): 7.98 ACTUAL PURGE VOL. (gal.): 6.0

DATE PURGED: 7/3/48 END PURGE: 1511
 DATE SAMPLED: ✓ SAMPLING TIME: 1537

TIME (2400 HR)	VOLUME (gal.)	pH (units)	E.C. ($\mu\text{mhos/cm @ } 25^{\circ}\text{C}$)	TEMPERATURE ($^{\circ}\text{F}$)	COLOR (visual)	TURBIDITY (visual)
<u>1508</u>	<u>5.0</u>	<u>6.85</u>	<u>2245</u>	<u>76.1</u>	<u>grey</u>	<u>mod</u>
<u>1535</u>	<u>after recharge</u>	<u>6.87</u>	<u>2348</u>	<u>74.4</u>	<u>✓</u>	<u>✓</u>

OTHER: / ODOR: Slight / /
 (COBALT 2-100) (NTU 0-200)

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

PURGING EQUIPMENT

☐ 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: /

WELL INTEGRITY: Good LOCK: /

REMARKS: Well dried @ 6.0 gallons purged, - 1511
DTW @ 1520 = 12.8
DTW @ 1530 = 11.6

pH, E.C., Temp. Meter Calibration: Date: See MW-2 Time: / Meter Serial No.: /
 E.C. 1000 / pH 7 / pH 10 / pH 4 /
 Temperature $^{\circ}\text{F}$ /

SIGNATURE: BA REVIEWED BY: JA PAGE 3 OF 3

Division of Atlantic/Richfield Company

Task Order No. 25200

Chain of Custody

ARCO Facility no.	6041	City (Facility)	Dublin	Project manager (Consultant)	Glen Vanderveen	Laboratory Name	CAS
ARCO engineer	Paul Scapple	Telephone no. (ARCO)		Telephone no. (Consultant)	(408) 452-7300	Fax no. (Consultant)	(408) 437-9526
Consultant name	EMCON	Address (Consultant)	1921 Rincwood Ave Sonoma, CA 95131				
		Contract Number					

[illegible]

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