aqua science engineers inc.

November 2, 1995

# QUARTERLY GROUNDWATER MONITORING REPORT
# OCTOBER 17, 1995 GROUNDWATER SAMPLING
at
Lim Family Property
250 8th Street
Oakland, California

Submitted by:
AQUA SCIENCE ENGINEERS, INC.
2411 Old Crow Canyon Road, #4
San Ramon, CA 94583
(510) 820-9391

## 1.0 INTRODUCTION

This report outlines the methods and findings of Aqua Science Engineer's, Inc. (ASE) quarterly groundwater monitoring at the property located at 250 8th Street in Oakland, California *(Figures 1 and 2).*

## 2.0 SITE HISTORY

A gasoline service station previously occupied the site. In May 1992, ASE removed ten underground fuel storage tanks from the site. The tanks consisted of one (1) 10,000-gallon gasoline tank, one (1) 5,000-gallon diesel tank, three (3) 2,000-gallon gasoline tanks, one (1) 2,000-gallon diesel tank, three (3) 500-gallon gasoline tanks and one (1) 250-gallon waste oil tank. Up to 10,000 parts per million (ppm) total petroleum hydrocarbons as gasoline (TPH-G) and 5,900 ppm total petroleum hydrocarbons as diesel (TPH-D) were detected in soil samples collected during the tank removal.

Between December 1992 and March 1993, All Environmental of San Ramon, California overexcavated 1,762 cubic yards of soil from the site and off-hauled the soil to the BFI Landfill in Livermore, California. Analytical results show that all on-site soil with hydrocarbon concentrations greater than 10 ppm was removed from the site with the exception of soil along the 8th Street shoring. Up to 1,800 ppm TPH-G and 120 ppm TPH-D were detected in soil samples collected along the shoring indicating that contamination likely extends below 8th Street. This contamination left in place may still be a source for groundwater contamination.

In January 1995, ASE installed monitoring wells MW-1 and MW-2 at the site. High hydrocarbon concentrations were detected in monitoring well MW-2, downgradient of the site. Moderate hydrocarbon concentrations were detected in on-site monitoring well MW-1.

Since April 1995, the site has been on a quarterly groundwater monitoring program. Analytical results for these sampling periods are presented in Tables One and Two.

## 3.0 MONITORING WELL SAMPLING

On October 17, 1995, ASE sampled monitoring wells MW-1 and MW-2 at the site. Prior to sampling, four well casing volumes of water were removed from each well. The pH, temperature and conductivity were monitored during the purging, and samples were not collected until these

parameters stabilized. After the water level in each well recovered to at least 80% of the water level measured prior to purging water from the well, groundwater samples were collected from the wells with dedicated polyethylene bailers. The groundwater samples from each well were decanted from the bailer into four (4) 40-ml volatile organic analysis (VOA) vials and three (3) 1-liter amber glass bottles. All of the samples were preserved with hydrochloric acid, labeled, placed in protective foam sleeves, and stored on ice for transport to American Environmental Network (AEN) of Pleasant Hill, California (DOHS #1172) under chain of custody. No hydrocarbon odor was present in groundwater from monitoring well MW-1 during the purging, but a strong hydrocarbon odor was present in groundwater from monitoring well MW-2 at the time of the sampling. A hydrocarbon sheen was present on the surface of the groundwater in monitoring well MW-2.

Well sampling purge water was contained in a DOT 17H drum and stored on-site for handling by the client at a later date. See Appendix A for a copy of the well sampling field logs.

## 4.0 ANALYTICAL RESULTS FOR GROUNDWATER

The groundwater samples were analyzed by AEN for TPH-G by modified EPA Method 5030/8015, TPH-D by modified EPA Method 3510/8015, benzene, toluene, ethylbenzene and total xylenes (BTEX) by EPA Method 8020, volatile organic compounds (VOCs) by EPA Method 8010 and oil and grease (O&G) by Standard Method 5520 C&F. The analytical results are tabulated below in Tables One and Two, and the certified analytical report and chain of custody record are included in Appendix B.

## TABLE ONE
Summary of Chemical Analysis of **GROUNDWATER** Samples
TPH-G, TPH-D and BTEX
All results are in **parts per billion**

| Boring | Date Sampled | TPH Gasoline | TPH Diesel | Benzene | Toluene | Ethyl Benzene | Total Xylenes |
|---|---|---|---|---|---|---|---|
| MW-1 | 01-30-95 | 740 | 200 | 3 | 5 | 1 | 4 |
| | 04-12-95 | 400 | 500 | <0.5 | <0.5 | 3 | <2 |
| | 07-14-95 | 520 | 400 | 1 | <0.5 | 2 | 3 |
| | 10-17-95 | **400** | **200** | **0.5** | 1 | 3 | <2 |
| MW-2 | 01-30-95 | 88,000 | 800 | 19,000 | 18,000 | 2,400 | 10,000 |
| | 04-12-95 | 110,000 | 990 | 21,000 | 28,000 | 2,800 | 14,000 |
| | 07-14-95 | 120,000 | 5,000 | 20,000 | 25,000 | 3,200 | 15,000 |
| | 10-17-95 | **190,000** | **4,000** | **15,000** | 26,000 | 4,900 | 23,000 |
| EPA METHOD | | 5030/ 8015 | 3550/ 8015 | 8020 | 8020 | 8020 | 8020 |

## TABLE TWO
Summary of Chemical Analysis of **GROUNDWATER** Samples
Lead, Oil & Grease and Volatile Organic Compounds
All results are in **parts per billion**

| Compound | MW-1 | | MW-2 | state MCL (ppb) |
|---|---|---|---|---|
| 1-30-95 oops! | | | | |
| ~~Dissolved~~ Lead | <0.04 | | <0.04 | |
| Total Oil and Grease | <500 | prop 65 | 19,000 | |
| Hydrocarbon Oil and Grease | <500 | | 17,000 | |
| Chloroform | 0.5 | 4.5 ppb | <30 → no MCL | |
| Tetrachloroethene (PCE) | 8 | | <30 → 5 | |
| Other VOCs | <0.5-2 | | <30-100 | |
| 4-12-95 | | | | |
| Dissolved Lead | <0.04 | | <0.04 | |
| Hydrocarbon Oil and Grease | <500 | | 22,000 | |
| Tetrachloroethene (PCE) | 6 | | 0.9 → 5 ppb | |
| 1,2-Dichloroethane | <0.5 | | 43 | ~~.5~~ ppb |
| Other VOCs | <0.5-2 | | <30-100 | |

## TABLE TWO (Continued)
Summary of Chemical Analysis of **GROUNDWATER** Samples
Lead, Oil & Grease and Volatile Organic Compounds
All results are in **parts per billion**

| Compound | MW-1 | MW-2 | MCL |
|---|---|---|---|
| 7-14-95 | | | |
| Total Oil and Grease | <500 | 25,000 | |
| Hydrocarbon Oil and Grease | <500 | 23,000 | |
| 1,2-Dichloroethane | <0.5 | (35) | 0.5 |
| Tetrachloroethene (PCE) | 4 | 5 | 5 |
| Other VOCs | <0.5-2 | <5-20 | |
| 10-17-95 | | | |
| Total Oil and Grease | <1,000 | 13,000 | |
| Hydrocarbon Oil and Grease | <1,000 | 15,000 | |
| Tetrachloroethene (PCE) | 5 ✓ | <0.5 | 5 |
| Trichloroethene (TCE) | <0.5 | 5 ✓ | 5 |

## 5.0 CONCLUSIONS AND RECOMMENDATION

Very high hydrocarbon concentrations were detected in groundwater samples collected from monitoring well MW-2, downgradient of the site. The benzene, ethylbenzene and total xylene concentrations in these samples exceeded the California Department of Toxic Substances (DTSC) maximum contaminant levels (MCLs) for drinking water. In addition, the toluene concentration in these samples exceeded the DTSC recomended action level for drinking water. Only low hydrocarbon concentrations, below the DTSC MCLs, were detected in on-site monitoring well MW-1. These concentrations are consistent with previous findings.

It appears that further assessment of the extent of contamination as well as soil and groundwater remediation will be required at the site in the future. ASE recommends at this time that groundwater monitoring be continued at the site on a quarterly basis.

## 6.0 REPORT LIMITATIONS

The results of this investigation represent conditions at the time of the groundwater sampling, at the specific locations at which the samples were collected, and for the specific parameters analyzed for by the laboratory.

It does not fully characterize the site for contamination resulting from unknown sources, or for parameters not analyzed for by the laboratory. All of the laboratory work cited in this report was prepared under the direction of an independent CSDHS certified laboratory. The independent laboratory is solely responsible for the contents and conclusions of the chemical analysis data.

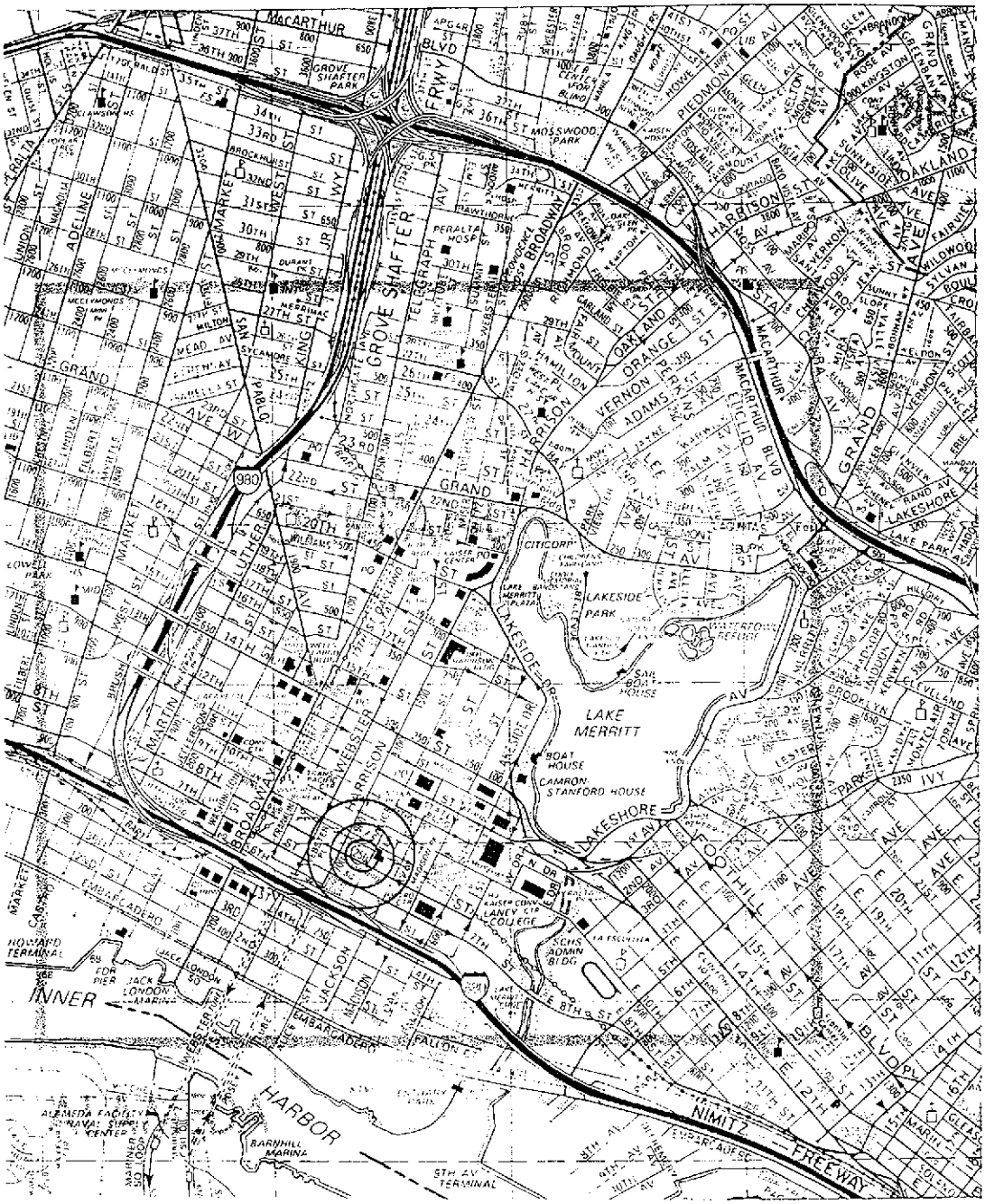
Aqua Science Engineers appreciates the opportunity to assist The Lim Family with their environmental needs. Should you have any questions or comments, please feel free to call us at (510) 820-9391.

Respectfully submitted,

AQUA SCIENCE ENGINEERS, INC.

Robert E. Kitay, R.E.A.
Project Geologist


Attachments: Figures 1 and 2
Appendices A and B

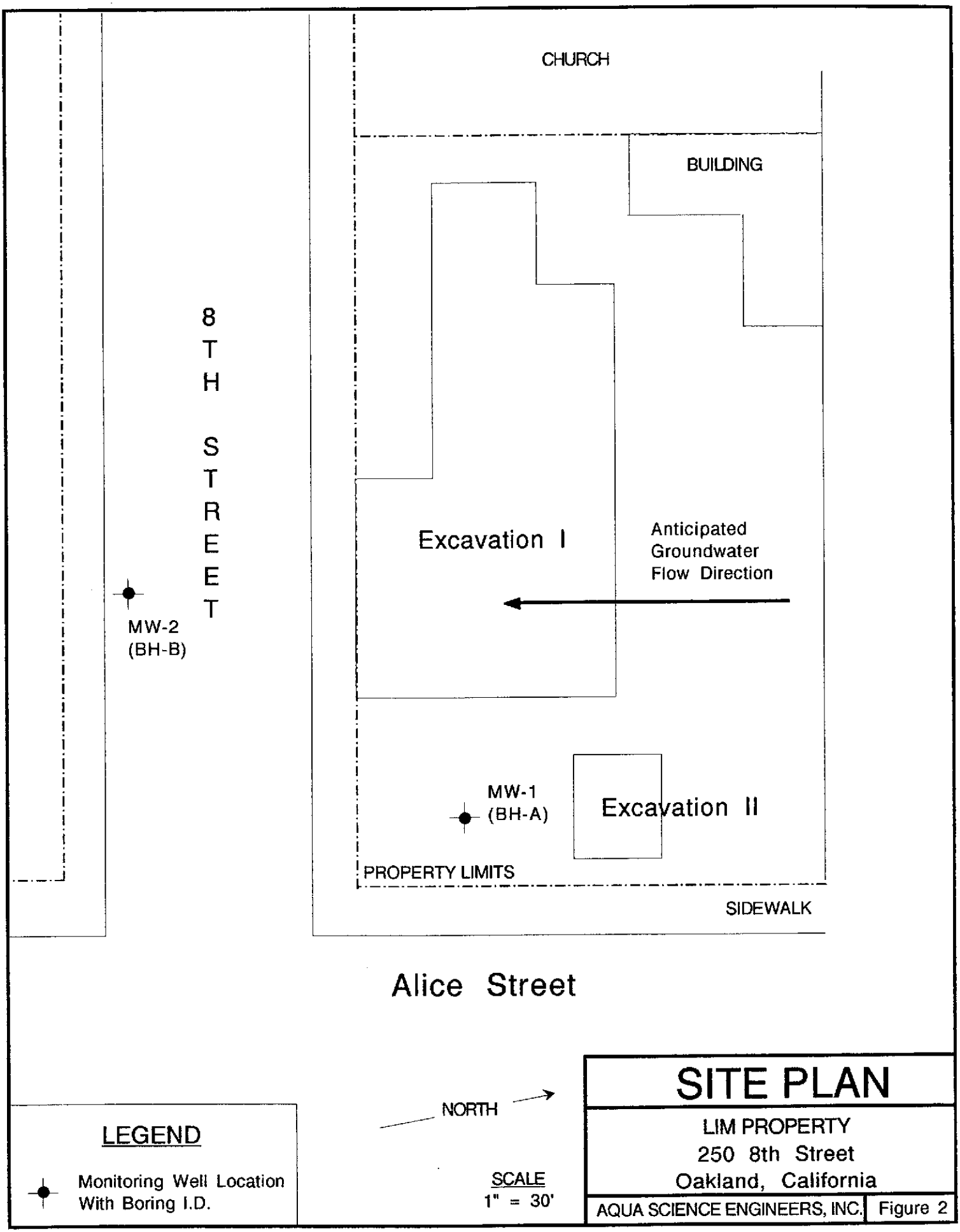



# SITE LOCATION MAP

Lim Property
250 8th Street
Oakland, California

Aqua Science Engineers | Figure 1

BASE: The Thomas Guide, Alameda and Contra Costa Counties Street Guide & Directory, 1990




# SITE PLAN

LIM PROPERTY
250 8th Street
Oakland, California

AQUA SCIENCE ENGINEERS, INC. | Figure 2

# APPENDIX A

Well Sampling Field Log

aqua science engineers inc.

# WELL SAMPLING FIELD LOG

Project Name and Address: Lim Property, 250-8th Street, Oakland, CA
Job #: 2808 Date of sampling: 10-17-95
Well Name: MW-1 Sampled by: RK
Total depth of well (feet): 27.96 Well diameter (inches): 2
Depth to water before sampling (feet): 17.72
Thickness of floating product if any: None
Depth of well casing in water (feet): 10.24
Number of gallons per well casing volume (gallons): 1.7
Number of well casing volumes to be removed: 4
Req'd volume of groundwater to be purged before sampling (gallons): 6.8
Equipment used to purge the well: 12 volt PVC pump
Time Evacuation Began: 14:30 Time Evacuation Finished: 14:40
Approximate volume of groundwater purged: 7 gallons
Did the well go dry?: No After how many gallons: —
Time samples were collected: 15:15
Depth to water at time of sampling: ~~RK~~ 17.80
Percent recovery at time of sampling: 99%
Samples collected with: Dedicated polyethylene bailer
Sample color: None Odor: None
Description of sediment in sample: None

## CHEMICAL DATA

| Volume Purged | Temp | pH | Conductivity |
|---|---|---|---|
| Initial | 75.6 | 7.18 | 566 |
| 1.7 gals | 73.2 | 7.06 | 566 |
| 3.4 gals | 72.8 | 7.05 | 568 |
| 5.1 gals | 72.5 | 7.05 | 562 |
| 6.8 gals | 72.4 | 7.05 | 558 |

## SAMPLES COLLECTED

| Sample | # of containers | Volume & type container | Pres | Iced? | Analysis |
|---|---|---|---|---|---|
| MW-1 | 2 | 40-ml VOA vials | HCl | Yes | TPH-G/BTEX |
| | 2 | ↓ | | | EPA 8010 |
| | 2 | 1-liter amber glass | | | TPH-D |
| | 1 | ↓ | | | O&G |
| | | | | | |

aqua science engineers inc.

# WELL SAMPLING FIELD LOG

Project Name and Address: Lim Property, 250 8th Street Oakland, CA
Job #: 2808 Date of sampling: 10-17-95
Well Name: MW-2 Sampled by: RK
Total depth of well (feet): 25.82 Well diameter (inches): 2"
Depth to water before sampling (feet): 16.94
Thickness of floating product if any: sheen
Depth of well casing in water (feet): 8.88
Number of gallons per well casing volume (gallons): 1.5
Number of well casing volumes to be removed: 4
Req'd volume of groundwater to be purged before sampling (gallons): 6
Equipment used to purge the well: 12 volt PVC pump
Time Evacuation Began: 15:35 Time Evacuation Finished: 15:45
Approximate volume of groundwater purged: 6 gallons
Did the well go dry?: No After how many gallons: —
Time samples were collected: 15:59
Depth to water at time of sampling: 17.00
Percent recovery at time of sampling: 99%
Samples collected with: Dedicated polyethylene bailer
Sample color: turbid black Odor: very strong hc
Description of sediment in sample: black silt

## CHEMICAL DATA

| Volume Purged | Temp | pH | Conductivity |
|---|---|---|---|
| Initial | 76.4 | 7.26 | 920 |
| 1.6 gals | 74.0 | 7.12 | 620 |
| 3.0 gals | 72.8 | 7.06 | 580 |
| 4.5 gals | 72.2 | 7.06 | 572 |
| 6.0 gals | 72.1 | 7.05 | 574 |

## SAMPLES COLLECTED

| Sample | # of containers | Volume & type container | Pres | Iced? | Analysis |
|---|---|---|---|---|---|
| MW-2 | 2 | 40-ml VOA vials | HCl | Yes | TPH-G/BTEX |
| ↓ | 2 | ↓ | ↓ | ↓ | EPA 8010 |
| ↓ | 2 | 1-liter amber glass | ↓ | ↓ | TPH-D |
| ↓ | 1 | ↓ | ↓ | ↓ | O&G |
| | | | | | |

# APPENDIX B

Analytical Report and Chain of Custody Forms
For Groundwater Samples

# American Environmental Network

## Certificate of Analysis

DOHS Certification: 1172 AIHA Accreditation: 11134



AQUA SCIENCE ENGINEERS, INC
2411 OLD CROW CANYON RD. #4
SAN RAMON, CA 94583

ATTN: ROBERT KITAY
CLIENT PROJ. ID: 2808
CLIENT PROJ. NAME: LIM PROPERTY

REPORT DATE: 10/31/95

DATE(S) SAMPLED: 10/17/95

DATE RECEIVED: 10/18/95

AEN WORK ORDER: 9510237

PROJECT SUMMARY:

On October 18, 1995, this laboratory received 2 water sample(s).

Client requested sample(s) be analyzed for organic parameters. Results of analysis are summarized on the following page(s). Please see quality control report for a summary of QC data pertaining to this project.

Samples will be stored for 30 days after completion of analysis, then disposed of in accordance with State and Federal regulations. Samples may be archived by prior arrangement.

If you have any questions, please contact Client Services at (510) 930-9090.

Larry Klein
Laboratory Director

AQUA SCIENCE ENGINEERS, INC.

AEN JOB NO: 9510237
DATE SAMPLED: 10/17/95
DATE RECEIVED: 10/18/95
CLIENT PROJ. ID: 2808

| Client Sample Id | AEN Lab Id | Purgeable Hydrocarbons as Gasoline (ug/L) | Extractable Hydrocarbons as Diesel (ug/L) | Oil & Grease (ug/L) | Hydrocarbons (ug/L) | Benzene (ug/L) | Toluene (ug/L) | Ethylbenzene (ug/L) | Total Xylenes (ug/L) |
|---|---|---|---|---|---|---|---|---|---|
| MW-1 | 01 | 400 | 200 | ND | ND | 0.5 | 1.0 | 3 | ND |
| MW-2 | 02 | 190,000 (20000) | 4,000 (500) | 13,000 | 12,000 | 15,000 (200) | 26,000 (200) | 4,900 (200) | 23,000 (400) |
| Reporting Limit (unless otherwise noted by parentheses) | | 50 | 50 | 1000 | 1000 | 0.5 | 0.5 | 0.5 | 2 |
| EPA Method: | | 5030 GCFID | 3510 GCFID | 5520C | 5520F | 8020 | 8020 | 8020 | 8020 |
| Date Extracted: | | NA | 10/23/95 | 10/23/95 | 10/23/95 | NA | NA | NA | NA |
| Date Analyzed: | | 10/24/95 | 10/25/95 | 10/23/95 | 10/23/95 | 10/24/95 | 10/24/95 | 10/24/95 | 10/24/95 |

RLs elevated for gasoline/BTEX and diesel for sample MW-2 due to high levels of target compounds. Sample run at dilution.

NA = Not Applicable
ND = Not Detected

AQUA SCIENCE ENGINEERS, INC

SAMPLE ID: MW-1
AEN LAB NO: 9510237-01
AEN WORK ORDER: 9510237
CLIENT PROJ. ID: 2808

DATE SAMPLED: 10/17/95
DATE RECEIVED: 10/18/95
REPORT DATE: 10/31/95

| ANALYTE | METHOD/ CAS# | RESULT | REPORTING LIMIT | UNITS | DATE ANALYZED |
|---|---|---|---|---|---|
| EPA 8010 - Water matrix | EPA 8010 | | | | |
| Bromodichloromethane | 75-27-4 | ND | 0.5 | ug/L | 10/24/95 |
| Bromoform | 75-25-2 | ND | 0.5 | ug/L | 10/24/95 |
| Bromomethane | 74-83-9 | ND | 2 | ug/L | 10/24/95 |
| Carbon Tetrachloride | 56-23-5 | ND | 0.5 | ug/L | 10/24/95 |
| Chlorobenzene | 108-90-7 | ND | 0.5 | ug/L | 10/24/95 |
| Chloroethane | 75-00-3 | ND | 2 | ug/L | 10/24/95 |
| 2-Chloroethyl Vinyl Ether | 110-75-8 | ND | 0.5 | ug/L | 10/24/95 |
| Chloroform | 67-66-3 | ND | 0.5 | ug/L | 10/24/95 |
| Chloromethane | 74-87-3 | ND | 2 | ug/L | 10/24/95 |
| Dibromochloromethane | 124-48-1 | ND | 0.5 | ug/L | 10/24/95 |
| 1,2-Dichlorobenzene | 95-50-1 | ND | 0.5 | ug/L | 10/24/95 |
| 1,3-Dichlorobenzene | 541-73-1 | ND | 0.5 | ug/L | 10/24/95 |
| 1,4-Dichlorobenzene | 106-46-7 | ND | 0.5 | ug/L | 10/24/95 |
| Dichlorodifluoromethane | 75-71-8 | ND | 2 | ug/L | 10/24/95 |
| 1,1-Dichloroethane | 75-34-3 | ND | 0.5 | ug/L | 10/24/95 |
| 1,2-Dichloroethane | 107-06-2 | ND | 0.5 | ug/L | 10/24/95 |
| 1,1-Dichloroethene | 75-35-4 | ND | 0.5 | ug/L | 10/24/95 |
| cis-1,2-Dichloroethene | 156-59-2 | ND | 0.5 | ug/L | 10/24/95 |
| trans-1,2-Dichloroethene | 156-60-5 | ND | 0.5 | ug/L | 10/24/95 |
| 1,2-Dichloropropane | 78-87-5 | ND | 0.5 | ug/L | 10/24/95 |
| cis-1,3-Dichloropropene | 10061-01-5 | ND | 0.5 | ug/L | 10/24/95 |
| trans-1,3-Dichloropropene | 10061-02-6 | ND | 0.5 | ug/L | 10/24/95 |
| Methylene Chloride | 75-09-2 | ND | 2 | ug/L | 10/24/95 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | ND | 0.5 | ug/L | 10/24/95 |
| Tetrachloroethene | 127-18-4 | 5 * | 0.5 | ug/L | 10/24/95 |
| 1,1,1-Trichloroethane | 71-55-6 | ND | 0.5 | ug/L | 10/24/95 |
| 1,1,2-Trichloroethane | 79-00-5 | ND | 0.5 | ug/L | 10/24/95 |
| Trichloroethene | 79-01-6 | ND | 0.5 | ug/L | 10/24/95 |
| Trichlorofluoromethane | 75-69-4 | ND | 2 | ug/L | 10/24/95 |
| 1,1,2Trichlorotrifluoroethane | 76-13-1 | ND | 0.5 | ug/L | 10/24/95 |
| Vinyl Chloride | 75-01-4 | ND | 2 | ug/L | 10/24/95 |

ND = Not detected at or above the reporting limit
* = Value above reporting limit

AQUA SCIENCE ENGINEERS, INC

SAMPLE ID: MW-2
AEN LAB NO: 9510237-02
AEN WORK ORDER: 9510237
CLIENT PROJ. ID: 2808

DATE SAMPLED: 10/17/95
DATE RECEIVED: 10/18/95
REPORT DATE: 10/31/95

| ANALYTE | METHOD/ CAS# | RESULT | REPORTING LIMIT | UNITS | DATE ANALYZED |
|---|---|---|---|---|---|
| EPA 8010 - Water matrix | EPA 8010 | | | | |
| Bromodichloromethane | 75-27-4 | ND | 0.5 | ug/L | 10/24/95 |
| Bromoform | 75-25-2 | ND | 0.5 | ug/L | 10/24/95 |
| Bromomethane | 74-83-9 | ND | 2 | ug/L | 10/24/95 |
| Carbon Tetrachloride | 56-23-5 | ND | 0.5 | ug/L | 10/24/95 |
| Chlorobenzene | 108-90-7 | ND | 0.5 | ug/L | 10/24/95 |
| Chloroethane | 75-00-3 | ND | 2 | ug/L | 10/24/95 |
| 2-Chloroethyl Vinyl Ether | 110-75-8 | ND | 0.5 | ug/L | 10/24/95 |
| Chloroform | 67-66-3 | ND | 0.5 | ug/L | 10/24/95 |
| Chloromethane | 74-87-3 | ND | 2 | ug/L | 10/24/95 |
| Dibromochloromethane | 124-48-1 | ND | 0.5 | ug/L | 10/24/95 |
| 1,2-Dichlorobenzene | 95-50-1 | ND | 0.5 | ug/L | 10/24/95 |
| 1,3-Dichlorobenzene | 541-73-1 | ND | 0.5 | ug/L | 10/24/95 |
| 1,4-Dichlorobenzene | 106-46-7 | ND | 0.5 | ug/L | 10/24/95 |
| Dichlorodifluoromethane | 75-71-8 | ND | 2 | ug/L | 10/24/95 |
| 1,1-Dichloroethane | 75-34-3 | ND | 0.5 | ug/L | 10/24/95 |
| 1,2-Dichloroethane | 107-06-2 | ND | 0.5 | ug/L | 10/24/95 |
| 1,1-Dichloroethene | 75-35-4 | ND | 0.5 | ug/L | 10/24/95 |
| cis-1,2-Dichloroethene | 156-59-2 | ND | 0.5 | ug/L | 10/24/95 |
| trans-1,2-Dichloroethene | 156-60-5 | ND | 0.5 | ug/L | 10/24/95 |
| 1,2-Dichloropropane | 78-87-5 | ND | 0.5 | ug/L | 10/24/95 |
| cis-1,3-Dichloropropene | 10061-01-5 | ND | 0.5 | ug/L | 10/24/95 |
| trans-1,3-Dichloropropene | 10061-02-6 | ND | 0.5 | ug/L | 10/24/95 |
| Methylene Chloride | 75-09-2 | ND | 2 | ug/L | 10/24/95 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | ND | 0.5 | ug/L | 10/24/95 |
| Tetrachloroethene | 127-18-4 | ND | 0.5 | ug/L | 10/24/95 |
| 1,1,1-Trichloroethane | 71-55-6 | ND | 0.5 | ug/L | 10/24/95 |
| 1,1,2-Trichloroethane | 79-00-5 | ND | 0.5 | ug/L | 10/24/95 |
| Trichloroethene | 79-01-6 | 1 * | 0.5 | ug/L | 10/24/95 |
| Trichlorofluoromethane | 75-69-4 | ND | 2 | ug/L | 10/24/95 |
| 1,1,2Trichlorotrifluoroethane | 76-13-1 | ND | 0.5 | ug/L | 10/24/95 |
| Vinyl Chloride | 75-01-4 | ND | 2 | ug/L | 10/24/95 |

ND = Not detected at or above the reporting limit
* = Value above reporting limit

# AEN (CALIFORNIA)
# QUALITY CONTROL REPORT

AEN JOB NUMBER: 9510237

CLIENT PROJECT ID: 2808

## Quality Control and Project Summary

All laboratory quality control parameters were found to be within established limits.

**Definitions**

Laboratory Control Sample (LCS)/Method Spike(s): Control samples of known composition. LCS and Method Spike data are used to validate batch analytical results.

Matrix Spike(s): Aliquot of a sample (aqueous or solid) with added quantities of specific compounds and subjected to the entire analytical procedure. Matrix spike and matrix spike duplicate QC data are advisory.

Method Blank: An analytical control consisting of all reagents, internal standards, and surrogate standards carried through the entire analytical process. Used to monitor laboratory background and reagent contamination.

Not Detected (ND): Not detected at or above the reporting limit.

Relative Percent Difference (RPD): An indication of method precision based on duplicate analysis.

Reporting Limit (RL): The lowest concentration routinely determined during laboratory operations. The RL is generally 1 to 10 times the Method Detection Limit (MDL). Reporting limits are matrix, method, and analyte dependent and take into account any dilutions performed as part of the analysis.

Surrogates: Organic compounds which are similar to analytes of interest in chemical behavior, but are not found in environmental samples. Surrogates are added to all blanks, calibration and check standards, samples, and spiked samples. Surrogate recovery is monitored as an indication of acceptable sample preparation and instrumental performance.

D: Surrogates diluted out.

#: Indicates result outside of established laboratory QC limits.

## QUALITY CONTROL DATA

METHOD: SM 5520

AEN JOB NO: 9510237
DATE EXTRACTED: 10/03/95
DATE ANALYZED: 10/03/95
SAMPLE SPIKED: DI WATER
INSTRUMENT: GRAVIMETRIC
MATRIX: WATER

Method Spike Recovery Summary

| Analyte | Spike Added (mg/L) | Duplicate Spike Added (mg/L) | Average Percent Recovery | RPD | QC Limits Percent Recovery | QC Limits RPD |
|---|---|---|---|---|---|---|
| Oil | 98.5 | 94.2 | 67 | 3 | 60-108 | 5 |

Daily method blanks for all associated analytical runs showed no contamination at or above the reporting limit.

## QUALITY CONTROL DATA

METHOD: EPA 3510 GCFID

AEN JOB NO: 9510237
DATE EXTRACTED: 10/23/95
INSTRUMENT: C
MATRIX: WATER

Surrogate Standard Recovery Summary

| Date Analyzed | Client Id. | Lab Id. | Percent Recovery n-Pentacosane |
|---|---|---|---|
| 10/25/95 | MW-1 | 01 | 101 |
| 10/25/95 | MW-2 | 02 | I |
| QC Limits: | | | 59-118 |

I = Interference

DATE EXTRACTED: 10/20/95
DATE ANALYZED: 10/23/95
SAMPLE SPIKED: DI WATER
INSTRUMENT: C

Method Spike Recovery Summary

| Analyte | Spike Added (mg/L) | Average Percent Recovery | RPD | QC Limits Percent Recovery | QC Limits RPD |
|---|---|---|---|---|---|
| Diesel | 2.07 | 83 | 3 | 58-107 | 15 |

Daily method blanks for all associated analytical runs showed no contamination at or above the reporting limit.

## QUALITY CONTROL DATA

METHOD: EPA 8010

AEN JOB NO: 9510237
INSTRUMENT: I
MATRIX: WATER

Surrogate Standard Recovery Summary

| Date Analyzed | Client Id. | Lab Id. | Percent Recovery: Bromochloro-methane | Percent Recovery: 1-Bromo-3-chloro-propane |
|---|---|---|---|---|
| 10/24/95 | MW-1 | 01 | 95 | 114 |
| 10/24/95 | MW-2 | 02 | 95 | 118 |
| QC Limits: | | | 70-130 | 70-130 |

DATE ANALYZED: 10/24/95
SAMPLE SPIKED: 9510153-03
INSTRUMENT: I

Matrix Spike Recovery Summary

| Analyte | Spike Added (ug/L) | Average Percent Recovery | RPD | QC Limits: Percent Recovery | QC Limits: RPD |
|---|---|---|---|---|---|
| 1,1-Dichloroethene | 50 | 103 | <1 | 37-156 | 20 |
| Trichloroethene | 50 | 117 | 3 | 54-122 | 20 |
| Chlorobenzene | 50 | 96 | 4 | 54-141 | 20 |

Daily method blanks for all associated analytical runs showed no contamination at or above the reporting limit.

## QUALITY CONTROL DATA

METHOD: EPA 8020, 5030 GCFID

AEN JOB NO: 9510237
INSTRUMENT: H
MATRIX: WATER

Surrogate Standard Recovery Summary

| Date Analyzed | Client Id. | Lab Id. | Percent Recovery Fluorobenzene |
|---|---|---|---|
| 10/24/95 | MW-1 | 01 | 97 |
| 10/24/95 | MW-2 | 02 | 100 |
| QC Limits: | | | 92-109 |

DATE ANALYZED: 10/23/95
SAMPLE SPIKED: 9510167-03
INSTRUMENT: H

Matrix Spike Recovery Summary

| Analyte | Spike Added (ug/L) | Average Percent Recovery | RPD | QC Limits Percent Recovery | QC Limits RPD |
|---|---|---|---|---|---|
| Benzene | 35.4 | 109 | 2 | 85-109 | 17 |
| Toluene | 108.0 | 111 | 3 | 87-111 | 16 |
| Hydrocarbons as Gasoline | 1000 | 116 | 9 | 66-117 | 19 |

Daily method blanks for all associated analytical runs showed no contamination at or above the reporting limit.

*** END OF REPORT ***

R-1,S-E R-3,S-2 9510237

Aqua Science Engineers, Inc.
2411 Old Crow Canyon Road, #4,
San Ramon, CA 94583
(510) 820-9391 - FAX (510) 837-4853

# Chain of Custody

DATE 10-17-95 PAGE 1 OF 1

SAMPLERS (SIGNATURE) (PHONE NO.)
Robert E. Kitay (510) 372-9739

PROJECT NAME Lim Property NO. 2808
ADDRESS 280-8th Street Oakland, CA

## ANALYSIS REQUEST

SPECIAL INSTRUCTIONS:

| SAMPLE ID. | DATE | TIME | MATRIX | NO. OF SAMPLES | TPH- GASOLINE (EPA 5030/8015) | TPH- GASOLINE/BTEX (EPA 5030/8015-8020) AB | TPH- DIESEL (EPA 3510/8015) CO | PURGABLE AROMATICS (EPA 602/8020) | PURGABLE HALOCARBONS (EPA 601/8010) EF | VOLATILE ORGANICS (EPA 624/8240) | BASE/NUETRALS, ACIDS (EPA 625/8270) | OIL & GREASE (EPA 5520 E&F OR B&F) G | LUFT METALS (5) (EPA 6010+7000) | TITLE 22 (CAM 17) (EPA 6010+7000) | TCLP (EPA 1311/1310) | STLC- CAM WET (EPA 1311/1310) | REACTIVITY CORROSIVITY IGNITABILITY |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW-1 | 10/17 | 15:15 | Water | 7 | | X | X | | X | | | X | | | | | |
| MW-2 | 10/17 | 15:59 | Water | 7 | | X | X | | X | | | X | | | | | |

RELINQUISHED BY:
(signature) D. Alle 13:15 (time)
D. Alle 10-18-95 (printed name) (date)
Company- ASE

RECEIVED BY:
(signature) Michael E. McMillan 13:15 (time)
Michael McMillan 10/18/95 (printed name) (date)
Company- AEN

RELINQUISHED BY:
(signature) Michael E. McMillan 17:20 (time)
10/18/95 (printed name) (date)
Company-

RECEIVED BY LABORATORY:
(signature) Gina M Bellucci 19:20 (time)
10/18/95 Gina M Bellucci (printed name) (date)
Company- AEN

COMMENTS:
STANDARD
T.A.T.