Applied GeoSystems

3315 Almaden Expressway, Suite 34
San Jose, California 95118
(408) 264-7723 FAX (408) 264-2435

TRANSMITTAL

TO: MR. GIL WISTAR
ALAMEDA COUNTY DEPARTMENT OF ENVIRONMENTAL HEALTH
80 SWAN WAY, ROOM 200
OAKLAND, CA 94621

DATE: 8/29/90
PROJECT NUMBER: 69028-3
SUBJECT: LETTER REPORT

FROM: MARC BRIGGS
TITLE: GEOLOGICAL TECHNICAIN

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[ ] Shop drawings [ ] Prints [XX] Reports [ ] Specifications

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1	8/29/90	69028-3	LETTER REPORT QUARTERLY GROUND-WATER MONITORING SECOND QUARTER 1990 AT ARCO STATION 6113, 785 EAST STANLEY BOULEVARD, LIVERMORE, CA.

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LETTER REPORT
QUARTERLY GROUND-WATER MONITORING
Second Quarter 1990
at
ARCO Station 6113
785 East Stanley Boulevard
Livermore, California

AGS 69028-3

Applied GeoSystems 3315 Almaden Expressway, Suite 34, San Jose, CA 95118 (408) 264-7723

• FREMONT • IRVINE • HOUSTON • BOSTON • SACRAMENTO • CULVER CITY • SAN JOSE

August 29, 1990
0720kchr
AGS 69028-3

Mr. Kyle Christie
ARCO Products Company
P.O. Box 5811
San Mateo, California 94402

Subject: Second Quarter 1990 Quarterly Ground-water Monitoring Report for ARCO Station 6113, 785 East Stanley Boulevard, Livermore, California.

Mr. Christie:

As requested by ARCO Products Company (ARCO), this letter report summarizes the methods and results of June 1990 ground-water monitoring performed by Applied GeoSystems (AGS) at the above-referenced site. The station is on the southwestern side of the intersection of East Stanley and Murrieth Boulevards in Livermore, California, as shown on the Site Vicinity Map (Plate 1). ARCO has contracted with AGS to perform quarterly ground-water sampling and analyses to monitor hydrocarbon concentrations associated with the former waste-oil tank at the site, and to evaluate trends related to fluctuations of these hydrocarbon concentrations.

Prior to the present monitoring, Pacific Environmental Group (Pacific) and AGS performed limited subsurface environmental investigations related to the former underground waste-oil storage tank at the site. Pacific performed soil sampling and observation during removal of the waste-oil tank in January 1989. Our work included the installation of three ground-water monitoring wells (MW-1, MW-2, and MW-3) in September 1989. The results of these investigations are presented in the reports listed in the references attached to this letter report. The locations of the ground-water monitoring wells and pertinent site features are shown on the Generalized Site Plan (Plate 2).

Ground-Water Sampling and Gradient Evaluation

AGS personnel performed quarterly ground-water monitoring and sampling on June 21, 1990. Field work consisted of measuring depth-to-water (DTW) levels in wells MW-1, MW-2, and MW-3; subjectively analyzing water from these wells for the presence of

petroleum hydrocarbons, sheen and floating product; and purging and sampling ground water from these monitoring wells for laboratory analysis. The ground-water sampling protocol is attached.

The DTW levels, relative wellhead elevations, and relative ground-water elevations for this and previous monitoring episodes at the site are summarized in Table 1, Ground-Water Elevation Data. The ground-water gradient interpreted from the June 21, 1990 monitoring data is 0.012 (approximately 1.2 feet vertical per 100 feet horizontal) toward the northeast, as shown on the Ground-Water Gradient Map (Plate 3). This interpreted gradient is generally consistent with the previously interpreted ground-water gradient for this site.

Water samples were collected from wells MW-1, MW-2, and MW-3 for subjective analysis before the monitoring wells were purged and sampled. No evidence of floating product or noticeable product odor was noted in the water samples from the wells. Cumulative results of subjective analyses are presented in Table 2, Subjective Analyses of Ground Water.

Monitoring wells MW-1, MW-2, and MW-3 were purged and sampled in accordance with the attached protocol. Well purge data sheets for the parameters monitored are also attached.

Laboratory Analysis

Water samples collected from the wells were delivered to Applied Analytical Environmental Laboratories in Fremont, California (Hazardous Waste Testing Laboratory No. 153). The water samples were analyzed for total oil and grease (TOG) using standard method 503E. The water samples were also analyzed for total petroleum hydrocarbons as gasoline and diesel (TPHg and TPHd) and benzene, toluene, ethylbenzene, and total xylenes (BTEX) using modified Environmental Protection Agency (EPA) Methods 5030/8015/602. No volatile organic compound analyses were required for this quarterly monitoring, as discussed with Mr. Gil Wistar of the Alameda County Department of Environmental Health, due to nondetectable results of our previous analyses for these compounds at the site. The Chain of Custody Records and Laboratory Analysis Reports are attached. Results of these and previous water analyses are summarized in Table 3, Cumulative Results of Ground-Water Laboratory Analyses.

Results of this quarter's laboratory analyses of water samples from wells MW-1 through MW-3 indicate that:

- Reported concentrations of TOG have increased in wells MW-1 and MW-3 from less than the laboratory detection limit (5,000

ppb) in September 1989 to 13,000 and 10,000 ppb in wells MW-1 and MW-3, respectively, in June 1990. TOG in well MW-2 remains below the laboratory detection limit.

- Reported concentrations of BTEX in the wells are below laboratory detection limits for these compounds, with the exception of 0.66 parts per billion (ppb) toluene in well MW-1 and 1.0 ppb toluene in well MW-3. These concentrations are below the drinking water action level and maximum contaminant level (AL and MCL) set for toluene by the State of California Department of Health Services (DHS).

- Reported concentrations of TPHg and TPHd in water samples from MW-1 and MW-3 are below the laboratory detection limits of 20 ppb and 100 ppb, respectively.

Applied GeoSystems will continue the quarterly ground-water monitoring at this site to evaluate trends in petroleum hydrocarbons and changes in ground-water gradient with time. Routine well maintenance and quality control will be performed as necessary during these site visits.

Copies of this report should be forwarded to:

Mr. Gil Wistar
Alameda County Department of
Environmental Health
80 Swan Way, Room 200
Oakland, California 94621

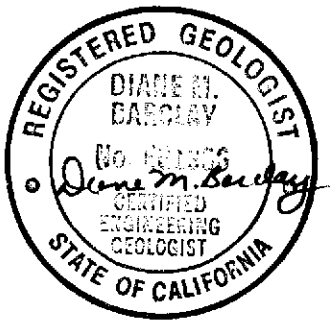
Mr. Lester Feldman
Regional Water Quality Control Board
San Francisco Bay Region
1800 Harrison Street
Oakland, California 94612

If you have any questions or comments, please call Mr. Greg Barclay at (408) 264-7723.

Sincerely,
Applied GeoSystems

Marc A Briggs

Marc A. Briggs
Geological Technician



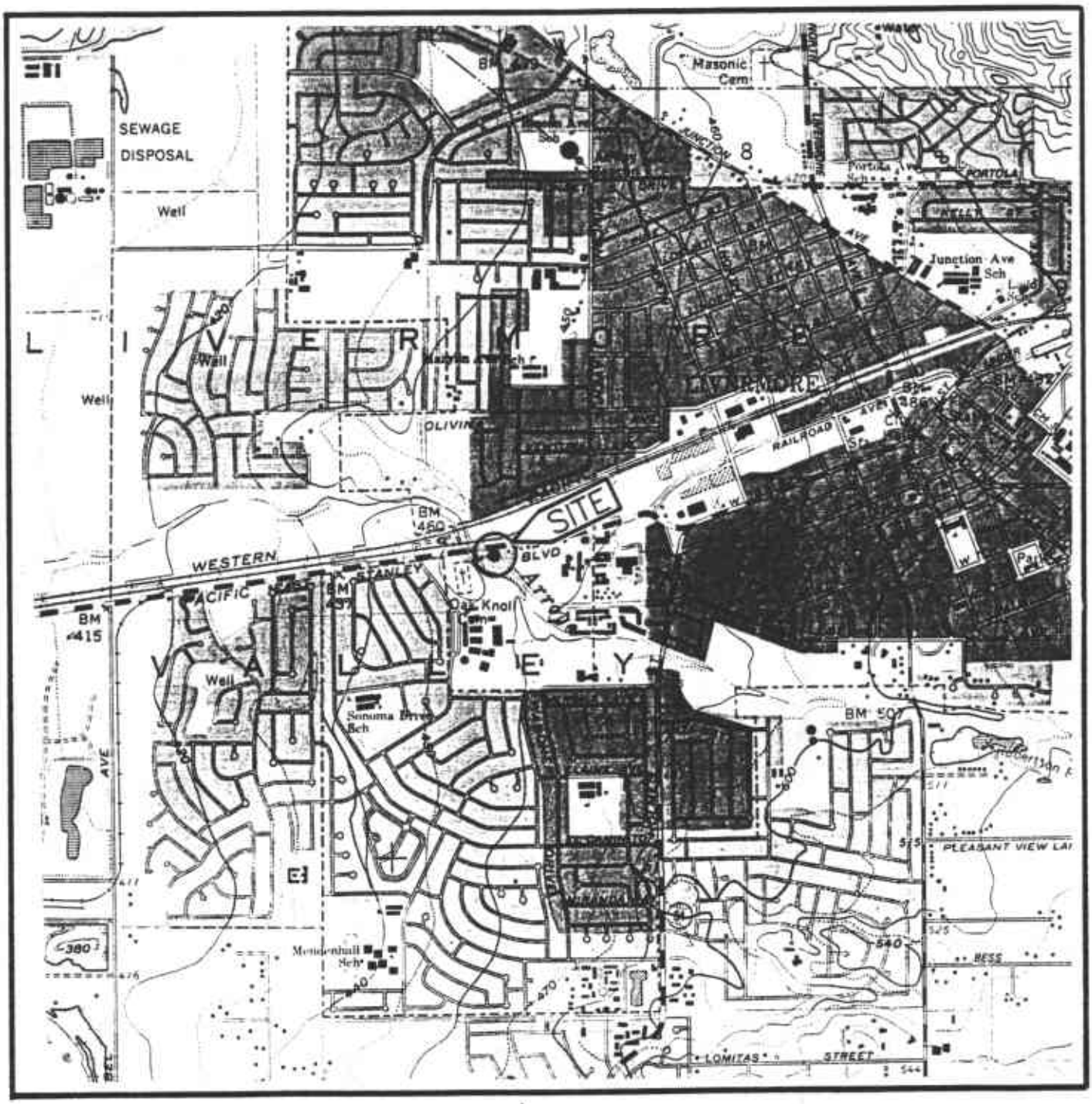
Diane Barclay
C.E.G. 1366

Enclosures: References
Plate 1, Site Vicinity Map
Plate 2, Generalized Site Plan
Plate 3, Ground-Water Gradient Map
Table 1, Ground-Water Elevation Data
Table 2, Subjective Analyses of Ground Water
Table 3, Cumulative Results of Ground-Water Laboratory Analyses
Ground-Water Sampling Protocol
Well Purge Data Sheets
Chain of Custody Records (2 pages)
Laboratory Analysis Reports (4 pages)

REFERENCES

Applied GeoSystems. December 6, 1989. Limited Subsurface Environmental Investigation at ARCO Station 6113, 785 East Stanley Boulevard, Livermore, California. AGS Report 69028-2.

Pacific Environmental Group. April 25, 1989. ARCO Station 6113, 785 E. Stanley Boulevard, Livermore, California. Project 330-53.01



Source: U.S. Geological Survey
7.5-Minute Quadrangle
Livermore, California
Photorevised 1980

N

Approximate Scale
2000 1000 0 2000 4000
feet

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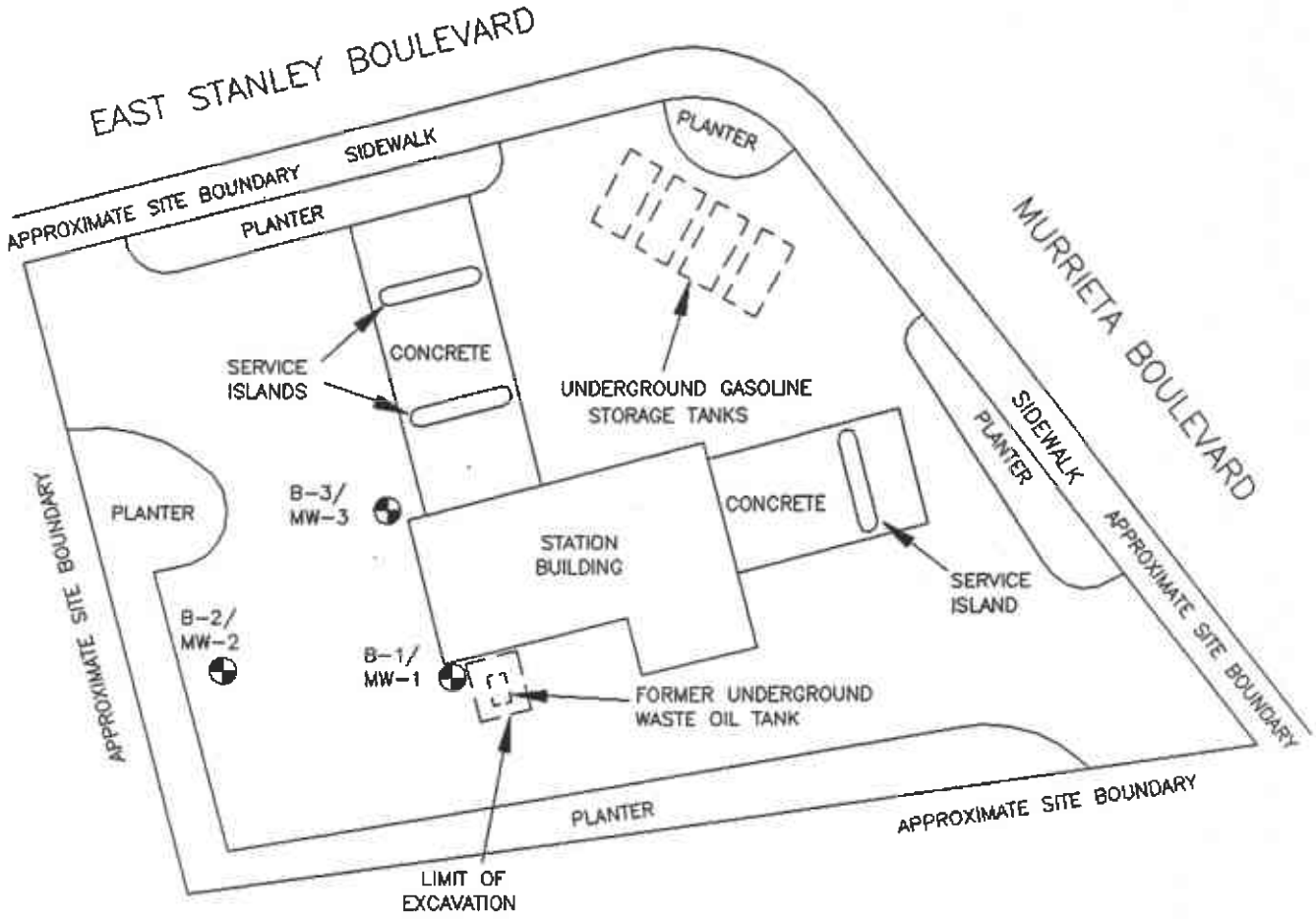
PROJECT 69028-3

SITE VICINITY MAP
ARCO Service Station 6113
785 East Stanley Boulevard
Livermore, California

PLATE
1



EXPLANATION

B-3/MW-3 = Boring/monitoring well (AGS, September 1989)

N

Approximate Scale

40 20 0 40 80

feet

Source: Modified from plan supplied by Arco

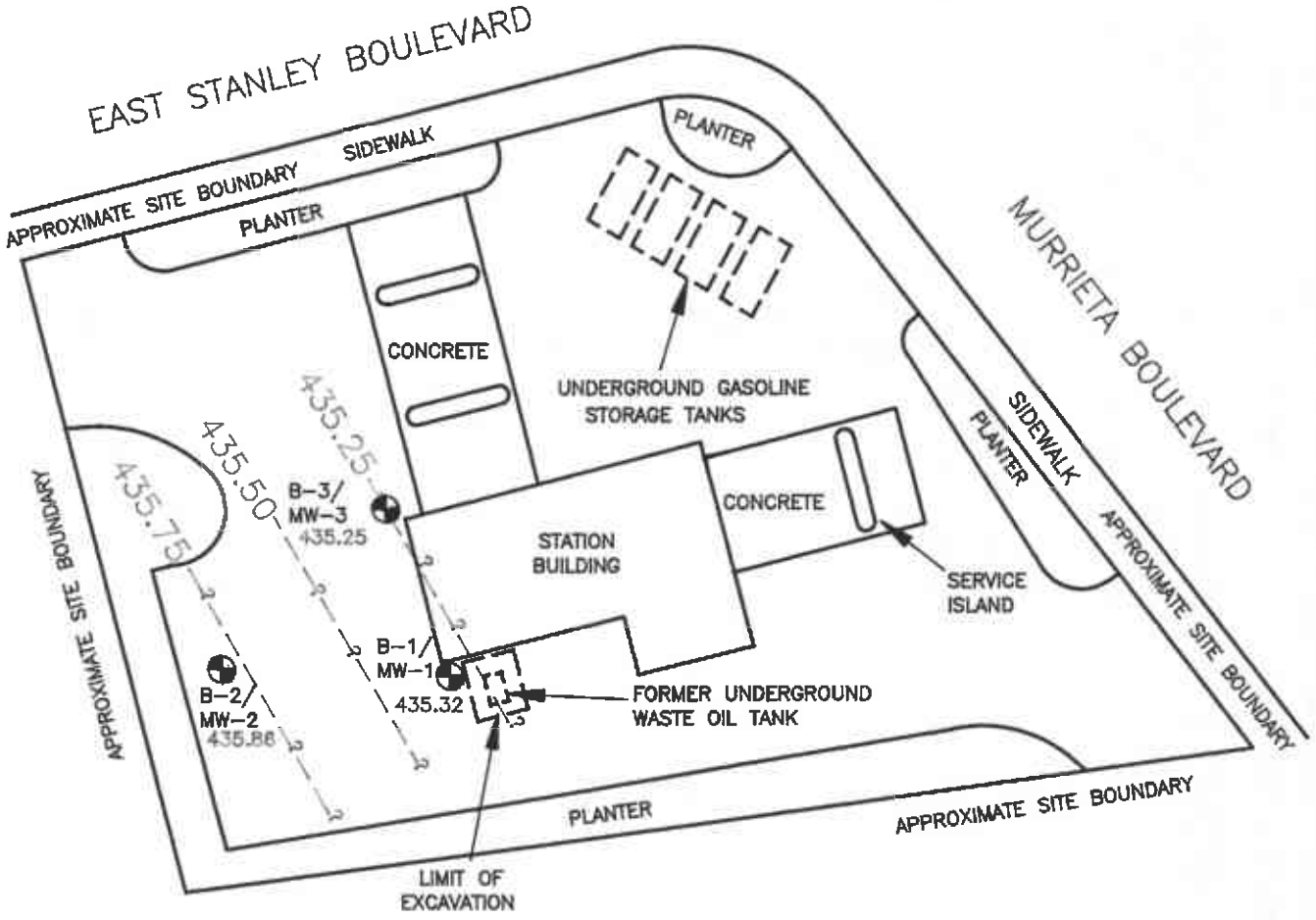
Applied GeoSystems

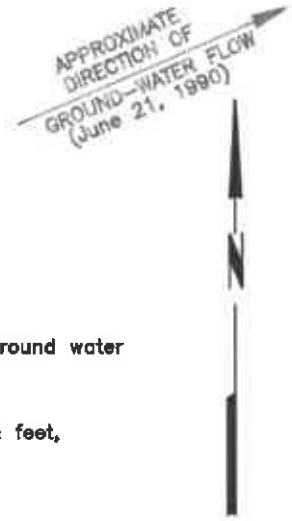
PROJECT 69028-3

GENERALIZED SITE PLAN
ARCO Service Station 6113
785 East Stanley Boulevard
Livermore, California

PLATE

2





435.75

EXPLANATION

= Line of equal elevation of ground water

435.86 = Elevation of ground water in feet, June 21, 1990

B-3/MW-3 = Boring/monitoring well (AGS, September 1989)

Approximate Scale

40 20 0 40 80

feet

Source: Modified from plan supplied by Arco

Applied GeoSystems

PROJECT 69028-3

GROUND-WATER GRADIENT MAP
ARCO Service Station 6113
785 East Stanley Boulevard
Livermore, California

PLATE 3

TABLE 1
GROUND-WATER ELEVATION DATA
ARCO Station 6113
785 East Stanley Boulevard
Livermore, California

Well Date	Elevation of Wellhead	Depth to Water	Elevation of Ground-Water
MW-1			
09/20/89	457.04	21.03	436.01
10/12/89		19.64	437.40
06/21/90		21.72	435.32
MW-2			
09/20/89	457.74	20.67	437.07
10/12/89		18.98	438.76
06/21/90		21.88	435.86
MW-3			
09/20/89	456.97	20.98	435.99
10/12/89		19.66	437.31
06/21/90		21.72	435.25

Wellhead Elevation based on benchmark: Top of pin set in concrete in the most westerly monument at the intersection of East Stanley Boulevard and Fenton Avenue. Elevation taken as 455.896, City of Livermore datum.
Measurements in feet.

TABLE 2
SUBJECTIVE ANALYSES OF GROUND WATER
ARCO Station 6113
785 East Stanley Boulevard
Livermore, California

Monitoring Well	Depth to Bottom	Floating Product	Product Odor
MW-1			
09/20/89	44.0	NONE	NONE
06/21/90	40.7	NONE	NONE
MW-2			
09/20/89	38.0	NONE	NONE
06/21/90	37.1	NONE	NONE
MW-3			
09/20/89	39.0	NONE	NONE
06/21/90	38.9	NONE	NONE

Measurements in feet.

TABLE 3
CUMULATIVE RESULTS OF GROUND-WATER LABORATORY ANALYSES
ARCO Station 6113
785 East Stanley Boulevard
Livermore, California
(Page 1 of 2)

Well Date	TPHg	Benzene	Toluene	Ethyl- benzene	Total Xylenes
MW-1					
09/20/89	80	3.0	1.0	0.7	1
06/21/90	<20	<0.50	0.66	<0.50	<0.50
MW-2					
09/20/89	<50	<0.5	<0.5	<0.5	<1
06/21/90	<20	<0.50	<0.50	<0.50	<0.50
MW-3					
09/20/89	170	8.9	0.6	1.1	<1
06/21/90	<20	<0.50	1.0	<0.50	<0.50
Jan. 1990					
MCLs	---	1.0	---	680	1,750
ALs	---	---	100	---	---

See Notes on Page 2 of 2

TABLE 3
CUMULATIVE RESULTS OF GROUND-WATER LABORATORY ANALYSES
ARCO Station 6113
785 East Stanley Boulevard
Livermore, California
(Page 2 of 2)

Well Date	TPHd	Total Oil & Grease
MW-1		
09/20/89	<50	<5000
06/21/90	<100	13,000
MW-2		
09/20/89	<50	<5000
06/21/90	<100	<5000
MW-3		
09/20/89	<50	<5000
06/21/90	<100	10,000

Results in parts per billion (ppb).
TPHg = Total petroleum hydrocarbons as gasoline
TPHd = Total petroleum hydrocarbons as diesel
< = Less than the detection limits shown.
MCLs = Adopted Maximum Contaminant Levels in Drinking Water, DHS (July 1989)
ALs = Recommended Drinking Water Action Levels, DHS (January 1990)

GROUND-WATER SAMPLING PROTOCOL

The static water level in each well that contained water was measured with a Solinst® water-level indicator; this instrument is accurate to the nearest 0.01 foot. These ground-water depths were subtracted from wellhead elevations measured in October 1989 by Ron Archer, Civil Engineer, Inc., of Pleasanton, California, a licensed land surveyor, to calculate the differences in ground-water elevations.

Water samples collected for subjective evaluation were collected by gently lowering approximately half the length of a clean Teflon® bailer past the air-water interface (if possible) and collecting a sample from near the surface of the water in the well. The samples were checked for measurable floating hydrocarbon product.

Before water samples were collected from the ground-water monitoring wells, the wells were purged until stabilization of the temperature, pH, and conductivity was obtained. Approximately 7 to 8 well casing volumes of water were purged before these characteristics stabilized. Turbidity measurements and dissolved oxygen readings were also collected from the purged well water. The quantity of water purged from the wells was calculated as follows:

1 well casing volume = $\pi r^2 h(7.48)$
where:
r = radius of the well casing in feet.
h = column of water in the well in feet (well depth - depth to water).
7.48 = conversion constant from cubic feet to gallons

gallons of water purged/gallons in 1 well casing volume = well casing volumes removed.

After purging, each well was allowed to recharge to the approximate initial water level. Water samples were then collected with an Environmental Protection Agency (EPA) approved Teflon® bailer which had been cleaned with Alconox® and deionized water. The water samples were carefully poured into 40-milliliter glass vials, which were filled so as to produce a positive meniscus. Each sample container was preserved with hydrochloric acid, sealed with a cap containing a Teflon® septum, and subsequently examined for air bubbles to avoid headspace which would allow volatilization to occur. The samples were promptly transported in iced storage in a thermally-insulated ice chest, accompanied by a Chain of Custody Record, to a California-certified laboratory.

WELL PURGE DATA SHEET

Project Name: ARCO 6113 Job No. 69028-3

Date: 6-21-90 Page 1 of 2

Well No. MW-1 Time Started 14:30

Time (hr)	Gallons (cum.)	Temp. (F)	pH	Conduct. (micromoh)	Turbidity (NTU)
14:30	Start purging MW-1				
14:35	5	76.1	7.10	6.14	>200
14:40	10	72.0	6.85	6.58	>200
14:45	15	69.8	6.88	6.52	>200
14:50	20	68.9	6.86	6.56	>200
14:55	25	68.3	6.90	6.56	>200
15:00	30	69.5	6.90	6.61	>200
15:05	35	68.2	7.01	6.57	>200
15:10	40	69.0	6.93	6.67	>200
15:16	45	68.0	6.89	6.61	>200
15:23	50	67.7	6.82	6.55	>200
15:29	55	68.3	6.87	6.60	>200
15:35	60	68.3	6.83	6.60	>200

Notes:

Depth to Bottom (feet) :	40.7
Depth to Water - initial (feet) :	21.72
Depth to Water - final (feet) :	21.80
% recovery :	99.58%
Time Sampled :	17:00
Dissolved Oxygen - initial (ppm) :	N/A
Dissolved Oxygen - final (ppm) :	N/A
Gallons per Well Casing Volume :	12.35
Gallons Purged :	95.0
Well Casing Volumes Purged :	7.7
Approximate Pumping Rate (gpm) :	0.95

WELL PURGE DATA SHEET

Project Name: ARCO 6113 Job No. 69028-3

Date: 6-21-90 Page 2 of 2

Well No. MW-1 Time Started 14:30

Time (hr)	Gallons (cum.)	Temp. (F)	pH	Conduct. (micromoh)	Turbidity (NTU)
15:40	65	66.8	6.63	6.46	>200
15:45	70	66.9	6.79	6.49	>200
15:50	75	66.7	6.87	6.59	>200
15:52	80	67.8	6.88	6.55	>200
15:58	85	67.3	6.91	6.53	>200
16:06	90	66.9	6.90	6.52	>200
16:10	95	65.9	6.91	6.53	>200
16:11	Stop purging MW-1				

Notes:

Depth to Bottom (feet)	:	40.7
Depth to Water - initial (feet)	:	21.72
Depth to Water - final (feet)	:	21.80
% recovery	:	99.58%
Time Sampled	:	17:00
Dissolved Oxygen - initial (ppm)	:	N/A
Dissolved Oxygen - final (ppm)	:	N/A
Gallons per Well Casing Volume	:	12.35
Gallons Purged	:	95.0
Well Casing Volumes Purged	:	7.7
Approximate Pumping Rate (gpm)	:	0.95

WELL PURGE DATA SHEET

Project Name: ARCO 6113 Job No. 69028-3

Date: 6-21-90 Page 1 of 2

Well No. MW-2 Time Started 12:00

Time (hr)	Gallons (cum.)	Temp. (F)	pH	Conduct. (micromoh)	Turbidity (NTU)
12:00	Start purging MW-2				
12:07	5	71.1	6.63	7.78	>200
12:15	10	68.5	6.78	7.47	>200
12:21	15	67.6	6.90	6.37	>200
12:27	20	67.8	6.94	6.37	>200
12:33	25	67.1	6.98	6.37	>200
12:39	30	68.4	7.00	6.40	169.4
12:47	35	67.2	7.05	6.30	144.4
12:53	40	67.0	7.13	6.33	126.9
13:00	45	66.0	7.08	6.27	113.5
13:07	50	66.5	7.81	6.29	94.3
13:13	55	66.6	7.70	6.30	91.2
13:20	60	67.1	8.06	6.34	84.2

Notes:

Depth to Bottom (feet)	:	37.1
Depth to Water - initial (feet)	:	21.88
Depth to Water - final (feet)	:	22.05
% recovery	:	98.88%
Time Sampled	:	15:30
Dissolved Oxygen - initial (ppm)	:	N/A
Dissolved Oxygen - final (ppm)	:	N/A
Gallons per Well Casing Volume	:	9.90
Gallons Purged	:	90.1
Well Casing Volumes Purged	:	9.1
Approximate Pumping Rate (gpm)	:	0.75

WELL PURGE DATA SHEET

Project Name: ARCO 6113 Job No. 69028-3

Date: 6-21-90 Page 2 of 2

Well No. MW-2 Time Started 12:00

Time (hr)	Gallons (cum.)	Temp. (F)	pH	Conduct. (micromoh)	Turbidity (NTU)
12:26	65	68.4	8.25	6.30	66.0
12:33	70	70.1	7.46	6.34	64.2
12:40	75	68.3	7.27	6.31	65.5
12:45	80	67.3	7.29	6.39	56.2
12:52	85	67.7	7.29	6.40	53.2
14:00	90	67.8	7.27	6.41	56.9
16:11	Stop purging MW-2				

Notes:

Depth to Bottom (feet)	:	37.10
Depth to Water - initial (feet)	:	21.88
Depth to Water - final (feet)	:	22.05
% recovery	:	98.88%
Time Sampled	:	15:30
Dissolved Oxygen - initial (ppm)	:	N/A
Dissolved Oxygen - final (ppm)	:	N/A
Gallons per Well Casing Volume	:	9.9
Gallons Purged	:	90.0
Well Casing Volumes Purged	:	9.1
Approximate Pumping Rate (gpm)	:	0.75

WELL PURGE DATA SHEET

Project Name: ARCO 6113 Job No. 69028-3

Date: 6-21-90 Page 1 of 2

Well No. MW-3 Time Started 9:50

Time (hr)	Gallons (cum.)	Temp. (F)	pH	Conduct. (micromoh)	Turbidity (NTU)
9:50	Start purging MW-3				
9:55	5	70.1	5.85	7.76	>200
10:00	10	66.5	5.77	7.30	>200
10:06	15	66.2	5.99	7.43	>200
10:12	20	66.1	6.18	7.44	>200
10:19	25	66.3	6.35	7.47	>200
10:27	30	66.7	6.42	7.50	165.0
10:32	35	66.4	6.42	7.50	145.9
10:39	40	67.0	6.57	7.53	132.2
10:46	45	66.9	6.47	7.50	117.4
10:55	50	67.5	6.59	7.56	100.7
11:01	55	67.1	6.60	7.57	91.5
11:09	60	67.5	6.59	7.56	79.0

Notes:

Depth to Bottom (feet)	:	38.9
Depth to Water - initial (feet)	:	21.72
Depth to Water - final (feet)	:	21.88
% recovery	:	99.07%
Time Sampled	:	13:30
Dissolved Oxygen - initial (ppm)	:	N/A
Dissolved Oxygen - final (ppm)	:	N/A
Gallons per Well Casing Volume	:	11.17
Gallons Purged	:	90.0
Well Casing Volumes Purged	:	8.05
Approximate Pumping Rate (gpm)	:	0.77

WELL PURGE DATA SHEET

Project Name: ARCO 6113 Job No. 69028-3

Date: 6-21-90 Page 2 of 2

Well No. MW-3 Time Started 9:50

Time (hr)	Gallons (cum.)	Temp. (F)	pH	Conduct. (micromoh)	Turbidity (NTU)
11:15	65	68.0	6.66	7.67	74.0
11:21	70	67.1	6.54	7.64	68.9
11:27	75	67.3	6.70	7.62	61.2
11:33	80	67.8	6.66	7.66	54.8
11:40	85	67.9	6.68	7.68	55.3
11:47	90	68.2	6.69	7.69	60.1
11:48	Stop purging MW-3				

Notes:

Depth to Bottom (feet)	:	38.90
Depth to Water - initial (feet)	:	21.72
Depth to Water - final (feet)	:	21.88
% recovery	:	99.07%
Time Sampled	:	13:30
Dissolved Oxygen - initial (ppm)	:	N/A
Dissolved Oxygen - final (ppm)	:	N/A
Gallons per Well Casing Volume	:	11.17
Gallons Purged	:	90.0
Well Casing Volumes Purged	:	8.1
Approximate Pumping Rate (gpm)	:	0.77

Applied GeoSystems

CHAIN-OF-CUSTODY RECORD (1 of 2)

PROJ. NO.	PROJECT NAME
69028-2	Arco 6113 - Livermore
P.O. NO.	SAMPLERS (Signature)
	Marc A Briggs

DATE (MM/DD/YY)	TIME		No. of Containers	TPHgasoline (8015)	BTEX (602/8020)	TPHdiesel (8015)	TOG (503.1)					Preserved? Ice	REMARKS	LABORATORY I.D. NUMBER
				ANALYSIS									Only Run Rinsate if test positive for analyses	
6/21/90	12:50	W - Rinsate - MW3 (Hold)	1									HCl		
		W-22-MW3	3	X	X							HCl		
		W - Rinsate - MW3 (Hold)	1									X		
		W-22-MW3	1			X						X		
	NB	W - Rinsate - MW3 (Hold)	1									X		
	12:50	W-22-MW3	2				X					X		
	15:30	W - Rinsate - MW2 (Hold)	1									HCl		
		W-21-MW2	3	X	X							HCl		
		W - Rinsate - MW2 (Hold)	1									X		
		W-21-MW2	2			X						X		
	NB	W - Rinsate - MW2 (Hold)	1									X		
6/21/90	15:30	W-21-MW2	2				X					X		

RELINQUISHED BY (Signature)	DATE / TIME	RECEIVED BY (Signature)
Marc A Briggs	6-22 1310	
RELINQUISHED BY (Signature)	DATE / TIME	RECEIVED BY (Signature)
RELINQUISHED BY (Signature)	DATE / TIME	RECEIVED FOR LABORATORY BY (Signature)
	6-22-90 1400	

Laboratory: Applied Analytical
3439 Edison Way
Fremont CA 94539

Turn Around: 2 Week

SEND RESULTS TO:
Applied GeoSystems
3315 Almaden Expressway
Suite 34
San Jose, California 95118
(408) 264-7723

Proj. Mgr.: C. Williams

Applied GeoSystems

CHAIN-OF-CUSTODY RECORD (2 of 2)

PROJ. NO.	PROJECT NAME
69028-2	Arco 6113-Livermore
P.O. NO.	SAMPLERS (Signature)
	Marc A Briggs

DATE MM/DD/YY	TIME		No. of Containers	TPHgasoline (8015)	BTEX (602/8020)	TPHdiesel (8015)	TOG (5520)					Preserved?	REMARKS	LABORATORY I.D. NUMBER
													Only run rinsate if test positive for analyses listed	
6/21/90	11:00	W-RINSATE-MW1 (Hold)	1									HCl		
	17:00	W-21-MW1	3	X	X							HCl		
	11:00	W-RINSATE-MW1 (Hold)	1											
	11:00	W-21-MW1	2			X						X		
												X		
	17:00	W-RINSATE-MW1 (Hold)	1									X		
6/21/90	17:00	W-21-MW1	2				X					X		

RELINQUISHED BY (Signature):	DATE / TIME	RECEIVED BY (Signature):
Marc A Briggs	6-22 1310	
RELINQUISHED BY (Signature):	DATE / TIME	RECEIVED BY (Signature):
RELINQUISHED BY (Signature):	DATE / TIME	RECEIVED FOR LABORATORY BY (Signature):
	6-22 1400	

Laboratory: Applied Analytical
3459 ~~Edison Way~~ Edison Wy
Fremont CA 94538

Turn Around: 2 Week

SEND RESULTS TO:
Applied GeoSystems
3315 Almaden Expressway
Suite 34
San Jose, California 95118
(408) 264-7723

Proj. Mgr.: G. Williams

APPLIED ANALYTICAL

Environmental Laboratories

42501 Albrae St., Suite 100
Fremont, CA 94538
Bus: (415) 623-0775
Fax: (415) 651-8647

ANALYSIS REPORT

1020lab.frm

Attention:	Mr. George Williams	Date Sampled:	06-21-90
	Applied GeoSystems	Date Received:	06-22-90
	3315 Almaden Expressway	BTEX Analyzed:	07-05-90
	San Jose, CA 95113	TPHg Analyzed:	07-05-90
Project:	AGS 69028-2	TPHd Analyzed:	07-06-90
		Matrix:	Water

	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPHg	TPHd
	ppb	ppb	ppb	ppb	ppb	ppb
Detection Limit:	0.50	0.50	0.50	0.50	20	100
SAMPLE Laboratory Identification						
W-21-MW1 W1006809	ND	0.66	ND	ND	ND	ND
W-21-MW2 W1006810	ND	ND	ND	ND	ND	ND
W-22-MW3 W1006811	ND	1.0	ND	ND	ND	ND

ppb = parts per billion = µg/L = micrograms per liter.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not requested.

ANALYTICAL PROCEDURES

BTEX– Benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction using EPA Method 5030 followed by analysis using EPA Method 8020/602, which utilizes a gas chromatograph (GC) equipped with a photoionization detector (PID) and a flame-ionization detector (FID) in series.

TPHg–Total petroleum hydrocarbons as gasoline (low-to-medium boiling points) are measured by extraction using EPA Method 5030, followed by analysis using modified EPA Method 8015, which utilizes a GC equipped with an FID.

TPHd–Total petroleum hydrocarbons as diesel (high boiling points) are measured by extraction using EPA Method 3550 for soils and EPA Method 3510 for water, followed by modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Laboratory Representative

07-09-90
Date Reported

APPLIED ANALYTICAL

Environmental Laboratories

42501 Albrae St., Suite 100
Fremont, CA 94538
Bus: (415) 623-0775
Fax: (415) 651-8647

ANALYSIS REPORT

togwater.rpt

Report Prepared for:		Date Received:	06-22-90
Applied GeoSystems		Laboratory #:	W1006809
3315 Almaden Expressway		Project #:	69028-2
San Jose, CA 95113		Sample #:	W-21-MW1
Attention: George Williams		Matrix:	Water

Parameter	Result (µg/L)	Detection Limit (µg/L)	Date Analyzed
TPH as Oil and Grease	13000	5000	07-02-90

µg/L = micrograms per liter = ppb
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.

PROCEDURES

TPH as Oil and Grease: Total Oil and Grease of mineral or petroleum origin are measured by extraction and gravimetric analysis according to Standard Method 503A/E.

Laura Kuck, Laboratory Manager

07-09-90
Date Reported

APPLIED ANALYTICAL

Environmental Laboratories

42501 Albrae St., Suite 100
Fremont, CA 94538
Bus: (415) 623-0775
Fax: (415) 651-8647

ANALYSIS REPORT

togwater.rpt

Report Prepared for:
Applied GeoSystems
3315 Almaden Expressway
San Jose, CA 95113
Attention: George Williams

Date Received:	06-22-90
Laboratory #:	W1006810
Project #:	69028-2
Sample #:	W-21-MW2
Matrix:	Water

Parameter	Result (µg/L)	Detection Limit (µg/L)	Date Analyzed
TPH as Oil and Grease	ND	5000	07-03-90

µg/L = micrograms per liter = ppb
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.

PROCEDURES

TPH as Oil and Grease: Total Oil and Grease of mineral or petroleum origin are measured by extraction and gravimetric analysis according to Standard Method 503A/E.

Laura Kuck, Laboratory Manager

07-09-90
Date Reported

APPLIED ANALYTICAL

Environmental Laboratories

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Fremont, CA 94538
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ANALYSIS REPORT

togwater.rpt

Report Prepared for:
Applied GeoSystems
3315 Almaden Expressway
San Jose, CA 95113
Attention: George Williams

Date Received: 06-22-90
Laboratory #: W1006811
Project #: 69028-2
Sample #: W-22-MW3
Matrix: Water

Parameter	Result (µg/L)	Detection Limit (µg/L)	Date Analyzed
TPH as Oil and Grease	10000	5000	07-02-90

µg/L = micrograms per liter = ppb
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.

PROCEDURES

TPH as Oil and Grease: Total Oil and Grease of mineral or petroleum origin are measured by extraction and gravimetric analysis according to Standard Method 503A/E.

Laura Kuck, Laboratory Manager

07-09-90
Date Reported

APPLIED ANALYTICAL

Environmental Laboratories

42501 Albrae St., Suite 100
Fremont, CA 94538
Bus: (415) 623-0775
Fax: (415) 651-8647

ANALYSIS REPORT

1020lab.frm

Attention:	Mr. George Williams	Date Sampled:	06-21-90
	Applied GeoSystems	Date Received:	06-22-90
	3315 Almaden Expressway	BTEX Analyzed:	07-10-90
	San Jose, CA 95118	TPHg Analyzed:	07-10-90
Project:	AGS 69028-2	TPHd Analyzed:	NR
		Matrix:	Water

	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPHg	TPHd
	ppb	ppb	ppb	ppb	ppb	ppb
Detection Limit:	0.50	0.50	0.50	0.50	20	100
SAMPLE Laboratory Identification						
W-RINSATE-MW1 W1006812	ND	ND	ND	ND	ND	NR
W-RINSATE-MW3 W1006814	ND	ND	ND	ND	ND	NR

ppb = parts per billion = µg/L = micrograms per liter.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not requested.

ANALYTICAL PROCEDURES

BTEX– Benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction using EPA Method 5030 followed by analysis using EPA Method 8020/602, which utilizes a gas chromatograph (GC) equipped with a photoionization detector (PID) and a flame-ionization detector (FID) in series.

TPHg–Total petroleum hydrocarbons as gasoline (low-to-medium boiling points) are measured by extraction using EPA Method 5030, followed by analysis using modified EPA Method 8015, which utilizes a GC equipped with an FID.

TPHd–Total petroleum hydrocarbons as diesel (high boiling points) are measured by extraction using EPA Method 3550 for soils and EPA Method 3510 for water, followed by modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Laboratory Representative

07-12-90
Date Reported