100 Pine Street, 10th Floor
San Francisco, CA 94111
(415) 434-9400 • FAX (415) 434-1365

GEOMATRIX

**Transmittal**

92 SEP -2 AM 9:13

**Date** 1 September 1992

**To** Ms. Juliet Shin
Alameda County Department of Environmental Health
Hazardous Materials Divison
80 Swan Way, Room 200, Oakland, CA 94621

**Project Number** 1736.11

**Project Name** Marina Village

**Transmitted via**
- ☐ Messenger
- ☐ U.S. Mail
- ☒ Federal Express
- ☐ Fax

**Total pages** ____

| Item | Description |
|---|---|
| 1. | Letter Regarding Underground Storage Tank Compliance Tanks 1 and 2 |
| 2. | Letter Regarding Underground Storage Tank Compliance Tank 3 |
| 3. | Letter Regarding Underground Storage Tank Compliance 1020 Atlantic Avenue |
| 4. | Agenda for 3 September 1992 Meeting |

**Remarks** Enclosed are the above-mentioned items. Please call if you have any questions.

**Signed** Elizabeth A. Nixon

**cc:** Mr. Richard Hiett - RWQCB, Ms. Cathy Luck - AREI

**Geomatrix Consultants, Inc.**
Engineers, Geologists, and Environmental Scientists

GEOMATRIX

# ATTACHMENT A

## Geomatrix Letter to the ACDEH
## Dated 1 September 1992

100 Pine Street, 10th Floor
San Francisco, CA 94111
(415) 434-9400 • FAX (415) 434-1365

GEOMATRIX

1 September 1992
Project 1736.11

Ms. Juliet Shin
Alameda County Department of Environmental Health
Hazardous Materials Division
80 Swan Way, Room 200
Oakland, California 94621

Subject: Underground Storage Tank Compliance
Tanks 1 and 2
1150 Marina Village Parkway
Marina Village Development
Alameda, California

Dear Ms. Shin:

Geomatrix Consultants, Inc. (Geomatrix), has prepared this letter, on behalf of Alameda Real Estate Investments (AREI), to provide additional information on two underground storage tanks (USTs) discussed in a letter from your office to AREI dated 29 June 1992. The letter specifically notes that detectable concentrations of petroleum hydrocarbons or related compounds were identified in two samples, one soil and one groundwater, collected near the two USTs during removal of the tanks in 1988 and reported in Levine-Fricke's 5 October 1988 report describing tank removal activities (Removal of Petroleum-Affected Soils from the Field Area South of the Powerhouse, Alameda Marina Village, Alameda, California). This report was submitted to Alameda County Department of Environmental Health (ACDEH) on 13 May 1992. Because detectable concentrations of petroleum and petroleum-related compounds were found, the letter further states that a site investigation or groundwater monitoring is required at the site to comply with Regional Water Quality Control Board (RWQCB) guidelines.

The purpose of this letter is to present information on the subject site and tank removals obtained from our review of available reports and AREI's files. At AREI's request, and in response to the 29 June 1988 letter from your office, Geomatrix is currently preparing a groundwater monitoring plan for the site to comply with RWQCB guidelines. The basis for the proposed groundwater monitoring plan is discussed below. The groundwater monitoring plan will be submitted to the ACDEH when it is completed.

## BACKGROUND

The two underground storage tanks were encountered and removed from the site during site remediation activities in 1988. The tanks are designated Tank 1 and Tank 2 as shown on the attached Site Plan, Figure 1, and are of 1500 gallon and 2400 gallon capacities, respectively. The tanks were removed by Tank Excavators of Santa Cruz on 26 July, 1988. An engineer from Levine-Fricke was on site to observe the tank removals and collect soil and groundwater samples from the excavations. A representative from the Alameda Fire Department was also on site to observe the tank removals. An ACDEH representative was not present. The tanks were initially discovered during remediation of soil that contained petroleum hydrocarbons in the area shown on the attached Figure 1.

As described in the Levine-Fricke report, the occurrence of the petroleum hydrocarbons in the soil was largely unrelated to the tanks, although Tank 1 had evidence of leakage into subsurface soil in the immediate vicinity of the tank. The petroleum-affected soil was removed in conjunction with the overall site remediation.

## SAMPLING AND ANALYSIS DURING TANK REMOVAL

After the tanks were removed, four soil samples, two from each of the two tank excavations, and one grab groundwater sample from the excavation for Tank 1 were obtained for chemical analysis. All of the samples were analyzed by Brown & Caldwell laboratories of Emeryville, a California, state-certified laboratory. The analytical results are summarized below and were originally reported in the 5 October 1988 Levine-Fricke report.

### Tank 1

The two soil samples taken from the Tank 1 excavation were analyzed for TPHd by EPA method 8015. Results of the TPH analyses were non-detect for those samples indicating petroleum-affected soil had been removed from the vicinity of the tank.

The one grab groundwater sample was analyzed for TPHd by EPA method 8015 and for purgeable aromatics by EPA Method 602. Analytical results of the analysis for TPHd were non-detect. Results of detectable purgeable aromatics were 32 micrograms per kilogram ($\mu$g/kg) 1,3-dichlorobenzene, 23 $\mu$g/kg 1,4-dichlorobenzene, and 2.3 $\mu$g/kg chlorobenzene, but the aromatics benzene, toluene, ethylbenzene and xylenes (BTEX), typically associated with petroleum fuels, were absent. The occurrence of the chlorobenzenes probably were not a result of leakage from the underground tank.

Tank 2

Both soil samples from the Tank 2 excavation were analyzed for TPHd by EPA Method 8015. One of the soil samples at Tank 2 was found to contain 33 mg/kg TPHd and there was no detection of TPHd in the other sample. Because there was no other evidence of fuel leakage from Tank 2 and the occurrence of 33 mg/kg TPH does not suggest a significant release of fuel, we do not recommend further characterization of subsurface conditions in the vicinity of Tank 2.

## GROUNDWATER QUALITY

In February 1988, before remediation, Levine-Fricke was retained by AREI to perform an investigation to characterize the extent and concentrations of petroleum hydrocarbons that existed at the site. Part of the investigation included the installation, sampling and analysis of five shallow groundwater monitoring wells in the vicinity of the petroleum-affected soil.

Groundwater from the five wells was collected and analyzed for TPHg, TPHd, and BTEX using EPA Methods 8015 and 602. Of the five wells sampled, only one was found to contain detectable petroleum hydrocarbons and related compounds, including 1.8 mg/l TPHd and 0.001 mg/l total xylenes, and a second well contained trace concentrations (0.0006 to 0.003 mg/l) of toluene, ethylbenzene and xylenes.

Based on the data obtained during the investigation, groundwater in the vicinity of the petroleum-affected soil and the two tanks appeared to contain only a small amount of petroleum compounds. The findings of the investigation are summarized in a draft 25 April 1988 Levine-Fricke report submitted to AREI (Draft Investigation of Field Area South of Powerhouse, Marina Village, Alameda, California). A copy of the draft report is appended to this letter as Attachment 1 for your files. Four of the five wells were removed or abandoned during remediation and subsequent site development. The one remaining well LF2, is shown on Figure 1.

## CURRENT SITE STATUS

Since tank removal and soil remediation activities occurred in 1988, the area has been developed as an office building surrounded by parking lots. Figure 1 shows the location of the new office building in relation to the former excavation. To meet RWQCB and ACDEH guidelines for underground storage tank closure, we are recommending to AREI that a monitoring well be constructed downgradient of the entire excavation area to obtain groundwater quality data representative of the area and to evaluate whether there are residual effects on groundwater quality from the former Tank 1. Other existing shallow monitoring wells (LF-2 and WC-3, Figure 1) can be used in conjunction with the new well to confirm groundwater flow direction.

We propose to sample the well quarterly for a period of one year, and analyze the samples for TPHd and BTEX. We will recommend closure if analyses are non-detect for at least the last two quarters. We are in the process of developing a work plan describing the proposed groundwater monitoring program, and will submit the plan for your review in the near future.

If you require further information, please contact me or Steve Sanders at (415) 434-9400 at your earliest convenience.

Sincerely yours,

GEOMATRIX CONSULTANTS, INC.

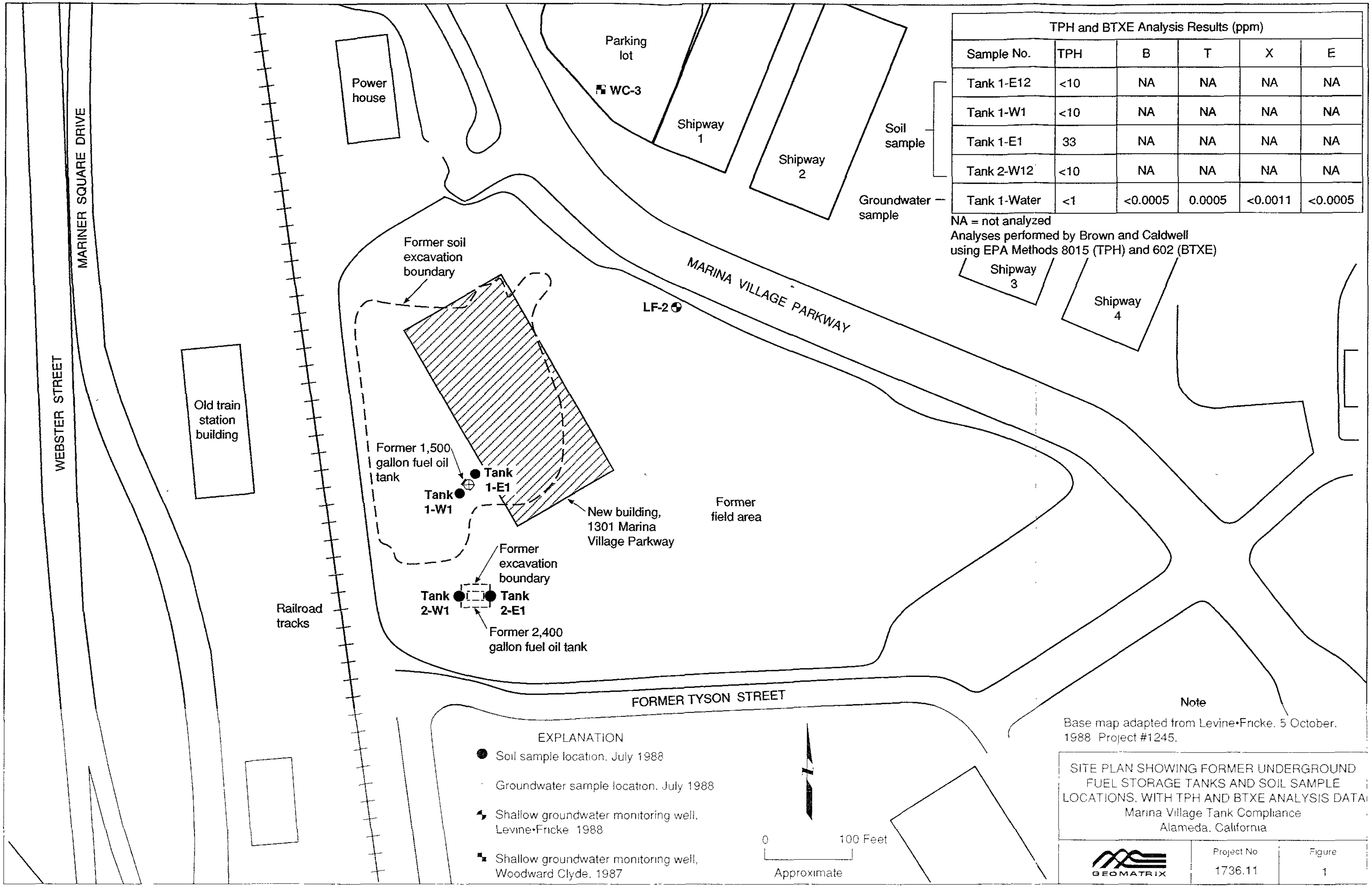
Elizabeth Nixon
Project Manager

Pamela H. Rey
Pamela H. Rey, P.E.
Senior Engineer

EAN/PHR/bap
CONTR\1736T1&2.LTR

Attachments: 1 - Figure 1 - Site Plan Showing Former Underground Fuel Storage Tanks and Soil Sample Locations, with TPH and BTXE Analysis Data
2 - 25 April 1988 Levine-Fricke Draft Report

cc: Ms. Cathy Luck - AREI (w/o attachment)
Mr. Richard Hiett - RWQCB




**TPH and BTXE Analysis Results (ppm)**

| | Sample No. | TPH | B | T | X | E |
|---|---|---|---|---|---|---|
| Soil sample | Tank 1-E12 | <10 | NA | NA | NA | NA |
| | Tank 1-W1 | <10 | NA | NA | NA | NA |
| | Tank 1-E1 | 33 | NA | NA | NA | NA |
| | Tank 2-W12 | <10 | NA | NA | NA | NA |
| Groundwater sample | Tank 1-Water | <1 | <0.0005 | 0.0005 | <0.0011 | <0.0005 |

NA = not analyzed
Analyses performed by Brown and Caldwell using EPA Methods 8015 (TPH) and 602 (BTXE)

EXPLANATION

- Soil sample location, July 1988
- Groundwater sample location, July 1988
- Shallow groundwater monitoring well, Levine•Fricke 1988
- Shallow groundwater monitoring well, Woodward Clyde, 1987

Note

Base map adapted from Levine•Fricke, 5 October, 1988 Project #1245.

SITE PLAN SHOWING FORMER UNDERGROUND FUEL STORAGE TANKS AND SOIL SAMPLE LOCATIONS, WITH TPH AND BTXE ANALYSIS DATA
Marina Village Tank Compliance
Alameda, California

GEOMATRIX | Project No 1736.11 | Figure 1

# ATTACHMENT A

**Geomatrix Letter to the ACDEH**
**Dated 1 September 1992**

100 Pine Street, 10th Floor
San Francisco, CA 94111
(415) 434-9400 • FAX (415) 434-1365

GEOMATRIX

1 September 1992
Project 1736.11

Ms. Juliet Shin
Alameda County Department of Environmental Health
Hazardous Materials Division
80 Swan Way, Room 200
Oakland, CA 94621

Subject: Underground Storage Tank Compliance
Tank 3
1150 Marina Village Parkway
Marina Village Development
Alameda, California

Dear Ms. Shin:

On behalf of Alameda Real Estate Investments (AREI), Geomatrix Consultants, Inc. (Geomatrix), has prepared this letter to respond to an Alameda County Department of Environmental Health (ACDEH) letter to AREI dated 29 June 1992 requesting information on the removal of a 15,000-gallon underground storage tank (UST) from the subject site in 1989. We have identified the tank as "Tank 3" to distinguish it from two other USTs removed at the same address. Based on discussions with AREI, Tank 3 may have been installed in the 1940s but has been out of service at least since AREI began acquiring Marina Village properties in the 1970s. The tank is reported to have stored primarily diesel fuel. According to AREI files, two soil and groundwater sampling and analysis events were performed at the former tank site; one in August 1988, before the tank was removed, and a second in January 1989 during tank removal activities. Figure 1, attached, shows a layout of the site, sampling locations, and a summary table of related analytical data.

## SOIL AND GROUNDWATER SAMPLING BEFORE TANK REMOVAL

In August 1988, before the tank was removed, AREI drilled soil borings and collected soil and groundwater grab samples for laboratory analysis at the locations shown on Figure 1. Depth to groundwater was not reported at the time of sampling; however, groundwater was encountered at a depth of 12 feet below ground surface during subsequent excavation for tank removal. Soil and groundwater samples were analyzed by GTEL Environmental Laboratories of Concord, California, a state-certified laboratory, for total petroleum hydrocarbons as gasoline and diesel (TPHg and TPHd, respectively) by modified Environmental Protection Agency (EPA) Method 8015. Results of the analyses of soil samples indicate that 39 milligrams per kilogram (mg/kg) of TPHd were detected in one soil sample taken within 10 feet of the tank. No TPHg was detected in that sample. Six other soil samples collected in the vicinity of the tank did not contain detectable concentrations of TPHd or TPHg. Three of four groundwater samples collected from two of the soil borings did not contain TPHd or TPHg above laboratory detection limits ranging from 250 to 700 micrograms per liter (μg/l). One groundwater sample, however, collected from a third boring was reported to contain 130 μg/l TPHd, which the laboratory further characterized as degraded diesel fuel. Copies of the laboratory data sheets and chain-of-custody records are appended to this letter as Attachment A.

## TANK REMOVAL AND POST-REMOVAL SAMPLING

The tank was subsequently removed by Tank Excavators, Inc., of Santa Cruz, California, on 9 January 1989 under the direction of Fanfa Inc., a San Lorenzo, California, based engineering contractor retained by AREI. A representative of ACDEH, Ms. Katherine Chesick, observed the tank removal. Safety Specialists, Inc., of Santa Clara, California, an environmental health and safety contractor, was retained by Tank Excavators, Inc., to collect soil and groundwater samples from the tank excavation for chemical analysis. A report documenting the tank removal was prepared by Safety Specialists, Inc., and is appended to this letter as Attachment B.

As documented in the tank removal report by Safety Specialists, Inc., three soil samples were collected from the tank excavation sidewalls at the groundwater interface and two groundwater samples were collected from standing water within the excavation for chemical analysis. The samples were analyzed by Sequoia Analytical, a state certified laboratory. The analytical results are included in the table shown on Figure 1. The soil samples were analyzed for TPHg by EPA Method 5030/8015; TPHd by EPA Method 3550/8015; total oil and grease (TOG) by EPA Method 418.1; and benzene, toluene, ethylbenzene, and xylenes (BTEX) by EPA Method 8020. Analytical results indicated TPHd was present in soil at concentrations ranging from not detected to 5300 mg/kg, and TOG was detected at concentrations ranging from 9.1 to 5300 mg/kg. Benzene, toluene, and xylenes were not detected in the soil samples. Both groundwater samples were analyzed for volatile organic compounds (VOCs) according to EPA Method 8240; no VOCs were detected in the samples. One groundwater sample was analyzed for TPHg and TPHd by EPA Method 8015 and BTEX by EPA Method 8020. This groundwater sample contained 270 μg/l TPHg, 6400 μg/l TPHd, and a total of 27.8 μg/l BTEX.

Based on discussions with AREI personnel, soil that was visibly stained with petroleum was removed from the tank excavation under the direction of AREI's construction manager during tank removal activities. The soil apparently was added to a stockpile of diesel-affected soil generated from a different excavation within Marina Village. The excavation was then backfilled with imported fill.

## GROUNDWATER MONITORING PLAN

Based on visual observation of the tank excavation by Tank Excavators, Inc., and a representative from your office, and results of soil and groundwater sample analyses, it was apparent at the time the tank was removed that petroleum hydrocarbons, primarily diesel, had leaked into the soil surrounding the tank. Levine-Fricke, Inc., was subsequently retained by AREI to develop a work plan to monitor groundwater in the area of the removed tank. The work plan, dated 20 November 1989, was submitted to ACDEH on 30 November 1989; however, the plan was not implemented. The plan proposed installing two shallow groundwater wells and monitoring them on a quarterly basis for one year. Samples from the wells would be analyzed for TPHg, TPHd, and BTEX. For your records, a copy of the work plan and cover letter is appended to this letter as attachment C.

To comply with ACDEH and Regional Water Quality Control Board (RWQCB) guidelines, we are developing an updated work plan to monitor groundwater at the site. We will submit the work plan to you in the near future for your review. Please call either of the undersigned or Steve Sanders at (415) 434-9400 if you have any questions.

Sincerely yours,

GEOMATRIX CONSULTANTS, INC.

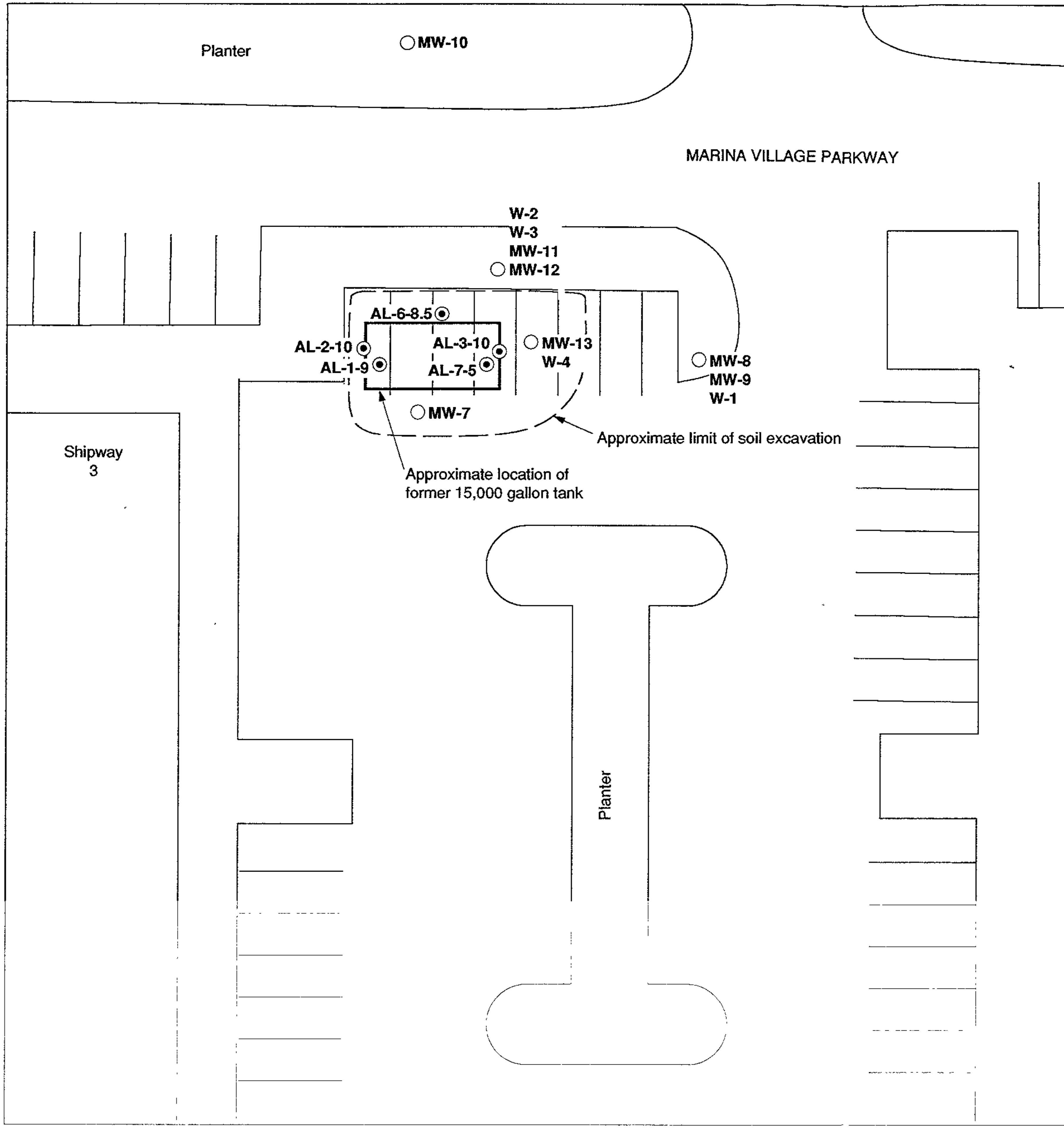
Elizabeth Nixon
Project Manager

Pamela H. Rey, P.E.
Senior Engineer

EAN/PHR/bap
CONTR\1736UST3.LTR

Attachments: 1 - Figure 1 - Tank 3, Soil and Groundwater Sample Location Plan
2 - August 1988 Analytical Data
3 - February 1989 Safety Specialists Report
4 - November 1989 Work Plan Prepared by Levine-Fricke, Inc.

cc: Ms. Cathy Luck - AREI
Mr. Richard Hiett - RWQCB




## SUMMARY OF ANALYTICAL DATA

| Sample No. | Depth (ft.) | TPH - gasoline | TPH - diesel | TOG[1] | Benzene | Toluene | Ethylbenzene | Xylenes |
|---|---|---|---|---|---|---|---|---|
| ANALYTICAL DATA FOR SAMPLES OBTAINED BEFORE TANK REMOVAL IN AUGUST 1988[3] | | | | | | | | |
| SOIL (mg/kg) | | | | | | | | |
| MW-7 | 7.5 | <10 | 39 | | | | | |
| MW-8 | 6 | <10 | <10 | | | | | |
| MW-9 | 10 | <10 | <10 | | | | | |
| MW-10 | 8 | <10 | <10 | | | | | |
| MW-11 | 6 | <10 | <10 | | | | | |
| MW-12 | 10 | <10 | <10 | | | | | |
| MW-13 | 7.5 | <10 | <10 | | | | | |
| WATER (µg/l) | | | | | | | | |
| W-1 | | <700 | <700 | | | | | |
| W-2 | | <250 | <250 | | | | | |
| W-3 | | <250 | <250 | | | | | |
| W-4 | | <10 | 130[2] | | | | | |
| ANALYTICAL DATA FOR SAMPLES OBTAINED FOLLOWING TANK REMOVAL IN JANUARY 1989[4] | | | | | | | | |
| SOIL (mg/kg) | | | | | | | | |
| AL-2-10 | 10[3] | ND | 9.1 | 5300 | ND | ND | | ND |
| AL-3-10 | 10[3] | 6.9 | 5300 | 1400 | ND | ND | | ND |
| AL-6-8.5 | 8.5[3] | 1.0 | 2300 | 34 | ND | ND | | ND |
| WATER (µg/l) | | | | | | | | |
| AL-1-9[5] | | | | | ND | ND | ND | ND |
| AL-7-5[6] | | 270 | 6400 | | 4.8 | 8.8 | 2.2 | 12 |

Notes

1. TOG = total oil and grease.
2. Degraded diesel.
3. Test data referenced from AREI files.
4. Test data referenced from Safety Specialists, Inc., letter dated 13 February 1989.
5. BTEX results based on EPA Method 8240 analysis.
6. BTEX results based on EPA Method 8020 analysis.

EXPLANATION

○ Approximate location of sample(s) obtained before tank removal. Based on unpublished data from AREI files

⦿ Approximate location of sample(s) obtained during tank removal. Based on Safety Specialists, Inc., letter dated 13 February 1989

0 20 Feet

TANK 3
SOIL AND GROUNDWATER SAMPLE LOCATION PLAN
1150 Marina Village Parkway
Alameda, California

GEOMATRIX

| Project No | Figure |
|---|---|
| 1736 11 | 1 |

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**ATTACHMENT A**

**Geomatrix Letter to the ACDEH**
**Dated 1 September 1992**

100 Pine Street, 10th Floor
San Francisco, CA 94111
(415) 434-9400 • FAX (415) 434-1365

GEOMATRIX

1 September 1992
Project 1736.11

Ms. Juliet Shin
Alameda County Department of Environmental Health
Hazardous Materials Division
80 Swan Way, Room 200
Oakland, California 94621

Subject: Underground Storage Tank Compliance
1020 Atlantic Avenue
(Formerly 2051 Sherman Street,
Rigging International Building)
Marina Village Development
Alameda, California

Dear Ms. Shin:

On behalf of Alameda Real Estate Investments (AREI), Geomatrix Consultants, Inc. (Geomatrix) has prepared this letter to provide additional information about two underground storage tanks (USTs) discussed in a letter sent from your office, the Alameda County Department of Environmental Health (ACDEH), to AREI dated 29 June 1992. The ACDEH letter notes that petroleum hydrocarbons and related compounds were detected in one soil and one groundwater sample obtained during the UST removals and site remediation activities in the tank area in 1988. The letter further requires additional soil and groundwater investigations at the site to conform with Regional Water Quality Control Board (RWQCB) guidelines for site closure.

The remainder of this letter presents information obtained from a review of available reports and AREI's files. At AREI's request and in response to the 29 June 1992 letter from ACDEH, Geomatrix is currently preparing a groundwater monitoring plan for the site to comply with RWQCB Guidelines. The basis for the proposed groundwater monitoring plan is discussed in this letter following the summary of soil and groundwater conditions at the site. The plan will be submitted to the ACDEH and the RWQCB when it has been completed.

## BACKGROUND

Tank removal and site remediation activities are described in Levine-Fricke's 25 April 1988 report entitled Removal of Petroleum-Affected Soils in the Vicinity of the Rigging International Building, 2051 Sherman Street, Alameda, California. According to the report, the two USTs, one of 1,000-gallon capacity and one of 5,000-gallon capacity, were removed on 2 March 1988 by Alameda Paving and Excavation according to AREI files. The tanks most recently had contained diesel fuel, but may have contained gasoline in the past. The ages of the tanks were reportedly unknown but are believed to have been at least 15 years old.

Evidence that the former tank(s) had leaked was apparent during tank removal when residual fuel was observed in the excavation sidewall soil. AREI retained Levine-Fricke to observe subsequent excavation of soil and groundwater in the vicinity of the former USTs and obtain samples of soil and groundwater for analysis. Remediation activities included the removal of 300 cubic yards of petroleum-containing soil and 2000 gallons of groundwater.

Soil

Post-remediation soil sampling and analyses for petroleum hydrocarbons indicated that gasoline and diesel were not present in the sidewalk and bottom of the excavation with the exception of one sample that contained 69 mg/kg diesel. One other sample contained petroleum hydrocarbons characterized as motor oil at a concentration of 120 mg/kg.

Based on the results of the chemical analysis, it appears that the soil containing petroleum hydrocarbons was largely removed during remediation, and the extent of soil containing petroleum hydrocarbons characterized as motor oil was localized. Because the former tanks are reportedly known only to have contained diesel fuel or gasoline, it is unlikely the motor oil detected in the soil samples is related to the fuel leakage from the tanks. As indicated in the cover letter of the 1988 Levine-Fricke report, conversations with a representative from the Regional Water Quality Control Board indicated no further excavation of soil at the site was required as long as groundwater was not significantly affected by the presence of the oil. The excavation was subsequently backfilled with imported fill.

Groundwater

During tank removal and remediation activities, four groundwater samples were analyzed by Anatec Laboratories, Inc., (now NET Pacific Laboratory) for TPHg, TPHd, and benzene, toluene, and xylenes (BTX). One sample was taken at the beginning of remediation, and a second taken midway through remediation from within the excavation; a third sample was taken at the end of remediation from the portable tank used to store pumped groundwater from the excavation; and a fourth sample was taken from a test pit dug adjacent to the tank excavation at the end of remediation.

The first sample, taken within the excavation at the beginning of remediation, contained 13 mg/l TPHg, 75 mg/l TPHd, and a total of 1.18 mg/l BTX. The analyses on the remaining three samples taken during remediation were significantly improved, reporting non-detect for benzene and xylene, 0.073 mg/kg toluene in one sample, non-detect to 0.6 mg/kg TPHg, and non-detect to 8.5 mg/kg TPHd. These results are generally representative of the groundwater that was removed from the excavation.

After remediation, a groundwater monitoring well (RC-1) was installed at the site (see Figure 1). Initial sampling and analysis of groundwater from well RC-1 was performed on March 28, 1988 shortly after remediation activities were completed and was reported in Levine-Fricke's April 1988 report. The results indicate that TPHg and BTX were not detected above method detection limits and TPHd was detected at a concentration of 1.5 mg/l.

Sampling and analysis of groundwater from well RC-1 was performed a second time in February of 1989 as part of an environmental assessment for a nearby property. The groundwater was analyzed by Med-Tox Associates, Inc., of Pleasant Hill, California (now Quanteq Laboratories), a state-certified laboratory, for volatile organic compounds (VOCs) by Environmental Protection Agency (EPA) Method 624, CAM-17 metals (now California Code of Regulations (CCR) Title 22 metals), and polychlorinated biphenyls (PCBs) by EPA Method 608. Analysis of the groundwater sample for petroleum hydrocarbons was not included in the environmental assessment scope of work.

Results of the analyses indicated that VOCs, including BTX, were not detected in the groundwater, and metals, including lead, generally either were not present or at concentrations typical of background groundwater quality. For your files, analytical data from the 1989 sampling event is attached to this letter.

## CURRENT SITE STATUS

Since 1989, the site has been extensively redeveloped. Redevelopment has included elimination of Sherman Road and extension of Atlantic Avenue, construction of a new building in place of the former Rigging International building, and construction of a new parking lot. In the process of redevelopment, well RC-1 was inadvertently covered by the new parking lot. Figure 1 shows the new site layout and the former locations of the tanks, the excavation boundary, and well RC-1. The site address is now 1020 Atlantic Avenue.

To comply with current RWQCB and ACDEH guidelines for closure of underground storage tank sites, Geomatrix has recommended to AREI that a new monitoring well be installed downgradient with respect to groundwater flow from the formerly excavated area to evaluate the residual effects of the former tanks on groundwater quality. We propose to sample the well quarterly for a period of one year, and analyze the samples for TPHg, TPHd, and benzene, toluene, ethylbenzene, and xylenes (BTEX). We will recommend closure if analyses are non-detect for at least the last two quarters. We are in the process of developing a work plan describing the proposed groundwater monitoring program, and will submit the plan for your review in the near future.

If you require further information, please contact either of the undersigned or Steve Sanders at (415) 434-9400 at your earliest convenience.

Sincerely yours,

GEOMATRIX CONSULTANTS, INC.

Elizabeth Nixon
Project Manager

Pamela H. Rey, P.E.
Senior Engineer

EAN/PHR/bap
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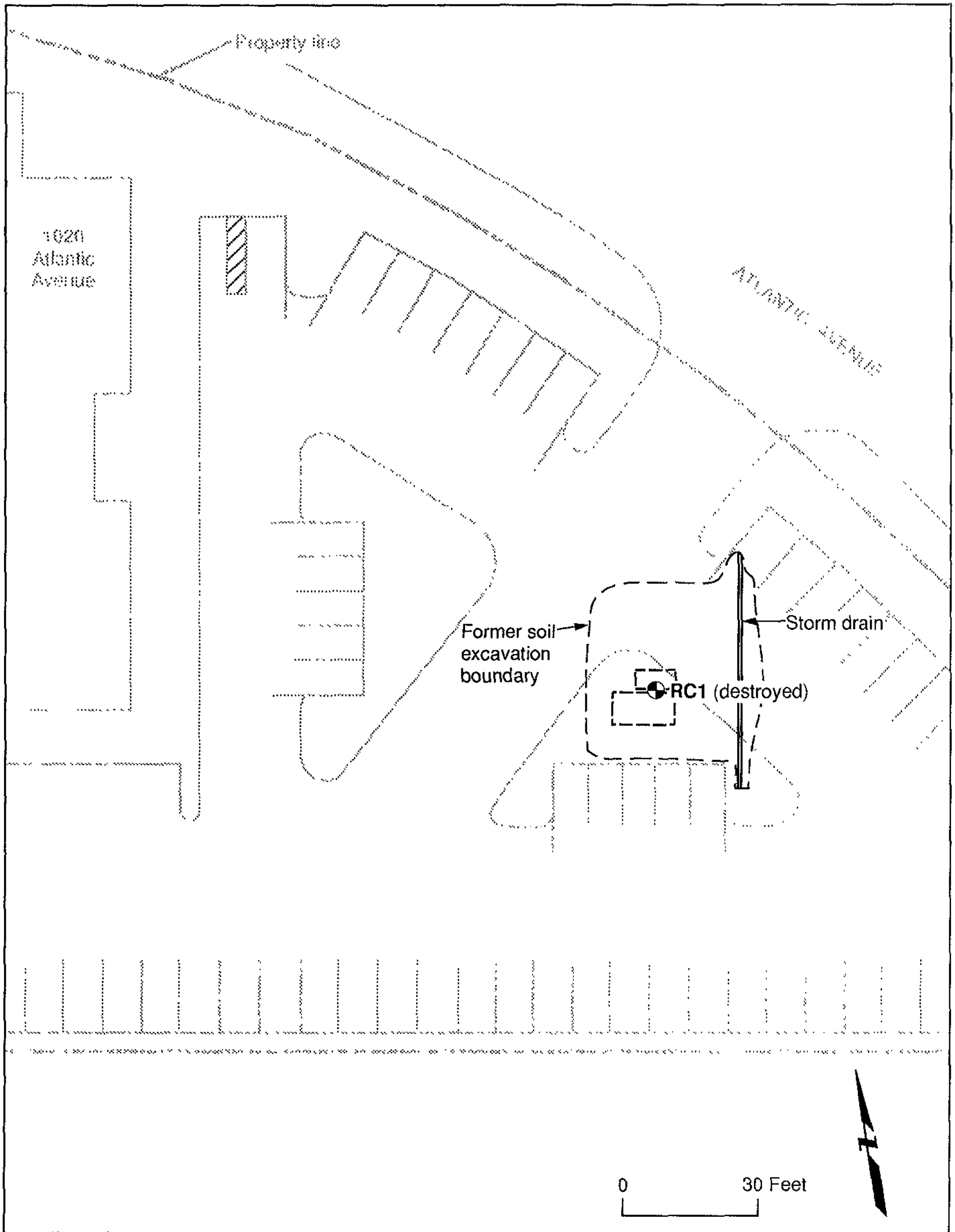
Attachment: 1 - Figure 1 - Former Well and Excavation Location Plan
2 - February 1989 Groundwater Analytical Data for Well RC-1

cc: Ms. Cathy Luck - AREI
Mr. Richard Hiett - RWQCB

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FORMER WELL AND EXCAVATION LOCATION PLAN
1020 Atlantic Avenue (Formerly 2051 Sherman Street
Rigging International Building)
Alameda, California

Figure 1

Project No. 1736.11

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# ATTACHMENT B

## Geomatrix Protocols

# PROTOCOL

# INSTALLATION AND DESTRUCTION OF WELLS

## 1.0 INTRODUCTION

This protocol describes procedures to be followed during the installation or destruction of monitoring, groundwater extraction, and vapor extraction wells. The procedures presented herein are intended to be of general use. As the work progresses, and if warranted, appropriate revisions will be made and approved by the project manager. Detailed procedures in this protocol may be superceded by applicable regulatory requirements.

## 2.0 WELL INSTALLATION

If required, permits for the installation of wells will be acquired from the appropriate regulatory agency before drilling is initiated. After well installation, well completion report(s) will be completed and filed with the California State Department of Water Resources or the appropriate agency.

Each groundwater monitoring well will be designed to enable measurement of the potentiometric surface and to permit water sampling of a specific water-bearing zone. Each vapor monitoring well will be designed to enable measurement of pressure conditions and permit sampling of a specific zone. The field geologist/engineer, in consultation with the project Geologist or Engineer who will be registered with the State of California if required, will specify the screened interval using the lithologic log and geophysical log (if performed) and will select the well materials and techniques for well completion to be compatible with the formations and the intended use of the well. Drilling and logging of the borings for the wells will be in conformance with the protocol DRILLING OF SOIL BORINGS.

Construction of all wells will be in conformance with the following provisions. A TYPICAL MONITORING WELL CONSTRUCTION DIAGRAM is attached.

## 2.1 WELL SCREEN AND CASING

The well casing will generally consist of threaded stainless steel or polyvinyl chloride (PVC) schedule 40 (minimum) casing. The inside diameter of the casing will be large enough to permit easy passage of an appropriate water level probe and equipment for purging wells and water sample collection.

The well screen will generally consist of machine-slotted or wire-wrapped PVC or stainless steel screen. The slot sizes will be compatible in size with the selected filter material. The screened sections will provide flow between the target zone and the well, allowing efficiency in well development and collection of representative samples.

## 2.2 FILTER MATERIAL

Filter material will be well graded, clean sand with less than 2 percent by weight passing a No. 200 sieve and less than 5 percent by weight of calcareous material. The filter material will be either a standard sand gradation designed for a range of anticipated soil types or a sand gradation specifically designed to fit the soils collected from anticipated well completion zones.

## 2.3 SETTING SCREENS AND RISER CASING

Upon completion of drilling and/or geophysical logging, the boring will be sounded to verify the total depth, and the well casing will be assembled and lowered into the boring. Well casing materials will be measured to the nearest 0.01 foot and steam cleaned before being lowered into the borehole. The casing and screen will be suspended a few inches above the bottom of the boring. The well assembly will be designed so that the well screen is opposite the target zone. The bottom of the screen will typically be flush with the bottom of the well and will be fitted with a secure bottom cap. The PVC casing and well screen joints will be flush coupled. No PVC cement or other solvents will be used to fasten the joints of casing or well screen. When installing wells in an open borehole, stainless steel centralizers will be used immediately above and below the well screen and approximately every thirty (30) to fifty (50) feet along the length of the casing. Centralizers need not be placed on well assemblies installed within augers or drill casings because the auger or drill casing will adequately center the well casing and screen in the borehole.

For borings drilled by the mud rotary method, potable water may be added to the drill mud fluid and circulated in the borehole after completion of the boring. Circulation will continue until the suspended sediment in the return fluid has been thinned. If borehole conditions are relatively stable, the mud will be thinned before the casing assembly is lowered to the specified depth. This is preferred because it minimizes clogging of the well screen with thick mud. Conversely, if borehole conditions are relatively unstable, the mud will be thinned after the casing is placed at the specified depth but prior to installation of annular fill materials. After installation of the well assembly, a slurry of filter sand and potable water will then be tremied into the annular space. For borings drilled using the hollow stem auger method, the filter sand will be placed after the well assembly has been lowered to the specific depth through the augers. The augers will be incrementally raised as the filter sand is placed by free fall through the augers. The depth to the top of the filter pack will be measured after each increment to detect possible bridging. If bridging occurs, it will be broken by washing the filter materials into proper place with potable water, or by repeatedly raising and lowering the augers slightly. The filter sand will be placed in a calculated quantity sufficient to fill the annular space to a level of about 1 to 2 feet above the top of the well screen for monitoring wells. For extraction wells the level of filter sand above the well screen will be based on site-specific conditions. The depth to the top of the filter pack will be verified by measuring, using a tremie pipe or a weighted tape. Groundwater extraction wells or monitoring wells may be surged before placement of the transition seal to promote filter pack settlement, as specified by the project manager.

Once the depth to the top of the filter pack has been verified, bentonite or fine sand may be placed in the annular space as a transition seal between the filter sand and the grout. If bentonite is to be placed below standing water, a high solids bentonite grout will be pumped through a tremie pipe, or pellets may be poured through the annulus. If bentonite is to be placed above standing water, a high solids bentonite grout should be used or pellets may be placed in three-inch lifts. Each lift should be hydrated using approximately one gallon of potable water per 3-inch lift of pellets. A sufficient quantity of bentonite will be poured to fill the annular space to a level of about 2 feet above the top of the filter pack. The completed bentonite transition seal will be allowed to hydrate for at least 30 minutes prior to placing the grout. If a layer of fine sand is placed as the transition seal, the fine sand will be mixed with potable water and placed as a slurry through the tremie pipe or poured dry through the annulus. The depth to the top of the transition seal will be verified by measuring, using the tremie pipe or a weighted tape.

A neat cement grout, cement/sand grout, or cement/bentonite grout seal will be placed from the top of the transition seal to the ground surface. The grout seal will be placed by pumping through a tremie pipe lowered to within five feet of the top of the transition seal in mud rotary borings. The grout seal will be placed in hollow stem auger borings by free fall through the augers as they are incrementally raised or by pumping through flexible hose lowered to near the bottom of the zone to be grouted. The grout must be tremied if there is any standing water in the augers above the transition seal. Grout/additive/water mixtures will be determined on a site-specific basis. Typical specifications of grout mixtures include: a) neat cement/bentonite grout, a mixture of one sack (94 pounds) portland cement, approximately 2 to 5 percent by weight (of cement) powdered bentonite, and approximately 6 to 8 gallons of water; b) neat cement grout consisting of one sack of portland cement and approximately 5 to 6 gallons of water; and c) cement/sand grout consisting of no more than two parts sand to 1 part cement and approximately 7 gallons of water. Only potable water will be used to prepare the grout. After grouting, no work will be done on the monitoring well until the grout has set a minimum of 24 hours.

## 2.4 DEVELOPMENT OF GROUNDWATER MONITORING OR EXTRACTION WELLS

When the well installation is complete, the well will be developed by surging, bailing, and/or pumping or other appropriate method as specified by the project manager. The objectives of well development are to remove sediment that may have accumulated during well installation, to consolidate the filter pack around the well screen, and to enhance the hydraulic connection between the target zone and the well. A minimum of 24 hours must pass between completion of grouting and development, to allow sufficient curing of the grout. In most instances, a bailer will be used to remove sediment and turbid water from the bottom of the well. A surge block then used within the entire screened interval to flush the filter pack of fine sediment. Surging will be conducted slowly to minimize disruption to the filter pack and screen. The well will be bailed again to remove sediment drawn in by the surging process until suspended sediment is minimized. Following the bailing and surging the well will be further developed using air-lift or pumping methods. A bailer may be used for low-yield wells. The well will be developed at a higher pumping rate than the anticipated rate of future purging, if possible. During development, the turbidity of the water will be monitored and the pH, specific conductance, and temperature of the return water will be measured. Drawdown and recovery will be measured during and at the end of the development process, respectively, using an electric sounder. Well development will proceed until the return water is of sufficient clarity, in the judgment of the Geomatrix field personnel. If the screened interval is too long to be developed adequately in one stage, additional stages will be employed, in which the end of the pump intake will be raised or lowered to various depths, as required.

## 2.5 SURFACE COMPLETION

Upon completion of the well, a suitable slip-on cap, threaded end cap, or waterproof cap will be fitted on the top of the riser casing to prevent the entry of surface runoff or foreign matter. A steel protective well cover (e.g., stovepipe) will be completed either above the ground surface, or a vault with a traffic rated cover will be completed at the ground surface. All wells will be locked for security, and will be designed to limit surface water infiltration.

## 2.6 DOCUMENTATION

A well construction diagram for each well will be completed in the field on the MONITORING WELL LOG by the field geologist/engineer and submitted to the project geologist or engineer upon completion of each well. Well installation and construction data will be summarized on the FIELD WELL CONSTRUCTION SUMMARY. Well development notes and field measurements of water quality parameters will be summarized on a MONITORING WELL SAMPLING RECORD. A DAILY FIELD RECORD and the well development record will also be submitted to the project geologist or engineer upon completion of each monitoring well.

# 3.0 CLEANING OF DRILLING EQUIPMENT

Cleaning of the drill rig and associated drilling equipment will follow the procedures discussed in Section 2 of the protocol DRILLING AND DESTRUCTION OF SOIL BORINGS.

All well casing materials will be cleaned thoroughly before they are installed. Well development equipment will be cleaned thoroughly before use. The following cleaning procedure has been found to be effective and will be used or adapted as appropriate for general conditions of materials or equipment to be cleaned.

1. Swab surfaces, inside and out, with a laboratory grade detergent-potable water solution or steam clean with a detergent-potable water solution.

2. Steam rinse with potable water or rinse in deionized or organic-free water.

3. Cover with clean plastic to protect materials and equipment from contact with chemical products, dust, or other contaminants.

Alternatively, well casing materials that have been steam-cleaned and sealed in individual airtight plastic bags by the factory can be used.

Decontamination rinsate will be collected and stored for future disposal by the client in accordance with legal requirements.

## 4.0 WELL DESTRUCTION

Destruction of wells will be completed in accordance with applicable state and local requirements. If required, permits for destruction will be obtained from the appropriate regulatory agency. As part of destruction design and implementation, care will be taken to seal groundwater pathways between multiple aquifers, and limit surface water infiltration through the destroyed borehole.

If possible, the well casing will be removed from the borehole. For shallow wells, and if the well has been completed in the uppermost aquifer, the casing may be pulled from the borehole before auger entry. Alternatively, and if the well has been completed below the uppermost aquifer, the annular fill may be drilled out with hollow-stem augers and the casing removed from the borehole through the augers. If the well casing is PVC or other similar material and cannot be removed as described above, it may be removed by drilling out the casing and annular fill using a tricone or drag bit and a rotary drilling method. The borehole will be redrilled to the same or slightly larger diameter than the original borehole. The redrilled borehole will be plumb and adequately centered, and all the well casing will be removed. The borehole will be filled with a neat cement, cement/sand or cement/bentonite grout. A high-solids bentonite grout may be used in the saturated zone. The grout will be placed in one continuous pour before its initial set from the bottom of the boring to the ground surface. The grout will be emplaced by pumping through a tremie pipe or flexible hose which is initially lowered to the bottom of the borehole. and raised incrementally as emplacement proceeds. The augers should be raised incrementally as emplacement proceeds, but not to exceed increments of 20 feet or greater than allowed by borehole stability. Boreholes that are terminated above the water table and are not greater than 20 feet deep may be grouted by a continuous pour originating at the ground surface.

If the well casing cannot be removed, grout may be tremied into the casing as described above. If the filter pack interconnects multiple distinct water-yielding zones, the casing must be cut opposite the aquifer to be sealed as well as through the intervening aquitard before grout is emplaced. This will allow the grout to seal the filter pack area, thereby prohibiting vertical movement of groundwater between the zones. Grout should be placed opposite the aquifer and for a vertical distance of at least ten feet above (and below the aquifer, if applicable). If the aquifer is confined and the head pressure is great, the grout may need to be emplaced under pressure.

The volume of sealing material used will be calculated and compared to the casing or borehole volume to ensure bridging has not taken place during well destruction. If the well is in an urban area and if the casing remains in the borehole, a hole will be excavated around the well to a depth of five feet, and the casing will be removed to the bottom of the excavation. The sealing material will be allowed to spill over into the excavation to form a cap. The remainder of the excavation will be backfilled with either native material, grout, or concrete.

# PROTOCOL

# WATER LEVEL, WELL DEPTH, AND FREE PRODUCT MEASUREMENTS

## 1.0 INTRODUCTION

This protocol describes procedures to be followed during water level, well depth, and free product measurements. The procedures presented herein are intended to be of a general nature and, as the investigation progresses and when warranted, appropriate revisions may be made by the project manager.

## 2.0 WATER LEVEL AND WELL DEPTH MEASUREMENTS

Water level measurements at a site will be taken as quickly as possible, to best represent the potentiometric surface across the site at a single time. If pressure is suspected or has developed inside the well casing, the well will be allowed to stand without a cap for a few minutes before taking the water-level measurement. Water-level measurements will be recorded to the nearest hundredth foot, and well depth measurements will be noted to the nearest half foot. Equipment placed in the wells for water level and well depth measurements will be cleaned prior to reuse, as discussed in Section 5. Care will be taken to not drop any foreign objects into the wells and to not allow the tape or sounding device to touch the ground around the well during monitoring.

### 2.1 WATER LEVEL MEASUREMENTS

Water level measurements will be performed by one of the following methods:

A. Wetted-tape Method

A steel surveyor's tape will be prepared by coating several feet of the lower end of the tape with chalk or water-finding paste. A lead weight is attached to the lower end of the steel tape to keep it taut. The tape is lowered into the well until a foot or two of the chalked portion is submerged.

Tape without weight can be used if the well opening or pump casing clearance is too small and restricts the passage of weight. The proper length to lower the tape may have to be determined experimentally. Measurement will be done as follows:

1. Lower and hold the tape at an even foot mark at the Measuring Point (MP) and note this tape reading.

2. Remove the steel tape from the well. Add or subtract the wetted length from the even foot mark noted in Step 1 as appropriate for your tape, and record this as water level below MP on the WATER LEVEL MONITORING RECORD.

B. Electric Sounder Method

An electric sounder consists of a contact electrode that is suspended by an insulated electric cable from a reel that has an ammeter, a buzzer, a light, or other closed circuit indicator attached. The indicator shows a closed circuit and flow of current when the electrode touches the water surface. Electric sounders will be calibrated by measuring each interval and remarking them where necessary.

The procedure for measuring water levels with an electric sounder is as follows:

1. Switch on.

2. Lower the electric sounder cable into the well until the ammeter or buzzer indicates a closed circuit. Raise and lower the electric cable slightly until the shortest length of cable that gives the maximum response on the indicator is found.

3. With the cable in this fixed position, note the length of cable at the MP.

4. Since the electric cable is graduated in intervals, use a pocket steel tape measure (graduated in hundredths of a foot) to interpolate between consecutive marks. Care must be taken that the tape measurements are subtracted from graduated mark footage value when the water level hold point (determined in Step 3) is below the graduated mark and added when above the mark. Record the resulting value as water level below MP on the WATER LEVEL MONITORING RECORD.

## 2.2 WELL DEPTH MEASUREMENT

Depth of a well will be measured by sounding with a weighted steel surveying tape or an electric sounding line, weighted when possible. Procedures to be followed are described below.

A. Measure the distance between the zero mark on the end of the measuring line and the bottom of the weight.

B. Lower the weighted measuring line into the well until the line becomes slack or there is noticeable decrease in weight, which indicates the bottom of the well. Raise the line slowly until it becomes taut (this may have to be done several times to determine that taut point) and, with the line in this fixed position, note the reading at the MP. Add the distance described in Step A to this reading, and record the resulting value as well depth. This procedure will be performed before and after initial well development or as necessary to determine well casing depth.

C. Record the well depth value on a MONITORING WELL SAMPLING RECORD.

## 4.0 FLOATING FREE PRODUCT MEASUREMENT

Floating free product level/thickness measurements will be measured using a Flexidip interface probe (or other similar interface probe) or using an electric sounder and a bailer. The electric sounder and bailer method is limited to measuring product thickness less than the length of the bailer. Alternatively, if the free product is to be measured is hydrocarbon product, the thickness is greater than the length of the bailer, and a Flexidip is not available, a steel surveyor's tape and gasoline or oil finding paste in combination with water finding paste may be used. All floating free product level measurements shall be recorded to the nearest hundredth foot. All equipment placed in the wells for free product level measurement will be cleaned prior to reuse, as discussed in Section 5.0. Care will be taken to not drop any foreign objects into the wells and to not allow the measuring device to touch the ground around the well during monitoring.

## 4.1 FLEXIDIP INTERFACE PROBE METHOD

The Flexidip free product-water interface probe consists of a contract electrode that is suspended by a graduated tape from a reel that has a light and two-toned audible signals. Audible and visual signals occur when the electrode touches the free product surface and then the water surface.

The procedure for measuring free product levels using the Flexidip is as follows:

1. Turn the probe on. A short chirp every 5 seconds signals that the probe is on.

2. Lower the steel probe cover into the well until the cover sits on well casing near the measuring point. Make sure the WIPER switch is off.

3. Unlock the reel using the lock screw and lower tape and probe down into well using reel.

4. When the probe reaches the free product level, the audible signal will be a continuous tone, and the yellow OIL light will be illuminated.

5. Lock reel using lock screw, lift up, and read the level from the tape-viewing window on the side of the steel probe cover.

6. Unlock the reel and slowly lower probe to find the interface level.

7. When the probe reaches the interface, the audible signal changes from a continuous tone to an interrupted tone, and the red INTERFACE light flashes.

8. Lock reel and read level.

9. Turn on WIPER switch and reel up. Always thoroughly clean off any free product before reeling the tape and probe in.

10. Turn probe off and store in case after cleaning.

11. Replace battery when a continuous chirping sound is heard after turning on power with the probe in air. Always replace battery in a gas-free atmosphere.

## 4.2 ELECTRIC SOUNDER AND BAILER METHOD

The procedure for measuring free product using an electric sounder and an acrylic bailer are as follows:

A. Measure the water level with the electric sounder as described in Section 2.1

B. Suspend a clean acrylic bailer on a line and slowly lower the bailer into the well until it partially intersects the groundwater surface

C. Slowly pull the bailer to the surface

D. Let the bailer stand for several minutes

E. Measure the thickness of the product in the bailer to the nearest 0.01 foot and record the value on the sampling record. If the product is less than 0.01 foot thick the amount should be recorded as less than 0.01 foot. If only a shean is observed, or no free product is seen, these observations should be recorded.

## 4.3 STEEL TAPE AND PASTE METHOD

A. Measure the water level with an electric sounder as described in Section 2.1.

B. Spread a thin layer of gasoline or oil finding paste on one side of a steel surveyor's tape beginning at the zero foot mark and extending up the tape about one-foot more than the anticipated thickness of the free product.

C. Spread a thin film of water finding paste on the opposite side of the tape beginning at the zero foot mark and extending up the tape about one-foot.

D. Slowly lower the tape into the well until the zero foot mark is located about six inches below the water level (the tape reading at the measuring point should be six inches greater than the actual depth to water). Take care not touch the sides of the well with the tape.

E. Slowly remove the tape from the well. The pastes will have changed color upon contact with the water or the free product. The product thickness is the difference between the tape reading at the point where water finding paste indicates the water level to be and the point where the gasoline or oil finding paste indicates the top of the free product to be.

## 5.0 EQUIPMENT CLEANING

Steel tapes, electric well sounders, and acrylic bailers will be cleaned after measurements in each well. Cleaning procedures will be as follows:

A. Wipe free product off with disposable towels. Rinse probe or portion of instrument that was immersed in well water with a solution of laboratory-grade detergent and potable water.

B. Rinse with potable water.

C. Dry with a clean paper towel.

D. The Flexidip may also be cleaned with acetone at this stage.

Solutions resulting from cleaning procedures will be collected and stored for future disposal by the client in accordance with legal requirements.

# PROTOCOL

# SAMPLING OF GROUNDWATER MONITORING WELLS AND WATER SUPPLY WELLS

## 1.0 INTRODUCTION

This protocol describes procedures to be followed during collection of field water quality measurements and groundwater samples for laboratory chemical analysis from monitoring wells and water supply wells. The procedures presented herein are intended to be of general use. As the work progresses, and if warranted, appropriate revisions will be made by the Geomatrix project manager.

## 2.0 SAMPLING

### 2.1 SAMPLE COLLECTION

A. Monitoring Wells - For wells completed without dedicated sampling pumps, at least four well casing volumes or one saturated borehole volume, whichever is greater, will be removed to purge the well prior to collection of groundwater samples. The saturated borehole volume is the volume of water in the well casing plus the volume of water in the filterpack. Periodic observations of turbidity and measurements of temperature, pH, and specific conductance will be made with field equipment during purging to evaluate whether the water samples are representative of the target zone. Samples will be collected only when: 1) a minimum of four sets of parameter readings have been taken, and 2) the temperature, pH, and specific conductance reach relatively constant values, and the turbidity has stabilized.

Wells that recharge very slowly may be purged dry once, allowed to recharge, and then sampled as soon as sufficient water is available. In this case, at least two parameter readings of field water quality should be taken; one initially and one after recharge.

A submersible pump, diaphragm pump, positive displacement pump which may contain a bladder, or a bailer will be used for evacuating (purging) the monitoring well casing. Generally, purging will begin with the pump inlet at the midscreen interval and the pump will be raised through the water column as purging progresses, ending just below the water table in order to remove stagnant water from the well casing. The majority of the purge volume will be taken from the mid-screen interval. Purging will progress at a rate intended to minimize differential drawdown between the interior of the wellscreen and the filter sand, to limit cascading water along the inside of the well casing.

Clean latex or solvex gloves will be worn by the sampler before beginning sampling. A Teflon® bailer or a stainless steel positive displacement Teflon® bladder pump with Teflon® tubing will be used to collect the water samples for laboratory chemical analysis. The sample will be taken from the midscreen interval and the depth will be recorded.

Each sampling episode will begin with the well having the least suspected concentrations of target compounds. Successive wells will be sampled in sequence of increasing suspected concentration.

B. Water Supply Wells - Water supply wells, designated by the project manager, will be sampled by purging the wells for a period of time adequate to purge the pump riser pipe. If the well is currently pumping, the sample can be taken without purging the well. Water samples will then be collected from the discharge point nearest the well head. Samples will be collected directly in laboratory-prepared bottles.

C. Extraction Wells - Extraction wells will be sampled while extraction is occurring, from an in-line sampling port after purging the sampling line. Samples will be collected directly in laboratory-prepared bottles.

A MONITORING WELL SAMPLING RECORD will be used to record the following information:

- Sample I.D.
- Duplicate I.D., if applicable
- Date and time sampled.
- Name of sample collector.
- Well designation (State well numbering system for water supply wells, and unique sequential number for other wells).
- Owner's name, or other common designation for water supply wells.
- Well diameter
- Depth to water on day sampled
- Casing volume on day sampled
- Method of purging (bailing, pumping, etc.).
- Amount of water purged.
- Extraordinary circumstances (if any).

- Results of instrument calibration/standardization and field measurements (temperature, pH, specific electrical conductance) and observed relative turbidity.
- Depth from which sample was obtained.
- Number and type of sample container(s).
- Purging pump intake depth.
- Times and volumes corresponding to water quality measurement.
- Purge rate.

## 2.2 SAMPLE CONTAINERS AND PRESERVATION

Appropriate sample containers and preservatives for the analyses to be performed will be obtained from the subcontracted analytical laboratory. Frequently requested analyses and sample handling requirements are listed in Table 1.

## 2.3 SAMPLE LABELING

Sample containers will be labeled with self-adhesive tags having the following information written in waterproof ink:

A. Geomatrix

B. Project number.

C. Sample number.

D. Date and time sample was collected.

E. Initials of sample collector.

## 2.4 QUALITY CONTROL SAMPLES

In order to evaluate the precision and accuracy of analytical data, quality control samples such as duplicates and blanks will be periodically employed. These samples will be collected, or prepared and analyzed by the laboratory, as specified in the project Quality Assurance Project Plan or by the project manager.

## 2.5 HANDLING, STORAGE, AND TRANSPORTATION

Efforts will be made to handle, store, and transport supplies and samples safely. Exposure to dust, direct sunlight, high temperature, adverse weather conditions, and possible contamination will be avoided. Samples will be placed in a clean chest, which contains ice or blue ice if cooling is required, immediately following collection and will be transported to the subcontracted laboratory as soon as possible.

## 3.0 FIELD MEASUREMENTS

Field measurements of temperature, pH, and specific conductance will be performed on groundwater samples. Data obtained from field water quality measurements will be recorded on the MONITORING WELL SAMPLING RECORD. Field measurements will be made on aliquots of groundwater that will not be submitted for laboratory analysis.

### 3.1 TEMPERATURE MEASUREMENT

Temperature measurements will be made with a mercury filled thermometer or an electronic thermistor, and all measurements will be recorded in degrees Celsius.

### 3.2 PH MEASUREMENT

The pH measurement will be made as soon as possible after collection of the sample, generally within a few minutes.

The pH meter will be calibrated at the beginning and once during each sampling day and whenever appropriate in accordance with the equipment manufacturer's specifications as outlined in the instruction manual for the specific pH meter used. Two buffers (either pH-4 and pH-7, or pH-7 and pH-10, whichever most closely bracket the anticipated range of groundwater conditions) will be used for instrument calibration.

### 3.3 SPECIFIC CONDUCTANCE MEASUREMENT

Specific conductance will be measured by immersing the conductivity probe directly in the water source or into a sample. The probes used should automatically compensate for the temperature of the sample. Measurements will be reported in units of micromhos per centimeter at 25 degrees Celsius.

The specific conductance meter will be calibrated at the beginning and once during each sampling day in accordance with the equipment manufacturer's specifications as outlined in the instruction manual for the specific conductivity meter used. The conductivity meter will be calibrated with a standardized potassium chloride (KCl) solution.

# 4.0 DOCUMENTATION

## 4.1 FIELD DATA SHEETS

A MONITORING WELL SAMPLING RECORD will be used to record the information collected during water quality sampling. Following completion of sampling and review by the project manager or task leader, the original data sheets will be placed in the project file.

## 4.2 CHAIN-OF-CUSTODY PROCEDURES

After samples have been collected and labeled, they will be maintained under chain-of-custody procedures. These procedures document the transfer of custody of samples from the field to a designated laboratory.

A CHAIN-OF-CUSTODY RECORD will be filled out for each shipment of samples to be sent to the laboratory for analysis. Each sample will be entered on the Chain-of-Custody form after it is collected and labeled. Information contained on the triplicate carbonless form will include the following:

- Name of sampler.
- Date and time sampled.
- Sample I.D.
- Number of sample bottles.
- Sample Matrix (soil, water, or other).
- Analyses required.
- Remarks, including any preservatives, special conditions, or specific quality control measures.
- Turnaround time and person to receive lab report.
- Project number.
- Signatures of all people assuming custody.

- Signatures of field sampler at top of chain-of-custody.
- Condition of samples when received by lab.

Blank spaces on the CHAIN-OF-CUSTODY RECORD will be crossed out between last sample number listed and signatures at the bottom of the sheet.

The field sampler will sign the and record the time and the date at the time of transfer to the laboratory or to an intermediate person. A set of signatures is required for each relinquished/reserved transfer including transfer within Geomatrix. The original imprint of the chain-of-custody record will accompany the sample containers. Following review by the project manager or task leader, a duplicate copy will be placed in the project file.

## 5.0 EQUIPMENT CLEANING

Bailers, sampling pumps, purge pumps, and any other purging or sampling apparatus will be cleaned before and after sampling of each well. Factory new and sealed disposable bailers may be used for sampling, but may not be reused. Thermometers, pH electrodes, and conductivity probes that will be used repeatedly will be cleaned before and after sampling each well and at any time during sampling if the object comes in contact with foreign matter.

Purged waters and solutions resulting from cleaning of purging or sampling equipment will be collected stored for future disposal by the client in accordance with legal requirements. Disposal of purged water will be arranged following receipt of laboratory analyses for groundwater samples.

Cleaning of reusable equipment which is not dedicated to a particular well will consist of the following:

- Bailers - the inside and outside of bailers will be cleaned in a solution of laboratory grade detergent and potable water, followed by a thorough rinse with deionized (DI) water. They may also be steam cleaned, followed by a DI rinse. If metals samples are to be collected, the bailer should be rinsed with a pH2 nitric acid solution before the final DI rinse.

- Purge Pumps - All downhole, reusable portions of purge pumps will be steam cleaned on the outside. If the pump does not have a backflow check valve, the inside of the pump and tubing should also be steam cleaned. For purge pump with a backflow check valve, the interior of the pump and tubing may be cleaned by pumping a laboratory-grade detergent and potable water solution through the system followed by a potable water rinse, or by steam-cleaning.

- Water Quality Meters - All meters will be cleaned by rinsing the probe portions in DI water and allowing to air-dry.

- Bailer Tripod - The tripod cable will be steam cleaned or rinsed with DI water.

Sample bottles and bottle caps will be cleaned by the subcontracted laboratory using standard EPA-approved protocols. Sample bottles and bottle caps will be protected from contact with solvents, dust, or other contamination between time of receipt by Geomatrix Consultants and time of actual usage at the sampling site. Sample bottles will not be reused.

GEOMATRIX

# ATTACHMENT 2

August 1988 Analytical Data

FIRST SAMPLING EVENT DATA
AUGUST 1988

GTEL
Environmental
Laboratories
A division of Groundwater Technology, Inc

**Western Region**
4080-C Pike Lane
Concord, CA 94520
(415) 685-7852
(800) 544-3422 *from inside California*
(800) 423-7143 *from outside California*

CA CERTIFICATION #194 SINCE THEY OPENED

08/10/88 mh



RECEIVED AUG 1 ? 1988 MARINA VIL

MANAGER: Steve Getty
ALAMEDA MARINA VILLAGE ASSOCIATES
1150 Marina Village Parkway #100
Alameda, CA 94501
PROJECT#: SFB-0146-3

SAMPLED: 08/02/88 BY: S. Getty
RECEIVED: 08/04/88 BY: K. Biava
ANALYZED: 08/08/88 BY: E. Popek
MATRIX: Soil
UNITS: mg/kg (ppm)

TEST RESULTS

| PARAMETER | MDL | LAB # I.D.# | 28690 MW 7 | 28691 MW 8 | 28692 MW 9 | 28693 MW 10 | 28694 MW 11 |
|---|---|---|---|---|---|---|---|
| Total Petroleum Hydrocarbons as Diesel | 10 | | 39 | <10 | <10 | <10 | <10 |
| Total Petroleum Hydrocarbons as Gasoline | 10 | | <10 | <10 | <10 | <10 | <10 |

MDL = Method Detection Limit.

METHOD:
Modified EPA Method 3550/8015

**GTEL**
Environmental
Laboratories
A division of Groundwater Technology, Inc.

**Western Region**
4080-C Pike Lane
Concord, CA 94520
(415) 685-7852
(800) 544-3422 *from inside California*
(800) 423-7143 *from outside California*





MANAGER: Steve Getty

PROJECT#: SFB-0146-3
MATRIX: Soil
UNITS: mg/kg (ppm)

TEST RESULTS

| PARAMETER | MDL | LAB # I.D.# | 28695 MW 12 | 28696 MW 13 |
|---|---|---|---|---|
| Total Petroleum Hydrocarbons as Diesel | 10 | | <10 | <10 |
| Total Petroleum Hydrocarbons as Gasoline | 10 | | <10 | <10 |

MDL = Method Detection Limit.

METHOD:
Modified EPA Method 3550/8015

SAFY KHALIFA, Ph.D., Director

**GTEL Environmental Laboratories**
4080-C Pike Lane
Concord, CA 94520
415-685-7852
800 544-3422 (In CA)
800-423-7143 (Outside CA)

# CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

RECEIVED AUG 1990

Project Manager: Steve Gelly
Phone #: 521-9555
Address: 1150 Marina Vllg. Parkway #100 Alameda 94501
MARINA VILLAGE
FAX #:
Project Number: SFB-0146-3
Project Name:
Project Location:
Sampler Signature:

| Sample ID | Lab # (Lab use only) | # CONTAINERS | Volume/Amount | Matrix: WATER | SOIL | AIR | SLUDGE | OTHER | Method Preserved: HCl | HNO3 | ICE | NONE | OTHER | Sampling: DATE | TIME | Analysis Request: BTEX (602/8020) | ~~BTEX~~/TPH as Gasoline (602/8020/8015) + Diesel | TPH as Diesel (8015 or 8270) | TPH as Jetfuel (8015 or 8270) | Total Oil & Grease (413.1) | Total Oil & Grease (413.2) | Total Petroleum Hydrocarbons (418.1) | EPA 601/8010 | EPA 602/8020 | EPA 608/8080 | EPA 608/8080-PCBs Only | EPA 624/8240 | EPA 625/8270 | CAM - 17 Metals | EPTOX - 8 Metals | EPA - Priority Pollutant Metals | LEAD(7420/7421/239.2) | ORGANIC LEAD | Other: Fingerprint | | | | | Special Handling: PRIORITY ONE SERVICE (24 hr) | EXPEDITED SERVICE (2-4 days) | VERBALS/FAX | SPECIAL DETECTION LIMITS (SPECIFY) | SPECIAL REPORTING REQUIREMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW7 | 28690 | | | | X | | | | | | | | | 8/2 | | | X | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MW8 | 28691 | | | | X | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MW9 | 28692 | | | | X | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MW10 | 28693 | | | | X | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MW11 | 28694 | | | | X | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MW12 | 28695 | | | | X | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MW13 | 28696 | | | | X | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | | | | | | | | | | |
| W1 | | | | X | | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | | | | | | | | | | |
| W2 | | | | X | | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | | | | | | | | | | |
| W3 | | | | X | | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | | | | | | | | | | |
| W4 | | | | X | | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Relinquished by: | Date | Time | Received by: |
|---|---|---|---|
| Steve Gelly | | | |
| Relinquished by | Date | Time | Received by: |
| | | | |
| Relinquished by | Date | Time | Received by Laboratory: |
| | 8/3 | 455 | Katherine Bicucc |

Remarks:
Received Room Temp.
They decided not to run the partial sample.

**GTEL**
Environmental
Laboratories
A division of Groundwater Technology, Inc.

**Western Region**
4080-C Pike Lane
Concord, CA 94520
(415) 685-7852
(800) 544-3422 *from inside California*
(800) 423-7143 *from outside California*

08/10/88 mh



RECEIVED
MARINA VILLAGE

MANAGER: Steve Getty
ALAMEDA MARINA VILLAGE ASSOCIATES
1150 Marina Village Parkway #100
Alameda, CA 94501
PROJECT#: SFB-0146-4

SAMPLED: 08/02/88 BY: S. Getty
RECEIVED: 08/04/88 BY: K. Biava
ANALYZED: 08/09/88 BY: E. Popek
MATRIX: Water
UNITS: ug/L (ppb)

TEST RESULTS

| PARAMETER | MDL | LAB # I.D.# | 28697 W 1 | 28698 W 2 | 28699 W 3 | 28700 W 4 | |
|---|---|---|---|---|---|---|---|
| Total Petroleum Hydrocarbons as Diesel | 10 | | <700 | <250 | <250 | 130 * | |
| Total Petroleum Hydrocarbons as Gasoline | 10 | | <700 | <250 | <250 | <10 | |
| Extraction Factor | | | 70 | 25 | 25 | 1 | |

MDL = Method Detection Limit.
METHOD: Modified EPA 3510/8015.
Detection Limit = MDL x Extraction Factor.
* = Biodegraded diesel.

Safy Khalifa

SAFY KHALIFA, Ph.D., Director

**GTEL Environmental Laboratories**

4080-C Pike Lane
Concord, CA 94520
415-685-7852

800-544-3422 (In CA)
800-423-7143 (Outside CA)

# CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

RECEIVED [illegible]

Project Manager: [illegible] Gelly

Phone #: [illegible]

Address: [illegible]

FAX #:

Project Number: [illegible]-4

Project Name:

Project Location:

Sampler Signature:

| Sample ID | Lab # (Lab use only) | # CONTAINERS | Volume/Amount | Matrix: WATER | Matrix: SOIL | Matrix: AIR | Matrix: SLUDGE | Matrix: OTHER | Method Preserved: HCl | Method Preserved: $HNO_3$ | Method Preserved: ICE | Method Preserved: NONE | Method Preserved: OTHER | Sampling: DATE | Sampling: TIME |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| [illegible]7 | | | | | X | | | | | | | | | [illegible]/2 | |
| [illegible]8 | | | | | X | | | | | | | | | ↓ | |
| [illegible]9 | | | | | X | | | | | | | | | | |
| [illegible]10 | | | | | X | | | | | | | | | | |
| [illegible]11 | | | | | X | | | | | | | | | | |
| [illegible]12 | | | | | X | | | | | | | | | | |
| [illegible]13 | | | | | X | | | | | | | | | ↓ | |
| [illegible]1 | 28697 | 1 | [illegible] | X | | | | | | | | | | ↓ | |
| [illegible]2 | 28698 | 1 | ↓ | X | | | | | | | | | | | |
| [illegible]3 | 28699 | 1 | ↓ | X | | | | | | | | | | | |
| [illegible]4 | 28700 | 1 | [illegible] | | | | | | | | | | | ↓ | |

ANALYSIS REQUEST

| Sample ID | BTEX (602/8020) | BTEX/TPH as Gasoline (602/8020/8015) | TPH as Diesel (8015 or 8270) | TPH as Jetfuel (8015 or 8270) | Total Oil & Grease (413.1) | Total Oil & Grease (413.2) | Total Petroleum Hydrocarbons (418.1) | EPA 601/8010 | EPA 602/8020 | EPA 608/8080 | EPA 608/8080-PCBs Only | EPA 624/8240 | EPA 625/8270 | CAM - 17 Metals | EPTOX - 8 Metals | EPA - Priority Pollutant Metals | LEAD(7420/7421/239.2) | ORGANIC LEAD | OTHER: [illegible] | OTHER | OTHER | OTHER | OTHER | PRIORITY ONE SERVICE (24 hr) | EXPEDITED SERVICE (2-4 days) | VERBALS/FAX | SPECIAL DETECTION LIMITS (SPECIFY) | SPECIAL REPORTING REQUIREMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| [illegible]7 | | X | | | | | | | | | | | | | | | | | | | | | | | | | | |
| [illegible]8 | | X | | | | | | | | | | | | | | | | | | | | | | | | | | |
| [illegible]9 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| [illegible]10 | | X | | | | | | | | | | | | | | | | | | | | | | | | | | |
| [illegible]11 | | X | | | | | | | | | | | | | | | | | | | | | | | | | | |
| [illegible]12 | | X | | | | | | | | | | | | | | | | | | | | | | | | | | |
| [illegible]13 | | X | | | | | | | | | | | | | | | | | | | | | | | | | | |
| [illegible]1 | | X | | | | | | | | | | | | | | | | | | | | | | | | | | |
| [illegible]2 | | X | | | | | | | | | | | | | | | | | | | | | | | | | | |
| [illegible]3 | | X | | | | | | | | | | | | | | | | | | | | | | | | | | |
| [illegible]4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Relinquished by: | Date | Time | Received by: |
|---|---|---|---|
| [illegible] Gelly | | | |

| Relinquished by | Date | Time | Received by: |
|---|---|---|---|
| | | | |

| Relinquished by | Date | Time | Received by Laboratory: |
|---|---|---|---|
| | 8/[illegible] | [illegible] | [illegible] |

Remarks:
[illegible]
[illegible]
[illegible]

**ATTACHMENT 3**

February 1989 Safety Specialist's Report

TANK EXCAVATION CORRESPONDENCE AND SECOND SAMPLING EVENT DATA JANUARY 1989

TANK 5

Fanfa Inc. Engineering Contractor Lic. No. 272541

2401 GRANT AVENUE
SAN LORENZO, CA 94580-1888
FAX 415-278-3095
415-278-8410

MARINA VILLAGE
FEB 23 1989
RECEIVED

February 22, 1989

ALAMEDA REAL ESTATE INVESTMENTS
1150 Marina Village Parkway, Suite 100
Alameda, CA 94501

Attention: Mr. Steve Getty

Re: Tank Removal - Marina Village
P.O. No. 10280

Dear Mr. Getty:

Enclosed please find the following reports for the removal of the above referenced tank.

1) Report from Safety Specialists, Inc., dated February 13, 1989, for soil and groundwater investigation, showing their analysis and results.

2) Certificate of Disposal dated January 12, 1989, from Ship Service Company.

Please feel free to contact our office if you have any questions on the enclosed, or require additional information.

Sincerely,

FANFA, INC.

Jean M. Ingram
Secretary-Treasurer

jmi
Enclosures

SAFETY SPECIALISTS, Inc.
The Full Service Environmental, Health & Safety Corporation

P.O. Box 4420, Santa Clara, CA 95054
Telephone (408) 988-1111
Contractor's License No. 460905

February 13, 1989

RECEIVED
FEB 16 1989
FANFA, INC.
SAN LORENZO, CA 94580-1088

RECEIVED
FEB 1 5 1989

Mr. Bob Smith
Tank Excavators
P.O. Box 8402
Santa Cruz, CA 95061

Reference: Safety Specialists, Inc., Project No. 510188

Dear Mr. Smith:

Safety Specialists, Inc., is pleased to submit this summary of soil and groundwater investigation for a site located at 1150 Marina Village Parkway, Alameda, California.

At the above-mentioned site one underground tank (15,000-gallon capacity) was excavated by Tank Excavators, Inc.'s, personnel on January 9, 1989. The tank stored gasoline, diesel, and/or fuel oil. Groundwater was encountered beneath the tank (12 feet from the ground surface). Accordingly, two groundwater samples (AL-1-9 and AL-1-5) were collected from beneath the tank. Also, soil samples (AL-2-10, AL-3-10, and AL-6-8.5) were collected from the excavation walls directly above the groundwater table (see Figure 1, attached, for sample location). The purpose of this sampling was to evaluate the concentrations of total hydrocarbons, if any, in the soil and in the groundwater (grab) samples, collected from beneath the excavated tank.

Brass sleeves (1.92 inch internal diameter, 6 inch long) were used for collecting relatively undisturbed soil samples. Samples from appropriate depths were collected by manually pushing the brass sleeves into the soils.

The groundwater samples (grab) were collected in 500 milliliter capacity Nalgene bottles fitted with teflon lined screw type caps.

Prior to sample collection, all sampling tools (i.e., brass sleeves) were thoroughly cleaned by washing in a trisodium phosphate solution, followed by a rinse of distilled water. All brass sleeves used to collect soil samples were wrapped in aluminum foil, capped, labeled and immediately placed on Blue Ice, in order to minimize the escape of any volatiles present in the samples. Soil and groundwater samples were subsequently sent to a State-certified laboratory accompanied by a chain of custody record.

<u>Analysis Performed on Samples</u>

Soil Samples AL-2-10, AL-3-10, and AL-6-8.5 were analyzed individually for Total Petroleum Hydrocarbon (TPH) as diesel using EPA Test Method 3550/8015, TPH as gasoline including Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX) using EPA Test Method 5030/8015/8020, and Total Oil and Grease (TOG) using EPA Test Method 418.1.

Water samples were analyzed individually for volatile organics using EPA Test Method 8240. In addition, water sample AL-7-5 was analyzed for TPH as diesel using EPA Test Method 3510/8015 and TPH as gasoline, including BTEX, using EPA Test Method 5070/8015.

Results

A copy of the analytical results as received from the analytical laboratory is enclosed. The TPH as diesel was found to be 9.1, 5,300 and 2,300 parts per million (ppm) for Samples AL-2-10, AL-3-10 and AC-6-8.5, respectively.

The TPH as gasoline was found to be Not Detected for Soil Sample AL-2-10, and 6.9 ppm for Soil Sample AL-3-10 and 1 ppm for Soil Sample AL-6-8.5.

The TOG was detected at 5,300, 1,400 and 34 ppm for Soil Samples AL-2-10, AL-3-10, and AL-6-8.5, respectively.

No volatile organics were detected in either water sample, which is indicated by the N.D. sign in the hard copy of the analytical results. However, TPH as gasoline (270 parts per billion) and TPH as diesel (6,400 parts per billion) were detected in Water Sample AL-7-5.

Based on the "Regional Board Staff Guidelines Addressing Fuel Leaks", a guideline prepared by the California Regional Water Quality Control Board, San Francisco Bay Region, dated June 1988, this site is categorized as "Confirmed Release Site". Safety Specialists, Inc., recommends the following:

1. Drill soil borings around the excavated tank area to define the extent of contamination.
2. Excavation of all contaminated soils and disposal of these soils as hazardous waste.
3. Installation of at least three ground monitoring wells to help study the groundwater contamination.

The preparation of this report concludes our scope of work. If you have any questions or require any additional information, please call me at (408) 988-1111.

Sincerely,

SAFETY SPECIALISTS, INC.

Bruce Nyberg

Bruce Nyberg
Program Manager
Field Services

BN:ml
Enclosures

cc: Katherine Chesick, Alameda County Health Department
Alameda Fire Department

SAFETY SPECIALISTS, Inc.
The Full Service Environmental, Health & Safety Corporation

P.O. Box 4420, Santa Clara, CA 95054
Telephone (408) 988-1111
Contractor's License No. 460905

# CHAIN OF SAMPLE CUSTODY RECORD

Collector: SSI - Bruce Nyberg Date Sampled: 1/9/89 Time: 12:30

Location of Sampling: 1150 Marina Village Parkway - Alameda

Project Number: 510188 Survey Number: E -89

Sample Type: 1 - Water 2/ - Soil

Container Type and Condition: Glass Bottle for Liquid - New Brass Sleeves for Soil - Clean

Contract Laboratory Record/Name:

| Sample ID | Field Information |
|---|---|
| AL-1-9' | Water Sample at 9' - Footing water - Took Sample at 12:30 |
| AL-2-10' | Soil Sample - Away from Building end of Tank at about 10' sampled at 12:40 |
| AL-3-10' | Soil Sample - Parking lot Entrance side away from Building at about 10' Sampled at 12:45 |
| AL-4-10' | Soil Sample - As a backup same location as AL-3-10 sample at 1:30 |
| AL-5-10' | Soil Sample - as a backup Same Location as AL-2-10 Sampled at 1:45 |

Analysis Requested: AL-1-9 - 8240 / TPH-Diesel low to Mod Boiling Point TPH - Gas Diesel & Fuel Oil w/BTEX and EPA 418.1

AL-2-10 & AL-3-10 - TPH Gas Diesel - Fuel Oil [redacted]

TPH Diesel - low to Mod Boiling Point w/BTEX and EPA 418.1

AL-4 & AL-5 - [redacted] hold for Adals. Phone talk to Kevin Keely

Results Needed By: Normal Turnaround

| | | | | |
|---|---|---|---|---|
| Travel Blank: | ☐ Yes ☒ No | Travel Blank to be Analyzed Separately: | ☐ Yes | ☒ No |
| Duplicate Samples: | ☐ Yes ☒ No | Duplicates to be Analyzed Separately: | ☐ Yes | ☒ No |
| Field Blank: | ☐ Yes ☒ No | Field Blank to be Analyzed Separately: | ☐ Yes | ☒ No |
| Background Soil Sample: | ☐ Yes ☒ No | Background Soil Sample to be Analyzed Separately: | ☐ Yes | ☒ No |

Chain of Custody:

| | |
|---|---|
| Bruce Nyberg — Field Personnel | 1/9/89 — Date |
| King — Courier | 1/10/89 — Date |
| Kevin [signature] — Lab | 1/10/89 4:20 PM — Date |

8020 Soils

Gas & Diesel Standard Extended

**SAFETY SPECIALISTS, Inc.**
The Full Service Environmental, Health & Safety Corporation

P.O. Box 4420, Santa Clara, CA 95054
Telephone (408) 988-1111
Contractor's License No. 460905

# CHAIN OF SAMPLE CUSTODY RECORD

Collector: SSI - Bruce Nyberg Date Sampled: 1/9/89 Time: 9

Location of Sampling: 1150 Marina Village Parkway - Alameda

Project Number: 70183 Survey Number: E-5-89

Sample Type: Soil -

Container Type and Condition:

Contract Laboratory Record/Name:

| Sample ID | Field Information |
|---|---|
| AL-6-8.5' | Soil Sample of the Excavating ... about 6' taken at a depth of 8.5' sampled at 9:35 |
| AL-7-5' | Water Sample taken at Building side of hole Bucket dipped in water. Sampled at 9:40 |

Analysis Requested: AL-6-8.5- TPH Diesel - low + Med Boiling Point w/BTEX and EPA 418.1
AL-7-5 - Water Sample - TPH Diesel - Low + Med Boiling Point w/BTEX and 8240

Please ... early

Results Needed By: Normal Turnaround.

| | | | | | |
|---|---|---|---|---|---|
| Travel Blank: | ☐ Yes | ☒ No | Travel Blank to be Analyzed Separately: | ☐ Yes | ☒ No |
| Duplicate Samples: | ☐ Yes | ☒ No | Duplicates to be Analyzed Separately: | ☐ Yes | ☒ No |
| Field Blank: | ☐ Yes | ☒ No | Field Blank to be Analyzed Separately: | ☐ Yes | ☒ No |
| Background Soil Sample: | ☐ Yes | ☒ No | Background Soil Sample to be Analyzed Separately: | ☐ Yes | ☒ No |

**Chain of Custody:**

1. Bruce Nyberg — Field Personnel — 1/9/89 Date
2. [illegible] — Courier — 1/10/89 Date
3. [illegible] — Lab — 1/10/89 4:20 PM Date

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

| | | | | | |
|---|---|---|---|---|---|
| Safety Specialists, Inc. | Client Project ID: | 810188, Survey E-5-89 | | Sampled: | Jan 9, 1989 |
| P.O. Box 4420 | Sample Descript: | Water, AL-7-6' | | Received: | Jan 10, 1989 |
| Santa Clara, CA 95054 | Analysis Method: | EPA 8240 | | Analyzed: | Jan 19, 1989 |
| Attention: Bruce Nyberg | Lab Number: | 901-1109 | | Reported: | Feb 6, 1989 |

# VOLATILE ORGANICS by GC/MS (EPA 8240)

| Analyte | Detection Limit ug/L | Sample Results ug/L |
|---|---|---|
| Acetone | 10.0 | N.D. |
| Benzene | 2.0 | N.D. |
| Bromodichloromethane | 2.0 | N.D. |
| Bromoform | 2.0 | N.D. |
| Bromomethane | 2.0 | N.D. |
| 2-Butanone | 10.0 | N.D. |
| Carbon disulfide | 2.0 | N.D. |
| Carbon tetrachloride | 2.0 | N.D. |
| Chlorobenzene | 2.0 | N.D. |
| Chlorodibromomethane | 2.0 | N.D. |
| Chloroethane | 2.0 | N.D. |
| 2-Chloroethyl vinyl ether | 10.0 | N.D. |
| Chloroform | 2.0 | N.D. |
| Chloromethane | 2.0 | N.D. |
| 1,1-Dichloroethane | 2.0 | N.D. |
| 1,2-Dichloroethane | 2.0 | N.D. |
| 1,1-Dichloroethene | 2.0 | N.D. |
| Total 1,2-Dichloroethene | 2.0 | N.D. |
| 1,2-Dichloropropane | 2.0 | N.D. |
| cis 1,3-Dichloropropene | 2.0 | N.D. |
| trans 1,3-Dichloropropene | 2.0 | N.D. |
| Ethylbenzene | 2.0 | N.D. |
| 2-Hexanone | 10.0 | N.D. |
| Methylene chloride | 2.0 | N.D. |
| 4-Methyl-2-pentanone | 10.0 | N.D. |
| Styrene | 2.0 | N.D. |
| 1,1,2,2-Tetrachloroethane | 2.0 | N.D. |
| Tetrachloroethene | 2.0 | N.D. |
| Toluene | 2.0 | N.D. |
| 1,1,1-Trichloroethane | 2.0 | N.D. |
| 1,1,2-Trichloroethane | 2.0 | N.D. |
| Trichloroethene | 2.0 | N.D. |
| Trichlorofluoromethane | 2.0 | N.D. |
| Vinyl acetate | 2.0 | N.D. |
| Vinyl chloride | 2.0 | N.D. |
| Total Xylenes | 2.0 | N.D. |

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Arthur G. Burton
Laboratory Director

9011109.SAF <6>

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

| | | | | | |
|---|---|---|---|---|---|
| Safety Specialists, Inc. | Client Project ID: | 510188, Survey E-5-89 | | Sampled: | Apr 18, 1900 |
| P.O. Box 4420 | Sample Descript: | Water, AL-1-9 | | Received: | Jan 10, 1989 |
| Santa Clara, CA 95054 | Analysis Method: | EPA 8240 | | Analyzed: | Jan 23, 1989 |
| Attention: Bruce Nyberg | Lab Number: | 901-1110 | | Reported: | Feb 6, 1989 |

## VOLATILE ORGANICS by GC/MS (EPA 8240)

| Analyte | Detection Limit ug/L | Sample Results ug/L |
|---|---|---|
| Acetone | 10.0 | N.D. |
| Benzene | 2.0 | N.D. |
| Bromodichloromethane | 2.0 | N.D. |
| Bromoform | 2.0 | N.D. |
| Bromomethane | 2.0 | N.D. |
| 2-Butanone | 10.0 | N.D. |
| Carbon disulfide | 2.0 | N.D. |
| Carbon tetrachloride | 2.0 | N.D. |
| Chlorobenzene | 2.0 | N.D. |
| Chlorodibromomethane | 2.0 | N.D. |
| Chloroethane | 2.0 | N.D. |
| 2-Chloroethyl vinyl ether | 10.0 | N.D. |
| Chloroform | 2.0 | N.D. |
| Chloromethane | 2.0 | N.D. |
| 1,1-Dichloroethane | 2.0 | N.D. |
| 1,2-Dichloroethane | 2.0 | N.D. |
| 1,1-Dichloroethene | 2.0 | N.D. |
| Total 1,2-Dichloroethene | 2.0 | N.D. |
| 1,2-Dichloropropane | 2.0 | N.D. |
| cis 1,3-Dichloropropene | 2.0 | N.D. |
| trans 1,3-Dichloropropene | 2.0 | N.D. |
| Ethylbenzene | 2.0 | N.D. |
| 2-Hexanone | 10.0 | N.D. |
| Methylene chloride | 2.0 | N.D. |
| 4-Methyl-2-pentanone | 10.0 | N.D. |
| Styrene | 2.0 | N.D. |
| 1,1,2,2-Tetrachloroethane | 2.0 | N.D. |
| Tetrachloroethene | 2.0 | N.D. |
| Toluene | 2.0 | N.D. |
| 1,1,1-Trichloroethane | 2.0 | N.D. |
| 1,1,2-Trichloroethane | 2.0 | N.D. |
| Trichloroethene | 2.0 | N.D. |
| Trichlorofluoromethane | 2.0 | N.D. |
| Vinyl acetate | 2.0 | N.D. |
| Vinyl chloride | 2.0 | N.D. |
| Total Xylenes | 2.0 | N.D. |

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Arthur G. Burton
Laboratory Director

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

| | | | |
|---|---|---|---|
| Safety Specialists, Inc. | Client Project ID: 510188, Survey E-5-89 | Sampled: | Jan 9, 1989 |
| P.O. Box 4420 | Sample Descript.: Water, AL-7-5' | Received: | Jan 10, 1989 |
| Santa Clara, CA 95054 | Analysis Method: EPA 5030/8015/8020 | Analyzed: | Jan 24, 1989 |
| Attention: Bruce Nyberg | Lab Number: 901-1109 | Reported: | Feb 6, 1989 |

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

| Analyte | Detection Limit ug/L (ppb) | Sample Results ug/L (ppb) |
|---|---|---|
| Low to Medium Boiling Point Hydrocarbons | 50.0 | 170 |
| Benzene | 0.5 | 4.8 |
| Toluene | 0.5 | 6.6 |
| Ethyl Benzene | 0.5 | 2.2 |
| Xylenes | 0.5 | 12 |

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

**SEQUOIA ANALYTICAL**

Arthur G. Burton
Laboratory Director

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

| | | | | | |
|---|---|---|---|---|---|
| Safety Specialists, Inc. | Client Project ID: | 510188, Survey E-5-89 | | Sampled: | Jan 9, 1989 |
| P.O. Box 4420 | Matrix Descript: | Water | | Received: | Jan 10, 1989 |
| Santa Clara, CA 95054 | Analysis Method: | EPA 3510/8015 | | | |
| Attention: Bruce Nyberg | First Sample #: | 901-1109 | | Reported: | Feb 6, 1989 |

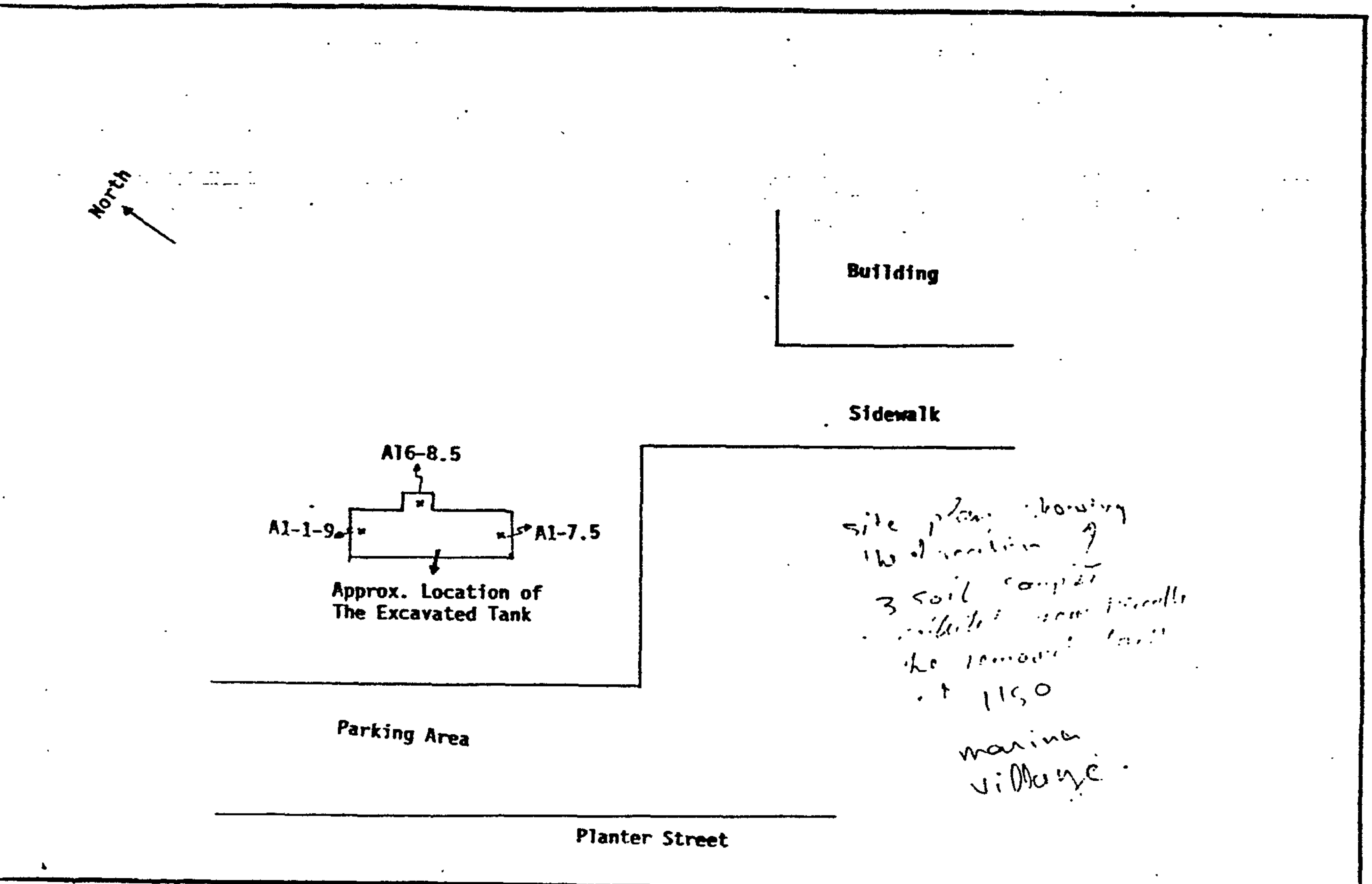
# TOTAL PETROLEUM FUEL HYDROCARBONS (EPA 8015)

| Sample Number | Sample Description | High B.P. Hydrocarbons ug/L (ppb) |
|---|---|---|
| 901-1109 | AL-7-5' | 6,400 |
| **Detection Limits:** | | **50.0** |

High Boiling Point Hydrocarbons are quantitated against a diesel fuel standard.
Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Arthur G. Burton
Laboratory Director




SAFETY SPECIALISTS INC.
SANTA CLARA, CA

FIGURE NO.
1

H & H
SHIP SERVICE COMPANY
W. J. HARRIS

RECEIVED
FEB - 8 1989
FANFA, INC.
SAN LORENZO, CA 94580-1888

# CERTIFICATE OF DISPOSAL

JANUARY 12, 1989

H & H Ship Service Company hereby certifies to EAGAN & COMPANY that:

1. The storage tank(s), size(s) ONE (1) 12,000 GALS.

   removed from the VINTAGE PROPERTIES

   facility at 1150 MARINA VILLAGE PKWY.

   ALAMEDA, CALIFORNIA

were transported to H & H Ship Service Company, 220 China Basin Street, San Francisco, California 94107.

2. The following tank(s), H & H Job Number: 9418 have been steamed cleaned, cut with approximately 2' X 2' holes, rendered harmless and disposed of as scrap metal.

3. Disposal site: LEVIN METALS CORPORATION, RICHMOND, CALIFORNIA.

4. The foregoing method of destruction/disposal is suitable for the materials involved, and fully complies with all applicable regulatory and permit requirements.

5. Should you require further information, please call (415) 543-4836.

Very Truly Yours,

Cleveland Valrey
Q. A. & Safety Coordinator

220 CHINA BASIN, P.O. BOX 77363 · SAN FRANCISCO, CA 94107 · DAY AND NIGHT: 543-4835

Please print or type (Form designed for use on elite (12 pitch) typewriter) and Front of Page 7 Sacramento, California

| UNIFORM HAZARDOUS WASTE MANIFEST | 1. Generator's US EPA ID No. CAC000140557 | Manifest Document No. 31482 | 2. Page 1 of 1 | Information in the shaded areas is not required by Federal law. |
|---|---|---|---|---|

3. Generator's Name and Mailing Address: MARINA VILLAGE, 1150 MARINA VILLAGE PKY ALAMEDA CALIF 94526

4. Generator's Phone (415) 521-9555

A. State Manifest Document Number: 88231482

B. State Generator's ID

5. Transporter 1 Company Name: H&H SHIP SERVICE — 6. US EPA ID Number: CAD004771168

C. State Transporter's ID: 902 437

D. Transporter's Phone: 415-543 4835

7. Transporter 2 Company Name — 8. US EPA ID Number

E. State Transporter's ID

F. Transporter's Phone

9. Designated Facility Name and Site Address: H&H SHIP SERVICE, Co. 220 CHINA BASIN ST. SAN FRANCISCO CA 94107 — 10. US EPA ID Number: CAD004771168

G. State Facility's ID: 381-001-78

H. Facility's Phone: 415-543 0906

| 11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number) | 12. Containers No. | Type | 13. Total Quantity | 14. Unit Wt/Vol | I. Waste No. |
|---|---|---|---|---|---|
| a. WASTE COMBUSTIBLE EMPTY OIL TANK U.N 1270 | 001 | TP | 99991 | G | State 512 / EPA/Other |
| b. | | | | | State / EPA/Other |
| c. (565) | | | | | State / EPA/Other |
| d. | | | | | State / EPA/Other |

J. Additional Descriptions for Materials Listed Above: EMPTY UNDEGROUND WASTE OIL TANK DRY ICE INERTED AND READY FOR DISPOSAL

K. Handling Codes for Wastes Listed Above: a. 01 b. c. d.

15. Special Handling Instructions and Additional Information: NONE. [SHIPWAY TANK]

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

| Printed/Typed Name | Signature | Month Day Year |
|---|---|---|
| STEPHEN C. GETTY | [signature] | 01 09 89 |

17. Transporter 1 Acknowledgement of Receipt of Materials

| Printed/Typed Name | Signature | Month Day Year |
|---|---|---|
| ESTEBAN M. PENALVER | [signature] | 01 09 89 |

18. Transporter 2 Acknowledgement of Receipt of Materials

| Printed/Typed Name | Signature | Month Day Year |
|---|---|---|
| | | |

19. Discrepancy Indication Space

20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

| Printed/Typed Name | Signature | Month Day Year |
|---|---|---|
| Cleveland Valrey | [signature] | 01 09 89 |

022 A (1/88)
700—22
(1-88) Previous editions are obsolete.

Do Not Write Below This Line

White: TSDF SENDS THIS COPY TO DOHS WITHIN 30 DAYS
To: P.O. Box 3000, Sacramento, CA 95812

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: CAC000140557 | Manifest Document No.: 00001 | 2. Page 1 of 1 | Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address: MARINA VILLAGE, ATTN: STEVE GETTY, 1150 MARINA VILLAGE PARKWAY ALAMEDA

4. Generator's Phone (415) 521-9555

A. State Manifest Document Number: 88231489

B. State Generator's ID

5. Transporter 1 Company Name: H&H SHIP SERVICE | 6. US EPA ID Number: CAD004771168

C. State Transporter's ID: 902440

D. Transporter's Phone: 543-4835

7. Transporter 2 Company Name | 8. US EPA ID Number

E. State Transporter's ID

F. Transporter's Phone

9. Designated Facility Name and Site Address: H&H SHIP SERVICE, 220 CHINA BASIN, SAN FRANCISCO, CA 94107 | 10. US EPA ID Number: CAD004771168

G. State Facility's ID: 318-00178

H. Facility's Phone: 543-4835

| 11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID Number) | 12. Containers No. | Type | 13. Total Quantity | 14. Unit Wt/Vol | I. Waste No. |
|---|---|---|---|---|---|
| a. WASTE COMBUSTIBLE LIQUID NOS NA1993 | 001 | TT | 04000 | 6 | State: 241; EPA/Other: |
| b. 1-24-89- copy fanta pa | | | | | State: ; EPA/Other: |
| c. | | | | | State: ; EPA/Other: |
| d. | | | | | State: ; EPA/Other: |

J. Additional Descriptions for Materials Listed Above: 95% WATER, 5% OIL

K. Handling Codes for Wastes Listed Above: a. 01 | b. | c. | d.

15. Special Handling Instructions and Additional Information: WEAR GLOVES

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name: STEPHEN C GETTY | Signature: [signature] | Month Day Year

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: STEVE MESQUITE | Signature: [signature] | Month Day Year: 01 09 89

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name | Signature | Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name: Roshan Bharathan | Signature: [signature] | Month Day Year: 01 09 89

22 A (1/88)
00—22
(88) Previous editions are obsolete.

Do Not Write Below This Line

White: TSDF SENDS THIS COPY TO DOHS WITHIN 30 DAYS
To: P.O. Box 3000, Sacramento, CA 95812

GEOMATRIX

**ATTACHMENT 4**

November 1989 Work Plan
Prepared by Levine•Fricke, Inc.

ORIGINAL WORKPLAN FOR GW MONITORING

MARINA VILLAGE
ALAMEDA CALIFORNIA

November 30, 1989

Department of Environmental Health
Hazardous Materials Program
80 Swan Way, Room 200
Oakland, CA 94621

Attention: Katherine Chesick

Reference: Tank Removal - Marina Village
1150 Marina Village Parkway, Alameda

Dear Ms. Chesick:

Enclosed is a work plan proposed by Levine-Fricke to monitor the groundwater in the area of the removed tank which we are considering. Please review and forward to me any comments that you may have.

Sincerely,

ALAMEDA REAL ESTATE INVESTMENTS
By: Vintage Properties - Alameda Commercial

By: Stephen C. Getty
Construction Manager

SCG:ls

Enclosure

1150 Marina Village Parkway, Suite 100
Alameda, CA 94501
415 521-9555 Telex 5231638
A Development of Vintage Properties

LF 89P-276
November 20, 1989

# WORK PLAN FOR HYDROGEOLOGIC INVESTIGATION MARINA VILLAGE DEVELOPMENT 1150 MARINA VILLAGE PARKWAY ALAMEDA, CALIFORNIA

The following text describes the Scope of Work, Schedule, and Estimated Budget for installation of two shallow ground-water monitoring wells in the vicinity of a former underground fuel storage tank located in the Marina Village Development in Alameda, California (the "Site", Figures 1 and 2). This Work Plan was prepared at the request of Vintage Properties/Alameda Commercial (Vintage), current owner of the property, and is being submitted to the Alameda County Health Agency (ACHA) and Regional Water Quality Control Board (RWQCB) for their review.

## BACKGROUND

A 15,000-gallon capacity fuel storage tank was removed from the Site in January of 1989 by Safety Specialists of Santa Cruz, California. The tank was out of service for a number of years (at least since the acquisition of the property by Vintage in the 1970's), but reportedly may have been installed as early as the 1940's. At the time of the tank removal, indications of petroleum hydrocarbons in subsurface soils and ground water in the vicinity of the tank were reportedly observed. Removal of these petroleum-affected soils was reportedly performed by Vintage subsequent to the tank removal in July, 1989.

In a letter dated August 11, 1989 from the ACHD to Vintage, the ACHD requested that a ground-water monitoring program be implemented in the vicinity of the former tank to address potential impacts of petroleum on Site ground water. In response to this request, Vintage retained Levine·Fricke to prepare this Work Plan.

## SCOPE OF WORK

The purposes of the proposed Scope of Work are to provide data to:

- evaluate ground-water flow direction and gradient
- evaluate ground-water quality regarding petroleum hydrocarbons

o evaluate potential migration of petroleum-affected ground water, if present

The proposed Scope of Work includes the following tasks:

Task 1: Obtain Permits and Obtain Utility Clearances
Task 2: Install Shallow Ground-Water Monitoring Wells
Task 3: Well Development and Sampling
Task 4: Laboratory Analyses
Task 5: Data Analysis and Report Preparation
Task 6: Project Management and Meetings

A detailed description of these tasks follows.

Task 1: Obtain Permits and Obtain Utilities Clearances

Well drilling permits will be obtained, as required, from the Alameda County Flood Control and Water Conservation District for the installation of proposed monitoring wells.

Utility clearances will be obtained for areas selected for monitoring well installations. Underground Service Alert (USA) will be contacted prior to drilling for public utility locations. Private utilities will be identified by Vintage.

Task 2: Install Shallow Ground-Water Monitoring Wells

Depth to ground water in this area of the Marina Village Development is less than approximately 10 feet below grade. The general ground-water flow direction is reported to be to the northeast, in the direction of the Alameda Inner Harbor. The Harbor is located approximately 400 feet northeast of the former tank location.

During previous work performed by Levine·Fricke, one shallow ground-water monitoring well (LF-1) was installed southwest and on the opposite side of Marina Village Parkway (Figure 2). This well provides data upgradient with respect to ground-water flow direction from the former tank area. In conjunction with data from the two proposed monitoring wells, this existing well can be used to assess localized ground-water flow direction. Another shallow ground-water monitoring well (WC-3), previously installed by Woodward Clyde Consultants (Figure 2) and located approximately 350 northwest of the former tank location, can also be utilized to provide data to evaluate ground-water flow in the area.

Two shallow (approximately 15 feet deep) monitoring wells will be installed within 10 feet of the northeastern edge of the former excavation edge. Approximate locations of proposed monitoring wells are shown in Figure 2. Since the depth to ground water is anticipated to be shallow (less than 10 feet) the proposed wells will be completed to a depth of about 15 feet. The actual length and depth of perforated intervals in each well will be determined in the field, based on the depth to ground water and the types, depths and thicknesses of sediments encountered. The bottom of each well will be placed in a lower-permeability zone, if possible. The perforated interval will be selected to sample ground water from shallower and more permeable sediments. The well will be constructed so that the shallow ground-water surface will be below the top of the perforated section of the well to provide for measurement of floating product, if present.

After the well casing has been placed in the completed borehole, the well annulus opposite the perforated interval will be back-filled with an appropriately-sized sand pack to approximately two feet above the perforations. Bentonite will be placed above the sand pack to isolate the perforated interval from the material above. Cement-bentonite grout will then be placed above the bentonite seal to the land surface to seal the remainder the bentonite interval from surface water. A protective, locking steel cover will then be placed over the top of the casing to protect the well's integrity. A weatherproof and tamperproof metal or concrete box and cover will then be cemented in place, flush with the surface grade over the top of the well.

All newly-installed wells will be surveyed to the nearest 0.01 foot and related to the City of Alameda Datum to allow accurate ground-water elevation measurement.

Water-level measurements will be collected from monitoring wells at the site to evaluate shallow ground-water flow direction and gradients. At each monitoring well, thickness of the free product (if any) will be measured.

Task 3: Well Development and Sampling

Newly-installed monitoring wells will be developed by pumping, surging and/or bailing to remove finer particles near the well screen and improve hydraulic communication with the surrounding formation. Parameters such as water clarity, pH, temperature, specific conductance and volume extracted will be measured during development. Development will terminate when the well visually produces little or no sediment and water-quality indicators measured during development and sampling stabilize. All water will be stored in temporary holding tanks pending receipt of the water-quality results.

One round of samples will be collected from each newly installed monitoring well. The wells will be sampled after at least three well casing volumes have been withdrawn from each well. Samples will be collected using a Teflon bailer. The bailer will be cleaned with laboratory-grade detergent, followed by a deionized water rinse between each sampling. Samples will be decanted from the bailer into laboratory-supplied glass or plastic bottles and 40-ml VOA vials with Teflon septa, then stored in a chilled cooler for shipment to the laboratory.

Duplicate and field blank samples will be collected and analyzed during each round of sampling for quality control purposes. The second round of samples will be collected within approximately one week after the first round is collected to confirm initial laboratory results. Samples will be collected and transported using strict chain of custody protocol.

The ACHA has required that ground-water sampling be performed quarterly for at least one year in order to provide ground-water quality data and to establish ground-water elevation levels, gradient and flow direction. Therefore, for budgetary purposes, four rounds of water sampling have been included.

Task 4: Laboratory Analysis

Five ground-water samples (one sample from each of three wells, a blank and a duplicate) per sampling event will be analyzed for total petroleum hydrocarbon (TPH) as both gasoline and diesel and BTX compounds using modified EPA Methods 8015 and 602.

All analyses have been budgeted for normal two-week laboratory turnaround time. All samples will be analyzed by a State-certified laboratory.

Task 5: Data Analysis and Report Preparation

Data gathered during the course of investigation will be evaluated, and a report will be prepared. The report will contain descriptions of methodologies used to collect and analyze data, include graphical representation of well locations, ground-water elevation contours, ground-water quality data, and product thickness data (if present), the interpretations of such data, and the technical rationale for the conclusions reached.

Subsequent to the initial report, three additional reports (one per quarter) will be prepared to present data gathered during each sampling event.

Task 6: Project Management and Meetings

Ms. Elizabeth Nixon, Project Geotechnical Engineer, will be the project manager. As such, she will be the primary contact for Vintage and will be responsible for technical and administrative aspects of the project. Mr. Charles Pardini, Senior Staff

Hydrogeologist, will assist with project management duties and responsibilities, and will be responsible for the field investigations and hydrogeologic evaluations. Mr. Thomas Johnson, R.G. and Principal Hydrogeologist, will be the project's peer reviewer and will participate in the technical, administrative and regulatory aspects of the project.

**SCHEDULE**

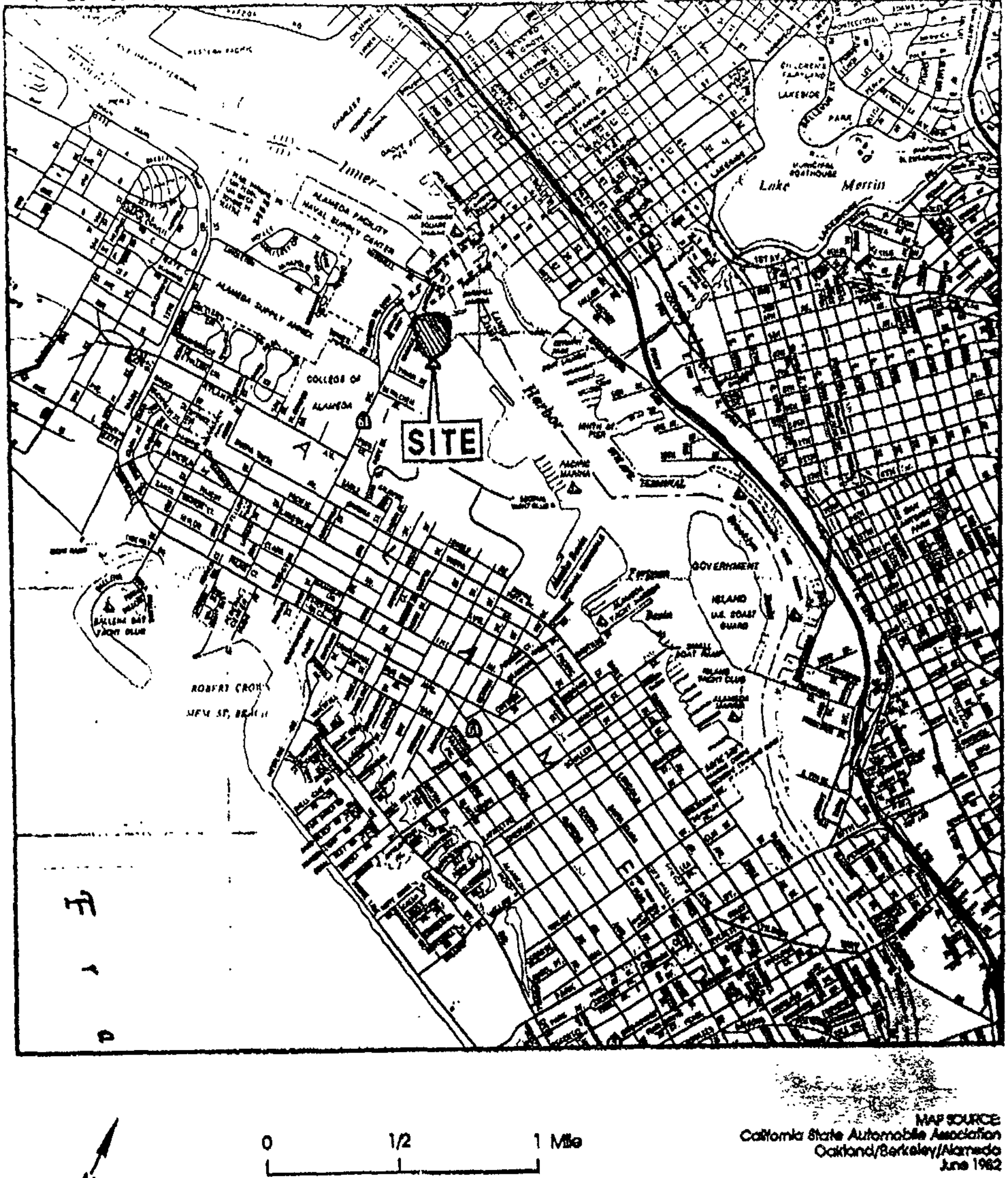
Levine·Fricke can begin this work within one month after receiving authorization to proceed from Vintage Properties, depending on subcontractor availability and the acquisition of drilling permits from the ACFCWCD.

We estimate that drilling and surveying can be completed within approximately two weeks after beginning work. Based on a standard laboratory turnaround time of two weeks, it is estimated that a draft report can be completed within approximately eight weeks after initiation of drilling at the site. After receipt of review comments from Vintage, a final report will be submitted to the RWQCB and the ACHA.

ESTIMATED BUDGET

Work will be conducted on a time-and-materials basis in accordance with our current Schedule of Charges. We estimate the time requirements and subsequent costs of this proposed Scope of Work based upon a level of effort deemed appropriate for the investigation. Any anticipated modifications to this estimate will be discussed with Vintage representatives as they become evident. The estimated total budget will not be exceeded without prior authorization from those representatives.

| | | |
|---|---|---|
| Task 1: | Obtain Permits and Obtain Utility Clearances | $ 800 |
| Task 2: | Install Two Shallow (15-foot deep) Ground-Water Monitoring Wells (includes drilling subcontractor, survey contractor and Levine·Fricke personnel) | 4,500 |
| Task 3: | Well Development and Sampling (Four sampling events) | 4,000 |
| Task 4: | Laboratory Analysis (20 water samples using modified EPA Method 8015 and EPA Method 602) | 6,000 |
| Task 5: | Data Analysis and Report Preparation (Four quarterly reports) | 9,000 |
| Task 6: | Project Management and Meetings | 3,000 |
| | Estimated Total | $ 27,300 |




MAP SOURCE:
California State Automobile Association
Oakland/Berkeley/Alameda
June 1982

Figure 1 : SITE LOCATION MAP

Project No.1245

LEVINE•FRICKE
CONSULTING ENGINEERS AND HYDROGEOLOGISTS

LAN09AUC88JM

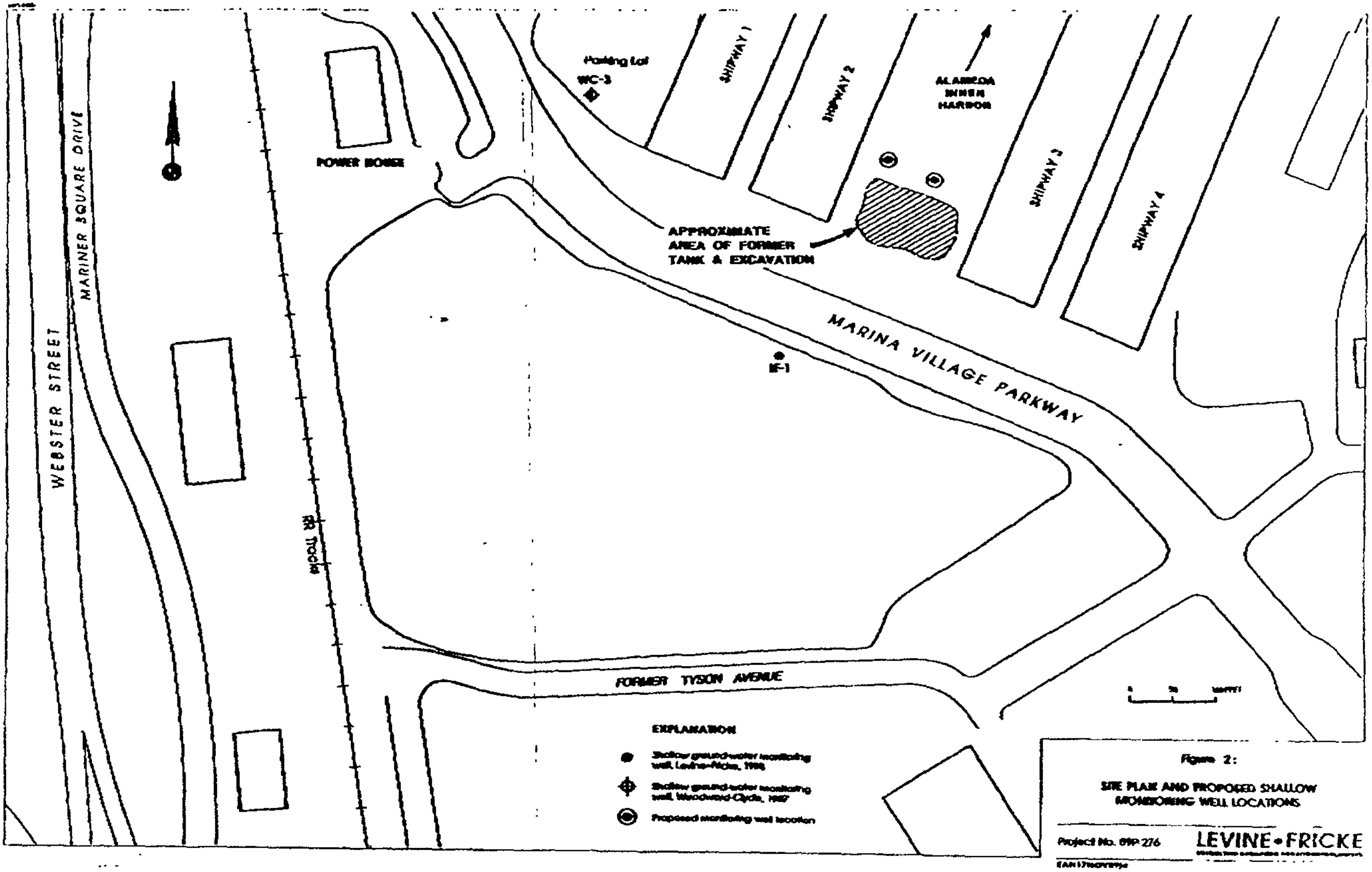
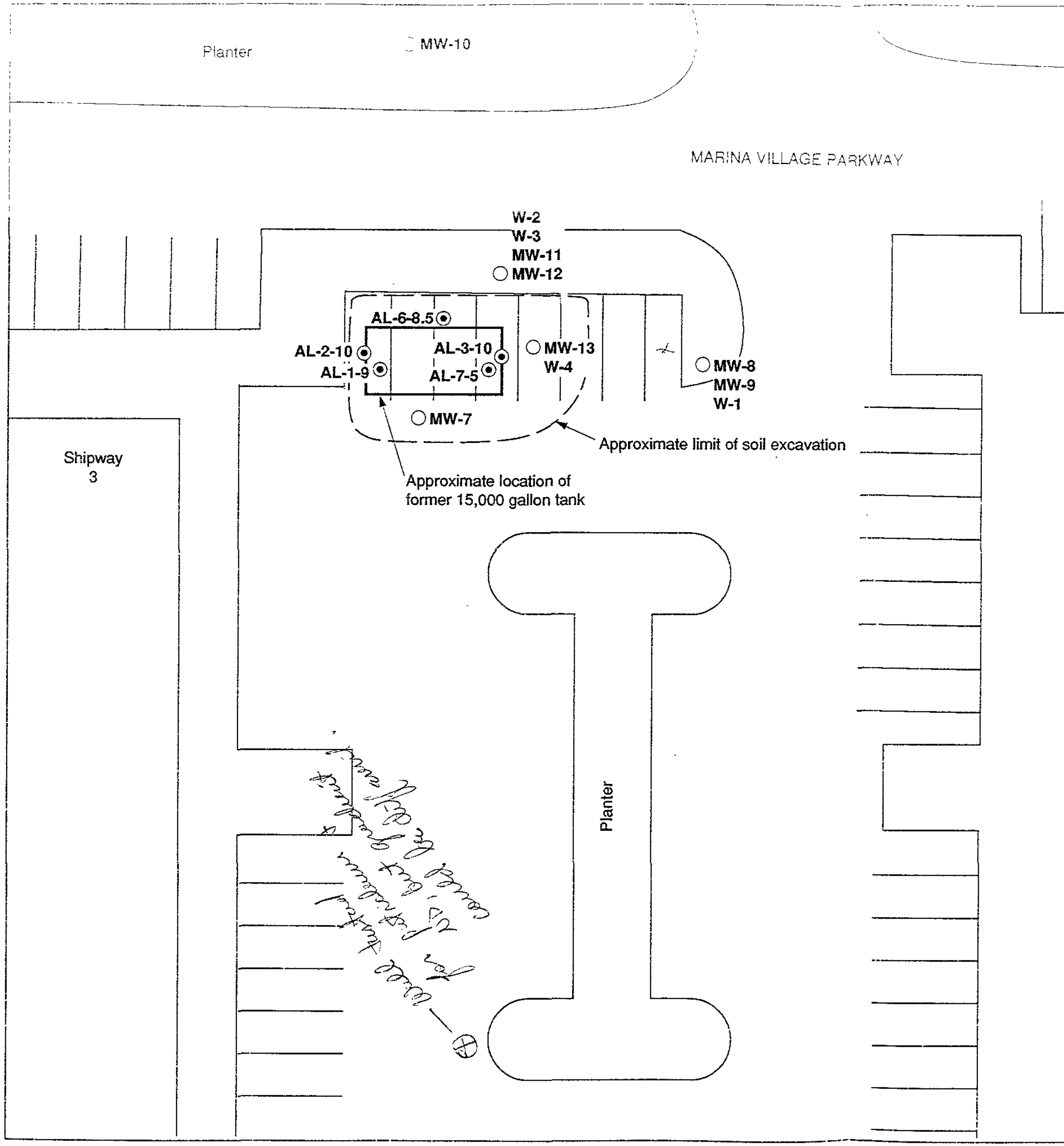



Figure 2:

SITE PLAN AND PROPOSED SHALLOW MONITORING WELL LOCATIONS

Project No. 09P 276

LEVINE • FRICKE




## SUMMARY OF ANALYTICAL DATA

| Sample No. | Depth (ft.) | TPH - gasoline | TPH - diesel | TOG(1) | Benzene | Toluene | Ethylbenzene | Xylenes |
|---|---|---|---|---|---|---|---|---|
| ANALYTICAL DATA FOR SAMPLES OBTAINED BEFORE TANK REMOVAL IN AUGUST 1988(3) | | | | | | | | |
| SOIL (mg/kg) | | | | | | | | |
| MW-7 | 7.5 | <10 | 39 | | | | | |
| MW-8 | 6 | <10 | <10 | | | | | |
| MW-9 | 10 | <10 | <10 | | | | | |
| MW-10 | 8 | <10 | <10 | | | | | |
| MW-11 | 6 | <10 | <10 | | | | | |
| MW-12 | 10 | <10 | <10 | | | | | |
| MW-13 | 7.5 | <10 | <10 | | | | | |
| WATER (µg/l) | | | | | | | | |
| W-1 | | <700 | <700 | | | | | |
| W-2 | | <250 | <250 | | | | | |
| W-3 | | <250 | <250 | | | | | |
| W-4 | | <10 | 130 (2) | | | | | |
| ANALYTICAL DATA FOR SAMPLES OBTAINED FOLLOWING TANK REMOVAL IN JANUARY 1989(4) | | | | | | | | |
| SOIL (mg/kg) | | | | | | | | |
| AL-2-10 | 10 (3) | ND | 9.1 | 5300 | ND | ND | | ND |
| AL-3-10 | 10 (3) | 6.9 | 5300 | 1400 | ND | ND | | ND |
| AL-6-8.5 | 8.5 (3) | 1.0 | 2300 | 34 | ND | ND | | ND |
| WATER (µg/l) | | | | | | | | |
| AL-1-9 (5) | | | | | ND | ND | ND | ND |
| AL-7-5 (6) | | 270 | 6400 | | 4.8 | 8.8 | 2.2 | 12 |

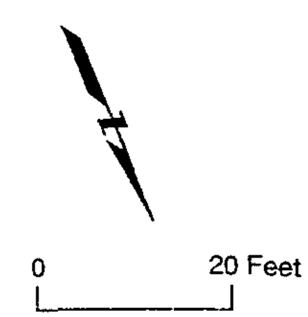
### Notes

1. TOG = total oil and grease.
2. Degraded diesel.
3. Test data referenced from AREI files.
4. Test data referenced from Safety Specialists, Inc., letter dated 13 February 1989.
5. BTEX results based on EPA Method 8240 analysis.
6. BTEX results based on EPA Method 8020 analysis.

### EXPLANATION

○ Approximate location of sample(s) obtained before tank removal. Based on unpublished data from AREI files

⦿ Approximate location of sample(s) obtained during tank removal. Based on Safety Specialists, Inc., letter dated 13 February 1989




TANK 3
SOIL AND GROUNDWATER SAMPLE
LOCATION PLAN
1150 Marina Village Parkway
Alameda, California

GEOMATRIX | Project No. 1736.11 | Figure 1