aqua resources inc. a wholly owned subsidiary of The Earth Technology Corporation

2030 Addison Street, Suite 500 • Berkeley, California 94704 • 510 540-6954

June 4, 1992

Alameda County Health Agency
Department of Environmental Health
Hazardous Materials Division
80 Swan Way, Room 200
Oakland, CA 94621

87157.07
File: report

Attention: Mr. Jeff Shapiro

Subject: Annual Groundwater Monitoring Summary Report
Mill Springs Park Apartments (Formerly Livermore Superblock)
Railroad Avenue between South P and South L Streets
Livermore, California

Introduction

This report presents results of the groundwater monitoring program conducted at the subject site from March 1991 to May 1992. Groundwater monitoring was performed six times on an approximately quarterly basis during this one year period. This monitoring program was performed as part of the approved final closure plan for the subject site. Aqua Resources Inc. (ARI) provided environmental consultation and engineering services during the previous Phase I, Phase II, and Final Site Remediation and Closure for the Mill Springs Park Apartment Site. The site is located on Railroad Avenue, between South L and South P Streets, in Livermore, California. The site was known formerly as the Livermore Superblock, and is shown in relation to the City of Livermore on the Vicinity Map, Plate 1.

The purpose of the monitoring program is to determine whether leakage of fuel oil from the previously removed concrete vault structure had migrated to groundwater underlying the site. The location of the monitoring well was determined based on the results of a March 14, 1989, Groundwater Study Report, and approved by the Alameda County Health Agency. The location of the monitoring well is shown in relation to the approved development plan on the Monitoring Well Location Map, Plate 2.

This letter report includes the following information obtained from the most recent sampling events (from March, 1991 to May, 1992):

- Summary of the monitoring well sampling methodology and chemical analyses performed,
- Discussion of results of chemical analyses, and
- Conclusions and Recommendations based on field observations and interpretation of chemical analytical data.

Copies of the monitoring well log and the Alameda County Flood Control and Water Conservation District Well Permit Form were presented in the Monitoring Well Installation report dated June 1, 1989. Chain of Custody Forms and the Certified Chemical Analysis reports for the current year long monitoring program are presented as attachments to this report. A previous groundwater monitoring report covering the period from May, 1989 to May, 1990, was submitted for regulatory review on July 2, 1990.

Groundwater Level Observations

Prior to sampling the monitoring well, the depth to groundwater was measured form the top of the casing in the well and recorded to the nearest hundredth of a foot using an electronic interface probe or water level meter. The groundwater elevations observed at the time of each sampling interval are shown on Table 1. The plot of groundwater elevation over time is shown on Plate 3.

Table 1
Observed Groundwater Elevations
(Mean Sea Level Datum)

Date of Observation	Groundwater Elevation (feet)
April 19, 1989	433.58
May 1, 1989	434.34
August 1, 1989	433.22
September 1, 1989	431.73
November 2, 1989	430.69
February 2, 1990	431.72
May 2, 1990	434.50
March 6, 1991	435.83
May 2, 1991	437.03
August 7, 1991	423.29
November 5, 1991	417.83*
February 21, 1992	417.81*
May 4, 1992	423.71

(* Elevation at bottom of screened casing; groundwater elevation is at or below this point)

The groundwater level at the site has varied significantly during the current monitoring period. At the beginning of the 1991 to 1992 sampling year, the groundwater level in the monitoring well rose slightly to its highest elevation of 437.03 feet above mean sea level (MSL) in May 1991. In August 1991, the groundwater level had dropped 13.74 feet to 423.29 feet. During the subsequent two

sampling events in November, 1991, and February, 1992, the water level had dropped more than 5 1/2 feet to an elevation below 417.81 feet. This elevation, which corresponds approximately to the bottom of the screened portion of the well casing, was utilized in plotting the graph presented on Plate 3, but does not represent the actual groundwater elevation at the time of the measurement.

The water levels recorded for the November and February are apparently the level of residual water remaining in the sump/sediment trap at the bottom of the well casing below the well screen. Measurement of the groundwater level at these two events required removal of the dedicated bladder pump in order to lower the water level probe beyond the top of the pump. No water samples were obtained during these two site visits due to the insufficient water in the monitoring well. At the final sampling interval in May 1992, the groundwater level was observed to have risen to an elevation of 423.71 feet above MSL.

ARI contacted the Alameda County Flood Control and Water Conservation District, Zone 7 to determine the cause of the drawdown observed in August 1991. They explained that the supply of water into the Livermore area from the State Water Project aqueduct had been shutdown in March 1991, and that continued and/or increased pumping of the aquifer would result in the observed groundwater level drawdown. A contributing factor to the significant drawdown of the aquifer may be the pumping of three nearby wells operated by California Water Service Company (CWS) in Livermore. One of the wells operated by CWS is located approximately 2000 feet west of the subject monitoring well. This well was out of service until July 1991, when it was brought back into service. With the resumed operation of this CWS well and the probable increased pumping rate of the two other local wells, it is expected that local as well as regional groundwater levels could be lowered significantly. However, groundwater recharge appears to have been sufficient to raise the water level so that the monitoring well could be purged and sampled during the last sample interval.

Groundwater Sampling Procedures and Field Observations

The monitoring well was developed prior to each sampling event. Well development was accomplished by pumping 3 to 5 well volumes of water from the well utilizing the dedicated bladder pump previously installed in the monitoring well. The water removed from the well during development was placed in sealed containers and stored on-site pending results of chemical analyses. Based on the results of the initial analysis, the Livermore Public Works Department, Water Reclamation Plant approved disposal of the development water to the sanitary sewer. Stored purge water and water subsequently generated from purging at quarterly sampling intervals were discharged to the sanitary sewer.

After the groundwater elevation was determined, the monitoring well was purged and allowed to recover. When the groundwater level had recovered, a groundwater sample was collected from the discharge tube of the bladder pump. The samples were collected in 40 ml sample vials, provided by the laboratory. The sample vials were then placed in a chilled ice chest and transported to the laboratory under chain-of-custody control.

Summary of Chemical Analyses and Discussion of Results

As discussed earlier, groundwater samples obtained at each quarterly sampling interval for chemical analysis were submitted to a State certified laboratory utilizing chain of custody protocols. Chemical analyses were performed by Curtis and Tompkins, Ltd., Analytical Laboratories in Berkeley. Travel blanks were also taken and analyzed where considered appropriate.

Chemical analyses included determination of Benzene, Toluene, Xylene, Ethylbenzene (BTXE) by EPA Method 8020. Results of the chemical analyses are presented on the attached certified laboratory reports. The results for this monitoring period are summarized in Table 2. Benzene was the only EPA Method 8020 analyte detected above the method detection limit (0.5 ppb) in samples obtained during sampling intervals prior to August, 1991; the other analytes (Toluene, Xylene and Ethylbenzene) were not detected in any of the samples collected and analyzed.

Benzene was not detected at every sample interval, and its detected concentration was determined to range from less than 0.5 ppb (method detection limit) to a measured maximum of 5 ppb in August, 1989. The Benzene concentration over time is shown in Figure 4. Benzene was not detected in the baseline sample interval nor in the fourth quarter sample interval of the first year sampling; it was, however, detected in the first, second and third quarter sample intervals of the first year. At the first, second and third sample intervals, the monitoring well was resampled. Benzene was not detected in the resample analysis at the first and second quarter sample interval, but was detected in the third quarter sample interval.

In the second year sampling, Benzene concentrations were detected at 2.8 ppb during the initial March, 1991, sampling interval and at 2.0 ppb during the second sampling interval in May, 1991. Benzene was not detected (less than 0.5 ppb) in both the August, 1991, and the May, 1992, samples. Groundwater samples were not recovered from the monitoring well in November, 1991 and in February, 1992, due to insufficient water volume within the well casing resulting from local and regional lowering of the groundwater table.

Conclusions and Recommendations

Based on the analyses of groundwater samples collected during the monitoring period from the monitoring well, there does not appear to be significant hydrocarbon contamination in the groundwater associated with the concrete vault structure that was removed. Review of the chemical test results indicates that all the first year TPH analytes were below the method detection limits. Benzene was detected above the method detection level (.5 ppb), but not on a consistent, repeatable basis. In addition, the measured benzene concentration did not exceed the Maximum Contaminant Level (MCL) established by the EPA (5 ppm). The results of the second year sampling intervals indicate that the concentration of benzene is apparently on the decline.

Based on the measured petroleum concentrations and field observation that no free petroleum product was observed in the groundwater samples collected as part of the groundwater monitoring program, ARI concludes that continued monitoring is not beneficial. Therefore, ARI recommends that the monitoring well be abandoned and sealed in conformance with Alameda County Flood Control and Water Conservation District, Zone 7, requirements.

Limitations

Consistent with our discussions with the Client and the lead regulatory agency, namely the Alameda County Health Agency, our groundwater monitoring program was limited to the installation and development of one groundwater monitoring well and quarterly groundwater sample collection. Chemical analyses were performed by others, not under ARI direct supervision. Test results are reported as received. Final determination of additional site remediation, if required, will be determined by the Alameda County Public Health Agency. We cannot guarantee or warrant that soil or groundwater at this site are not contaminated above allowable limits for a given contaminant. This report is limited in its scope to the analyses and review of samples obtained from the one monitoring well as required by the regulatory agency. All services were performed in substantial conformance with current standards of environmental engineering practice. No other warranty, express or implied, is made.

It has been a pleasure to provide you with this information. If you have any questions regarding the above, please do not hesitate to contact the undersigned.

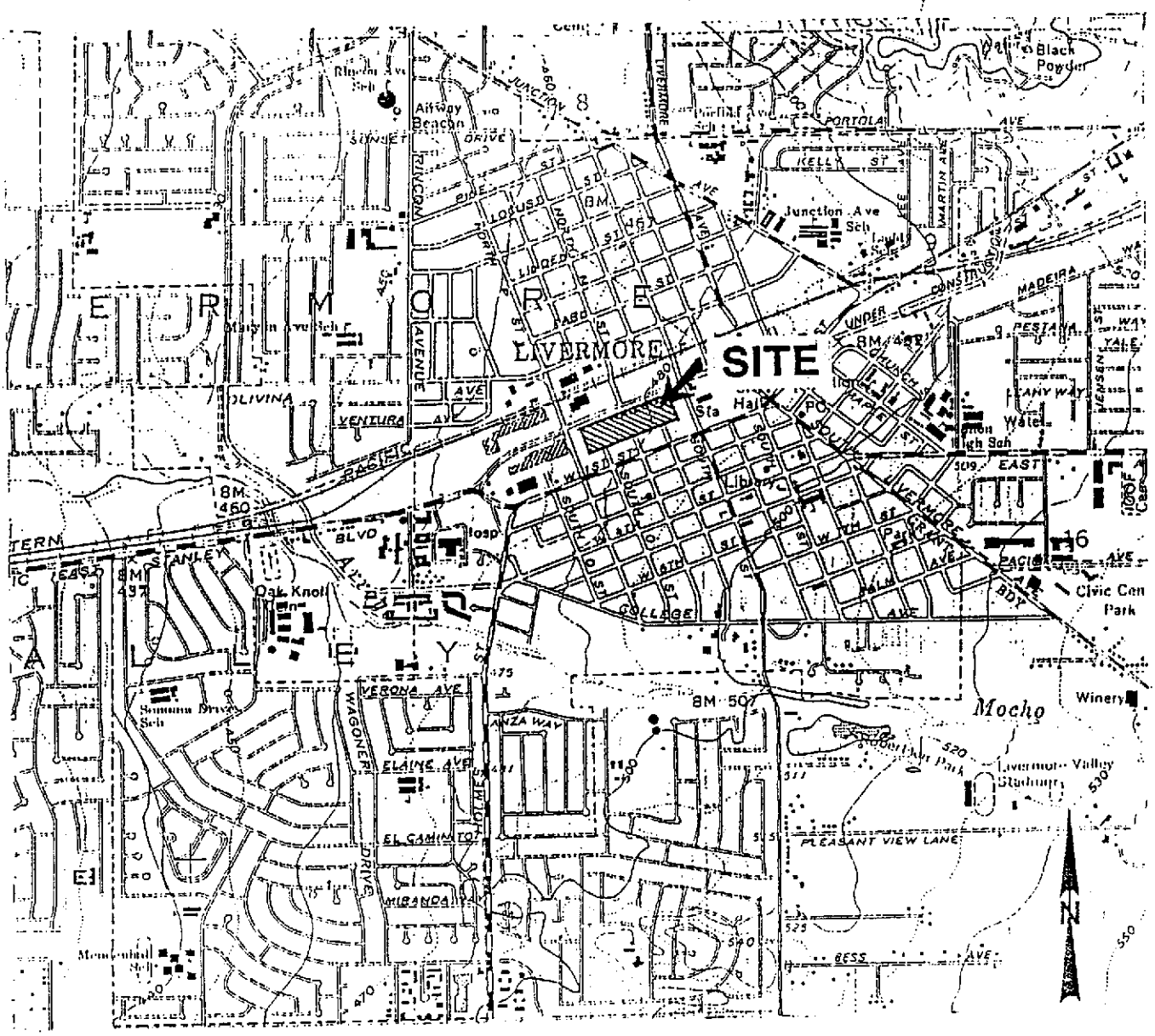
Very truly yours,
AQUA RESOURCES INC.

Mark Milani, P.E.
Project Manager

Enclosures: Certified Laboratory Reports
Chain of Custody Form
Figure 1 - Vicinity Map
Figure 2 - Monitoring Well Location Plan
Figure 3 - Groundwater Elevation Over Time
Figure 4 - Benzene Concentration Over Time

cc: Addressee (two copies)
Mr. W. Robert Kohorst, K H Realty 2, Inc. (two copies)
Regional Water Quality Control Board, San Francisco Bay Region

87157\2\mllspr92.rpt



VICINITY MAP

MILL SPRINGS PARK APARTMENTS

Railroad Avenue

Livermore, California

REFERENCE:

Portion of U.S.G.S. 7.5 Minute Topographic Quadrangle Map, Livermore, California, dated 1961, photorevised 1980, at a scale of 1:24,000.

PLATE 1

Plate 3
Groundwater Elevation Over Time

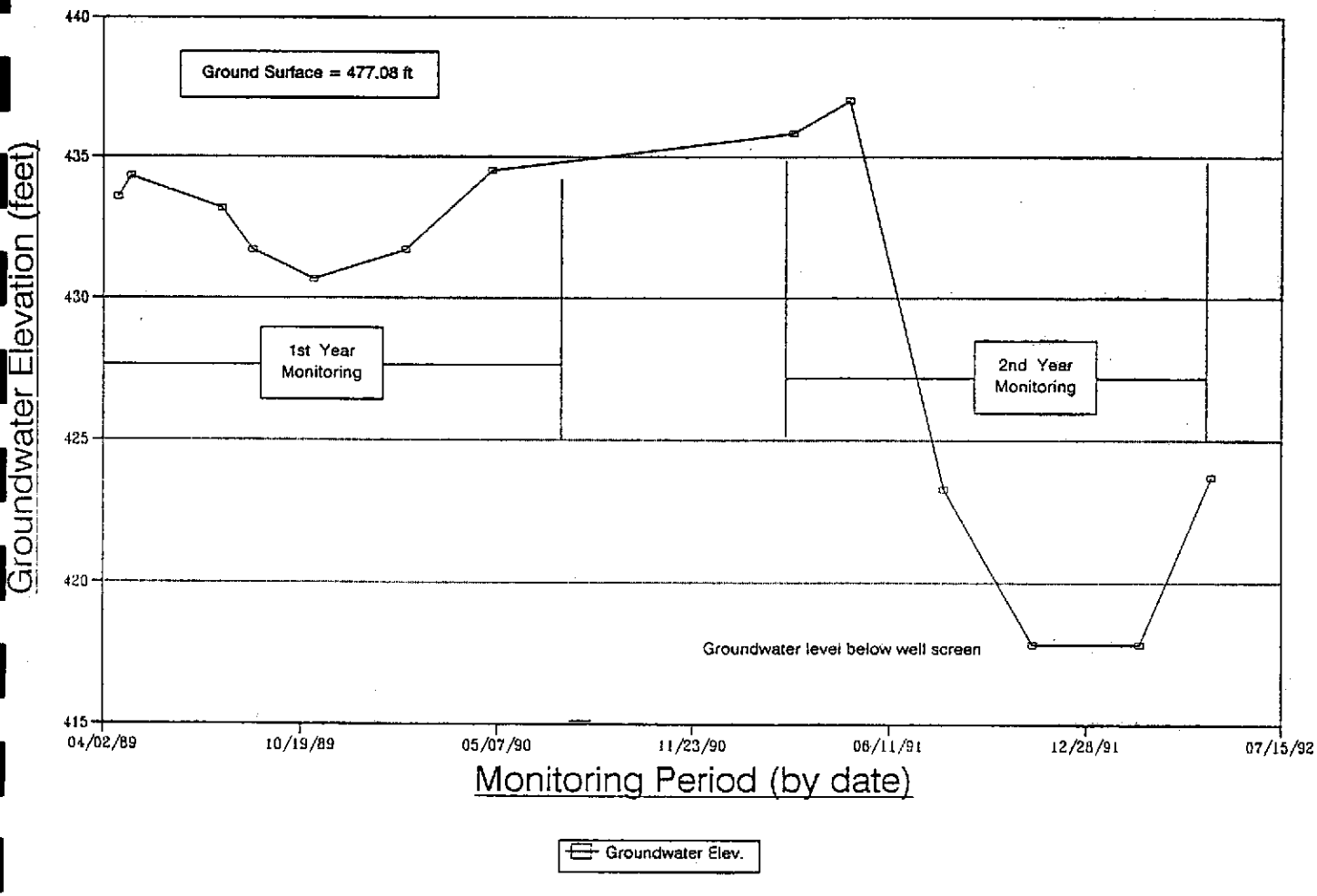
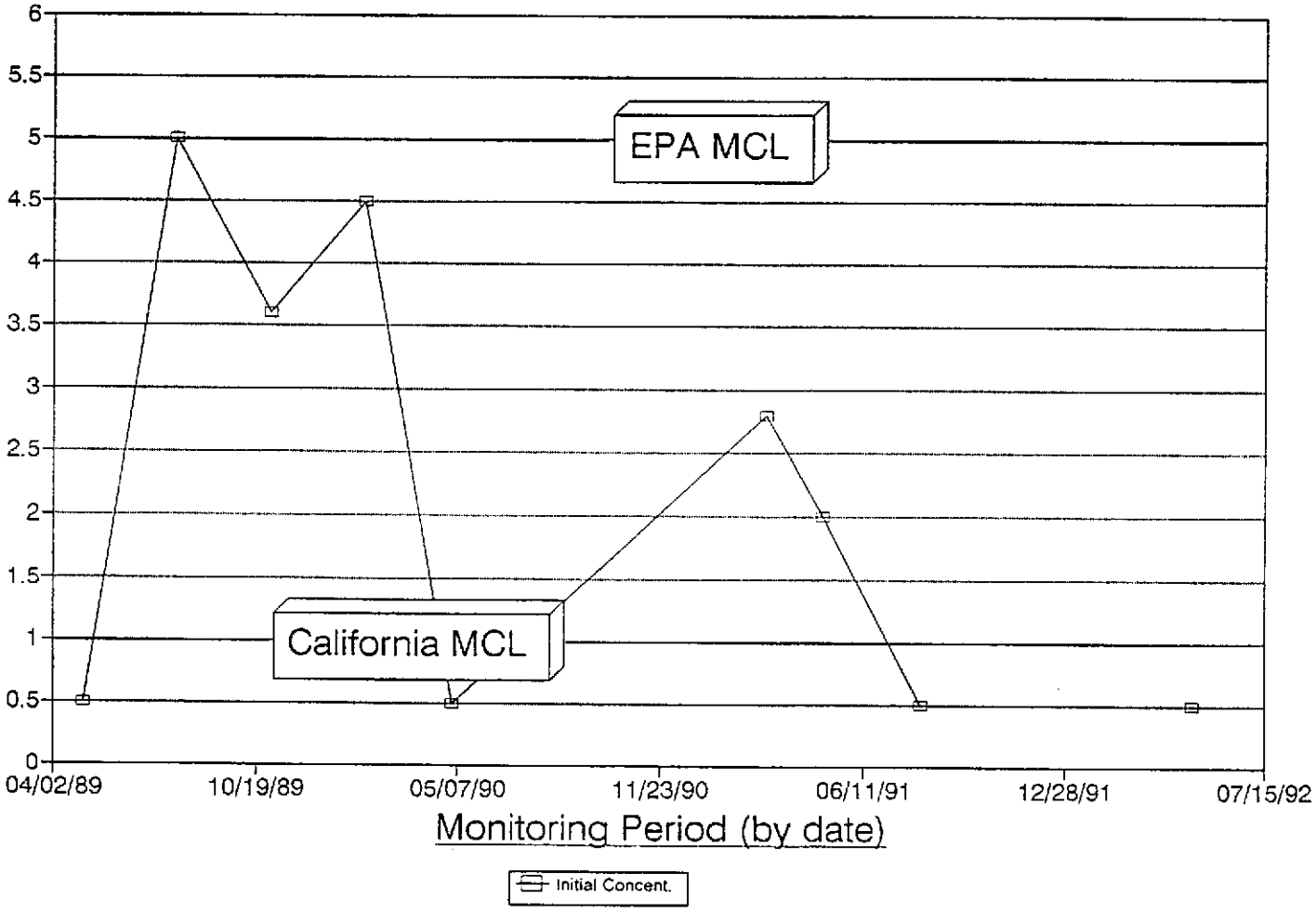


Plate 4
Benzene Concentration over Time



Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710. Phone (415) 486-0900

DATE RECEIVED: 03/07/91
DATE REPORTED: 03/21/91

AQUA RESOURCES, INC
RECEIVED
MAR 27 1991

LAB NUMBER: 103174

JOB NO. 687157.07
FILE lab results

CLIENT: AQUA RESOURCES

REPORT ON: TWO WATER SAMPLES

PROJECT ID: 87157
LOCATION: LIVERMORE

RESULTS: SEE ATTACHED

QA/QC Approval

Final Approval

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 103174
CLIENT: AQUA RESOURCES
PROJECT ID: 87157
LOCATION: LIVERMORE

DATE RECEIVED: 03/07/91
DATE ANALYZED: 03/14/91
DATE REPORTED: 03/21/91

Benzene, Toluene, Ethyl Benzene, Xylenes by EPA 8020
Extraction by EPA 5030 Purge and Trap

LAB ID	CLIENT ID	BENZENE (ug/L)	TOLUENE (ug/L)	ETHYL BENZENE (ug/L)	TOTAL XYLENES (ug/L)	REPORTING LIMIT * (ug/L)
103174-1	MW-1-1	2.8	ND	ND	ND	.5
103174-2	MW-1-2	2.1	ND	ND	ND	.5

ND = Not detected at or above reporting limit.

* Reporting Limit applies to all analytes.

QA/QC SUMMARY

RECOVERY, %	102

[redacted]UA[redacted]SO[redacted]CE[redacted]NC[redacted]
2030 ADDISON STREET, SUITE 500
Berkeley, CA. 94704
(415)540-6954

CHAIN OF CUSTODY RECORD

Project Code	Project Name
87157	Livermore

SAMPLERS (Signature)

P. Rodgers Wojciech Bajkiewicz

[redacted]

	Sample	BTXE									REMARKS
1	MW-1-1 (water)	✓									
2	MW-1-2 (water)	✓									

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Patricia Rodgers	3/7/91 4:15				

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)

Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)	Date/Time	Remarks
		Mary Hunter	3/7/91 4:15pm	Normal TAT

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (415) 486-0900

DATE RECEIVED: 05/02/91
DATE REPORTED: 05/10/91

AQUA RESOURCES, INC
RECEIVED
MAY 15 1991
JOB NO. 87157
FILE

LAB NUMBER: 103690

CLIENT: AQUA RESOURCES

PROJECT ID: 87157

RESULTS: SEE ATTACHED

QA/QC Approval

Final Approval

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 103690
CLIENT: AQUA RESOURCES
PROJECT ID: 87157

DATE RECEIVED: 05/02/91
DATE ANALYZED: 05/07/91
DATE REPORTED: 05/10/91

Benzene, Toluene, Ethyl Benzene, Xylenes by EPA 8020
Extraction by EPA 5030 Purge and Trap

LAB ID	CLIENT ID	BENZENE (ug/L)	TOLUENE (ug/L)	ETHYL BENZENE (ug/L)	TOTAL XYLENES (ug/L)	REPORTING LIMIT * (ug/L)
103690-1	W-1-1	2.0	ND	ND	ND	0.5
103690-2	W-1-2	2.0	ND	ND	ND	0.5
103690-3	W-1-3	2.0	ND	ND	ND	0.5

ND = Not detected at or above reporting limit.

* Reporting Limit applies to all analytes.

QA/QC SUMMARY

RPD, %	1
RECOVERY, %	100

10 3690

AQUA RESOURCES, INC.

CHAIN OF CUSTODY RECORD

SHIPMENT NO.: ______

PAGE 1 OF 1

DATE 5/2/91

PROJECT NAME: ______

PROJECT NO.: 87157

Sample Number	Location	Type of Sample: Material	Type of Sample: Method	Type of Container	Type of Preservation: Temp	Type of Preservation: Chemical	Analysis Required
W-1-1		water		VOAS	ice		BTXE by
W-1-2		↓		↓	↓		EPA 8020
W-1-3		↓		↓	↓		↓
travel blank		↓		↓	↓		*

Total Number of Samples Shipped: 4 Sampler's Signature: Patricia Rodgers

Relinquished By:	Received By:	Date / Time
Signature: Patricia Rodgers Printed Name: PATRICIA RODGERS Company: AQUA RESOURCES INC Reason: analysis	Signature: [illegible] Printed Name: ______ Company: ______	Date: 5/2/91 Time: ______
Signature: ______ Printed Name: ______ Company: ______ Reason: ______	Signature: ______ Printed Name: ______ Company: ______	Date: / / Time: ______

4:50

REMARKS: If there are any questions, refer back to your lab #103174

* Hold travel blank to be run based on results of W-1-1, W-1-2, and W-1-3. Call with results prior to expiration of travel blank holding time.

Special Shipment / Handling / Storage Requirements:

103690 has ≥ W-1-4

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (415) 486-0900

DATE RECEIVED: 08/07/91
DATE REPORTED: 08/15/91

LABORATORY NUMBER: 104749

CLIENT: AQUA RESOURCES, INC.

PROJECT ID: 87157.7

LOCATION: MILLSPRING PARK APTS.

RESULTS: SEE ATTACHED

QA/QC Approval

Final Approval

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 104749
CLIENT: AQUA RESOURCES, INC..
PROJECT ID: 87157.7
LOCATION: MILLSPRING PARK APTS.

DATE RECEIVED: 08/07/91
DATE ANALYZED: 08/09/91
DATE REPORTED: 08/15/91

Benzene, Toluene, Ethyl Benzene, Xylenes by EPA 8020
Extraction by EPA 5030 Purge and Trap

LAB ID	CLIENT ID	BENZENE (ug/L)	TOLUENE (ug/L)	ETHYL BENZENE (ug/L)	TOTAL XYLENES (ug/L)	REPORTING LIMIT * (ug/L)
104749-1	#1	ND	ND	ND	ND	0.5
104749-2	#2	ND	ND	ND	ND	0.5
104749-3	#3	ND	ND	ND	ND	0.5
104749-4	TBA	ND	ND	ND	ND	0.5

ND = Not detected at or above reporting limit.

* Reporting Limit applies to all analytes.

QA/QC SUMMARY

RPD, %	1
RECOVERY, %	103

704749

AQUA RESOURCES, INC.

SHIPMENT NO.: _____

CHAIN OF CUSTODY RECORD — Wellspring Park Apts.

PAGE 1 OF 1

DATE 8/7/91

PROJECT NAME: Wingfield Barrett Range

PROJECT NO.: 8715.7

Sample Number	Location	Type of Sample: Material	Type of Sample: Method	Type of Container	Type of Preservation: Temp	Type of Preservation: Chemical	Analysis Required
#1		water	pump	VOAS	ice	HCL	BTXE
#2		"	"	"	"	"	"
#3		"	"	"	"	"	"
TBA		"	"	"	"	"	"

Total Number of Samples Shipped: 4

Sampler's Signature: Patricia Rodgers

Relinquished By:
Signature: Patricia Rodgers
Printed Name: PATRICIA RODGERS
Company: AQUA RESOURCES
Reason: analyses

Received By:
Signature: [illegible]
Printed Name: [illegible]
Company: [illegible]
Date: 8/7/91
Time: 1:30

Relinquished By:
Signature: _____
Printed Name: _____
Company: _____
Reason: _____

Received By:
Signature: _____
Printed Name: _____
Company: _____
Date: _____
Time: _____

REMARKS:

TBA = ambient

Special Shipment / Handling / Storage Requirements:

Curtis & Tompkins, Ltd., Analytical Laboratories. Since 1878
2323 Fifth Street, Berkeley, CA 94710. Phone (415) 486-0900

DATE RECEIVED: 05/04/92
DATE REPORTED: 05/13/92

LABORATORY NUMBER: 107291

CLIENT: AQUA RESOURCES

PROJECT ID: 87157.7

LOCATION: MILL SPRING

RESULTS: SEE ATTACHED

Reviewed By

Reviewed By

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 107291
CLIENT: AQUA RESOURCES
PROJECT ID: 87157.7
LOCATION: MILL SPRING

DATE SAMPLED: 05/04/92
DATE RECEIVED: 05/04/92
DATE ANALYZED: 05/06/92
DATE REPORTED: 05/13/92

Benzene, Toluene, Ethyl Benzene, Xylenes by EPA 8020
Extraction by EPA 5030 Purge and Trap

LAB ID	CLIENT ID	BENZENE (ug/L)	TOLUENE (ug/L)	ETHYL BENZENE (ug/L)	TOTAL XYLENES (ug/L)	REPORTING LIMIT * (ug/L)
107291-1	MS-MW1-W1A	ND	ND	ND	ND	0.5
107291-2	MS-MW1-TB1	ND	ND	ND	ND	0.5
107291-3	MS-MW1-W1B	ND	ND	ND	ND	0.5
107291-4	MS-MW1-W1C	ND	ND	ND	ND	0.5

ND = Not detected at or above reporting limit.

* Reporting Limit applies to all analytes.

QA/QC SUMMARY

RPD, %	<1
RECOVERY, %	91

MAY 15 '92 10:24 CURTIS & TOMPKINS BERKELEY P.4

Earth[redacted]nolog[redacted] Corporation

Chain of Custody Record

[redacted] job no. [redacted]

Date 5-4-92

Page 1 of 1

Laboratory CURTIS & TOMPKINS
Address 2323 5th St.
BERKELEY, CA

Method of Shipment: VEHICLE

Shipment No. NA

Client AQUA RESOURCES
Address 2030 ADDISON ST #500
BERKELEY, CA 94704

Project Manager MARK MILANI

Telephone No. (510) 540-6954

Project Name / Number MILL SPRING / 871577

Fax. No. (510) 540-7496

Contract / Purchase Order / Quote NA

Samplers: (Signature) [signature]

	Field Sample Number	Location/Depth	Date	Time	Sample Type	Type/Size of Container	Preservation: Temp.	Preservation: Chemical	Analysis Required: [illegible]	BTEX							Remarks
-1	MS-MWI-W1A	—	5/4/92	1505	H_2O	40ml VOA	ICE	HCl	[illegible]	X							
-2	MS-MWI-TB1	NA	5/4/92	NA	H_2O	40ml VOA	ICE	HCl	1	X							
-3	MS-MWI-W1B	—	5/4/92	1505	"	"	"	HCl	1	X							
-4	MS MWI W1C	—	5/4/92	1505	"	"	"	HCl	1	X							
-5	MS MWI-W1D	—	5/4/92	1505	"	"	"	HCl	1								Hold

Relinquished by:	Date / Time	Received by:	Date / Time
Signature [signature] Printed MARK C. PETERSON Company ARI Reason Analyses	Date 5/4/92 Time 1720	Signature [signature] Printed Nancy Wilson Company C-T Lab Reason Analyses	Date 5/4 Time 1720

Relinquished by:	Date / Time	Received by:	Date / Time
Signature Printed Company Reason	Date Time	Signature Printed Company Reason	Date Time
Signature Printed Company Reason	Date Time	Signature Printed Company Reason	Date Time

Comments:

DISTRIBUTION: White to Laboratory, Canary to Earth Technology Project File, Pink to Courier, Golden to Field File

F1000
2/15/91