



RECEIVED

1:55 pm, Nov 26, 2007

Alameda County
Environmental Health

Environmental Services
Site Remediation
3400 Crow Canyon Road
San Ramon, CA 94583

November 16, 2007

Mr. Jerry Wickham
Alameda County Environmental Health Department
Division of Environmental Protection
1131 Harbor Bay Parkway, 2nd Floor
Alameda, California 94502

Subject: Pacific Gas and Electric Company Oakland General Construction Yard, 4930 Coliseum Way, Oakland, California, Alameda County Case #RO0000099

Dear Mr. Wickham:

Attached is the *Additional Investigation Work Plan, PG&E Oakland General Construction Yard, 4930 Coliseum Way, Oakland, California*, dated November 16, 2007 and prepared by Geomatrix Consultants, Inc. (Geomatrix) on behalf of Pacific Gas and Electric Company (PG&E).

The attached Work Plan was prepared in response to the Alameda County Environmental Health Department (the County) letter dated June 29, 2007, and the October 10, 2007 meeting between representatives of the County, the PG&E property, the former AAA property, the Learner property, and the former Superior Plaster Castings property. PG&E understands that the County considers the dichlorobenzene (DCB) and chlorobenzene (CB) impacts that have been detected in groundwater beneath the PG&E property, the AAA property, and the Superior Plaster Castings property to be from a common source of historic releases that occurred and resulted in a commingled plume. Therefore, the County considers the responsible parties for the PG&E property, the AAA property, the Learner property, and the Superior Plaster Casting property responsible for the release. The County has requested that responsible parties for each of the four properties evaluate the source and extent of the DCB and CB impacts, either individually or in conjunction with the other responsible parties. Based on the discussions that took place during the October 10, 2007 meeting, PG&E understands that the responsible parties for each of the four properties will investigate the source of the DCB and CB impacts on their respective properties individually.

The attached Work Plan proposes an additional soil and groundwater investigation for the PG&E property. The objectives of the proposed Work Plan are to: evaluate the lateral and vertical extent of petroleum hydrocarbon, DCB and CB impacts to groundwater in the northern portion of the PG&E property; access whether there are polynuclear aromatic hydrocarbons (PAHs) impacts to soil in the northern portion of the PG&E property; assess whether there are DCB and CB impacts to shallow soil on the PG&E property; and to further assess whether there are petroleum hydrocarbon impacts to soil in the vicinity of the former diesel underground storage tank (UST) on the PG&E property.

Upon your approval of this Work Plan, PG&E will initiate the proposed Additional Investigation.

Please contact me at 925.866.5888 or r4sw@pge.com if you have any questions.

Sincerely,

Robert Saur
Environmental Geologist

Additional Investigation Work Plan

PG&E Oakland General Construction Yard

4930 Coliseum Way

Oakland, California

Prepared for:

Pacific Gas and Electric Company

3400 Crow Canyon Road

San Ramon, California 94583

November 2007

Project No. 13045.007.A



Geomatrix

Additional Investigation Work Plan

PG&E Oakland General Construction Yard

4930 Coliseum Way

Oakland, California

Prepared for:

Pacific Gas and Electric Company

3400 Crow Canyon Road

San Ramon, California 94583

Prepared by:

Geomatrix Consultants, Inc.

2101 Webster Street, 12th Floor

Oakland, California 94612

(510) 663-4100

November 2007

Project No. 13045.007.A



Geomatrix


ADDITIONAL INVESTIGATION WORK PLAN

PG&E Oakland General Construction Yard
4930 Coliseum Way
Oakland, California

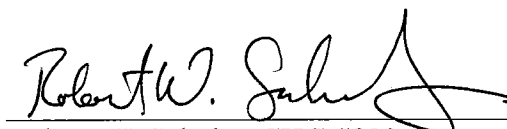
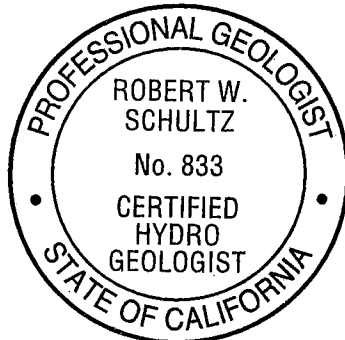
November 16, 2007
Project 13045.007.A

This report was prepared by the staff of Geomatrix Consultants, Inc., under the supervision of the Senior Geologist whose seal and signature appears hereon.

The findings, recommendations, specifications, or professional opinions are presented within the limits described by the client, in accordance with generally accepted professional engineering and geologic practice. No warranty is expressed or implied.



Jonathan M. Skaggs, PG #7823
Project Geologist



Robert W. Schultz, CHG #833
Senior Geologist

TABLE OF CONTENTS

| | | Page |
|-----|--|-------------|
| 1.0 | INTRODUCTION | 1 |
| 2.0 | BACKGROUND INFORMATION | 2 |
| 2.1 | SITE HISTORY | 2 |
| 2.2 | REGIONAL GEOLOGY AND HYDROGEOLOGY | 2 |
| 2.3 | SITE LITHOLOGY AND HYDROGEOLOGY | 3 |
| 2.4 | PREVIOUS ENVIRONMENTAL INVESTIGATION AT THE PG&E SITE..... | 3 |
| 2.5 | PREVIOUS 1,4-DCB RESULTS AT THE PG&E AND ADJACENT SITES | 4 |
| 3.0 | SCOPE OF WORK | 5 |
| 3.1 | PRE-FIELD ACTIVITIES | 6 |
| | 3.1.1 Health and Safety Plan | 6 |
| | 3.1.2 Utility Location, Borehole Clearance, and Permitting | 7 |
| 3.2 | FIELD ACTIVITIES | 7 |
| | 3.2.1 Soil Sampling Activities..... | 7 |
| | 3.2.2 Depth-Discrete Groundwater Sampling Activities..... | 8 |
| | 3.2.3 Borehole Destruction and Surveying..... | 9 |
| | 3.2.4 Investigation Waste Management | 9 |
| | 3.2.5 Sample Analysis | 9 |
| | 3.2.6 Quality Assurance and Quality Control Methodology..... | 10 |
| 3.3 | REPORTING | 11 |
| 4.0 | SCHEDULE | 11 |
| 5.0 | REFERENCES | 12 |

FIGURES

| | |
|----------|--|
| Figure 1 | Site Location Map |
| Figure 2 | Proposed Sampling Locations |
| Figure 3 | Compilation of Historical Detections of 1,4-DCB in Groundwater |

APPENDIXES

| | |
|------------|--|
| Appendix A | Historical UST Cluster Excavation Confirmation Sample Analytical Results and Locations |
| Appendix B | “Groundwater Analytical Results (April 12, 2007)”—ITSI |
| Appendix C | Historical Monitoring Well Lithologic Logs |

ADDITIONAL INVESTIGATION WORK PLAN
PG&E Oakland General Construction Yard
4930 Coliseum Way
Oakland, California

1.0 INTRODUCTION

On behalf of the Pacific Gas and Electric Company (PG&E), Geomatrix Consultants, Inc. (Geomatrix), has prepared this Additional Investigation Work Plan for the PG&E Oakland General Construction Yard site, located at 4930 Coliseum Way in Oakland, California (the “PG&E site”) (Figure 1). In a letter addressed to PG&E dated June 29, 2007, the Alameda County Environmental Health Department (ACEH) requested that PG&E submit a “joint” work plan together with other responsible parties to address chlorobenzene compounds (chlorobenzene and dichlorobenzenes) in groundwater on the PG&E site and at three upgradient sites: the former AAA property, the Learner property, and the former Superior Plaster Castings facility (Figure 2). During a meeting on October 10, 2007, with representatives from PG&E, the former AAA property, the Learner property, and the former Superior Plaster Castings property, the ACEH agreed to allow each of the four parties to submit separate investigation work plans. In response to the ACEH’s request, this work plan has been prepared to address the PG&E site.

The objectives of the proposed sampling are to:

1. further define the total petroleum hydrocarbons quantified as diesel (TPHd), total petroleum hydrocarbons quantified as motor oil (TPHmo), and chlorobenzene impacts to groundwater in the northern portion of the PG&E site, including an evaluation of deeper groundwater;
2. further assess the potential for chlorobenzenes to be in shallow soil at the site; and
3. assess whether polynuclear aromatic hydrocarbons (PAHs) are present in soil in the vicinity of the former waste oil UST
4. assess whether TPHd and TPHmo are present in soil in the vicinity of the former diesel underground storage tank (UST) and cluster.

This work plan includes a summary of background information for the PG&E site, our proposed scope of work, and a proposed schedule for completing the work.

2.0 BACKGROUND INFORMATION

The site history, regional geology and hydrogeology, site lithology and hydrogeology, previous environmental investigations performed at the PG&E site, and 1,4-dichlorobenzene (1,4-DCB) findings at the PG&E and surrounding sites are summarized below.

2.1 SITE HISTORY

The site has been used by PG&E as a natural gas distribution center and equipment storage facility from at least the late 1930s until 1990, when a former natural gas aboveground storage tank (AST) was removed. Since 1990, the site has been used as an equipment and vehicle storage facility (PG&E, 1988). Five underground storage tanks were formerly present at the site. Four USTs were in a cluster located in the north corner of the PG&E site and the fifth (a 1,000-gallon diesel UST) was located near the west corner of the site (Figure 2). Sampling results indicated that of the four tanks in the former UST cluster, two contained mineral spirits, one contained lubrication oil, and one contained heavy oil. The former UST cluster is also thought to have been used to store waste oils (PG&E, 1988). For the purposes of this report, the former UST cluster will be referred to as the “former waste oil UST cluster.” Known historical use indicated, and sampling results confirmed, that the fifth UST contained diesel fuel.

2.2 REGIONAL GEOLOGY AND HYDROGEOLOGY

The site and the surrounding region are located on the East Bay Plain, which is the eastern flank of a broad bedrock depression centered on San Francisco Bay. In the vicinity of the site, the subsurface sediments consist of a thick sequence of alluvial fan deposits (300 to 700 feet thick) (Water Board, 1999). The U.S. Geological Survey geologic map of the region indicates that the site and the area to the east are underlain by Holocene alluvial fan and fluvial deposits (Graymer, 2000). Streams drained the East Bay Hills and deposited sands and gravels in stream channels that flowed toward the bay. As the stream channels meandered, areas where the coarsest sands and gravels were deposited varied in location across the active alluvial plain. Finer-grained sands, silts, and clays were deposited between active stream channels. These processes produced a complexly interbedded sequence of interfingering gravels, sand, silts, and clays more than 1,000 feet thick (Helley and Lajoie, 1979). Along the San Francisco Bay margin, the alluvial deposits are interfingered with marine sediments. The site is located just to the east of historical artificial fill used to reclaim land along the San Francisco Bay margin. Major water-bearing units within the East Bay Plain include the early Pleistocene Santa Clara Formation, the late Pleistocene Alameda Formation, the Holocene Temescal Formation, and artificial fill (CDWR, 2003).

2.3 SITE LITHOLOGY AND HYDROGEOLOGY

The PG&E site is located approximately 1/4 mile east of the margin of San Leandro Bay, on a plain gently sloping toward San Francisco Bay. Based on lithologic logs developed by others from investigations at the PG&E site, the uppermost portion of the subsurface at the PG&E site is underlain by interbedded deposits of clays, sands, and gravels approximately 19 feet below ground surface (bgs), the maximum depth drilled. Based on depth-to-groundwater measurements collected during historical groundwater monitoring events between 1988 and 2005, groundwater ranged between approximately 3.5 and 8 feet bgs at the PG&E site, and groundwater flow direction has generally been to the south (CSS, 2005). Based on depth-to-groundwater measurements collected during the most recent sampling event, the groundwater gradient and flow direction was 0.04 foot per foot to the south (ITSI, 2007).

2.4 PREVIOUS ENVIRONMENTAL INVESTIGATION AT THE PG&E SITE

The following summarizes previous environmental activities associated with the PG&E site:

- **February 1987**—Soil borings were advanced and soil and groundwater samples were collected in the vicinity of the former waste oil UST cluster and the diesel UST (PG&E, 1987a). Petroleum hydrocarbons and benzene, toluene, ethylbenzene, and xylenes (collectively known as BTEX) were detected in soil and groundwater in the vicinity of the former waste oil UST cluster. No petroleum hydrocarbons were detected in soil or groundwater in the vicinity of the former diesel UST.
- **December 1987**—Samples of the contents of five USTs were collected and analyzed (the four USTs in the former cluster and the former diesel UST (PG&E, 1987b). At that time, the results indicated that of the four tanks in the former waste oil UST cluster, two contained mineral spirits, one contained lubrication oil, and one contained heavy oil. The sample collected from the former diesel UST indicated that diesel was present in this UST.
- **January 1988**—The former waste oil UST cluster and associated piping were removed from the northern portion of the site, and the diesel UST and associated piping was removed from the western portion of the site (Figure 2) (PG&E, 1988). Petroleum hydrocarbons were detected in soil and in an excavation groundwater sample collected from the former waste oil UST cluster excavation; however, petroleum hydrocarbons were not detected in the excavation soil sample collected from the former diesel UST excavation.
- **March and April 1988**—Groundwater monitoring wells OW-1 through OW-4 were installed to monitor groundwater elevations and assess the potential presence of dissolved petroleum hydrocarbon concentrations in groundwater (PG&E, 1988). In addition, soil borings were advanced in the vicinities of the former waste oil UST cluster and the former diesel UST. Based on groundwater elevation

measurements from wells OW-1 through OW-4, groundwater flow direction is interpreted to be to the south-southwest. Analytical results from soil samples and soil borings indicated that petroleum hydrocarbons were present in the soil in the vicinity of the former waste oil UST cluster and that soil in the vicinity of the former diesel UST had not been impacted by petroleum hydrocarbons.

- **May 1990**—The natural gas holder was removed from the central portion of the site. Following demolition of the former natural gas AST, paint chips were reported to have been observed in shallow soil in the vicinity of the former natural gas AST (CSS, 2005).
- **April 1991**—Groundwater monitoring well OW-5 was installed along the northeast property line. A groundwater sample was collected from well OW-5 on April 17, 1991. Dichlorobenzenes were not detected; however, petroleum hydrocarbons and other chlorinated volatile organic compounds (VOCs) were detected (CSS, 2005).
- **November and December 1991**—Approximately 2,000 cubic yards of soil were excavated to a depth of between approximately 4 and 9 feet bgs as a remedial action for the petroleum hydrocarbons identified in the soil in the vicinity of the former waste oil UST cluster. Groundwater monitoring wells OW-6 and OW-7 were installed and well OW-3 was abandoned to allow for the excavation (Aqua, 1992). TPHd-impacted soil was removed to below cleanup levels up to the site property boundaries (Appendix A).
- **September and October 1992**—An asphaltic concrete cap was constructed above lead-affected surface soil in the vicinity of the former natural gas AST. The purpose of the asphaltic concrete cap was to limit potential exposure to lead-affected soil and to limit groundwater infiltration in the lead-affected soil area. Lead from lead-based paint chips, generated from sandblasting of the former natural gas AST, was found in shallow soil samples collected from this area (CSS, 2005).
- **February 1993**—Groundwater monitoring well OW-8 was installed in the southern area of the yard near the location of the former natural gas AST to assess whether lead was present in groundwater at the PG&E site (ACFCWCD, 1993). Lead has not been detected in groundwater samples since June 1997, when lead was detected in a sample collected from well OW-5 at a concentration of 5 micrograms per liter ($\mu\text{g/L}$).
- **July 1994 to present**—Since 1994, PG&E has performed semiannual groundwater monitoring at the site. A figure showing the groundwater analytical results from the April 2007 groundwater sampling event conducted at the PG&E site is included as Appendix B (ITSI, 2007).

2.5 PREVIOUS 1,4-DCB RESULTS AT THE PG&E AND ADJACENT SITES

Historical 1,4-DCB concentrations in groundwater in the northern corner of the PG&E site are shown on Figure 3 using available analytical data. In October 1998, 1,4-DCB was detected at

1,500 µg/L in a groundwater sample collected from well WCC-1A at the former Superior Plaster Castings property (ATC, 1998). During the October 1998 groundwater sampling event at the PG&E site, 1,4-DCB was detected at 470 µg/L and 68 µg/L in on-site wells OW-7 and OW-6, which are located closest to the upgradient former Superior Plaster Castings site (CSS, 2005) (Figure 2). During the April 2007 groundwater sampling event at the PG&E site, 1,4-DCB was detected at 64 µg/L, 5.0 µg/L, 22 µg/L, and 460 µg/L in on-site wells OW-1, OW-5, OW-6, and OW-7 (ITSI, 2007).

3.0 SCOPE OF WORK

To accomplish the objectives outlined above, Geomatrix proposes to advance borings at nine locations to collect soil and groundwater samples at the PG&E site. The rationale for each of the investigation locations is presented below. The proposed investigation locations are shown on Figure 2.

- Boring SB-23 is proposed in the western corner of the PG&E site, near the former diesel UST. The primary rationale for this boring is to further assess the potential presence of petroleum hydrocarbons in soil adjacent to and immediately downgradient of the former diesel UST excavation. Confirmation samples were collected beneath the water table during UST removal; Geomatrix will collect a sample from immediately above the groundwater surface. The secondary rationale for this boring is to assess whether chlorobenzenes are present in shallow soil in this area.
- Boring SB-24 is proposed along the northwestern boundary of the PG&E site and the former Superior Plaster Castings property. The rationale for this boring is to further define the extent of TPHd, TPHmo, and chlorobenzenes in shallow soil and groundwater downgradient of the former Superior Plaster Castings property.
- Boring SB-25 is proposed in the northern portion of the PG&E site, just southwest of the limits of the former UST cluster excavation. The primary rationale for this boring is to further define the extent of TPHd, TPHmo, and chlorobenzenes in groundwater downgradient of the former Superior Plaster Castings property and the Learner property. The secondary rationale for this boring is to assess whether chlorobenzenes or PAHs are present in soil outside of the limits of the former UST cluster excavation.
- Borings SB-26, SB-27, and SB-28 are proposed in the northern corner of the PG&E site, inside the limits of the former UST cluster excavation boundary. The rationale for these borings is to further define the extent of TPHd, TPHmo, and chlorobenzenes in groundwater downgradient of the former Superior Plaster Castings property, the Learner property, and the former AAA property. The

secondary rationale for these borings is to assess the presence of PAHs beneath the former UST cluster excavation.

- Boring SB-29 is proposed south of the limits of the former UST cluster excavation on the PG&E site. The primary rationale for this boring is to further define the extent of TPHd, TPHmo, and chlorobenzenes in groundwater downgradient of well OW-7. The secondary rationale for this boring is to assess whether chlorobenzenes or PAHs exist in soils outside of the limits of the former UST cluster excavation.
- Boring SB-30 is proposed in the northern corner of the PG&E site. The primary rationale for this boring is to assess whether TPHd, TPHmo, and chlorobenzenes are present in groundwater further downgradient of well OW-7. The secondary rationale for this boring is to assess whether chlorobenzenes exist in soil at this location.
- Boring SB-31 is proposed in the northern corner of the PG&E site, along the property boundaries for the former Superior Plaster Castings and former AAA properties. The rationale for this boring is to assess whether TPHd, TPHmo, and chlorobenzenes are present in groundwater downgradient of the former Superior Plaster Castings property, the former AAA property, and the Learner property.
- Depending on field observations during drilling and on drilling progress, we may advance additional borings on site as part of this mobilization. Additional soil and groundwater sampling would be intended to increase the resolution of the investigation program.

Our scope of work is divided into tasks and is described below.

3.1 PRE-FIELD ACTIVITIES

The following sections describe the pre-field activities to be conducted as part of the additional investigation activities at the PG&E site.

3.1.1 Health and Safety Plan

Geomatrix will prepare a site-specific health and safety plan (HSP) to protect the public and site personnel during the fieldwork. The HSP will include health and safety precautions for known and potential physical and chemical hazards anticipated for the field effort. The HSP will include a map showing the route to the nearest hospital, and will include material safety data sheets (MSDS), or equivalent chemical data information, for chemicals of concern. All members of the field team will sign and adhere to the HSP.

3.1.2 Utility Location, Borehole Clearance, and Permitting

Prior to conducting field activities, Geomatrix will mark proposed drilling locations, contact Underground Service Alert (USA), and retain a utility location contractor to clear the boring locations for utilities. As part of our safety protocol, Geomatrix will hand auger to 5 feet bgs at each boring location. Geomatrix will obtain a boring permit from Alameda County Public Works Agency (ACPWA).

3.2 FIELD ACTIVITIES

The following sections describe the field activities to be conducted as part of the additional investigation at the PG&E site

3.2.1 Soil Sampling Activities

Geomatrix will retain a California-licensed driller to perform drilling activities. All sampling and soil classification will be conducted by a trained field geologist working under the supervision of a California Professional Geologist. Soil will be continuously cored for lithologic logging using a direct-push drill rig equipped with a dual-tube direct-push sampling system. Dual-tube sampling systems consist of an outer drive casing and inner soil sample liner. The drill rig advances the outer casing and inner liner simultaneously, collecting the soil core sample in the sample liner. The sampler is then retrieved while the outer casing remains in place, protecting the integrity of the borehole. A new sampler is lowered into place and advanced further to collect the next soil sample run.

Nondedicated downhole sampling equipment will be steam cleaned or triple-washed between each soil boring location and prior to reuse. A lithologic log will be prepared for each boring by a Geomatrix field geologist using visual-manual procedures of the American Society for Testing and Materials (ASTM) Standard D2488-90 for guidance, which is based on the Unified Soil Classification System (USCS).

Field screening of soil samples for petroleum hydrocarbons will be performed using a portable photoionization detector (PID) and visual inspection for soil staining. Geomatrix plans to use a PID fitted with a 10.6 electron volt lamp, calibrated daily prior to use to a 100 parts per million by volume (ppmv) isobutylene standard, to measure and record headspace concentrations in plastic resealable bags with aliquots of soil from the target lithologic unit. If necessary, soil screening methods may be modified based on field conditions.

Soil samples will be retained for potential laboratory analysis from each boring location. Geomatrix plans to collect samples for laboratory analysis as described in Table A, below. Additional samples will be retained for analysis if field observations (e.g., observed staining and/or elevated PID readings) suggest the potential presence of VOCs or petroleum hydrocarbons.

Soil samples for VOC analysis will be collected from new, clean butyrate soil liners within the sample barrel as soon as the soil core is available, in accordance with EPA field preservation Method 5035. Approximately 5 grams of soil will be removed from the soil core by pushing a soil sampling syringe into the soil core and then extruding the sample into two laboratory prepared volatile organic analysis (VOA) vials preserved with sodium bisulfate and one laboratory prepared VOA vial preserved with methanol. Sample bottles will be labeled, sealed in plastic bags, placed in an ice-chilled cooler, and transported to a state-certified analytical laboratory under Geomatrix chain-of-custody procedures. Soil samples for all other analyses will be collected in new, clean butyrate liners and sealed at each end with Teflon sheets, plastic end caps, and silicone tape.

3.2.2 Depth-Discrete Groundwater Sampling Activities

Geomatrix will collect groundwater samples from first-encountered groundwater at boring locations SB-24 through SB-30. Additionally, we will collect groundwater samples from deeper groundwater at boring locations SB-29 and SB-30. Groundwater samples will be collected from depth-discrete intervals of 5 feet or less. Based on previous water level measurements and historical lithologic boring logs from the PG&E site, we anticipate that samples from first-encountered groundwater will be collected from a target interval beginning at the top of first-encountered groundwater to 5 feet below (Appendix C). Deeper groundwater samples will be collected from a target interval from the next deeper groundwater-bearing interval below the first-encountered groundwater. The exact depth intervals to be sampled will be determined in the field, based on the depth to groundwater and lithologic observations.

Depth-discrete groundwater samples will be collected by advancing additional boring(s) directly adjacent to the soil sampling boring using direct-push technology. Depth-discrete groundwater samples will be collected using a Hydropunch groundwater sampler or equivalent. Only the target water-bearing interval will be screened for sampling, and care will be taken to prevent hydraulic communication between the target interval and overlying or underlying saturated soils. If adequate groundwater is present, Geomatrix will purge at a low-flow rate to

reduce turbidity and help ensure representative samples; this will be done prior to collecting a groundwater sample at each location.

3.2.3 Borehole Destruction and Surveying

Following completion of sampling activities, the drilling contractor will fill the borings with grout using a tremie pipe, according to ACPWA requirements. Geomatrix will use a global positioning system (GPS) unit to collect location information for all boring locations. The GPS unit to be used has an accuracy of approximately +/- 1 foot in the horizontal plane, and approximately +/- 3 feet in elevation.

3.2.4 Investigation Waste Management

Soil cuttings, purge water, and rinse water generated during drilling will be temporarily stored at the PG&E site in labeled, Department of Transportation (DOT)-approved 55-gallon drums, pending profiling, transportation, and off-site disposal or recycling at an appropriate facility. All waste containers will be clearly labeled with generator contact and phone number, drilling location(s), and date of generation.

3.2.5 Sample Analysis

All samples retained for laboratory analysis will be labeled and stored in an ice-chilled cooler prior to delivery to Creek Environmental Laboratories, Inc., of San Luis Obispo, California, under Geomatrix chain-of-custody procedures. Soil samples will be analyzed using the following methods:

- total petroleum hydrocarbons quantified as gasoline (TPHg) using EPA Method 8015M,
- TPHd and TPHmo using EPA Method 8015M with silica gel cleanup,
- VOCs using EPA Method 8260B, and
- PAHs using EPA Method 8270 in selective ion monitoring (SIM) mode.

The sampling locations are shown on the attached Figure 2, and our proposed sampling and analysis plan is outlined in the table below.

Table 1. Sampling and Analysis Plan

| Sampling Location | Location | Sample Depths to be Analyzed (feet bgs) | VOCs | TPHg | TPHd with Silica Gel Cleanup | TPHmo with Silica Gel Cleanup | PAHs |
|-------------------|--|--|------|------|------------------------------|-------------------------------|------|
| SB-23 | Former diesel UST, downgradient of former Superior Plaster | Soil: 3 ¹ | X | | | | |
| | | Soil: 4 ² | | | X | X | |
| SB-24 | Downgradient of former Superior Plaster | Soil: 3 | X | | | | |
| | | Groundwater: first ³ | X | | X | X | |
| SB-25 | Downgradient of former Superior Plaster and Learner, Adjacent to former Excavation | Soil: 3 ¹ | X | | | | |
| | | Soil: 4 ² | | | | | X |
| | | Groundwater: first ³ | X | X | X | X | |
| SB-26 | Downgradient of former AAA, Superior Plaster, and Learner | Soil: 10 | | | | | X |
| | | Groundwater: first ³ | X | X | X | X | |
| SB-27 | Downgradient of former AAA | Groundwater: first ³ | X | X | X | X | |
| SB-28 | Downgradient of former AAA | Soil: 9 | | | | | X |
| | | Groundwater: first ³ | X | X | X | X | |
| SB-29 | Downgradient of well OW-7, adjacent to former excavation | Soil: 3 ¹ | X | X | | | |
| | | Soil: 4 ² | | | X | X | X |
| | | Groundwater: first and deeper ³ | X | X | X | X | |
| SB-30 | Downgradient of well OW-7 | Soil: 3 ¹ | X | | | | |
| | | Groundwater: first and deeper ³ | X | X | X | X | |
| SB-31 | Downgradient of former AAA, Superior Plaster, and Learner | Groundwater: first ³ | X | X | X | X | |

Notes:

- ¹ Sample to be collected in vadose-zone soil at least 1 foot above first-encountered groundwater.
 - ² Sample to be collected from immediately above first-encountered groundwater.
 - ³ Depth to groundwater is estimated at 5 feet bgs. Sampling interval will be from water table to 5 feet below.
- X Sample to be analyzed for listed parameters.

3.2.6 Quality Assurance and Quality Control Methodology

Field quality assurance/quality control (QA/QC) samples for chemical analysis will include the collection of one groundwater blind field duplicate and one trip blank per sample cooler.

QA/QC procedures will include adherence to protocols for field sampling and decontamination procedures, as well as collection and laboratory analysis of controlled standards, matrix spike

samples, and field duplicate samples to evaluate accuracy and precision. Data validation will include a data completeness check of each data package, a transcription check for sample results, and a thorough review of all laboratory reporting forms.

3.3 REPORTING

Following completion of field activities, sample analysis, validation of the analytical laboratory results, and analysis of the data, Geomatrix will prepare a report summarizing the sampling methods and results. At a minimum, the report will contain:

- a description of the PG&E site background information, field activities and results, along with conclusions and recommendations;
- a site map depicting sampling locations;
- an updated, scaled map showing the PG&E site and the upgradient properties, including recent and historical sampling locations for the PG&E site and relevant locations on the three upgradient sites;
- tabulated data from the current investigation;
- cumulative data tables for chlorobenzenes and TPH in soil at the PG&E site;
- a map of groundwater sampling locations with plotted analytical laboratory results for TPH and VOCs in groundwater;
- analytical laboratory reports and chain-of-custody forms; and
- boring logs and two lithologic cross sections, including data from this proposed field investigation and lithologic data generated during previous on-site drilling activities.

4.0 SCHEDULE

We anticipate that the field activities will require two days to complete, and that field work will be completed within six weeks of ACEH approval. We plan to submit the report to ACEH within eight weeks of completion of the field work.

5.0 REFERENCES

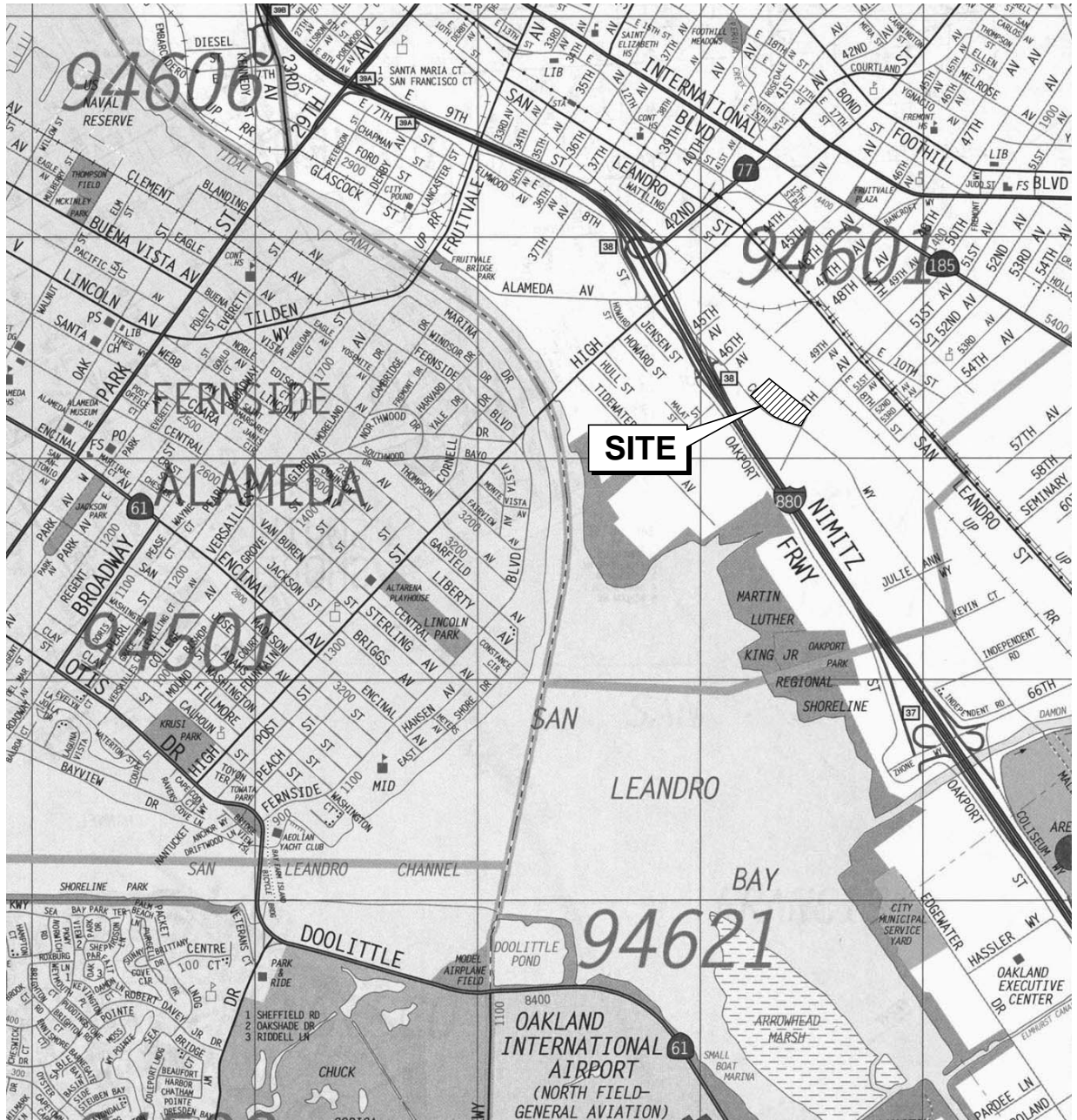
- Alameda County Flood Control and Water Conservation District (ACFCWCD), 1993, Drilling Permit 93058 for 4930 Coliseum Way in Oakland, February 9.
- Aqua Resources, Inc. (Aqua), 1991, Remedial Investigation Report, PG&E, ENCON-GAS Transmission and Distribution Construction Yard, Former Tank Cluster Area, 4930 Coliseum Way, Oakland, California, July 23.
- Aqua, 1992, Site Remediation and Closure Report Former Tank Cluster Area, Pacific Gas and Electric General Construction Yard, 4930 Coliseum Way, Oakland, California, February.
- ATC Associates, Inc. (ATC), 1998, Phase II Environmental Site Investigation Report, Metalcast Engineering Facility, 4800 Coliseum Way, Oakland, CA, November 25.
- California Department of Water Resources (CDWR), 2003, California's Groundwater, Bulletin 118, Santa Clara Groundwater Basin, East Bay Plain Sub-Basin.
- California Regional Water Quality Control Board, San Francisco Bay Region (Water Board), 1999, East Bay Plain Groundwater Basin Beneficial Use Evaluation Report, June.
- CSS Environmental Services, Inc. (CSS), 2005, Groundwater Monitoring Report, PG&E Oakland General Construction Yard, Oakland, California, September.
- Graymer, R.W., 2000, Geologic Map and Map Database of the Oakland Metropolitan Area, Alameda, Contra Costa, and San Francisco Counties, California: U.S. Geologic Survey Miscellaneous Field Studies Map MF 2342.
- Harding ESE (HE), 2002, Environmental Investigation, 745 50th Avenue, Oakland, CA, May 30.
- Helley E.J., and Lajoie, K.R., 1979, Flatland Deposits of the San Francisco Bay Region, California—Their Geology and Engineering Properties, and Their Importance to Comprehensive Planning: U.S. Geological Professional Paper 943.
- Innovative Technical Solutions, Inc. (ITSI), 2007, Semiannual Groundwater Monitoring Report, April 2007 Sampling Event, Pacific Gas and Electric Company, Oakland General Construction Yard, 4930 Coliseum Way, Oakland, California, May.
- LFR Levine-Fricke, 2004, Underground Storage Tank Removal Report, Former AAA Equipment Company Site, 745 50th Avenue, Oakland, CA, April 27.
- Pacific Gas and Electric Company (PG&E), 1987a, Underground Tank Investigation (DER Report 402.331-87.12), Oakland General Construction Gas Yard, May.

PG&E, 1987b, Analysis of Liquid Wastes Contained in Underground Storage Tank Located at Peralta Way, Oakland (DER Report 402.331-87.56), Oakland General Construction Gas Yard, December.

PG&E, 1988, Report 402.331-88.32, Coliseum Way Oakland, General Construction Gas Yard, Underground Tanks Investigation, July.

PG&E, 1993, Letter to Britt Johnson, Subject: Completion of Lead Contamination Cap 4930 Coliseum Way, Oakland, California, April 12.

FIGURES



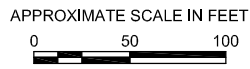
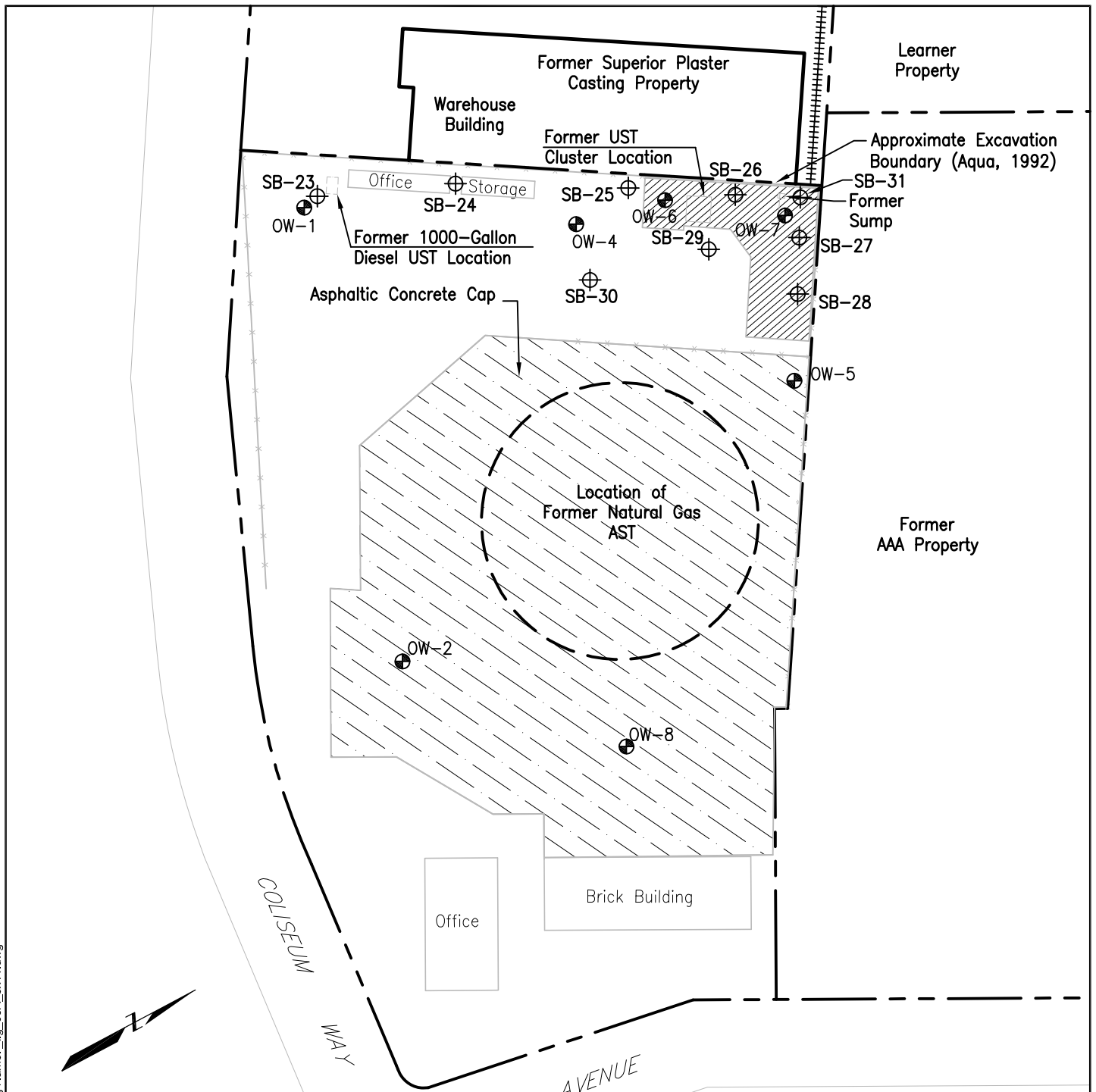
Base map from The Thomas Guide, 2007 Alameda and Contra Costa Counties Edition. Reproduced with permission granted by THOMAS BROS. MAPS®. This map is copyrighted by THOMAS BROS. MAPS®. It is unlawful to copy or reproduce all or any part thereof, whether for personal use or resale, without permission. All rights reserved.

S:130001304513045.007A\task_B1_fig_01(01).ai



| | | |
|---|----------------|------------------------|
| SITE LOCATION MAP Pacific Gas & Electric Company Oakland General Construction Yard 4930 Coliseum Way Oakland, California | | |
| By: JMS | Date: 11/07/07 | Project No. 13045.007A |
|  Geomatrix | | Figure 1 |

Plot Date: 11/16/07 - 12:57pm. Plotted by: amcgilberry
 Drawing Path: S:\13000\13045\13045.007\task_5107_0413_.mdl. Drawing Name: _fig_03A_8x11.dwg



EXPLANATION

- Groundwater Monitoring Well
- Proposed Sampling Location
- Approximate Parcel Boundary
- Railroad Spur

ABBREVIATIONS

- AST Aboveground Storage Tank
- UST Underground Storage Tank

Notes:

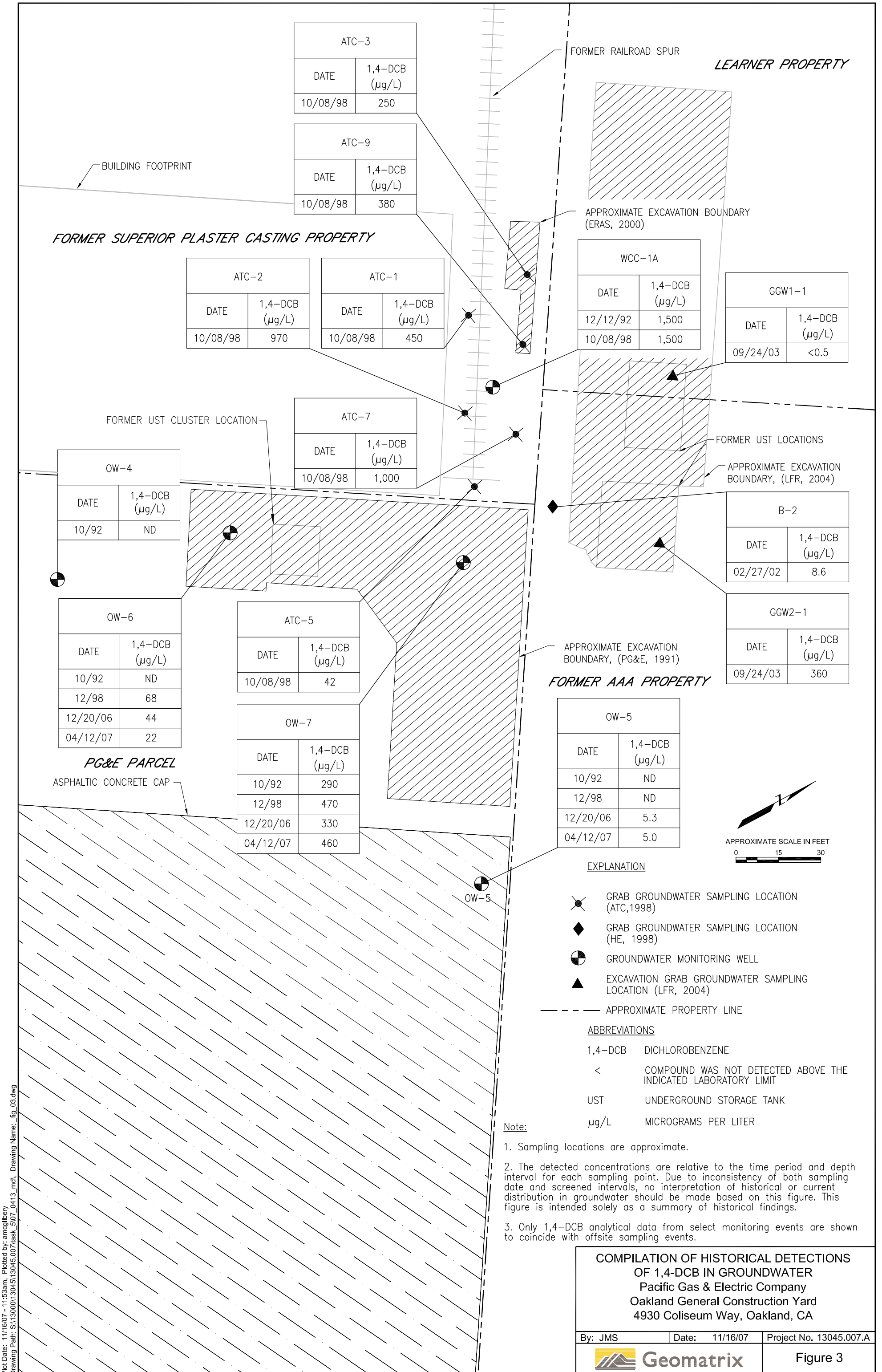
1. Well locations are approximate.
2. Basemap from CCS Environmental Services, Inc., 2005, Groundwater Monitoring Report, PG&E Oakland General Construction Yard, Oakland, California.

PROPOSED SAMPLING LOCATIONS
 Pacific Gas & Electric Company
 Oakland General Construction Yard
 4930 Coliseum Way, Oakland, CA

By: JMS Date: 11/16/07 Project No. 13045.007.A



Figure 2



| ATC-3 | |
|----------|----------------|
| DATE | 1,4-DCB (µg/L) |
| 10/08/98 | 250 |

| ATC-9 | |
|----------|----------------|
| DATE | 1,4-DCB (µg/L) |
| 10/08/98 | 380 |

| ATC-2 | |
|----------|----------------|
| DATE | 1,4-DCB (µg/L) |
| 10/08/98 | 970 |

| ATC-1 | |
|----------|----------------|
| DATE | 1,4-DCB (µg/L) |
| 10/08/98 | 450 |

| WCC-1A | |
|----------|----------------|
| DATE | 1,4-DCB (µg/L) |
| 12/12/92 | 1,500 |
| 10/08/98 | 1,500 |

| GGW1-1 | |
|----------|----------------|
| DATE | 1,4-DCB (µg/L) |
| 09/24/03 | <0.5 |

| ATC-7 | |
|----------|----------------|
| DATE | 1,4-DCB (µg/L) |
| 10/08/98 | 1,000 |

| OW-4 | |
|-------|----------------|
| DATE | 1,4-DCB (µg/L) |
| 10/92 | ND |

| OW-6 | |
|----------|----------------|
| DATE | 1,4-DCB (µg/L) |
| 10/92 | ND |
| 12/98 | 68 |
| 12/20/06 | 44 |
| 04/12/07 | 22 |

| ATC-5 | |
|----------|----------------|
| DATE | 1,4-DCB (µg/L) |
| 10/08/98 | 42 |

| OW-7 | |
|----------|----------------|
| DATE | 1,4-DCB (µg/L) |
| 10/92 | 290 |
| 12/98 | 470 |
| 12/20/06 | 330 |
| 04/12/07 | 460 |

| GGW2-1 | |
|----------|----------------|
| DATE | 1,4-DCB (µg/L) |
| 09/24/03 | 360 |

| B-2 | |
|----------|----------------|
| DATE | 1,4-DCB (µg/L) |
| 02/27/02 | 8.6 |

| OW-5 | |
|----------|----------------|
| DATE | 1,4-DCB (µg/L) |
| 10/92 | ND |
| 12/98 | ND |
| 12/20/06 | 5.3 |
| 04/12/07 | 5.0 |

EXPLANATION

- ⊗ GRAB GROUNDWATER SAMPLING LOCATION (ATC, 1998)
- ◆ GRAB GROUNDWATER SAMPLING LOCATION (HE, 1998)
- ⊕ GROUNDWATER MONITORING WELL
- ▲ EXCAVATION GRAB GROUNDWATER SAMPLING LOCATION (LFR, 2004)
- - - APPROXIMATE PROPERTY LINE

ABBREVIATIONS

- 1,4-DCB DICHLORO BENZENE
- < COMPOUND WAS NOT DETECTED ABOVE THE INDICATED LABORATORY LIMIT
- UST UNDERGROUND STORAGE TANK
- µg/L MICROGRAMS PER LITER

- Note:**
1. Sampling locations are approximate.
 2. The detected concentrations are relative to the time period and depth interval for each sampling point. Due to inconsistency of both sampling date and screened intervals, no interpretation of historical or current distribution in groundwater should be made based on this figure. This figure is intended solely as a summary of historical findings.
 3. Only 1,4-DCB analytical data from select monitoring events are shown to coincide with offsite sampling events.

COMPILATION OF HISTORICAL DETECTIONS OF 1,4-DCB IN GROUNDWATER
Pacific Gas & Electric Company
Oakland General Construction Yard
4930 Coliseum Way, Oakland, CA

| | | |
|---------|----------------|-------------------------|
| By: JMS | Date: 11/16/07 | Project No. 13045.007.A |
|---------|----------------|-------------------------|

Geomatrix Figure 3

Plot Date: 11/16/07 - 11:53am. Plotted by: amcgilberry
Drawing Path: S:\130001\13045\13045.007\task_5107_0413.mxd, Drawing Name: _fig_03.dwg

APPENDIX A

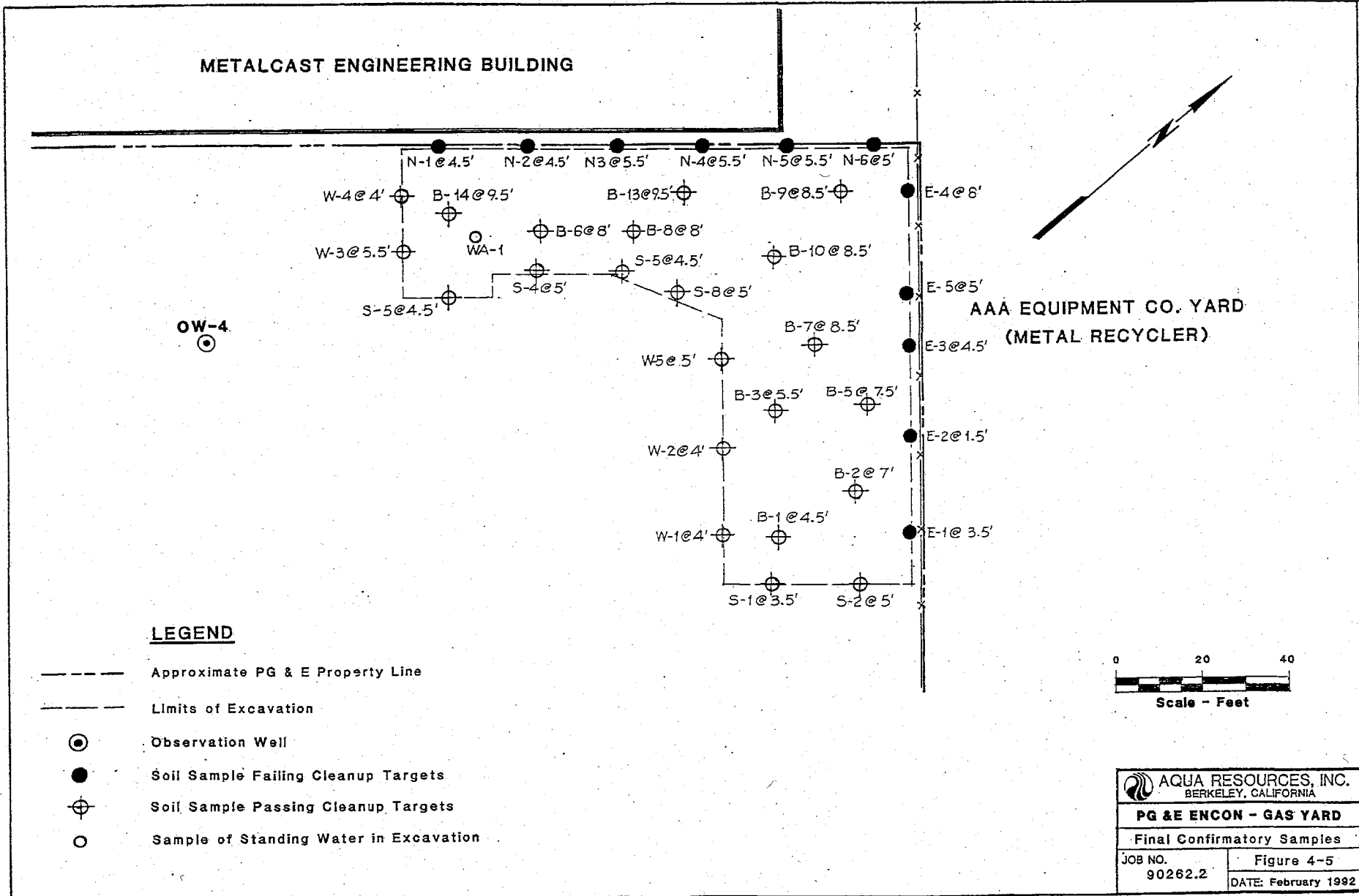
Historical UST Cluster Excavation Confirmation Sample Analytical Results and Locations

Aqua, 1992

TABLE 4-7
 PETROLEUM HYDROCARBONS DETECTED IN CONFIRMATORY SOIL SAMPLES
 RELATED TO THE FORMER DIESEL TANK AREA

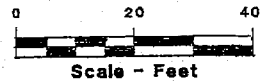
| Sample I.D. | Sample Depth | TPH as Gasoline (mg/kg) | TPH as Kerosene (mg/kg) | TPH as Diesel (mg/kg) | Benzene (ug/kg) | Toluene (ug/kg) | Ethyl-Benzene (ug/kg) | Xylenes (ug/kg) | O&G (mg/kg) |
|-------------|--------------|-------------------------|-------------------------|-----------------------|-----------------|-----------------|-----------------------|-----------------|-------------|
| B-1 | 4.5' | ND | ND | ND | N/R | N/R | N/R | N/R | ND |
| B-2 | 7' | ND | ND | ND | ND | ND | ND | ND | ND |
| B-3 | 5.5' | ND | ND | ND | ND | ND | ND | ND | ND |
| B-4 | 8' | 290 | ND | 130 | 10 | 21 | 900 | 6900 | 3300 |
| B-5 | 7.5' | ND | ND | ND | ND | ND | ND | ND | 740 |
| B-6 | 8' | ND | ND | ND | ND | ND | ND | ND | ND |
| B-7 | 8.5' | ND | ND | ND | ND | ND | ND | ND | ND |
| B-8 | 8.5' | ND | ND | ND | ND | ND | ND | ND | ND |
| B-9 | 6' | ND | ND | 27 | ND | ND | ND | ND | 670 |
| B-10 | 8.5' | 1.6 | ND | ND | ND | ND | ND | 8.3 | 33 |
| B-11 | 8.5' | ND | ND | 130 | ND | ND | ND | ND | 1600 |
| B-13 | 9.5' | ND | ND | ND | ND | ND | ND | ND | ND |
| B-14 | 9.5' | ND | ND | ND | ND | ND | ND | ND | ND |
| E-1 | 3.5' | ND | ND | ND | ND | ND | ND | ND | 1600 |
| E-2 | 1.5' | ND | ND | ND | ND | ND | ND | ND | 1100 |
| E-3 | 4.5' | ND | ND | 1500 | ND | ND | ND | ND | 5600 |
| E-4 | 8.5' | 1.9 | ND | 51.7 | ND | ND | ND | 9 | 1200 |
| E-5 | 5' | 6.3 | ND | 5000 | 14 | 8 | 13 | 76 | 5300 |
| N-1 | 4.5' | 340 | ND | 340 | ND | 140 | 110 | 4500 | 8800 |
| N-2 | 4.5' | ND | ND | 410 | ND | ND | ND | 25 | 18000 |
| N-3 | 5.5' | 45 | ND | 1200 | ND | 77 | 160 | 410 | 5100 |
| N-4 | 5.5' | 73 | ND | 2500 | ND | 110 | 77 | 920 | 8800 |
| N-5 | 5.5' | 120 | 6500 | ND | 12 | 140 | 61 | 1200 | 34000 |
| N-6 | 5' | 65 | 6000 | ND | 19 | 65 | 170 | 690 | 13000 |
| S-1 | 3.5' | ND | ND | ND | ND | ND | ND | ND | ND |
| S-2 | 5' | ND | ND | ND | ND | ND | ND | ND | 100 |
| S-3 | 4.5' | ND | ND | 21 | ND | ND | ND | 8.5 | 240 |
| S-4 | 5' | ND | ND | ND | ND | ND | ND | ND | 16 |
| S-5 | 4.5' | ND | ND | ND | ND | ND | ND | ND | ND |
| S-6 | 4.5' | ND | ND | ND | ND | ND | ND | ND | 300 |
| S-7 | 4.5' | 15 | ND | 730 | ND | 9.5 | 30 | 68 | 4000 |
| S-8 | 5' | ND | ND | ND | ND | ND | ND | ND | ND |
| W-1 | 4' | ND | ND | ND | ND | ND | ND | ND | ND |
| W-2 | 4' | ND | ND | ND | ND | ND | ND | ND | ND |
| W-3 | 5.5' | ND | ND | ND | ND | ND | ND | ND | ND |
| W-4 | 4' | ND | ND | 15 | ND | ND | ND | ND | 72 |
| W-5 | 5' | ND | ND | ND | ND | ND | ND | ND | ND |
| W-6 | 4' | 17 | ND | 1100 | 5.3 | 11 | 33 | 79 | 4500 |

Aqua, 1992



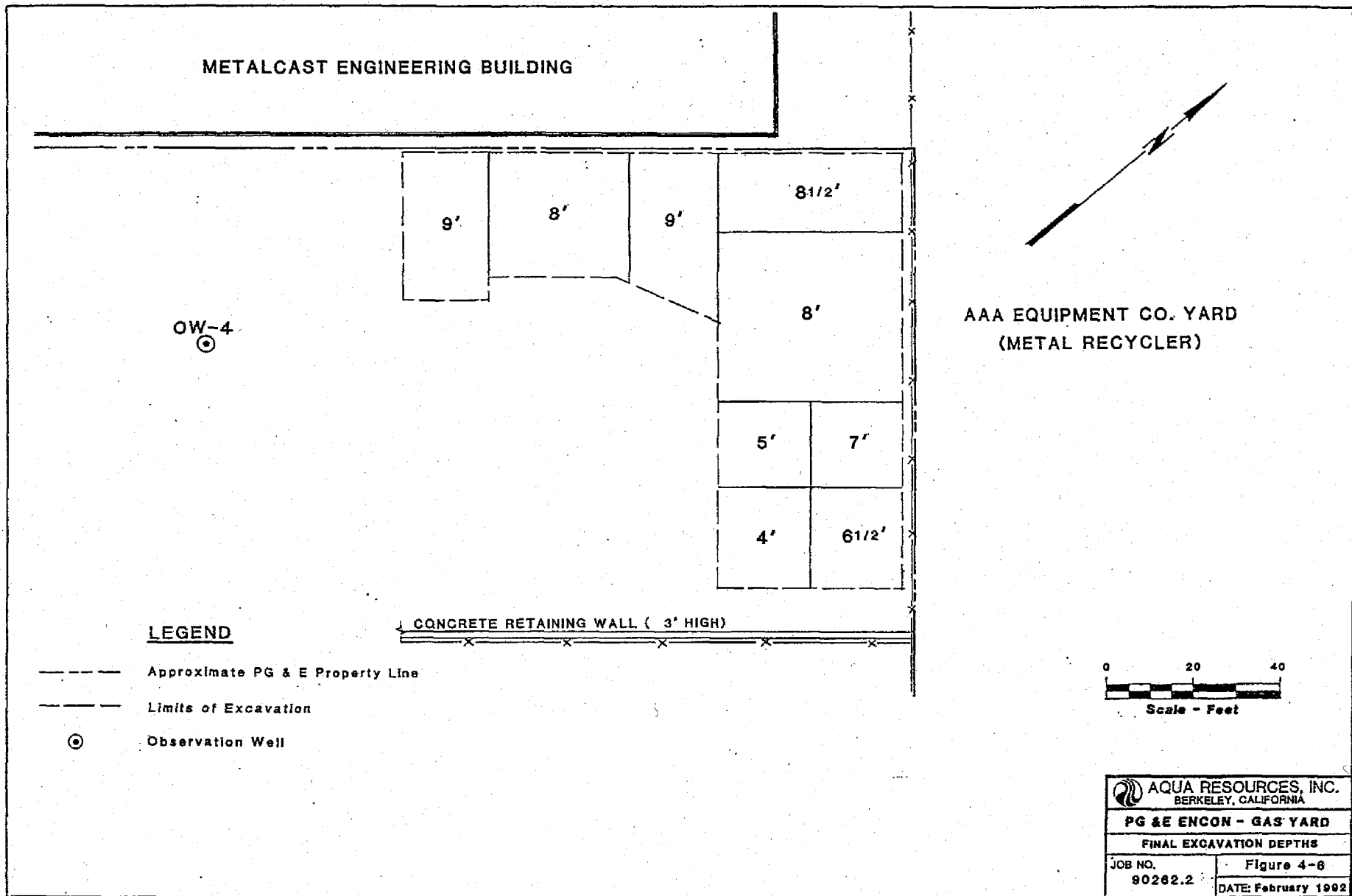
LEGEND

- Approximate PG & E Property Line
- Limits of Excavation
- ⊙ Observation Well
- Soil Sample Failing Cleanup Targets
- ⊕ Soil Sample Passing Cleanup Targets
- Sample of Standing Water in Excavation



| | |
|---|-----------------------------------|
| AQUA RESOURCES, INC. BERKELEY, CALIFORNIA | |
| PG & E ENCON - GAS YARD | |
| Final Confirmatory Samples | |
| JOB NO. 90262.2 | Figure 4-5 DATE: February 1992 |

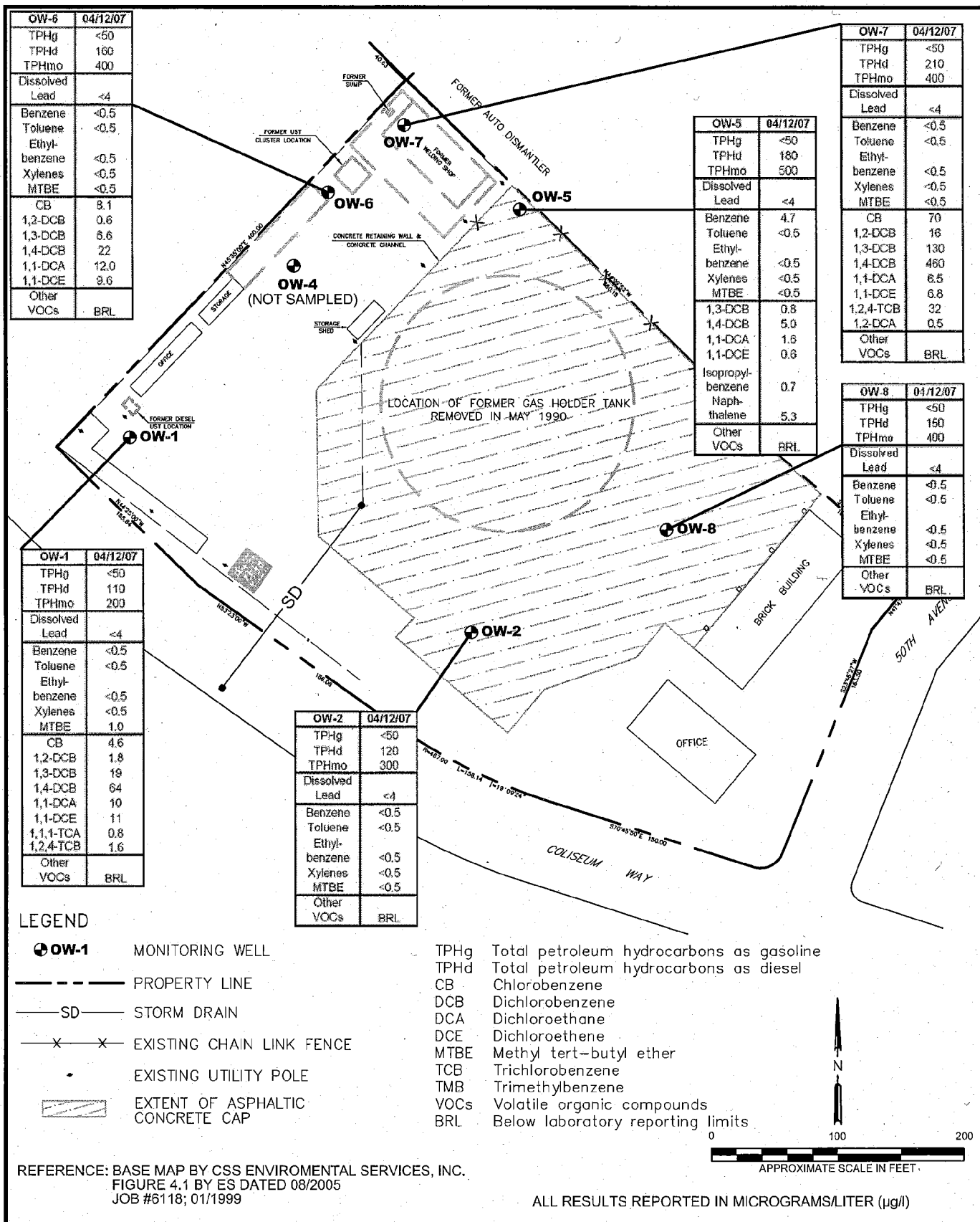
Aqua, 1992



APPENDIX B

“Groundwater Analytical Results (April 12, 2007)”—ITSI

FILENAME: P:\07037 PG&E\Entri\07037.0018 PG&E Oakland SC UST Program\10.0 CADD\400_CADD Current Drawings\07037.0018 OKLND SC Figure 2-3-4.dwg



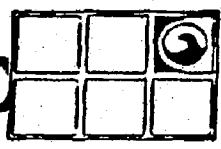
Pacific Gas and Electric
 Oakland General Construction Yard
 Oakland, California

FIGURE 4
 Groundwater Analytical
 Results
 (April 12, 2007)

APPENDIX C

Historical Monitoring Well Lithologic Logs

PG&E, 1988



GROUNDWATER TECHNOLOGY, INC.
OIL RECOVERY SYSTEMS

Geologist / Engineer ABE License No. 4394

Soil Boring OW-1

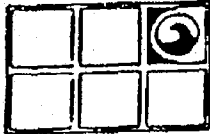
Drilling Log

Project PG&E/Oakland Owner Pacific Gas & Electric Co.
 Location Oakland Project Number 203-799-2727
 Date Drilled 3/17/88 Total Depth of Hole 15 ft. Diameter 8 in.
 Surface Elevation _____ Water Level Initial 9.5 ft. 24-hrs. _____
 Screen: Dia. 2 IN. Length 15 FEET Slot Size .010
 Casing: Dia. 2 IN. Length 3 FEET Type PVC
 Drilling Company Pacific Gas & Electric Co. Drilling Method Hollow stem auger.
 Driller R. Hendren Log by D. Higgins

Sketch Map

Notes

| Depth (Feet) | Well Construction | TIP (ppm) | Sample Number | Graphic Log | Description/Soil Classification |
|--------------|-------------------|-----------|----------------|-------------|--|
| 0 | | | | | Base course, ± 12 inches |
| 2 | | | 32, 34, 18, 26 | GM | Brownish-orange sandy gravel with silt (very dense, moist, no product odor) |
| 4 | | 22 | 11, 14, 6 | CL | |
| 6 | | 2.5 | 11, 14, 15, 12 | | (Grades to dark grey) |
| 8 | | 3.1 | 22, 12, 15, 12 | | Dark grey sandy gravel with clay and silt (very dense, moist, no product odor) |
| 10 | | 3.1 | 18 | GC | ▼ Encountered water 3/17/88 (1515hrs) (Grades orangish-brown, wet) |
| 12 | | 3.0 | 18, 22, 24, 22 | | |
| 14 | | 2.8 | 22, 24, 22 | G | (Grades dense) |
| 16 | | | | | |
| 18 | | | | | |
| 20 | | | | | End of boring, installed monitor well. |
| 22 | | | | | |
| 24 | | | | | |



**GROUNDWATER
TECHNOLOGY, INC.**
OIL RECOVERY SYSTEMS

Geologist / Engineer MSam License No. 4394

Soil Boring OW-3

Drilling Log

Project PG&E/Oakland Owner Pacific Gas & Electric
 Location Oakland Project Number 203 799 2727
 Date Drilled 3/16/88 Total Depth of Hole 14.5 ft Diameter 8 in
 Surface Elevation _____ Water Level Initial 9 ft 24-hrs.
 Screen: Dia. 2 IN. Length 15 FEET Slot Size .010
 Casing: Dia. 2 IN. Length 3.5 FEET Type PVC
 Drilling Company Pacific Gas & Electric Drilling Method Hollow Stem Auger
 Driller R. Hendren Log by D. Higgins

Sketch Map

Notes

| Depth (Feet) | Well Construction | TIP (ppm) | Sample Number | Graphic Log | Description/Soil Classification |
|--------------|-------------------|-----------|----------------------|-------------|--|
| 0 | | | | | Base course, + 12 inches |
| 2 | | 37 | 21 13 11 | ML | Black sandy silt (very stiff, slightly moist, moderate oil odor) (grades grey, stiff) |
| 4 | | 16 | 9 6 5 | SW | Grey silty fine to coarse sand (medium dense, very moist, moderate oil odor) |
| 6 | | 96 | 11 17 28 30 | CL | Black silty clay (hard, very moist, moderate oil odor) (grades grey) |
| 8 | | 292 | 17 28 32 | GP | Greenish grey-black sandy gravel (very dense, very moist, strong oil odor) (sheen on samples) ▼ Encountered water 3/16/88 (0930 hrs.) |
| 10 | | 2.0 | 26 36 30 32 | GM | Brown sandy, fine to coarse gravel with silt and clay (very dense, wet, no product odor) |
| 14 | | 1.5 | 15 40 80 | | |
| 16 | | | | | |
| 18 | | | | | |
| 20 | | | | | |
| 22 | | | | | |
| 24 | | | | | End of boring, installed monitor well. |

| | | | | | |
|---------------------------------------|--|---|--|---|--|
| Job No. TES 3647 | | Boring No. OW-4 | | Sheet 1 of 1 | |
| Ground Elevation | | Type & Diameter of Boring 12" O.D. HOLLOW-STEM AUGERS | | Location Coliseum Way, Oakland | |
| n of Hole Elevation | | Depth 20'9" | | Groundwater Depth ~9' | |
| Date 5/18/88 | | Date Started 5/18/88 | | Finished 5/18/88 | |
| Name of Driller RON HENDREN | | Name of Inspector/Logger DARRELL KLINGMAN | | Boring Contractor PG+E MOBLE B-80 | |

| DRILL TE IN. | DEPTH (FT.) | SOIL SYMBOL | SAMPLE TYPE & NUMBER | RECOVERY (INCHES) | BLOWS / FT. | F | NOTES ON GROUNDWATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, METHOD OF ADVANCING BORING, SIZE OF CASING WATER TIGHT, SECURITY TRAFFIC COVER |
|--------------------|----------------|----------------|----------------------------|----------------------|----------------|---|---|
| | | | | | | | |
| | 0 | GW | | | | | PPM readings taken with Photo vac TIP 1 PVC CAP |
| | 0-4 | CL | 2" SS 1-3 | 19/24 | 10 | | CEMENT/BENTONITE GROUT |
| | 4-5 | CL | 2" SS 1-2 | 16/24 | 16 | | BENTONITE SEALS 2" DIA. PVC SOLID CASING |
| | 5-6 | GC | 2" SS 2-2 | 16/24 | 20 | | -2.6ppm @ 4' |
| | 6-7 | GC | 2" SS 3-1 | 11/17 | 24 | | -2.9ppm @ 6' |
| | 7-8 | GM | 2" SS 4-2 | 15/24 | 24 | | -2.3ppm @ 7.5' |
| | 8-9 | SM | 2" SS 5-2 | 14/24 | 30 | | * 1.5ppm @ 10' |
| | 9-10 | GP | 2" SS 5-1 | 16/24 | 33 | | 2.9ppm @ 11' |
| | 10-11 | GP | | | 34 | | * SANDPACK LONESTAR 2/12 12" DIA. BOREHOLE |
| | 11-12 | SC | 2" SS 6-1 | 10/24 | 33 | | -2.7ppm @ 16' |
| | 12-13 | CL | 2" SS 7-2 | | 34 | | 2" DIA. PVC SCH. 40 SCREEN, 0.075-INCH WIDE SLOTS |
| | 13-14 | CL | 2" SS 7-1 | | 33 | | 3.5ppm @ 18.5' |
| | 14-15 | | | | 33 | | PVC PLUG |
| | 15-16 | | | | 33 | | |
| | 16-17 | | | | 33 | | |
| | 17-18 | | | | 33 | | |
| | 18-19 | | | | 33 | | |
| | 19-20 | | | | 33 | | |
| | 20-21 | | | | 33 | | |
| | 21-22 | | | | 33 | | |
| | 22-23 | | | | 33 | | |
| | 23-24 | | | | 33 | | |
| | 24-25 | | | | 33 | | |
| | 25 | | | | 33 | | BORING TERMINATED @ 21'9" MONITORING WELL (2" Ø) INSTALLED |

WELL CONSTRUCTION

NOTES:

* sample submitted for lab chemical analysis

Aqua, 1991

AQUA RESOURCES, INC.



BORING LOG

LOCATION & NOTES

| | | |
|--|---|-------------------------|
| LOCATION Oakland, CA | JOB NAME PG&E | JOB NO. 90262.1 |
| DRILLING COMPANY HEW Drilling | DRILLER'S NAME Anibal | BOHOLET NO. OW-5 |
| DRILL LOG CMB55 | <input checked="" type="checkbox"/> Hollow Auger <input type="checkbox"/> Rotary Wash | DEPTH 1 OF 1 |
| SAMPLER TYPE: <input checked="" type="checkbox"/> 2.5" ID Split Barrel <input type="checkbox"/> 2.5" ID Shelby Tube <input type="checkbox"/> SPT | | |
| DRIVE WEIGHT LB | FALL FT | START TIME 8:40 AM |
| WATER LEVEL (FEET) | | FINISH TIME 10:45 AM |
| TIME | | DATE 4/16/91 |
| DATE | | |
| CASING DEPTH (FEET) | | |
| ELEVATION | FEET | FIELD ENGINEER |

DATUM: Mean Sea Level Other

| BLOWS PER HALF FOOT | BLOWS/FT. | MOISTURE CONTENT % | DRY UNIT WEIGHT PCF | DEPTH IN FEET | SAMPLE NO. | SURFACE CONDITIONS |
|------------------------|-----------|-----------------------|---------------------------|------------------|------------|---|
| | | | | 0 | | gravel |
| | | | | 1 | 1 | Silty clay, very dark brown to black, moist, soft, slightly plastic, some gravel up to 1/2" diam. (CL) |
| | | | | 2 | 2 | |
| | | | | 3 | 3 | Silty clay, dark gray, moist, medium stiff, slightly plastic, some decomposed rock & gravel up to 1" diam. (CL) |
| | | | | 4 | 4 | |
| | | | | 5 | 5 | Sandy gravelly clay varying to gravelly sandy clay, dark gray mottled with brown & white from decomposed rock, moist, medium stiff to stiff, slightly plastic, some gravel up to 1" diam. Liquid brown oil at 5' (CL) |
| | | | | 6 | 6 | |
| | | | | 7 | 7 | |
| | | | | 8 | 8 | |
| | | | | 9 | 9 | |
| | | | | 10 | 10 | Clayey sand, with interbedded clayey gravel, medium brown, wet, loose, some gravel up to 1" diam. (SC) |
| | | | | 11 | 11 | |
| | | | | 12 | 12 | |
| | | | | 13 | 13 | |
| | | | | 14 | 14 | Sandy clay, interbedded with silty clay, medium brown with black and reddish brown mottling, saturated, medium stiff to stiff, slightly plastic, small amount of gravel up to 1/4" diam. (CL) |
| | | | | 15 | 15 | |
| | | | | 16 | 16 | |
| | | | | 17 | 17 | |
| | | | | 18 | 18 | |
| | | | | 19 | 19 | |
| | | | | 20 | 20 | |
| | | | | 21 | 21 | |
| | | | | 22 | 22 | |
| | | | | 23 | 23 | |
| | | | | 24 | 24 | |

Aqua, 1991

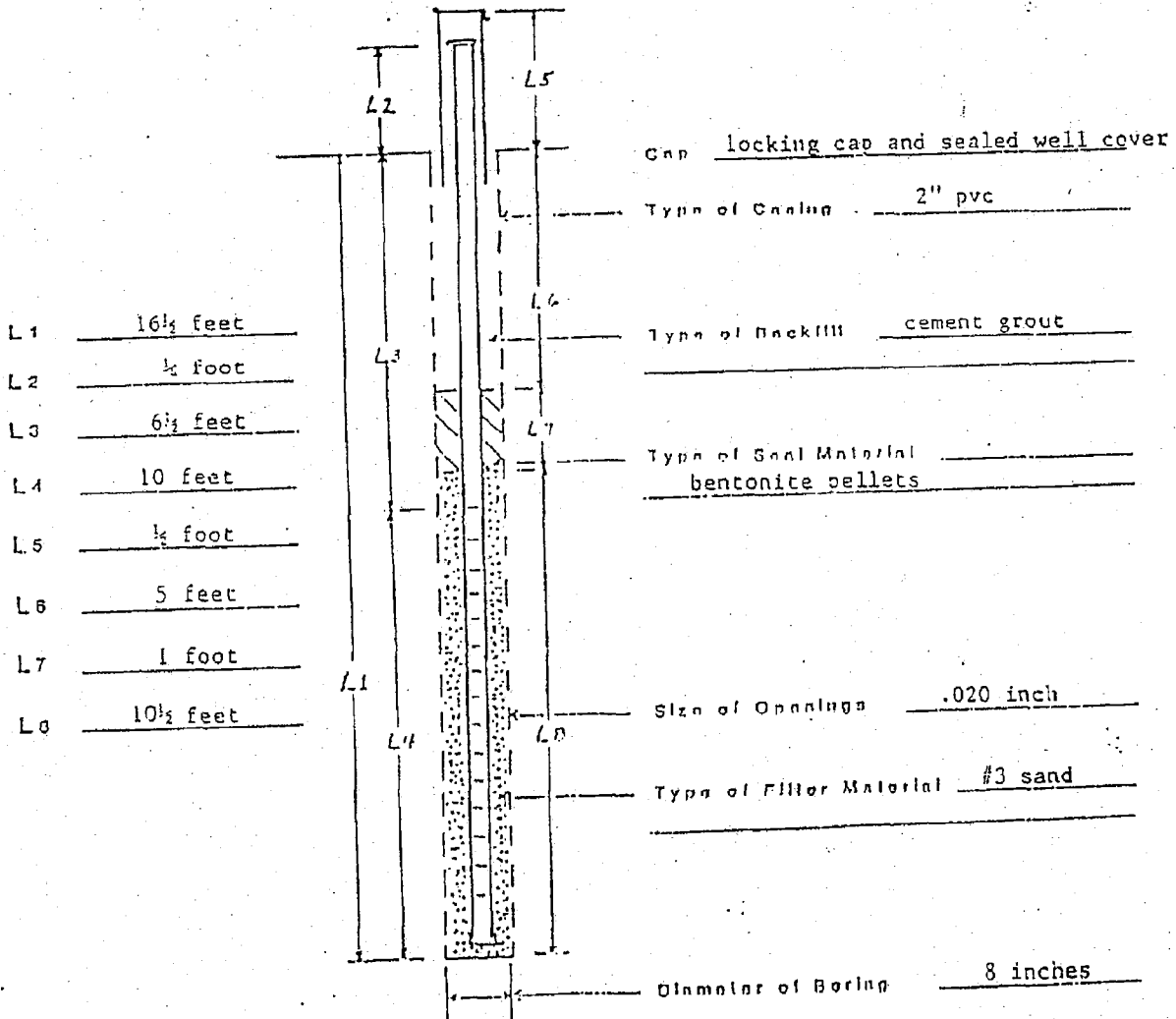


AQUA RESOURCES, INC.

OBSERVATION WELL INSTALLATION REPORT

Well # OW-5

Project PG&E
 Location 4930 Coliseum Way, Oakland, CA 94601
 Type of Rig CME 55 Installed by HEW Drilling
 Date Started 4/16/91 Date Finished 4/16/91
 Type of Observation Well water Ground Elev. _____ Casing Top, Elev. _____



Remarks _____

Observed by _____

Aqua, 1992

AQUA RESOURCES, INC.



BORING LOG

LOCATION & NOTES

| | | | | | |
|---------------------|--|----------|--------|----------------|---------------|
| LOCATION | Oakland | JOB NAME | PG&E | JOB NO. | 90282.2 |
| DRILLING COMPANY | Exceltech/Resna | | | BORING NO. | OW-6 |
| DRILLER'S NAME | Don Jenkins | | | SHEET | 1 of 2 |
| DRILL RIG | <input type="checkbox"/> Solid Flight Auger <input checked="" type="checkbox"/> 8" Hollow Auger <input type="checkbox"/> Rotary Wash | | | | |
| SAMPLE TYPE | <input checked="" type="checkbox"/> 2.5" ID Split Barrel <input type="checkbox"/> 3.0" ID Shelby Tube <input type="checkbox"/> SST | | | | |
| DRIVE WEIGHT | 140 LB. | FALL | 30 IN. | START TIME | |
| WATER LEVEL (FEET) | 8' | | | 8:05 AM | 8:54 AM |
| TIME | 8:15 am | | | | |
| DATE | 12/19/91 | | | DATE | 12/19/91 |
| CASING DEPTH (FEET) | 18' | | | | |
| ELEVATION | 3.37' | FEET | | FIELD ENGINEER | Mark Peterson |

DATUM: Mean Sea Level Other OW-2

| SLOWS PER HALF FOOT | BLOWS/ft. | MOISTURE CONTENT % | DRY UNIT WEIGHT (pcf) | DEPTH IN FEET | USCS CLASSIFICATION |
|---------------------|-----------|--------------------|-----------------------|---------------|---------------------|
| | | | | 0 | |
| | | | | 1 | |
| | | | | 2 | |
| | | | | 3 | |
| | | | | 4 | |
| | | | | 5 | |
| | | | | 6 | |
| | | | | 7 | |
| | | | | 8 | |
| 16 | | | | 8.5 | GC |
| 18 | | | | 9 | |
| 20 | | 38 | | 9.5 | |
| | | | | 10 | SP |

SURFACE CONDITIONS.
 Graded surface of aggregate to base rock, nearly level - Since installation of well the surface has been paved with AC.

Water on top end of sampler with slight sheen
 Gravel with interstitial silty clay, olive brown (2.5Y 4/3), saturated. Gravel backfill that penetrated saturated native soil.

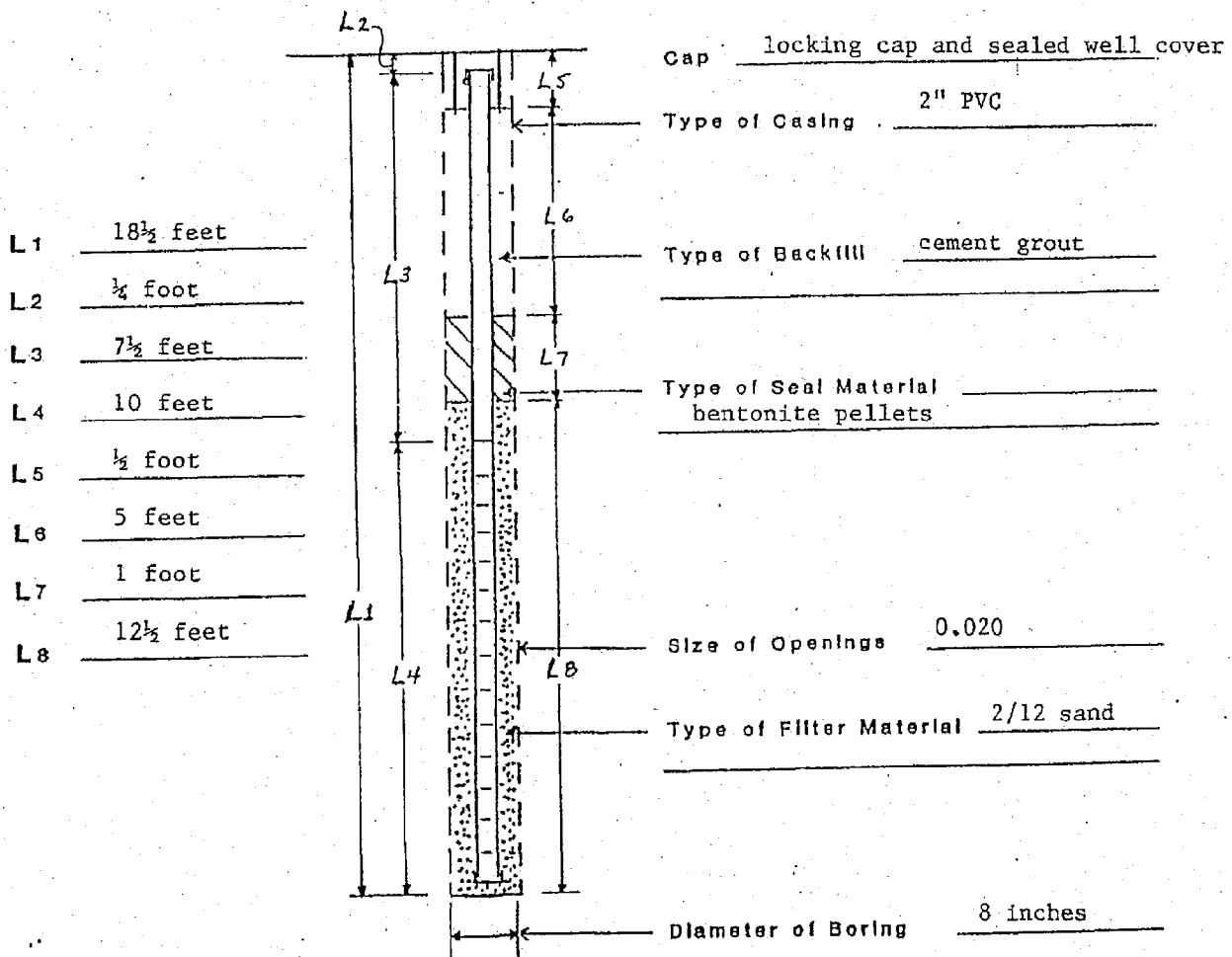
Gravelly sand, brown (10YR 4/3), saturated, medium dense, fine to coarse grained sand, poorly sorted, subangular gravel up to 3/4" across.



OBSERVATION WELL INSTALLATION REPORT

Well # OW-6

Project PG&E
 Location 4930 Coliseum Way, Oakland CA 94601
 Type of Rig Mobile B61 Installed by RESNA
 Date Started 12/19/91 Date Finished 12/19/91
 Type of Observation Well Water Ground Elev. _____ Casing Top, Elev: _____



Remarks _____

Observed by M. Peterson/A. Stessman

Aqua, 1992

AQUA RESOURCES, INC.



BORING LOG

LOCATION & NOTES

| | | |
|--|---|----------------------|
| LOCATION Oakland | JOB NAME PG&E | JOB NO 90262.2 |
| DRILLING COMPANY Exceltech/Resna | | BORING NO. OW-7 |
| DRILLER'S NAME Don Jenkins | | DIEST 1 OF 2 |
| DRILL RIG 8" <input checked="" type="checkbox"/> Hollow Auger <input type="checkbox"/> Rotary Wash | | |
| SAMPLER TYPE: <input checked="" type="checkbox"/> 2.5" ID Split Barrel <input type="checkbox"/> 2.0" ID Shelby Tube <input type="checkbox"/> SST | | |
| DRIVE WEIGHT 140 LB. | FALL 30 IN. | START TIME 9:55PM |
| WATER LEVEL (Feet) 13 1/2 | | FINISH TIME PM |
| TIME 10:00am | | DATE 12/19/91 |
| DATE 12/19/91 | | |
| CASING DEPTH (FEET) 17 1/2 | | |
| ELEVATION 4.76 FEET | FIELD ENGINEER M. Peterson/ A. Stessman | |

DATUM: Mean Sea Level Office OW-2

| SLOWS PER HALF FOOT | BLOWS/ft. | MOISTURE CONTENT % | DRY UNIT WEIGHT (pcf) | DEPTH IN FEET | USCS CLASSIFICATION |
|---------------------|-----------|--------------------|-----------------------|---------------|---------------------|
| | | | | 0 | |
| | | | | 1 | |
| | | | | 2 | |
| | | | | 3 | |
| | | | | 4 | |
| | | | | 5 | |
| | | | | 6 | |
| | | | | 7 | |
| | | | | 8 | |
| | | | | 9 | |
| 20 | | | | 9 | |
| 12 | | | | 9 | |
| 11 | 23 | | | 9 | SP/SC |
| | | | | 10 | |

SURFACE CONDITIONS:
Graded surface of aggregate to base rock, nearly level - since well installation the surface has been paved with AC.

NOTE: No OVM = OVM reading of 0.0

Gravel backfill material

Gravelly sand with minor silt and clay, greyish green (5G4/2), medium dense, wet, fine to coarse grained sand, poorly sorted, subangular gravel. Note tarry product visible. No OVM, slight hydrocarbon odor.

Aqua, 1992

AQUA RESOURCES, INC.



BORING LOG

LOCATION & NOTES

| | | | | | |
|---|---|----------------|--------------------------------------|------------|------------|
| LOCATION | Oakland | JOB NAME | PG&E | JOB NO. | 90262.2 |
| DRILLING COMPANY | | | | BORING NO. | OW-7 |
| DRILLER'S NAME | | | | PIPET | 2 OF 2 |
| DRILLING | <input type="checkbox"/> Solid Flight Auger | | <input type="checkbox"/> Rotary Wash | | |
| SAMPLER TYPE: <input type="checkbox"/> 2.5" ID Split Barrel <input type="checkbox"/> 2.0" ID Shelby Tube <input type="checkbox"/> SPT | | | | | |
| DRIVE WEIGHT | LB. | FALL | IN. | START | FINISH |
| WATER LEVEL (FEET) | | | | TIME AM/PM | TIME AM/PM |
| TIME | | | | DATE | |
| DATE | | | | | |
| CASING DEPTH (FEET) | | | | | |
| ELEVATION | FEET | FIELD ENGINEER | | | |

DATUM: Mean Sea Level Other

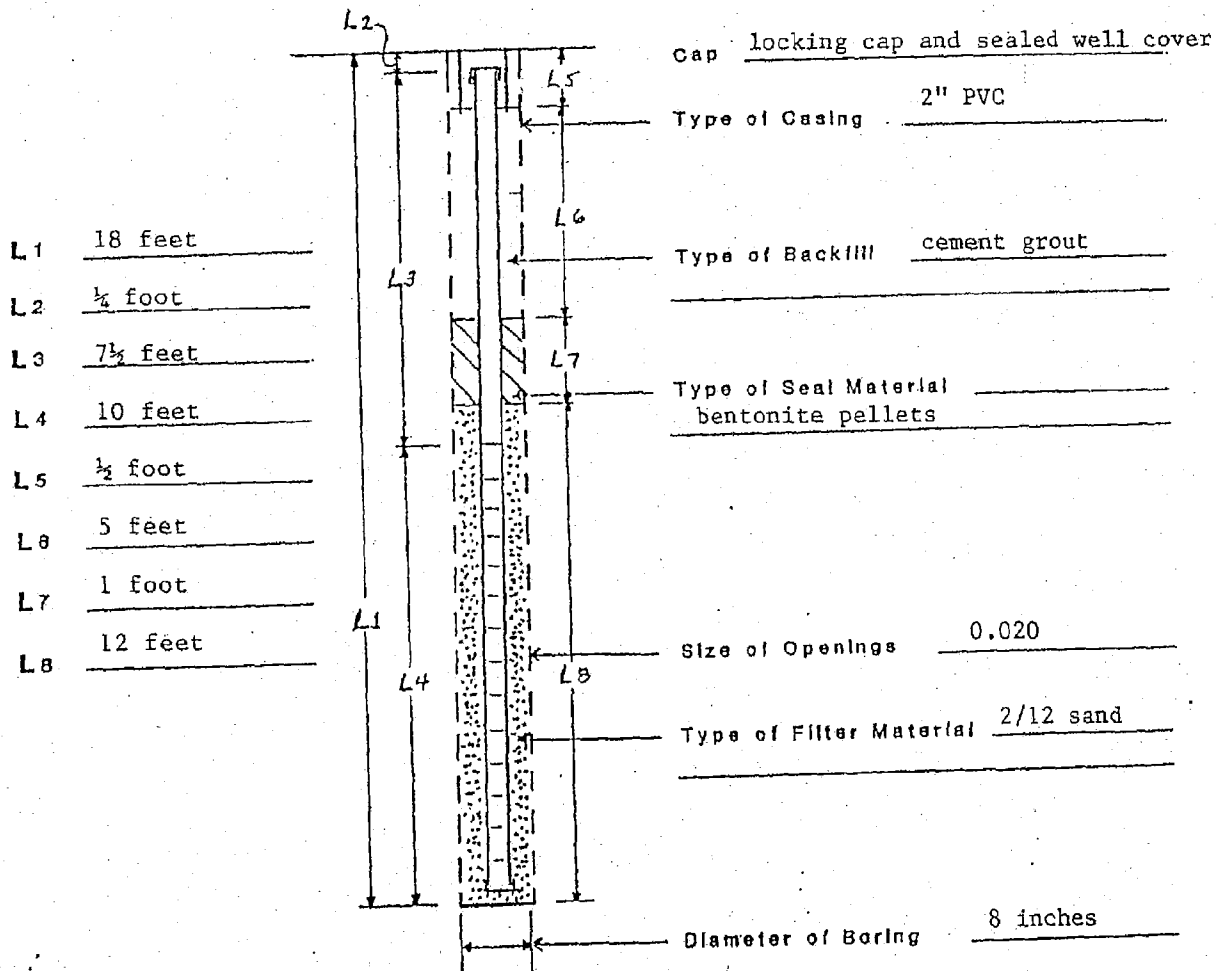
| SLOWS PER HALF FOOT | BLOWS/ft. | MOISTURE CONTENT % | DRY UNIT WEIGHT (pcf) | DEPTH IN FEET | USCS CLASSIFICATION | SURFACE CONDITIONS |
|---------------------|-----------|--------------------|-----------------------|---------------|---------------------|--|
| | | | | 10 | SC | Gravelly sand with increasing clay and silt, yellowish brown (10 YR 516), loose, saturated, fine to coarse grained sand, poorly sorted, subangular gravel. No OVM or odor. |
| 7 | | | | 11 | | |
| 14 | | | | 12 | | |
| | | | | 13 | CL/CH | Silty clay with minor very fine grained sand, light yellowish-brown (2.5Y 613), wet, stiff, rare dark brown staining. No OVM. |
| 11 | 25 | | | 14 | | |
| | | | | 15 | | |
| 5 | | | | 16 | CL/CH | No recovery/Redrove same interval recovered 100% 2" gravel lense |
| 8 | | | | 17 | | |
| 10 | 18 | | | 18 | | |
| 6 | | | | 19 | CL/CH | 3" gravelly clay lense |
| 7 | | | | 20 | | |
| 8 | 15 | | | 21 | | |
| | | | | 22 | | Silty clay with trace sand and gravel, light yellowish brown (2.5Y 613), wet, stiff, common dark brown-brown staining. No OVM. |
| | | | | 23 | | Bottom at 18' |



OBSERVATION WELL INSTALLATION REPORT

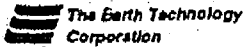
Well # OW-7

Project PG&E
 Location 4930 Coliseum Way, Oakland CA 94601
 Type of Rig Mobile B61 Installed by RESNA
 Date Started 12/19/91 Date Finished 12/19/91
 Type of Observation Well Water Ground Elev. _____ Casing Top, Elev. _____



Remarks _____

Observed by M. Peterson/A. Stessman



Borehole Log

| | | | |
|---|--|--|---------------------------------------|
| Project Name: PG&E Oakland | | Project Number: 690262.03 | |
| Borehole Location: 100 ft west of east Prop. line 75' north or south Prop. line | | Borehole No. OW-8 | Sheet 1 of 1 |
| Drilling Agency: HEW | | Driller: Jasper Booker/Mike Campy (helper) | |
| Drilling Equipment: GME 55 | | Date Started: 0900 2/10/93 | Total Depth (feet): 18'4" |
| Drilling Method: Hollow Stem Auger | | Date Finished: 0925 2/10/93 | Depth to Bedrock (feet): |
| Drilling Fluid: NA | | Number of grab only Samples: for logging | Depth to Water (feet): 11:30 7.71' |
| Completion Information: 2" PVC set bottom @ 18.2' screen (0.020): 8'-18' bentonite: 6'-7' sand (2/12): 7'-18' cement grout: 0.5'-6' | | Borehole Diameter (in): 8" | Elevation and Datum: |
| | | Logged By: MP | |
| | | Checked by: | Date: |

| Depth (feet) | Sample | | | | | Field Analysis | | LOG | | Lithologic Description | Remarks |
|--------------|--------|----------|------------|----------|------|----------------|---------------|---------|-------------------|---|---------|
| | Number | Interval | Blow Count | Recovery | Time | FID (ppm) S/B | PID (ppm) S/B | Graphic | USCS or Rock Type | | |
| 0 | | | | | | | | | | 4" Asphalt over approx 10" lt gray base rock overlying about 10" brown base rock w/ sand, moist | |
| 5 | | | | | | | | | ML | SANDY SILT, dk yellowish brown (10YR3/4), moist, some gravel to 1" | |
| 10 | | | | | | | | | CL | SANDY CLAY (CL), very dk gray (10YR2/1) to black (2.5YN2/), wet to saturated at 7', medium stiff to soft, fine grained sand, trace gravel | |
| 15 | | | | | | | | | SC | SANDY CLAY, dk brown (10YR 2/3), wet, stiff, coarse grained sand, some subangular gravel to 1/2" | |
| 20 | | | | | | | | | CH | CLAYEY SAND, dk yellowish brown (10YR4/4), saturated, medium dense, uncemented | |
| 25 | | | | | | | | | | SILTY CLAY (CH), olive gray (5Y5/2), moist to wet, stiff, high plasticity | |
| 30 | | | | | | | | | | Bottom at 18'4" | |

Key * S/B = Sample reading / background reading; NA = not analyzed

Monitoring Well Construction Log - Flush Mount

| | | |
|------------------------------------|----------------------------|----------------------------|
| Project Name: PG&E Oakland | Project Number: 690262.03 | Date: 2/10/93 |
| Well Observation/monitoring | Well ID: OW-8 | Sheet <u>1</u> of <u>1</u> |
| Driller: Jasper Booker | Borehole Diameter (in): 8" | Total Depth (ft): 18' 4" |
| Drilling Agency: HEW | Date Started: 2/10/93 | Depth to Water (ft): |
| Drilling Equipment: CME-55 | Date Finished: 2/10/93 | Elevation and Datum: |
| Drilling Method: Hollow Stem Auger | Logged by: M. Peterson | Checked by: |
| Drilling Fluid: NA | Number of Samples: 0 | Date: |

PROTECTIVE CSO Diversified Well Products
 Material / Type: Cast Iron cover w/ PVC Sleeve
 Diameter: 8" ID/8 3/4" OD
 Depth BGS: 9" Weep Hole (Y/N)

GUARD POSTS (Y/N)
 No.: _____ Type: _____

SURFACE PAD Concrete - 16" Diameter
 Composition and Size: _____

RISER PIPE SCH 40 PVC
 Type: SCH 40 PVC
 Diameter: 2"
 Total Length (TOC to TOS): 8'

Ventilated Cap (Y/N)
GROUT 2-94 lb sacks/13 gal
 Composition and Proportions: H₂O

Tremied (Y/N) 0.5' to 6'
 Interval BGS: _____

CENTRALIZERS NA
 Depth(s): _____

SEAL 3/8" Bentonite pellets
 Type: _____

Source: _____
 Setup / Hydration Time: 25 min Vol. Fluid Added: 3 gallons
 Tremied (Y/N) 10:05 - 10:30

FILTER PACK Lapis Lustre 2/12
 Type: Lapis Lustre 2/12
 Amt. Used: 3-100 lb. sacks
 Tremied (Y/N) 7' to 18' 4"
 Source: RMC Lone star

Gr. Size Dist.: _____
SCREEN SCH 40 PVC

Type: SCH 40 PVC
 Diameter: 2"
 Slot Size and Type: 0.020 slot
 Interval BGS: 8' to 18'

WELL FOOT (Y/N) 18' to 18.3' Length: 3 1/2"

Bottom Cap (Y/N)
BACKFILL PLUG NA
 Material: NA

Setup / Hydration Time: _____
 Tremied (Y/N) Form F-1025 2/15/91

