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October 3, 2007

Ms. Donna Drogos
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

Subject: Site Address: 557 Merrimac Street, Oakland, California

Dear Ms Drogos.:

SOMA's "Workplan to Conduct Additional Soil and Groundwater Investigation Around Former Underground Storage Tanks" for the subject property has been uploaded to Alameda County's FTP site for your review. As soon as we receive authorization from Mr. Yi, we will upload the workplan to the State's geotracker database.

Thank you for your time in reviewing our report. Please do not hesitate to call me at (925) 734-6400, if you have questions or comments.

Sincerely,

Mansour Sepehr, Ph.D.,PE
Principal Hydrogeologist

REGISTERED PROFESSIONAL ENGINEER
MANSOUR SEPEHR
No. C042928
Exp. 3-31-08
CIVIL
STATE OF CALIFORNIA

cc: Mr. Noel Yi w/report enclosure

WORKPLAN TO CONDUCT ADDITIONAL SOIL AND GROUNDWATER INVESTIGATION AROUND FORMER UNDERGROUND STORAGE TANKS

557 MERRIMAC STREET
OAKLAND, CALIFORNIA

October 2, 2007

Project 3020

Prepared for
Mr. Noel Yi
2756 Alvarado Street #A-B
San Leandro, California 94577

SOMA ENVIRONMENTAL ENGINEERING, INC.
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CERTIFICATION

SOMA Environmental Engineering, Inc. has prepared this workplan on behalf of Mr. Noel Yi, property owner of 557 Merrimac Street, Oakland, California, to further evaluate the presence of petroleum hydrocarbons in soil and groundwater and determine whether existing chemicals in soil and groundwater pose an unacceptable human health risk to future residents of the property.

Mansour Sepehr, Ph.D., P.E.
Principal Hydrogeologist

REGISTERED PROFESSIONAL ENGINEER
MANSOUR SEPEHR
No. C042928
Exp. 3-31-08
CIVIL
STATE OF CALIFORNIA

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1. INTRODUCTION

SOMA Environmental Engineering, Inc., (SOMA) has prepared this workplan on behalf of Mr. Noel Yi, property owner of 557 Merrimac Street, Oakland, California (the Site). Figure 1 shows the Site and surrounding areas. The property is located on the western end of the 500 block of Merrimac Street, in the City of Oakland, California. The Site was formerly used as a gasoline service station. The property consists of a rectangular-shaped parcel of approximately 14,162 square feet and contains a former service station building, currently vacant and used for storage of the owner's belongings. Areas around the former underground storage tank (UST) pit and former waste oil tank pit are patched with concrete. The concrete foundations for the former pump island are still visible. Three groundwater monitoring wells formerly at the Site have been abandoned and closed under supervision of the Alameda County Health Care Services Agency (ACHCSA). The Site is surrounded by residential properties.

This report presents the current status of the Site's environmental conditions and proposes an additional field investigation to further characterize the extent of soil and groundwater contamination beneath the Site.

1.1 Site History

The Site is a closed Leaking Underground Storage Tank (LUST) case. In January 1995, four USTs were removed from the Site, including one 6,000-gallon, one 8,000-gallon and one 10,000-gallon gasoline UST, and one 500-gallon waste oil UST. The removals were witnessed by the ACHCSA. Holes were reported in one of the fuel USTs and in the waste oil UST. Following the UST removals, 17 soil samples were collected from UST pit excavations and stockpiled soils and witnessed by the ACHCSA (sample locations shown in Figure 2). In addition to the 17 samples, three soil samples were collected from beneath the dispenser islands. A groundwater sample was collected from the UST pit.

Results of laboratory analyses showed non-detectable levels for only six soil samples of total petroleum hydrocarbons as gasoline (TPH-g), and for BTEX (benzene, toluene, ethylbenzene and total xylenes). The three samples collected from beneath the dispenser islands yielded largely non-detectable results. The groundwater sample collected from the excavation contained 910 µg/L TPH-g, and BTEX constituents ranging from 6.9 µg/L to 19 µg/L. The soil sample collected from beneath the waste oil tank contained 8.1 mg/kg TPH-g, 74 mg/kg total petroleum hydrocarbon as diesel (TPH-d), and BTEX constituents ranging up to 92 mg/kg xylenes. Oil and grease was detected at 2,500 mg/kg. The LUFT five metals (calcium, chromium, lead, nickel, and zinc) were detected at background concentrations. Chlorinated hydrocarbons were non-detectable.

In February 1995, under supervision of ACHCSA, the waste oil tank was over-excavated. The excavated area was 25’ x 25’ x 9’ and during this process 250 cubic yards of soil were excavated and disposed of off-site. Four soil samples from sidewalls yielded non-detectable levels of petroleum hydrocarbons. However, a soil sample collected from the bottom of the excavation just above water-table contained elevated levels of petroleum hydrocarbons.

Due to presence of petroleum hydrocarbons in soil samples collected from the bottom of the excavation, per ACHCSA’s request three groundwater monitoring wells were installed at the Site (Figure 2). Following groundwater monitoring well installations, four quarterly groundwater monitoring events from July 1995 through June 1996 were conducted at the Site. Results indicated non-detectable levels of petroleum hydrocarbons in groundwater with one exception in the March 1996 groundwater monitoring event, when TPH-g and TPH-d were detected at 2,300 µg/L and 1,100 µg/L, respectively at MW-3 located downgradient of USTs. In addition, a groundwater sample collected from MW-3 contained benzene, ethylbenzene and xylenes concentrations at 30 µg/L, 140 µg/L, and 22 µg/L, respectively.

In a letter dated January 29, 1997, “no further action” status was granted by the ACHCSA. In the Case Closure Summary that accompanied this letter, the remaining residual hydrocarbons in soil are stated as 120 mg/kg of TPH-g; 420 mg/kg of TPH-d; 6,800 mg/kg of total oil and grease; and BTEX constituents ranging between 0.032 mg/kg and 0.140 mg/kg. The residual concentrations of dissolved phase hydrocarbons in groundwater are stated as 150 µg/L of TPH-g, 58 µg/L of TPH-d, 0.73 µg/L of ethylbenzene, and below environmental screening levels (ESLs) of chromium, nickel, and zinc.

The Case Closure Summary specifically states that the reason for Site case closure included removal of the source of contaminants, adequate characterization of the Site, absence of sensitive environmental receptors, and absence of significant human health risk in using the site as commercial development. It was noted that agency notification is required if there is a proposal for change in land use or site activity, or if basements to buildings are to be constructed.

The property owner, Mr. Noel Yi, is planning to convert the Site into a residential dwelling consisting of a 40-unit condominium development with an underground parking garage. There is a potential exposure pathway for volatile organic compounds (VOCs) to impact indoor air quality inside the underground parking garage. As such, in early 2007, he informed ACHCSA about his conversion plan and retained PIERS Environmental Services, Inc. (PIERS) to conduct additional investigations to evaluate the current status of environmental conditions at the Site. On February 9, 2007, PIERS drilled two exploratory soil borings, designated as B1 and B1A, within 1.5 feet of MW-3. Mr. Jesse Kupers of the Oakland Fire Department witnessed the drilling and sampling collection activities. During drilling no evidence of odor or staining was noted. A soil sample from 11.5 feet below ground surface (bgs) was collected, which would correspond to the area directly below the slab of the proposed parking garage floor. Based on PIERS field observation, a hydrocarbon-stained interval that corresponds with the first water-bearing zone was encountered between 9.25 and 10.8 feet below grade. A soil sample from approximately 10.3 feet below grade was also retained from this interval. Based on PIERS observation, groundwater stabilized at 7.8 feet below grade. A groundwater sample was collected from the borehole using a small diameter vinyl tubing fitted with a chuck ball tip to surge the water to the surface. No odor or sheen was observed in the water sample.

Soil and groundwater samples were analyzed for TPH-g, TPH-d, BTEX and methyl tertiary butyl ether (MtBE) using EPA Methods 8015 and 8020.

Soil samples collected from 10.3 feet below grade contained 20 mg/kg TPH-g, .065 mg/kg toluene, and 0.0081 mg/kg xylenes. Soil samples collected from 11.5 feet depth did not contain petroleum hydrocarbons above the laboratory detection limit. The grab groundwater sample collected from the same borehole contained 2,300 µg/L of TPH-d, and 11,000 µg/L of motor oil.

2. SCOPE OF WORK

The scope of work will involve delineation of the extent of the soil and groundwater chemical plume and concentrations of volatile organic chemicals in the vadose zone just above the water-bearing zone at the Site. The data will be used to evaluate the emission rate of VOCs and indoor air concentration of chemicals inside the hypothetical parking garage at the Site.

The scope of work will include the following tasks:

- Task 1: Permit Acquisition and Preparation of a Site Health and Safety Plan
- Task 2: Drilling bore holes using direct push technology (DPT) and collecting soil and groundwater samples.
- Task 3: Conducting Soil Gas Survey
- Task 4: Laboratory Analysis
- Task 5: Evaluation of Indoor Air Quality Using Soil Gas Data
- Task 6: Report Preparation

Following are brief descriptions of the above tasks.

2.1 Permit Acquisition and Preparation of Site Health and Safety Plan

Before drilling, the necessary permits will be obtained from the Alameda County Public Works Agency, Water Resources Section.

Prior to commencing field activities, a site-specific health and safety plan (HASP) will be prepared by SOMA. The HASP is designed to address safety provisions during field activities. It provides procedures to protect the field crew from physical and chemical hazards resulting from drilling, well installation, and groundwater monitoring and sampling. The HASP establishes personnel responsibilities, general safe work practices, field procedures, personal protective equipment standards, decontamination procedures, and emergency action plans.

2.2 Drilling Soil Borings and Collecting Soil and Groundwater Samples

The Site Closure Summary statement issued by ACHCSA in 1997 indicated that residual hydrocarbons are present in soil at up to 120 mg/kg of TPH-g, 420 mg/kg of TPH-d, 6,800 mg/kg of total oil and grease, and BTEX constituents ranging between 0.032 mg/kg and 0.140 mg/kg. These concentrations exceed the ESLs for residential land use type as set forth by the RWQCB. However, after 10 years the biodegradation process in soil and groundwater may have reduced these levels to below the ESL values for residential land use type. To evaluate whether the existing chemical concentrations in soil and groundwater are harmful to human health, SOMA plans to drill a number of soil borings around the former USTs and collect soil and groundwater samples for laboratory analysis. SOMA proposes advancing six direct-push borings at the locations presented in Figure 3.

The direct-push borings will be advanced to approximately 20 feet bgs depending on lithology encountered. Each boring will be continuously cored, and the cored soil described in accordance with the Unified Soil Classification System (USCS). In addition, the cored soil will be checked for hydrocarbon odors, visual staining, liquid phase hydrocarbons (free product), and screened using a photo-ionization detector (PID). PID readings will be noted on the boring logs. At each boring location, one grab groundwater sample and two soil samples for laboratory analyses will be collected from the top of water table (capillary fringe area) and below the water table.

Following soil sampling, the borings will be abandoned with a neat cement grout mixture tremmied into place as the push rods are removed, and completed at the surface with materials to match existing grade.

Soil and wastewater generated during boring activities will be temporarily stored on the Site in separate DOT-rated 55-gallon steel drums pending characterization, profiling and transportation to an approved disposal/recycling facility.

A description of the general field procedures is included in Appendix A.

2.3 Conducting the Soil Gas Survey

VOCs in the subsurface through volatilization can generate organic vapors which can enter into enclosed spaces and impact indoor air quality conditions. To evaluate vapor concentrations in the vadose zone just above the water table, a soil gas survey will be conducted. In conducting the soil gas survey, guidelines of the Department of Toxic Substances Control (DTSC) will be followed. Figure 3 shows soil gas sampling locations. The samples will be analyzed to evaluate potential human health risk posed by inhalation of contaminant vapors from petroleum hydrocarbon impacted soil and groundwater at the Site.

2.3.1 Soil Vapor Sampling Procedures

As outlined in the DTSC's guidelines, soil vapor samples will be collected by temporarily inserting a 1-inch diameter steel drilling rod equipped with a steel drop off tip. The probe will be hydraulically driven through the ground surface by direct push technology using a Geoprobe. Once the probe reaches the designated sampling depth of 4 to 5 feet bgs, a ¼-inch diameter Teflon flow sampling tube will be inserted down the center of the probe and threaded into the sampling port at the end of the rod. The sampling tube will then be capped with a vapor tight valve and the probe will be retracted 6 inches and allowed to equilibrate for approximately 20 to 30 minutes. A Summa Canister provided by the analytical laboratory (Air Toxic Laboratory) will be connected to the inlet side of the valve.

Hydrated bentonite will be placed around the top of the opening of the drill rod and on the ground surface surrounding the drill rod to inhibit surface air migration down the center or outer portion of the drill rod. A pre-and post-sample vacuum reading will be recorded for each Summa Canister.

A 200 milliliter/minute (ml/min) flow regulator with a built-in vacuum gauge will be connected to the downhole side of the tee fitting. A particulate filter will be also installed on the downhole side of the regulator. A vacuum test (mechanical leak check) will be performed for 10 minutes to test the connections between the Summa Canister and vapor tight valve. A leak detector compound (isopropyl alcohol) will be placed around the borehole subsurface, top of the probe rod, and at the vapor tight valve. The vapor tight valve and purge canister valve will then be opened to purge three volumes of air from the sample tubing and borehole. In addition to purging the calculated volume, a visual inspection of the vacuum gauge will be noted to insure adequate flow.

After three tubing volumes have been purged, the vapor tight valve and the purge canister valve will be closed. The vapor tight valve and sample canister valve will be closed until the sample canister gauge indicates approximately 5 inches mercury (Hg) of vacuum remaining in the canister, approximately 20% of the presample vacuum. As a quality control measure, one duplicate field sample will be collected from at least one boring.

After the vapor samples are collected, SOMA's field geologist will label the Summa Canisters with the post-sample vacuum reading. The drilling contractor will then remove the tubing and drilling rod and grout the borehole with Portland cement to surface grade. Soil vapor samples will be shipped via UPS to Air Toxics Ltd. (Air Toxics), a state-certified analytical laboratory under chain-of-custody.

2.4 Laboratory Analysis

Collected soil and groundwater samples will be submitted to a California state-certified environmental laboratory for analyses. The samples will be analyzed for:

- TPH-g
- TPH-d
- BTEX and MtBE

The soil vapor samples will be analyzed for TPH-g, TPH-d, BTEX, oil and grease using TO-17 Analysis Method.

2.5 Data Analysis

The analytical data generated during this investigation period will be combined with the existing analytical data to evaluate whether the current soil and groundwater chemical concentrations are below the ESL set forth by the RWQCB for residential dwelling use. In addition, the soil gas data gathered during this investigation will be used to evaluate indoor air quality using Johnson Ettinger Model as recommended by DTSC. The simulated indoor air concentration of petroleum hydrocarbons inside the underground parking garage will be used to conduct a human health risk assessment, if warranted.

2.6 Report Preparation

SOMA will prepare a report to include the following:

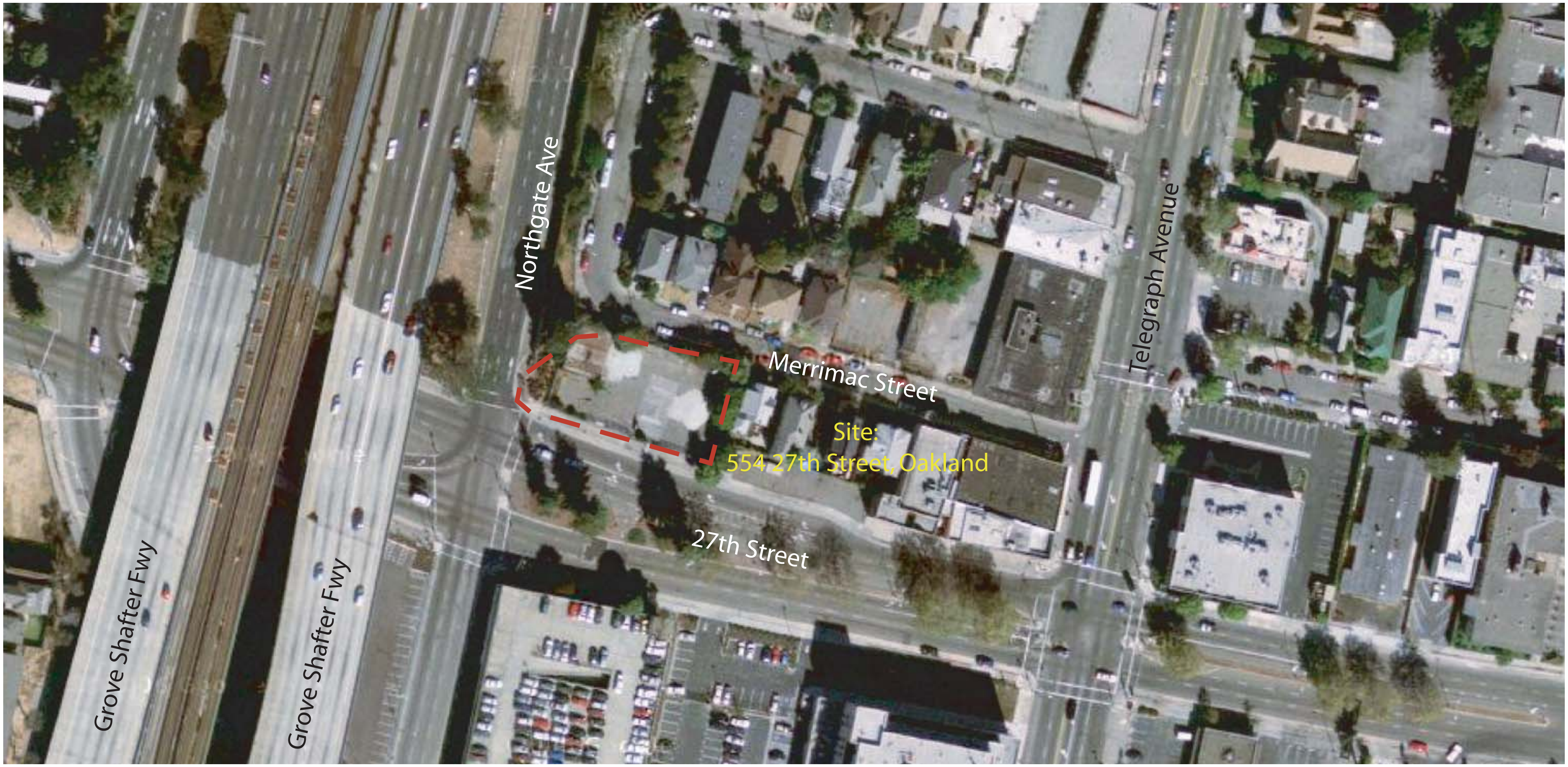
- A description of the field activities
- Tabulation of soil sample analytical data
- Maps illustrating the boring locations
- Boring logs
- Simulated indoor air concentration of petroleum hydrocarbons
- Conclusions regarding the adequacy of data based on the data and information derived from the field work and analytical data

- Recommendations

3. SCHEDULE

This workplan will be implemented upon receipt of written authorization from the ACHCSA. SOMA anticipates that the scope of work described in this workplan will be completed within a time period of eight to ten weeks, under normal conditions, from the date of obtaining necessary approvals, authorizations and permits. Field activities will be scheduled according to the availability of necessary equipment and personnel.

FIGURES



N

approximate scale in feet
0 100 200

Figure 1: Site Vicinity Map

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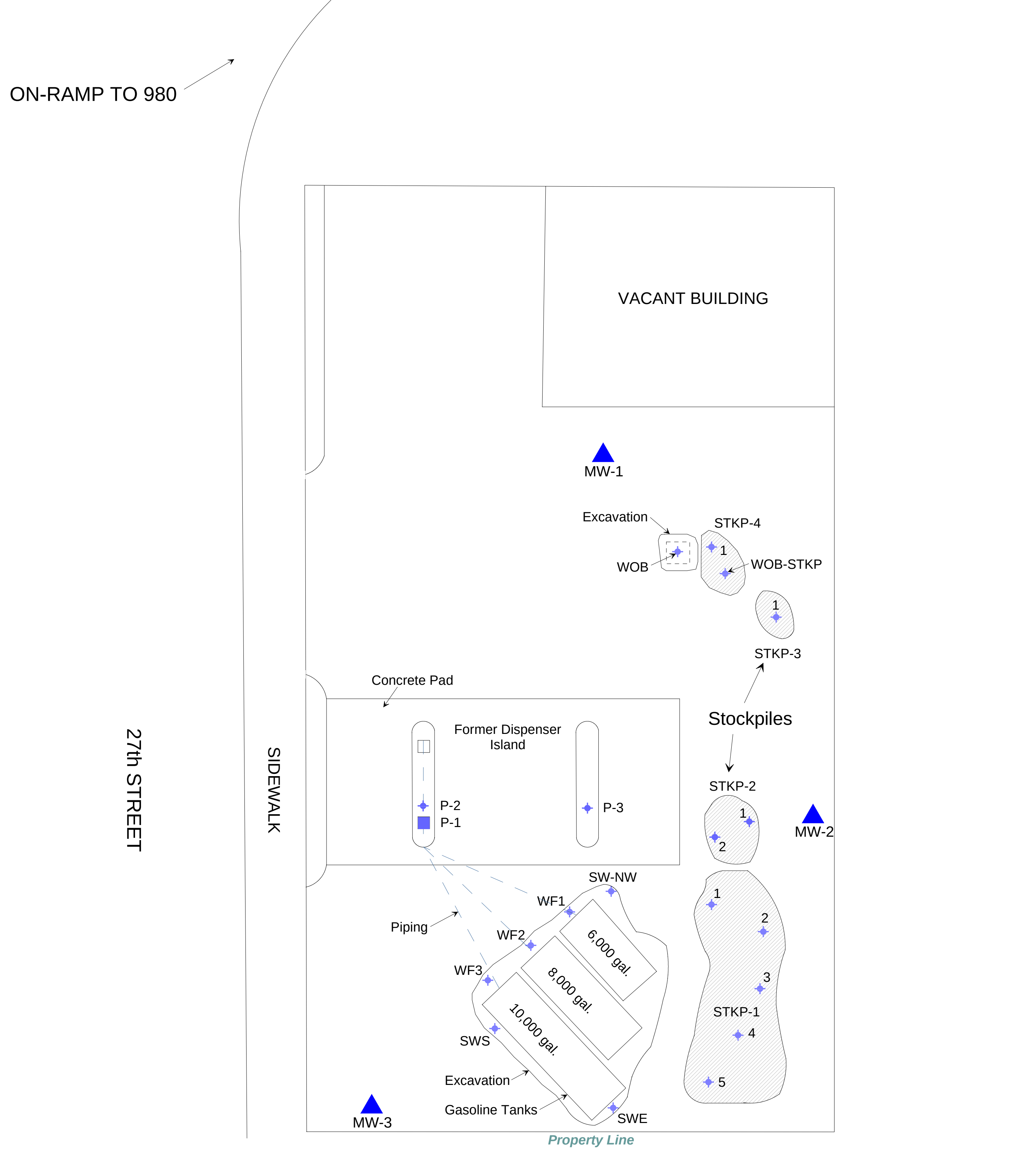

SOIL SAMPLE LOCATION

MONITORING WELL LOCATION

Note: Stockpiles 2 and 3 contain spoils from the same area. Samples STKP-2, 1 and 2, and STKP-3, 1 were combined to form one lab sample.

approximate scale in feet

0 20 40

Figure 2: Site map (554 27th Street, Oakland)

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Proposed Soil Boring

Proposed Soil Gas Sampling

MONITORING WELL LOCATION

N

Note: Stockpiles 2 and 3 contain spoils from the same area. Samples STKP-2, 1 and 2, and STKP-3, 1 were combined to form one lab sample.

approximate scale in feet

0 20 40

Figure 3: Site map showing the locations of the proposed soil and soil gas sampling locations

SOMA ENVIRONMENTAL ENGINEERING, INC.

APPENDIX A

Field Procedures

FIELD PROCEDURES

Single-Wall Hydraulic Push (GEOPROBE) Drilling

Utility Locating

Prior to drilling, boring locations are marked with white paint or other discernible marking and cleared for underground utilities through Underground Service Alert (USA). In addition, the first five feet of each borehole are air-knifed, or carefully advanced with a hand auger if shallow soil samples are necessary, to help evaluate the borehole location for underground structures or utilities.

Borehole Advancement

Pre-cleaned push rods (typically one to two inches in diameter) are advanced using a hydraulic push type rig for the purpose of collecting samples and evaluating subsurface conditions. The drill rod serves as a soil sampler, and an acetate liner is inserted into the annulus of the drill rod prior to advancement. Once the sample is collected, the rods and sampler are retracted and the sample tubes are removed from the sampler head. The sampler head is then cleaned, filled with clean sample tubes, inserted into the borehole and advanced to the next sampling point where the sample collection process is repeated.

Soil Sample Collection

The undisturbed soil samples intended for laboratory analysis are cut away from the acetate sample liner using a hacksaw, or equivalent tool, in sections approximately 6 inches in length. The 6 inch samples are lined at each end with Teflon® sheets and capped with plastic caps. Labels documenting job number, borehole identification, collection date, and depth are affixed to each sample. The samples are then placed into an ice-filled cooler for delivery under chain-of-custody to a laboratory certified by the State of California to perform the specified tests. The remaining collected soil that has not been selected for laboratory analysis is logged using the United Soil Classification System (USCS) under the direction of a State Registered Professional Geologist, and is field screened for organic vapors using a photo-ionization detector (PID), or an equivalent tool. Soil cuttings generated are stored in Department of Transportation (DOT) approved 55-gallon steel drums, or an equivalent storage container.

Grab Groundwater Sample Collection

Once the desired groundwater sampling depth has been reached, a Hydropunch tip is affixed to the head of the sampling rods. The Hydropunch tip is advanced between approximately 6 inches to one foot within the desired groundwater sampling zone (effort is made to emplace the Hydropunch screen across the center of the water table), and retracted to expose the Hydropunch screen. Grab groundwater samples are collected by lowering a pre-cleaned, single-sample polypropylene, disposable bailer down the annulus of the sampler rod. The groundwater sample is discharged from the bailer to the sample container through a bottom emptying flow control valve to minimize volatilization.

Alternatively, groundwater samples are collected by lowering a disposable bailer through the sampler rod or into the borehole.

Collected water samples are discharged directly into laboratory-provided, pre-cleaned vials or containers and sealed with Teflon-lined septum, screw-on lids. Labels documenting sample number, well identification, collection date, and type of preservative (if applicable, e.g., HCI for TPPH, BTEX, and fuel oxygenates) are affixed to each sample. The samples are then placed into an ice-filled cooler for delivery under chain-of-custody to a laboratory certified by the State of California to perform the specified tests.

Borehole Completion

Upon completion of drilling and sampling, the rods are retracted. Neat cement grout, mixed at a ratio of 6 gallons of water per 94 pounds of Portland cement, is introduced, *via* a tremmie pipe, and pumped to displace standing water in the borehole. Displaced groundwater is collected at the surface into DOT approved 55-gallon steel drums, or an equivalent storage container. In areas where the borehole penetrates asphalt or concrete, the borehole is capped with an equivalent thickness of asphalt or concrete patch to match finished grade.

Organic Vapor Procedures

Soil samples are collected for analysis in the field for ionizable organic compounds using a PID with a 10.2 eV lamp. The test procedure *involves* measuring approximately 30 grams from an undisturbed soil sample, placing this subsample in a Ziploc--type bag or in a clean glass jar, and sealing the jar with aluminum foil secured under a ring-type threaded lid. The container is warmed for approximately 20 minutes (in the sun); then the head-space within the container is tested for total organic *vapor,* measured in parts per million as benzene (ppm; volume/volume). The instrument is calibrated prior to drilling. The results of the field-testing are noted on the boring logs. PID readings are useful for indicating relative levels of contamination, but cannot be used to evaluate petroleum hydrocarbon levels with the confidence of laboratory analyses.

Equipment Decontamination

Equipment that could potentially contact subsurface media and compromise the integrity of the samples is carefully decontaminated prior to drilling and sampling. Drill augers and other large pieces of equipment are decontaminated using high pressure hot water spray. Samplers, groundwater pumps, liners and other equipment are decontaminated in an Alconox scrub solution and double rinsed in clean tap water rinse followed by a final distilled water rinse.

The rinsate and other wastewater are contained in 55-gallon DOT-approved drums, labeled (to identify the contents, generation date and project) and stored on-site pending waste profiling and disposal.

Soil Cuttings and Rinsate/Purge Water

Soil cuttings and rinsate/purge water generated during drilling and sampling are stored onsite in DOT-approved 55-gallon steel drums pending characterization. A label is affixed to the drums indicating the contents of the drum, suspected contaminants, date of generation, and the boring number from which the waste is generated. The drums are removed from the site by a licensed waste disposal contractor under manifest to an appropriate facility for treatment/recycling.