CLEARWATER
GROUP
Environmental Services

PHASED SOIL AND GROUNDWATER INVESTIGATION AND RECOVERY TEST WELL INSTALLATION WORKPLAN

Lucasey Manufacturing Corporation
2744 East 11th Street
Oakland, California

Prepared by:

CLEARWATER GROUP

July 6, 2007

229 Tewksbury Avenue ◆ Point Richmond, California 94801 ◆ Telephone: 510-307-9943 ◆ Fax: 510-232-2823

CLEARWATER
GROUP
Environmental Services

TABLE OF CONTENTS

FIGURES

APPENDICES

1 INTRODUCTION

The Clearwater Group (Clearwater) has prepared this *Phased Soil and Groundwater Investigation and Test Recovery Well Installation Workplan* for the Lucasey Manufacturing Corporation facility at 2744 East 11th Street, Oakland, California (Subject Property) (**Figure 1**). The work proposed is one part of Clearwater's response to an April 6, 2007, Alameda County Environmental Health Services (ACEH) letter (see **Appendix A**) prepared in response to Clearwater's March 7, 2007 *Soil And Groundwater Investigation Report.*

All site investigation work will be performed according to State Water Resources Control Board (SWRCB) Resolution No. 68-16 and the Tri-Regional Guidelines set forth by the Regional Water Quality Control Board (RWQCB), April 2004.

2 SITE DESCRIPTION AND HISTORY

The site is located in a mixed light industrial, regional transportation corridor (rail and highway) and residential area of Oakland (**Figure 2**). The subject property occupies about 2.32 acres and is improved with one building of approximately 100,000 square feet. The building is owned and occupied by the Lucasey Manufacturing Corporation, a sheet metal fabricator of television mounting systems.

The 1903 Sanborn Fire Insurance (Sanborn) map of the subject property shows it to be improved with multiple residences and associated residential buildings. According to the 1911 Sanborn map, the site was developed with residences as well as a portion of the current building and other buildings associated with the Cude-Portwood Canning Company. With the change from residential to industrial use came a restructuring of the parcel map as well. The property was developed with other portions of the current building in the 1910's and 1920's. Over time, the property and buildings were used by H.G. Prince, the California Packing Corporation, Del Monte Corporation and Roadway as a canning factory, canned goods warehouse and warehousing facility.

3 RECENT ENVIRONMENTAL INVESTIGATIONS

Between January 8 and January 12, 2007, Clearwater supervised the driving of 13 soil borings (SB-7 through SB-15 and SB-21 through SB-24) at the Subject Property. Continuous soil cores were collected from each soil boring and soil and grab groundwater samples were taken.

The site lithology consists primarily of interbedded clayey sediments (lean clays to fat clays, sandy clays) with thin interbeds of relatively more permeable clayey sands and clayey gravels, typical of alluvial deposits along the bay margin. There are no readily apparent distinct lithological horizons. An uppermost zone of clayey silt to silty clay extends to a depth of approximately 8 to 10 feet bgs. Below the silty clay/clayey silt zone is lean clay to fat clay with interbeds of clayey sands and clayey gravels. Below are coarser closely interbedded clayey gravels, clayey sands, lean clays, and silty sands within a clayey matrix to at least 36 feet, the deepest depth explored by drilling.

Laboratory analysis of the soil cores indicate that:

- Free product occurs primarily at, or near, the top of the site groundwater (10 feet bgs). Vertical changes in the groundwater level appear to have spread (smeared) the contaminant across a depth of approximately 8–12 feet.
- Soil contamination was predominantly reported as TPH-d and TPH-mo. The highest reported concentrations in soil of TPH-mo (3,400 mg/kg) and TPH-d (5,300 mg/kg) were from boring SB-15 at 15 ft bgs. Based on the current information, this area is thought to be close to the center of the plume.
- Borings SB-11, SB-14, SB-22, and SB-24 reported elevated concentrations of TPH-mo and TPH-d, ranging from 2,500 to 3,400 mg/kg and from 3,300 to 3,800 mg/kg, respectively.
- Free product occurs within the deeper, more permeable, clayey gravel zones (borings SB-12 and SB-13) around 24 to 30 feet.
- During drilling, free product was frequently observed filling root burrows (rootlet holes) and fissures in the clay. Open root burrows were observed to a depth of approximately 20 feet, and free product was noted occurring to a depth of 26.5

feet in boring SB-12. Therefore, according to the current data set, the free product has a maximum potential range of approximately 15 feet.

Laboratory analysis of the groundwater samples indicate that:

- The highest concentration of TPH-mo and TPH-d in groundwater was reported from sample SB13-W (sampled at 18 ft bgs, the first encountered water level). This sample contained 5,800,000 µg/L TPH-d and 3,000,000 µg/L TPH-mo.
- The sample from SB24-W reported the second highest concentrations with 430,000 µg/L TPH-d and 210,000 µg/L TPH-mo in groundwater.
- Low concentrations of tetrachloroethene (PCE) and trichloroethene (TCE) were detected across the southern half of the site and across the intersection to the west. PCE was detected in the grab groundwater samples from borings SB-7 and SB-21 (water from 17 foot depth) at 6.6 and 0.5 µg/L, respectively. TCE was detected in five grab groundwater samples at concentrations ranging from 1.5 µg/L (boring SB-23) to 16 µg/L (boring SB-10).
- Low concentrations of MTBE (methyl tertiary butyl ether) and the BTEX components toluene and total xylenes were detected in the grab groundwater samples collected from boring SB-21 at a depth of 26 feet bgs. Low concentrations of MTBE were detected in SB-13 at a depth of 26 ft bgs.

4 SCOPE OF WORK

4.1 Extent of Free Product and Dissolved Phase Plume

In their staff's letter of April 6, 2007, ACEH requested further definition of the extent of free product and the dissolved phase plume to the west, south and north of the existing borings. ACEH requested that Clearwater conduct soil borings as the initial or first phase of investigation to delineate the free product and dissolved phase plume.

Clearwater proposes to conduct this investigation with a phased approach. The initial phase will be to determine the lateral extents of the plume to the west, south and north. The most efficient way to delineate the lateral extent of free product and dissolved hydrocarbon contaminants is to conduct a Gore-Sorber® soil gas survey. Gore-Sorber® approach is a more efficient way of screening the property for contamination especially

inside buildings and other locations with limited access. Clearwater is proposing module locations, which are a first "step out" from the last (January 2007) soil boring locations. Based on the results of this (first) proposed phase of Gore-Sorber® Results, a second Gore-Sorber survey may be necessary to further define the lateral extents. Gore-Sorber® surveys will be used to find the location of the zero contamination line.

The second phase of the investigation will be conducted following a review of the Gore-Sorber® survey results. This second phase will include soil borings conducted at locations where Gore-Sorber results indicated low concentrations of TPH-d and TPH-mo. Data from these soil borings will be used to corroborate the extents of the free product and the dissolved phase plume.

4.2 Product Recovery

ACEH Staff also requested a proposal to initiate active removal of free product. Clearwater proposes the installation of two test recovery wells within the plume area. The first well construction is proposed at the location of the "oil tank in ground" shown on the 1950 Sanborn Fire Map. This well is proposed to be drilled in this location for two reasons:

1. The former tank location would reasonably have substantial amounts of residual product (supported by high concentrations in both SB-12 and SB-11 which are positioned on either side of this location).
2. It is unknown whether the tank remains in place.

For safety reasons, prior to drilling, a magnetic geophysical study will be performed in the field at the boring surface locations. A geophysical study including ground penetrating radar and magnetic survey was performed by Subtronic Corp. of Concord, CA on November 15, 2005. No subsurface tanks were interpreted from the field data at that time. To this end if the tank has not been removed, any remaining tank related metal, concrete brick or wood remnants would be observed in the well installation cuttings. This would provide direct evidence of the presence or absence of the former underground tank

and would assist the client with resolving tank ownership and Underground Storage Tank Cleanup Fund (USTCF) eligibility.

The second well will be installed at a suitable location close to soil boring SB-14; This area was identified from the soil borings to have a considerable product thickness.

These wells will be used to collect product, monitor the product thickness within the plume and to conduct pilot testing of product recovery methods to determine the most efficient oil recovery methods for this site. At a later date, after this phase of soil and groundwater investigations are complete (and the contaminant plume is defined) groundwater-monitoring wells will need to be installed outside the free product area to calculate the groundwater gradient and quantify the extents of the dissolved-phase contamination.

This scope of work as outlined in sections 4.1 and 4.2, above, will be implemented in the following steps (the detail of these follows in sections 5-8).

This work plan will address the following tasks:

- Investigation planning and permitting;
- Utility locating and clearance;
- Performance of a Gore-Sorber Survey using 24 modules;
- Analysis of the Gore-Sorber modules;
- Installation of 2 test recovery wells;
- Disposal of investigation derived waste;
- Preparation of the subsequent investigation report;
- Production of plans for future investigations.

5 PERMITTING / FIELD PREPARATION

All work will be pre-approved by ACEH staff prior to initiation.

5.1 Permitting

Permits for the Gore-Sorber survey and the well installations will be obtained from the ACEH and Alameda County Public Works Agency (ACPWA) before the field activities begin. Encroachment and excavation permits to drill soil borings at the subject property in East 11th Street and in Lisbon Avenue (or the sidewalks thereof) will be obtained from the City of Oakland, Building and Public Works Departments. A traffic control plan will be submitted to the City of Oakland, Public Works Department in order to close the sidewalk for the work.

5.2 Health and Safety Plan

The January 2007 site-specific Health and Safety Plan (HSP) will be updated to cover the activities proposed in this phase of work. Traffic control will also be discussed in the HSP. The HSP will be signed by the Clearwater project manager and the H&S officer before it is released to the field staff. All field staff and subcontractor staff will review and sign the HSP before the field activities begin.

5.3 Utility Locating

The perimeter of the site investigation area will be marked with white paint and Underground Service Alert (USA) will be notified to have those utility companies with underground utilities in the area mark their utilities and clear the proposed boring locations. Prior to driving any soil borings a private utility locator service will be engaged to pre-screen (GPR) each proposed boring location and confirm the current utility (sewer and storm laterals) locations and also search for unmarked buried utilities. The locator service will use utility locating instruments, such as pipe and cable locators and metal detectors. **Figure 3** shows all known utilities on the Subject Property.

6 GORE-SORBER SURVEY

In order to establish the extent and distribution of potential TPH-d and TPH-mo contamination in the soil and groundwater, Clearwater proposes that a Gore™ passive

soil gas survey (Gore-Sorber® Survey) be undertaken. Twenty-four (24) Gore-Sorber® modules will be installed on the grounds of the subject property and along the sidewalks of East 11th Street and Lisbon Avenue (**Figure 3**). The proposed locations of these modules, along with the reason for their placement, are listed below.

6.1 Gore-Sorber® Module Placement

Module No.	Delineation of TPH-d, TPH-mo	Proposed Analysis
G1-G5	Delineating contamination down the north side of East 11th Street.	TPH-g, TPH-d, TPH-mo
G6-G10	Delineating contamination down the south side of East 11th Street. Down-gradient and adjacent to residential properties.	TPH-g, TPH-d, TPH-mo
G11-G14	Delineating contamination along the west side of Lisbon Ave. Down-gradient and adjacent to residential properties.	TPH-g, TPH-d, TPH-mo
G15-G17	Delineating contamination along the east side of Lisbon Ave. Down-gradient and adjacent to residential properties.	TPH-g, TPH-d, TPH-mo
G18-G20	Delineating contamination under the warehouse building. (Client requested no holes in the office floor).	TPH-g, TPH-d, TPH-mo
G21-G23	Delineation from the loading dock towards the railroad tracks to the north-east of the building (railroad tracks contain two fuel product lines) to intercept any up gradient sources and /or a possible product line from the tracks to the tank.	TPH-g, TPH-d, TPH-mo
G24	Placed near SB-14 and used to corroborate the Gore-Sorber® results to the soil boring sample results (there is no direct correlation).	TPH-g, TPH-d, TPH-mo

6.2 Gore-Sorber® Procedure

The Gore-Sorber® modules are made of activated carbon within a sheath of Gore-Tex® material. Each module is installed in a shallow, hand-driven soil boring at a depth of approximately 30 inches bgs and capped with a cork, per Gore recommended procedures. See **Appendix B** for Statement of Procedures for Gore-Sorber® surveys. Organic vapors released from petroleum hydrocarbons and solvents in the soil and groundwater are adsorbed into the modules during the 14-day exposure period.

To maximize the soil gas survey results the modules are placed with the maximum spacing between modules equal to or less than 3 times the average depth to water. The locations proposed are at 20-foot centers. After a 14-day exposure period, the modules were removed from the boreholes. Following the removal of each module, the emptied borehole is filled with bentonite pellets and hydrated.

6.3 Analysis of Gore-Sorber® Modules

The modules are placed directly in Gore-provided inert glass sample containers and capped and sealed. The module retrieval time and date are noted on the Chain-of-Custody document, which accompanies the samples. The samples are labeled and shipped under chain-of-custody procedures, via FedEx, to Gore for analysis. The modules are analyzed by Gore using a modified version of EPA Method 8260 (volatile organics).

6.4 Gore-Sorber® Report

The Gore-Sorber® results are presented in micrograms (μg), the unit of measure for Gore-Sorber® surveys. There is no accepted method of directly correlating the Gore-Sorber® results with the soil or groundwater sample analytical results.

7 INSTALLATION OF RECOVERY TEST WELLS

Two test recovery wells (RW-1 & RW-2) are proposed to be installed on the Subject Property in areas of known free product. RW-1 will be drilled directly above the assumed location of the "oil tank in ground" as noted on the 1950 Sanborn Fire Map. The drill cuttings will be examined for concrete or brick remnants, which would indicate the presence of a tank. Recovery test well RW-2 will be drilled close to soil boring SB-14.

This location is thought to be the center of the plume and a location of known free product. See **Figure 4** for well locations. Wells will be screened from 10 to 25 feet bgs. This screen interval was determined by examining the soil boring logs (SB-13, SB-14 and SB-15) from the January 2007 Soil and Groundwater Investigation. These logs indicate that free product was first observed at approximately 11 feet bgs and persists down to approximately 20 to 25 feet bgs. Therefore, a screened interval from 10 to 25 feet bgs will accommodate for seasonal groundwater fluctuations.

7.1 Well Specifications

Both wells will be constructed with the following specifications:

- 4-inch diameter, schedule 40 PVC well casing with 0.02" screen;
- 25 feet deep bgs and screened from 10 to 25 feet;
- A #2/12 sand pack will be installed from 25 to 9 feet bgs;
- A bentonite seal will be installed from 9 to 3 feet bgs;
- A concrete seal will be installed from 3 to 1 foot bgs;
- An 10-inch diameter ground-level, steel, well completion vault will be set in concrete over the top of the well;
- A locking watertight well plug will be installed to seal the top of the well casing.

7.2 Well Installation

The majority of the site is covered with an 8-inch thick concrete pad. Prior to drilling the wells, a concrete corer will be used to cut a 10" circular hole in the existing concrete. Clearwater proposes to drill the wells using a hollow stem auger drill rig with 10-inch augers. Drill cuttings will be stored in 55-gallon drums pending disposal.

7.3 Well Surveying

All wells will be surveyed with a Trimble TSC1 GPS locator. Top-of-casing (TOC) and Top-of-ground (TOG) measurement will be taken using a laser leveler. All measurements will be tied to a known local benchmark.

7.4 Well Development

Wells RW-1 and RW-2 will be developed a minimum of 48 hours after they have been installed. Clearwater's Well Development and Well Installation Field Operating Procedures are included as **Appendix C**.

7.5 Disposal Of Investigation-Derived Waste

Efforts will be made to minimize the quantity of soil discarded. Soil cuttings will be stored in labeled 55-gallon steel drums and temporarily stored onsite, pending receipt of the soil disposal characterization sample results. The drummed soil will be disposed of at a permitted landfill, pending receipt of the sample results.

Purge water from the well development activities will be transported to the Clearwater yard in a tank within the sampling van. The water will then be transferred into and stored in labeled 55-gallon drums, pending receipt of analytical results. The drummed water will disposed of at Instrat Inc., of Rio Vista, California or the Asbury, Alviso, CA Recycling Facility.

8 REPORT PREPARATION

Following the Gore-Sorber® survey and installation of the three recovery wells, a report detailing these activities will be prepared. The Gore-Sorber® report will include all analytical results and color maps showing concentrations of the contaminants at each of the Gore-Sorber® sampling points. The recovery test well installation report will include boring logs with well completion diagrams, well development details, soil cutting disposal manifests and site photographs. Any well design modification will also be reported.

9 SCHEDULE

Task	Description	Start Date	End Date	Duration
1	Workplan approval by Local Oversight Agency	07/7/2007	8/7/2007	30
2	Use comments to amend proposed work	8/8/2007	8/22/07	14

3	Budget preparation and client approval	8/23/2007	9/7/2007	14
4	Permit application, submittal and approval (engage driller, USA notification, Gore module acquisition etc)	9/7/2007	9/28/2007	21
5	Gore-Sorber® Deployment	9/29/2007	9/30/2007	2
6	Gore-Sorber® in ground	9/30/2007	10/4/2007	14
7	Gore-Sorber® analysis and report preparation	10/5/2007	10/26/2007	21
8	Well Installation	10/1/2007	10/3/2007	3
9	Well Development	10/8/2007	10/9/2007	2
10	Well Surveying	10/9/2007	10/9/2007	1
11	Report Preparation	10/27/2007	12/13/2007	45

10 FUTURE INVESTIGATIONS / ACTIVITIES

10.1 Additional Gore-Sorber® Survey

If the results of the initial Gore-Sorber® survey reports high levels of TPH-d or TPH-mo contamination at the outer limits of the survey area, a decision can be made to conduct a second round of Gore-Sorber® to further delineate the lateral extents of the plume.

10.2 Confirmation Soil Borings

Once the lateral extents of the plume have been defined by Gore-Sorber®, soil borings can be conducted on the edge of the plume to confirm the Gore-Sorber® findings.

10.3 Oil Recovery Pilot Tests

Wells RW-1 and RW-2 will be used as test recovery wells to conduct pilot tests for oil recovery. Various technologies such as High Vacuum Dual Phase Extraction (HVDPE), Chemical Oxidation and Bio-Solvent injection may be used in the pilot tests.

CLEARWATER
GROUP
Environmental Services

13 DISTRIBUTION

Jerry Wickham
Alameda County Environmental Health
1131 Harbor Bay Parkway
Alameda, CA 94502-6577

Mr. Christopher Lucasey
Lucasey Manufacturing Corporation
2744 East 11th Street
Oakland, California 94601

FIGURES

11 LICENSED PROFESSIONALS

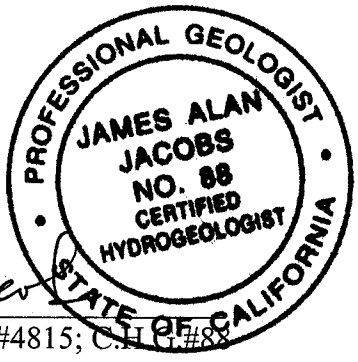
All projects are directed by in-house licensed professionals. These professionals, including geologists or engineers, shall be guided by the highest standards of ethics, honesty, integrity, fairness, personal honor, and professional conduct. To the fullest extent possible, the licensed professional seeks to protect the public health and welfare and property in carrying out professional duties. In the course of normal business, recommendations by the in-house professional may include the use of equipment, services or products in which the Clearwater has an interest. Therefore, Clearwater is making full disclosure of potential or perceived conflicts of interest to all parties.

12 CERTIFICATION

This report was prepared by and under the supervision of a State of California Professional Geologist at the Clearwater Group. All statements, conclusions and recommendations are based solely upon field observations by Clearwater Group or previous consultants.

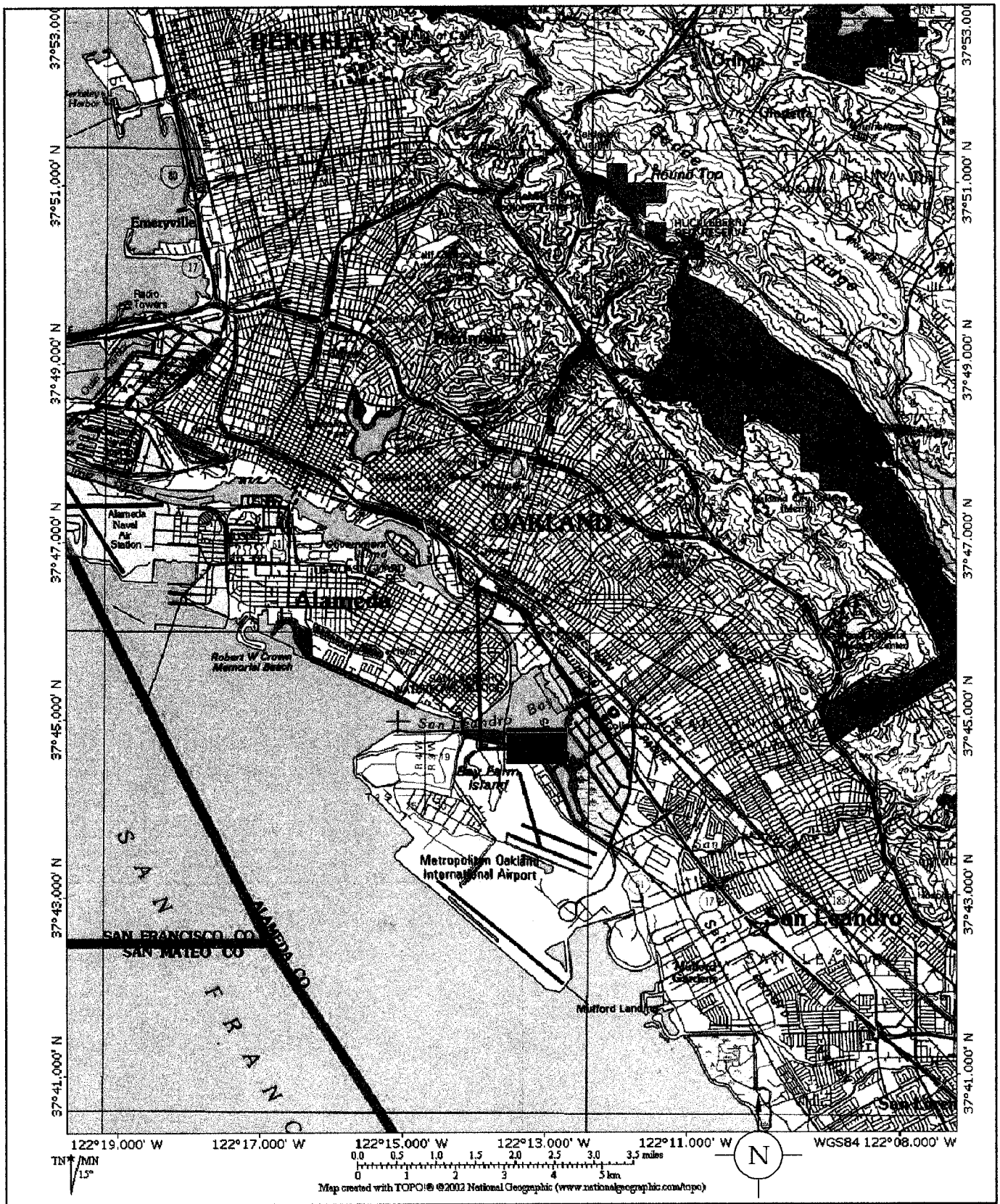
Information and interpretation presented herein are for the sole use of the client and regulatory agency. A third party should not rely upon the information and interpretation contained in this document. The service performed by the Clearwater Group has been conducted in a manner consistent with the level of care and skill ordinarily exercised by members of our profession currently practicing under similar conditions in the area of the site. No other warranty, expressed or implied, is made.

Sincerely,
Clearwater Group,



Matthew Ryder-Smith
Project Manager

James A. Jacobs, P.G.#4815; C.H.G.#88
Chief Hydrogeologist



SITE VICINITY MAP

Lucasey Manufacturing
2744 E 11th Street
Oakland, California

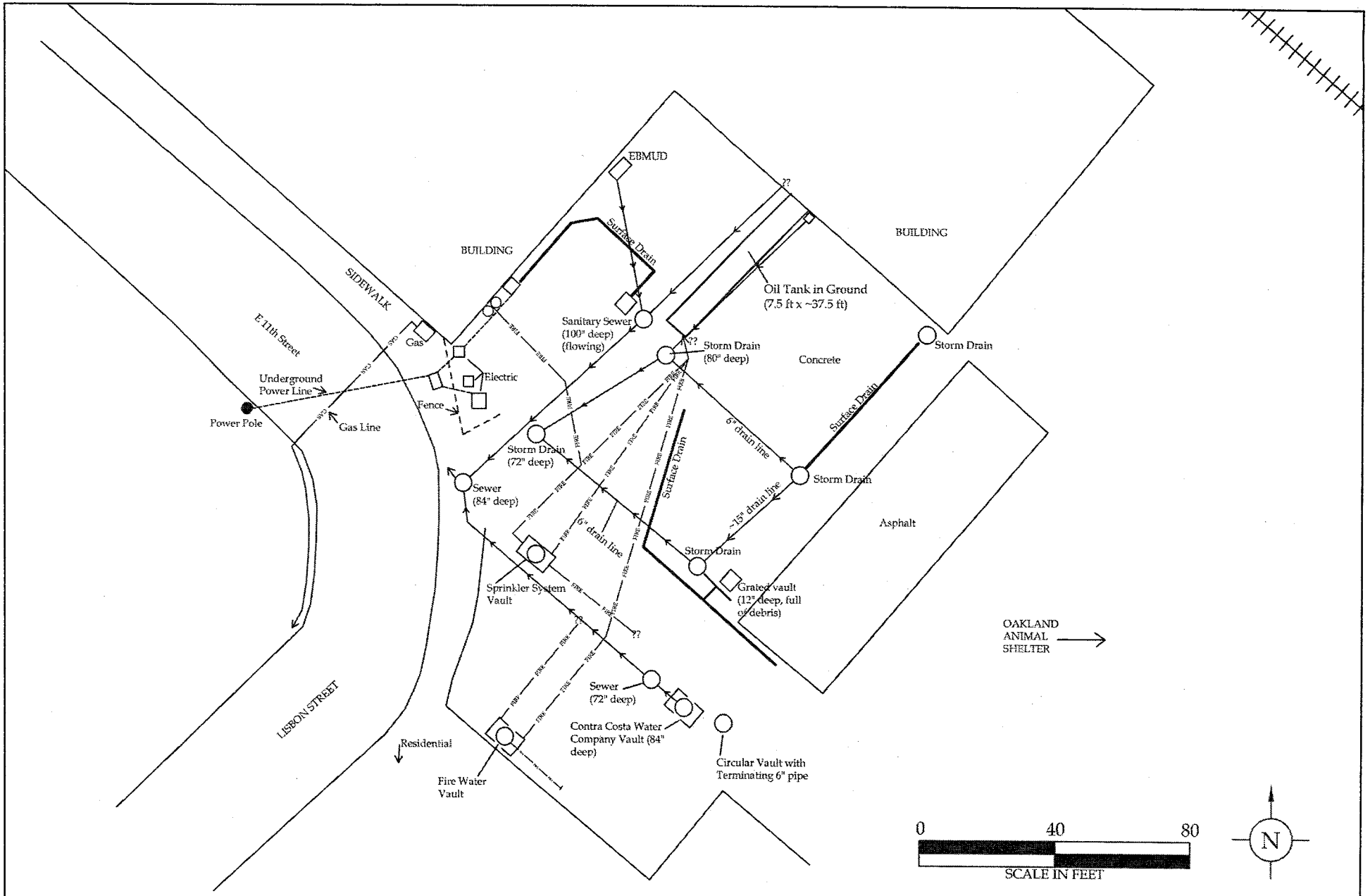
CLEARWATER GROUP

Project No.	Figure Date	Figure
FB022G	**4/06**	**1**

SITE LOCALITY PLAN
Lucasey Manufacturing
2744 East 11th Street
Oakland, California

CLEARWATER GROUP

Project No.	Figure Date	Figure
FB022G	**02/20**	**2**



LEGEND

Fire-water Line

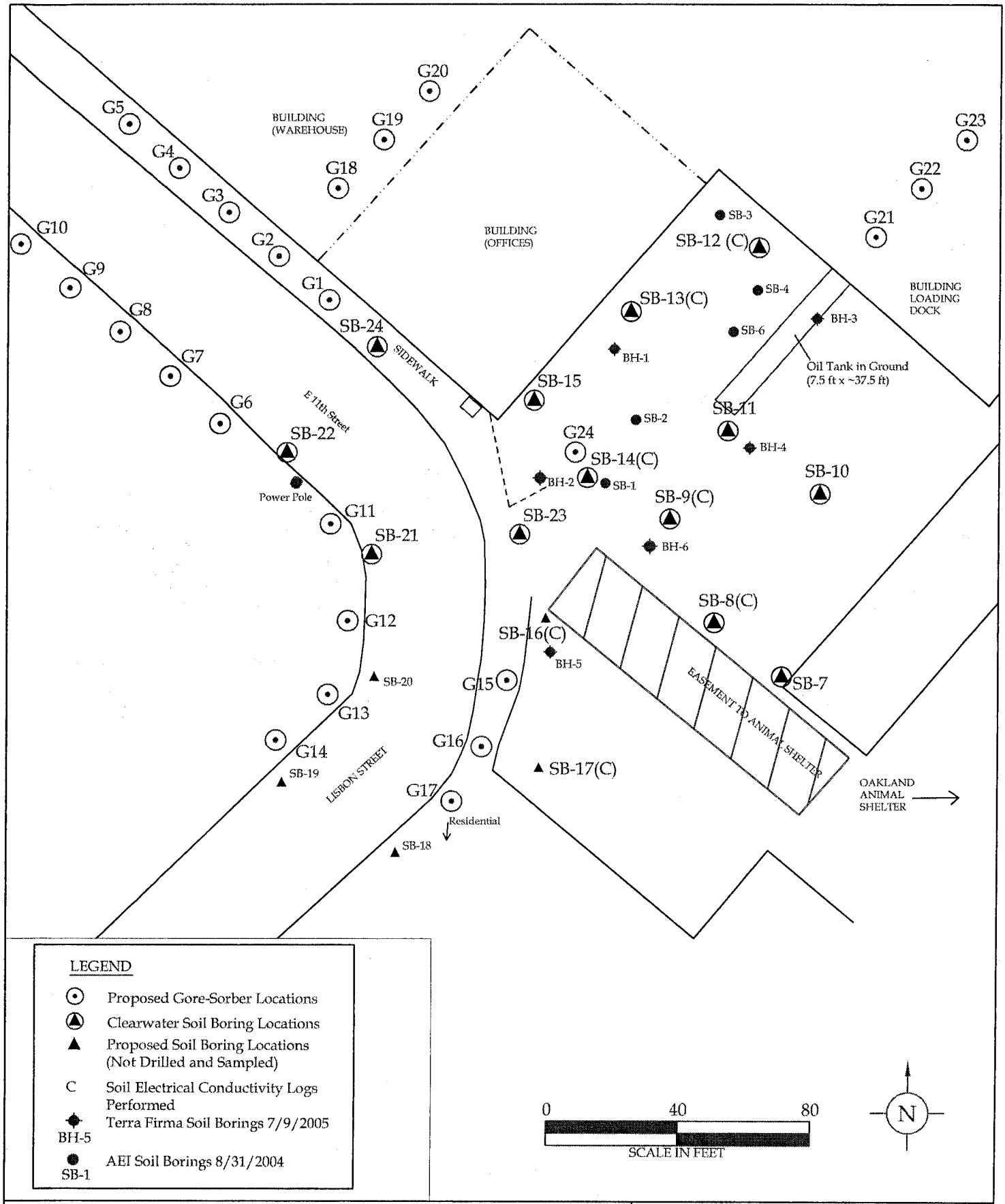
PG&E Gas Line

Manhole

UTILITY SURVEY MAP
Lucasey Manufacturing
2744 East 11th Street
Oakland, California

CLEARWATER GROUP

Project No.	Figure Date	Figure
FB022I	**06/07**	3

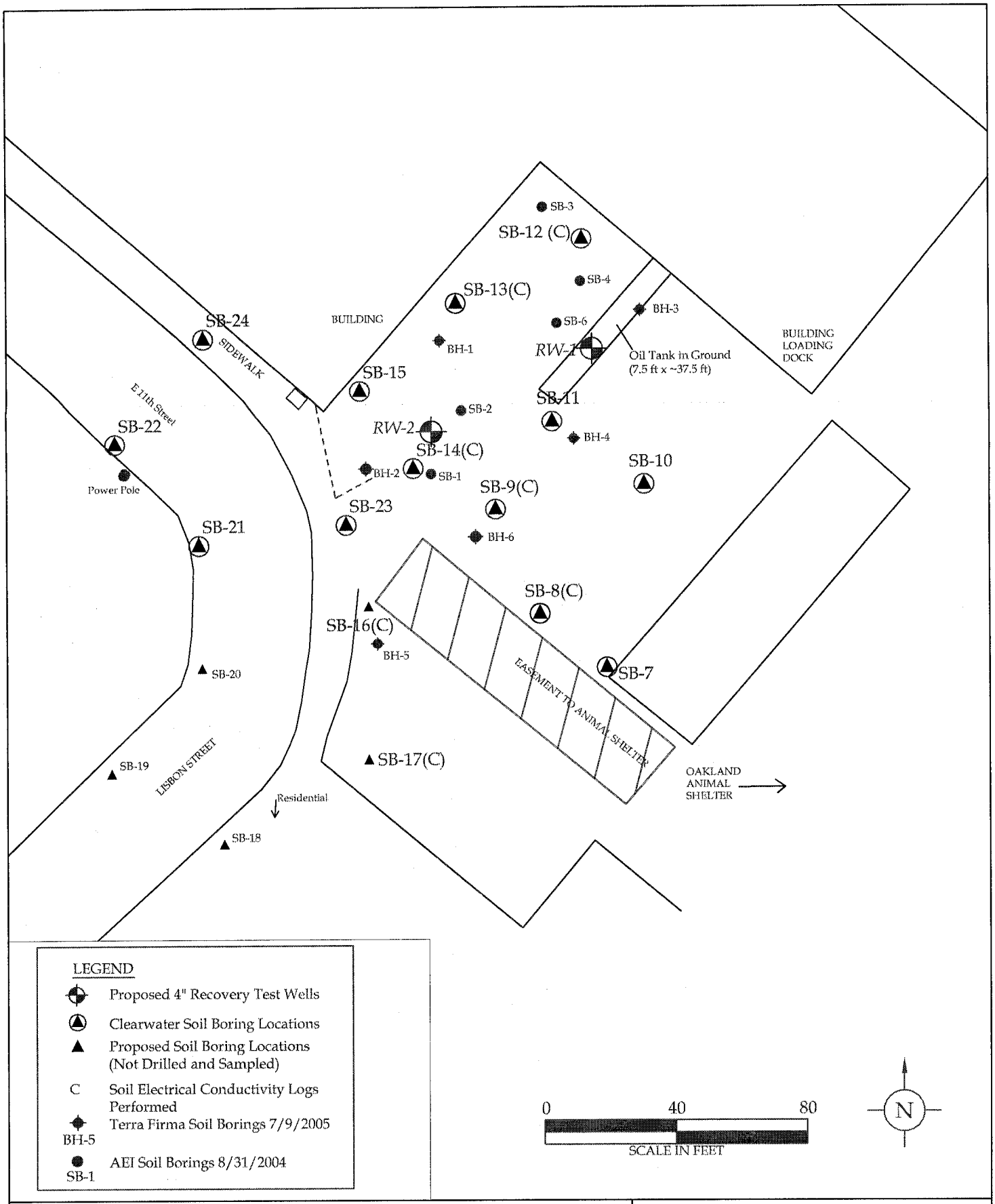


Proposed Gore-Sorber Location Map

Lucasey Manufacturing
2744 East 11th Street
Oakland, California

CLEARWATER GROUP

Project No.	Figure Date	Figure
FB022I	**6/07**	**4**



PROPOSED RECOVERY TEST WELL LOCATIONS

Lucasey Manufacturing
2744 East 11th Street
Oakland, California

CLEARWATER GROUP

Project No.	Figure Date	Figure
FB022I	**6/07**	**5**

APPENDIX A

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
DAVID J. KEARS, Agency Director

ENVIRONMENTAL HEALTH SERVICES
ENVIRONMENTAL PROTECTION
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577
(510) 567-6700
FAX (510) 337-9335

April 6, 2007

Mr. Chris Lucasey
Lucasey Manufacturing Corporation
P.O. Box 14023
Oakland, CA 94614-2023

Subject: SLIC Case RO0002902 and Geotracker Global ID T0600133151, Lucasey Manufacturing, 2744 East 11th Street, Oakland, CA 94601

Dear Mr. Lucasey:

Alameda County Environmental Health (ACEH) staff has reviewed the Spills, Leaks, Investigations, and Cleanups (SLIC) case file for the above-referenced site, including the recently submitted document entitled, "Soil and Groundwater Investigation Report," dated March 7, 2007. The report presents the results of soil and groundwater sampling from 13 direct push borings and electrical conductivity at 7 borings. Free product was observed in several borings both on-site and off-site. The extent of contamination has not been determined to the west, south, and north from the apparent source area. Three proposed borings (SB-18 through SB-20) along Lisbon Street were not completed and two proposed borings were not sampled (SB-16 and SB-17). The field investigation was apparently stopped due to budgetary constraints.

Further investigation is required to define the on-site and off-site extent of contamination. We request that you prepare a Work Plan that includes two phases of investigation. The first phase of investigation is to define the extent of free phase product and the dissolved phase plume to the west, south, and north of the existing borings using soil sampling and grab groundwater sampling. The second phase of investigation is to include installation of monitoring and free product recovery wells.

We request that you address the following technical comments, perform the proposed work, and send us the reports described below.

TECHNICAL COMMENTS

1. **Extent of Free Product.** Free phase product likely extends beneath the on-site building and may extend beneath off-site residences. We request that you prepare a Work Plan that includes as an initial phase, soil borings to define the extent of free product and the dissolved phase plume to the west, south, and north of the existing borings. As noted in the Soil and Groundwater Investigation Report, the additional subsurface investigation will require access agreements with adjacent landowners and encroachment permits from the City of Oakland. Soil and groundwater sampling from direct push soil borings beyond the area of the existing borings is acceptable. Please present plans for the soil borings in the Work Plan requested below.

2. **Groundwater Monitoring and Recovery Wells.** Following the initial phase of soil borings to define the extent of free product and the dissolved phase plume, we request that you install groundwater monitoring and recovery wells. Free product recovery will be required at this site. Therefore, groundwater monitoring/recovery wells are to be installed within the area of free product to initially measure the thickness of free product present in the formation and then to recover free product. Groundwater monitoring wells will also be required outside the area of free product to evaluate the hydraulic gradient and monitor water quality over time. Please present plans for the monitoring and recovery wells in the Work Plan requested below.

3. **Soil Vapor Sampling.** The Soil and Groundwater Investigation Report recommends a soil vapor survey to help define the lateral extent of contamination. Site conditions are described as predominantly fine-grained soils with groundwater under semi-confined to confined conditions. Benzene, toluene, ethylbenzene, and xylenes were not detected in any soil samples and were not detected in groundwater samples at concentrations greater than 1.7 micrograms per liter. Given these conditions, we do not concur that soil vapor sampling would be useful to define the extent of contamination.

4. **Request for Identification of Adjacent Property Owners.** Public participation is a requirement for the Corrective Action Plan process. In order to provide notification to potentially affected members of the public, please provide a list of all properties, which are currently or may in the future be directly or indirectly affected by the petroleum release from your site or the proposed corrective action. The list is to identify the properties by street address, parcel number, and property owner name. Please also provide a map showing the street address for each of the listed properties. A current mailing address is to be included for each property owner. ACEH will notify each of the property owners on the list of the proposed investigation.

TECHNICAL REPORT REQUEST

Please submit technical reports to Alameda County Environmental Health (Attention: Jerry Wickham), according to the following schedule:

- **June 7, 2007** – Work Plan

These reports are being requested pursuant to California Health and Safety Code Section 25296.10. 23 CCR Sections 2652 through 2654, and 2721 through 2728 outline the responsibilities of a responsible party in response to an unauthorized release from a petroleum UST system, and require your compliance with this request.

ELECTRONIC SUBMITTAL OF REPORTS

The Alameda County Environmental Cleanup Oversight Programs (LOP and SLIC) require submission of all reports in electronic form to the county's ftp site. Paper copies of reports will no longer be accepted. The electronic copy replaces the paper copy and will be used for all public information requests, regulatory review, and compliance/enforcement activities. Instructions for submission of electronic documents to the Alameda County Environmental Cleanup Oversight

Program ftp site are provided on the attached "Electronic Report Upload (ftp) Instructions." Please do not submit reports as attachments to electronic mail.

Submission of reports to the Alameda County ftp site is an addition to existing requirements for electronic submittal of information to the State Water Resources Control Board (SWRCB) Geotracker website. Submission of reports to the Geotracker website does not fulfill the requirement to submit documents to the Alameda County ftp site. In September 2004, the SWRCB adopted regulations that require electronic submittal of information for groundwater cleanup programs. For several years, responsible parties for cleanup of leaks from underground storage tanks (USTs) have been required to submit groundwater analytical data, surveyed locations of monitor wells, and other data to the Geotracker database over the Internet. Beginning July 1, 2005, electronic submittal of a complete copy of all necessary reports was required in Geotracker (in PDF format). Please visit the SWRCB website for more information on these requirements (http://www.swrcb.ca.gov/ust/cleanup/electronic_reporting).

PERJURY STATEMENT

All work plans, technical reports, or technical documents submitted to ACEH must be accompanied by a cover letter from the responsible party that states, at a minimum, the following: "I declare, under penalty of perjury, that the information and/or recommendations contained in the attached document or report is true and correct to the best of my knowledge." This letter must be signed by an officer or legally authorized representative of your company. Please include a cover letter satisfying these requirements with all future reports and technical documents submitted for this fuel leak case.

PROFESSIONAL CERTIFICATION & CONCLUSIONS/RECOMMENDATIONS

The California Business and Professions Code (Sections 6735, 6835, and 7835.1) requires that work plans and technical or implementation reports containing geologic or engineering evaluations and/or judgments be performed under the direction of an appropriately registered or certified professional. For your submittal to be considered a valid technical report, you are to present site specific data, data interpretations, and recommendations prepared by an appropriately licensed professional and include the professional registration stamp, signature, and statement of professional certification. Please ensure all that all technical reports submitted for this fuel leak case meet this requirement.

UNDERGROUND STORAGE TANK CLEANUP FUND

Please note that delays in investigation, later reports, or enforcement actions may result in your becoming ineligible to receive grant money from the state's Underground Storage Tank Cleanup Fund (Senate Bill 2004) to reimburse you for the cost of cleanup.

AGENCY OVERSIGHT

If it appears as though significant delays are occurring or reports are not submitted as requested, we will consider referring your case to the Regional Board or other appropriate agency, including the County District Attorney, for possible enforcement actions. California Health and Safety Code, Section 25299.76 authorizes enforcement including administrative action or monetary penalties of up to $10,000 per day for each day of violation.

If you have any questions, please call me at (510) 567-6791.

Sincerely,

Jerry Wickham
Hazardous Materials Specialist

Enclosure: ACEH Electronic Report Upload (ftp) Instructions

cc: Parwez Faizi, Lucasey Manufacturing, 2744 East 11th Street, Oakland, CA 94601

Matthew Ryder-Smith, Clearwater Group, 229 Tewksbury Avenue, Point Richmond, CA 94801

Robert Nelson, Clearwater Group, 229 Tewksbury Avenue, Point Richmond, CA 94801

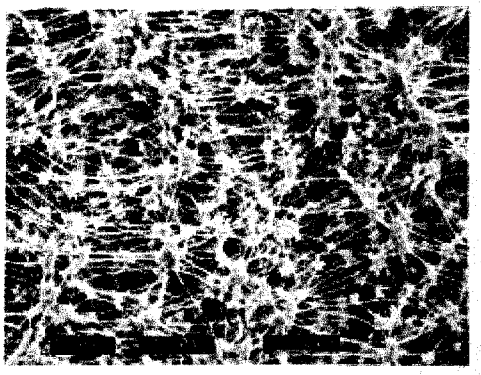
Donna Drogos, ACEH
Jerry Wickham, ACEH
File

APPENDIX B

STATEMENT OF PROCEDURES
Clearwater Group

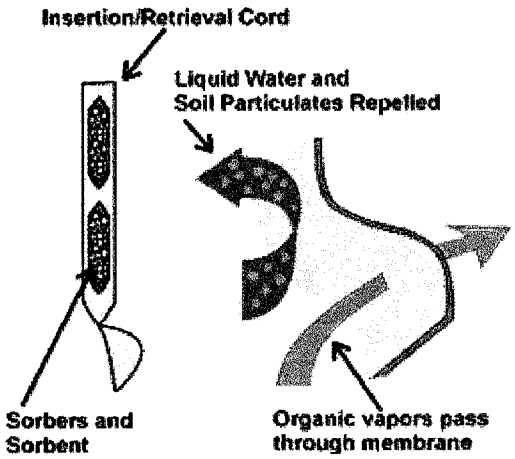
PASSIVE GORE-SORBER® SOIL GAS SURVEY

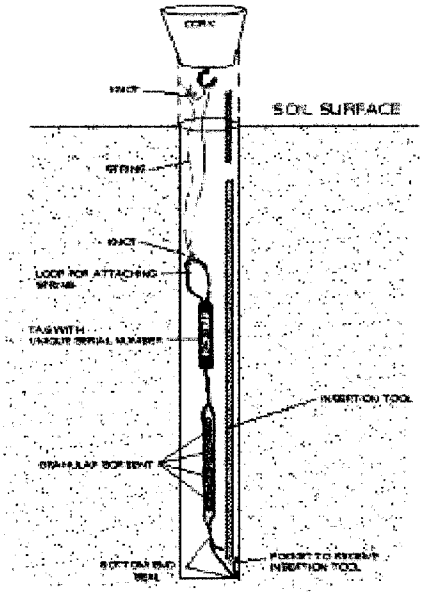
The GORE-SORBER® Module is a patented, passive soil gas sampler, is used to evaluate soil gas for contaminant source identification in environmental projects. The temporary survey process involves planting a dozen or more Gore-sorber modules in a sampling grid designed to meet the project objectives.



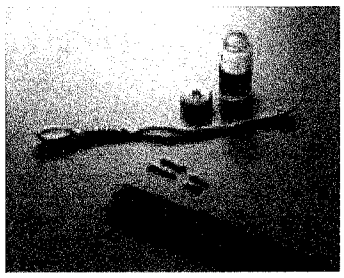
The module is constructed entirely of GORE-TEX® membrane. This membrane is an expanded polytetrafluoroethylene (ePTFE) which is a chemically inert, microporous (vapor permeable), and hydrophobic (waterproof). Much of the node and fibril structure is void space available for vapor transfer. Pore spaces are designed to be orders of magnitude smaller than a liquid drop of water.

The module is constructed of a hollow ePTFE insertion/retrieval cord that contains smaller ePTFE tubes (sorbers). The sorbers contain various polymeric and carbonaceous adsorbents selected for their affinity to a wide variety of volatile and semi-volatile organic compounds, while minimizing the uptake of water vapor.





The membrane facilitates vapor transfer across the entire surface area while providing strength for retrieval from the subsurface. Organic vapors present in the soil gas migrate unimpeded through the membrane to the adsorbent housed in the sorbers. This design prevents soil particles and liquid water from impacting sample integrity.



The module itself is approximately one foot in length and contains enough sorbers for two samples. This allows for duplicate analyses, if required, or a back up analyses in the event of an instrument malfunction. Additional sorbers can be placed in the module if a greater number of samples are required. Each module is stored in individual containers and is uniquely numbered and tracked throughout the project.

Trip Blanks

Additional modules are provided with each project to document impact to the modules during transit, storage and installation/retrieval away from Gore's facility. Trip blanks are identical to the field-installed modules. The client selects which modules are to be trip blanks and leaves them unopened during all phases of the passive soil gas survey.

Module Installation for GORE-SORBER® Screening Surveys

In general, the installation and retrieval of the modules is simple. A narrow diameter hole (three-quarter inch) is drilled into the subsurface to a maximum depth of three feet, the recommended depth for soil gas sampling in environmental sampling applications (1, 2). The hole can be created using hand tools such as a slide hammer and tile probe, a Geoprobe-type or similar direct push probe rig or a rotary hammer drill with a 36-inch carbide-tipped drill bit attached. Once the hole is created, a length of cord is tied to the loop end of the module, and a cork is tied to the surface end of the cord. A stainless steel insertion rod (supplied by Gore) is placed in the pocket at the opposite end of the module, and the unit is inserted down the hole. The insertion rod is removed and the cork tamped flush into the ground at the surface. The site map is marked with the location of the module and its serial number, and the Chain of Custody undated. Global positioning systems (GPS) are now being used to record actual coordinate information in the field.

Following the recommended exposure period, each module is retrieved, the cord and cork discarded properly and the module is returned to its respective container. The serial number and location are verified, and the modules are returned to Gore's laboratory for analysis. The Chain of Custody is updated and returned with the modules.

DETAILS OF THE MODULE INSTALLATION

To facilitate the installation of the modules, it is recommended that the cord and corks be prepared prior to going to the field. For the installation of each module, cut a piece of the supplied polypropylene cord to a length of approximately 7.0 feet or 2.25 meters. Tie the ends of the cord together using a non-slip knot (square knot is suggested - see below). This loop should be long enough to allow for an installation of three feet (one meter) into the subsurface. Pass the looped cord through the eyelet in the cork and pull it back through itself. This will attach the cord to the cork. Wrap the remainder of the cord around the cork and secure the cord/cork combination with a rubber band. The cork and cord are now ready to attach to the module after the pilot hole is created at the installation location.

STATEMENT OF PROCEDURES
Clearwater Group

Square knot instructions (see Figure 1)

1. Take an end of the cord in each hand.
2. Pass the left-hand cord over the right-hand cord and wrap it around the right-hand cord.
3. Take the cord end that is now in your right hand, place it over the cord end in your left hand and wrap it around that cord.
4. Pull the cord carefully to tighten the knot.

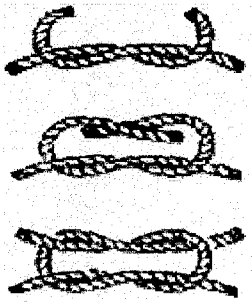


Figure 1.Square Knot

- Always obtain utility clearance before digging or probing.
- We do not recommend installation of modules within 15 feet of monitoring wells, utility trenches or other conduits, which may act as a preferential pathway for soil vapor migration.
- Drive/drill narrow pilot hole at desired pre-marked location. In sandy soils, occasionally the pilot hole will collapse after the drill or tile probe is removed. Adding deionized water to the sandy soil will temporarily compact the soil and keep the hole open for module insertion.
- Wearing clean surgical gloves, remove module from numbered container and re-seal the jar (this numbered container should correspond to the numbered module ID tag - please verify this).
- Attach the cord and cork to the module by passing the looped cord through the loop on the module and pull the cord/cork back through itself.
- Place insertion rod into the pre-cut pocket at the base of the module and lower it into the hole. If you encounter resistance remove the module and ream the hole and re-insert the module.
- Once deployed to the desired depth, press the insertion rod against the side of the hole and twist slightly to release the module. Remove the rod and push any excess cord into the pilot hole and plug it with the cork. (See Figure 2 for schematic of completed module installation.)
- Indicate the module number, date and time of installation and any pertinent comments on the installation/retrieval log. Write the module serial number on the site map adjacent to the appropriate map location.
- To minimize sample location errors, it is preferable to record the GORE-SORBER Module location on the field map. However, if another sample numbering system is used, information relating the sample number system to the GORE-SORBER Module serial numbers must be provided either on the Installation and Retrieval Log, or in a separate table.

- Clean the tile probes or drill bits and the insertion rod prior to use at the next location. Replace the surgical gloves as necessary before handling any modules.
- Following module installation, the modules selected as trip blanks should be kept in the sample box provided and stored as described above in "STORAGE" until sample retrieval.

DETAILS OF THE MODULE RETRIEVAL

- Following the module exposure period (usually 10 - 14 days) identify and check each module location in the field using the site map.
- Remove the cork with a penknife or corkscrew. Grasp the cord and pull the module from the ground; verify the module ID number. Cut off and discard the cork and cord. Place the entire module in its labeled container and tightly secure the lid.
- Use caution when screwing down the lid on the sample jars. Be sure the seal is tight and that no part of module or any dirt/ debris is pinched in the jar threads. Over-tightening may cause breakage.
- Replace the sample container in the box. Where possible, please attempt to keep modules in numbered sequence to expedite sample check-in and processing.
- Complete the module retrieval date/time on the installation/retrieval log.
- Do not use Styrofoam "peanuts" as packing material. Bubble packing is acceptable. Water ice can be added if desired, but cooling in general is not necessary. If shipping with ice, please take precautions to keep boxes dry (perhaps shipping in a cooler).
- Return the samples with insertion rod and paperwork (preferably by overnight courier) to:

Screening Modules Laboratory
W.L. Gore & Associates, Inc.
100 Chesapeake Blvd.
Elkton, MD 21921
Phone: (410) 392-7600

Attn: NOTIFY LAB IMMEDIATELY UPON DELIVERY!!

IMPORTANT: Samples should not be shipped for weekend or holiday delivery at GORE.

Module Installation for the GORE-SORBER® Exploration Surveys

Installation and retrieval of the module in this application is similar to the screening surveys. However, these surveys tend to be carried out in remote locations over large areas necessitating portable hand tools. A narrow diameter hole (1 cm) is created to

depths of 24 inches (60cm) below grade by hammering a narrow steel tool, such as a long screwdriver, into the ground.

After the pilot hole is completed, modules are tied to a section of cord and inserted into the completed hole using the stainless steel insertion rod. The cord is secured at the surface by collapsing the hole. The location is marked on a map and location coordinates are secured where possible with a GPS having file download capabilities.

Module retrieval requires that field personnel locate the retrieval cord and manually pull the module from each location. The cord is separated from the module and discarded properly. The exposed modules are resealed in their respective containers and returned to Gore for analysis. The appropriate paperwork including the Chain of Custody is returned with the modules. Additional installation and retreival information can be found by clicking here.

Creating the Installation Hole

Narrow diameter, uncased installation holes are easily prepared using a slide hammer and long tile probe (left), a rotary hammer drill with a long carbide tipped bit (typically used to create the installation hole through impermeable layers such as asphalt; middle), or with a handheld hammer and steel rod (right).

Installing a Module

The photo at left illustrates a module, its container, and a length of string tied to the loop of the module. String is cut to the appropriate length in the field and attached to each module loop during the installation process. The insertion rod is placed in the pocket at the opposite end of the module, and a cork it tied to the string. The entire unit is slid down into the installation hole (middle photo). The insertion rod is pulled out of the hole, decontaminated, and is ready for use at the next sample location. A quick twist of the rod while in the hole, or placing the unit against the side of the hole while pulling the rod out of the ground, will cause the module to slip off of the insertion rod and remain at the required installation depth. The installation hole is plugged with a cork at the surface. The field map and installation notes are updated.

FIELD PHOTOS: Using the Gore-Sorber Modules

String, an insertion rod, and corks (as needed) are supplied by Gore.
NOTE: For the exploration surveys, corks are not required to seal the installation hole. The cord is secured at the surface by collapsing the hole.

INTERPRETATION

Soil Gas Data Interpretation

In general, the detection of VOCs and SVOCs in field-exposed modules indicates that potential sources (i.e. soil adsorbed-, dissolved- and separate-phase organics) of the detected compound(s) may exist in proximity to the module location. The module will adsorb migrating gases present in the adjacent media (soil or water). The processes that govern the movement of gases in the subsurface are complex, involving interactions between the soil, soil moisture, pore gasses, ground water, natural and human made barriers, and the volatile contaminant. Chemical and microbiological processes can further influence the presence of soil gases, by reacting with or metabolizing these compounds.

Vapor pressure, water solubility, molecular weight, and the Henry's Law partitioning coefficient, are important chemical parameters to consider when interpreting soil gas data. The Henry's Law coefficient reflects a compound's behavior when partitioned into air and water, which aids in understanding an organic chemical's likely state in the subsurface. An understanding of the site geology (geologic structure, geochemistry), hydrogeolology and operational history are also important when interpreting the distribution of soil gases.

A strong relative correlation is often observed between the soil gas mass levels and the compound concentrations in the subsurface.

Contour Maps

Graphic presentation of the data extracted from GORE-SORBER® Modules is normally presented by overlaying the contamination patterns detected during analysis onto CAD maps supplied by the customer. Either minimum surface curvature or kriging models are employed. Standard "B-sized" (11" x 17") color contour plots are included with each project, however up to "E-size" (24" x 36") plots are available, if requested. The site plan base map(s) provided by the customer must include a scaled drawing with relevant site features, and a layer containing the sample locations and module serial numbers for the survey.

Tentatively Identified Compounds (TICs)

Some of the modules may contain non-target analytes (compounds not on GORE's target list). GORE can provide tentative identification of prominent non-target compound peaks

(TICs). These compounds can include non-target soil gas analytes, and contaminants introduced during sample transport and installation/retrieval activities.

Final Reporting

The results of the GORE-SORBER® Screening Survey will be summarized in a brief report, which will include the chain of custody, analytical data summary table, sample chromatograms, and color contour maps. A laboratory analytical data deliverables package incorporating results of samples, standards and blanks, and mass spectra compared to standards for all detects can be provided as an option.

References:

1 – Field Sampling Procedures Manual, ed. J.R. Schoenleber and P.S. Morton, New Jersey Department of Environmental Protection and Energy, 364pp., 1992

2 – Devitt, D. A., Evans, R.B., Jury, W. A., and Starks, T.H., Soil Gas Sensing for Detection and Mapping of Volatile Organics, National Groundwater Association, Dublin, OH

NOTES: This statement of procedures was compiled from materials provided by Gore. http://www.gore.com/surveys/

APPENDIX C

CLEARWATER GROUP

Field Procedure for Soil Borehole Drilling and Groundwater Monitoring Well Installation and Development

---

Drilling and Soil Sampling

Permits, Site Safety Plan, Utility Clearance

Clearwater Group (Clearwater) obtains all the required permits, unless otherwise contractually directed. Clearwater prepares a site-specific Site Safety Plan detailing site hazards, site safety and control, decontamination procedures, and emergency response procedures to be employed throughout the work or in the event of an accident. At least 48 hours prior to drilling, Underground Service Alert (USA) or an equivalent agency is notified of the planned work. Clearwater attempts to locate all underground and aboveground utilities by site inspection (in conjunction with its subcontractors and knowledgeable site managers, if available), and review of site as-built drawings. Clearwater may employ a private, professional utility locator to refine the site utility inspection.

Drilling Equipment

Soil borings are drilled using either a continuous core drill (Geoprobe®) or a hollow-stem auger drill rig, unless site conditions warrant a different drilling method. Subsurface conditions permitting, the first 5 feet of each boring is advanced using a hand-auger or post-hole digger. All drilling equipment is inspected daily and maintained in safe working condition by the operator. All down-hole drilling equipment is steam cleaned prior to arriving on site. Working components of the drill rig near the borehole, as well as augers and drill rods, are thoroughly steam cleaned between each boring location. All Clearwater drilling and sampling methods are consistent with American Society for Testing and Material Standards (ASTM) Method D 1452-80 and local, state, and federal regulations.

Soil Sampling and Lithologic Description

Whenever possible, the first boring to be drilled at a site is continuously cored to obtain a complete lithologic description using a Geoprobe®, or similar, continuous core soil probe drill rig.

Typically, groundwater monitoring wells are installed using a hollow-stem auger drill, and samples for lithologic characterization or environmental analysis are collected every 5 feet to the total depth explored. The samples are collected using brass tubes fitted inside a split spoon sampler. If copper or zinc contamination is the subject of the investigation, stainless steel liners are used instead of brass. Additional soil samples may be collected if there are significant changes in lithology or in areas of obvious soil contamination. The soil sampler and liners are cleaned with an Alconox® solution and rinsed with tap water prior to each sampling event. New liners are used whenever a soil sample may be retained for laboratory analysis.

During soil sample collection, the split spoon sampler is driven 18 to 24 inches past the lead auger by a 140-pound hammer falling 30 inches. The number of hammer blows necessary to drive the sampler every 6 inches ("Blow Count") and the amount of soil recovered are recorded on the Field Exploratory Soil Boring Log. It is necessary to record the type, diameter, and length of the split spoon sampler on the boring log, in order to be able to convert the blow counts to standard values.

The soil descriptions will be made according to ASTM Method D 2488-90, Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). The soil colors will be described, by color name and numeric description, according to Munsell® Soil Color Charts.

Monitoring Well Installation

Construction of Well Casing, Screen, and Filter Pack

Groundwater monitoring wells are constructed with threaded, Schedule 40, polyvinyl chloride (PVC) casing unless site geochemistry or contamination necessitates an alternative material. The wells are constructed with factory-slotted screened casing and threaded end caps.

A graded sand filter pack is placed in the annular space across the screened interval and extended approximately 1 to 2 feet above the screened casing, as site conditions permit. The well screen slot size is the maximum size capable of retaining 90% of the filter pack. Typically, 0.010-inch diameter slotted screen is used where the formation is predominantly clay and/or silt or fine sand and 0.020-inch screen is used where the formation is predominantly medium to coarse sand and/or gravel.

The filter pack grade (mean grain size) is selected according to native sediment type as follows: a) for poorly graded fine sand or silt/clay - 4 times the 70% grain size of the formation (grain size where 30% of the grains are larger and 70% are smaller); b) for medium to coarse sand, gravel, or well graded sediments - 6 times the 70% grain size. Since grain size analysis is not always available, Clearwater often selects screen size and filter pack on the basis of the site stratigraphy, specifically the finest significantly thick layer of sediment to be screened. Commonly selected grades are Lone Star® 3, 2/12, or 2/16 (or equivalent) with 0.020-inch slotted screen and Lone Star® 1/20 with 0.010-inch slotted screen. To prevent sand bridging of the filter pack and help settle the filter pack sand, a surge block should be used to swab the inside of the screened casing, prior to placing the well seal.

Well Seal and Completion

A minimum 2-foot-thick seal of bentonite pellets is placed above the filter pack to prevent extension of the filter pack into an overlying water-bearing unit. The bentonite seal is hydrated by either formation water or potable water. Neat cement or a cement/bentonite grout mixture seals the remaining annular space to the surface. If bentonite is used in the grout mixture, it will not exceed 5% by weight. The grout is placed using a tremie pipe, if the top of the bentonite is more than 20 feet below grade, or if water is present in the boring above the bentonite seal. A watertight locking cap and protective traffic-rated vault box is installed to protect the top of each well. Well construction details are recorded on a Well Construction Log and the Field Exploratory Soil Boring Log Form. Following completion of a well, Clearwater completes and submits, or ensures that the driller has sufficient information to complete, sign, and submit, a California Department of Water Resources Well Completion Report (Form 188) for each well.

Well Development

Well development is performed 48 hours, or more, after well installation, in order to allow the grout seal to set. Well development removes most of the particles that are smaller than the slot openings from the filter pack, thereby increasing the porosity and hydraulic conductivity of the filter pack.

The total depth of the well (depth to bottom of well) is measured, then the well is pumped, or bailed, of several well volumes to remove turbid water and sediment from the bottom of the well and to draw sediment that is finer than the slot opening through the well screen. The well is surged with a surge block for approximately 10 minutes to further remove loose sediment and then pumped, or bailed, to remove the turbid water and sediment from the well. The surging and bailing procedure is performed at least twice, followed by additional purging until the purged water is observed to be clear. Typically, greater than ten well volumes of groundwater will be removed from a well during development. Finally, the total depth of the well and depth to water are remeasured.

Multiple, large diameter, and/or deep wells can be developed by a drilling or well-servicing contractor using a truck-mounted well development rig. The contractor may use alternative well development techniques, such as bailing, jetting, or air development procedures.

Soil Boring Abandonment

Soil borings which are not to be converted into monitoring wells are sealed to the ground surface using neat cement or sand-cement slurry, in accordance with federal, state, and local regulations. Native soil or road construction surfacing may be used to fill the top 2 to 3 feet to ensure a completed flush surface and for cosmetic purposes, as permitted.