Applied GeoSystems, Inc.
A RESNA Company

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Working To Restore Nature

3315 Almaden Expressway, Suite 34
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LETTER REPORT
QUARTERLY GROUNDWATER MONITORING
Second Quarter 1992
at
ARCO Station 2152
22141 Center Street
Castro Valley, California

9-22-92

69013.09

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San Jose, CA 95118
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TRANSMITTAL

TO: Mr. Scott Seery
Alameda County Health Care Services
80 Swan Way, Room 200
Oakland, California 94621

DATE: September 22, 1992
PROJECT NUMBER: 69013.09
SUBJECT: Final - Second Quarter 1992 Quarterly Groundwater Monitoring at ARCO Station 2152, 22141 Center Street, Castro Valley, California.

FROM: Lou Leet
TITLE: Staff Geologist

WE ARE SENDING YOU:

COPIES	DATED	DESCRIPTION
1	9/22/92	Final - Second Quarter 1992, Groundwater Monitoring at the above subject site.

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REMARKS: cc: Mr. H.C. Winsor, ARCO Products Company
Mr. Michael Whelan, ARCO Products Company
Mr. Richard Hiett, CRWQCB, San Francisco Bay Region
Mr. Joel Coffman, RESNA Industries Inc.

Copies: 1 to RESNA project file no. 69013.09

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September 22, 1992
0804MWHE
69013.09

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

Subject: Letter Report on Second 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 the second 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 were performed under the direction of EMCON and included measuring depths to groundwater, subjectively analyzing groundwater for the presence of petroleum product, collecting groundwater samples from the wells for laboratory analyses, and directing a State-certified laboratory to analyze the groundwater samples. Field procedures and acquisition of field data were performed under the direction of EMCON; evaluation and warrant of their field data and field protocols is beyond RESNA Industries Inc's. (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

(USTs). In May 1989, RESNA performed a limited site assessment (AGS, May 26, 1989) to evaluate the presence of gasoline hydrocarbons in soil near the USTs prior to ARCO's planned tank replacement at the site. The work involved drilling three soil borings (B-1 through B-3) close to the fill ends of the tanks. In August 1989, RESNA supervised the removal of five USTs 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). In March 1992, RESNA performed a subsurface investigation which included drilling and sampling two soil borings (RESNA, July 17, 1992). The results of these investigations are described in the reports listed in the references section of this letter 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 in the four onsite wells by EMCON field personnel on April 24, May 15, and June 8, 1992. Quarterly sampling was performed by EMCON field personnel on June 8, 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). The DTW measurements in groundwater monitoring wells MW-1 through MW-3 on June 8, 1992, were reported to the tenth rather than to the hundredth of the foot on EMCON's Field Report, Depth to Water/Floating Product Survey, attached in Appendix A. Groundwater elevations in wells

MW-1 through MW-4 decreased an average of 0.1 feet between April 24 and June 8, 1992. The groundwater gradients interpreted from the April, May, and June 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 June 8, 1992. EMCON's water sample field data sheets, field report sheet, and Summary of Groundwater Monitoring Data for June 8, 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 nondetectable (<30 parts per billion [ppb]) in groundwater samples from wells MW-1 through MW-4.
- Concentrations of benzene were nondetectable (<0.30 ppb) in groundwater samples from wells MW-1 through MW-4.
- Concentrations of toluene, ethylbenzene, and total xylenes were nondetectable (<0.30 ppb) in groundwater samples from wells MW-1 through MW-4.

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 and July 8, 1991 quarterly monitoring episodes. Concentrations of TPHg and BTEX have been nondetectable in the groundwater during the other six quarterly monitoring episodes on September 26, 1990, January 8, April 2, and October 15, 1991, and March 13 and June 8, 1992. The presence of gasoline hydrocarbons and BTEX in the groundwater in June 1990 and July 1991 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 the June 1990 and July 1991 quarterly monitoring episodes.

Conclusions

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

RESNA recommends that copies of this report be forwarded to:

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

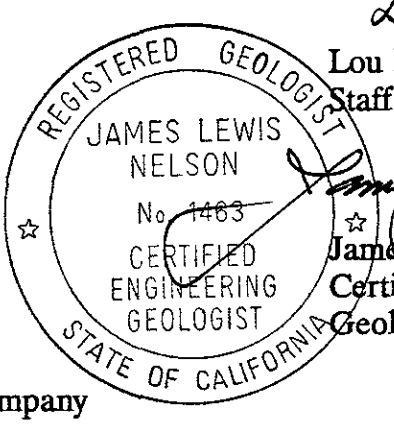
Mr. Richard Hiett
Regional Water Quality Control Board
San Francisco Bay Region
2101 Webster Street, Suite 500
Oakland, California 94612

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

Sincerely,
RESNA Industries Inc.

L. A. Leet

Lou Leet
Staff Geologist



James L. Nelson
Certified Engineering
Geologist No. 1463

cc: H.C. Winsor, ARCO Products Company

RESNA

Enclosures: References
Plate 1, Site Vicinity Map
Plate 2, Generalized Site Plan
Plate 3, Groundwater Gradient Map, April 24, 1992
Plate 4, Groundwater Gradient Map, May 15, 1992
Plate 5, Groundwater Gradient Map, June 8, 1992
Plate 6, TPHg/Benzene Concentrations in Groundwater, June 8, 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 26, 1989. Limited Environmental Site Assessment, 22141 Center Street, Castro Valley, California, AGS Report 69013-1.

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

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

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

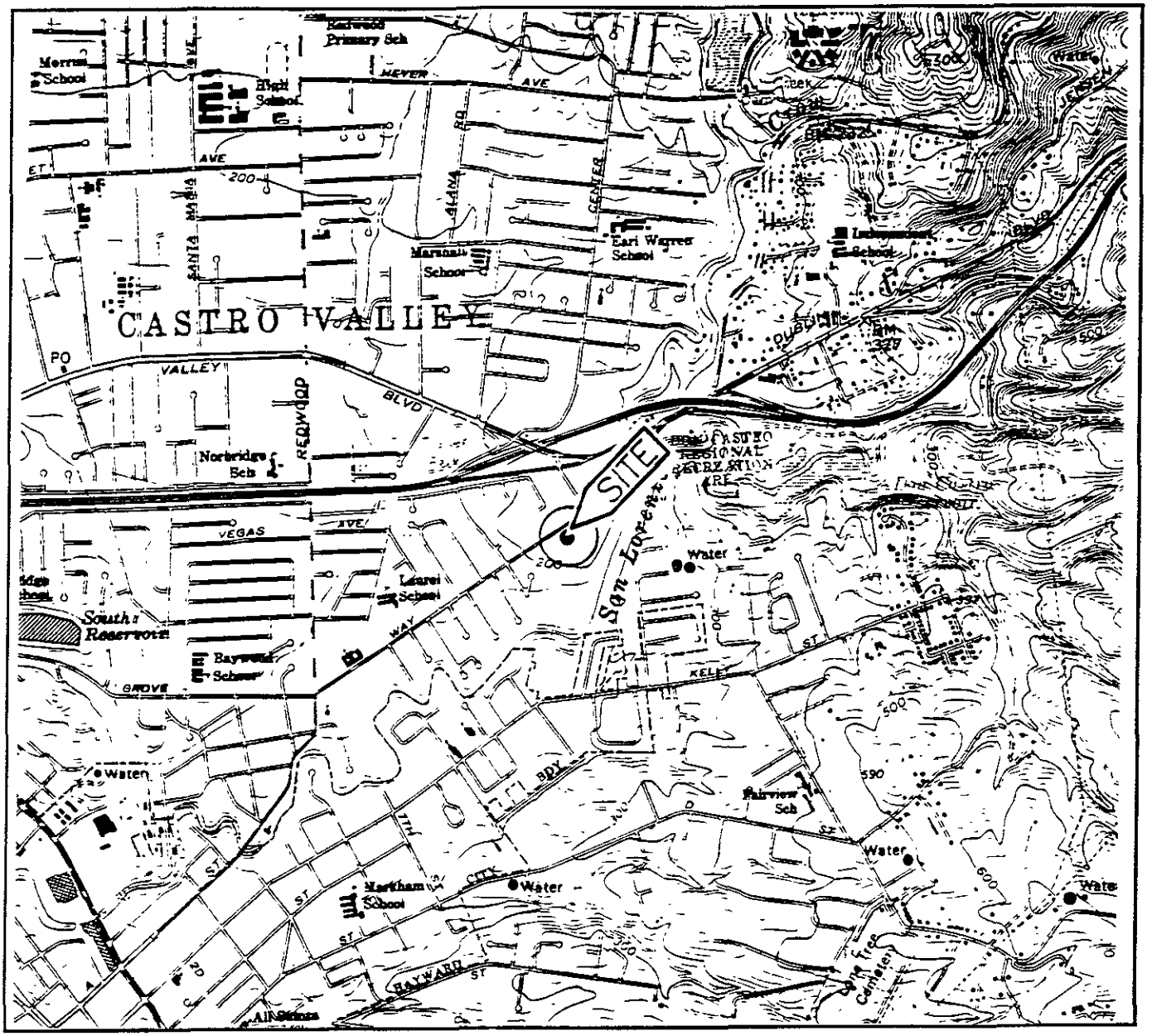
RESNA. October 8, 1991. Supplemental Subsurface and Remedial Investigation at ARCO Station 2152, 22141 Center Street, Castro Valley, California, AGS 69013-5.

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 Groundwater Monitoring, Fourth Quarter 1991, 22141 Center Street, Castro Valley, California, 69013.09.

RESNA. May 1, 1992. Letter Report, Quarterly Groundwater Monitoring, First Quarter 1992, 22141 Center Street, Castro Valley, California, 69013.09.

RESNA. July 17, 1992. Letter Report, Limited Subsurface Environmental Investigation, ARCO Station 2152, 22141 Center Street, Castro Valley, California, 69013.08



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

N

LEGEND

◉ = Site Location

Approximate Scale

2000 1000 0 2000 4000

feet

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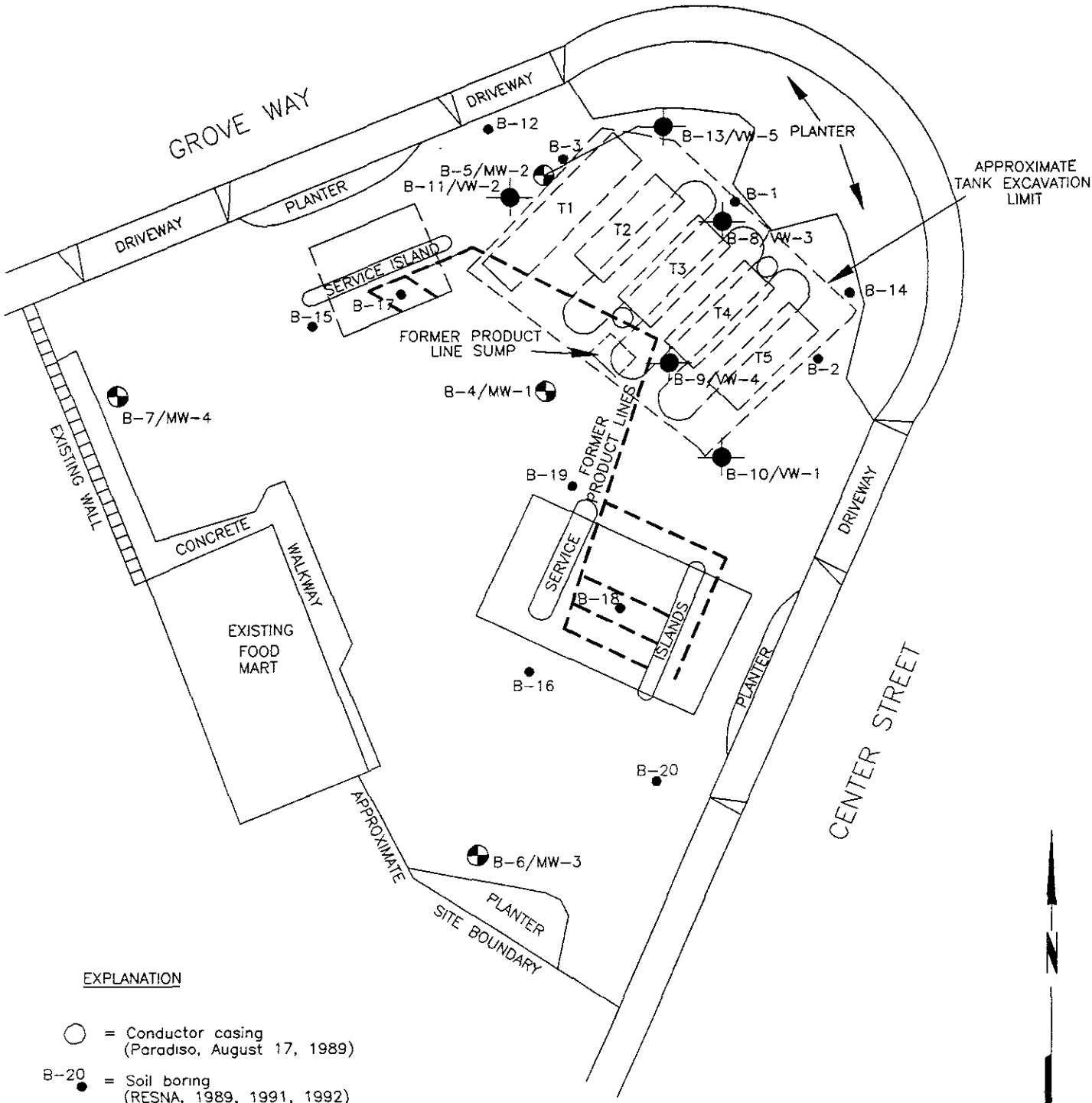
SITE VICINITY MAP
ARCO Station 2152
22141 Center Street
Castro Valley, California

PLATE
1



EXPLANATION

- ○ = Conductor casing (Paradiso, August 17, 1989)
- B-20 ● = Soil boring (RESNA, 1989, 1991, 1992)
- B-6/MW-3 ◐ = Boring/monitoring well (RESNA, 1989, 1990)
- B-13/VW-5 ◉ = Boring/vapor well (RESNA, June 1990)
- [T5] = Former underground gasoline-storage tanks
- ⊂⊃ = Present underground gasoline-storage tanks

30 15 0 30 60

Approximate Scale in Feet

Source: Surveyed by Ron Archer Civil Engineer, Inc.

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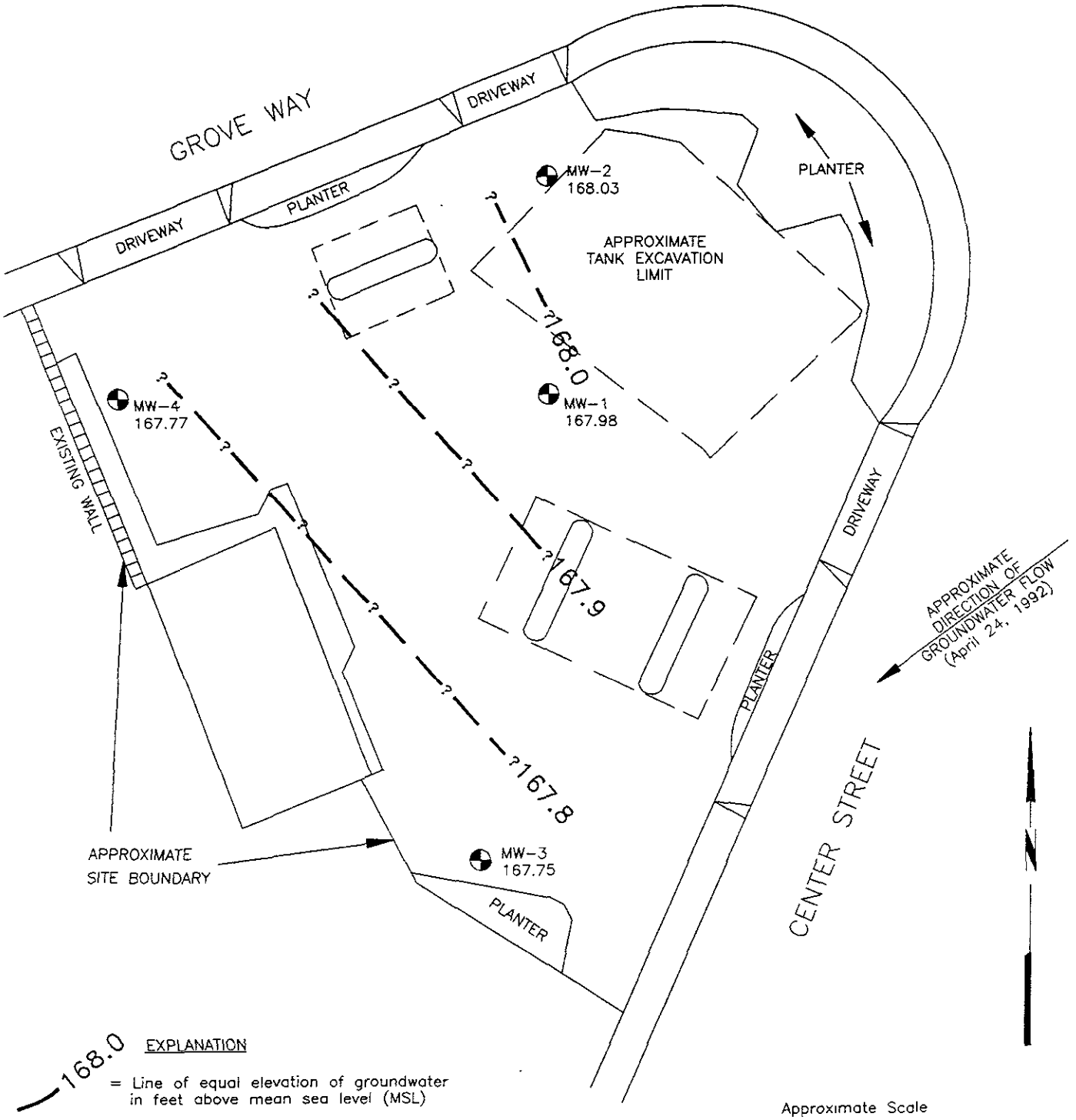
GENERALIZED SITE PLAN
ARCO Station 2152
22141 Center Street
Castro Valley, California

PLATE
2



Source: Surveyed by Ron Archer Civil Engineer, Inc.

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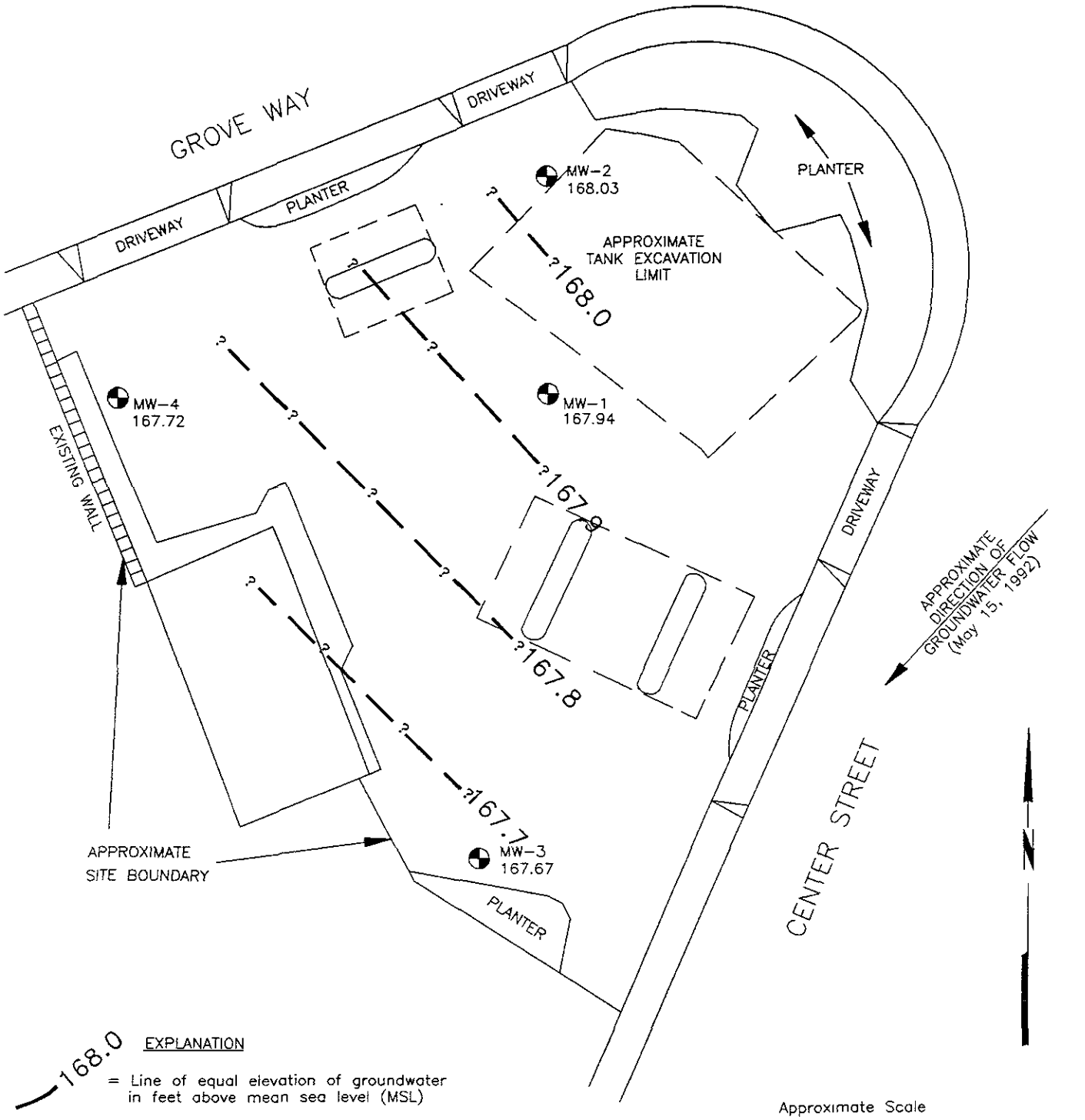
GROUNDWATER GRADIENT MAP
ARCO Station 2152
22141 Center Street
Castro Valley, California

PLATE
3



Source: Surveyed by Ron Archer Civil Engineer, Inc.

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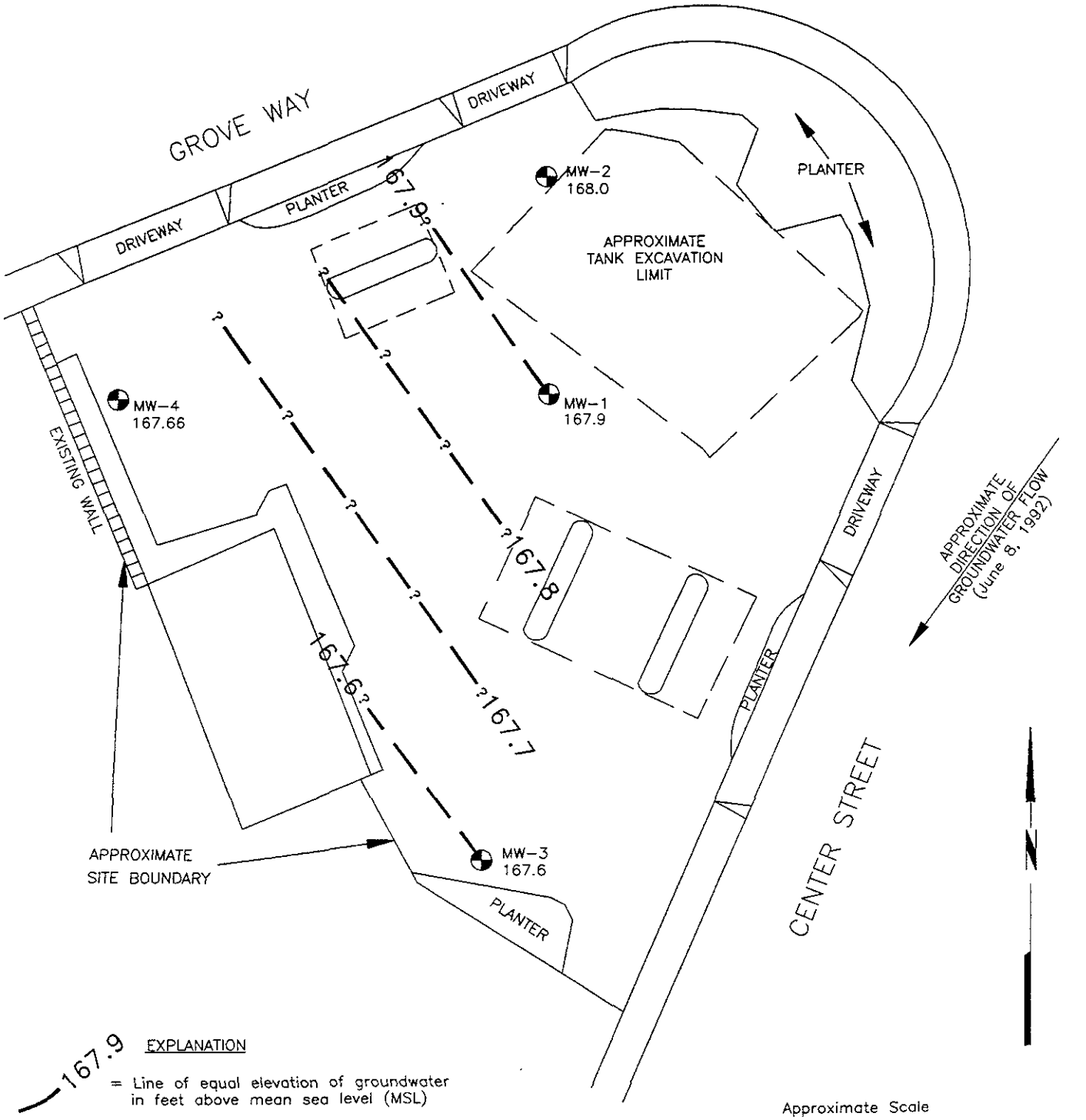
GROUNDWATER GRADIENT MAP
ARCO Station 2152
22141 Center Street
Castro Valley, California

PLATE
4



167.9 EXPLANATION

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

168.0 = Elevation of groundwater in feet above MSL, June 8, 1992

MW-4 = Monitoring well (RESNA, 1990)

Approximate Scale

30 15 0 30 60

feet

Source: Surveyed by Ron Archer Civil Engineer, Inc.

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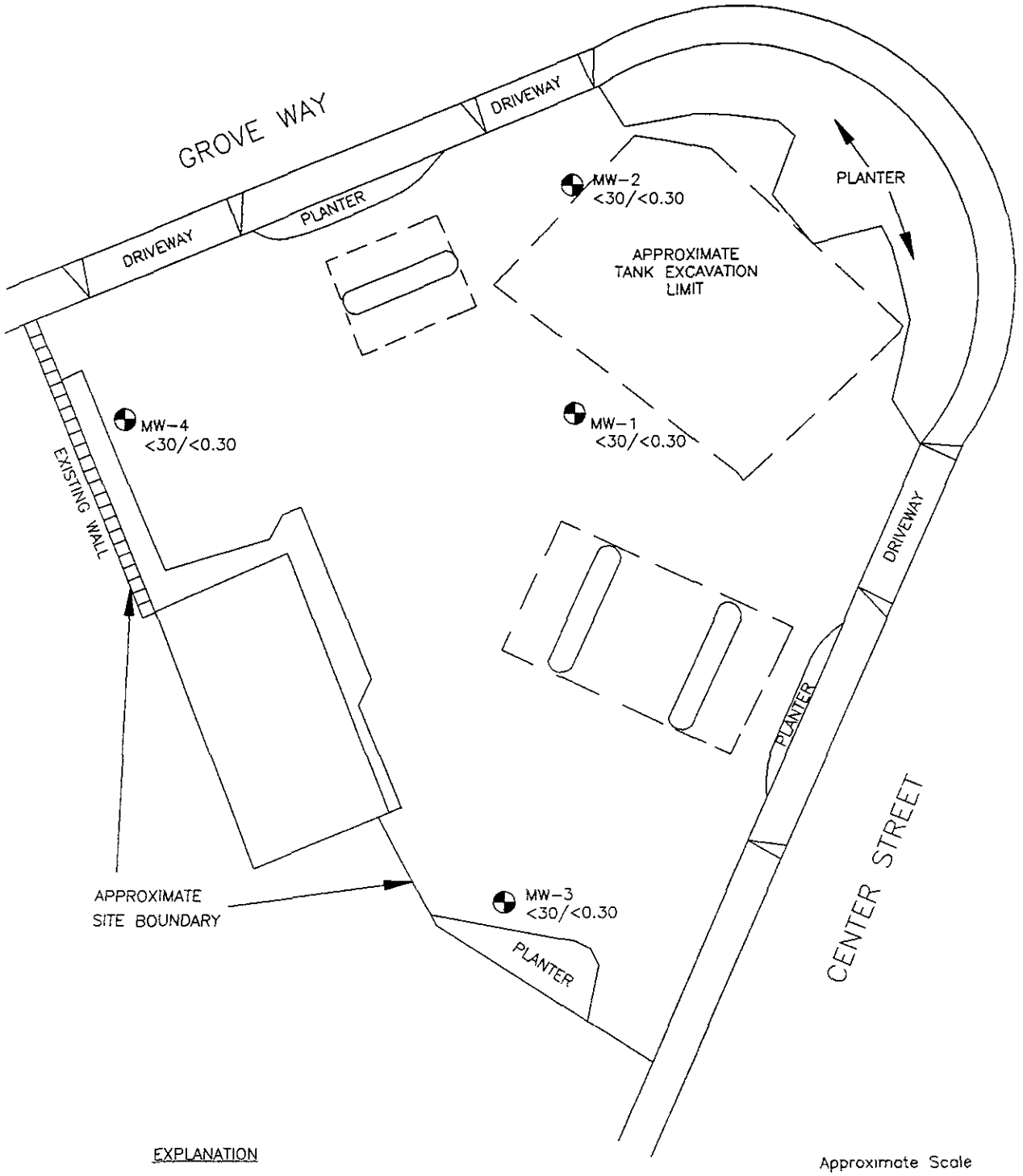
GROUNDWATER GRADIENT MAP
ARCO Station 2152
22141 Center Street
Castro Valley, California

PLATE 5



EXPLANATION

<30/<0.30 = Concentration of TPHg/benzene in groundwater in parts per billion, June 8, 1992

MW-4 = Monitoring well (RESNA, 1990)

Approximate Scale

30 15 0 30 60

feet

Source: Surveyed by Ron Archer Civil Engineer, Inc

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TPHG/BENZENE CONCENTRATIONS IN GROUNDWATER
ARCO Station 2152
22141 Center Street
Castro Valley, California

PLATE 6

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
04/24/92			49.18	167.98
05/15/92			49.22	167.94
06/08/92			49.3*	167.9*
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-2				
04/24/92			48.47	168.03
05/15/92			48.47	168.03
06/08/92			48.5*	168.0*
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
04/24/92			49.82	167.75
05/15/92			49.90	167.67
06/08/92			50.0*	167.6*
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
05/02/91	60.00		48.04	167.14
06/18/91			48.00	167.18

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				
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
04/24/92			47.41	167.77
05/15/92			47.46	167.72
06/08/92			47.52	167.66

Depth measurements in feet. Water elevation is mean sea level.
Static water level measured in feet below top of casing.
* = Depth to water measurements reported to tenth of foot on EMCON's field sheets.

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	<30	<0.30	<0.30	<0.30	<0.30
	06/08/92	<30	<0.30	<0.30	<0.30	<0.30
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	<30	<0.30	<0.30	<0.30	<0.30
	06/08/92	<30	<0.30	<0.30	<0.30	<0.30
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	<30	<0.30	<0.30	<0.30	<0.30
	06/08/92	<30	<0.30	<0.30	<0.30	<0.30
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	<30	<0.30	<0.30	<0.30	<0.30
	06/08/92	<30	<0.30	<0.30	<0.30	<0.30

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 April 27, 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 Results
	April 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 MK

Robert Porter, Senior Project Engineer.

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

FIELD REPORT
DEPTH TO WATER / FLOATING PRODUCT SURVEY

PROJECT # : G70-26.01 STATION ADDRESS : 22141 Center Street, Castro Valley DATE : 4-24-92

ARCO STATION # : 2152 FIELD TECHNICIAN : Mark Knuttel 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	OK	YES	✓	3259	Yes	49.18	49.18	ND	ND	58.0	—
2	MW-2	OK	yes	✓	3259	Yes	48.47	48.48	ND	ND	59.07	—
3	MW-3	OK	No	✓	3259	YES	49.82	49.82	~~49.82~~ ND	ND	59.6	diversified well LID IS BROKEN. CRACKED NEAR SCREW
4	MW-4	OK	YES	✓	3259	yes	47.41	47.41	ND	ND	60.17	—

EMCON
ASSOCIATES
Consultants in Wastes
Management and
Environmental Control

RECEIVED
MAY 27 1992
RESNA
SAN JOSE

Date May 19, 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 Results
	May 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: Date 6/30/92

JB
Jim Butera

Robert C Porter
Robert Porter, Senior Project Engineer.

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

FIELD REPORT
DEPTH TO WATER / FLOATING PRODUCT SURVEY

PROJECT # : G70-26.01 STATION ADDRESS : 22141 Center Street, Castro Valley DATE : 5·15·92

ARCO STATION # : 2152 FIELD TECHNICIAN : BUTERA 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	ok	HEX	NA	3259	yes	49.22	49.22	ND	NA	58.0	—
2	MW-2	ok	HEX	NA	3259	yes	48 47	48.47	ND	NA	59.1	—
3	MW-3	ok	HEX	NA	3259	yes	49.90	49.90	ND	NA	59.6	—
4	MW-4	ok	HEX	NA	3259	yes	47.46	47.45	ND	NA	60.2	—

EMCON ASSOCIATES
Consultants in Wastes Management and Environmental Control

Date July 1, 1992
Project G70-26.01

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

We are enclosing:

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

For your: X Information Sent by: X Mail

Comments:
Enclosed are the data from the second quarter 1992 monitoring event at ARCO service station 2152, 22141 Center Street, Castro Valley, California. Groundwater monitoring is conducted consistent with applicable regulatory guidelines. Please call if you have any questions: (408) 453-2266.

Reviewed by:

REGISTERED PROFESSIONAL ENGINEER ROBERT CURTIS PORTER No: 4084 Exp. 6/30/94 INDUSTRIAL STATE OF CALIFORNIA

Jim Butera JB

Robert Porter, Senior Project Engineer.

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

FIELD REPORT
DEPTH TO WATER / FLOATING PRODUCT SURVEY

PROJECT # : G70-26.01 STATION ADDRESS : 22141 Center Street, Castro Valley DATE : 6-8-92

ARCO STATION # : 2152 FIELD TECHNICIAN : M Gallegos DAY : Monday

DTW Order	WELL ID	Well Box Seal	Well Lid Secure	Gasket	Lock	Locking Well Cap	FIRST DEPTH TO WATER (feet)	SECOND DEPTH TO WATER (feet)	DEPTH TO FLOATING PRODUCT (feet)	FLOATING PRODUCT THICKNESS (feet)	WELL TOTAL DEPTH (feet)	COMMENTS
1	MW-1	Good	yes	yes	3259	X	49.3	49.3	ND	NA	58.0	—
2	MW-2	good	Yes	Yes	3259	X	48.5	48.5	ND	NA	59.1	—
3	MW-3	Good	Yes	Yes	3259	X	50.0	50.0	ND	NA	59.61	need new L.D. (cracked)
4	MW-4	Good	Yes	Yes	3259	X	47.52	47.52	ND	NA	60.16	—

Summary of Groundwater Monitoring Data
Second 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)	06/08/92	49.30	ND.[2]	<30.	<0.30	<0.30	<0.30	<0.30
MW-2(58)	06/08/92	48.50	ND.	<30.	<0.30	<0.30	<0.30	<0.30
MW-3(58)	06/08/92	50.0	ND.	<30.	<0.30	<0.30	<0.30	<0.30
MW-4(59)	06/08/92	47.52	ND.	<30.	<0.30	<0.30	<0.30	<0.30
FB-1[3]	06/08/92	NA.[4]	NA.	<30.	<0.30	<0.30	<0.30	<0.30

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 Junction Ave.
San Jose, CA 95131
Attention: Jim Butera

Project: Arco 2152

Enclosed are the results from 5 water samples received at Sequoia Analytical on June 9,1992. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE OF COLLECTION	TEST METHOD
2061739	Water, MW-1, (57')	6/8/92	EPA 5030/8015/8020
2061740	Water, MW-2, (58')	6/8/92	EPA 5030/8015/8020
2061741	Water, MW-3, (58')	6/8/92	EPA 5030/8015/8020
2061742	Water, MW-4, (59')	6/8/92	EPA 5030/8015/8020
2061743	Water, FB-1	6/8/92	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: Jun 8, 1992
1938 Junction Ave.	Matrix Descript:	Water	Received: Jun 9, 1992
San Jose, CA 95131	Analysis Method:	EPA 5030/8015/8020	Analyzed: 6/15-16/92
Attention: Jim Butera	First Sample #:	206-1739	Reported: Jun 19, 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)
206-1739	MW-1, (57')	N.D.	N.D.	N.D.	N.D.	N.D.
206-1740	MW-2, (58')	N.D.	N.D.	N.D.	N.D.	N.D.
206-1741	MW-2, (58')	N.D.	N.D.	N.D.	N.D.	N.D.
206-1742	MW-4, (59')	N.D.	N.D.	N.D.	N.D.	N.D.
206-1743	FB-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 Junction Ave.
San Jose, CA 95131
Attention: Jim Butera

Client Project ID: Arco 2152

QC Sample Group: 2061739 - 43

Reported: Jun 19, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl-Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	L.Laikhtman	L.Laikhtman	L.Laikhtman	L.Laikhtman
Reporting Units:	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Jun 15, 1992	Jun 15, 1992	Jun 15, 1992	Jun 15, 1992
QC Sample #:	BLK061592	BLK061592	BLK061592	BLK061592
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	10	10	10	30
Conc. Matrix Spike:	9.9	10	10	30
Matrix Spike % Recovery:	99	100	100	100
Conc. Matrix Spike Dup.:	9.9	10	10	30
Matrix Spike Duplicate % Recovery:	99	100	100	100
Relative % Difference:	0.0	0.0	0.0	0.0

SEQUOIA ANALYTICAL

Maile A. Springer
Project Manager

$$\% \text{ Recovery:} \quad \frac{\text{Conc. of M.S. - Conc. of Sample}}{\text{Spike Conc. Added}} \times 100$$

$$\text{Relative \% Difference:} \quad \frac{\text{Conc. of M.S. - Conc. of M.S.D.}}{\text{(Conc. of M.S. + Conc. of M.S.D.) / 2}} \times 100$$

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. EMCEC-92-01

Chain of Custody

ARCO Facility no 2152	City (Facility) Castro Valley	Project manager (Consultant) JIM Butera	Laboratory name SEQUOIA
ARCO engineer Kyle Christie	Telephone no (ARCO) (415) 571-2434	Telephone no (Consultant) (408) 453-0719	Fax no (Consultant) (408) 453-0452
Consultant name EMCON ASSOCIATES	Address (Consultant) 1938 JUNCTION AVENUE SAN JOSE CA		Contract number 07-073

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 GAS 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 ☐ VOA ☐ Semi VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐		
MW-1(57')		2		X		X	HCl				X			206		1739						
MW-2(58')		2		X		X	HCl				X					1740						
MW-3(58')		2		X		X	HCl				X					1741						
MW-4(59')		2		X		X	HCl				X					1742						
FB-1		2		X		X	HCl				X					1743						

Special detection Limit/reporting: Lowest Possible

Special QA/QC: AS Normal

Remarks: 2 40 ml VOA's Per Well

Lab number

Turnaround time

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

Method of shipment: Courier will Pick up

Condition of sample: GOOD

Temperature received: COOL

	Date	Time		Date	Time
Relinquished by sampler	6-9-92	0900	Received by	6-9-92	1015
Relinquished by	6-9-92	10:42	Received by		
Relinquished by	Date	Time	Received by laboratory	6-9	10:40

Distribution White copy — Laboratory, Canary copy — ARCO Environmental Engineering, Pink copy — Consultant
APPC-3292 (2-91)

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 270-2601 SAMPLE ID: MW-1

PURGED BY: M. Gallegos CLIENT NAME: ARCO # 2152

SAMPLED BY: M Gallegos LOCATION: Castro Valley

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.): 5.7

DEPTH TO WATER (feet): 45.3 CALCULATED PURGE (gal.): 28.53

DEPTH OF WELL (feet): 580 / 5.7 ACTUAL PURGE VOL. (gal.): 30 gal.

DATE PURGED: 6-8-92 Start (2400 Hr) 1132 End (2400 Hr) 1201

DATE SAMPLED: 6-8-92 Start (2400 Hr) 1212 End (2400 Hr) 1218

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1137	6	6.23	1525	72.0	Clear	Heavy Mud
1145	12	6.63	18.15	754	Light Brown	Heavy
1151	18	6.59	2190	728	Clear	Heavy Mud
1157	24	6.60	2170	716	Clear	Heavy
1201	30	6.71	2190	708	Clear	Heavy

D. O. (ppm): None ODOR: None N/A N.A.

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

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

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

WELL INTEGRITY: Good. LOCK #: 3259

REMARKS: All samples taken

Meter Calibration: Date: 6-8-92 Time: 1102 Meter Serial #: AQ97551G Temperature °F: 77

(EC 1000 997 / 1000) (DI ___) (pH 7 708 / 700) (pH 10 9.93 / 1000) (pH 4 3.86 / ___)

Location of previous calibration: MW-1

Signature: M. Gallegos Reviewed By: JB Page 1 of 4

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 670-2601 SAMPLE ID: MW-2

PURGED BY: M Gallegos CLIENT NAME: ARCO # 7152

SAMPLED BY: M Gallegos LOCATION: Castro Valley

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.): 16.9

DEPTH TO WATER (feet): 48.5 CALCULATED PURGE (gal.): 34.76

DEPTH OF WELL (feet): 59.1 / 12.6 ACTUAL PURGE VOL. (gal.): 35 gallons

DATE PURGED: 6-8-92 Start (2400 Hr) 1250 End (2400 Hr) 1320

DATE SAMPLED: 6-8-92 Start (2400 Hr) ~~1300~~ 1325 End (2400 Hr) 1331

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1302	7	6.76	2,840	72.2	Clear	~~mod.~~ light
1306	14	6.63	2,800	70.7	Clear	Light
1310	21	6.75	2740	66.7	Clear	Light
1315	28	6.66	2,690	66.2	Clear	Light
1320	35	6.68	2720	66.2	Clear	Light

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	X Bailer (Teflon®)
X Centrifugal Pump	___ Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
X Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: Good LOCK #: 3259

REMARKS: All samples taken

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

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

Location of previous calibration: MW-1

Signature: M Gallegos Reviewed By: JB Page 2 of 4

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 670-2601 SAMPLE ID: MW-3

PURGED BY: M. Gallegos CLIENT NAME: ARCO # 2152

SAMPLED BY: M Gallegos LOCATION: Castro Valley

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.): 6.3

DEPTH TO WATER (feet): 50.0 CALCULATED PURGE (gal.): 31.52

DEPTH OF WELL (feet): 59.61 / 59.61 ACTUAL PURGE VOL. (gal.): 33 gal.

DATE PURGED: 6-8-92 Start (2400 Hr) ~~1409~~ 1409 End (2400 Hr) 1440

DATE SAMPLED: 6-8-92 Start (2400 Hr) 1448 End (2400 Hr) 1454

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1423	6.5	6.75	~~3170~~ 3170	70.4	Light Grey	Heavy
1427	13.0	6.80	~~2980~~ 2980	69.5	Clear	Moderate
1432	19.5	6.68	~~2820~~ 2820	69.0	Clear	Light
1436	26.0	6.61	~~2820~~ 2820	68.4	Clear	Light
1440	32.5	6.62	~~2800~~ 2800	68.3	Clear	Light

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

(COBALT 0 - 100) (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)
X Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: Good LOCK #: 3259

REMARKS: All Samples Taken.

Meter Calibration: Date: ~~Mon.~~ Time: ___ Meter Serial #: ___ Temperature °F: ___

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

Location of previous calibration: MW-1

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

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 670-2601 SAMPLE ID: MW-4

PURGED BY: M. Gallegos CLIENT NAME: ARCO #2152

SAMPLED BY: M. Gallegos LOCATION: Castro Valley

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.): 8.3

DEPTH TO WATER (feet): 47.52 CALCULATED PURGE (gal.): 41.45

DEPTH OF WELL (feet): 60.16 / 12.64 ACTUAL PURGE VOL. (gal.): 43 gallons

DATE PURGED: 6-8-92 Start (2400 Hr) 1533 End (2400 Hr) 1604

DATE SAMPLED: 6-8-92 Start (2400 Hr) 1612 End (2400 Hr) 1617

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1541	8.5	6.77	1870	71.9	Light Grey	Moderate Heavy
1547	17.0	6.71	1980	69.3	Light Grey	Moderate Heavy
1553	25.5	6.72	1960	68.9	Clear	Mod
1558	34.0	6.68	1960	68.8	Clear	Light
1604	42.5	6.73	1961	68.5	"	"

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

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: Good LOCK #: 3259

REMARKS: All Samples Taken.

Meter Calibration: Date: 6-8-92 Time: ___ Meter Serial #: ___ Temperature °F: ___

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

Location of previous calibration: MW-1

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