RESNA

Working To Restore Nature

3315 Almaden Expressway, Suite 34
San Jose, CA 95118
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LETTER REPORT
QUARTERLY GROUNDWATER MONITORING
Third Quarter 1992
at
ARCO Station 6148
5131 Shattuck Avenue
Oakland, California

11/30/92

61035.03

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3315 Almaden Expressway, Suite 34
San Jose, CA 95118
Phone: (408) 264-7723
Fax: (408) 264-2345

TRANSMITTAL

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

DATE: November 30, 1992
PROJECT NUMBER: 61035.03
SUBJECT: ARCO Station 6148, 5131 Shattuck Avenue, Oakland, California

FROM: Robert Campbell
TITLE: Staff Geologist

WE ARE SENDING YOU:

COPIES	DATED	NO.	DESCRIPTION
1	11/30/92	61035.03	Letter Report Quarterly Groundwater Monitoring Third Quarter 1992 at ARCO Station 6148, 5131 Shattuck Avenue, Oakland, California.

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[ ] For approval [ ] Return for corrections [ ] Return ___ corrected prints

[ ] For your files

REMARKS:
Per ARCO's request (Mr. Michael Whelan) this report has been forwarded to you for your review.

Copies: 1 to RESNA project file no. 61035.03

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3315 Almaden Expressway, Suite 34
San Jose, CA 95118
Phone: (408) 264-7723
Fax: (408) 264-2345

November 30, 1992
1116MWHE
61035.03

Mr. Michael Whelan
ARCO Products Company
Post Office Box 5811
San Mateo, California 94402

Subject: Third Quarter 1992 Groundwater Monitoring Report for ARCO Station 6148, 5131 Shattuck Avenue, Oakland, California.

Mr. Whelan:

As requested by ARCO Products Company (ARCO), RESNA Industries Inc. (RESNA) prepared this letter report, which summarizes the results of third 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 a former waste-oil tank and existing underground gasoline-storage tanks (USTs) at the site. The field work and laboratory analyses of groundwater samples during this quarter were performed under the direction of EMCON and included measuring depths to groundwater, subjectively analyzing groundwater for the presence of petroleum product, collecting groundwater samples from the wells for laboratory analyses, and directing a State-certified laboratory to analyze the groundwater samples. Field procedures and acquisition of field data were performed under the direction of EMCON; evaluation and warrant of their field data and field protocols is beyond RESNA'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 6148 is located on the southwestern corner of the intersection of Shattuck Avenue and 52nd Street at 5131 Shattuck Avenue, in Oakland, California, as shown on the Site Vicinity Map, Plate 1.

Prior to the present monitoring, RESNA conducted an initial subsurface investigation related to the former waste-oil tank, which was removed by Crosby and Overton in June

1987. In December 1991, RESNA initiated a subsurface investigation which included drilling four soil borings (B-1 through B-4) and installing three 4-inch-diameter groundwater monitoring wells (MW-1 through MW-3) in borings B-1 through B-3, respectively. Based on the results of this investigation RESNA concluded that the soil and groundwater in the vicinity of the former waste-oil tank pit had been impacted by hydrocarbons. The detailed results of this investigation are summarized in the initial subsurface investigation related to former waste-oil tank report (RESNA, September 29, 1992). The location of the groundwater monitoring wells, borings, 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 July 15, August 7, and September 14, 1992. Quarterly sampling was performed by EMCON field personnel on September 14, 1992. The results of EMCON's field work on the site, including DTW levels and subjective analysis for the presence of product in the groundwater in MW-1 through MW-3 are presented on EMCON's Field Reports and EMCON's Summary of Groundwater Monitoring Data. These data are included in Appendix A.

The DTW levels, wellhead elevations, groundwater elevations, and subjective observations of product in the groundwater from MW-1 through MW-3 for this and previous quarterly groundwater monitoring at the site are summarized in Table 1, Cumulative Groundwater Monitoring Data. EMCON's DTW levels from July 15, August 7, and September 14, 1992, were used to evaluate groundwater gradients. The presence of 0.55 feet of product was recorded by EMCON's field personnel in MW-2 on September 14, 1992. Presence of product or sheen was not observed in MW-1 and MW-3 by EMCON's field personnel during this quarter (see EMCON's Field Reports, Appendix A). Groundwater elevations in wells MW-1 through MW-3 decreased an average of approximately 0.25 feet between July 15 and September 14, 1992. The groundwater gradients interpreted for this quarter are shown on Plates 3 through 5, Groundwater Gradient Maps. The interpreted groundwater gradients were approximately 0.01 and groundwater flow directions were toward the southeast on July 1992, toward the south in August, and toward the southwest in September 1992. These gradients and flow directions are generally consistent with previously interpreted gradients. The gradient may be skewed by the presence of floating product in MW-2 and proximity of wells to each other.

Groundwater monitoring wells MW-1 and MW-3 were purged and sampled by EMCON field personnel on September 14, 1992. EMCON's Water Sample Field Data Sheets are included in Appendix A. Approximately three well volumes were purged from MW-1 and five well volumes were purged from MW-3 prior to collecting groundwater samples on

September 14, 1992. Purge water was removed from the site by a licensed hazardous waste hauler. The Monitoring Well Purge Water Transport Form is included in Appendix A.

Laboratory Methods and Results

Under the direction of EMCON, water samples collected from the wells were analyzed by Columbia Analytical Services, Inc., located in San Jose, California (California Hazardous Waste Testing Laboratory Certification No. 1426). The water samples from MW-1 and MW-3 were analyzed for total petroleum hydrocarbons as gasoline (TPHg) and benzene, toluene, ethylbenzene, and total xylenes (BTEX) using modified Environmental Protection Agency (EPA) Methods 5030/8020/DHS LUFT Method. TPHg/Benzene Concentrations in Groundwater are shown on Plate 6. Groundwater from wells MW-1 and MW-3 were also analyzed for total petroleum hydrocarbons as diesel (TPHd) using EPA Method 3510, total recoverable petroleum hydrocarbons (TRPH) using EPA Method 418.1, and volatile organic compounds (VOCs) using EPA Method 5030/8010. The Chain of Custody Records and Laboratory Analytical Reports are included in Appendix A. Results of these and previous water analyses are summarized in Tables 2 and 3, Cumulative Results of Laboratory Analyses of Water Samples.

Analytical results of water samples from wells MW-1 and MW-3 indicate:

- TPHg was detected at concentrations of 1,000 parts per billion (ppb) in MW-1 and 53,000 ppb in MW-3.

- Benzene was detected at concentrations of 370 ppb in MW-1 and 4,300 ppb in MW-3; which are greater than the State Maximum Contaminant Level (MCL) of 1 ppb benzene in drinking water.

- Toluene, ethylbenzene, and total xylenes were detected at concentrations ranging from 6.5 ppb to 17 ppb in well MW-1, and at concentrations ranging from 1,300 ppb to 7,300 ppb in well MW-3. The concentrations of toluene, ethylbenzene and total xylenes in well MW-3 are greater than the Drinking Water Action Level (DWAL) of 100 ppb toluene, the MCL of 680 ppb ethylbenzene, and the MCL of 1,750 ppb total xylenes.

- A lower boiling point hydrocarbon mixture quantified as TPHd was detected at a concentration of 40,000 ppb in MW-3. The mixture was nondetectable (less than 80 ppb) in MW-1. The chromatogram of the hydrocarbon mixture does not match the typical diesel fingerprint, and is probably weathered gasoline.

- TRPH was detected at a concentration of 0.9 parts per million (ppm) in well MW-1 and at a concentration of 5.5 ppm in MW-3.

- Trichloroethene (TCE) was detected at a concentration of 1.5 ppb in MW-1; and was nondetectable (less than 0.5 ppb) in MW-3.

- Tetrachloroethene (PCE) was detected at a concentration of 15 ppb in MW-1; and was detected at a concentration of 2.0 ppb in MW-3. PCE concentrations were greater than the State MCL of 5 ppb in MW-1.

- Other designated VOCs were nondetectable in both MW-1 and MW-3.

The following is a general summary of analytical results of the concentrations of hydrocarbon constituents in the groundwater from the two onsite wells MW-1 and MW-3. Water from well MW-1, located closest to the former waste-oil UST contained the lowest concentrations of TPHg, TPHd, BTEX, and TRPH, and water from well MW-3, located south (down-gradient) of the former waste-oil UST, contained the highest concentrations.

Conclusions

Groundwater on this site has been impacted by petroleum hydrocarbons and VOCs; the lateral extent of petroleum hydrocarbons and VOCs has not been delineated. Although the laboratory analytical results indicated detectable amounts of TPHd, the laboratory evidence suggests that the detected TPHd may actually be weathered gasoline. According to ARCO, diesel has not been stored at the site; and according to the laboratory, the chromatography of the TPHd does not match the typical diesel fingerprint, but falls within the expected weathered gasoline range.

It is recommended that copies of this report be forwarded to:

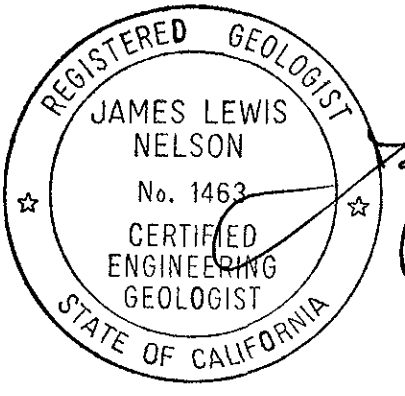
Ms. Susan Hugo
Alameda County Health Care Services Agency
Department of Environmental Health
80 Swan Way, Room 200
Oakland, California 94621

Mr. Richard Hiett
California 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.

Robert D. Campbell
Staff Geologist



James L. Nelson
Certified Engineering
Geologist No. 1463

Enclosures: References

Plate 1, Site Vicinity Map
Plate 2, Generalized Site Plan
Plate 3, Groundwater Gradient Map, July 15, 1992
Plate 4, Groundwater Gradient Map, August 7, 1992
Plate 5, Groundwater Gradient Map, September 14, 1992
Plate 6, TPHg/Benzene Concentrations in Groundwater, September 14, 1992

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

Appendix A: EMCON's Field Reports,
Summary of Groundwater Monitoring Data,
Certified Analytical Reports with Chain-of-Custody,
Water Sample Field Data Sheets, and
Monitoring Well Purge Water Transport Form

REFERENCES

RESNA. August 30, 1991. Work Plan for Initial Subsurface Investigation Related to the Former Waste-Oil Tank at ARCO Station 6148, 5131 Shattuck Avenue, Oakland, California. RESNA Report 61035.01.

RESNA. November 7, 1991. Addendum to Work Plan at ARCO Station 6148, 5131 Shattuck Avenue, Oakland, California. RESNA Report 61035.02.

RESNA. June 6, 1992. Letter Report, Quarterly Groundwater Monitoring First Quarter 1992 at ARCO Station 6148, 5131 Shattuck Avenue, Oakland, California. RESNA Report 61035.03

RESNA. September 28, 1992. Letter Report, Quarterly Groundwater Monitoring Second Quarter 1992 at ARCO Station 6148, 5131 Shattuck Avenue, Oakland, California. RESNA Report 61035.03

RESNA. September 29, 1992. Initial Subsurface Investigation Related to the Former Waste-Oil Tank at ARCO Station 6148, 5131 Shattuck Avenue, Oakland, California. RESNA Report 61035.02.

RESNA. September 29, 1992. Work Plan for Additional Subsurface Investigation at ARCO Station 6148, 5131 Shattuck Avenue, Oakland, California. RESNA Report 61035.04.

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

N

LEGEND

⊙ = Site Location

Approximate Scale

2000 1000 0 2000 4000

feet

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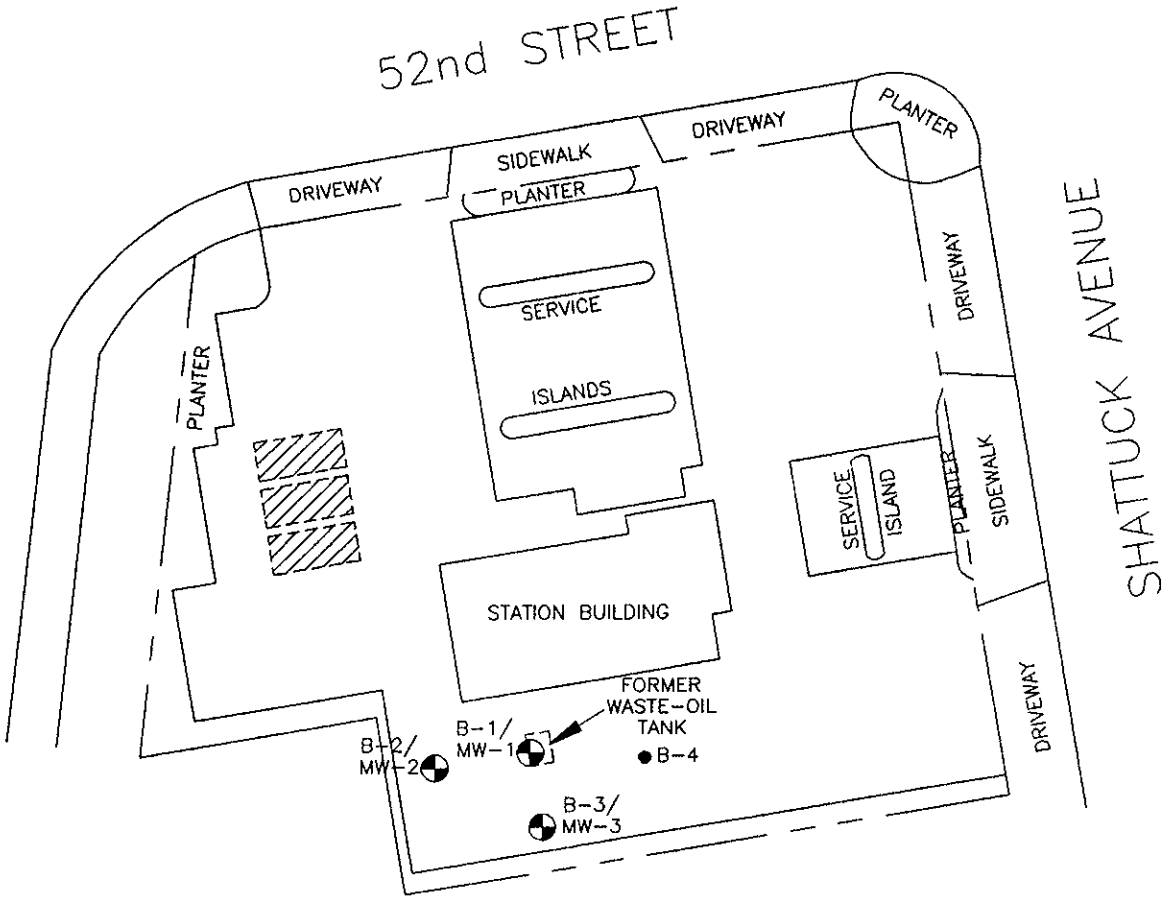
SITE VICINITY MAP
ARCO Station 6148
5131 Shattuck Avenue
Oakland, California

PLATE
1



EXPLANATION

= Underground storage tanks

B-4 ● = Soil boring (RESNA, December 1991)

B-3/ MW-3 ◓ = Monitoring well (RESNA, December 1991)

N

Approximate Scale

40 20 0 40 80

feet

Source: Based on John Koch survey of December 1991.

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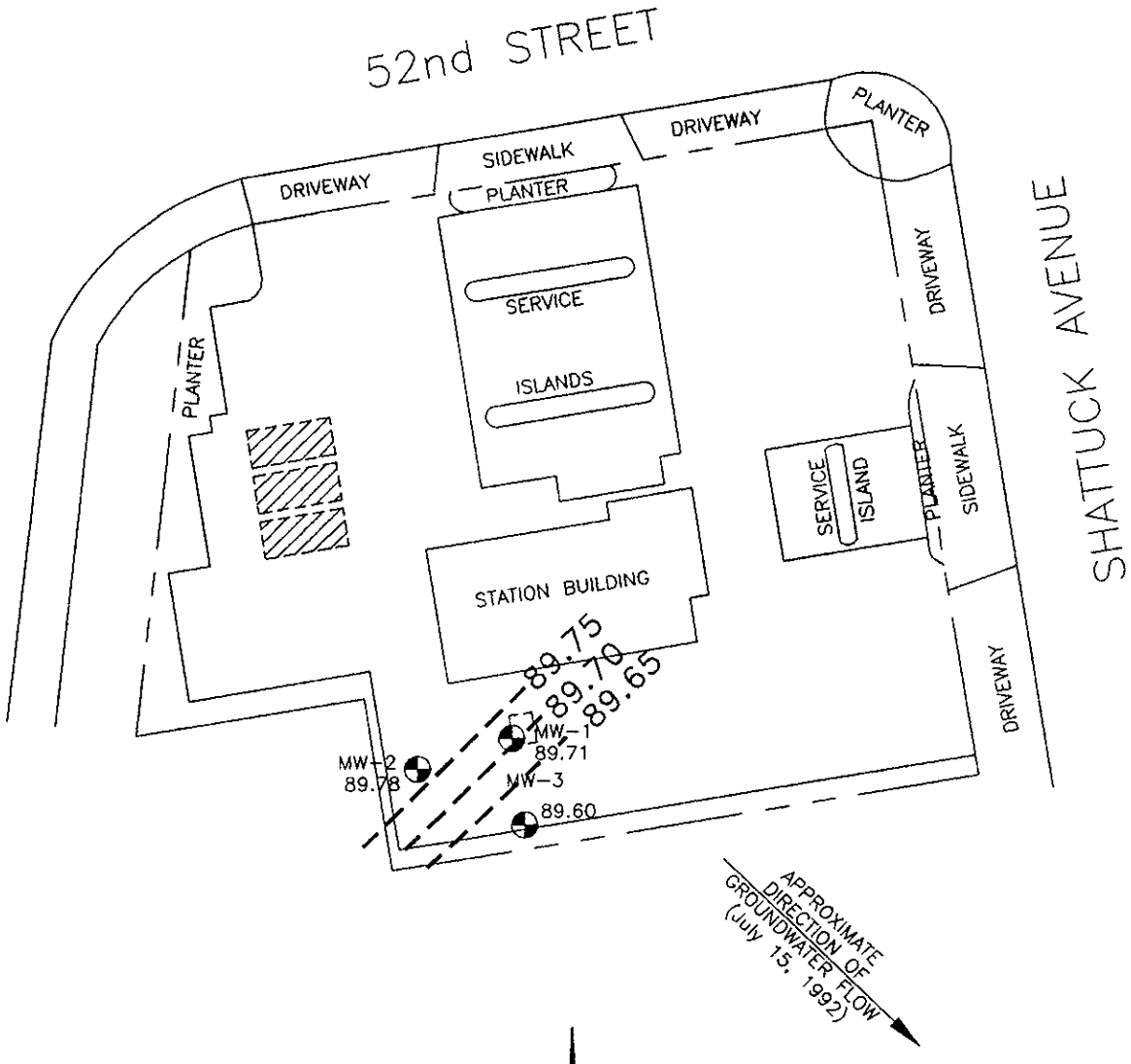
GENERALIZED SITE PLAN
ARCO Station 6148
5131 Shattuck Avenue
Oakland, California

PLATE
2



EXPLANATION

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

89.78 = Elevation of groundwater in feet above MSL, July 15, 1992

MW-3 = Monitoring well (RESNA, December 1991)

= Underground storage tanks

N

Approximate Scale

40 20 0 40 80

feet

Source: Based on John Koch survey of December 1991

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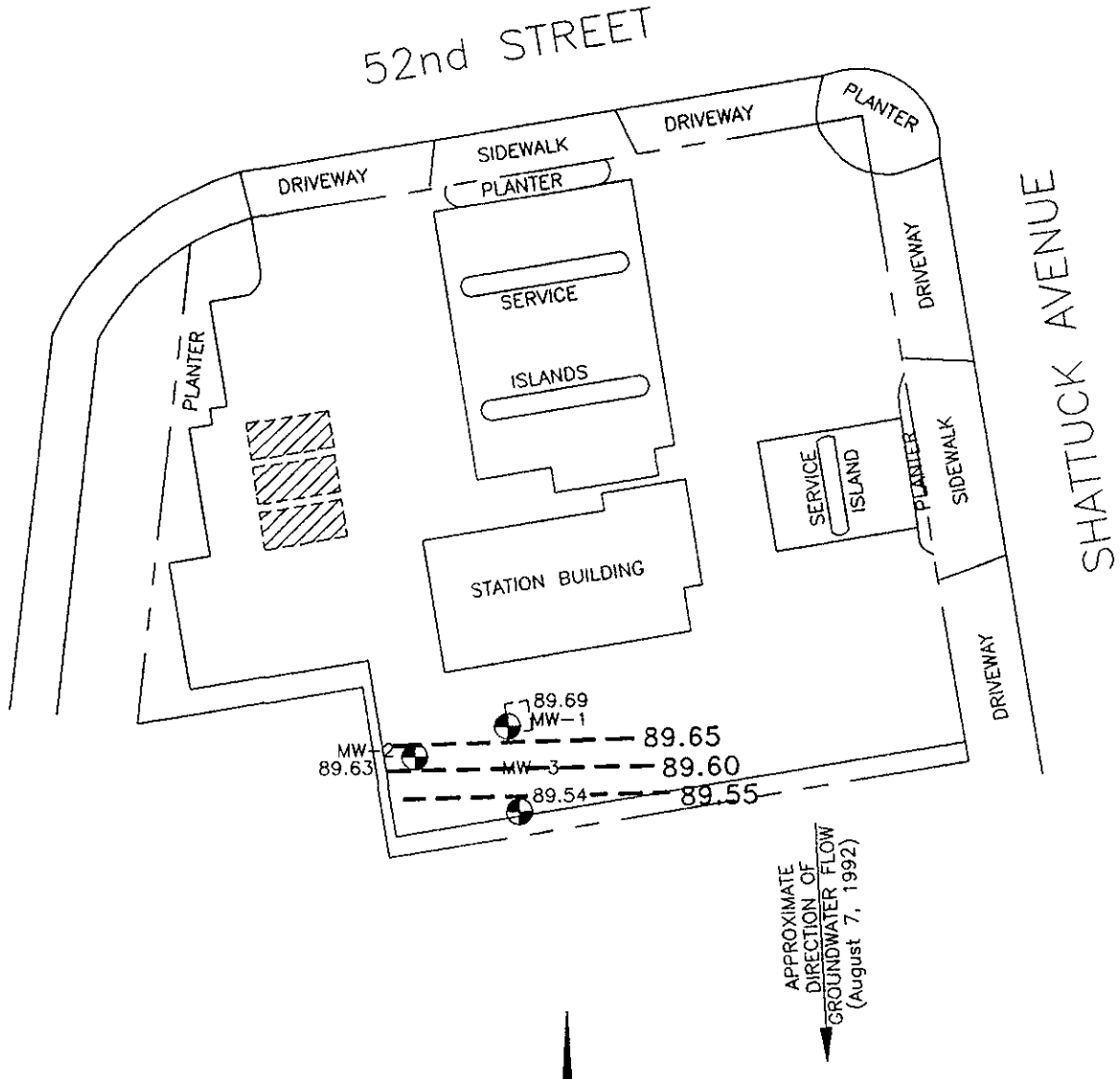
GROUNDWATER GRADIENT MAP
ARCO Station 6148
5131 Shattuck Avenue
Oakland, California

PLATE
3



EXPLANATION

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

89.69 = Elevation of groundwater in feet above MSL, August 7, 1992

MW-3 = Monitoring well (RESNA, December 1991)

= Underground storage tanks

N

Approximate Scale

40 20 0 40 80

feet

Source: Based on John Koch survey of December 1991

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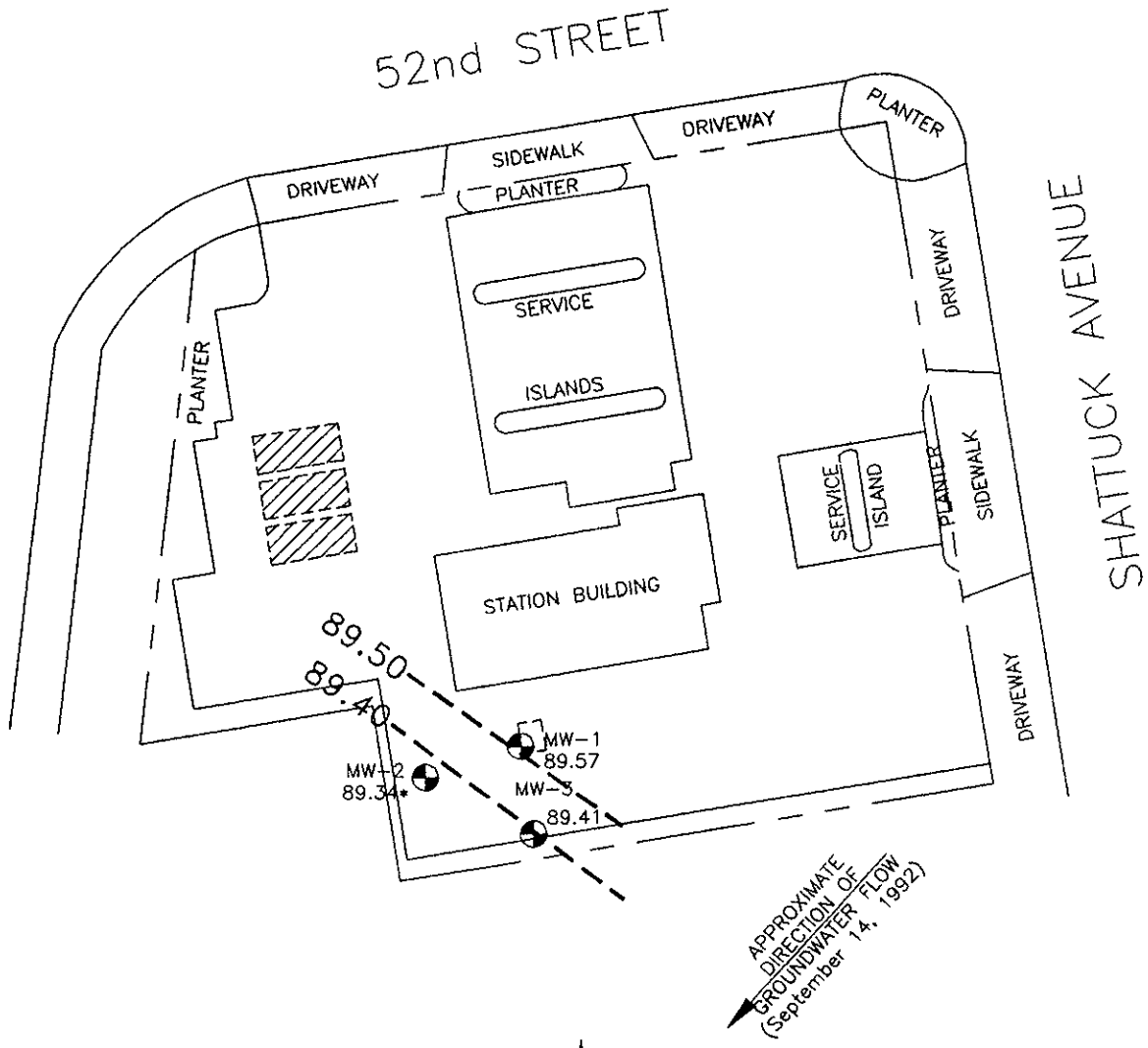
GROUNDWATER GRADIENT MAP
ARCO Station 6148
5131 Shattuck Avenue
Oakland, California

PLATE
4



EXPLANATION

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

89.57 = Elevation of groundwater in feet above MSL, September 14, 1992

* = Groundwater elevation corrected to allow for floating product in well

MW-3 = Monitoring well (RESNA, December 1991)

= Underground storage tanks

N

Approximate Scale

40 20 0 40 80

feet

Source: Based on John Koch survey of December 1991

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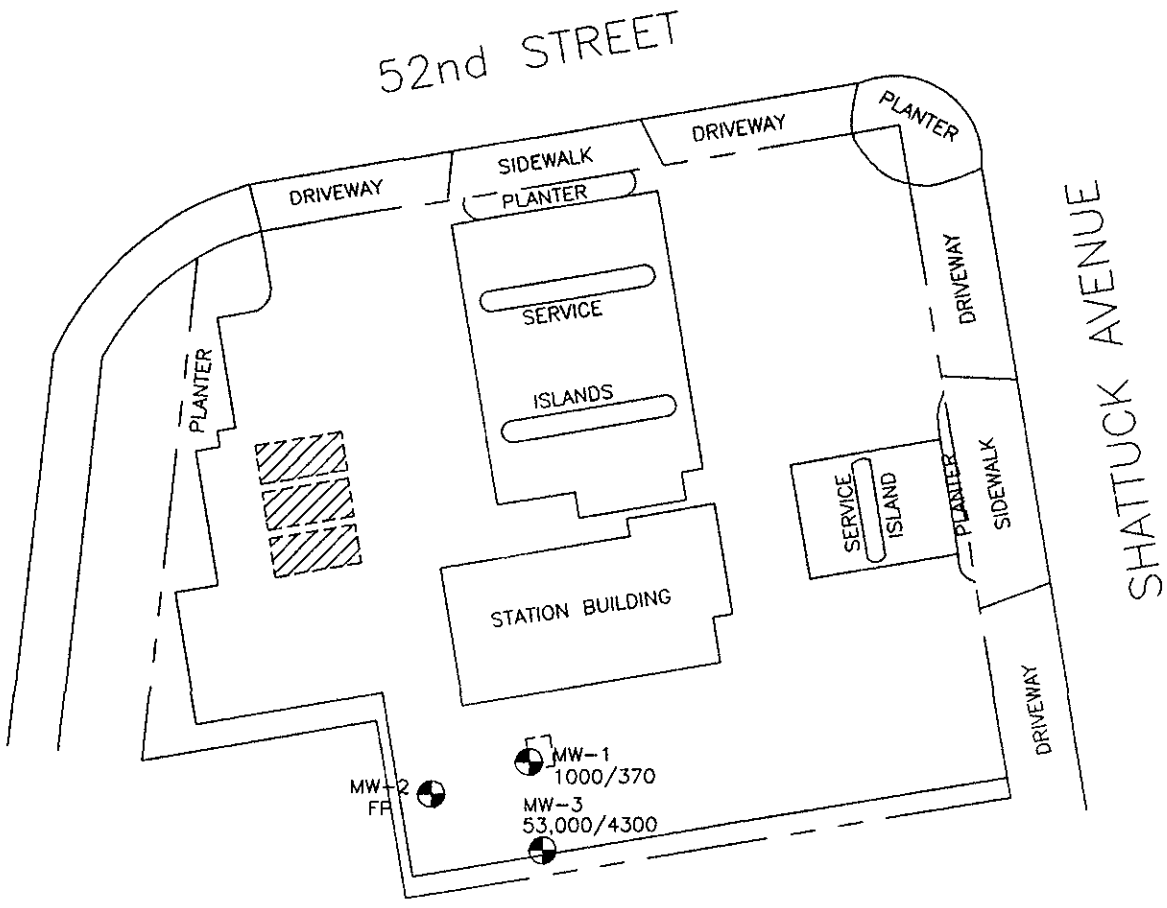
GROUNDWATER GRADIENT MAP
ARCO Station 6148
5131 Shattuck Avenue
Oakland, California

PLATE
5



EXPLANATION

53,000/4300 = Concentration of TPHg/benzene in groundwater in parts per billion, September 14, 1992

FP = Floating product

MW-3 = Monitoring well (RESNA, December 1991)

= Underground storage tanks

Approximate Scale

40 20 0 40 80

feet

Source: Based on John Koch survey of December 1991

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TPHg/BENZENE CONCENTRATIONS IN GROUNDWATER
ARCO Station 6148
5131 Shattuck Avenue
Oakland, California

PLATE 6

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Quarterly Groundwater Monitoring
ARCO Station 6148, Oakland, California

November 30, 1992
61035.03

TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 6148
Oakland, California

Date Well Measured	Well Elevation	Depth to Water	Water Elevation	Floating Product
MW-1				
12-23-91		18.26	89.77	Sheen
01-07-92	108.03	17.44	90.59	Sheen
01-19-92		17.17	90.86	None
02-19-92		16.52	91.51	None
03-18-92		16.81	91.22	None
04-20-92		17.56	90.47	None
05-15-92		17.96	90.07	None
06-12-92		18.16	89.87	None
07-15-92		18.32	89.71	None
08-07-92		18.34	89.69	None
09-14-92		18.46	89.57	None
MW-2				
12-23-91		17.98	89.45	Sheen
01-07-92	107.43	17.15	90.28	Sheen
01-19-92		17.47	89.96	None
02-19-92		16.28	91.15	None
03-18-92		16.52	90.91	None
04-20-92		17.27	90.16	None
05-15-92		17.62	89.81	None
06-12-92		17.63*	89.80*	0.05
07-15-92		17.65	89.78	None
08-07-92		17.80	89.63	None
09-14-92		18.09*	89.34*	0.55
MW-3				
12-23-91		18.14	89.63	Sheen
01-07-92	107.77	17.26	90.51	Sheen
01-19-92		17.63	90.14	None
02-19-92		16.34	91.43	None
03-18-92		16.62	91.15	None
04-20-92		17.38	90.39	None
05-15-92		17.80	89.97	None
06-12-92		18.01	89.76	None
07-15-92		18.17	89.60	None
08-07-92		18.23	89.54	None
09-14-92		18.36	89.41	None

Measurements in feet.
Wells surveyed on December 27, 1991. Datum is City of Oakland = (USGS) + 3.00
Elevations in feet above mean sea level.
* indicates that the depth to water (DTW) and water elevation were corrected for the presence of floating product by the following method. Measured product thickness (PT) is multiplied by a correction factor of 0.8 and subtracted from DTW. (Adjusted DTW= DTW - [PT X 0.8]).

TABLE 2
CUMULATIVE RESULTS OF LABORATORY ANALYSES OF WATER SAMPLES-
TPHg, TPHd, BTEX, TOG, and Metals
ARCO Station 6148
Oakland, California

WELL DATE	TPHg	TPHd	B	T	E	X	Cd	Cr	Pb	Ni	Zn	TRPH
MW-1												
03/18/92	790	<50	310	26	12	44	<3	5	3	<20	31	<0.5 (1.4)
06-12-92	1,000	<50	290	15	10	30	NA	NA	NA	NA	NA	<0.5
09-14-92	1,000	<80*	370	6.5	6.5	17	NA	NA	NA	NA	NA	0.9
MW-2												
03/18/92	8,400	230**	1,400	1,000	220	870	<3	21	9	38	54	1.2 (3.0)
06/12/92	Not sampled–floating product											
09/14/92	Not Sampled–floating product											
MW-3												
03/18/92	20,000	2,800**	3,200	560	380	1,000	<3	67	27	113	156	7.8 (8.1)
06/12/92	46,000	1,600**	3,400	4,200	1,300	5,400	NA	NA	NA	NA	NA	16
09/14/92	53,000	40,000**	4,300	5,700	1,300	7,300	NA	NA	NA	NA	NA	5.5
MCL:	—	—	1	—	680	1,750	10	50	50	—	—	—
DWAL:	—	—	—	100	—	—	—	—	—	—	—	—

Results in parts per billion (ppb), except TOG which is in parts per million (ppm).
TPHg: Total petroleum hydrocarbons as gasoline by EPA method 5030/8015/8020.
TPHd: Total petroleum hydrocarbons as diesel by EPA method 3510/California DHS LUFT Method.
B: benzene, T: toluene, E: ethylbenzene, X: total xylenes isomers
BTEX: Analyzed by EPA method 5030/8020/DHS LUFT Method.
TOG: Total oil and grease by Standard method 5520F-IR (on 09/14/92 by EPA Method 418.1)
( ): Concentrations in parentheses were results of Method 5520C.
*: Raised MRL due to insufficient sample quantity.
Metals: By EPA method 6010 and 7421.
<: Results reported below the laboratory detection limit.
**: Laboratory reported sample contains a lower boiling point hydrocarbon mixture quantified as diesel. The chromatogram does not match the typical diesel fingerprint, but appears to be weathered gasoline.
MCL: Adopted Maximum Contaminant Levels in Drinking Water (DHS, October 1990).
DWAL: Recommended Drinking Water Action Level (DHS, October 1990).

TABLE 3
CUMULATIVE RESULTS OF LABORATORY ANALYSES OF WATER SAMPLES-VOCs
ARCO Station 6148
Oakland, California

Date/Well	Compound	VOCs (ppb)
MW-1		
03/18/21	Tetrachloroethene	13
	Trichloroethene	1.2
06/12/92	Tetrachloroethene	18
	Trichloroethene	1.4
09/14/92	Tetrachloroethene	15
	Trichloroethene	1.5
MW-2		
03/18/92	Tetrachloroethene	19
	Trichloroethene	2.22
	cis-1,2-Dichloroethene	0.5
06/12/92	Not sampled--floating product	
09/14/92	Not sampled--floating product	
MW-3		
03/18/92	Tetrachloroethene	2.7
06/12/92	Tetrachloroethene	1.9
09/14/92	Tetrachloroethene	2.0

MCL:	PCE	TCE	cis-1,2-DCE
	5	5	6*

Results in parts per billion (ppb).
VOCs: Volatile Organic Compounds by EPA method 5030/8010. Compounds not shown were not detected.
Cd: Cadmium by EPA method 6010.
Cr: Chromium by EPA method 6010.
Pb: Lead by EPA method 7421.
Zn: Zinc by EPA method 6010.
Ni: Nickel by EPA method 6010.
MCLs: Maximum Contaminant Levels as reported by the California Department of Health Services 10/24/90.
*: Proposed MCL.

APPENDIX A

EMCON'S FIELD REPORTS, SUMMARY OF GROUNDWATER MONITORING DATA, CERTIFIED ANALYTICAL REPORTS WITH CHAIN-OF-CUSTODY, WATER SAMPLE FIELD DATA SHEETS, AND MONITORING WELL PURGE WATER TRANSPORT FORM

EMCON
ASSOCIATES
Consultants in Wastes Management and Environmental Control

Date July 20, 1992
Project G70-39.01

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
	July 1992 monthly water level survey, ARCO
	station 6148, 5131 Shattuck Avenue, 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: 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 # : G70-39.01 STATION ADDRESS : 5131 Shattuck Ave., Oakland, CA DATE : 7.15.95

ARCO STATION # : 6148 FIELD TECHNICIAN : [illegible] DAY : [illegible]

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-1	Yes	Yes	Yes	3259	Yes	18.32	18.32	N.D	N.D	26.09	—
2	MW-2	Yes	Yes	Yes	3259	Yes	17.65	17.65	N.D	N.D.	26.17	—
3	MW-3	Yes	Yes	Yes	3259	Yes	15.17	18.17	N.D	N.D	25.18	—

SURVEY POINTS ARE TOP OF WELL CASINGS

EMCON ASSOCIATES
Consultants in Wastes Management and Environmental Control

Date Sept 01, 1992
Project G70-39.01

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
	August 1992 monthly water level survey, ARCO
	station 6148, 5131 Shattuck Avenue, 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: 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 # : G70-39.01 STATION ADDRESS : 5131 Shattuck Ave., Oakland, CA DATE : 8.7.92

ARCO STATION # : 6148 FIELD TECHNICIAN : Rich Schaeffer DAY : FRI.

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-1	OK	Yes	OK	3259	Yes	18.34	18.34	N.D	N.D	25.8	
2	MW-2	OK	Yes	OK	3259	Yes	17.80	17.80	N.D	N.D	25.8	
3	MW-3	OK	Yes	OK	3259	Yes	18.23	18.23	N.D	N.D	25.8	—

SURVEY POINTS ARE TOP OF WELL CASINGS

EMCON ASSOCIATES
Consultants in Wastes Management and Environmental Control

RECEIVED
OCT 14 1992
RESNA
SAN JOSE

Date October 7 1992
Project 0G70-039.01

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

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
3	Water Sample Field Data Sheets

For your: X Information Sent by: X Mail

Comments:
Enclosed are the data from the third quarter 1992 monitoring event at ARCO service station 6148, located at 5131 Shattuck Avenue, Oakland CA. Groundwater monitoring is conducted consistent with applicable regulatory guidelines. Please call if you have any questions. (408) 453-2266.

Reviewed by:

REGISTERED PROFESSIONAL ENGINEER ROBERT CURTIS PORTER No: 4034 Exp. 6/30/96 INDUSTRIAL STATE OF CALIFORNIA

Jim Butera JB

Robert Porter, Senior Project Engineer.

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

FIELD REPORT
DEPTH TO WATER / FLOATING PRODUCT SURVEY

PROJECT # : 0G70-039.01 STATION ADDRESS : 5131 Shattuck Ave., Oakland, CA DATE : 9-14-92

ARCO STATION # : 6148 FIELD TECHNICIAN : L. RATH M. ADLER 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-1	good	yes	good	yes	yes	18.46	18.47	ND	ND	25.5	—
2	MW-2	good	yes	good	yes	yes	18.53	18.53	17.98	0.55	25.8	0.55' of product in well
3	MW-3	good	yes	good	yes	yes	18.36	18.36	ND	NO	25.8	—

SURVEY POINTS ARE TOP OF WELL CASINGS

EMCON ASSOCIATES
Consultants in Wastes Management and Environmental Control

Date November 9, 1992
Project 0G70-039.01

To:
Mr. Robert Campbell
RESNA/ Applied Geosystems
3315 Almaden Expressway, Suite 34
San Jose, California 95050

RECEIVED
NOV 12 1992
RESNA
SAN JOSE

We are enclosing:

Copies	Description
1	Corrected Summary of Groundwater Monitoring Data

For your: X Information Sent by: X Mail

Comments:

Attached is the corrected Summary of Groundwater Monitoing Data, Third Quarter 1992 for ARCO service station 6148, located at 5131 Shattuck Avenue, Oakland CA. I applogize for the error and hope it has not caused you any inconvience. Please call if you have any questions.

Jim Butera

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

Summary of Groundwater Monitoring Data
Third Quarter 1992
ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California
micrograms per liter (µg/l) and milligrams per liter (mg/l)

Well ID and Sample Depth	Sampling Date	Depth To Water (feet)	Floating Product Thickness (feet)	TPH[1] as Gasoline (µg/l)	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Total Xylenes (µg/l)	TPH as Diesel (µg/l)	Total Oil and Grease 418.1 (mg/l)
MW-1(25)	09/14/92	18.46	ND.[2]	1,000.	370.	6.5	6.5	17.	<80.	0.9
MW-2	09/14/92	18.53	0.55	FP.[3]	FP	FP	FP	FP	FP	FP
MW-3(25)	09/14/92	18.36	ND.	53,000.	4,300.	5,700.	1,300.	7,300.	40,000.	5.5
FB-1.[4]	09/14/92	NA.[5]	NA.	<50	<0.5	<0.5	<0.5	<0.5	NR.[6]	NR.

1. TPH. = Total petroleum hydrocarbons
2. ND. = Not detected
3. FP.= Floating product detected in well, no sample was taken
4. FB. = Field Blank
5. NA. = Not applicable
6. NR. = Not reported; sample was not scheduled for analysis of the selected parameter

Columbia Analytical Services inc.

September 28, 1992

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

Re: **EMCON Project No. G70-39.01**
Arco Facility No. 6148

Dear Mr. Butera:

Enclosed are the results of the water samples submitted to our lab on September 14, 1992. For your reference, our service request number for this work is SJ92-1146.

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:**	09/14/92
Project:	EMCON Project No. G70-39.01 Arco Facility No. 6148	**Work Order #:** **Sample Matrix:**	SJ92-1146 Water

Inorganic Parameters[1]
mg/L (ppm)

Sample Name:			MW-1 (25)	MW-3(25)	Method Blank
Date Sampled:			09/14/92	09/14/92	
Analyte	**Method**	**MRL**			
TRPH	418.1	0.5	0.9	5.5	ND

TRPH Total Recoverable Petroleum Hydrocarbons
MRL Method Reporting Limit
ND None Detected at or above the method reporting limit
[1] Unless otherwise noted, all analyses were performed within EPA recommended maximum holding times specified in *Test Methods for Evaluating Solid Waste,* (SW-846, 3rd Edition) and *Methods for Chemical Analysis of Water and Waste* (EPA-600/4-79-020, Revised March 1983).

Approved by _____ Date 9/30/92

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

Analytical Report

Client:	EMCON Associates	**Date Received:**	09/14/92
Project:	EMCON Project No. G70-39.01	**Date Extracted:**	09/22/92
	Arco Facility No. 6148	**Date Analyzed:**	09/23/92
Sample Matrix:	Water	**Work Order #:**	SJ92-1146

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

Sample Name	MRL	TPH as Diesel
MW-1 (25)	50.	<80. *
MW-3 (25)	50.	40,000. **
Method Blank	50.	ND

MRL Method Reporting Limit
TPH Total Petroleum Hydrocarbons
ND None Detected at or above the method reporting limit
* Raised MRL due to insufficient sample quantity. Samples required re-extraction and the duplicate sample bottle was accidently broken, only 65 percent of the duplicate was saved.
** Sample contains a lower boiling point hydrocarbon mixture quantitated as diesel. The chromatogram does not match the typical diesel fingerprint.

Approved by _____ Date September 25, 1992

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

Analytical Report

Client:	EMCON Associates	**Date Received:**	09/14/92
Project:	EMCON Project No. G70-39.01	**Work Order #:**	SJ92-1146
	Arco Facility No. 6148	**Sample Matrix:**	Water

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

Sample Name:		MW-1 (25)	MW-3 (25)	FB-1
Date Analyzed:		09/15/92	09/16/92 *	09/15/92
Analyte	**MRL**			
Benzene	0.5	370.	4,300.	ND
Toluene	0.5	6.5	5,700.	ND
Ethylbenzene	0.5	6.5	1,300.	ND
Total Xylenes	0.5	17.	7,300.	ND
TPH as Gasoline	50	1,000.	53,000.	ND

TPH Total Petroleum Hydrocarbons
MRL Method Reporting Limit
ND None Detected at or above the method reporting limit
* This sample was part of the analytical batch started on September 16, 1992. However, it was analyzed after midnight so the date analyzed is actually September 17, 1992.

Approved by _____ Date _____

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

Analytical Report

Client: EMCON Associates
Project: EMCON Project No. G70-39.01
Arco Facility No. 6148

Date Received: 09/14/92
Work Order #: SJ92-1146
Sample Matrix: Water

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

Sample Name:		Method Blank	Method Blank
Date Analyzed:		09/15/92	09/16/92
Analyte	**MRL**		
Benzene	0.5	ND	ND
Toluene	0.5	ND	ND
Ethylbenzene	0.5	ND	ND
Total Xylenes	0.5	ND	ND
TPH as Gasoline	50	ND	ND

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

Approved by _____ Date September 23, 1992

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

Analytical Report

Client: EMCON Associates
Project: EMCON Project No. G70-39.01
Arco Facility No. 6148

Date Received: 09/14/92
Work Order #: SJ92-1146
Sample Matrix: Water

Halogenated Volatile Organic Compounds
EPA Methods 5030/8010
µg/L (ppb)

Sample Name:		MW-1 (25)	MW-3 (25)	Method Blank
Date Analyzed:		09/15/92	09/15/92	09/15/92
Analyte	**MRL**			
Dichlorodifluoromethane (Freon 12)	1	ND	ND	ND
Chloromethane	1	ND	ND	ND
Vinyl Chloride	0.5	ND	ND	ND
Bromomethane	0.5	ND	ND	ND
Chloroethane	0.5	ND	ND	ND
Trichlorofluoromethane (Freon 11)	0.5	ND	ND	ND
1,1-Dichloroethene	0.5	ND	ND	ND
Trichlorotrifluoroethane (Freon 113)	0.5	ND	ND	ND
Methylene Chloride	0.5	ND	ND	ND
trans-1,2-Dichloroethene	0.5	ND	ND	ND
cis-1,2-Dichloroethene	0.5	ND	ND	ND
1,1-Dichloroethane	0.5	ND	ND	ND
Chloroform	0.5	ND	ND	ND
1,1,1-Trichloroethane (TCA)	0.5	ND	ND	ND
Carbon Tetrachloride	0.5	ND	ND	ND
1,2-Dichloroethane	0.5	ND	ND	ND
Trichloroethene (TCE)	0.5	1.5	ND	ND
1,2-Dichloropropane	0.5	ND	ND	ND
Bromodichloromethane	0.5	ND	ND	ND
2-Chloroethyl Vinyl Ether	5	ND	ND	ND
trans-1,3-Dichloropropene	0.5	ND	ND	ND
cis-1,3-Dichloropropene	0.5	ND	ND	ND
1,1,2-Trichloroethane	0.5	ND	ND	ND
Tetrachloroethene (PCE)	0.5	15.	2.0	ND
Dibromochloromethane	0.5	ND	ND	ND
Chlorobenzene	0.5	ND	ND	ND
Bromoform	0.5	ND	ND	ND
1,1,2,2-Tetrachloroethane	0.5	ND	ND	ND
1,3-Dichlorobenzene	1	ND	ND	ND
1,4-Dichlorobenzene	1	ND	ND	ND
1,2-Dichlorobenzene	1	ND	ND	ND

MRL Method Reporting Limit
ND None Detected at or above the method reporting limit

Approved by _____ Date _____

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APPENDIX A

LABORATORY QC RESULTS

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

Client: EMCON Associates
Project: EMCON Project No. G70-39.01
Arco Facility No. 6148

Date Received: 09/14/92
Work Order #: SJ92-1146
Sample Matrix: Water

QA/QC Report
Continuing Calibration Summary
Inorganics
EPA Method 418.1
mg/L

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Criteria
TRPH	100.	110.	110.	80-120

TRPH Total Recoverable Petroleum Hydrocarbons

Approved by _____ Date _____

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

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	EMCON Associates	Date Received:	09/14/92
Project:	EMCON Project No. G70-39.01	Work Order #:	SJ92-1146
	ARCO Facility No. 6148	Sample Matrix:	Water

QA/QC Report
Matrix Spike Summary
Inorganic Parameters
mg/L (ppm)

Sample Name: MW-1 (25)
Date Sampled: 09/14/92

Parameter	Spike Level	Sample Result	Spike Result MS	Spike Result DMS	Percent Recovery MS	Percent Recovery DMS	Recovery Acceptance Criteria
TRPH	6.1	0.9	4.5	4.5	59.	59.	53-149

TRPH Total Recoverable Petroleum Hydrocarbons

Approved by _____ Date _____

1921 Ringwood Avenue • San Jose, California 95131 • Telephone 408/437-2400 • Fax 408/437-9056

Client: EMCON Associates
Project: EMCON Project No. G70-39.01
Arco Facility No. 6148

Date Received: 09/14/92
Work Order #: SJ92-1146
Sample Matrix: Water

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

Date Analyzed: 09/23/92

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Criteria
TPH as Diesel	1000.	1019.	102.	90-110

TPH Total Petroleum Hydrocarbons

Approved by _____ Date September 25, 1992

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

Client: EMCON Associates
Project: EMCON Project No. G70-39.01
Arco Facility No. 6148

Date Received: 09/14/92
Work Order #: SJ92-1146
Sample Matrix: Water

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

Sample Name	Date Analyzed	Percent Recovery P-Terphenyl
MW-1 (25)	09/23/92	77.
MW-3 (25)	09/23/92	57.
LCS	09/23/92	88.
DLCS	09/23/92	90.
Method Blank	09/23/92	89.
	CAS Acceptance Criteria	55-145

TPH Total Petroleum Hydrocarbons
LCS Laboratory Control Spike
DLCS Duplicate Laboratory Control Spike

Approved by _____ Date _____

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

Client: EMCON Associates
Project: EMCON Project No. G70-39.01
Arco Facility No. 6148

Date Received: 09/14/92
Work Order #: SJ92-1146
Sample Matrix: Water

QA/QC Report
Spike/Duplicate Spike Summary
TPH as Diesel
DHS LUFT Method
µg/L (ppb)

Date Analyzed: 09/23/92

Parameter	Spike Level	Sample Result	Spike Result LCS *	Spike Result DLCS *	Percent Recovery LCS	Percent Recovery DLCS	Acceptance Criteria
Diesel	2,000.	ND	2,000.	1,990.	100.	100.	55-145

TPH Total Petroleum Hydrocarbons
ND None Detected at or above the method reporting limit
LCS Laboratory Control Spike
* Due to insufficient sample volume an LCS and duplicate LCS pair were analyzed instead of an MS/MSD pair.

Approved by _____ Date _____

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

Client: EMCON Associates
Project: EMCON Project No. G70-39.01
Arco Facility No. 6148

Date Received: 09/14/92
Work Order #: SJ92-1146

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

Date Analyzed: 09/15/92

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Criteria
Benzene	250.	254.	102.	85-115
Toluene	250.	273.	109.	85-115
Ethylbenzene	250.	266.	106.	85-115
Total Xylenes	750.	831.	111.	85-115
TPH as Gasoline	2,500.	2,613.	105.	90-110

Date Analyzed: 09/16/92

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Criteria
Benzene	250.	255.	102.	85-115
Toluene	250.	271.	108.	85-115
Ethylbenzene	250.	263.	105.	85-115
Total Xylenes	750.	819.	109.	85-115
TPH as Gasoline	2,500.	2,701.	108.	90-110

TPH Total Petroleum Hydrocarbons

Approved by _____ Date _____

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

Client: EMCON Associates
Project: EMCON Project No. G70-39.01
Arco Facility No. 6148

Date Received: 09/14/92
Work Order #: SJ92-1146
Sample Matrix: Water

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

Sample Name	Date Analyzed	Percent Recovery α,α,α-Trifluorotoluene
MW-1 (25)	09/15/92	109.
MW-3 (25)	09/16/92	106.
FB-1	09/15/92	107.
MS	09/15/92	118.
DMS	09/15/92	122.
Method Blank	09/15/92	105.
Method Blank	09/16/92	78.
	CAS Acceptance Criteria	70-130

TPH Total Petroleum Hydrocarbons

Approved by _____ Date _____

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

Client: EMCON Associates
Project: EMCON Project No. G70-39.01
Arco Facility No. 6148

Date Received: 09/14/92
Work Order #: SJ92-1146
Sample Matrix: Water

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

Date Analyzed: 09/15/92

			Spike Result		Percent Recovery		
Analytes	Spike Level	Sample Result	MS	DMS	MS	DMS	Acceptance Criteria
TPH as Gasoline	250.	ND	281.	286.	112.	114.	70-130

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

Approved by _____ Date _____

1924 Bingwood Avenue • San Jose, California 95131 • Telephone 408/437-2400 • Fax 408/437-9356

Client: EMCON Associates
Project: EMCON Project No. G70-39.01
Arco Facility No. 6148

Date Received: 09/14/92
Work Order #: SJ92-1146

Initial Calibration Verification
Halogenated Volatile Organic Compounds
EPA Methods 5030/601
Nanograms

Date Analyzed: 09/15/92

Analyte	True Value	Result	Percent Recovery	EPA Percent Recovery Acceptance Criteria
Chloromethane	50	44.	88.	D-193
Vinyl Chloride	50	49.	98.	28-163
Bromomethane	50	48.	96.	D-144
Chloroethane	50	59.	118.	46-137
Trichlorofluoromethane (Freon 11)	50	57.	114.	21-156
1,1-Dichloroethene	50	70.	140.	28-167
Methylene Chloride	50	64.	128.	25-162
trans-1,2-Dichloroethene	50	59.	118.	38-155
1,1-Dichloroethane	50	57.	114.	47-132
Chloroform	50	61.	122.	49-133
1,1,1-Trichloroethane (TCA)	50	64.	128.	41-138
Carbon Tetrachloride	50	60.	120.	43-143
1,2-Dichloroethane	50	54.	108.	51-147
Trichloroethene (TCE)	50	53.	106.	35-146
1,2-Dichloropropane	50	57.	114.	44-156
Bromodichloromethane	50	55.	110.	42-172
trans-1,3-Dichloropropene	50	59.	118.	22-178
cis-1,3-Dichloropropene	50	52.	104.	22-178
1,1,2-Trichloroethane	50	57.	114.	39-136
Tetrachloroethene (PCE)	50	59.	118.	26-162
Dibromochloromethane	50	56.	112.	24-191
Chlorobenzene	50	60.	120.	38-150
Bromoform	50	49.	98.	13-159
1,1,2,2-Tetrachloroethane	50	61.	122.	8-184
1,3-Dichlorobenzene	50	53.	106.	7-187
1,4-Dichlorobenzene	50	61.	122.	42-143
1,2-Dichlorobenzene	50	60.	120.	D-208

D Detected

Approved by _____ Date _____

1923 Ringwood Avenue • San Jose, California 95131 • Telephone 408/437-2400 • Fax 408/437-9356

Client: EMCON Associates
Project: EMCON Project No. G70-39.01
Arco Facility No. 6148

Date Received: 09/14/92
Work Order #: SJ92-1146
Sample Matrix: Water

QA/QC Report
Surrogate Recovery Summary
Halogenated Volatile Organic Compounds
EPA Methods 5030/8010

Sample Name	Date Analyzed	Percent Recovery 4-Bromofluorobenzene
MW-1 (25)	09/15/92	120.
MW-3 (25)	09/15/92	105.
MW-3 (25) MS	09/15/92	118.
MW-3 (25) DMS	09/15/92	126.
Method Blank	09/15/92	111.
	CAS Acceptance Criteria	70-130

Approved by _____ Date _____

1924 Bisceyard Avenue • San Jose, California 95131 • Telephone 408/437-2400 • Fax 408/437-9256

Client: EMCON Associates
Project: EMCON Project No. G70-39.01
Arco Facility No. 6148

Date Received: 09/14/92
Work Order #: SJ92-1146
Sample Matrix: Water

QA/QC Report
Matrix Spike/Duplicate Matrix Spike Summary
Halogenated Volatile Organic Compounds
EPA Methods 5030/8010
µg/L (ppb)

Sample Name: MW-3 (25)
Date Analyzed: 09/15/92

Analyte	Spike Level	Sample Result	Spike Result MS	Spike Result DMS	Percent Recovery MS	Percent Recovery DMS	EPA Acceptance Criteria
1,1-Dichloroethene	10.	ND	11.6	13.0	116.	130.	28-167
Trichloroethene	10.	ND	12.8	13.1	128.	131.	35-146
Tetrachloroethene	10.	2.0	14.1	14.8	121.	128.	26-162

ND None Detected at or above the method reporting limit

Approved by _____ Date _____

APPENDIX B

CHAIN OF CUSTODY

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

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. EMCGC-92-1

Chain of Custody

ARCO Facility no: 6148	City (Facility): OAKLAND	Project manager (Consultant): JIM FITTERA	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: As Normal

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 GMS EPA M602/8020/8015	TPH Modified 8015 Gas ☐ Diesel ☐	EPA 413.1 Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Semi Metals ☐ VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐ ☐
MW-1 (2.5)	11-10	6		X		X	HCl	9-14-92	1320		X		X		X					
MW-2		6		X		X	HCl				X		X		X	→	NO SAMPLES TAKEN			
MW-3 (2.5)	7-12	6		X		X	HCl	9-14-92	1355		X		X		X		Product in well			
FB-1	13-14	2		X		X	HCl	9-14-92	1410		X									
MW-1 (2.5)	15-16	2		X		X	NP	9-14-92	1325			X								
MW-2		2		X		X	NP					X				→	NO SAMPLES TAKEN			
MW-3 (2.5)	17-18	2		X		X	NP	9-14-92	1355			X					Product in well			

Remarks: 4 40ml HCl VOA's
2-LITER HCl (GLASS)
2-LITER NP (GLASS)
G70-3901

Lab number: 5392-1146

Turnaround time

Priority Rush 1 Business Day	☐
Rush 2 Business Days	☐
Expedited 5 Business Days	☐
Standard 10 Business Days	☑

Condition of sample: Okay

Temperature received: COOL

Relinquished by sampler: M Fuller / M Fuller	Date: 9-14-92	Time: 1515	Received by: CAS/SS
Relinquished by	Date	Time	Received by: 9/14/92 1515
Relinquished by	Date	Time	Received by laboratory / Date / Time

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: 0676-039.01 | SAMPLE ID: MW-1 (25)

PURGED BY: L. RATH / M. Adler | CLIENT NAME: Arco 6148

SAMPLED BY: + | LOCATION: 5131 Shattuck Ave Oakland, CA.

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

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

CASING ELEVATION (feet/MSL): NA | VOLUME IN CASING (gal.): 4.81

DEPTH TO WATER (feet): 18.46 | CALCULATED PURGE (gal.): 24.07

DEPTH OF WELL (feet): 25.8 | ACTUAL PURGE VOL. (gal.): 16.0

DATE PURGED: 9.14.92 | Start (2400 Hr) 1307 | End (2400 Hr) 1313

DATE SAMPLED: 9.14.92 | Start (2400 Hr) 1325 | End (2400 Hr) 1332

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1307	5.0	6.50	439	74.2	clear	light
1309	10.0	6.35	441	71.4	clear	light
1312	15.0	6.53	438	71.3	yellow	light
1313	Well dried @ 16 gallons (DTW 20.00)				—	
1321	recharged	6.71	443	73.5	yellow	light

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	+ 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 #: 3255

REMARKS:

Recharged @ 1321 (DTW 20.22)

Meter Calibration: Date: 9.14.92 | Time: 12.45 | Meter Serial #: 3112 | Temperature °F: 69.5

(EC 1000 1029 / 1001) (DI 29.6) (pH 7 7.02 / 7.00) (pH 10 10.01 / 10.00) (pH 4 3.95 / ___)

Location of previous calibration: MW-1 (25)

Signature: [signature] | Reviewed By: B | Page 1 of 3

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 0670-039.01 SAMPLE ID: MW-2

PURGED BY: L RATH / M Adler CLIENT NAME: Arco 6148

SAMPLED BY: NA LOCATION: 5131 Shattuck Ave 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.): NA

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

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

DATE PURGED: 9-14-92 Start (2400 Hr) NA End (2400 Hr) NA

DATE SAMPLED: ___ 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	Samples	- Product in	well		

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

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

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

WELL INTEGRITY: Good LOCK #: 3257

REMARKS: .55' of product in well - No samples

Meter Calibration: Date: ___ Time: ___ Meter Serial #: ___ Temperature °F: ___

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

Location of previous calibration: ___

Signature: ___ Reviewed By: JP Page 2 of 3

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 0670-139.01 SAMPLE ID: MW-3 (25)

PURGED BY: L RATH / M Adler CLIENT NAME: Arco 6148

SAMPLED BY: LR LOCATION: 5131 Shattuck Ave 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.): 4.76

DEPTH TO WATER (feet): 18.53 CALCULATED PURGE (gal.): 23.84

DEPTH OF WELL (feet): 25.8 ACTUAL PURGE VOL. (gal.): 24.0

DATE PURGED: 9.14.92 Start (2400 Hr) 1338 End (2400 Hr) 1356

DATE SAMPLED: 9 14.92 Start (2400 Hr) 1358 End (2400 Hr) 1408

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1341	5.0	6.46	476	72.9	Yellow	Light
1343	10.0	6.51	526	71.2	Yellow	Light
1348	15.0	6.45	555	71.5	Yellow	clear
1352	20.0	6.47	550	71.5	yellow	clear
1356	24.0	6.47	554	71.3	clear	clear

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): FB-1

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

WELL INTEGRITY: Good LOCK #: 3259

REMARKS:

Meter Calibration: Date: 9-14-92 Time: 12:48 Meter Serial #: 9112 Temperature °F: ___

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

Location of previous calibration: MW-1 (25)

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

(TF1047) TF NUMBER: 1047 GIB-92-056

MONITORING WELL PURGE WATER TRANSPORT FORM

GENERATOR INFORMATION

NAME: ARCO PRODUCTS RECEIVED

ADDRESS: P.O. BOX 5811 JUL 30 1992

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

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

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

Kyle Christie by/ Tom DeTon 7-2-92
(Typed or printed full name & signature) (Date)

SITE INFORMATION

	STA #	JOB #	ADDRESS	GALS
1	A-697	20598&20565	420W. SHAW AVE., FRESNO, CA	58
2	A-335	20597-PW	4595 E. CLINTON ST., FRESNO, CA	5
3	A-6100	20717-DW	25775 SO. PATTERSON PASS RD., TRACY, CA	102
4	A-771	20656-PW	899 RINCON AVE., LIVERMORE, CA	90
5	A-6041	20657-PW	7249 VILLAGE PARKWAY, DUBLIN, CA	31
6	A-5387	20655-PW	20200 HESPERIAN BLVD., SAN LORENZO, CA	187
7	A-761	20599-PW	1985 BROADWAY AVE., VALLEJO, CA	109
8	A-2035	20659-PW	1001 SAN PABLO AVE., ALBANY, CA	165
9	A-414	20660-PW	5000 SHATTUCK AVE., BERKELEY, CA	80
10	A-6148	20658-PW	5131 SHATTUCK AVE., OAKLAND, CA	54
			TOTAL GALLONS:	881

TRANSPORTER INFORMATION

NAME: BALCH PETROLEUM

ADDRESS: 930 AMES AVE.

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

TRUCK ID #: PETERBILT HURSCHEL WARD Hurschel Ward 7-2-92
(Typed or printed full name & signature) (Date)

TSD FACILITY INFORMATION

NAME: GIBSON OIL & REFINING

ADDRESS: 475 SEAPORT BLVD

CITY,STATE,ZIP: REDWOOD CITY, CA 94063 PHONE #: (415) 368-5511

RELEASE #: 11320 Bill Edwin Bill E— 7-2-92
(Typed or printed full name & signature) (Date)

Gair 1100