GeoStrategies Inc.
2140 WEST WINTON AVENUE
HAYWARD, CALIFORNIA 94545
(510) 352-4800

July 2, 1992

County of Alameda
Department of Environmental Health
Hazardous Materials Division
80 Swan Way, Room 200
Oakland, California 94621

Attention: Mr. Dennis Byrne Certified Mail

Reference: ARCO Service Station #2169
889 West Grand Avenue
Oakland, California 94607

Mr. Byrne:

As requested by ARCO Products Company, we are forwarding a copy of the Well Installation Report dated June 30, 1992 for the above referenced location. The report documents the installation of four ground-water monitoring wells, one ground-water recovery well, and presents analytical results of related soil and ground-water sampling.

If you have any questions or comments, please call.

Sincerely,

John F. Vargas

JFV/rcm

Enclosure

cc: Mr. Michael Whelan, ARCO Products Company
Mr. H. C. Winsor, ARCO Products Company
Mr. Lester Feldman, Regional Water Quality Control Board (Certified Mail)

GeoStrategies Inc.

WELL INSTALLATION REPORT

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

792705-3

June 30, 1992

GeoStrategies Inc.
2140 WEST WINTON AVENUE
HAYWARD, CALIFORNIA 94545
(510) 352-4800

June 30, 1992

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

Attn: Mr. Michael Whelan

Re: WELL INSTALLATION REPORT
ARCO Service Station No. 2169
889 West Grand Avenue
Oakland, California

Gentlemen:

INTRODUCTION

This Well Installation Report was prepared by GeoStrategies Inc. (GSI) and presents well installation activities and ground-water sampling results for the above referenced location (Plate 1). Between March 16 and 25, 1992, five exploratory soil borings were drilled and completed as ground-water monitoring wells A-1 through A-4 and recovery well AR-1. Well locations are shown on Plate 2. Field work was performed to comply with current State of California Water Resources Control Board (SWRCB) and local agency guidelines. Field Methods and Procedures were presented in the GSI Work Plan dated October 29, 1991.

SITE BACKGROUND

On May 14, 1991, GSI drilled [redacted] as documented in a GSI Preliminary Tank Replacement Report dated July 1, 1991. Four soil borings were drilled adjacent to the underground storage tank (UST) complex (A-B through A-E) and one soil boring (A-A) was drilled in the proposed UST complex location. Total Petroleum Hydrocarbons calculated as Gasoline (TPH-Gasoline) and as Diesel (TPH-Diesel) and Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX) were detected in soil samples from each boring collected from 5.5 to 11.0 feet below grade. In addition, [redacted] to the existing USTs was properly abandoned.

In February and March 1992, the underground storage tanks at the site were removed and replaced. The former tank complex was composed of four steel tanks: one 12,000 gallon tank (unleaded), one 8,000 gallon tank (regular), and two 6,000 gallon tanks (diesel and super unleaded). The present tank complex is composed of [redacted] complexes are shown on Plate 2. A report documenting the tank removal is forthcoming.

FIELD ACTIVITIES AND PROCEDURES

Five on-site exploratory borings were drilled on [redacted], using a truck-mounted, hollow-stem auger drilling rig. Borings A-1 through A-4 and AR-1 drilled to total depths ranging from [redacted] below grade. Soil samples were collected at five-foot intervals using a modified California split-spoon sampler fitted with stainless steel sample tube liners. A GSI geologist observed the drilling, described the soil samples using the Unified Soil Classification System and Munsell Soil Color Chart, and prepared a lithologic log for each boring. Exploratory boring logs are presented in Appendix A.

Soil Sampling

An Organic Vapor Monitor (OVM) photoionization detector was used to perform head-space analysis on soils from each sampled interval, as a reconnaissance-level test for the presence of Volatile Organic Compounds (VOCs) in the soil. Head-space analysis results are presented on each boring log in Appendix A.

Soil samples retained for chemical analyses were collected in clean stainless steel liners and sealed on both ends with aluminum foil and plastic end caps. Samples were labeled, entered onto a Chain-of-Custody form, and transported in a cooler with blue ice to Sequoia Analytical (Sequoia), a State-certified environmental laboratory located in Redwood City, California.

Monitoring Well Installation

Borings A-1, A-2, A-3, and A-4 were drilled using 8-inch-diameter and 10-inch-diameter augers. Monitoring Wells A-1, A-2, A-3, and A-4 were installed to depths of 25.0, 25.0, 29.5, and 28.0 feet below existing ground surface, respectively. Bentonite was placed in the lower portions of Borings A-1, A-2, A-3, and A-4 at thicknesses of 5.0, 1.5, 0.5, and 2.0 feet, respectively. The wells were constructed using 3-inch-diameter Schedule 40 PVC well casing with 0.020-inch machine-slotted well screen. Well screen extends from 9 to 25 feet in well A-1, from 10 to 25 feet in well A-2, from 9 to 29.5 feet in well A-3, and from 8 to 28 feet in well A-4. Lonestar #2/12 graded sand was placed in the annular space across the entire screened interval and extends one-foot above the top of the well screen. A one-foot thick bentonite seal was placed above the sandpack in each well and then hydrated with clean water. A neat cement seal was placed from the top of the bentonite to approximately 1.0-foot below ground surface in each well. A water-proof underground vault box, set in concrete, was installed over the top of each well, and a water-proof locking well cap and lock were placed on each well casing.

Recovery Well Installation

Boring AR-1 was installed using 8-inch-diameter and 12-inch-diameter augers. Recovery Well AR-1 was installed to a depth of 28.0 feet below grade. Bentonite was placed in the lower 2.0 feet of Boring AR-1 as a bottom seal. The recovery well was constructed using 6-inch-diameter Schedule 40 PVC blank well casing and 0.020-inch continuous wrap, carbon steel well screen. Well screen extends from 8 to 28 feet in well AR-1. Lonestar #2/12 graded sand was placed across the entire screened interval and extends one-foot above the top of the well screen. A one-foot thick bentonite seal was placed above the sandpack and then hydrated with clean water. A neat cement seal was placed from the top of the bentonite to approximately 1.0-foot below ground surface. A waterproof underground vault box was installed over the top of the well and a waterproof locking well cap and lock were placed on the well casing. Well completion details are presented with the Exploratory Boring Logs in Appendix A.

HYDROGEOLOGIC CONDITIONS

Regional Setting

The site is located in Oakland, California at the base of the Berkeley Hills approximately 1/2-mile east of the San Francisco Bay. The site is situated on alluvial-fan deposits of the Temescal Formation comprised of interfingering lenses of clayey gravel, sandy silty clay, and sand-clay-silt mixtures (Radbruch, D.H., 1957). Local topography suggests ground-water flows to the west toward San Francisco Bay.

Local Setting

Based on exploratory boring data, the local subsurface lithology appears to consist of clay, sand, silt, and minor gravel to the total depth explored of 30.0 feet below ground surface. Clay was observed in each boring from ground surface to between 8 (AR-1) and 16.5 (A-2) feet below grade. The clay was underlain by interbedded sand, clayey sand, silt, and clay to the total depths of the borings. Minor interbedded gravel lenses were also observed in Borings AR-1 and A-3. Each boring was terminated in soil composed of either clay or silt, which may represent a local aquitard. Groundwater was first encountered in each boring at depths ranging from 10 to 18.5 feet below grade. Water-levels stabilized after completion of the wells at depths ranging from 9.5 to 11 feet below grade.

SOIL CHEMICAL ANALYTICAL RESULTS

Soil samples were analyzed for Total Petroleum Hydrocarbons calculated as Gasoline (TPH-Gasoline) and as Diesel (TPH-Diesel) according to EPA Method 8015 (Modified) and Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX) according to EPA Method 8020. Chemical analyses were performed at Sequoia in Redwood City, California.

Soil chemical analytical data are summarized in Table 1. Six soil samples from Borings A-1 through A-4, collected at depths ranging between 4 and 10 feet below grade, were selected for chemical analysis. Soil samples from Boring AR-1 were not analyzed due to fill material being encountered from ground surface to first encountered water. TPH-Gasoline was detected in the soil sample collected from Boring A-1, at a depth of 10 feet, at a concentration of 2.2 parts per million (ppm). Benzene was identified in soil samples from Boring A-1 at depths of 4.5 and 10.0 feet, at concentrations of 0.024 ppm and 0.13 ppm, respectively. TPH-Diesel was detected in the 4.0-foot soil sample from Boring A-2 at a concentration of 14 ppm. TPH-Gasoline and BTEX were reported as not detected (ND) for soil samples from Borings A-2, A-3, and A-4. TPH-Diesel was reported as ND for soil samples from Borings A-1, A-3, and A-4. The Sequoia chemical analytical report and Chain-of-Custody form are presented in Appendix B.

GROUND-WATER MONITORING RESULTS

Depths to water-levels were measured in each monitoring well prior to sampling. Static ground-water levels were measured from the surveyed top of each well box and recorded to the nearest ± 0.01 foot. Water - level measurements were referenced to Mean Sea Level (MSL) datum and used to construct a potentiometric map (Plate 2). Potentiometric data indicate that groundwater flows to the northwest at a calculated hydraulic gradient of 0.004.

Each well was inspected for the presence of floating product. Floating product was not observed in any well. Depth-to-groundwater and floating product measurements are presented in Table 2 (Field Monitoring Data).

GROUND-WATER CHEMICAL ANALYTICAL RESULTS

Groundwater samples were collected by Gettler-Ryan Inc. (G-R) from Wells A-1 through A-4 and AR-1 on April 3, 1992. Groundwater samples were analyzed for TPH-Gasoline and TPH-Diesel according to EPA Method 8015 (Modified) and BTEX according to EPA Method 8020. Chemical analyses were performed by Sequoia in Redwood City, California.

TPH-Gasoline was detected in samples from Wells A-1, A-3, A-4, and AR-1 at concentrations ranging between 35 parts per billion (ppb) and 34,000 ppb. TPH-Diesel was detected in Wells A-1, A-3, A-4, and AR-1 at concentrations ranging between 85 ppb and 12,000 ppb. Benzene was identified in Wells A-1, A-3, and AR-1 at concentrations of 6200 ppb, 0.79 ppb, and 310 ppb, respectively. A chemical concentration map for TPH-Gasoline and benzene is presented on Plate 3. Ground-water chemical analytical data are summarized in Table 3. The Sequoia analytical report and Chain-of-Custody form are presented in Appendix C.

SUMMARY

The results of this investigation are summarized below:

- Five exploratory soil borings were drilled on March 16, 17, and 25, 1992 and completed as ground-water monitoring wells A-1 through A-4 and recovery well AR-1.
- Lithology beneath the site consists primarily of clay and interbedded sand, silt, clay, and minor gravel to the maximum depth explored of 30.0 feet.
- Ground water-levels were initially encountered at depths between 10.0 and 18.0 feet below grade. Water-levels stabilized at depths ranging from 9.5 to 11 feet below grade.
- Potentiometric data indicate that groundwater flows to the northwest at a calculated hydraulic gradient of 0.004.
- TPH-Gasoline was detected in the soil sample from Boring A-1 at 10.0 feet at a concentration of 2.2 ppm. TPH-Diesel was identified in Boring A-2 at 4.0 feet at a concentration 14 ppm. TPH-Gasoline and TPH-Diesel were not detected in the 10.0 foot samples from Borings A-3 and A-4.
- TPH-Gasoline was identified in ground-water samples from Wells A-1, A-3, A-4, and AR-1 at concentrations ranging between 35 ppb and 34,000 ppb. Benzene was detected in Wells A-1, A-3, and AR-1 at concentrations ranging between 0.79 ppb and 6200 ppb. TPH-Gasoline and benzene were reported as not detected (ND) for Well A-2. TPH-Diesel was detected in Wells A-1, A-3, A-4, and AR-1 at concentrations of between 85 ppb and 12,000 ppb.

CONCLUSIONS

Based on the results of this investigation, petroleum hydrocarbons have impacted soil and groundwater beneath the site. Soil contamination appears to be primarily present in the vicinity of the former tank complex. Contamination [redacted] source based on the well proximity to the former tank complex and the

PLANNED SITE ACTIVITIES

The following are activities planned for the site for the third quarter of 1992:

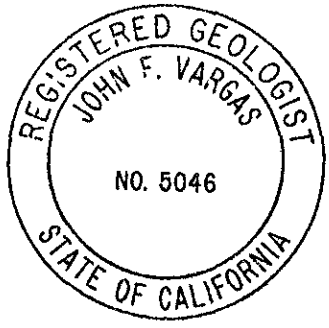
- An aquifer test will be performed to estimate hydraulic properties and evaluate potential hydrocarbon pathways in the upper-most aquifer beneath the site.
- Research properties in the site vicinity for potential up-gradient sources of hydrocarbon contamination.
- The proposed vapor extraction/monitoring wells and groundwater extraction well, within the new tank complex, have been installed. In addition, a vapor extraction test has been conducted. A report documenting the results of these field activities is forthcoming.
- Perform groundwater sampling and monitoring for the third quarter of 1992.

If you have any questions, please call.

GeoStrategies Inc. by,

Robert C. Mallory
Geologist

John F. Vargas
Senior Geologist
R.G. 5046



RCM/JFV/shl

Plate 1. Vicinity Map
Plate 2. Site Plan/Potentiometric Map
Plate 3. TPH-G/Benzene Concentration Map

Appendix A: Exploratory Boring Logs and Well Construction Details
Appendix B: Soil Analytical Report and Chain-of-Custody Form
Appendix C: Groundwater Analytical Report and Chain-of-Custody Form

QC Review: _____

References Cited

Dorothy H. Radbruch, 1957, Areal and Engineering Geology of the Oakland West Quadrangle, California, U.S. Geological Survey Map I-239.

TABLE 1

SOIL ANALYSES DATA

SAMPLE ID	SAMPLE DATE	ANALYZED DATE	TPH-G (PPM)	BENZENE (PPM)	TOLUENE (PPM)	ETHYLBENZENE (PPM)	XYLENES (PPM)	TPH-D (PPM)
A-1-4.5	16-Mar-92	01-Apr-92	<1.0	0.024	0.014	0.009	0.034	<1.0
A-1-10.0	16-Mar-92	01-Apr-92	2.2	0.13	0.051	0.023	0.71	<1.0
A-2-4.0	16-Mar-92	01-Apr-92	<1.0	<0.0050	0.0050	<0.0050	<0.0050	14
A-2-10.0	16-Mar-92	01-Apr-92	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<1.0
A-3-10.0	17-Mar-92	01-Apr-92	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<1.0
A-4-10.0	17-Mar-92	01-Apr-92	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<1.0

TPH-G = Total petroleum hydrocarbons calculated as gasoline
TPH-D = Total petroleum hydrocarbons calculated as diesel
PPM = Parts Per Million

NOTES: 1. All data shown as <X are reported as ND (None Detected)
2. The last number of the sample I.D. corresponds to the depth the sample was taken.

TABLE 2

FIELD MONITORING DATA

WELL NO.	MONITORING DATE	CASING DIA. (IN)	TOTAL WELL DEPTH (FT)	WELL ELEV. (FT)	DEPTH TO WATER (FT)	PRODUCT THICKNESS (FT)	STATIC WATER ELEV. (FT)	PURGED WELL VOLUMES	pH	TEMPERATURE (F)	CONDUCTIVITY (u MHOS/CM)
A-1	03-Apr-92	3	24.5	14.75	10.35	----	4.40	5	7.13	66.7	1399
A-2	03-Apr-92	3	25.2	15.16	10.97	----	4.19	5	7.50	67.0	1031
A-3	03-Apr-92	3	29.0	16.38	11.70	----	4.68	5	7.73	66.2	920
A-4	03-Apr-92	3	28.0	15.89	10.84	----	5.05	5	7.60	66.1	1015
AR-1	03-Apr-92	6	28.0	15.71	11.07	----	4.64	5	7.70	67.2	880

Notes: 1. Static water elevations referenced to Mean Sea Level (MSL).
2. Physical parameter measurements represent stabilized values.

TABLE 3

HISTORICAL GROUND-WATER QUALITY DATABASE

WELL NO.	SAMPLE DATE	ANALYZED DATE	TPH-G (PPB)	BENZENE (PPB)	TOLUENE (PPB)	ETHYLBENZENE (PPB)	XYLENES (PPB)	TPH-DIESEL (PPB)
A-1	03-Apr-92	10-Apr-92	34000	6200	3900	410	3100	6100
A-2	03-Apr-92	10-Apr-92	<30	<0.30	<0.30	<0.30	<0.30	<50
A-3	03-Apr-92	10-Apr-92	200	0.79	0.65	4.4	<0.30	130
A-4	03-Apr-92	10-Apr-92	35	<0.30	<0.30	<0.30	<0.30	85
AR-1	03-Apr-92	10-Apr-92	17000	310	1400	320	3000	12000

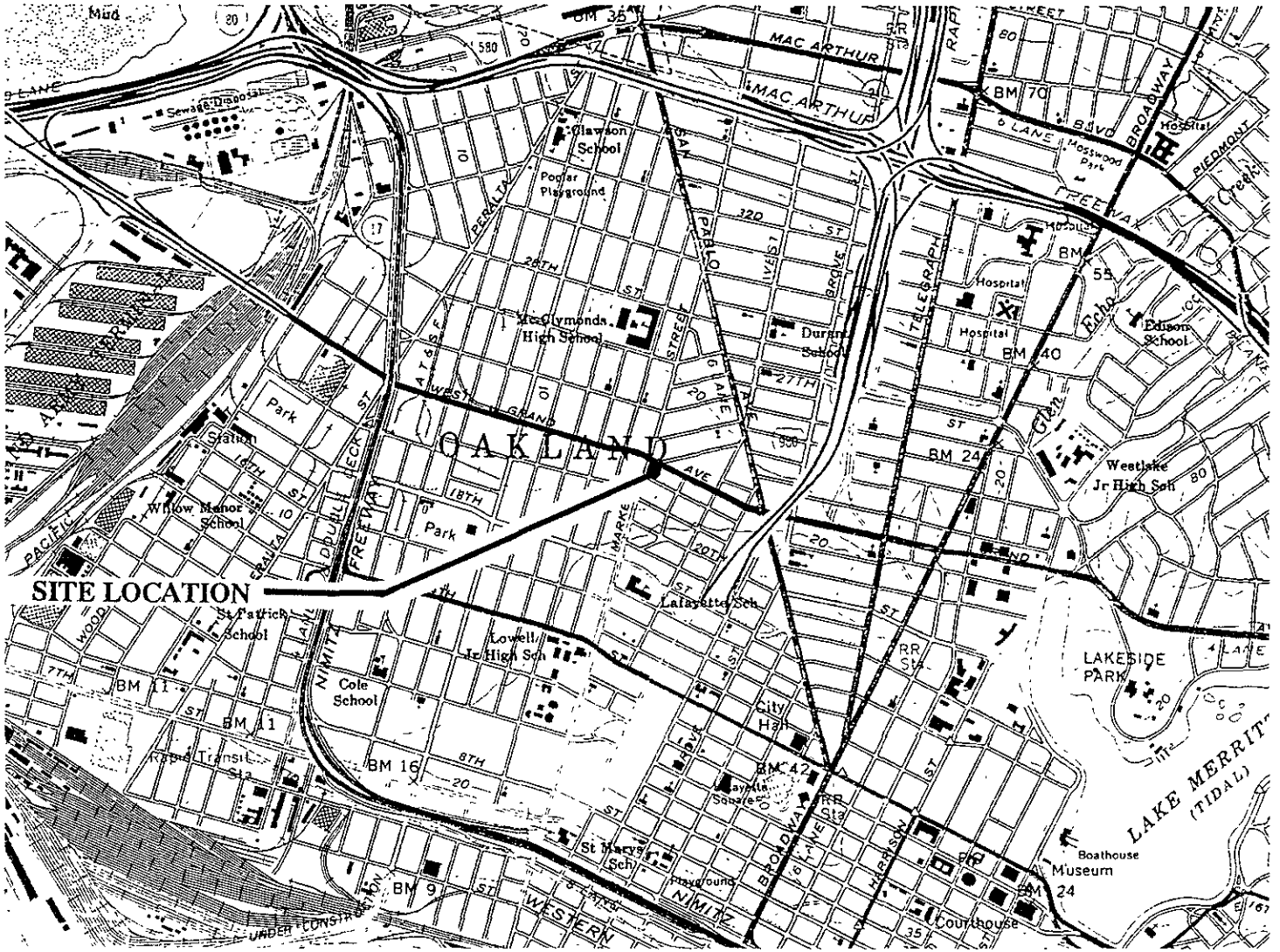
CURRENT REGIONAL WATER QUALITY CONTROL BOARD MAXIMIM CONTAMINANT LEVELS
Benzene 1. ppb Xylenes 1750. ppb Ethylbenzene 680. ppb

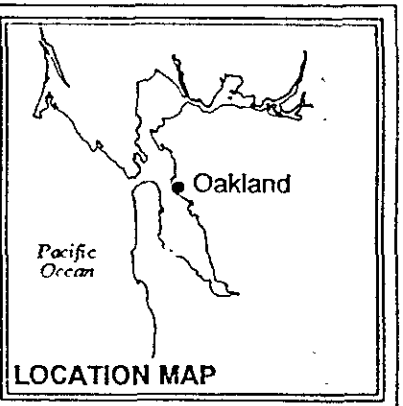
CURRENT DHS ACTION LEVELS
Toluene 100.0 ppb

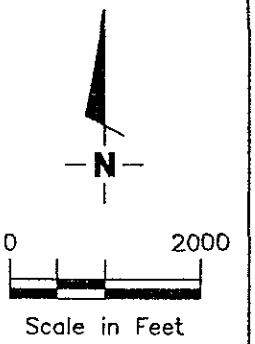
TPH-G = Total Petroleum Hydrocarbons calculated as Gasoline
PPB = Parts Per Billion

Notes: 1. DHS Action levels and MCL's are subject to change pending State of California review.
2. All data shown as <X are reported as ND (none detected).

ILLUSTRATIONS







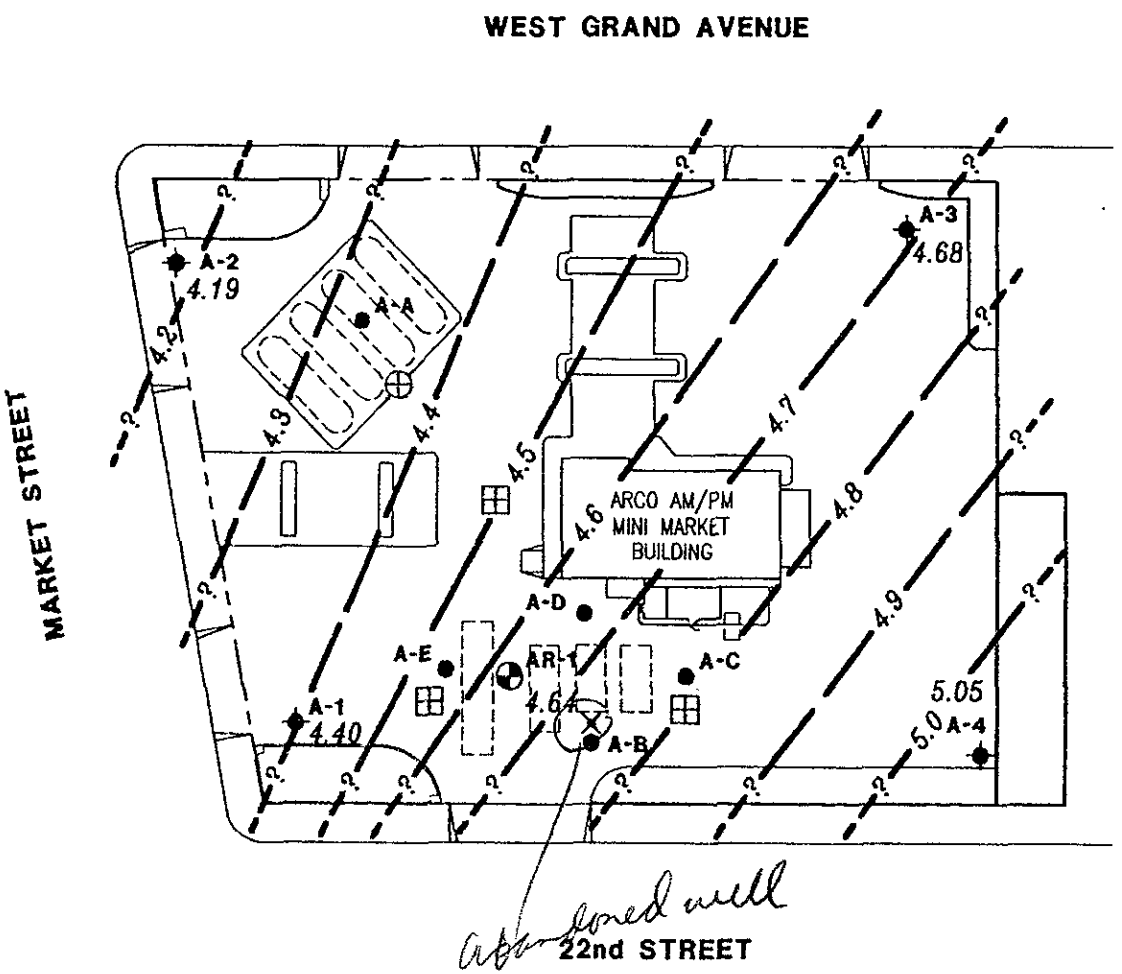
Base Map: USGS Topographic Map

GeoStrategies Inc.

VICINITY MAP
ARCO Service Station #2169
889 West Grand Avenue
Oakland, California

PLATE 1

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
7927		5/91	



EXPLANATION

- Ground-water monitoring well
- Ground-water recovery well
- Soil Boring
- Abandoned well
- Proposed vapor extraction well
- Proposed ground-water recovery well
- 99.99 — Ground-water elevation contour. Approximate Gradient = 0.004
- 99.99 — Ground-water elevation in feet referenced to Mean Sea Level (MSL) measured on April 3, 1992

NOTES: 1. Contours may be influenced by irrigation practices and/or site construction activities.

N

0 50

Scale in Feet

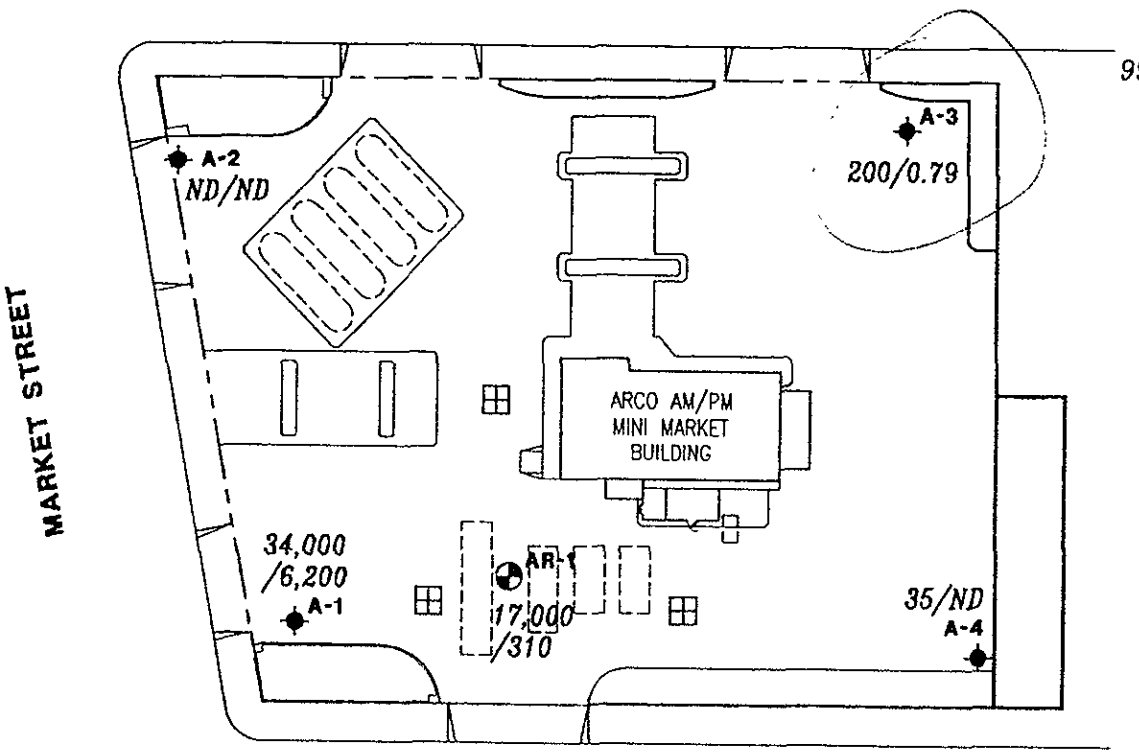
Base Map: ARCO Site Plan dated 6-17-83 and ARCO Tank & Line Replacement Site Plan dated 4-22-91

GeoStrategies Inc.

SITE PLAN/POTENTIOMETRIC MAP
ARCO Service Station #2169
889 West Grand Avenue
Oakland, California

PLATE 2

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
792705-3	RCm	5/92	



EXPLANATION

- Ground-water monitoring well
- Ground-water recovery well
- Proposed vapor extraction well

99/9.9 TPH-G (Total Petroleum Hydrocarbons calculated as Gasoline)/Benzene concentrations in ppb sampled on April 3, 1992

ND Not Detected (See laboratory reports for detection limits)

N

0 50

Scale in Feet

Base Map: ARCO Site Plan dated 6-17-83 and ARCO Tank & Line Replacement Site Plan dated 4-22-91

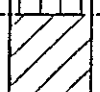
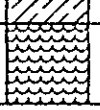
GSI GeoStrategies Inc.

TPH-G/BENZENE CONCENTRATION MAP
ARCO Service Station #2169
889 West Grand Avenue
Oakland, California

PLATE 3

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
792705-3	RCM	5/92	

APPENDIX A
EXPLORATORY BORING LOGS
WELL CONSTRUCTION DETAILS

MAJOR DIVISIONS					TYPICAL NAMES
COARSE-GRAINED SOILS MORE THAN HALF IS COARSER THAN NO. 200 SIEVE	GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE SIZE	CLEAN GRAVELS WITH LITTLE OR NO FINES	GW		WELL GRADED GRAVELS WITH OR WITHOUT SAND, LITTLE OR NO FINES
			GP		POORLY GRADED GRAVELS WITH OR WITHOUT SAND, LITTLE OR NO FINES
		GRAVELS WITH OVER 15% FINES	GM		SILTY GRAVELS, SILTY GRAVELS WITH SAND
			GC		CLAYEY GRAVELS, CLAYEY GRAVELS WITH SAND
	SANDS MORE THAN HALF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE SIZE	CLEAN SANDS WITH LITTLE OR NO FINES	SW		WELL GRADED SANDS WITH OR WITHOUT GRAVEL, LITTLE OR NO FINES
			SP		POORLY GRADED SANDS WITH OR WITHOUT GRAVEL, LITTLE OR NO FINES
		SANDS WITH OVER 15% FINES	SM		SILTY SANDS WITH OR WITHOUT GRAVEL
			SC		CLAYEY SANDS WITH OR WITHOUT GRAVEL
FINE-GRAINED SOILS MORE THAN HALF IS FINER THAN NO. 200 SIEVE	SILTS AND CLAYS LIQUID LIMIT 50% OR LESS		ML		INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTS WITH SANDS AND GRAVELS
			CL		INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY CLAYS WITH SANDS AND GRAVELS, LEAN CLAYS
			OL		ORGANIC SILTS OR CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50%		MH		INORGANIC SILTS, MICACEOUS OR DIATOMACIOUS, FINE SANDY OR SILTY SOILS, ELASTIC SILTS
			CH		INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
			OH		ORGANIC SILTS OR CLAYS OF MEDIUM TO HIGH PLASTICITY
HIGHLY ORGANIC SOILS			PT		PEAT AND OTHER HIGHLY ORGANIC SOILS

LL - Liquid Limit (%)

PI - Plastic Index (%)

PID - Volatile Vapors in ppm

MA - Particle Size Analysis

2.5 YR 6/2 - Soil Color according to Munsell Soil Color Charts (1975 Edition)

5 GY 5/2 - GSA Rock Color Chart

- No Soil Sample Recovered
- "Undisturbed" Sample
- Bulk or Classification Sample
- First Encountered Ground Water Level
- Piezometric Ground Water Level

Penetration - Sample drive hammer weight - 140 pounds falling 30 inches. Blows required to drive sampler 1 foot are indicated on the logs

GeoStrategies Inc.

Unified Soil Classification - ASTM D 2488-85
and Key to Test Data

Field location of boring:

(See Plate 2)

Project No.:	792705	Date: 3/16/92	Boring No. A-1
Client:	ARCO Products Company SS#2169		
Location:	889 W. Grand Avenue		
City:	Oakland		Sheet 1 of 2
Logged by:	RCM	Driller: Bayland	

Drilling method: Hollow Stem Auger

Hole diameter: 8" converted to 10"

Casing installation data:

Top of Box Elevation: 14.75' Datum: MSL

Water Level	13.5'	10.8'
Time	9:40	11:10
Date	3/16/92	3/16/92

PID (ppm)	Blows/ft.* or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Description
				1	PAVEMENT SECTION - 0.75 feet.
				2	
				3	
	250	S&H	A-1-	4	CLAY (CL) - olive (5Y 5/4); medium stiff; damp; 90% clay;
54.0	250		4.5		10% silt; trace fine sand.
	350			5	
				6	
				7	
				8	
		S&H		9	Very stiff, trace organic matter at 10.0 feet.
			A-1-		
82	17		10.0	10	
		S&H		11	CLAYEY SAND (SC) - light olive brown, (2.5Y S/Y);
			A-1-		medium dense; moist; 60% find sand; 40% clay; trace
74	11		12.5	12	fine gravel.
				13	
					Saturated at 13.5 feet.
		S&H		14	
			A-1-		
12.4	12		15.0	15	SAND WITH CLAY (SP-SC) - dark greenish grey (5GY
				16	4/1); medium dense; saturated; 90% fine to medium
					sand; 10% clay; trace fine gravel.
				17	
				18	
		S&H		19	CLAYEY SAND (SC) - light olive brown (2.5Y 5/4)
			A-1-		medium dense; saturated; 60% fine to coarse sand, 30%
5.5	25		20.0	20	clay; 10% fine to medium angular gravel.

Remarks:

*Converted to equivalent Standard Penetration blows/ft.

GeoStrategies Inc.

Log of Boring

BORING NO. A-1

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
792705		3/92		

Field location of boring:

(See Plate 2)

Project No.: 792705	Date: 3/16/92	Boring No.: A-1	
Client: ARCO Products Company SS#2169			
Location: 889 W. Grand Avenue			
City: Oakland		Sheet 2 of 2	
Logged by: RCM	Driller: Bayland		

Drilling method: Hollow Stem Auger

Hole diameter: 8" , converted to 10"

Casing installation data:

Top of Box Elevation: Datum:

Water Level				
Time				
Date				

PID (ppm)	Blows/ft. or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description
				21				
				22				
				23				
		S&H		24				SAND (SW) - dark yellowish brown (10 YR 4/4) loose; saturated; 95% fine to coarse sand; 5% fines; trace fine gravel.
			A-1-					
0	9		25.0	25				CLAY (CL) - dark greenish gray (5G 4/1); stiff; moist; 95% clay; 5% sand, trace fine gravel.
				26				
				27				
				28				
		S&H		29				SANDY SILT (ML) - olive gray (5Y 4/2) stiff; moist; 70% fines; 20% sand; 10% fine gravel.
2.5			A-1-					
	11		30.0	30				Bottom of boring 30.0 feet. 3/16/92
				31				
				32				
				33				
				34				
				35				
				36				
				37				
				38				
				39				
				40				

Remarks:

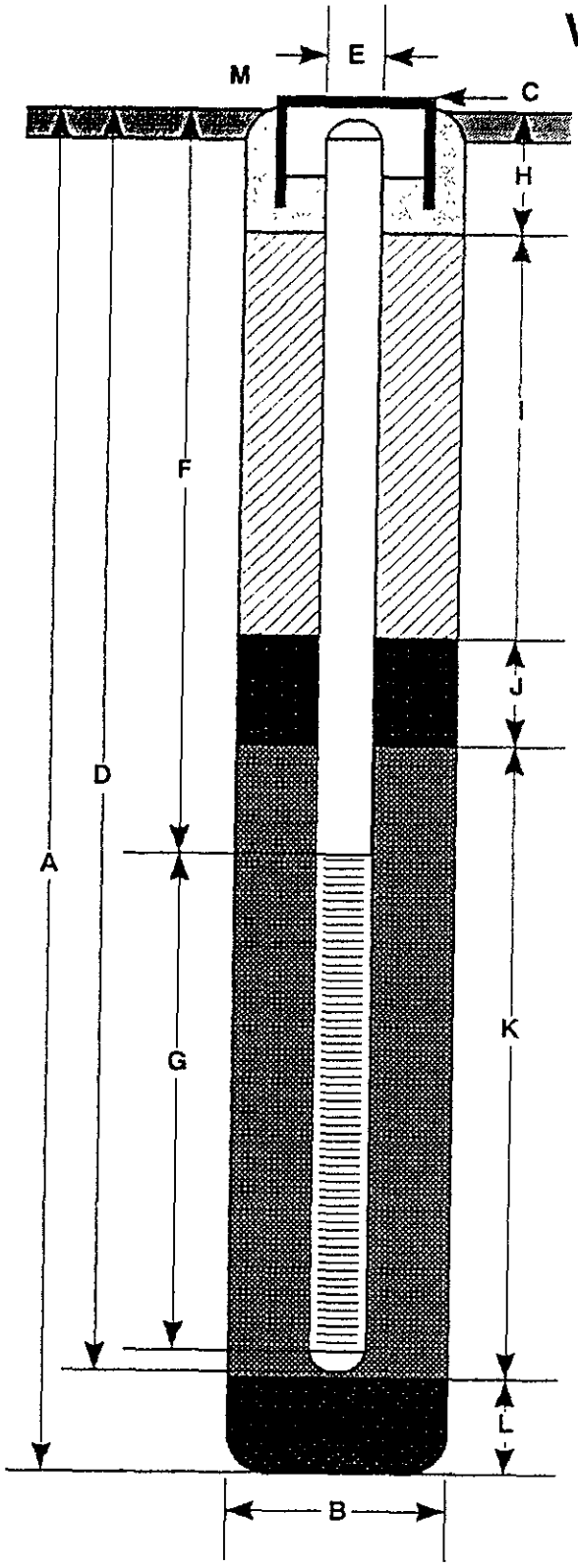
GeoStrategies Inc.

Log of Boring

BORING NO. A-1

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
792705	JFV	3/92		

WELL CONSTRUCTION DETAIL



A Total Depth of Boring 30.0 ft.

B Diameter of Boring 10 in.
Drilling Method Hollow Stem Auger

C Top of Box Elevation 14.75 ft.
[X] Referenced to Mean Sea Level
[ ] Referenced to Project Datum

D Casing Length 25.0 ft.
Material Schedule 40 PVC

E Casing Diameter 3 in.

F Depth to Top Perforations 9.0 ft.

G Perforated Length 16.0 ft.
Perforated Interval from 9.0 to 25.0 ft.
Perforation Type Machine Slotted
Perforation Size 0.020 in.

H Surface Seal from 0 to 1.0 ft.
Seal Material Concrete

I Backfill from 1.0 to 7.0 ft.
Backfill Material Neat Cement

J Seal from 7.0 to 8.0 ft.
Seal Material Bentonite

K Gravel Pack from 8.0 to 25.0 ft.
Pack Material Lonestar #2/12 Graded Sand

L Bottom Seal 5.0 ft.
Seal Material Bentonite

M Waterproof vault box with locking cap and lock.

Note: Depths measured from initial ground surface.

GeoStrategies Inc.

Well Construction Detail

WELL NO
A-1

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
792705		3/92		

Field location of boring.

(See Plate 2)

Project No.: 792705	Date: 3/16/92	Boring No: A-2	
Client: ARCO Products Company SS#2169			
Location: 889 W. Grand Avenue			
City: Oakland		Sheet 1 of 2	
Logged by: RCM	Driller: Bayland		

Drilling method: Hollow Stem Auger

Hole diameter: 8", converted to 10"

Casing installation data:

Top of Box Elevation: 15.16' Datum: MSL

Water Level	18.5'	11.5'			
Time	14:20	15:01			
Date	3/16/92	3/16/92			

PID (ppm)	Blows/ft.* or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description
				1				PAVEMENT SECTION - 0.75 feet.
				2				CLAY (CL) - very dark gray (10 YR 3/1); medium stiff; damp; 85% clay; 15% sand; trace brick fragments (fill).
				3				
			A-2-					
0	200	S&H	4.0	4				
	200							
	200			5				
				6				
				7				
				8				
		S&H		9				COLOR CHANGE TO greenish gray (5GY 5/1); increase fine to coarse sand to 35%; stiff at 8.5 feet.
			A-2-					
2.2	11		10.0	10				
				11				
				12		▼		COLOR CHANGE TO yellowish brown (10 YR 5/8) greenish gray (5GY 5/1) medium stiff; discoloration in rootholes at 12.0 feet.
		S&H						
			A-2-	13				
3.9	9		13.5					
		S&H		14				
			A-2-					
1.5	7		15.0	15				COLOR CHANGE TO olive yellow (2.5 Y 6/6) at 14.5 feet.
				16				
				17				
				18				
		S&H		19		▽		SAND (SW) - olive brown (2.5 Y 4/4) medium dense; saturated; 95% fine to coarse sand; 5% fine.
			A-2-					
3.1	17		20.0	20				

Remarks: *Converted to equivalent standard penetration blows/ft.

GeoStrategies Inc.

Log of Boring

BORING NO. A-2

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
792705		3/92		

Field location of boring:

(See Plate 2)

Project No.:	792705	Date: 3/16/92	Boring No: A-2
Client:	ARCO Products Company SS#2169		
Location:	889 W. Grand Avenue		
City:	Oakland		Sheet 2 of 2
Logged by:	RCM	Driller: Bayland	

Drilling method: Hollow Stem Auger

Hole diameter: 8", converted to 10"

Casing installation data.

Top of Box Elevation: Datum:

Water Level				
Time				
Date				

PID (ppm)	Blows/ft.* or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description
				21				
				22				
				23				Increase fine subangular gravel to 20% at 23.5 feet.
		S&H		24				
			A-2-					
0.4	19		25.0	25				CLAY (CL) - greenish gray (5G 5/1) stiff; damp; 80% clay; 20% fine sand interbedded laminae.
		SPT						
				26				
0	15							
				27				
				28				
				29				Bottom of boring 26.5 feet. 3/16/92
				30				
				31				
				32				
				33				
				34				
				35				
				36				
				37				
				38				
				39				
				40				

Remarks:

GeoStrategies Inc.

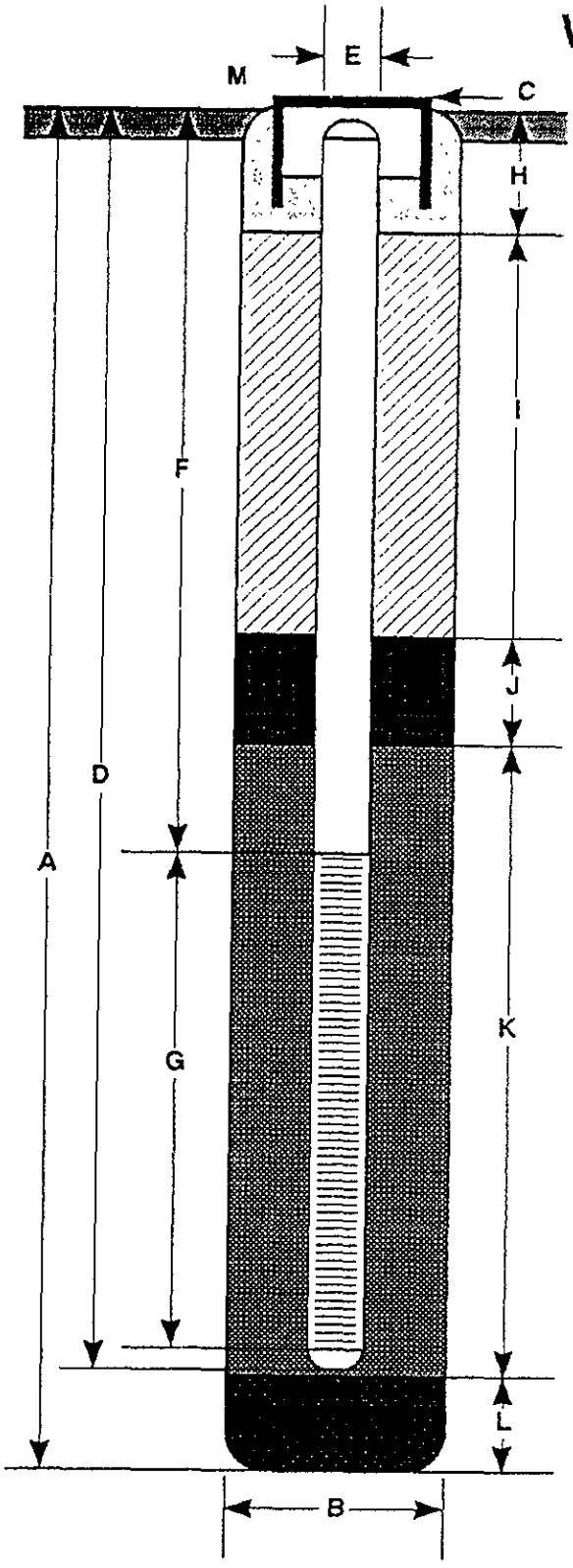
Log of Boring

BORING NO

A-2

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
792705		3/92		

WELL CONSTRUCTION DETAIL



A Total Depth of Boring 26.5 ft.

B Diameter of Boring 10 in.
Drilling Method Hollow Stem Auger

C Top of Box Elevation 15.16 ft.
[X] Referenced to Mean Sea Level
[ ] Referenced to Project Datum

D Casing Length 25.0 ft.
Material Schedule 40 PVC

E Casing Diameter 3 in.

F Depth to Top Perforations 10.0 ft.

G Perforated Length 15.0 ft.
Perforated Interval from 10.0 to 25.0 ft.
Perforation Type Machine Slotted
Perforation Size 0.020 in.

H Surface Seal from ____ to 1.0 ft.
Seal Material Concrete

I Backfill from 1.0 to 8.0 ft.
Backfill Material Neat Cement

J Seal from 8.0 to 9.0 ft.
Seal Material Bentonite

K Gravel Pack from 9.0 to 25.0 ft.
Pack Material Lonestar #2/12 Graded Sand

L Bottom Seal 1.5 ft.
Seal Material Bentonite

M Waterproof vault box with locking cap and lock.

Note: Depths measured from initial ground surface.

GeoStrategies Inc.

Well Construction Detail

WELL NO
A-2

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
792705		3/92		

Field location of boring: (See Plate 2)	Project No.: 792705	Date: 3/17/92	Boring No.: A-3
	Client: ARCO Products Company SS#2169		
	Location: 889 W. Grand Avenue		
	City: Oakland		Sheet 1 of 2
	Logged by: RCM	Driller: Bayland	
Drilling method: Hollow Stem Auger	Casing installation data:		
Hole diameter: 8", converted to 10"	Top of Box Elevation: 16.38'		Datum: MSL

Water Level	12.0'							
Time	9:15							
Date	3/17/92							

PID (ppm)	Blows/ft.* or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description
								PAVEMENT SECTION - 0.75 feet
				1				
				2				CLAY (CL) - very dark gray (10 YR 3/1) medium stiff;
								damp; 80% clay; 15% silt; 5% fine sand; trace brick
				3				fragments (Fill).
	150	S&H	A-3-	4				
0	250		4.5					Trace fine gravel; organic matter at 4.5 feet.
	250			5				
				6				
				7				
				8				
		S&H						
			A-3-	9				COLOR CHANGE TO light olive brown (2.5 Y 5/4) with
0	19		10.0					greenish gray (5 GY 6/1) discoloration; increase fine
				10				sand to 25%; very stiff at 8.5 feet.
				11				
				12		▽		*Saturated; medium stiff at 12.0 feet.*
		SPT						
				13				
0	4							
		S&H		14				CLAYEY SAND (SC) - brown (10 YR 5/3) - saturated;
			A-3-					loose; 60% fine sand; 30% clay; 10% silt.
0	9		15.0	15				
				16				
				17				
								CLAY (CL) - light olive brown (2.5 Y 5/4) very stiff; moist;
				18				80% clay; 20% fine sand.
								GRAVEL with SAND (GW) - light olive brown (2.5 Y 5/4);
		S&H		19				medium dense; saturated; 65% fine to medium;
			A-3-					sub-rounded to sub-angular gravel; 30% fine to coarse
0	28		20.0	20				sand; 5% fines.

Remarks:

*Converted to equivalent standard penetration blows/ft.

GeoStrategies Inc.

Log of Boring

BORING NO. A-3

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
792705		3/92		

Field location of boring:

(See Plate 2)

Project No.:	792705	Date: 3/17/92	Boring No: A-3
Client:	ARCO Products Company SS#2169		
Location:	889 W. Grand Avenue		
City:	Oakland		Sheet 2 of 2
Logged by:	RCM	Driller: Bayland	

Casing installation data:

Drilling method: Hollow Stem Auger

Hole diameter: 8", converted to 10"

Top of Box Elevation: Datum:

Water Level				
Time				
Date				

PID (ppm)	Blows/ft. or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description
				21				
				22				
				23				
		S&H		24				CLAY (CL) - greenish gray (5GY 5/1) very stiff; moist;
			A-3-					90% clay, 10% fine sand.
0	30		25.0	25				
		SPT						SAND (SP) - olive (5 Y 4/3) dense; saturated; 100% fine
				26				sand; trace fines.
	43							
				27				
				28				
		S&H		29				COLOR CHANGE TO dark greenish gray (5G 4/1) at 28.5
			A3-					feet.
0	36		30.0	30				CLAY (CL) dark greenish gray (5G 4/1) moist; hard; 75%
				31				clay, 25% silt; trace fine to coarse sand.
				32				
				33				Bottom of boring 30.0 feet.
								3/17/92
				34				
				35				
				36				
				37				
				38				
				39				
				40				

Remarks:

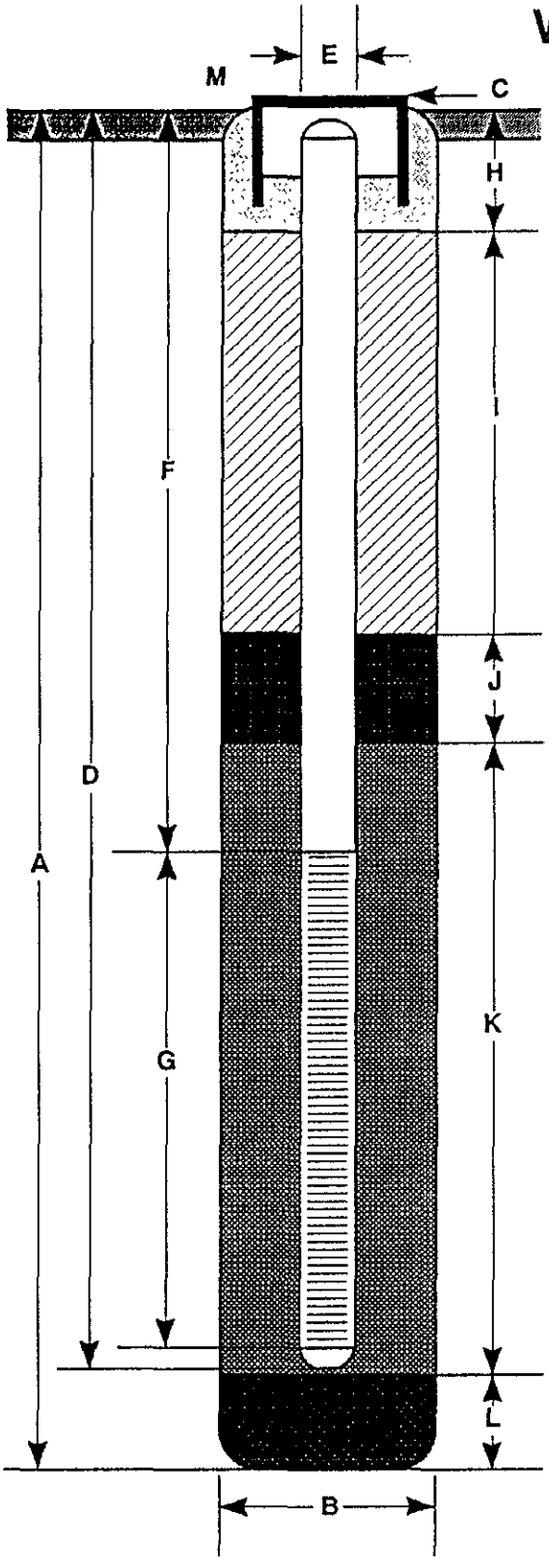
GeoStrategies Inc.

Log of Boring

BORING NO. A-3

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
792705		3/92		

WELL CONSTRUCTION DETAIL



A Total Depth of Boring 30.0 ft.

B Diameter of Boring 10 in.
Drilling Method Hollow Stem Auger

C Top of Box Elevation 16.38 ft.
[S] Referenced to Mean Sea Level
[ ] Referenced to Project Datum

D Casing Length 29.5 ft.
Material Schedule 40 PVC

E Casing Diameter 3 in.

F Depth to Top Perforations 9.0 ft.

G Perforated Length 20.5 ft.
Perforated Interval from 9.0 to 29.5 ft.
Perforation Type Machine Slotted
Perforation Size 0.020 in.

H Surface Seal from 0 to 1.0 ft.
Seal Material Concrete

I Backfill from 1.0 to 7.0 ft.
Backfill Material Neat Cement

J Seal from 1.0 to 7.0 ft.
Seal Material Bentonite

K Gravel Pack from 8 to 29.5 ft.
Pack Material Lonestar #2/12 Graded Sand

L Bottom Seal 0.5 ft.
Seal Material Bentonite

M Waterproof vault box with locking cap and lock

Note: Depths measured from initial ground surface.

GeoStrategies Inc.

Well Construction Detail

WELL NO. A-3

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
792705	JPV	3/92		

Field location of boring: (See Plate 2)	Project No.: 792705	Date: 3/17/92	Boring No: A-4
	Client: ARCO Products Company SS#2169		
	Location: 889 W. Grand Avenue		
	City: Oakland		Sheet 1 of 2
	Logged by: RCM	Driller: Bayland	
Drilling method: Hollow Stem Auger	Casing installation data:		
Hole diameter: 8", converted to 10"	Top of Box Elevation: 15.89'		Datum: MSL

Water Level	13.5'	
Time	13:55	
Date	3/17/92	

PID (ppm)	Blows/ft.* or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description
								PAVEMENT SECTION - 0.75 feet.
				1				
								CLAY (CL) - very dark gray (10 YR 3/1) stiff; damp; 80% clay, 20% silt, trace fine sand; trace brick fragments.
				2				
				3				
	200	S&H		4				
	200		A-4-					
0	250		5.0	5				
				6				
				7				
				8				
		S&H		9				COLOR CHANGE TO light olive brown (2.5 Y 5/4), very stiff at 8.5 feet.
			A-4-					
0	23		10.0	10				
				11				SAND (SW) - yellowish brown (10 YR 5/4) medium dense; moist' 80% fine to coarse sand; 20% sub-rounded to sub-angular fine gravel.
				12				
				13				
						▽		CLAYEY SAND (SC) - light olive brown; (2.5 Y 5/4) medium dense; saturated; 70% fine sand; 30% clay.
		S&H		14				
			A-4-					
0	10		15.0	15				
				16				
				17				
				18				SAND (SW) - dark yellowish brown (10 YR 4/6) medium dense; saturated; 95% fine to coarse sand; 5% fines; trace fine gravel
		S&H		19				
			A-4-					CLAY (CL) - greenish gray (5GY 5/1) stiff; moist; 90% clay; 10% fine sand.
0	15		20.0	20				

Remarks:

*Converted to equivalent Standard Penetration blows/ft.

GeoStrategies Inc.

Log of Boring

BORING NO. A-4

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
792705		3/92		

Field location of boring:	Project No.: 792705	Date: 3/17/92	Boring No:
(See Plate 2)	Client: ARCO Products Company SS#2169		A-4
	Location: 889 W. Grand Avenue		
	City: Oakland		Sheet 2
	Logged by: RCM	Driller: Bayland	of 2
Drilling method: Hollow Stem Auger	Casing installation data:		
Hole diameter: 8", converted to 10"	Top of Box Elevation:	Datum:	

Water Level			
Time			
Date			

PID (ppm)	Blows/ft. or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description
				21				
				22				
				23				
		S&H		24				SILT (ML) - olive (5Y 5/3); stiff; moist; 70% silt; 20% fine sand; 10% clay.
			A-4-					
0	26		25.0	25				
				26				SAND (SP) - greenish gray (5G 5/1) dense; saturated; 95% fine sand; 5% fines.
				27				
				28				
		S&H		29				
			A-4-					SILT (ML) - dark greenish gray (5G 4/1) stiff; damp; 80% silt; 20% clay; trace fine sand; rootholes.
0	13		30.0	30				
				31				
				32				
				33				Bottom of boring 30.0 feet 3/17/92
				34				
				35				
				36				
				37				
				38				
				39				
				40				

Remarks:

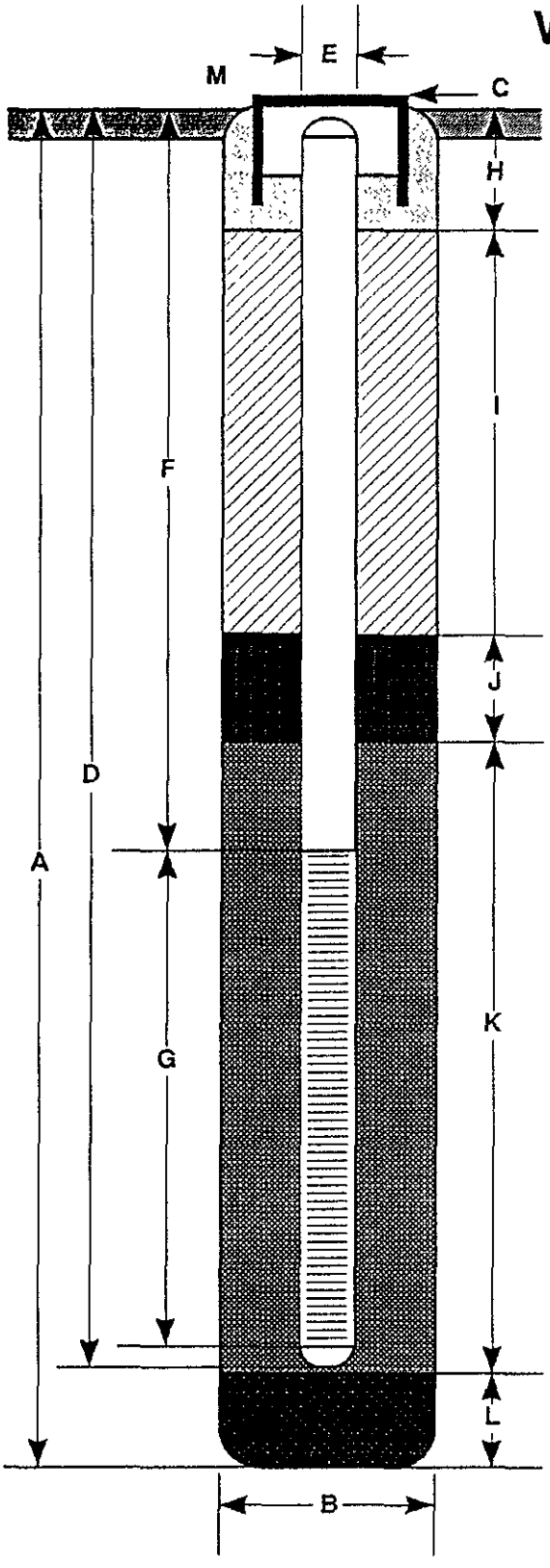
GeoStrategies Inc.

Log of Boring

BORING NO. A-4

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
792705		3/92		

WELL CONSTRUCTION DETAIL



A Total Depth of Boring 30.0 ft.

B Diameter of Boring 10 in.
Drilling Method Hollow Stem Auger

C Top of Box Elevation 15.89 ft.
[X] Referenced to Mean Sea Level
[ ] Referenced to Project Datum

D Casing Length 28.0 ft.
Material Schedule 40 PVC

E Casing Diameter 3 in.

F Depth to Top Perforations 8.0 ft.

G Perforated Length 20.0 ft.
Perforated Interval from 8.0 to 28.0 ft.
Perforation Type Machine Slotted
Perforation Size 0.020 in.

H *Surface Seal from* 0 to 1.0 ft.
Seal Material Concrete

I Backfill from 1.0 to 6.0 ft.
Backfill Material Neat Cement

J Seal from 6.0 to 7.0 ft.
Seal Material Bentonite

K Gravel Pack from 7.0 to 28.0 ft.
Pack Material Lonestar #2/12 Graded Sand

L Bottom Seal 2.0 ft.
Seal Material Bentonite

M Waterproof vault box with locking cap and lock.

Note: Depths measured from initial ground surface.

GeoStrategies Inc.

Well Construction Detail

WELL NO. A-4

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
792705		3/92		

Field location of boring: (See Plate 2)	Project No.: 792705	Date: 3/25/92	Boring No: AR-1
	Client: ARCO Products Company SS #2169		
	Location: 889 W. Grand Avenue		
	City: Oakland		Sheet 1 of 2
	Logged by: RCM	Driller: Bayland	
Drilling method: Hollow Stem Auger	Casing installation data:		
Hole diameter: 8", converted to 12"	Top of Box Elevation: 15.71'		Datum: MSL

Water Level	10.0'		
Time	9:50		
Date	3/25/92		

PID (ppm)	Blows/IL* or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description
				1				STOCKPILED SOIL - 0.5 ft.
				2				
				3				
				4				
				5				GRAVELLY CLAY (CL) - dark gray (5Y 4/1) stiff; moist;
		S&H	AR-1-					60% clay, 25% fine gravel; 15% sand (fill).
1.5			6.0	6				
	8			7				
				8				
				9				
				10		▽		
		S&H		11				GRAVEL (GW) - greenish gray (5 G 5/1) medium dense; saturated; 95% fine to coarse gravel; 5% sand (fill).
	11			12				
				13				
				14				
				15				SAND (SP) - greenish gray (5GY 5/1) medium dense;
		S&H						saturated; 95% fine sand; 5% fines.
			AR-1-	16				
131.3	14		16.5					
				17				GRAVELLY CLAY (CL) brown (10 YR 5/3) stiff; saturated;
				18				55% clay; 30% fine to medium gravel; 15% fine to coarse sand; minor black (10YR 3/1) mottling and bluish gray (5B 5/1) discoloration.
				19				
				20				

Remarks:

*Converted to equivalent standard penetration blows/ft.

GeoStrategies Inc.

Log of Boring

BORING NO. AR-1

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
792705		3/92		

Field location of boring:

(See Plate 2)

Project No.: 792705	Date: 3/25/92	Boring No: AR-1	
Client: ARCO Products Company SS#2169			
Location: 889 W. Grand Avenue			
City: Oakland		Sheet 2 of 2	
Logged by: RCM	Driller: Bayland		

Casing installation date:

Drilling method: Hollow Stem Auger

Hole diameter: 8", convertedto 12"

Top of Box Elevation: Datum:

Water Level				
Time				
Date				

PID (ppm)	Blows/ft.* or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description
		S&H		21				SAND with GRAVEL (SW) - dark greenish gray (5GY 4/1)
			AR-1-					medium dense; saturated; 85% fine to coarse sand; 15%
197.2	29		21.5					fine to medium gravel.
				22				SAND with CLAY (SW - SC) - dark greenish gray (5GY
								4/1) medium dense; saturated ; 80% fine to coarse sand;
				23				10% clay; 10% fine to medium gravel.
				24				
				25				
		S&H						SAND (SW) - dark greenish gray (5BG 4/1) very dense
			AR-1-	26				saturated; 95% fine to coarse sand; 5% fine gravel.
19.9	79		26.5					SAND (SP) olive (5Y 4/4) very dense; saturated; 95% fine
				27				sand; 5% silt.
				28				
		S&H		29				
			AR-1-					SILTY CLAY (CL/ML) dark greenish gray (5GY 4/1) very
2.5	19		30	30				stiff; damp; 70% clay; 30% silt; trace organic matter;
								rootholes.
				31				
				32				Bottom of boring 30.0 feet.
				33				3/25/92
				34				
				35				
				36				
				37				
				38				
				39				
				40				

Remarks:

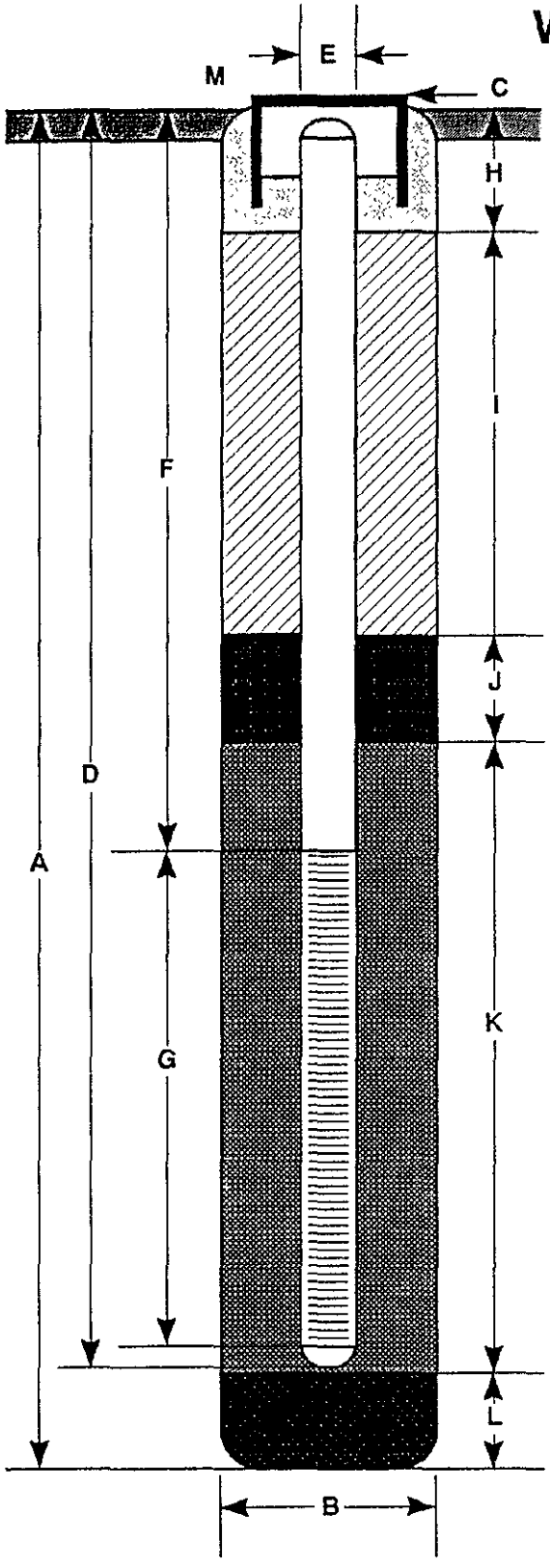
GeoStrategies Inc.

Log of Boring

BORING NO. AR-1

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
792705		3/92		

WELL CONSTRUCTION DETAIL



A Total Depth of Boring 30 ft.

B Diameter of Boring 12 in.
Drilling Method Hollow Stem Auger

C Top of Box Elevation 15.71 ft.
[X] Referenced to Mean Sea Level
[ ] Referenced to Project Datum

D Casing Length 28 ft.
Material *Sch. 40 PVC & Carbon Steel*

E Casing Diameter 6 in.

F Depth to Top Perforations 8 ft.

G Perforated Length 20 ft.
Perforated Interval from 8 to 28 ft.
Perforation Type Continuous wrap
Perforation Size 0.020 in.

H Surface Seal from 0 to 1 ft.
Seal Material Concrete

I Backfill from 1 to 6 ft.
Backfill Material Neat Cement

J Seal from 6 to 7 ft.
Seal Material Bentonite

K *Gravel Pack from* 7 *to* 28 ft.
Pack Material Lonestar #2/12 Graded Sand

L Bottom Seal 2 ft.
Seal Material Bentonite

M Waterproof vault box with waterproof locking cap and lock.

Note: Depths measured from initial ground surface.

GeoStrategies Inc.

Well Construction Detail

WELL NO. **AR-1**

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
792705		3/92		

APPENDIX B
SOIL ANALYTICAL REPORT
AND
CHAIN-OF-CUSTODY FORM

SEQUOIA ANALYTICAL

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

Gettler Ryan
2150 W. Winton Avenue
Hayward, CA 94545
Attention: John Vargas

GETTLER-RYAN INC.
GENERAL CONTRACTORS

Project: 2169-92-2, Arco 2169, Oakland

Enclosed are the results from 6 soil samples received at Sequoia Analytical on March 20,1992. The requested analyses are listed below:

2033682	Soil, A-1-4.5	Mar 16-17, 1992	EPA 3550/8015 EPA 5030/8015/8020
2033683	Soil, A-1-10.0	Mar 16-17, 1992	EPA 3550/8015 EPA 5030/8015/8020
2033684	Soil, A-2-4.0	Mar 16-17, 1992	EPA 3550/8015 EPA 5030/8015/8020
2033685	Soil, A-2-10.0	Mar 16-17, 1992	EPA 3550/8015 EPA 5030/8015/8020
2033686	Soil, A-3-10.0	Mar 16-17, 1992	EPA 3550/8015 EPA 5030/8015/8020
2033687	Soil, A-4-10.0	Mar 16-17, 1992	EPA 3550/8015 EPA 5030/8015/8020

Please contact me if you have any questions. In the meantime, thank you for the opportunity to work with you on this project.

Very truly yours,

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

SEQUOIA ANALYTICAL

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

Gettler Ryan	Client Project ID:	2169-92-2, Arco 2169, Oakland	Sampled:	Mar 16-17, 1992
2150 W. Winton Avenue	Matrix Descript:	Soil	Received:	Mar 20, 1992
Hayward, CA 94545	Analysis Method:	EPA 5030/8015/8020	Analyzed:	Mar 25-Apr 1, 1992
Attention: John Vargas	First Sample #:	203-3682	Reported:	Apr 2, 1992

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

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons mg/kg (ppm)	Benzene mg/kg (ppm)	Toluene mg/kg (ppm)	Ethyl Benzene mg/kg (ppm)	Xylenes mg/kg (ppm)
203-3682	A-1-4.5	N.D.	0.024	0.014	0.0090	0.034
203-3683	A-1-10.0	2.2	0.13	0.051	0.023	0.71
203-3684	A-2-4.0	N.D.	N.D.	N.D.	N.D.	N.D.
203-3685	A-2-10.0	N.D.	N.D.	N.D.	N.D.	N.D.
203-3686	A-3-10.0	N.D.	N.D.	N.D.	N.D.	N.D.
203-3687	A-4-10.0	N.D.	N.D.	N.D.	N.D.	N.D.
Detection Limits:		**1.0**	**0.0050**	**0.0050**	**0.0050**	**0.0050**

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

Gettler Ryan	Client Project ID:	2169-92-2, Arco 2169, Oakland	Sampled:	Mar 16-17, 1992
2150 W. Winton Avenue	Matrix Descript:	Soil	Received:	Mar 20, 1992
Hayward, CA 94545	Analysis Method:	EPA 3550/8015	Extracted:	Mar 23, 1992
Attention: John Vargas	First Sample #:	203-3682	Analyzed:	Mar 24, 1992
			Reported:	Apr 2, 1992

TOTAL PETROLEUM FUEL HYDROCARBONS (EPA 8015)

Sample Number	Sample Description	High B.P. Hydrocarbons mg/kg (ppm)
203-3682	A-1-4.5	N.D.
203-3683	A-1-10.0	N.D.
203-3684	A-2-4.0	14
203-3685	A-2-10.0	N.D.
203-3686	A-3-10.0	N.D.
203-3687	A-4-10.0	N.D.

Detection Limits:	1.0

High Boiling Point Hydrocarbons are quantitated against a diesel fuel 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

Gettler Ryan
2150 W. Winton Avenue
Hayward, CA 94545
Attention: John Vargas

Client Project ID: 2169-92-2, Arco 2169, Oakland

QC Sample Group: 203-3682

Reported: Apr 2, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	A. Maralit	A. Maralit	A. Maralit	A. Maralit
Reporting Units:	mg/kg	mg/kg	mg/kg	mg/kg
Date Analyzed:	Apr 1, 1992	Apr 1, 1992	Apr 1, 1992	Apr 1, 1992
QC Sample #:	GBLK040192	GBLK040192	GBLK040192	GBLK040192
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	0.20	0.20	0.20	0.60
Conc. Matrix Spike:	0.;20	0.20	0.21	0.61
Matrix Spike % Recovery:	100	100	105	102
Conc. Matrix Spike Dup.:	0.21	0.21	0.21	0.61
Matrix Spike *Duplicate* % Recovery:	105	105	105	102
Relative % Difference:	4.9	4.9	0.0	0.0

Quality Assurance Statement: All standard operating procedures and quality control requirements have been met.

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / *Spike Conc. Added*	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

SEQUOIA ANALYTICAL

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

Gettler Ryan
2150 W. Winton Avenue
Hayward, CA 94545
Attention: John Vargas

Client Project ID: 2169-92-2, Arco 2169, Oakland

QC Sample Group: 203-3683

Reported: Apr 2, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	E. Cunanan	E. Cunanan	E. Cunanan	E. Cunanan
Reporting Units:	mg/kg	mg/kg	mg/kg	mg/kg
Date Analyzed:	Mar 26, 1992	Mar 26, 1992	Mar 26, 1992	Mar 26, 1992
QC Sample #:	GBLK032592	GBLK032592	GBLK032592	GBLK032592
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	0.20	0.20	0.20	0.60
Conc. Matrix Spike:	0.20	0.20	0.21	0.63
Matrix Spike % Recovery:	100	100	105	105
Conc. Matrix Spike Dup.:	0.19	0.20	0.21	0.63
Matrix Spike Duplicate % Recovery:	95	100	105	105
Relative % Difference:	5.1	0.0	0.0	0.0

Quality Assurance Statement: All standard operating procedures and quality control requirements have been met.

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S + Conc. of M.S.D.) / 2	x 100

SEQUOIA ANALYTICAL

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

Gettler Ryan
2150 W. Winton Avenue
Hayward, CA 94545
Attention: John Vargas

Client Project ID: 2169-92-2, Arco 2169, Oakland

QC Sample Group: 2033684-86

Reported: Apr 2, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	A. Maralit	A. Maralit	A. Maralit	A. Maralit
Reporting Units:	mg/kg	mg/kg	mg/kg	mg/kg
Date Analyzed:	Mar 27, 1992	Mar 27, 1992	Mar 27, 1992	Mar 27, 1992
QC Sample #:	GBLK032792	GBLK032792	GBLK032792	GBLK032792
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	0.20	0.20	0.20	0.60
Conc. Matrix Spike:	0.22	0.22	0.23	0.67
Matrix Spike % Recovery:	110	110	115	112
Conc. Matrix Spike Dup.:	0.23	0.24	0.23	0.69
Matrix Spike Duplicate % Recovery:	115	120	115	115
Relative % Difference:	4.4	8.7	0.0	2.9

Quality Assurance Statement: All standard operating procedures and quality control requirements have been met.

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

SEQUOIA ANALYTICAL

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

Gettler Ryan
2150 W. Winton Avenue
Hayward, CA 94545
Attention: John Vargas

Client Project ID: 2169-92-2, Arco 2169, Oakland

QC Sample Group: 203-3687

Reported: Apr 2, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	A. Maralit	A. Maralit	A. Maralit	A. Maralit
Reporting Units:	mg/kg	mg/kg	mg/kg	mg/kg
Date Analyzed:	Mar 25, 1992	Mar 25, 1992	Mar 25, 1992	Mar 25, 1992
QC Sample #:	GBLK032592	GBLK032592	GBLK032592	GBLK032592
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	0.20	0.20	0.20	0.60
Conc. Matrix Spike:	0.21	0.22	0./22	0.66
Matrix Spike % Recovery:	105	110	110	110
Conc. Matrix Spike Dup.:	0.20	0.21	0.21	0.63
Matrix Spike Duplicate % Recovery:	100	105	105	105
Relative % Difference:	4.9	4.7	4.7	4.7

Quality Assurance Statement: All standard operating procedures and quality control requirements have been met.

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

SEQUOIA ANALYTICAL

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

Gettler Ryan
2150 W. Winton Avenue
Hayward, CA 94545
Attention: John Vargas

Client Project ID: 2169-92-2, Arco 2169, Oakland

QC Sample Group: 2033682-87

Reported: Apr 2, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	High Boiling Point Hydrocarbons

Method:	EPA 8015
Analyst:	R. Lee
Reporting Units:	mg/kg
Date Analyzed:	Mar 24, 1992
QC Sample #:	DBLK032392B

Sample Conc.:	N.D.
Spike Conc. Added:	15
Conc. Matrix Spike:	12
Matrix Spike % Recovery:	80
Conc. Matrix Spike Dup.:	12
Matrix Spike Duplicate % Recovery:	80
Relative % Difference:	0.0

Quality Assurance Statement: All standard operating procedures and quality control requirements have been met.

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. 2169-92-2

Chain of Custody

COPY

ARCO Facility no. 2169	City (Facility) OAKLAND	Project manager (Consultant) JOHN VALEES	Laboratory name SEQUOIA
ARCO engineer CHARLES CALMEL	Telephone no. (ARCO)	Telephone no. (Consultant) (510)-55z-4800	Fax no. (Consultant) (510)-783-1089
Consultant name GEO STRATEGIES INC.	Address (Consultant) 2140 W. WINTON AVE. HAYWARD 94545		Contract number 07-073

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	8TEX 602/EPA 8020	BTEX/TPH – Gas EPA M602/8020/8015	TPH Modified 8015 Gas ☐ Diesel ☒	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals ☐ Semi VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐		
A-1-4.5		1	X			X		3/16/92	9:11		X	X				2033682						
A-1-10.0		1	X			X		3/16/92	9:22		X	X					$3					
A-2-4.0		1	X			X		3/16/92	13:31		X	X					$4					
A-2-10.0		1	X			X		3/16/92	13:53		X	X					$5					
A-3-10.0		1	X			X		3/17/92	9:08		X	X					$6					
A-4-10.0		1	X			X		3/17/92	13:42		X	X					$7					
FEM																						

Special detection Limit/reporting: LOWEST POSSIBLE

Special QA/QC: NORMAL

Method of shipment: COURIER

Remarks

Lab number

Turnaround time

- Priority Rush 1 Business Day [ ]
- Rush 2 Business Days [ ]
- Expedited 5 Business Days [ ]
- Standard 10 Business Days [X]

Condition of sample: good

Temperature received: cool

Relinquished by sampler	Date	Time	Received by
[illegible]	3/17/92	14:00	
Relinquished by: Ken Follett	3-20-92	1400	Received by: Ken Follett
Relinquished by: Ken Follett	3-20-92	15:45	Received by
Relinquished by	Date	Time	Received by laboratory: [signature] Date: 3-20 Time: 1545

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

APPC-3292 (2-91)

APPENDIX C
GROUNDWATER ANALYTICAL REPORT
AND
CHAIN-OF-CUSTODY FORM

SEQUOIA ANALYTICAL

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

Gettler Ryan
2150 W. Winton Avenue
Hayward, CA 94545
Attention: Frank Cline

Project: 3927.02, Arco 2126, Oakland

Enclosed are the results from 5 water samples received at Sequoia Analytical on April 3,1992. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE OF COLLECTION	TEST METHOD
2040520	Water, A-1	4/3/92	EPA 3510/8015 EPA 5030/8015/8020
2040521	Water, A-2	4/3/92	EPA 3510/8015 EPA 5030/8015/8020
2040522	Water, A-3	4/3/92	EPA 3510/8015 EPA 5030/8015/8020
2040523	Water, A-4	4/3/92	EPA 3510/8015 EPA 5030/8015/8020
2040524	Water, AR-1	4/3/92	EPA 3510/8015 EPA 5030/8015/8020

Please contact me if you have any questions. In the meantime, thank you for the opportunity to work with you on this project.

Very truly yours,

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

SEQUOIA ANALYTICAL

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

Gettler Ryan	Client Project ID:	3927.02, Arco 2126, Oakland	Sampled: Apr 3, 1992
2150 W. Winton Avenue	Matrix Descript:	Water	Received: Apr 3, 1992
Hayward, CA 94545	Analysis Method:	EPA 5030/8015/8020	Analyzed: Apr 9-10, 1992
Attention: Frank Cline	First Sample #:	204-0520	Reported: Apr 15, 1992

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)
204-0520	A-1	34,000	6,200	3,900	410	3,100
204-0521	A-2	N.D.	N.D.	N.D.	N.D.	N.D.
204-0522	A-3	200	0.79	0.65	4.4	N.D.
204-0523	A-4	35	N.D.	N.D.	N.D.	N.D.
204-0524	AR-1	17,000	310	1,400	320	3,000
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

Gettler Ryan	Client Project ID:	3927.02, Arco 2126, Oakland	Sampled:	Apr 3, 1992
2150 W. Winton Avenue	Matrix Descript:	Water	Received:	Apr 3, 1992
Hayward, CA 94545	Analysis Method:	EPA 3510/8015	Extracted:	Apr 6, 1992
Attention: Frank Cline	First Sample #:	204-0520	Analyzed:	Apr 8, 1992
			Amended:	Jun 22, 1992

TOTAL PETROLEUM FUEL HYDROCARBONS (EPA 8015)

Sample Number	Sample Description	High B.P. Hydrocarbons µg/L (ppb)
204-0520	A-1	6,100
204-0521	A-2	N.D.
204-0522	A-3	130
204-0523	A-4	85
204-0524	AR-1	12,000

Detection Limits:	50

High Boiling Point Hydrocarbons are quantitated against a diesel fuel standard.
Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Nokowhat D. Herrera
Project Manager

Please Note:
The above samples do not appear to contain diesel.

SEQUOIA ANALYTICAL

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

Gettler Ryan
2150 W. Winton Avenue
Hayward, CA 94545
Attention: Frank Cline

Client Project ID: 3927.02, Arco 2126, Oakland

QC Sample Group: 2040520-22, 24

Reported: Apr 15, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	L. Laikhtman	L. Laikhtman	L. Laikhtman	L. Laikhtman
Reporting Units:	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Apr 9, 1992	Apr 9, 1992	Apr 9, 1992	Apr 9, 1992
QC Sample #:	GBLK040992	GBLK040992	GBLK040992	GBLK040992
Sample Conc.:	N.D.	N.D.	N.D.	ND..
Spike Conc. Added:	10	10	10	30
Conc. Matrix Spike:	11	11	11	33
Matrix Spike % Recovery:	110	110	110	110
Conc. Matrix Spike Dup.:	11	11	10	32
Matrix Spike Duplicate % Recovery:	110	110	100	107
Relative % Difference:	0.0	0.0	9.5	3.1

Quality Assurance Statement: All standard operating procedures and quality control requirements have been met.

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

SEQUOIA ANALYTICAL

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

Gettler Ryan
2150 W. Winton Avenue
Hayward, CA 94545
Attention: Frank Cline

Client Project ID: 3927.02, Arco 2126, Oakland

QC Sample Group: 204-0523

Reported: Apr 15, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	M. Nipp	M. Nipp	M. Nipp	M. Nipp
Reporting Units:	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Apr 10, 1992	Apr 10, 1992	Apr 10, 1992	Apr 10, 1992
QC Sample #:	GBLK040992	GBLK040992	GBLK040992	GBLK040992
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	10	10	10	30
Conc. Matrix Spike:	9.6	9.5	9.5	28
Matrix Spike % Recovery:	96	95	95	93
Conc. Matrix Spike Dup.:	10	10	10	30
Matrix Spike Duplicate % Recovery:	100	100	100	100
Relative % Difference:	4.1	5.1	5.1	6.9

Quality Assurance Statement: All standard operating procedures and quality control requirements have been met.

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

SEQUOIA ANALYTICAL

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

Gettler Ryan
2150 W. Winton Avenue
Hayward, CA 94545
Attention: Frank Cline

Client Project ID: 3927.02, Arco 2126, Oakland

QC Sample Group: 2040520-24

Reported: Apr 15, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	High Boiling Point Hydrocarbons
Method:	EPA 8015
Analyst:	R. Lee
Reporting Units:	µg/L
Date Analyzed:	Apr 7, 1992
QC Sample #:	DBLK040692X
Sample Conc.:	N.D.
Spike Conc. Added:	300
Conc. Matrix Spike:	210
Matrix Spike % Recovery:	70
Conc. Matrix Spike Dup.:	250
Matrix Spike Duplicate % Recovery:	83
Relative % Difference:	17

Quality Assurance Statement: All standard operating procedures and quality control requirements have been met.

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. 2126-92-SSA

COPY

Chain of Custody

ARCO Facility no. 2126	City (Facility) Oakland	Project manager (Consultant) Frank Cline	Laboratory name SEQ
ARCO engineer Charles Caramel	Telephone no. (ARCO)	Telephone no. (Consultant) 510-783-7560	Fax no. (Consultant) 510-783-1085
Consultant name Cortner Ryan Inc	Address (Consultant) 2150 W. Winton Ave Hayward		Contract number 07-073

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH EPA M602/8020/8015	TPH Modified 8015 Gas ☑ Diesel ☑	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals ☐ Semi VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐		
A-1		3		✓		✓	✓	4-3-91		✓		✓				2040520						
A-2																		21				
A-3																		22				
A-4																		23				
~~A-5~~																						
AR-1																		24				
TRIP																						

Condition of sample: good

Temperature received: cool

Relinquished by sampler	Date 4-3-92	Time 17:43	Received by
Relinquished by	Date	Time	Received by
Relinquished by	Date	Time	Received by laboratory Sophie Patzi

Date 4/3 Time 1743

Special detection Limit/reporting: Standard

Special QA/QC: Standard

Remarks: GR # 3927.02

Lab number:

Turnaround time

- Priority Rush 1 Business Day ☐
- Rush 2 Business Days ☐
- Expedited 5 Business Days ☐
- Standard 10 Business Days ☑

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

APPC-3292 (2-91)

GETTLER–RYAN INC.

General and Environmental Contractors

WELL SAMPLING FIELD DATA SHEET

COMPANY Arco JOB # 3927

LOCATION _____ DATE 4-3-92

CITY Oakland TIME _____

Well ID. A-1 Well Condition _____

Well Diameter 3" in. Hydrocarbon Thickness _____ ft.

Total Depth 24.05 ft.

Depth to Liquid- 10.35 ft.

Volume Factor (VF)			
	2" = 0.17	6" = 1.50	12" = 5.80
	3" = 0.38	8" = 2.60	
	4" = 0.66	10" = 4.10	

(# of casing volumes) _____ x 14.15 x(VF) 6.38 = (Estimated Purge Volume) 54.27 gal.

Purging Equipment Suction

Sampling Equipment Bailer

Starting Time 11:46 Purging Flow Rate 2.5 gpm.

(Estimated Purge Volume) _____ gal. / (Purging Flow Rate) _____ gpm. = (Anticipated Purging Time) _____ min.

Time	pH	Conductivity	Temperature	Volume
11:46	7.33	1422	19.5	5.5 gals
11:50	7.21	1413	20.1	12 gals
11:53	7.16	1407	20.1	17.5
11:55	7.10	1399	20.1	22.5
11:57	7.11	1396	20.2	27.5
12:01	7.13	1399	19.9	29 gals.

Did well dewater? No If yes, time _____ Volume _____

Sampling Time 12:01 Weather Conditions _____

Analysis _____ Bottles Used _____

Chain of Custody Number _____

COMMENTS _____

FOREMAN _____ ASSISTANT _____

GETTLER-RYAN INC.

General and Environmental Contractors

WELL SAMPLING FIELD DATA SHEET

COMPANY Arco JOB # 3927

LOCATION _____ DATE 4-3-92

CITY Oakland TIME _____

Well ID. A-2 Well Condition _____

Well Diameter 3" in. Hydrocarbon Thickness _____ ft.

Total Depth 25.2 ft.

Depth to Liquid- 10.97 ft.

Volume Factor (VF)			
	2" = 0.17	6" = 1.50	12" = 5.80
	3" = 0.38	8" = 2.60	
	4" = 0.66	10" = 4.10	

(# of casing volumes) _____ x 14.23 x(VF) 0.38 = (Estimated Purge Volume) 5.4 27 gal.

Purging Equipment Suction

Sampling Equipment Bailer

Starting Time 11:20 Purging Flow Rate 2.5 gpm.

(Estimated Purge Volume) _____ gal. / (Purging Flow Rate) _____ gpm. = (Anticipated Purging Time) _____ min.

Time	pH	Conductivity	Temperature	Volume
11:22	7.85	1049	20.9	5.4
11:24	7.81	1043	20.1	10 gals
11:27	7.58	1031	20.4	17.5
11:29	7.56	1029	20.4	22.5
11:32	7.50	1029	20.5	30 gals
11:36	7.50	1031	20.4	35 gals

Did well dewater? No If yes, time _____ Volume _____

Sampling Time 11:39 Weather Conditions _____

Analysis _____ Bottles Used _____

Chain of Custody Number _____

COMMENTS _____

FOREMAN _____ ASSISTANT _____

GETTLER-RYAN INC.

General and Environmental Contractors

WELL SAMPLING FIELD DATA SHEET

COMPANY ARCC JOB # 3927

LOCATION _____ DATE 4-3-92

CITY Oakland TIME _____

Well ID. A-3 Well Condition _____

Well Diameter 3" in. Hydrocarbon Thickness _____ ft.

Total Depth 29' ft.

Depth to Liquid- 11.70 ft.

Volume Factor (VF)			
	2" = 0.17	6" = 1.50	12" = 5.80
	3" = 0.38	8" = 2.60	
	4" = 0.66	10" = 4.10	

(# of casing volumes) _____ x 17.3 x(VF) 0.38 = (Estimated Purge Volume) 6.6 (33) gal.

Purging Equipment Suction

Sampling Equipment Bailer

Starting Time 10:36 Purging Flow Rate ~~.25~~ 6 2.5 gpm.

(Estimated Purge Volume) _____ gal. / (Purging Flow Rate) _____ gpm. = (Anticipated Purging Time) _____ min.

Time	pH	Conductivity	Temperature	Volume
10:38	7.97	467	18.6	6.6
10:42	8.05	908	19.0	13.2
10:45	7.92	909	19.1	19.8
10:48	7.75	918	19.2	26.4
10:51	7.73	919	19.2	33.0
10:54	7.73	920	19.1	39

Did well dewater? No If yes, time _____ Volume _____

Sampling Time 10:54 Weather Conditions _____

Analysis _____ Bottles Used _____

Chain of Custody Number _____

COMMENTS _____

FOREMAN _____ ASSISTANT _____

GETTLER–RYAN INC.

General and Environmental Contractors

WELL SAMPLING
FIELD DATA SHEET

COMPANY Arco JOB # 3927.03

LOCATION _____ DATE 4-3-92

CITY Oakland TIME _____

Well ID. A-4 Well Condition okay

Well Diameter 3" in. Hydrocarbon Thickness _____ ft.

Total Depth 28' ft.

Depth to Liquid- 10.84 ft.

Volume Factor (VF)			
	2" = 0.17	6" = 1.50	12" = 5.80
	3" = 0.38	8" = 2.60	
	4" = 0.66	10" = 4.10	

(# of casing volumes) _____ x 17.16 x(VF) _____ = (Estimated Purge Volume) 6.5 (32) gal.

Purging Equipment Suction

Sampling Equipment Bailer

Starting Time 9:55 Purging Flow Rate 1.5 gpm.

(Estimated Purge Volume) _____ gal. / (Purging Flow Rate) _____ gpm. = (Anticipated Purging Time) _____ min.

Time	pH	Conductivity	Temperature	Volume
9:59	8.50	1222	18.9	6.5 gals
10:03	7.78	1116	18.8	13.0
10:07	7.59	~~1038~~ 1022	18.9	19.5
10:11	7.58	1013	18.9	26.0
10:15	7.59	1016	19.0	32.5
10:20	9.60	1015	19.0	39 gals

Did well dewater? NO If yes, time _____ Volume _____

Sampling Time 10:20 Weather Conditions _____

Analysis _____ Bottles Used _____

Chain of Custody Number _____

COMMENTS _____

FOREMAN _____ ASSISTANT _____

GETTLER–RYAN INC.

General and Environmental Contractors

WELL SAMPLING FIELD DATA SHEET

COMPANY Arco JOB # 3927

LOCATION _____ DATE 8

CITY Oakland TIME _____

Well ID. AR-1 Well Condition _____

Well Diameter 6" in. Hydrocarbon Thickness _____ ft.

Total Depth 28' ft.

Depth to Liquid- 11.07 ft.

Volume Factor (VF)			
	2" = 0.17	6" = 1.50	12" = 5.80
	3" = 0.38	8" = 2.60	
	4" = 0.66	10" = 4.10	

(# of casing volumes) _____ x 16.93 x(VF) 1.5 = (Estimated Purge Volume) 25.4 gal. (127)

Purging Equipment Suction

Sampling Equipment Bailer

Starting Time 1215 Purging Flow Rate 6 gpm.

(Estimated Purge Volume) _____ gal. / (Purging Flow Rate) _____ gpm. = (Anticipated Purging Time) _____ min.

Time	pH	Conductivity	Temperature	Volume
12:19	7.80	903	17.3	24 gals
12:23	7.69	876	17.1	48
12:27	7.70	872	17.1	72
12:32	7.70	875	17.1	102
12:36	7.70	879	17.3	126
12:46	7.70	880	17.5	128

Did well dewater? No If yes, time _____ Volume _____

Sampling Time 12:40 Weather Conditions _____

Analysis _____ Bottles Used _____

Chain of Custody Number _____

COMMENTS _____

FOREMAN _____ ASSISTANT _____