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Working To Restore Nature

TRANSMITTAL

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DATE: May 5, 1993
PROJECT NO.: 60000.15

TO: Alameda County Health Care Services Agency
Department of Environmental health
80 Swan Way, Room 200
Oakland, California 94621

ATTENTION: Ms. Susan Hugo

SUBJECT: ARCO Station No. 771

WE ARE SENDING YOU:

COPIES	DATED	DESCRIPTION
1	4/29/93	First Quarter 1993 Groundwater Monitoring Report for ARCO Station No. 771, 899 Rincon Avenue, Livermore, California.

THESE ARE TRANSMITTED as checked below:

[ ] For review and comment [ ] As requested [√] For your files [ ] For approval

REMARKS:

James L. Nelson, C.E.G. No. 1463

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LETTER REPORT
QUARTERLY GROUNDWATER MONITORING
First Quarter 1993
at
ARCO Station 771
899 Rincon Avenue
Livermore, California

60000.15 Apr 1993

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Phone: (408) 264-7723
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April 29, 1993
0401MWHE
60000.15

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

Subject: First Quarter 1993 Groundwater Monitoring Report for ARCO Station 771, 899 Rincon Avenue, Livermore, California.

Mr. Whelan:

As requested by ARCO Products Company (ARCO), RESNA Industries Inc. (RESNA) prepared this letter report which summarizes the results of first quarter 1993 groundwater monitoring performed by ARCO's contractor, EMCON Associates (EMCON) of San Jose, California, at the above-referenced site. The objectives of this quarterly groundwater monitoring are to evaluate changes in the groundwater flow direction and gradient, and changes in concentrations of petroleum hydrocarbons in the local groundwater associated with the former gasoline-storage tanks and former waste-oil tank at the site. The field work and laboratory analyses of groundwater samples during this quarter performed under the direction of EMCON included measuring depths to groundwater, subjectively analyzing groundwater for the presence of petroleum product, collecting groundwater samples from the wells for laboratory analyses, and directing a State-certified laboratory to analyze the groundwater samples. Field procedures and acquisition of field data were performed under the direction of EMCON; warrant of their field data and evaluation of their field protocols is beyond RESNA's scope of work. RESNA's scope of work was limited to monthly inspections of the Horner EZY Floating Product Skimmers, interpretation of field and laboratory analytical 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 771 is located on the southwestern corner of the intersection of Rincon Avenue and Pine Street in Livermore, California. The site location is shown on the Site Vicinity Map, Plate 1.

Results of previous environmental investigations at the site are summarized in the reports listed in the References section. The locations of soil borings, groundwater monitoring wells, and other 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 January 29, February 26, and March 29, 1993. Quarterly sampling was performed by EMCON field personnel on January 29, 1993. The results of EMCON's field work on the site, including DTW measurements and subjective analyses for the presence of product in the groundwater in MW-1 through MW-11 and RW-1, are presented on EMCON's Field Reports, Water Sample Data Sheets, and 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-11 and RW-1 for this and previous quarterly groundwater monitorings at the site are summarized in Table 1, Cumulative Groundwater Monitoring Data. It appears that DTW level measured in MW-5 may not be accurate because measurements were made through an L-shaped fitting on the well head. Therefore, this DTW level was not used to calculate water elevation. DTW levels measured in well RW-1 in February and March appear to be anomalous. Therefore, these DTW levels were also not used for gradient evaluation. Groundwater elevations increased an average of about 9 feet between December 1992 and January 1993, and then decreased an average of about 2½ feet between January and March 1993. The average groundwater gradient interpreted from the January, February and March 1993 monitoring events is approximately 0.05 ft/ft, with flow directions to the north-northwest in January, and to the north in February and March. The groundwater gradients and flow directions are shown on Plates 3 through 5, Groundwater Gradient Maps. The presence of floating product sheen was noted on the purge water from monitoring wells MW-1 and MW-2; although no floating product or product sheen was observed in the samples collected from these wells for the subjective analyses during the January monitoring event. No evidence of floating product or sheen was observed in the other wells by EMCON's field personnel during this quarter (see EMCON's Field Reports, Appendix A).

Groundwater monitoring wells MW-1 through MW-4, MW-6 through MW-11, and RW-1 were purged and sampled by EMCON field personnel on January 29, 1993. Well MW-5 was not sampled due to the presence of the L-shaped wellhead fitting, which blocked access of a pump or bailer. Purge water generated during purging and sampling of the monitoring wells was transported to Gibson Environmental in Redwood City, California for recycling.

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 (Hazardous Waste Testing Laboratory Certification No. 1426). The water samples from MW-1 through MW-4, MW-6 through MW-11, and RW-1 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/California DHS LUFT Method. Concentrations of TPHg and benzene in the groundwater are shown on Plate 6, TPHg Concentrations in Groundwater, and Plate 7, Benzene Concentrations in Groundwater. Well MW-6, the nearest downgradient well to the former waste-oil tank, was also analyzed for total petroleum hydrocarbons as diesel (TPHd) and total oil and grease (TOG) using EPA Methods 3510/California DHS LUFT Method and Standard Methods 5520 C and F, respectively. The Chain of Custody Records and Laboratory Analyses Reports are attached in Appendix A. Results of these and previous water analyses are summarized in Table 2, Cumulative Results of Laboratory Analyses of Groundwater Samples.

The following is a general summary of changes in the concentrations of hydrocarbon constituents in the groundwater from wells MW-3, MW-4, MW-6, MW-7, MW-11 and RW-1 since the last quarterly monitoring. Concentrations of TPHg and BTEX generally increased in wells MW-3, MW-6 and RW-1; generally decreased in wells MW-4 and MW-7; and remained nondetectable in offsite well MW-11. Concentrations of TPHd and TOG increased in MW-6. Trends since last quarter could not be evaluated in the following wells: MW-1 and MW-2 were not sampled during last quarter; MW-5 was not sampled during this and the previous quarter; and MW-8 through MW-10 were constructed in January 1993.

Product Recovery

RESNA measured and removed floating product on a monthly basis, as summarized in Table 3, Approximate Cumulative Product Recovered. In January 1992, Horner EZY Skimmers were installed in wells MW-1, MW-2, and MW-5, for interim remediation at the site. In November 1992 the product skimmers were removed from the wells due to the installation of new wellhead fittings that connected the wells to the vapor extraction system. The skimmers were reinstalled in wells MW-1 and MW-2 in February 1993. The skimmer could not be reinstalled in well MW-5 because the new L-shaped wellhead fitting blocked access to the well. RESNA inspected wells MW-1 MW-2 and MW-5 for the presence of floating product on January 14, February 26 and March 26, 1993. No measurable floating product was detected in wells MW-1, MW-2 and MW-5 during these inspections. However,

product sheen was observed in these wells. The results of the monthly inspections are presented on RESNA's Field Reports, which are included in Appendix A. No floating product was recovered during this quarter. The total product recovered at the site for 1991 and 1992 is approximately 3.06 gallons.

Conclusions

Groundwater at the site has been impacted by petroleum hydrocarbons. TPHg and BTEX appear to have been delineated to the north, east and southeast in the vicinity of offsite wells MW-8 through MW-11. The extent of the petroleum hydrocarbons has not yet been delineated to the southwest or west. Attempts to gain access to install offsite wells for further delineation of hydrocarbon-impacted groundwater in the vicinity of the site are ongoing. Ms. Susan Hugo of the Alameda County Health Care Services Agency has agreed to assist with efforts to gain offsite access.

RESNA recommends that copies of this letter 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. Eddy So
Regional Water Quality Control Board
San Francisco Bay Region
2101 Webster Street, Suite 500
Oakland, California 94612

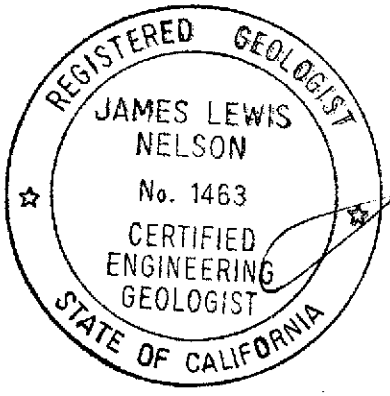
Ms. Danielle Stefani
Livermore Fire Department
4550 East Avenue
Livermore, California 94550

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

Sincerely,
RESNA Industries Inc.

Barbara Sieminski

Barbara Sieminski
Assistant Project 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, January 29, 1993
Plate 4, Groundwater Gradient Map, February 26, 1993
Plate 5, Groundwater Gradient Map, March 29, 1993
Plate 6, TPHg Concentrations in Groundwater, January 29, 1993
Plate 7, Benzene Concentrations in Groundwater, January 29, 1993

Table 1, Cumulative Groundwater Monitoring Data
Table 2, Cumulative Results of Laboratory Analyses of Groundwater Samples
Table 3, Approximate Cumulative Product Recovered

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

RESNA's Field Reports

REFERENCES

Applied GeoSystems, June 22, 1990. Limited Subsurface Environmental Assessment, ARCO Station No. 771, Livermore, California. AGS 60000-1.

Brown and Caldwell, September 16, 1987. Soil Sample Results for Waste-Oil tank Removal, ARCO Station 771, 899 Rincon Avenue, Livermore, California. 17/3456-02/3.

California Department of Health Services, Office of Drinking Water, October 24, 1990, Summary of Drinking Water Standards.

RESNA/Applied Geosystems, April 12, 1991. Supplemental Subsurface Investigation at ARCO Station No. 771, Livermore, California. AGS 60000.

RESNA/Applied GeoSystems, July 12, 1991. Letter Report Quarterly Ground-Water Monitoring Second Quarter 1991 at ARCO Station 771, 899 Rincon Avenue, Livermore, California. AGS 60000.05

RESNA, October 17, 1991. Report on Additional Subsurface Investigation at ARCO Station 771, 899 Rincon Avenue, Livermore, California. 60000.06

RESNA, November 21, 1991. Letter Report Quarterly Ground-Water Monitoring Third Quarter 1991 at ARCO Station 771, 899 Rincon Avenue, Livermore, California. 60000.05

RESNA, April 7, 1992. Letter Report Quarterly Groundwater Monitoring Fourth Quarter 1991 at ARCO Station 771, 899 Rincon Avenue, Livermore, California. 60000.05

RESNA, May 1, 1992. Letter Report Quarterly Groundwater Monitoring First Quarter 1992 at ARCO Station 771, 899 Rincon Avenue, Livermore, California. 60000.05

RESNA, September 28, 1992. Letter Report Quarterly Groundwater Monitoring Second Quarter 1992 at ARCO Station 771, 899 Rincon Avenue, Livermore, California. 60000.13

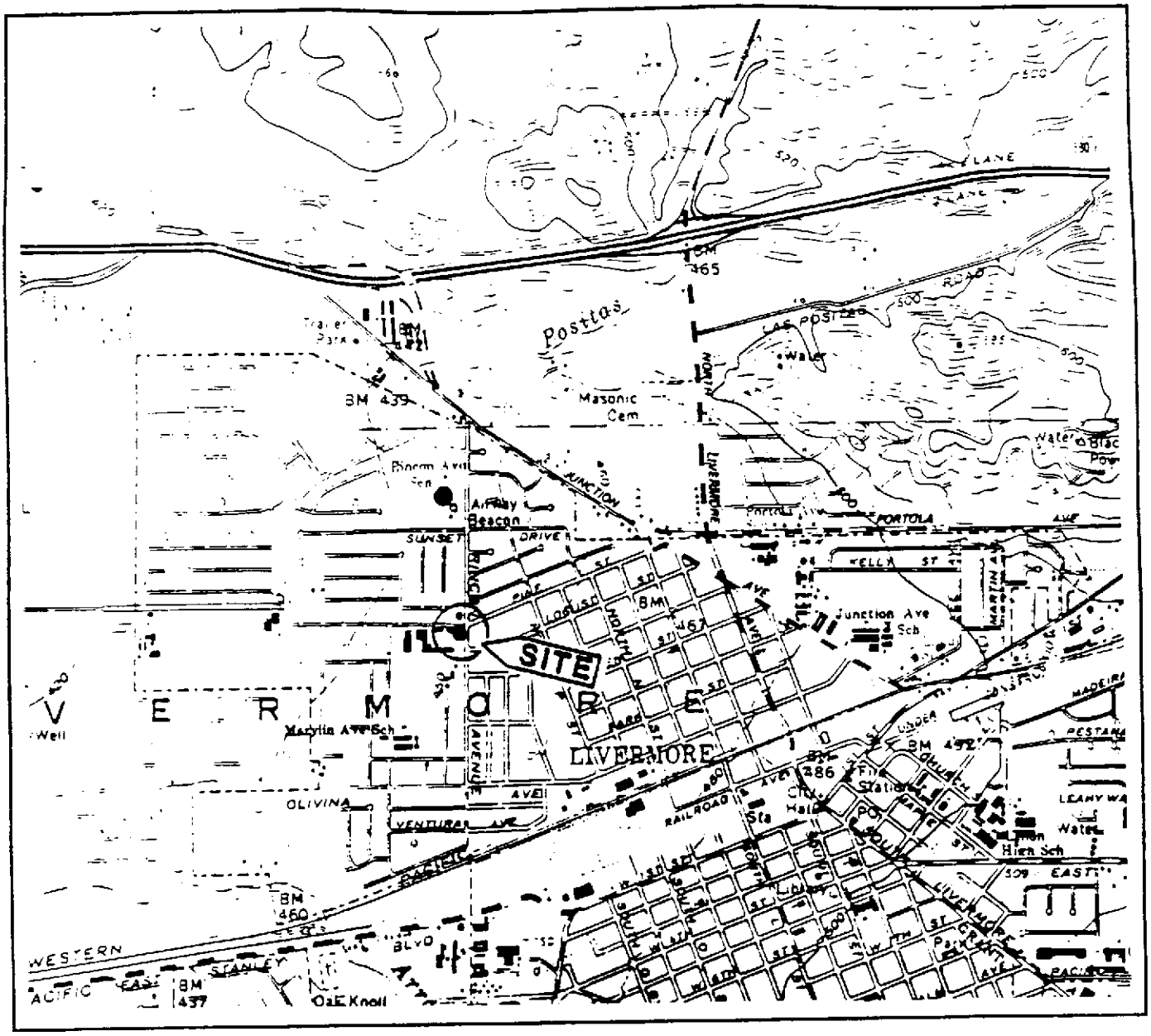
RESNA, December 4, 1992. Letter Report Quarterly Groundwater Monitoring Third Quarter 1992 at ARCO Station 771, 899 Rincon Avenue, Livermore, California. 60000.13

REFERENCES

RESNA, February 26, 1993. Report on Additional Onsite and Initial Offsite Subsurface Investigation at ARCO Station 771, 899 Rincon Avenue, Livermore, California. 60000.09

RESNA, March 18, 1993. Letter Report Quarterly Groundwater Monitoring Fourth Quarter 1992 at ARCO Station 771, 899 Rincon Avenue, Livermore, California. 60000.13

Roux, July 10, 1992. Underground Storage Tank Removal and Soil Sampling, ARCO Facility No. 771, 899 Rincon Avenue, Livermore, California. A135W01



Base: U.S. Geological Survey
7.5-Minute Quadrangles
Livermore, California
Photorevised 1980

LEGEND

● = Site Location

Approximate Scale

2000 1000 0 2000

feet

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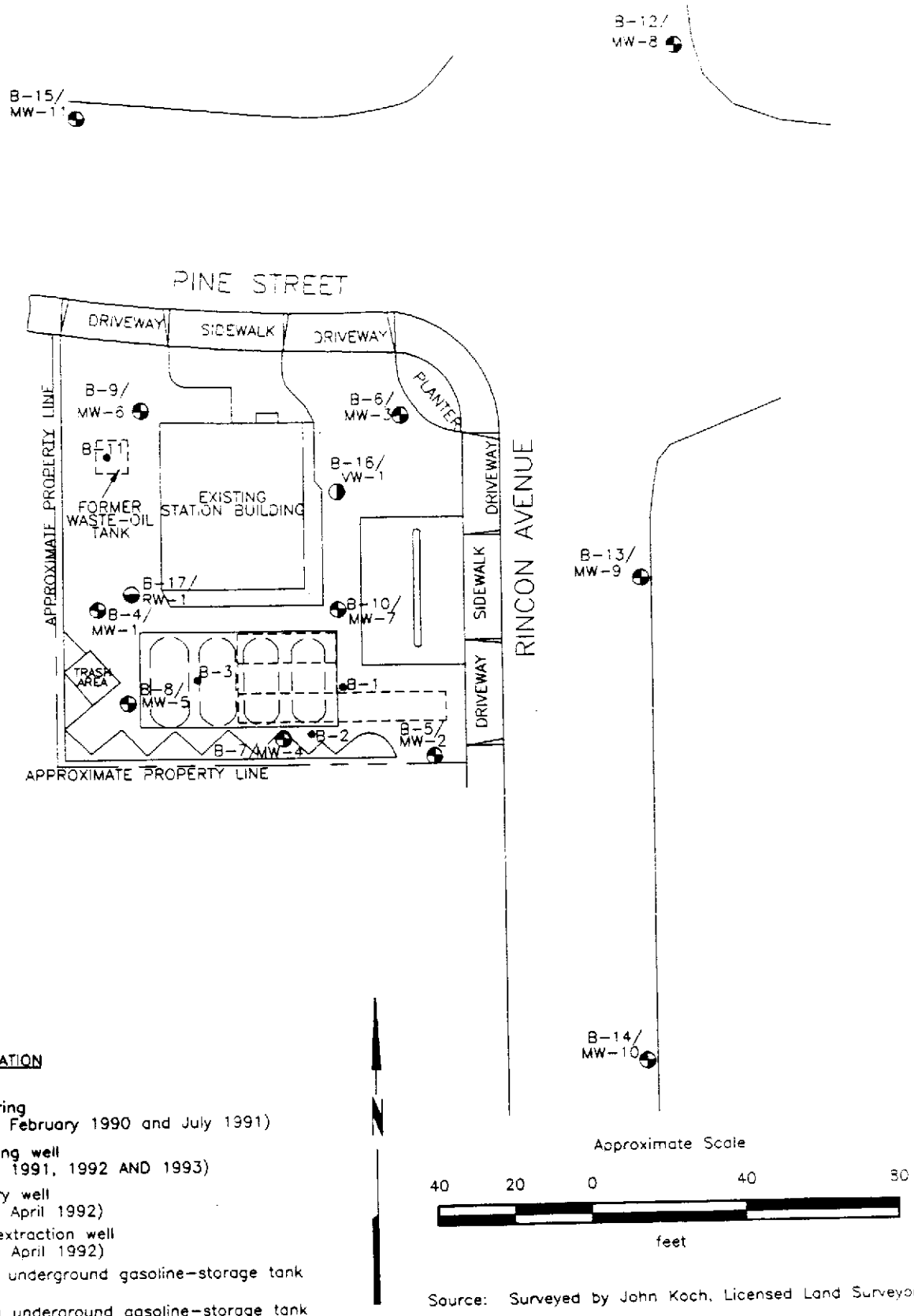
SITE VICINITY MAP
ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE
1



EXPLANATION

- B-11 = Soil boring (RESNA, February 1990 and July 1991)
- B-15/MW-11 = Monitoring well (RESNA, 1991, 1992 AND 1993)
- B-17/RW-1 = Recovery well (RESNA, April 1992)
- B-16/VW-1 = Vapor extraction well (RESNA, April 1992)
- = Former underground gasoline-storage tank
- = Existing underground gasoline-storage tank

N

Approximate Scale

40 20 0 40 80

feet

Source: Surveyed by John Koch, Licensed Land Surveyor.

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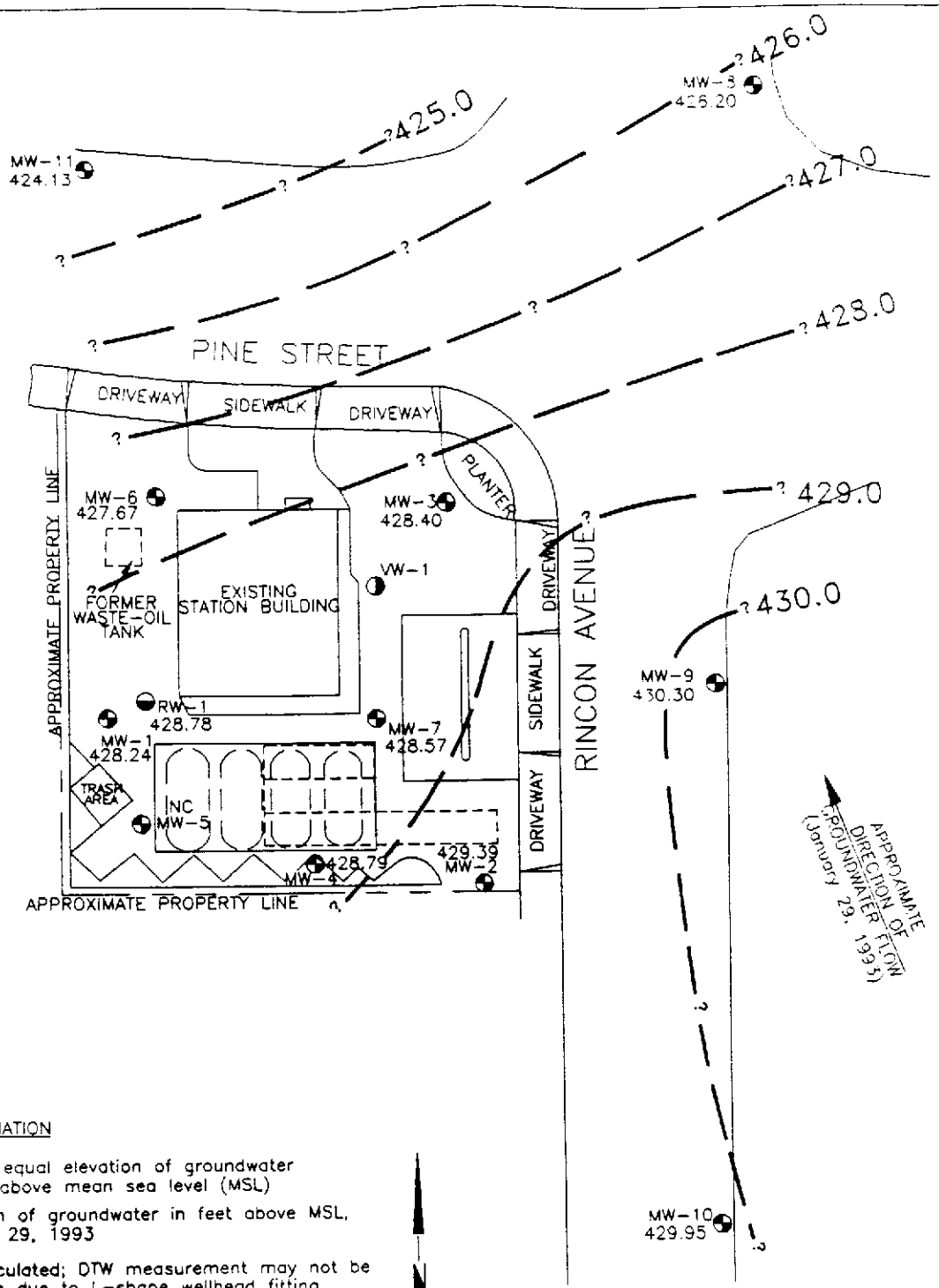
GENERALIZED SITE PLAN
ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 2



EXPLANATION

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

430.30 = Elevation of groundwater in feet above MSL, January 29, 1993

NC = Not calculated; DTW measurement may not be accurate due to L-shape wellhead fitting.

MW-11 = Monitoring well (RESNA, 1991, 1992 AND 1993)

RW-1 = Recovery well (RESNA, April 1992)

VW-1 = Vapor extraction well (RESNA, April 1992)

= Former underground gasoline-storage tank

= Existing underground gasoline-storage tank

Approximate Scale

40 20 0 40 80

feet

Source: Surveyed by John Koch, Licensed Land Surveyor.

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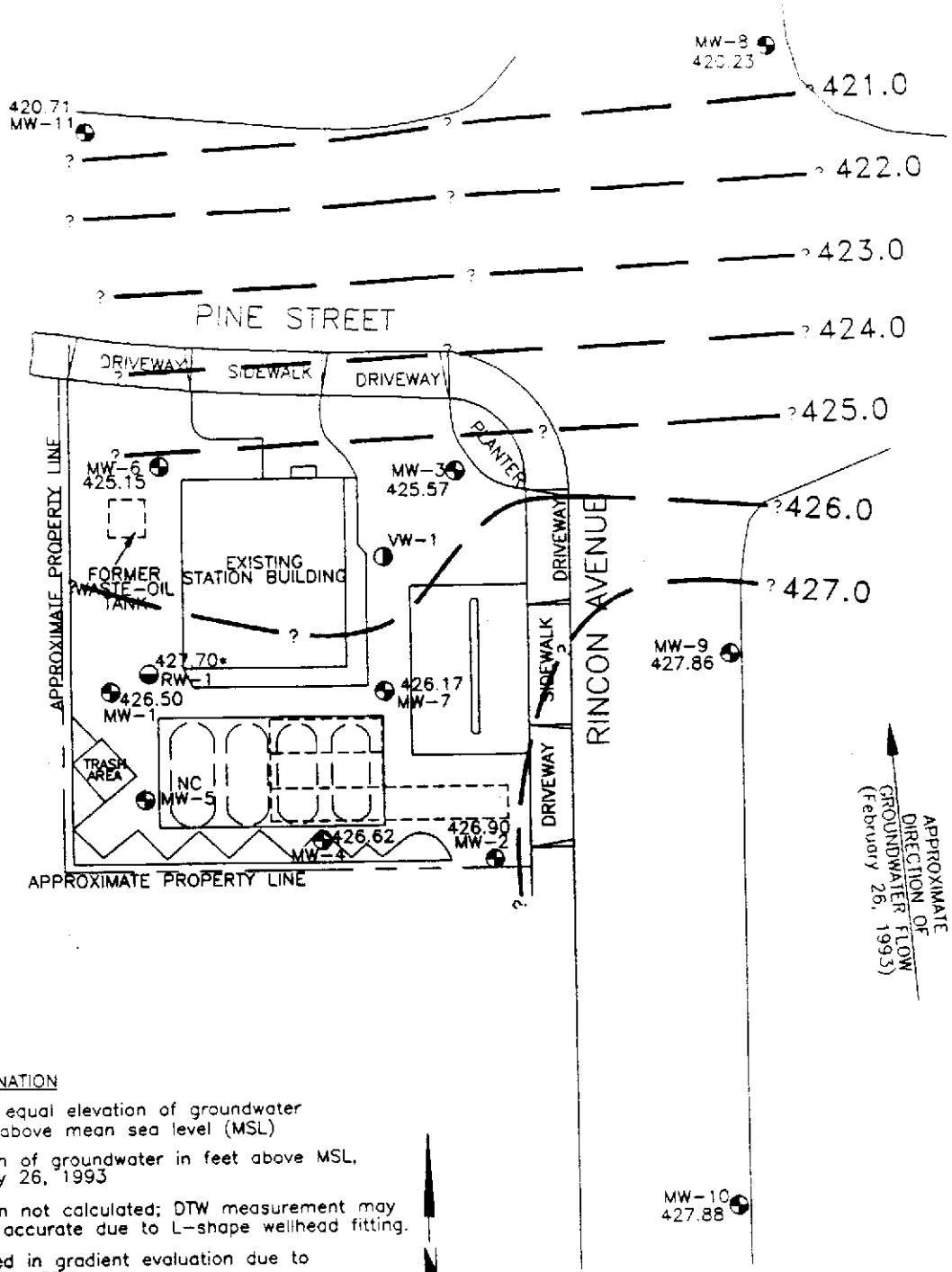
GROUNDWATER GRADIENT MAP
ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE
3



EXPLANATION

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

427.88 = Elevation of groundwater in feet above MSL, February 26, 1993

NC = Elevation not calculated; DTW measurement may not be accurate due to L-shape wellhead fitting.

* = Not used in gradient evaluation due to anomalous DTW level

MW-11 = Monitoring well (RESNA, 1991, 1992 AND 1993)

RW-1 = Recovery well (RESNA, April 1992)

VW-1 = Vapor extraction well (RESNA, April 1992)

= Former underground gasoline-storage tank

= Existing underground gasoline-storage tank

Approximate Scale

40 20 0 40 80

feet

Source: Surveyed by John Koch, Licensed Land Surveyor

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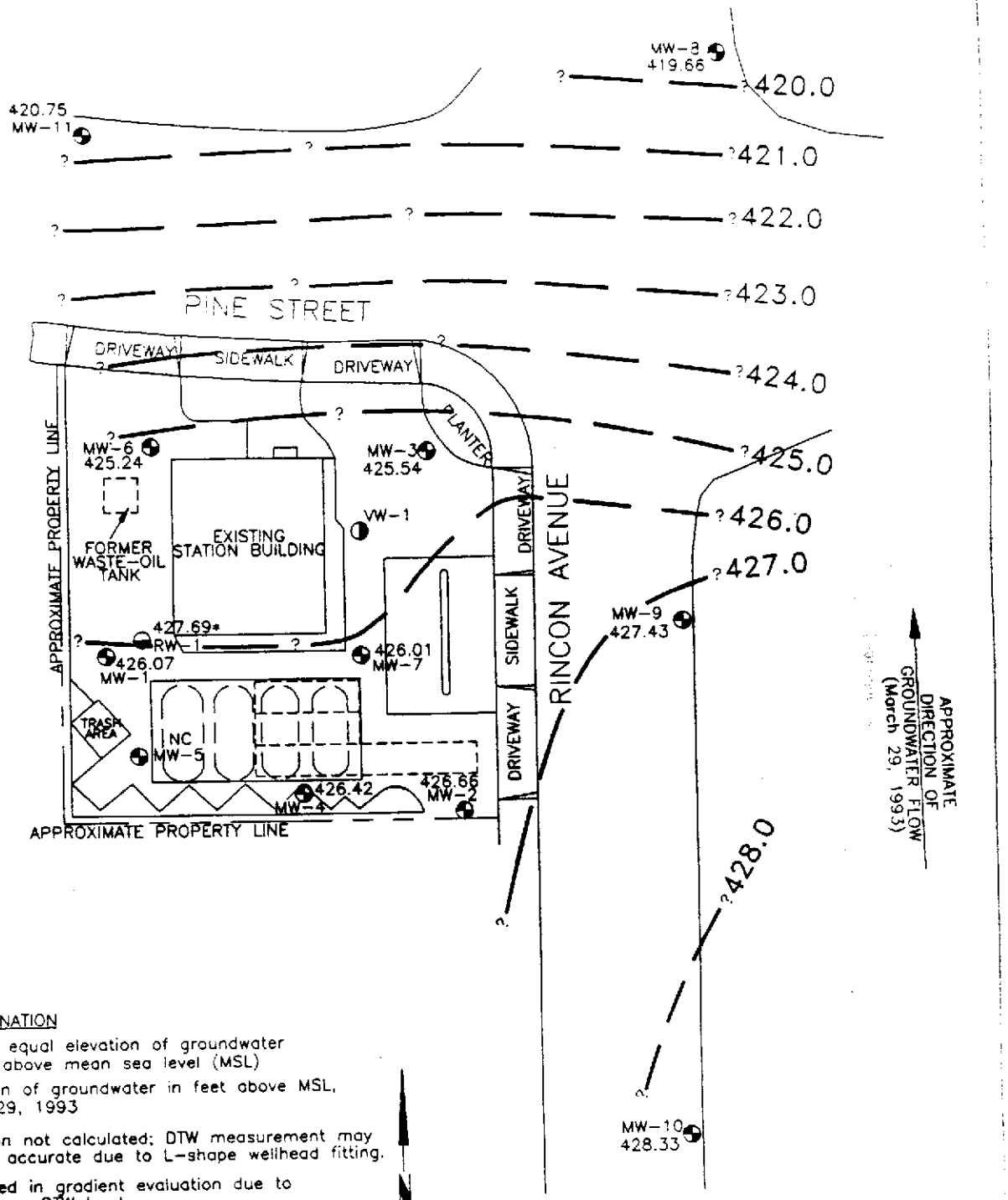
GROUNDWATER GRADIENT MAP
ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 4



EXPLANATION

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

428.33 = Elevation of groundwater in feet above MSL, March 29, 1993

NC = Elevation not calculated; DTW measurement may not be accurate due to L-shape wellhead fitting.

* = Not used in gradient evaluation due to anomalous DTW level

MW-11 = Monitoring well (RESNA, 1991, 1992 AND 1993)

RW-1 = Recovery well (RESNA, April 1992)

VW-1 = Vapor extraction well (RESNA, April 1992)

= Former underground gasoline-storage tank

= Existing underground gasoline-storage tank

Approximate Scale

40 20 0 40 80

feet

Source: Surveyed by John Koch, Licensed Land Surveyor.

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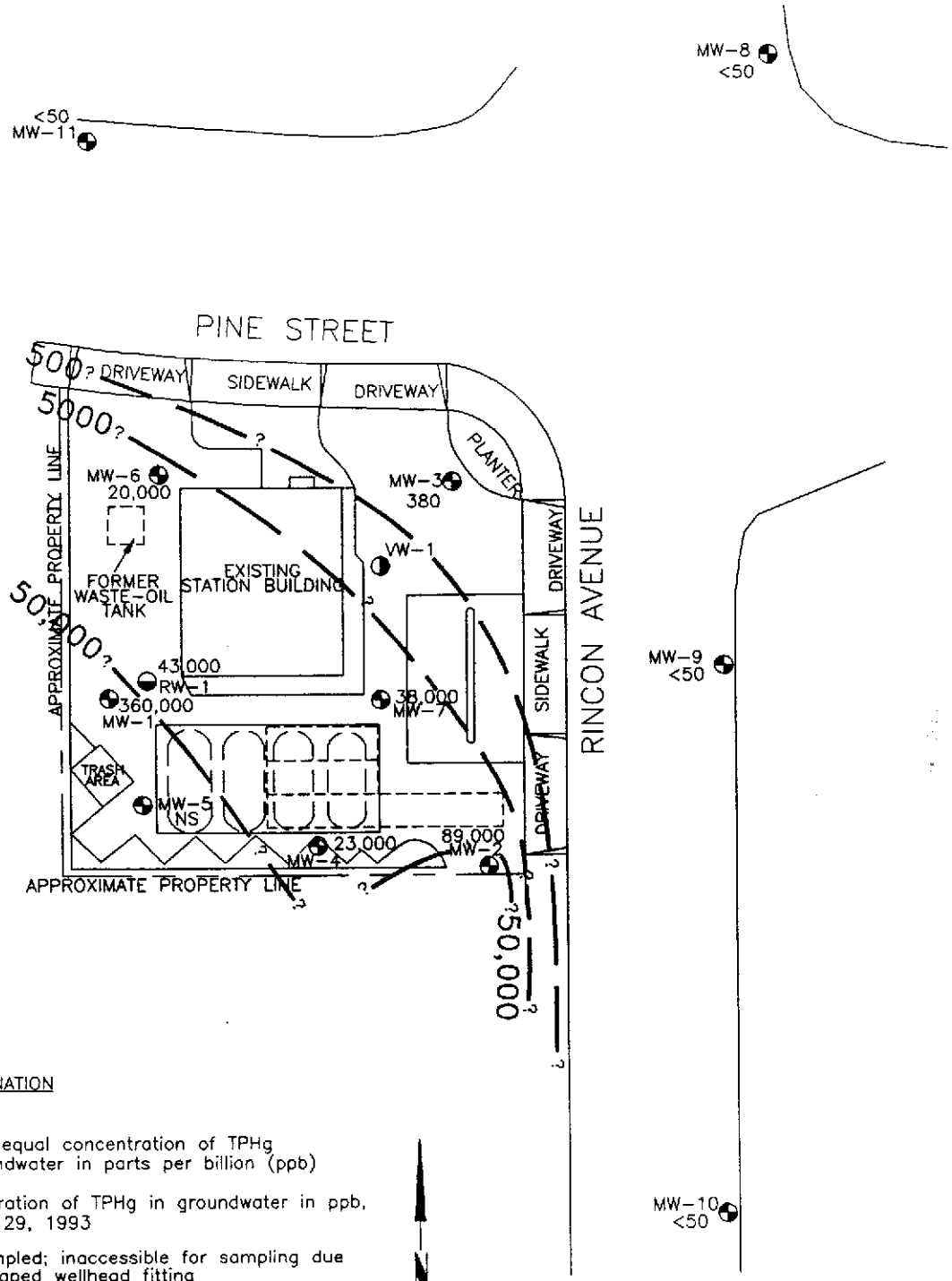
GROUNDWATER GRADIENT MAP
ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 5



EXPLANATION

50,000 = Line of equal concentration of TPHg in groundwater in parts per billion (ppb)

360,000 = Concentration of TPHg in groundwater in ppb, January 29, 1993

NS = Not sampled; inaccessible for sampling due to L-shaped wellhead fitting

MW-11 = Monitoring well (RESNA, 1991, 1992 AND 1993)

RW-1 = Recovery well (RESNA, April 1992)

VW-1 = Vapor extraction well (RESNA, April 1992)

= Former underground gasoline-storage tank

= Existing underground gasoline-storage tank

Approximate Scale

40 20 0 40 80

feet

Source: Surveyed by John Koch, Licensed Land Surveyor.

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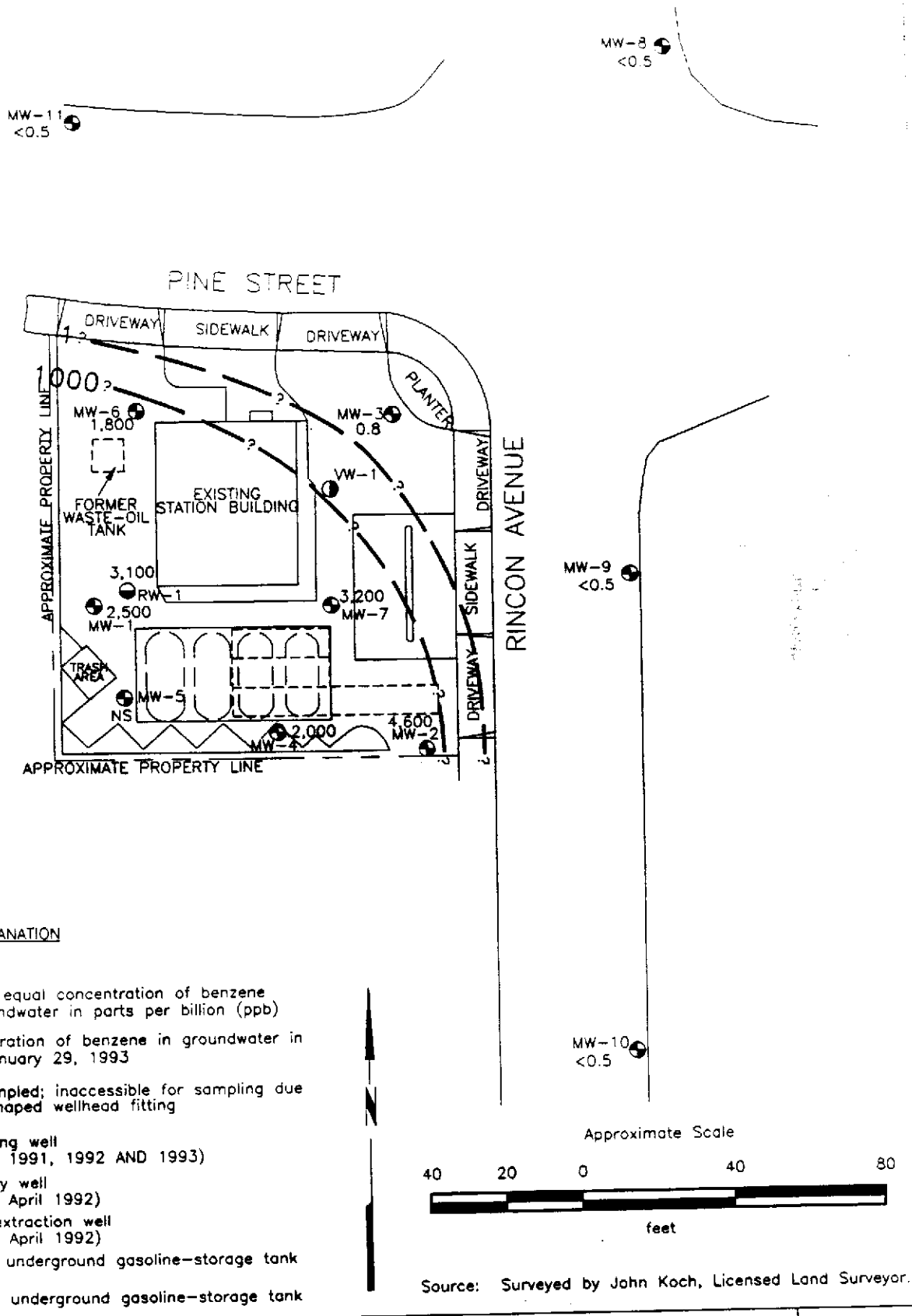
TPHg CONCENTRATIONS IN GROUNDWATER
ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 6



EXPLANATION

1000 = Line of equal concentration of benzene in groundwater in parts per billion (ppb)

4,600 = Concentration of benzene in groundwater in ppb, January 29, 1993

NS = Not sampled; inaccessible for sampling due to L-shaped wellhead fitting

MW-11 = Monitoring well (RESNA, 1991, 1992 AND 1993)

RW-1 = Recovery well (RESNA, April 1992)

VW-1 = Vapor extraction well (RESNA, April 1992)

= Former underground gasoline-storage tank

= Existing underground gasoline-storage tank

N

Approximate Scale

40 20 0 40 80

feet

Source: Surveyed by John Koch, Licensed Land Surveyor.

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PROJECT 60000.15 60000151

BENZENE CONCENTRATIONS IN GROUNDWATER
ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 7

APPENDIX A
EMCON'S FIELD REPORTS, SUMMARY OF GROUNDWATER MONITORING DATA, CERTIFIED ANALYTICAL REPORTS WITH CHAIN-OF-CUSTODY, WATER SAMPLE FIELD DATA SHEETS, AND

RESNA'S FIELD REPORTS

TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 771
Livermore, California
(Page 1 of 6)

Well / Date	Well Elevation	Depth-to-Water	Water Elevation	Floating Product
MW-1				
01-15-91	451.80[a]	32.77	419.03	Sheen
02-27-91		32.23	419.57	None
03-20-91		27.38	424.42	Sheen
04-10-91		26.49	425.31	None
05-20-91	451.80[b]	Not measured - interface probe failure		
06-20-91		33.95	417.85	Sheen
07-25-91		36.59*	415.21*	0.10
08-13-91		37.72*	414.08*	0.20
09-12-91		39.25*	412.55*	0.23
10-30-91		39.14*	412.66*	0.20
11-13-91		Dry	Dry	None
12-26-91		39.30*	412.50	0.01
01-18-92		37.81**	NC	Skimmer
02-21-92		Well inaccessible due to construction		
03-31-92		31.90**	NC	Skimmer
04-24-92	451.42[c]	Well inaccessible due to construction		
05-20-92		33.00	418.42	Skimmer
06-12-92		33.25	418.17	0.02
07-28-92		32.31	419.11	None
08-24-92		30.87	420.55	None
09-15-92		32.24*	419.18*	0.01
10-29-92		32.29	419.13	None
11-25-92	451.73[d]	32.15	419.58	Floating product**
12-14-92		30.54	421.19	None
01-29-93		23.49	428.24	None
02-26-93		25.23	426.50	None
03-29-93		25.66	426.07	None
MW-2				
01-15-91	449.52[a]	30.89*	418.63*	0.16
02-27-91		29.11*	420.41*	0.02
03-20-91		24.57*	424.95*	0.02
04-10-91		22.85*	426.67*	0.05
05-20-91	449.51[b]	NM	NM	NM
06-20-91		31.42*	418.09*	0.15
07-25-91		33.69*	415.82*	0.49
08-13-91		34.80*	414.71*	0.47
09-12-91		36.39*	413.12*	0.45
10-30-91		Dry	Dry	None
11-13-91		Dry	Dry	None
12-26-91		36.45	413.06	Sheen
01-18-92		Well inaccessible due to construction		

See notes on Page 6 of 6.

TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 771
Livermore, California
(Page 2 of 6)

Well / Date	Well Elevation	Depth-to-Water	Water Elevation	Floating Product
MW-2 (cont.)				
02-21-92	449.51[b]	26.27	NC	Skimmer
03-31-92		28.85	NC	Skimmer
04-24-92		30.95	418.56	Skimmer
05-20-92		30.69	418.82	Skimmer
06-12-92		31.25	418.26	None
07-28-92		30.31	419.20	None
08-24-92		29.83	419.68	None
09-15-92		30.06	419.45	Sheen
10-29-92		30.90	418.61	None
11-25-92	449.49[d]	31.13	418.36	Floating Product**
12-14-92		29.24	420.25	None
01-29-93		20.12	429.39	None
02-26-93		22.59	426.90	None
03-29-93		22.83	426.66	None
MW-3				
01-15-91	450.29[a]	32.34	417.95	None
02-27-91		31.78	418.51	None
03-20-91		27.74	422.55	None
04-10-91		25.05	425.24	None
05-20-91	450.28[b]	27.06	423.22	None
06-20-91		32.35	417.93	None
07-25-91		35.02	415.26	None
08-13-91		36.50	413.78	None
09-12-91		38.47	413.81	None
10-30-91		Dry	Dry	None
11-13-91		Dry	Dry	None
12-26-91		38.53	411.75	None
01-18-92		Well inaccessible due to construction		
02-21-92		Well inaccessible due to construction		
03-31-92		30.61	NC	None
04-24-92	450.28[c]	32.83	417.45	None
05-20-92		33.85	416.43	None
06-12-92		34.51	415.77	None
07-28-92		34.42	415.86	None
08-24-92		32.46	417.82	None
09-15-92		34.29	415.99	None
10-29-92		33.40	416.88	None
11-25-92		33.67	416.61	None
12-14-92		34.26	416.02	None
01-29-93		21.88	428.40	None
02-26-93		24.71	425.57	None

See notes on Page 6 of 6.

TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 771
Livermore, California
(Page 3 of 6)

Well Date	Well Elevation	Depth-to-Water	Water Elevation	Floating Product
MW-3 (cont.)				
03-29-93	450.28[c]	24.74	425.54	None
MW-4				
07-25-91	451.56[b]	36.07	415.49	None
08-13-91		37.54	414.02	None
09-12-91		38.73	412.83	None
10-10-91	451.56[b]	39.90	411.66	None
11-13-91		40.56	411.00	None
12-26-91	450.99[c]	38.78	412.78	None
01-18-92		38.71	NC	None
02-21-92		31.91	NC	None
03-31-92		30.36	NC	None
04-24-92		32.65	418.34	None
05-20-92		32.62	418.37	None
06-12-92		32.73	418.26	None
07-28-92		31.48	419.51	None
08-24-92		32.84	418.15	None
09-15-92		31.37	419.62	None
10-29-92		32.58	418.41	None
11-25-92	451.09[d]	32.37	418.72	None
12-14-92		30.99	420.10	None
01-29-93		22.30	428.79	None
02-26-93		24.47	426.62	None
03-29-93		24.67	426.42	None
MW-5				
07-25-91	451.41[b]	36.67	414.74	Sheen
08-13-91		37.98*	413.43*	0.01
09-12-91		39.01*	412.40*	0.05
10-30-91		38.28	412.13	Sheen
11-13-91		39.24	412.17	Sheen
12-26-91		39.11	412.30	Sheen
01-18-92		38.15	NC	Skimmer
02-21-92		30.59	NC	Skimmer
03-18-92		30.84	NC	Skimmer
04-24-92	451.40[e]	33.00	418.40	Skimmer
05-20-92		32.86	418.54	Skimmer
06-12-92		33.03	418.37	None
07-28-92		31.92	419.48	None
08-24-92		32.17	419.23	None
09-15-92		31.90	419.50	None
10-29-92		32.94	418.46	None

See notes on Page 6 of 6.

TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 771
Livermore, California
(Page 4 of 6)

Well Date	Well Elevation	Depth-to-Water	Water Elevation	Floating Product
MW-5(cont.)				
11-25-92	Not measured - new L-shape wellhead fitting prevented sounder from going down well			
12-14-92		30.90***	NC	None
01-29-93		23.25***	NC	None
02-26-93		25.02***	NC	None
03-29-93		24.72***	NC	None
MW-6				
07-25-91	451.38[b]	37.68	413.70	None
08-13-91		39.17	412.21	None
09-12-91		41.14	410.24	None
10-30-91		42.10	409.28	None
11-13-91		41.45	409.93	None
12-26-91		41.23	410.15	None
01-18-92		38.23	NC	None
02-21-92	451.37[e]	35.21	NC	None
03-31-92		32.26	NC	None
04-24-92		33.24	418.13	None
05-20-92		33.14	418.23	None
06-12-92		33.43	417.94	None
07-28-92		32.52	418.85	None
08-24-92		32.57	418.80	None
09-15-92		32.58	418.79	None
10-29-92		32.33	419.04	None
11-25-92		32.43	418.94	None
12-14-92		31.52	419.85	None
01-29-93		23.70	427.67	None
02-26-93		26.22	425.15	None
03-29-93		26.13	425.24	None
MW-7				
07-25-91	450.65[b]	34.88	415.77	Sheen
08-13-91		36.17	414.48	None
09-12-91		37.81	412.84	None
10-30-91		38.50	412.15	None
11-13-91		38.31	412.34	None
12-26-91		37.90	412.75	None
01-18-92		Well inaccessible due to construction		
02-21-92		31.50	NC	None
03-31-92		29.40	NC	None
04-24-92	450.63[e]	32.14	418.49	None
05-20-92		32.51	418.12	None
06-12-92		32.45	418.18	None

See notes on Page 6 of 6.

TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 771
Livermore, California
(Page 5 of 6)

Well / Date	Well Elevation	Depth-to-Water	Water Elevation	Floating Product
MW-7(cont.)				
07-28-92		32.08	418.55	None
08-24-92		32.29	418.34	None
09-15-92		31.93	418.70	None
10-29-92		32.37	418.26	None
11-25-92	450.33[d]	31.80	418.53	None
12-14-92		30.44	419.89	None
01-29-93		21.76	428.57	None
02-26-93		24.16	426.17	None
03-29-93		24.32	426.01	
MW-8				
01-29-93	449.43[d]	23.23	426.20	None
02-26-93		29.20	420.23	None
03-29-93		29.77	419.66	None
MW-9				
01-29-93	449.21[d]	18.91	430.30	None
02-26-93		21.35	427.86	None
03-29-93		21.78	427.43	None
MW-10				
01-29-93	449.22[d]	19.27	429.95	None
02-26-93		21.34	427.88	None
03-29-93		20.89	428.33	None
MW-11				
04-24-92	448.02[e]	35.06	412.96	None
05-20-92		34.10	413.92	None
06-12-92		34.48	413.54	None
07-28-92		35.13	412.89	None
08-24-92		33.32	414.70	None
09-15-92		35.72	412.30	None
10-29-92		35.26	412.76	None
11-25-92		36.44	411.58	None
12-14-92		33.18	414.84	None
01-29-93		23.89	424.13	None
02-26-93		27.31	420.71	None
03-29-93		27.27	420.75	None
RW-1				
04-24-92	451.44[e]	32.85	418.59	None
05-20-92		32.60	418.84	None

See notes on Page 6 of 6.

Quarterly Groundwater Monitoring
ARCO Station 771, Livermore, California

April 29, 1993
60000.15

TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 771
Livermore, California
(Page 6 of 6)

Well / Date	Well Elevation	Depth-to-Water	Water Elevation	Floating Product
RW-1(cont.)				
06-12-92	451.44[a]	32.72	418.72	None
07-28-92		31.94	419.50	None
08-24-92		31.73	419.71	None
09-15-92		31.94	419.50	None
10-29-92		32.15	419.29	None
11-25-92	451.67[d]	32.21	419.46	None
12-14-92		30.58	421.09	None
01-29-93		22.89	428.78	None
02-26-93		23.97	427.70	None
03-29-93		23.98	427.69	None

Measurements in feet.

* = Floating product present in well; DTW with floating product present was calculated using the following: The recorded thickness of the floating product was multiplied by 0.80 to obtain an approximate value for the displacement of water by the floating product. This approximate displacement value was then subtracted from the measured depth to water to obtain an adjusted depth to water. These adjusted groundwater depths were subtracted from wellhead elevations to calculate the differences in groundwater elevations.

** = Floating product not initially present but came into well during purging.

*** = DTW measurement may not be accurate due to L-shape wellhead fitting.

[a] = Surveyed by Ron Archer, Civil Engineer, in January 1991.

[b] = Surveyed by John Koch, Licensed Land Surveyor, in July 1991.

[c] = Surveyed by John Koch, Licensed Land Surveyor, in May 1992.

[d] = Surveyed by John Koch, Licensed Land Surveyor, in January 1993.

Wellhead elevations based on benchmark: top of pin in standard monument, west side of intersection of Rincon Avenue and Pine Street. Elevation taken as 448.741 feet. City of Livermore Datum.

NC = Elevation not calculated; wellhead elevations may no longer be correct due to construction of remediation system.

TABLE 2
CUMULATIVE RESULTS OF LABORATORY ANALYSES OF GROUNDWATER SAMPLES
ARCO Station 771
Livermore, California
(Page 1 of 3)

Sample	TPHg	B	T	E	X	TPHd	TOG
MW-1							
01-15-91	Not sampled--sheen						
04-10-91	98,000	11,000	18,000	2,800	20,000	NA	NA
07-25-91	Not sampled--floating product						
10-30-91	Not sampled--floating product						
03-31-92	Not sampled--floating product						
06-12-92	Not sampled--floating product						
09-16-92	Not sampled--floating product						
11-25-92	Not sampled--floating product						
01-29-93	360,000	2,500	9,300	5,100	41,000	NA	NA
MW-2							
01-15-91	Not sampled--floating product						
04-10-91	Not sampled--floating product						
07-25-91	Not sampled--floating product						
10-30-91	Not sampled--sheen						
03-31-92	270,000	7,000	12,000	4,400	40,000	NA	NA
06-12-92	110,000	8,900	13,000	2,800	16,000	NA	NA
09-16-92	Not sampled--sheen						
11-25-92	Not sampled--floating product						
01-29-93	89,000	4,600	5,700	1,800	15,000	NA	NA
MW-3							
01-15-91	230	<0.5	<0.5	2.2	2.1	NA	NA
04-10-91	530	12	8.4	4.0	7.0	NA	NA
07-25-91	110	0.32	0.75	1.2	1.0	NA	NA
10-30-91	Not sampled--dry						
03-31-92	670	12	1.1	7.4	27	NA	NA
06-12-92	280	<0.5	<0.5	2.1	2.0	NA	NA
09-15-92	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
11-25-92	220	1.0	<0.5	4.9	1.2	NA	NA
01-29-93	380***	0.8	0.6	2.1	2.0	NA	NA
MW-4							
07-25-91	23,000	590	730	360	3,500	NA	NA
10-30-91	19,000	320	340	230	180	NA	NA
03-31-92	30,000	1,300	740	770	4,800	NA	NA
06-12-92	28,000	990	440	550	3,200	NA	NA
09-16-92	21,000	740	240	350	1,300	NA	NA
11-25-92	26,000	1,200	300	350	730	NA	NA
01-29-93	23,000	2,000	580	770	2,500	NA	NA

See notes on Page 3 of 3.

TABLE 2
CUMULATIVE RESULTS OF LABORATORY ANALYSES OF GROUNDWATER SAMPLES
ARCO Station 771
Livermore, California
(Page 2 of 3)

Sample	TPHg	B	T	E	X	TPHd	TOG
MW-5							
07-25-91	57,000	2,300	4,200	77	14,000	NA	NA
10-30-91		Not sampled--sheen					
03-31-92	80,000	7,100	9,100	2,000	16,000	NA	NA
06-12-92	69,000	4,000	5,300	2,200	12,000	NA	NA
09-16-92	65,000	2,300	2,600	1,700	9,900	NA	NA
11-25-92	Inaccessible for sampling, L-shape fitting installed at wellhead for use in interim remediation system						
01-29-93	Inaccessible for sampling, L-shape fitting installed at wellhead for use in interim remediation system						
MW-6							
07-25-91	10,000	3,000	200	340	1,000	NA	NA
10-30-91	970	150	4.4	4.9	6.6	NA	NA
03-31-92	16,000	3,600	1,500	660	1,700	2,400[a]	2.5[c], 4.0[b]
06-12-92	2,900	480	17	190	170	1,100[a]	1.2[c]
09-16-92	2,300	220	<5**	92	43	810[a]	1.5[c]
11-25-92	2,700	240	11	103	32	720[a]	1.6[c], 1.8[b]
01-29-93	20,000	1,800	1,700	490	2,600	2,300[a]	3.6[c], 4.0[b]
MW-7							
07-25-91	45,000	1,500	2,700	1,200	9,200	NA	NA
10-30-91	93,000	1,800	770	780	6,700	NA	NA
03-31-92	35,000	960	350	300	5,900	NA	NA
06-12-92	27,000	900	270	340	4,800	NA	NA
09-16-92	39,000	1,900	410	470	5,000	NA	NA
11-25-92	49,000	2,900	810	750	5,300	NA	NA
01-29-93	38,000	3,200	1,100	740	4,300	NA	NA
MW-8							
01-29-93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-9							
01-29-93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-10							
01-29-93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-11							
06-12-92	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
09-15-92	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
11-25-92	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
01-29-93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA

See notes on Page 3 of 3.

TABLE 2
CUMULATIVE RESULTS OF LABORATORY ANALYSES OF GROUNDWATER SAMPLES
ARCO Station 771
Livermore, California
(Page 3 of 3)

Sample	TPHg	B	T	E	X	TPHd	TOG
RW-1							
06-12-92	54,000	2,300	4,400	1,200	12,000	NA	NA
09-15-92	49,000	1,500	2,200	870	6,900	NA	NA
11-25-92	32,000	1,500	2,500	1,000	5,500	NA	NA
01-29-93	43,000	3,100	2,500	990	7,400	NA	NA
MCLs	—	1	—	680	1,750		
DWAL	—	—	100	—	—		

Results in parts per billion (ppb), except TOG, which is reported in parts per million (ppm).
TPHg: Total petroleum hydrocarbons as gasoline (measured by EPA Method 5030/8015).
B: Benzene T: toluene E: ethylbenzene X: total xylene isomers
BTEX: Measured by EPA Method 5030/8020.
TPHd: Total petroleum hydrocarbons as diesel (measured by EPA Method 3510). May be weathered gasoline.
TOG: Total oil and grease: [a] by method 5520F-IR; [b] by method 5520C; [c] by method 413.2; [d] by method 418.1
NA: Not analyzed.
<: Less than the laboratory detection limit.
*: Sample contains a lower boiling point hydrocarbon mixture quantified as diesel. The chromatogram does not match the typical diesel fingerprint.
**: Method Reporting Limit raised due to high analyte concentration requiring sample dilution.
***: Sample contained components eluting in the gasoline range that were quantitated as gasoline. The chromatogram did not match the typical gasoline fingerprint.
MCL: State Maximum Contaminant Level in ppb (October 1990).
DWAL: State Recommended Drinking Water Action Level in ppb (October 1990).

TABLE 3
APPROXIMATE CUMULATIVE PRODUCT RECOVERED
ARCO Station 771
Livermore, California
(Page 1 of 2)

Year/Date	Floating Product Removed (gallons)
1991	TOTAL: 2.77 Gallons
MW-1	
01-15-92	Well inaccessible due to construction
02-28-92	Well inaccessible due to construction
03-26-92	0.25
04-27-92	Well inaccessible due to construction
05-14-92	None present
06-30-92	0.02
07-27-92	Sheen
08-28-92	Sheen
09-28-92	Sheen
10-26-92	Sheen
11-30-92	Sheen
12-30-92	Sheen
MW-2	
01-15-92	Well inaccessible due to construction
02-28-92	None present
03-26-92	0.01
04-27-92	None present
05-14-92	None present
06-30-92	None present
07-27-92	Sheen
08-28-92	Sheen
09-28-92	Sheen
10-26-92	Sheen
11-30-92	Sheen
12-30-92	Sheen
MW-5	
01-15-92	Well inaccessible due to construction
02-28-92	None present
03-26-92	0.01
04-27-92	None present
05-14-92	None present
06-30-92	None present
07-27-92	Sheen
08-28-92	Sheen
09-28-92	Sheen
10-26-92	Sheen
11-30-92	Sheen
12-30-92	Sheen
1992	TOTAL: 0.29 Gallons

TABLE 3
APPROXIMATE CUMULATIVE PRODUCT RECOVERED
ARCO Station 771
Livermore, California
(Page 2 of 2)

Year/Date		Floating Product Removed (gallons)
MW-1		
01-15-93		Sheen
02-26-93		Sheen
03-26-93		Sheen
MW-2		
01-15-93		Sheen
02-26-93		Sheen
03-26-93		Sheen
MW-5		
01-15-93		Sheen
02-26-93		Sheen
03-26-93		Sheen
1993	TOTAL:	0.00 Gallons
1991-1993	TOTAL:	3.06 Gallons

APPENDIX A
EMCON'S FIELD REPORTS;
SUMMARY OF GROUNDWATER MONITORING DATA,
CERTIFIED ANALYTICAL REPORTS WITH CHAIN-OF-CUSTODY, AND
WATER SAMPLE FIELD DATA SHEETS

RESNA'S FIELD REPORTS

EMCON
ASSOCIATES
Consultants in Wastes
Management and
Environmental Control

Date February 4, 1993
Project 0G70-017.01

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

We are enclosing:

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

For your: X Information Sent by: X Mail

Comments:
Enclosed are the data from the first quarter 1993 monitoring event at ARCO service station 2035, 1001 San Pablo Avenue, Albany, California. Groundwater monitoring is conducted consistent with applicable regulatory guidelines. Please call if you have any questions: (408) 453-2266.

Jim Butera JB

Reviewed by:

REGISTERED PROFESSIONAL ENGINEER
ROBERT CURTIS PORTER
No: 4004
Exp. 4/30/96
INDUSTRIAL
STATE OF CALIFORNIA

Robert Porter, Senior Project Engineer.

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

FIELD REPORT
DEPTH TO WATER / FLOATING PRODUCT SURVEY

PROJECT # : 0G70-017.01 STATION ADDRESS : 1001 San Pablo Ave. Albany, CA DATE : 1-13-93

ARCO STATION # : 2035 FIELD TECHNICIAN : REICHELDERFER / GALLEGOS DAY : WEDNESDAY

DTW Order	WELL ID	Well Box Seal	Well Lid Secure	Gasket	Lock	Locking Well Cap	FIRST DEPTH TO WATER (feet)	SECOND DEPTH TO WATER (feet)	DEPTH TO FLOATING PRODUCT (feet)	FLOATING PRODUCT THICKNESS (feet)	WELL TOTAL DEPTH (feet)	COMMENTS
1	MW-4	OK	YES	OK	3259	OK	8.05	8.05	ND	NA	25.1	—
2	MW-5	OK	YES	OK	DOLPHIN	OK	8.22	8.22	ND	NA	24.3	—
3	MW-6	OK	YES	OK	DOLPHIN	OK	9.84	9.84	ND	NA	24.3	—
4	MW-2	OK	YES	OK	3259	OK	8.25	8.25	ND	NA	28.7	—
5	MW-3	OK	YES	OK	3259	OK	9.12	9.12	ND	NA	33.0	—
6	MW-1	OK	YES	OK	3259	BAD	7.73	7.73	ND	NA	29.6	REPLACED LWC
7	RW-1	OK	YES	OK	3259	BAD	8.35	8.35	*NA	*NA	NA	*SKIMMER CONTAINS PRODUCT • METAL L.W.C. DOES NOT SEAL CORRECTLY — NEEDS NEW L.W.C. • WATER IN BOX, @ CASING LEVEL

SURVEY POINTS ARE TOP OF WELL CASINGS

Columbia Analytical Services, Inc.

January 27, 1993

Service Request No. SJ93-0050

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

Re: **EMCON Project No. 0G70-017.01**
ARCO Facility No. 2035

Dear Mr. Butera:

Attached are the results of the water samples submitted to our lab on January 14, 1993. For your reference, these analyses have been assigned our service request number SJ93-0050.

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.

Keoni A. Murphy
Laboratory Manager

Annelise J. Bazar
Regional QA Coordinator

KAM/kt

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: EMCON Associates
Project: EMCON Project No. 0G70-017.01
Arco Facility No. 2035

Date Received: 01/14/93
Service Request No.: SJ93-0050
Sample Matrix: Water

Inorganic Parameters[1]
mg/L (ppm)

Sample Name:		MW-3 (33)	Method Blank
Date Sampled:		01/13/93	
Analyte	**Method**	**MRL**	
Total Oil and Grease	SM 5520C	0.5	0.78	ND
Hydrocarbons, IR	SM 5520F	0.5	1.10	ND

MRL Method Reporting Limit
ND None Detected at or above the method reporting limit
SM *Standard Methods for the Examination of Water and Wastewater*, 17th Ed., 1989
[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: Kevin Murphy Date: January 27, 1993

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Associates	**Date Received:**	01/14/93
Project:	EMCON Project No. 0G70-017.01	**Service Request No.:**	SJ93-0050
	ARCO Facility No. 2035	**Sample Matrix:**	Water

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

Sample Name:		MW-1 (29)	MW-2 (28)	MW-3 (33)
Date Analyzed:		01/21/93	01/20/93	01/20/93
Analyte	**MRL**			
Benzene	0.5	130.	ND	1.1
Toluene	0.5	5.3	ND	ND
Ethylbenzene	0.5	5.0	ND	ND
Total Xylenes	0.5	9.0	ND	ND
TPH as Gasoline	50	430.	ND	ND

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

Approved by: Kevin Murphy Date: January 27, 1993

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Associates	**Date Received:**	01/14/93
Project:	EMCON Project No. 0G70-017.01	**Service Request No.:**	SJ93-0050
	ARCO Facility No. 2035	**Sample Matrix:**	Water

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

Sample Name:		MW-4 (25)	MW-5 (24)	MW-6 (24)
Date Analyzed:		01/20/93	01/21/93	01/20/93
Analyte	**MRL**			
Benzene	0.5	ND	ND	ND
Toluene	0.5	1.3	ND	ND
Ethylbenzene	0.5	ND	ND	ND
Total Xylenes	0.5	1.6	ND	ND
TPH as Gasoline	50	ND	ND	ND

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

Approved by: Kevin A Murphy Date: January 27, 1993

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Associates	**Date Received:**	01/14/93
Project:	EMCON Project No. 0G70-017.01	**Service Request No.:**	SJ93-0050
	ARCO Facility No. 2035	**Sample Matrix:**	Water

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

Sample Name:		FB-1	Method Blank	Method Blank
Date Analyzed:		01/20/93	01/20/93	01/21/93
Analyte	**MRL**			
Benzene	0.5	ND	ND	ND
Toluene	0.5	ND	ND	ND
Ethylbenzene	0.5	ND	ND	ND
Total Xylenes	0.5	ND	ND	ND
TPH as Gasoline	50	ND	ND	ND

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

Approved by: Kathy Murphy Date: January 27, 1993

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON Associates	**Date Received:**	01/14/93
Project:	EMCON Project No. 0G70-017.01	**Service Request No.:**	SJ93-0050
	ARCO Facility No. 2035	**Sample Matrix:**	Water

Continuing Calibration Summary
Inorganics
SM5520
mg/L

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Criteria
Total Oil and Grease	4.0	3.42	78.	56-151

SM *Standard Methods for the Examination of Water and Wastewater,* 17th Ed., 1989

Approved by: _____ Date: January 27, 1993

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON Associates	**Date Received:**	01/14/93
Project:	EMCON Project No. 0G70-017.01	**Service Request No.:**	SJ93-0050
	ARCO Facility No. 2035	**Sample Matrix:**	Water

Matrix Spike Summary
Total Recoverable Petroleum Hydrocarbons
SM5520
mg/L (ppm)

Sample Name: MW-3 (33)

Spike Level	Sample Result	Spike Result MS	Spike Result DMS	Percent Recovery MS	Percent Recovery DMS	CAS Acceptance Criteria
6.15	1.10	5.72	5.56	75.	73.	56-151

SM *Standard Methods for the Examination of Water and Wastewater,* 17th Ed., 1989

Approved by: Kevin A Murphy Date: January 27, 1993

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON Associates
Project: EMCON Project No. 0G70-017.01
ARCO Facility No. 2035

Date Received: 01/14/93
Service Request No.: SJ93-0050

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

Date Analyzed: 01/20/93

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Criteria
Benzene	250.	244.	98.	85-115
Toluene	250.	252.	101.	85-115
Ethylbenzene	250.	232.	93.	85-115
Total Xylenes	750.	684.	91.	85-115
TPH as Gasoline	2,500.	2,708.	108.	90-110

Date Analyzed: 01/21/93

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Criteria
Benzene	250.	252.	101.	85-115
Toluene	250.	258.	103.	85-115
Ethylbenzene	250.	239.	96.	85-115
Total Xylenes	750.	687.	92.	85-115
TPH as Gasoline	2,500.	2,273.	91.	90-110

TPH Total Petroleum Hydrocarbons

Approved by: Kevin Murphy Date: January 27, 1993

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON Associates	**Date Received:**	01/14/93
Project:	EMCON Project No. 0G70-017.01	**Service Request No.:**	SJ93-0050
	ARCO Facility No. 2035	**Sample Matrix:**	Water

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

Sample Name	Date Analyzed	Percent Recovery α,α,α-Trifluorotoluene
MW-1 (29)	01/21/93	105.
MW-2 (28)	01/20/93	109.
MW-3 (33)	01/20/93	109.
MW-4 (25)	01/20/93	110.
MW-5 (24)	01/21/93	104.
MW-6 (24)	01/20/93	107.
FB-1	01/20/93	109.
MW-2 (28) MS	01/20/93	113.
MW-2 (28) DMS	01/20/93	113.
Method Blank	01/20/93	102.
Method Blank	01/21/93	104.
CAS Acceptance Criteria		70-130

TPH Total Petroleum Hydrocarbons

Approved by: Kevin Murphy Date: January 27, 1993

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON Associates
Project: EMCON Project No. 0G70-017.01
ARCO Facility No. 2035

Date Received: 01/14/93
Service Request No.: SJ93-0050
Sample Matrix: Water

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

Sample Name: MW-2 (28)
Date Analyzed: 01/20/93

Analyte	Spike Level	Sample Result	Spike Result MS	Spike Result DMS	Percent Recovery MS	Percent Recovery DMS	CAS Acceptance Criteria
Benzene	25.	ND	25.2	25.4	101.	102.	39-150
Toluene	25.	ND	25.1	25.3	100.	101.	46-148
Ethylbenzene	25.	ND	24.5	24.5	98.	98.	32-160

ND None Detected at or above the method reporting limit

Approved by: _____ Date: January 27, 1993

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. EMCGC-97-1

Chain of Custody

ARCO Facility no. 2035	City (Facility) Albany	Project manager (Consultant) JIM BUTERA	Laboratory name CAS
ARCO engineer Kyle Christie	Telephone no. (ARCO) 415 571-2434	Telephone no. (Consultant) 453-0719	Fax no. (Consultant) 453-0852	Contract number 07077
Consultant name EMCON Associates	Address (Consultant) 1938 Junction Ave San Jose		Method of shipment sampler will deliver

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH EPA M602/8020/8015	TPH Modified 8015 Gas ☐ Diesel ☐	5520 C&F Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals ☐ Semi VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐		
MW-1 (29')	1-2	2		X		X	HCl	1-13-93	1512		X											
MW-2 (28')	3-4	2		X		X	HCl		1355		X											
MW-3 (33')	15-16 S-6	6		X		X	HCl		1429		X		X									
MW-4 (25')	7-8	2		X		X	HCl		1225		X											
MW-5 (24')	9-10	2		X		X	HCl		1250		X											
MW-6 (24')	11-12	2		X		X	HCl		1320		X											
~~RW-1~~		2		X		X	HCl		—		X	no Sample Product In well										
EP-1	BH	2		X		X	HCl		1340		X											

Special detection Limit/reporting: Lowest Possible

Special QA/QC: As Normal

Remarks: 2-40 ml HCl VOA's
4-Liter HCl GLASS
OG-70-01701
IR added per J. Butera 1-14-93
17

Lab number: SJ93-0050

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

Condition of sample: OK

Temperature received: cool

	Date	Time	Received by
Relinquished by sampler: Manuel L. Gallegos	1-14-93	0958	
Relinquished by	Date	Time	Received by
Relinquished by	Date	Time	Received by laboratory: [signature] Date: 1-14-93 Time: 10:00

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

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 0670-017.01 SAMPLE ID: MW-1 (29)

PURGED BY: REICHELDERFER/GALLEGOS CLIENT NAME: ARCO 2035

SAMPLED BY: ↓ LOCATION: 1001 SAN PABLO AVE ALBANY, 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.):	14.90
DEPTH TO WATER (feet):	7.56	CALCULATED PURGE (gal.):	43 20
DEPTH OF WELL (feet):	29.6	ACTUAL PURGE VOL. (gal.):	43.50

DATE PURGED: 1-13-93 Start (2400 Hr) 1453 End (2400 Hr) 1505

DATE SAMPLED: 1-13-93 Start (2400 Hr) 1512 End (2400 Hr) 1514

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1456	14.50	6.92	578	64.7	CLOUDY	LIGHT
1500	29.00	6.85	772	65.1	↓	↓
1505	43.50	6.94	779	66.1	↓	↓

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

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

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

WELL INTEGRITY: OK LOCK #: 0464

REMARKS: ___

Meter Calibration: Date: 1-13-93 Time: 1200 Meter Serial #: 9203 Temperature °F: ___

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

Location of previous calibration: MW-4

Signature: Kevin Reichelderfer Reviewed By: JG Page 1 of 7

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 0670-017.01 SAMPLE ID: MW-2(28)

PURGED BY: REICHELDERFER/GALLEGOS CLIENT NAME: ARCO 2035

SAMPLED BY: ✓ LOCATION: 1001 SAN PABLO AVE ALBANY, CA

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

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

CASING ELEVATION (feet/MSL):	NR	VOLUME IN CASING (gal.):	13.46
DEPTH TO WATER (feet):	8.10	CALCULATED PURGE (gal.):	40.38
DEPTH OF WELL (feet):	28.7	ACTUAL PURGE VOL. (gal.):	40.50

DATE PURGED: 1-13-93 Start (2400 Hr) 1340 End (2400 Hr) 1349

DATE SAMPLED: 1-13-93 Start (2400 Hr) 1355 End (2400 Hr) 1357

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1343	13.50	6.80	771	66.1	BROWN	MODERATE
1346	27.00	6.81	790	66.4	↓	↓
1349	40.50	6.73	798	67.0	↓	↓

D. O. (ppm): NR ODOR: ~~ALONE~~ SLIGHT NR (COBALT 0 - 100) NR (NTU 0 - 200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): FB-1 (1340)

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

WELL INTEGRITY: OK LOCK #: 3259

REMARKS: ___

Meter Calibration: Date: 1-13-93 Time: 1200 Meter Serial #: 9203 Temperature °F: ___

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

Location of previous calibration: MW-4

Signature: Kevin Reichelderfer Reviewed By: AB Page 2 of 7

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 0670-017.01 SAMPLE ID: MW-3(33)

PURGED BY: REICHELDERFER/GALLEGOS CLIENT NAME: ARCO 2035

SAMPLED BY: ✓ LOCATION: 1001 SAN PABLO AVE ALBANY, 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.):	15.58
DEPTH TO WATER (feet):	9.15	CALCULATED PURGE (gal.):	46.75
DEPTH OF WELL (feet):	33.0	ACTUAL PURGE VOL. (gal.):	47.00

DATE PURGED: 1-13-93 Start (2400 Hr) 1408 End (2400 Hr) 1420

DATE SAMPLED: 1-13-93 Start (2400 Hr) 1429 End (2400 Hr) 1435

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1411	16.00	6.90	766	63.4	BROWN	MODERATE
1414	32.00	6.89	809	64.0	↓	↓
1420	47.00	6.88	739	64.9	↓	HEAVY

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

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

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

WELL INTEGRITY: OK LOCK #: 3259

REMARKS: ___

Meter Calibration: Date: 1-13-93 Time: 1200 Meter Serial #: 9203 Temperature °F: ___

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

Location of previous calibration: MW-4

Signature: [signature] Reviewed By: JG Page 3 of 7

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 0670-017.01 SAMPLE ID: MW-4 (25)

PURGED BY: REICHELDERFER/GALLEGOS CLIENT NAME: ARCO 2035

SAMPLED BY: ↓ LOCATION: 1001 SAN PABLO AVE ALBANY, 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.):	11.14
DEPTH TO WATER (feet):	8.05	CALCULATED PURGE (gal.):	33.42
DEPTH OF WELL (feet):	25.1	ACTUAL PURGE VOL. (gal.):	26.00

DATE PURGED: 1-13-93 Start (2400 Hr) 1200 End (2400 Hr) 1210

DATE SAMPLED: 1-13-93 Start (2400 Hr) 1225 End (2400 Hr) 1227

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1204	11.50	6.78	981	65.1	BROWN	HEAVY
1207	23.00	6.81	924	66.7	↓	↓
1210	WELL DRIED @ 26.00 GALLONS					
1228	RECHARGE	6.77	830	66.6	BROWN	HEAVY

D. O. (ppm): NR ODOR: NONE

COLOR (COBALT 0 - 100): NR

TURBIDITY (NTU 0 - 200): NR

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

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

WELL INTEGRITY: OK LOCK #: 3259

REMARKS:
- 1210 WELL DRIED @ 26.00 GALLONS
- 1220 DTW @ 14.19
- HEAVY EXHAUST EMISSIONS FROM NEARBY CAR WHILE SAMPLING

Meter Calibration: Date: 1-13-93 Time: 1200 Meter Serial #: 9203 Temperature °F: 59.5

(EC 1000 974 / 1000) (DI 6.71) (pH 7 7.10 / 7.00) (pH 10 9.89 / 10.00) (pH 4 3.92 / ___)

Location of previous calibration: ___

Signature: Kevin Reichelderfer Reviewed By: JB Page 4 of 7

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 0670-017.01 SAMPLE ID: MW-5 (24)

PURGED BY: REICHELDERFER/GALLEGOS CLIENT NAME: ARCO 2035

SAMPLED BY: ↓ LOCATION: 1001 SAN PABLO AVE ALBANY, 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.):	10.49
DEPTH TO WATER (feet):	8.24	CALCULATED PURGE (gal.):	31.48
DEPTH OF WELL (feet):	24.3	ACTUAL PURGE VOL. (gal.):	31.50

DATE PURGED: 1-13-93 Start (2400 Hr) 1232 End (2400 Hr) 1244

DATE SAMPLED: 1-13-93 Start (2400 Hr) 1250 End (2400 Hr) 1257

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1234	10.50	6.96	844	64.3	BROWN	HEAVY
1237	21.00	7.02	849	65.3	↓	↓
1244	31.50	7.04	774	65.4	↓	↓

D. O. (ppm): NR ODOR: NONE

COLOR (COBALT 0 - 100): NR

TURBIDITY (NTU 0 - 200): NR

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

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

WELL INTEGRITY: OK LOCK #: [illegible] DOLPHIN

REMARKS: ___

Meter Calibration: Date: 1-13-93 Time: 1200 Meter Serial #: 9203 Temperature °F: ___

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

Location of previous calibration: MW-4

Signature: Kevin Reichelderfer Reviewed By: JB Page 5 of 7

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: OG70-017.01 SAMPLE ID: MW-6(24)

PURGED BY: REICHELDERFER/GALLEGOS CLIENT NAME: ARCO 2035

SAMPLED BY: ↓ LOCATION: 1001 SAN PABLO AVE ALBANY, CA

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

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

CASING ELEVATION (feet/MSL):	NR	VOLUME IN CASING (gal.):	2.36
DEPTH TO WATER (feet):	9.84	CALCULATED PURGE (gal.):	7.09
DEPTH OF WELL (feet):	24.3	ACTUAL PURGE VOL. (gal.):	7.50

DATE PURGED: 1-13-93 Start (2400 Hr) 1310 End (2400 Hr) 1315

DATE SAMPLED: 1-13-93 Start (2400 Hr) 1320 End (2400 Hr) 1322

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1310	2.50	7.09	862	63.9	BROWN	HEAVY
1312	5.00	7.10	866	64.3	↓	↓
1315	7.50	7.09	864	64.4	↓	↓

D. O. (ppm): NR ODOR: NONE

COLOR (COBALT 0 - 100): NR

TURBIDITY (NTU 0 - 200): NR

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

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

WELL INTEGRITY: OK LOCK #: DOLPHIN

REMARKS: ___

Meter Calibration: Date: 1-13-93 Time: 12:00 Meter Serial #: 9203 Temperature °F: ___

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

Location of previous calibration: MW-4

Signature: [signature] Reviewed By: GPB Page 6 of 7

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 0670-017.01 SAMPLE ID: RW-1

PURGED BY: REICHELDERFER/GALLEGOS CLIENT NAME: ARCO 2035

SAMPLED BY: ↓ LOCATION: 1001 SAN PABLO AVE ALBANY, CA

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

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

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

DEPTH TO WATER (feet): 8.35 CALCULATED PURGE (gal.): NA

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

DATE PURGED: 1-13-93 Start (2400 Hr) NA End (2400 Hr) NA

DATE SAMPLED: NA Start (2400 Hr) NA End (2400 Hr) NA

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
NO SAMPLE - PRODUCT IN WELL; SKIMMER						
CONTAINED PRODUCT						

D. O. (ppm): NR ODOR: NA COLOR (COBALT 0 - 100): NR TURBIDITY (NTU 0 - 200): NR

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

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	___ 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: NA		Other: NA	

WELL INTEGRITY: OK LOCK #: 3259

REMARKS: METAL L.W.C. DOES NOT SEAL CORRECTLY; NEEDS NEW L.W.C.

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

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

Location of previous calibration: ___

Signature: Kevin Reichelderfer Reviewed By: JB Page 7 of 7

Summary of Groundwater Monitoring Data
First Quarter 1993
ARCO Service Station 2035
1001 San Pablo Avenue, Albany, California
micrograms per liter (µg/l) or parts per billion (ppb)

Well ID and Sample Depth	Sampling Date	Depth To Water (feet)	Floating Product Thickness (feet)	TPH[1] as Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Total Xylenes (ppb)	Hydro-carbons IR (ppm)*	Total Oil and Grease (ppm)*
MW-1(29)	01/13/93	7.73	ND.[2]	430.	130.	5.3	5.0	9.0	NR.[3]	NR.
MW-2(28)	01/13/93	8.25	ND.	<50.	<0.5	<0.5	<0.5	<0.5	NR.	NR.
MW-3(33)	01/13/93	9.12	ND.	<50.	1.1	<0.5	<0.5	<0.5	1.10	0.78
MW-4(25)	01/13/93	8.05	ND.	<50.	<0.5	1.3	<0.5	1.6	NR.	NR.
MW-5(24)	01/13/93	8.22	ND.	<50.	<0.5	<0.5	<0.5	<0.5	NR.	NR.
MW-6(24)	01/13/93	9.84	ND.	<50.	<0.5	<0.5	<0.5	<0.5	NR.	NR.
RW-1	01/13/93	11.45	FP.[4]	FP.	FP.	FP.	FP.	FP.	NR.	NR.
FB-1[5]	01/13/93	NA.[6]	NA.	<50.	<0.5	<0.5	<0.5	<0.5	NR.	NR.

1. TPH. = Total petroleum hydrocarbons
2. ND. = Not detected
3. NR. = Not required, well was not analized for the above listed parameter
4. FP. = Floating product; well was not sampled due to detection of floating product
5. FB. = Field blank
6. NA. = Not applicable
   * = Reported as parts-per-million