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TO: Mr. Barney Chan
Alameda County Health
Care Services Agency
80 Swan Way, Room 200
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DATE: April 20, 1994
PROJECT NUMBER: 69038.15
SUBJECT: ARCO Station 4494

FROM: Erin D. Krueger

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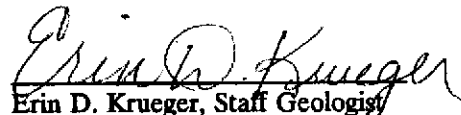
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REMARKS:

Copies: 1 to RESNA project file no. 69038.15


Erin D. Krueger, Staff Geologist

cc: Mr. Michael Whelan, ARCO
Mr. Richard Hiatt, RWQCB

3315 Almaden Expressway, Suite 34
San Jose, CA 95118
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LETTER REPORT
QUARTERLY GROUNDWATER MONITORING
First Quarter 1994
at
ARCO Station 4494
566 Hegenberger Road
Oakland, California

69038.15

3315 Almaden Expressway, Suite 34
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April 19, 1994

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

Subject: Letter Report, Quarterly Groundwater Monitoring
First Quarter 1994
ARCO Station 4494
566 Hegenberger Road, Oakland, California.

Mr. Whelan:

As requested by ARCO Products Company (ARCO), RESNA Industries Inc. (RESNA) presents this letter report summarizing the results of First Quarter 1994 Groundwater Monitoring performed by Integrated Wastestream Management Inc. (IWM) of Milpitas, California at the above-referenced site (Plates 1 and 2). RESNA's scope of work was to interpret field and laboratory analytical data, which included evaluating trends in hydrocarbon concentrations in the local groundwater, the groundwater gradient, and direction of groundwater flow beneath the site. Evaluation and warrant of IWM's field procedures, field data, and field protocols, is beyond RESNA's scope of work. Previous environmental work at the site is summarized in RESNA reports cited in the Reference section.

GROUNDWATER MONITORING

Field Work

IWM field personnel were onsite February 21 and 22, 1994 to measure depth to water (DTW) levels, perform subjective analysis for the presence of product in groundwater, and perform quarterly sampling of wells MW-1, MW-3 through MW-7, and RW-1.

Laboratory Analyses

Water samples were analyzed by Columbia Analytical Services, Inc., located in San Jose, California (Hazardous Waste Testing Laboratory Certification No. 1426) for benzene, toluene, ethylbenzene, and total xylenes (BTEX), and total petroleum hydrocarbons as gasoline (TPHg) using Environmental Protection Agency (EPA) Methods 5030/8020/California DHS LUFT Method. The chain of custody records and laboratory analysis reports are included in Appendix A.

Results of Groundwater Monitoring

Groundwater elevations rose average of about 1.01 feet in wells MW-1, and MW-3 through MW-7 since the last quarter. Evidence of floating product or product sheen was not noted in any of the wells during this quarter. Based on February 21, 1994, DTW data, groundwater is interpreted to flow toward the north-northwest with a gradient of approximately 0.01 ft/ft (Plate 3). Groundwater monitoring data from this and previous quarters is presented in Table 1. The results of IWM's field work on the site, are presented in Appendix A.

The following trends in hydrocarbon concentrations have been identified since the last quarter: concentrations of TPHg and benzene have remained not detected in wells MW-1, and MW-3 through MW-7 (Plate 4). Well RW-1 was not sampled last quarter so no trend could be evaluated. Cumulative analytical results of water samples are presented in Table 2.

Previous and Future Work

First Quarter 1994

- Submitted Letter Report, Quarterly Groundwater Monitoring, Fourth Quarter 1993 to ARCO and regulatory agencies.
- Performed First Quarter 1994 Groundwater Monitoring.
- Redeveloped well RW-1 to remove accumulated sediments, and constructed a 2-inch diameter well inside well RW-1.
- Replaced the well boxes on offsite wells MW-5 and MW-6, and reset the well box on onsite well MW-3.

Second Quarter 1994

- Submit Letter Report, Quarterly Groundwater Monitoring, First Quarter 1994 to ARCO and regulatory agencies.
- Perform Second Quarter 1994 Groundwater Monitoring.

Reporting Requirements

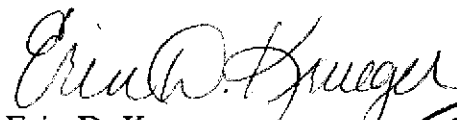
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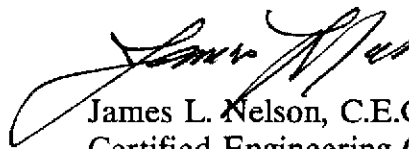
Mr. Barney Chan
Alameda County Health Care Services Agency
Department of Environmental Health
80 Swan Way, Room 200
Oakland, California 94621

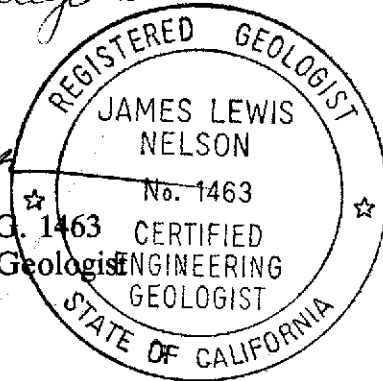
Mr. Richard Hiatt
Regional Water Quality Control Board
San Francisco Bay Region
2101 Webster Street, Suite 500
Oakland, California 94612

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

Sincerely,
RESNA Industries Inc.


Erin D. Krueger
Staff Geologist


James L. Nelson, C.E.G. 1463
Certified Engineering Geologist



Enclosures: References

- Plate 1: Site Vicinity Map
Plate 2: Generalized Site Plan
Plate 3: Groundwater Gradient Map, February 21, 1994
Plate 4: TPHg/Benzene Concentrations in Groundwater, February 22, 1994
- Table 1: Cumulative Groundwater Monitoring Data
Table 2: Cumulative Results of Laboratory Analyses of Water Samples--TPHg, TPHd, BTEX, and TOG
- Appendix A: IWM's Summary of Ground Water Sample Analyses, Field Report, Ground Water Sample Field Data Sheet, and Certified Analytical Reports with Chain of Custody Record

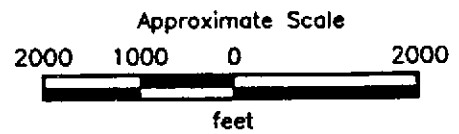
REFERENCES

RESNA. May 17, 1993. Report of Findings Underground Gasoline-Storage Tank Removal and Replacement at ARCO Station 4494, 566 Hegenberger Road in Oakland, California. RESNA Report 69038.13.

RESNA. March 8, 1994. Letter Report on Quarterly Groundwater Monitoring, Fourth Quarter 1993 at ARCO Station 4494, 566 Hegenberger Road in Oakland, California. RESNA Report 69038.12.



Source: U.S. Geological Survey
 7.5-Minute Quadrangles
 Oakland East/San Leandro, California
 Photorevised 1980

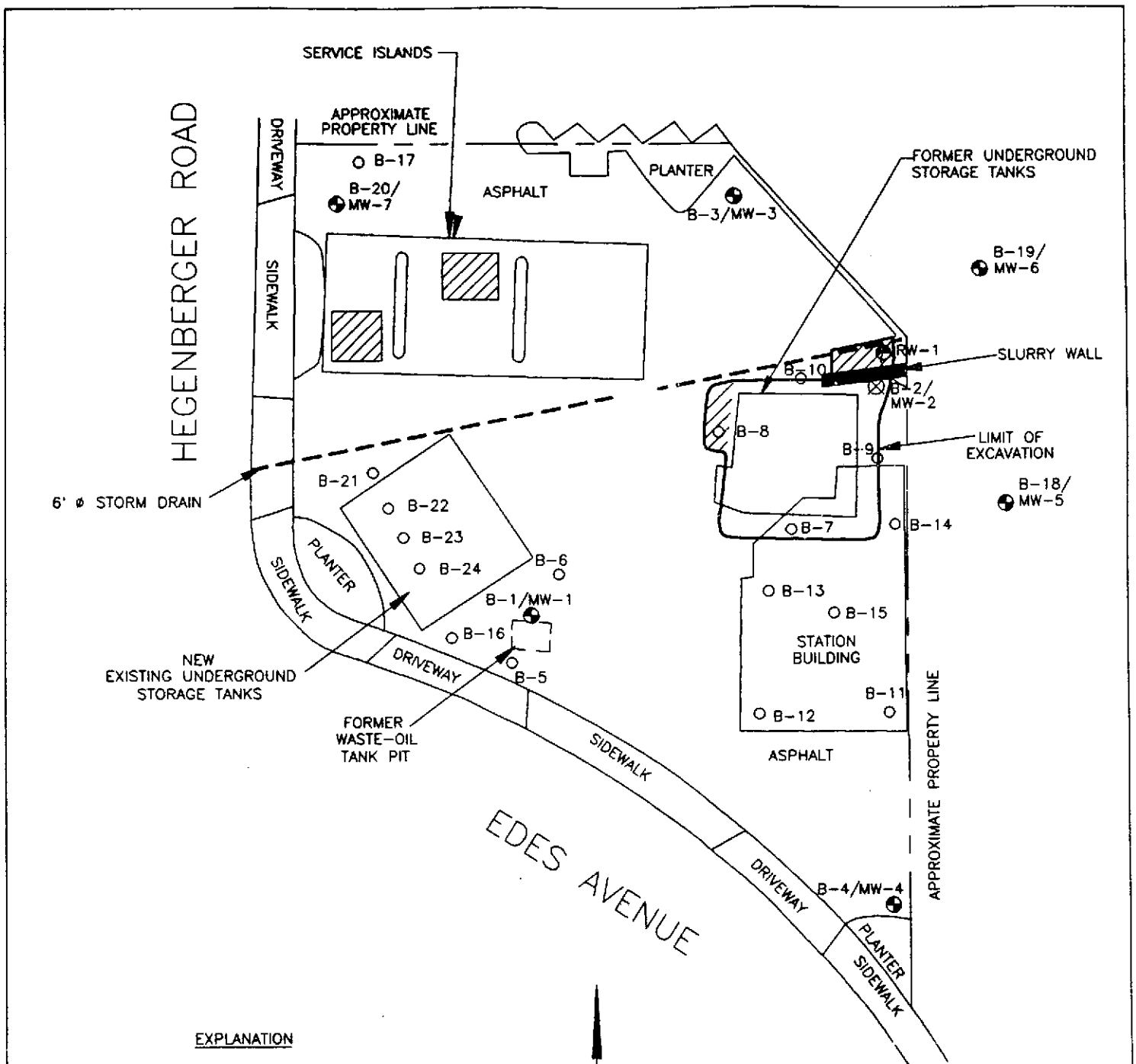


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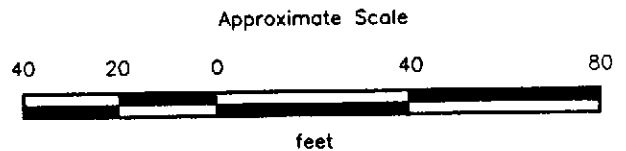
SITE VICINITY MAP
 ARCO Station 4494
 566 Hegenberger Road
 Oakland, California

PLATE
 1



EXPLANATION

- RW-1 ● = Recovery well installed during slurry wall construction (RESNA April 1993)
- B-20/MW-7 ● = Monitoring wells (Applied GeoSystems, October 1989, August 1990; and RESNA, July 1992)
- B-2/MW-2 ⊗ = Destroyed monitoring well (December 1992)
- ▨ = Approximate location of over-excavated areas
- B-24 ○ = Soil boring (Applied GeoSystems, August 1990, March 1991; and RESNA, December 1992)



Source: Surveyed by John Koch, Licensed Land surveyor, July 1992.



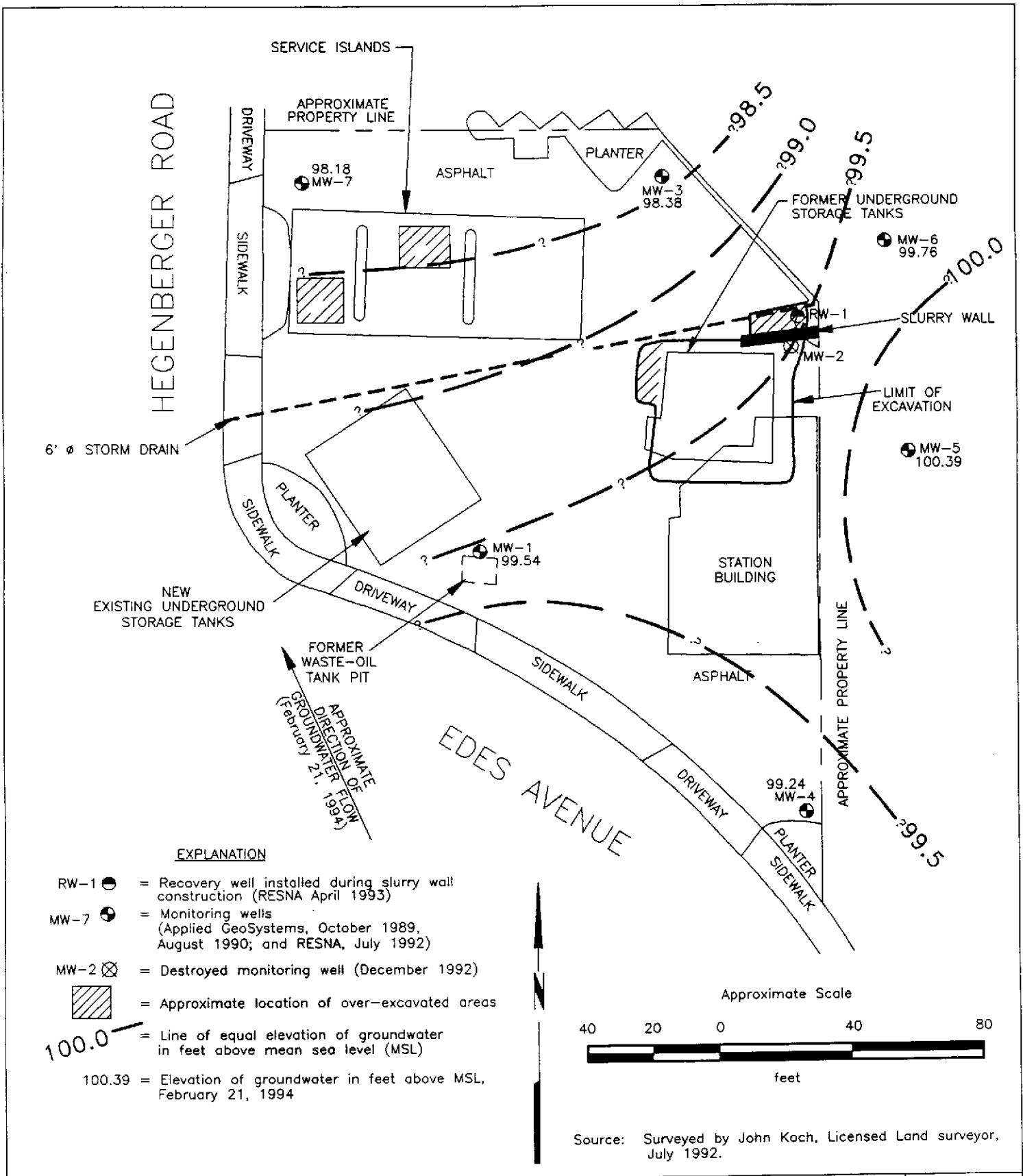
GENERALIZED SITE PLAN
ARCO Service Station 4494
566 Hegenberger Road
Oakland, California

PLATE
2

PROJECT

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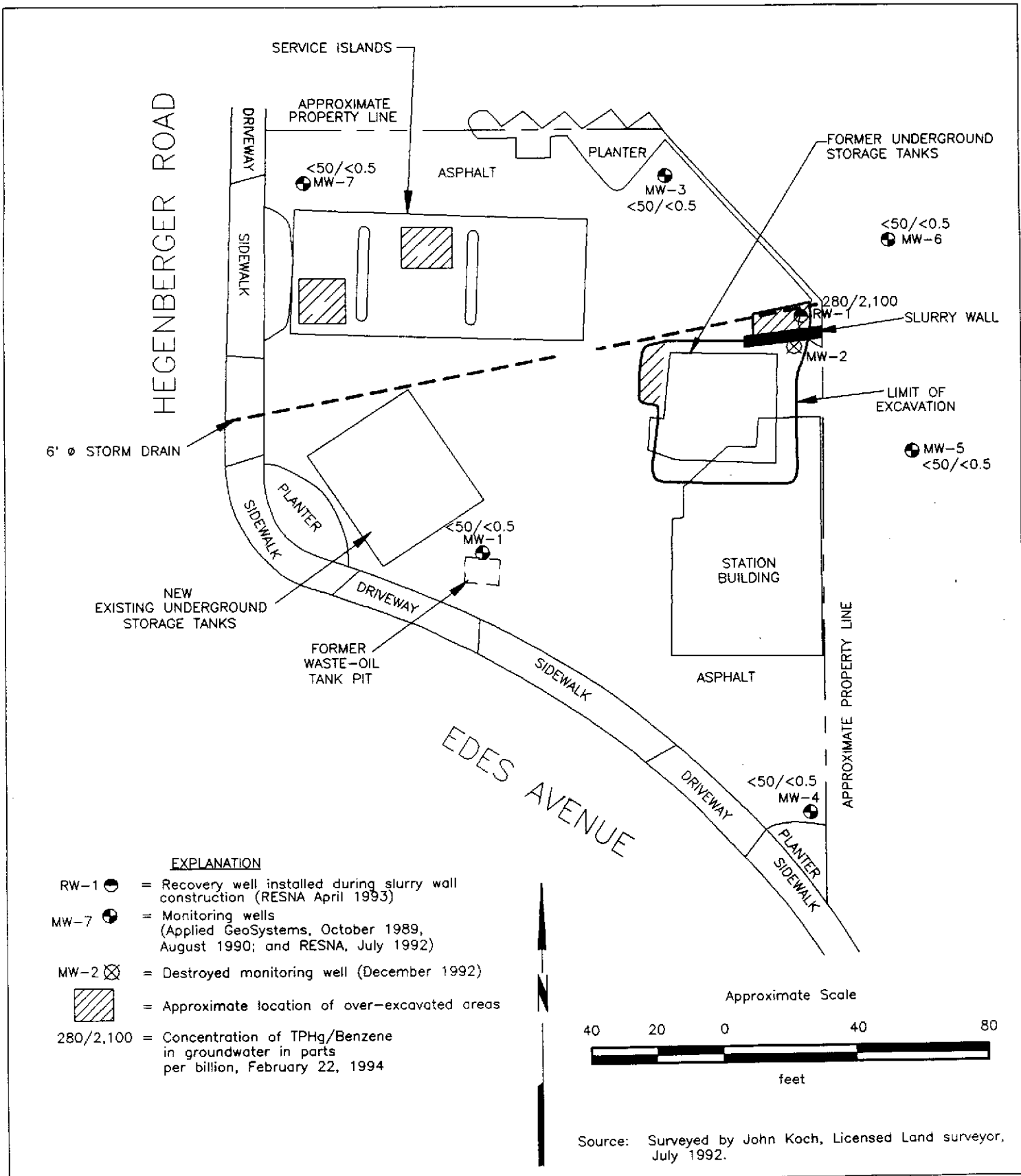
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GROUNDWATER GRADIENT MAP
ARCO Service Station 4494
566 Hegenberger Road
Oakland, California

PLATE
3

PROJECT 69038.15

90381501



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**TPHg/BENZENE CONCENTRATIONS
IN GROUNDWATER**
ARCO Service Station 4494
566 Hegenberger Road
Oakland, California

PLATE
4

TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 4494
Oakland, California
(Page 1 of 4)

Well Date	Elevation of Wellhead	Depth to Water	Water Elevation	Floating Product
<u>MW-1</u>				
06/06/90	105.31	6.65	98.66	None
08/16/90		7.00	98.31	None
08/21/90		7.05	98.26	None
09/07/90		7.24	98.07	None
11/20/90		7.46	97.85	None
11/29/90		7.40	97.91	None
12/19/90		6.99	98.32	None
01/29/91		7.23	98.08	None
02/27/91		7.45	97.86	None
03/07/91		6.96	98.35	None
03/26/91		6.02	99.29	None
05/02/91		7.04	98.27	None
06/27/91		6.71	98.60	None
07/24/91		6.91	98.40	None
08/22/91		6.85	98.46	None
09/30/91		7.04	98.27	None
10/17/91		7.22	98.09	None
11/21/91		7.17	98.14	None
12/18/91		7.46	97.85	None
01/19/92		7.44	97.87	None
02/20/92		6.25	99.06	None
03/20/92		6.40	98.91	None
04/20/92		6.88	98.43	None
05/19/92		7.10	98.21	None
06/08/92		7.22	98.09	None
07/15/92		7.92	97.39	None
08/06/92		106.10	7.29	98.81
10/29/92	7.34		98.76	None
11/23/92	8.15		97.95	None
08/16/93	7.23		98.87	None
11/17/93	7.51		98.59	None
02/21/94	6.56		99.54	None
<u>MW-2</u>				
06/06/90	105.78	9.00*	96.78*	0.92 Black Product
08/16/90		NM	NM	0.17 Black Product
08/21/90		NM	NM	0.17 Black Product
09/07/90		9.17*	96.61*	0.17 Black Product
11/20/90		9.20*	96.58*	Heavy Sheen
11/29/90		9.92*	95.86*	Heavy Sheen
12/19/90		8.95	96.83	None
01/29/91		9.01	96.77	Sheen

See notes on page 4 of 4

TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 4494
Oakland, California
(Page 2 of 4)

Well Date	Elevation of Wellhead	Depth to Water	Water Elevation	Floating Product
<u>MW-2 (cont.)</u>				
02/27/91		9.14	96.64	Sheen
03/07/91		8.94	96.84	Sheen
03/26/91		8.11	97.67	Sheen
05/02/91		8.72	97.06	None
06/27/91		9.20	96.58	Sheen
07/24/91		9.25	96.53	None
08/22/91		9.20	96.58	None
09/30/91		9.31	96.47	Sheen
10/17/91		9.39	96.39	Sheen
11/21/91		9.20	96.58	None
12/18/91		9.23	96.55	Sheen
01/19/92		9.96**	95.82	Skimmer
02/20/92		9.13**	96.65	Skimmer
03/20/92	105.78	9.31**	96.47	Skimmer
04/20/92		9.69	96.09	Skimmer
05/15/92		9.92	95.86	Skimmer
06/08/92		9.84	95.94	Skimmer
07/15/92		10.19	95.59	Skimmer
08/06/92	106.57	10.05	96.52	Skimmer
10/29/92		10.00	96.57	Skimmer
11/23/92		9.87	96.70	0.01
12/08/92		Well Destroyed		
<u>MW-3</u>				
08/16/90	105.51	8.87	96.64	None
08/21/90		8.85	96.66	None
09/07/90		8.98	96.53	None
11/20/90		9.10	96.41	None
11/29/90		9.05	96.46	None
12/19/90		8.67	96.84	None
01/29/91		8.96	96.55	None
02/27/91		8.71	96.80	None
03/07/91		8.49	97.02	None
03/26/91		7.65	97.86	None
05/02/91		8.62	96.89	None
06/27/91		8.94	96.57	None
07/24/91		8.96	96.55	None
08/22/91		8.92	96.59	None
09/30/91		9.04	96.47	None
10/17/91		9.12	96.39	None
11/21/91		8.92	96.59	None
12/18/91		8.97	96.54	None

See notes on page 4 of 4

TABLE 1
 CUMULATIVE GROUNDWATER MONITORING DATA
 ARCO Station 4494
 Oakland, California
 (Page 3 of 4)

Well Date	Elevation of Wellhead	Depth to Water	Water Elevation	Floating Product
<u>MW-3 (cont.)</u>				
01/19/92		8.69	96.82	None
02/20/92		7.78	97.73	None
03/20/92		8.15	97.36	None
04/20/92		8.57	96.94	None
05/15/92		8.76	96.75	None
06/08/92		8.74	96.77	None
07/15/92		9.12	96.39	None
08/06/92	106.29	8.95	97.34	None
10/29/92		8.78	97.51	None
11/23/92		9.91	96.38	None
08/16/93		8.62	97.67	None
11/17/93		8.72	97.57	None
02/21/94		7.91	98.38	None
<u>MW-4</u>				
08/16/90	106.61	8.16	98.45	None
08/21/90		8.22	98.39	None
09/07/90		8.39	98.22	None
11/20/90		8.57	98.04	None
11/29/90		8.53	98.08	None
12/19/90		8.13	98.48	None
01/29/91		8.66	97.95	None
02/27/91		8.44	98.17	None
03/07/91		8.18	98.43	None
03/26/91		7.56	99.05	None
05/02/91		8.25	98.36	None
06/27/91		7.75	98.86	None
07/24/91	106.61	8.12	98.49	None
08/22/91		7.98	98.63	None
09/30/91		8.26	98.35	None
10/17/91		8.42	98.19	None
11/21/91		8.65	97.96	None
12/18/91		8.77	97.84	None
01/19/92		8.42	98.19	None
02/20/92		7.60	99.01	None
03/20/92		7.61	99.00	None
04/20/92		8.15	98.46	None
05/15/92		8.34	98.27	None
06/08/92		8.40	98.21	None
07/15/92		8.72	97.89	None
08/06/92	107.40	8.52	98.09	None

See notes on page 4 of 4

TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 4494
Oakland, California
(Page 4 of 4)

Well Date	Elevation of Wellhead	Depth to Water	Water Elevation	Floating Product
<u>MW-4 (cont.)</u>				
10/29/92		8.63	98.77	None
11/23/92		8.75	98.65	None
08/16/93		8.69	98.71	None
11/17/93		9.11	98.29	None
02/21/94		8.16	99.24	None
<u>MW-5</u>				
08/06/92	105.19	7.19	98.00	None
10/29/92		6.99	98.20	None
11/23/92		6.90	98.29	None
08/16/93		7.06	98.13	None
11/17/93		6.91	98.28	None
02/21/94		5.52	100.39	None
<u>MW-6</u>				
08/06/92	105.07	7.01	98.06	None
10/29/92		6.70	98.37	None
11/23/92		6.75	98.32	None
08/16/93		6.71	98.36	None
11/17/93		6.67	98.40	None
02/21/94		5.31	99.76	None
<u>MW-7</u>				
08/06/92	105.52	8.28	97.24	None
10/29/92		8.62	96.90	None
11/23/92		8.21	97.31	None
08/16/93		8.11	97.41	None
11/17/93		8.11	97.41	None
02/21/94		7.34	98.18	None
<u>RW-1</u>				
08/16/93	Not Surveyed	Dry	Dry	NM
11/17/93		Dry	Dry	NM
02/21/94		7.69	NA	None

Depth measurements in feet.

- : Floating Product present in well.
- : Skimmer Installed (12/24/91)
- NM : Not measured.
- NA : Not Applicable

Elevations in feet above mean sea level (plus one hundred feet to avoid negative ground-water elevations).

TABLE 2
CUMULATIVE RESULTS OF LABORATORY ANALYSES OF WATER SAMPLES—TPHg, TPHd, BTEX, and TOG
ARCO Station 4494
Oakland, California
(Page 1 of 3)

Well Date	TPHg (ppb)	TPHd (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl- benzene (ppb)	Total Xylenes (ppb)	TOG (ppm)
<u>MW-1</u>							
06/19/90	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<5,000
08/16/90	<20	NA	<0.50	<0.50	<0.50	<0.50	NA
09/07/90	NA	NA	NA	NA	NA	NA	<5,000
11/29/90	<50	NA	<0.50	0.7	<0.50	<0.50	NA
03/07/91	<50	NA	<0.30	<0.30	<0.30	<0.50	NA
06/27/91	<30	NA	<0.30	<0.30	<0.30	<0.30	NA
09/30/91	<30	NA	<0.30	<0.30	<0.30	<0.30	NA
12/18/91	<30	NA	<0.30	<0.30	<0.30	<0.30	NA
03/20/92	<50	NA	<0.50	<0.50	<0.50	<0.50	NA
06/08/92	<50	NA	<0.50	<0.50	<0.50	<0.50	NA
08/06/92	<50	NA	<0.50	<0.50	<0.50	<0.50	NA
10/29/92	<50	NA	<0.5	<0.5	<0.5	<0.5	NA
08/16/93	<50	NA	<0.5	<0.5	<0.5	<0.5	NA
11/17/93	<50	NA	<0.5	<0.5	<0.5	<0.5	NA
02/22/94	<50	NA	<0.5	<0.5	<0.5	<0.5	NA
<u>MW-2</u>							
06/19/90			Not sampled—product				
08/16/90			Not sampled—product				
09/07/90			Not sampled—product				
11/29/90			Not sampled—sheen				
03/07/91			Not sampled—sheen				
06/27/91			Not sampled—sheen				
09/30/91			Not sampled—sheen				
12/18/91			Not sampled—sheen				
03/20/92	48,000	NA	2,000	580	2,300	7,000	NA
06/08/92	43,000	NA	2,900	940	2,400	5,100	NA
08/06/92	78,000	NA	2,500	6,700	2,900	16,000	NA
10/29/92			Not sampled—product				
12/08/92			Well Destroyed				
<u>MW-3</u>							
08/16/90	<20	NA	<0.50	<0.50	<0.50	<0.50	NA
09/07/90	NA	NA	NA	NA	NA	NA	<5,000
11/29/90	<50	NA	<0.50	<0.50	<0.50	<0.50	NA
03/07/91	<50	NA	<0.30	<0.30	<0.30	<0.50	NA
06/27/91	<30	NA	<0.30	<0.30	<0.30	<0.30	NA
09/30/91	<30	NA	<0.30	<0.30	<0.30	<0.30	NA
12/18/91	<30	NA	<0.30	<0.30	<0.30	<0.30	NA
03/20/92	<50	NA	<0.50	<0.50	<0.50	<0.50	NA
06/08/92	<50	NA	<0.50	<0.50	<0.50	<0.50	NA

See notes on page 3 of 3

TABLE 2
CUMULATIVE RESULTS OF LABORATORY ANALYSES OF WATER SAMPLES--TPHg, TPHd, BTEX, and TOG
ARCO Station 4494
Oakland, California
(Page 2 of 3)

Well Date	TPHg (ppb)	TPHd (ppb)	Benzene (ppb)	Toluene (ppb)	Ethylbenzene (ppb)	Total Xylenes (ppb)	TOG (ppm)
<u>MW-3 (cont.)</u>							
08/06/92	<50	NA	<0.50	<0.50	<0.50	<0.50	NA
10/29/92	<50	NA	<0.5	<0.5	<0.5	<0.5	NA
08/16/93	<50	NA	<0.5	<0.5	<0.5	<0.5	NA
11/17/93	<50	NA	<0.5	<0.5	<0.5	<0.5	NA
02/22/94	<50	NA	<0.5	<0.5	<0.5	<0.5	NA
<u>MW-4</u>							
08/16/90	<20	NA	<0.50	<0.50	<0.50	<0.50	NA
09/07/90	NA	NA	NA	NA	NA	NA	<5,000
11/29/90	<50	NA	<0.50	<0.50	<0.50	<0.50	NA
03/07/91	<50	NA	<0.30	<0.30	<0.30	<0.50	NA
06/27/91	<30	NA	0.75	1.1	<0.30	1.6	NA
09/30/91	<30	NA	<0.30	<0.30	<0.30	<0.30	NA
12/18/91	<30	NA	0.83	1.2	<0.30	0.58	NA
03/20/92	<50	NA	<0.50	<0.50	<0.50	<0.50	NA
06/08/92	<50	NA	<0.50	<0.50	<0.50	<0.50	NA
08/06/92	<50	NA	<0.50	<0.50	<0.50	<0.50	NA
10/29/92	<50	NA	<0.5	<0.5	<0.5	<0.5	NA
08/16/93	<50	NA	<0.5	<0.5	<0.5	<0.5	NA
11/17/93	<50	NA	<0.5	<0.5	<0.5	<0.5	NA
02/22/94	<50	NA	<0.5	<0.5	<0.5	<0.5	NA
<u>MW-5</u>							
08/06/92	<50	NA	<0.50	<0.50	<0.50	<0.50	NA
10/29/92	<50	NA	<0.5	<0.5	<0.5	<0.5	NA
08/16/93	<50	NA	<0.5	<0.5	<0.5	<0.5	NA
11/17/93	<50	NA	<0.5	<0.5	<0.5	<0.5	NA
02/22/94	<50	NA	<0.5	<0.5	<0.5	0.6	NA
<u>MW-6</u>							
08/06/92	<50	NA	<0.50	<0.50	<0.50	<0.50	NA
10/29/92	<50	NA	<0.5	<0.5	<0.5	<0.5	NA
08/16/93	<50	NA	<0.5	<0.5	<0.5	<0.5	NA
11/17/93	<50	NA	<0.5	<0.5	<0.5	<0.5	NA
02/22/94	<50	NA	<0.5	<0.5	<0.5	<0.5	NA

See notes on page 3 of 3

TABLE 2
CUMULATIVE RESULTS OF LABORATORY ANALYSES OF WATER SAMPLES--TPHg, TPHd, BTEX, and TOG
ARCO Station 4494
Oakland, California
(Page 3 of 3)

Well Date	TPHg (ppb)	TPHd (ppb)	Benzene (ppb)	Toluene (ppb)	Ethylbenzene (ppb)	Total Xylenes (ppb)	TOG (ppm)
<u>MW-7</u>							
08/06/92	<50	NA	<0.50	<0.50	<0.50	<0.50	NA
10/29/92	<50	NA	<0.5	<0.5	<0.5	<0.5	NA
08/16/93	<50	NA	<0.5	<0.5	<0.5	<0.5	NA
11/17/93	<50	NA	<0.5	<0.5	<0.5	<0.5	NA
02/22/94	<50	NA	<0.5	<0.5	<0.5	<0.5	NA
<u>RW-1</u>							
08/16/93	NS	NS	NS	NS	NS	NS	NS
11/17/93	NS	NS	NS	NS	NS	NS	NS
02/22/94	280	NA	2,100	19	40	66	NA
<u>Jan. 1990</u>							
MCLs	---	---	1.0	---	680	1,750	---
DWAL	---	---	---	100	---	---	---
TPHg : Total petroleum hydrocarbons as gasoline using EPA Methods 5030 and 8015. TPHd : Total petroleum hydrocarbons as diesel using EPA Methods 3550 and 8015. BTEX : Benzene, toluene, ethylbenzene, and total xylene isomers using EPA Method 5030 and 8020. TOG : Total oil and grease using EPA Standard Method 503E. NA : Not Analyzed. NS : Not Sampled. MCL : State Maximum Contaminant Level (October 1990). DWAL : State Drinking Water Action Level (October 1990).							

APPENDIX A

**IWM'S SUMMARY OF GROUND WATER SAMPLE ANALYSES, FIELD
REPORT, GROUND WATER SAMPLE FIELD DATA SHEET, AND
CERTIFIED ANALYTICAL REPORTS WITH CHAIN OF CUSTODY
RECORD**

I NTEGRATED
W ASTESTREAM
M ANAGEMENT, INC.

March 14, 1994

March 14, 1994

Mr. John Young
RESNA Industries
3315 Almaden Expressway
Suite 34
San Jose, CA. 95118


Dear Mr. John Young:


Attached are the field data sheets and analytical results for quarterly ground water sampling at ARCO Facility No. A-4494 in Oakland, California. Integrated Wastestream Management measured the depth to water and collected samples from wells at this site on February 22, 1994.

Sampling was carried out in accordance with the protocols described in the "Request for Bid for Quarterly Sampling at ARCO Facilities in Northern California".

Please call us if you have any questions.

Sincerely,
Integrated Wastestream Management


Tom DeLon
Project Manager


Walter H. Howe
Registered Geologist

I NTEGRATED
W ASTESTREAM
M ANAGEMENT

Summary of Ground Water Sample Analyses ARCO Facility No.A-4494, Oakland, California

WELL NUMBER	MW-1	MW-3	MW-4	MW-5	MW-6	MW-7	RW-1
DATE SAMPLED	2/22/94	2/22/94	2/22/94	2/22/94	2/22/94	2/22/94	2/22/94
DEPTH TO WATER	6.56	7.91	8.16	5.52	5.31	7.34	7.69
SHEEN	NONE	NONE	NONE	NONE	NONE	NONE	NONE
PRODUCT THICKNESS	NA	NA	NA	NA	NA	NA	NA
TPHg	ND	ND	ND	ND	ND	ND	280
BTEX							
BENZENE	ND	ND	ND	ND	ND	ND	2,100
TOLUENE	ND	ND	ND	ND	ND	ND	19
ETHLYBENZENE	ND	ND	ND	ND	ND	ND	40
XYLENES	ND	ND	ND	0.6	ND	ND	66

FOOTNOTES:

Concentrations reported in ug/L (ppb).

TPHg = Total Purgeable Petroleum Hydrocarbons (USEPA Method 8015 Modified)

BTEX Distinction (USEPA Method 8020)

PCE = Tetrachloroethene (USEPA Method 8010)

DCE = cis-1, 2-Dichloroethene (USEPA Method 8010)

TCE = Trichloroethene (USEAP Method 8010)

N.D. = Not Detected.

GROUND WATER SAMPLE FIELD DATA SHEET

PROJECT NO: _____
 CLIENT/STATION #: ARCO 4494

WELL ID: MW-1
 ADDRESS: 566 HEGENBERGER RD

CASING DIAMETER (inches): 2 3 4 6 8 12 Other _____
 GALLON/LINEAR FOOT: 0.17 0.38 0.66 1.5 2.6 5.8 Other _____

TD 23.3 - DTW 6.56 X $\frac{\text{GALLON}}{\text{LINEAR FT.}}$ 0.66 X $\frac{\text{CASING VOLUME}}{\text{VOLUME}}$ 3 = $\frac{\text{CALCULATED PURGE}}$ 33.14 ACTUAL PURGE 33.14

DATE PURGED: 2-22-94 START (2400 Hr) 900 END (2400 Hr) 910
 DATE SAMPLED: 2-22-94 START (2400 Hr) 918 END (2400 Hr) 918

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (μmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
<u>903</u>	<u>2</u>	<u>6.67</u>	<u>2.29</u>	<u>68.0</u>	<u>cloudy</u>	
<u>905</u>	<u>8</u>	<u>6.89</u>	<u>2.15</u>	<u>67.8</u>	<u>cloudy</u>	
<u>908</u>	<u>17</u>	<u>7.01</u>	<u>2.21</u>	<u>67.4</u>	<u>clear</u>	
<u>910</u>	<u>24</u>	<u>6.72</u>	<u>2.19</u>	<u>67.2</u>	<u>clear</u>	

DTW 10.0

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

PURGING EQUIPMENT

SAMPLING EQUIPMENT

- | | | | |
|--|---|---|---|
| <input type="checkbox"/> 2" Bladder Pump | <input type="checkbox"/> Bailer (Teflon®) | <input type="checkbox"/> 2" Bladder Pump | <input 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"/> Dedicated | | <input checked="" type="checkbox"/> Bailer Disposable | <input type="checkbox"/> Dedicated |

Other: _____

Other: _____

REMARKS: Well pumped dry at 24 gallons.

PRINT NAME: Vince Vargas
 SIGNATURE: Vince Vargas

GROUND WATER SAMPLE FIELD DATA SHEET

PROJECT NO: _____

WELL ID: MW-4

CLIENT/STATION #: ARCO 4494

ADDRESS: 566 HEGENBERGER RD.

CASING DIAMETER (inches): 2 3 4 6 8 12 Other _____

GALLON/LINEAR FOOT: 0.17 0.38 0.66 1.5 2.6 5.8 Other _____

TD 18.1 - DTW 8.16 X $\frac{\text{GALLON}}{\text{LINEAR FT.}}$ 0.66 X $\frac{\text{CASING VOLUME}}$ 3 = $\frac{\text{CALCULATED PURGE}}$ 19.68 ACTUAL PURGE 20.0

DATE PURGED: 2-22-94 START (2400 Hr) 949 END (2400 Hr) 1000
 DATE SAMPLED: 2-22-94 START (2400 Hr) 1008 END (2400 Hr) 1008

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
<u>951</u>	<u>5</u>	<u>7.38</u>	<u>1723</u>	<u>69.6</u>	<u>clear</u>	
<u>953</u>	<u>10</u>	<u>7.42</u>	<u>3.65</u>	<u>69.3</u>	<u>clear</u>	
<u>956</u>	<u>15</u>	<u>7.44</u>	<u>3.83</u>	<u>68.3</u>	<u>clear</u>	
<u>1000</u>	<u>20</u>	<u>7.22</u>	<u>5.04</u>	<u>65.7</u>	<u>clear</u>	

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

PURGING EQUIPMENT

SAMPLING EQUIPMENT

- | | | | |
|--|---|---|---|
| <input type="checkbox"/> 2" Bladder Pump | <input type="checkbox"/> Bailer (Teflon®) | <input type="checkbox"/> 2" Bladder Pump | <input 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"/> Dedicated | | <input checked="" type="checkbox"/> Bailer Disposable | <input type="checkbox"/> Dedicated |
- Other: _____

REMARKS: _____

PAGE 3 OF 8 PRINT NAME: Vince Valdes
 SIGNATURE: Vince Valdes

GROUND WATER SAMPLE FIELD DATA SHEET

PROJECT NO: _____ WELL ID: MW-7
 CLIENT/STATION #: Arco 4494 ADDRESS: 566 HEGENBERGER RD.

CASING DIAMETER (inches): 2 3 4 6 8 12 Other _____
 GALLON/LINEAR FOOT: 0.17 0.38 0.66 1.5 2.6 5.8 Other _____

TD 15.0 - DTW 7.34 X $\frac{\text{GALLON}}{\text{LINEAR FT.}}$ 0.66 X $\frac{\text{CASING VOLUME}}{\text{VOLUME}}$ 3 = $\frac{\text{CALCULATED PURGE}}$ 15.16 ACTUAL PURGE 15.0

DATE PURGED: 2-22-94 START (2400 Hr) 1019 END (2400 Hr) 1026
 DATE SAMPLED: 2-22-94 START (2400 Hr) 1033 END (2400 Hr) 1033

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR ^{DTW 8.0} (visual)	TURBIDITY (visual)
<u>1020</u>	<u>2</u>	<u>6.81</u>	<u>11.46</u>	<u>65.1</u>	<u>yellow</u>	
<u>1022</u>	<u>8</u>	<u>6.96</u>	<u>6.13</u>	<u>65.0</u>	<u>yellow</u>	
<u>1024</u>	<u>12</u>	<u>6.87</u>	<u>5.47</u>	<u>64.9</u>	<u>cloudy</u>	
<u>1026</u>	<u>15</u>	<u>6.88</u>	<u>4.88</u>	<u>64.7</u>	<u>clear</u>	

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

PURGING EQUIPMENT

SAMPLING EQUIPMENT

<input type="checkbox"/> 2" Bladder Pump	<input type="checkbox"/> Bailor (Teflon®)	<input type="checkbox"/> 2" Bladder Pump	<input 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"/> Dedicated		<input checked="" type="checkbox"/> Bailor Disposable	<input type="checkbox"/> Dedicated

Other: _____ Other: _____

REMARKS: _____

PAGE 4 OF 8 PRINT NAME: Vince Galdes
 SIGNATURE: Vince Galdes

GROUND WATER SAMPLE FIELD DATA SHEET

PROJECT NO: _____

WELL ID: MW-3

CLIENT/STATION #: ARCO 4494

ADDRESS: 566 HEINZBERGER RD.

CASING DIAMETER (inches): 2 3 4 6 8 12 Other _____

GALLON/LINEAR FOOT: 0.17 0.38 0.66 1.5 2.6 5.8 Other _____

TD 18.0 - DTW 7.91 X $\frac{\text{GALLON}}{\text{LINEAR FT.}}$ 0.66 X $\frac{\text{CASING}}{\text{VOLUME}}$ 3 = $\frac{\text{CALCULATED}}{\text{PURGE}}$ 19.97

ACTUAL PURGE 20.0

DATE PURGED: 2-22-94 START (2400 Hr) 908 END (2400 Hr) 917

DATE SAMPLED: 2-22-94 START (2400 Hr) 926 END (2400 Hr) 926

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
<u>911</u>	<u>3</u>	<u>7.25</u>	<u>1.39</u>	<u>63.9</u>	<u>CLOUDY</u>	_____
<u>912</u>	<u>10</u>	<u>6.97</u>	<u>4.70</u>	<u>63.8</u>	<u>CLOUDY</u>	_____
<u>914</u>	<u>15</u>	<u>6.93</u>	<u>5.19</u>	<u>63.8</u>	<u>CLEAR</u>	_____
<u>917</u>	<u>19</u>	<u>6.85</u>	<u>6.18</u>	<u>63.6</u>	<u>CLEAR</u>	_____

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

PURGING EQUIPMENT

- 2" Bladder Pump
 - Centrifugal Pump
 - Submersible Pump
 - Dedicated
- Other: _____

- Bailer (Teflon®)
- Bailer (PVC)
- Bailer (Stainless Steel)

SAMPLING EQUIPMENT

- 2" Bladder Pump
 - DDL Sampler
 - Dipper
 - Bailer Disposable
 - Bailer (Teflon®)
 - Bailer (Stainless Steel)
 - Submersible Pump
 - Dedicated
- Other: _____

REMARKS: _____

PRINT NAME: Francisco Abunjan
 SIGNATURE: Francisco Abunjan

GROUND WATER SAMPLE FIELD DATA SHEET

PROJECT NO: _____
 CLIENT/STATION #: Arco 4494

WELL ID: MW-5
 ADDRESS: 566 HEGERBERGER RD.

CASING DIAMETER (inches): 2 3 4 6 8 12 Other _____
 GALLON/LINEAR FOOT: 0.17 0.38 0.66 1.5 2.6 5.8 Other _____

TD 17.0 - DTW 5.52 X $\frac{\text{GALLON}}{\text{LINEAR FT.}}$ 0.17 X $\frac{\text{CASING VOLUME}}{\text{VOLUME}}$ 3 = $\frac{\text{CALCULATED PURGE}}{\text{PURGE}}$ 5.85 ACTUAL PURGE 6.0

DATE PURGED: 2-22-94 START (2400 Hr) 1001 END (2400 Hr) 1006
 DATE SAMPLED: 2-22-94 START (2400 Hr) 1041 END (2400 Hr) 1041

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
<u>1002</u>	<u>2</u>	<u>7.31</u>	<u>5.34</u>	<u>60.5</u>	<u>CLEAR</u>	_____
<u>1003</u>	<u>4</u>	<u>7.42</u>	<u>4.75</u>	<u>60.5</u>	<u>CLEAR</u>	_____
<u>1006</u>	<u>5</u>	<u>7.42</u>	<u>3.91</u>	<u>60.4</u>	<u>CLEAR</u>	_____

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

PURGING EQUIPMENT

SAMPLING EQUIPMENT

- 2" Bladder Pump
- Centrifugal Pump
- Submersible Pump
- Dedicated

- Bailer (Teflon®)
- Bailer (PVC)
- Bailer (Stainless Steel)

- 2" Bladder Pump
- DDL Sampler
- Dipper
- Bailer Disposable
- Bailer (Teflon®)
- Bailer (Stainless Steel)
- Submersible Pump
- Dedicated

Other: _____

Other: _____

REMARKS: _____

PRINT NAME: Francisco Abunyan

SIGNATURE: Francisco Abunyan

GROUND WATER SAMPLE FIELD DATA SHEET

PROJECT NO: _____

WELL ID: MW-6

CLIENT/STATION #: ARCO 7494

ADDRESS: 566 HEGENBERGER RD.

CASING DIAMETER (inches): 2 3 4 6 8 12 Other _____
 GALLON/LINEAR FOOT: 0.17 0.38 0.66 1.5 2.6 5.8 Other _____

TD 165 - DTW 5.31 X $\frac{\text{GALLON}}{\text{LINEAR FT.}}$ 0.17 X $\frac{\text{CASING VOLUME}}{\text{VOLUME}}$ 3 = $\frac{\text{CALCULATED PURGE}}$ 5.70 ACTUAL PURGE 6.0

DATE PURGED: 2-22-94 START (2400 Hr) 1012 END (2400 Hr) 1020
 DATE SAMPLED: 2-22-94 START (2400 Hr) 1053 END (2400 Hr) 1053

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
<u>1014</u>	<u>1.5</u>	<u>7.63</u>	<u>4.60</u>	<u>59.7</u>	<u>CLOUDY</u>	_____
<u>1016</u>	<u>2.5</u>	<u>7.64</u>	<u>4.19</u>	<u>59.7</u>	<u>CLOUDY</u>	_____
<u>1018</u>	<u>4</u>	<u>7.61</u>	<u>4.17</u>	<u>59.7</u>	<u>CLEAR</u>	_____
<u>1020</u>	<u>5</u>	<u>7.57</u>	<u>4.07</u>	<u>59.8</u>	<u>CLEAR</u>	_____

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

PURGING EQUIPMENT

SAMPLING EQUIPMENT

- | | | | |
|--|---|---|---|
| <input type="checkbox"/> 2" Bladder Pump | <input type="checkbox"/> Bailer (Teflon®) | <input type="checkbox"/> 2" Bladder Pump | <input 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"/> Dedicated | | <input checked="" type="checkbox"/> Bailer Disposable | <input type="checkbox"/> Dedicated |
- Other: _____

REMARKS: _____

PRINT NAME: FRANCISCO ABUNGAN
 SIGNATURE: Francisco Abungan

GROUND WATER SAMPLE FIELD DATA SHEET

PROJECT NO: _____

WELL ID: RW-1

CLIENT/STATION #: ARCO 7494

ADDRESS: 506 HEBENBERGER RD

CASING DIAMETER (inches): 2 3 4 6 8 12 Other _____

GALLON/LINEAR FOOT: 0.17 0.38 0.66 1.5 2.6 5.8 Other _____

TD 15.0 - DTW 7.69 x $\frac{\text{GALLON}}{\text{LINEAR FT.}}$ 0.17 x $\frac{\text{CASING VOLUME}}{\text{VOLUME}}$ 3 = $\frac{\text{CALCULATED PURGE}}{\text{PURGE}}$ 3.72 ACTUAL PURGE 4.0

DATE PURGED: 2-22-94 START (2400 Hr) 1121 END (2400 Hr) 1133
 DATE SAMPLED: 2-22-94 START (2400 Hr) 1150 END (2400 Hr) 1150

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
<u>1124</u>	<u>1</u>	<u>7.26</u>	<u>5.85</u>	<u>55.9</u>	<u>CLEAR</u>	
<u>1128</u>	<u>2.5</u>	<u>7.33</u>	<u>6.09</u>	<u>55.9</u>	<u>CLEAR</u>	
<u>1133</u>	<u>3</u>	<u>7.32</u>	<u>7.66</u>	<u>55.7</u>	<u>CLEAR</u>	

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

PURGING EQUIPMENT

SAMPLING EQUIPMENT

- | | | | |
|--|---|---|---|
| <input type="checkbox"/> 2" Bladder Pump | <input type="checkbox"/> Bailer (Teflon®) | <input type="checkbox"/> 2" Bladder Pump | <input 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"/> Dedicated | | <input checked="" type="checkbox"/> Bailer Disposable | <input type="checkbox"/> Dedicated |
- Other: Bailer disp. Other: _____

REMARKS: _____

PRINT NAME: Francisco Abungar
 SIGNATURE: Francisco Abungar



March 9, 1994

Service Request No. SJ94-0231

Gina Austin
Tom DeLon
IWM
950 Ames Avenue
Milpitas, CA 95035

Re: **ARCO Facility No. 4494**

Dear Ms. Austin/Mr. DeLon:

Attached are the results of the water samples submitted to our lab on February 23, 1994. For your reference, these analyses have been assigned our service request number SJ94-0231.

All analyses were performed consistent with our laboratory's quality assurance program. All results are intended to be considered in their entirety, and CAS is not responsible for use of less than the complete report. Results apply only to the samples analyzed.

Please call if you have any questions.

Respectfully submitted:

COLUMBIA ANALYTICAL SERVICES, INC.

A handwritten signature in black ink, appearing to read "Keoni A. Murphy".

Keoni A. Murphy
Laboratory Manager

A handwritten signature in black ink, appearing to read "Annelise J. Bazar".

Annelise J. Bazar
Regional QA Coordinator

KAM/kmh

COLUMBIA ANALYTICAL SERVICES, Inc.

Acronyms

ASTM	American Society for Testing and Materials
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MRL	Method Reporting Limit
NA	Not Applicable
NAN	Not Analyzed
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected at or above the MRL
NR	Not Requested
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
VPH	Volatile Petroleum Hydrocarbons

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: IWM
Project: ARCO Facility No. 4494
Sample Matrix: Water

Dates Collected: 02/22/94
Date Received: 02/23/94
Date Extracted: NA
Date Analyzed: 03/01/94
Service Request: SJ94-0231

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

Analyte:	Benzene	Toluene	Ethyl- benzene	Total Xylenes	TPH as Gasoline
Units:	µg/L (ppb)	µg/L (ppb)	µg/L (ppb)	µg/L (ppb)	µg/L (ppb)
Method Reporting Limit:	0.5	0.5	0.5	0.5	50

<u>Sample Name</u>	<u>Date Analyzed</u>					
MW-1 (10)	03/01/94	ND	ND	ND	ND	ND
MW-3 (8)	03/01/94	ND	ND	ND	ND	ND
MW-4 (11)	03/01/94	ND	ND	ND	ND	ND
MW-5 (5.6)	03/01/94	ND	ND	ND	0.6	ND
MW-6 (5)	03/01/94	ND	ND	ND	ND	ND
MW-7 (8)	* 03/01/94	ND	ND	ND	ND	ND
RW-1 (8)	03/02/94	2,100.	19.	40.	66.	280.
Method Blank	03/01/94	ND	ND	ND	ND	ND
Method Blank	03/02/94	ND	ND	ND	ND	ND

* This sample is part of the analytical batch started on March 1, 1994. However, it was analyzed after midnight so the actual date analyzed is March 2, 1994.

Approved By: _____

Kenneth Murphy

Date: _____

March 9, 1994

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: IWM
Project: ARCO Facility No. 4494
Sample Matrix: Water

Dates Collected: 02/22/94
Date Received: 02/23/94
Date Extracted: NA
Date Analyzed: 03/01/94
Service Request: SJ94-0231

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

<u>Sample Name</u>	<u>Date Analyzed</u>	<u>Percent Recovery</u> a.a.a-Trifluorotoluene
MW-1 (10)	03/01/94	79.
MW-3 (8)	03/01/94	77.
MW-4 (11)	03/01/94	82.
MW-5 (5.6)	03/01/94	78.
MW-6 (5)	03/01/94	81.
MW-7 (8)	03/01/94	75.
RW-1 (8)	03/02/94	95.
Method Blank	03/01/94	80.
Method Blank	03/02/94	87.

CAS Acceptance Limits: 62-112

Approved By: _____

Kenneth Murphy

Date: _____

March 9, 1994

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: IWM
 Project: ARCO Facility No. 4494
 Sample Matrix: Water

Dates Collected: 02/22/94
 Date Received: 02/23/94
 Date Extracted: NA
 Date Analyzed: 03/01/94
 Service Request: SJ94-0231

Initial Calibration Verification
 BTEX and TPH as Gasoline
 EPA Methods 5030/8020/California DHS LUFT Method
 Units: µg/L (ppb)

<u>Analyte</u>	<u>True Value</u>	<u>Result</u>	<u>Percent Recovery</u>	<u>CAS Acceptance Criteria</u>
Benzene	25.	27.1	108.	85-115
Toluene	25.	24.9	100.	85-115
Ethylbenzene	25.	22.6	90.	85-115
Total Xylenes	75.	79.8	106.	85-115
TPH as Gasoline	250.	252.	101.	90-110

Approved By:

Kenneth Murphy

Date:

March 9, 1994

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: IWM
Project: ARCO Facility 4494
Sample Matrix: Water

Dates Collected: 02/22/94
Date Received: 02/23/94
Date Extracted: NA
Date Analyzed: 03/01/94
Service Request: SJ94-0231

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

<u>Analyte</u>	<u>Spike Level</u>	<u>Sample Result</u>	<u>Spike Result</u>		<u>Percent Recovery</u>		<u>CAS Acceptance Criteria</u>
			<u>MS</u>	<u>DMS</u>	<u>MS</u>	<u>DMS</u>	
Benzene	25.	ND	25.3	25.4	101.	102.	75-135
Toluene	25.	ND	24.1	24.9	96.	100.	73-136
Ethylbenzene	25.	ND	23.5	24.2	94.	97.	69-142

Approved By: _____

K. Murphy

Date: _____

March 9, 1994

ARCO Products Company

Division of AtlanticRichfieldCompany

Task Order No. **IWM-94-5CC**

Chain of Custody

ARCO Facility no. A4494	City (Facility) OAKLAND	Project manager (Consultant) Tom De Jon	Laboratory name Columbia
ARCO engineer Kyle Christie	Telephone no. (ARCO)	Telephone no. (Consultant) 408/9428955	Contract number 07077
Consultant name IWM	Address (Consultant) 950 Arnes ave Milp Ca 95035		

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 checked="" 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 625/6270	TC/TP Metals <input type="checkbox"/> VOA <input type="checkbox"/> VOA <input type="checkbox"/>	Semi Metals <input type="checkbox"/> VOA <input type="checkbox"/> VOA <input type="checkbox"/>	CAN Metals EPA 8010/7000 TLC <input type="checkbox"/> STLC <input type="checkbox"/>	Lead Org IDHS <input type="checkbox"/> Lead EPA <input type="checkbox"/> 7420/7421 <input type="checkbox"/>	Method of shipment CAS COURIER				
			Soil	Water	Other	Ice	Acid HCL																			
FB-1	1-2	2		✓		✓	✓	2-22-94	835		✓	✓												Special detection Limit/reporting		
MW-1	3-4	2		✓		✓	✓		918		✓	✓													Special QA/QC	
MW-3	5-6	2		✓		✓	✓		926		✓	✓														Remarks Hold on F.B.
MW-4	7-8	2		✓		✓	✓		1008		✓	✓														
MW-5	9-10	2		✓		✓	✓		1041		✓	✓														
MW-6	11-12	2		✓		✓	✓		1053		✓	✓														
MW-7	13-14	2		✓		✓	✓		1033		✓	✓														
RW-1	15-16	2		✓		✓	✓		1150		✓	✓														

Condition of sample:				Temperature received: cool			
Relinquished by sampler Tom Salda	Date 2-23	Time 1500	Received by Valup	Date 2-23-94	Time 1520		
Relinquished by	Date	Time	Received by	Date	Time		
Relinquished by	Date	Time	Received by laboratory	Date	Time		

Lab number **SJ94-0231**

Turnaround time

Priority Rush

1 Business Day

Rush

2 Business Days

Expedited

5 Business Days

Standard

10 Business Days