RESNA
Working To Restore Nature

93 SEP 13 PM 2:33

3315 Almaden Expressway, Suite 34
San Jose, CA 95118
Phone: (408) 264-7723
FAX: (408) 264-2435

TRANSMITTAL

TO: Ms. Eva Chu
Alameda County Health Care Services Agency
Department of Environmental Health
80 Swan Way, Room 200
Oakland, CA 94621

DATE: September 8, 1993
PROJECT NUMBER: 60006.06
SUBJECT: ARCO Station No. 6041

FROM: John C. Young

WE ARE SENDING YOU:

COPIES	DATED	DESCRIPTION
1	9/8/93	Second Quarter 1993 Groundwater Monitoring Report for ARCO Station No. 6041, 7249 Village Parkway, Dublin, California.

THESE ARE TRANSMITTED as checked below:

[ ] For review and comment	[ ] Approved as submitted	[ ] Resubmit ___ copies for approval
[X] As requested	[ ] Approved as noted	[ ] Submit___ copies for distribution
[ ] For approval	[ ] Return for corrections	[ ] Return ___ corrected prints
[X] For your files		

REMARKS:
Copies: 1 to RESNA project file no. 60006.06

John C. Young, Project Manager

cc: Mr. Michael Whelan, ARCO
Mr. Richard Hiett, CRWQCB

RESNA
Working To Restore Nature

3315 Almaden Expressway, Suite 34
San Jose, CA 95118
Phone: (408) 264-7723
FAX: (408) 264-2435

LETTER REPORT
QUARTERLY GROUNDWATER MONITORING
Second Quarter 1993
at
ARCO Station 6041
7249 Village Parkway
Dublin, California

60006.06

RESNA
Working To Restore Nature

3315 Almaden Expressway, Suite 34
San Jose, CA 95118
Phone: (408) 264-7723
FAX: (408) 264-2435

September 8, 1993
60006.06

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

Subject: Second Quarter 1993 Groundwater Monitoring Report for ARCO Station 6041, 7249 Village Parkway, Dublin, California.

Mr. Whelan:

As requested by ARCO Products Company (ARCO), RESNA Industries Inc. (RESNA) has prepared this letter report summarizing the results of the second quarter 1993 groundwater monitoring performed by ARCO's contractor, EMCON Associates (EMCON) of San Jose, California, at the above-referenced site.

The operating ARCO Station 6041 is located at the northern corner of the intersection of Village Parkway and Amador Valley Boulevard in a commercial and residential area at 7249 Village Parkway, in Dublin, California. The site location is shown on the Site Vicinity Map, Plate 1. The location of the groundwater monitoring wells, borings, and pertinent site features are shown on the Generalized Site Plan, Plate 2. Results of previous environmental investigations at the site are summarized in the reports listed in the References section.

The purpose of quarterly groundwater monitoring is to evaluate changes in the groundwater flow direction and gradient and changes in concentrations of petroleum hydrocarbons in the local groundwater previously detected at the site. Field work and laboratory analyses of groundwater samples during this quarter were performed under the direction of EMCON. This work included measuring depth-to-water (DTW) levels, subjectively evaluating groundwater for the presence of petroleum hydrocarbons, and collecting and submitting groundwater samples from the wells to a State-certified laboratory for analyses. Field procedures and acquisition of field data were performed under direction of EMCON; evaluation and warrant of their field data and field protocols is beyond RESNA's scope of work. RESNA's scope of work was limited to interpretation of field and laboratory analyses

data, which included evaluating trends in reported hydrocarbon concentrations in the local groundwater, the groundwater gradient, and flow direction beneath the site.

Groundwater Sampling and Gradient Evaluation

Depth to water (DTW) levels were measured in groundwater monitoring wells MW-1 through MW-6 by EMCON field personnel on April 27, May 10, and June 18, 1993. At the request of Mr. Scott Seery of Alameda County Health Care Services Agency (ACHCSA) the May monitoring of the wells at the ARCO site was coordinated with monitoring by other consultants of wells at three other sites located at the intersection of Village Parkway and Amador Boulevard (BP, former Shell, and Unocal Stations) to obtain more complete data for gradient evaluation. Quarterly sampling was performed by EMCON field personnel on May 10, 1993. Joint monitoring was conducted on May 10, 1993, with exception of the BP Station which was conducted on May 21, 1993. The results of EMCON's field work on the site, including DTW levels and subjective analyses are presented on EMCON's Field Reports, and EMCON's Summary of Groundwater Monitoring Data in Appendix A.

The DTW levels, wellhead elevations, groundwater elevations, and subjective evaluation of groundwater from wells at the subject site for this and previous quarters are summarized in Table 1, Cumulative Groundwater Monitoring Data. DTW levels, wellhead elevations and groundwater elevations for groundwater monitoring wells at BP, former Shell, and Unocal Stations are reported in Table 2, Groundwater Monitoring Data - BP, Former Shell, and Unocal Stations. Evidence of product or sheen was not observed during this quarter in any of the wells at the ARCO site (see EMCON's Field Reports, Appendix A). The average groundwater gradient, interpreted from EMCON's DTW levels for April, May, and June 1993, was generally less than 0.004 ft/ft. Groundwater flow direction was toward the northeast in April and toward the west-southwest in May and June. DTW measurements obtained on May 10, 1993, from wells located at former Shell, and Unocal Stations were used to evaluate the gradient in the vicinity of ARCO Station 6041. DTW measurements from the BP Station were collected on May 21, 1993. The average gradient in the vicinity of ARCO Station on May 10, 1993, was approximately 0.005 ft/ft with a flow direction toward the west-southwest. This interpreted flow direction is not consistent with the regional flow direction which appears to be toward the east-northeast. Plates 3 through 5, Groundwater Gradient Maps, are graphic interpretations of the groundwater elevations measured on April 27, May 10, and June 18, 1993. Plates 3 through 5 depict the groundwater gradients and flow directions at the ARCO site, and Plate 6 depicts the groundwater gradients and flow directions in the vicinity of the ARCO site.

Groundwater monitoring wells MW-1 through MW-6 were purged and sampled by EMCON field personnel on May 10, 1993. EMCON's water sample field data sheets are included in Appendix A. 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 Analyses

Water samples collected from the wells MW-1 through MW-6 were analyzed by Columbia Analytical Services, Inc., located in San Jose, California (Hazardous Waste Testing Laboratory Certification No. 1426), and 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 Methods. Concentrations of TPHg and benzene in the groundwater are shown on Plate 7, TPHg Concentrations in Groundwater; and Plate 8, Benzene Concentrations in Groundwater. The Chain of Custody Records and Laboratory Analyses Reports are included in Appendix A. Groundwater analytical results from this and previous quarters are summarized in Table 3, Cumulative Results of Laboratory Analyses of Groundwater Samples.

Compared to analytical results from the previous quarter, concentrations of TPHg and BTEX decreased in well MW-1, increased in wells MW-2 and MW-3, and showed no change (nondetectable) in wells MW-4 through MW-6.

Conclusions

Groundwater in the shallow aquifer beneath the southeastern, southern, and southwestern portions of the site has been impacted by gasoline hydrocarbons. The lateral extent of gasoline hydrocarbons in the groundwater appears to have been delineated to less than 50 ppb of TPHg beneath the northwestern, northern and northeastern portions of the site.

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

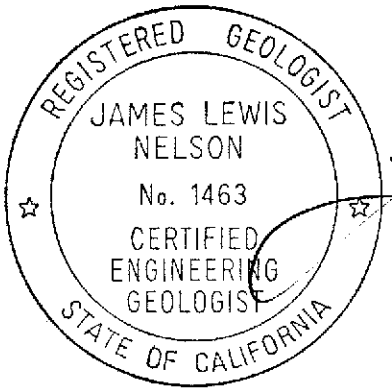
Ms. Eva Chu
Alameda County Health Care Services Agency
Department of Environmental Health
80 Swan Way, Room 200
Oakland, California 94621

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

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

Sincerely,
RESNA Industries Inc.

Keith McVicker
Project Geologist



James L. Nelson
Certified Engineering
Geologist 1463

Enclosures: References

Plate 1, Site Vicinity Map
Plate 2; Generalized Site Plan
Plate 3, Groundwater Gradient Map, April 27, 1993
Plate 4, Groundwater Gradient Map, May 10, 1993
Plate 5, Groundwater Gradient Map, June 18, 1993
Plate 6, Areal Groundwater Gradient Map, May 10, 1993
Plate 7, TPHg Concentrations in Groundwater, May 10, 1993
Plate 8, Benzene Concentrations in Groundwater, May 10, 1993

Table 1, Cumulative Groundwater Monitoring Data
Table 2, Cumulative Groundwater Monitoring Data; BP, Former Shell, and Unocal Stations
Table 3, Cumulative Results of Laboratory Analyses of Groundwater Samples

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

REFERENCES

Alameda County Flood Control and Water Conservation District, Zone 7. January 16, 1991. Fall 1990 groundwater Level Report.

Applied GeoSystems. September 19, 1990. Letter Report Limited Environmental Investigation Related to the Removal of Waste-Oil Tank at ARCO Station 6041, 7249 Village Parkway, Dublin, California. 60006-1.

California Department of Water Resources, 1974. Evaluation of Ground-Water Resources Engineering Livermore and Sunol Valleys; Bulletin No. 118-2, Appendix A.

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

RESNA. August 22, 1991. Work Plan for Subsurface Investigation and Remediation at ARCO Station 6041, 7249 Village Parkway, Dublin, California. 60006.02.

RESNA. August 22, 1991. Addendum One to Work Plan for Subsurface Investigation and Remediation at ARCO Station 6041, 7249 Village Parkway, Dublin, California. 60006.02.

RESNA. August 30, 1991. Site Safety Plan. 60006.02S.

RESNA. February 12, 1992. Subsurface Environmental Investigation at ARCO Station 6041, 7249 Village Parkway, Dublin, California. 60006.02

RESNA. March 7, 1992. Letter Report, Quarterly Groundwater Monitoring, Fourth Quarter 1992 at ARCO Station, 6041, 7249 Village Parkway, Dublin, California. 60006.03

RESNA. May 1, 1992. Letter Report, Quarterly Groundwater Monitoring, First Quarter 1992 at ARCO Station, 6041, 7249 Village Parkway, Dublin, California. 60006.03

RESNA. September 25, 1992. Letter Report, Quarterly Groundwater Monitoring, Second Quarter 1992 at ARCO Station, 6041, 7249 Village Parkway, Dublin, California. 60006.03

REFERENCES

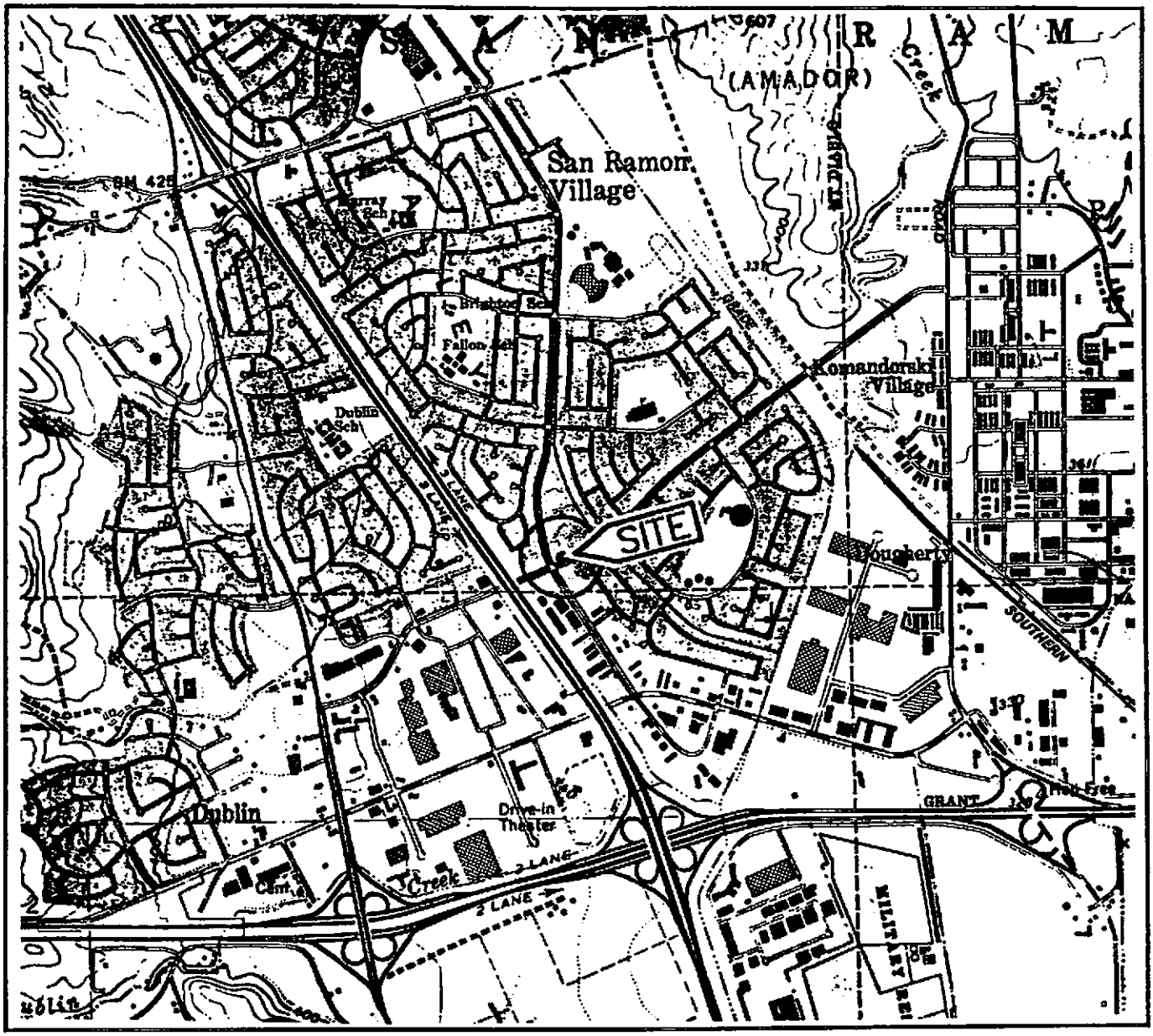
RESNA. September 29, 1992. Work Plan for Initial Offsite and Additional Onsite Subsurface Investigations at ARCO Station 6041, 7249 Village Parkway, Dublin, California. 60006.04

RESNA. December 29, 1992. Letter Report, Quarterly Groundwater Monitoring, Third Quarter 1992 at ARCO Station, 6041, 7249 Village Parkway, Dublin, California. 60006.03

RESNA. January 29, 1993. Additional Onsite Subsurface Investigation and Vapor Extraction Test at ARCO Station 6041, 7249 Village Parkway, Dublin, California. 60006.04

RESNA. March 31, 1993. Letter Report, Quarterly Groundwater Monitoring, Fourth Quarter 1992 at ARCO Station, 6041, 7249 Village Parkway, Dublin, California. 60006.05

RESNA. April 29, 1993. Letter Report, Quarterly Groundwater Monitoring, First Quarter 1993 at ARCO Station, 6041, 7249 Village Parkway, Dublin, California. 60006.05



Base: U.S. Geological Survey
7.5–Minute Quadrangles
Dublin, California
Photorevised 1980

N

LEGEND

◉ = Site Location

Approximate Scale

2000 1000 0 2000 4000

feet

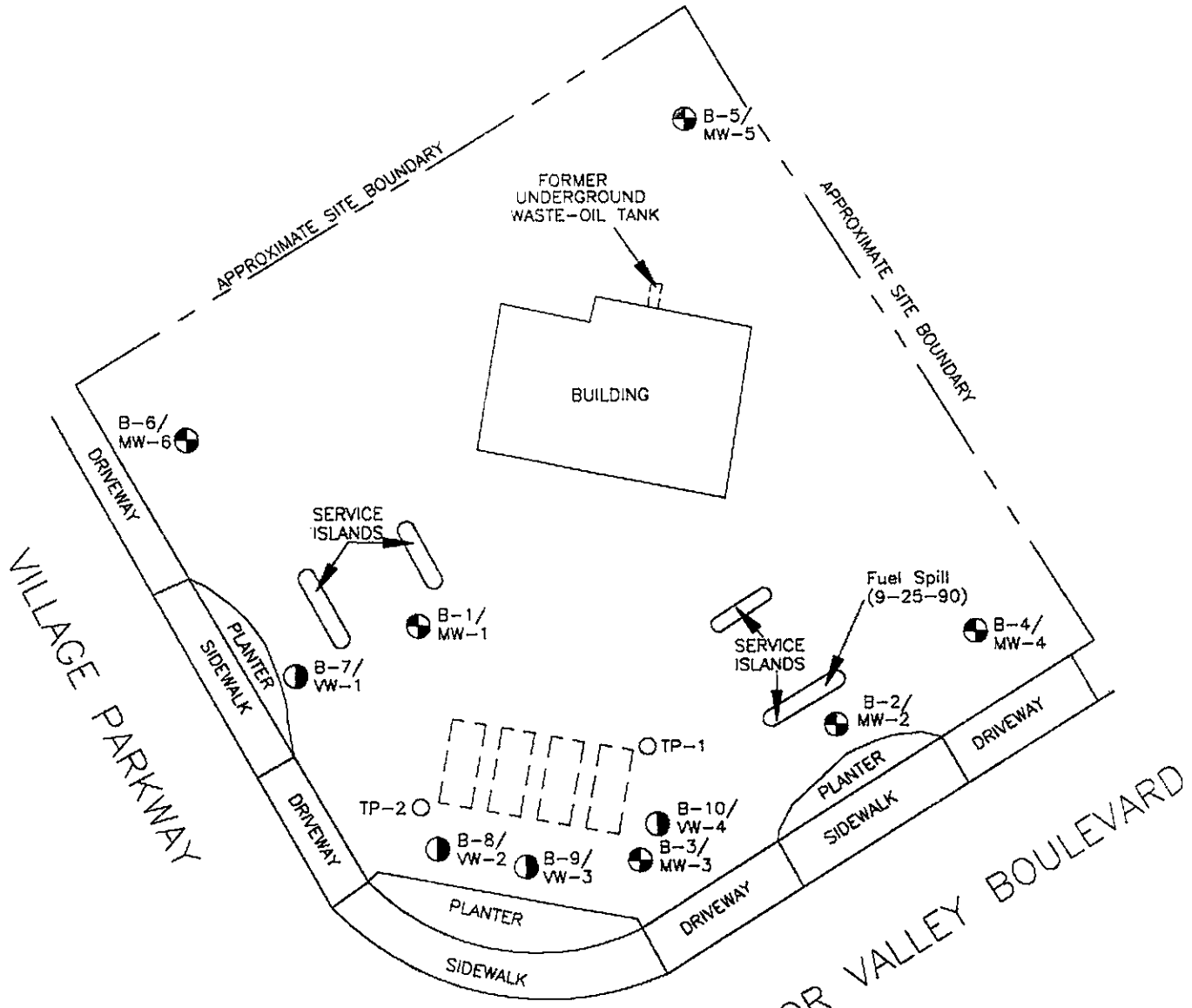
RESNA
Working to Restore Nature

PROJECT **60006.06**

SITE VICINITY MAP
ARCO Station 6041
365 Jackson Street
Dublin, California

PLATE
1

60006-6



EXPLANATION

B-6/MW-6 = Boring/groundwater monitoring well (RESNA, September 1991 and October 1992)

B-10/VW-4 = Boring/vapor extraction well (RESNA, October 1992)

TP-2 = Tank pit observation well

= Underground storage tanks

N

Approximate Scale

40 20 0 40 80

feet

Source: Modified from plan supplied by ARCO.

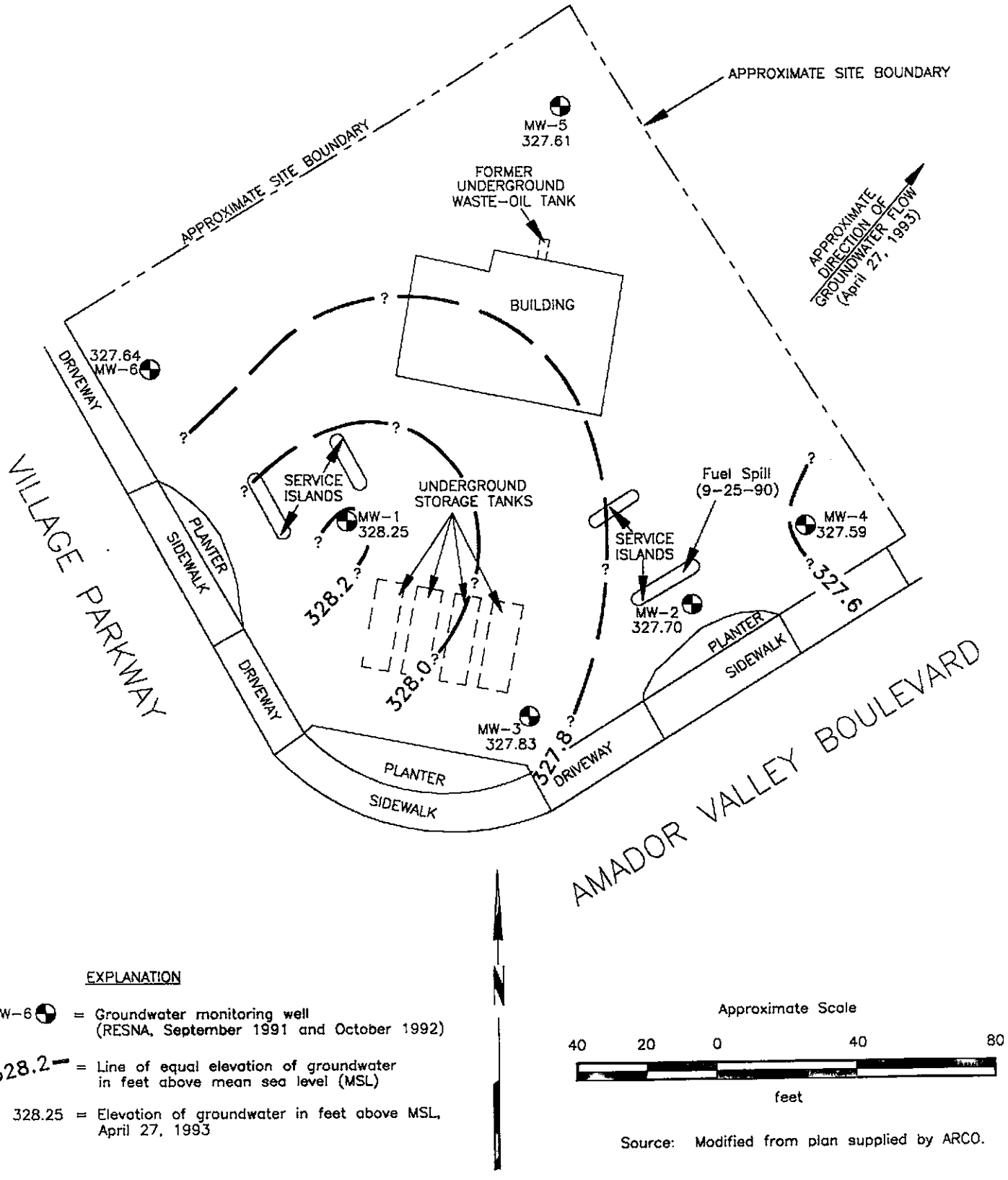
RESNA
Working to Restore Nature

PROJECT 60006.06

GENERALIZED SITE PLAN
ARCO Service Station 6041
7249 Village Parkway
Dublin, California

PLATE
2

600066P4



EXPLANATION

MW-6 = Groundwater monitoring well (RESNA, September 1991 and October 1992)

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

328.25 = Elevation of groundwater in feet above MSL, April 27, 1993

N

Approximate Scale

40 20 0 40 80

feet

Source: Modified from plan supplied by ARCO.

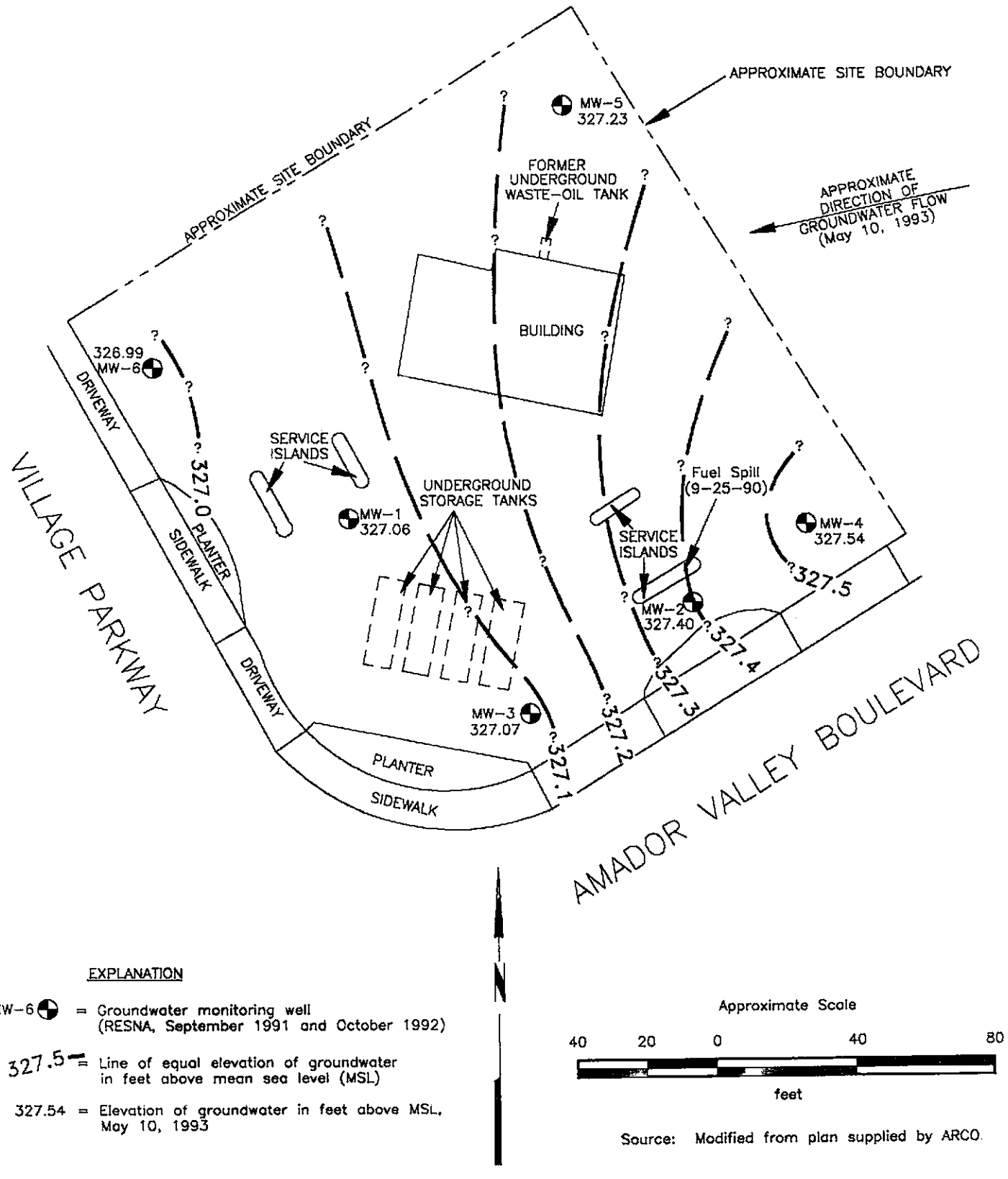
RESNA
Working to Restore Nature

PROJECT 60006.06

GROUNDWATER GRADIENT MAP
ARCO Service Station 6041
7249 Village Parkway
Dublin, California

PLATE 3

600066P5



EXPLANATION

MW-6 = Groundwater monitoring well (RESNA, September 1991 and October 1992)

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

327.54 = Elevation of groundwater in feet above MSL, May 10, 1993

N

Approximate Scale

40 20 0 40 80

feet

Source: Modified from plan supplied by ARCO.

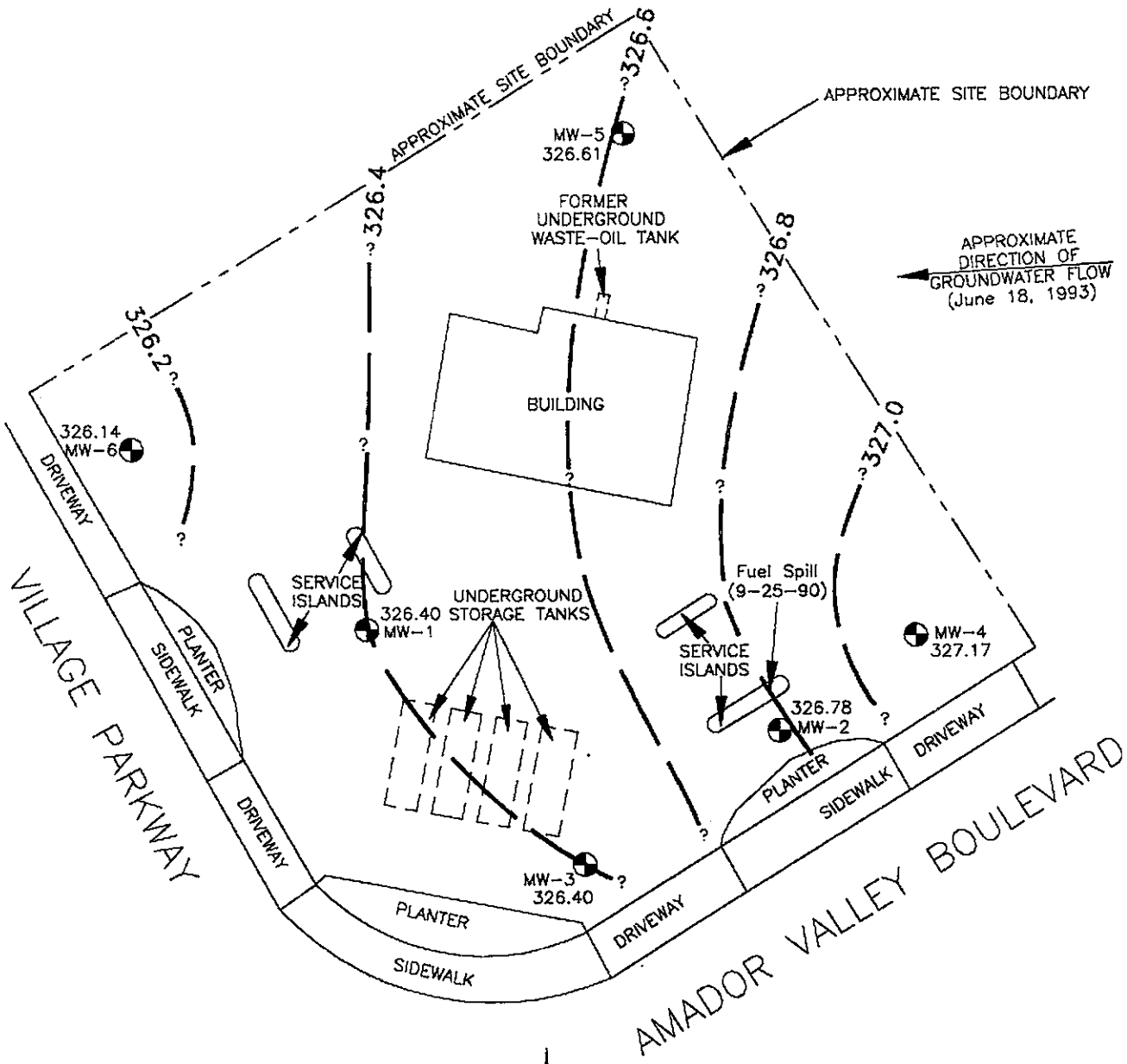
RESNA
Working to Restore Nature

PROJECT 60006.06

GROUNDWATER GRADIENT MAP
ARCO Service Station 6041
7249 Village Parkway
Dublin, California

PLATE
4

600066P6



EXPLANATION

MW-6 = Groundwater monitoring well (RESNA, September 1991 and October 1992)

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

327.17 = Elevation of groundwater in feet above MSL, June 18, 1993

N

Approximate Scale

40 20 0 40 80

feet

Source: Modified from plan supplied by ARCO.

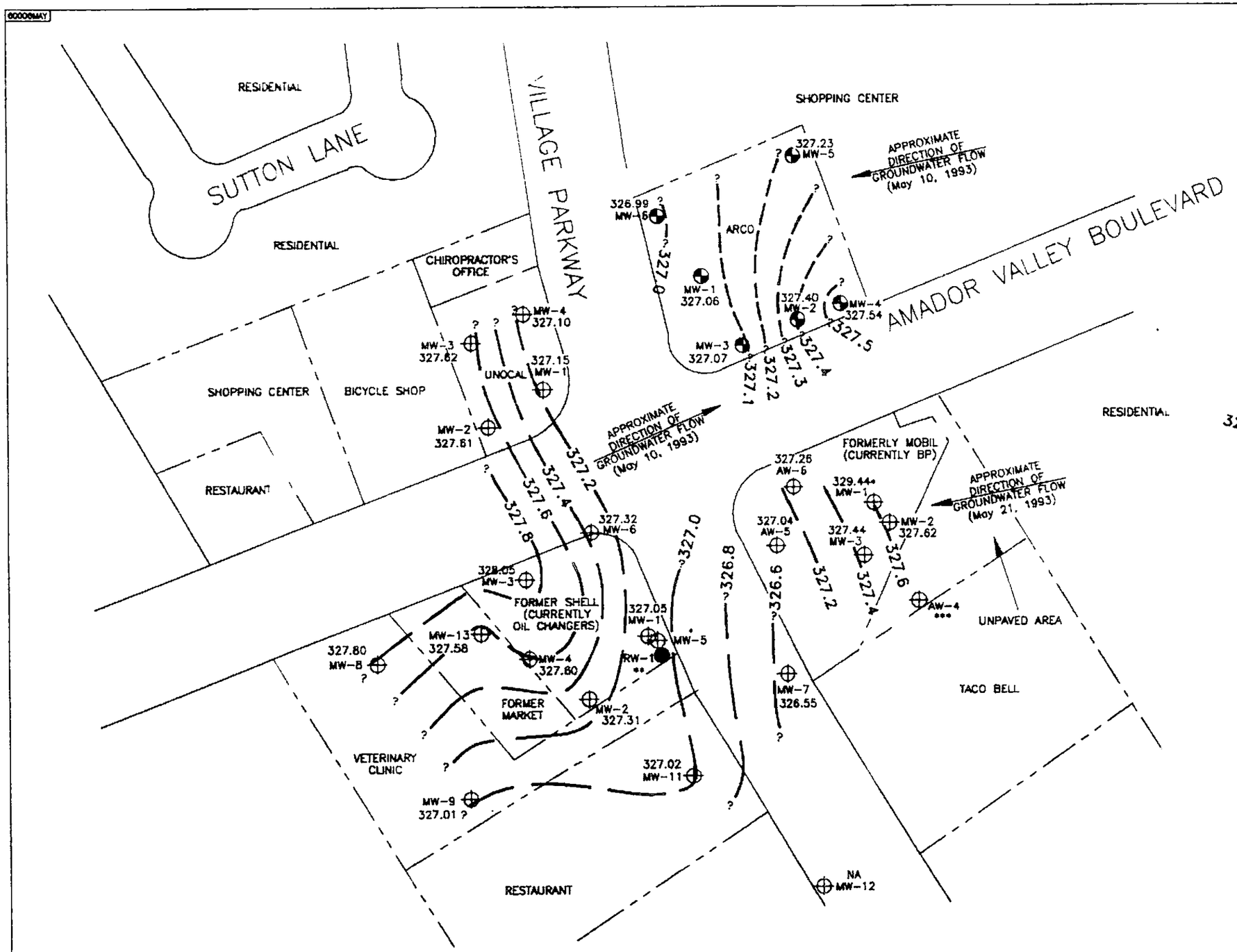
RESNA
Working to Restore Nature

PROJECT 60006.06

GROUNDWATER GRADIENT MAP
ARCO Service Station 6041
7249 Village Parkway
Dublin, California

PLATE
5

60006MAY



EXPLANATION

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

327.80 = Elevation of groundwater in feet above MSL, May 10, 1993. Elevations of groundwater for BP Station, May 21, 1993

NA = Not accessible

= Groundwater monitoring well installed by RESNA

= Groundwater monitoring well installed by OTHERS

= Recovery well

* = Not used for gradient evaluation (well screened across deeper aquifer)

** = RW-1 was not measured

*** = Well destroyed

All property lines & well locations are approximate

Approximate Scale

100 50 0 100 200

feet

Source: Modified from plan supplied by ALTON GEOSCIENCE

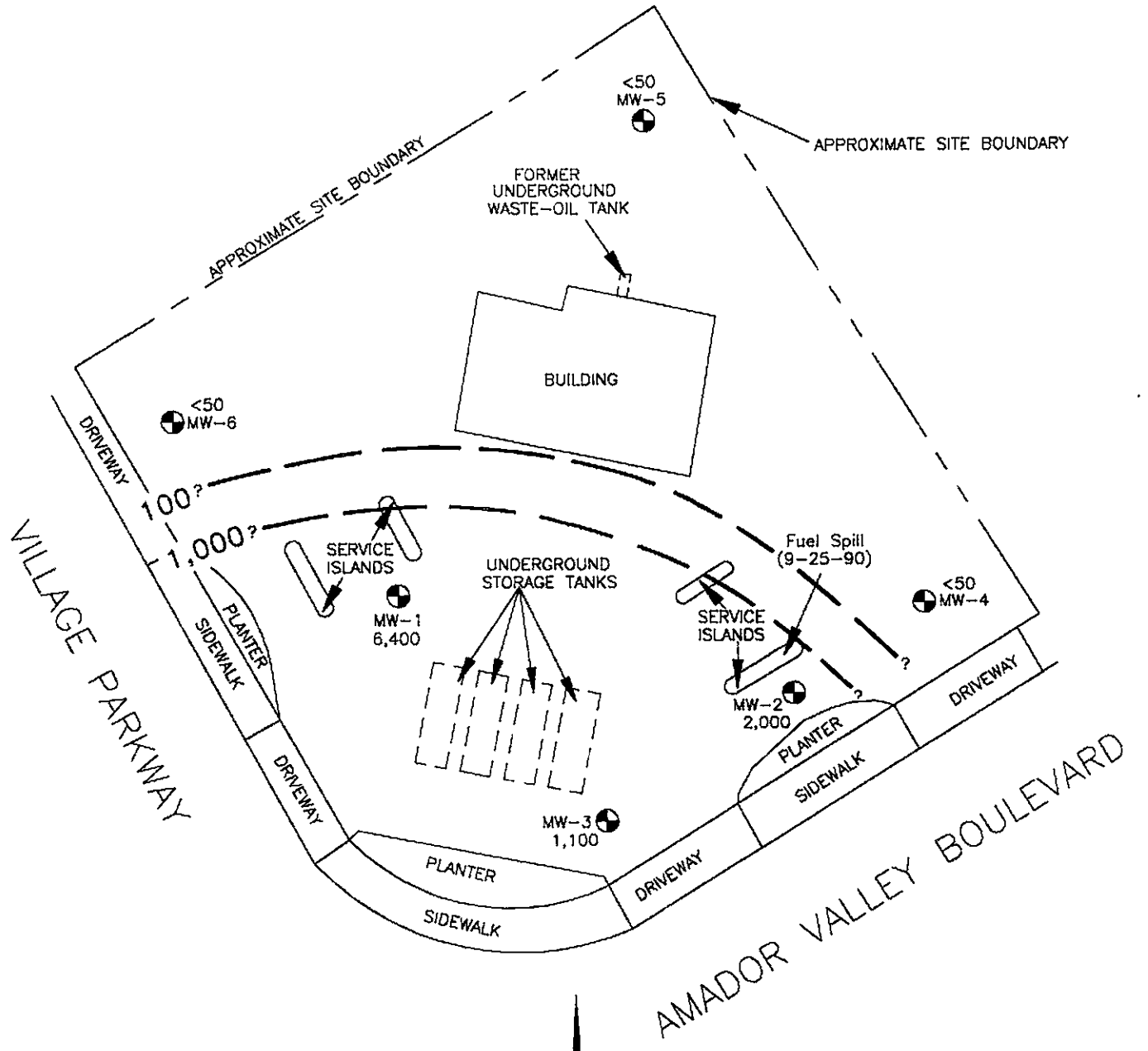
RESNA
Working to Restore Nature

PROJECT 60006.06

AREAL GROUNDWATER GRADIENT MAP
ARCO Service Station 6041
7249 Village Parkway
Dublin, California

PLATE
6

60006GT5



EXPLANATION

1,000 = Line of equal concentration of TPHg in groundwater in parts per billion (ppb)

6,400 = Concentration of TPHg in groundwater in ppb, May 10, 1993

MW-6 = Groundwater monitoring well (RESNA, September 1991 and October 1992)

TPHg = Total petroleum hydrocarbons as gasoline

N

Approximate Scale

40 20 0 40 80

feet

Source: Modified from plan supplied by ARCO.

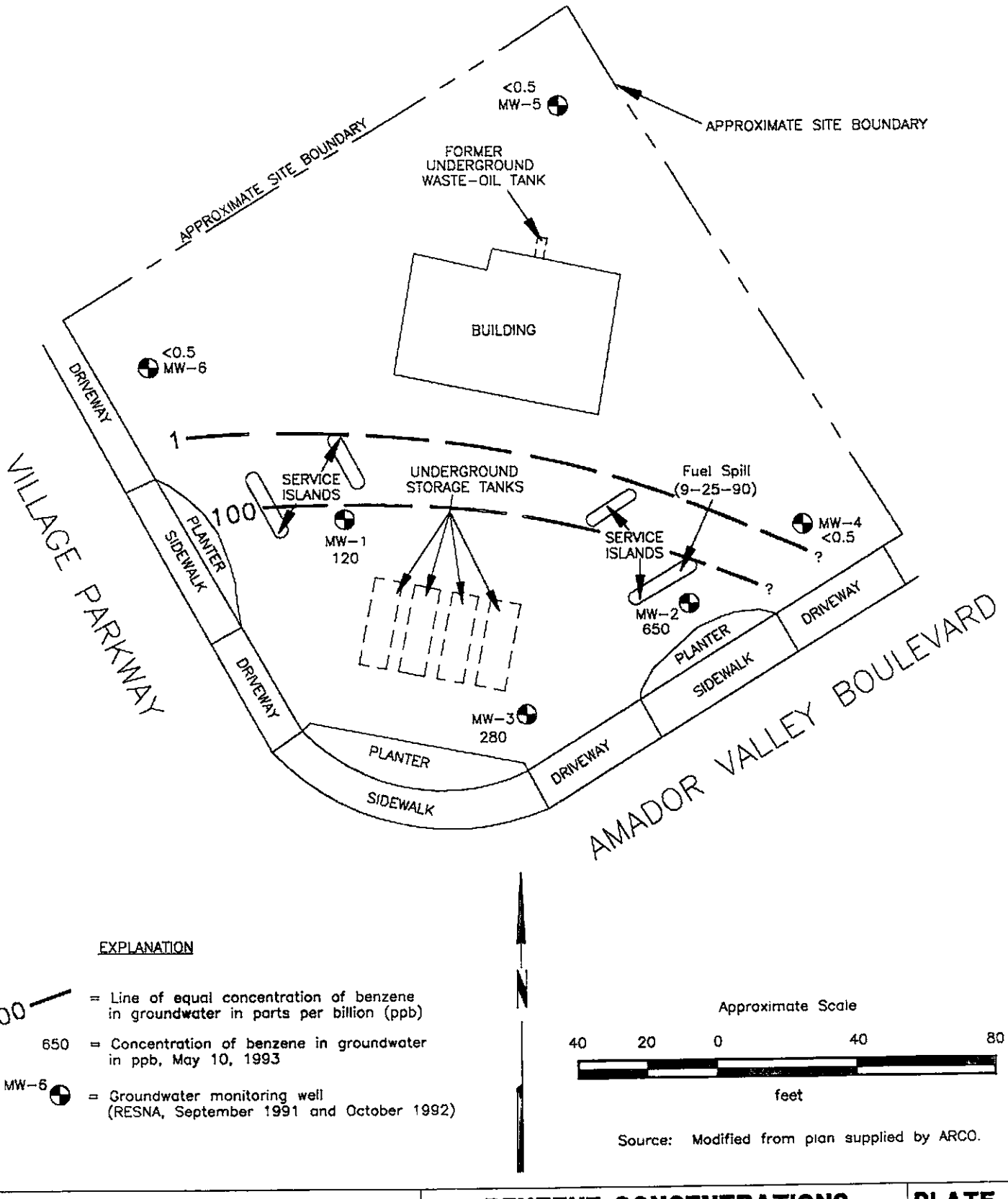
RESNA
Working to Restore Nature

PROJECT 60006.06

TPHg CONCENTRATIONS IN GROUNDWATER
ARCO Service Station 6041
7249 Village Parkway
Dublin, California

PLATE 7

60006685



EXPLANATION

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

650 = Concentration of benzene in groundwater in ppb, May 10, 1993

MW-6 = Groundwater monitoring well (RESNA, September 1991 and October 1992)

N

Approximate Scale

40 20 0 40 80

feet

Source: Modified from plan supplied by ARCO.

RESNA
Working to Restore Nature

PROJECT 60006.06

BENZENE CONCENTRATIONS IN GROUNDWATER
ARCO Service Station 6041
7249 Village Parkway
Dublin, California

PLATE 8

TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 6041
Dublin, California
(Page 1 of 3)

Date Measured	Well Elevation	Depth to Water	Water Elevation	Floating Product
MW-1				
09-20-91	336.56	11.20	325.36	None
10-22-91		11.48	325.08	None
11-27-91		11.27	325.29	None
12-16-91		11.55	325.01	None
01-18-92		11.37	325.19	None
02-21-92		9.13	327.43	None
03-16-92		9.70	326.86	None
04-24-92		10.20	326.36	None
05-15-92		10.46	326.10	None
06-09-92		10.73	325.83	None
07-28-92		11.04	325.52	None
08-24-92		11.32	325.24	None
09-09-92		11.54	325.02	None
10-26-92		11.80	324.76	None
11-10-92		11.74	324.84	None
12-14-92		10.77	325.79	None
01-15-93		8.88	327.68	None
02-10-93		9.66	326.90	None
03-29-93		8.31	328.25	None
04-27-93		9.03	328.25	None
05-10-93		9.50	327.06	None
06-18-93		10.16	326.40	None
MW-2				
09-20-91	334.80	9.22	325.58	None
10-22-91		9.66	325.14	None
11-27-91		9.48	325.32	None
12-16-91		9.76	325.04	None
01-18-92		9.47	325.33	None
02-21-92		7.62	327.18	None
03-16-92		7.84	326.96	None
04-24-92		8.34	326.46	None
05-15-92		8.62	326.18	None
06-09-92		8.88	325.92	None
07-28-92		9.38	325.42	None
08-24-92		9.81	324.99	None
09-09-92		9.92	324.88	None
10-26-92		10.13	324.67	None
11-10-92		10.12	324.68	None
12-14-92		8.99	325.81	None
01-15-93		7.20	327.60	None

See notes on Page 3 of 3

TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 6041
Dublin, California
(Page 2 of 3)

Date Measured	Well Elevation	Depth to Water	Water Elevation	Floating Product
MW-2	334.80 (Cont.)			
02-10-93		7.30	327.50	None
03-29-93		6.60	328.20	None
04-27-93		7.10	327.70	None
05-10-93		7.40	327.40	None
06-18-93		8.02	326.78	None
MW-3				
09-20-91	335.53	10.16	325.37	None
10-22-91		10.48	325.05	None
11-27-91		10.17	325.36	None
12-16-91		10.25	325.28	None
01-18-92		10.71	324.82	None
02-21-92		8.68	326.85	None
03-16-92		8.91	326.62	None
04-24-92		9.14	326.39	None
05-15-92		9.54	325.99	None
06-09-92		9.72	325.81	None
07-28-92		10.15	325.38	None
08-24-92		10.42	325.11	None
09-09-92		10.53	325.00	None
10-26-92		10.92	324.61	None
11-10-92		10.72	324.81	None
12-14-92		9.78	325.75	None
01-15-93		7.66	327.87	None
02-10-93		7.87	327.66	None
03-29-93		7.35	328.18	None
04-27-93		7.70	327.83	None
05-10-93		8.46	327.07	None
06-18-93		9.13	326.40	None
MW-4				
11-10-92	334.22	9.58	324.64	None
12-14-92		8.72	325.50	None
01-15-93		7.27	326.95	None
02-10-93		6.80	327.42	None
03-29-93		6.29	327.93	None
04-27-93		6.33	327.59	None
05-10-93		6.68	327.54	None
06-18-93		7.05	327.17	None

See notes on Page 3 of 3

RESNA
Working to Restore Nature

Quarterly Groundwater Monitoring
ARCO Station 6041, Dublin, CA

September 8, 1993
60006.06

TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 6041
Dublin, California
(Page 3 of 3)

Date Measured	Well Elevation	Depth to Water	Water Elevation	Floating Product
MW-5				
11-10-92	335.87	11.02	324.85	None
12-14-92		10.17	325.70	None
01-15-93		8.14	327.73	None
02-10-93		8.00	327.87	None
03-29-93		7.52	328.35	None
04-27-93		8.26	327.61	None
05-10-93		8.64	327.23	None
06-18-93		9.26	326.61	None
MW-6				
11-10-92	335.84	11.03	324.81	None
12-14-92		10.03	325.81	None
01-15-93		7.64	328.20	None
02-10-93		8.22	327.62	None
03-29-93		7.59	328.25	None
04-27-93		8.20	327.64	None
05-10-93		8.85	326.99	None
06-18-93		9.26	326.14	None

Measurements in feet.
Wells MW-1 through MW-3 surveyed on October 11, 1991. Wells MW-4 through MW-6 surveyed on November 12, 1992. Datum is City of Dublin = (USGS)

RESNA
Working to Restore Nature

Quarterly Groundwater Monitoring
ARCO Station 6041, Dublin, CA

September 8, 1993
60006.06

TABLE 2
CUMULATIVE GROUNDWATER MONITORING DATA
BP Station 1116, 7197 Village Parkway,
Former Shell Station, 7194 Amador Valley Boulevard,
and Unocal Station, 7375 Amador Valley Boulevard,
Dublin, California
(Page 1 of 4)

Date Measured	Well Elevation	Depth-to -Water	Water Elevation
BP Station 1116			
MW-1			
11-10-92	335.17	10.67	324.50
02-10-93		5.25	329.92
05-21-93		5.73	329.44
MW-2			
11-10-92	334.58	10.27	324.31
02-10-93		6.46	328.12
05-21-93		6.96	328.12
MW-3			
11-10-92	335.13	10.78	324.35
02-10-93		7.16	327.97
05-21-93		7.69	327.44
AW-4			
11-10-92	333.41	9.10	324.31
02-10-93		Well destroyed	
AW-5			
11-10-92	334.81	10.27	324.54
02-10-93		7.29	327.52
05-21-93		7.77	327.04
AW-6			
11-10-92	334.90	10.10	324.80
02-10-93		7.13	327.77
05-21-93		7.64	327.26
Former Shell Station			
MW-1			
11-10-92	334.83	10.04	324.79
02-10-93		7.24	327.59
05-10-93		7.78	327.05

See Notes on Page 4 of 4.

TABLE 2
GROUNDWATER MONITORING DATA
BP Station 1116, 7197 Village Parkway,
Former Shell Station, 7194 Amador Valley Boulevard,
and UNOCAL Station, 7375 Amador Valley Boulevard,
Dublin, California
(Page 2 of 4)

Date Measured	Well Elevation	Depth-to -Water	Water Elevation
Former Shell Station cont.			
MW-2			
11-10-92	336.96	12.05	324.91
02-10-93		9.28	327.68
05-10-93		9.65	327.31
MW-3			
11-10-92	338.93	11.84	327.09
02-10-93		8.82	330.11
05-10-93		10.88	328.05
MW-4			
11-10-92	337.14	12.12	325.02
02-10-93		9.40	327.74
05-10-93		9.54	327.60
MW-5			
11-10-92	334.96	9.65	325.31
02-10-93		7.97	326.99
05-10-93		---	---
MW-6			
11-10-92	335.42	10.56	324.86
02-10-93		7.65	327.77
05-10-93		8.10	327.32
MW-7			
11-10-92	333.23	8.82	324.41
02-10-93		6.06	327.17
05-10-93		6.68	326.55

See Notes on Page 4 of 4.

TABLE 2
GROUNDWATER MONITORING DATA
BP Station 1116, 7197 Village Parkway,
Former Shell Station, 7194 Amador Valley Boulevard,
and UNOCAL Station, 7375 Amador Valley Boulevard,
Dublin, California
(Page 3 of 4)

Date Measured	Well Elevation	Depth-to -Water	Water Elevation
Former Shell Station cont.			
MW-8			
11-10-92	335.80	10.41	325.39
02-10-93		7.35	328.45
05-10-93		8.00	327.80
MW-9			
11-10-92	334.57	9.61	324.96
02-10-93		7.20	327.37
05-10-93		7.56	327.01
MW-11			
11-10-92	334.20	9.47	324.73
02-10-93		6.79	327.41
05-10-93		7.18	327.02
MW-12			
11-10-92	332.53	8.32	324.31
02-10-93		6.75	325.78
05-10-93		---	---
MW-13			
11-10-92	335.64	10.69	324.95
02-10-93		7.49	328.15
05-10-93		8.06	327.58
UNOCAL Station			
MW-1			
11-10-92	336.72	11.97	324.75
02-10-93		8.63	328.09
05-10-93		9.57	327.15

See Notes on Page 4 of 4.

TABLE 2
GROUNDWATER MONITORING DATA
BP Station 1116, 7197 Village Parkway,
Former Shell Station, 7194 Amador Valley Boulevard,
and UNOCAL Station, 7375 Amador Valley Boulevard,
Dublin, California
(Page 4 of 4)

Date Measured	Well Elevation	Depth-to -Water	Water Elevation
UNOCAL Station cont.			
MW-2			
11-10-92	337.36	12.15	325.21
02-10-93		8.81	328.55
05-10-93		9.75	327.61
MW-3			
11-10-92	337.53	12.33	325.20
02-10-93		8.95	328.58
05-10-93		9.91	327.62
MW-4			
11-10-92	337.00	12.32	324.68
02-10-93		8.94	328.06
05-10-93		9.90	327.10

Measurements in feet.
Depth-to-water and wellhead elevation data obtained from Alisto Engineering Group.
Datum is City of Dublin = (USGS)
--- = No data available.

RESNA
Working to Restore Nature

Quarterly Groundwater Monitoring
ARCO Station 6041, Dublin, CA

September 8, 1993
60006.06

TABLE 3
CUMULATIVE RESULTS OF LABORATORY ANALYSES
OF GROUNDWATER SAMPLES
ARCO Station 6041
Dublin, California
(Page 1 of 2)

ppb

Well Date	TPHg	Benzene	Toluene	Ethyl- Benzene	Total Xylenes
MW-1					
09-20-91	410	28	36	4.3	89
12-16-91	840	50	50	3.9	12
03-16-92	780	22	12	45	22
06-09-92	700	8.8	15	16	18
09-09-92	400	5.4	8.4	4.6	6.7
11-10-92	2,800	93	56	190	390
02-10-93	9,700	180	100	450	740
05-10-93	6,400	120	12	410	300
MW-2					
09-20-91	130	6.6	0.96	1.4	1.5
12-16-91	83	0.96	<0.30	<0.30	<0.30
03-16-92	430	130	<2.5*	37	5.0
06-09-92	120	3.7	<0.5	5.7	<0.5
09-09-92	<50	<0.5	<0.5	<0.5	<0.5
11-10-92	<50	<0.5	<0.5	<0.5	<0.5
02-10-93	740	110	<5*	35	<5*
05-10-93	2,000	650	14	86	28
MW-3					
09-20-91	990	50	100	11	200
12-16-91	1,000	180	5.1	23	4.3
03-16-92	430	86	<1.0*	22	3.4
06-09-92	1,800	290	2.4	49	17
09-09-92	2,600	550	<5*	120	12
11-10-92	1,100	280	<5*	100	<5*
02-10-93	980	190	<5*	52	<5*
05-10-93	1,100	280	<2.5*	70	<2.5*
MW-4					
11-10-92	<50	<0.5	<0.5	<0.5	<0.5
02-10-93	<50	<0.5	<0.5	<0.5	<0.5
05-10-93	<50	<0.5	<0.5	<0.5	<0.5
MW-5					
11-10-92	<50	<0.5	<0.5	<0.5	<0.5
02-10-93	<50	<0.5	<0.5	<0.5	<0.5
05-10-93	<50	<0.5	<0.5	<0.5	<0.5

See notes on Page 2 of 2

TABLE 3
CUMULATIVE RESULTS OF LABORATORY ANALYSES
OF GROUNDWATER SAMPLES
ARCO Station 6041
Dublin, California
(Page 2 of 2)

Well Date	TPHg	Benzene	Toluene	Ethyl- Benzene	Total Xylenes
MW-6					
11-10-92	<50	<0.5	<0.5	<0.5	<0.5
02-10-93	<50	<0.5	<0.5	<0.5	<0.5
05-10-93	<50	<0.5	<0.5	<0.5	<0.5
MCL	---	1	---	680	1,750
DWAL	---	---	100	---	---

Results in parts per billion (ppb)
Benzene, toluene, ethylbenzene, and total xylenes analyzed by EPA Method 5030/8020/DHS LUFT Methods.
TPHg: Total petroleum hydrocarbons as gasoline (analyzed by EPA Method 5030/8020/DHS LUFT Methods).
MCL: Maximum contaminant level in drinking water (DHS, October 1990)
DWAL: Department of Health Services Recommended Drinking Water Action Level (DHS, October 1990).
*: Raised method reporting limit due to high analyte concentration requiring sample dilution, as reported by Columbia Analytical Services, Inc.

APPENDIX A

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

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

Date May 4, 1993
Project 0G70-035.01

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 1993 monthly water level survey, ARCO
	station 6041, 7249 Village Parkway, Dublin, 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 PROFESSIONAL ENGINEER
ROBERT CURTIS PORTER
No: 4094
EXP. 6/30/96
INDUSTRIAL
STATE OF CALIFORNIA

Jim Butera JB

Robert Porter

Robert Porter, Senior Project Engineer.

FIELD REPORT
DEPTH TO WATER / FLOATING PRODUCT SURVEY

PROJECT # : 0G70-035.01 STATION ADDRESS : 7249 Village Parkway, Dublin, CA DATE : 4/27/93

ARCO STATION # : 6041 FIELD TECHNICIAN : J. BOTERA DAY : TUESDAY

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	EW*	OK	3259	yes	6.33	6.33	ND	ND	14.5	—
2	MW-5	OK	EW	ok	3259	yes	8.26	8.26	ND	ND	17.5	—
3	MW-6	OK	EW	ok	3259	Yes	8.20	8.20	ND	ND	15.8	some water in BOX.
4	MW-2	OK	EW	OK	3416	Yes	7.10	7.10	ND	ND	14.1	—
5	MW-3	OK	EW	OK	3259	Broken	7.70	7.70	ND	ND	14.7	REPLACED LWC 4"
6	MW-1	OK	EW	OK	3259	Broken	9.03	9.03	ND	ND	17.6	REPLACED LWC 4"
												*EMCO WHEATON BOX

SURVEY POINTS ARE TOP OF WELL CASINGS

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

Date May 27, 1993
Project 0G70-035.01

To:
Ms. Erin McLucas
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
6	Water Sample Field Data Sheets

For your: X Information Sent by: X Mail

Comments:

Enclosed are the data from the second quarter 1993 monitoring event at ARCO service station 6041, 7249 Village Parkway, Dublin, California. Groundwater monitoring is conducted consistent with applicable regulatory guidelines. Please call if you have any questions: (408) 453-2266.

Jim Butera

Reviewed by

Robert Porter, Senior Project Engineer.

FIELD REPORT
DEPTH TO WATER / FLOATING PRODUCT SURVEY

PROJECT # : 0G70-035.01 STATION ADDRESS : 7249 Village Parkway, Dublin, CA DATE : 5-10-93

ARCO STATION # : 6041 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-4	good	yes	good	3259	good	6.68	6.68	ND	NR	14.5	—
2	MW-5	good	yes	good	3259	good	8.64	8.64	ND	NR	17.4	—
3	MW-6	good	yes	good	3259	good	8.85	8.85	ND	NR	15.8	well box seal has starting to crack
4	MW-2	good	yes	good	3259	good	7.40	7.40	ND	NR	14.1	water in box
5	MW-3	good	yes	good	3259	good	8.46	8.46	ND	NR	14.7	—
6	MW-1	good	yes	good	3259	good	9.50	9.50	ND	NR	17.5	—

SURVEY POINTS ARE TOP OF WELL CASINGS

Summary of Groundwater Monitoring Data
Second Quarter 1993
ARCO Service Station 6041
7249 Village Parkway, Dublin, 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(17)	05/10/93	9.50	ND.[2]	6,400.	120.	12.	410.	300.
MW-2(14)	05/10/93	7.40	ND.	2,000.	650.	14.	86.	28.
MW-3(14)	05/10/93	8.46	ND.	1,100.	280.	<2.5	70.	<2.5
MW-4(14)	05/10/93	6.68	ND.	<50.	<0.5	<0.5	<0.5	<0.5
MW-5(17)	05/10/93	8.64	ND.	<50.	<0.5	<0.5	<0.5	<0.5
MW-6(15)	05/10/93	8.85	ND.	<50.	<0.5	<0.5	<0.5	<0.5
FB-1[3]	05/10/93	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

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

Date June 21, 1993
Project 0G70-035.01

To:
Mr. John Young
RESNA
3315 Almaden Expressway, Suite 34
San Jose, California 95118

We are enclosing:

Copies	Description
1	Depth To Water/Floating Product Survey Results
	June 1993 monthly water level survey, ARCO
	station 6041, 7249 Village Parkway, Dublin, 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.

Jim Butera JB

Reviewed by:

Robert Porter, Senior Project Engineer.

FIELD REPORT
DEPTH TO WATER / FLOATING PRODUCT SURVEY

PROJECT # : 0G70-035.01 STATION ADDRESS : 7249 Village Parkway, Dublin, CA DATE : FRI

ARCO STATION # : 6041 FIELD TECHNICIAN : J Williams DAY : 6-18-93

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	7.05	7.05	ND	ND	14.6	—
2	MW-5	OK	YES	OK	3259	OK	9.26	9.26	ND	ND	17.5	—
3	MW-6	BAD	YES	OK	3259	OK	9.26	9.26	ND	ND	16.8	—
4	MW-3	OK	YES	OK	3259	OK	9.13	9.13	ND	ND	14.7	—
5	MW-2	~~OK~~	YES	OK	~~3259~~ 3616	OK	8.02	8.02	ND	ND	14.1	BAD SEAL
6	MW-1	OK	YES	OK	3259	OK	10.16	10.16	ND	ND	17.5	—

SURVEY POINTS ARE TOP OF WELL CASINGS

Columbia Analytical Services INC.

May 24, 1993

Service Request No. SJ93-0643

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

Re: **EMCON Project No. 0G70-035.01**
ARCO Facility No. 6041

Dear Mr. Butera:

Attached are the results of the water samples submitted to our lab on May 10, 1993. For your reference, these analyses have been assigned our service request number SJ93-0643.

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/ajb

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Associates	**Date Received:**	05/10/93
Project:	EMCON Project No. 0G70-035.01	**Service Request No.:**	SJ93-0643
	ARCO Facility No. 6041	**Sample Matrix:**	Water

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

Sample Name:		MW-1 (17)	MW-2 (14)	MW-3 (14)
Date Analyzed:		05/18/93	05/19/93	05/18/93
Analyte	**MRL**			
Benzene	0.5	120.	650.	280.
Toluene	0.5	12.	14.	<2.5 *
Ethylbenzene	0.5	410.	86.	70.
Total Xylenes	0.5	300.	28.	<2.5 *
TPH as Gasoline	50	6,400.	2,000.	1,100.

TPH Total Petroleum Hydrocarbons
MRL Method Reporting Limit
* Raised MRL due to high analyte concentration requiring sample dilution.

Approved by: Keen A Murphy Date: May 24, 1993

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: EMCON Associates
Project: EMCON Project No. 0G70-035.01
ARCO Facility No. 6041

Date Received: 05/10/93
Service Request No.: SJ93-0643
Sample Matrix: Water

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

Sample Name:		MW-4 (14)	MW-5 (17)	MW-6 (15)
Date Analyzed:		05/18/93	05/18/93	05/18/93 *
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
* This sample was part of the analytical batch started on May 18, 1993. However, it was analyzed after midnight so the actual date analyzed is May 19, 1993.

Approved by: Keenan Murphy Date: May 24, 1993

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Associates	**Date Received:**	05/10/93
Project:	EMCON Project No. 0G70-035.01	**Service Request No.:**	SJ93-0643
	ARCO Facility No. 6041	**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:		05/18/93 *	05/18/93	05/19/93
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
* This sample was part of the analytical batch started on May 18, 1993. However, it was analyzed after midnight so the actual date analyzed is May 19, 1993.

Approved by: Kenneth Murphy Date: May 24, 1993

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON Associates
Project: EMCON Project No. 0G70-035.01
ARCO Facility No. 6041

Date Received: 05/10/93
Service Request No.: SJ93-0643

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

Date Analyzed: 05/18/93

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Criteria
Benzene	25.	23.4	94.	85-115
Toluene	25.	24.4	98.	85-115
Ethylbenzene	25.	23.4	94.	85-115
Total Xylenes	75.	71.1	95.	85-115
TPH as Gasoline	250.	245.	98.	90-110

TPH Total Petroleum Hydrocarbons

Approved by: Kevin Murphy Date: May 24, 1993

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON Associates	Date Received:	05/10/93
Project:	EMCON Project No. 0G70-035.01	Service Request No.:	SJ93-0643
	ARCO Facility No. 6041	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 (17)	05/18/93	93.
MW-2 (14)	05/19/93	92.
MW-3 (14)	05/18/93	92.
MW-4 (14)	05/18/93	89.
MW-5 (17)	05/18/93	92.
MW-6 (15)	05/18/93	92.
FB-1	05/18/93	92.
MS	05/18/93	97.
DMS	05/18/93	97.
Method Blank	05/18/93	85.
Method Blank	05/19/93	89.
CAS Acceptance Criteria		70-130

TPH Total Petroleum Hydrocarbons

Approved by: Keon A Murphy Date: May 24, 1993

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON Associates	**Date Received:**	05/10/93
Project:	EMCON Project No. 0G70-035.01	**Service Request No.:**	SJ93-0643
	ARCO Facility No. 6041	**Sample Matrix:**	Water

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

Date Analyzed: 05/18/93

			Spike Result		Percent Recovery		
Analyte	Spike Level	Sample Result	MS	DMS	MS	DMS	CAS Acceptance Criteria
TPH as Gasoline	250.	ND	257.	238.	103.	95.	76-130

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

Approved by: Karen A Murphy Date: May 24, 1993

ARCO Products Company
Division of AtlanticRichfieldCompany

Chain of Custody

Task Order No. EMC-93-5

ARCO Facility no. 6041	City (Facility) DUBLIN	Project manager (Consultant) JIM BUTERA	Laboratory name CAS
ARCO engineer KYLE CHRISTIE	Telephone no. (ARCO) 571-2434	Telephone no. (Consultant) 453-0719	Fax no. (Consultant) 453-0457
Consultant name EMCON ASSOCIATES	Address (Consultant) 1933 JUNCTION AVENUE SAN JOSE		Contract number 07077

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 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 ☐ Sem. VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐		
MW-1(17')	1-2	2		X		X	HCl	5-10-93	1505		X											
MW-2(14')	3-4	2		↓		↓	↓		1402		X											
MW-3(14')	5-6	2							1438		X											
MW-4(14')	7-8	2							1228		X											
MW-5(17')	9-10	2							1257		X											
MW-6(15')	11-12	2							1330		X											
EB-1	13-14	2		↓		↓	↓	↓	1505		X											

Special detection Limit/reporting: LOWEST POSSIBLE

Special QA/QC: AS NORMAL

Remarks: 2-40 ml HCl VOA's

0670-035.01

KAD

Lab number: SJ93-0644 3

Condition of sample: OK

Temperature received: 0001

Relinquished by sampler	Date 5-10-93	Time 1600	Received by Kevin Howard
Relinquished by	Date	Time	Received by
Relinquished by	Date	Time	Received by laboratory: Date 5-10-93 Time 1600

Turnaround time

- Priority Rush 1 Business Day [ ]
- Rush 2 Business Days [ ]
- Expedited 5 Business Days [ ]
- Standard 10 Business Days [X]

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

Rev. 2, 5/91

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 0870-035-01 SAMPLE ID: MW-1

PURGED BY: M Gallegos CLIENT NAME: ARCO #6041

SAMPLED BY: M Gallegos LOCATION: Dublin, 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.): 5.22

DEPTH TO WATER (feet): 9.51 CALCULATED PURGE (gal.): 15.66

DEPTH OF WELL (feet): 17.5 ACTUAL PURGE VOL (gal.): 6.5

DATE PURGED: 5-10-93 Start (2400 Hr) 1453 End (2400 Hr) 1459

DATE SAMPLED: 5-10-93 Start (2400 Hr) 1502 End (2400 Hr) 1505

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1456	5.0	7.10	3130	73.4	Cloudy	heavy
1505	recharge	6.61	3060	70.9	"	"

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

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

PURGING EQUIPMENT

___ 2" Bladder Pump ___ Bailer (Teflon®)

___ Centrifugal Pump X Bailer (PVC)

___ Submersible Pump ___ Bailer (Stainless Steel)

___ Well Wizard™ ___ Dedicated

Other: ___

SAMPLING EQUIPMENT

___ 2" Bladder Pump X Bailer (Teflon®)

___ DDL Sampler ___ Bailer (Stainless Steel)

___ Dipper ___ Submersible Pump

___ Well Wizard™ ___ Dedicated

Other: ___

WELL INTEGRITY: Good LOCK #: 3259

REMARKS: Well Dried at 6.5 gallons

Sheen on top of water.

All Samples taken

Meter Calibration: Date: 5-10-93 Time: ___ Meter Serial #: 41972 Temperature °F: ___

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

Location of previous calibration: MW-4

Signature: [signature] Reviewed By: [signature] Page 1 of 1

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 0670-035.01 SAMPLE ID: MW-2

PURGED BY: M Gallegos CLIENT NAME: ARCO # 6041

SAMPLED BY: M Gallegos LOCATION: Dublin, 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): N.R. VOLUME IN CASING (gal.): 4.37

DEPTH TO WATER (feet): 7.40 CALCULATED PURGE (gal.): 13.13

DEPTH OF WELL (feet): 14.1 ACTUAL PURGE VOL. (gal.): 13.5

DATE PURGED: 5-10-93 Start (2400 Hr) 1345 End (2400 Hr) 1355

DATE SAMPLED: 5-10-93 Start (2400 Hr) 1359 End (2400 Hr) 1402

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1348	4.5	7.70	2620	72.9	Cloudy	heavy
1352	9.0	6.85	3210	70.7	grey	heavy
1355	13.5	6.78	3290	70.1	"	"

D. O. (ppm): N.R. ODOR: ~~None~~ Slight. N.R. (COBALT 0 - 100) N.R. (NTU 0 - 200)

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

PURGING EQUIPMENT

___ 2" Bladder Pump ___ Bailer (Teflon®)

___ Centrifugal Pump X Bailer (PVC)

___ Submersible Pump ___ Bailer (Stainless Steel)

___ Well Wizard™ ___ Dedicated

Other: ___

SAMPLING EQUIPMENT

___ 2" Bladder Pump X Bailer (Teflon®)

___ DDL Sampler ___ Bailer (Stainless Steel)

___ Dipper ___ Submersible Pump

___ Well Wizard™ ___ Dedicated

Other: ___

WELL INTEGRITY: Good LOCK #: 3259

REMARKS: All samples taken

Meter Calibration: Date: 5-10-93 Time: ___ Meter Serial #: 4972 Temperature °F: ___

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

Location of previous calibration: MW-4

Signature: M Gallegos Reviewed By: JB Page 2 of 6

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 0670-035.01 SAMPLE ID: MW-3

PURGED BY: M. Gallegos CLIENT NAME: ARCO #6041

SAMPLED BY: M. Gallegos LOCATION: Dublin, CA.

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

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

CASING ELEVATION (feet/MSL):	NR	VOLUME IN CASING (gal.):	4.07
DEPTH TO WATER (feet):	8.46	CALCULATED PURGE (gal.):	12.23
DEPTH OF WELL (feet):	14.7	ACTUAL PURGE VOL (gal.):	5.0

DATE PURGED: 5-10-93 Start (2400 Hr) 1426 End (2400 Hr) 1430

DATE SAMPLED: 5-10-93 Start (2400 Hr) 1435 End (2400 Hr) 1438

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1428	4.0	7.41	2370	75.4	Cloudy	heavy
1438	recharg.	7.23	2230	73.4	"	"

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

___ 2" Bladder Pump
___ Centrifugal Pump
___ Submersible Pump
___ Well Wizard™
___ Bailer (Teflon®)
X Bailer (PVC)
___ Bailer (Stainless Steel)
___ Dedicated
Other: ___

SAMPLING EQUIPMENT

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

WELL INTEGRITY: Good LOCK #: 3259

REMARKS: Well Dried Aft. 5.0 gallons

All Samples taken.

Meter Calibration: Date: 5-10-93 Time: ___ Meter Serial #: 4972 Temperature °F: ___

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

Location of previous calibration: MW-4

Signature: M. Gallegos Reviewed By: JB

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 0670-035.01 SAMPLE ID: MW-4

PURGED BY: M. Gallegos CLIENT NAME: ARCO #6041

SAMPLED BY: M. Gallegos LOCATION: Dublin, 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.): 5.10

DEPTH TO WATER (feet): 6.68 CALCULATED PURGE (gal.): 15.32

DEPTH OF WELL (feet): 14.5 ACTUAL PURGE VOL. (gal.): 15.5

DATE PURGED: 5-10-93 Start (2400 Hr) 1212 End (2400 Hr) 1221

DATE SAMPLED: 5-10-93 Start (2400 Hr) 1226 End (2400 Hr) 1228

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1214	5.0	7.50	5410	69.7	Cloudy	heavy
1218	10.0	7.09	5520	68.7	"	"
1221	15.5	7.00	5450	68.3	Brn	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

___ 2" Bladder Pump
___ Centrifugal Pump
___ Submersible Pump
___ Well Wizard™
___ Bailer (Teflon®)
X Bailer (PVC)
___ Bailer (Stainless Steel)
___ Dedicated
Other: ___

SAMPLING EQUIPMENT

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

WELL INTEGRITY: Good LOCK #: 3259

REMARKS: All Samples Taken

Meter Calibration: Date: 5-10-93 Time: 1210 Meter Serial #: 4972 Temperature °F: 79.3

(EC 1000 1062/1000) (DI ___) (pH 7 6.85/7.00) (pH 10 10.05/10.00) (pH 4 3.99 ___)

Location of previous calibration: ___

Signature: [signature] Reviewed By: JB Page 4 of 6

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 0670-035-01 SAMPLE ID: MW-5

PURGED BY: M. Gallegos CLIENT NAME: ARCO # 6041

SAMPLED BY: M. Gallegos LOCATION: Dublin, 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.):	5.72
DEPTH TO WATER (feet):	8.64	CALCULATED PURGE (gal.):	17.16
DEPTH OF WELL (feet):	17.4	ACTUAL PURGE VOL (gal.):	15.0

DATE PURGED: 5-10-93 Start (2400 Hr) 1243 End (2400 Hr) 1252

DATE SAMPLED: 5-10-93 Start (2400 Hr) 1255 End (2400 Hr) 1257

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1246	6.0	7.55	4340	70.3	cloudy	heavy
1249	12.0	7.11	4310	69.5	cloudy	heavy
1255	recharge	7.10	4310	69.5	"	"

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

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

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

PURGING EQUIPMENT

___ 2" Bladder Pump
___ Centrifugal Pump
___ Submersible Pump
___ Well Wizard™
___ Bailer (Teflon®)
X Bailer (PVC)
___ Bailer (Stainless Steel)
___ Dedicated
Other: ___

SAMPLING EQUIPMENT

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

WELL INTEGRITY: Good LOCK #: 3259

REMARKS: well dried at 15.0 gallons

All samples taken

Meter Calibration: Date: 5-10-93 Time: ___ Meter Serial #: 4972 Temperature °F: ___

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

Location of previous calibration: MW-4

Signature: M. Gallegos Reviewed By: ___ Page 5 of 6

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 2670-035.01 SAMPLE ID: MW-6

PURGED BY: M. Gallegos CLIENT NAME: ARCO # 6041

SAMPLED BY: M. Gallegos LOCATION: Dublin, CA.

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

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

CASING ELEVATION (feet/MSL):	NR	VOLUME IN CASING (gal.):	4.54
DEPTH TO WATER (feet):	8.85	CALCULATED PURGE (gal.):	13.62
DEPTH OF WELL (feet):	15.8	ACTUAL PURGE VOL. (gal.):	14.0

DATE PURGED: 5-10-93 Start (2400 Hr) 1315 End (2400 Hr) 1324

DATE SAMPLED: 5-10-93 Start (2400 Hr) 1328 End (2400 Hr) 1330

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1318	5.0	7.58	6320	75.2	BRN	HEAVY
1321	10.0	7.02	6190	72.1	"	"
1324	14.0	6.94	6180	71.2	"	"

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): NR

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
___ Centrifugal Pump	X 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: 5-10-93 Time: ___ Meter Serial #: 4/972 Temperature °F: ___

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

Location of previous calibration: MW-4

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

KEI-P88-0205.QR20
June 30, 1993

TABLE 1

SUMMARY OF MONITORING DATA

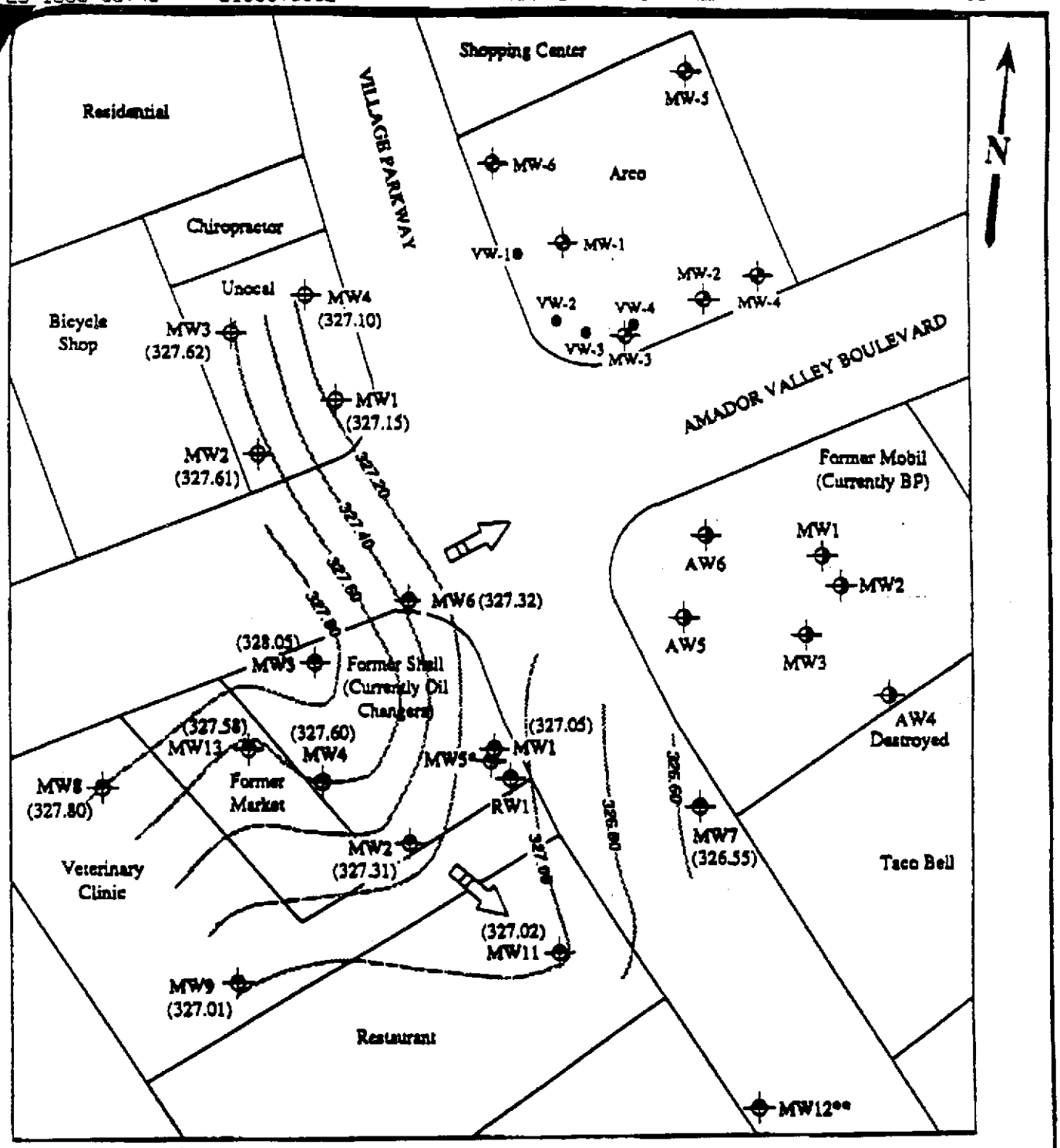
Well No.	Ground Water Elevation (feet)	Depth to Water (feet)	Product Thickness (feet)	Sheen	Water Purged (gallons)
(Monitored and Sampled on May 10, 1993)					
MW1	327.15	9.57	0	No	10
MW2*	327.61	9.75	0	--	0
MW3*	327.62	9.91	0	--	0
MW4*	327.10	9.90	0	--	0

Well #	Well Cover Elevation** (feet)
MW1	336.72
MW2	337.36
MW3	337.53
MW4	337.00

-- Sheen determination was not performed.

* Monitored only.

** The elevations of the tops of the well covers have been surveyed relative to Mean Sea Level (MSL), per a County of Alameda Benchmark (elevation = 337.40 MSL).



LEGEND

- Monitoring well (Unocal)
- Monitoring well (BP)
- Monitoring well (Shell)
- Monitoring well (Arco)
- Vapor extraction well (Arco)
- ( ) Ground water elevation in feet above Mean Sea Level
- Contours of ground water elevation
- Direction of ground water flow
- * Ground water elevation not used for contours (well screened across deeper aquifer).
- ** Well was inaccessable

POTENTIOMETRIC SURFACE MAP FOR THE MAY 10, 1993 JOINT MONITORING EVENT

KAPREALIAN ENGINEERING

UNOCAL SERVICE STATION #5366
7375 AMADOR VALLEY BLVD.
DUBLIN, CA

FIGURE
1

TABLE 1 - SUMMARY OF RESULTS OF GROUNDWATER SAMPLING
BP OIL COMPANY SERVICE STATION NO. 11116
7197 VILLAGE PARKWAY, DUBLIN, CALIFORNIA

ALISTO PROJECT NO. 10-017

WELL ID	DATE OF SAMPLING/ MONITORING	CASING ELEVATION (a)	DEPTH TO WATER (Feet)	GROUNDWATER ELEVATION (b) (Feet)
MW-1	10/12/90	335.17	9.92	325.25
MW-1	11/15/90	335.17	10.16	325.01
MW-1	12/11/90	335.17	9.97	325.20
MW-1	02/15/91	335.17	9.89	325.28
MW-1	05/14/91	335.17	8.43	326.74
MW-1	08/23/91	335.17	9.98	325.19
MW-1	11/13/91	335.17	10.09	325.09
MW-1	02/25/92	335.17	8.28	326.89
MW-1	04/15/92	335.17	8.50	326.67
MW-1	08/03/92	335.17	9.06	326.11
MW-1	08/12/92	335.17	10.01	325.16
MW-1	11/10/92	335.17	10.67	324.50
MW-1	02/10/93	335.17	5.25	329.92
MW-1	05/21/93	335.17	5.73	329.44
MW-2	10/12/90	334.58	9.60	324.98
MW-2	11/15/90	334.58	9.68	324.90
MW-2	12/11/90	334.58	9.47	325.11
MW-2	02/15/91	334.58	9.28	325.30
MW-2	05/14/91	334.58	7.74	326.84
MW-2	08/23/91	334.58	9.81	324.77
MW-2	11/13/91	334.58	9.73	324.85
MW-2	02/25/92	334.58	7.55	327.03
MW-2	04/15/92	334.58	8.00	326.58
MW-2	08/03/92	334.58	8.56	326.02
MW-2	08/12/92	334.58	9.62	324.96
MW-2	11/10/92	334.58	10.27	324.31
MW-2	02/10/93	334.58	6.46	328.12
MW-2	05/21/93	334.58	6.96	327.62

TABLE 1 - SUMMARY OF RESULTS OF GROUNDWATER SAMPLING
BP OIL COMPANY SERVICE STATION NO. 11116
7197 VILLAGE PARKWAY, DUBLIN, CALIFORNIA

ALISTO PROJECT NO. 10-017

WELL ID		DATE OF SAMPLING/ MONITORING	CASING ELEVATION (a)	DEPTH TO WATER (Feet)	GROUNDWATER ELEVATION (b) (Feet)
MW-3		10/12/90	335.13	10.08	325.05
MW-3		11/15/90	335.13	10.12	325.01
MW-3		12/11/90	335.13	9.92	325.21
MW-3		02/15/90	335.13	9.84	325.29
MW-3		05/14/91	335.13	8.40	326.73
MW-3		08/23/91	335.13	10.27	324.86
MW-3		11/13/91	335.13	10.27	324.86
MW-3		02/25/92	335.13	8.15	326.98
MW-3		04/15/92	335.13	8.63	326.50
MW-3		06/03/92	335.13	9.18	325.95
MW-3		08/12/92	335.13	10.18	324.95
MW-3		11/10/92	335.13	10.78	324.35
MW-3		02/10/93	335.13	7.16	327.97
MW-3		05/21/93	335.13	7.69	327.44
AW-4		11/15/90	333.41	8.51	324.90
AW-4		12/11/90	333.41	9.19	324.22
AW-4		02/15/91	333.41	8.32	325.09
AW-4		05/14/91	333.41	6.97	326.44
AW-4		08/23/91	333.41	8.59	324.82
AW-4		11/13/91	333.41	8.57	324.84
AW-4		02/25/92	333.41	6.26	327.15
AW-4		04/15/92	333.41	7.05	326.36
AW-4		06/03/92	333.41	7.41	326.00
AW-4		08/12/92	333.41	8.45	324.96
AW-4		11/10/92	333.41	9.10	324.31
AW-4	(e)	02/10/93	333.41	—	—
AW-4	(e)	05/21/93	333.41	—	—

TABLE 1 - SUMMARY OF RESULTS OF GROUNDWATER SAMPLING
BP OIL COMPANY SERVICE STATION NO. 11116
7197 VILLAGE PARKWAY, DUBLIN, CALIFORNIA

ALISTO PROJECT NO. 10-017

WELL ID	DATE OF SAMPLING/ MONITORING	CASING ELEVATION (a)	DEPTH TO WATER (Feet)	GROUNDWATER ELEVATION (b) (Feet)
AW-5	11/15/90	334.81	9.67	325.14
AW-5	12/11/90	334.81	9.44	325.37
AW-5	02/15/91	334.81	10.00	324.81
AW-5	05/14/91	334.81	8.64	326.17
AW-5	08/23/91	334.81	9.58	325.23
AW-5	11/13/91	334.81	9.80	325.01
AW-5	02/25/92	334.81	7.89	326.92
AW-5	04/15/92	334.81	8.54	326.27
AW-5	08/03/92	334.81	8.97	325.84
AW-5	08/12/92	334.81	9.73	325.08
AW-5	11/10/92	334.81	10.27	324.54
QC-1 (f)	11/10/92	—	—	—
AW-5	02/10/93	334.81	7.29	327.52
AW-5	05/21/93	334.81	7.77	327.04
AW-6	11/15/90	334.90	9.58	325.32
AW-6	12/11/90	334.90	9.58	325.32
AW-6	02/15/91	334.90	9.66	325.24
AW-6	05/14/91	334.90	8.38	326.52
AW-6	08/23/91	334.90	9.61	325.29
AW-6	11/13/91	334.90	9.58	325.32
AW-6	02/25/92	334.90	8.00	326.90
AW-6	03/05/92	334.90	7.58	327.32
AW-6	04/15/92	334.90	8.33	326.57
AW-6	08/03/92	334.90	8.91	325.99
AW-6	08/12/92	334.90	9.61	325.29
AW-6	11/10/92	334.90	10.10	324.80
AW-6	02/10/93	334.90	7.13	327.77
QC-1 (f)	02/10/93	—	—	—
AW-6	05/21/93	334.90	7.64	327.26
QC-1 (f)	05/21/93	—	—	—

TABLE 1 - SUMMARY OF RESULTS OF GROUNDWATER SAMPLING
BP OIL COMPANY SERVICE STATION NO. 11116
7197 VILLAGE PARKWAY, DUBLIN, CALIFORNIA

ALISTO PROJECT NO. 10-017

WELL ID	DATE OF SAMPLING/ MONITORING	CASING ELEVATION (a)	DEPTH TO WATER (Feet)	GROUNDWATER ELEVATION (b) (Feet)
QC-2 (g)	11/10/92	—	—	—
QC-2 (g)	02/10/93	—	—	—
QC-2 (g)	05/21/93	—	—	—

ABBREVIATIONS:

TPH-G	Total petroleum hydrocarbons as gasoline
TPH-D	Total petroleum hydrocarbons as diesel
B	Benzene
T	Toluene
E	Ethylbenzene
X	Total xylenes
TOG	Total oil and grease
HVOC	Halogenated volatile organic compounds
ppb	Parts per billion
ND	Not detected at or above reported detection limit
—	Not analyzed/available
ANA	Anametrix, Inc.
SUP	Superior Analytical Laboratory
SEQ	Sequoia Analytical laboratory
PACE	Pace, Inc.

NOTES:

(a)	Top of casing elevation surveyed in reference to the City of Dublin monument at intersection of Village Parkway and Amador Valley Boulevard, with an elevation of 335.92 feet above mean sea level.
(b)	In feet above mean sea level.
(c)	Methylene chloride.
(d)	Typical chromatogram patterns not present.
(e)	Well could not be located.
(f)	Blind duplicate.
(g)	Travel blank.