

# RECEIVED

By lopprojectop at 9:29 am, May 16, 2006

May 15, 2006 Trinity Project No. 103.002.001

Mr. Jerry Wickham Alameda County Health Care Services Agency Environmental Health Services, Environmental Protection 1131 Harbor Bay Parkway, Suite 250 Alameda, California 94502-6577

Re: Soil Vapor Sampling Workplan

Searway Property (SLIC Case No. RO0002584)

649 Pacific Avenue Alameda, California

Dear Mr. Wickham:

This document, prepared by Trinity Source Group, Inc. (Trinity) on behalf of Timber Del Properties, L.L.C., c/o Mr. Donald Lindsey, presents a Soil Vapor Sampling Workplan for the referenced site (Figures 1 and 2). In a letter dated March 17, 2006, the Alameda County Health Care Services Agency (ACHCSA) requested submission of the subject Workplan to evaluate the potential for indoor air vapor intrusion of total volatile hydrocarbons due to the previously identified Stoddard solvent impacts to soil and groundwater beneath the site. This Workplan includes discussions of the site description, previous environmental investigation activities, proposed scope of work, reporting, and an implementation schedule.

## SITE DESCRIPTION

The site is located at the intersection of Pacific Avenue and Webster Street in Alameda, California. The site was formerly the location of a dry cleaning operation from the 1940's until at least 1979. The project site building is currently used as a Kelly-Moore paint store. The general land use in the site vicinity is commercial and residential.

Previous investigations have shown total volatile hydrocarbons as Stoddard solvent (TVHss) to be present in shallow soil and groundwater beneath a portion of the site. Elevated concentrations of total extractable hydrocarbons (TEH) have also been detected in previously collected soil and grab-groundwater samples. The detection range of the TVH and TEH analytical methods overlap for the higher boiling point compounds contained in Stoddard solvent. Stoddard solvent is a

mixture of  $C_7$  to  $C_{12}$  hydrocarbons primarily containing straight and branched chain alkanes (30 to 50%), cycloalkanes (30 to 40%) and alkyl aromatic hydrocarbons (10 to 20%)<sup>1</sup>. The TVH analysis includes detection of  $C_7$  to  $C_{12}$  hydrocarbons while the TEH analysis includes detection of  $C_{10}$  to  $C_{24}$  hydrocarbons. The TVH analysis is the appropriate and representative analysis for quantifying Stoddard solvent.

# SUMMARY OF PREVIOUS INVESTIGATION ACTIVITIES

On March 8, 2003, Stellar Environmental Solutions, Inc. (Stellar) performed subsurface investigation activities at the site; investigation work was reported in Stellar's March 18, 2003 *Subsurface Site Investigation Report*. Four borings, designated BH-01 through BH-04 were advanced at the site. Soils encountered during drilling consisted of base rock fill to approximately 2.5 feet below ground surface (bgs), underlain by a fine-grained sand to a depth of approximately 5.5 feet bgs. The sand layer is underlain by clayey sand to depths ranging from 10 feet bgs to 15 feet bgs, the maximum depth explored. In boring BH-01, the clayey sand was underlain by a medium-grained sand from a depth of approximately 10 feet bgs to 12 feet bgs. Groundwater was encountered at depths ranging from 10 feet bgs to 13 feet bgs in each of the borings. Based on regional topography and information from monitoring activities performed at a site on the corner of Webster Street and Pacific Avenue from 1993 to 1995, groundwater flow at the site is generally west.

Soil samples were collected at depths ranging from 6.5 feet bgs to 12.5 feet bgs; and grab groundwater samples were collected from each of the boreholes. All samples were analyzed in the laboratory for gasoline range and Stoddard solvent range total volatile hydrocarbons (TVHg and TVHss, respectively) and diesel range and motor oil range total extractable hydrocarbons (TEHd and TEHmo, respectively) by Environmental Protection Agency (EPA) Method 8015 modified; benzene, toluene, ethyl benzene, and xylenes (BTEX) and methyl tert-butyl ether (MTBE) by EPA Method 8021B; and volatile organic compounds (VOCs) by EPA Method 8260B. In soil, TVHg were detected in two of the four samples at concentrations of 4.7 parts per million (ppm) and 8,800 ppm. TVHss were detected in two of the four samples at concentrations of 3.1 ppm and 5,800 ppm. The laboratory reported that the TVHg and TVHss results did not match the chromatogram standard for gasoline and Stoddard solvent. BTEX compounds, MTBE, TEHd, and TEHmo were not detected in any of the soil samples collected. No detectable concentrations of VOCs were found in any of the soil samples collected.

In groundwater, TVHg were detected in two of the four samples at concentrations of 360 parts per billion (ppb) and 270 ppb. TVHss were detected at concentrations of 270 ppb and 280 ppb. BTEX compounds were detected in one of the four samples with benzene detected at a

U.S. Department of Health and Human Services, Public Health Service, Agency for Toxic Substances and Disease Registery (June 1995), Toxicological Profile for Stoddard Solvent.

concentration of 0.68 ppb. MTBE was detected in three of the four samples at concentrations ranging from 2.1 ppb to 7.4 ppb. TEHd were detected in all four samples at concentrations ranging from 86 ppb to 8,400 ppb. TEHmo were detected in two of the four samples at concentrations of 470 ppb and 2,600 ppb. Grab-groundwater samples contained chloroform in one of four samples at a concentration of 1.0 ppb; trichloroethene (TCE) in two of four samples at concentrations of 1.3 ppb and 1.9 ppb; tetrachloroethene (PCE) in two of four samples at concentrations ranging of 1.9 ppb and 2.6 ppb, trans 1,2-dichloroethene (trans 1,2-DCE) in one of four samples at a concentration of 0.5 ppb and cis 1,2-dichloroethene (cis 1,2-DCE) in one of four samples at a concentration of 0.7 ppb. Four additional borings (BH-05 through BH-08) were advanced at the 1713 Webster Street address, adjacent to the subject site. These borings are outside the area of investigation related to 649 Pacific Avenue, and are not discussed further. Furthermore, no further investigation is required at this time for the suspected underground storage tank at 1713 Webster Street as indicated by ACHCSA in a letter dated March 17, 2006.

Based on the findings of the investigation, Stellar recommended review of additional environmental records to identify the sources of the impact discovered, the advancement of additional borings to define the lateral extent of Stoddard solvent impact, notification of relevant regulatory agencies regarding the findings, and an eventual site closure assessment after completion of additional assessment work.

On March 25, 2003, Stellar performed additional soil sampling along an exposed sanitary sewer trench at the site. This phase of the investigation was reported in Stellar's April 2, 2003 Report of Soil Analytical Results, Sanitary Sewer Line Trench at 649 Pacific Avenue, Alameda, California. Soil conditions along the trench were not logged during this phase of the investigation. A total of 9 soil samples were collected along the trench and 1 soil sample was collected from the base of the floor drain leading to the sanitary sewer line. Soil samples from along the sewer trench were collected from two depths at each of four locations. All samples were analyzed for TVHss, BTEX, and MTBE. TVHss was detected in three of the nine samples at concentrations ranging from 960 ppm to 2,700 ppm; all the samples with detected TVHss concentrations were from the lower soil strata at depths ranging from 7.5 feet to 8.0 feet bgs. Trace concentrations of ethyl benzene and xylenes were detected in the same three samples. MTBE was not detected in any of the samples collected.

Remedial investigation activities performed by Stellar between March and July 2003 were documented in Stellar's July 31, 2003 *Site Remedial Investigation Report*. Some of the data discussed in the July 31, 2003 report were previously reported in Stellar's March 18, 2003 and April 2, 2003 reports. The July 31, 2003 report summarized new findings and the findings of these previous investigation activities. A total of 16 additional soil borings were advanced on July 9 and July 10, 2003. Groundwater was encountered at depths ranging from ranging from 10 feet bgs to 13 feet bgs in each of the borings. A total of 14 soil samples collected from the borings were selected for laboratory analyses; samples were analyzed for TVHss, BTEX

compounds, and MTBE. Four of the samples were also analyzed for TEH. TVHss were detected in two of the soil samples at concentrations of 17 ppm and 1,900 ppm. TEH range hydrocarbons were detected in three soil samples at concentrations ranging from 9.4 ppm to 3,700 ppm. BTEX compounds and MTBE were not detected in any of the soil samples analyzed. A total of 9 grab-groundwater samples were collected and analyzed for TVHss, BTEX compounds, and MTBE. Four of the grab-groundwater samples were also analyzed for TEH. TVHss were detected in one of the samples at a concentration of 99,000 ppb. TEH were detected in all four samples at concentrations ranging from 100 to 250 ppb. Trace concentrations of toluene (2 samples) and total xylenes (one sample) were detected. MTBE was detected in 7 of the 9 grab-groundwater samples at concentrations ranging from 3.3 ppb to 12 ppb. During July 2003, five additional borings (BH-13, BH-14, and BH-31 through BH-33) were advanced at the 1713 Webster Street address, adjacent to the subject site. These borings are outside the area of investigation related to 649 Pacific Avenue, and thus are not discussed by this report.

Based on the results of previous investigations, Stellar attributed the soil and groundwater impact to former uses of the 649 Pacific Avenue building and potential discharges from the sanitary sewer line. After review of investigation data, RRM, Inc. (RRM) has also concluded that the sanitary sewer is the most likely source of Stoddard solvent impact at the site.

Based on the findings of investigation activities performed at the site, Stellar prepared a corrective action plan (CAP) dated July 31, 2003. The corrective action for the site proposed by Stellar included excavation of soil from beneath the floor of the 649 Pacific Avenue site. Stellar estimated that approximately 150 tons of impacted soil would be removed during the excavation activities to remove impacted soil to concentrations at or below 100 ppm. Stellar also proposed confirmation soil sampling following the removal of impacted soils. After completion of soil excavation and site restoration activities, Stellar proposed the installation of four groundwater monitoring wells and the performance of quarterly groundwater monitoring activities to confirm the effectiveness of the remedial excavation.

Pursuant to the recommendations made by Stellar and RRM, Inc. (RRM), RRM recommended in the March 2004 work plan that a soil and groundwater investigation be performed. The general scope for this investigation included installing five groundwater monitoring wells, well development, sampling, and surveying, and laboratory analyses of soil and groundwater samples. Borings MW-1 though MW-5 were advanced to 20 feet below ground surface, and completed as 2-inch diameter groundwater monitoring wells. Wells MW-1 and MW-2 were completed inside the building at 649 Pacific Avenue, and wells MW-3, MW-4 and MW-5 were located in the parking lot immediately west of the building. These well locations were selected to delineate soil and groundwater conditions in the vicinity and downgradient of the previously identified Stoddard solvent detections.

Selected soil samples were analyzed in the laboratory for TPHss and BTEX. Groundwater samples from each well were analyzed in the laboratory for TPHss, TPHg, and BTEX. Soils beneath the site consisted predominantly of silty sand to the maximum depth explored of 20 feet bgs. Wells MW-2, MW-3, MW-4 and MW-5 also penetrated a clayey sand layer ranging in thickness from approximately 1 to 4 feet, within the depth interval from 4 to 11 feet bgs. Groundwater was encountered and stabilized at depths of approximately 5.0 to 5.6 feet bgs on March 1, 2005. Groundwater flow direction was calculated toward the northeast at a gradient of approximately 0.004 feet/foot. The soil analytical data indicate non-detectable concentrations of TPHss in all borings except for MW-1, which had 380 ppm TPHss at a depth of 10 feet bgs, and 7 ppm TPHss at 20 feet bgs. BTEX concentrations were below detection limits in all soil samples analyzed. The groundwater analytical data indicate non-detectable concentrations of TPHss and TPHg in all wells except Well MW-1, which had 550 ppb TPHss. BTEX concentrations were also non-detectable, except for toluene in wells MW-1 and MW-2. These wells had 0.73 and 0.53 ppb toluene detected, respectively. Based on the results of this investigation, RRM recommended quarterly monitoring of the five wells for a period of at least one year to provide data for evaluation of plume stability.

Based on one year of groundwater monitoring in 2005 of wells MW-1 through MW-5, groundwater levels have ranged from 5.06 feet to 7.89 feet below top of well casing. On April 29, 2006, depth to water in wells MW-3 through MW-5 ranged from 4.02 feet to 5.01 feet below top of well casing. Since 2003, groundwater levels have increased approximately five feet on average across the site. Soil data indicates that the bulk of Stoddard solvent affected soil was encountered between approximately 6.5 and 8 feet bgs, soil which is now submerged below groundwater.

In the *Groundwater Monitoring Results – Fourth Quarter 2005* report, RRM recommended that the site be evaluated for low-risk closure based on four quarters of groundwater monitoring data. In response, the ACHCSA requested submission of the subject Workplan to evaluate the potential for indoor air vapor intrusion of total volatile hydrocarbons due to Stoddard solvent impacts to soil and groundwater. The proposed scope of work for the requested Workplan is included below.

#### PROPOSED SCOPE OF WORK

In general, Trinity proposes the advancement of three hand auger soil borings to a depth of approximately 4 to 5 feet bgs for the purpose of constructing semi-permanent soil gas probes for the collection of soil vapor samples for laboratory analysis of TVHss, BTEX and MTBE.

The following tasks detail the scope of work to complete the proposed soil vapor investigation.

#### **Pre-Field Activities**

#### Permitting

Prior to conducting the fieldwork, Trinity will procure all the required permits. Alameda County Public Works Agency requires a completed site hazard information form and drilling permits for contamination investigation and environmental monitoring.

### Health and Safety Plan and Utility Clearance

Site safety procedures will involve the preparation of a site-specific health and safety plan identifying potential chemical and physical hazards which may be encountered during the course of field activities. All Trinity personnel involved in conducting the field activities will have met OSHA 40 Hour Hazardous Waste Operations and Emergency Response Training.

Before any drilling activity at the site, the site will cleared for underground utilities by notification of Underground Service Alert (USA), and available site plans will be reviewed.

As part of the health and safety plan, a borehole clearance review form will be completed prior to beginning work. As outlined in the health and safety plan, a communication stream will be maintained to address any and all safety and project related issues that may arise.

### Preparation of Site Building for Interior Work

The 649 Pacific Avenue structure is currently being used as a paint store. Any obstructions and/or floor coverings will need to be cleared prior to initiation of drilling.

# Soil Vapor Sampling Protocol

This phase of investigation will include soil vapor sampling at three locations inside the Kelly-Moore Paint store at locations shown on Figure 2. These locations contain the highest levels of TVHss detected in soil and groundwater sampling previously conducted at the site. The sampling will be performed on a Sunday when the paint store is closed. Sampling will be accomplished by installing semi-permanent soil vapor probes in a 2-inch diameter hand auger boring. The installation, sampling and analysis procedures will generally follow the guidelines contained in the California Department of Toxic Substances Control (DTSC) Advisory for Active Soil Gas Investigations dated January 28, 2003<sup>2</sup>.

The proposed soil vapor sample collection procedures are summarized below:

<sup>&</sup>lt;sup>2</sup> California Environmental Protection Agency, Department of Toxic Substances Control (2003), ADVISORY – ACTIVE SOIL GAS INVESTIGATIONS.

Hand Auger Borings: Concrete cores will be cut through the existing concrete slab. The soil borings will be advanced using hand auger drilling equipment to a depth of approximately 5 feet bgs. For each boring, the hand auger will be advanced in intervals of approximately ½ foot, then the rods and hand auger will be removed from the borehole for soil evaluation by the onsite Trinity geologist. The auger head will then be cleaned, inserted into the borehole, and advanced over the next sampling interval where the soil evaluation process is repeated.

The onsite Trinity geologist will log the soils including a physical description of observed soil characteristics (i.e. moisture content, consistency, obvious odor, color, photo-ionization detector [PID] readings, etc.), drilling difficulty, and soil type as a function of depth in accordance with the Unified Soil Classification System (USCS).

Screening with the PID will be performed at approximately one-foot depth intervals directly in the retrieved soil. The PID screening is conducted by inserting a ½ inch inside diameter brass tube approximately 1 inch into the soils contained in the bottom of the hand auger head. The brass tube will be attached to the PID sample tube with an air tight fitting for field screening. The PID readings represent relative levels of organic vapors for the site conditions at the time of drilling. The PID readings will be noted on the field logs.

Semi-Permanent Soil Gas Probe Construction: Upon completion of hand auger drilling and soil evaluation, the boring will be completed as a semi-permanent soil gas probe. The onsite Trinity geologist will determine the interval for the soil gas probe, based on observations made during the advancement of the continuously cored boring. Soil gas probe installation depths will be above the water table and selected near lithologic interfaces within soils of higher relative permeability (sandy horizons) and/or with elevated PID readings. If no lithologic change or elevated PID readings are encountered and if groundwater is at 6 feet or lower, a default sampling depth of 5 feet bgs will be selected. If groundwater is shallower than 6 feet, then a sampling depth of one foot above groundwater will be selected.

Once the total depth of the borehole is reached and the soil vapor sampling depths are determined, the probe will be constructed. A schematic diagram of the proposed soil gas probe is included as Figure 3. The probe will be constructed with a tip consisting of a ceramic air stone (aquarium micro air bubbler) of ½ inch outside diameter, 2 inches long and a standard NPT barb fitting; an appropriate length of ¼ inch outside diameter tubing; and with a surface termination on the tubing with a press-in barbed plug. Approximately 5 inches of #2/12 sand will be placed in the bottom of the borehole. If the borehole is deeper than the desired sampling interval, the bottom portion will be filled with hydrated bentonite chips prior to adding sand pack. The tip-tube-plug assembly will be placed into the borehole with the tip resting on top of the sand pack. The ceramic tip will then be covered with #2/12 sand until the top portion of the tip is covered with approximately 5-inches of sand. Bentonite chips will be added to the hole in 1 foot lifts and approximately 1 cup of tap water will be added to each lift until the borehole is filled.

Prior to the installation of the next soil gas probe, a label with the soil gas probe identification and depth noted will be placed near the top of the tube. The subsequent soil gas probes will be constructed in the same manner. The bentonite chips will be allowed to fully hydrate and the soil gas probes will be allowed to equilibrate for a minimum of 30 minutes prior to purging and sample collection.

Soil Vapor Sample Collection: The DTSC protocol outlines steps for a purge volume test to determine the site-specific purge volume to be employed prior to soil vapor sample collection. Conducting a purge volume test for this project is impractical for several reasons: 1) the limited number of sampling points and weekend work requirements makes the use of an onsite laboratory cost prohibitive; 2) the work will be conducted inside an active business and conducting purge volume tests would require multiple mobilizations; 3) due to the sandy and permeable nature of the shallow soils, there is little likelihood that variable purge volumes will produce significantly different results; and 4) leaving the vapor probes installed over several weeks waiting for the purge volume test analytical report may result in drying of the bentonite and cause ambient venting of the shallow soil gas. For these reasons, Trinity proposes using the DTSC recommended default of three (3) purge volumes for all sampling points. The unit purge volume will be calculated based on the volume of the annular sand pack pore space around the probe tip and the internal volume of the tubing. To purge soil gas, a 60 cubic centimeter (cc) plastic or glass syringe is connected to the soil gas probe tubing via a plastic on-off valve. Three (3) volumes of ambient air is then purged at a rate between 100 to 200 cc per minute. Leakage during soil vapor sampling may dilute samples with ambient air and/or cross contaminate the sample from an external source. At each soil gas sample probe location, a leak check will be performed by taping a plastic bag around the sample tubes and covering the top of the bentonite seal. Immediately prior to purging, approximately 0.5 liters of 1,1-difluoroethane ("canned air") will be sprayed into the air space of the plastic bag around the tubing and bentonite seal. The syringe connection will be leak checked by closing the 3-way valve and attempting to force ambient air through the needle.

Following purging, the soil vapor samples will be collected. A fitting is connected to a 1 liter Summa canister with a pressure gauge installed on top of the fitting. The Summa canister will be connected by 1 to 2 feet of tubing to a 100 to 200 milliliter per minute flow regulator followed by a laboratory supplied particulate filter. On the downhole side of the particulate filter, a vapor-tight valve will be installed to connect the sampling equipment with the probe tube. In addition, a plastic bag will be taped around the connections between the sample tubing, the flow regulator and the Summa canister. Immediately prior to sample collection, approximately 0.1 liters of 1,1-difluoroethane ("canned air") will be sprayed into the air space of the plastic bag.

The time at which sample collection begins will be recorded. Once the sample Summa canister pressure gauge indicates approximately 5 inches of mercury, the sample canister valve will be closed and the time recorded. The fitting on the sample canister will be replaced with a

laboratory supplied brass plug. The sample canister will be labeled and chain-of-custody maintained by recording: sample name, sample date, sample time, final vacuum, canister and flow controller serial numbers, initials of sample collector, and the compounds to be analyzed by the certified laboratory. The sample canisters will be stored in a container that blocks sunlight to the opaque canister and does not subject the air-tight canister to changes in pressure and temperature. The sample canisters will be delivered to the analytical laboratory via ground transportation under chain-of-custody documentation.

**Abandonment of Soil Gas Probes:** Once all soil vapor sampling has been completed, the soil gas probes will be abandoned. To abandon the semi-permanent nested probes, the sample tubes will be removed manually and the boring will be re-drilled with a hand auger to the total depth. Once the total depth is achieved, the borings will be filled with a "redi-mix" type of concrete to match finish grade.

# Laboratory Analysis

**Analysis of Soil vapor Samples:** Soil vapor samples will be submitted to a California Certified analytical laboratory for analysis by the following EPA test methods:

- EPA Method TO-14A for BTEX and MTBE
- EPA Method TO-3 for TVHss
- 1,1-difluoroethane by EPA Method TO-14A to verify that no leaks were present in the sampling apparatus.

All analyses will be conducted by California State-certified laboratory. All Summa canisters will be analyzed within 72 hours of collection.

### REPORTING

After completion of the field work and receipt of all analytical data, Trinity will prepare a comprehensive report of the activities and findings. The report will include boring logs, analytical data, maps showing sample locations, comparison of the soil vapor sampling results with Environmental Screening Levels (ESLs)<sup>3</sup> and recommendations for future site compliance and/or closure activities.

<sup>&</sup>lt;sup>3</sup> California Environmental Protection Agency, California Regional Water Quality Control Board, San Francisco Bay Region (2005), INTERIM FINAL – Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater.

### **SCHEDULE**

Trinity will begin the above scope of work immediately following the approval of this Workplan by the ACHCSA. Upon approval, it is anticipated that drilling permit will take up to three weeks to complete and process. Field work will likely begin approximately one to two weeks following the procurement of the necessary permits. Allowing for routine laboratory turnaround, the soil analytical results should be available approximately two weeks later. After receiving the analytical data, Trinity will submit our report to ACHCSA within four weeks.

### DISTRIBUTION

A copy of this Workplan has been forwarded to the following:

Mr. Don Lindsey Timber Del Properties, L.L.C. 2424 Central Avenue

Alameda, California 94501 Mr. Carl Searway 3032 Dakota Street Mr. Mark Russel

The Mechanics Bank

343 Sansome Street, Suite 101 San Francisco, California 94101

Alameda, California 94501

If you have any questions regarding this Workplan, please call Trinity at (831) 685-1217.

Sincerely,

TRINITY SOURCE GROUP, INC.

David A. Reinsma, P.G.

President and Principal Geologist

VID A. REINSMA

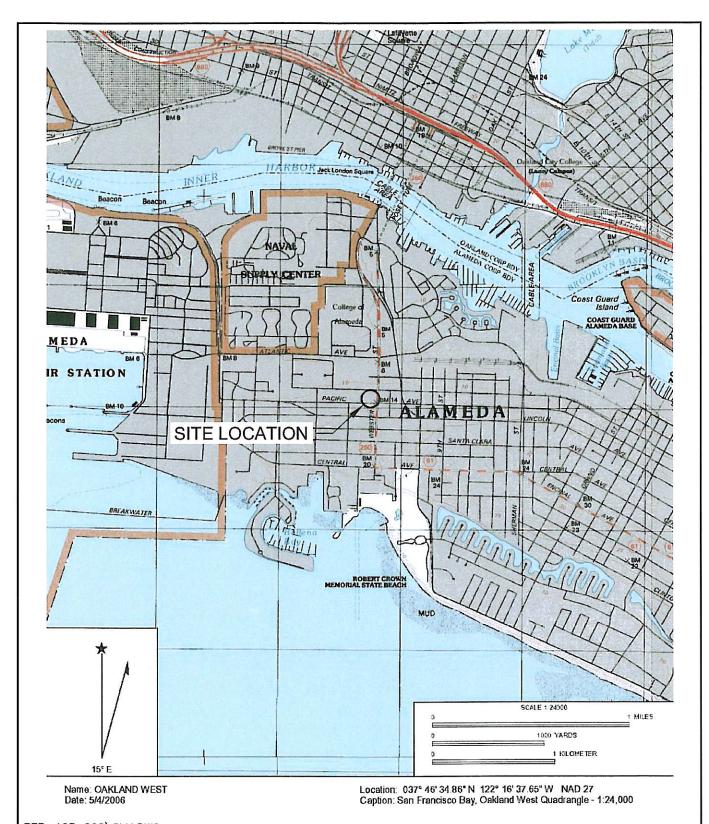
Howard Whitney, P.G., C.H.G.

Senior Hydrogeologist

Attachments Figure 1 – Site Location Map

Figure 2 – Proposed Soil Vapor Probe Locations

Figure 3 – Semi-Permanent Soil Gas Probe Construction Schematic



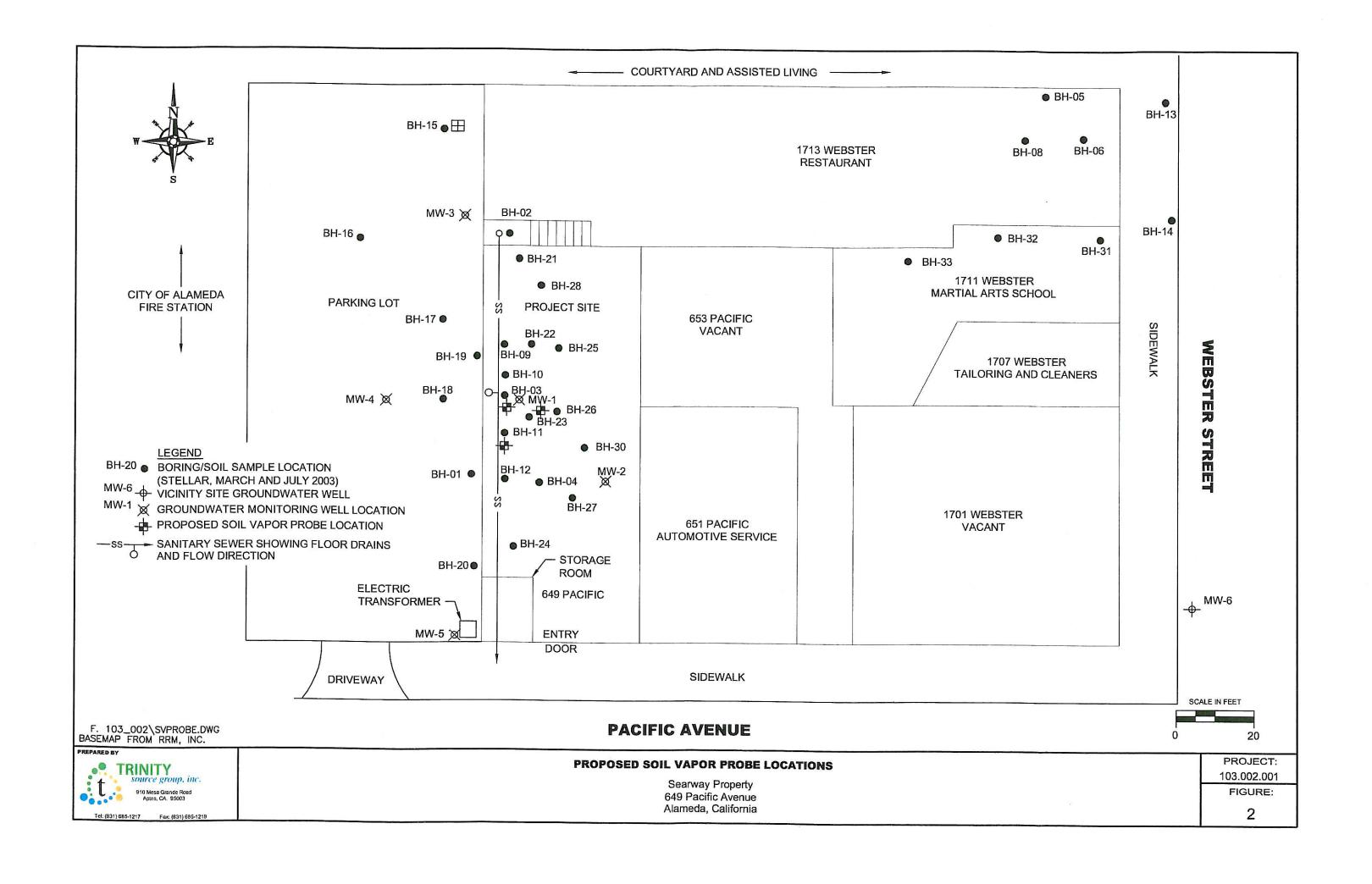
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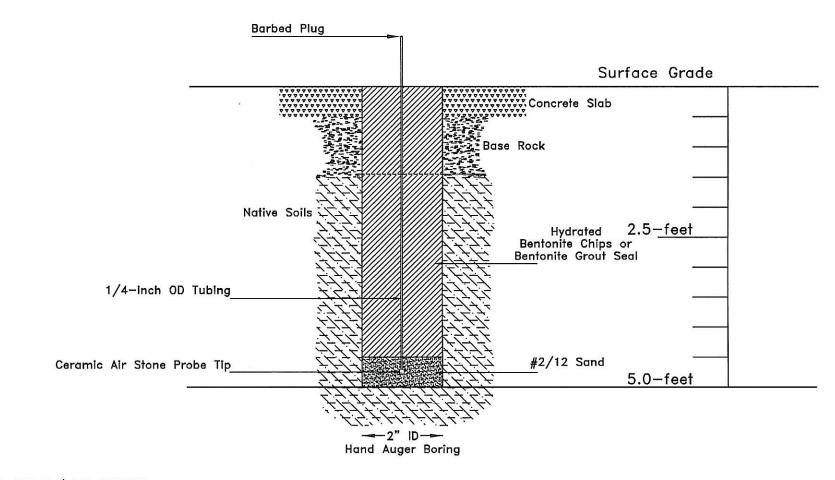
### SITE LOCATION MAP

Searway Property 649 Pacific Avenue Alameda, California PROJECT: 103.002.001 FIGURE:

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# Semi-Permanent Soil Gas Probe Construction Schematic



REF. 103\_002\GAS-SCH.DWG



SEMI-PERMANENT SOIL GAS PROBE CONSTRUCTION SCHEMATIC	PROJECT:
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Searway Property	FIGURE:
649 Pacific Avenue Alameda, California	3