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LETTER REPORT
QUARTERLY GROUNDWATER MONITORING
Second Quarter 1992
at
ARCO Station 374
6407 Telegraph Avenue
Oakland, California

60025.07

08/28/92



A RESNA Company



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92 SEP -1 10:03

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TRANSMITTAL

TO: Ms. Susan Hugo
Alameda County Health Care Services
Dept. of Environmental Health
80 Swan Way, Room 200
Oakland, California 94621

DATE: August 2, 1992
PROJECT NUMBER: 60025.07
SUBJECT: Final - Second Quarter 1992
Quarterly Groundwater Monitoring at
ARCO Station 374, 6407 Telegraph Avenue,
Oakland, California.

FROM: Erin McLucas
TITLE: Staff Geologist

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Mr. Michael Whelan, ARCO Products Company
Mr. Richard Hiatt, CRWQCB, San Francisco Bay Region
Mr. Joel Coffman, RESNA Industries Inc.
Ms. Lou Leet, RESNA Industries Inc.

Copies: 1 to RESNA project file no. 60025.07

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August 28, 1992
0825MWHE
60025.07

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

Subject: Second Quarter 1992 Groundwater Monitoring Report for ARCO Station 374,
6407 Telegraph Avenue, Oakland, California.

Mr. Whelan:

As requested by ARCO Products Company (ARCO), this letter report summarizes the results of second quarter 1992 groundwater monitoring performed by ARCO's contractor, EMCON Associates (EMCON) of San Jose, California, at the above-referenced site. The objectives of this quarterly groundwater monitoring are to evaluate changes in the groundwater flow direction and gradient, and changes in concentrations of petroleum hydrocarbons in the local groundwater associated with the former gasoline-storage tanks at the site. The field work and laboratory analyses of groundwater samples during this quarter was performed under the direction of EMCON and included measuring depths to groundwater, subjectively analyzing groundwater for the presence of petroleum product, collecting groundwater samples from the wells for laboratory analyses, and directing a State-certified laboratory to analyze the groundwater samples. Field procedures and acquisition of field data were performed under the direction of EMCON; evaluation and warrant of their field data and field protocols is beyond RESNA Industries' Inc. (RESNA's) scope of work. RESNA's scope of work was limited to interpretation of field and laboratory analyses data, which included evaluating trends in reported hydrocarbon concentrations in the local groundwater, the groundwater gradient, and direction of groundwater flow beneath the site.

The operating Arco Station 374 is located on the northwestern corner of the intersection of Alcatraz and Telegraph Avenues in Oakland, California, as shown on the Site Vicinity Map, Plate 1.

Prior to the present monitoring, RESNA (formerly Applied GeoSystems [AGS]) performed subsurface environmental investigations related to the former and new underground

gasoline-storage tanks at the site. In April 1988, prior to tank replacement activities, RESNA performed a preliminary environmental assessment which included drilling four exploratory borings (B-1 through B-4) at the site (AGS, June 15, 1988). In June 1988, RESNA observed the removal of four underground storage tanks (USTs) situated in the southwestern portion of the site and collected soil samples in the vicinity of the USTs. Four tank pit monitoring wells were installed at the site during tank replacement activities; two in the former tank pit (W-1 and W-2) and two in the new tank pit (W-3 and W-4) (AGS, August 1, 1988). In July 1989, RESNA performed an additional subsurface investigation which included the installation of three groundwater monitoring wells (MW-1, MW-2, and MW-4) onsite and one groundwater monitoring well (MW-3) offsite (AGS, March 27, 1991). In April 1991, RESNA performed a step-drawdown and pump and recovery test of a local water-bearing unit (RESNA, July 31, 1991). A list of reports that summarize the results of these investigations are presented in the references section of this letter report. On April 1, 1992, RESNA conducted a subsurface investigation which included installation of two offsite groundwater monitoring wells MW-5 and MW-6. The results of the investigation will be reported in a forthcoming report. The locations of the groundwater monitoring wells and pertinent site features are shown on the Generalized Site Plan, Plate 2.

Groundwater Sampling and Gradient Evaluation

Depth-to-water measurements (DTW) were performed by EMCON field personnel on April 15, May 12, and June 16, 1992. Quarterly sampling was performed by EMCON field personnel on April 15, 1992. The results of EMCON's field work on the site, including DTW measurements and subjective analysis for the presence of product in the groundwater in MW-1 through MW-6, are presented on EMCON's Field Reports, Summary of Groundwater Monitoring Data, and Water Sample Field Data Sheets. These data are included in Appendix A.

The DTW levels, wellhead elevations, groundwater elevations, and subjective observations for product in the groundwater from MW-1 through MW-6 for this quarter and wells MW-1 through MW-4 for previous quarterly groundwater monitoring at the site are summarized in Table 1, Cumulative Groundwater Monitoring Data. EMCON's DTW measurements for wells MW-1 through MW-6 were used to evaluate groundwater elevations. Evidence of product or sheen was not observed by EMCON's field personnel during this quarterly monitoring (see Appendix A). During sampling, however, a strong odor was reported in wells MW-3 and MW-4. Groundwater elevations in wells MW-1, MW-2, and MW-4 through MW-6 decreased between approximately 2/3 foot and 1-1/2 feet between April 15 and June 16, 1992. However, the groundwater elevation in MW-3 increased approximately 1/4 foot. The groundwater gradients and flow directions interpreted from the April, May, and June 1992 groundwater monitoring episodes are shown on the Groundwater Gradient Maps,

Plates 3 through 5. These interpreted groundwater gradients and flow directions average about 0.04 toward the southwest. The groundwater gradients for this quarter are generally consistent with previously interpreted data.

Groundwater monitoring wells MW-1 through MW-6 were purged and sampled by EMCON field personnel on April 15, 1992. Pertinent field sampling information is presented on EMCON's Water Sample Field Data Sheets (see Appendix A). According to EMCON's field data, each of the six wells (MW-1 through MW-6) went dry and were sampled after approximately 2-1/2 to 4 well volumes were purged. The purge water was removed from the site by a licensed hazardous waste hauler; the Monitoring Well Purge Water Disposal Form is also included in Appendix A.

Laboratory Methods and Analyses

Under the direction of EMCON, water samples collected from the wells were analyzed by Columbia Analytical Services, Inc., located in San Jose, California (Hazardous Waste Testing Laboratory Certification No. 1426). The water samples from MW-1 through MW-6 were analyzed for total petroleum hydrocarbons as gasoline (TPHg) and benzene, toluene, ethylbenzene, and total xylenes (BTEX) using Environmental Protection Agency (EPA) Methods 5030/8020/DHS LUFT. Concentrations of TPHg and benzene in the groundwater are shown on Plate 6, TPHg Concentrations in Groundwater, and Plate 7, Benzene Concentrations in Groundwater. The Chain of Custody Records and Laboratory Analysis Reports are included in Appendix A. Results of these and previous water analyses are summarized in Table 2, Cumulative Results of Laboratory Analyses of Groundwater--TPHg, TPHd, BTEX, and TOG. Results of these analyses are presented in Table 3, Cumulative Results of Laboratory Analyses of Groundwater--VOCs and Metals.

Results of this quarter's groundwater monitoring indicate:

- o TPHg was detected in groundwater samples from wells MW-2, MW-3, and MW-4 at concentrations ranging from 86 parts per billion (ppb) (well MW-2) to 8,500 ppb (well MW-4).
- o Benzene was detected in groundwater samples from well MW-2, MW-3, and MW-4 at concentrations ranging from 20 ppb (MW-2) to 2,100 ppb (MW-4). These concentrations exceed the California Department of Health Services Maximum Contaminant Level (MCL) of 1.0 ppb benzene in drinking water.
- o Toluene was detected in groundwater samples from wells MW-2, MW-3, and MW-4 at concentrations ranging from 2.3 ppb (MW-2) to 750 ppb (MW-4). The

concentration in well MW-4 exceeds the State Recommended Drinking Water Action Level (DWAL) of 100 ppb toluene.

- o Ethylbenzene was detected in groundwater samples from wells MW-2, MW-3, and MW-4 at concentrations ranging from 3.8 ppb (MW-2) to 280 ppb (MW-4). These concentrations do not exceed the MCL of 680 ppb ethylbenzene.
- o Total xylenes were detected in groundwater samples from MW-2, MW-3, and MW-4 at concentrations ranging from 8.5 ppb (MW-2) to 1,000 ppb (MW-4). These concentrations do not exceed the MCL of 1,750 ppb total xylenes.
- o The groundwater samples from wells MW-1, MW-5 and MW-6 were below the laboratory detection limits for TPHg and BTEX.

The following general trends were noted in reported hydrocarbon concentrations in groundwater from monitoring wells MW-1 through MW-4 since the last quarterly monitoring: reported concentrations of TPHg and BTEX have remained nondetectable in well MW-1; decreased in well MW-2; remained relatively consistent in well MW-3; and increased in well MW-4. Trends have not been established for wells MW-5 and MW-6 because this is the first quarterly monitoring of these wells.

RESNA recommends continuing monthly groundwater monitoring, quarterly groundwater sampling of the monitoring wells, and laboratory analyses of groundwater samples for TPHg and BTEX.

RESNA recommends that copies of this report be forwarded to:

Ms. Susan Hugo
Alameda County Health Care Services Agency
Department of Environmental Health
80 Swan Way, Room 200
Oakland, California 94621


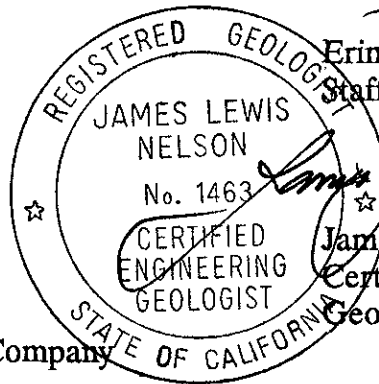
Mr. Richard Hiatt
Regional Water Quality Control Board
San Francisco Bay Region
2101 Webster Street, Suite 500
Oakland, California 94612

If you have any questions or comments, please call us at (408) 264-7723.

Sincerely,
RESNA Industries Inc.



Erin McLucas
Staff Geologist



James L. Nelson
Certified Engineering
Geologist No. 1463

cc: H.C. Winsor, ARCO Products Company

Attachments: References

- Plate 1, Site Vicinity Map
- Plate 2, Generalized Site Plan
- Plate 3, Groundwater Gradient Map, April 15, 1992
- Plate 4, Groundwater Gradient Map, May 12, 1992
- Plate 5, Groundwater Gradient Map, June 16, 1992
- Plate 6, TPHg Concentrations In Groundwater, April 15, 1992
- Plate 7, Benzene Concentrations In Groundwater, April 15, 1992

- Table 1, Cumulative Groundwater Monitoring Data
- Table 2, Cumulative Results of Laboratory Analyses of Groundwater--
TPHg, TPHd, BTEX, and TOG
- Table 3, Cumulative Results of Laboratory Analyses of Groundwater--
VOCs and Metals

- Appendix A: EMCON's Field Reports (2), Depth To Water/Floating
Product Survey Results, Summary of Groundwater
Monitoring Data, Certified Analytical Reports with Chain
of Custody, Water Sample Field Data Sheets
Monitoring Well Purge Water Disposal Form

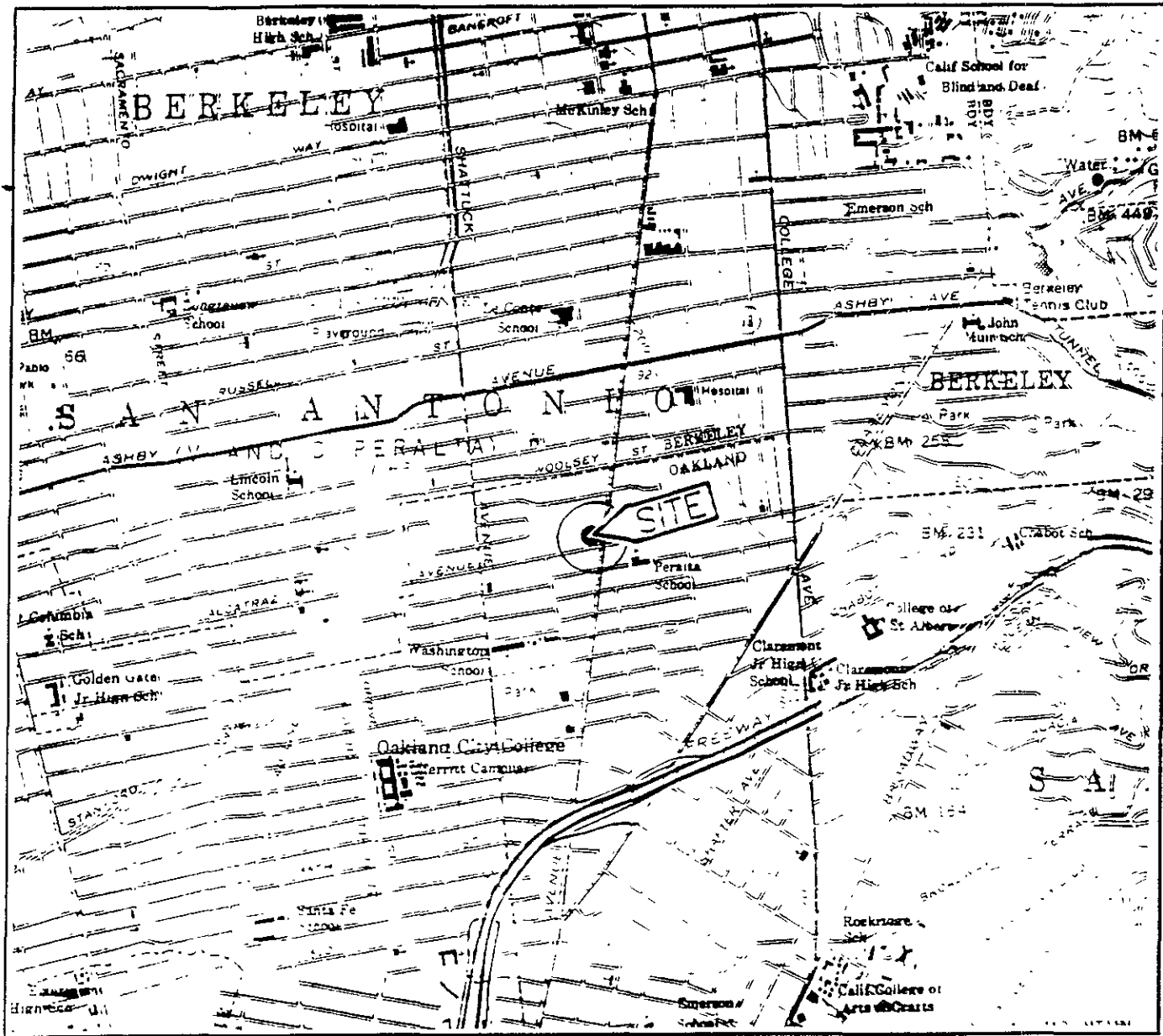
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- Applied GeoSystems. June 15, 1988. Limited Environmental Site Assessment at ARCO Service Station No. 374, Telegraph Avenue and Alcatraz Avenue, Oakland, California. Job 18039-1.
- Applied GeoSystems. August 1, 1988. Report Environmental Investigation Related to Underground Tank Removal at ARCO Service Station No. 374, Telegraph Avenue and Alcatraz Avenue, Oakland, California. Job 18039-2.
- Applied GeoSystems. August 30, 1990. Letter Report, Quarterly Ground-Water Monitoring Third Quarter 1990 at ARCO Station 374, 6407 Telegraph Avenue, Oakland, California. AGS 60025-1.
- Applied GeoSystems. February 20, 1991. Letter Report, Quarterly Ground-Water Monitoring Fourth Quarter 1990 at ARCO Station 374, 6407 Telegraph Avenue, Oakland, California. AGS 60025-1.
- Applied GeoSystems. March 27, 1991. Report Limited Subsurface Environmental Investigation at ARCO Station 374, 6407 Telegraph Avenue, Oakland, California. AGS Report No. 18039-3.
- Applied GeoSystems. April 16, 1991. Letter Report, Quarterly Ground-Water Monitoring First Quarter 1991 at ARCO Station 374, 6407 Telegraph Avenue, Oakland, California. AGS 60025-2.
- Applied GeoSystems. May 15, 1991. Work Plan for Subsurface Investigations and Remediation at ARCO Station 374, 6407 Telegraph Avenue, Oakland, California. AGS 60025-3.
- RESNA/Applied GeoSystems. July 31, 1991. Report of pumping and Recovery Test Results at ARCO 374, 6407 Telegraph Avenue, Oakland, California. 60025.04
- RESNA. September 4, 1991. Letter Report, Quarterly Ground-Water Monitoring Second Quarter 1991 at ARCO Station 374, 6407 Telegraph Avenue, Oakland, California. RESNA 60025-2.
- RESNA. November 21, 1991. Letter Report, Quarterly Groundwater Monitoring Third Quarter 1991 at ARCO Station 374, 6407 Telegraph Avenue, Oakland, California. RESNA 60025-2.

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(Continued)

RESNA. March 6, 1992. Letter Report, Quarterly Groundwater Monitoring Fourth Quarter 1991 at ARCO Station 374, 6407 Telegraph Avenue, Oakland, California. RESNA 60025-2.

RESNA. May 5, 1992. Letter Report, Quarterly Groundwater Monitoring First Quarter 1992 at ARCO Station 374, 6407 Telegraph Avenue, Oakland, California. RESNA 60025-2.

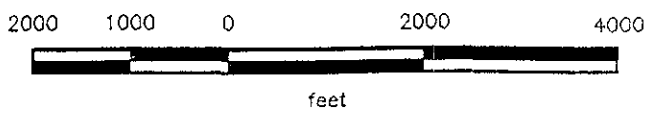


Base: U.S. Geological Survey
 7.5-Minute Quadrangles
 Oakland West/East
 California
 Photorevised 1980

LEGEND

(●) = Site Location

Approximate Scale

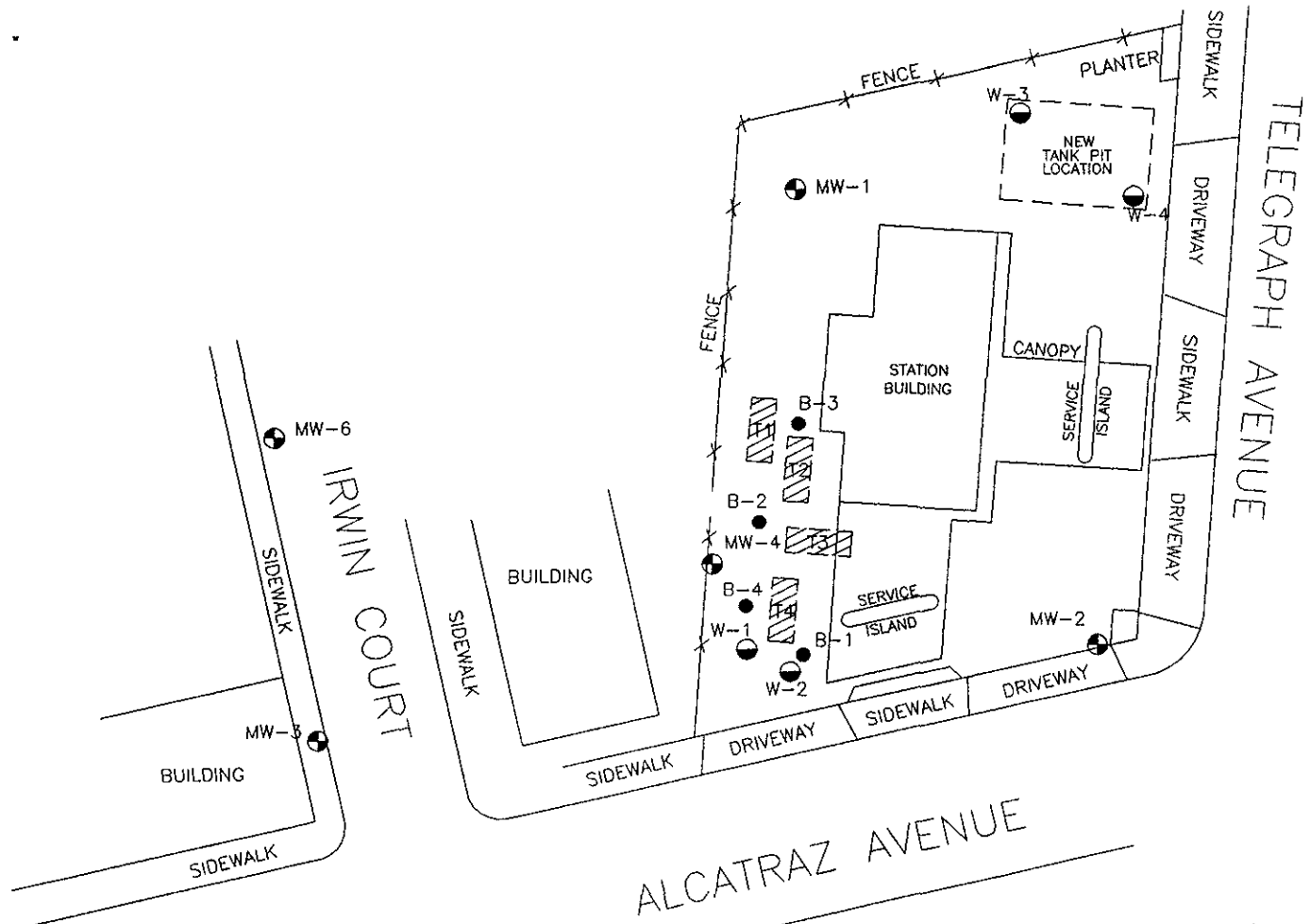


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SITE VICINITY MAP
 ARCO Station 374
 6407 Telegraph Avenue
 Oakland, California

PLATE
 1



MW-5

EXPLANATION

- B-4 ● = Soil boring
(RESNA, 1988)
- MW-6 ⊕ = Monitoring well
(RESNA, July 1989, and April 1992)
- W-4 ⊙ = Tank pit monitoring well
(RESNA, 1988)
- ▨ = Former underground storage tanks

Approximate Scale



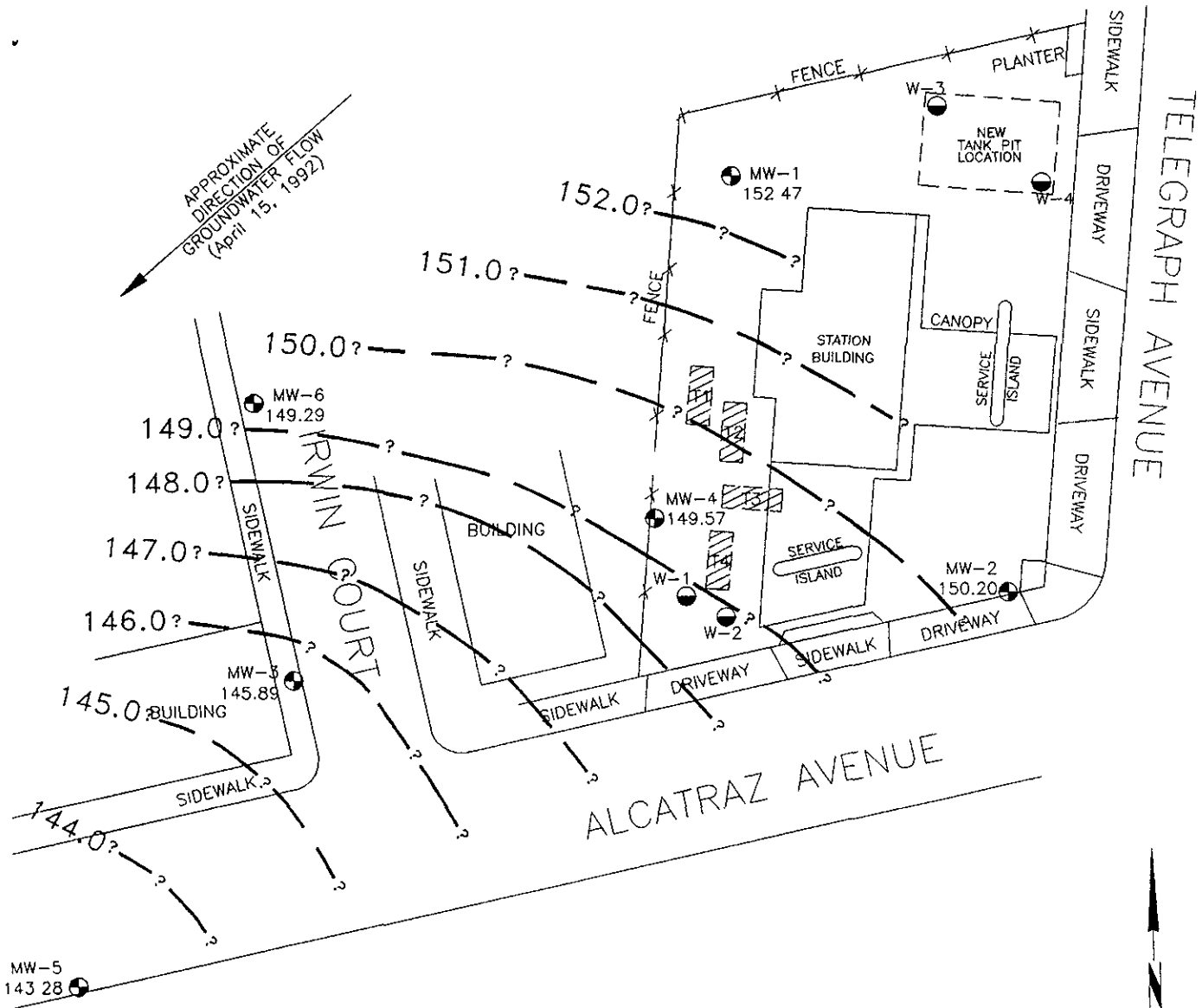
Source: Surveyed by John Koch, Licensed Land Surveyor

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**GENERALIZED SITE PLAN
ARCO Station 374
6407 Telegraph Avenue
Oakland, California**

**PLATE
2**

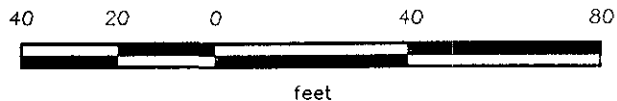
PROJECT 60025.07



EXPLANATION

- 152.0 = Line of equal elevation of groundwater in feet above mean sea level (MSL)
- 152.47 = Elevation of groundwater in feet above MSL April 15, 1992
- MW-6 = Monitoring well (RESNA, July 1989, and April 1992)
- W-4 = Tank pit monitoring well (RESNA, 1988)
- = Former underground storage tanks

Approximate Scale



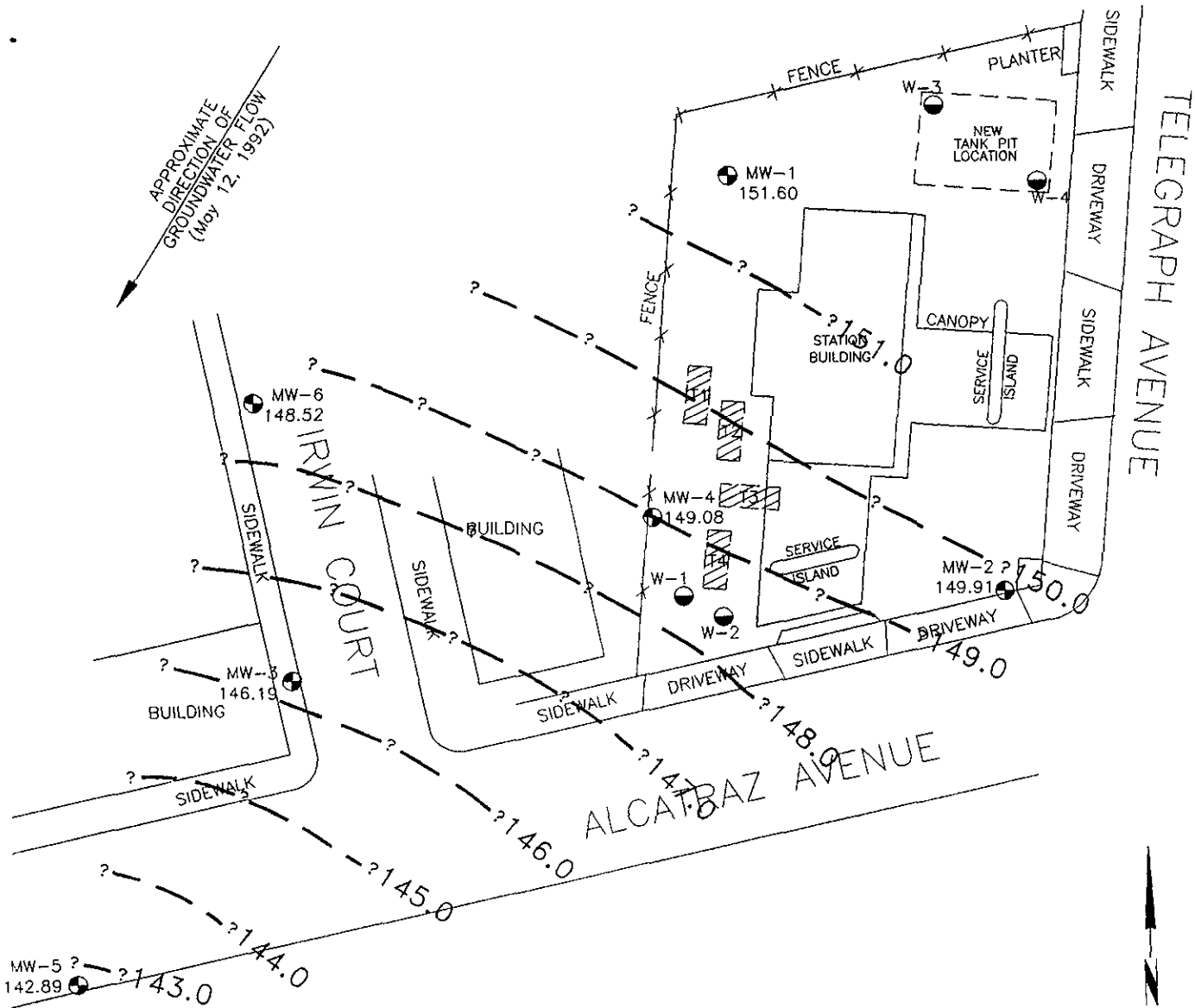
Source: Surveyed by John Koch, Licensed Land Surveyor

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GROUNDWATER GRADIENT MAP
ARCO Station 374
6407 Telegraph Avenue
Oakland, California

PLATE
3

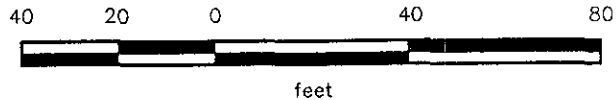
PROJECT 60025.07



EXPLANATION

- = Line of equal elevation of groundwater in feet above mean sea level (MSL)
- 151.60 = Elevation of groundwater in feet above MSL May 12, 1992
- MW-6 = Monitoring well (RESNA, July 1989, and April 1992)
- W-4 = Tank pit monitoring well (RESNA, 1988)
- = Former underground storage tanks

Approximate Scale



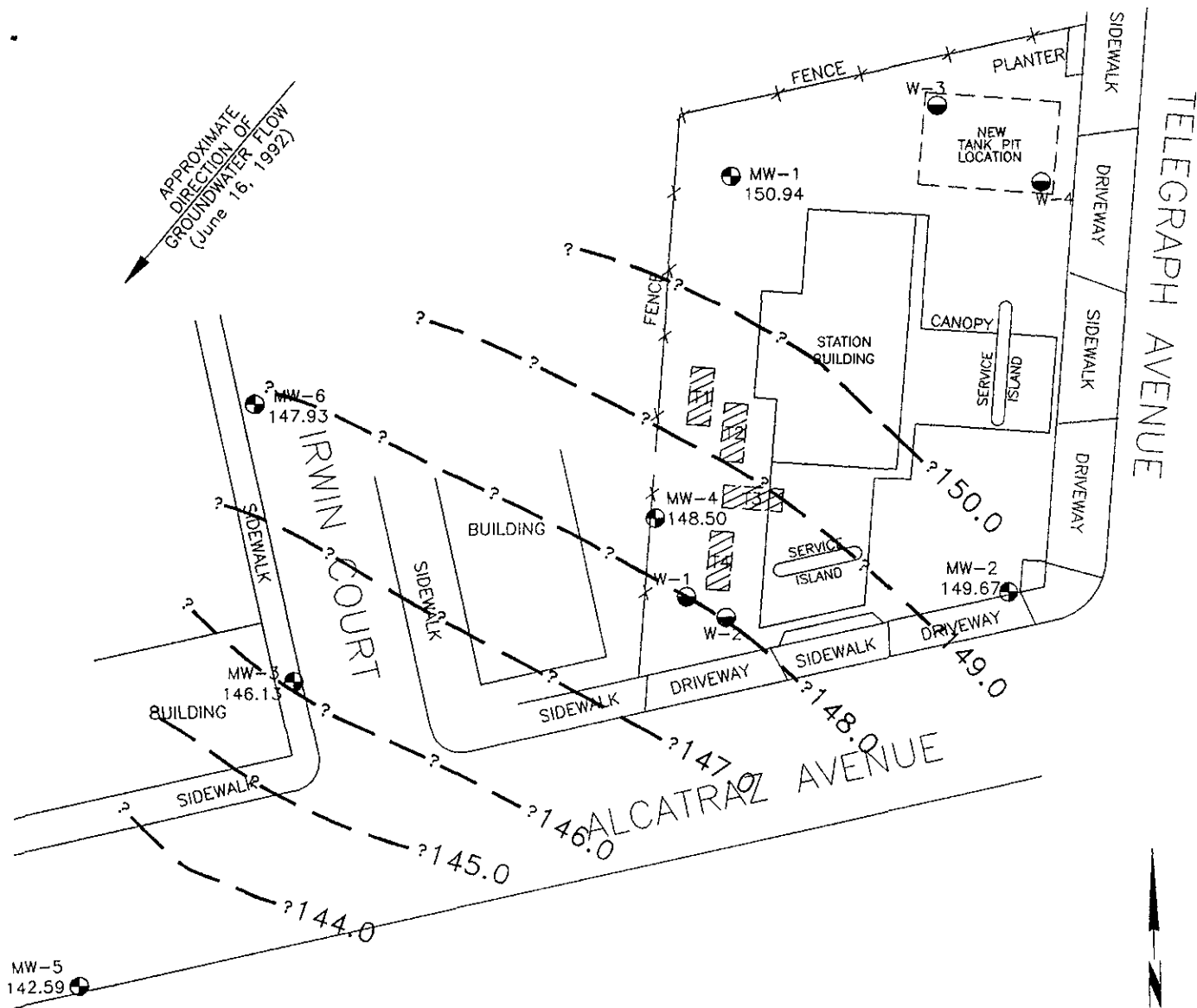
Source: Surveyed by John Koch, Licensed Land Surveyor.

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GROUNDWATER GRADIENT MAP
ARCO Station 374
6407 Telegraph Avenue
Oakland, California

PLATE
4

PROJECT 60025.07



EXPLANATION

- 150.0 = Line of equal elevation of groundwater in feet above mean sea level (MSL)
- 150.94 = Elevation of groundwater in feet above MSL June 16, 1992
- MW-6 = Monitoring well (RESNA, July 1989, and April 1992)
- W-4 = Tank pit monitoring well (RESNA, 1988)
- = Former underground storage tanks

Approximate Scale



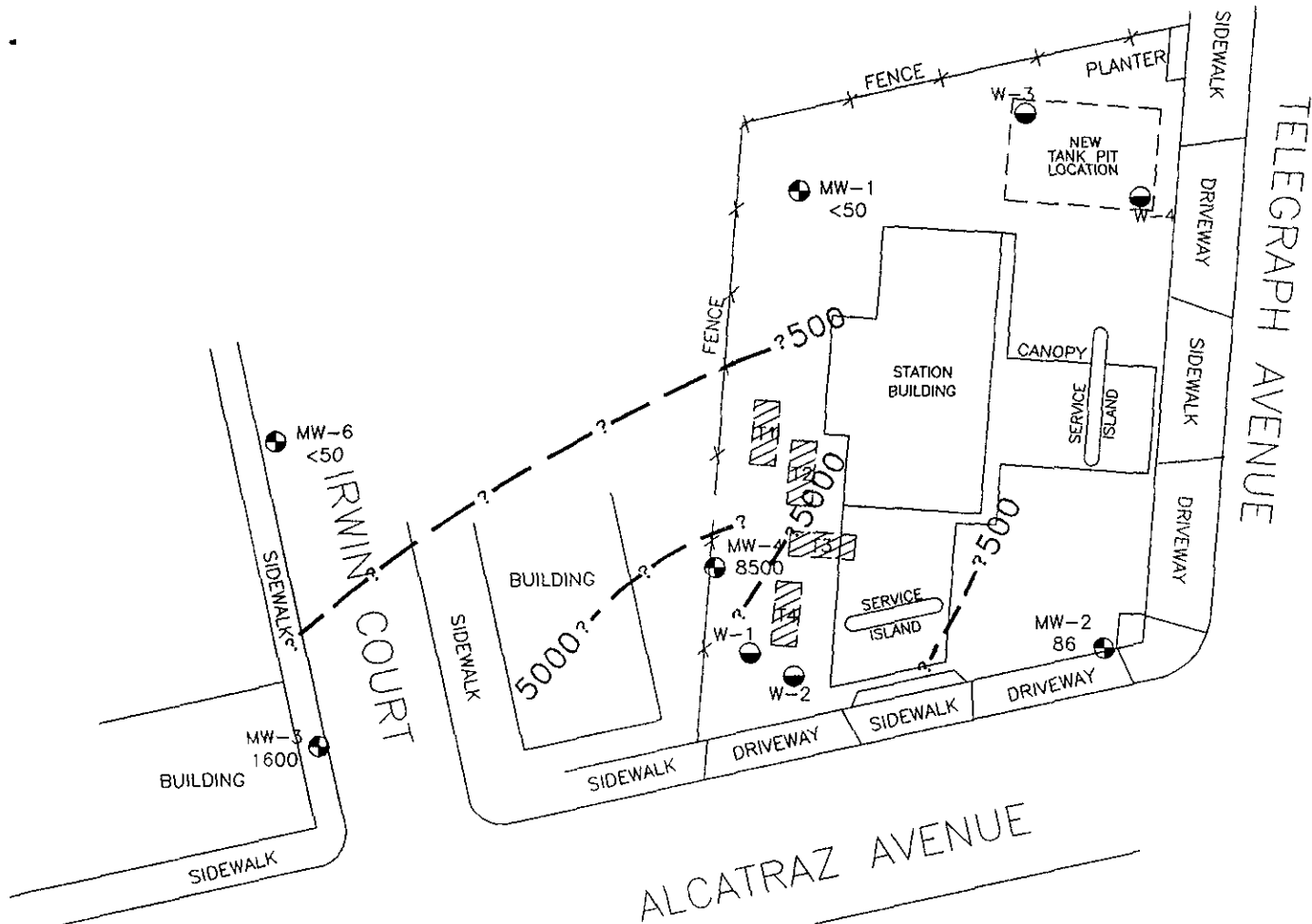
Source: Surveyed by John Koch, Licensed Land Surveyor

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GROUNDWATER GRADIENT MAP
ARCO Station 374
6407 Telegraph Avenue
Oakland, California

PLATE
5

PROJECT 60025.07



EXPLANATION

— 5000 = Line of equal concentration of TPHg in groundwater, in parts per billion (ppb)

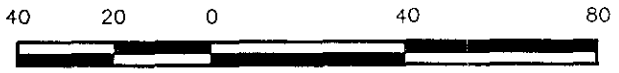
8500 = Concentration of TPHg in groundwater, in ppb, April 15, 1992

MW-6 ⊕ = Monitoring well (RESNA, July 1989, and April 1992)

W-4 ⊖ = Tank pit monitoring well (RESNA, 1988)

▨ = Former underground storage tanks

Approximate Scale



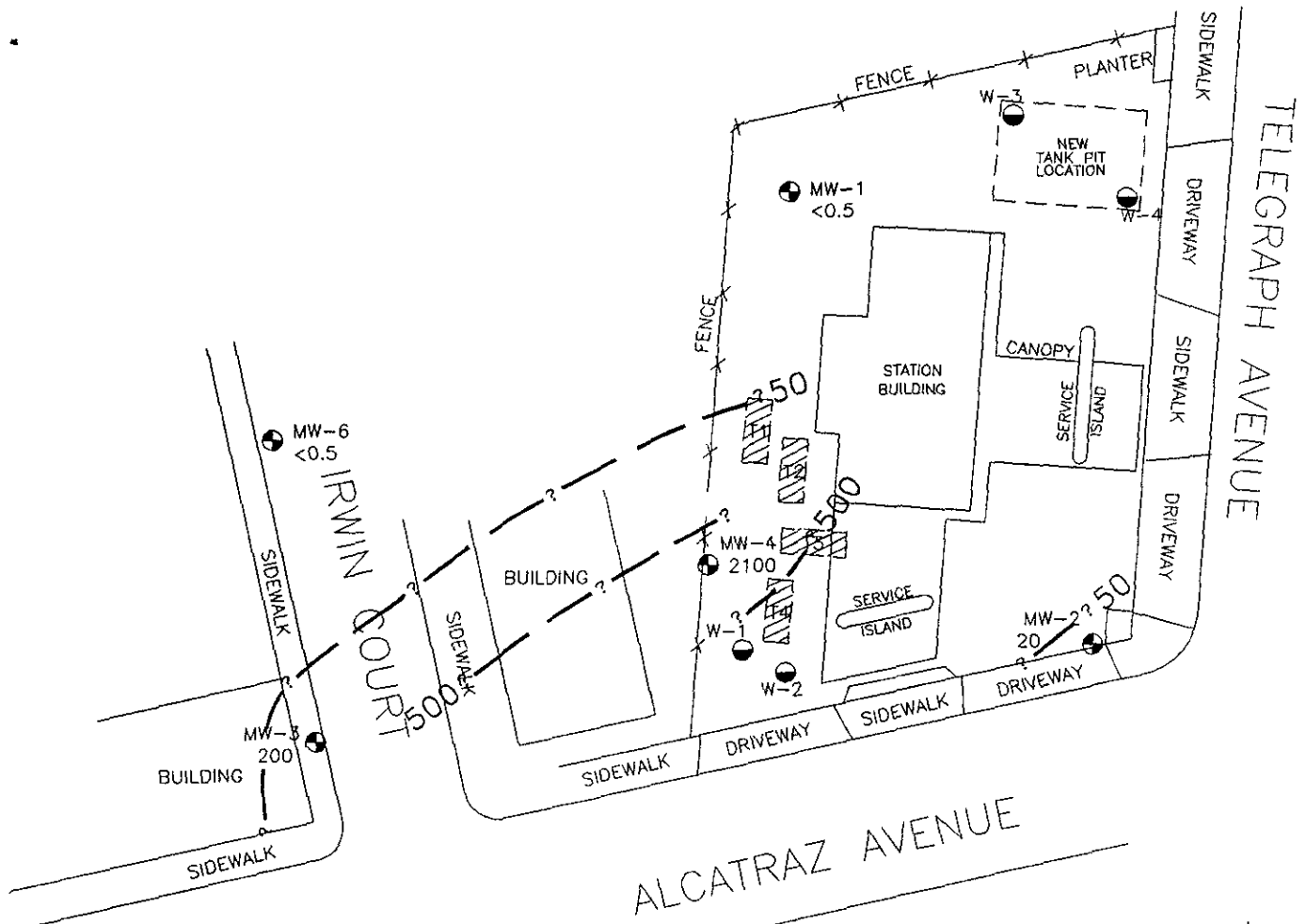
Source: Surveyed by John Koch, Licensed Land Surveyor.



PROJECT 60025.07

**TPHg CONCENTRATIONS IN GROUNDWATER
ARCO Station 374
6407 Telegraph Avenue
Oakland, California**

**PLATE
6**



MW-5
<math><0.5</math>

EXPLANATION

—500 = Line of equal concentration of benzene in groundwater, in parts per billion (ppb)

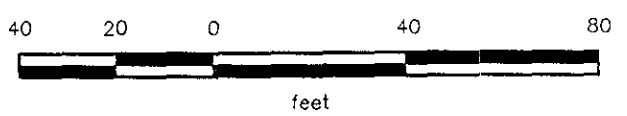
2100 = Concentration of benzene in groundwater, in ppb, April 15, 1992

MW-6 ⊕ = Monitoring well (RESNA, July 1989, and April 1992)

W-4 ⊙ = Tank pit monitoring well (RESNA, 1988)

▨ = Former underground storage tanks

Approximate Scale



Source: Surveyed by John Koch, Licensed Land Surveyor.



**BENZENE CONCENTRATIONS
IN GROUNDWATER
ARCO Station 374
6407 Telegraph Avenue
Oakland, California**

**PLATE
7**

PROJECT 60025.07

TABLE 1
 CUMULATIVE GROUNDWATER MONITORING DATA
 ARCO Station 374
 Oakland, California
 (Page 1 of 3)

Date Well Measured	Well Elevation	Depth to Water	Water Elevation	Floating Product
<u>MW-1</u>				
07/20/89		8.04	151.40	None
08/30/89		8.47	150.97	None
10/04/89	159.44	8.50	150.94	None
01/10/90		6.74	152.70	None
08/07/90		6.87	152.57	None
12/06/90		7.35	152.09	None
12/19/90		7.22	152.22	None
01/29/91		8.28	151.16	None
02/20/91		7.98	151.46	None
04/25/91		6.89	152.55	None
05/31/91		7.64	151.80	None
07/08/91		8.17	151.27	None
08/09/91		8.58	150.86	None
09/25/91		8.82	150.62	None
10/17/91		8.96	150.48	None
11/20/91		8.60	150.84	None
12/27/91		8.71	150.73	None
01/19/92		7.83	151.61	None
02/19/92		6.68	152.76	None
03/09/92		4.47	154.97	None
04/15/92	158.91**	6.44	152.47	None
05/12/92		7.31	151.60	None
06/16/92		7.97	150.94	None
<u>MW-2</u>				
07/20/89		8.15	150.31	None
08/30/89		8.42	150.04	None
10/04/89	158.46	8.40	150.06	None
01/10/90		6.12	152.34	None
08/07/90		6.35	152.11	None
12/06/90		7.15	151.31	None
12/19/90		7.38	151.08	None
01/29/01		8.41	150.05	None
02/20/91		8.26	150.20	None
04/25/91		7.70	150.76	NM
05/31/91		8.10	150.36	None
07/08/91		8.34	150.12	None
08/09/91		8.51	149.95	None
09/25/91		8.66	149.80	None
10/17/91		8.80	149.66	None

See notes on page 3 of 3

TABLE 1
 CUMULATIVE GROUNDWATER MONITORING DATA
 ARCO Station 374
 Oakland, California
 (Page 2 of 3)

Date Well Measured	Well Elevation	Depth to Water	Water Elevation	Floating Product
<u>MW-2</u>				
11/20/91		8.66	149.80	None
12/27/91		8.57	149.89	Sheen
01/19/92		8.25	150.21	None
02/19/92		7.50	150.96	None
03/09/92		7.40	151.06	None
04/15/92	157.92**	7.72	150.20	None
05/12/92		8.01	149.91	None
06/16/92		8.25	149.67	None
<u>MW-3</u>				
07/20/89		7.58	146.60	None
08/30/89		8.00	146.18	None
10/04/89	154.18	7.73	146.45	Emulsion
01/10/90		7.78	146.40	None
08/07/90		7.66	146.52	None
12/06/90		7.75	146.43	None
12/19/90		7.58	146.60	None
01/29/91	154.18	7.60	146.58	None
02/20/91		7.51	146.67	None
04/25/91		6.37	147.81	None
05/31/91		7.19	146.99	None
07/08/91		7.60	146.58	None
08/09/91		7.94	146.24	None
09/25/91		8.23	145.95	None
10/17/91		8.44	145.74	None
11/20/91		8.78	145.40	None
12/27/91		8.05	146.13	Sheen
01/19/92		7.65	146.53	None
02/19/92		6.48	147.70	None
03/09/92		5.45	148.73	None
04/15/92	153.64**	7.75	145.89	None
05/12/92		7.45	146.19	None
06/16/92		7.51	146.13	None
<u>MW-4</u>				
07/20/89		8.09	148.99	None
08/30/89		8.45	148.63	Sheen
10/04/89	157.08	8.57	148.51	Sheen
01/10/90		7.26	149.82	None
08/07/90		6.87	150.21	None
12/06/90		8.02*	149.06*	Sheen
12/19/90		7.69	149.39	None
01/29/91		8.39	148.69	Sheen

See notes on page 3 of 3

TABLE 1
 CUMULATIVE GROUNDWATER MONITORING DATA
 ARCO Station 374
 Oakland, California
 (Page 3 of 3)

Date Well Measured	Well Elevation	Depth to Water	Water Elevation	Floating Product
<u>MW-4 Continued</u>				
02/20/91		8.16	148.92	None
04/25/91		7.14	149.94	None
05/31/91		7.64	149.44	None
07/08/91		8.34	148.74	None
08/09/91		8.60	148.48	None
09/25/91		8.80	148.28	None
10/17/91		8.98	148.10	None
11/20/91		8.78	148.30	None
12/27/91		8.82	148.26	Sheen
01/19/92		8.18	148.90	None
02/19/92		7.62	149.46	None
03/09/92		6.68	150.40	None
04/15/92	156.53**	6.96	149.57	None
05/12/92		7.45	149.08	None
06/16/92		7.94	148.59	None
<u>MW-5</u>				
04/15/92	151.33**	8.05	143.28	None
05/12/92		8.44	142.89	None
06/16/92		8.74	142.59	None
<u>MW-6</u>				
04/15/92	153.84**	4.55	149.29	None
05/12/92		5.32	148.52	None
06/16/92		5.91	147.93	None

Notes:

Elevations and DTW measured in feet.

* = Floating Product.

** = Wellheads surveyed by John E. Koch on April 27, 1992.

TABLE 2
 CUMULATIVE RESULTS OF LABORATORY ANALYSES OF GROUNDWATER—TPHg, TPHd, BTEX, AND TOG
 ARCO Service Station 374
 Oakland, California
 (Page 1 of 2)

Date/Well	TPHg	TPHd	B	T	E	X	TOG
<u>MW-1</u>							
07/21/89	33	NA	0.77	1.6	1.5	5.0	NA
08/30/89	<20	NA	<0.50	<0.50	<0.50	<0.50	NA
10/04/89	<20	NA	<0.50	<0.50	<0.50	<0.50	NA
01/10/90	<20	NA	<0.50	<0.50	<0.50	<0.50	NA
08/07/90	<20	NA	<0.50	<0.50	<0.50	<0.50	NA
12/06/90	<50	NA	3.6	2.7	0.60	5.80	NA
02/20/91	<50	NA	<0.50	<0.50	<0.50	<0.50	NA
07/08/91	<30	NA	<0.30	<0.30	<0.30	<0.30	NA
09/25/91	<30	NA	0.57	0.57	0.54	1.7	NA
11/20/91	57	NA	9.2	3.7	0.63	2.5	NA
03/09/92	<50	NA	<0.5	<0.5	<0.5	<0.5	NA
04/15/92	<50	NA	<0.5	<0.5	<0.5	<0.5	NA
<u>MW-2</u>							
07/21/89	4,200	NA	280	210	38	24	NA
08/30/89	4,200	NA	160	260	45	240	NA
10/04/89	4,300	NA	860	300	29	330	NA
01/10/90	8,000	NA	890	710	120	760	NA
08/07/90	6,000	NA	880	76	25	80	NA
12/06/90	1,600	NA	330	69	18	63	NA
02/20/91	1,300	NA	160	46	13	48	NA
07/08/91	310	NA	76	18	7.7	24	NA
09/25/91	83	NA	17	0.69	2.2	4.1	NA
11/20/91	180	NA	46	6.1	3.0	8.7	NA
03/09/92	690	NA	170	25	21	58	NA
04/15/92	86	NA	20	2.3	3.8	8.5	NA
<u>MW-3</u>							
07/21/89	430	NA	9	4.8	<0.50	50	NA
08/30/89	1,200	NA	85	46	8.4	55	NA
10/04/89	7,000	NA	580	900	120	670	NA
01/10/90	940	NA	130	59	21	73	NA
08/07/90	2,300	NA	180	64	59	120	NA
12/06/90	460	350	52	55	14	39	NA
02/20/91	470	<100	36	30	9.3	31	<5,000
07/08/91	2,500	NA	240	470	74	320	NA
09/25/91	1,100	NA	120	110	34	120	NA
11/20/91	1,000	NA	180	140	43	140	NA
03/10/92	1,200	NA	200	110	53	130	NA
04/15/92	1,600	NA	200	13	110	81	NA
<u>MW-4</u>							
07/21/89	8,700	NA	720	360	120	640	NA

See notes on page 2 of 2

TABLE 2
 CUMULATIVE RESULTS OF LABORATORY ANALYSES OF GROUNDWATER--TPHg, TPHd, BTEX, AND TOG
 ARCO Service Station 374
 Oakland, California
 (Page 2 of 2)

Date/Well	TPHg	TPHd	B	T	E	X	TOG
<u>MW-4 Continued</u>							
08/30/89	7,300	NA	630	220	72	320	NA
10/04/89	21,000	NA	2,300	1,300	280	1,300	NA
01/10/90	4,300	NA	470	250	63	430	NA
08/07/90	69,000	28,000	8,700	4,200	540	4,600	<5,000
12/06/90	Not sampled--product sheen						
02/20/91	5,200	<100	690	200	95	580	<5,000
07/08/91	1,700	NA	280	68	37	170	NA
09/25/91	6,300	NA	2,100	290	210	590	NA
11/20/91	2,700	NA	1,200	200	110	320	NA
03/10/92	690	NA	180	80	18	43	NA
04/15/92	8,500	NA	2,100	750	280	1,000	NA
<u>MW-5</u>							
04/15/92	<50	NA	<0.5	<0.5	<0.5	<0.5	NA
<u>MW-6</u>							
04/15/92	<50	NA	<0.5	<0.5	<0.5	<0.5	NA
MCL:	--	--	1	--	680	1,750	--
DWAL:	--	--	--	100	--	--	--

Results in micrograms per liter (ug/L) = parts per billion (ppb).

TPHg: Total petroleum hydrocarbons as gasoline by EPA method 5030/8015.

TPHd: Total petroleum hydrocarbons as diesel by EPA method 3510/8015.

BTEX: B: Benzene, T: Toluene, E: Ethylbenzene, X: Total Xylene isomers; measured by EPA method 8020/602.

TOG: Total oil and grease measured by Standard Method 5520 B/F.

<: Results reported as less than the detection limit.

NA: Not analyzed

*: Unregulated by California DHS, October 24, 1990.

MCL: State Maximum Contaminant Level (October 1990).

DWAL: State recommended Drinking Water Action Level (October 1990).

TABLE 3
 CUMULATIVE RESULTS OF LABORATORY ANALYSES OF GROUNDWATER--VOCs and Metals
 ARCO Service Station 374
 Oakland, California

Date/Well	VOC (ppb)	Cd (ppm)	Cr (ppm)	Pb (ppm)	Ni (ppm)	Zn (ppm)
<u>MW-4</u> 07/31/90	Nondetectable for thirty one compounds tested (<1.0)	NA	NA	NA	NA	NA
02/20/91	Chloromethane* 3.4; nondetectable for twenty eight other compounds tested (<0.5)	NA	NA	NA	NA	NA
11/20/91	NA	<0.010	<0.010	<0.0050	<0.050	0.019
03/10/92	NA	NA	NA	NA	NA	NA
04/15/92	NA	NA	NA	NA	NA	NA

VOC results in micrograms per liter (ug/L) = parts per billion (ppb).
 Metal results in milligrams per liter (mg/L) = parts per million (ppm).
 Halogenated Volatile Organics measured by EPA method 601/8010.
 NA = Not Analyzed

APPENDIX A

**EMCON'S FIELD REPORTS, DEPTH TO WATER/FLOATING PRODUCT SURVEY
RESULTS, SUMMARY OF GROUNDWATER MONITORING DATA, CERTIFIED
ANALYTICAL REPORTS WITH CHAIN OF CUSTODY, WATER SAMPLE FIELD
DATA SHEETS**

MONITORING WELL PURGE WATER DISPOSAL FORM



EMCON
ASSOCIATES

Consultants in Wastes
Management and
Environmental Control

RECEIVED

MAY 6 1992

RESNA
SAN JOSE

Date May 1, 1992

Project G70-04.01

To:

Mr. Joel Coffman
RESNA/ Applied Geosystems
3315 Almaden Expressway, Suite 34
San Jose, California 95050

We are enclosing:

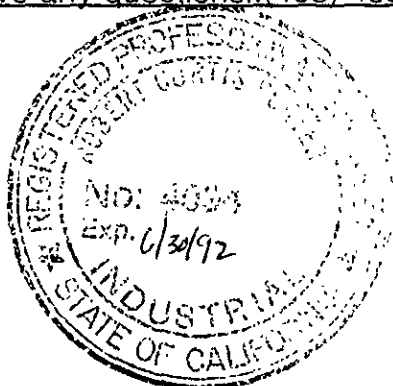
Copies	Description
<u>1</u>	<u>Depth To Water / Floating Product Survey Results</u>
<u>1</u>	<u>Summary of Groundwater Monitoring Data</u>
<u>1</u>	<u>Certified Analytical Reports with Chain-of-Custody</u>
<u>6</u>	<u>Water Sample Field Data Sheets</u>

For your: X Information Sent by: X Mail

Comments:

Enclosed are the data from the second quarter 1992 monitoring event at ARCO service station 374, 6407 Telegraph Hill, Oakland, California. Please call if you have any questions: (408) 453-2266.

Reviewed by:



Mark Knuttel *MK*

Robert C Porter
Robert Porter, Senior Project
Engineer.



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

PROJECT # : G70-04.01

STATION ADDRESS : 6407 Telegraph Hill, Oakland, CA

DATE : 04-15-92

ARCO STATION # : 374

FIELD TECHNICIAN : JOHN WATAHA

DAY : 04-15-92 WEDNESDAY

DTW Order	WELL ID	Well Box Seal	Well Lid Secure	Gasket	Lock	Locking Well Cap	FIRST DEPTH TO WATER (feet)	SECOND DEPTH TO WATER (feet)	DEPTH TO FLOATING PRODUCT (feet)	FLOATING PRODUCT THICKNESS (feet)	WELL TOTAL DEPTH (feet)	COMMENTS
1	MW-5	OK	OK	OK	NO LOCK	OK	8.05	8.04	NO	NO	23.00	---
2	MW-6	OK	OK	OK	NO LOCK	OK	4.55	4.55	NO	NO	14.60	---
3	MW-1	OK	OK	OK	3259	OK	6.44	6.45	NO	NO	26.50	---
4	MW-2	OK	OK	OK	3259	OK	7.72	7.72	NO	NO	26.20	REPLACED LOCKING WELL CAP
5	MW-4	OK	OK	OK	3259	OK	6.96	6.96	NO	NO	26.50	ORIGINAL PRODN WELL LID CHIPPED
6	MW-3	OK	OK	OK	3259	OK	7.75	7.76	NO	NO	26.70	---

Summary of Groundwater Monitoring Data
 Second Quarter 1992
 ARCO Service Station 374
 6407 Telegraph Hill, Oakland, 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)	Ethylbenzene (ppb)	Total Xylenes (ppb)
MW-1(24)	04/15/92	6.44	ND. ²	<50	<0.5	<0.5	<0.5	<0.5
MW-2(25)	04/15/92	7.72	ND.	86.	20.	2.3	3.8	8.5
MW-3(25)	04/15/92	7.75	ND.	1,600	200.	13.	110.	81.
MW-4(20)	04/15/92	6.96	ND.	8,500.	2,100.	750	280.	1,000.
MW-5(22)	04/15/92	8.05	ND.	<50	<0.5	<0.5	<0.5	<0.5
MW-6(14)	04/15/92	4.55	ND.	<50	<0.5	<0.5	<0.5	<0.5
FB-1 ³	04/15/92	NA. ⁴	NA.	<50	<0.5	<0.5	<0.5	<0.5

1. TPH. = Total petroleum hydrocarbons

2. ND. = Not detected

3. FB. = Field blank

4. NA. = Not applicable



April 28, 1992

Mark Knuttel
EMCON Associates
1921 Ringwood Avenue
San Jose, CA 95131

Re: **EMCON Project No. G70-04.01**
Arco Facility No. 374

Dear Mr. Knuttel:

Enclosed are the results of the water samples submitted to our lab on April 16, 1992. For your reference, our service request number for this work is SJ92-0450.

All analyses were performed in accordance with the laboratory's quality assurance program.

Please call if you have any questions.

Respectfully submitted:

A handwritten signature in black ink, appearing to read "Keoni A. Murphy". The signature is fluid and cursive, with a long horizontal flourish extending to the right.

Keoni A. Murphy
COLUMBIA ANALYTICAL SERVICES, INC.

le/KAM

Analytical Report

Client: EMCON Associates
 Project: EMCON Project No. G70-04.01
 Arco Facility No. 374

Date Received: 04/16/92
 Work Order #: SJ92-0450
 Sample Matrix: Water

BTEX and TPH as Gasoline
 EPA Methods 5030/8020/DHS LUFT Method
 µg/L (ppb)

Sample Name: MW-1 (24) MW-2 (25) MW-3 (25)
 Date Analyzed: 04/20/92 04/21/92 04/21/92

<u>Analyte</u>	<u>MRL</u>			
Benzene	0.5	ND	20.	200.
Toluene	0.5	ND	2.3	13.
Ethylbenzene	0.5	ND	3.8	110.
Total Xylenes	0.5	ND	8.5	81.
TPH as Gasoline	50	ND	86.	1,600.

TPH Total Petroleum Hydrocarbons
 MRL Method Reporting Limit
 ND None Detected at or above the method reporting limit

Approved by Karen Murphy Date April 26, 1992

Analytical Report

Client: EMCON Associates
 Project: EMCON Project No. G70-04.01
 Arco Facility No. 374

Date Received: 04/16/92
 Work Order #: SJ92-0450
 Sample Matrix: Water

BTEX and TPH as Gasoline
 EPA Methods 5030/8020/DHS LUFT Method
 µg/L (ppb)

Sample Name: MW-4 (20) MW-5 (22) MW-6 (14)
 Date Analyzed: 04/23/92 04/20/92 04/20/92

<u>Analyte</u>	<u>MRL</u>			
Benzene	0.5	2,100.	ND	ND
Toluene	0.5	750.	ND	ND
Ethylbenzene	0.5	280.	ND	ND
Total Xylenes	0.5	1,000.	ND	ND
TPH as Gasoline	50	8,500.	ND	ND

TPH Total Petroleum Hydrocarbons
 MRL Method Reporting Limit
 ND None Detected at or above the method reporting limit

Approved by *Kenneth Murphy* Date *April 28, 1992*

Analytical Report

Client: EMCON Associates
 Project: EMCON Project No. G70-04.01
 Arco Facility No. 374

Date Received: 04/16/92
 Work Order #: SJ92-0450
 Sample Matrix: Water

BTEX and TPH as Gasoline
 EPA Methods 5030/8020/DHS LUFT Method
 µg/L (ppb)

Sample Name: _____
 Date Analyzed: _____

Method Blank Method Blank Method Blank
 04/20/92 04/21/92 04/23/92

<u>Analyte</u>	<u>MRL</u>			
Benzene	0.5	ND	ND	ND
Toluene	0.5	ND	ND	ND
Ethylbenzene	0.5	ND	ND	ND
Total Xylenes	0.5	ND	ND	ND
TPH as Gasoline	50	ND	ND	ND

TPH Total Petroleum Hydrocarbons
 MRL Method Reporting Limit
 ND None Detected at or above the method reporting limit

Approved by Kom Murphy Date April 28, 1992

APPENDIX A
LABORATORY QC RESULTS

Client: EMCON Associates
 Project: EMCON Project No. G70-04.01
 Arco Facility No. 374

Date Received: 04/16/92
 Work Order #: SJ92-0450
 Sample Matrix: Water

QA/QC Report
 Surrogate Recovery Summary
 BTEX and TPH as Gasoline
 EPA Methods 5030/8020/DHS LUFT Method

<u>Sample Name</u>	<u>Date Analyzed</u>	<u>Percent Recovery</u> <i>α,α,α-Trifluorotoluene</i>
MW-1 (24)	04/20/92	88.
MW-2 (25)	04/21/92	91.
MW-3 (25)	04/21/92	102.
MW-4 (20)	04/23/92	83.
MW-5 (22)	04/20/92	94.
MW-6 (14)	04/20/92	87.
Method Blank	04/20/92	88.
Method Blank	04/21/92	91.
Method Blank	04/23/92	87.

CAS Acceptance Criteria 70-130

TPH Total Petroleum Hydrocarbons

Approved by *Kean Murphy* Date *April 28, 1992*

APPENDIX B
CHAIN OF CUSTODY

ARCO Facility no **374** City (Facility) **Oakland** Project manager (Consultant) **Mark Knuttap**
 ARCO engineer **Kyle Christie** Telephone no. (ARCO) **415-571-2434** Telephone no. (Consultant) **408-453-0719** Fax no. (Consultant) **408-453-0452**
 Consultant name **E.M.C.O.N ASSOCIATES** Address (Consultant) **1938 JUNCTION AVE. SAN JOSE, CA**

Laboratory name
CAS

Contract number
67077

Method of shipment
Sampler will deliver

Special detection Limit/reporting
Lowest possible

Special QA/QC
as normal

Remarks **TPH/STEX
2-40ml HCl VOAs
per well
G70-04.01**

Lab number
5592-0450

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 602/EPA 8020	BTEX/TPH EPA 1602/8020/8015	TPH Modified 8015 Gas <input type="checkbox"/> Diesel <input type="checkbox"/>	Oil and Grease 413.1 <input type="checkbox"/> 413.2 <input type="checkbox"/>	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	Semi Metals <input type="checkbox"/> VOA <input type="checkbox"/> VOA <input type="checkbox"/>	CAN Metals EPA 60107000 TTL <input type="checkbox"/> STL <input type="checkbox"/>	Lead Org./DHS <input type="checkbox"/> Lead EPA 7420/1421 <input type="checkbox"/>	
			Soil	Water	Other	Ice	Acid														
MW 1 (24)	1-2	2		X		X	Hcl	4-15-92	1415		X										
MW 2 (25)	3-4	2		X		X	Hcl		1500		X										
MW 3 (25)	5-6	2		X		X	Hcl		1552		X										
MW 4 (30)	7-8	2		X		X	Hcl		1513		X										
MW 5 (32)	9-10	2		X		X	Hcl		1304		X										
MW 6 (14)	11-12	2		X		X	Hcl		1158		X										

Condition of sample: **ok**

Relinquished by sampler **John D. Katsuba** Date **04-15-92** Time

Relinquished by Date Time

Relinquished by Date Time

Temperature received: **cool**

Received by **Chubym** Date **4-16-92** Time **9:15**

Received by laboratory Date Time



EMCON ASSOCIATES

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

PROJECT NO: G70-04.01
PURGED BY: J WATAHA
SAMPLED BY: J WATAHA

SAMPLE ID: MW-1(24)
CLIENT NAME: ARCO 374
LOCATION: OAKLAND

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>13.15</u>
DEPTH TO WATER (feet):	<u>6.45</u>	CALCULATED PURGE (gal.):	<u>65.76</u>
DEPTH OF WELL (feet):	<u>26.50</u>	ACTUAL PURGE VOL (gal.):	<u>45.00</u>

DATE PURGED:	<u>04-15-92</u>	Start (2400 Hr)	<u>1335</u>	End (2400 Hr)	<u>1355</u>
DATE SAMPLED:	<u>04-15-92</u>	Start (2400 Hr)	<u>1415</u>	End (2400 Hr)	<u>1417</u>

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
<u>1339</u>	<u>13</u>	<u>6.08</u>	<u>1155</u>	<u>65.9</u>	<u>CLEAR</u>	<u>TRACE</u>
<u>1344</u>	<u>26</u>	<u>6.30</u>	<u>1196</u>	<u>65.7</u>	<u>SLIGHTLY CLOUDY</u>	<u>LIGHT</u>
<u>1349</u>	<u>39</u>	<u>6.33</u>	<u>1136</u>	<u>65.2</u>	<u> </u>	<u> </u>
	<u>52</u>	<u>DRIED WELL AT 45 GALLONS</u>				
<u>1414</u>	<u>AFTER REWORK</u>	<u>6.99</u>	<u>1042</u>	<u>65.5</u>	<u>SLIGHTLY CLOUDY</u>	<u>LIGHT</u>

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

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): FB-1 TAKEN HERE AT 1418

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: GOOD LOCK #: 3259

REMARKS: DRIED WELL AT 45 GALLONS
WATER LEVEL 19.58 AT 1412

Meter Calibration: Date: _____ Time: _____ Meter Serial #: _____ Temperature °F: _____
(EC 1000 _____ / _____) (DI _____) (pH 7 _____ / _____) (pH 10 _____ / _____) (pH 4 _____ / _____)

Location of previous calibration: MW-5

Signature: J Wataha Reviewed By: MK Page 1 of 6



EMCON ASSOCIATES

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

PROJECT NO: 670-04.01
PURGED BY: J WITANG
SAMPLED BY: J WITANG

SAMPLE ID: MW-2 (25)
CLIENT NAME: ARCO 374
LOCATION: OAKLAND

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>12.12</u>
DEPTH TO WATER (feet):	<u>7.72</u>	CALCULATED PURGE (gal.):	<u>60.61</u>
DEPTH OF WELL (feet):	<u>26.20</u>	ACTUAL PURGE VOL. (gal.):	<u>45.00</u>

DATE PURGED:	<u>04-15-92</u>	Start (2400 Hr)	<u>1426</u>	End (2400 Hr)	<u>1446</u>
DATE SAMPLED:	<u>04-15-92</u>	Start (2400 Hr)	<u>1500</u>	End (2400 Hr)	<u>1502</u>

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (umhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
<u>1431</u>	<u>12</u>	<u>6.39</u>	<u>644</u>	<u>67.3</u>	<u>CLEAR</u>	<u>TRACE</u>
<u>1436</u>	<u>24</u>	<u>6.55</u>	<u>660</u>	<u>67.0</u>	<u>"</u>	<u>"</u>
<u>1440</u>	<u>36</u>	<u>6.78</u>	<u>705</u>	<u>67.4</u>	<u>"</u>	<u>"</u>
	<u>48</u>	<u>DRIED WELL AT 45 GALLONS</u>				
<u>1459</u>	<u>AFTER 60 MIN. PURGE</u>	<u>6.82</u>	<u>840</u>	<u>66.4</u>	<u>CLEAR</u>	<u>TRACE</u>
D. O. (ppm):	<u>NR</u>	ODOR:	<u>NONE</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): NR

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: GOOD LOCK #: 3259

REMARKS: DRIED WELL AT 45 GALLONS
WATER LEVEL 19.20 AT 1459

Meter Calibration: Date: _____ Time: _____ Meter Serial #: _____ Temperature °F: _____
(EC 1000 _____ / _____) (DI _____) (pH 7 _____ / _____) (pH 10 _____ / _____) (pH 4 _____ / _____)

Location of previous calibration: MW-6
Signature: J. Witang Reviewed By: ME Page 2 of 6

WATER SAMPLE FIELD DATA SHEET



EMCON
ASSOCIATES

PROJECT NO: 670-04-01
PURGED BY: J WATSON
SAMPLED BY: J WATSON

SAMPLE ID: MW-3 (25)
CLIENT NAME: ARCO 374
LOCATION: OKLAHOMA

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>12.42</u>
DEPTH TO WATER (feet):	<u>7.76</u>	CALCULATED PURGE (gal.):	<u>62.12</u>
DEPTH OF WELL (feet):	<u>26.70</u>	ACTUAL PURGE VOL (gal.):	<u>35.00</u>

DATE PURGED:	<u>04-15-92</u>	Start (2400 Hr)	<u>1518</u>	End (2400 Hr)	<u>1535</u>
DATE SAMPLED:	<u>04-15-92</u>	Start (2400 Hr)	<u>1552</u>	End (2400 Hr)	<u>1553</u>

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (umhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
<u>1523</u>	<u>12.50</u>	<u>6.04</u>	<u>751</u>	<u>65.4</u>	<u>CLEAR</u>	<u>TRACE</u>
<u>1528</u>	<u>25</u>	<u>6.11</u>	<u>782</u>	<u>65.0</u>	<u>"</u>	<u>"</u>
<u>DRIED WELL AT 35 GALLONS</u>						
<u>1550</u>	<u>AFTER RECHARGE</u>	<u>6.87</u>	<u>773</u>	<u>64.0</u>	<u>GRAY</u>	<u>HEAVY</u>
D. O. (ppm):	<u>NR</u>	ODOR:	<u>STRONG</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): NR

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: GOOD LOCK #: 3259

REMARKS: DRIED WELL AT 35 GALLONS
WATER LEVEL AT 20.80 AT 1548

Meter Calibration: Date: _____ Time: _____ Meter Serial #: _____ Temperature °F: _____
(EC 1000 _____ / _____) (DI _____) (pH 7 _____ / _____) (pH 10 _____ / _____) (pH 4 _____ / _____)

Location of previous calibration: MW-6

Signature: J. Watson Reviewed By: MW Page 3 of 10



WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON
ASSOCIATES

PROJECT NO: 670-0401
PURGED BY: M. Kmetz
SAMPLED BY: M. Kmetz

SAMPLE ID: MW-4 (20)
CLIENT NAME: ARCO 374
LOCATION: OAKLAND

TYPE: Ground Water Surface Water Treatment Effluent Other
CASING DIAMETER (Inches): 2 3 4 4.5 6 Other

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 12.74
DEPTH TO WATER (feet): 77.6.96 CALCULATED PURGE (gal.): 60.6863.70
DEPTH OF WELL (feet): 26.50 ACTUAL PURGE VOL (gal.): 46.0

DATE PURGED: 4-15-92 Start (2400 Hr) 1440 End (2400 Hr) 1502
DATE SAMPLED: 4-15-92 Start (2400 Hr) 1513 End (2400 Hr) 1518

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (umhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1446	13.0	6.80	1736	67.8	Green	heavy
1452	26.0	6.96	1669	66.3	"	"
1458	39.0	7.08	1380	65.8	"	"
1502	52.0	Dry				
1505	after recharge	7.30	1349	65.5	Green	light

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

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

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: Good. BROKEN DIVERSIFIED LID. LOCK #: 3259

REMARKS: Dried well at 46.0 gallons at 1502
WL at 21.50 at 1510. samples collected

Meter Calibration: Date: 4-15-92 Time: 1430 Meter Serial #: 9105 Temperature °F: 69.4
(EC 1000 1008, 1000) (DI 7.62) (pH 7 7.02, 7.0) (pH 10 10.85, 10.0) (pH 4 4.02, 4.0)
Location of previous calibration: _____

Signature: Mark Kmetz Reviewed By: MK Page 4 of 6



EMCON ASSOCIATES

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

PROJECT NO: G70-04.01
PURGED BY: J WATKINS
SAMPLED BY: J WATKINS

SAMPLE ID: MW-5 (22)
CLIENT NAME: ARCO 374
LOCATION: OAKLAND

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>9.81</u>
DEPTH TO WATER (feet):	<u>8.04</u>	CALCULATED PURGE (gal.):	<u>49.05</u>
DEPTH OF WELL (feet):	<u>23.00</u>	ACTUAL PURGE VOL (gal.):	<u>28.00</u>

DATE PURGED:	<u>04-15-92</u>	Start (2400 Hr)	<u>1233</u>	End (2400 Hr)	<u>1244</u>
DATE SAMPLED:	<u>04-15-92</u>	Start (2400 Hr)	<u>1304</u>	End (2400 Hr)	<u>1305</u>

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (umhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
<u>1237</u>	<u>10</u>	<u>6.60</u>	<u>895</u>	<u>67.5</u>	<u>SLIGHTLY CLOUDY</u>	<u>LIGHT</u>
<u>1241</u>	<u>20</u>	<u>6.77</u>	<u>926</u>	<u>66.2</u>	<u>"</u>	<u>"</u>
<u>DRIED WELL AT 28 GALLONS</u>						
<u>1302</u>	<u>ARCO RECORD</u>	<u>7.31</u>	<u>918</u>	<u>66.9</u>	<u>LIGHT BROWN</u>	<u>HEAVY</u>
D. O. (ppm):	<u>NR</u>	ODOR:	<u>NONE</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): NR

PURGING EQUIPMENT

SAMPLING EQUIPMENT

- | | | | |
|--|---|--|--|
| <input checked="" 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: GOOD LOCK #: NO LOCK

REMARKS: DRIED WELL AT 28 GALLONS
WATER LEVEL 13.28 AT 1259

Meter Calibration: Date: _____ Time: _____ Meter Serial #: _____ Temperature °F: _____
(EC 1000 _____ / _____) (DI _____) (pH 7 _____ / _____) (pH 10 _____ / _____) (pH 4 _____ / _____)
Location of previous calibration: MW-5

Signature: [Signature] Reviewed By: [Signature] Page 5 of 6

WATER SAMPLE FIELD DATA SHEET



EMCON
ASSOCIATES

PROJECT NO: G70-04.01

SAMPLE ID: MW-6 (14)

PURGED BY: J WATAKA

CLIENT NAME: ARCO 374

SAMPLED BY: J WATAKA

LOCATION: ORLAND

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>6.59</u>
DEPTH TO WATER (feet):	<u>4.55</u>	CALCULATED PURGE (gal.):	<u>32.96</u>
DEPTH OF WELL (feet):	<u>14.60</u>	ACTUAL PURGE VOL (gal.):	<u>17.00</u>

DATE PURGED:	<u>04-15-92</u>	Start (2400 Hr)	<u>1133</u>	End (2400 Hr)	<u>1140</u>
DATE SAMPLED:	<u>04-15-92</u>	Start (2400 Hr)	<u>1158</u>	End (2400 Hr)	<u>1200</u>

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (umhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
<u>1135</u>	<u>6.5</u>	<u>7.15</u>	<u>641</u>	<u>64.9</u>	<u>CLOUDY</u>	<u>HEAVY</u>
<u>1138</u>	<u>13</u>	<u>7.16</u>	<u>694</u>	<u>62.3</u>	<u>11</u>	<u>11</u>
	<u>19.5</u>	<u>DRIED WELL AT 176 GALLONS</u>				
<u>1157</u>	<u>AFTER RECHARGE</u>	<u>7.23</u>	<u>719</u>	<u>62.6</u>	<u>CLOUDY</u>	<u>HEAVY</u>
D. O. (ppm):	<u>NR</u>	ODOR:	<u>NONE</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): NR

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: GOOD LOCK #: NO LOCK

REMARKS: DRIED WELL AT 176 GALLONS
WATER LEVEL 10.15 AT 1155

Meter Calibration: Date: 04-15-92 Time: 1125 Meter Serial #: K9976134 Temperature °F: 66.7
(EC 1000 994 / 1000) (DI 3.24) (pH 7 6.96 / 7.00) (pH 10 9.94 / 10.00) (pH 4 3.90 / -)

Location of previous calibration: _____
Signature: J Wataka Reviewed By: ME Page 6 of 6



EMCON
ASSOCIATES

Consultants in Wastes
Management and
Environmental Control

RECEIVED

MAY 27 1992

RESNA
SAN JOSE

Date May 13, 1992

Project G70-04.01

To:

Mr. Joel Coffman

RESNA/ Applied Geosystems

3315 Almaden Expressway, Suite 34

San Jose, California 95118

We are enclosing:

Copies	Description
<u>1</u>	<u>Depth To Water/Floating Product Survey Form,</u>
<u> </u>	<u>May 1992 monthly water level survey, ARCO</u>
<u> </u>	<u>station 374, 6407 Telegraph Hill, Oakland, CA</u>

For your: X Information Sent by: X Mail

Comments:

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

Reviewed by:



Mark Knuttel *MK*

Robert Porter
Robert Porter, Senior Project
Engineer.



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

PROJECT # : G70-04.01

STATION ADDRESS : 6407 Telegraph Hill, Oakland, CA

DATE : 5-12-92

ARCO STATION # : 374

FIELD TECHNICIAN : B. Stafford

DAY : Tuesday

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	MW-5	OK	Yes	OK	3499	Yes	8.44	8.45	ND	ND	23.1	
2	MW-6	OK	Yes	OK	0464	Yes	5.32	5.31	ND	ND	14.7	Multicolored v. bug pinked on well. I got it moved
3	MW-1	OK	Yes	OK	0909	Yes	7.31	7.31	ND	ND	26.8	
4	MW-2	OK	Yes	OK	3259	Yes	8.01	8.01	ND	ND	26.4	
5	MW-3	OK	Yes	OK	3259	Yes	7.45	7.44	ND	ND	26.8	Slight odor.
6	MW-4	Yes	ND	OK	"	Yes	7.45	7.46	ND	ND	26.6	C. Box lid broken around Diversified screw. Slight odor.



EMCON
ASSOCIATES

Consultants in Wastes
Management and
Environmental Control

RECEIVED

JUN 25 1992

RESNA
SAN JOSE

Date June 18, 1992

Project G70-04.01

To:

Mr. Joel Coffman

RESNA/ Applied Geosystems

3315 Almaden Expressway, Suite 34

San Jose, California 95118

We are enclosing:

Copies	Description
<u>1</u>	<u>Depth To Water/Floating Product Survey Form,</u>
<u> </u>	<u>June 1992 monthly water level survey, ARCO</u>
<u> </u>	<u>station 374, 6407 Telegraph Hill, Oakland, CA</u>

For your: X Information Sent by: X Mail

Comments:

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

Reviewed by:



Jim Butera JB

Robert Porter

Robert Porter, Senior Project
Engineer.



FIELD REPORT
DEPTH TO WATER / FLOATING PRODUCT SURVEY

PROJECT # : G70-04.01

STATION ADDRESS : 6407 Telegraph Hill, Oakland, CA

DATE : 6/16-92

ARCO STATION # : 374

FIELD TECHNICIAN : S. William Smith

DAY : Tuesday

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	MW-5	OK	OK	OK	3259	✓	8.74	8.75	ND	ND	23.05	—
2	MW-6				3259	✓	5.91	5.91	ND	ND	14.60	—
3	MW-1				0909	✓	7.97	7.98	ND	ND	26.75	—
4	MW-2				3259	✓	8.25	8.26	ND	ND	26.30	—
5	MW-3				3259	✓	7.51	7.51	ND	ND	26.76	—
6	MW-4	✓	✓	✓	0909	✓	7.94	7.94	ND	ND	26.60	—

MONITORING WELL PURGE WATER TRANSPORT FORM

GENERATOR INFORMATION

NAME: ARCO PRODUCTS

ADDRESS: P.O. BOX 5811

CITY, STATE, ZIP: SAN MATEO, CA 94402 PHONE #: (415) 571-2434

DESCRIPTION OF WATER: PURGE WATER GENERATED DURING SAMPLING OR DEVELOPMENT OF MONITORING WELLS LOCATED AT VARIOUS SITES. AUGER RINSEATE GENERATED DURING THE INSTALLATION OF MONITORING WELLS AT VARIOUS SITES. THE WATER MAY CONTAIN DISSOLVED HYDROCARBONS.

THE GENERATOR CERTIFIES THAT THIS WATER AS DESCRIBED IS NON-HAZARDOUS

Kyle Christie by Jon DeLor 5-22-92
(Typed or printed full name & signature) (Date)

SITE INFORMATION

	STA #	JOB #	ADDRESS	GALS
1	A-6206	20538	43500 GRIMMER BLVD., FREMONT, CA	249
2	A-2100	20499	98 S. PARK VICTORIA DR., MILPITAS, CA	220
3	A-4430	20514-DW	2995 MIDDLEFIELD RD., PALO ALTO, CA	324
4	A-2093	20414-PW	3425 TRACY BLVD., TRACY, CA	164
5	A-2130	20416-PW	7906 NO. EL DORADO ST., STOCKTON, CA	98
6	A-725	20403-DW	402 NO. EL CAMINO REAL, SAN MATEO, CA	381
7	A-374	20408-PW	6407 TELEGRAPH HILL, OAKLAND, CA	198
8	A-414	20409-PW	3000 SHATTUCK AVE., BERKELEY, CA	95
9	A-771	20412-DW	899 RINCON AVE., LIVERMORE, CA	153
10	A-362	20353-DW	29900 MISSION BLVD., HAYWARD, CA	22
11	A-374	20354-DW	6407 TELEGRAPH AVE., OAKLAND, CA	69
TOTAL GALLONS:				1,973

TRANSPORTER INFORMATION

NAME: BALCH PETROLEUM

ADDRESS: 930 AMES AVE.

CITY, STATE, ZIP: MILPITAS, CA 95035 PHONE #: (408) 942-8686

TRUCK ID #: PETERBLT HURSHEL WARD 5-22-92
(Typed or printed full name & signature) (Date)

TSD FACILITY INFORMATION

NAME: GIBSON OIL & REFINING

ADDRESS: 3300 TRUXTUN AVE., SUITE 200

CITY, STATE, ZIP: BAKERSFIELD, CA 93301 PHONE #: (805) 861-0229

RELEASE #: 13813 [Signature] 5-22-92
(Typed or printed full name & signature) (Date)