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Alameda County Health Care Services Agency  
Hazardous Materials Division  
80 Swan Way, Room 200  
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DATE: January 13, 1994  
PROJECT #: 7927.01  
SUBJECT: Quarterly Monitoring  
Report - 4th Quarter 1993  
for ARCO Station 2169

FROM:  
Barbara Sieminski  
Project Geologist  
GeoStrategies, Inc.  
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Dublin, California 94568

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1	01/05/93	Quarterly Monitoring Report - Fourth Quarter 1993, ARCO Station 2169, 899 West Grand Avenue, Oakland, California.

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cc: Mr. Joel Coffman, GSI  
Mr. Richard Hiatt, RWQCB, (Certified Mail)  
Mr. Michael Whelan, ARCO Products Company

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GeoStrategies Inc.

**QUARTERLY MONITORING REPORT - Fourth Quarter 1993**

ARCO Station 2169  
*889* ~~899~~ West Grand Avenue  
Oakland, California

792701-17

January 5, 1994



GeoStrategies Inc.

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Mr. Michael Whelan  
ARCO Products Company  
Post Office Box 5811  
San Mateo, California

January 5, 1994

Subject: **QUARTERLY MONITORING REPORT - Fourth Quarter 1993**  
ARCO Station 2169, 899 West Grand Avenue, Oakland,  
California.

Mr. Whelan:

This Quarterly Monitoring Report was prepared by GeoStrategies Inc. (GSI) and presents the results of the fourth quarter 1993 groundwater sampling for the above referenced site (Plate 1). Sampling data were furnished by the ARCO Products Company contractor, EMCON Associates of San Jose, California (EMCON).

#### **SITE BACKGROUND**

In 1991, GSI conducted a limited site assessment which included drilling of five exploratory soil borings (A-A through A-E) at the site. Four onsite (A-1 through A-4) and two offsite (A-5 and A-6) groundwater monitoring wells, two groundwater recovery wells (AR-1 and AR-2), and three vapor extraction wells (AV-1 through AV-3) were installed at the site by GSI between 1992 and 1993. These wells and borings were drilled to evaluate the horizontal and vertical extent of petroleum hydrocarbons in soil and groundwater beneath the site, and to provide extraction points for future soil and groundwater remediation systems. The former underground storage tanks (USTs) containing gasoline and diesel fuel were replaced in April 1992. The locations of the wells, former and existing tanks and other pertinent site features are shown on Plate 2.

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In June 1992, GSI performed a vapor extraction test to determine the feasibility of vapor extraction as a remedial option for the site.

In July 1992, GSI performed an aquifer pumping and recovery test to evaluate the feasibility of groundwater extraction as a groundwater remediation method for the site.

In September 1993, GSI installed air sparging wells AS-1 through AS-3 and additional vapor extraction wells AV-4 and AV-5 (not shown on Plate 2) at the site and conducted air sparging/vapor extraction tests to evaluate the feasibility of vapor extraction/air sparging as a method for remediation of soil and groundwater at the site. The results of this investigation will be presented in a forthcoming report. In December 1993, construction will commence for installation of an interim soil and groundwater remediation system.

Quarterly groundwater monitoring and sampling of the site wells began in April 1992. Groundwater samples are currently analyzed for Total Petroleum Hydrocarbons calculated as Gasoline (TPH-G) and gasoline constituents benzene, toluene, ethylbenzene and xylenes (BTEX) using EPA Methods 5030/8015/8020; and Total Petroleum Hydrocarbons calculated as Diesel (TPH-D) using EPA Methods 3510/3520/8015.

### **CURRENT QUARTER SAMPLING RESULTS**

#### Groundwater Level Measurements and Gradient Evaluation

Depth to water-level measurements were obtained from monitoring and recovery wells on October 8, 1993, by EMCON. Static groundwater 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 were used to construct potentiometric maps (Plate 3). Shallow groundwater beneath the site is interpreted to flow to the northwest at an average hydraulic gradient of 0.004.

Each well was inspected for the presence of floating product. Floating product has not been observed in any well since quarterly monitoring began in April 1992. Depth to groundwater for the current quarter are

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presented in Table 1 and in the EMCON sampling report (Appendix A). Current and historical water-level data and floating product measurements are summarized in Table 2.

### Chemical Analyses of Groundwater Samples

Groundwater samples were collected from wells A-1 through A-6, AR-1 and AR-2 on October 8, 1993, by EMCON. Samples were analyzed for TPH-G and BTEX using EPA Methods 5030/8015/8020. In addition, groundwater samples collected from wells A-1, AR-1 and AR-2 were analyzed for TPH-D using EPA Methods 3510/3520/8015. Groundwater samples were analyzed by Sequoia Analytical of Redwood City, California (Sequoia), a California State-certified laboratory (Hazardous Waste Testing Laboratory #1210).

Current quarter chemical analytical data are presented in Table 1 and have also been added to the Historical Groundwater Quality Database presented in Table 3. TPH-G and BTEX were detected in samples collected from onsite wells A-1 and AR-1, and offsite wells A-5 and A-6 at concentrations ranging between 220 parts per billion (ppb) and 6,800 ppb for TPH-G, and between 0.73 ppb and 490 ppb for benzene. Concentrations of TPH-G and benzene were nondetectable (less than 50 ppb and less than 0.50 ppb, respectively) in groundwater samples collected from onsite wells A-2 through A-4 and AR-2. TPH-D was nondetectable (less than 50 ppb) in the groundwater sample collected from well AR-2. Laboratory analytical results (EPA Methods 3510/3520/8015) indicated 1,200 ppb and 4,100 ppb of non-diesel mix hydrocarbons in groundwater samples collected from wells A-1 and AR-1, respectively. The EMCON groundwater sampling report, laboratory analytical reports and the Chain-of-Custody form are presented in Appendix A. Chemical isoconcentration maps for TPH-G and benzene are presented on Plates 4 and 5, respectively.

### **CONCLUSIONS**

Groundwater elevations in the site wells have not changed significantly since the third quarter 1993. The groundwater gradient and flow

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direction for this quarter is generally consistent with previously interpreted gradients and flow directions for this site.

Concentrations of TPH-G and BTEX have remained nondetectable in wells A-2 through A-4 and AR-2; have not changed significantly in AR-1 and A-1; and have increased in well A-5 since the last quarter. A comparison could not be made for well A-6 because this well was not sampled during the third quarter 1993. Offsite well A-5 is located crossgradient from the ARCO site and concentrations of gasoline hydrocarbons detected in this well may reflect an offsite source of gasoline hydrocarbons.

If you have any questions, please call us at (510) 551 - 8777.

GeoStrategies Inc. by,

*Barbara Sieminski*

Barbara Sieminski  
Project Geologist

*Stephen J. Carter*

Stephen J. Carter  
Senior Geologist  
R.G. 5577



- Table 1. Current Groundwater Monitoring Data
- Table 2. Historical Water-level Data
- Table 3. Historical Groundwater Quality Database

- Plate 1. Vicinity Map
- Plate 2. Site Plan
- Plate 3. Potentiometric Map
- Plate 4. TPH-G Concentration Map
- Plate 5. Benzene Concentration Map

Appendix A: EMCON Groundwater Sampling Report

QC Review: *BS*

**GeoStrategies Inc.**

**TABLES**

TABLE 1

CURRENT GROUNDWATER MONITORING DATA  
ARCO Station 2169  
Oakland, California

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 TO WATER (FT)
A-1	08-Oct-93	18-Oct-93	2600	430	65	64	99	1200*	14.75	2.54	0.00	12.21
A-2	08-Oct-93	15-Oct-93	<50	<0.50	<0.50	<0.50	<0.50	N/A	15.16	2.51	0.00	12.65
A-3	08-Oct-93	15-Oct-93	<50	<0.50	<0.50	<0.50	<0.50	N/A	16.38	2.90	0.00	13.48
A-4	08-Oct-93	15-Oct-93	<50	<0.50	<0.50	<0.50	<0.50	N/A	15.89	3.32	0.00	12.57
A-5	08-Oct-93	15-Oct-93	6800	490	620	280	980	N/A	14.14	2.46	0.00	11.68
A-6	08-Oct-93	18-Oct-93	220	0.73	<0.50	0.82	0.65	N/A	14.17	2.37	0.00	11.80
AR-1	08-Oct-93	15-Oct-93	3500	200	85	120	290	4100*	15.71	2.87	0.00	12.84
AR-2	08-Oct-93	18-Oct-93	<50	<0.50	<0.50	<0.50	<0.50	<50	15.79	2.47	0.00	13.32
TB-1	08-Oct-93	18-Oct-93	<50	<0.50	<0.50	<0.50	<0.50	<0.50	---	---	---	---

## Current Regional Water Quality Control Board Maximum Contaminant Levels

Benzene 1.0 ppb Xylenes 1750. ppb Ethylbenzene 680. ppb

Current Cal EPA Action Levels Toluene 100.0 ppb

TPH-G = Total Petroleum Hydrocarbons calculated as Gasoline.

TPH-D = Total Petroleum Hydrocarbons calculated as Diesel.

PPB = Parts Per Billion.

\* Reported as a non-diesel mix (&lt;C14).

- Notes:
1. All data shown as <x are reported as ND (none detected).
  2. Water level elevations referenced to Mean Sea Level (MSL).



TABLE 2

HISTORICAL WATER-LEVEL DATA  
 ARCO Station 2169  
 Oakland, California

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
22-Feb-93	A-1	9.46	14.75	5.29	0.00
25-Mar-93	A-1	10.02	14.75	4.73	0.00
15-Apr-93	A-1	10.50	14.75	4.25	0.00
22-May-93	A-1	11.33	14.75	3.42	0.00
16-Jun-93	A-1	11.51	14.75	3.24	0.00
27-Jul-93	A-1	11.91	14.75	2.84	0.00
26-Aug-93	A-1	12.11	14.75	2.64	0.00
27-Sep-93	A-1	12.21	14.75	2.54	0.00
08-Oct-93	A-1	12.21	14.75	2.54	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
22-Feb-93	A-2	9.28	15.16	5.88	0.00
25-Mar-93	A-2	10.57	15.16	4.59	0.00
15-Apr-93	A-2	11.20	15.16	3.96	0.00
22-May-93	A-2	11.91	15.16	3.25	0.00

TABLE 2

HISTORICAL WATER-LEVEL DATA  
ARCO Station 2169  
Oakland, California

MONITORING DATE	WELL NUMBER	DEPTH TO WATER (ft)	WELL ELEVATION (FT)	STATIC WATER ELEVATION (FT)	FLOATING PRODUCT THICKNESS (FT)
16-Jun-93	A-2	12.04	15.16	3.12	0.00
27-Jul-93	A-2	12.41	15.16	2.75	0.00
25-Aug-93	A-2	12.54	15.16	2.62	0.00
27-Sep-93	A-2	12.66	15.16	2.50	0.00
08-Oct-93	A-2	12.65	15.16	2.51	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
22-Feb-93	A-3	10.44	16.38	5.94	0.00
25-Mar-93	A-3	11.27	16.38	5.11	0.00
15-Apr-93	A-3	11.98	16.38	4.40	0.00
22-May-93	A-3	12.70	16.38	3.68	0.00
16-Jun-93	A-3	12.84	16.38	3.54	0.00
27-Jul-93	A-3	13.22	16.38	3.16	0.00
25-Aug-93	A-3	13.35	16.38	3.03	0.00
27-Sep-93	A-3	13.50	16.38	2.88	0.00
08-Oct-93	A-3	13.48	16.38	2.90	0.00
03-Apr-92	A-4	10.84	15.89	5.05	0.00
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

TABLE 2

HISTORICAL WATER-LEVEL DATA  
 ARCO Station 2169  
 Oakland, California

MONITORING DATE	WELL NUMBER	DEPTH TO WATER (ft)	WELL ELEVATION (FT)	STATIC WATER ELEVATION (FT)	FLOATING PRODUCT THICKNESS (FT)
28-Jan-93	A-4	9.40	15.89	6.49	0.00
22-Feb-93	A-4	9.35	15.89	6.54	0.00
25-Mar-93	A-4	10.32	15.89	5.57	0.00
15-Apr-93	A-4	11.15	15.89	4.74	0.00
22-May-93	A-4	11.84	15.89	4.05	0.00
16-Jun-93	A-4	12.01	15.89	3.88	0.00
27-Jul-93	A-4	12.33	15.89	3.56	0.00
25-Aug-93	A-4	12.48	15.89	3.41	0.00
27-Sep-93	A-4	12.60	15.89	3.29	0.00
08-Oct-93	A-4	12.57	15.89	3.32	0.00
11-Feb-93	A-5	9.15	14.14	4.99	0.00
25-Mar-93	A-5	9.33	14.14	4.81	0.00
15-Apr-93	A-5	10.11	14.14	4.03	0.00
22-May-93	A-5	10.71	14.14	3.43	0.00
16-Jun-93	A-5	10.84	14.14	3.30	0.00
27-Jul-93	A-5	11.22	14.14	2.92	0.00
26-Aug-93	A-5	11.44	14.14	2.70	0.00
27-Sep-93	A-5	11.51	14.14	2.63	0.00
08-Oct-93	A-5	11.68	14.14	2.46	0.00
11-Feb-93	A-6	9.35	14.17	4.82	0.00
25-Mar-93	A-6	Not measured			
16-Apr-93	A-6	9.36	14.17	4.81	0.00
22-May-93	A-6	10.86	14.17	3.31	0.00
16-Jun-93	A-6	10.98	14.17	3.19	0.00
27-Jul-93	A-6	Not measured			
25-Aug-93	A-6	Not measured			
27-Sep-93	A-6	11.65	14.17	2.52	0.00
08-Oct-93	A-6	11.80	14.17	2.37	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

TABLE 2

HISTORICAL WATER-LEVEL DATA  
ARCO Station 2169  
Oakland, California

MONITORING DATE	WELL NUMBER	DEPTH TO WATER (ft)	WELL ELEVATION (FT)	STATIC WATER ELEVATION (FT)	FLOATING PRODUCT THICKNESS (FT)
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
22-Feb-93	AR-1	10.05	15.71	5.66	0.00
25-Mar-93	AR-1	10.75	15.71	4.96	0.00
15-Apr-93	AR-1	11.26	15.71	4.45	0.00
22-May-93	AR-1	12.07	15.71	3.64	0.00
16-Jun-93	AR-1	12.21	15.71	3.50	0.00
27-Jul-93	AR-1	12.60	15.71	3.11	0.00
25-Aug-93	AR-1	12.78	15.71	2.93	0.00
27-Sep-93	AR-1	12.89	15.71	2.82	0.00
08-Oct-93	AR-1	12.84	15.71	2.87	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
22-Feb-93	AR-2	10.52	15.79	5.27	0.00
25-Mar-93	AR-2	11.18	15.79	4.61	0.00
15-Apr-93	AR-2	11.81	15.79	3.98	0.00
22-May-93	AR-2	12.46	15.79	3.33	0.00
16-Jun-93	AR-2	12.53	15.79	3.26	0.00
27-Jul-93	AR-2	12.77	15.79	3.02	0.00
26-Aug-93	AR-2	13.23	15.79	2.56	0.00
27-Sep-93	AR-2	13.16	15.79	2.63	0.00
08-Oct-93	AR-2	13.32	15.79	2.47	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.
  4. Well A-6 was not accessible on March 25, July 27 and August 25, 1993.

TABLE 3

HISTORICAL GROUNDWATER QUALITY DATABASE  
ARCO Station 2169  
Oakland, California

SAMPLE DATE	WELL NO.	TPH-G (PPB)	BENZENE (PPB)	TOLUENE (PPB)	ETHYLBENZENE (PPB)	XYLENES (PPB)	TPH-D (PPB)
03-Apr-92	A-1	34000	6200	3900	410	3100	6100
17-Jul-92	A-1	5600	3000	500	<100	<100	N/A
13-Oct-92	A-1	5600	980	590	85	910	N/A
28-Jan-93	A-1	3700	780	360	130	460	620*
15-Apr-93	A-1	210	34	11	7.1	20	420*
26-Aug-93	A-1	2000	370	35	50	220	1500*
08-Oct-93	A-1	2600	430	65	64	99	1200*
03-Apr-92	A-2	<30	<0.30	<0.30	<0.30	<0.30	<50
17-Jul-92	A-2	<50	<0.50	<0.50	<0.50	<0.50	N/A
13-Oct-92	A-2	<50	0.57	<0.50	<0.50	<0.50	N/A
28-Jan-93	A-2	<50	<0.50	<0.50	<0.50	<0.50	N/A
15-Apr-93	A-2	<50	<0.50	<0.50	<0.50	<0.50	N/A
25-Aug-93	A-2	<50	<0.50	<0.50	<0.50	<0.50	N/A
08-Oct-93	A-2	<50	<0.50	<0.50	<0.50	<0.50	N/A
03-Apr-92	A-3	200	0.79	0.65	4.4	<0.30	130
17-Jul-92	A-3	<50	<0.50	<0.50	1.3	2.3	N/A
13-Oct-92	A-3	<50	<0.50	<0.50	<0.50	<0.50	N/A
28-Jan-93	A-3	<50	<0.50	<0.50	<0.50	<0.50	N/A
15-Apr-93	A-3	<50	<0.50	<0.50	<0.50	<0.50	N/A
25-Aug-93	A-3	<50	<0.50	<0.50	<0.50	<0.50	N/A
08-Oct-93	A-3	<50	<0.50	<0.50	<0.50	<0.50	N/A
03-Apr-92	A-4	35	<0.30	<0.30	<0.30	<0.30	85
17-Jul-92	A-4	<50	<0.50	<0.50	<0.50	<0.50	N/A
13-Oct-92	A-4	<50	<0.50	<0.50	<0.50	<0.50	N/A
28-Jan-93	A-4	<50	<0.50	<0.50	<0.50	<0.50	N/A
15-Apr-93	A-4	<50	<0.50	<0.50	<0.50	<0.50	N/A
25-Aug-93	A-4	<50	<0.50	<0.50	<0.50	<0.50	N/A
08-Oct-93	A-4	<50	<0.50	<0.50	<0.50	<0.50	N/A
11-Feb-93	A-5	4900	380	640	140	970	N/A
15-Apr-93	A-5	27000	3100	4000	1100	4600	N/A
26-Aug-93	A-5	13000	1100	1400	480	1800	N/A
08-Oct-93	A-5	6800	490	620	280	980	N/A
11-Feb-93	A-6	990	1.8	5.1	17	7.2	N/A

TABLE 3

HISTORICAL GROUNDWATER QUALITY DATABASE  
ARCO Station 2169  
Oakland, California

SAMPLE DATE	WELL NO.	TPH-G (PPB)	BENZENE (PPB)	TOLUENE (PPB)	ETHYLBENZENE (PPB)	XYLENES (PPB)	TPH-D (PPB)
16-Apr-93	A-6	390	1.3	1.6	1.7	7.7	N/A
25-Aug-93	A-6	Not	Sampled				
08-Oct-93	A-6	220	0.73	<0.50	0.82	0.65	N/A
03-Apr-92	AR-1	17000	310	1400	320	3000	12000
17-Jul-92	AR-1	44000	4300	1800	1800	10000	N/A
13-Oct-92	AR-1	32000	310	730	570	3100	22000*
28-Jan-93	AR-1	15000	1200	510	510	2600	5300*
15-Apr-93	AR-1	17000	1800	360	520	1600	5400*
25-Aug-93	AR-1	2900	260	54	80	160	2800*
08-Oct-93	AR-1	3500	200	85	120	290	4100*
17-Jul-92	AR-2	150	6.6	24	6.6	39	N/A
13-Oct-92	AR-2	<50	2.0	0.86	0.51	3.8	58*
28-Jan-93	AR-2	2000	570	13	<10	380	290*
15-Apr-93	AR-2	85	15	<0.50	<0.50	2.4	<50
26-Aug-93	AR-2	<50	<0.50	<0.50	<0.50	<0.50	<50
08-Oct-93	AR-2	<50	<0.50	<0.50	<0.50	<0.50	<50

## CURRENT REGIONAL WATER QUALITY CONTROL BOARD MAXIMUM CONTAMINANT LEVELS:

Benzene 1. ppb Xylenes 1750. ppb Ethylbenzene 680 ppb

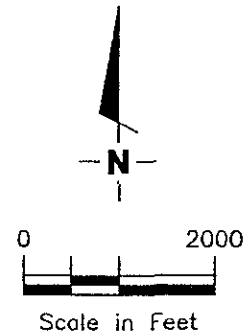
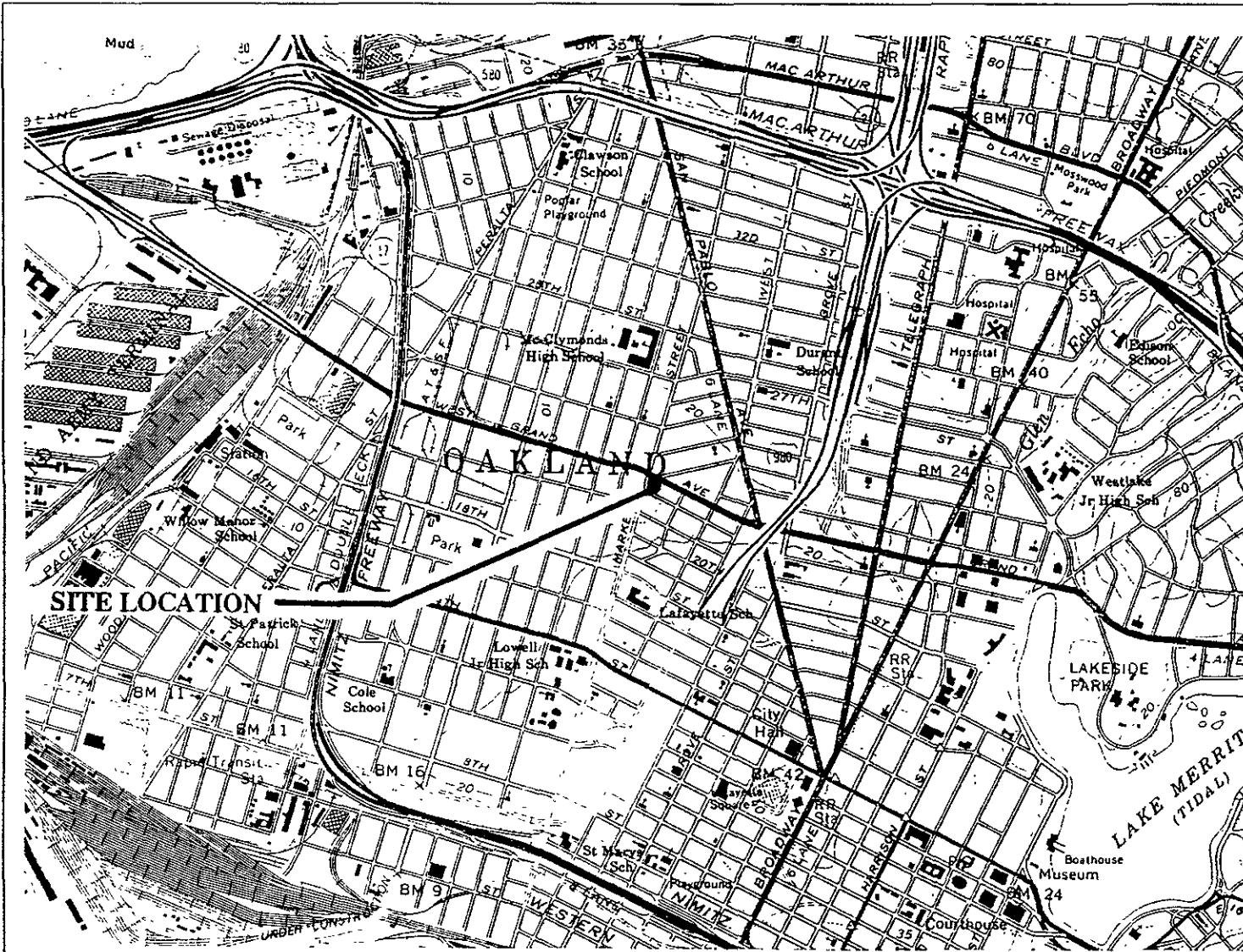
## CURRENT CAL EPA ACTION LEVELS: Toluene 100

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.

Notes: 1. All data shown as < x are reported as ND (not detected above the reporting limit).

**GeoStrategies Inc.**

**ILLUSTRATIONS**



Base Map: USGS Topographic Map



GeoStrategies Inc.

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

PLATE

1

JOB NUMBER  
7927

REVIEWED BY

DATE  
5/91

REVISED DATE

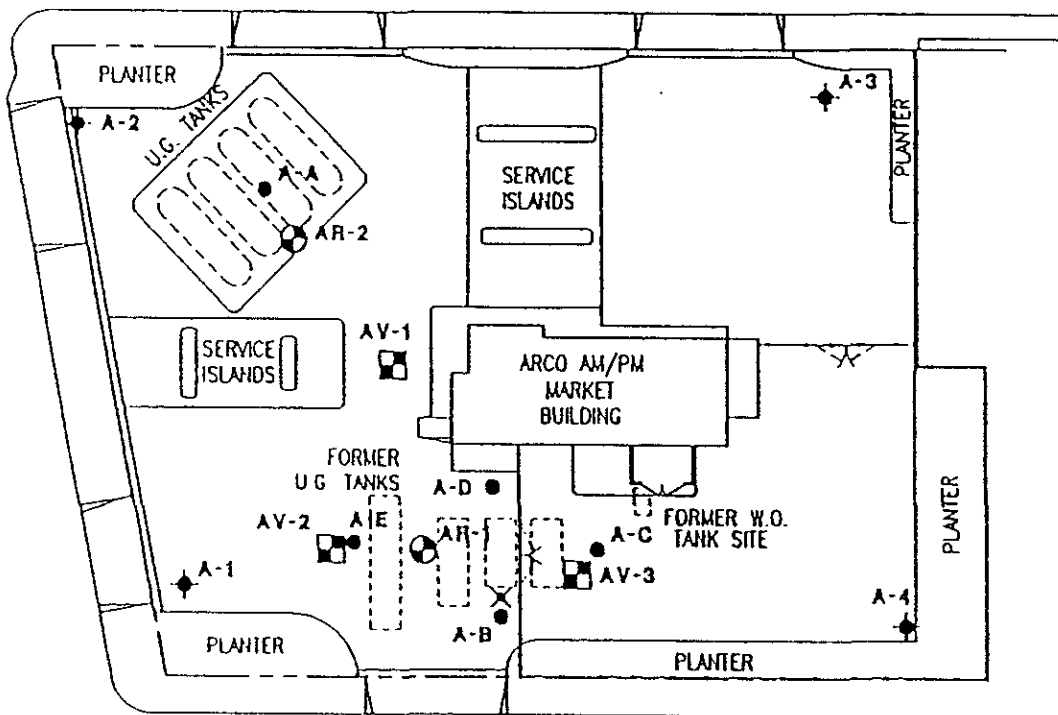


WEST GRAND AVENUE

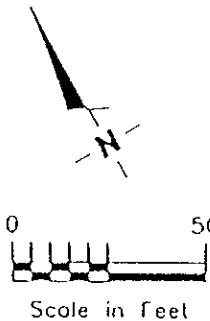
EXPLANATION

- ◆ Groundwater monitoring well
- ⊙ Groundwater recovery well
- ⊠ Vapor extraction well
- Soil Boring
- ✕ Abandoned well

MARKET STREET



22nd STREET



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  
7927

REVIEWED BY

DATE  
7/93

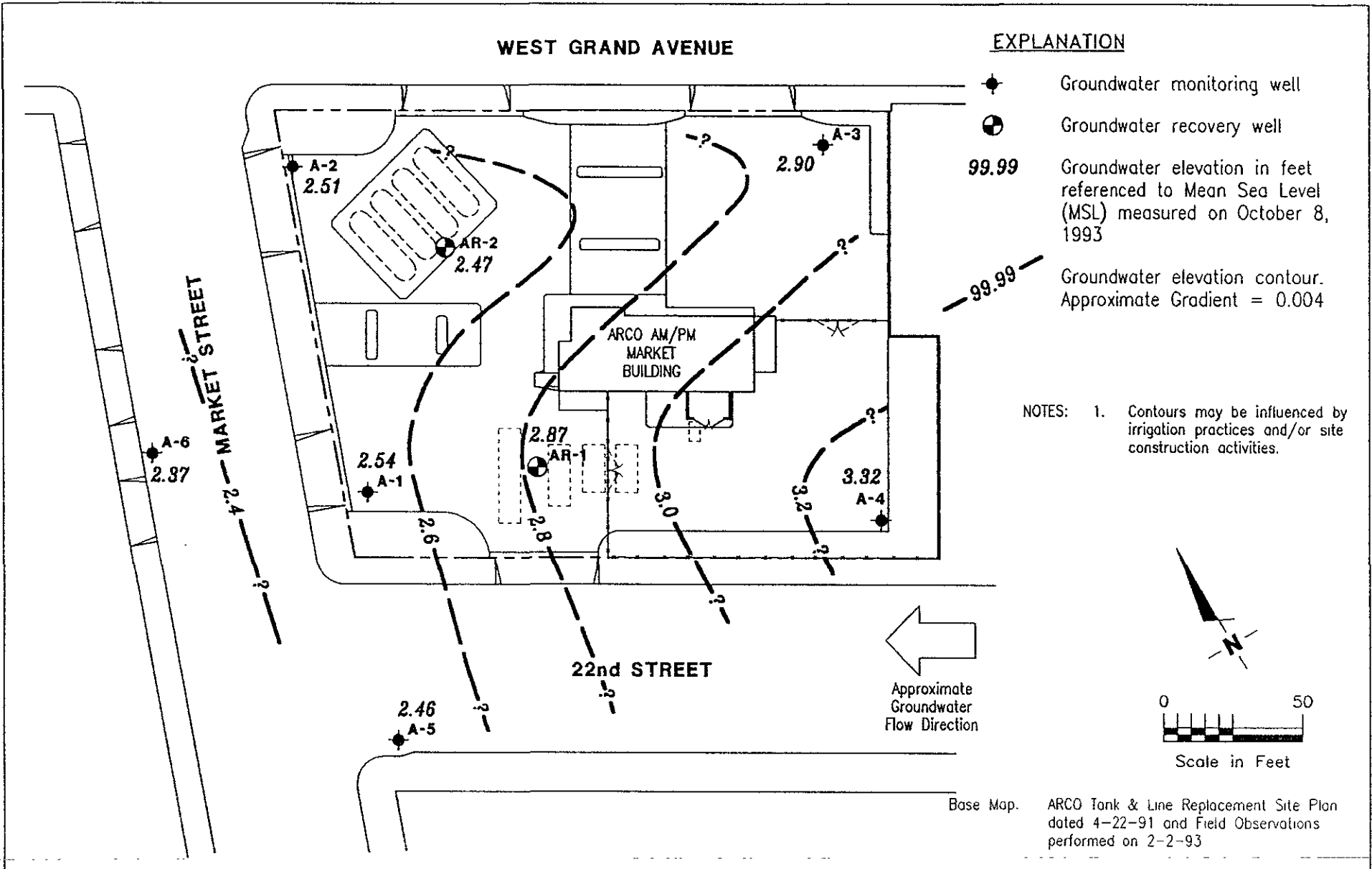
REVISED DATE

WEST GRAND AVENUE

EXPLANATION

- ◆ Groundwater monitoring well
- ⊕ Groundwater recovery well
- 99.99 Groundwater elevation in feet referenced to Mean Sea Level (MSL) measured on October 8, 1993
- - - 99.99 Groundwater elevation contour. Approximate Gradient = 0.004

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



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



GeoStrategies Inc.

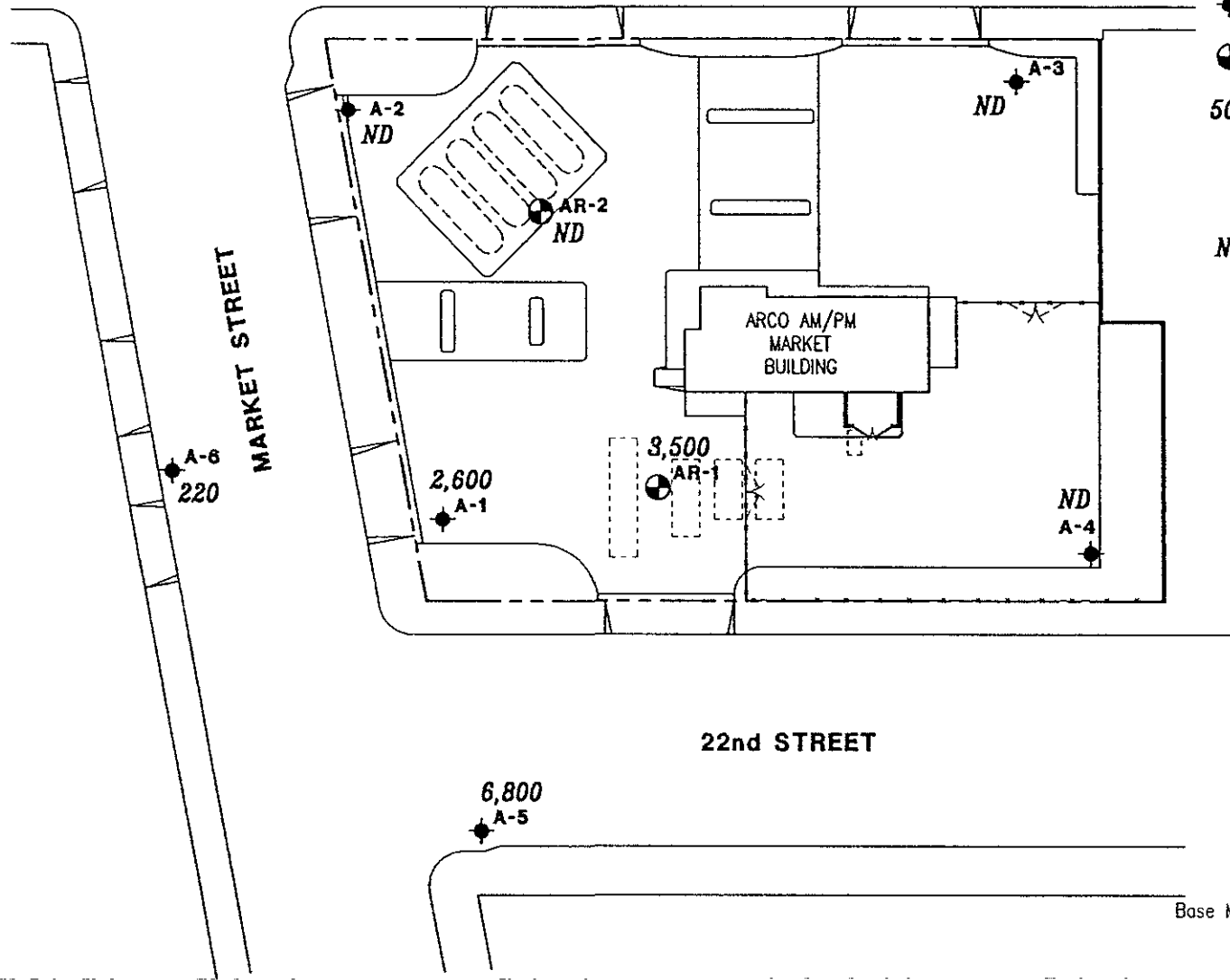
POTENTIOMETRIC MAP  
ARCO Service Station #2169  
889 West Grand Avenue  
Oakland, California

PLATE

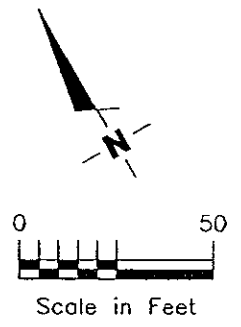
3

WEST GRAND AVENUE

EXPLANATION



- ◆ Groundwater monitoring well
- Groundwater recovery well
- 500 TPH-G (Total Petroleum Hydrocarbons calculated as Gasoline) concentration in ppb sampled on October 8, 1993
- ND Not Detected (See laboratory reports for detection limits)



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



GeoStrategies Inc.

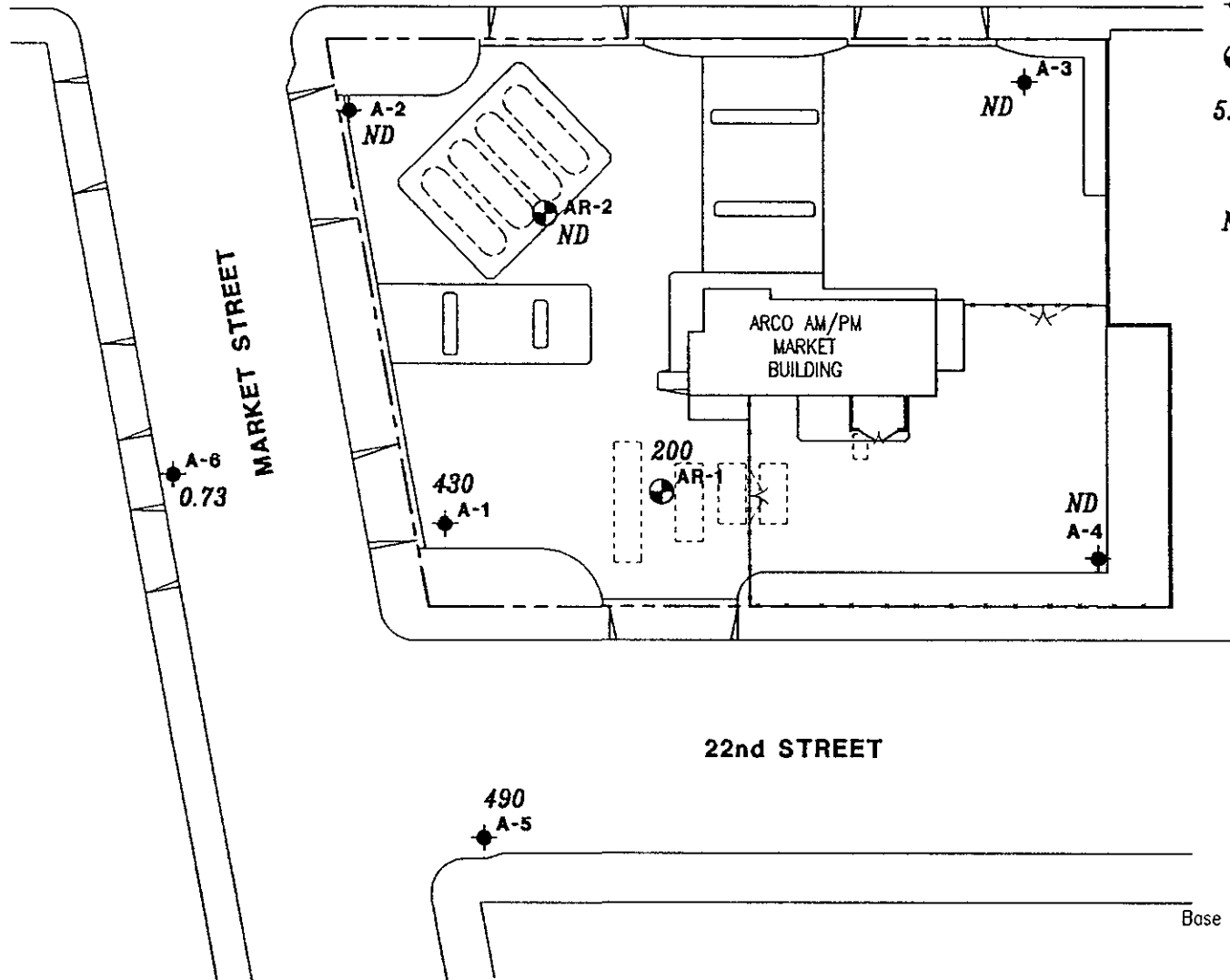
TPH-G CONCENTRATION MAP  
 ARCO Service Station #2169  
 889 West Grand Avenue  
 Oakland, California

PLATE  
**4**

WEST GRAND AVENUE

EXPLANATION

- ◆ Groundwater monitoring well
- ⊕ Groundwater recovery well
- 5.00 Benzene concentration in ppb sampled on October 8, 1993
- ND Not Detected (See laboratory reports for detection limits)



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



GeoStrategies Inc.

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

PLATE

**5**

**APPENDIX A**

**EMCON GROUNDWATER SAMPLING REPORT**



# EMCON Associates

1921 Ringwood Avenue • San Jose, California 95131-1721 • (408) 453-7300 • Fax (408) 437-9526

1993

Date October 27, 1993  
Project OG70-023.01

To:  
Ms. Barbara Sieminski  
GeoStrategies, Inc.  
2140 West Winton Avenue  
Hayward, California 94545

We are enclosing:

Copies	Description
<u>1</u>	<u>Depth To Water / Floating Product Survey Results</u>
<u>1</u>	<u>Summary of Groundwater Monitoring Data</u>
<u>1</u>	<u>Certified Analytical Reports with Chain-of-Custody</u>
<u>8</u>	<u>Water Sample Field Data Sheets</u>

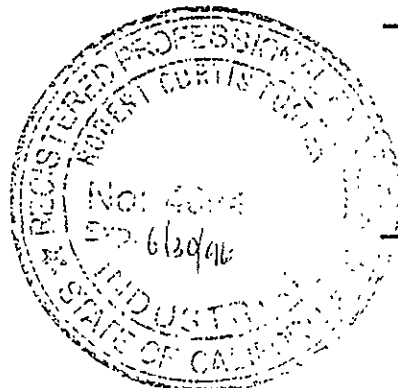
For your:  X  Information Sent by:  X  Mail

Comments:

Enclosed are the data from the fourth 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.

Jim Butera *JB*

Reviewed by:



*Robert Porter*  
Robert Porter, Senior Project Engineer.



**FIELD REPORT**  
**DEPTH TO WATER / FLOATING PRODUCT SURVEY**

PROJECT # : 0G70-052.01

STATION ADDRESS : 889 West Grand Ave, Oakland, CA

DATE : 10-8-93

ARCO STATION # : 2169

FIELD TECHNICIAN : I.G / M.B.

DAY : FRIDAY

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-2	OK	15/16	OK	2268	OK	12.65	12.65	ND	NR	25.1	—
2	A-3	OK	15/16	OK	2268	OK	13.48	13.48	ND	NR	29.1	—
3	A-4	OK	15/16	OK	2268	OK	12.57	12.57	ND	NR	28.3	—
4	AR-2	OK	3'	OK	2008	OK	13.32	13.32	ND	NR	29.2	3' diameter lid
5	A-6	OK	G-5	N/A	2268	OK	11.80	11.80	ND	NR	28.5	—
6	A-1	OK	15/16	OK	2268	OK	12.21	12.21	ND	NR	24.5	—
7	AR-1	OK	15/16	OK	2268	OK	12.84	12.84	ND	NR	27.7	—
8	A-5	OK	G-5	N/A	2268	OK	11.68	11.68	ND	NR	30.2	—

**SURVEY POINTS ARE TOP OF WELL BOXES**

Summary of Groundwater Monitoring Data  
 Fourth 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 <sup>1</sup> 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(23)	10/08/93	12.21	ND. <sup>2</sup>	2,600.	430.	65.	64.	99.	1,200.
A-2(24)	10/08/93	12.65	ND.	<50.	<0.5	<0.5	<0.5	<0.5	NR. <sup>3</sup>
A-3(28)	10/08/93	13.48	ND.	<50.	<0.5	<0.5	<0.5	<0.5	NR.
A-4(27)	10/08/93	12.57	ND.	<50.	<0.5	<0.5	<0.5	<0.5	NR.
A-5(29)	10/08/93	11.68	ND.	6,800.	490.	620.	280.	980.	NR.
A-6(27)	10/08/93	11.80	ND.	220.	0.73	<0.5	0.82	0.65	NR.
AR-1(26)	10/08/93	12.84	ND.	3,500.	200.	85.	120.	290.	4,100.
AR-2(28)	10/08/93	13.32	ND.	<50.	<0.5	<0.5	<0.5	<0.5	<50.
TB-1 <sup>4</sup>	10/08/93	NA. <sup>5</sup>	NA.	<50.	<0.5	<0.5	<0.5	<0.5	NR.

1. TPH. = Total petroleum hydrocarbons

2. ND. = Not detected

3. NR. = Not reported, well was not sampled for the above parameter

4. TB. = Trip blank

5. NA. = Not applicable





# SEQUOIA ANALYTICAL

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

Emcon Associates  
1921 Ringwood Avenue  
San Jose, CA 95131  
Attention: Jim Butera

Project: EMC-93-5/Arco 2169, Oakland

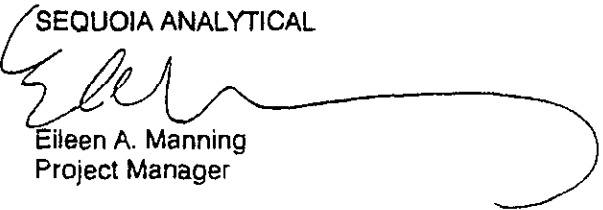
Enclosed are the results from 9 water samples received at Sequoia Analytical on October 11, 1993. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE OF COLLECTION	TEST METHOD
3J66901	Water, A-1 (23)	10/8/93	EPA 3510/3520/8015 EPA 5030/8015/8020
3J66902	Water, A-2(24)	10/8/93	EPA 5030/8015/8020
3J66903	Water, A-3 (28)	10/8/93	EPA 5030/8015/8020
3J66904	Water, A-4 (27)	10/8/93	EPA 5030/8015/8020
3J66905	Water, A-5 (29)	10/8/93	EPA 5030/8015/8020
3J66906	Water, A-6 (27)	10/8/93	EPA 5030/8015/8020
3J66907	Water, AR-1 (26)	10/8/93	EPA 3510/3520/8015 EPA 5030/8015/8020
3J66908	Water, AR-2 (28)	10/8/93	EPA 3510/3520/8015 EPA 5030/8015/8020
3J66909	Water, TB-1	10/8/93	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

  
Eileen A. Manning  
Project Manager



# SEQUOIA ANALYTICAL

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

Emcon Associates  
1921 Ringwood Avenue  
San Jose, CA 95131  
Attention: Jim Butera

Client Project ID: EMC-93-5/Arco 2169, Oakland  
Sample Matrix: Water  
Analysis Method: EPA 5030/8015/8020  
First Sample #: 3J66901

Sampled: Oct 8, 1993  
Received: Oct 11, 1993  
Reported: Oct 20, 1993

## TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

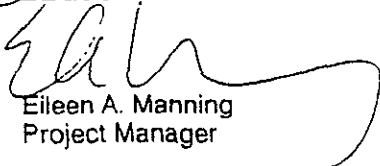
Analyte	Reporting Limit µg/L	Sample I.D. 3J66901 A-1 (23)	Sample I.D. 3J66902 A-2(24)	Sample I.D. 3J66903 A-3 (28)	Sample I.D. 3J66904 A-4 (27)	Sample I.D. 3J66905 A-5 (29)	Sample I.D. 3J66906 A-6 (27)
Purgeable Hydrocarbons	50	2,600	N.D.	N.D.	N.D.	6,800	220
Benzene	0.50	430	N.D.	N.D.	N.D.	490	0.73
Toluene	0.50	65	N.D.	N.D.	N.D.	620	N.D.
Ethyl Benzene	0.50	64	N.D.	N.D.	N.D.	280	0.82
Total Xylenes	0.50	99	N.D.	N.D.	N.D.	980	0.65
Chromatogram Pattern:		Gas	--	--	--	Gas	Non-Gas C6-C12

### Quality Control Data

Report Limit Multiplication Factor:	10	1.0	1.0	1.0	20	1.0
Date Analyzed:	10/18/93	10/15/93	10/15/93	10/15/93	10/15/93	10/18/93
Instrument Identification:	GCHP-2	GCHP-18	GCHP-18	GCHP-18	GCHP-18	GCHP-3
Surrogate Recovery, %: (QC Limits = 70-130%)	98	88	95	94	109	95

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: EMC-93-5/Arco 2169, Oakland	Sampled: Oct 8, 1993
1921 Ringwood Avenue	Sample Matrix: Water	Received: Oct 11, 1993
San Jose, CA 95131	Analysis Method: EPA 5030/8015/8020	Reported: Oct 20, 1993
Attention: Jim Butera	First Sample #: 3J66907	

## TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

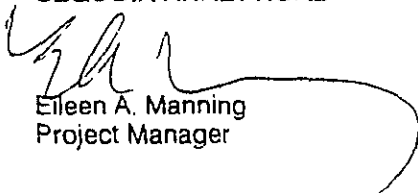
Analyte	Reporting Limit µg/L	Sample I.D. 3J66907 AR-1 (26)	Sample I.D. 3J66908 AR-2 (28)	Sample I.D. 3J66909 TB-1	Sample I.D.	Sample I.D.	Sample I.D.
Purgeable Hydrocarbons	50	3,500	N.D.	N.D.			
Benzene	0.50	200	N.D.	N.D.			
Toluene	0.50	85	N.D.	N.D.			
Ethyl Benzene	0.50	120	N.D.	N.D.			
Total Xylenes	0.50	290	N.D.	N.D.			
Chromatogram Pattern:		Gas	--	--			

### Quality Control Data

Report Limit Multiplication Factor:	5.0	1.0	1.0
Date Analyzed:	10/15/93	10/18/93	10/18/93
Instrument Identification:	GCHP-18	GCHP-3	GCHP-2
Surrogate Recovery, %: (QC Limits = 70-130%)	156 *	95	89
* - Coelution Confirmed			

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  
1921 Ringwood Avenue  
San Jose, CA 95131  
Attention: Jim Butera

Client Project ID: EMC-93-5/Arco 2169, Oakland  
Sample Matrix: Water  
Analysis Method: EPA 3510/3520/8015  
First Sample #: 3J66901

Sampled: Oct 8, 1993  
Received: Oct 11, 1993  
Reported: Oct 20, 1993

## TOTAL EXTRACTABLE PETROLEUM HYDROCARBONS

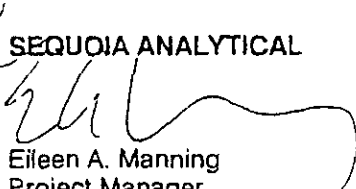
Analyte	Reporting Limit µg/L	Sample I.D. 3J66901 A-1 (23)	Sample I.D. 3J66907 AR-1 (26)	Sample I.D. 3J66908 AR-2 (28)	Sample I.D.	Sample I.D.	Sample I.D.
Extractable Hydrocarbons	50	1,200	4,100	N.D.			
Chromatogram Pattern:		Non-Diesel Mix < C14	Non-Diesel Mix < C14	--			

### Quality Control Data

Report Limit			
Multiplication Factor:	1.0	1.0	1.0
Date Extracted:	10/15/93	10/15/93	10/15/93
Date Analyzed:	10/15/93	10/15/93	10/15/93
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  
1921 Ringwood Avenue  
San Jose, CA 95131  
Attention: Jim Butera

Client Project ID: EMC-93-5/Arco 2169, Oakland  
Matrix: Water

QC Sample Group: 3J66901, 09

Reported: Oct 20, 1993

## QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl-Benzene	Xylenes
<b>Method:</b>	EPA 8020	EPA 8020	EPA 8020	EPA 8020
<b>Analyst:</b>	M.Nipp	M.Nipp	M.Nipp	M.Nipp
<b>Conc. Spiked:</b>	10	10	10	30
<b>Units:</b>	µg/L	µg/L	µg/L	µg/L
<b>LCS Batch#:</b>	GBLK101893	GBLK101893	GBLK101893	GBLK101893
<b>Date Prepared:</b>	10/18/93	10/18/93	10/18/93	10/18/93
<b>Date Analyzed:</b>	10/18/93	10/18/93	10/18/93	10/18/93
<b>Instrument I.D.#:</b>	GCHP-2	GCHP-2	GCHP-2	GCHP-2
<b>LCS % Recovery:</b>	96	95	96	97
<b>Control Limits:</b>	80-120	80-120	80-120	80-120

MS/MSD				
<b>Batch #:</b>	G3J73002	G3J73002	G3J73002	G3J73002
<b>Date Prepared:</b>	10/18/93	10/18/93	10/18/93	10/18/93
<b>Date Analyzed:</b>	10/18/93	10/18/93	10/18/93	10/18/93
<b>Instrument I.D.#:</b>	GCHP-2	GCHP-2	GCHP-2	GCHP-2
<b>Matrix Spike % Recovery:</b>	98	98	99	100
<b>Matrix Spike Duplicate % Recovery:</b>	97	98	99	100
<b>Relative % Difference:</b>	1.0	0.0	0.0	0.0

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

SEQUOIA ANALYTICAL

*Eileen A. Manning*  
Eileen A. Manning  
Project Manager

**Please Note:**

The LCS is a control sample of known, interferent free matrix that is analyzed using the same reagents, preparation and analytical methods employed for the samples. The LCS % recovery data is used for validation of sample batch results. Due to matrix effects, the QC limits for MS/MSD's are advisory only and are not used to accept or reject batch results.



# SEQUOIA ANALYTICAL

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

Emcon Associates  
1921 Ringwood Avenue  
San Jose, CA 95131  
Attention: Jim Butera

Client Project ID: EMC-93-5/Arco 2169, Oakland  
Matrix: Water

QC Sample Group: 3J66902-05, 07

Reported: Oct 20, 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
Conc. Spiked:	10	10	10	30
Units:	µg/L	µg/L	µg/L	µg/L
LCS Batch#:	GBLK101593	GBLK101593	GBLK101593	GBLK101593
Date Prepared:	10/15/93	10/15/93	10/15/93	10/15/93
Date Analyzed:	10/15/93	10/15/93	10/15/93	10/15/93
Instrument I.D.#:	GCHP-18	GCHP-2	GCHP-2	GCHP-2
LCS % Recovery:	91	91	91	90
Control Limits:	80-120	80-120	80-120	80-120

MS/MSD	Batch #:	31047305	31047305	31047305	31047305
Date Prepared:		10/15/93	10/15/93	10/15/93	10/15/93
Date Analyzed:		10/15/93	10/15/93	10/15/93	10/15/93
Instrument I.D.#:		GCHP-18	GCHP-18	GCHP-18	GCHP-18
Matrix Spike % Recovery:		93	93	93	93
Matrix Spike Duplicate % Recovery:		91	92	92	93
Relative % Difference:		2.2	1.1	1.1	0.0

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

SEQUOIA ANALYTICAL

Eileen A. Manning  
Project Manager

Please Note:  
The LCS is a control sample of known, interferent free matrix that is analyzed using the same reagents, preparation and analytical methods employed for the samples. The LCS % recovery data is used for validation of sample batch results. Due to matrix effects, the QC limits for MS/MSD's are advisory only and are not used to accept or reject batch results.



# SEQUOIA ANALYTICAL

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

Emcon Associates  
1921 Ringwood Avenue  
San Jose, CA 95131  
Attention: Jim Butera

Client Project ID: EMC-93-5/Arco 2169, Oakland  
Matrix: Water

QC Sample Group: 3J66902, 08

Reported: Oct 20, 1993

## QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl-Benzene	Xylenes	Diesel
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020	EPA 8015
Analyst:	M.Nipp	M.Nipp	M.Nipp	M.Nipp	Vartan H.
Conc. Spiked:	10	10	10	30	300
Units:	µg/L	µg/L	µg/L	µg/L	µg/L
LCS Batch#:	GBLK101893	GBLK101893	GBLK101893	GBLK101893	DBLK101493
Date Prepared:	10/18/93	10/18/93	10/18/93	10/18/93	10/13/93
Date Analyzed:	10/18/93	10/18/93	10/18/93	10/18/93	10/14/93
Instrument I.D.#:	GCHP-3	GCHP-3	GCHP-3	GCHP-3	GCHP-5
LCS % Recovery:	100	100	100	100	75
Control Limits:	80-120	80-120	80-120	80-120	50-150

MS/MSD					
Batch #:	G3J72503	G3J72503	G3J72503	G3J72503	31047301
Date Prepared:	10/18/93	10/18/93	10/18/93	10/18/93	10/13/93
Date Analyzed:	10/18/93	10/18/93	10/18/93	10/18/93	10/14/93
Instrument I.D.#:	GCHP-3	GCHP-3	GCHP-3	GCHP-3	GCHP-5
Matrix Spike % Recovery:	98	98	99	100	85
Matrix Spike Duplicate % Recovery:	96	95	96	97	88
Relative % Difference:	2.1	3.1	2.1	3.0	3.5

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

SEQUOIA ANALYTICAL

**Please Note:**

The LCS is a control sample of known, interferent free matrix that is analyzed using the same reagents, preparation and analytical methods employed for the samples. The LCS % recovery data is used for validation of sample batch results. Due to matrix effects, the QC limits for MS/MSD's are advisory only and are not used to accept or reject batch results

Eileen A. Manning  
Project Manager

ARCO Facility no. **2169** City (Facility) **OAKLAND** Project manager (Consultant) **JIM Butera**  
 ARCO engineer **Fyle Christie** Telephone no. (ARCO) **571-2434** Telephone no. (Consultant) **453-07300** Fax no. (Consultant) **453-0452**  
 Consultant name **EMCON** Address (Consultant) **1921 Ringwood Avenue SJ**

Laboratory name **ESCORIA**  
Contract number

Method of shipment **Courier will pick up**

Special detection Limit/reporting **Lowest Possible**

Special QA/QC **As Normal**

Remarks **2-40 ml HCl  
2-liter NP**

Lab number **9310669**

Turnaround time  
 Priority Rush 1 Business Day   
 Rush 2 Business Days   
 Expedited 5 Business Days   
 Standard 10 Business Days

Sample I.D.	Lab no.	Container no.	Matrix			Preservation		Sampling date	Sampling time	BTEX EPA 8020	BTEX/TPH EPA 8010/8015	TPH Modified 8015 Gas <input type="checkbox"/> Diesel <input checked="" type="checkbox"/>	Oil and Grease 413.1 <input type="checkbox"/> 413.2 <input type="checkbox"/>	TPH EPA 418.1/SM502E	EPA 601/6010	EPA 824/8240	EPA 825/8270	TCUP Mercury <input type="checkbox"/> VOA <input type="checkbox"/> YOA <input type="checkbox"/>	Cadmium EPA 6010/7000	Pb EPA 6010/7000	Lead EPA 7420/7421 <input type="checkbox"/>	
			Soil	Water	Other	Ice	Acid															
1-1(23)	01	2		X		X	HCl	10-8-93	1408		X											
1-2(24)	02	2							1147		X											
1-3(28)	03	2							1212		X											
1-4(27)	04	2							1237		X											
1-5(29)	05	2							1519		X											
1-6(27)	06	2							1338		X											
1-11(26)	07	2							1457		X											
1-12(28)	08	2		↓			↓		1302		X											
1B-1	09	2		X		X	HCl		—		X											
1-1(23)	01	2					NP		1408		X											
1-1(26)	07	2					NP		1457		X											
1-12(28)	08	2					NP	↓	1302		X											

Condition of sample: \_\_\_\_\_ Temperature received: \_\_\_\_\_

Relinquished by sampler **[Signature]** Date **10-11-93** Time **10:05** Received by **[Signature]**

Relinquished by **[Signature]** Date **10/11/93** Time **10:35** Received by **[Signature]**

Relinquished by **[Signature]** Date **10-11-93** Time **10:35** Received by laboratory **[Signature]**





EMCON ASSOCIATES

# WATER SAMPLE FIELD DATA SHEET

PROJECT NO: OG70-052.01

SAMPLE ID: A - 1 (23)

PURGED BY: I. GRAHAM / M. GALLEGOS

CLIENT NAME: ARCO # 2169

SAMPLED BY: I. GRAHAM / M. GALLEGOS

LOCATION: OAKLAND, CA.

TYPE: Ground Water  Surface Water \_\_\_\_\_ Treatment Effluent \_\_\_\_\_ Other \_\_\_\_\_

CASING DIAMETER (inches): 2 \_\_\_\_\_ 3  4 \_\_\_\_\_ 4.5 \_\_\_\_\_ 6 \_\_\_\_\_ Other \_\_\_\_\_

CASING ELEVATION (feet/MSL):	<u>NR</u>	VOLUME IN CASING (gal.):	<u>4.50</u>
DEPTH TO WATER (feet):	<u>12.21</u>	CALCULATED PURGE (gal.):	<u>13.51</u>
DEPTH OF WELL (feet):	<u>24.5</u>	ACTUAL PURGE VOL. (gal.):	<u>14.0</u>

DATE PURGED: 10-8-93 Start (2400 Hr) 1345 End (2400 Hr) 1405  
 DATE SAMPLED: 10-8-93 Start (2400 Hr) 1408 End (2400 Hr) 1408

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (umhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
<u>1350</u>	<u>4.50</u>	<u>6.94</u>	<u>1092</u>	<u>73.6</u>	<u>GREY</u>	<u>HEAVY</u>
<u>1358</u>	<u>9.0</u>	<u>6.93</u>	<u>1073</u>	<u>73.2</u>	<u>11</u>	<u>11</u>
<u>1405</u>	<u>14.0</u>	<u>6.97</u>	<u>1075</u>	<u>72.5</u>	<u>11</u>	<u>11</u>
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____

D. O. (ppm): NR ODOR: STRONG NR NR  
 (COBALTO - 100) (NTU 0 - 200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): NONE

### PURGING EQUIPMENT

### SAMPLING EQUIPMENT

<input type="checkbox"/> 2" Bladder Pump	<input type="checkbox"/> Bailer (Teflon®)	<input type="checkbox"/> 2" Bladder Pump	<input checked="" type="checkbox"/> Bailer (Teflon®)
<input checked="" type="checkbox"/> Centrifugal Pump	<input type="checkbox"/> Bailer (PVC)	<input type="checkbox"/> DDL Sampler	<input type="checkbox"/> Bailer (Stainless Steel)
<input type="checkbox"/> Submersible Pump	<input type="checkbox"/> Bailer (Stainless Steel)	<input type="checkbox"/> Dipper	<input type="checkbox"/> Submersible Pump
<input type="checkbox"/> Well Wizard™	<input type="checkbox"/> Dedicated	<input type="checkbox"/> Well Wizard™	<input type="checkbox"/> Dedicated
Other: _____		Other: _____	

WELL INTEGRITY: OK LOCK #: 2268

REMARKS: (DIESEL)

Meter Calibration: Date: 10-8-93 Time: 1130 Meter Serial #: 9105 Temperature °F: \_\_\_\_\_  
 ( EC 1000 \_\_\_\_\_ / \_\_\_\_\_ ) ( DI \_\_\_\_\_ ) ( pH 7 \_\_\_\_\_ / \_\_\_\_\_ ) ( pH 10 \_\_\_\_\_ / \_\_\_\_\_ ) ( pH 4 \_\_\_\_\_ / \_\_\_\_\_ )  
 Location of previous calibration: A-2

Signature: [Signature] Reviewed By: [Signature] Page 1 of 8



EMCON ASSOCIATES

# WATER SAMPLE FIELD DATA SHEET

PROJECT NO: OG70-052.01

SAMPLE ID: A - 2 (2)

PURGED BY: J. GRAHAM / M. GALLEGOS

CLIENT NAME: ARCO # 2169

SAMPLED BY: J. GRAHAM / M. GALLEGOS

LOCATION: OAKLAND, CA.

TYPE: Ground Water  Surface Water \_\_\_\_\_ Treatment Effluent \_\_\_\_\_ Other \_\_\_\_\_

CASING DIAMETER (inches): 2 \_\_\_\_\_ 3  4 \_\_\_\_\_ 4.5 \_\_\_\_\_ 6 \_\_\_\_\_ Other \_\_\_\_\_

CASING ELEVATION (feet/VMSL):	<u>NR</u>	VOLUME IN CASING (gal.):	<u>4.56</u>
DEPTH TO WATER (feet):	<u>12.65</u>	CALCULATED PURGE (gal.):	<u>13.69</u>
DEPTH OF WELL (feet):	<u>25.1</u>	ACTUAL PURGE VOL. (gal.):	<u>15.0</u>

DATE PURGED: 10-8-93 Start (2400 Hr) 1130 End (2400 Hr) 1145  
 DATE SAMPLED: 10-8-93 Start (2400 Hr) 1147 End (2400 Hr) 1147

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (umhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
<u>1135</u>	<u>5.0</u>	<u>7.02</u>	<u>980</u>	<u>70.8</u>	<u>BROWN</u>	<u>MODERATE</u>
<u>1140</u>	<u>10.0</u>	<u>6.98</u>	<u>952</u>	<u>71.0</u>	<u>"</u>	<u>"</u>
<u>1145</u>	<u>15.0</u>	<u>7.00</u>	<u>949</u>	<u>70.6</u>	<u>"</u>	<u>"</u>
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____

D. O. (ppm): NR ODOR: NO NR NR  
 (COBALT 0 - 100) (NTU 0 - 200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): NONE

### PURGING EQUIPMENT

### SAMPLING EQUIPMENT

- |  |   |  |  |
|--|---|--|--|
| <input type="checkbox"/> 2" Bladder Pump             | <input type="checkbox"/> Bailer (Teflon®)         | <input type="checkbox"/> 2" Bladder Pump | <input checked="" type="checkbox"/> Bailer (Teflon®) |
| <input checked="" type="checkbox"/> Centrifugal Pump | <input type="checkbox"/> Bailer (PVC)             | <input type="checkbox"/> DDL Sampler     | <input type="checkbox"/> Bailer (Stainless Steel)    |
| <input type="checkbox"/> Submersible Pump            | <input type="checkbox"/> Bailer (Stainless Steel) | <input type="checkbox"/> Dipper          | <input type="checkbox"/> Submersible Pump            |
| <input type="checkbox"/> Well Wizard™                | <input type="checkbox"/> Dedicated                | <input type="checkbox"/> Well Wizard™    | <input type="checkbox"/> Dedicated                   |
| Other: _____   |   | Other: _____                             |  |

WELL INTEGRITY: OK LOCK #: 2268

REMARKS: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Meter Calibration: Date: 10-8-93 Time: 1130 Meter Serial #: 9105 Temperature °F: 68.1  
 ( EC 1000 1007 / 1000 ) ( DI 300 ) ( pH 7 7.18 / 7.00 ) ( pH 10 10.03 / 10.00 ) ( pH 4 3.93 / \_\_\_\_\_ )

Location of previous calibration: \_\_\_\_\_

Signature: [Signature] Reviewed By: [Signature] Page 2 of 8



# WATER SAMPLE FIELD DATA SHEET

Rev 2, 5/91

PROJECT NO: OG70-052.01

SAMPLE ID: A-3 (28)

PURGED BY: J. GRAHAM / M. GALLEGOS

CLIENT NAME: ARCO # 2169

SAMPLED BY: J. GRAHAM / M. GALLEGOS

LOCATION: OAKLAND, CA.

TYPE: Ground Water  Surface Water \_\_\_\_\_ Treatment Effluent \_\_\_\_\_ Other \_\_\_\_\_

CASING DIAMETER (inches): 2 \_\_\_\_\_ 3  4 \_\_\_\_\_ 4.5 \_\_\_\_\_ 6 \_\_\_\_\_ Other \_\_\_\_\_

CASING ELEVATION (feet/MSL):	<u>NR</u>	VOLUME IN CASING (gal.):	<u>5.72</u>
DEPTH TO WATER (feet):	<u>13.48</u>	CALCULATED PURGE (gal.):	<u>17.18</u>
DEPTH OF WELL (feet):	<u>29.1</u>	ACTUAL PURGE VOL. (gal.):	<u>18.0</u>

DATE PURGED:	<u>10-8-93</u>	Start (2400 Hr)	<u>1155</u>	End (2400 Hr)	<u>1210</u>
DATE SAMPLED:	<u>10-8-93</u>	Start (2400 Hr)	<u>1212</u>	End (2400 Hr)	<u>1212</u>

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (umhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
<u>1200</u>	<u>6.0</u>	<u>7.65</u>	<u>889</u>	<u>71.3</u>	<u>GREY</u>	<u>MODERATE</u>
<u>1205</u>	<u>12.0</u>	<u>7.67</u>	<u>885</u>	<u>71.5</u>	<u>11</u>	<u>11</u>
<u>1210</u>	<u>18.0</u>	<u>7.69</u>	<u>889</u>	<u>71.7</u>	<u>11</u>	<u>11</u>
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____

D. O. (ppm): NR ODOR: NO NR NR  
(COBALT 0 - 100) (NTU 0 - 200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): NONE

### PURGING EQUIPMENT

### SAMPLING EQUIPMENT

- |  |   |  |  |
|--|---|--|--|
| <input type="checkbox"/> 2" Bladder Pump             | <input type="checkbox"/> Bailor (Teflon®)         | <input type="checkbox"/> 2" Bladder Pump | <input checked="" type="checkbox"/> Bailor (Teflon®) |
| <input checked="" type="checkbox"/> Centrifugal Pump | <input type="checkbox"/> Bailor (PVC)             | <input type="checkbox"/> DDL Sampler     | <input type="checkbox"/> Bailor (Stainless Steel)    |
| <input type="checkbox"/> Submersible Pump            | <input type="checkbox"/> Bailor (Stainless Steel) | <input type="checkbox"/> Dipper          | <input type="checkbox"/> Submersible Pump            |
| <input type="checkbox"/> Well Wizard™                | <input type="checkbox"/> Dedicated                | <input type="checkbox"/> Well Wizard™    | <input type="checkbox"/> Dedicated                   |
| Other: _____   | Other: _____                                      | Other: _____                             | Other: _____   |

WELL INTEGRITY: OK LOCK #: 2268

REMARKS: ~~XXXXX~~ ~~XXXXX~~

Meter Calibration: Date: 10-8-93 Time: 1130 Meter Serial #: 9105 Temperature °F. \_\_\_\_\_

( EC 1000 \_\_\_\_\_ / \_\_\_\_\_ ) ( DI \_\_\_\_\_ ) ( pH 7 \_\_\_\_\_ / \_\_\_\_\_ ) ( pH 10 \_\_\_\_\_ / \_\_\_\_\_ ) ( pH 4 \_\_\_\_\_ / \_\_\_\_\_ )

Location of previous calibration: A-2

Signature: [Signature] Reviewed By: [Signature] Page 3 of 5



EMCON  
ASSOCIATES

# WATER SAMPLE FIELD DATA SHEET

PROJECT NO: OG70-052.01

SAMPLE ID: A - 4 (27)

PURGED BY: J. GRAHAM / M. GALLEGOS

CLIENT NAME: ARCO # 2169

SAMPLED BY: J. GRAHAM / M. GALLEGOS

LOCATION: OAKLAND, CA.

TYPE: Ground Water  Surface Water \_\_\_\_\_ Treatment Effluent \_\_\_\_\_ Other \_\_\_\_\_

CASING DIAMETER (inches): 2 \_\_\_\_\_ 3  4 \_\_\_\_\_ 4.5 \_\_\_\_\_ 6 \_\_\_\_\_ Other \_\_\_\_\_

CASING ELEVATION (feet/VMSL): <u>NR</u>	VOLUME IN CASING (gal.): <u>5.76</u>
DEPTH TO WATER (feet): <u>12.57</u>	CALCULATED PURGE (gal.): <u>17.30</u>
DEPTH OF WELL (feet): <u>28.3</u>	ACTUAL PURGE VOL. (gal.): <u>19.0</u>

DATE PURGED: 10-8-93 Start (2400 Hr) 1220 End (2400 Hr) 1235  
 DATE SAMPLED: 10-8-93 Start (2400 Hr) 1237 End (2400 Hr) 1237

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
<u>1225</u>	<u>6.0</u>	<u>7.52</u>	<u>854</u>	<u>70.3</u>	<u>GREY</u>	<u>MODERATE</u>
<u>1230</u>	<u>12.0</u>	<u>7.46</u>	<u>856</u>	<u>69.9</u>	<u>11</u>	<u>11</u>
<u>1235</u>	<u>18.0</u>	<u>7.50</u>	<u>847</u>	<u>69.1</u>	<u>11</u>	<u>11</u>
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
D. O. (ppm): <u>NR</u>		ODOR: <u>NO</u>		COBALT 0 - 100: <u>NR</u>		NTU 0 - 200: <u>NR</u>

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): NONE

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
<input type="checkbox"/> 2' Bladder Pump	<input type="checkbox"/> Bailor (Teflon®)	<input type="checkbox"/> 2' Bladder Pump	<input checked="" type="checkbox"/> Bailor (Teflon®)
<input checked="" type="checkbox"/> Centrifugal Pump	<input type="checkbox"/> Bailor (PVC)	<input type="checkbox"/> DDL Sampler	<input type="checkbox"/> Bailor (Stainless Steel)
<input type="checkbox"/> Submersible Pump	<input type="checkbox"/> Bailor (Stainless Steel)	<input type="checkbox"/> Dipper	<input type="checkbox"/> Submersible Pump
<input type="checkbox"/> Well Wizard™	<input type="checkbox"/> Dedicated	<input type="checkbox"/> Well Wizard™	<input type="checkbox"/> Dedicated
Other: _____	_____	Other: _____	_____

WELL INTEGRITY: OK LOCK #: 2268

REMARKS : \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Meter Calibration: Date: 10-8-93 Time: 1130 Meter Serial #: 9105 Temperature °F: \_\_\_\_\_  
 ( EC 1000 \_\_\_\_\_ / \_\_\_\_\_ ) ( DI \_\_\_\_\_ ) ( pH 7 \_\_\_\_\_ / \_\_\_\_\_ ) ( pH 10 \_\_\_\_\_ / \_\_\_\_\_ ) ( pH 4 \_\_\_\_\_ / \_\_\_\_\_ )

Location of previous calibration: A-2  
 Signature: [Signature] Reviewed By: [Signature] Page 4 of 8



EMCON ASSOCIATES

# WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

PROJECT NO: OG70-052.01

SAMPLE ID: A-5 (29)

PURGED BY: J. GRAHAM / M. GALLEGOS

CLIENT NAME: ARCO # 2169

SAMPLED BY: J. GRAHAM / M. GALLEGOS

LOCATION: OAKLAND, CA.

TYPE: Ground Water  Surface Water \_\_\_\_\_ Treatment Effluent \_\_\_\_\_ Other \_\_\_\_\_

CASING DIAMETER (inches): 2  3 \_\_\_\_\_ 4 \_\_\_\_\_ 4.5 \_\_\_\_\_ 6 \_\_\_\_\_ Other \_\_\_\_\_

CASING ELEVATION (feet/MSL):	<u>NR</u>	VOLUME IN CASING (gal.):	<u>3.02</u>
DEPTH TO WATER (feet):	<u>11.68</u>	CALCULATED PURGE (gal.):	<u>9.07</u>
DEPTH OF WELL (feet):	<u>30.2</u>	ACTUAL PURGE VOL (gal.):	<u>9.5</u>

DATE PURGED:	<u>10-8-93</u>	Start (2400 Hr)	<u>1502</u>	End (2400 Hr)	<u>1517</u>
DATE SAMPLED:	<u>10-8-93</u>	Start (2400 Hr)	<u>1519</u>	End (2400 Hr)	<u>1519</u>

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
<u>1507</u>	<u>3.0</u>	<u>7.43</u>	<u>916</u>	<u>72.5</u>	<u>GREY</u>	<u>HEAVY</u>
<u>1512</u>	<u>6.0</u>	<u>7.35</u>	<u>917</u>	<u>71.6</u>	<u>11</u>	<u>11</u>
<u>1517</u>	<u>9.5</u>	<u>7.42</u>	<u>901</u>	<u>71.8</u>	<u>11</u>	<u>11</u>
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____

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

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): NONE

### PURGING EQUIPMENT

### SAMPLING EQUIPMENT

- |  |   |  |  |
|--|---|--|--|
| <input type="checkbox"/> 2" Bladder Pump             | <input type="checkbox"/> Bailor (Teflon®)         | <input type="checkbox"/> 2" Bladder Pump | <input checked="" type="checkbox"/> Bailor (Teflon®) |
| <input checked="" type="checkbox"/> Centrifugal Pump | <input type="checkbox"/> Bailor (PVC)             | <input type="checkbox"/> DDL Sampler     | <input type="checkbox"/> Bailor (Stainless Steel)    |
| <input type="checkbox"/> Submersible Pump            | <input type="checkbox"/> Bailor (Stainless Steel) | <input type="checkbox"/> Dipper          | <input type="checkbox"/> Submersible Pump            |
| <input type="checkbox"/> Well Wizard™                | <input type="checkbox"/> Dedicated                | <input type="checkbox"/> Well Wizard™    | <input type="checkbox"/> Dedicated                   |
| Other: _____   |   | Other: _____                             |  |

WELL INTEGRITY: OK      LOCK #: 2268

REMARKS: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Meter Calibration: Date: 10-8-93 Time: 1130 Meter Serial #: 9105 Temperature °F: \_\_\_\_\_  
(EC 1000 \_\_\_\_\_ / \_\_\_\_\_) (DI \_\_\_\_\_) (pH 7 \_\_\_\_\_ / \_\_\_\_\_) (pH 10 \_\_\_\_\_ / \_\_\_\_\_) (pH 4 \_\_\_\_\_ / \_\_\_\_\_)  
Location of previous calibration: A-2

Signature: [Signature]      Reviewed By: [Signature]      Page 5 of 8



# WATER SAMPLE FIELD DATA SHEET

PROJECT NO: OG70-052.01

SAMPLE ID: A - 6 (27)

PURGED BY: I. GRAHAM / M. GALLEGOS

CLIENT NAME: ARCO # 2169

SAMPLED BY: I. GRAHAM / M. GALLEGOS

LOCATION: OAKLAND, CA.

TYPE: Ground Water  Surface Water \_\_\_\_\_ Treatment Effluent \_\_\_\_\_ Other \_\_\_\_\_

CASING DIAMETER (inches): 2  3 \_\_\_\_\_ 4 \_\_\_\_\_ 4.5 \_\_\_\_\_ 6 \_\_\_\_\_ Other \_\_\_\_\_

CASING ELEVATION (feet/MSL):	<u>NR</u>	VOLUME IN CASING (gal.):	<u>2.72</u>
DEPTH TO WATER (feet):	<u>11.80</u>	CALCULATED PURGE (gal.):	<u>8.18</u>
DEPTH OF WELL (feet):	<u>28.5</u>	ACTUAL PURGE VOL. (gal.):	<u>6.0</u>

DATE PURGED:	<u>10-8-93</u>	Start (2400 Hr)	<u>1315</u>	End (2400 Hr)	<u>1330</u>
DATE SAMPLED:	<u>10-8-93</u>	Start (2400 Hr)	<u>1338</u>	End (2400 Hr)	<u>1338</u>

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (umhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
<u>1320</u>	<u>3.0</u>	<u>7.06</u>	<u>1056</u>	<u>74.7</u>	<u>GREY</u>	<u>HEAVY</u>
<u>1325</u>	<u>6.0</u>	<u>7.56</u>	<u>1100</u>	<u>75.0</u>	<u>"</u>	<u>"</u>
<u>1330</u>	<u>WELL DRIED @ 6.0 GAL W/L @ 28.03</u>					
<u>1339</u>	<u>RECHARGE</u>	<u>7.25</u>	<u>991</u>	<u>75.7</u>	<u>GREEN</u>	<u>HEAVY</u>
D. O. (ppm):	<u>NR</u>	ODOR:	<u>ND</u>		<u>NR</u>	<u>NR</u>
					(COBALT 0 - 100)	(NTU 0 - 200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): NONE

### PURGING EQUIPMENT

### SAMPLING EQUIPMENT

- |  |   |  |  |
|--|---|--|--|
| <input type="checkbox"/> 2' Bladder Pump             | <input type="checkbox"/> Bailer (Teflon®)         | <input type="checkbox"/> 2' Bladder Pump | <input checked="" type="checkbox"/> Bailer (Teflon®) |
| <input checked="" type="checkbox"/> Centrifugal Pump | <input type="checkbox"/> Bailer (PVC)             | <input type="checkbox"/> DDL Sampler     | <input type="checkbox"/> Bailer (Stainless Steel)    |
| <input type="checkbox"/> Submersible Pump            | <input type="checkbox"/> Bailer (Stainless Steel) | <input type="checkbox"/> Dipper          | <input type="checkbox"/> Submersible Pump            |
| <input type="checkbox"/> Well Wizard™                | <input type="checkbox"/> Dedicated                | <input type="checkbox"/> Well Wizard™    | <input type="checkbox"/> Dedicated                   |
| Other: _____   |   | Other: _____                             |  |

WELL INTEGRITY: OK LOCK #: 2268

REMARKS: (COR ON WELL) SHOULD BE BAILED W/ PVC BAILER NOT JACUZZI

RECHARGE W/L @ 15.81

Meter Calibration: Date: 10-8-93 Time: 1130 Meter Serial #: 9105 Temperature °F: \_\_\_\_\_

( EC 1000 \_\_\_\_\_ / \_\_\_\_\_ ) ( DI \_\_\_\_\_ ) ( pH 7 \_\_\_\_\_ / \_\_\_\_\_ ) ( pH 10 \_\_\_\_\_ / \_\_\_\_\_ ) ( pH 4 \_\_\_\_\_ / \_\_\_\_\_ )

Location of previous calibration: A-2

Signature: [Signature] Reviewed By: JB Page 6 of 8



EMCON ASSOCIATES

# WATER SAMPLE FIELD DATA SHEET

PROJECT NO. OG70-052.01

SAMPLE ID: AR-1 (26)

PURGED BY: J. GRAHAM/M. GALLEGOS

CLIENT NAME: ARCO # 2169

SAMPLED BY: J. GRAHAM/M. GALLEGOS

LOCATION: OAKLAND, CA.

TYPE: Ground Water  Surface Water \_\_\_\_\_ Treatment Effluent \_\_\_\_\_ Other \_\_\_\_\_

CASING DIAMETER (inches): 2 \_\_\_\_\_ 3 \_\_\_\_\_ 4 \_\_\_\_\_ 4.5 \_\_\_\_\_ 6  Other \_\_\_\_\_

CASING ELEVATION (feet/MSL):	<u>NR</u>	VOLUME IN CASING (gal.):	<u>21.84</u>
DEPTH TO WATER (feet):	<u>12.84</u>	CALCULATED PURGE (gal.):	<u>65.53</u>
DEPTH OF WELL (feet):	<u>27.7</u>	ACTUAL PURGE VOL. (gal.):	<u>66.0</u>

DATE PURGED: 10-8-93 Start (2400 Hr) 1425 End (2400 Hr) 1455  
 DATE SAMPLED: 10-8-93 Start (2400 Hr) 1457 End (2400 Hr) 1457

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (umhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
<u>1435</u>	<u>22.0</u>	<u>7.85</u>	<u>808</u>	<u>73.0</u>	<u>GREY</u>	<u>HEAVY</u>
<u>1445</u>	<u>44.0</u>	<u>7.90</u>	<u>808</u>	<u>72.8</u>	<u>11</u>	<u>11</u>
<u>1455</u>	<u>66.0</u>	<u>7.95</u>	<u>803</u>	<u>73.1</u>	<u>11</u>	<u>11</u>
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____

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): NONE

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
<input type="checkbox"/> 2" Bladder Pump	<input type="checkbox"/> Bailor (Teflon®)	<input type="checkbox"/> 2" Bladder Pump	<input checked="" type="checkbox"/> Bailor (Teflon®)
<input checked="" type="checkbox"/> Centrifugal Pump	<input type="checkbox"/> Bailor (PVC)	<input type="checkbox"/> DDL Sampler	<input type="checkbox"/> Bailor (Stainless Steel)
<input type="checkbox"/> Submersible Pump	<input type="checkbox"/> Bailor (Stainless Steel)	<input type="checkbox"/> Dipper	<input type="checkbox"/> Submersible Pump
<input type="checkbox"/> Well Wizard™	<input type="checkbox"/> Dedicated	<input type="checkbox"/> Well Wizard™	<input type="checkbox"/> Dedicated
Other: _____		Other: _____	

WELL INTEGRITY: OK LOCK #: 2268

REMARKS: (Dipped)

Meter Calibration: Date: 10-8-93 Time: 1130 Meter Serial #: 9105 Temperature °F: \_\_\_\_\_  
 ( EC 1000 \_\_\_\_\_ / \_\_\_\_\_ ) ( DI \_\_\_\_\_ ) ( pH 7 \_\_\_\_\_ / \_\_\_\_\_ ) ( pH 10 \_\_\_\_\_ / \_\_\_\_\_ ) ( pH 4 \_\_\_\_\_ / \_\_\_\_\_ )

Location of previous calibration: A-2  
 Signature: [Signature] Reviewed By: [Signature] Page 7 of 8



EMCON ASSOCIATES

# WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

PROJECT NO: OG70-052.01

SAMPLE ID: AR-2 (28)

PURGED BY: J. GRAHAM / M. GALLEGOS

CLIENT NAME: ARCO # 2169

SAMPLED BY: J. GRAHAM / M. GALLEGOS

LOCATION: OAKLAND, CA.

TYPE: Ground Water  Surface Water \_\_\_\_\_ Treatment Effluent \_\_\_\_\_ Other \_\_\_\_\_

CASING DIAMETER (inches): 2 \_\_\_\_\_ 3 \_\_\_\_\_ 4  4.5 \_\_\_\_\_ 6 \_\_\_\_\_ Other \_\_\_\_\_

CASING ELEVATION (feet/MSL):	<u>NR</u>	VOLUME IN CASING (gal.):	<u>10.37</u>
DEPTH TO WATER (feet):	<u>13.32</u>	CALCULATED PURGE (gal.):	<u>31.12</u>
DEPTH OF WELL (feet):	<u>29.2</u>	ACTUAL PURGE VOL. (gal.):	<u>32.0</u>

DATE PURGED: 10-8-93

Start (2400 Hr) 1245

End (2400 Hr) 1300

DATE SAMPLED: 10-8-93

Start (2400 Hr) 1302

End (2400 Hr) 1302

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	EC. (umhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
<u>1250</u>	<u>10.5</u>	<u>7.70</u>	<u>899</u>	<u>70.6</u>	<u>RED</u>	<u>MODERATE</u>
<u>1255</u>	<u>21.0</u>	<u>7.50</u>	<u>923</u>	<u>70.4</u>	<u>LT RED</u>	<u>LI</u>
<u>1300</u>	<u>32.0</u>	<u>7.46</u>	<u>979</u>	<u>70.5</u>	<u>LI</u>	<u>LI</u>
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
D. O. (ppm):	<u>NR</u>	ODOR:	<u>SLIGHT</u>		<u>NR</u>	<u>NR</u>
					(COBALT 0 - 100)	(NTU 0 - 200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): NONE

### PURGING EQUIPMENT

### SAMPLING EQUIPMENT

2" Bladder Pump  
 Centrifugal Pump  
 Submersible Pump  
 Well Wizard™  
 Other: \_\_\_\_\_

Bailer (Teflon®)  
 Bailer (PVC)  
 Bailer (Stainless Steel)  
 Dedicated  
 2" Bladder Pump  
 Bailer (Teflon®)  
 DDL Sampler  
 Dipper  
 Well Wizard™  
 Bailer (Stainless Steel)  
 Submersible Pump  
 Dedicated  
 Other: \_\_\_\_\_

WELL INTEGRITY: OK LOCK #: 2268

REMARKS: Diesel, MISSING (4) BOLTS ON LID

Meter Calibration: Date: 10-8-93 Time: 1130 Meter Serial #: 9105 Temperature °F: \_\_\_\_\_

( EC 1000 \_\_\_\_\_ / \_\_\_\_\_ ) ( DI \_\_\_\_\_ ) ( pH 7 \_\_\_\_\_ / \_\_\_\_\_ ) ( pH 10 \_\_\_\_\_ / \_\_\_\_\_ ) ( pH 4 \_\_\_\_\_ / \_\_\_\_\_ )

Location of previous calibration: A-2

Signature: [Signature] Reviewed By: [Signature] Page 8 of 8