GeoStrategies Inc.

QUARTERLY MONITORING REPORT - First Quarter 1993

ARCO Service Station No. 5387
20200 Hesperian Boulevard
San Lorenzo, California

792601-12

June 10, 1993

GeoStrategies Inc.

June 10, 1993

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

Attn: Mr. Michael Whelan

Re: **QUARTERLY MONITORING REPORT - First Quarter 1993**
ARCO Service Station No. 5387
20200 Hesperian Boulevard
San Lorenzo, California

Mr. Whelan:

This Quarterly Monitoring Report by GeoStrategies Inc. (GSI) presents the results of the first quarter, 1993 groundwater sampling for the above referenced site (Plate 1). Sampling data were furnished by the ARCO Products Company contractor.

SITE BACKGROUND

There are currently ten groundwater monitoring wells and two groundwater recovery wells located at the site. Eight wells are located on-site (Wells MW-1 through MW-3, A-4 through A-6, AR-1 and AR-2) and four wells are located off-site (Wells A-7 through A-10). In addition, four soil borings (SB-1 through SB-1), one air sparging well (AS-2), one air sparging/vapor extraction well (AS-2) and three vapor extraction wells (AV-1 through AV-3) were drilled and installed on-site. These wells and borings were drilled and installed by Groundwater Technology, Inc. (GTI) and GSI between 1986 and 1993 to evaluate the vertical and horizontal extent of petroleum hydrocarbons in soil and groundwater beneath the site.

792601-12

In October 1992, GSI conducted step-drawdown and constant-rate aquifer tests at the site. This test was performed to the feasibility of groundwater extraction and treatment as a remedial option.

In March 1993, GSI installed three vapor extraction wells (AV-1 through AV-3), one recovery well (AR-2), one air sparging well (AS-2), and one air sparging/vapor extraction well (AS-1) on-site. An air sparging/vapor extraction test was performed in March 1993 to determine the feasibility of air sparging/vapor extraction as a remedial option. These wells will be utilized as extraction points and remedial enhancements for the proposed interim remediation system. The results of this investigation will be presented in a future GSI report.

Quarterly groundwater monitoring and sampling of site wells began in December 1991. Groundwater samples are currently analyzed for Total Petroleum Hydrocarbons calculated as Gasoline (TPH-Gasoline) according to EPA Method 8015 (Modified) and Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX) according to EPA Method 8020.

CURRENT QUARTER SAMPLING RESULTS

Depth to water measurements were obtained in each monitoring well prior to sampling. Static groundwater levels were measured from the surveyed top of each well box and recorded to the nearest $\pm$0.01 foot. Water-level data were referenced to Mean Sea Level (MSL) datum and plotted on a water-level map (Plate 3). **Water-levels were not contoured this quarter due to surface water observed in well boxes and wells reported as being under pressure** (see EMCON Associates (EMCON) Field Data Sheets, Appendix A). Historically, shallow groundwater flow has been generally to the northwest at a gradient of approximately 0.005.

Each well was inspected for the presence of floating product. Floating product was not observed in any well this quarter and has never been observed in wells at this site. Depth to groundwater and floating product measurements are summarized in Table 1 and the attached EMCON groundwater sampling report (Appendix A). Historical water-level data and floating product measurements are summarized in Table 2.

Groundwater samples were collected on February 11, 1993. Well AR-2 was installed after first quarter, 1993 groundwater sampling. Samples were analyzed for TPH-Gasoline according to EPA Method 8015 (Modified) and for BTEX according to EPA Method 8020. The groundwater samples were analyzed by Sequoia Analytical (Sequoia), a California State-certified laboratory located in Redwood City, California. These data are summarized in Appendix A. Current chemical analytical data are presented in Table 1. Current chemical analytical data have also been added to the Historical Groundwater Quality Database presented in Table 3. Chemical isoconcentration maps for TPH-Gasoline and benzene are presented on Plates 4 and 5, respectively.

CONCLUSIONS

TPH-Gasoline and benzene concentrations in site wells increased slightly this quarter, with the exception of Wells A-5, A-7, and A-10. Increased concentrations may result from rising static-water levels dissolving residual hydrocarbons in the capillary and vadose zones beneath the site. Groundwater levels have risen approximately 3.5 feet since the fourth quarter 1992 sampling event.

If you have any questions, please call.

GeoStrategies Inc. by,

Robert C. Mallory
Geologist

REGISTERED GEOLOGIST
JOHN F. VARGAS
NO. 5046
STATE OF CALIFORNIA

John F. Vargas
Senior Geologist
R.G. 5046

Table 1. Current Groundwater Analyses Data
Table 2. Historical Water-Level Data
Table 3. Historical Groundwater Quality Database

Plate 1. Vicinity Map
Plate 2. Site Plan
Plate 3. Water-Level Map
Plate 4. TPH-G Isoconcentration Map
Plate 5: Benzene Isoconcentration Map

Appendix A: EMCON Groundwater Sampling Report

QC Review: JC

792601-12

TABLE 1

GROUNDWATER ANALYSES DATA

WELL NO.	SAMPLE DATE	ANALYZED DATE	TPH-G (PPB)	BENZENE (PPB)	TOLUENE (PPB)	ETHYLBENZENE (PPB)	XYLENES (PPB)	WELL ELEV. (FT)	STATIC WATER ELEV. (FT)	PRODUCT THICKNESS	DEPTH TO WATER (FT)
MW-1	11-Feb-93	18-Feb-93	4000	510	47	200	91	38.36	26.41	0.00	11.95
MW-2	11-Feb-93	19-Feb-93	27000	3500	720	1600	3800	38.58	26.31	0.00	12.27
MW-3	11-Feb-93	18-Feb-93	8600	580	<20	710	300	37.77	26.12	0.00	11.65
A-4	11-Feb-93	18-Feb-93	740	2.4	<0.50	5.0	3.5	39.86	26.43	0.00	13.43
A-5	11-Feb-93	18-Feb-93	150	3.0	<0.50	5.1	1.5	38.94	25.73	0.00	13.21
A-6	11-Feb-93	18-Feb-93	<50	<0.50	<0.50	<0.50	<0.50	39.07	26.03	0.00	13.04
A-7	11-Feb-93	18-Feb-93	260	20	1.0	11	21	39.95	26.15	0.00	13.80
A-8	11-Feb-93	18-Feb-93	<50	<0.50	<0.50	<0.50	<0.50	37.23	25.98	0.00	11.25
A-9	11-Feb-93	18-Feb-93	<50	<0.50	<0.50	<0.50	<0.50	38.71	26.40	0.00	12.31
A-10	11-Feb-93	24-Feb-93	210	<0.50	0.97	<0.50	<0.50	38.94	25.79	0.00	13.15
AR-1	11-Feb-93	22-Feb-93	360	190	<2.5	8.6	<2.5	38.11	25.30	0.00	12.81
XDUP-1 (MW-2)	11-Feb-93	19-Feb-93	28000	3600	780	1700	4100	---	---	---	---
TB-1	11-Feb-93	18-Feb-93	<50	<0.50	<0.50	<0.50	<0.50	---	---	---	---

TPH-G = Total Petroleum Hydrocarbons calculated as Gasoline.
PPB = Parts Per Billion.
TB = Trip Blank.

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

GeoStrategies Inc. **LETTER OF TRANSMITTAL**

Environmental Consulting
Engineering and Geologic Services

DATE 6/10/93

TO: MS. JULIET SHIN (CERTIFIED MAIL)
ALAMEDA COUNTY HEALTH AGENCY
80 SWAN WAY RM. 200
OAKLAND, CA. 94621

PROJECT NO. 7926
SUBJECT: QUARTERLY MONITORING REPORT - 1ST QUART. '93
ARCO SERVICE STATION # 5387
20200 HESPERIAN BLVD.
SAN LORENZO, CA.

THE FOLLOWING ITEMS ARE:

☑ ATTACHED ☐ FORWARDED SEPARATELY VIA _____

QUANTITY	PROJECT NO.	DATE	DESCRIPTION
1	7926	6/10/93	QUARTERLY MONITORING REPORT - 1ST QUARTER 1993

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: Robert C. Mallory

☑ 2140 W. Winton Avenue, Hayward, CA 94545
(510) 352-4800 - FAX (510) 783-1089

☐ 601 University Avenue, Suite 150, Sacramento, CA 95825
(916) 568-7500 - FAX (916) 568-7504

Copies To:

MR. MICHAEL WHELAN, ARCO PRODUCTS CO.
MR. RICHARD HIETT, RWQCB - SF. REGION (CERTIFIED MAIL)

D:\KELLY\LTROFTRN.FRM(kj)

TABLE 2

HISTORICAL WATER-LEVEL DATA

MONITORING DATE	WELL NUMBER	DEPTH TO WATER (FT)	WELL ELEVATION (FT)	STATIC WATER ELEVATION (FT)	FLOATING PRODUCT THICKNESS (FT)
08-Aug-86	MW-1	11.25	38.36	27.11	0.00
24-Dec-91	MW-1	16.12	38.36	22.24	0.00
10-Mar-92	MW-1	13.34	38.36	25.02	0.00
09-Jun-92	MW-1	14.12	38.36	24.24	0.00
14-Sep-92	MW-1	15.34	38.36	23.02	0.00
12-Nov-92	MW-1	15.46	38.36	22.90	0.00
11-Feb-93	MW-1	11.95	38.36	26.41	0.00
08-Aug-86	MW-2	11.62	38.58	26.96	0.00
24-Dec-91	MW-2	16.50	38.58	22.08	0.00
10-Mar-92	MW-2	13.50	38.58	25.08	0.00
09-Jun-92	MW-2	14.52	38.58	24.06	0.00
14-Sep-92	MW-2	15.78	38.58	22.80	0.00
12-Nov-92	MW-2	15.98	38.58	22.60	0.00
11-Feb-93	MW-2	12.27	38.58	26.31	0.00
08-Aug-86	MW-3	10.61	37.77	27.16	0.00
24-Dec-91	MW-3	15.60	37.77	22.17	0.00
10-Mar-92	MW-3	12.90	37.77	24.87	0.00
09-Jun-92	MW-3	13.60	37.77	24.17	0.00
14-Sep-92	MW-3	14.78	37.77	22.99	0.00
12-Nov-92	MW-3	14.92	37.77	22.85	0.00
11-Feb-93	MW-3	11.65	37.77	26.12	0.00
24-Dec-91	A-4	17.60	39.86	22.26	0.00
10-Mar-92	A-4	14.76	39.86	25.10	0.00
09-Jun-92	A-4	15.63	39.86	24.23	0.00
14-Sep-92	A-4	16.83	39.86	23.03	0.00
12-Nov-92	A-4	16.97	39.86	22.89	0.00
11-Feb-93	A-4	13.43	39.86	26.43	0.00
24-Dec-91	A-5	16.85	38.94	22.09	0.00
10-Mar-92	A-5	13.83	38.94	25.11	0.00
09-Jun-92	A-5	14.91	38.94	24.03	0.00
14-Sep-92	A-5	16.14	38.94	22.80	0.00
12-Nov-92	A-5	16.35	38.94	22.59	0.00

TABLE 2

HISTORICAL WATER-LEVEL DATA

MONITORING DATE	WELL NUMBER	DEPTH TO WATER (FT)	WELL ELEVATION (FT)	STATIC WATER ELEVATION (FT)	FLOATING PRODUCT THICKNESS (FT)
11-Feb-93	A-5	13.21	38.94	25.73	0.00
24-Dec-91	A-6	16.88	39.07	22.19	0.00
10-Mar-92	A-6	13.73	39.07	25.34	0.00
09-Jun-92	A-6	14.95	39.07	24.12	0.00
14-Sep-92	A-6	16.20	39.07	22.87	0.00
12-Nov-92	A-6	16.35	39.07	22.72	0.00
11-Feb-93	A-6	13.04	39.07	26.03	0.00
24-Dec-91	A-7	18.11	39.95	21.84	0.00
10-Mar-92	A-7	15.30	39.95	24.65	0.00
09-Jun-92	A-7	16.12	39.95	23.83	0.00
14-Sep-92	A-7	17.35	39.95	22.60	0.00
12-Nov-92	A-7	17.47	39.95	22.48	0.00
11-Feb-93	A-7	13.80	39.95	26.15	0.00
14-Sep-92	A-8	14.19	37.23	23.04	0.00
12-Nov-92	A-8	14.35	37.23	22.88	0.00
11-Feb-93	A-8	11.25	37.23	25.98	0..00
14-Sep-92	A-9	16.12	38.71	22.59	0.00
12-Nov-92	A-9	16.29	38.71	22.42	0.00
11-Feb-93	A-9	12.31	38.71	26.40	0.00
07-Dec-92	A-10	16.81	38.94	22.13	0.00
11-Feb-93	A-10	13.15	38.94	25.79	0.00
14-Sep-92	AR-1	15.21	38.11	22.90	0.00
12-Nov-92	AR-1	15.36	38.11	22.75	0.00
11-Feb-93	AR-1	12.81	38.11	25.30	0.00

Notes:
1. Static water elevations referenced to Mean Sea Level (MSL).
2. Well elevations and depth-to-water measurements are meadured from the top of the well box.

TABLE 3

HISTORICAL GROUNDWATER QUALITY DATABASE

SAMPLE DATE	SAMPLE POINT	TPH-G (PPB)	BENZENE (PPB)	TOLUENE (PPB)	ETHYLBENZENE (PPB)	XYLENES (PPB)
08-Aug-86	MW-1	7040	132	8.7	439	230
24-Dec-91	MW-1	2200	190	8.5	6.9	2.6
10-Mar-92	MW-1	2800	270	29	56	39
09-Jun-92	MW-1	2900	960	27	99	63
14-Sep-92	MW-1	2600	450	<5.0	45	21
12-Nov-92	MW-1	1600	310	7.2	22	8.9
11-Feb-93	MW-1	4000	510	47	200	91
08-Aug-86	MW-2	1910	20.1	2.8	1.8	—
24-Dec-91	MW-2	23000	1500	1100	480	1400
10-Mar-92	MW-2	210000	44000	3900	1700	5800
09-Jun-92	MW-2	33000	2300	370	780	2600
14-Sep-92	MW-2	16000	3700	100	470	1000
12-Nov-92	MW-2	16000	3800	86	470	910
11-Feb-93	MW-2	27000	3500	720	1600	3800
08-Aug-86	MW-3	7450	510	549	409	1380
24-Dec-91	MW-3	6800	450	10	610	45
10-Mar-92	MW-3	11000	2500	75	400	560
09-Jun-92	MW-3	16000	2000	69	1300	2600
14-Sep-92	MW-3	14000	630	<50	1500	2400
12-Nov-92	MW-3	7400	400	<25	860	330
11-Feb-93	MW-3	8600	580	<20	710	300
24-Dec-91	A-4	1900	29	1.9	25	29
10-Mar-92	A-4	7400	37	<0.60	11	73
09-Jun-92	A-4	4500	3.2	1.5	37	16
14-Sep-92	A-4	1300	<2.5	2.5	61	6.8
12-Nov-92	A-4	610	7.2	0.98	34	0.97
11-Feb-93	A-4	740	2.4	<0.50	5.0	3.5
24-Dec-91	A-5	1600	35	<0.30	32	52
10-Mar-92	A-5	1000	21	<1.5	43	100
09-Jun-92	A-5	680	1.6	<0.30	14	16
14-Sep-92	A-5	770	34	<2.5	51	65
12-Nov-92	A-5	520	12	0.96	29	36
11-Feb-93	A-5	150	3.0	<0.50	5.1	1.5
24-Dec-91	A-6	<30	<0.30	<0.30	<0.30	<0.30

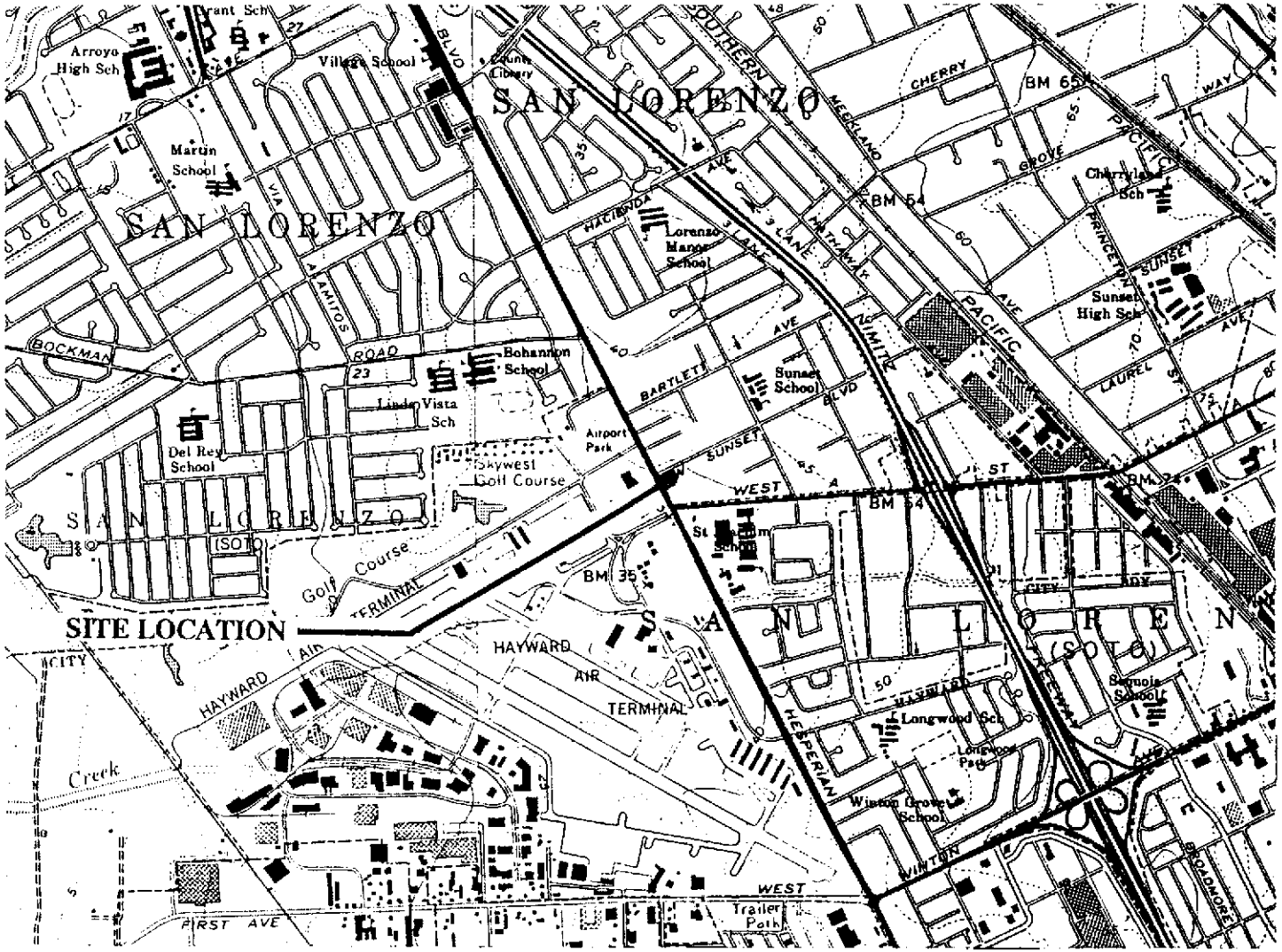
TABLE 3

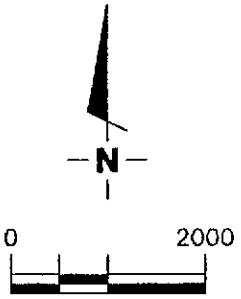
HISTORICAL GROUNDWATER QUALITY DATABASE

SAMPLE DATE	SAMPLE POINT	TPH-G (PPB)	BENZENE (PPB)	TOLUENE (PPB)	ETHYLBENZENE (PPB)	XYLENES (PPB)
10-Mar-92	A-6	<30	<0.30	<0.30	<0.30	<0.30
09-Jun-92	A-6	<30	<0.30	<0.30	<0.30	<0.30
14-Sep-92	A-6	<50	<0.50	<0.50	<0.50	<0.50
12-Nov-92	A-6	<50	<0.50	<0.50	<0.50	<0.50
11-Feb-93	A-6	<50	<0.50	<0.50	<0.50	<0.50
24-Dec-91	A-7	10000	88	16	170	610
10-Mar-92	A-7	320	9.3	0.54	8.8	34
09-Jun-92	A-7	340	11	1.1	8.9	26
14-Sep-92	A-7	510	12	<2.0	30	51
12-Nov-92	A-7	760	17	0.83	50	73
11-Feb-93	A-7	260	20	1.0	11	21
14-Sep-92	A-8	<50	<0.50	<0.50	<0.50	<0.50
12-Nov-92	A-8	<50	<0.50	<0.50	<0.50	<0.50
11-Feb-93	A-8	<50	<0.50	<0.50	<0.50	<0.50
14-Sep-92	A-9	<50	<0.50	<0.50	<0.50	<0.50
12-Nov-92	A-9	<50	<0.50	<0.50	<0.50	<0.50
11-Feb-93	A-9	<50	<0.50	<0.50	<0.50	<0.50
07-Dec-92	A-10	660	30	<2.5	<2.5	<2.5
11-Feb-93	A-10	210	<0.50	0.97	<0.50	<0.50
14-Sep-92	AR-1	820	67	<1.0	8.8	6.7
12-Nov-92	AR-1	140	66	<0.50	4.3	3.7
11-Feb-93	AR-1	360	190	<2.5	8.6	<2.5

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

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





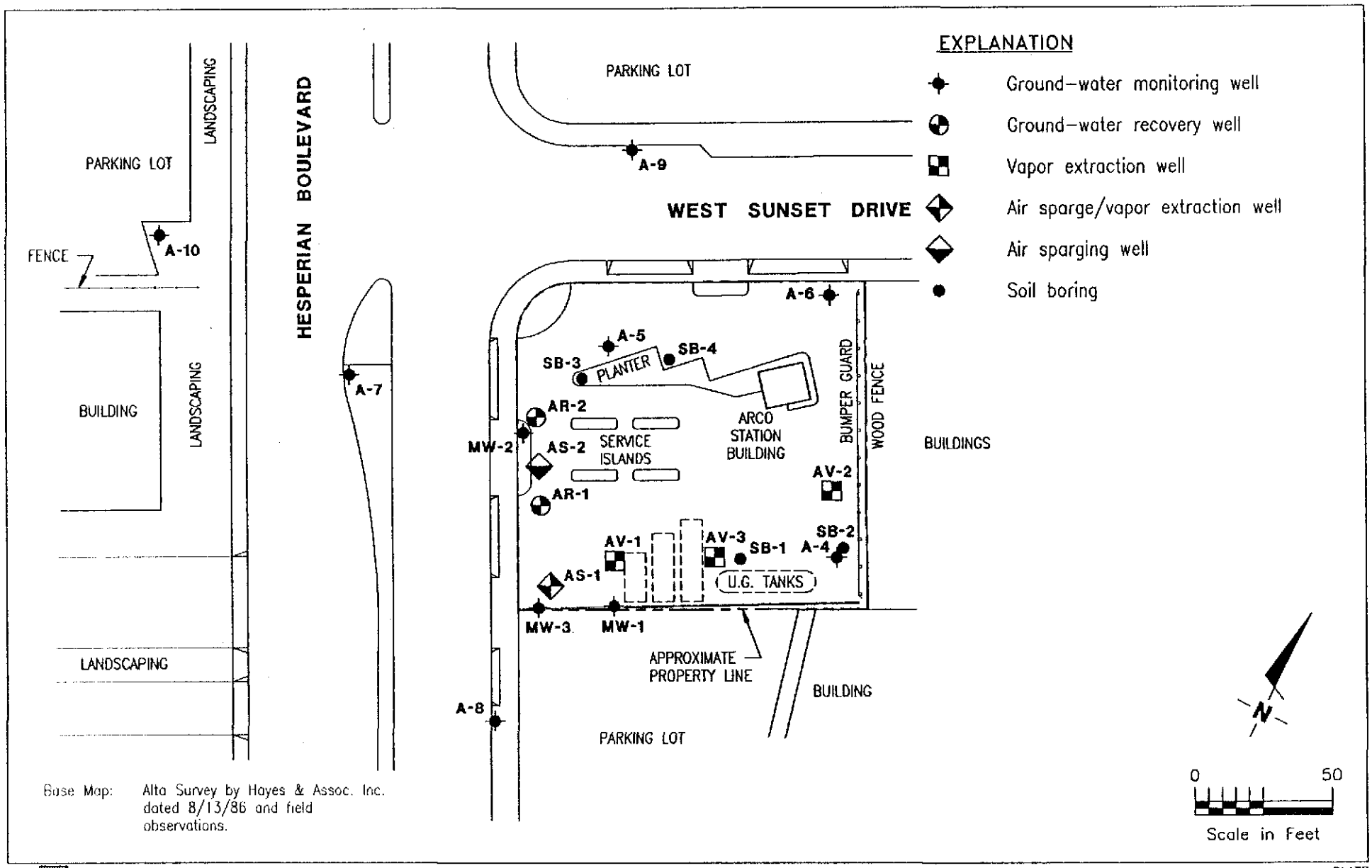
Base Map: USGS Topographic Map

GeoStrategies Inc.

VICINITY MAP
ARCO Service Station #5387
20200 Hesperian Boulevard
San Lorenzo, California

PLATE
1

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
7926		11/91	



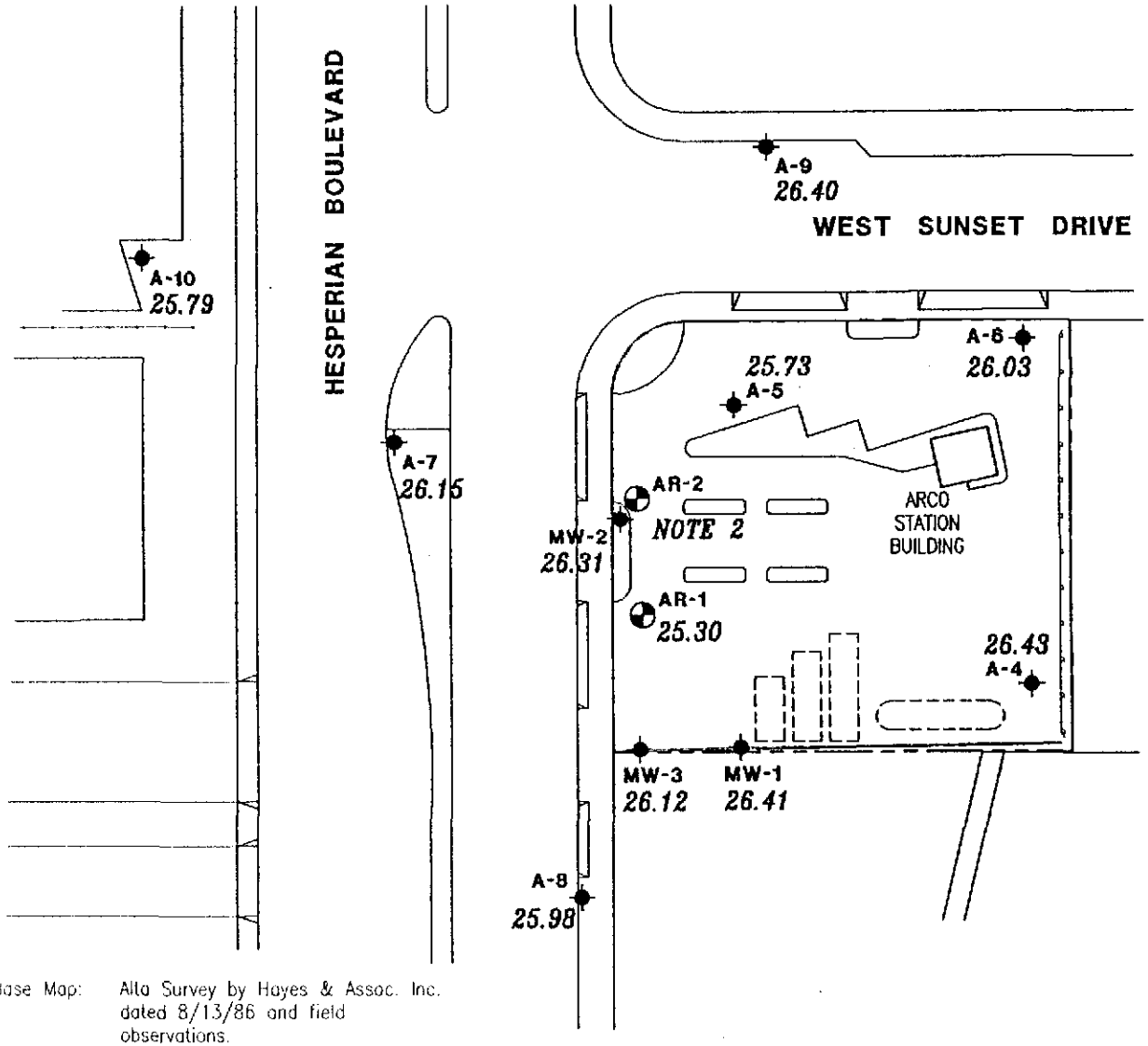
Base Map: Alta Survey by Hayes & Assoc. Inc. dated 8/13/86 and field observations.

GeoStrategies Inc.

SITE PLAN
ARCO Service Station #5387
20200 Hesperian Boulevard
San Lorenzo, California

PLATE
2

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
7926		6/93	



EXPLANATION

- Ground-water monitoring well
- Ground-water recovery well
- 99.99 Ground-water elevation in feet referenced to Mean Sea Level (MSL) measured on February 11, 1993

NOTES:
1. Water levels may be influenced by irrigation practices and/or site construction activities.
2. Well AR-2 was installed on 3/16/93.

Base Map: Alta Survey by Hayes & Assoc. Inc. dated 8/13/86 and field observations.

N

0 50

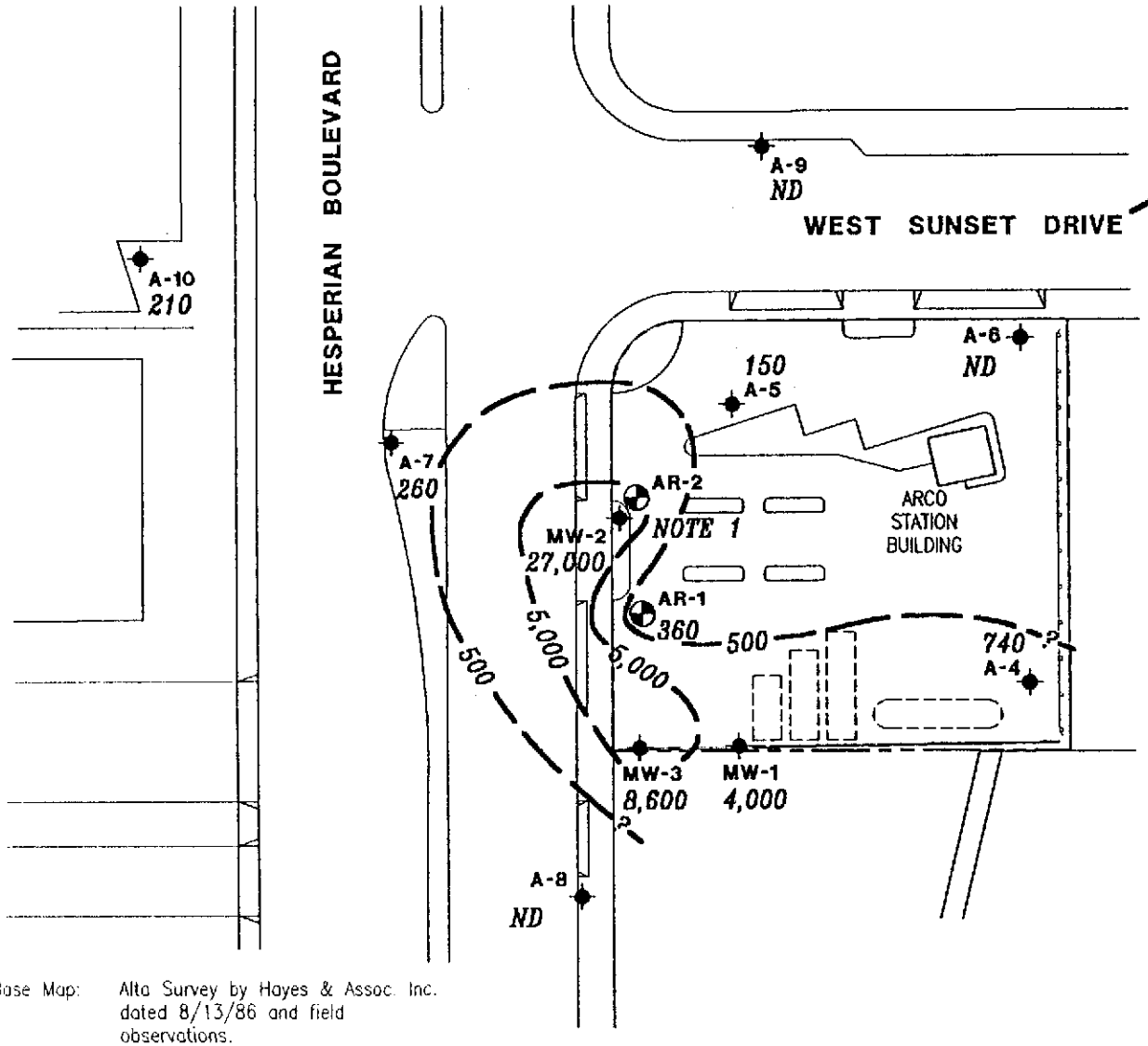
Scale in Feet

GeoStrategies Inc.

WATER-LEVEL MAP
ARCO Service Station #5387
20200 Hesperian Boulevard
San Lorenzo, California

PLATE 3

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
792601-12	ncm	6/93	



EXPLANATION

- Ground–water monitoring well
- Ground–water recovery well
- TPH–G isoconcentration contour
- 5.0 — TPH–G (Total Petroleum Hydrocarbons calculated as Gasoline) concentration in ppb sampled on February 11, 1993
- ND — Not Detected (See laboratory reports for detection limits)

NOTES:

1. Well AR–2 was installed on 3/16/93.

Base Map: Alta Survey by Hayes & Assoc. Inc. dated 8/13/86 and field observations.

N

0 50

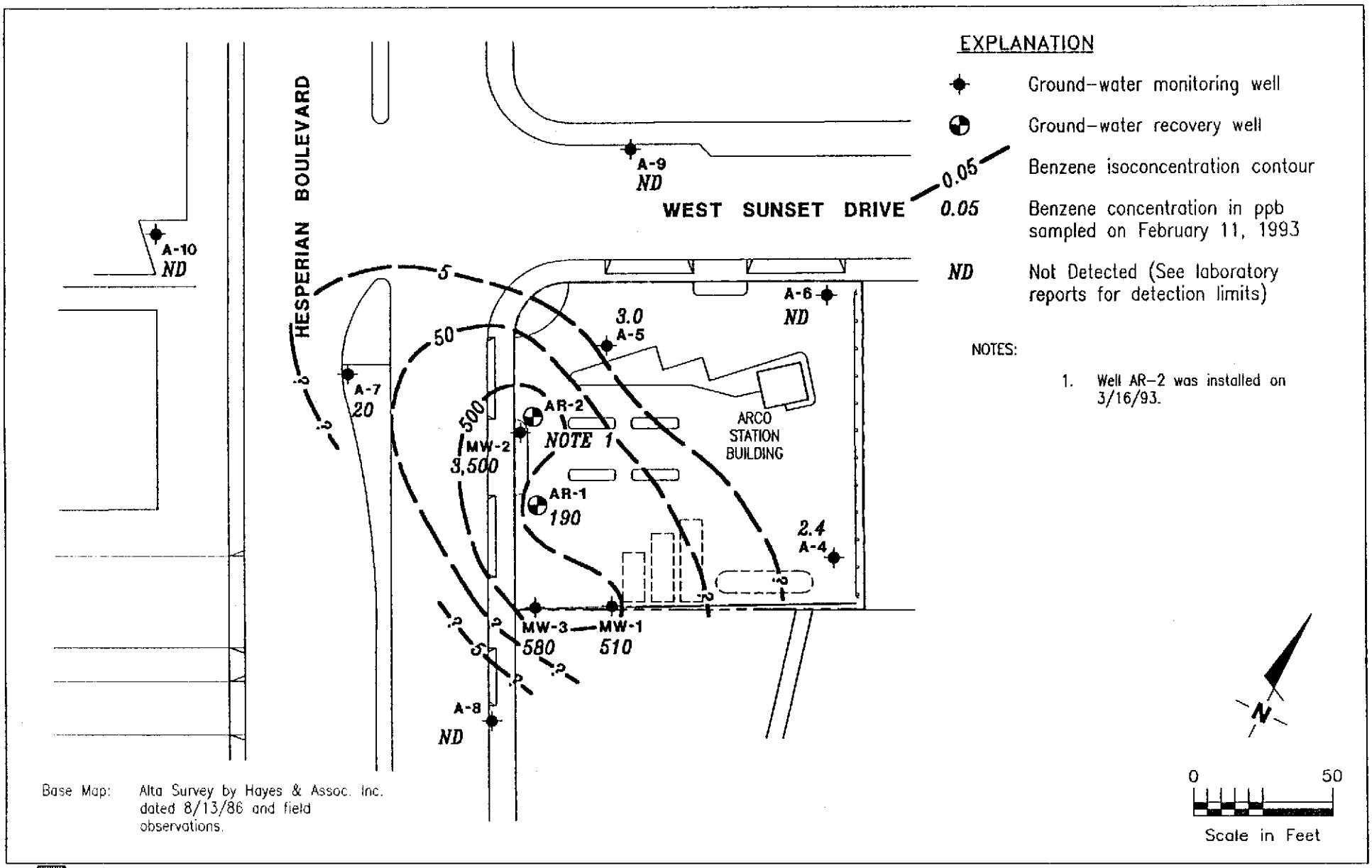
Scale in Feet

GeoStrategies Inc.

TPH–G ISOCONCENTRATION MAP
ARCO Service Station #5387
20200 Hesperian Boulevard
San Lorenzo, California

PLATE
4

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
792601–12	RCM	6/93	



EXPLANATION

- Ground-water monitoring well
- Ground-water recovery well
- 0.05 — Benzene isoconcentration contour
- 0.05 — Benzene concentration in ppb sampled on February 11, 1993
- ND — Not Detected (See laboratory reports for detection limits)

NOTES:

1. Well AR-2 was installed on 3/16/93.

Base Map: Alta Survey by Hayes & Assoc. Inc. dated 8/13/86 and field observations.

GeoStrategies Inc.

BENZENE ISOCONCENTRATION MAP
ARCO Service Station #5387
20200 Hesperian Boulevard
San Lorenzo, California

PLATE 5

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
792601-12	Ron	6/93	

EMCON Associates
1938 Junction Avenue • San Jose, California 95131-2102 • (408) 453-0719 • Fax (408) 453-0852

GeoStrategies Inc.

Date March 4, 1993
Project 0G70-034.01

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
11	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 5387, 20200 Hesperian Boulevard, San Lorenzo, 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:

REGISTERED PROFESSIONAL ENGINEER ROBERT CURTIS PORTER No: 4094 Exp. 4/30/94 INDUSTRIAL STATE OF CALIFORNIA

Robert Porter, Senior Project Engineer.

FIELD REPORT
DEPTH TO WATER / FLOATING PRODUCT SURVEY

PROJECT # : 0G70-034.01 STATION ADDRESS : 20200 Hesperian Blvd., Hayward DATE : 2-11-93

ARCO STATION # : 5387 FIELD TECHNICIAN : REICHELDERFER / GRAHAM DAY : THURSDAY

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-8	OK	YES	NO	2268	OK	11.25	11.25	ND	NA	34.8	BOX FULL OF WATER WELL UNDER PRESSURE
2	A-9	OK	YES	NO	2268	OK	12.31	12.31	ND	NA	34.1	BOX FULL OF WATER
3	A-6	OK	YES	OK	2268	BAD	13.04	13.04	ND	NA	34.8	LOCK & LWC ARE BAD NEED REPLACING
4	AR-1	OK	YES	OK	2268	OK	12.81	12.81	ND	NA	34.8	MILD ODOR
5	A-5	OK	YES	OK	2268	OK	13.21	13.21	ND	NA	30.0	WATER IN BOX, ABOVE LWC, WELL UNDER PRESSURE
6	A-4	OK	YES	OK	2268	OK	13.43	13.43	ND	NA	35.0	STRONG ODOR
7	A-10	OK	YES	OK	2268	OK	13.15	13.15	ND	NA	34.5	—
8	A-7	OK	YES	NO	2268	BAD	13.80	13.80	ND	NA	35.5	WELL NEEDS NEW LWC
9	MW-1	OK	YES	NO	2268	OK	11.95	11.95	ND	NA	29.1	STRONG ODOR
10	MW-2	OK	YES	NO	2268	OK	12.27	12.27	ND	NA	27.3	BOX FULL OF WATER, STRONG ODOR
11	MW-3	OK	YES	NO	2268	OK	11.65	11.65	ND	NA	29.5	STRONG ODOR BOX FULL OF WATER

SURVEY POINTS ARE TOP OF WELL BOXES

Summary of Groundwater Monitoring Data
First Quarter 1993
ARCO Service Station 5387
20200 Hesperian Boulevard, San Lorenzo, California
micrograms per liter (µg/l) or parts per billion (ppb)

Well ID and Sample Depth	Sampling Date	Depth To Water (feet)	Floating Product Thickness (feet)	TPH[1] as Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Total Xylenes (ppb)
MW-1(26)	02/11/93	11.95	ND.[2]	4,000.	510.	47.	200.	91.
MW-2(27)	02/11/93	12.27	ND.	27,000.	3,500.	720.	1,600.	3,800.
MW-3(29)	02/11/93	11.65	ND.	8,600.	580.	<20.	710.	300.
A-4(34)	02/11/93	13.43	ND.	740.	2.4	<0.5	5.0	3.5
A-5(29)	02/11/93	13.21	ND.	150.	3.0	<0.5	5.1	1.5
A-6(33)	02/11/93	13.04	ND.	<50.	<0.5	<0.5	<0.5	<0.5
A-7(34)	02/11/93	13.80	ND.	260.	20.	1.0	11.	21.
A-8(33)	02/11/93	11.25	ND.	<50.	<0.5	<0.5	<0.5	<0.5
A-9(31)	02/11/93	12.31	ND.	<50.	<0.5	<0.5	<0.5	<0.5
A-10(34)	02/11/93	13.15	ND.	210.	<0.5	0.97	<0.5	<0.5
AR-1(34)	02/11/93	12.81	ND.	360.	190.	<2.5	8.6	<2.5
X-Dup-1	02/11/93	NA.[3]	NA.	28,000.	3,600.	780.	1,700.	4,100.
TB-1[4]	02/11/93	NA.	NA.	<50.	<0.5	<0.5	<0.5	<0.5

1. TPH. = Total petroleum hydrocarbons
2. ND. = Not detected
3. NA. = Not applicable
4. TB. = Trip blank

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 5387, Hayward

Enclosed are the results from 13 water samples received at Sequoia Analytical on February 12,1993. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE OF COLLECTION	TEST METHOD
3B67301	Water, MW-1 (26)	2/11/93	EPA 5030/8015/8020
3B67302	Water, MW-2 (27)	2/11/93	EPA 5030/8015/8020
3B67303	Water, MW-3 (29)	2/11/93	EPA 5030/8015/8020
3B67304	Water, A-4 (34)	2/11/93	EPA 5030/8015/8020
3B67305	Water, A-5 (29)	2/11/93	EPA 5030/8015/8020
3B67306	Water, A-6 (33)	2/11/93	EPA 5030/8015/8020
3B67307	Water, A-7 (34)	2/11/93	EPA 5030/8015/8020
3B67308	Water, A-8 (33)	2/11/93	EPA 5030/8015/8020
3b67309	Water, A-9 (31)	2/11/93	EPA 5030/8015/8020
3B67310	Water, XDup-1	2/11/93	EPA 5030/8015/8020
3B67311	Water, TB-1	2/11/93	EPA 5030/8015/8020
3B67312	Water, A-10 (34)	2/11/93	EPA 5030/8015/8020
3B67313	Water, AR-1 (34)	2/11/93	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	Client Project ID:	EMCGC-92-1/Arco 5387, Hayward	Sampled:	Feb 11, 1993
1938 Junction Avenue	Sample Matrix:	Water	Received:	Feb 12, 1993
San Jose, CA 95131	Analysis Method:	EPA 5030/8015/8020	Reported:	Mar 1, 1993
Attention: Jim Butera	First Sample #:	3B67301		

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 3B67301 MW-1 (26)	Sample I.D. 3B67302 MW-2 (27)	Sample I.D. 3B67303 MW-3 (29)	Sample I.D. 3B67304 A-4 (34)	Sample I.D. 3B67305 A-5 (29)	Sample I.D. 3B67306 A-6 (33)
Purgeable Hydrocarbons	50	4,000	27,000	8,600	740	150	N.D.
Benzene	0.50	510	3,500	580	2.4	3.0	N.D.
Toluene	0.50	47	720	N.D.	N.D.	N.D.	N.D.
Ethyl Benzene	0.50	200	1,600	710	5.0	5.1	N.D.
Total Xylenes	0.50	91	3,800	300	3.5	1.5	N.D.
Chromatogram Pattern:		Gas	Gas	Gas	Gas	Gas	--

Quality Control Data

Report Limit Multiplication Factor:	20	100	40	1.0	1.0	1.0
Date Analyzed:	2/18/93	2/19/93	2/18/93	2/18/93	2/18/93	2/18/93
Instrument Identification:	GCHP-2	GCHP-7	GCHP-2	GCHP-2	GCHP-2	GCHP-2
Surrogate Recovery, %: (QC Limits = 70-130%)	118	112	101	145	120	94

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 5387, Hayward	Sampled:	Feb 11, 1993
1938 Junction Avenue	Sample Matrix:	Water	Received:	Feb 12, 1993
San Jose, CA 95131	Analysis Method:	EPA 5030/8015/8020	Reported:	Mar 1, 1993
Attention: Jim Butera	First Sample #:	3B67307		

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 3B67307 A-7 (34)	Sample I.D. 3B67308 A-8 (33)	Sample I.D. 3b67309 A-9 (31)	Sample I.D. 3B67310 XDup-1	Sample I.D. 3B67311 TB-1	Sample I.D. 3B67312 A-10 (34)
Purgeable Hydrocarbons	50	260	N.D.	N.D.	28,000	N.D.	210
Benzene	0.50	20	N.D.	N.D.	3,600	N.D.	N.D.
Toluene	0.50	1.0	N.D.	N.D.	780	N.D.	0.97
Ethyl Benzene	0.50	11	N.D.	N.D.	1,700	N.D.	N.D.
Total Xylenes	0.50	21	N.D.	N.D.	4,100	N.D.	N.D.
Chromatogram Pattern:		Gas	--	--	Gas	--	Gas

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0	1.0	100	1.0	1.0
Date Analyzed:	2/18/93	2/18/93	2/18/93	2/19/93	2/18/93	2/24/93
Instrument Identification:	GCHP-2	GCHP-2	GCHP-2	GCHP-7	GCHP-2	GCHP-7
Surrogate Recovery, %: (QC Limits = 70-130%)	100	97	103	110	96	103

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 5387, Hayward	Sampled:	Feb 11, 1993
1938 Junction Avenue	Sample Matrix:	Water	Received:	Feb 12, 1993
San Jose, CA 95131	Analysis Method:	EPA 5030/8015/8020	Reported:	Mar 1, 1993
Attention: Jim Butera	First Sample #:	3B67313		

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 3B67313 AR-1 (34)
Purgeable Hydrocarbons	50	360
Benzene	0.50	190
Toluene	0.50	N.D.
Ethyl Benzene	0.50	8.6
Total Xylenes	0.50	N.D.
Chromatogram Pattern:		Gas

Quality Control Data

Report Limit Multiplication Factor:	5.0
Date Analyzed:	2/22/93
Instrument Identification:	GCHP-3
Surrogate Recovery, %: (QC Limits = 70-130%)	101

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

Client Project ID: EMCGC-92-1/Arco 5387, Hayward

QC Sample Group: 3B67301-13

Reported: Mar 1, 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 #:	G9302675-03B	G9302675-03B	G9302675-03B	G9302675-03B
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	10	10	10	30
Conc. Matrix Spike:	11	11	11	33
Matrix Spike % Recovery:	110	110	110	110
Conc. Matrix Spike Dup.:	11	11	11	34
Matrix Spike Duplicate % Recovery:	110	110	110	113
Relative % Difference:	0.0	0.0	0.0	3.0

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

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 5387, Hayward

QC Sample Group: 3B67301-13

Reported: Mar 1, 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 19, 1993	Feb 19, 1993	Feb 19, 1993	Feb 19, 1993
QC Sample #:	9302394-02B	9302394-02B	9302394-02B	9302394-02B
Sample Conc.:	N.D.	N.D.	N.D.	ND..
Spike Conc. Added:	10	10	10	30
Conc. Matrix Spike:	10	9.9	9.9	30
Matrix Spike % Recovery:	100	99	99	100
Conc. Matrix Spike Dup.:	9.6	9.4	9.3	29
Matrix Spike Duplicate % Recovery:	96	94	93	97
Relative % Difference:	4.1	5.2	6.3	3.4

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

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 5387, Hayward

QC Sample Group: 3B67301-13

Reported: Mar 1, 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 22, 1993	Feb 22, 1993	Feb 22, 1993	Feb 22, 1993
QC Sample #:	G9302678-11C	G9302678-11C	G9302678-11C	G9302678-11C
Sample Conc.:	N.D.	N.D.	N.D.	ND..
Spike Conc. Added:	10	10	10	30
Conc. Matrix Spike:	9.6	9.3	9.5	28
Matrix Spike % Recovery:	96	93	95	93
Conc. Matrix Spike Dup.:	10	9.7	9.8	30
Matrix Spike Duplicate % Recovery:	100	97	98	100
Relative % Difference:	4.1	4.2	3.1	6.9

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

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 5387, Hayward

QC Sample Group: 3B67301-13

Reported: Mar 1, 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:	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Feb 24, 1993	Feb 24, 1993	Feb 24, 1993	Feb 24, 1993
QC Sample #:	G9302A38-05D	G9302A38-05D	G9302A38-05D	G9302A38-05D
Sample Conc.:	N.D.	N.D.	N.D.	ND..
Spike Conc. Added:	10	10	10	30
Conc. Matrix Spike:	12	11	11	34
Matrix Spike % Recovery:	120	110	110	113
Conc. Matrix Spike Dup.:	11	11	11	33
Matrix Spike Duplicate % Recovery:	110	110	110	110
Relative % Difference:	8.7	0.0	0.0	3.0

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

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

O Products Company

Division of AtlanticRichfieldCompany

Chain of Custody

Task Order No. EMCGC-92-1

Facility no. 5367	City (Facility) Hayward	Project manager (Consultant) Jim Bulera	Laboratory name Sequoia
Engineer Kyle Christie	Telephone no. (ARCO) 571-2434	Telephone no. (Consultant) 453-0719	Fax no. (Consultant) 453-0452
Consultant name EMCON Associates	Address (Consultant) 1938 Junction Avenue San Jose		Contract number 07-073

Method of shipment: Sampler will deliver

	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH(G/D) 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 ☐	
26		2		X		X	HCl	2-11-93	1452		X					930	26	73-01			
27		2							1515		X							02			
29		2							1510		X							03			
4		2							~~2400~~ 1339		X							04			
7		2							1306		X							05			
3		2							1133		X							06			
34		2							1431		X							07			
33		2							1017		X							08			
31		2							1052		X							09			
1		2							—		X							10			
		2									X							11			
34		2							1407		X							12			
(34)		2							1237		X							13			

Special detection Limit/reporting: Lowest Possible

Special QA/QC: As Normal

Remarks: 2-40 ml HCl VOA's (Sequoia Bottles)

34

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 2/12/93	Time 9:40	Received by
Relinquished by	Date 2/12/93	Time 10:20	Received by
Relinquished by	Date	Time	Received by laboratory: Date 2/12/93 Time 1020AM

ARCO Environmental Engineering: Pink copy — Consultant

Rev. 2. 5/91

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 0670-034.01 SAMPLE ID: MW-1 (24)

PURGED BY: GRAHAM/REICHELDERFER CLIENT NAME: ARCO #5387

SAMPLED BY: GRAHAM/REICHELDERFER LOCATION: HAYWARD, CA.

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

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

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 2.83

DEPTH TO WATER (feet): 11.80 CALCULATED PURGE (gal.): 8.48

DEPTH OF WELL (feet): 29.1 ACTUAL PURGE VOL (gal.): 8.50

DATE PURGED: 2-11-93 Start (2400 Hr) 1438 End (2400 Hr) 1447

DATE SAMPLED: 2-11-93 Start (2400 Hr) 1450 End (2400 Hr) 1452

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1441	3.00	6.68	1263	65.8	DK. BROWN	HEAVY
1444	6.00	6.63	1277	66.4	↓	↓
1447	8.50	6.68	1271	66.1	↓	↓

D. O. (ppm): NR ODOR: STRONG

COLOR: NR (COBALT 0 - 100) TURBIDITY: 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®)
___	Centrifugal Pump	X	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: 2-11-93 Time: 1410 Meter Serial #: 9203 Temperature °F: ___

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

Location of previous calibration: A-7

Signature: [signature] Reviewed By: ___ Page ___ of ___

Rev. 2, 5/91

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 0670-034.01 SAMPLE ID: MW-2 (27)

PURGED BY: GRAHAM/REICHELDERFER CLIENT NAME: ARCO #5387

SAMPLED BY: GRAHAM/REICHELDERFER LOCATION: HAYWARD, CA.

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

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

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 2.47

DEPTH TO WATER (feet): 12.17 CALCULATED PURGE (gal.): 7.41

DEPTH OF WELL (feet): 27.3 ACTUAL PURGE VOL. (gal.): 7.50

DATE PURGED: 2-11-93 Start (2400 Hr) 1459 End (2400 Hr) 1510

DATE SAMPLED: 2-11-93 Start (2400 Hr) 1513 End (2400 Hr) 1515

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1503	2.50	6.63	1313	66.9	GREY	HEAVY
1506	5.00	6.58	1325	68.5	"	"
1510	7.50	6.60	1348	69.0	"	"

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): XDUP-1

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
___ Centrifugal Pump	X 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: BOX FULL OF WATER - SHEEN ON TOP OF PURGE WATER

Meter Calibration: Date: 2-11-93 Time: 1410 Meter Serial #: 9203 Temperature °F: ___

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

Location of previous calibration: A-7

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

Rev. 2 5/91

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: OG70-034.01 SAMPLE ID: MW-3(29)

PURGED BY: GRAHAM/REICHELDERFER CLIENT NAME: ARCO #5387

SAMPLED BY: GRAHAM/REICHELDERFER LOCATION: HAYWARD, CA.

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

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

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 2.96

DEPTH TO WATER (feet): 11.30 CALCULATED PURGE (gal.): 8.89

DEPTH OF WELL (feet): 29.5 ACTUAL PURGE VOL (gal.): 9.00

DATE PURGED: 2-11-93 Start (2400 Hr) 1458 End (2400 Hr) 1505

DATE SAMPLED: 2-11-93 Start (2400 Hr) 1508 End (2400 Hr) 1510

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1501	3.00	6.58	1302	65.2	GREY	HEAVY
1503	6.00	6.61	1272	67.5	↓	↓
1505	9.00	6.57	1282	67.9		

D. O. (ppm): NR ODOR: STRONG

COLOR: NR (COBALT 0 - 100) TURBIDITY: 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®)
___ Centrifugal Pump	X 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: BOX FULL OF WATER

Meter Calibration: Date: 2-11-93 Time: 1410 Meter Serial #: 9203 Temperature °F: ___

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

Location of previous calibration: A-7

Signature: [signature] Reviewed By: AB Page 1 of 2

Rev. 2 5/91

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 0670-034.01 SAMPLE ID: AR-1(24)

PURGED BY: GRAHAM/REICHELDERFER CLIENT NAME: ARCO #5387

SAMPLED BY: GRAHAM/REICHELDERFER LOCATION: HAYWARD, 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.):	34.05
DEPTH TO WATER (feet):	11.64	CALCULATED PURGE (gal.):	102.14
DEPTH OF WELL (feet):	34.8	ACTUAL PURGE VOL. (gal.):	103.00

DATE PURGED: 2-11-93 Start (2400 Hr) 1200 End (2400 Hr) 1230

DATE SAMPLED: 2-11-93 Start (2400 Hr) 1235 End (2400 Hr) 1237

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1207	34.50	6.73	1264	68.7	RUSTY RED-Brown	MODERATE
1218	69.00	6.84	1392	70.1	CLOUDY	LIGHT
1230	103.00	6.75	1306	69.6	CLEAR	TRACE

D. O. (ppm): NR ODOR: MILD

COLOR: NR (COBALT 0 - 100) TURBIDITY: 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)	___ ODL 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: 2-11-93 Time: 1000 Meter Serial #: 9203 Temperature °F: ___

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

Location of previous calibration: R-3

Signature: Kim Reichelderfer Reviewed By: JP Page 4 of ___

Rev. 2. 5/91

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 0670-034.01 SAMPLE ID: A-4 (34)

PURGED BY: GRAHAM/REICHELDERFER CLIENT NAME: ARCO #5387

SAMPLED BY: GRAHAM/REICHELDERFER LOCATION: HAYWARD, 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.):	7.99
DEPTH TO WATER (feet):	13.20	CALCULATED PURGE (gal.):	23.98
DEPTH OF WELL (feet):	35.0	ACTUAL PURGE VOL (gal.):	24.00

DATE PURGED: 2-11-93 Start (2400 Hr) 1320 End (2400 Hr) 1333

DATE SAMPLED: 2-11-93 Start (2400 Hr) 1337 End (2400 Hr) 1339

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmnos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1324	8.00	6.54	1145	67.4	CLEAR	TRACE
1328	16.00	6.56	1142	67.9	↓	↓
1333	24.00	6.57	1142	68.0		

D. O. (ppm): NR ODOR: STRONG

COLOR: NR (COBALT 0 - 100) TURBIDITY: 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: 2-11-93 Time: 1000 Meter Serial #: 9203 Temperature °F: ____

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

Location of previous calibration: A-8

Signature: [signature] Reviewed By: ____ Page 5 of ____

Rev. 2 5/91

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 0670-034.01 SAMPLE ID: A-5(29)

PURGED BY: GRAHAM/REICHELDERFER CLIENT NAME: ARCO #5387

SAMPLED BY: GRAHAM/REICHELDERFER LOCATION: HAYWARD, 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.):	6.25
DEPTH TO WATER (feet):	12.95	CALCULATED PURGE (gal.):	18.76
DEPTH OF WELL (feet):	30.0	ACTUAL PURGE VOL. (gal.):	19.00

DATE PURGED: 2-11-93 Start (2400 Hr) 1245 End (2400 Hr) 1259

DATE SAMPLED: 2-11-93 Start (2400 Hr) 1304 End (2400 Hr) 1306

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1250	6.50	6.60	1275	69.0	LT GREY	LIGHT
1254	13.00	6.59	1295	69.5	↓	↓
1259	19.00	6.56	1284	69.4	LT BROWN	↓

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: WATER IN BOX, ABOVE LOCK; WELL UNDER PRESSURE

Meter Calibration: Date: 2-11-93 Time: 1000 Meter Serial #: 9203 Temperature °F: ____

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

Location of previous calibration: A-8

Signature: [signature] Reviewed By: DP Page 5 of ____

Rev. 2 5/91

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 0670-034.01 SAMPLE ID: A-6 (33)

PURGED BY: GRAHAM/REICHELDERFER CLIENT NAME: ARCO #5387

SAMPLED BY: GRAHAM/REICHELDERFER LOCATION: HAYWARD, 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.): ~~3.56~~ 7.99

DEPTH TO WATER (feet): 13.01 CALCULATED PURGE (gal.): ~~10.68~~ 23.97

DEPTH OF WELL (feet): 34.8 ACTUAL PURGE VOL. (gal.): ~~11.00~~ 24.00

DATE PURGED: 2-11-93 Start (2400 Hr) 1109 End (2400 Hr) 1123

DATE SAMPLED: 2-11-93 Start (2400 Hr) 1130 End (2400 Hr) 1133

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1114	8.00	6.74	908	65.8	LT GREY	MODERATE
1118	16.00	6.71	899	66.3	↓	↓
1123	24.00	6.72	904	66.7	↓	↓

D. O. (ppm): NR ODOR: NONE

COLOR: NR (COBALT 0 - 100) TURBIDITY: 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: LWC BAD (NEEDS REPLACING) LOCK NEEDS REPLACING, TOO

Meter Calibration: Date: 2-11-93 Time: 1000 Meter Serial #: 9203 Temperature °F: ___

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

Location of previous calibration: A-8

Signature: [signature] Reviewed By: ___ Page 3 of ___

Rev. 2, 5/91

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 0670-034.01 SAMPLE ID: A-7(34)

PURGED BY: GRAHAM/REICHELDERFER CLIENT NAME: ARCO #5387

SAMPLED BY: GRAHAM/REICHELDERFER LOCATION: HAYWARD, 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.): ~~3.55~~ 7.96

DEPTH TO WATER (feet): 13.79 CALCULATED PURGE (gal.): ~~10.64~~ 23.88

DEPTH OF WELL (feet): 35.5 ACTUAL PURGE VOL. (gal.): ~~11.00~~ 24.00

DATE PURGED: 2-11-93 Start (2400 Hr) 1415 End (2400 Hr) 1424

DATE SAMPLED: 2-11-93 Start (2400 Hr) 1429 End (2400 Hr) 1431

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1418	~~8~~ 8.00	6.76	1299	65.8	GREY	MODERATE
1421	~~16~~ 16.50	6.77	1325	68.5	↓	↓
1424	~~24~~ 24.00	6.71	1305	69.0		

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)	___ ODL 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: WELL NEEDS NEW LWC

Meter Calibration: Date: 2-11-93 Time: 1410 Meter Serial #: 9203 Temperature °F: 68.9

(EC 1000 991 / 1000) (DI 5.83) (pH 7 6.98 / 7.00) (pH 10 10.02 / 10.00) (pH 4 3.90 / ___)

Location of previous calibration: ___

Signature: [signature] Reviewed By: [signature] Page 3 of ___

Rev. 2. 5/9

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 0670-034.01 SAMPLE ID: A-8 (33)

PURGED BY: GRAHAM/REICHELDERFER CLIENT NAME: ARCO #5387

SAMPLED BY: GRAHAM/REICHELDERFER LOCATION: HAYWARD, CA.

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

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

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 3.85

DEPTH TO WATER (feet): 11.25 CALCULATED PURGE (gal.): 11.54

DEPTH OF WELL (feet): 34.8 ACTUAL PURGE VOL. (gal.): 12.00

DATE PURGED: 2-11-93 Start (2400 Hr) 1000 End (2400 Hr) 1010

DATE SAMPLED: 2-11-93 Start (2400 Hr) 1015 End (2400 Hr) 1017

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1003	4.00	6.68	1208	67.3	BROWN	HEAVY
1007	8.00	6.69	1220	68.1	↓	↓
1010	12.00	6.68	1231	68.7	↓	↓

D. O. (ppm): NR ODOR: NONE

COLOR: NR (COBALT 0 - 100) TURBIDITY: 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: BOX FULL OF WATER; WELL UNDER PRESSURE

Meter Calibration: Date: 2-11-93 Time: 1000 Meter Serial #: 9203 Temperature °F: 62.4

(EC 1000 964 / 1000) (DI 4.67) (pH 7 7.08 / 7.00) (pH 10 9.95 / 10.00) (pH 4 3.91 / —)

Location of previous calibration: ___

Signature: [signature] Reviewed By: MP Page 9 of 11

Rev. 2 5/91

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 0670-034.01 SAMPLE ID: A-9(31)

PURGED BY: GRAHAM/REICHELDERFER CLIENT NAME: ARCO #5387

SAMPLED BY: GRAHAM/REICHELDERFER LOCATION: HAYWARD, CA.

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

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

CASING ELEVATION (feet/MSL):	NR	VOLUME IN CASING (gal.):	3.56
DEPTH TO WATER (feet):	12.31	CALCULATED PURGE (gal.):	10.68
DEPTH OF WELL (feet):	34.1	ACTUAL PURGE VOL (gal.):	11.00

DATE PURGED: 2-11-93 Start (2400 Hr) 1035 End (2400 Hr) 1045

DATE SAMPLED: 2-11-93 Start (2400 Hr) 1050 End (2400 Hr) 1052

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1038	4.00	6.68	1198	67.0	BROWN	HEAVY
1042	7.50	6.71	1211	66.8	↓	↓
1045	11.00	6.71	1210	67.1	↓	↓

D. O. (ppm): NR ODOR: NONE

COLOR: NR (COBALT 0 - 100) TURBIDITY: 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: BOX FULL OF WATER

Meter Calibration: Date: 2-11-93 Time: 1000 Meter Serial #: 9203 Temperature °F: ___

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

Location of previous calibration: A-8

Signature: [signature] Reviewed By: [illegible] Page 9 of ___

Rev. 2. 5/91

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: OG70-034.01 SAMPLE ID: A-10 (34)

PURGED BY: GRAHAM/REICHELDERFER CLIENT NAME: ARCO #5387

SAMPLED BY: GRAHAM/REICHELDERFER LOCATION: HAYWARD, CA.

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

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

CASING ELEVATION (feet/MSL):	NR	VOLUME IN CASING (gal.):	3.49
DEPTH TO WATER (feet):	13.11	CALCULATED PURGE (gal.):	10.48
DEPTH OF WELL (feet):	34.5	ACTUAL PURGE VOL. (gal.):	10.50

DATE PURGED: 2-11-93 Start (2400 Hr) 1350 End (2400 Hr) 1400

DATE SAMPLED: 2-11-93 Start (2400 Hr) 1405 End (2400 Hr) 1407

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1354	3.50	6.79	1278	67.2	BROWN	HEAVY
1357	7.00	6.86	1310	67.0	↓	↓
1400	10.50	6.89	1346	67.6	↓	↓

D. O. (ppm): NR ODOR: NONE

COLOR: NR (COBALT 0 - 100) TURBIDITY: 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: NEW WELL

Meter Calibration: Date: 2-11-93 Time: 1000 Meter Serial #: 9203 Temperature °F: ____

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

Location of previous calibration: A-8

Signature: [signature] Reviewed By: ____ Page ____ of ____