Applied GeoSystems

91 APR 22 AM 10:25

TRANSMITTAL

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

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

FROM: MIKE BARMINSKI
TITLE: STAFF GEOLOGIST

DATE: 4/17/91
PROJECT NUMBER: AGS 60026.02
SUBJECT: ARCO STATION 276, 10600 MACARTHUR BLVD., OAKLAND, CALIFORNIA

WE ARE SENDING YOU [xk] Attached [ ] Under separate cover via _____ the following items:

[ ] Shop drawings [ ] Prints [xk] Reports [ ] Specifications

[ ] Letters [ ] Change Orders [ ] _____

COPIES	DATED	NO.	DESCRIPTION
1	4/16/91	0211ccar	FINAL FIRST QUARTER 1991 GROUND-WATER MONITORING REPORT FOR THE ABOVE SITE.

THESE ARE TRANSMITTED as checked below:

[ ] For review and comment [ ] Approved as submitted [ ] Resubmit ___ copies for approval

[ ] As requested [ ] Approved as noted [ ] Submit___ copies for distribution

[ ] For approval [ ] Return for corrections [ ] Return ___ corrected prints

[X] For your files [ ] _____

REMARKS: THIS REPORT HAS BEEN FORWARDED TO YOU AT THE REQUEST OF MR. CHUCK CARMEL OF ARCO PRODUCTS COMPANY.

Copies: 1 to AGS project file no. 60026.02

SAN JOSE READER'S FILE

*Revision Date: 10/15/90
*File Name: TRANSMT.PRJ

Applied GeoSystems
43255 Mission Boulevard, Fremont, CA 94539 (415) 651-1906
• FREMONT • IRVINE • HOUSTON • BOSTON • SACRAMENTO • CULVER CITY • SAN JOSE

LETTER REPORT ON GROUND-WATER MONITORING FOR FOURTH QUARTER 1989 and FIRST AND SECOND QUARTERS 1990 at ARCO Station No. 276 10600 MacArthur Blvd. Oakland, California

4-12-91

AGS 19014-4

Applied GeoSystems 43255 Mission Boulevard, Fremont, CA 94539 (415) 651-1906

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

April 12, 1991
AGS 19014-4

Mr. Kyle Christie
ARCO Products Company
P.O. Box 5811
2000 Alameda De Las Pulgas
San Mateo, California 94402

Subject: Letter Report on Ground-Water Monitoring for Fourth Quarter 1989 and First and Second Quarters 1990 at ARCO Station No. 276, 10600 MacArthur Boulevard, Oakland, Calfironia

Mr. Christie:

At the request of Arco Products Company (Arco), Applied GeoSystems (AGS) is providing this letter report summarizing the results of three quarterly ground-water monitoring events conducted during the fourth quarter of 1989, the first and second quarter of 1990. The site is located on the northeast corner of MacArthur Boulevard and 106th Avenue (Plate P-1).

Site Background and Previous Work

In 1988, Kaldveer Associates (KA) conducted a preliminary environmental assessment at the Foothill Square Shopping Center property adjacent to the ARCO station (KA Report No. KE812-3, 12056, October 3, 1988). A subsequent subsurface environmental investigation included drilling 12 borings, collecting soil samples, collecting water samples from a seasonally saturated perched water bearing zone encountered in the borings, and analyzing soil and water samples. Analyses of soil and ground-water samples indicated the presence of hydrocarbons. Pesticides, polychlorinated biphenyls (PCBs), and semi-volatile compounds were also detected in a water sample (KA Report No. KE812-3A, 12302, October 7, 1988).

Western Geologic Resources (WGR) conducted a subsurface environmental investigation at the Foothill Square Shopping Center, which included constructing five ground-water monitoring wells and analyzing nine soil and five water samples. The WGR investigation found hydrocarbons in the soil and ground water and semi-volatile compounds in ground water (WGR Report No. 8-088.01).

In 1988, Pacific Environmental Group (PEG) removed a waste-oil underground storage tank (UST) from the Arco Station No. 276. Hydrocarbons in soil in the vicinity of the tank pit were delineated and the soil excavated and removal for disposal (PEG, February 6, 1989).

In 1989, AGS installed 5 ground-water monitoring wells and collected and analyzed soil and water samples. Elevated hydrocarbon concentrations were not detected, except in monitoring well MW-2. Tetrachloroethene (PCE) was detected in the water sample from well MW-4 (AGS Report No. 19014-2, August 8, 1989).

In 1989, PEG conducted a soil-vapor survey at the station and a portion of the Foothills Square Shopping Center parking lot (PEG Report 330-40.02, July 17, 1989).

Soil borings drilled in the shopping center parking lot during August 1989 were located on the basis of the spatial distribution of hydrocarbon vapors detected during the PEG soil-vapor survey. Elevated concentrations (greater than 100 parts per million [ppm]) of hydrocarbons are present in borings B-6 and B-7 in the vadose zone between 20 and 32 feet (AGS Report No. 19014-3, May 11, 1989).

Work conducted at the site by AGS during the first quarter of 1990 included:

- tank removal soil sampling.
- drilling three exploratory soil borings and collecting soil samples from the proposed replacement tank pit area.
- excavation of new tank pit.
- aeration of soil excavated from the former and new tank pit.
- meeting with the Alameda County Health Care Services Agency to discuss the status and future direction of our investigation.

- completion of a pilot study and conceptual design of a soil vapor extraction system to be used for removing onsite and offsite hydrocarbon compounds from the unsaturated zone.

Monitoring Procedures

On October 13, 1989, and February 1, 1990, AGS conducted quarterly monitoring at the site that included measuring depths to ground water; subjectively evaluating ground-water samples; and purging, sampling, and analyzing ground water from the five monitoring wells (MW-1 through MW-5). Plate 2 shows the schematic layout of the site and the locations of the five monitoring wells. The field procedures are described in Attachment I.

Due to environmental investigations involving removal of four USTs, excavation of a new tank pit, and onsite aeration of stockpiled soils, the monitoring wells were not accessible and were not sampled, during the second quarter of 1990.

Analytical Methods

Ground-water samples collected on October 13, 1989 were submitted to State-certified laboratories for analyses. Samples were analyzed for total petroleum hydrocarbons as gasoline (TPHg) according to Environmental Protection Agency (EPA) Method 8015, and for the purgeable gasoline compounds benzene, toluene, ethylbenzene, and total xylenes (BTEX) according to EPA Method 602. A water sample collected from well MW-1 was submitted for analysis to determine general mineral concentrations. The Chain of Custody Records and Laboratory Analysis Report are included in Attachment II.

Ground water samples collected on February 1, 1990 were submitted to Sequoia Analytical and tested for TPHg, BTEX, and volatile organic compounds (VOCs) by EPA Method 8240. Chain of Custody Record and Analysis Reports are in Attachment II.

Results of Subjective Evaluations

As with previous monitoring, no evidence of oil sheen or floating product was observed in wells MW-1, MW-3, MW-4, and MW-5. Floating product was found in well MW-2 in October 1989, and a heavy sheen was detected in February 1990. Cumulative water level data and subjective evaluation results are summarized in Table 1.

Results of Ground-Water Analyses

Cumulative laboratory results for TPHg and BTEX analyses are presented in Table 2. In October 1989, TPHg was present in wells MW-2 through MW-5. Concentrations of TPHg ranged from 0.075 parts per million (ppm) in MW-5 to 0.76 ppm in MW-4. BTEX was not detected in MW-1, MW-3, MW-4, and MW-5, with exceptions of benzene (0.00086 ppm) and ethylbenzene (0.0012 ppm) in MW-4. MW-2 contained free product and was not sampled for analysis.

In February 1990, TPHg was present in each well sampled with the greatest concentration found in MW-4 (0.68 ppm). Benzene, toluene, and ethylbenzene were not found in wells MW-1, MW-3, and MW-4. Benzene (0.00094 ppm), toluene (0.00088 ppm), and total xylenes (0.0018 ppm) were found in well MW-5. Total xylenes were found in each well sampled. Well MW-2 was not sampled due to a sheen on the surface of the water.

As shown in Table 3, the VOC analysis detected tetrachloroethene (PCE) in MW-3, MW-4, and MW-5; and total xylenes in MW-5. The greatest PCE concentration was in MW-4 at 3.9 ppm.

Water Quality Analysis

A water quality analysis was conducted on a sample from well MW-1 to determine background water quality for beneficial uses. The results of the analysis are reported in Table 4, together with the secondary standards.

The general mineral analysis showed that chloride, iron, manganese, sulfate, and total dissolved solids (TDS) did not meet secondary drinking water standards. Bicarbonate alkalinity, calcium, and hardness were present in concentrations considered significant by the U.S. Geological Survey Water supply Paper 2220. The data indicates that the beneficial use of ground water is restricted.

Ground-Water Surface Elevations and Gradient

The measured ground-water surface elevations are summarized in Table 5. Depth-to-water measurements and wellhead elevations were used to construct hydraulic gradient maps for October 13, 1989 and February 1, 1990. These maps are shown in Plates 3 and 4, respectively. The inferred ground-water flow direction was toward the north on both dates. The approximate hydraulic gradient evaluated from the October 13 measurements is 0.003, while the February 1 measurements reveal a gradient of 0.002.

Conclusions

Since the quarterly monitoring program began in April 1989, TPHg concentrations have generally decreased in wells MW-3, MW-4, and MW-5. In MW-1, TPHg and total xylenes were first detected in February 1990. In well MW-2, floating product first appeared in October 1989, and a heavy sheen was observed in February 1990. Benzene was not detected in October 1989 in wells MW-1, MW-3, and MW-5. In February 1990, benzene was found exclusively in well MW-5.

The wells were not sampled during the second quarter of 1990 due to onsite environmental investigations involving UST removal and replacement, and onsite aeration of stockpiled soils.

General mineral analyses indicates a restricted beneficial use of ground water from the shallow aquifer. Background levels exceed recommended Maximum Contamination Level for Secondary Drinking Water Standards for chloride, iron, manganese, specific conductance, sulfate, and total dissolved solids. This indicates that these waters are not potable.

We recommend that copies of this report be sent to Mr. Don Dalke, of the California Regional Water Quality Control Board, 1800 Harrison Street, 7th Floor, Oakland, CA 94612; and to Mr. Ariu Levi of the Alameda County Department of Health Services, 80 Swan Way, Room 200, Oakland, CA 94621.

Please call if you have any questions.

Sincerely,
Applied GeoSystems

Catherine W. McCutchen
Project Geologist

REGISTERED GEOLOGIST
JAMES A. PERKINS
Nº 4472
6/92
STATE OF CALIFORNIA

James A. Perkins
Project Manager

April 12, 1991
AGS 19014-4

Enclosures:

Table 1 - Cumulative Results of Subjective Evaluations
Table 2 - Cumulative Results of Laboratory Analyses
Table 3 - Cumulative Results of Laboratory Analyses for Volatile Organic Compounds (VOCs)
Table 4 - Results of Water Quality Analysis
Table 5 - Ground-water Surface Elevation Data

Plate 1 - Site Vicinity Map
Plate 2 - Generalized Site Plan
Plate 3 - Ground-Water Elevation Map, October 13, 1989
Plate 4 - Ground-Water Elevation Map, February 1, 1990

Attachments:

Field Procedures
Chain of Custody Records
Laboratory Analytical Reports

cc: Mr. Chris Winsor

draft: 08/08/90
final: 04/15/91

TABLE 1
CUMULATIVE RESULTS OF SUBJECTIVE EVALUATIONS OF GROUND WATER
Arco Station 276
10600 MacArthur Boulevard, Oakland, CA

Well	Date	Depth to Water	Floating Product	Sheen
MW-1	04/17/89	33.04	None	None
	04/24/89	33.84	None	None
	10/13/89	37.19	None	None
	02/01/90	38.89	None	None
MW-2	04/17/89	17.20	None	Slight
	04/24/89	17.83	None	Slight
	10/13/89	20.17	0.04	NA
	02/01/90	not measured	None	Heavy
MW-3	04/24/89	34.47	None	None
	10/13/89	37.60	None	None
	02/01/90	37.20	None	None
MW-4	04/17/89	33.87	None	None
	04/24/89	33.76	None	None
	10/13/89	37.03	None	None
	02/01/90	36.57	None	None
MW-5	04/17/89	33.17	None	None
	04/24/89	33.06	None	None
	10/13/89	36.33	None	None
	02/01/90	35.96	None	None

Measurements are in feet below top of each well casing.

TABLE 2
CUMULATIVE RESULTS OF LABORATORY ANALYSES OF GROUND WATER
Arco Station No. 276
10600 MacArthur Boulevard
Oakland, California

Well/ Date	TPHg	Benzene	Toluene	Ethyl-benzene	Total Xylenes
MW-1					
04/24/89	<0.050	<0.00050	<0.00050	<0.00050	<0.00050
10/13/89	<0.020	<0.00050	<0.00050	<0.00050	<0.00050
02/01/90	0.091	<0.00030	<0.00030	<0.00030	0.00036
MW-2					
04/24/89	165	13	21	2.1	12.7
10/13/89	-floating product/heavy sheen present-				
02/01/90	-sheen present-				
MW-3					
04/24/89	0.56	0.00054	0.00075	<0.00050	<0.00050
10/13/89	0.45	<0.00050	<0.00050	<0.00050	<0.00050
02/01/90	0.36	<0.00030	<0.00030	<0.00030	0.00085
MW-4					
04/24/89	2.5	0.27	0.0014	<0.00050	0.085
10/13/89	0.76	0.00086	<0.00050	0.0012	<0.00050
02/01/90	0.68	<0.00030	<0.00030	<0.00030	0.0016
MW-5					
04/24/89	0.13	0.00067	<0.00050	<0.00050	<0.00050
10/13/89	0.075	<0.00050	<0.00050	<0.00050	<0.00050
02/01/90	0.081	0.00094	0.00088	<0.00030	0.0018

Results are in parts per million (ppm)
TPHg = total petroleum hydrocarbons as gasoline
< = below the reporting limits of the analysis

TABLE 3
CUMULATIVE RESULTS OF LABORATORY ANALYSES OR GROUND WATER
FOR VOLATILE ORGANIC COMPOUNDS (VOCs)
Arco Station No. 276
10600 MacArthur Boulevard
Oakland, California

Well	Tetrachloroethene (PCE)	All Other VOCs
April 24, 1989		
MW-4	1.50	ND
February 1, 1990		
MW-1	<0.002	ND
MW-3	2.000	ND
MW-4	3.900	ND
MW-5	0.180	ND except Xylene (0.0023)

Results are in parts per million (ppm).
Only positive results reported.
< = below the reporting limits of the analysis
ND = nondetectable

TABLE 4
RESULTS OF WATER QUALITY ANALYSIS
Arco Station No. 276, Oakland, California
October 13, 1989

Constituent	MW-1	MCL	
Bicarbonate Alkalinity	330	NA	
Calcium	320	NA	
Carbonate Alkalinity	<0.5	NA	
Chloride	1,900	250	+
Copper	0.11	1.0	
Hardness	1,500	NA	
Hydroxide Alkalinity	<0.001	NA	
Iron	33	0.3	+
Magnesium	170	NA	
Manganese	3.0	0.5	+
pH	7.1	NA	
Sodium	130	NA	
Specific Conductance(SP)	3,800	900	+
Sulfate	410	250	+
Surfactants	<0.02	0.05	
Total Dissolved Solids	3,000	500	+
Zinc	0.33	5.0	

Results and Values in parts per million. SP in micromhos.

MCL = Recommended Maximum Contamination Level for Secondary Drinking Water Standards established under Title 40, Code of Federal Regulations Part 143 and Title 22, California Administrative Code Section 64445.1.

+ = Constituent in ground water which exceeds established maximum or recommended contaminant level for secondary drinking water standards.

NA = Regulatory information not applicable/available.

TABLE 5
GROUND-WATER SURFACE ELEVATION DATA
Arco Station No. 276
10600 MacArthur Boulevard
Oakland, California

Well No.	Casing Elevation	Depth to Ground Water	Ground-water Elevation
October 13, 1989			
MW-1	55.91	37.19	18.72
MW-2	55.35	---	---
MW-3	56.55	37.60	18.95
MW-4	55.94	37.03	18.91
MW-5	55.43	36.33	19.10
February 1, 1990			
MW-1	55.91	36.73	19.18
MW-2	55.35	---	---
MW-3	56.55	37.20	19.35
MW-4	55.94	36.57	19.37
MW-5	55.43	35.96	19.47

Measurements are in feet.
Elevation measurements are referenced to mean sea level.
---: Not measured due to presence of floating product or sheen.

Source: U.S. Geological Survey
7.5-Minute Quadrangle
Oakland East/San Leandro
California
Photorevised 1980

N

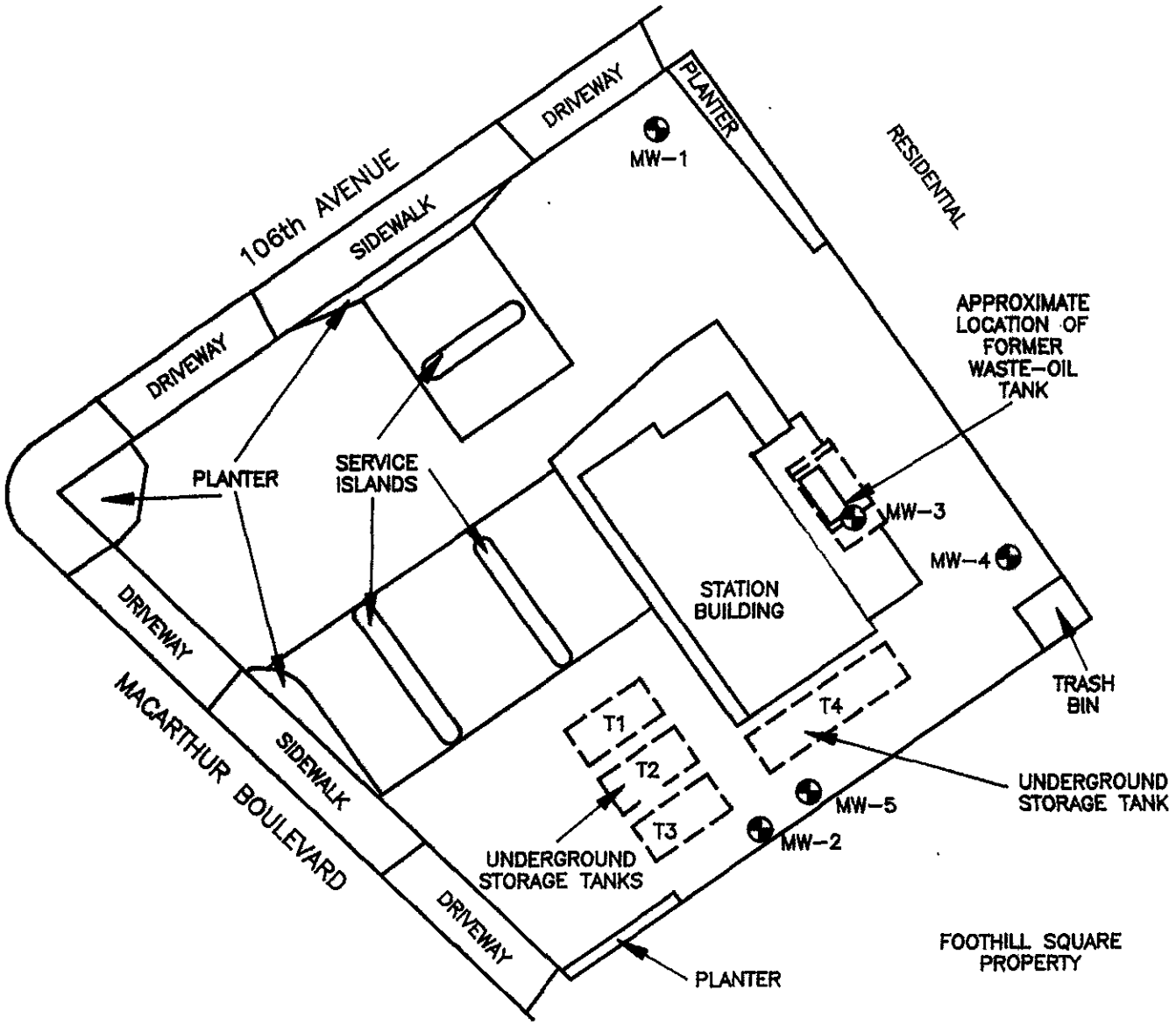
Approximate Scale
2000 1000 0 2000 4000
feet

Applied GeoSystems

PROJECT NO. 19014-4

SITE VICINITY MAP
ARCO Station No. 276
10600 MacArthur Boulevard
Oakland, California

PLATE
1



MW-5 ◓ = Ground-water monitoring well

Source: Modified from plan supplied by ARCO and surveyed by Ron Archer Civil Engineer, Inc.

N

Approximate Scale

30 15 0 30 60

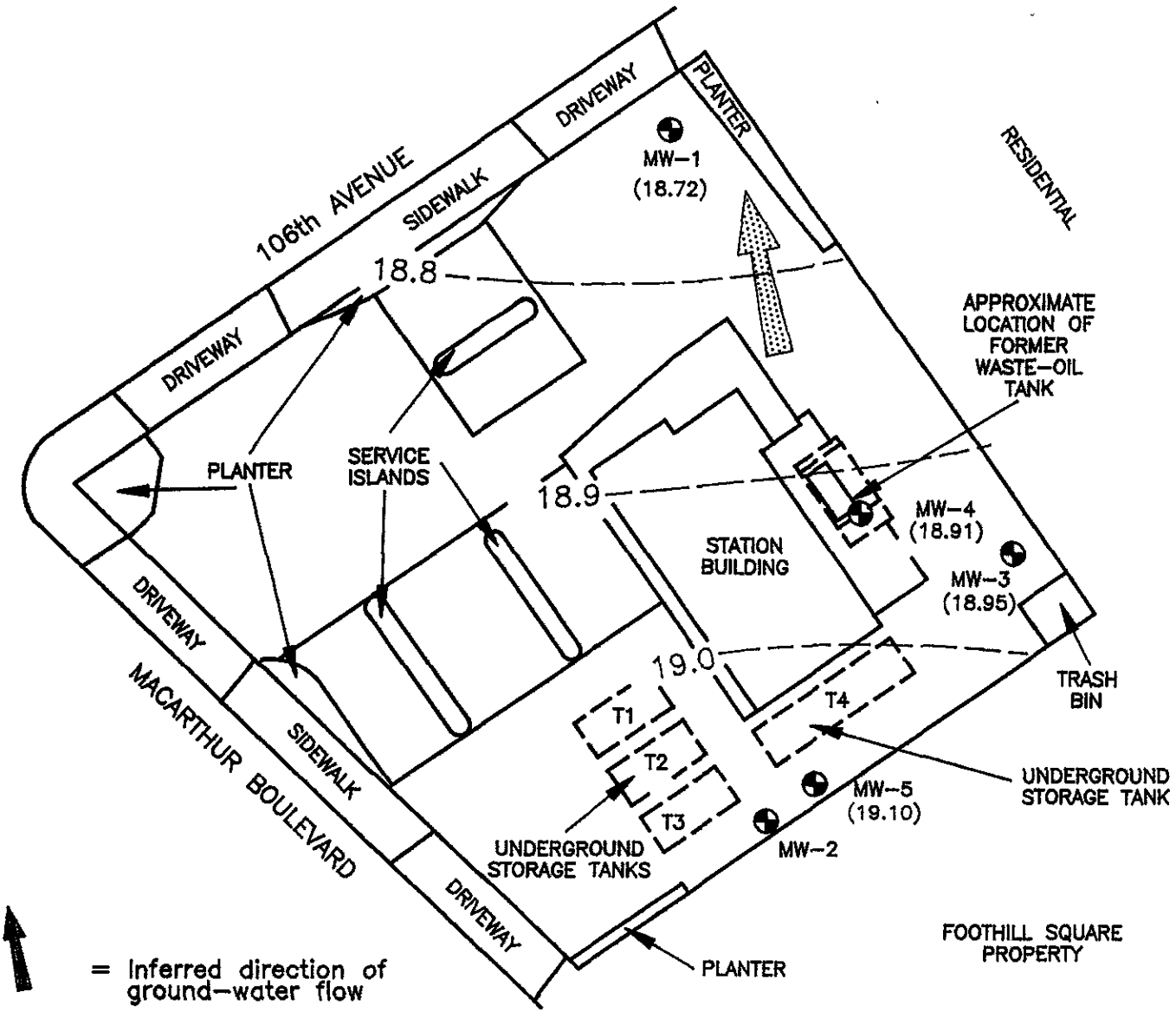
feet

Applied GeoSystems

PROJECT NO. 19014-4

GENERALIZED SITE PLAN
ARCO Station No. 276
10600 MacArthur Boulevard
Oakland, California

PLATE 2



= Inferred direction of ground-water flow

(19.10) = ground-water elevation above mean sea level

19.0 = Line of equal elevation of ground water above mean sea level

MW-5 = Ground-water monitoring well

Source: Modified from plan supplied by ARCO and surveyed by Ron Archer Civil Engineer, Inc.

N

Approximate Scale

30 15 0 30 60

feet

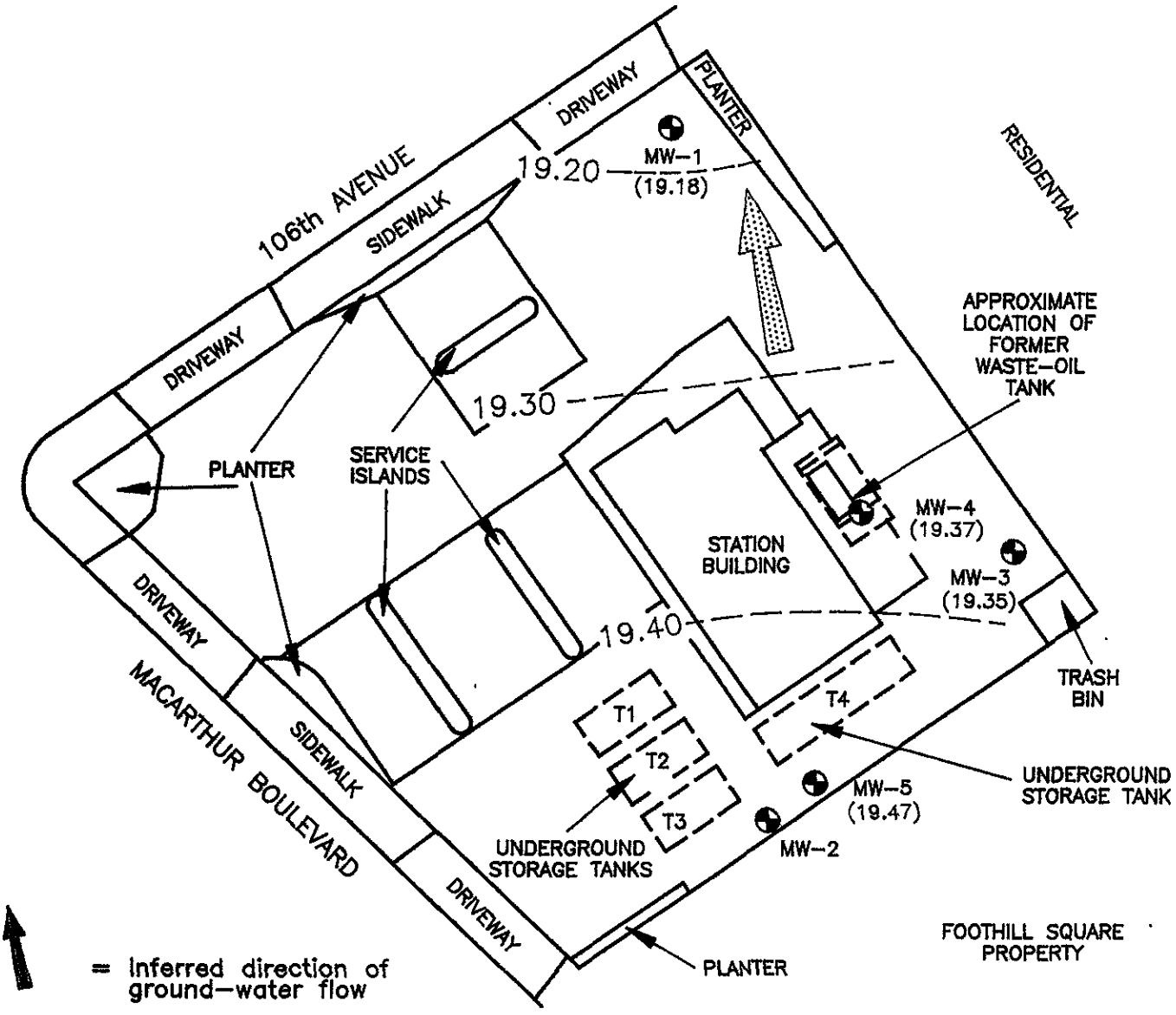
NOTE: Contours produced with SURFER using the Kriging method.

Applied GeoSystems

PROJECT NO. 19014-4

GROUND-WATER ELEVATION MAP
October 13, 1989
ARCO Station No. 276
10600 MacArthur Boulevard
Oakland, California

PLATE
3



= Inferred direction of ground-water flow

(19.47) = ground-water elevation above mean sea level

19.40 = Line of equal elevation of ground water above mean sea level

MW-5 = Ground-water monitoring well

Source: Modified from plan supplied by ARCO and surveyed by Ron Archer Civil Engineer, Inc.

Approximate Scale

30 15 0 30 60

feet

NOTE: Contours produced with SURFER using the Kriging method.

Applied GeoSystems

PROJECT NO. 19014-4

GROUND-WATER ELEVATION MAP
February 1, 1990
ARCO Station No. 276
10600 MacArthur Boulevard
Oakland, California

PLATE 4

ATTACHMENTS
FIELD PROCEDURES
CHAIN OF CUSTODY RECORDS
LABORATORY ANALYSES REPORTS

Field Procedures

Ground-Water Monitoring and Subjective Evaluation

The static ground-water levels in the wells were measured to the nearest 0.01 foot with a Solinist water-level indicator. After the static ground-water level was recorded, an initial water sample was collected from each well and checked for floating product, sheen, and water clarity. Each sample was collected by gently lowering approximately half the length of a clean Teflon bailer past the air-water interface and collecting a sample from near the surface of the water in each well.

Ground-Water Sampling

Each well was purged of approximately 3 well volumes and until temperature, pH, and specific conductivity had stabilized. Samples for laboratory analyses were collected near the static water surface with a pre-cleaned bailer. The samples were transferred to laboratory-cleaned, 40-milliliter glass vials and 1-liter glass bottles. Hydrochloric acid was added to the vials as preservative. The samples were sealed with Teflon-lined caps, labeled, and placed in iced storage for transport to either the AGS Analytical Laboratory (Certificate No. 153) or The Sequoia Laboratory (Certificate No. 145) for analyses. Chain-of-custody protocol was used throughout the process of handling the samples.

Purged water was stored on site in properly labeled Department of Transportation 17E 55-gallon liquid waste drums. Purge water remains the responsibility of Arco.

CHAIN OF CUSTODY RECORD

COPY

Applied GeoSystems
43255 Mission Blvd Suite B Fremont, CA 94539 (415)651-19

SAMPLER (signature): James N Koehler
Phone: 651-1906

LABORATORY: Severn Analytical

TURNAROUND TIME: 3 week chemistry

Project Leader: Bill Howell
Phone No. 651-1906

SHIPPING INFORMATION:
Shipper
Address
Date Shipped
Service Used
Airbill No. Cooler No.

Relinquished by: (signature)	Received by: (signature)	Date	Time
James N Koehler	Bill Howell	10/10	16:-
Bill Howell	[signature]	10-13	10
	Received for laboratory by:		

LABORATORY SHOULD SIGN UPON RECEIPT AND RETURN A COPY OF THIS FORM WITH THE LABORATORY RESULTS

Sample No.	Site Identification	Date Sampled	Analyses Requested	Sample Condition Upon Receipt
W-37-MW-1	19014-3	10/10/91	General Mineral Analysis	room temp

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Applied GeoSystems	Client Project ID:	#19014-3	Sampled:	Oct 13, 1989
43255 Mission Blvd., Suite B	Sample Descript:	Water, W-37, MW1	Received:	Oct 13, 1989
Fremont, CA 94539				
Attention: Bill Howell	Lab Number:	910-2310 A - C	Reported:	Nov 3, 1989

GENERAL MINERAL ANALYSIS

Analyte	Detection Limit mg/L (ppm)	Sample Results mg/L (ppm)
Bicarbonate Alkalinity	2.0	330
Calcium	2.0	320
Carbonate Alkalinity	0.5	N.D.
Chloride	0.2	1,900
Copper	0.01	0.11
Hardness	2.0	1,500
Hydroxide Alkalinity	0.001	N.D.
Iron	0.01	33
Magnesium	2.0	170
Manganese	0.01	3.0
pH (pH units)	N.A.	7.1
Sodium	0.5	130
Specific Conductance (umhos/cm)	1.0	3,800
Sulfate	0.1	410
Surfactants	0.02	N.D.
Total Dissolved Solids	5.0	3,000
Zinc	0.01	0.33

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Elizabeth W. Hackl
Project Manager

9102310.APG <1>

CHAIN OF CUSTODY RECORD

43255 Mission Blvd Suite B Fremont, CA 94539 (415) 651-1906

SAMPLER (signature): James N Koehler

Phone: 651-1906

LABORATORY: Applied Geo Systems

TURNAROUND TIME: 2 weeks

Project Leader: Bill Howell

Phone No. 651-1906

SHIPPING INFORMATION:

Shipper

Address

Date Shipped

Service Used

Airbill No. Cooler No.

Relinquished by: (signatures)	Received by: (signatures)	Date	Time
James N Koehler	Bill Howell	10/16/89	12:0
Bill Howell			
	Received for laboratory by:	10/16/89	12:00

LABORATORY SHOULD SIGN UPON RECEIPT AND RETURN A COPY OF THIS FORM WITH THE LABORATORY RESULTS

Sample No.	Site Identification	Date Sampled	Analyses Requested	Sample Condition Upon Receipt
W-37-MW-1	19014-3	10-13-89	BTEX w/ TPH9	ICE HCl
W-38-MW3	19014-3	10-13-89		ICE HCl
W-35-MW4	19014-3	10-13-89		ICE HCL
W-36-MW5	19014-3	10-10-89		ICE HCl

Applied GeoSystems 43255 Mission Boulevard, Fremont, CA 94539 (415) 651-1906

• FREMONT • COSTA MESA • SACRAMENTO • HOUSTON

ANALYSIS REPORT

0212lab.frm

Report Prepared for:
Applied GeoSystems
43255 Mission Boulevard
Fremont, CA 94539
Attention: K. William Howell

Date Received: 10-16-89
Laboratory Number: 91027W01
Project #: 19014-3
Sample #: W-37.8-MW1
Matrix: Water

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline		ND		0.020	10-17-89	
TEH as Diesel						NR
Benzene		ND		0.00050	10-17-89	
Toluene		ND		0.00050	10-17-89	
Ethylbenzene		ND		0.00050	10-17-89	
Total Xylenes		ND		0.00050	10-17-89	

mg/kg = milligrams per kilogram = parts per million (ppm).
mg/L = milligrams per liter = ppm.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not required.

PROCEDURES

TVH/BTEX--Total volatile hydrocarbons (TVH) and benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction according to EPA Method 5030 followed by analysis by a EPA Method 8020/602 (modified for TVH) which uses a gas chromatograph (GC) equipped with a photo-ionization detector (PID) and a flame-ionization detector (FID) in series. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TPH--Total petroleum hydrocarbons (low-to-medium boiling points) are measured by extraction according to EPA Method 5030 followed by analysis by a modified EPA Method 8015 which uses a GC equipped with an FID. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TEH--Total extractable hydrocarbons (high boiling points) are measured by extraction according to EPA Method 3550 for soils or EPA Method 3510 for water followed by a modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Tia Tran, Laboratory Supervisor

10-19-89
Date Reported

Applied GeoSystems 43255 Mission Boulevard, Fremont, CA 94539 (415) 651-1906

• FREMONT • COSTA MESA • SACRAMENTO • HOUSTON

ANALYSIS REPORT

0212lab.frm

Report Prepared for:
Applied GeoSystems
43255 Mission Boulevard
Fremont, CA 94539
Attention: K. William Howell

Date Received: 10-16-89
Laboratory Number: 91027W02
Project #: 19014-3
Sample #: W-38-MW3
Matrix: Water

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline		0.45		0.020	10-17-89	
TEH as Diesel						NR
Benzene		ND		0.00050	10-17-89	
Toluene		ND		0.00050	10-17-89	
Ethylbenzene		ND		0.00050	10-17-89	
Total Xylenes		ND		0.00050	10-17-89	

mg/kg = milligrams per kilogram = parts per million (ppm).
mg/L = milligrams per liter = ppm.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not required.

PROCEDURES

TVH/BTEX--Total volatile hydrocarbons (TVH) and benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction according to EPA Method 5030 followed by analysis by a EPA Method 8020/602 (modified for TVH) which uses a gas chromatograph (GC) equipped with a photo-ionization detector (PID) and a flame-ionization detector (FID) in series. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TPH--Total petroleum hydrocarbons (low-to-medium boiling points) are measured by extraction according to EPA Method 5030 followed by analysis by a modified EPA Method 8015 which uses a GC equipped with an FID. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TEH--Total extractable hydrocarbons (high boiling points) are measured by extraction according to EPA Method 3550 for soils or EPA Method 3510 for water followed by a modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Tia Tran, Laboratory Supervisor

10-19-89
Date Reported

Applied GeoSystems 43255 Mission Boulevard, Fremont, CA 94539 (415) 651-1906

• FREMONT • COSTA MESA • SACRAMENTO • HOUSTON

ANALYSIS REPORT

02121ab.frm

Report Prepared for:
Applied GeoSystems
43255 Mission Boulevard
Fremont, CA 94539
Attention: K. William Howell

Date Received: 10-16-89
Laboratory Number: 91027W03
Project #: 19014-3
Sample #: W-37.5-MW4
Matrix: Water

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline		0.76		0.020	10-17-89	
TEH as Diesel						NR
Benzene		0.00086		0.00050	10-17-89	
Toluene		ND		0.00050	10-17-89	
Ethylbenzene		0.0012		0.00050	10-17-89	
Total Xylenes		ND		0.00050	10-17-89	

mg/kg = milligrams per kilogram = parts per million (ppm).
mg/L = milligrams per liter = ppm.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not required.

PROCEDURES

TVH/BTEX--Total volatile hydrocarbons (TVH) and benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction according to EPA Method 5030 followed by analysis by a EPA Method 8020/602 (modified for TVH) which uses a gas chromatograph (GC) equipped with a photo-ionization detector (PID) and a flame-ionization detector (FID) in series. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TPH--Total petroleum hydrocarbons (low-to-medium boiling points) are measured by extraction according to EPA Method 5030 followed by analysis by a modified EPA Method 8015 which uses a GC equipped with an FID. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TEH--Total extractable hydrocarbons (high boiling points) are measured by extraction according to EPA Method 3550 for soils or EPA Method 3510 for water followed by a modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Tia Tran, Laboratory Supervisor

10-19-89
Date Reported

Applied GeoSystems 43255 Mission Boulevard, Fremont, CA 94539 (415) 651-1906

• FREMONT • COSTA MESA • SACRAMENTO • HOUSTON

ANALYSIS REPORT

0212lab.frm

Report Prepared for:
Applied GeoSystems
43255 Mission Boulevard
Fremont, CA 94539
Attention: K. William Howell

Date Received: 10-16-89
Laboratory Number: 91027W04
Project #: 19014-3
Sample #: W-36-MW5
Matrix: Water

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline		0.075		0.020	10-17-89	
TEH as Diesel						NR
Benzene		ND		0.00050	10-17-89	
Toluene		ND		0.00050	10-17-89	
Ethylbenzene		ND		0.00050	10-17-89	
Total Xylenes		ND		0.00050	10-17-89	

mg/kg = milligrams per kilogram = parts per million (ppm).
mg/L = milligrams per liter = ppm.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not required.

PROCEDURES

TVH/BTEX--Total volatile hydrocarbons (TVH) and benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction according to EPA Method 5030 followed by analysis by a EPA Method 8020/602 (modified for TVH) which uses a gas chromatograph (GC) equipped with a photo-ionization detector (PID) and a flame-ionization detector (FID) in series. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TPH--Total petroleum hydrocarbons (low-to-medium boiling points) are measured by extraction according to EPA Method 5030 followed by analysis by a modified EPA Method 8015 which uses a GC equipped with an FID. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TEH--Total extractable hydrocarbons (high boiling points) are measured by extraction according to EPA Method 3550 for soils or EPA Method 3510 for water followed by a modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Tia Tran, Laboratory Supervisor

10-19-89
Date Reported

** 2 week turn around.

Applied GeoSystems

CHAIN-OF-CUSTODY RECORD

PROJ. NO.	PROJECT NAME
19014-4	ARCO : OAKLAND
P.O. NO.	SAMPLERS (Signature)
	Russell J. Bake

SEQUOIA ANALYTICAL
680 Chesapeake Dr.
Redwood City, Ca. 94063

DATE MM/DD/YY	TIME	SAMPLE I.D.	No. of Containers	TPHg	BTEX	TPHd	VOC (624)	Preserved?	LABORATORY I.D. NUMBER
2-1-90	5813	W-37-MW1	6	✓	✓	✓		HCl Ice	
		W-36-MW5	6	✓	✓	✓		HCl Ice	
		W-37-MW3	6	✓	✓	✓		HCl Ice	
		W-37-MW4	6	✓	✓	✓		HCl Ice	

RELINQUISHED BY (Signature):	DATE / TIME	RECEIVED BY (Signature):
Russell Bake	2-1-90 5:13	Bill Howell
RELINQUISHED BY (Signature):	DATE / TIME	RECEIVED BY (Signature):
Bill Howell		
RELINQUISHED BY (Signature):	DATE / TIME	RECEIVED FOR LABORATORY BY (Signature):

REMARKS:
2 wk
Turnover

SEND RESULTS TO:
Applied GeoSystems
43255 Mission Boulevard
Fremont, California 95826
(415) 651-1906
Proj. Mgr.: Bill Howell

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Applied GeoSystems	Client Project ID:	#19014-4, Arco, Oakland	Sampled:	Feb 1, 1990
3315 Almaden Expressway, Ste 34	Matrix Descript:	Water	Received:	Feb 2, 1990
San Jose, CA 95118	Analysis Method:	EPA 5030/8015/8020	Analyzed:	Feb 6, 1990
Attention: Dave Higgins	First Sample #:	002-0436 A	Reported:	Feb 13, 1990

TOTAL PETROLEUM FUEL HYDROCARBONS with BTEX DISTINCTION (EPA 8015/8020)

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons µg/L (ppb)	Benzene µg/L (ppb)	Toluene µg/L (ppb)	Ethyl Benzene µg/L (ppb)	Xylenes µg/L (ppb)
0020436 A	W-37-MW1	91	N.D.	N.D.	N.D.	0.36
0020437 A	W-36-MW5	81	0.94	0.88	N.D.	1.8
0020438 A	W-37-MW3	360	N.D.	N.D.	N.D.	0.85
0020439 A	W-37-MW4	680	N.D.	N.D.	N.D.	1.6
Detection Limits:		30	0.30	0.30	0.30	0.30

Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard.
Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Applied GeoSystems	Client Project ID:	#19014-4, Arco, Oakland	Sampled:	Feb 1, 1990
3315 Almaden Expressway, Ste 34	Sample Descript:	Water, W-37-MW1	Received:	Feb 2, 1990
San Jose, CA 95118	Analysis Method:	EPA 8240	Analyzed:	Feb 8, 1990
Attention: Dave Higgins	Lab Number:	002-0436 D	Reported:	Feb 13, 1990

VOLATILE ORGANICS by GC/MS (EPA 8240)

Analyte	Detection Limit µg/L	Sample Results µg/L
Acetone	10	N.D.
Benzene	2.0	N.D.
Bromodichloromethane	2.0	N.D.
Bromoform	2.0	N.D.
Bromomethane	2.0	N.D.
2-Butanone	10	N.D.
Carbon disulfide	2.0	N.D.
Carbon tetrachloride	2.0	N.D.
Chlorobenzene	2.0	N.D.
Chlorodibromomethane	2.0	N.D.
Chloroethane	2.0	N.D.
2-Chloroethyl vinyl ether	10	N.D.
Chloroform	2.0	N.D.
Chloromethane	2.0	N.D.
1,1-Dichloroethane	2.0	N.D.
1,2-Dichloroethane	2.0	N.D.
1,1-Dichloroethene	2.0	N.D.
Total 1,2-Dichloroethene	2.0	N.D.
1,2-Dichloropropane	2.0	N.D.
cis 1,3-Dichloropropene	2.0	N.D.
trans 1,3-Dichloropropene	2.0	N.D.
Ethylbenzene	2.0	N.D.
2-Hexanone	10	N.D.
Methylene chloride	2.0	N.D.
4-Methyl-2-pentanone	10	N.D.
Styrene	2.0	N.D.
1,1,2,2-Tetrachloroethane	2.0	N.D.
Tetrachloroethene	2.0	N.D.
Toluene	2.0	N.D.
1,1,1-Trichloroethane	2.0	N.D.
1,1,2-Trichloroethane	2.0	N.D.
Trichloroethene	2.0	N.D.
Trichlorofluoromethane	2.0	N.D.
Vinyl acetate	2.0	N.D.
Vinyl chloride	2.0	N.D.
Total Xylenes	2.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

V M Tague

Vickie Tague
Project Manager

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Applied GeoSystems	Client Project ID:	#19014-4, Arco, Oakland	Sampled:	Feb 1, 1990
3315 Almaden Expressway, Ste 34	Sample Descript:	Water, W-37-MW3	Received:	Feb 2, 1990
San Jose, CA 95118	Analysis Method:	EPA 8240	Analyzed:	Feb 8, 1990
Attention: Dave Higgins	Lab Number:	002-0438 D	Reported:	Feb 13, 1990

VOLATILE ORGANICS by GC/MS (EPA 8240)

Analyte	Detection Limit µg/L	Sample Results µg/L
Acetone	200	N.D.
Benzene	40	N.D.
Bromodichloromethane	40	N.D.
Bromoform	40	N.D.
Bromomethane	40	N.D.
2-Butanone	200	N.D.
Carbon disulfide	40	N.D.
Carbon tetrachloride	40	N.D.
Chlorobenzene	40	N.D.
Chlorodibromomethane	40	N.D.
Chloroethane	40	N.D.
2-Chloroethyl vinyl ether	200	N.D.
Chloroform	40	N.D.
Chloromethane	40	N.D.
1,1-Dichloroethane	40	N.D.
1,2-Dichloroethane	40	N.D.
1,1-Dichloroethene	40	N.D.
Total 1,2-Dichloroethene	40	N.D.
1,2-Dichloropropane	40	N.D.
cis 1,3-Dichloropropene	40	N.D.
trans 1,3-Dichloropropene	40	N.D.
Ethylbenzene	40	N.D.
2-Hexanone	200	N.D.
Methylene chloride	40	N.D.
4-Methyl-2-pentanone	200	N.D.
Styrene	40	N.D.
1,1,2,2-Tetrachloroethane	40	N.D.
Tetrachloroethene	40	2,000
Toluene	40	N.D.
1,1,1-Trichloroethane	40	N.D.
1,1,2-Trichloroethane	40	N.D.
Trichloroethene	40	N.D.
Trichlorofluoromethane	40	N.D.
Vinyl acetate	40	N.D.
Vinyl chloride	40	N.D.
Total Xylenes	40	N.D.

Analytes reported as N.D. were not present above the stated limit of detection. Because matrix effects and/or other factors required additional sample dilution, detection limits for this sample have been raised.

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Applied GeoSystems	Client Project ID:	#19014-4, Arco, Oakland	Sampled:	Feb 1, 1990
3315 Almaden Expressway, Ste 34	Sample Descript:	Water, W-37-MW4	Received:	Feb 2, 1990
San Jose, CA 95118	Analysis Method:	EPA 8240	Analyzed:	Feb 8, 1990
Attention: Dave Higgins	Lab Number:	002-0439 D	Reported:	Feb 13, 1990

VOLATILE ORGANICS by GC/MS (EPA 8240)

Analyte	Detection Limit µg/L	Sample Results µg/L
Acetone	200	N.D.
Benzene	40	N.D.
Bromodichloromethane	40	N.D.
Bromoform	40	N.D.
Bromomethane	40	N.D.
2-Butanone	200	N.D.
Carbon disulfide	40	N.D.
Carbon tetrachloride	40	N.D.
Chlorobenzene	40	N.D.
Chlorodibromomethane	40	N.D.
Chloroethane	40	N.D.
2-Chloroethyl vinyl ether	200	N.D.
Chloroform	40	N.D.
Chloromethane	40	N.D.
1,1-Dichloroethane	40	N.D.
1,2-Dichloroethane	40	N.D.
1,1-Dichloroethene	40	N.D.
Total 1,2-Dichloroethene	40	N.D.
1,2-Dichloropropane	40	N.D.
cis 1,3-Dichloropropene	40	N.D.
trans 1,3-Dichloropropene	40	N.D.
Ethylbenzene	40	N.D.
2-Hexanone	200	N.D.
Methylene chloride	40	N.D.
4-Methyl-2-pentanone	200	N.D.
Styrene	40	N.D.
1,1,2,2-Tetrachloroethane	40	N.D.
Tetrachloroethene	40	3,900
Toluene	40	N.D.
1,1,1-Trichloroethane	40	N.D.
1,1,2-Trichloroethane	40	N.D.
Trichloroethene	40	N.D.
Trichlorofluoromethane	40	N.D.
Vinyl acetate	40	N.D.
Vinyl chloride	40	N.D.
Total Xylenes	40	N.D.

Analytes reported as N.D. were not present above the stated limit of detection. Because matrix effects and/or other factors required additional sample dilution, detection limits for this sample have been raised.

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Applied GeoSystems	Client Project ID:	#19014-4, Arco, Oakland	Sampled:	Feb 1, 1990
3315 Almaden Expressway, Ste 34	Sample Descript:	Water, W-36-MW5	Received:	Feb 2, 1990
San Jose, CA 95118	Analysis Method:	EPA 8240	Analyzed:	Feb 8, 1990
Attention: Dave Higgins	Lab Number:	002-0437 D	Reported:	Feb 13, 1990

VOLATILE ORGANICS by GC/MS (EPA 8240)

Analyte	Detection Limit µg/L	Sample Results µg/L
Acetone	10	N.D.
Benzene	2.0	N.D.
Bromodichloromethane	2.0	N.D.
Bromoform	2.0	N.D.
Bromomethane	2.0	N.D.
2-Butanone	10	N.D.
Carbon disulfide	2.0	N.D.
Carbon tetrachloride	2.0	N.D.
Chlorobenzene	2.0	N.D.
Chlorodibromomethane	2.0	N.D.
Chloroethane	2.0	N.D.
2-Chloroethyl vinyl ether	10	N.D.
Chloroform	2.0	N.D.
Chloromethane	2.0	N.D.
1,1-Dichloroethane	2.0	N.D.
1,2-Dichloroethane	2.0	N.D.
1,1-Dichloroethene	2.0	N.D.
Total 1,2-Dichloroethene	2.0	N.D.
1,2-Dichloropropane	2.0	N.D.
cis 1,3-Dichloropropene	2.0	N.D.
trans 1,3-Dichloropropene	2.0	N.D.
Ethylbenzene	2.0	N.D.
2-Hexanone	10	N.D.
Methylene chloride	2.0	N.D.
4-Methyl-2-pentanone	10	N.D.
Styrene	2.0	N.D.
1,1,2,2-Tetrachloroethane	2.0	N.D.
Tetrachloroethene	2.0	160
Toluene	2.0	N.D.
1,1,1-Trichloroethane	2.0	N.D.
1,1,2-Trichloroethane	2.0	N.D.
Trichloroethene	2.0	N.D.
Trichlorofluoromethane	2.0	N.D.
Vinyl acetate	2.0	N.D.
Vinyl chloride	2.0	N.D.
Total Xylenes	2.0	2.3

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

VM Tague

Vickie Tague
Project Manager

Rand

Applied GeoSystems

TRANSMITTAL

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

TO: MR. RAFAT SHAHID
COUNTY OF ALAMEDA
DEPARTMENT OF ENVIRONMENTAL HEALTH
80 SWAN WAY, ROOM 200
OAKLAND, CALIFORNIA 94621

DATE: 4/12/91
PROJECT NUMBER: AGS 19011-1
SUBJECT: FIRST QUARTER 1991 ARCO SUMMARY REPORTS

FROM: MR. GREG BARCLAY
TITLE: GENERAL MANAGER

WE ARE SENDING YOU [XX] Attached [ ] Under separate cover via _____ the following items:

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

[ ] Letters [ ] Change Orders [ ] _____

COPIES	DATED	NO.	DESCRIPTION
1	4/12/91	19011-1	FIRST QUARTER 1991 SUMMARY REPORTS FOR VARIOUS ARCO SERVICE STATIONS IN ALAMEDA COUNTY.

THESE ARE TRANSMITTED as checked below:

[ ] For review and comment [ ] Approved as submitted [ ] Resubmit ___ copies for approval

[XX] As requested [ ] Approved as noted [ ] Submit___ copies for distribution

[ ] For approval [ ] Return for corrections [ ] Return ___ corrected prints

[ ] For your files [ ] _____

91 APR 15 AM 7:10

REMARKS: THESE REPROTS ARE BEING FORWARDED TO YOU ON BEHALF OF MR. KYLE CHRISTIE OF ARCO PRODUCTS COMPANY.

SUMMARY REPORT FOR ARCO STATION #5369 IS ALSO INCLUDED.

Copies: 1 to AGS project file no. 19011-1

SAN JOSE READER'S FILE

*Revision Date: 10/15/90
*File Name: TRANSMT.PRJ

Possible Waste Minimization Workshop Cosponsors

1) During a waste minimization meeting with our office on March 4, 1991, City of Hayward expressed a willingness to cosponsor workshops with us. If Hayward cosponsors workshops, they can get Centennial Hall as a place to hold a workshop for free or for very cheap (unless of course we only want to hold workshops at actual businesses/shops). The City of Hayward may be interested in cosponsoring a metal finishing workshop (they held a metal finishing workshop a year or two ago). Contact Joe Lucia, Steve Faelz and John Boykin.

2) SF's waste minimization workshop and assessment consultant (Geo/Resource Consultants) is interested in working with us in developing and holding workshops. Please discuss this with Bill Quan of City and County of S.F. before making any firm arrangements with S.F.'s consultant. Bill Quan is the person "in charge" of the consultant. Should Bill Quan be amenable to co-sponsored workshops, time and expense arrangements will need to be worked out.

    Bill Quan
    City and County of San Francisco
    Chief Administrator's Office
    554-6184/554-6188

    Mary L. Loo
    Geo/Resource Consultants, Inc.
    851 Harrison Street
    San Francisco, CA 94107
    777-3177

3) Lawrence Livermore National Laboratory may also be interested in cosponsoring a waste minimization workshops in general and a metal finishers workshop in particular. Apparently there is at least one metal finishing shop at LLNL which has recently gotten organized and may be a "case study" for waste minimization or compliance-geared-toward-waste-minimization. Contact Julio Diaz.

    Julio Diaz
    P.O. Box 808
    Livermore, CA 94550
    423-0624

4) Contra Costa County has cosponsored workshops with us in the past. They may be willing to do it again?? Contact Gina Gargano at 646-2286.

5) Bay Area Air Quality Management District?

6) EBMUD? Other sanitary districts?

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

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

April 12, 1991
0412rsha

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

Subject: **First Quarter 1991 Summary Reports** for various ARCO Service Stations located in Alameda County, California.

Mr. Shahid:

Enclosed are the Quarterly Summary Reports for various ARCO Service Stations in Alameda County, California, as listed below. We are sending you these reports on behalf of Mr. Kyle Christie of ARCO Products Company.

1260 Park Street	Alameda	Service Station 2112
1001 San Pablo Avenue	Albany	Service Station 2035
3000 Shattuck Avenue	Berkeley	Service Station 414
22141 Center Street	Castro Valley	Service Station 2152
2770 Castro Valley Road	Castro Valley	Service Station 4977
40055 Blacow Road	Fremont	Service Station 2147
35900 Fremont Boulevard	Fremont	Service Station 2158
40077 Mission Boulevard	Fremont	Service Station 6201
43500 Grimmer Boulevard	Fremont	Service Station 6206
365 Jackson Street	Hayward	Service Station 1319
899 Rincon Avenue	Livermore	Service Station 771
10600 MacArthur Blvd.	Oakland	Service Station 276
6407 Telegraph Avenue	Oakland	Service Station 374
2110 Mountain/Merced	Oakland	Service Station 623
3310 Park Boulevard	Oakland	Service Station 2107
889 West Grand Avenue	Oakland	Service Station 2169
556 Hegenberger Road	Oakland	Service Station 4494
731 W. MacArthur Blvd.	Oakland	Service Station 4931
52nd Street	Oakland	Service Station 6148

(TEST & MONITORING SYSTEM)

V. (CONT'D)

(a)
METHOD SENSITIVITY: (Vapor-Phase Detection)

FILLED WITH DRY SAND, THE LIQUID GASOLINE WOULD MOVE BY GRAVITY TO THE LESS PREMEABLE BOTTOM WALL OF CLAY AND BY CAPILLARITY TO THE SIDE WALLS. IF THE CLAY WERE MOIST THE GASOLINE WOULD BE CONTAINED UNLESS THE CLAY HAD CRACKS OR LESS-DENSE PERMEABLE STRATA.

HIGH SPECIFIC GRAVITY LIQUIDS SUCH AS HALOGENATED HYDRO-CARBONS WOULD PENETRATE THE CLAY MORE READILY AND MOVE TO LOWER STRATA, ESPECIALLY IF THE CLAY WERE NOT SATURATED WITH MOISTURE.

GASOLINE VAPORS, PRIMARILY ISO-OCTANE, WOULD PERMEATE RAPIDLY INTO THE MORE POROUS SAND FILLING THE CLAY PIT (SEE SOIL EFFECTS). THE TOTAL VOID VOLUME, NO SAND, IS 860 CU. FT. (EQUIVALENT TO ABOUT 24,355 LITERS) THEREFOR 100 PARTS PER/MILLION (PPM) OF ISO-OCTANE WOULD BE 2.44 LITERS OF ISO-OCTANE VAPOR.

THIS VAPOR IS EQUAL TO 0.001 GALLONS (4.6 GRAMS) OF LIQUID ISO-OCTANE. THEREFOR A GAS CHROMATOGRAPH SYSTEM WITH A SEN-SITIVITY OF (1 PPM) ONE PART PER MILLION, WOULD PROVIDE READY CONFIRMATION OF A LEAK AT THE REQUIRED LEVEL OF DISCOVERY.

AFTER READING OUR PRESENTATION OF TOXGUARDS "TOX-ALERT" SYSTEM, FEEL FREE TO CONTACT OUR OFFICE REGARDING ADDITIONAL INFORMATION, OR IF YOU WOULD PREFER A COMPANY SPECIALIST TO CONTACT YOU. FOR A SALES APPOINTMENT OR CONSULTATION, CALL (714) 370-3470

. . . . THANK YOU FOR LETTING TOXGUARD SERVE YOU . . . . . .

15135 Hesperian Blvd.	San Leandro	Service Station 2162
17601 Hesperian Blvd.	San Lorenzo	Service Station 608

The Regional Water Quality Control Board and ARCO Products Company have no records for the following service station:

1401 Grand Avenue	San Leandro	Service Station 530

We understand that ARCO does not own the service station located at 4191 First Street in Pleasanton, California. Please call me at (408) 264-7723 if you have questions regarding the summary reports.

Sincerely,
Applied GeoSystems

Greg Barclay
Branch Manager

Enclosures: First Quarter 1991 Summary Reports

cc: Mr. Kyle Christie, ARCO Products Company

Mr. Ray Newsome
Senior District Engineer
Shell Oil Co.
P.O. Box 4023
Concord, CA 94524

RE: 2724 Castro Valley Blvd., Castro Valley, CA.

Dear Mr. Newsome:

This letter is to confirm the meeting with Shell Oil Company and Dr. Milton Righetti, for March 15, 1991 at 9:00 a.m. at my office at the above address.

If you have any question, please contact me at 271-4320.

Sincerely,

Larry Seto
Senior Hazardous Materials Specialist

LS:lp

cc: Rich Hiett, RWQCB
Charles Comstock, Converse Environmental
Matthew Righetti, Attorney
Dr. Milton Righetti, Property Owner
David Swope, Attorney
Mohsen Mehran, Geosystem Consultants
Rafat Shahid, Assistant Agency Director, Environmental Health
Ariu Levi, Supervisor, Hazardous Materials
Ed Howell, Chief, Hazardous Materials
files

UST LEAK SITE UPDATE Date of Last Review/Update: January 15, 1991 Current Date: April 15, 1991

SITE IDENTIFICATION

Name: ARCO Service Station 276 Case No.: _____

Address: 10600 MacArthur Boulevard
Street Number Street

Oakland 94605
City ZIP Code

County: Alameda Substance: Gasoline

Local Agency: Alameda County Environmental Health Department

Regional Board: Regional Water Quality Control Board - San Francisco Bay Area

LEAD STAFF PERSON

ACEHD-Scott Seary

CASE TYPE

_____ Undetermined _____ Soil Only _____ Ground Water _____ Drinking Water

STATUS (Date indicates when case moved into status)

_____	No Action Taken	
_____	Leak Being Confirmed	Date _____
_____	Preliminary Site Assessment Workplan Submitted	Date _____
_____	Preliminary Site Assessment Underway	Date _____
_____	Pollution Characterization	Date _____
_____	Remediation Plan	Date _____
_____	Remedial Action Underway	Date _____
_____	Post Remedial Action Monitoring	Date _____
_____	Case Referred to Regional Board	Date _____
_____	Case Referred to Dept. of Health Services	Date _____
_____	Case Closed	Date _____

REMEDIAL ACTIONS

COMMENTS

In the previous quarter ARCO performed an onsite and offsite investigation for assessment of possible soil and/or ground-water contamination. Soil and ground water have been impacted by hydrocarbons. Assessment reports for onsite and offsite investigations to be issued during first quarter of 1991. ARCO is currently monitoring water levels monthly and water quality quarterly.

Please refer to the attached page for listing of previously submitted reports which document site history.

RESPONSIBLE PARTY IDENTIFICATION (Only if newly discovered or changed)

Name _____

Contact _____ Phone ( )

Address _____
Street Number Street

_____
City State ZIP Code

USTARCO.FRM/12/90/ssj

REPORT	DATE	CONSULTANT
Letter Report on Quarterly Ground-Water Monitoring for Fourth Quarter 1990 AGS 60026-1	1/29/91	Applied GeoSystems
Letter Report on Quarterly Ground-Water Monitoring for Third Quarter 1990 AGS 60026-1	1/2/90	Applied GeoSystems
Letter Report on Quarterly Ground-Water Monitoring for Fourth Quarter 1989, First & Second Quarter 1990 at ARCO Station 276, Oakland, CA AGS 19014-4	8/6/90	Applied GeoSystems
Report on Limited Subsurface Environmental Investigation AGS 19014-1	8/8/89	Applied GeoSystems
Results of Soil Sampling in Proposed Tank Pit Location	2/13/90	Applied GeoSystems
Report on Gasoline Storage Tank Removal and Replacement AGS 19014-5	2/11/91	Applied GeoSystems
Former Waste-Oil Tank Pit Analytical Results and Site Plan (Correspondence to Ms. Mary Meirs, ACEHD/HMD)	2/6/89	Pacific Environmental Group, Inc.
Preliminary Environmental Assessment Proposed Foothill Square Job No. KE812-3, 12056	10/3/88	Kaldveer Associates
Preliminary Soil and Groundwater Quality Testing Program Foothill Square Job No. KE812-3A, 12302	10/7/88	Kaldveer Associates
Soil Sampling and Monitoring Well Installation Foothill Square. Job No. 8-088.01		Western Geologic Resources, Inc.