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TO: Mr. Barney Chan
ACHCSA, Dept. of Env. Health
80 Swan Way, Room 200
Oakland, California 94621

DATE: June 9, 1994
PROJECT NUMBER: 60026.19
SUBJECT: ARCO Station 276
10600 MacArthur Boulevard, Oakland,
California

FROM: Mary E. Rysdale
TITLE: Geologic Technician

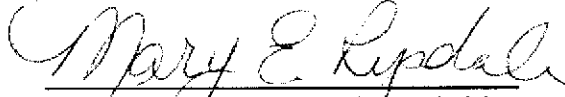
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REMARKS:
Copies: 1 copy for RESNA file.


Mary E. Rysdale, Geologic Technician

LETTER REPORT
QUARTERLY GROUNDWATER MONITORING
First Quarter 1994

ARCO Station 2185
9800 East 14th Street
Oakland, California

5-17-94
2185

62026.06

✓

May 17, 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 2185
9800 East 14th Street, 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 8, and March 4, 1994, to measure depth-to-water (DTW) levels and perform subjective analysis for the presence of product in groundwater in wells MW-1 through MW-7. Quarterly sampling was performed by IWM field personnel on March 4, 1994.

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 Certified Analytical Reports with Chain of Custody Record are included in Appendix A.

Results of Groundwater Monitoring

Groundwater elevations rose an average of approximately 2.07 feet in wells MW-1 through MW-7 since the last quarter (October 11, 1993 to March 4, 1994). Evidence of floating product or product sheen was not noted in any of the wells during this quarter. Based on DTW data from February and March, groundwater is interpreted to flow toward the southwest with an average gradient of approximately 0.004 ft/ft (Plates 3 and 4). 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 TPHg and benzene concentrations have been identified since the last quarter: TPHg and benzene concentrations have generally decreased in wells MW-5 and MW-7; TPHg concentrations have increased and benzene concentrations have decreased in wells MW-2, MW-3, and MW-6 (benzene increased); and have remained not detected in wells MW-1 and MW-4 (Plate 5). The laboratory continues to report that the TPHg chromatograph pattern in groundwater from offsite monitoring well MW-7 did not match the typical gasoline fingerprint. According to ARCO, gasoline has been the only fuel source dispensed at the subject site. Based on historical aerial photo data and City of Oakland records, the property adjoining well MW-7 (currently a Big-O Tire Store) was previously a gasoline service station. Well MW-7 appears to be located within 15 feet of a former pump island. 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.
- Submitted Work Plan to ACHCSA for approval for next phase of work.

- Received a letter from ACHCSA dated February 10, 1994, and met with ACHCSA on February 28, 1994 to discuss approval of Work Plan and site status.
- Submitted follow up letter dated March 10, 1994 to ACHCSA concerning their February 10, 1994 letter and the meeting held between ACHCSA, ARCO and RESNA.
- Performed First Quarter 1994 Groundwater Monitoring.

Second Quarter 1994

- Submit Letter Report, Quarterly Groundwater Monitoring, First Quarter 1994, to ARCO and regulatory agencies. 8
- Install, develop, and sample monitoring well MW-10. Prepare and submit Letter Report of findings to ARCO and regulatory agencies.
- Continue access agreement with the City of Oakland and CALTRANS to install two additional monitoring wells as outlined in RESNA's Work Plan.
- Perform Second Quarter 1994 Groundwater Monitoring.

REPORTING REQUIREMENTS

RESNA recommends that copies of this report be forwarded to:

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

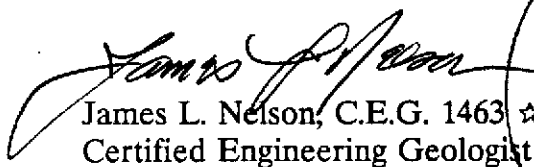
Ms. Joan Curtis
City of Oakland
Engineering Services Department
1330 Broadway, 2nd Floor
Oakland, California 94612
(1 report per year, per encroachment permit)

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

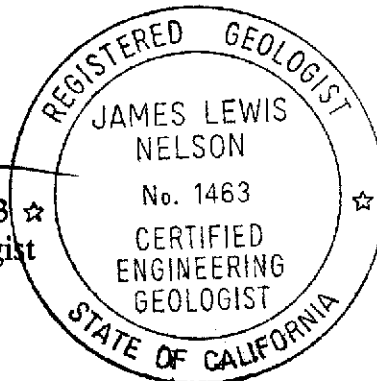
Sincerely,
RESNA Industries Inc.



Mary E. Rysdale
Geologic Technician



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



Attachments:

References

- Plate 1: Site Vicinity Map
- Plate 2: Generalized Site Plan
- Plate 3: Groundwater Gradient Map, February 8, 1994
- Plate 4: Groundwater Gradient Map, March 4, 1994
- Plate 5: TPHg/Benzene Concentrations in Groundwater

- Table 1: Cumulative Groundwater Monitoring Data
- Table 2: Cumulative Results of Laboratory Analyses of Groundwater Samples

Appendix A: IWM's Summary of Ground Water Sample Analyses, Field Reports, and Certified Analytical Reports with Chain of Custody Record

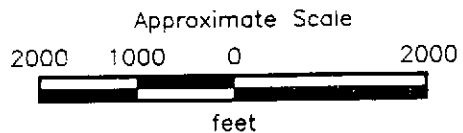
REFERENCES

RESNA Industries Inc. October 12, 1993. Report of Findings, Initial Offsite and Additional Onsite Subsurface Investigation and Aquifer Pumping Test. RESNA 62026.02

RESNA Industries Inc. March 3, 1994. Letter Report, Quarterly Groundwater Monitoring, Fourth Quarter 1993. RESNA 62026.04



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

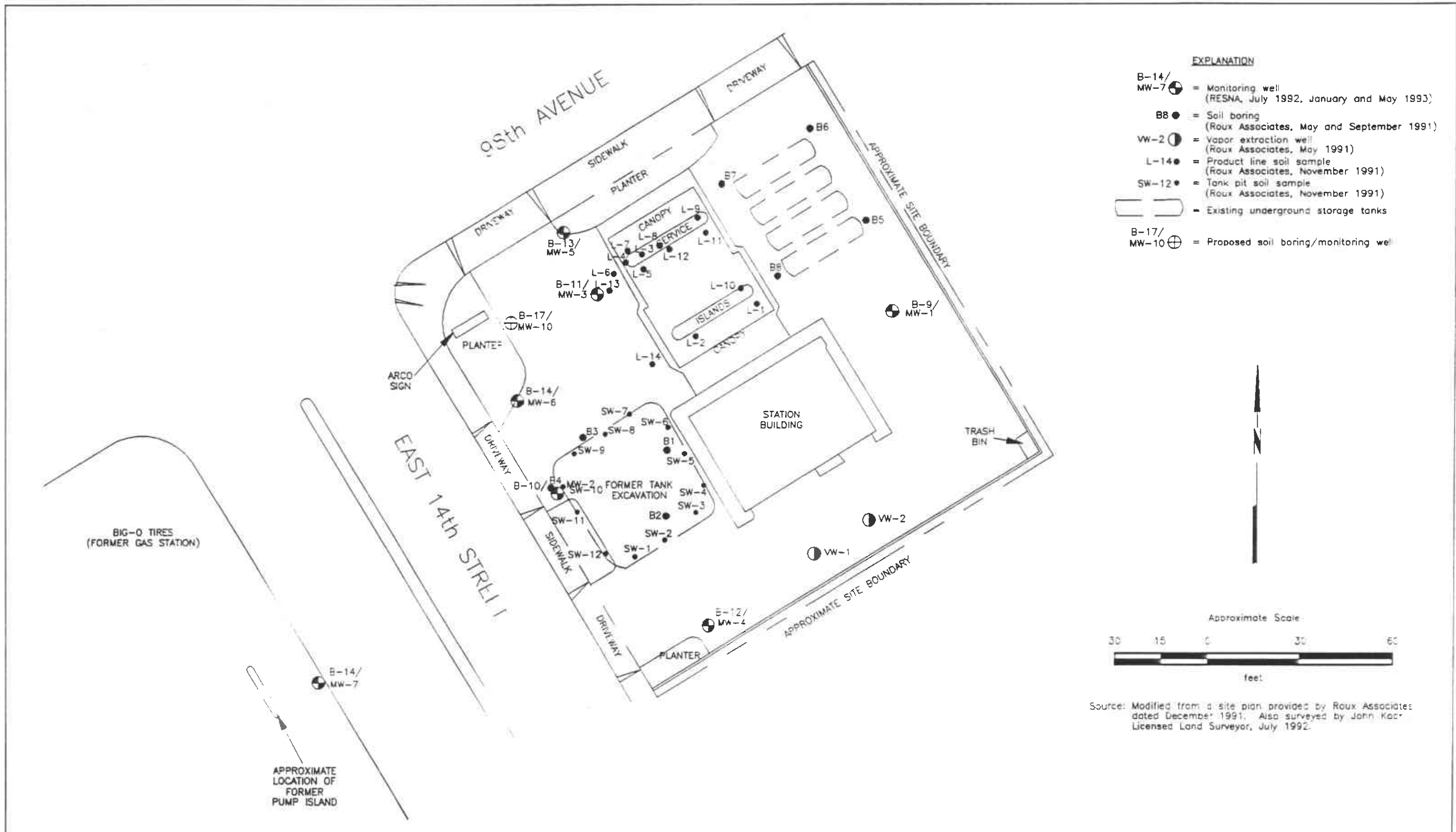


RESNA
 Working to Restore Nature

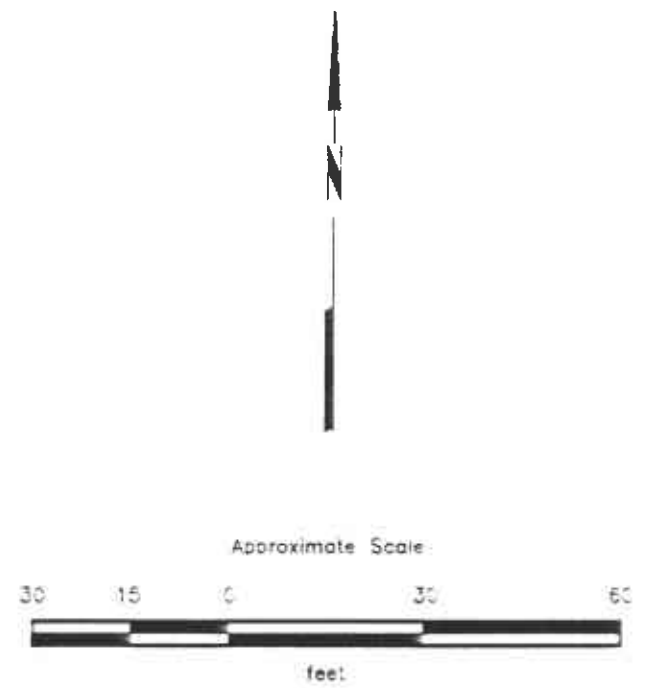
SITE VICINITY MAP
 ARCO Station 2185
 9800 East 14th Street
 San Leandro, California

PLATE
 1

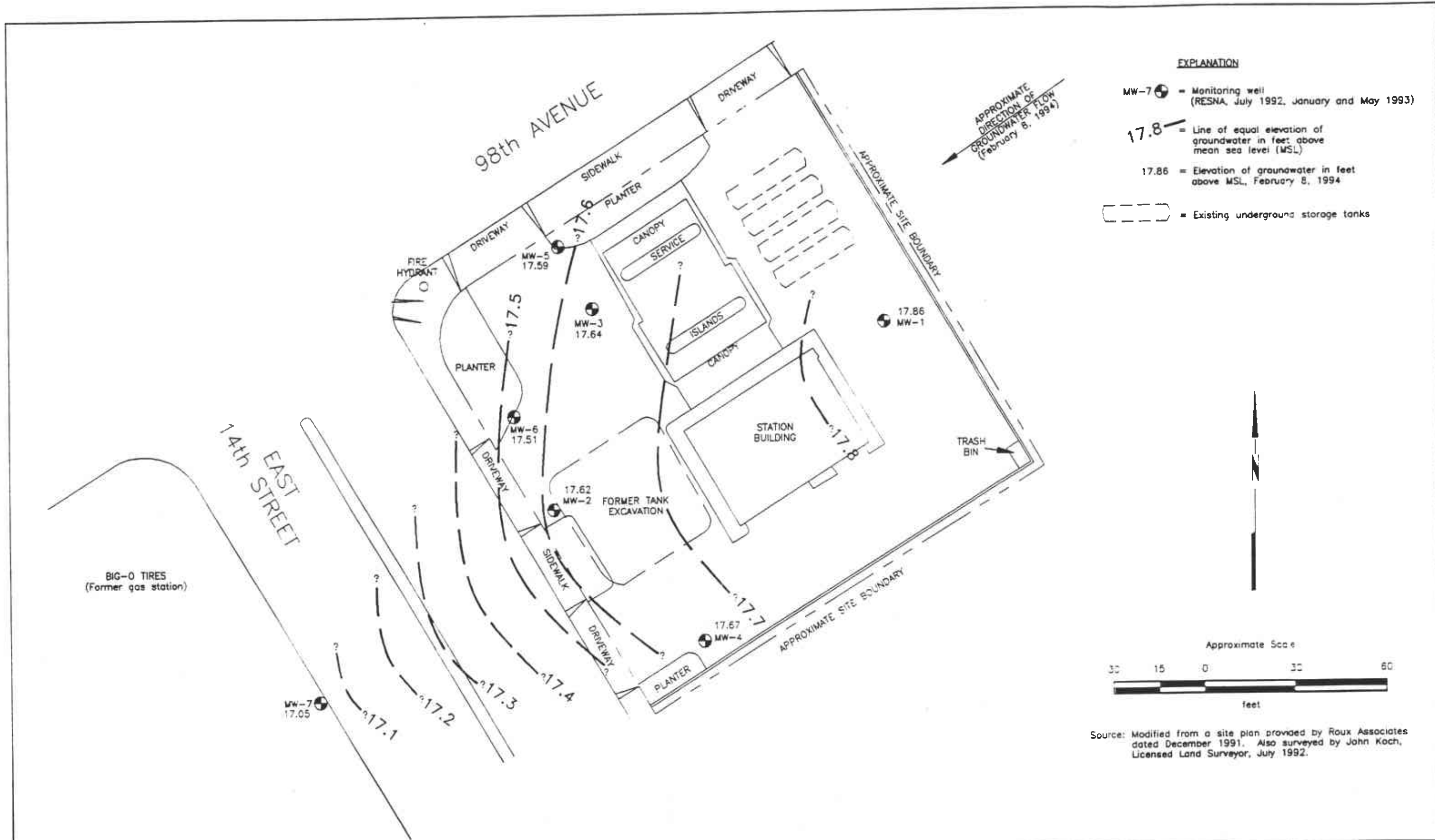
PROJECT 62026.06

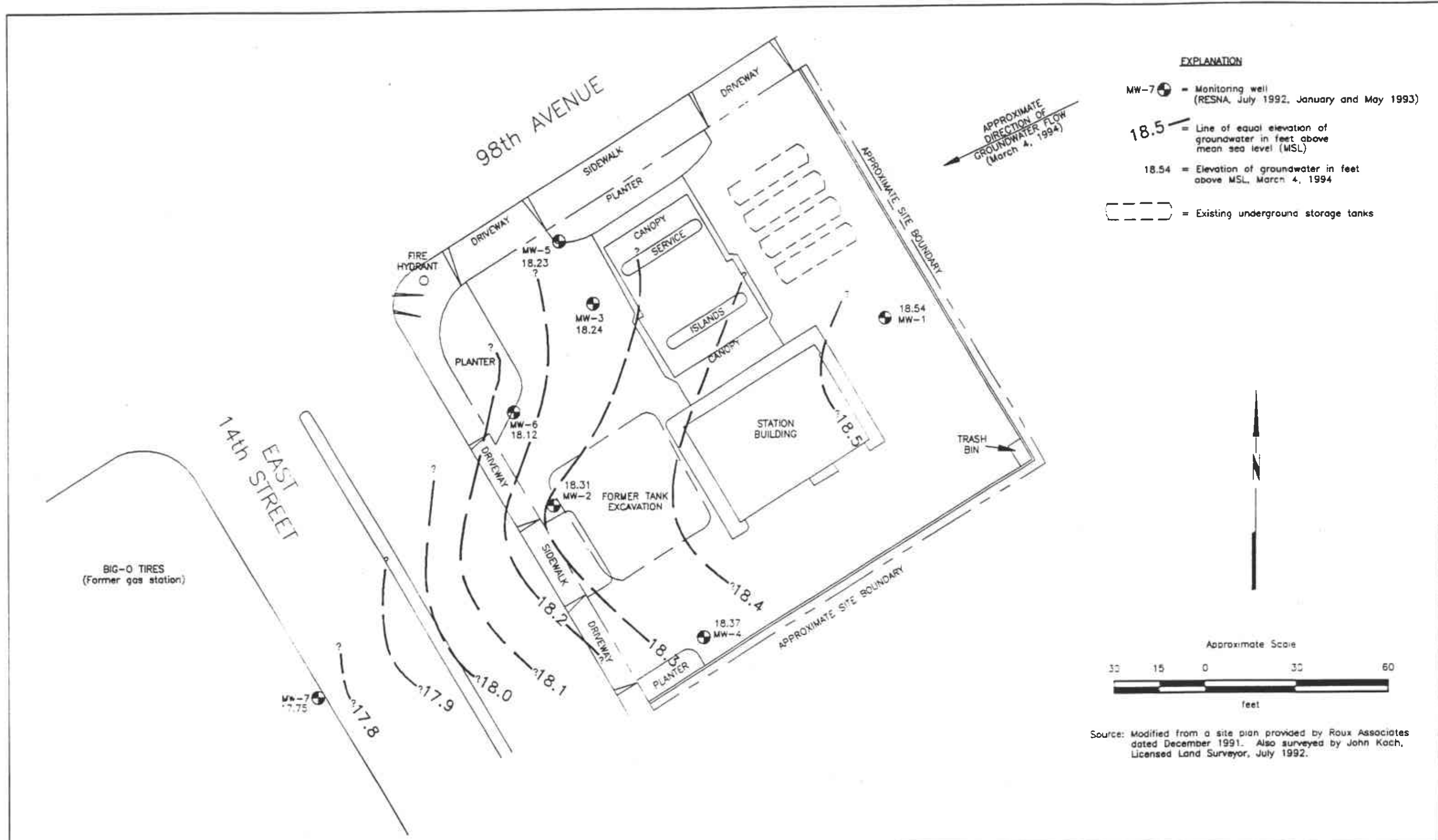


- EXPLANATION**
- B-14/
MW-7 = Monitoring well
(RESNA, July 1992, January and May 1993)
 - B8 = Soil boring
(Roux Associates, May and September 1991)
 - VW-2 = Vapor extraction well
(Roux Associates, May 1991)
 - L-14 = Product line soil sample
(Roux Associates, November 1991)
 - SW-12 = Tank pit soil sample
(Roux Associates, November 1991)
 - = Existing underground storage tanks
 - B-17/
MW-10 = Proposed soil boring/monitoring well





Source: Modified from a site plan provided by Roux Associates dated December 1991. Also surveyed by John Kac Licensed Land Surveyor, July 1992.





98th AVENUE

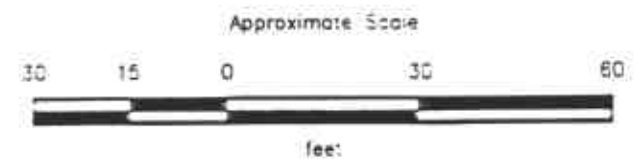
EXPLANATION

- MW-7  = Monitoring well (RESNA, July 1992, January and May 1993)
- 17,000/50 = Concentrations of TPHg/benzene in groundwater in parts per billion, March 4, 1994
-  = Existing underground storage tanks



BIG-O TIRES
(Former gas station)

14th EAST STREET



Source: Modified from a site plan provided by Roux Associates dated December 1991. Also surveyed by John Koch, Licensed Land Surveyor, July 1992.



PROJECT 62026.06 62026601

TPHg/BENZENE CONCENTRATIONS
IN GROUNDWATER
ARCO Station 2185
9800 East 14th Street
Oakland, California

PLATE
5

TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 2185
Oakland, California
(Page 1 of 4)

Date Well Measured	Well Elevation	Depth to Water	Water Elevation	Floating Product
<u>MW-1</u>				
07-24-92	29.15	13.38	15.77	None
08-26-92		13.92	15.23	None
09-22-92		14.18	14.97	None
10-19-92		14.52	14.63	None
11-23-92		14.54	14.61	None
12-16-92		12.20	16.95	None
01-14-93		9.32	19.83	None
02-26-93		9.38	19.77	None
03-26-93		10.04	19.11	None
04-09-93		10.50	18.65	None
05-19-93		11.26	17.89	None
06-17-93		11.53	17.62	None
07-28-93		12.00	17.15	None
08-23-93		12.31	16.84	None
09-28-93		12.60	16.55	None
10-11-93		12.74	16.41	None
11-16-93		12.96	16.19	None
12-16-93		11.68	17.47	None
02-08-94		11.29	17.86	None
03-04-94		10.61	18.54	None
<u>MW-2</u>				
07-24-92	28.47	12.95	15.52	None
08-26-92		13.55	14.92	None
09-22-92		13.78	14.69	None
10-19-92		14.09	14.38	None
11-23-92		14.06	14.41	None
12-16-92		11.70	16.77	None
01-14-93		8.87	19.60	None
02-26-93		8.98	19.49	None
03-26-93		9.57	18.90	None
04-09-93		10.02	18.45	None
05-19-93		10.81	17.66	None
06-17-93		11.08	17.39	None
07-28-93		11.60	16.87	None
08-23-93		11.90	16.57	None
09-28-93		12.17	16.30	None
10-11-93		12.31	16.16	None
11-16-93		12.54	15.93	Sheen

See notes on page 4 of 4.

TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 2185
Oakland, California
(Page 2 of 4)

Date Well Measured	Well Elevation	Depth to Water	Water Elevation	Floating Product
<u>MW-2 cont.</u>	28.47			
12-16-93		11.29	17.18	None
02-08-94		10.85	17.62	None
03-04-94		10.16	18.31	None
<u>MW-3</u>	28.57			
07-24-92		12.90	15.67	Sheen
08-26-92		13.51	15.06	None
09-22-92		13.73	14.84	None
10-19-92		14.04	14.53	None
11-23-92		14.02	14.55	None
12-16-92		11.73	16.84	None
01-14-93		9.17	19.40	None
02-26-93		9.30	19.27	None
03-26-93		9.83	18.74	None
04-09-93		10.22	18.35	None
05-19-93		10.91	17.66	None
06-17-93		10.74	17.83	None
07-28-93		11.60	16.97	None
08-23-93		11.93	16.64	None
09-28-93		12.13	16.44	None
10-11-93		12.26	16.31	None
11-16-93		12.48	16.09	None
12-16-93		11.26	17.31	None
02-08-94		10.93	17.64	None
03-04-94		10.33	18.24	None
<u>MW-4</u>	29.21			
07-24-92		13.68	15.53	None
08-26-92		14.12	15.09	None
09-22-92		14.46	14.75	None
10-19-92		14.74	14.47	None
11-23-92		14.75	14.46	None
12-16-92		12.45	16.76	None
01-14-93		9.46	19.75	None
02-26-93		9.54	19.67	None
03-26-93		10.19	19.02	None
04-09-93		10.67	18.54	None
05-19-93		11.52	17.69	None

See notes on page 4 of 4.

TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 2185
Oakland, California
(Page 3 of 4)

Date Well Measured	Well Elevation	Depth to Water	Water Elevation	Floating Product
<u>MW-4 cont.</u>	29.21			
06-17-93		11.79	17.42	None
07-28-93		12.30	16.91	None
08-23-93		12.60	16.61	None
09-28-93		12.88	16.33	None
10-11-93		13.03	16.18	None
11-16-93		13.24	15.97	None
12-16-93		11.96	17.25	None
02-08-94		11.54	17.67	None
03-04-94		10.84	18.37	None
<u>MW-5</u>	28.12			
02-26-93		9.00	19.12	None
03-26-93		9.41	18.71	None
04-09-93		9.80	18.32	None
05-19-93		10.50	17.62	None
06-17-93		10.73	17.39	None
07-28-93		11.15	16.97	None
08-23-93		11.43	16.69	None
09-28-93		11.66	16.46	None
10-11-93		11.80	16.32	None
11-16-93		12.00	16.12	None
12-16-93		10.81	17.31	None
02-08-94		10.53	17.59	None
03-04-94		9.89	18.23	None
<u>MW-6</u>	27.79			
02-26-93		8.47	19.32	None
03-26-93		9.07	18.72	None
04-09-93		9.53	18.26	None
05-19-93		10.23	17.56	None
06-17-93		10.51	17.28	None
07-28-93		10.98	16.81	None
08-23-93		11.28	16.51	None
09-28-93		11.50	16.29	None
10-11-93		11.65	16.14	None
11-16-93		11.87	15.92	None
12-16-93		10.63	17.16	None
02-08-94		10.28	17.51	None
03-04-94		9.67	18.12	None

See notes on page 4 of 4.

TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 2185
Oakland, California
(Page 4 of 4)

Date Well Measured	Well Elevation	Depth to Water	Water Elevation	Floating Product
<u>MW-7</u>				
07-28-93	27.88	11.67	16.21	None
08-23-93		12.00	15.88	None
09-28-93		12.17	15.71	None
10-11-93		12.33	15.55	None
11-16-93		12.46	15.42	None
12-16-93		11.23	16.65	None
02-08-94		10.83	17.05	None
03-04-94		10.13	17.75	None

All measurements in feet.

Well Elevation if top-of-casing (TOC) in feet above mean sea level (msl).

Depth-to-Water (DTW) is measured in feet below TOC

Groundwater Elevation = TOC - DTW

Floating Product = Subjective evidence of floating product noted.

Wells MW-1 through MW-4 surveyed on July 23, 1992, wells MW-5 through MW-7 surveyed on May 11, 1993 (Benchmark #24/D, near the corner of 98th Avenue [5' feet west of west curb] and East 14th Street [7' feet east of the south curb] in Oakland).

TABLE 2
CUMULATIVE RESULTS OF LABORATORY ANALYSES OF
GROUNDWATER SAMPLES
ARCO Station 2185
Oakland, California
(Page 1 of 2)

Well	TPHg	B	T	E	X
MW-1					
07-24-92	<50	<0.5	<0.5	<0.5	<0.5
10-19-92	<50	<0.5	<0.5	<0.5	<0.5
01-14-93	<50	<0.5	<0.5	<0.5	<0.5
04-09-93	<50	<0.5	<0.5	<0.5	<0.5
08-23-93	<50	<0.5	<0.5	<0.5	<0.5
10-11-93	<50	<0.5	<0.5	<0.5	<0.5
03-04-94	<50	<0.5	<0.5	<0.5	<0.5
MW-2					
07-24-92	5,900	510	<10*	370	430
10-19-92	4,100	110	<10*	100	62
01-14-93	12,000	700	10	720	680
04-09-93	8,400	220	<10*	480	320
08-23-93	3,700	89	<5*	230	150
10-11-93	2,700	50	<2.5*	<140	68
03-04-94	3,100	49	<2.5*	180	98
MW-3					
07-24-92		Not sampled - sheen			
10-19-92	42,000	740	1,100	1,500	5,700
01-14-93	44,000	1,100	840	2,200	9,600
04-09-93	21,000	33	69	350	1,600
08-23-93	13,000	63	21	530	1,300
10-11-93	11,000	56	13	530	1,200
03-04-94	17,000	50	<10*	790	1,600
MW-4					
07-24-92	<50	<0.5	<0.5	<0.5	<0.5
10-19-92	<50	<0.5	<0.5	<0.5	<0.5
01-14-93	<50	<0.5	<0.5	<0.5	<0.5
04-09-93	<50	<0.5	<0.5	<0.5	<0.5
08-23-93	<50	<0.5	<0.5	<0.5	<0.5
10-11-93	<50	<0.5	<0.5	<0.5	<0.5
03-04-94	<50	<0.5	<0.5	<0.5	<0.5
MW-5					
02-11-93	9,300	620	<50*	890	2,200
04-09-93	960	29	<1*	100	96
08-23-93	2,700	50	<2.5*	260	250
10-11-93	840	9	<1*	87	41
03-04-94	540	0.9	0.6	16	6.3

See notes on page 2 of 2

TABLE 2
CUMULATIVE RESULTS OF LABORATORY ANALYSES OF
GROUNDWATER SAMPLES
ARCO Station 2185
Oakland, California
(Page 2 of 2)

Well	TPHg	B	T	E	X
MW-6					
02-11-93	4,800	630	<10*	490	460
04-09-93	13,000	880	<10*	1,000	1,000
08-23-93	6,300	390	<20*	450	390
10-11-93	2,900	150	3.4	190	140
03-04-94	5,800	320	<5*	510	360
MW-7					
05-14-93	350	0.83	<0.50	<0.50	<0.50
08-23-93	630**	7.3	<1*	<1*	<1*
10-11-93	620**	3.5	<0.5	<0.5	<0.5
03-04-94	320**	<0.5	<0.5	<0.5	<0.5
MCL	---	1.0	---	680	1,750
DWAL	---	---	100	---	---

Results in parts per billion (ppb).

TPHg = Total petroleum hydrocarbons as gasoline using EPA Method 5030/8020/DHS LUFT.

B = benzene, T = toluene, E = ethylbenzene, X = total xylenes using EPA Method 5030/8020/DHS LUFT

< = Below indicated laboratory detection limits.

* = Laboratory raised Method Reporting Limit (MRL) due to high analyte concentration requiring sample dilution.

** = According to the laboratory, the sample contains components eluting in the gasoline range that were quantitated as gasoline. The chromatogram does not match the typical gasoline fingerprint.

MCL = State Maximum Contaminant Level (California Department of Health Services, October 1990).

DWAL = State Recommended Drinking Water Action Level (California Department of Health Services, October 1990).

APPENDIX A

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

I NTEGRATED
W ASTESTREAM
M ANAGEMENT, INC.

April 8, 1994

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

Dear Mr. Young:

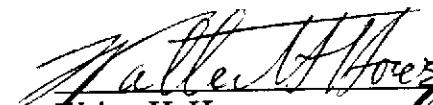
Attached are the field data sheets and analytical results for quarterly ground water sampling at ARCO Facility No. 2185 in Oakland, California. Integrated Wastestream Management measured the depth to water and collected samples from wells at this site on March 4, 1994.

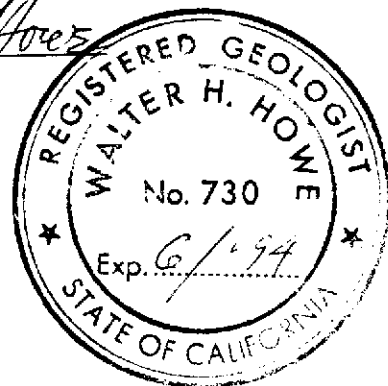
Sampling was carried out in accordance with the protocols described in the "Request for Bid for Quarterly Sampling at ARCO Facilities in Northern California".

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 for ARCO Facility A-2185, Oakland, California

WELL NUMBER	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7
DATE SAMPLED	3/4/94	3/4/94	3/4/94	3/4/94	3/4/94	3/4/94	3/4/94
DEPTH TO WATER	10.61	10.16	10.33	10.84	9.89	9.67	10.13
SHEEN	NONE	NONE	NONE	NONE	NONE	NONE	NONE
PRODUCT THICKNESS	NA	NA	NA	NA	NA	NA	NA
TPHg	ND	3,100	17,000	ND	540	5,800	320
BTEX							
BENZENE	ND	49	50	ND	0.9	320	ND
TOLUENE	ND	<2.5	<10	ND	0.6	<5	ND
ETHLYBENZENE	ND	180	790	ND	16	510	ND
XYLENES	ND	98	1,600	ND	6.3	360	ND

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.

NA = Not applicable.

WELL ID: MW-1 TD 23.6 - DTW 10.61 x 0.66 Gal. X 3 Casing = 25.72 Calculated
 Linear Ft. Volume Purge

DATE PURGED: 3-4-94 TIME (2400 HR): 1309 END DTW: 1314
 DATE SAMPLED: 3-4-94 TIME (2400 HR): 1317 DTW: 140

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	E.C. (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1310	2	6.85	0.57	70.3	CLEAR
1311	10	6.77	0.52	68.6	CLEAR
1312	15	6.71	0.50	67.5	CLEAR
1314	25	6.75	0.51	67.6	CLEAR
Total purge:	24				

PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP.: Bailer Disp.

REMARKS:

WELL ID: MW-4 TD 238 - DTW 1084 x 0.66 Gal. X 3 Casing = 25.66 Calculated
 Linear Ft. Volume Purge

DATE PURGED: 3-4-94 TIME (2400 HR): 1333 END DTW: 1338
 DATE SAMPLED: 3-4-94 TIME (2400 HR): 1439 DTW: 11.0

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	E.C. (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1333	2	6.79	0.59	70.4	CLEAR
1335	13	6.75	0.54	68.8	CLEAR
1337	20	6.71	0.54	68.6	CLEAR
1338	25	6.71	0.55	68.5	CLEAR
Total purge:	26				

PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP.: Bailer Disp.

REMARKS:

WELL ID: MW-2 TD 23.6 - DTW 10.16 x 0.66 Gal. X 3 Casing = 26.61 Calculated
 Linear Ft. Volume Purge

DATE PURGED: 3-4-94 TIME (2400 HR): 1412 END DTW: 1417
 DATE SAMPLED: 3-4-94 TIME (2400 HR): 1431 DTW: 10.0

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	E.C. (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1412	2	6.67	0.82	73.1	CLEAR
1413	7	6.65	0.79	71.0	CLEAR
1417	22	6.64	0.76	69.4	CLEAR
1417	24	6.53	0.75	69.2	CLEAR
Total purge:	27				

PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP.: Bailer Disp.

REMARKS:

WELL ID: MW-7 TD 25.3 - DTW 10.13 x 0.17 Gal. X 3 Casing = 7.73 Calculated
 Linear Ft. Volume Purge

DATE PURGED: 3-4-94 TIME (2400 HR): 1428 END DTW: 1432
 DATE SAMPLED: 3-4-94 TIME (2400 HR): 1445 DTW: 14.0

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	E.C. (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1429	3	6.91	0.79	68.3	clear
1431	6	6.87	0.75	68.4	clear
1432	9	6.86	0.73	68.0	clear
Total purge:	9.0				

PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP.: Bailer Disp.

REMARKS: Vine Valdes
John Valdes

PRINT NAME:

Francesco Abundant

SIGNATURE:

Francesco Abundant

WELL ID: MW-5 TD 26.9 DTW 9.89 X Gal. 0.66 X Casing 3 - Calculated 33.67
Linear Ft. Volume Purge

DATE PURGED: 3-4-94 TIME (2400 HR): 1330 END DTW: 1338
 DATE SAMPLED: 3-4-94 TIME (2400 HR): 1343 DTW: 12.8

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	E.C. (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1332	2	6.86	0.46	68.9	clear
1334	9	6.78	0.45	67.7	clear
1335	18	6.80	0.45	67.5	clear
1338	26	6.84	0.46	67.3	cloudy
Total purge:	34	6.84	0.46	67.0	cloudy

PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.

REMARKS:

WELL ID: MW-6 TD 27.8 DTW 9.67 X Gal. 0.66 X Casing 3 - Calculated 35.89
Linear Ft. Volume Purge

DATE PURGED: 3-4-94 TIME (2400 HR): 1349 END DTW: 1359
 DATE SAMPLED: 3-4-94 TIME (2400 HR): 1402 DTW: 13.0

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	E.C. (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1357	2	6.62	0.71	69.8	clear
1353	10	6.63	0.67	69.5	clear
1355	22	6.59	0.68	69.3	clear
1359	36	6.60	0.70	69.0	clear
Total purge:	36				

PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.

REMARKS:

WELL ID: MW-3 TD 23.3 DTW 10.33 X Gal. 0.66 X Casing 3 - Calculated 25.68
Linear Ft. Volume Purge

DATE PURGED: 3-4-94 TIME (2400 HR): 1414 END DTW: 1423
 DATE SAMPLED: 3-4-94 TIME (2400 HR): 1426 DTW: 11.0

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	E.C. (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1416	4	6.84	0.55	69.7	clear
1418	12	6.77	0.55	68.6	clear
1420	18	6.69	0.57	68.3	clear
1423	26	6.66	0.58	68.5	clear
Total purge:					

PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.

REMARKS:

WELL ID: _____ TD _____ DTW _____ X Gal. _____ X Casing _____ - Calculated _____
Linear Ft. Volume Purge

DATE PURGED: _____ TIME (2400 HR): _____ DTW: _____
 DATE SAMPLED: _____ TIME (2400 HR): _____ DTW: _____

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	E.C. (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
Total purge:	_____				

PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.

REMARKS:

PRINT NAME:

Vince Uldes

SIGNATURE:

Vince Uldes



March 21, 1994

March 21, 1994

Service Request No. SJ94-0276

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

Re: **ARCO Facility No. 2185**

Dear Ms. Austin/Mr. DeLon:

Attached are the results of the water samples submitted to our lab on March 7, 1994. For your reference, these analyses have been assigned our service request number SJ94-0276.

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/df

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.

QA/QC Report

Client: IWM
Project: ARCO Facility No. 2185
Sample Matrix: Water

Dates Collected: 3/4/94
Date Received: 3/7/94
Date Extracted: N/A
Date Analyzed: 3/10, 14/94
Service Request: SJ94-0276

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

<u>Sample Name</u>	<u>Lab Code</u>	<u>Percent Recovery</u> a,a,a-Trifluorotoluene
MW-4	940276-3-4	80.
MW-7	940276-5-6	87.
MW-5	940276-7-8	85.
MW-2	940276-9-10	109.
MW-6	940276-11-12	88.
MW-3	940276-13-14	100.
MW-1	940276-15-16	81.
MS	940310-MS	91.
DMS	940310-DMS	86.
Method Blank	940310-WMB	93.
Method Blank	940314-WMB	90.

CAS Acceptance Limits: 62-112

Approved By: _____

K. O. Murphy

Date: _____

March 21, 1994

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report



Client: IWM
Project: ARCO Facility No. 2185
Sample Matrix: Water

Dates Collected: 3/4/94
Date Received: 3/7/94
Date Extracted: N/A
Date Analyzed: 3/10/94
Service Request: SJ94-0276

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.	25.7	103.	85-115
Toluene	25.	25.3	101.	85-115
Ethylbenzene	25.	24.7	99.	85-115
Total Xylenes	75.	74.9	100.	85-115
TPH as Gasoline	250.	255.	102.	90-110

Approved By:

K. O. Murphy

Date:

March 21, 1994

COLUMBIA ANALYTICAL SERVICES, INC.



QA/QC Report

Client: IWM
Project: ARCO Facility No. 2185
Sample Matrix: Water

Dates Collected: 03/04/94
Date Received: 03/07/94
Date Extracted: NA
Date Analyzed: 3/10/94
Service Request: SJ94-0276

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

Sample Name: Batch QC

<u>Analyte</u>	<u>Spike Level</u>	<u>Sample Result</u>	<u>Percent Recovery</u>				<u>CAS Acceptance Criteria</u>
			<u>MS</u>	<u>DMS</u>	<u>MS</u>	<u>DMS</u>	
TPH as Gasoline	250.	ND	269.	245.	108.	98.	67-121

Approved By:

Keon Murphy

Date:

March 21, 1994

ARCO Facility no. **A 2135** City (Facility) **OAKLAND** Project manager (Consultant) **TOM De Jon**
 ARCO engineer **KYLE CHRISTIE** Telephone no. (ARCO) **415/571 2434** Telephone no. (Consultant) **408/942 1499** Fax no. (Consultant) **408/942 8955**
 Consultant name **IWM** Address (Consultant) **950 Ames Cir Milp CA 95035**

Laboratory name **Columbia**
 Contract number **07077**

Sample I.D.	Lab no.	Container no.	Matrix			Preservation		Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH EPA 8020/8020/8015	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 625/8270	TCCLP Metals <input type="checkbox"/> VOA <input type="checkbox"/> VOA <input type="checkbox"/> Semi <input type="checkbox"/>	CAN Metals EPA 8010/7000 TLC <input type="checkbox"/> STLC <input type="checkbox"/>	Lead Org. DHS Lead EPA 7420/7421 <input type="checkbox"/>		
			Soil	Water	Other	Ice	Acid HCL															
F-B1	1-2	2		✓		✓	✓	3-4-94	1030		✓	✓										
MW-4	7-9	2		✓		✓	✓	}	1439		✓	✓										
MW-7	5-6	2		✓		✓	✓		1445		✓	✓										
MW-5	7-8	2		✓		✓	✓		1343		✓	✓										
MW-2	9-10	2		✓		✓	✓		1431		✓	✓										
MW-6	11-12	2		✓		✓	✓		1402		✓	✓										
MW-3	13-14	2		✓		✓	✓		1426		✓	✓										
MW-1	15-16	2		✓		✓	✓		1317		✓	✓										

Method of shipment
CAS
LOURIER

Special detection
 Limit/reporting

Special QA/QC

Remarks
Hold
on
F-B

Lab number
5994-0276

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

Condition of sample: **good** Temperature received: **cool**
 Relinquished by sampler **Alma Chuldi** Date **3/7/94** Time **8:45 AM** Received by **Alma Austin**
 Relinquished by **[Signature]** Date **3-7-94** Time **10:20** Received by **[Signature]** Date **3-7-94** Time **10:20**
 Relinquished by _____ Date _____ Time _____ Received by laboratory _____ Date _____ Time _____