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A RESNA Company

RESNA
Working To Restore Nature

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TRANSMITTAL

TO: MR. SCOTT O. SEERY
ACHCSA
80 SWAN WAY, ROOM 200
OAKLAND, CA 94621

DATE: 5/1/92
PROJECT NUMBER: 69013.09
SUBJECT: ARCO STATION 2152, 22141 CENTER STREET, CASTRO VALLEY, CA.

FROM: LOU LEET
TITLE: STAFF GEOLOGIST

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1	5/1/92	69013.09	FINAL--LETTER REPORT QUARTERLY GROUNDWATER MONITORING FIRST QUARTER 1992 AT ARCO STATION 2152, 22141 CENTER STREET, CASTRO VALLEY, CA.

THESE ARE TRANSMITTED as checked below:

[ ] For review and comment [ ] Approved as submitted [ ] Resubmit ___ copies for approval

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REMARKS: AT THE REQUEST OF MR. MICHAEL WHELAN (ARCO PRODUCTS COMPANY) THIS REPORT HAS BEEN FORWARDED TO YOU FOR YOUR REVIEW.

Copies: 1 to project file no. 69013.09

*Revision Date: 11/21/91
*File Name: TRANSMT.PRJ

reviewed 5-15-92 SDS

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LETTER REPORT
QUARTERLY GROUNDWATER MONITORING
First Quarter 1992
at
ARCO Station 2152
22141 Center Street
Castro Valley, California

5/1/92 69013.09

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May 1, 1992
0405MWHE
69013.09

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

Subject: Letter Report on First Quarter 1992 Groundwater Monitoring at ARCO Station 2152, 22141 Center Street, Castro Valley, California.

Mr. Whelan:

As requested by ARCO Products Company (ARCO), this letter report summarizes the results of first quarter 1992 groundwater monitoring performed by ARCO's contractor, EMCON Associates (EMCON) of San Jose, 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 former gasoline-storage tanks at the site. The field work and laboratory analyses of groundwater samples during this quarter was performed under the direction of EMCON and included measuring depths to groundwater, subjectively analyzing groundwater for the presence of petroleum product, collecting groundwater samples from the wells for laboratory analyses, and directing a State-certified laboratory to analyze the groundwater samples. Field procedures and acquisition of field data were performed under the direction of EMCON; evaluation and warrant of their field data and field protocols is beyond RESNA Industries' (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 2152 is located on the southwestern corner of Grove Way and Center Street in Castro Valley, California, as shown on the Site Vicinity Map, Plate 1.

Previously, RESNA (formerly Applied GeoSystems [AGS]) performed subsurface environmental investigations at the site related to the former underground storage tanks.

In August 1989, RESNA supervised the removal of five underground storage tanks and installation of three new tanks onsite, and collected soil samples for laboratory analyses in and around the former tank pit area (AGS, January, 1990). In October 1989, the product-dispenser lines and product-line sump associated with the former tanks were replaced (AGS, January, 1990). In June 1990, RESNA performed a limited environmental investigation, which included drilling six soil borings (B-4 through B-7, B-10, and B-11), collecting soil samples from the borings, and installing four groundwater monitoring wells (MW-1 through MW-4) and two vadose monitoring wells (VW-1 and VW-2) (AGS, November 1990). In September 1990, RESNA began quarterly groundwater monitoring. During January 14 through 17, and February 21, 1991, RESNA performed a supplemental subsurface and remedial investigation at the site, which included drilling nine soil borings (B-8, B-9, and B-12 through B-18), installing three vadose wells (VW-3 through VW-5), and performing a vapor extraction test (RESNA/AGS, July 2, 1991). The results of these investigations are described in the reports listed in the references attached to this letter report. In March 1992, RESNA initiated a subsurface investigation which included drilling and sampling two soil borings. The results of this investigation will be presented in a forthcoming report. The locations of the groundwater and vadose monitoring wells and pertinent site features are shown on the Generalized Site Plan, Plate 2.

Groundwater Sampling and Gradient Evaluation

Depth to water measurements (DTW) were performed by EMCON field personnel on January 18, February 20, and March 13, 1992. Quarterly sampling was performed by EMCON field personnel on March 13, 1992. The results of EMCON's field work on the site, including DTW measurements and subjective analysis for the presence of product in the groundwater in MW-1 through MW-4, are presented on EMCON's field report sheets. These data are included in Appendix A.

The DTW levels, wellhead elevations, groundwater elevations, and subjective observations for product in the groundwater from MW-1 through MW-4 for this quarter and previous quarterly groundwater monitoring at the site are summarized in Table 1, Cumulative Groundwater Monitoring Data. EMCON's DTW measurements were used to evaluate groundwater elevations. Evidence of product or sheen was not reported on EMCON's field report sheets during this quarter (see Appendix A). Groundwater elevations in wells MW-1 through MW-4 increased an average of 0.69 feet between January 18 and March 13, 1992. The groundwater gradients interpreted from the January, February, and March 1992 groundwater monitoring episodes are shown on the Groundwater Gradient Maps, Plates 3 through 5. Relatively flat groundwater gradients, less than 0.01 toward the southwest, were interpreted from EMCON's DTW measurements. The groundwater gradients for this quarter are generally consistent with previously interpreted data.

Groundwater monitoring wells MW-1 through MW-4 were purged and sampled by EMCON field personnel on March 13, 1992. EMCON's water sample field data sheets, field report sheet, and Summary of Groundwater Monitoring Data for March 13, 1992, are included in Appendix A. The purge water was removed from the site by a licensed hazardous waste hauler; the Monitoring Well Purge Water Disposal Form is also included in Appendix A.

Laboratory Methods and Analyses

Under the direction of EMCON, water samples collected from the wells were analyzed by Sequoia Analytical located in Redwood City, California (Hazardous Waste Testing Laboratory Certification No. 1210). The water samples from MW-1 through MW-4 were analyzed for total petroleum hydrocarbons as gasoline (TPHg) and benzene, toluene, ethylbenzene, and total xylenes (BTEX) using modified Environmental Protection Agency (EPA) Methods 5030/8015/8020. Concentrations of TPHg and benzene in the groundwater are shown on Plate 6, TPHg/Benzene Concentrations in Groundwater. The Chain of Custody Records and Laboratory Analysis 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.

Results of this quarter's groundwater monitoring indicate:

- Concentrations of TPHg were reported as nondetectable (<50 parts per billion [ppb]) in groundwater samples from wells MW-1 through MW-4.
- Concentrations of benzene were reported as nondetectable (<0.5 ppb) in groundwater samples from wells MW-1 through MW-4.
- Concentrations of toluene were reported as nondetectable (<0.5 ppb) in groundwater samples from wells MW-1 through MW-4.
- Concentrations of ethylbenzene were reported as nondetectable (<0.5 ppb) in groundwater samples from wells MW-1 through MW-4.
- Concentrations of total xylenes were reported as nondetectable (<0.5 ppb) in wells MW-1 through MW-4.

ND for all target compounds

The following is a general summary of changes in the concentrations of hydrocarbon constituents in the groundwater from the four onsite wells since the last quarterly monitoring

on October 15, 1991. Concentrations of TPHg and BTEX have only been detected in groundwater samples from the onsite monitoring wells during the June 26, 1990 quarterly monitoring and the July 8, 1991 quarterly monitoring. Concentrations of TPHg and BTEX have been nondetectable in the groundwater during the other five quarterly monitorings on September 26, 1990, January 8, April 2, and October 15, 1991, and March 13, 1992. The presence of gasoline hydrocarbons and BTEX in the groundwater during the June 1990 and July 1991 quarterly monitoring may be related to the seasonal rise of water levels into a portion of a confining soil layer that contains petroleum hydrocarbons. This appears reasonable because water levels were highest during both quarterly monitorings when detectable hydrocarbons were reported.

Conclusions and Recommendations

Concentrations of TPHg and BTEX were reported as nondetectable in the groundwater from all four onsite groundwater monitoring wells. RESNA recommends monthly groundwater monitoring and quarterly groundwater sampling at the site, including analyses for TPHg and BTEX.

Schedule

The results of RESNA's initiated in March 1992, subsurface investigation, will be reported in a forthcoming report. Monthly groundwater monitoring and quarterly groundwater sampling will continue to be performed by ARCO's contracted sampler. At ARCO's request, RESNA will continue to analyze and report monthly and quarterly groundwater monitoring data from this site to evaluate trends in petroleum hydrocarbons, and changes in groundwater gradient with time. Permitting and design of the future vapor extraction remediation system is ongoing.

RESNA recommends that copies of this report be forwarded to:

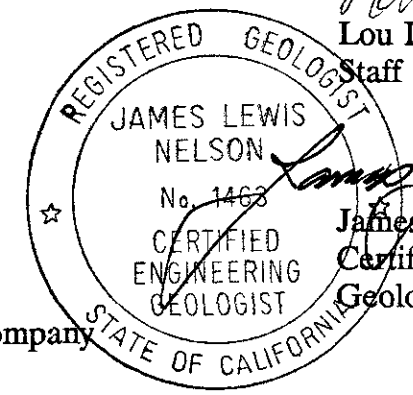
Mr. Scott O. Seery
Alameda County Health Care Services Agency
Department of Environmental Health
80 Swan Way, Room 200
Oakland, California 94621

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

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

Sincerely,
RESNA Industries

Lou Leet
Staff Geologist



James L. Nelson
Certified Engineering
Geologist No. 1463

cc: H.C. Winsor, ARCO Products Company

Enclosures: References
Plate 1, Site Vicinity Map
Plate 2, Generalized Site Plan
Plate 3, Groundwater Gradient Map, January 18, 1992
Plate 4, Groundwater Gradient Map, February 20, 1992
Plate 5, Groundwater Gradient Map, March 13, 1992
Plate 6, TPHg/Benzene Concentrations in Groundwater, March 13, 1992

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

Appendix A: EMCON's Field Reports (2), Depth to Water/Floating Product Survey Results, Summary of Groundwater Monitoring Data, Certified Analytical Reports with Chain-of-Custody, and Water Sample Field Data Sheets.
Monitoring Well Purge Water Disposal Form

REFERENCES

Applied GeoSystems. May 20, 1991. Letter Report, Quarterly Ground-Water Monitoring, Second Quarter 1991, 22141 Center Street, Castro Valley, California, AGS Report 69013-5.

Applied GeoSystems. March 24, 1991. Letter Report, Quarterly Ground-Water Monitoring, First Quarter 1991, 22141 Center Street, Castro Valley, California, AGS Report 69013-5.

Applied GeoSystems. November 13, 1990. Environmental Subsurface Investigation at ARCO Station 2152, 22141 Center Street, Castro Valley, California, AGS Report 69013-4.

Applied GeoSystems. January 18, 1990. Limited Subsurface Environmental Investigation Related to Underground Tank Removal, 22141 Center Street, Castro Valley, California, AGS Report 69013-2.

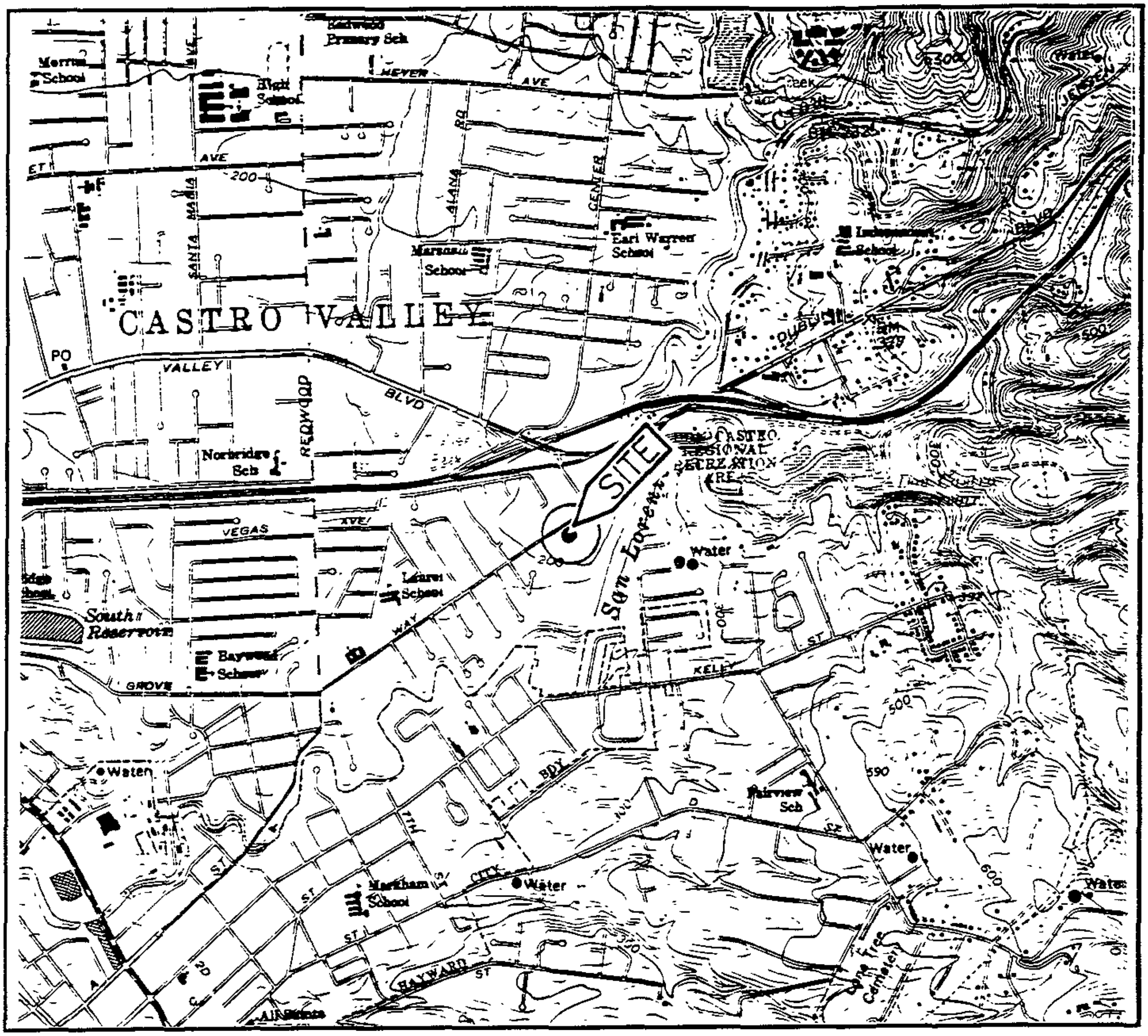
Applied GeoSystems. May 26, 1989. Limited Environmental Site Assessment, 22141 Center Street, Castro Valley, California, AGS Report 69013-1.

RESNA. October 8, 1991. Supplemental Subsurface and Remedial Investigation at ARCO Station 2152, 22141 Center Street, Castro Valley, California, AGS 69013-5.

RESNA. July 2, 1991. Supplemental Subsurface and Remedial Investigation at ARCO Station 2152, 22141 Center Street, Castro Valley, California, AGS 69013-6.

RESNA. October 18, 1991. Letter Report, Quarterly Ground-Water Monitoring, Third Quarter 1991, 22141 Center Street, Castro Valley, California, AGS Report 69013-5.

RESNA. March 2, 1992. Letter Report, Quarterly Ground-Water Monitoring, Fourth Quarter 1991, 22141 Center Street, Castro Valley, California, AGS Report 69013-5.



Base: U.S. Geological Survey
7.5-Minute Quadrangle
Hayward, California.
Photorevised 1980

LEGEND

(•) = Site Location

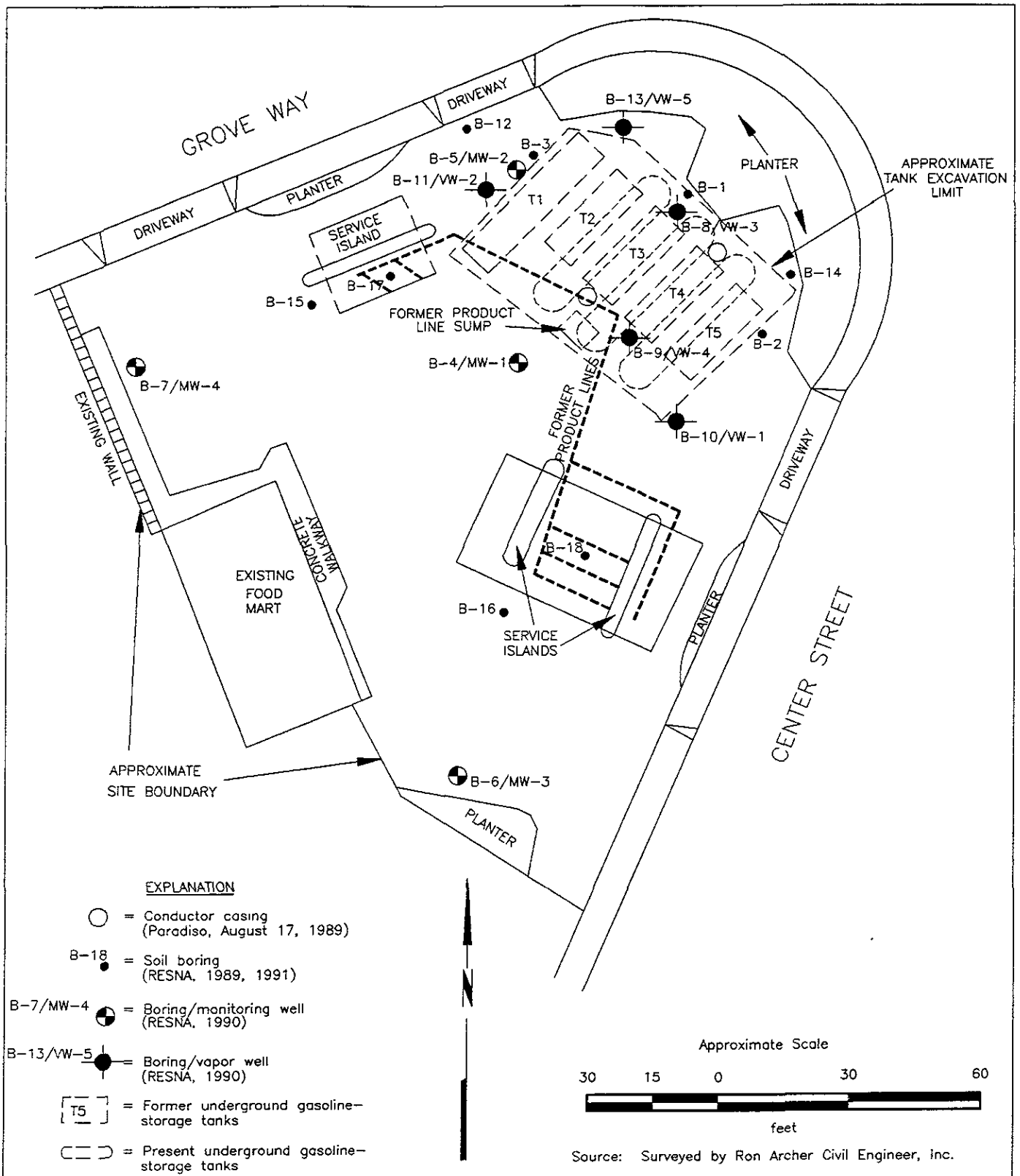
N

Approximate Scale

2000 1000 0 2000 4000

feet

RESNA	**SITE VICINITY MAP** **ARCO Station 2152** **22141 Center Street** **Castro Valley, California**	**PLATE** **1**
PROJECT 69013.09		

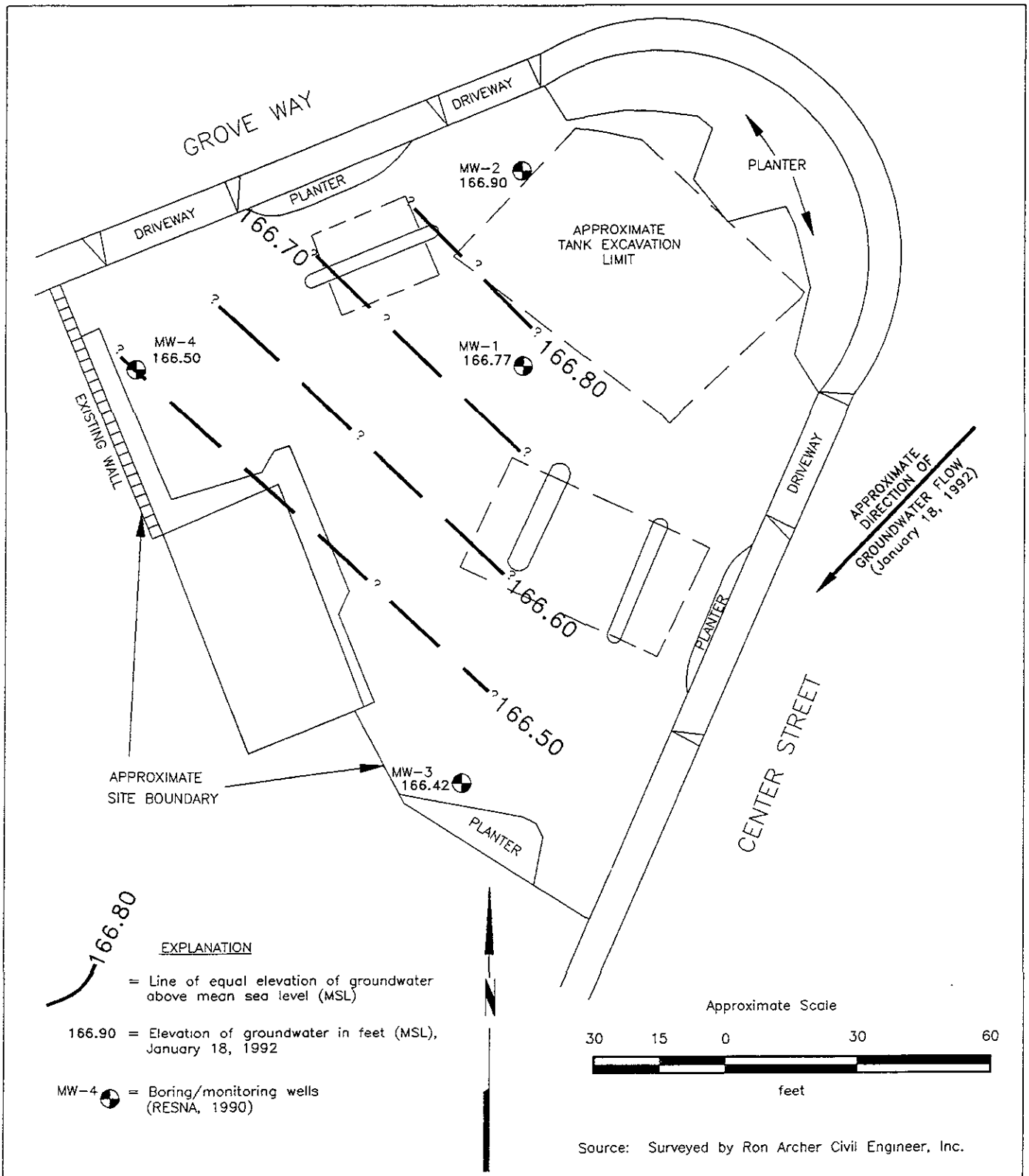


RESNA

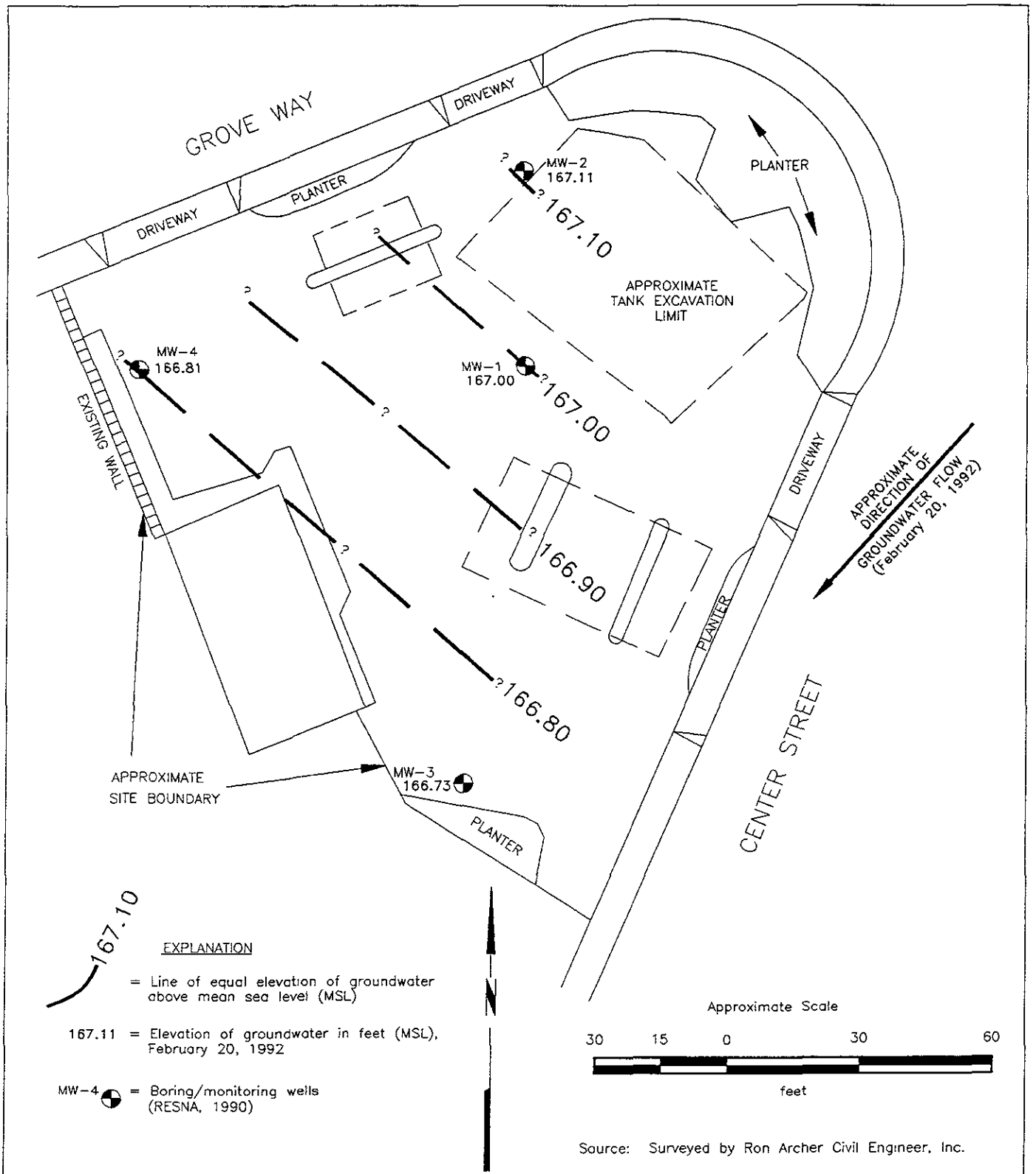
PROJECT 69013.09

GENERALIZED SITE PLAN
ARCO Station 2152
22141 Center Street
Castro Valley, California

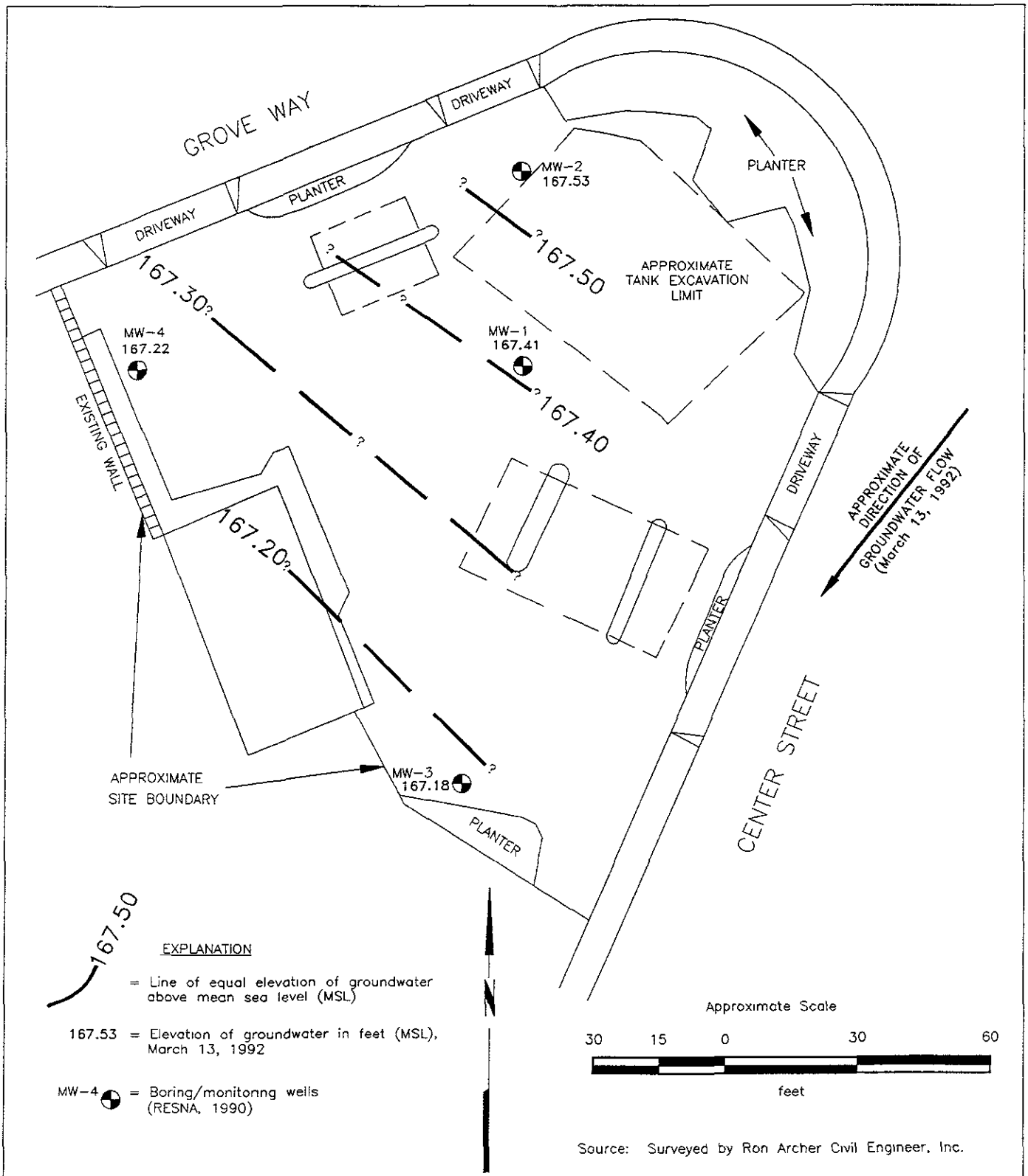
PLATE 2



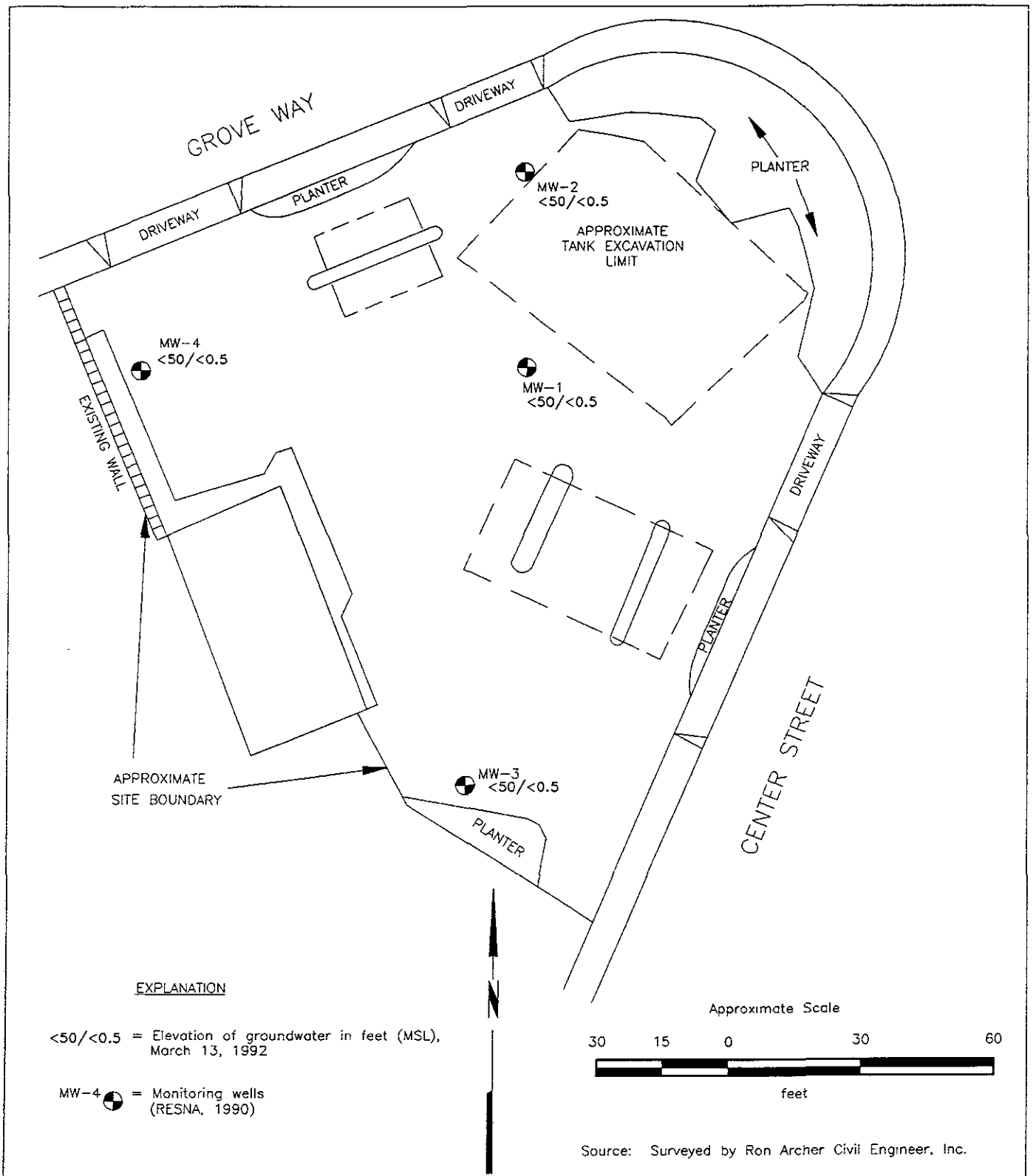
RESNA	**GROUNDWATER GRADIENT MAP** **ARCO Station 2152** **22141 Center Street** **Castro Valley, California**	**PLATE** **3**
PROJECT 69013.09		



RESNA	**GROUNDWATER GRADIENT MAP** **ARCO Station 2152** **22141 Center Street** **Castro Valley, California**	**PLATE** **4**
PROJECT 69013.09		



RESNA	**GROUNDWATER GRADIENT MAP** **ARCO Station 2152** **22141 Center Street** **Castro Valley, California**	**PLATE** **5**
PROJECT 69013.09		



RESNA	**TPHg/BENZENE CONCENTRATIONS IN GROUNDWATER** **ARCO Station 2152** **22141 Center Street** **Castro Valley, California**	**PLATE** **6**
PROJECT 69013.09		

TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 2152
Castro Valley, California
(Page 1 of 3)

Date Well Measured	Depth of Well	Well Elevation	Static Water Depth	Water Elevation
MW-1				
06/25/90	58.10	217.16	49.80	167.36
09/07/90			50.00	167.16
09/26/90			50.09	167.07
12/14/90			50.44	166.72
01/08/91			50.45	166.71
02/21/91			50.51	166.65
03/19/91			50.16	167.00
04/02/91			50.14	167.02
05/02/91	57.80		49.77	167.39
06/18/91			49.75	167.41
07/08/91			49.80	167.36
08/22/91			50.08	167.08
09/18/91			50.11	167.05
10/15/91			50.30	166.86
11/13/91			50.30	166.86
12/27/91			50.28	166.88
01/18/92			50.39	166.77
02/20/92			50.16	167.00
03/13/92			49.75	167.41
MW-2				
06/25/90	59.20	216.50	49.04	167.46
09/07/90			49.22	167.28
09/26/90			49.32	167.18
12/14/90			49.66	166.84
01/08/91			49.72	166.78
02/21/91			49.77	166.73
03/19/91			49.44	167.06
04/02/91			49.43	167.07
05/02/91	58.90		49.03	167.47
06/18/91			48.98	167.52
07/08/91			49.03	167.47
08/22/91			49.30	167.20
09/18/91			49.34	167.16
10/15/91			49.51	166.99
11/13/91			49.53	166.97
12/27/91			49.49	167.01
01/18/92			49.60	166.90
02/20/92			49.39	167.11
03/13/92			48.97	167.53

See notes on Page 3 of 3.

TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 2152
Castro Valley, California
(Page 2 of 3)

Date Well Measured	Depth of Well	Well Elevation	Static Water Depth	Water Elevation
MW-3				
06/25/90	59.70	217.57	50.55	167.02
09/07/90			50.73	166.84
09/26/90			50.81	166.76
12/14/90			51.15	166.42
01/08/91			51.16	166.41
02/21/91			51.21	166.36
03/19/91			50.93	166.64
04/02/91			50.92	166.65
05/02/91	59.34		50.51	167.06
06/18/91			50.47	167.10
07/08/91			50.54	167.03
08/22/91			50.80	166.77
09/18/91			50.82	166.75
10/15/91			51.02	166.55
11/13/91			51.03	166.54
12/27/91			51.01	166.56
01/18/92			51.15	166.42
02/20/92			50.84	166.73
03/13/92			50.39	167.18
MW-4				
06/25/90	60.30	215.18	48.06	167.12
09/07/90			48.25	166.93
09/26/90			48.35	166.83
12/14/90			48.68	166.50
01/08/91			48.70	166.48
02/21/91			48.76	166.42
03/19/91			48.44	166.74
04/02/91			48.43	166.75

See notes on Page 3 of 3.

TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 2152
Castro Valley, California
(Page 3 of 3)

Date Well Measured	Depth of Well	Well Elevation	Static Water Depth	Water Elevation
MW-4				
05/02/91	60.00		48.04	167.14
06/18/91			48.00	167.18
07/08/91			48.04	167.14
08/22/91			48.34	166.84
09/18/91			48.35	166.83
10/15/91			48.54	166.64
11/13/91			48.56	166.62
12/27/91			48.52	166.66
01/18/92			48.68	166.50
02/20/92			48.37	166.81
03/13/92			47.96	167.22

Depth measurements in feet. Water elevation is mean sea level.
Static water level measured in feet below top of casing.

TABLE 2
CUMULATIVE RESULTS OF LABORATORY ANALYSES
OF GROUNDWATER SAMPLES
ARCO Station 2152
Castro Valley, California

Well	Date	TPHg	B	T	E	X
MW-1	06/26/90	64	0.63	<0.50	<0.50	<0.50
	09/26/90	<50	<0.50	<0.50	<0.50	<0.50
	01/08/91	<50	<0.50	<0.50	<0.50	<0.50
	04/02/91	<50	<0.05	<0.05	<0.05	<0.05
	07/08/91	120	2.3	4.6	1.3	9.6
	10/15/91	<30	<0.30	<0.30	<0.30	<0.30
	03/13/92	<50	<0.5	<0.5	<0.5	<0.5
MW-2	06/26/90	27	<0.50	<0.50	<0.50	<0.50
	09/26/90	<50	<0.50	<0.50	<0.50	<0.50
	01/08/91	<50	<0.50	<0.50	<0.50	<0.50
	04/02/91	<50	<0.05	<0.05	<0.05	<0.05
	07/08/91	30	0.42	0.47	<0.30	0.89
	10/15/91	<30	<0.30	<0.30	<0.30	<0.30
	03/13/92	<50	<0.5	<0.5	<0.5	<0.5
MW-3	06/25/90	52	0.65	1.5	<0.50	2.0
	09/26/90	<50	<0.50	<0.50	<0.50	<0.50
	01/08/91	<50	<0.50	<0.50	<0.50	<0.50
	04/02/91	<50	<0.05	<0.05	<0.05	<0.05
	07/08/91	67	0.69	1.5	0.65	4.7
	10/15/91	<30	<0.30	<0.30	<0.30	<0.30
	04/13/92	<50	<0.5	<0.5	<0.5	<0.5
MW-4	06/25/90	<20	<0.50	<0.50	<0.50	<0.50
	09/26/90	<50	<0.50	<0.50	<0.50	<0.50
	01/08/91	<50	<0.50	<0.50	<0.50	<0.50
	04/02/91	<50	<0.05	<0.05	<0.05	<0.05
	07/08/91	50	1.4	2.4	0.62	4.2
	10/15/91	<30	<0.30	<0.30	<0.30	<0.30
	03/13/92	<50	<0.5	<0.5	<0.5	<0.5

Results in parts per billion (ppb).
TPHg: Total petroleum hydrocarbons as gasoline
B:benzene T:toluene E:ethylbenzene X:total xylene isomers

APPENDIX A

EMCON'S FIELD REPORTS (2), DEPTH TO WATER/FLOATING PRODUCT SURVEY RESULTS, SUMMARY OF GROUNDWATER MONITORING DATA, CERTIFIED ANALYTICAL REPORTS WITH CHAIN-OF-CUSTODY, AND WATER SAMPLE FIELD DATA SHEETS

MONITORING WELL PURGE WATER DISPOSAL FORM

EMCON ASSOCIATES
Consultants in Wastes Management and Environmental Control

Date January 29, 1992
Project G70-26.01

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

We are enclosing:

Copies	Description
1	DTW/FP Survey Form, January 1992 monthly water level survey, ARCO station 2152, 22141 Center Street, Castro Valley, 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: Mark Knuttel MF

REGISTERED PROFESSIONAL ENGINEER ROBERT CURTIS PORTER No: 4094 Exp. 6/30/92 INDUSTRIAL STATE OF CALIFORNIA

Robert C Porter
Robert Porter, Senior P.E. #4094

FIELD REPORT
DEPTH TO WATER / FLOATING PRODUCT SURVEY

PROJECT # : G70-26.01 STATION ADDRESS : 22141 Center Street, Castro Valley DATE : 1-18-92

ARCO STATION # : 2152 FIELD TECHNICIAN : M. Kmuthal / J. Watake DAY : Saturday

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	yes	yes	50.39	50.39	ND	ND	58.0	hex key needed
2	MW-2	ok	yes	OK	yes	yes	49.58	49.60	ND	ND	59.05	hex key needed
3	MW-3	OK	yes	ok	yes	yes	51.14	51.15	ND	ND	59.60	hex key needed
4	MW-4	OK	yes	ok	yes	yes	48.66	48.68	ND	ND	60.20	hex key needed

EMCON
ASSOCIATES
Consultants in Wastes
Management and
Environmental Control

Date February 25, 1992
Project G70-26.01

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

We are enclosing:

Copies	Description
1	Depth To Water/Floating Product Survey Form, February 1992 monthly water level survey, ARCO station 2152, 22141 Center Street, Castro Valley, CA

For your: X Information Sent by: X Mail

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

Reviewed by:

REGISTERED GEOLOGIST No. 4084 Exp. 6/30/92 INDUSTRIAL STATE OF CALIFORNIA

Mark Knuttel MK

Robert Porter, Senior Project Engineer.

FIELD REPORT
DEPTH TO WATER / FLOATING PRODUCT SURVEY

PROJECT # : G70-26.01 STATION ADDRESS : 22141 Center Street, Castro Valley DATE : 02/20/92

ARCO STATION # : 2152 FIELD TECHNICIAN : Vince Barlock DAY : Friday

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/ok	Yes	OK	YES	YES	50.15	50.16	ND	ND	57.99	—
2	MW-2	yes/ok	Yes	OK	YES	YES	49.38	49.39	ND	ND	59.09	—
3	MW-3	yes/ok	Yes	OK	YES	YES	50.83	50.84	ND	ND	58.20	—
4	MW-4	yes/ok	Yes	OK	YES	YES	48.37	48.37	ND	ND	60.18	—

EMCON ASSOCIATES
Consultants in Wastes Management and Environmental Control

APR 1[illegible] 1992

Date March 27, 1992
Project G70-26.01

To:
Mr. Joel Coffman
RESNA/ Applied Geosystems
3315 Alamden 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
4	Water Sample Field Data Sheets

For your: X Information Sent by: X Mail

Comments:

Enclosed are the data from the first quarter 1992 monitoring event at ARCO service station 2152, 22141 Center Street, Castro Valley, California. Please call if you have any questions: (408) 453-2266.

Mark Knuttel MK

Reviewed by:

REGISTERED PROFESSIONAL ENGINEER ROBERT CURTIS PORTER No: 4004 Exp. 6/30/92 INDUSTRIAL STATE OF CALIFORNIA

Robert Porter, Senior Project Engineer.

1938 Junction Avenue, San Jose, California 95131-2102 (408) 453-0710 Fax (408) 453-0453

FIELD REPORT
DEPTH TO WATER / FLOATING PRODUCT SURVEY

PROJECT # : G70-26.01 STATION ADDRESS : 22141 Center Street, Castro Valley DATE : 3/3/95

ARCO STATION # : 2152 FIELD TECHNICIAN : O Chinco DAY : Friday

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	49.75	49.73	ND	ND	58.0	—
2	MW-2	yes	yes	yes	3259	↓	48.97	48.97	↓	↓	59.0	—
3	MW-3	yes	yes	yes	3259	↓	50.39	50.39	↓	↓	59.63	—
4	MW-4	yes	yes	yes	3259	↓	47.96	47.96	↓	↓	60.10	—

Summary of Groundwater Monitoring Data
First Quarter 1992
ARCO Service Station 2152
22141 Center Street, Castro Valley, 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)
MW-1(57)	03/13/92	49.75	ND.[2]	<50	<0.5	<0.5	<0.5	<0 5
MW-2(58)	03/13/92	48.97	ND.	<50	<0.5	<0.5	<0.5	<0.5
MW-3(59)	03/13/92	50.39	ND.	<50	<0.5	<0.5	<0 5	<0.5
MW-4(59)	03/13/92	47.96	ND.	<50	<0.5	<0.5	<0.5	<0.5
FB-1[3]	03/13/92	NA.[4]	NA.	<50	<0.5	<0.5	<0 5	<0.5

1. TPH. = Total petroleum hydrocarbons
2. ND. = Not detected
3. FB. = Field blank
4. NA. = Not applicable

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Emcon Associates
1938 Jucntion Ave.
San Jose, CA 95131
Attention: Mark Knuttel

Project: Arco, #2152

Enclosed are the results from 5 water samples received at Sequoia Analytical on March 13,1992. The requested analyses are listed below:

2032410	Water, MW-1, (57)	3/13/92	EPA 5030/8015/8020
2032411	Water, MW-2, (58)	3/13/92	EPA 5030/8015/8020
2032412	Water, MW-3, (59)	3/13/92	EPA 5030/8015/8020
2032413	Water, MW-4, (59)	3/13/92	EPA 5030/8015/8020
2032414	Water, Field Blank - 1	3/13/92	EPA 5030/8015/8020

Please contact me if you have any questions. In the meantime, thank you for the opportunity to work with you on this project.

Very truly yours,

SEQUOIA ANALYTICAL

Maile A. Springer
Project Manager

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Emcon Associates	Client Project ID:	Arco, #2152	Sampled:	Mar 13, 1992
1938 Junction Ave.	Matrix Descript:	Water	Received:	Mar 13, 1992
San Jose, CA 95131	Analysis Method:	EPA 5030/8015/8020	Analyzed:	Mar 16, 1992
Attention: Mark Knuttel	First Sample #:	203-2410	Amended:	Mar 24, 1992

TOTAL PETROLEUM FUEL HYDROCARBONS with BTEX DISTINCTION (EPA 8015/8020)

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons µg/L (ppb)	Benzene µg/L (ppb)	Toluene µg/L (ppb)	Ethyl Benzene µg/L (ppb)	Xylenes µg/L (ppb)
203-2410	MW-1, (57)	N.D.	N.D.	N.D.	N.D.	N.D.
203-2411	MW-2, (58)	N.D.	N.D.	N.D.	N.D.	N.D.
203-2412	MW-3, (59)	N.D.	N.D.	N.D.	N.D.	N.D.
203-2413	MW-4, (59)	N.D.	N.D.	N.D.	N.D.	N.D.
203-2414	Field Blank - 1	N.D.	N.D.	N.D.	N.D.	N.D.
Detection Limits:		**30**	**0.30**	**0.30**	**0.30**	**0.30**

Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard.
Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Maile A. Springer
Project Manager

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Emcon Associates
1938 Jucntion Ave.
San Jose, CA 95131
Attention: Mark Knuttel

Client Project ID: Arco, #2152

QC Sample Group: 2032410 - 14

Reported: Mar 20, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl-Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	M.Nipp	M.Nipp	M.Nipp	M.Nipp
Reporting Units:	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Mar 16, 1992	Mar 16, 1992	Mar 16, 1992	Mar 16, 1992
QC Sample #:	GBLK031692	GBLK031692	GBLK031692	GBLK031692
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	10	10	10	10
Conc. Matrix Spike:	9.6	9.6	9.6	30
Matrix Spike % Recovery:	96	96	96	97
Conc. Matrix Spike Dup.:	10	10	10	30
Matrix Spike Duplicate % Recovery:	100	100	100	100
Relative % Difference:	4.1	4.1	4.1	3.4

SEQUOIA ANALYTICAL

Maile A. Springer
Project Manager

% Recovery:	$\frac{\text{Conc. of M.S. - Conc. of Sample}}{\text{Spike Conc. Added}}$	x 100
Relative % Difference:	$\frac{\text{Conc. of M.S. - Conc. of M.S.D.}}{\text{(Conc. of M.S. + Conc. of M.S.D.) / 2}}$	x 100

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. EMCGC-92-1

Chain of Custody

ARCO Facility no. 2152 | City (Facility) Castro Valley | Project manager (Consultant) Mark Knuttal | Laboratory name SEQUOIA

ARCO engineer Kyle Christie | Telephone no. (ARCO) [illegible]-2434 | Telephone no. (Consultant) 408-453-0719 | Fax no. (Consultant) 408-453-0452 | Contract number 07-073

Consultant name Emcon Associates | Address (Consultant) 1938 Junction Ave, San Jose, CA | Method of shipment Courier

COPY

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 ☐	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(57)				X		X	HCl	3-13	09:52		X					2	03	24	10	
MW-2(58)				X		X	HCl	3-13	010:56		X								11	
MW-3(59)				X		X	HCl	3-13	12:08		X								12	
MW-4( )				X		X	HCl	3-13	13:20		X								13	
TB-1				X		X	HCl	3-13	13:28		X								14	

Special detection Limit/reporting: Lowest possible

Special QA/QC: as normal

Remarks: 7 SEQUOIA BOTTLES 2-40ml VOA HCl / well

Lab number

Turnaround time

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

Condition of sample:

Temperature received:

Relinquished by sampler	Date	Time	Received by
[signature]	3-13-92	16:15	[signature]
Relinquished by [signature]	Date 3-13-92	Time 515	Received by
Relinquished by	Date	Time	Received by laboratory [signature] Date 3-13-92 Time 5:15

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: 670-26.01 | SAMPLE ID: MW-1

PURGED BY: C. Chaco | CLIENT NAME: ARCO 2152

SAMPLED BY: " | LOCATION: Castro Valley

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

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

CASING ELEVATION (feet/MSL): NR | VOLUME IN CASING (gal.): 5.41

DEPTH TO WATER (feet): 49.75 | CALCULATED PURGE (gal.): 27.06

DEPTH OF WELL (feet): 58.0 | ACTUAL PURGE VOL. (gal.): 28.00

DATE PURGED: 3-13-92 | Start (2400 Hr) 09.15 | End (2400 Hr) 09.47

DATE SAMPLED: " | Start (2400 Hr) 09.50 | End (2400 Hr) 09:52

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
09:25	5	6.77	1616	65.6	Brown	Heavy
09:30	10	6.79	1734	66.4		
09:34	16	6.79	1867	66.5		
09:43	22	6.84	1879	65.5		
09:47	28	6.82	1893	65.8	↓	↓

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

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

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	✓ 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 #: ~~BS~~ 3259

REMARKS: Sinker at (57')

Meter Calibration: Date: 3-13-92 Time: 08:40 Meter Serial #: 9112 Temperature °F: 61.2

(EC 1000 1070 / 1000) (DI 5) (pH 7 706 / 700) (pH 10 1005 / 1000) (pH 4 396 / ___)

Location of previous calibration: ___

Signature: [signature] | Reviewed By: MK | Page 1 of 4

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: G70-2601 SAMPLE ID: MW-2

PURGED BY: C. Chace CLIENT NAME: ARCO 2152

SAMPLED BY: " LOCATION: Castro Valley

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

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

CASING ELEVATION (feet/MSL):	NR	VOLUME IN CASING (gal.):	6.54
DEPTH TO WATER (feet):	48.96	CALCULATED PURGE (gal.):	32.93
DEPTH OF WELL (feet):	59.0	ACTUAL PURGE VOL. (gal.):	33.0

DATE PURGED: 3-13-92 Start (2400 Hr) 10:20 End (2400 Hr) 10:52

DATE SAMPLED: " Start (2400 Hr) 10:55 End (2400 Hr) 10:56

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
10:29	6	6.70	2400	65.5	Brown	Heavy
10:34	12	6.74	2370	65.6	"	"
10:44	19	6.80	2350	65.1	"	"
10:48	26	6.81	2390	65.5	"	"
10:52	33	6.81	2390	65.2	✓	✓

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

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

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 #: 3259

REMARKS: Started at (581)

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

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

Location of previous calibration: MW-1

Signature: [signature] Reviewed By: MK

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 6702601 SAMPLE ID: MW-3

PURGED BY: C. Chavez CLIENT NAME: ARCO 2152

SAMPLED BY: " LOCATION: Castro Valley

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

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

CASING ELEVATION (feet/MSL):	NR	VOLUME IN CASING (gal.):	6.05
DEPTH TO WATER (feet):	50.40	CALCULATED PURGE (gal.):	30.27
DEPTH OF WELL (feet):	59.63	ACTUAL PURGE VOL. (gal.):	31.0

DATE PURGED: 3-13-92 Start (2400 Hr) 11:35 End (2400 Hr) 12:05

DATE SAMPLED: " Start (2400 Hr) 12:05 End (2400 Hr) 12:10

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
10:46	6	6.63	2540	67.0	Brown	Heavy
10:51	12	6.66	2610	65.2	1	/
10:55	18	6.74	2640	65.4	/	/
12:01	24.5	6.72	2630	65.5	/	/
12:05	31.0	6.76	2700	65.2	1	4

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

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

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 #: 3259

REMARKS: Sinked at (59')

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

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

Location of previous calibration: MW-1

Signature: [signature] Reviewed By: MK Page 3 of 4

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 670-26.01 SAMPLE ID: MW-4

PURGED BY: C. Chavez CLIENT NAME: ARCO 2152

SAMPLED BY: " LOCATION: Castro Valley

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.): 7.97

DEPTH TO WATER (feet): 47.94 CALCULATED PURGE (gal.): 39.88

DEPTH OF WELL (feet): 60.10 ACTUAL PURGE VOL. (gal.): 40.0

DATE PURGED: 2-13-92 Start (2400 Hr) 12:40 End (2400 Hr) 13:15

DATE SAMPLED: " Start (2400 Hr) 13:19 End (2400 Hr) 13:22

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
12:48	8	6.90	1680	62.0	Brown	Heavy
12:54	16	6.91	1693	66.0		
13:02	24	6.87	1694	65.1		
13:09	32	6.88	1681	65.0		
13:15	40	6.94	1723	64.9	✓	✓

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

NR (COBALT 0 - 100) NR (NTU 0 - 200)

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

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 #: 3259

REMARKS: Sampled at (59')

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

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

Location of previous calibration: MW-1

Signature: [signature] Reviewed By: MK Page 4 of 4