RESNA
Working To Restore Nature

3315 Almaden Expressway, Suite 34
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LETTER REPORT
QUARTERLY GROUNDWATER MONITORING
Fourth Quarter 1992
at
ARCO Station 374
6407 Telegraph Avenue
Oakland, California

60025.10

03/09/93

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TRANSMITTAL

TO: Ms. Susan Hugo
ACHCSA
Dept. of Environmental Health
80 Swan Way, Room 200
Oakland, California 94621

DATE: March 9, 1993
PROJECT NUMBER: 60025.10
SUBJECT: ARCO Station 374, 6407 Telegraph Avenue, Oakland, California

FROM: Erin McLucas
TITLE: Staff Geologist

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1	3/09/93	60025.10	Final--Letter Report Quarterly Groundwater Monitoring Fourth Quarter 1992 at ARCO Station 374, 6407 Telegraph Avenue, Oakland, California.

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REMARKS:

Per ARCO's request (Mr. Michael Whelan) copies of this report have been forwarded to you for your files.

Copies: 1 to RESNA project file no. 60025.10

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March 9, 1993
0115MWHE
60025.10

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

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

Mr. Whelan:

As requested by ARCO Products Company (ARCO), RESNA Industries Inc. (RESNA) presents this letter report which summarizes the results of fourth 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 underground gasoline-storage tanks (USTs) at the site. 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; warrant of their field data and evaluation of their field protocols is beyond 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. The site location is shown on the Site Vicinity Map, Plate 1.

Results of previous environmental investigations at the site are presented in the reports listed in the references section. 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 levels (DTW) were measured by EMCON field personnel on October 12 and 25, November 23, and December 16, 1992. Quarterly sampling was performed by EMCON field personnel on October 12, and 25, 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 and previous quarterly groundwater monitoring at the site are summarized in Table 1, Cumulative Groundwater Monitoring Data. Evidence of product or sheen was not observed by EMCON's field personnel during this quarterly monitoring (see Appendix A). The groundwater gradients and flow directions interpreted from EMCON's DTW measurements from October, November, and December 1992 are shown on the Groundwater Gradient Maps, Plates 3 through 5. DTW levels in wells MW-5 and MW-6 were not used to interpret the October gradient and the DTW level in MW-5 was not used to interpret the November gradient because cars were parked over these wells. The interpreted groundwater gradients and flow directions average about 0.04 toward the southwest. The groundwater gradients for this quarter are generally consistent with those previously interpreted.

Groundwater monitoring wells MW-1 through MW-4 were purged and sampled by EMCON field personnel on October 12, and wells MW-5 and MW-6 were purged and sampled on October 25, 1992. Pertinent field sampling information is presented on EMCON's Water Sample Field Data Sheets (see Appendix A). The purge water was removed from the site by a licensed hazardous waste hauler; the Monitoring Well Purge Water Transport 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/California DHS LUFT Method. Monitoring well MW-4 was also analyzed for TPH as diesel using EPA Method 3510/California DHS LUFT Method. 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 previous analyses are also presented in Table 3, Cumulative Results of Laboratory Analyses of Groundwater--VOCs and Metals.

The following general trends were noted in reported hydrocarbon concentrations in groundwater from monitoring wells MW-1 through MW-6 since last quarterly monitoring: reported concentrations of TPHg and BTEX have remained nondetectable or near nondetectable in onsite well MW-1, and in offsite wells MW-5 and MW-6. Concentrations of TPHg and BTEX have generally increased in onsite wells MW-2 and MW-4, and decreased in offsite well MW-3.

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 Hiett
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

REGISTERED GEOLOGIST
JAMES LEWIS NELSON
No. 1463
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

James L. Nelson
Certified Engineering Geologist No. 1463

Attachments: References

Plate 1, Site Vicinity Map
Plate 2, Generalized Site Plan
Plate 3, Groundwater Gradient Map, October 12, 1992
Plate 4, Groundwater Gradient Map, November 23, 1992
Plate 5, Groundwater Gradient Map, December 16, 1992
Plate 6, TPHg Concentrations In Groundwater, October 12, 1992
Plate 7, Benzene Concentrations In Groundwater, October 12, 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 Depth To Water/Floating Product Survey Results, Summary of Groundwater Monitoring Data, Certified Analytical Reports with Chain of Custody, Water Sample Field Data Sheets

REFERENCES

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.

REFERENCES
(continued)

RESNA. November 21, 1991. Letter Report, Quarterly Groundwater Monitoring Third Quarter 1991 at ARCO Station 374, 6407 Telegraph Avenue, Oakland, California. RESNA 60025-2.

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.

RESNA. August 28, 1992. Letter Report, Quarterly Groundwater Monitoring Second Quarter 1992 at ARCO Station 374, 6407 Telegraph Avenue, Oakland, California. RESNA 60025-7.

RESNA. December 18, 1992. Letter Report, Quarterly Groundwater Monitoring Third Quarter 1992 at ARCO Station 374, 6407 Telegraph Avenue, Oakland, California. RESNA 60025-7.

RESNA. September 23, 1992. Report on Offsite Subsurface Environmental Investigation at ARCO Station 374, 6407 Telegraph Avenue, Oakland, California. RESNA 60035-5.

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

LEGEND

⊙ = Site Location

N

Approximate Scale

2000 1000 0 2000 4000

feet

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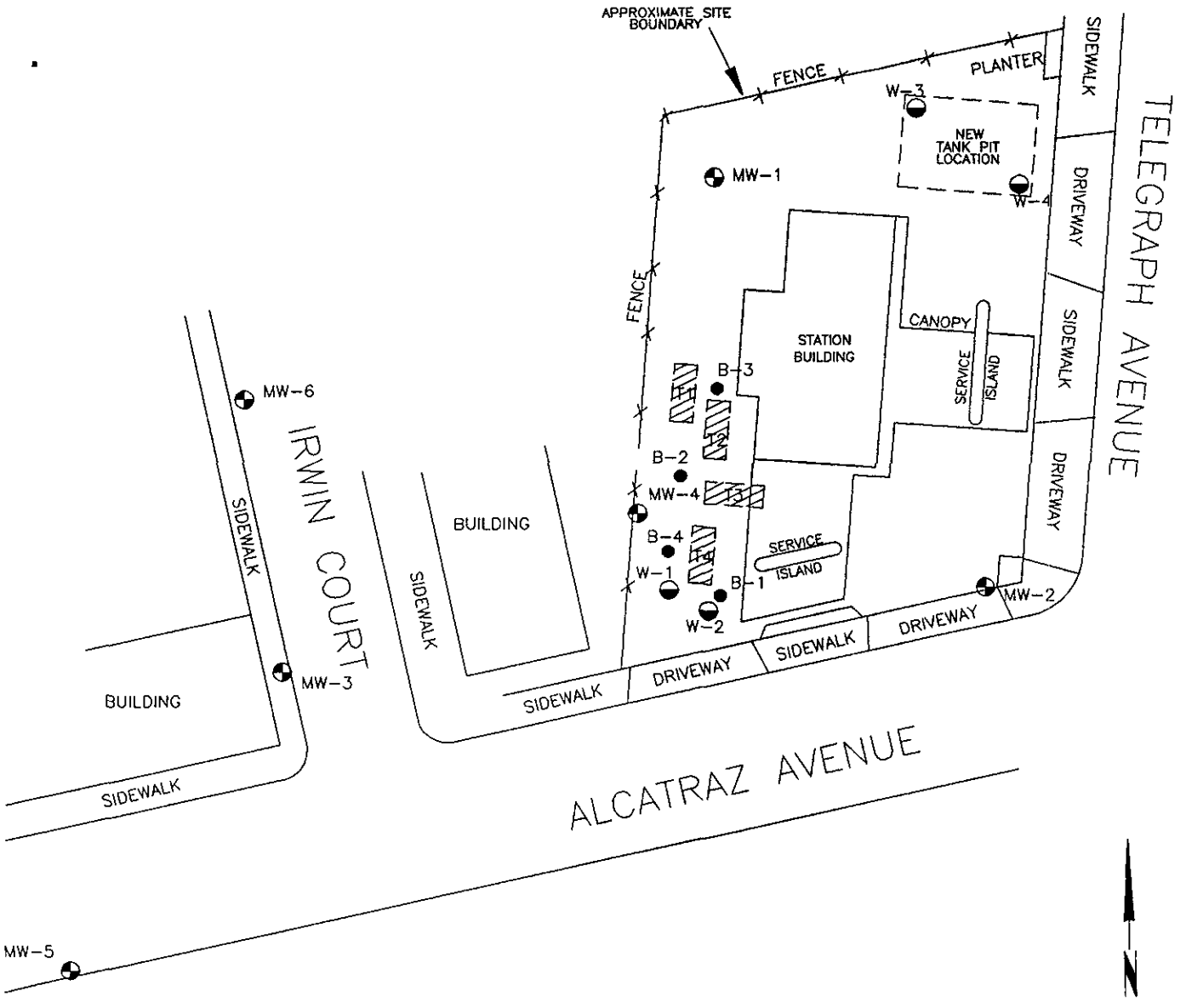
SITE VICINITY MAP
ARCO Station 374
6407 Telegraph Avenue
Oakland, California

PLATE
1



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

40 20 0 40 80

feet

Source: Surveyed by John Koch, Licensed Land Surveyor.

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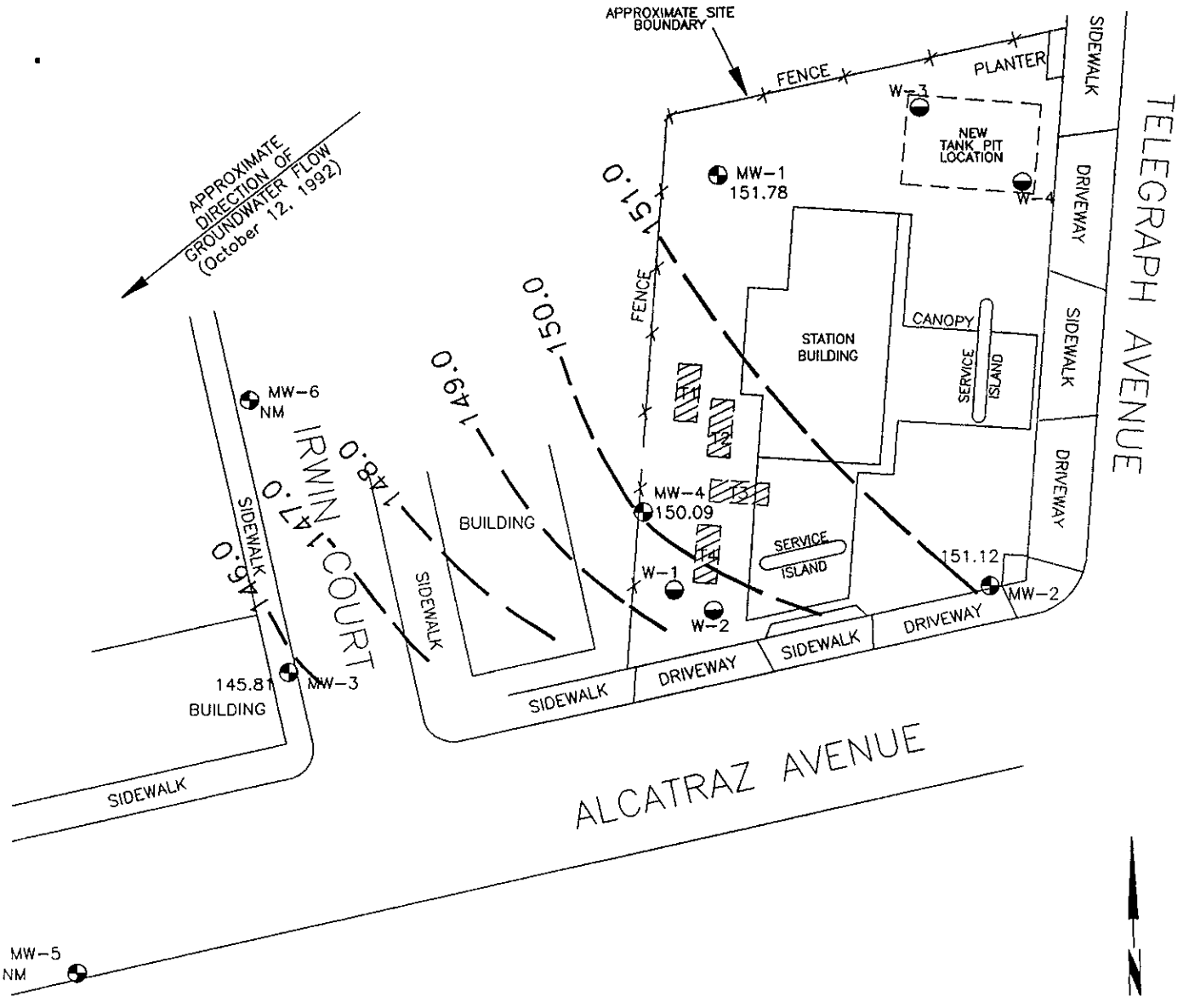
GENERALIZED SITE PLAN
ARCO Station 374
6407 Telegraph Avenue
Oakland, California

PLATE 2



EXPLANATION

151.0 = Line of equal elevation of groundwater in feet above mean sea level (MSL)

151.78 = Elevation of groundwater in feet above MSL October 12, 1992

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

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

= Former underground storage tanks

NM = Not measured on 10/12/92

Approximate Scale

40 20 0 40 80

feet

Source: Surveyed by John Koch, Licensed Land Surveyor.

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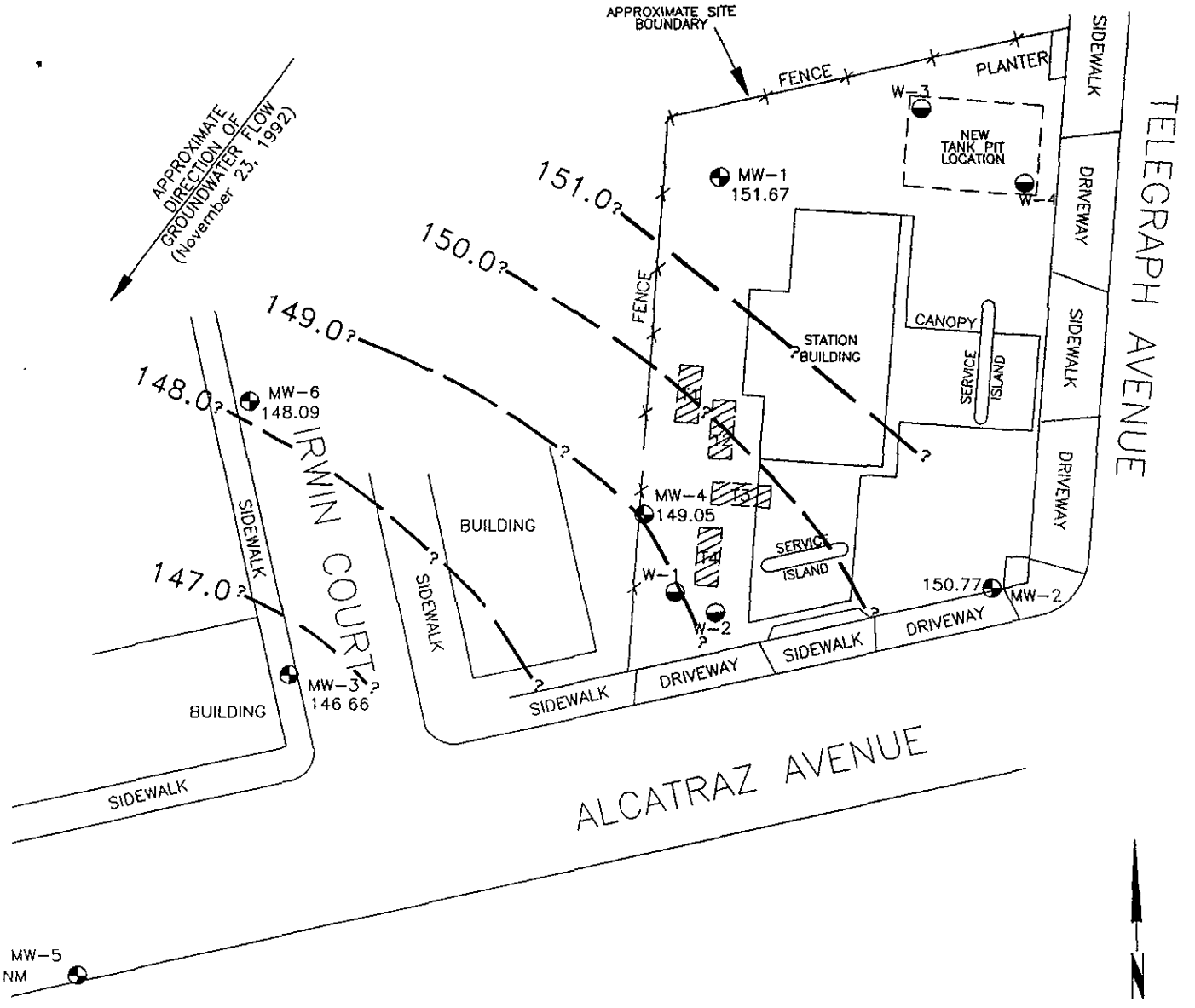
GROUNDWATER GRADIENT MAP
ARCO Station 374
6407 Telegraph Avenue
Oakland, California

PLATE 3



EXPLANATION

151.0 = Line of equal elevation of groundwater in feet above mean sea level (MSL)

151.67 = Elevation of groundwater in feet above MSL November 23, 1992

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

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

= Former underground storage tanks

NM = Not measured on 11/23/92

Approximate Scale

40 20 0 40 80

feet

Source: Surveyed by John Koch, Licensed Land Surveyor.

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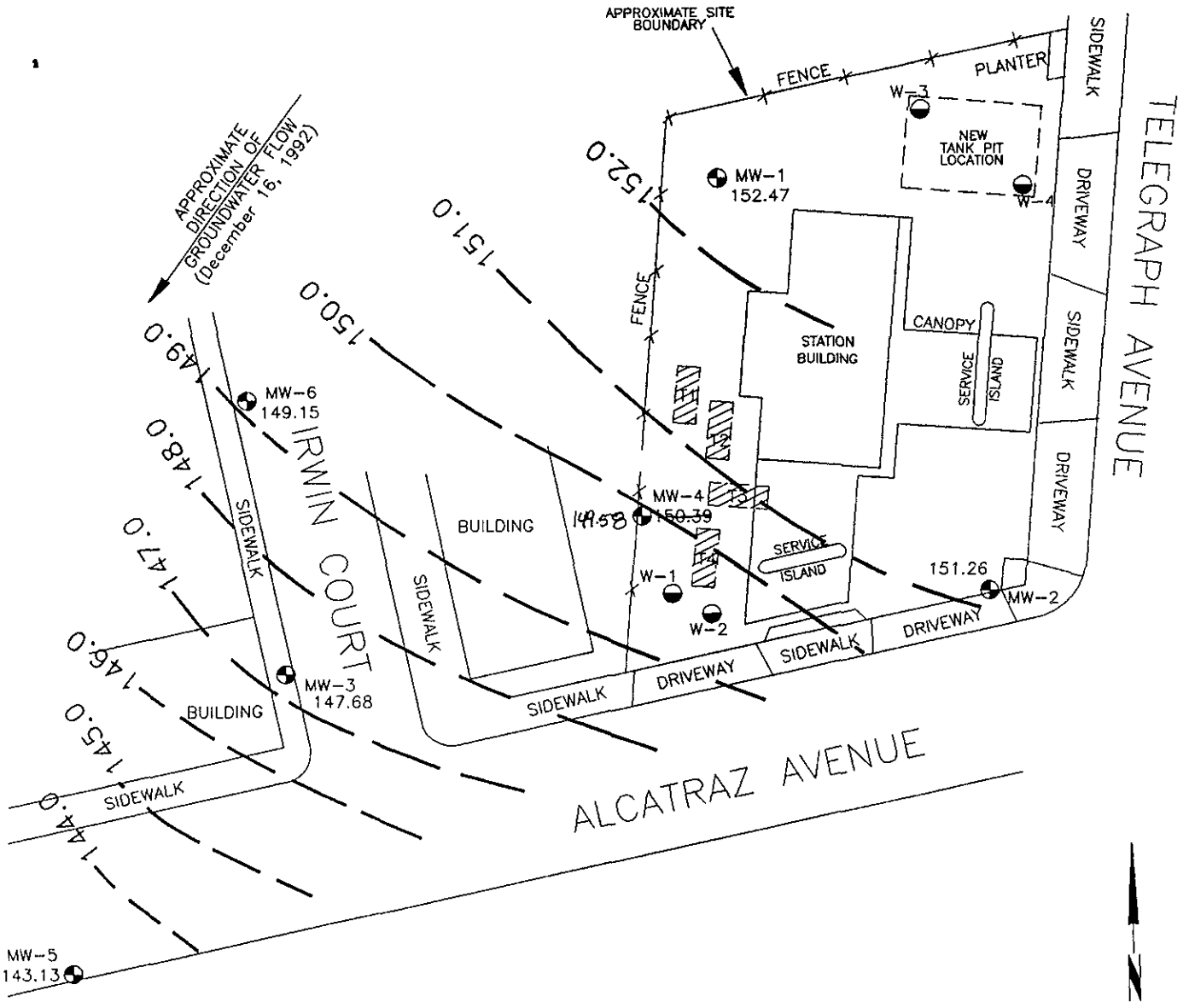
GROUNDWATER GRADIENT MAP
ARCO Station 374
6407 Telegraph Avenue
Oakland, California

PLATE 4



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 December 16, 1992

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

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

= Former underground storage tanks

NM = Not measured on 12/16/92

Approximate Scale

40 20 0 40 80

feet

Source: Surveyed by John Koch, Licensed Land Surveyor

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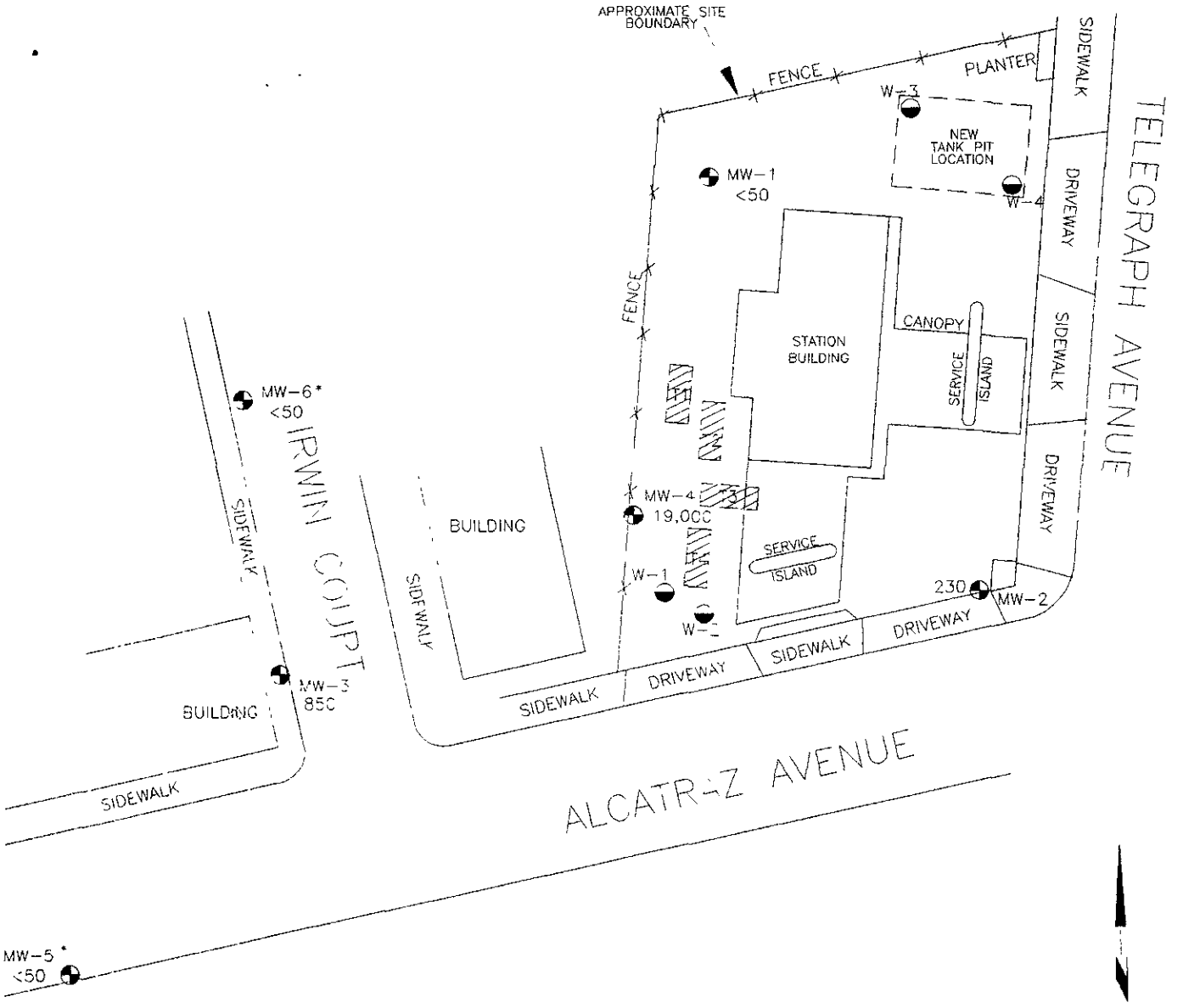
GROUNDWATER GRADIENT MAP
ARCO Station 374
6407 Telegraph Avenue
Oakland, California

PLATE 5



EXPLANATION

19,000 = Concentration of TPHg in groundwater, in ppb, October 12, 1992

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

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

= Former underground storage tanks

* = *Sampled on October 25, 1992 due to* obstructed well on October 12, 1992

Approximate Scale

40 20 0 40 80

feet

Source Surveyed by John Koch, Licensed Land Surveyor

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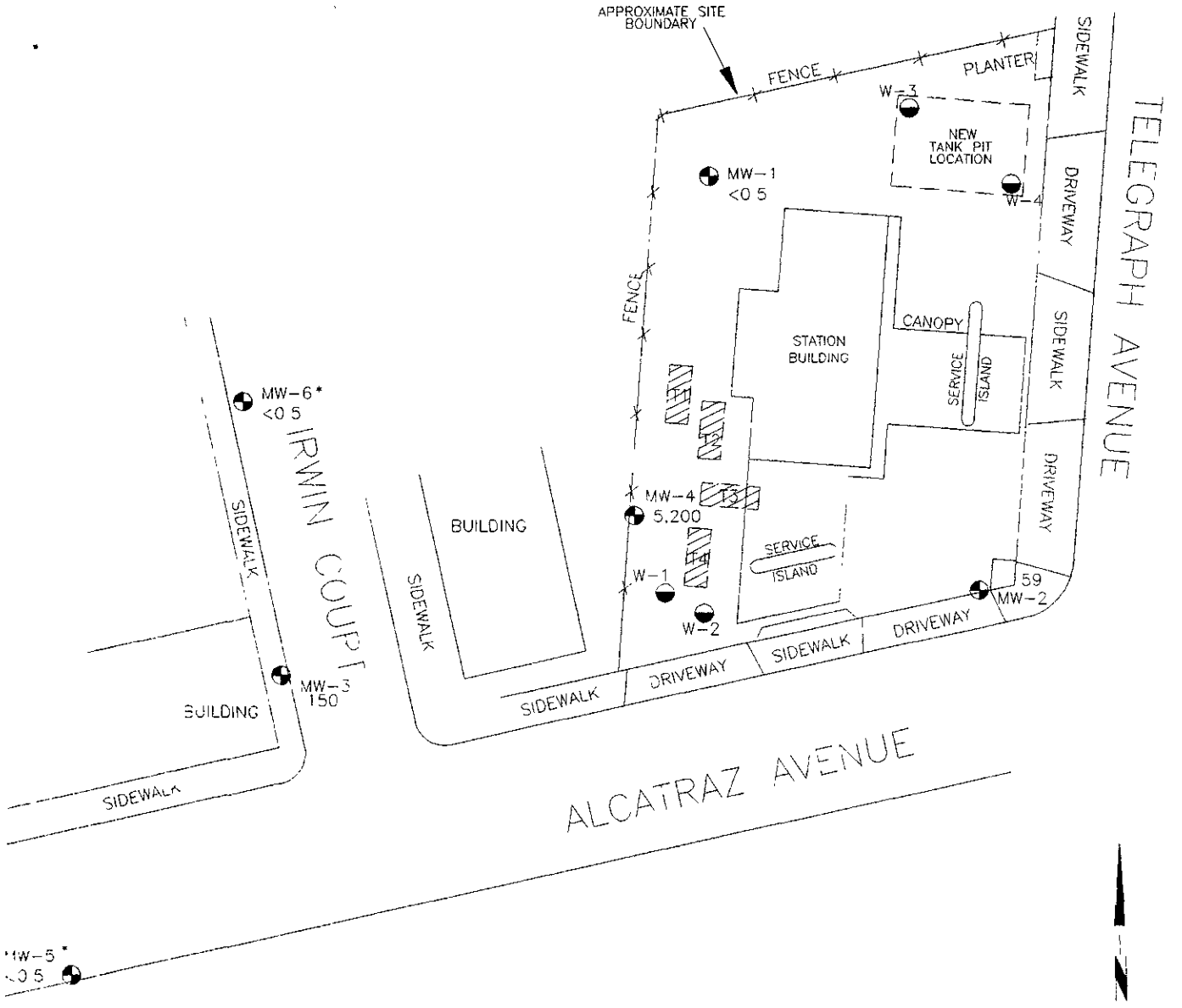
TPHg CONCENTRATIONS IN GROUNDWATER
ARCO Station 374
6407 Telegraph Avenue
Oakland, California

PLATE
6



EXPLANATION

5,200 = Concentration of benzene in groundwater, in ppb, October 12, 1992

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

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

T1 T2 T3 = Former underground storage tanks

* = Sampled on October 25, 1992 due to obstructed well on October 12, 1992

Approximate Scale

40 20 0 40 80

feet

Source Surveyed by John Koch, Licensed Land Surveyor

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

PLATE
7

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Quarterly Groundwater Monitoring
ARCO Station 374, Oakland, California

March 9, 1993
60025.10

TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 374
Oakland, California
(Page 1 of 4)

Date Well Measured	Well Elevation	Depth to Water	Water Elevation	Floating Product
MW-1				
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
07/14/92		8.22	150.69	None
08/07/92		8.46	150.45	None
09/22/92		6.76	152.15	None
10/12/92		7.13	151.78	None
11/23/92		7.24	151.67	None
12/16/92		6.44	152.47	None
MW-2				
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

See notes on page 4 of 4

TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 374
Oakland, California
(Page 2 of 4)

Date Well Measured	Well Elevation	Depth to Water	Water Elevation	Floating Product
MW-2 cont				
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
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
07/14/92		8.33	149.59	None
08/07/92		8.42	149.50	None
09/22/92		6.13	151.79	None
10/12/92		6.80	151.12	None
11/23/92		7.15	150.77	None
12/16/92		6.66	151.26	None
MW-3				
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

See notes on page 4 of 4

TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 374
Oakland, California
(Page 3 of 4)

Date Well Measured	Well Elevation	Depth to Water	Water Elevation	Floating Product
MW-3 cont				
06/16/92		7.51	146.13	None
07/14/92		7.60	146.04	None
08/07/92		7.85	145.79	None
09/22/92		7.73	145.91	None
10/12/92		7.83	145.81	None
11/23/92		6.98	146.66	None
12/16/92		5.96	147.68	None
MW-4				
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
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
07/14/92		8.21	148.32	None
08/07/92		8.41	148.12	None
09/22/92		6.14	150.39	None
10/12/92		6.45	150.08	None
11/23/92		7.48	149.05	None
12/16/92		6.95	149.58	None

See notes on page 4 of 4

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Quarterly Groundwater Monitoring
ARCO Station 374, Oakland, California

March 9, 1993
60025.10

TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 374
Oakland, California
(Page 4 of 4)

Date Well Measured	Well Elevation	Depth to Water	Water Elevation	Floating Product
MW-5				
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
07/14/92		9.70	141.63	None
08/07/92		9.10	142.23	None
09/22/92		9.26	142.07	None
10/25/92#		9.24	142.09	None
11/23/92			Well Inaccessible	
12/16/92		8.20	143.13	None
MW-6				
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
07/14/92		6.08	147.76	None
08/07/92		6.36	147.48	None
09/22/92		6.53	147.31	None
10/25/92#		6.54	147.30	None
11/23/92		5.75	148.09	None
12/16/92		4.69	149.15	None

Notes:
Elevations and DTW measured in feet.
* = Floating Product.
** = Wellheads surveyed by John E. Koch on April 27, 1992. Well elevation datum is mean sea level (MSL).
# = Wells inaccessible on 10/12/92 due to parked cars. EMCON returned and sampled on 10/25/92.

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
MW-1							
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
07/14/92	<50	NA	<0.5	0.7	<0.5	1.3	NA
10/12/92	<50	NA	<0.5	<0.5	<0.5	<0.5	NA
MW-2							
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
07/14/92	160	NA	46	1.4	1.2	3.5	NA
10/12/92	230	NA	59	7.0	5.5	11	NA
MW-3							
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

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
MW-3 cont							
03/10/92	1,200	NA	200	110	53	130	NA
04/15/92	1,600	NA	200	13	110	81	NA
07/14/92	5,200	NA	620	44	310	250	NA
10/12/92	850	NA	150	5.2	55	46	NA
MW-4							
07/21/89	8,700	NA	720	360	120	640	NA
8/30/89	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
07/14/92	10,000	NA	2,900	530	290	930	NA
10/12/92	19,000	690*	5,200	1,600	490	1,800	NA
MW-5							
04/15/92	<50	NA	<0.5	<0.5	<0.5	<0.5	NA
07/14/92	<50	NA	<0.5	<0.5	<0.5	<0.5	NA
10/25/92	<50	NA	<0.5	<0.5	<0.5	<0.5	NA
MW-6							
04/15/92	<50	NA	<0.5	<0.5	<0.5	<0.5	NA
07/15/92	<50	NA	<0.5	<0.5	<0.5	<0.5	NA
10/25/92	<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 using EPA method 5030/8015.
TPHd: Total petroleum hydrocarbons as diesel using EPA method 3510/8015.
BTEX: B: Benzene, T: Toluene, E: Ethylbenzene, X: Total Xylene isomers; measured using EPA method 8020/602.
TOG: Total oil and grease measured using Standard Method 5520 B/F.
<: Results reported as less than the detection limit.
NA: Not analyzed
*: The sample contains a lower boiling point hydrocarbon mixture quantitated as diesel. The chromatogram does not match the typical diesel fingerprint.
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)
MW-4						
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
07/14/92	NA	NA	NA	NA	NA	NA
10/12/92	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

6025.10

EMCON ASSOCIATES
Consultants in Wastes Management and Environmental Control

Date December 31, 1992
Project 0G70-004.01

To:
Mr. Joel Coffman
RESNA/ Applied Geosystems
3315 Almaden Expressway, Suite 34
San Jose, California 95118

We are enclosing:

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

For your: X Information Sent by: X Mail

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

Reviewed by:

REGISTERED PROFESSIONAL ENGINEER ROBERT CURTIS PORTER No. 4984 Exp. 6/30/96 INDUSTRIAL STATE OF CALIFORNIA

Jim Butera JB

Robert C Porter

Robert Porter, Senior Project Engineer.

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

FIELD REPORT
DEPTH TO WATER / FLOATING PRODUCT SURVEY

PROJECT # : 0G70-004.01 STATION ADDRESS : 6407 Telegraph Hill, Oakland, CA DATE : 12/16/92

ARCO STATION # : 374 FIELD TECHNICIAN : Steve Horton DAY : Wednesday

DTW Order	WELL ID	Well Box Seal	Well Lid Secure	Gasket	Lock	Locking Well Cap	FIRST DEPTH TO WATER (feet)	SECOND DEPTH TO WATER (feet)	DEPTH TO FLOATING PRODUCT (feet)	FLOATING PRODUCT THICKNESS (feet)	WELL TOTAL DEPTH (feet)	COMMENTS
1	**MW-5**	good	yes	na	D464	yes	8.20	8.19	ND	ND	23.1	—
2	**MW-6**	good	yes	na	C464	yes	4.69	4.69	ND	ND	14.6	water in box
3	**MW-1**	good	yes	na	C909	yes	6.44	6.44	ND	ND	26.8	
4	**MW-2**	good	yes	na	3259	yes	6.66	6.66	ND	ND	25.3	—
5	**MW-3**	good	yes	na	3259	yes	5.96	5.96	ND	ND	26.8	straw cdcr
6	**MW-4**	good	yes	na	3259	yes	6.95	6.95	ND	ND	26.6	cracked div. lid straw cdcr

WELL SURVEY POINTS ARE TOP OF CASING

6 0 C 2 5. 1 6

EMCON ASSOCIATES
Consultants in Wastes Management and Environmental Control

Date December 3, 1992
Project 0G70-004.01

To:
Mr. Joel Coffman
RESNA/ Applied Geosystems
3315 Almaden Expressway, Suite 34
San Jose, California 95118

We are enclosing:

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

For your: X Information Sent by: X Mail

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

Reviewed by:

6/30/96

Jim Butera JB

Robert Porter, Senior Project Engineer.

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

FIELD REPORT
DEPTH TO WATER / FLOATING PRODUCT SURVEY

PROJECT # : 0G70-004.01 STATION ADDRESS : 6407 Telegraph Hill, Oakland, CA DATE : 11/23/92

ARCO STATION # : 374 FIELD TECHNICIAN : IG/MG DAY : MONDAY

DTW Order	WELL ID	Well Box Seal	Well Lid Secure	Gasket	Lock	Locking Well Cap	FIRST DEPTH TO WATER (feet)	SECOND DEPTH TO WATER (feet)	DEPTH TO FLOATING PRODUCT (feet)	FLOATING PRODUCT THICKNESS (feet)	WELL TOTAL DEPTH (feet)	COMMENTS
1	**MW-5**	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	CAR ON WELL
2	**MW-6**	OK	YES	YES	0464	OK	5.95	5.95	ND	NR	14.7	–
3	**MW-1**	OK	YES	YES	0464	OK	7.24	7.24	ND	NR	26.8	~~STRONG ODOR~~
4	**MW-2**	OK	YES	YES	0464	OK	7.15	7.15	ND	NR	26.3	–
5	**MW-3**	OK	YES	YES	0464	OK	6.98	6.98	ND	NR	26.8	STRONG ODOR
6	**MW-4**	OK	YES	YES	0464	OK	7.48	7.45	ND	NR	26.6	LID OPEN (NEEDS NEW LID CAP OFF

WELL SURVEY POINTS ARE TOP OF CASING

6 0025.10

RECEIVED

NOV 15 1992

RESNA
SAN JOSE

EMCON ASSOCIATES
Consultants in Wastes Management and Environmental Control

Date November 12, 1992
Project 0G70-004.01

To:
Mr. Joel Coffman
RESNA/ Applied Geosystems
3315 Almaden Expressway, Suite 34
San Jose, California 95118

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
10	Water Sample Field Data Sheets

For your: X Information Sent by: X Mail

Comments:

Enclosed are the data from the fourth quarter 1992 monitoring event at ARCO service station 374, 6407 Telegraph Avenue, Oakland, CA. Note wells MW-5 and MW-6 were sampled later in the month due to well access problems. Groundwater monitoring is conducted consistent with applicable regulatory guidelines. Please call if you have any questions: (408) 453-2266.

Reviewed by:

Jim Butera JB

Robert Porter, Senior Project Engineer.

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

FIELD REPORT
DEPTH TO WATER / FLOATING PRODUCT SURVEY

PROJECT # : 0G70-004.01 STATION ADDRESS : 6407 Telegraph Hill, Oakland, CA DATE : October 12, 1992

ARCO STATION # : 374 FIELD TECHNICIAN : Steve Horton DAY : Monday

DTW Order	WELL ID	Well Box Seal	Well Lid Secure	Gasket	Lock	Locking Well Cap	FIRST DEPTH TO WATER (feet)	SECOND DEPTH TO WATER (feet)	DEPTH TO FLOATING PRODUCT (feet)	FLOATING PRODUCT THICKNESS (feet)	WELL TOTAL DEPTH (feet)	COMMENTS
1	MW-5	good	yes	na	3259	yes	* 9.25	9.35	ND	ND	23.1	well covered by car on 10/14-15
2	MW-6	good	yes	na	3259	yes	* 6.54	6.54	ND	ND	14.6	well covered by car on 10/12-13
3	MW-1	good	yes	na	3259	yes	7.13	7.13	ND	ND	26.8	—
4	MW-2	good	yes	na	3259	yes	6.80	6.80	ND	ND	26.3	—
5	MW-3	good	yes	na	3259	yes	7.83	7.83	ND	ND	26.8	—
6	MW-4	good	no	na	3259	yes	6.44	6.45	ND	ND	26.6	broken diversified lid
												* wells (~~Thursday~~) sampled on 10/25/92 due to access problems.

WELL SURVEY POINTS ARE TOP OF CASING

Summary of Groundwater Monitoring Data
Fourth 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)	Ethyl-benzene (ppb)	Total Xylenes (ppb)	TPH as Diesel (ppb)
MW-1(26)	10/12/92	7.13	ND.[2]	<50	<0.5	0.5	<0.5	0.5	NR.[3]
MW-2(26)	10/12/92	6.80	ND.	230.	59.	7.0	5.5	11.	NR.
MW-3(26)	10/12/92	7.83	ND.	850.	150.	5.2	55.	46.	NR.
MW-4(26)	10/12/92	6.44	ND.	19,000.	5,200.	1,600.	490.	1,800.	690.
MW-5(22)	10/25/92	9.25	ND.	<50	<0.5	<0.5	<0.5	<0.5	NR.
MW-6(13)	10/25/92	6.54	ND.	<50	<0.5	<0.5	<0.5	<0.5	NR.
FB-1[4]	10/12/92	NA.[5]	NA.	<50	<0.5	<0.5	<0.5	<0.5	NR.

1. TPH. = Total petroleum hydrocarbons
2. ND. = Not detected
3. NR. = Not reported, well was not scheduled for sample of the above parameter
4. FB. = Field blank
5. NA. = Not applicable

Columbia Analytical Services, Inc.

October 26, 1992

Jim Butera
EMCON Associates
1921 Ringwood Avenue
San Jose, CA 95131

Re: EMCON Project No. 0G70-004.01
Arco Facility No. 374

Dear Mr. Butera:

Enclosed are the results of the water samples submitted to our lab on October 13, 1992. For your reference, our service request number for this work is SJ92-1266.

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

Please call if you have any questions.

Respectfully submitted:

COLUMBIA ANALYTICAL SERVICES, INC.

Keoni A. Murphy
Laboratory Manager

Annelise J. Bazar
Regional QA Coordinator

KAM/ajb

1921 Ringwood Avenue • San Jose, California 95131 • Telephone 408/437-2400 • Fax 408/437-9356

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Associates	**Date Received:**	10/13/92
Project:	EMCON Project No. 0G70-004.01	**Date Extracted:**	10/19/92
	ARCO Facility No. 374	**Date Analyzed:**	10/20/92
Sample Matrix:	Water	**Work Order #:**	SJ92-1266

TPH as Diesel
EPA Method 3510/California DHS LUFT Method
µg/L (ppb)

Sample Name	MRL	TPH as Diesel
MW-4 (26)	50	690. *
Method Blank	50	ND

MRL Method Reporting Limit
TPH Total Petroleum Hydrocarbons
ND None Detected at or above the method reporting limit
***** The sample contains a lower boiling point hydrocarbon mixture quantitated as diesel. The chromatogram does not match the typical diesel fingerprint.

Approved by: Kenneth Murphy Date: October 26, 1992

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Associates	**Date Received:**	10/13/92
Project:	EMCON Project No. 0G70-004.01	**Work Order No.:**	SJ92-1266
	ARCO Facility No. 374	**Sample Matrix:**	Water

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

Sample Name:		MW-1 (26)	MW-2 (26)	MW-3 (26)
Date Analyzed:		10/15/92	10/15/92	10/16/92
Analyte	**MRL**			
Benzene	0.5	ND	59.	150.
Toluene	0.5	ND	7.0	5.2
Ethylbenzene	0.5	ND	5.5	55.
Total Xylenes	0.5	ND	11.	46.
TPH as Gasoline	50	ND	230.	850.

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

Approved by: Kevin A Murphy Date: October 26, 1992

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Associates	**Date Received:**	10/13/92
Project:	EMCON Project No. 0G70-004.01	**Work Order No.:**	SJ92-1266
	ARCO Facility No. 374	**Sample Matrix:**	Water

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

Sample Name:		MW-4 (26)	FB-1	Method Blank
Date Analyzed:		10/15/92	10/15/92	10/15/92
Analyte	**MRL**			
Benzene	0.5	5,200.	ND	ND
Toluene	0.5	1,600.	ND	ND
Ethylbenzene	0.5	490.	ND	ND
Total Xylenes	0.5	1,800.	ND	ND
TPH as Gasoline	50	19,000.	ND	ND

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

Approved by: Kevin Murphy Date: October 26, 1992

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Associates	**Date Received:**	10/13/92
Project:	EMCON *Project No.* 0G70-004.01	***Work Order No.:***	SJ92-1266
	ARCO Facility No. 374	**Sample Matrix:**	Water

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

Sample Name:		Method Blank
Date Analyzed:		10/16/92
Analyte	**MRL**	
Benzene	0.5	ND
Toluene	0.5	ND
Ethylbenzene	0.5	ND
Total Xylenes	0.5	ND
TPH as Gasoline	50	ND

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

Approved by: Kevin Murphy Date: October 26, 1992

APPENDIX A

LABORATORY QC RESULTS

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON Associates
Project: EMCON Project No. 0G70-004.01
ARCO Facility No. 374

Date Received: 10/13/92
Work Order #: SJ92-1266
Sample Matrix: Water

Initial Calibration Verification
TPH as Diesel
EPA Methods 3510/DHS LUFT Method
mg/L (ppm)

Date Analyzed: 10/20/92

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Criteria
TPH as Diesel	1,000.	1,010.	101.	90-110

TPH Total Petroleum Hydrocarbons

Approved by: Kevin A Murphy Date: October 26, 1992

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON Associates
Project: EMCON Project No. 0G70-004.01
ARCO Facility No. 374

Date Received: 10/13/92
Work Order #: SJ92-1266
Sample Matrix: Water

Surrogate Recovery Summary
TPH as Diesel
EPA Method 3510/DHS LUFT Method

Sample Name	Date Analyzed	Percent Recovery P-Terphenyl
MW-4 (26)	10/20/92	99.
MS	10/20/92	94.
DMS	10/20/92	89.
Method Blank	10/20/92	107.
	CAS Acceptance Criteria	61-121

TPH Total Petroleum Hydrocarbons

Approved by: Kevin A Murphy Date: October 26, 1992

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON Associates
Project: EMCON Project No. 0G70-004.01
ARCO Facility No. 374

Date Received: 10/13/92
Work Order #: SJ92-1266
Sample Matrix: Water

Matrix Spike/Duplicate Matrix Spike Summary
Total Petroleum Hydrocarbons as Diesel
EPA Method 3510/DHS LUFT Method
µg/L (ppb)

Date Analyzed: 10/20/92

			Spike Result		Percent Recovery		
Parameter	Spike Level	Sample Result	MS	DMS	MS	DMS	Acceptance Criteria
Diesel	4,000.	ND	4,140.	3,580.	105.	90.	46-133

ND None Detected at or above the method reporting limit

Approved by: Kevin Murphy Date: October 26, 1992

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON Associates
Project: EMCON Project No. 0G70-004.01
ARCO Facility No. 374

Date Received: 10/13/92
Work Order #: SJ92-1266

Initial Calibration Verification
BTEX and TPH as Gasoline
EPA Methods 5030/8020/DHS LUFT Method
Nanograms

Date Analyzed: 10/15/92

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Criteria
Benzene	250.	275.	110.	85-115
Toluene	250.	283.	113.	85-115
Ethylbenzene	250.	271.	109.	85-115
Total Xylenes	750.	779.	104.	85-115
TPH as Gasoline	2,500.	2,415.	97.	90-110

Date Analyzed: 10/16/92

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Criteria
Benzene	250.	266.	106.	85-115
Toluene	250.	272.	109.	85-115
Ethylbenzene	250.	262.	105.	85-115
Total Xylenes	750.	753.	100.	85-115
TPH as Gasoline	2,500.	2,454.	98.	90-110

TPH Total Petroleum Hydrocarbons

Approved by: Kevin Murphy Date: October 26, 1992

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON Associates	**Date Received:**	10/13/92
Project:	EMCON Project No. 0G70-004.01	**Work Order No.:**	SJ92-1266
	ARCO Facility No. 374	**Sample Matrix:**	Water

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

Sample Name	Date Analyzed	Percent Recovery α,α,α-Trifluorotoluene
MW-1 (26)	10/15/92	107.
MW-2 (26)	10/15/92	106.
MW-3 (26)	10/16/92	104.
MW-4 (26)	10/15/92	108.
FB-1	10/15/92	102.
MS	10/15/92	113.
DMS	10/15/92	121.
Method Blank	10/15/92	100.
Method Blank	10/16/92	101.
	CAS Acceptance Criteria	70-130

TPH Total Petroleum Hydrocarbons

Approved by: Kevin Murphy Date: October 26, 1992

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON Associates	**Date Received:**	10/13/92
Project:	EMCON Project No. 0G70-004.01	**Work Order No.:**	SJ92-1266
	ARCO Facility No. 374	**Sample Matrix:**	Water

Matrix Spike/Duplicate Matrix Spike Summary
TPH as Gasoline
EPA Methods 5030/California DHS LUFT Method
µg/L (ppb)

Date Analyzed: 10/15/92

			Spike Result		Percent Recovery		CAS Acceptance
Analyte	Spike Level	Sample Result	MS	DMS	MS	DMS	Criteria
TPH as Gasoline	250.	ND	258.	260.	103.	104.	70-130

TPH Total Petroleum Hydrocarbons
ND None Detected at or above the method reporting limit

Approved by: Kevin Murphy Date: October 26, 1992

APPENDIX B

CHAIN OF CUSTODY

Columbia Analytical Services, Inc.

November 11, 1992

Jim Butera
EMCON Associates
1921 Ringwood Avenue
San Jose, CA 95131

Re: EMCON Project No. OG70-004.01
Arco Facility No. 374

Dear Mr. Butera:

Enclosed are the results of the water samples submitted to our lab on October 28, 1992. For your reference, our service request number for this work is SJ92-1334.

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

Please call if you have any questions.

Respectfully submitted:

COLUMBIA ANALYTICAL SERVICES, INC.

Carol J Klein for
Keoni A. Murphy
Laboratory Manager

Annelise Jade Bazar
Annelise J. Bazar
Regional QA Coordinator

KAM/ajb

[redacted] • Telephone 408/437-2400 • Fax 408/437-9356

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Associates	**Date Received:**	10/28/92
Project:	EMCON Project No. OG70-004.01	**Work Order No.:**	SJ92-1334
	ARCO Facility No. 374	**Sample Matrix:**	Water

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

Sample Name:		MW-5 (22)	MW-6 (13)	Method Blank
Date Analyzed:		11/04/92	11/04/92	11/04/92
Analyte	**MRL**			
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: Carol Klein Date: 11-11-92

APPENDIX A

LABORATORY QC RESULTS

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON Associates
Project: EMCON Project No. OG70-004.01
ARCO Facility No. 374

Date Received: 10/28/92
Work Order No.: SJ92-1334

Initial Calibration Verification
BTEX and TPH as Gasoline
EPA Methods 5030/8020/DHS LUFT Method
Nanograms

Date Analyzed: 11/04/92

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Criteria
Benzene	250.	265.	106.	85-115
Toluene	250.	277.	111.	85-115
Ethylbenzene	250.	264.	106.	85-115
Total Xylenes	750.	793.	106.	85-115
TPH as Gasoline	2,500.	2,315.	93.	90-110

TPH Total Petroleum Hydrocarbons

Approved by: Carol Klein Date: 11-11-92

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON Associates	**Date Received:**	10/28/92
Project:	EMCON Project No. OG70-004.01	**Work Order No.:**	SJ92-1334
	ARCO Facility No. 374	**Sample Matrix:**	Water

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

Sample Name	Date Analyzed	Percent Recovery α,α,α-Trifluorotoluene
MW-5 (22)	11/04/92	86.
MW-6 (13)	11/04/92	86.
MS	11/04/92	93.
DMS	11/04/92	93.
Method Blank	11/04/92	97.
	CAS Acceptance Criteria	70-130

TPH Total Petroleum Hydrocarbons

Approved by: Carol Klein Date: 11-11-92

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON Associates	**Date Received:**	10/28/92
Project:	EMCON Project No. OG70-004.01	**Work Order No.:**	SJ92-1334
	ARCO Facility No. 374	**Sample Matrix:**	Water

Matrix Spike/Duplicate Matrix Spike Summary
BTE
EPA Methods 5030/8020
µg/L (ppb)

Date Analyzed: 11/04/92

			Spike Result		Percent Recovery		CAS Acceptance
Analyte	Spike Level	Sample Result	MS	DMS	MS	DMS	Criteria
Benzene	250.	54.0	314.	340.	104.	114.	39-150
Toluene	250.	157.	418.	434.	103.	110.	46-148
Ethylbenzene	250.	37.0	278.	328.	96.	116.	32-160

Approved by: Carol Klein Date: 11-11-92

APPENDIX B

CHAIN OF CUSTODY

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. EMCG-92-01

Chain of Custody

ARCO Facility no: 374	City (Facility): OAKLAND	Project manager (Consultant): JIM BUTERA	Laboratory name: CAS
ARCO engineer: Kyle Christie	Telephone no. (ARCO): 415 571-2434	Telephone no. (Consultant): 408 453-0719	Fax no. (Consultant): 408-453-0452
Consultant name: EMCON ASSOCIATES	Address (Consultant): 1938 JUNCTION Ave San Jose		Contract number: 07077

Method of shipment: Sampler will deliver

Special detection Limit/reporting: Lowest Possible

Special QA/QC: Normal

Remarks: 2-40ml HCl VOA's; Add: 2-Liter NP

0670-0041

Lab number: SJ92-1266

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: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH EPA M602/8020/8015 GAS	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 ☐ Sem. VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐	
MW-1(26)	1-2	2		X		X	HCl	10/12/92	11:40		X										
MW-2(26)	3-4	2		X		X	HCl	10/12/92	12:30		X										
MW-3(26)	5-6	2		X		X	HCl	10/12/92	13:12		X										
MW-4(26)	7-8	2		X		X	HCl	10/12/92	14:00		X										
MW5( )		2		X		X	HCl				X		No Sample, Car on well								
MW-6( )		2		X		X	HCl				X		No Sample, Car on well								
FB-1	9-10	2		X		X	HCl	10/12/92	11:45												
MW-4(26)	11-12	2		X		X	NP	10/12/92	14:00			X									

Condition of sample: bubble in one VOA for each well, MW-2 MW-4

Temperature received: Cool

Relinquished by sampler: Stan Ware	Date: 10/13/92	Time: 9:50	Received by:
Relinquished by:	Date:	Time:	Received by:
Relinquished by:	Date:	Time:	Received by laboratory: A	Date: 10-13-92	Time: 0950

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

APPC-3292 (2-91)

[redacted]RCO [redacted] Company
Division of AtlanticRichfieldCompany

Task Order No. EMCGC-92-1

Chain of Custody

ARCO Facility no. 374	City (Facility) OAKLAND	Project manager (Consultant) JIM BUTERA	Laboratory name CAS
ARCO engineer Kyle Christie	Telephone no. (ARCO) 571-2434	Telephone no (Consultant) 453-0719 / Fax no. (Consultant) 453-0452	Contract number 07-077
Consultant name EMCON ASSOCIATES		Address (Consultant) 1938 Junction Ave San Jose	

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH GAS EPA M602/8020/8015	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals ☐ VOA ☐ Semi VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐		
MW5 (22)	1-2	2		X		X	HCl	10/25	1000		X											
MW6 (13)	3-4	2		X		X	HCl	10/25	0935		X											

Method of shipment: Sampler will deliver

Special detection Limit/reporting: Lowest possible

Special QA/QC: As Normal

Remarks: 2-40ml VOA's

0G70-004.01

Lab number: SJ92-1334

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

Condition of sample: OK

Temperature received: cool

Relinquished by	Date	Time	Received by	Date	Time
Relinquished by sampler: L Rath	10/25	1800	Received by: J Btu[illegible]	10/25	
Relinquished by: M Adler	10.28.92	0830	Received by: [signature]	10-28-92	8:30
Relinquished by			Received by laboratory		

Distribution: White copy — Laboratory; Canary copy — ARCO Environmental Engineering, Pink copy — Consultant
APPC-3292 (2-91)

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 2676.004.01 SAMPLE ID: MW-1

PURGED BY: S. Horton CLIENT NAME: ARCO #374

SAMPLED BY: S. Horton LOCATION: Oakland, CA

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

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

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 12.9C

DEPTH TO WATER (feet): 7.13 CALCULATED PURGE (gal.): 64.5

DEPTH OF WELL (feet): 26.8 ACTUAL PURGE VOL. (gal.): 41 C

DATE PURGED: 10/12/92 Start (2400 Hr) 11:1C End (2400 Hr) 11:22

DATE SAMPLED: 10/12/92 Start (2400 Hr) 11:3C End (2400 Hr) 11:4C

TIME (2400 Hr)	VOLUME (gal)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
11:15	13.0	6.84	955	71.1	clear	trace
11:19	26.C	6.52	946	69.4	cldcau	slight
11:22	39.0	6.61	962	68.7	brown	moderate
		Well Dried At 41 C Gallons				
11:4C	recharge	6.51	934	67.5	brown	moderate

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

COLOR (COBALT 0 - 100): NR

TURBIDITY (NTU 0 - 200): NR

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

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: Good LOCK #: 3259

REMARKS: DTW prior to sampling @ 11:35 = 23.47

Meter Calibration: Date: 10/12/92 Time: ___ Meter Serial #: 9264 Temperature °F: ___

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

Location of previous calibration: MW-5

Signature: Steve Horton Reviewed By: JB Page 1 of 8

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 6670-004.01 SAMPLE ID: MW-2

PURGED BY: S. Horton CLIENT NAME: ARCO #374

SAMPLED BY: S. Horton LOCATION: Oakland, CA

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

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

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 12.79

DEPTH TO WATER (feet): 6.80 CALCULATED PURGE (gal.): 63.96

DEPTH OF WELL (feet): 26.3 ACTUAL PURGE VOL. (gal.): 62.0

DATE PURGED: 10/12/92 Start (2400 Hr) 11:59 End (2400 Hr) 12:22

DATE SAMPLED: 10/12/92 Start (2400 Hr) 12:29 End (2400 Hr) 12:30

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
12:01	13.0	6.67	823	72.8	clear	trace
12:07	26.0	6.72	878	72.5	clear	trace
12:16	39.0	6.72	917	71.6	clear	trace
12:22	52.0	6.77	851	70.7	clear	trace
		Well Dried At 62.0 Gallons				
12:30	recharge	6.69	854	69.8	clear	trace

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

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

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

WELL INTEGRITY: Good LOCK #: 3259

REMARKS: DTW prior to sampling at 12:25 = 16:43

Meter Calibration: Date: 10/12/92 Time: ___ Meter Serial #: 9204 Temperature °F: ___

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

Location of previous calibration: MW-5

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

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: CG70-CC4.C1 | SAMPLE ID: MW-3

PURGED BY: S. Horton | CLIENT NAME: ARCO #374

SAMPLED BY: S. Horton | LOCATION: Oakland, CA

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

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

CASING ELEVATION (feet/MSL):	NR	VOLUME IN CASING (gal.):	12.44
DEPTH TO WATER (feet):	7.83	CALCULATED PURGE (gal.):	62.22
DEPTH OF WELL (feet):	26.9	ACTUAL PURGE VOL. (gal.):	32.5

DATE PURGED: 10/12/92 | Start (2400 Hr) 12:50 | End (2400 Hr) 13:01

DATE SAMPLED: 10/12/92 | Start (2400 Hr) 13:11 | End (2400 Hr) 13:12

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
12:55	12.5	6.81	682	68.5	clear	trace
12:57	25.0	6.57	714	67.6	clear	trace
13:01	———	Well Dried At 32.5 Gallons			———	———
13:10	recharge	6.51	722	67.9	clear	trace
———	———	———	———	———	———	———

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): N/R

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: Good | LOCK #: 3259

REMARKS: DTW prior to sampling @ 13:10 = 24.05

Meter Calibration: Date: 10/12/92 Time: ___ Meter Serial #: 9204 Temperature °F: ___

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

Location of previous calibration: MW-5

Signature: [signature] | Reviewed By: JB | Page 3 of 8

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: CG70-CC4.01 SAMPLE ID: MW-4

PURGED BY: S.Horton CLIENT NAME: ARCO # 374

SAMPLED BY: S.Horton LOCATION: Oakland, CA

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

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

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 13.21

DEPTH TO WATER (feet): 6.45 CALCULATED PURGE (gal.): 66.09

DEPTH OF WELL (feet): 26.6 ACTUAL PURGE VOL. (gal.): 38.5

DATE PURGED: 10/12/92 Start (2400 Hr) 13:40 End (2400 Hr) 13:47

DATE SAMPLED: 10/12/92 Start (2400 Hr) 13:59 End (2400 Hr) 14:00

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
13:41	13.5	6.34	1840	72.0	clear	trace
13:43	27.0	6.40	1822	70.7	cloudy	slight
13:47	~~28.5~~	Well Dried At 38.5 Gallons				
14:00	recharge	6.49	1615	68.8	cloudy	slight

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

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

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

WELL INTEGRITY: Good LOCK #: 3259

REMARKS: DTW prior to sampling @ 13:57 = 20.97

Meter Calibration: Date: 10/12/92 Time: ___ Meter Serial #: 9204 Temperature °F: ___

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

Location of previous calibration: MW-5

Signature: [signature] Reviewed By: JB Page 4 of 8

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: OG70-004.01 SAMPLE ID: MW-5

PURGED BY: S. Horton CLIENT NAME: ARCO #374

SAMPLED BY: S. Horton LOCATION: Oakland, CA

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

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

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

DEPTH TO WATER (feet): ___ CALCULATED PURGE (gal.): ___

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

DATE PURGED: ~~10/12/92~~ NA Start (2400 Hr) ___ End (2400 Hr) ___

DATE SAMPLED: ~~10/12/92~~ NA Start (2400 Hr) ___ End (2400 Hr) ___

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
		NA				

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

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): ~~FB-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: Good LOCK #: 3259

REMARKS: No Sample, Car Parked on well
Well Sampled 10/25/92

Meter Calibration: Date: 10/12/92 Time: 10:31 Meter Serial #: 92C4 Temperature °F: 72.8

(EC 1000 940 / 1000) (DI ___) (pH 7 6.83 / 7.00) (pH 10 9.72 / 10.00) (pH 4 4.00 / ___)

Location of previous calibration: ___

Signature: Stuart Horton Reviewed By: JB Page 5 of 8

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 0G70-004.01 SAMPLE ID: MW-5 (22)

PURGED BY: L. RATH CLIENT NAME: ARCO 374

SAMPLED BY: L. RATH LOCATION: Oakland

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

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

CASING ELEVATION (feet/MSL):	NR	VOLUME IN CASING (gal.):	9.09
DEPTH TO WATER (feet):	9.24	CALCULATED PURGE (gal.):	45.46
DEPTH OF WELL (feet):	23.1 / 13.86	ACTUAL PURGE VOL. (gal.):	30.0

DATE PURGED: 10-25-92 Start (2400 Hr) 0945 End (2400 Hr) 0959

DATE SAMPLED: 10-25-92 Start (2400 Hr) 1000 End (2400 Hr) ___

TIME (2400 Hr)	VOLUME (gal)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
0949	9.5	6.72	783	67.2	Brown	Heavy
0953	19.0	6.89	794	67.6	Brown	Heavy
0957	28.5	6.90	788	67.4	Brown	Heavy
0959	Well Dried at	30 gal				
1000	Recharge	7.09	744	66.4	Brown	Heavy

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: good LOCK #: 3259

REMARKS: well Dried at 30 gal

Meter Calibration: Date: 10-25-92 Time: 0900 Meter Serial #: 5516 Temperature °F: ___

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

Location of previous calibration: MW-6

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

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: CG7C-CC4.C1 SAMPLE ID: MW-6

PURGED BY: S.Horton CLIENT NAME: ARCC #374

SAMPLED BY: S.Horton LOCATION: Oakland, CA

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

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

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

DEPTH TO WATER (feet): ___ CALCULATED PURGE (gal.): ___

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

DATE PURGED: 10/12/92 NA Start (2400 Hr) ___ End (2400 Hr) ___

DATE SAMPLED: 10/12/92 NA Start (2400 Hr) ___ End (2400 Hr) ___

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
			NA			

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

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

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

WELL INTEGRITY: Good LOCK #: 3259

REMARKS: No Sample, Car Parked on well
well Sampled 10/25/92

Meter Calibration: Date: 10/12/92 Time: ___ Meter Serial #: 9204 Temperature °F: ___

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

Location of previous calibration: MW-5

Signature: [signature] Reviewed By: JB Page 7 of 8

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 0G70-004.01 SAMPLE ID: MW-6 (13)

PURGED BY: L.RATH CLIENT NAME: ARCO 374

SAMPLED BY: L.RATH LOCATION: Oakland

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

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

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 5.28

DEPTH TO WATER (feet): 6.54 CALCULATED PURGE (gal.): 26.43

DEPTH OF WELL (feet): 14.6 8.06 ACTUAL PURGE VOL. (gal.): 15.0

DATE PURGED: 10-25-92 Start (2400 Hr) 0910 End (2400 Hr) 0922

DATE SAMPLED: 10-25-92 Start (2400 Hr) 0935 End (2400 Hr) —

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
0917	5.5	6.64	773	67.2	Brown	Heavy
0920	11.0	6.73	697	67.9	Brown	Heavy
0922	well Dried at ~~15~~ 15 gal			66.8		
0935	Recharge	6.61	681	66.8	Brown	Heavy

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

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

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
✓ 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: good LOCK #: 3259

REMARKS: white car parked over well
Well Dried at ~~15~~ 15 gal at 0922 HRS

Meter Calibration: Date: 10-25-92 Time: 0900 Meter Serial #: 5516 Temperature °F: 67.2

(EC 1000 1021 / 1000) (DI 1945) (pH 7 7.02 / 7.00) (pH 10 10004 / 10.09) (pH 4 3.96 / ___)

Location of previous calibration: ___

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