GeoStrategies Inc.

LETTER OF TRANSMITTAL

Environmental Consulting
Engineering and Geologic Services

DATE 4/14/93

STID

MR. DENNIS BYRNE (CERTIFIED MAIL)
ALAMEDA COUNTY HEALTH AGENCY
HAZARDOUS MATERIALS DIVISION
80 SWAN WAY RM. 200
OAKLAND, CA. 94621

PROJECT NO. 7927
SUBJECT: QUARTERLY MONITORING/WELL INSTALL. REPORT
ARCO SERVICE STATION #2169
889 W. GRAND AVE.
OAKLAND, CA. 94610

THE FOLLOWING ITEMS ARE:

☑ ATTACHED ☐ FORWARDED SEPARATELY VIA _____

QUANTITY	PROJECT NO.	DATE	DESCRIPTION
1	7927	4/9/93	QUARTERLY MONITORING/WELL INSTALL. REPORT 1ST QUARTER '93

THESE ARE TRANSMITTED as checked below:

☐ For approval
☑ For your use
☐ As requested
☐ For review and

☐ Approved
☐ Approved as noted
☐ Returned for
☐ Other _____

COMMENTS:

Signed: _____

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MR. H. C. WINSOR, ARCO PRODUCTS CO.
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GeoStrategies Inc.

QUARTERLY MONITORING/WELL INSTALLATION REPORT

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

792701-8

April 9, 1993

GeoStrategies Inc.

April 9, 1993

ARCO Products Company
Post Office Box 5811
San Mateo, California

Attn: *Mr. Michael Whelan*

Re: **QUARTERLY MONITORING/WELL INSTALLATION REPORT - *First Quarter 1993***
ARCO Service Station No. 2169
889 West Grand Avenue
Oakland, California

Mr. Whelan:

This Quarterly Monitoring/Well Installation Report was prepared by GeoStrategies Inc. (GSI) and presents first quarter, 1993 ground-water sampling and field activities performed for the above referenced location (Plate 1). On February 4, 1993, two exploratory borings were drilled off-site and completed as ground-water monitoring wells A-5 and A-6 (Plate 2) as outlined in the GSI Work Plan dated January 8, 1993. Groundwater in wells A-5 and A-6 was sampled on February 11, 1993. Quarterly monitoring and sampling of the previously installed site wells were conducted by the ARCO contractor for the first quarter on January 28, 1993. Field work was performed to comply with current State of California Water Resources Control Board (SWRCB) and local agency guidelines. GSI Field Methods and Procedures were presented in the GSI Work Plan dated October 29, 1991.

792701-8

SITE BACKGROUND

On May 14, 1991, GSI drilled five exploratory soil borings (A-A through A-E), 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), 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. TPH-Gasoline concentrations ranged between 2.3 parts per million (ppm) and 1,900 ppm. Benzene concentrations ranged between 0.10 ppm and 18 ppm. In addition, a well adjacent to the existing USTs was properly abandoned.

Between January and April 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 current tank complex is composed of four double wall fiberglass 10,000 gallon tanks containing unleaded gasoline and diesel products. The location of the former and present tank complexes are shown on Plate 2. Soil sample analytical results from the former tank complex confirmed results from previous soil boring samples that petroleum hydrocarbons had impacted soil in the tank complex vicinity to a depth of 12 feet below grade (fbg). Soil sample results from product line trenching revealed a TPH-Diesel concentration of 450 ppm in the vicinity of the diesel dispenser on the westernmost island. This area was overexcavated and resampled at a depth of 7 feet below ground surface. Results of the second sample identified TPH-Diesel at a concentration of 54 ppm. TPH-Gasoline and Benzene were reported at levels of less than or equal to 140 ppm and 2.2 ppm, respectively, from the remaining trench samples. An Underground Storage Tank Removal and Soil Sampling Report documenting the tank removal and soil sampling analytical results was issued by ROUX Associates (ROUX) on July 14, 1992.

Between March 16 and 25, 1992, five exploratory soil borings were drilled and completed as Recovery Well AR-1 and ground-water monitoring wells A-1 through A-4. TPH-Gasoline was detected in the soil sample from a depth of 10.0 feet in Boring A-1 at a concentration of 2.2 ppm. Benzene was identified in samples from depths of 4.5 feet and 10.0 feet in Boring A-1 at concentrations of 0.024 ppm and 0.13 ppm, respectively. Results of this investigation are presented in the GSI Well Installation Report dated June 30, 1992. Four additional exploratory borings were completed as vapor extraction wells AV-1 through AV-3 and groundwater extraction well AR-2 by GSI on June 8, 1992. TPH-Gasoline was detected in soil samples submitted from borings; AV-1 (11.5 fbg), AV-2 (6.5 fbg and 11.5 fbg), and AV-3 (11.5 fbg), at concentrations of 12 ppm, 1.8 ppm, 1,500 ppm, and 110 ppm, respectively. Benzene was detected in soil samples submitted from AV-1 (6.5 fbg and 11.5 fbg), AV-2 (6.5 fbg and 11.5 fbg), and AV-3 (6.5 fbg and 11.5 fbg) at concentrations of 0.15 ppm, 0.81 ppm, 0.31 ppm, 21 ppm, 0.037 ppm, and 2.4 ppm, respectively. TPH-Diesel was not detected (ND) in any of the soil samples submitted for analysis. These results were presented in the GSI report dated November 24, 1992.

Quarterly ground-water monitoring and sampling of site wells began in April 1992. Ground-water samples are currently analyzed for TPH-Gasoline according to EPA Method 8015 (Modified) and BTEX according to EPA Method 8020. Samples from Wells A-1, AR-1, and AR-2 are also analyzed for TPH-Diesel according to EPA Method 8015 (Modified).

WELL INSTALLATION FIELD ACTIVITIES

Two off-site exploratory soil borings were drilled on February 4, 1993, using a truck-mounted, hollow-stem auger drilling rig. Borings A-5 and A-6 were drilled to total depths of 30.0 fbg. 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 (ASTM D 2488-84) and Munsell Color Chart, and prepared a lithologic log for each boring. Exploratory boring logs are presented in Appendix A.

Soil Sampling

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.

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.

Monitoring Well Installation

Borings A-5 and A-6 were drilled using 8-inch diameter hollow-stem augers to a depth of 30.0 fbg. Ground-water monitoring Wells A-5 and A-6 were constructed using 2-inch diameter Schedule 40 PVC blank well casing and 0.020-inch machine slotted well screen to depths of 30.0 feet and 28.5 feet, respectively. Well screen extends from 8.0 to 30.0 fbg in Well A-5 and from 8.0 to 28.5 feet in Well A-6. Lonestar #2/12 graded sand was placed across the entire screened intervals and extends 1.0-foot above the top of the well screen. A 1.0-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 one foot below ground surface. A traffic-rated vault box, set in concrete, was installed over the top of each well.

A waterproof locking well cap and lock were placed on each well casing. Each well was developed using methods outlined in GSI's Field Methods and Procedures. The well completion details are presented with the Exploratory Boring Logs in Appendix A.

Soil Chemical Analytical Results

Soil samples were analyzed for TPH-Gasoline according to EPA Method 8015 (Modified) and BTEX according to EPA Method 8020. Soil samples from Boring A-5 were also analyzed for Halogenated Volatile Organics (HVO) according to EPA Method 8010. Chemical analyses were performed by Sequoia in Redwood City, California.

Soil chemical analytical data are summarized in Table 1. Four soil samples were collected from Borings A-5 and A-6, at depths of 6.5 fbg and 9.5 fbg in Boring A-5 and 6.5 fbg and 9.0 fbg in Boring A-6, for chemical analysis. Soil samples from 6.5 fbg were collected in the vadose zone. Samples from 9.0 fbg and 9.5 fbg were collected from the capillary fringe. The soil sample from Boring A-5 collected at 9.5 fbg contained TPH-Gasoline and Benzene concentrations of 17 ppm and 0.21 ppm, respectively. TPH-Gasoline and BTEX were reported as ND for the remaining soil samples. The soil chemical analytical report and chain-of-custody form are presented in Appendix B.

Ground-water Chemical Analytical Results

Ground-water samples were collected from Wells A-5 and A-6 on February 11, 1993 by Gettler-Ryan Inc. (G-R). The samples were analyzed for TPH-Gasoline according to EPA Method 8015 (Modified), BTEX according to EPA Method 8020 and HVOs according to EPA Method 8010. Chemical analyses were performed by Sequoia.

Ground-water chemical analytical data are summarized in Table 2. TPH-Gasoline was detected in the samples from Wells A-5 and A-6 at concentrations of 4,900 parts per billion (ppb) and 990 ppb, respectively. Benzene was identified in these same samples at concentrations of 380 ppb and 1.8 ppb, respectively. HVO's were reported as ND for groundwater samples from Wells A-5 and A-6. The G-R field data sheets and Sequoia analytical report are presented in Appendix C.

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 westward towards San Francisco Bay.

Local Setting

Based on exploratory boring data from investigations performed to date, the local subsurface lithologically appears to consist of clay, sand, silt, and minor gravel to the total depth explored of 30.0 feet below ground surface. Lithologies encountered in Wells A-5 and A-6 consist of well to poorly sorted sand, silty sand, clay, and silty clay. A clay aquitard was observed in Well A-6 at a depth of 28.75 feet. This clay aquitard was not observed in Well A-5. Groundwater was first encountered in borings A-5 and A-6 at depths of 10.0 feet and 9.2 feet, respectively. Water-levels stabilized at 10.5 feet and 9.5 feet, respectively. The close correlation between first encountered water and stabilized water-levels indicates unconfined to semi-confined aquifer conditions.

CURRENT QUARTER SAMPLING RESULTS

Depth to water-level measurements were obtained from each monitoring and recovery well. Static ground-water levels were measured from the surveyed top of the well box and recorded to the nearest $\pm$0.01 foot. Water-level data were referenced to Mean Sea Level (MSL) datum and used to construct monthly potentiometric maps (Plates 3 through 5). The EMCON Associates (EMCON) Groundwater Monitoring Reports and Groundwater Sampling Report are presented in Appendices D and E, respectively. Shallow ground-water beneath the site flows north to west at approximate hydraulic gradients of 0.004, 0.005, and 0.005, respectively.

Each well was checked for the presence of floating product. Floating product was not observed in any well this quarter. Historically, floating product has not been observed in Wells A-1 through S-6, AR-1, and AR-2. Depth to groundwater and floating product measurements for the current quarter are summarized in Table 2. Current and historical water-level data and floating product measurements are summarized in Table 3.

Ground-water samples were collected on January 28, 1993 by EMCON Associates (EMCON). Samples were analyzed for TPH-Gasoline according to EPA Method 8015 (Modified) and BTEX according to EPA Method 8020. Samples from Wells A-1, AR-1, and AR-2 were also analyzed for TPH-Diesel according to EPA Method 8015.

Current quarter chemical analytical data are presented in Table 2 and have also been added to the Historical Groundwater Quality Database presented in Table 4. TPH-Gasoline was detected in samples from Wells A-1, AR-1, and AR-2 at concentrations ranging between 2,000 ppb and 15,000 ppb. Benzene was identified in Wells A-1, AR-1, and AR-2 at concentrations ranging between 570 ppb and 1,200 ppb. TPH-Gasoline and Benzene were reported as ND in Wells A-2, A-3, and A-4.

The EMCON Groundwater Sampling Report is presented in Appendix E. Chemical isoconcentration maps for TPH-Gasoline and benzene are presented on Plates 6 and 7, respectively.

SUMMARY

The results of this investigation are summarized below:

- Two exploratory borings were drilled off-site on February 4, 1993 and completed as ground-water monitoring wells A-5 and A-6.

- The lithology of the borings consisted primarily of clay, silty clay, sand and silty sand to the total depth explored of 30.0 feet. Water-levels in Wells A-5 and A-6 were first encountered at approximately 10.0 and 9.2 fbg and stabilized at 10.5 and 9.5 fbg.

- Soil samples were collected from depths of 6.5 fbg and 9.5 fbg in boring A-5 and 6.5 fbg and 9.0 fbg in Boring A-6 and analyzed for TPH-Gasoline and BTEX. Samples from 6.5 fbg were collected from the vadose zone. Samples from 9.0 fbg and 9.5 were collected in the capillary zone. Samples from Boring A-5 were also analyzed for HVOs. TPH-Gasoline and benzene were detected in the sample from A-5 collected at a depth of 9.5 feet at concentrations of 17 ppm and 0.21 ppm, respectively. TPH-Gasoline and benzene were reported as ND for the remaining samples. HVO analyses for Boring A-5 were also reported as ND.

- Groundwater samples were collected from Wells A-5 and A-6 on February 11, 1993 and analyzed for TPH-Gasoline, BTEX, and HVOs. TPH-Gasoline was detected from Wells A-5 and A-6 at concentrations of 4,900 ppb and 990 ppb, respectively. Benzene was identified in Wells A-5 and A-6 at concentrations of 380 ppb and 1.8 ppb, respectively. HVOs were reported as ND for each well.

- Water-level data collected in November and December 1992 and January 1993, indicate that groundwater flows north to west at calculated hydraulic gradients ranging from 0.004 to 0.005.

- Floating product was not observed in any well during this quarter. Historically, floating product has not been observed in Wells A-1 through A-6, AR-1 and AR-2.

- First quarter, 1993 groundwater sampling was performed on January 28, 1993. TPH-Gasoline was detected in Wells A-1, AR-1, and AR-2 at concentrations ranging between 2,000 ppb and 15,000 ppb. Benzene was identified in Wells A-1, AR-1, and AR-2 at concentrations ranging between 570 ppb and 1,200 ppb.

CONCLUSIONS

Based on the most recent water-level measurements, shallow groundwater flow direction beneath the site appears to be fluctuating north to west. The westward component of recent hydraulic gradients is inconsistent with historical gradients of north to northwest flow directions and may result from recent groundwater recharge. Additionally, the detection of dissolved hydrocarbons in newly installed Well A-5 supports a westerly groundwater flow direction. Wells A-2, A-3, and A-4 reported ND levels for TPH-Gasoline and BTEX and suggests upgradient delineation of dissolved hydrocarbons occurs on-site. Groundwater sampling and monitoring of the current monitoring well network in the second quarter of 1993 will attempt to confirm groundwater flow direction and dissolved hydrocarbon concentrations. Water-levels beneath the site have risen approximately 3 feet during the period from November 1992 to January 1993.

If you have any questions or comments, please call.

GeoStrategies Inc. by,

Robert C. Mallory
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REGISTERED GEOLOGIST
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RCM/JFV/rt

Table 1.	Soil Analyses Data
Table 2.	Ground-water Analyses Data
Table 3.	Historical Water-level Data
Table 4.	Historical Ground-water Quality Database

Plate 1.	Vicinity Map
Plate 2.	Site Plan
Plate 3.	Potentiometric Map (November 23, 1992)
Plate 4.	Potentiometric Map (December 16, 1992)
Plate 5.	Potentiometric Map (January 28, 1993)
Plate 6.	TPH-G Isoconcentration Map
Plate 7.	Benzene Isoconcentration Map

Appendix A.	Exploratory Boring Logs and Well Construction Details
Appendix B.	Soil Chemical Analytical Report and Chain-of-Custody Form
Appendix C.	G-R Field Data Sheets and Sequoia Chemical Analytical Report
Appendix D.	EMCON Monitoring Reports
Appendix E.	EMCON Ground-water Sampling Report

QC Review: EM

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REFERENCES CITED

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

TABLES

TABLE 1

SOIL ANALYSES DATA

Sample I.D.	Sample Date	Analyzed Date	TPH-G (PPM)	Benzene (PPM)	Toluene (PPM)	Ethylbenzene (PPM)	Xylenes (PPM)
A-5-6.5	04-Feb-93	08-Feb-93	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
A-5-9.5	04-Feb-93	08-Feb-93	17	0.21	0.076	0.28	0.54
A-6-6.5	04-Feb-93	08-Feb-93	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
A-6-9.0	04-Feb-93	08-Feb-93	<1.0	<0.0050	<0.0050	<0.0050	<0.0050

TPH-G = Total Petroleum Hydrocarbons calculated as Gasoline
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 collected.
3. Halogenated volatile organic analyses performed on samples A-5-6.5 and A-5-.9.5 were reported as ND.

TABLE 2

GROUND-WATER ANALYSES DATA

WELL NO.	SAMPLE DATE	ANALYZED DATE	TPH-G (PPB)	BENZENE (PPB)	TOLUENE (PPB)	ETHYLBENZENE (PPB)	XYLENES (PPB)	TPH-D (PPB)	WELL ELEV. (FT)	STATIC WATER ELEV. (FT)	PRODUCT THICKNESS (FT)	DEPTH WATER (FT)
A-1	23-Nov-92	---	---	---	---	---	---	---	14.75	2.92	0.00	11.83
	16-Dec-92	---	---	---	---	---	---	---	14.75	3.72	0.00	11.03
	28-Jan-93	03-Feb-93	3700	780	360	130	460	620*	14.75	5.67	0.00	9.08
A-2	23-Nov-92	---	---	---	---	---	---	---	15.16	2.98	0.00	12.18
	16-Dec-92	---	---	---	---	---	---	---	15.16	3.64	0.00	11.52
	28-Jan-93	03-Feb-93	<50	<0.50	<0.50	<0.50	<0.50	N/A	15.16	5.43	0.00	9.73
A-3	23-Nov-92	---	---	---	---	---	---	---	16.38	2.78	0.00	13.60
	16-Dec-92	---	---	---	---	---	---	---	16.38	4.07	0.00	12.31
	28-Jan-93	03-Feb-93	<50	<0.50	<0.50	<0.50	<0.50	N/A	16.38	6.05	0.00	10.33
A-4	23-Nov-92	---	---	---	---	---	---	---	15.89	3.26	0.00	12.63
	16-Dec-92	---	---	---	---	---	---	---	15.89	4.55	0.00	11.34
	28-Jan-93	03-Feb-93	<50	<0.50	<0.50	<0.50	<0.50	N/A	15.89	6.49	0.00	9.40
A-5	11-Feb-93	17-Feb-93	4900	380	640	140	970	N/A	14.14	4.99	0.00	9.15
A-6	11-Feb-93	18-Feb-93	990	1.8	5.1	17	7.2	N/A	14.17	4.82	0.00	9.35
AR-1	23-Nov-92	---	---	---	---	---	---	---	15.71	2.91	0.00	12.80
	16-Dec-92	---	---	---	---	---	---	---	15.71	4.22	0.00	11.49
	28-Jan-93	03-Feb-93	15000	1200	510	510	2600	5300*	15.71	6.25	0.00	9.46
AR-2	23-Nov-92	---	---	---	---	---	---	---	15.79	---	---	---
	16-Dec-92	---	---	---	---	---	---	---	15.79	3.63	0.00	12.16
	28-Jan-93	03-Feb-93	2000	570	13	<10	380	290*	15.79	5.53	0.00	10.26

TABLE 2

GROUND-WATER ANALYSES DATA

Current Regional Water Quality Control Board Maximum Contaminant Levels
Benzene 1.0 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.
TB = Trip Blank

* Reported as a non-diesel mix.

Notes:
1. All data shown as <x are reported as ND (none detected).
2. Water level elevations referenced to Mean Sea Level (MSL).
3. Well AR-2 could not be located on November 23, 1992.
4. Halogenated volatile organic analyses performed on samples from Wells A-5 and A-6 collected on February 11, 1993 were reported as ND.

TABLE 3

HISTORICAL WATER-LEVEL DATA

MONITORING DATE	WELL NUMBER	DEPTH TO WATER (ft)	WELL ELEVATION (FT)	STATIC WATER ELEVATION (FT)	FLOATING PRODUCT THICKNESS (FT)
03-Apr-92	A-1	10.35	14.75	4.40	0.00
20-May-92	A-1	11.66	14.75	3.09	0.00
16-Jun-92	A-1	11.95	14.75	2.80	0.00
17-Jul-92	A-1	12.23	14.75	2.52	0.00
07-Aug-92	A-1	12.16	14.75	2.59	0.00
22-Sep-92	A-1	12.42	14.75	2.33	0.00
13-Oct-92	A-1	12.47	14.75	2.28	0.00
23-Nov-92	A-1	11.83	14.75	2.92	0.00
16-Dec-92	A-1	11.03	14.75	3.72	0.00
28-Jan-93	A-1	9.08	14.75	5.67	0.00
03-Apr-92	A-2	10.97	15.16	4.19	0.00
20-May-92	A-2	12.17	15.16	2.99	0.00
16-Jun-92	A-2	12.43	15.16	2.73	0.00
17-Jul-92	A-2	12.64	15.16	2.52	0.00
07-Aug-92	A-2	12.75	15.16	2.41	0.00
22-Sep-92	A-2	12.88	15.16	2.28	0.00
13-Oct-92	A-2	12.92	15.16	2.24	0.00
23-Nov-92	A-2	12.18	15.16	2.98	0.00
16-Dec-92	A-2	11.52	15.16	3.64	0.00
28-Jan-93	A-2	9.73	15.16	5.43	0.00
03-Apr-92	A-3	11.70	16.38	4.68	0.00
20-May-92	A-3	13.00	16.38	3.38	0.00
16-Jun-92	A-3	13.46	16.38	2.92	0.00
17-Jul-92	A-3	13.45	16.38	2.93	0.00
07-Aug-92	A-3	12.37	16.38	4.01	0.00
22-Sep-92	A-3	13.71	16.38	2.67	0.00
13-Oct-92	A-3	13.76	16.38	2.62	0.00
23-Nov-92	A-3	13.60	16.38	2.78	0.00
16-Dec-92	A-3	12.31	16.38	4.07	0.00
28-Jan-93	A-3	10.33	16.38	6.05	0.00
03-Apr-92	A-4	10.84	15.89	5.05	0.00

TABLE 3

HISTORICAL WATER-LEVEL DATA

MONITORING DATE	WELL NUMBER	DEPTH TO WATER (ft)	WELL ELEVATION (FT)	STATIC WATER ELEVATION (FT)	FLOATING PRODUCT THICKNESS (FT)
20-May-92	A-4	12.13	15.89	3.76	0.00
16-Jun-92	A-4	12.33	15.89	3.56	0.00
17-Jul-92	A-4	12.60	15.89	3.29	0.00
07-Aug-92	A-4	12.56	15.89	3.33	0.00
22-Sep-92	A-4	12.87	15.89	3.02	0.00
13-Oct-92	A-4	12.87	15.89	3.02	0.00
23-Nov-92	A-4	12.63	15.89	3.26	0.00
16-Dec-92	A-4	11.34	15.89	4.55	0.00
28-Jan-93	A-4	9.40	15.89	6.49	0.00
11-Feb-93	A-5	9.15	14.14	4.99	0.00
11-Feb-93	A-6	9.35	14.17	4.82	0.00
03-Apr-92	AR-1	11.07	15.71	4.64	0.00
20-May-92	AR-1	12.37	15.71	3.34	0.00
16-Jun-92	AR-1	12.47	15.71	3.24	0.00
17-Jul-92	AR-1	13.00	15.71	2.71	0.00
07-Aug-92	AR-1	12.87	15.71	2.84	0.00
22-Sep-92	AR-1	12.99	15.71	2.72	0.00
13-Oct-92	AR-1	13.05	15.71	2.66	0.00
23-Nov-92	AR-1	12.80	15.71	2.91	0.00
16-Dec-92	AR-1	11.49	15.71	4.22	0.00
28-Jan-93	AR-1	9.46	15.71	6.25	0.00
17-Jul-92	AR-2	13.14	15.79	2.65	0.00
07-Aug-92	AR-2	13.25	15.79	2.54	0.00
22-Sep-92	AR-2	13.58	15.79	2.21	0.00
13-Oct-92	AR-2	13.65	15.79	2.14	0.00
23-Nov-92	AR-2	Not measured			
16-Dec-92	AR-2	12.16	15.79	3.63	0.00
28-Jan-93	AR-2	10.26	15.79	5.53	0.00

Notes: 1. Static water elevations referenced to Mean Sea Level (MSL).
2. Well elevations and depths-to-water are referenced to the top of the well box.
3. Well AR-2 could not be located on November 23, 1992.

TABLE 4

HISTORICAL GROUND-WATER QUALITY DATABASE

WELL NO.	SAMPLE DATE	ANALYZED DATE	TPH-G (PPB)	TOLUENE (PPB)	ETHYLBENZENE (PPB)	XYLENES (PPB)	TPH-D (PPB)
A-1	03-Apr-92	10-Apr-92	34000	6200	410	3100	6100
A-1	17-Jul-92	21-Jul-92	5600	3000	<100	<100	N/A
A-1	13-Oct-92	19-Oct-92	5600	980	85	910	N/A
A-1	28-Jan-93	03-Feb-93	3700	780	130	460	620*
A-2	03-Apr-92	10-Apr-92	<30	<0.30	<0.30	<0.30	<50
A-2	17-Jul-92	21-Jul-92	<50	<0.50	<0.50	<0.50	N/A
A-2	13-Oct-92	19-Oct-92	<50	0.57	<0.50	<0.50	N/A
A-2	28-Jan-93	03-Feb-93	<50	<0.50	<0.50	<0.50	N/A
A-3	03-Apr-92	10-Apr-92	200	0.79	4.4	<0.30	130
A-3	17-Jul-92	21-Jul-92	<50	<0.50	1.3	2.3	N/A
A-3	13-Oct-92	19-Oct-92	<50	<0.50	<0.50	<0.50	N/A
A-3	28-Jan-93	03-Feb-93	<50	<0.50	<0.50	<0.50	N/A
A-4	03-Apr-92	10-Apr-92	35	<0.30	<0.30	<0.30	85
A-4	17-Jul-92	21-Jul-92	<50	<0.50	<0.50	<0.50	N/A
A-4	13-Oct-92	19-Oct-92	<50	<0.50	<0.50	<0.50	N/A
A-4	28-Jan-93	03-Feb-93	<50	<0.50	<0.50	<0.50	N/A
A-5	11-Feb-93	17-Feb93	4900	380	140	970	N/A
A-6	11-Feb-93	18-Feb-93	990	1.8	17	7.2	N/A
AR-1	03-Apr-92	10-Apr-92	17000	310	320	3000	12000
AR-1	17-Jul-92	21-Jul-92	44000	4300	1800	10000	N/A
AR-1	13-Oct-92	19-Oct-92	32000	310	570	3100	22000*
AR-1	28-Jan-93	03-Feb-93	15000	1200	510	2600	5300*
AR-2	17-Jul-92	21-Jul-92	150	6.6	6.6	39	N/A
AR-2	13-Oct-92	19-Oct-92	<50	2.0	0.51	3.8	58*
AR-2	28-Jan-93	03-Feb-93	2000	570	<10	380	290*

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

CURRENT DHS ACTION LEVELS Toluene 100

TPH-G = Total Petroleum Hydrocarbons calculated as Gasoline.
TPH-D = Total Petroleum Hydrocarbons calculated as Diesel.
PPB = Parts Per Billion.
N/A = Not Analyzed.
* = reported as a non-diesel mix.

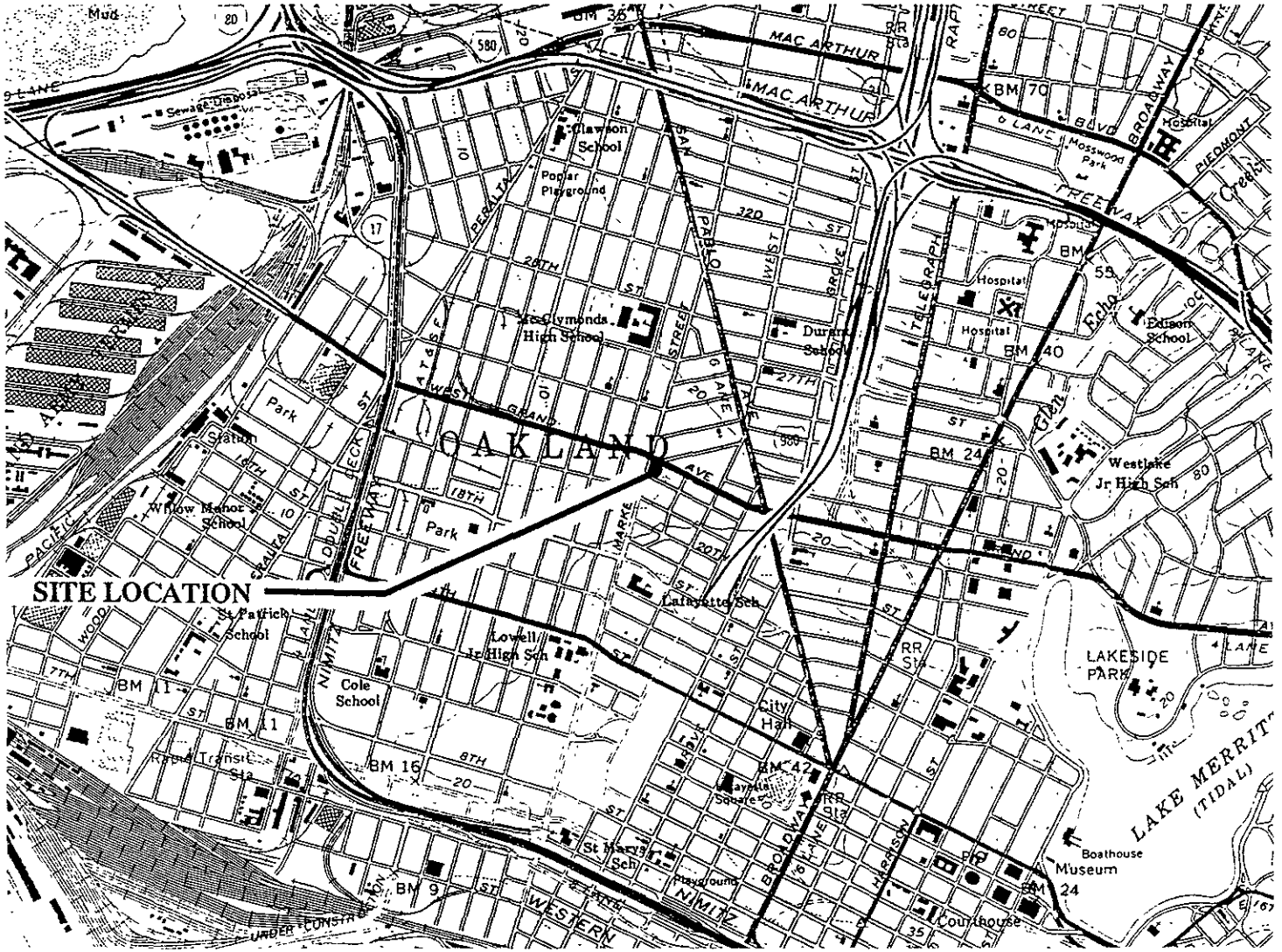
792701-8

TABLE 4

HISTORICAL GROUND-WATER QUALITY DATABASE

Notes: 1. All data shown as <x are reported as ND (none detected).

ILLUSTRATIONS



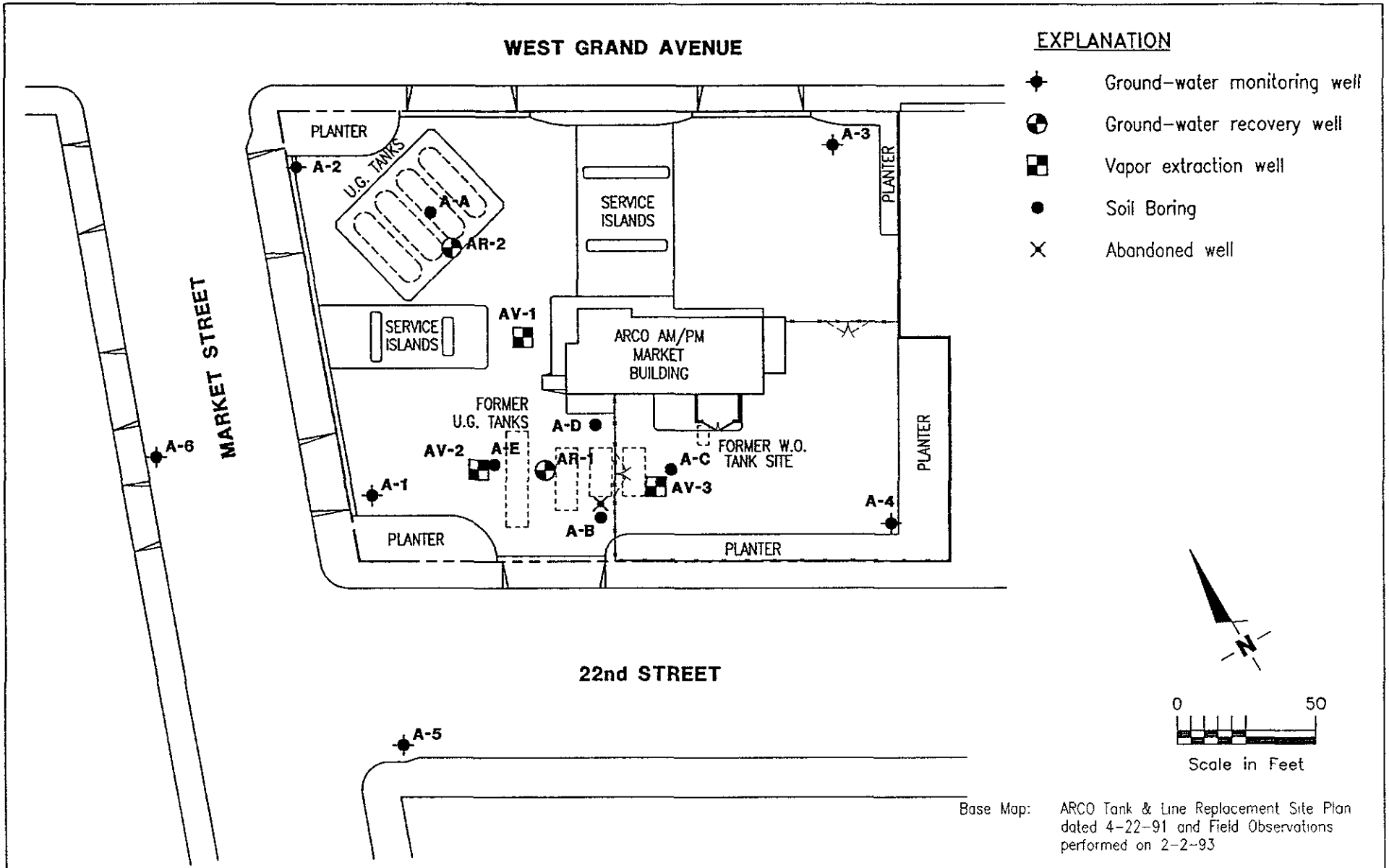
Base Map: USGS Topographic Map

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	



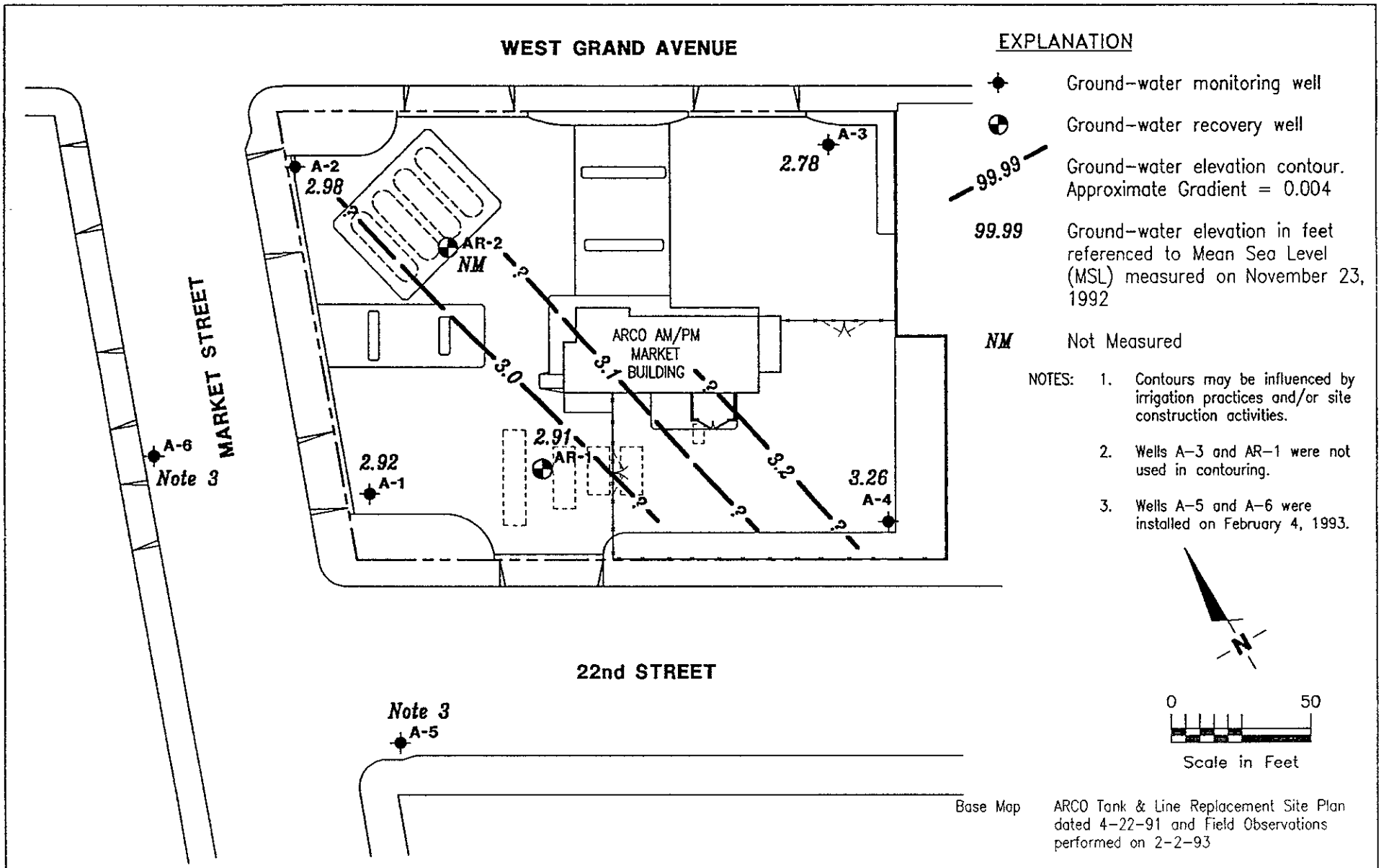
Base Map: ARCO Tank & Line Replacement Site Plan dated 4-22-91 and Field Observations performed on 2-2-93

GeoStrategies Inc.

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

PLATE
2

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
7927		4/93	



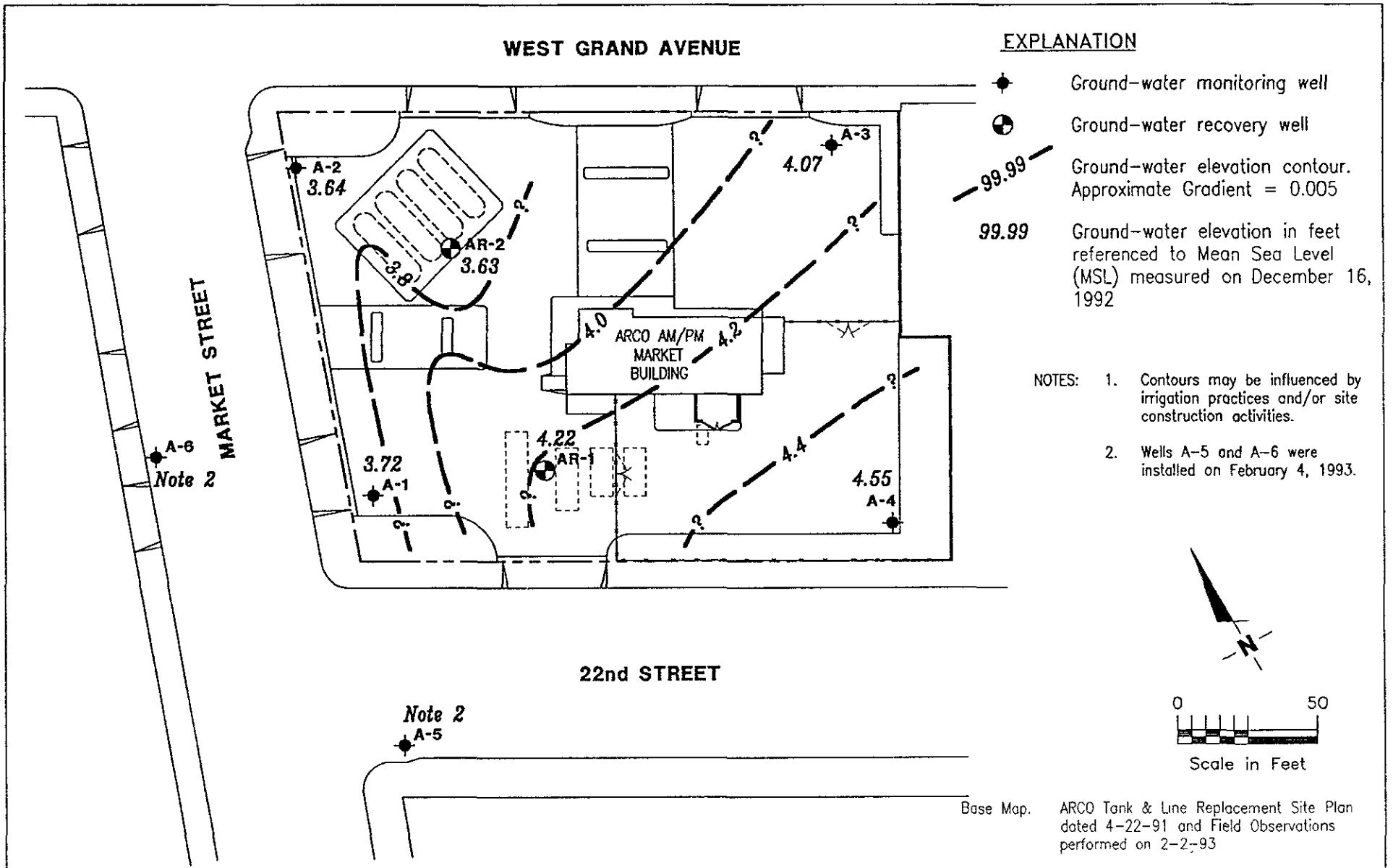
GeoStrategies Inc.

POTENTIOMETRIC MAP (NOVEMBER 23, 1992)

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

PLATE **3**

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
792708-8	rcm	4/93	

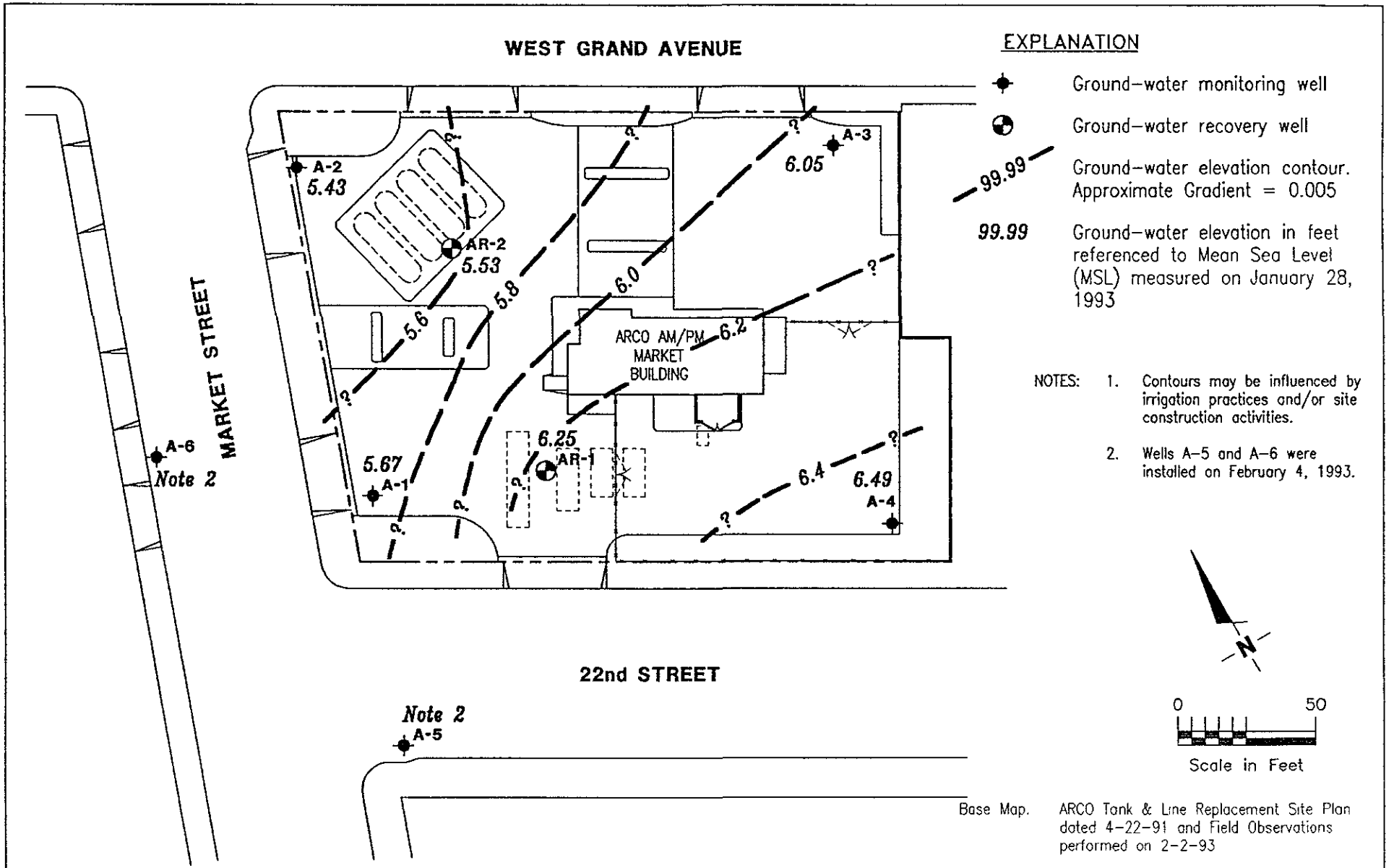


GeoStrategies Inc.

POTENTIOMETRIC MAP (DECEMBER 16, 1992)
ARCO Service Station #2169
889 West Grand Avenue
Oakland, California

PLATE **4**

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
792708-8		4/93	

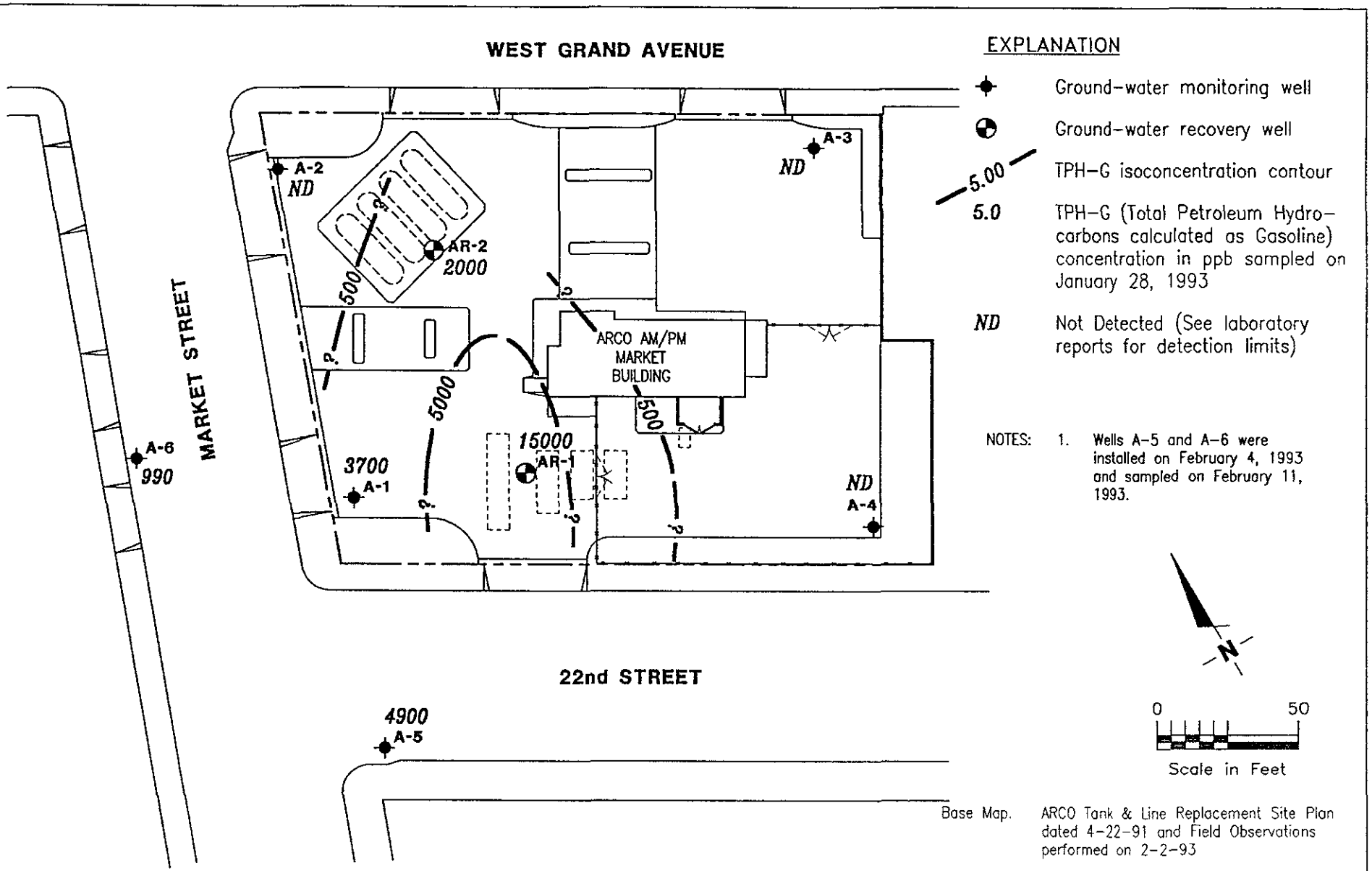


GeoStrategies Inc.

POTENTIOMETRIC MAP (JANUARY 28, 1993)
ARCO Service Station #2169
889 West Grand Avenue
Oakland, California

PLATE 5

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
792708-8	RCM	4/93	

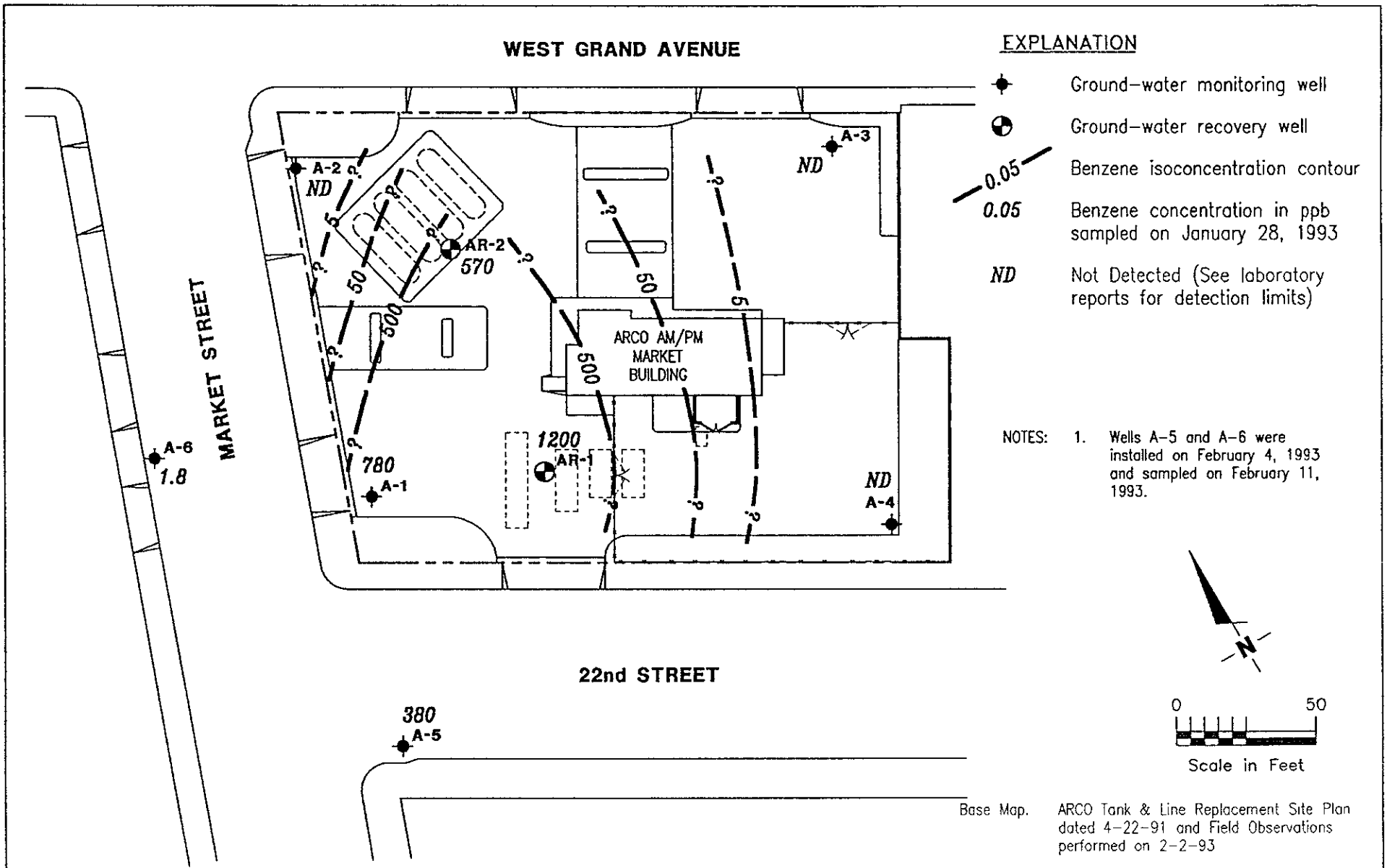


GeoStrategies Inc.

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

PLATE
6

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
792708-8	Ken	4/93	



GeoStrategies Inc.

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

PLATE **7**

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
792708-8		4/93	

APPENDIX A
EXPLORATORY BORING LOGS
AND
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.: 792708	Date: 02/04/93	Boring No: A-5		
	Client: ARCO Products Company SS#2169				
	Location: 889 W. Grand Avenue				
	City: Oakland		Sheet 1 of 2		
	Logged by: RCM	Driller: Great Sierra			
	Casing installation data:				
Drilling method: Hollow Stem Auger					
Hole diameter: 8-inch	Top of Box Elevation: 14.14		Datum: MSL		
	Water Level	10.0'	10.5'		
	Time	13:50	16:30		
	Date	2/4/93	2/4/93		

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 - 1.0 ft
				2				CLAY (CL) - very dark gray (10YR 3/1); medium stiff, sand, medium plasticity; 65% clay, 25% silt, 10% fine sand.
				3				
				4				
				5				
		S&H						SANDY SILT (ML) - olive (5Y 4/3); very stiff; moist; 55% silt, 45% fine to medium sand.
			A-5	6				
13	21		6.5					
				7				
				8				
		S&H						SILTY SAND (SM) - greenish gray (5GY 5/1); medium dense; very moist; 80% fine to medium sand, 20% silt.
			A-5	9				
154	15		9.5					
				10		▽		Saturated; increase fine gravel to 5%; light yellowish brown (2.5Y 6/4) mottling; fe-oxide staining at 10.0 ft.
		S&H				▼		
			A-5	11				
618	14		11.5					
				12				
				13				
				14				
				15				
		S&H						
			A-5	16				Increase silt to 60%; dense at 15.0 ft.
251	31		16.5					
				17				
				18				
				19				
				20				

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

GeoStrategies Inc.

Log of Boring

BORING NO. A-5

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
792708		2/93		

Field location of boring:	Project No.: 792708	Date: 02/04/93	Boring No:
(See Plate 2)	Client: ARCO Products Company SS#2169		A-5
	Location: 889 W. Grand Avenue		
	City: Oakland		Sheet 2
	Logged by: RCM	Driller: Great Sierra	of 2
	Casing installation data:		
Drilling method: Hollow Stem Auger			
Hole diameter: 8-inch	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						SAND (SP) - dark greenish gray (5GY 5/1); medium
			A-5	21				dense; saturated; 95% medium sand, 5% fines.
27	26		21.5					
				22				
				23				
				24				
				25				Grading to fine sand at 25.0 ft.
		S&H						
			A-5	26				
31	12		26.5					
				27				
				28				
		S&H		29				
			A-5					
106	11		30.0	30				
				31				
				32				
				33				
								Bottom of boring at 30.0 ft. 2/4/93
				34				
				35				
				36				
				37				
				38				
				39				
				40				

Remarks:

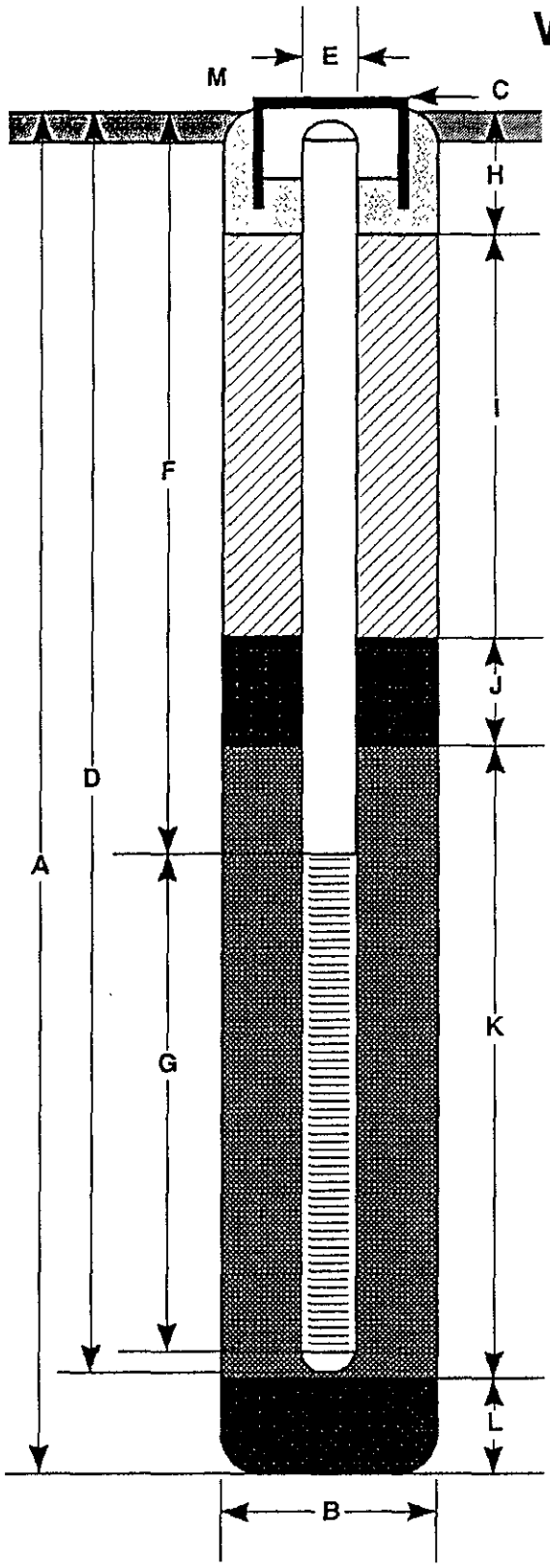
GeoStrategies Inc.

Log of Boring

BORING NO. A-5

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
792708		2/93		

WELL CONSTRUCTION DETAIL



A Total Depth of Boring 30.0 ft.

B Diameter of Boring 8 in.
Drilling Method Hollow Stem Auger

C Top of Box Elevation 14.14 ft.
[x] Referenced to Mean Sea Level
[ ] Referenced to Project Datum

D Casing Length 30.0 ft.
Material Schedule 40 PVC

E Casing Diameter 2 in.

F Depth to Top Perforations 8.0 ft.

G Perforated Length 22.0 ft.
Perforated Interval from 8.0 to 30.0 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 30.0 ft.
Pack Material Lonestar #2/12 Graded Sand

L Bottom Seal ft.
Seal Material

M Traffic-rated underground vault box with locking cap and lock.

Note: Depths measured from initial ground surface.

GeoStrategies Inc.

Well Construction Detail

WELL NO. A-5

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
792708		2/93		

Field location of boring: (See Plate 2)	Project No.: 792708	Date: 02/04/93	Boring No: A-6		
	Client: ARCO Products Company				
	Location: 889 W. Grand Avenue				
	City: Oakland		Sheet 1 of 2		
	Logged by: RCM	Driller: Great Sierra			
	Casing installation data:				
Drilling method: Hollow Stem Auger					
Hole diameter: 8-inch	Top of Box Elevation: 14.17		Datum: MSL		
	Water Level	9.2'	9.5'		
	Time	10:30	13:00		
	Date	2/4/93	2/4/93		

PID (ppm)	Blows/ft.* or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description
								PAVEMENT SECTION 1.5 FT.
				1				CLAY (CL) - very dark gray (10YR 3/1); medium stiff,
				2				damp, medium plasticity; 70% clay, 25% silt, 5% fine
				3				sand.
				4				
				5				
		S&H						Color change to dark greenish gray (5GY 4/1); very stiff;
			A-6	6				increase in silt to 40%, fine sand to 10%; caliche nodules.
29	21		6.5					
				7				
				8				
		S&H						
31			A-6 9.0	9				SAND (SP) - dark greenish gray (5GY 4/1); medium
61	21		A-6 9.5					dense, saturated (at 9.2 ft.); 95% fine to medium sand,
				10				5% fines.
		S&H						
			A-6	11				
341	17		11.5					SILTY CLAY (ML/CL) - greenish gray (5GY 5/1); very stiff,
				12				moist, medium plasticity; 60% clay, 35% silt, 5% fine
				13				sand; olive (5Y 4/4) mottling.
				14				
				15				
		S&H						Increase in sand to 25%; organic matter in rootholes.
			A-6	16				
85	13		16.5					
				17				
				18				
				19				
				20				

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

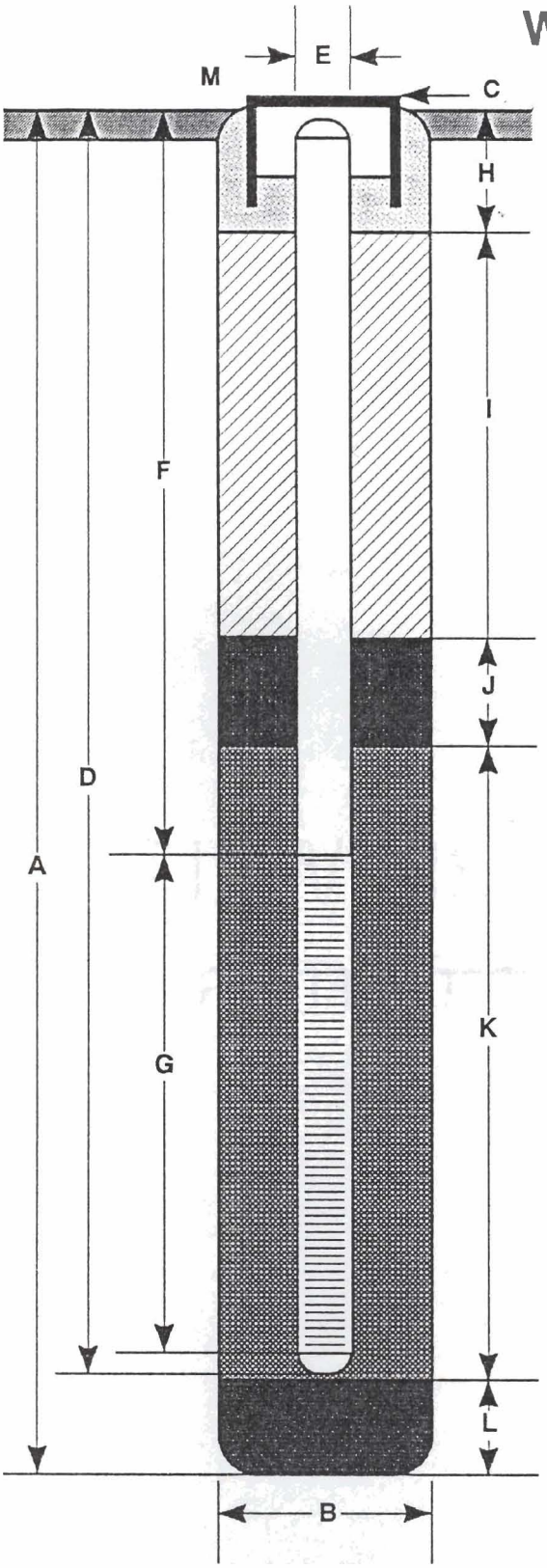
GeoStrategies Inc.

Log of Boring

BORING NO. A-6

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
792708		2/93		

WELL CONSTRUCTION DETAIL



A	Total Depth of Boring	30.0	ft.
B	Diameter of Boring	8	in.
	Drilling Method	Hollow Stem Auger	
C	Top of Box Elevation	14.17	ft.
	[X] Referenced to Mean Sea Level		
	[ ] Referenced to Project Datum		
D	Casing Length	28.5	ft.
	Material	Schedule 40 PVC	
E	Casing Diameter	2	in.
F	Depth to Top Perforations	8.0	ft.
G	Perforated Length	20[illegible]	ft.
	Perforated Interval from	8.0[illegible] to 28.5	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 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 28.5	ft.
	Pack Material	Lonestar #2/12 Graded Sand	
L	Bottom Seal	1.5	ft.
	Seal Material	Bentonite	
M	Traffic-rated underground vault box with locking cap and lock.		

Note: Depths measured from initial ground surface.

GeoStrategies Inc.

Well Construction Detail

WELL NO. A-6

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
792708	JTW	2/93		

Field location of boring: (See Plate 2)	Project No.: 792708	Date: 2/4/93	Boring No.: A-6
	Client: ARCO Products Company SS# 2169		
	Location: 889 W. Grand Avenue		
	City: Oakland		Sheet 2 of 2
	Logged by: RCM	Driller: Great Sierra	
	Casing installation data:		
Drilling method: Hollow Stem Auger			
Hole diameter: 8-inch	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						SAND (SW) - dark yellowish brown (10YR 4/4); dense,
			A-6	21				saturated; 90% fine to coarse sand, 10% fine gravel.
38	37		21.5					
				22				
				23				
				24				
				25				Increase in fines to 15%; fine gravel to 25%.
		S&H						
			A-6	26				SAND (SP) - very dark gray (2.5Y 3/1); medium dense,
3	24		26.5					saturated; 100% fine sand, trace fines.
				27				
				28				
								SAND (SW) - brown (10YR 4/3) - medium dense,
		S&H		29				saturated; 90% fine to coarse sand, 10% fine gravel.
			A-6					
0	18		30.0	30				CLAY (CL) - greenish gray (5G 5/1); stiff, moist, medium
								plasticity; 60% clay, 30% silt, 10% fine sand.
				31				
				32				Bottom of boring at 30.0 ft.
								2/4/93
				33				
				34				
				35				
				36				
				37				
				38				
				39				
				40				

Remarks:

GeoStrategies Inc.

Log of Boring

BORING NO. A-6

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
792708		2/93		

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

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

Enclosed are the results from 4 soil samples received at Sequoia Analytical on February 5,1993. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE OF COLLECTION	TEST METHOD
3B30201	Soil, A-5-6.6	2/4/93	EPA 5030/8010 EPA 5030/8015/8020
3B30202	Soil, A-5-9.5	2/4/93	EPA 5030/8010 EPA 5030/8015/8020
3B30203	Soil, A-6-6.5	2/4/93	EPA 5030/8015/8020
3B30204	Soil, A-6-9.0	2/4/93	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

Nokowhat D. Herrera
Project Manager

927-A

SEQUOIA ANALYTICAL

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

Gettler Ryan	Client Project ID:	2169-92-2B, Arco 2169-Oakland	Sampled:	Feb 4, 1993
2150 W. Winton Avenue	Sample Matrix:	Soil	Received:	Feb 5, 1993
Hayward, CA 94545	Analysis Method:	EPA 5030/8015/8020	Reported:	Feb 19, 1993
Attention: John Vargas	First Sample #:	3B30201		

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit mg/kg	Sample I.D. 3B30201 A-5-6.6	Sample I.D. 3B30202 A-5-9.5	Sample I.D. 3B30203 A-6-6.5	Sample I.D. 3B30204 A-6-9.0	Sample I.D.	Sample I.D.
Purgeable Hydrocarbons	1.0	N.D.	17	N.D.	N.D.		
Benzene	0.0050	N.D.	0.21	N.D.	N.D.		
Toluene	0.0050	N.D.	0.076	N.D.	N.D.		
Ethyl Benzene	0.0050	N.D.	0.28	N.D.	N.D.		
Total Xylenes	0.0050	N.D.	0.54	N.D.	N.D.		
Chromatogram Pattern:		--	Gas	--	--		

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0	1.0	1.0
Date Analyzed:	2/8/93	2/8/93	2/8/93	2/8/93
Instrument Identification:	GCHP7	GCHP7	GCHP7	GCHP7
Surrogate Recovery, %: (QC Limits = 70-130%)	102	138	94	102

Purgeable Hydrocarbons are quantitated against a fresh gasoline standard.
Analytes reported as N.D. were not detected above the stated reporting limit.

SEQUOIA ANALYTICAL

Nokowhat D. Herrera
Project Manager

SEQUOIA ANALYTICAL

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

Gettler Ryan	Client Project ID:	2169-92-2B, Arco 2169-Oakland	Sampled:	Feb 4, 1993
2150 W. Winton Avenue	Sample Descript:	Soil, A-5-6.6	Received:	Feb 5, 1993
Hayward, CA 94545	Analysis Method:	EPA 5030/8010	Analyzed:	Feb 12, 1993
Attention: John Vargas	Lab Number:	3B30201	Reported:	Feb 19, 1993

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/kg	Sample Results µg/kg
Bromodichloromethane	5.0	N.D.
Bromoform	5.0	N.D.
Bromomethane	10	N.D.
Carbon tetrachloride	5.0	N.D.
Chlorobenzene	5.0	N.D.
Chloroethane	10	N.D.
2-Chloroethylvinyl ether	10	N.D.
Chloroform	5.0	N.D.
Chloromethane	10	N.D.
Dibromochloromethane	5.0	N.D.
1,3-Dichlorobenzene	5.0	N.D.
1,4-Dichlorobenzene	5.0	N.D.
1,2-Dichlorobenzene	5.0	N.D.
1,1-Dichloroethane	5.0	N.D.
1,2-Dichloroethane	5.0	N.D.
1,1-Dichloroethene	5.0	N.D.
cis-1,2-Dichloroethene	5.0	N.D.
trans-1,2-Dichloroethene	5.0	N.D.
1,2-Dichloropropane	5.0	N.D.
cis-1,3-Dichloropropene	5.0	N.D.
trans-1,3-Dichloropropene	5.0	N.D.
Methylene chloride	50	N.D.
1,1,2,2-Tetrachloroethane	5.0	N.D.
Tetrachloroethene	5.0	N.D.
1,1,1-Trichloroethane	5.0	N.D.
1,1,2-Trichloroethane	5.0	N.D.
Trichloroethene	5.0	N.D.
Trichlorofluoromethane	5.0	N.D.
Vinyl chloride	10	N.D.

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

SEQUOIA ANALYTICAL

Nokowhat D. Herrera
Project Manager

SEQUOIA ANALYTICAL

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(415) 364-9600 • FAX (415) 364-9233

Gettler Ryan	Client Project ID:	2169-92-2B, Arco 2169-Oakland	Sampled:	Feb 4, 1993
2150 W. Winton Avenue	Sample Descript:	Soil, A-5-9.5	Received:	Feb 5, 1993
Hayward, CA 94545	Analysis Method:	EPA 5030/8010	Analyzed:	Feb 11, 1993
Attention: John Vargas	Lab Number:	3B30202	Reported:	Feb 19, 1993

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/kg	Sample Results µg/kg
Bromodichloromethane	10	N.D.
Bromoform	10	N.D.
Bromomethane	20	N.D.
Carbon tetrachloride	10	N.D.
Chlorobenzene	10	N.D.
Chloroethane	20	N.D.
2-Chloroethylvinyl ether	20	N.D.
Chloroform	10	N.D.
Chloromethane	20	N.D.
Dibromochloromethane	10	N.D.
1,3-Dichlorobenzene	10	N.D.
1,4-Dichlorobenzene	10	N.D.
1,2-Dichlorobenzene	10	N.D.
1,1-Dichloroethane	10	N.D.
1,2-Dichloroethane	10	N.D.
1,1-Dichloroethene	10	N.D.
cis-1,2-Dichloroethene	10	N.D.
trans-1,2-Dichloroethene	10	N.D.
1,2-Dichloropropane	10	N.D.
cis-1,3-Dichloropropene	10	N.D.
trans-1,3-Dichloropropene	10	N.D.
Methylene chloride	100	N.D.
1,1,2,2-Tetrachloroethane	10	N.D.
Tetrachloroethene	10	N.D.
1,1,1-Trichloroethane	10	N.D.
1,1,2-Trichloroethane	10	N.D.
Trichloroethene	10	N.D.
Trichlorofluoromethane	10	N.D.
Vinyl chloride	20	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

Nokowhat D. Herrera
Project Manager

SEQUOIA ANALYTICAL

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

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

QC Sample Group: 3B30201 - 04

Reported: Feb 19, 1993

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl-Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	B.Ali	B.Ali	B.Ali	B.Ali
Reporting Units:	mg/kg	mg/kg	mg/kg	mg/kg
Date Analyzed:	Feb 8, 1993	Feb 8, 1993	Feb 8, 1993	Feb 8, 1993
QC Sample #:	G3B25401	G3B25401	G3B25401	G3B25401
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	0.20	0.20	0.20	0.60
Conc. Matrix Spike:	0.17	0.17	0.17	0.50
Matrix Spike % Recovery:	85	85	85	83
Conc. Matrix Spike Dup.:	0.19	0.19	0.19	0.55
Matrix Spike Duplicate % Recovery:	95	95	95	93
Relative % Difference:	11	11	11	9.5

SEQUOIA ANALYTICAL

Nokowhat D. Herrera
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

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(415) 364-9600 • FAX (415) 364-9233

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

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

QC Sample Group: 3B30401 - 02

Reported: Feb 19, 1993

QUALITY CONTROL DATA REPORT

ANALYTE	1,1-Dichloroethene	Trichloroethene	Chloro-benzene
Method:	EPA 8010	EPA 8010	EPA 8010
Analyst:	V.Nunzir	V.Nunzir	V.Nunzir
Reporting Units:	µg/kg	µg/kg	µg/kg
Date Analyzed:	Feb 9, 1993	Feb 9, 1993	Feb 9, 1993
QC Sample #:	V3B22102	V3B22102	V3B22102
Sample Conc.:	N.D.	N.D.	N.D.
Spike Conc. Added:	25	25	25
Conc. Matrix Spike:	23	29	23
Matrix Spike % Recovery:	92	116	92
Conc. Matrix Spike Dup.:	22	30	24
Matrix Spike Duplicate % Recovery:	88	120	96
Relative % Difference:	4.4	3.4	4.3

SEQUOIA ANALYTICAL

Nokowhat D. Herrera
Project Manager

% Recovery:	$\frac{\text{Conc. of M.S. - Conc. of Sample}}{\text{Spike Conc. Added}}$	x 100
Relative % Difference:	$\frac{\text{Conc. of M.S. - Conc. of M.S.D.}}{\text{(Conc. of M.S. + Conc. of M.S.D.) / 2}}$	x 100

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. 2169-92-23

Chain of Custody

ARCO Facility no. 2169	City (Facility) OAKLAND	Project manager (Consultant) JOHN VARGAS	Laboratory name SEQUOIA
ARCO engineer MICHAEL WHELAN	Telephone no. (ARCO) (415) 571-2434	Telephone no. (Consultant) (510)-352-4800	Fax no. (Consultant) (510) 783-1089
Consultant name GeoSTRATEGIES INC.	Address (Consultant) 2150 W. WINTON AVE., HAYWARD		Contract number

Method of shipment: COURIER

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-5-6.5		1	X			X		2/4/93			X				X			9302	3	02-01	
A-5-7.5		1	X			X		2/4/93			X				X						02
A-6-6.5		1	X			X		2/4/93			X										03
A-6-9.0		1	X			X		2/4/93			X										04

Special detection Limit/reporting

Special QA/QC

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:

Temperature received:

	Date	Time		Date	Time
Relinquished by sampler: Richard C. Mallory	2/4/93	14:00	Received by: [signature] 1157	2/4/93	1400
Relinquished by	Date	Time	Received by		
Relinquished by	Date	Time	Received by laboratory: [signature]	2/5/93	3:25

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

APPENDIX C
G-R FIELD DATA SHEETS
AND
SEQUOIA CHEMICAL ANALYTICAL REPORT

GETTLER-RYAN INC.

General and Environmental Contractors

WELL SAMPLING
FIELD DATA SHEET

COMPANY Arco 2169 JOB # 9927

LOCATION 889 W Grand DATE 2-~~12~~-93

CITY Oakland TIME 2-11-93

Well ID. A-5 Well Condition Okay

Well Diameter 2 in. Hydrocarbon Thickness — ft.

Total Depth 30.3 ft.

Depth to Liquid ~~18.60~~ 9.15 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 21.15 x(VF) 0.17 = (Estimated Purge Volume) 3.6 gal.

Purging Equipment Suction

Sampling Equipment Bailer

Starting Time 10:06 Purging Flow Rate 2 gpm.

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

Time	pH	Conductivity	Temperature	Volume
10:08	7.43	868	69.0	4
10:10	7.42	864	67.1	8
10:12	7.44	866	67.1	12
10:14	7.43	868	67.1	16
10:16	7.43	868	67.0	20

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

Sampling Time 10:20 Weather Conditions ____

Analysis Gas BTXE EPA 601 Bottles Used 3 x 40ml

Chain of Custody Number ____

COMMENTS ____

FOREMAN ____ ASSISTANT

GETTLER-RYAN INC.

General and Environmental Contractors

WELL SAMPLING
FIELD DATA SHEET

COMPANY Arco ~~Shell~~ 2169 JOB # ~~9905~~ 9927

LOCATION ~~Shell Mowry~~ 889 Grand DATE 2-14-93

CITY ~~Pleasanton CA~~ Oakland TIME

Well ID. A-6 Well Condition okay

Well Diameter 2" in. Hydrocarbon Thickness — ft.

Total Depth 27.65' ft.

Depth to Liquid- ~~19.35~~ ft.

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

(# of casing volumes) ____ x 18.30 x(VF) 0.17 = (Estimated Purge Volume) 3.1 gal.

Purging Equipment Suction

Sampling Equipment Bailer

Starting Time 9:40 Purging Flow Rate ____ gpm.

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

Time	pH	Conductivity	Temperature	Volume
9:43	7.39	985	66.0	4.5
9:50	7.37	976	67.0	6.5 gals
10:28	7.19	960	66.5	10 gals
10:32	7.01	958	66.7	12 gals
10:40	7.00	959	66.7	15 gals

Did well dewater? Yes If yes, time 9:50 Volume 8.5 gals

Sampling Time 10:45 Weather Conditions

Analysis Bottles Used

Chain of Custody Number

NTS

ASSISTANT

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: #2169-93-5, Arco 2169-Oakland

Enclosed are the results from 3 water samples received at Sequoia Analytical on February 11,1993. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE OF COLLECTION	TEST METHOD
3B65101	Water, A-6	2/11/93	EPA 5030/8010 EPA 5030/8015/8020
3B65102	Water, A-5	2/11/93	EPA 5030/8010 EPA 5030/8015/8020
3B65103	Water, Travel Blank	2/11/93	EPA 5030/8010 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

Nokowhat D. Herrera
Project Manager

927-A

SEQUOIA ANALYTICAL

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

Gettler Ryan	Client Project ID:	#2169-93-5, Arco 2169-Oakland	Sampled: Feb 11, 1993
2150 W. Winton Avenue	Sample Matrix:	Water	Received: Feb 11, 1993
Hayward, CA 94545	Analysis Method:	EPA 5030/8015/8020	Reported: Feb 25, 1993
Attention: John Vargas	First Sample #:	3B65101	

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 3B65101 A-6	Sample I.D. 3B65102 A-5	Sample I.D. 3B65103 Travel Blank	Sample I.D.	Sample I.D.	Sample I.D.
Purgeable Hydrocarbons	50	990	4,900	N.D.			
Benzene	0.50	1.8	380	N.D.			
Toluene	0.50	5.1	640	N.D.			
Ethyl Benzene	0.50	17	140	N.D.			
Total Xylenes	0.50	7.2	970	N.D.			
Chromatogram Pattern:		Gas + Non-Gas C4-C12	Gas	--			

Quality Control Data

Report Limit Multiplication Factor:	1.0	10	1.0
Date Analyzed:	2/18/93	2/17/93	2/17/93
Instrument Identification:	GCHP-3	GCHP-7	GCHP-7
Surrogate Recovery, %: (QC Limits = 70-130%)	97	77	102

Purgeable Hydrocarbons are quantitated against a fresh gasoline standard.
Analytes reported as N.D. were not detected above the stated reporting limit.

SEQUOIA ANALYTICAL

Nokowhat D. Herrera
Project Manager

SEQUOIA ANALYTICAL

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

Gettler Ryan	Client Project ID:	#2169-93-5, Arco 2169-Oakland	Sampled:	Feb 11, 1993
2150 W. Winton Avenue	Sample Descript:	Water, A-6	Received:	Feb 11, 1993
Hayward, CA 94545	Analysis Method:	EPA 5030/8010	Analyzed:	Feb 19, 1993
Attention: John Vargas	Lab Number:	3B65101	Reported:	Feb 25, 1993

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/L	Sample Results µg/L
Bromodichloromethane	0.50	N.D.
Bromoform	0.50	N.D.
Bromomethane	1.0	N.D.
Carbon tetrachloride	0.50	N.D.
Chlorobenzene	0.50	N.D.
Chloroethane	1.0	N.D.
2-Chloroethylvinyl ether	1.0	N.D.
Chloroform	0.50	N.D.
Chloromethane	1.0	N.D.
Dibromochloromethane	0.50	N.D.
1,3-Dichlorobenzene	0.50	N.D.
1,4-Dichlorobenzene	0.50	N.D.
1,2-Dichlorobenzene	0.50	N.D.
1,1-Dichloroethane	0.50	N.D.
1,2-Dichloroethane	0.50	N.D.
1,1-Dichloroethene	0.50	N.D.
cis-1,2-Dichloroethene	0.50	N.D.
trans-1,2-Dichloroethene	0.50	N.D.
1,2-Dichloropropane	0.50	N.D.
cis-1,3-Dichloropropene	0.50	N.D.
trans-1,3-Dichloropropene	0.50	N.D.
Methylene chloride	5.0	N.D.
1,1,2,2-Tetrachloroethane	0.50	N.D.
Tetrachloroethene	0.50	N.D.
1,1,1-Trichloroethane	0.50	N.D.
1,1,2-Trichloroethane	0.50	N.D.
Trichloroethene	0.50	N.D.
Trichlorofluoromethane	0.50	N.D.
Vinyl chloride	1.0	N.D.

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

SEQUOIA ANALYTICAL

Nokowhat D. Herrera
Project Manager

SEQUOIA ANALYTICAL

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

Gettler Ryan	Client Project ID:	#2169-93-5, Arco 2169-Oakland	Sampled:	Feb 11, 1993
2150 W. Winton Avenue	Sample Descript:	Water, A-5	Received:	Feb 11, 1993
Hayward, CA 94545	Analysis Method:	EPA 5030/8010	Analyzed:	Feb 19, 1993
Attention: John Vargas	Lab Number:	3B65102	Reported:	Feb 25, 1993

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/L	Sample Results µg/L
Bromodichloromethane	5.0	N.D.
Bromoform	5.0	N.D.
Bromomethane	10	N.D.
Carbon tetrachloride	5.0	N.D.
Chlorobenzene	5.0	N.D.
Chloroethane	10	N.D.
2-Chloroethylvinyl ether	10	N.D.
Chloroform	5.0	N.D.
Chloromethane	10	N.D.
Dibromochloromethane	5.0	N.D.
1,3-Dichlorobenzene	5.0	N.D.
1,4-Dichlorobenzene	5.0	N.D.
1,2-Dichlorobenzene	5.0	N.D.
1,1-Dichloroethane	5.0	N.D.
1,2-Dichloroethane	5.0	N.D.
1,1-Dichloroethene	5.0	N.D.
cis-1,2-Dichloroethene	5.0	N.D.
trans-1,2-Dichloroethene	5.0	N.D.
1,2-Dichloropropane	5.0	N.D.
cis-1,3-Dichloropropene	5.0	N.D.
trans-1,3-Dichloropropene	5.0	N.D.
Methylene chloride	50	N.D.
1,1,2,2-Tetrachloroethane	5.0	N.D.
Tetrachloroethene	5.0	N.D.
1,1,1-Trichloroethane	5.0	N.D.
1,1,2-Trichloroethane	5.0	N.D.
Trichloroethene	5.0	N.D.
Trichlorofluoromethane	5.0	N.D.
Vinyl chloride	10	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

Nokowhat D. Herrera
Project Manager

SEQUOIA ANALYTICAL

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

Gettler Ryan	Client Project ID:	#2169-93-5, Arco 2169-Oakland	Sampled:	Feb 11, 1993
2150 W. Winton Avenue	Sample Descript:	Water, Travel Blank	Received:	Feb 11, 1993
Hayward, CA 94545	Analysis Method:	EPA 5030/8010	Analyzed:	Feb 19, 1993
Attention: John Vargas	Lab Number:	3B65103	Reported:	Feb 25, 1993

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/L	Sample Results µg/L
Bromodichloromethane	0.50	N.D.
Bromoform	0.50	N.D.
Bromomethane	1.0	N.D.
Carbon tetrachloride	0.50	N.D.
Chlorobenzene	0.50	N.D.
Chloroethane	1.0	N.D.
2-Chloroethylvinyl ether	1.0	N.D.
Chloroform	0.50	N.D.
Chloromethane	1.0	N.D.
Dibromochloromethane	0.50	N.D.
1,3-Dichlorobenzene	0.50	N.D.
1,4-Dichlorobenzene	0.50	N.D.
1,2-Dichlorobenzene	0.50	N.D.
1,1-Dichloroethane	0.50	N.D.
1,2-Dichloroethane	0.50	N.D.
1,1-Dichloroethene	0.50	N.D.
cis-1,2-Dichloroethene	0.50	N.D.
trans-1,2-Dichloroethene	0.50	N.D.
1,2-Dichloropropane	0.50	N.D.
cis-1,3-Dichloropropene	0.50	N.D.
trans-1,3-Dichloropropene	0.50	N.D.
Methylene chloride	5.0	N.D.
1,1,2,2-Tetrachloroethane	0.50	N.D.
Tetrachloroethene	0.50	N.D.
1,1,1-Trichloroethane	0.50	N.D.
1,1,2-Trichloroethane	0.50	N.D.
Trichloroethene	0.50	N.D.
Trichlorofluoromethane	0.50	N.D.
Vinyl chloride	1.0	N.D.

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

SEQUOIA ANALYTICAL

Nokowhat D. Herrera
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: #2169-93-5, Arco 2169-Oakland

QC Sample Group: 3B65101

Reported: Feb 25, 1993

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:	Feb 18, 1993	Feb 18, 1993	Feb 18, 1993	Feb 18, 1993
QC Sample #:	G3B67503	G3B67503	G3B67503	G3B67503
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	10	10	10	30
Conc. Matrix Spike:	10	10	10	30
Matrix Spike % Recovery:	100	100	100	100
Conc. Matrix Spike Dup.:	10	10	10	30
Matrix Spike Duplicate % Recovery:	100	100	100	100
Relative % Difference:	0.0	0.0	0.0	0.0

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

SEQUOIA ANALYTICAL

Nokowhat D. Herrera
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: #2169-93-5, Arco 2169-Oakland

QC Sample Group: 3B65102 -03

Reported: Feb 25, 1993

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	R.Geckler	R.Geckler	R.Geckler	R.Geckler
Reporting Units:	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Feb 17, 1993	Feb 17, 1993	Feb 17, 1993	Feb 17, 1993
QC Sample #:	G3B40601	G3B40601	G3B40601	G3B40601
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	10	10	10	30
Conc. Matrix Spike:	11	11	10	32
Matrix Spike % Recovery:	110	110	100	107
Conc. Matrix Spike Dup.:	10	10	10	31
Matrix Spike Duplicate % Recovery:	100	100	100	103
Relative % Difference:	9.5	9.5	0.0	3.2

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

SEQUOIA ANALYTICAL

Nokowhat D. Herrera
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: #2169-93-5, Arco 2169-Oakland

QC Sample Group: 3B65101 - 03

Reported: Feb 25, 1993

QUALITY CONTROL DATA REPORT

ANALYTE	1,1-Dichloroethene	Trichloroethene	Chloro-benzene
Method:	EPA 8010	EPA 8010	EPA 8010
Analyst:	V.Nunzir	V.Nunzir	V.Nunzir
Reporting Units:	µg/L	µg/L	µg/L
Date Analyzed:	Feb 19, 1993	Feb 19, 1993	Feb 19, 1993
QC Sample #:	VBLK021993	VBLK021993	VBLK021993
Sample Conc.:	N.D.	N.D.	N.D.
Spike Conc. Added:	25	25	25
Conc. Matrix Spike:	29	19	22
Matrix Spike % Recovery:	116	76	88
Conc. Matrix Spike Dup.:	31	20	23
Matrix Spike Duplicate % Recovery:	124	80	92
Relative % Difference:	6.5	5.1	4.4

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

SEQUOIA ANALYTICAL

Nokowhat D. Herrera
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. 2169-93-5

Chain of Custody

ARCO Facility no. 2169	City (Facility) Oakland	Project manager (Consultant) John Vargas	Laboratory name SEQ
ARCO engineer Kyle Christie	Telephone no. (ARCO)	Telephone no. (Consultant) 510-783-7500	Fax no. (Consultant) 510 783-0280
Consultant name Carter Ryan Inc	Address (Consultant) 2150 W. Winton Ave Hayward CA		Contract number 07-073

Method of shipment: 6/L

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 (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-6		3		✓		+	+	2-11-93	10:45		+				+			9302651-01		
A-5		3		✓		+	+	2-11-93			+				+			↓		02
TB		2		✓		+	+	—			+				+					03

Special detection Limit/reporting: Standard

Special QA/QC: Standard

Remarks: LeL # 9927.08

Lab number:

Turnaround time

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

Condition of sample: Good		Temperature received: Cool	
Relinquished by sampler	Date 2-11-93	Time 16:25	Received by
Relinquished by	Date	Time	Received by
Relinquished by	Date	Time	Received by laboratory: Date 2-11-93 Time 675

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

ADHS 3292 (2-91)

APPENDIX D

EMCON MONITORING REPORTS

EMCON ASSOCIATES
Consultants in Wastes Management and Environmental Control

Date December 3, 1992
Project 0G70-052.01

To:
Mr. John Vargas
GeoStrategies Inc.
2140 West Winton Avenue
Hayward, California 94545

We are enclosing:

Copies	Description
1	Depth To Water/Floating Product Survey Results
	November 1992 monthly water level survey, ARCO
	station 2169, 889 West Grand Ave. Oakland, CA.

For your: X Information Sent by: X Mail

Comments:

Monthly water level data for the above mentioned site are attached. Please call if you have any questions: (408) 453-2266.

Reviewed by: Jim Butera JB

REGISTERED PROFESSIONAL ENGINEER ROBERT CURTIS PORTER No: 4094 Exp. 6/30/96 INDUSTRIAL STATE OF CALIFORNIA

Robert Porter, Senior Project Engineer

1938 Junction Avenue, San Jose, California 95131-2102, (408) 453-0719, Fax (408) 453-0452

927-A

FIELD REPORT
DEPTH TO WATER / FLOATING PRODUCT SURVEY

PROJECT # : 0G70-052.01 STATION ADDRESS : 889 West Grand Ave, Oakland, CA DATE : 11/23/92

ARCO STATION # : 2169 FIELD TECHNICIAN : MG / IG DAY : MONDAY

DTW Order	WELL ID	Well Box Seal	Well Lid Secure	Gasket	Lock	Locking Well Cap	FIRST DEPTH TO WATER (feet)	SECOND DEPTH TO WATER (feet)	DEPTH TO FLOATING PRODUCT (feet)	FLOATING PRODUCT THICKNESS (feet)	WELL TOTAL DEPTH (feet)	COMMENTS
1	A-1	OK	YES	YES	2268	OK	11.83	11.83	ND	NR	24.0	—
2	A-2	OK	YES	YES	2268	OK	12.18	12.18	ND	NR	24.7	(+5)
3	A-3	OK	YES	YES	2268	OK	13.60	13.60	NO	NR	28.7	(+5) inches
4	A-4	OK	YES	YES	2268	OK	12.63	12.63	ND	NR	28.3	—
5	AR-1	OK	YES	YES	2269	OK	12.80	12.80	ND	NR	27.8	STRONG ODOR
6	AR-2	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	COULD NOT FIND

SURVEY POINTS ARE TOP OF WELL BOXES

EMCON ASSOCIATES
Consultants in Wastes Management and Environmental Control

Date December 31, 1992
Project 0G70-052.01

To:
Mr. John Vargas
GeoStrategies Inc.
2140 West Winton Avenue
Hayward, California 94545

We are enclosing:

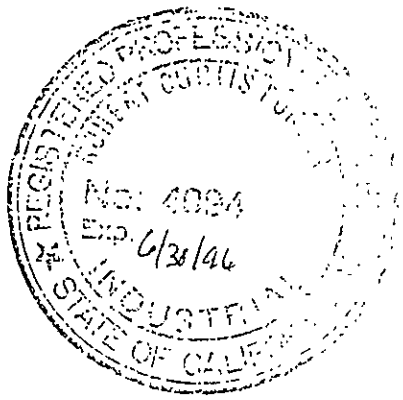
Copies	Description
1	Depth To Water/Floating Product Survey Results
	December 1992 monthly water level survey, ARCO
	station 2169, 889 West Grand Ave. Oakland, CA.

For your: X Information Sent by: X Mail

Comments:
Monthly water level data for the above mentioned site are attached. Please call if you have any questions: (408) 453-2266.

Jim Butera JB

Reviewed by:



Robert Porter, Senior Project Engineer

1938 Junction Avenue San Jose California 95131-2102 (408) 453-0719 Fax (408) 453-0452

FIELD REPORT
DEPTH TO WATER / FLOATING PRODUCT SURVEY

PROJECT # : 0G70-052.01 STATION ADDRESS : 889 West Grand Ave, Oakland, CA DATE : 12/16/92

ARCO STATION # : 2169 FIELD TECHNICIAN : Steve Horton DAY : Wednesday

DTW Order	WELL ID	Well Box Seal	Well Lid Secure	Gasket	Lock	Locking Well Cap	FIRST DEPTH TO WATER (feet)	SECOND DEPTH TO WATER (feet)	DEPTH TO FLOATING PRODUCT (feet)	FLOATING PRODUCT THICKNESS (feet)	WELL TOTAL DEPTH (feet)	COMMENTS
1	A-1	good	yes	na	2268	yes	11.03	11.03	ND	ND	24.4	strong odor water in box
2	A-2	good	yes	na	2268	yes	11.52	11.52	ND	ND	25.2	—
3	A-3	good	yes	na	2268	yes	12.31	12.31	ND	ND	29.1	water in box
4	A-4	good	yes	na	2268	yes	11.34	11.34	ND	ND	28.3	—
5	AR-1	good	yes	na	2268	yes	11.49	11.49	ND	ND	27.8	strong odor
6	AR-2	good	yes	na	none	yes	12.16	12.16	ND	ND	29.7	—

SURVEY POINTS ARE TOP OF WELL BOXES

APPENDIX E

EMCON GROUND-WATER SAMPLING REPORT

EMCON ASSOCIATES
Consultants in Wastes Management and Environmental Control

RECEIVED
FEB 23 1993
GeoStrategies Inc.

Date February 18, 1993
Project 0G70-023.01

To:
Mr. John Vargas
GeoStrategies, Inc.
2140 West Winton Avenue
Hayward, California 94545

We are enclosing:

Copies	Description
1	Depth To Water / Floating Product Survey Results
1	Summary of Groundwater Monitoring Data
1	Certified Analytical Reports with Chain-of-Custody
6	Water Sample Field Data Sheets

For your: X Information Sent by: X Mail

Comments:

Enclosed are the data from the first quarter 1993 monitoring event at ARCO service station 2169, 889 West Grand Avenue, Oakland, CA. Groundwater monitoring is conducted consistent with applicable regulatory guidelines. Please call if you have any questions: (408) 453-2266.

Reviewed by:

REGISTERED PROFESSIONAL ENGINEER
ROBERT CURTIS PORTER
No: 4094
Exp. 6/30/96
INDUSTRIAL
STATE OF CALIFORNIA

Jim Butera JB

Robert Porter, Senior Project Engineer.

927-A

1938 Junction Avenue, San Jose, California 95131-2102, (408) 453-0719, Fax (408) 453-0452

Summary of Groundwater Monitoring Data
First Quarter 1993
ARCO Service Station 2169
889 West Grand Avenue, Oakland, California
micrograms per liter (µg/l) and milligrams per liter (mg/l)

Well ID and Sample Depth	Sampling Date	Depth To Water (feet)	Floating Product Thickness (feet)	TPH[1] as Gasoline (µg/l)	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Total Xylenes (µg/l)	TPH as Diesel (µg/l)
A-1(24)	01/28/93	9.08	ND.[2]	3,700.	780.	360.	130.	460.	620.*
A-2(25)	01/28/93	9.73	ND.	<50.	<0.5	<0.5	<0.5	<0.5	NR.[3]
A-3(29)	01/28/93	10.33	ND.	<50.	<0.5	<0.5	<0.5	<0.5	NR.
A-4(28)	01/28/93	9.40	ND.	<50.	<0.5	<0.5	<0.5	<0.5	NR.
AR-1(27)	01/28/93	9.46	ND.	15,000.	1,200.	510.	510.	2,600.	5,300.*
AR-2(29)	01/28/93	10.26	ND.	2,000.	570.	13.	<10	380.	290.*

1. TPH. = Total petroleum hydrocarbons
2. ND. = Not detected
3. NR. = Not *reported, well was not sampled for the above parameter*

* = Chromatogram does not match typical diesel fingerprint, number reported as a Non-Diesel Mix

SEQUOIA ANALYTICAL

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

Emcon Associates
1938 Junction Avenue
San Jose, CA 95131
Attention: Jim Butera

Project: EMCGC-92-1/ARCO 2169, Oakland

Enclosed are the results from 6 water samples received at Sequoia Analytical on January 29,1993. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE OF COLLECTION	TEST METHOD
3A58801	Water, A-1 (24)	1/28/93	EPA 3510/3520/8015 EPA 5030/8015/8020
3A58802	Water, A-2 (25)	1/28/93	EPA 5030/8015/8020
3A58803	Water, A-3 (29)	1/28/93	EPA 5030/8015/8020
3A58804	Water, A-4 (28)	1/28/93	EPA 5030/8015/8020
3A58805	Water, AR-1 (27)	1/28/93	EPA 3510/3520/8015 EPA 5030/8015/8020
3A58806	Water, AR-2 (29)	1/28/93	EPA 3510/3520/8015 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

Eileen A. Manning
Project Manager

SEQUOIA ANALYTICAL

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

Emcon Associates	Client Project ID:	EMCGC-92-1/ARCO 2169, Oakland	Sampled:	Jan 28, 1993
1938 Junction Avenue	Sample Matrix:	Water	Received:	Jan 29, 1993
San Jose, CA 95131	Analysis Method:	EPA 5030/8015/8020	Reported:	Feb 12, 1993
Attention: Jim Butera	First Sample #:	3A58801		

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 3A58801 A-1 (24)	Sample I.D. 3A58802 A-2 (25)	Sample I.D. 3A58803 A-3 (29)	Sample I.D. 3A58804 A-4 (28)	Sample I.D. 3A58805 AR-1 (27)	Sample I.D. 3A58806 AR-2 (29)
Purgeable Hydrocarbons	50	3,700	N.D.	N.D.	N.D.	15,000	2,000
Benzene	0.50	780	N.D.	N.D.	N.D.	1,200	570
Toluene	0.50	360	N.D.	N.D.	N.D.	510	13
Ethyl Benzene	0.50	130	N.D.	N.D.	N.D.	510	N.D.
Total Xylenes	0.50	460	N.D.	N.D.	N.D.	2,600	380
Chromatogram Pattern:		Gas	--	--	--	Gas	Gas

Quality Control Data

Report Limit Multiplication Factor:	40	1.0	1.0	1.0	100	20
Date Analyzed:	2/3/93	2/3/93	2/3/93	2/3/93	2/3/93	2/3/93
Instrument Identification:	GCHP-2	GCHP-2	GCHP-2	GCHP-2	GCHP-2	GCHP-2
Surrogate Recovery, %: (QC Limits = 70-130%)	103	92	98	96	103	106

Purgeable Hydrocarbons are quantitated against a fresh gasoline standard.
Analytes reported as N.D. were not detected above the stated reporting limit.

SEQUOIA ANALYTICAL

Eileen A. Manning
Project Manager

SEQUOIA ANALYTICAL

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

Emcon Associates	Client Project ID:	EMCGC-92-1/ARCO 2169, Oakland	Sampled:	Jan 28, 1993
1938 Junction Avenue	Sample Matrix:	Water	Received:	Jan 29, 1993
San Jose, CA 95131	Analysis Method:	EPA 3510/3520/8015	Reported:	Feb 12, 1993
Attention: Jim Butera	First Sample #:	3A58801		

TOTAL EXTRACTABLE PETROLEUM HYDROCARBONS

Analyte	Reporting Limit µg/L	Sample I.D. 3A58801 A-1 (24)	Sample I.D. 3A58805 AR-1 (27)	Sample I.D. 3A58806 AR-2 (29)
Extractable Hydrocarbons	50	620	5,300	290
Chromatogram Pattern:		Non-Diesel Mix <C19	Non-Diesel Mix C9-C14	Non-Diesel Mix <C14

Quality Control Data

Report Limit Multiplication Factor:	1.0	10	1.0
Date Extracted:	2/4/93	2/4/93	2/4/93
Date Analyzed:	2/5/93	2/8/93	2/5/93
Instrument Identification:	GCHP-5	GCHP-5	GCHP-5

Extractable Hydrocarbons are quantitated against a fresh diesel standard.
Analytes reported as N.D. were not detected above the stated reporting limit.

SEQUOIA ANALYTICAL

Eileen A. Manning
Project Manager

SEQUOIA ANALYTICAL

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

Emcon Associates
1938 Junction Avenue
San Jose, CA 95131
Attention: Jim Butera

Client Project ID: EMCGC-92-1/ARCO 2169, Oakland

QC Sample Group: 3A58801-05

Reported: Feb 12, 1993

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:	Feb 3, 1993	Feb 3, 1993	Feb 3, 1993	Feb 3, 1993
QC Sample #:	G9302041-01C MS/MSD	G9302041-01C MS/MSD	G9302041-01C MS/MSD	G9302041-01C MS/MSD
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	10	10	10	30
Conc. Matrix Spike:	9.4	9.5	9.2	27
Matrix Spike % Recovery:	94	95	92	90
Conc. Matrix Spike Dup.:	11	11	10	32
Matrix Spike Duplicate % Recovery:	110	110	100	107
Relative % Difference:	16	15	8.3	17

SEQUOIA ANALYTICAL

Eileen A. Manning
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

Emcon Associates
1938 Junction Avenue
San Jose, CA 95131
Attention: Jim Butera

Client Project ID: EMCGC-92-1/ARCO 2169, Oakland

QC Sample Group: 3A58801-05

Reported: Feb 12, 1993

QUALITY CONTROL DATA REPORT

ANALYTE	Extractable Hydrocarbons

Method: EPA3510/3520/8015
Analyst: C. Lee
Reporting Units: µg/L
Date Analyzed: Feb 5, 1993
QC Sample #: DBLK020493A-X

Sample Conc.:	N.D.
Spike Conc. Added:	300
Conc. Matrix Spike:	160
Matrix Spike % Recovery:	53
Conc. Matrix Spike Dup.:	190
Matrix Spike Duplicate % Recovery:	63
Relative % Difference:	17

SEQUOIA ANALYTICAL

Eileen A. Manning
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. EMCGC-92-1

Chain of Custody

ARCO Facility no. 2169	City (Facility) OAKLAND	Project manager (Consultant) JIM BUERA	Laboratory name SEQUOIA
ARCO engineer Kyle Christie	Telephone no. (ARCO) 571-2434	Telephone no. (Consultant) 453-0719	Fax no. (Consultant) 453-2452
Consultant name EMCON ASSOCIATES	Address (Consultant) 1938 Junction Avenue San Jose		Contract number

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 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 ☐	
A1(24)		2		X		X	HCl	1-25-93	1337		X										
A2(25)		2		X		X	HCl		1145		X										
A3(27)		2		X		X	HCl		1113		X										
A4(28)		2		X		X	HCl		1221		X										
~~A5~~ B1(27)		2		X		X	HCl		1413		X										
MW-2(27)		2		X		X	HCl		1256		X										
A-1(24)		2		X		X	NP		1337			X									
SB-1(27)		2		X		X	NP		1413			X									
MW-2(27)		2		X		X	NP		1256			X									

Method of shipment: Courier will pick up

Special detection Limit/reporting: Lowest possible

Special QA/QC: AS Normal

Remarks: 2-40 ml HCl VOA's
2 Liter NP Glass
(Sequoia Bottles)
(52)

Lab number

Turnaround time

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

Condition of sample:

Temperature received:

	Date	Time	
Relinquished by sampler	1-25-93	1630	Received by
Relinquished by			Received by
Relinquished by			Received by laboratory

Date: Time:

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

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/

EMCON ASSOCIATES

PROJECT NO: OG70-052.01 SAMPLE ID: A-1 (24)

PURGED BY: MRadler CLIENT NAME: Arco 2169

SAMPLED BY: MRadler LOCATION: 889 West Grand Oakland, CA.

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

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

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 5.61

DEPTH TO WATER (feet): 9.08 CALCULATED PURGE (gal.): 16.85

DEPTH OF WELL (feet): 24.4 ACTUAL PURGE VOL (gal.): 17.0

DATE PURGED: 1-28-93 Start (2400 Hr) 1328 End (2400 Hr) 1333

DATE SAMPLED: 1-28-93 Start (2400 Hr) 1337 End (2400 Hr) 1341

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1330	6.0	7.10	1409	65.7	grey	heavy
1332	12.0	7.06	1436	68.7	grey	heavy
1333	17.0	7.03	1450	69.0	grey	heavy

D. O. (ppm): NR ODOR: Strong COLOR (COBALT 0 - 100): NR TURBIDITY (NTU 0 - 200): NR

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

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
X Centrifugal Pump	___ Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
___ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: Ok LOCK #: 2268

REMARKS: ___

Meter Calibration: Date: 1-28-93 Time: 0955 Meter Serial #: 9112 Temperature °F: ___

(EC 1000 ___ / ___) (DI ___) (pH 7 ___ / ___) (pH 10 ___ / ___) (pH 4 ___ / ___)

Location of previous calibration: A-3 (29)

Signature: MRadler Reviewed By: JB Page 1 of 6

Rev. 2, 5/

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 06-70-052.01 SAMPLE ID: A-2 (25)

PURGED BY: MAdler CLIENT NAME: Arco 2165

SAMPLED BY: MAdler LOCATION: 889 West Grand Ave Oakland, CA.

TYPE: Ground Water X Surface Water ____ Treatment Effluent ____ Other ____

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

CASING ELEVATION (feet/MSL): NA VOLUME IN CASING (gal.): 5.67

DEPTH TO WATER (feet): 9.73 CALCULATED PURGE (gal.): 17.01

DEPTH OF WELL (feet): 25.2 ACTUAL PURGE VOL. (gal.): 18.0

DATE PURGED: 1-28-93 Start (2400 Hr) 1137 End (2400 Hr) 1143

DATE SAMPLED: 1-28-93 Start (2400 Hr) 1145 End (2400 Hr) 1146

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1139	6.0	7.28	1136	63.?	green	heavy
1142	12.0	7.12	1169	67.4	green/brown	moderate
1143	14.0	7.11	1171	68.4	green/TAN	moderate

D. O. (ppm): NR ODOR: NONE COLOR (COBALT 0 - 100): NR TURBIDITY (NTU 0 - 200): NR

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

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
____ 2" Bladder Pump	____ Bailer (Teflon®)	____ 2" Bladder Pump	X Bailer (Teflon®)
X Centrifugal Pump	____ Bailer (PVC)	____ DDL Sampler	____ Bailer (Stainless Steel)
____ Submersible Pump	____ Bailer (Stainless Steel)	____ Dipper	____ Submersible Pump
____ Well Wizard™	____ Dedicated	____ Well Wizard™	____ Dedicated
Other: ____		Other: ____	

WELL INTEGRITY: OK LOCK #: 2268

REMARKS: ____

Meter Calibration: Date: 1-28-93 Time: 1055 Meter Serial #: 9112 Temperature °F: ____

(EC 1000 ____ / ____) (DI ____) (pH 7 ____ / ____) (pH 10 ____ / ____) (pH 4 ____ / ____)

Location of previous calibration: A-3 (29)

Signature: ____ Reviewed By: JB Page 2 of 6

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/9

EMCON ASSOCIATES

PROJECT NO: 2670-052.01 SAMPLE ID: A-3 (29)

PURGED BY: MAdler CLIENT NAME: Arco2169

SAMPLED BY: MAdler LOCATION: 889 West Grand Ave Oakland, CA.

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

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

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 6.88

DEPTH TO WATER (feet): 10.33 CALCULATED PURGE (gal.): 20.64

DEPTH OF WELL (feet): 29.1 ACTUAL PURGE VOL. (gal.): 28.0

DATE PURGED: 1-28-93 Start (2400 Hr) 1058 End (2400 Hr) 1110

DATE SAMPLED: 1-28-93 Start (2400 Hr) 1113 End (2400 Hr) 1114

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1101	7.0	6.78	981	63.1	grey	heavy
1105	14.0	7.14	1022	63.8	grey	heavy
1108	21.0	7.68	1034	65.7	grey	heavy
1110	28.0	7.71	1055	66.7	grey	heavy

D. O. (ppm): NM ODOR: NONE NR (COBALT 0 - 100) NR (NTU 0 - 200)

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

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
X Centrifugal Pump	___ Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
___ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: OK LOCK #: 2268

REMARKS: Purged 4 casing volumes to get a stable reading

Meter Calibration: Date: 1-28-93 Time: 10:55 Meter Serial #: 9112 Temperature °F: 65.3

(EC 1000 1039 / 1000) (DI 15.3) (pH 7 6.95 / 7.00) (pH 10 10.09 / 10.00) (pH 4 4.03 / ___)

Location of previous calibration: A-3 (29)

Signature: MAdler Reviewed By: JB Page 3 of 6

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/9

EMCON ASSOCIATES

PROJECT NO: 0670-052.01 SAMPLE ID: A-4 (28)

PURGED BY: MAdler CLIENT NAME: Arco 2169

SAMPLED BY: MAdler LOCATION: 889 West Grand Ave Oakland, CA.

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

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

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 6.96

DEPTH TO WATER (feet): 9.46 CALCULATED PURGE (gal.): 20.9

DEPTH OF WELL (feet): 28.4 ACTUAL PURGE VOL. (gal.): 21.0

DATE PURGED: 1-28-93 Start (2400 Hr) 1214 End (2400 Hr) 1219

DATE SAMPLED: 1-28-93 Start (2400 Hr) 1221 End (2400 Hr) 1222

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1215	7.0	7.22	1418	66.7	Gray	heavy
1217	14.0	7.28	1393	67.2	gray	moderate
1219	21.0	7.34	1331	67.1	tan	moderate

D. O. (ppm): NR ODOR: NONE NR (COBALT 0 - 100) NR (NTU 0 - 200)

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

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
X Centrifugal Pump	___ Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
___ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: OIC LOCK #: ~~2008~~ 2008

REMARKS: replaced 4" LWC & Lock (2008) this lock is a long neck & should be traded out next visit

Meter Calibration: Date: 1-28-93 Time: 1655 Meter Serial #: 9112 Temperature °F: ___

(EC 1000 ___ / ___) (DI ___) (pH 7 ___ / ___) (pH 10 ___ / ___) (pH 4 ___ / ___)

Location of previous calibration: A-3 (29)

Signature: MAdler Reviewed By: JB Page 4 of 6

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/

EMCON ASSOCIATES

PROJECT NO: 0670-052.01 SAMPLE ID: AK-1 (27)

PURGED BY: MAller CLIENT NAME: Arco 2169

SAMPLED BY: MAller LOCATION: 889 West Grand Oakland, CA.

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

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

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 26.95

DEPTH TO WATER (feet): 9.46 CALCULATED PURGE (gal.): 80.87

DEPTH OF WELL (feet): 27.8 ACTUAL PURGE VOL. (gal.): 81.0

DATE PURGED: 1-28-93 Start (2400 Hr) 1358 End (2400 Hr) 1411

DATE SAMPLED: 1-28-93 Start (2400 Hr) 1413 End (2400 Hr) 1418

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1401	27.0	7.56	936	69.6	gray	light
1406	54.0	7.80	921	68.2	grey	light
1411	81.0	7.83	902	67.3	grey	moderate

D. O. (ppm): NR ODOR: Strong NR (COBALT 0 - 100) NR (NTU 0 - 200)

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

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
X Centrifugal Pump	___ Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
___ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: OK LOCK #: 2268

REMARKS: ___

Meter Calibration: Date: 1-28-93 Time: 1055 Meter Serial #: 9112 Temperature °F: ___

(EC 1000 ___ / ___) (DI ___) (pH 7 ___ / ___) (pH 10 ___ / ___) (pH 4 ___ / ___)

Location of previous calibration: A-3 (29)

Signature: MCollier Reviewed By: JB Page 5 of 6

WATER SAMPLE FIELD DATA SHEET

Rev. 2. 5/9

EMCON ASSOCIATES

PROJECT NO: 06-70-052.01 SAMPLE ID: AR-2 (29)

PURGED BY: M Adler CLIENT NAME: Arco 2169

SAMPLED BY: M Adler LOCATION: 884 West Grand Oakland, CA

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

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

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 12.37

DEPTH TO WATER (feet): 10.26 CALCULATED PURGE (gal.): 37.12

DEPTH OF WELL (feet): 29.2 ACTUAL PURGE VOL. (gal.): 37.5

DATE PURGED: 1-28-93 Start (2400 Hr) 1245 End (2400 Hr) 1253

DATE SAMPLED: 1-28-93 Start (2400 Hr) 1256 End (2400 Hr) 1301

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1248	12.5	7.58	1108	65.6	rust	heavy
1251	25.0	7.24	1172	66.7	rust	heavy
1253	37.5	7.21	1202	66.5	rust	moderate

D. O. (ppm): NR ODOR: NONE NR (COBALT 0 - 100) . air (NTU 0 - 200)

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

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
X Centrifugal Pump	___ Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
___ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: Ok LOCK #: 2008

REMARKS: Replaced lock (2008)

Meter Calibration: Date: 1-28-93 Time: 10:55 Meter Serial #: 9112 Temperature °F: ___

(EC 1000 ___ / ___) (DI ___) (pH 7 ___ / ___) (pH 10 ___ / ___) (pH 4 ___ / ___)

Location of previous calibration: A-3 (29)

Signature: M Adler Reviewed By: JB Page 6 of 6