SOMA
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October 17, 2013

Mr. Mark Detterman
Alameda County Environmental Health Services
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502

Re: Workplan Addendum
15101 Freedom Avenue, San Leandro, California
Fuel Leak Case No. RO0000473

Dear Mr. Detterman:

SOMA has prepared this letter workplan in response to your email directive dated October 10, 2013 and to address the data gaps based on our discussion with the ACEH representatives. In addition to the work proposed in SOMA's report 'Updated Site Conceptual Model and Data Gap Workplan, dated July 22, 2013, SOMA will incorporate the following into the work schedule. A revised figure to show boring/sampling locations is also attached.

Free-Product (FP) Fingerprinting: During the Third Quarter 2013 groundwater monitoring event 0.05 feet of FP was observed in MW-6. Previously FP has been observed in this well twice (December 2011 and September 2012). Based on the SOMA's discussion with the ACEH staff, fingerprinting analysis is being conducted on a sample of FP obtained from MW-6 (Figure 1). Results of this analysis will reveal the nature of this FP and indicate if it is weathered.

Vapor Sampling: In order to determine the risk of vapor intrusion into the neighboring residences, SOMA will collect a vapor sample (SV-1) from the crawl space of the residence adjacent to the southern boundary of the site. This vapor sampling will be conducted in accordance with the most recent DTSC guidelines. Along with the contaminants of concern, oxygen, nitrogen, and tracer gas samples will also be collected. Proposed sampling location is as shown on Figure 1. General field procedures to be followed are adopted from the DTSC document 'Guidance for the evaluation and mitigation of subsurface vapor intrusion to indoor air', dated October 2011 and are included in the attachments.

Direct Push (DP) Boring: SOMA will install one DP boring (DP-6) on the property adjacent to the southern boundary of the site in order to delineate the extent of contamination into the residential neighborhood. Proposed boring location is as shown on Figure 1. DPT is an efficient method of collecting continuous soil cores while preventing cross-contamination; it involves

hydraulically hammering a set of steel rods into the subsurface with the lead section consisting of a polyethylene-lined sampler. After drilling rods are pushed to the desired depth, the soil-filled liner is retrieved. Each boring will be continuously cored, and descriptions of cored soil will be entered in logs in accordance with the Unified Soil Classification System (USCS). In addition, cored soil sections will be checked for hydrocarbon odors and visual staining, and screened using a photo-ionization detector (PID). PID readings will be noted on boring logs.

Additional CPT/MIP Borings: In order to evaluate the source of benzene in wells MW-1 and MW-2, SOMA will install two additional CPT/MIPs (CPT/MIP-17 and CPT/MIP-18) upgradient of the source on 151st Avenue. Proposed boring locations are as shown on Figure 1.

Additional multi-phase extraction (MPE) Event: SOMA has recently conducted extended MPE events in May 2013 and August 2013. Based on the success of these events, SOMA will conduct another extended MPE event from October 15, 2013 to November 15, 2013. During this event MPE-1, MPE-2, and MW-6 (Figure 1) will be used as extraction wells.

The MPE operation will be performed using a self-contained mobile treatment system (MTS), equipped with an electrical generator, propane tank, liquid ring vacuum pump rated at 25-horsepower and 428-standard cubic feet per minute (scfm), electrical submersible pumps, air/water separator vessel, discharge hoses and traffic-rated hose ramps, downhole stingers, and a thermal oxidizer for vapor abatement. The oxidizer operates under a valid various locations BAAQMD permit. Both soil vapor and groundwater will be extracted from the subsurface. Extracted groundwater will be discharged into an existing treatment system.

Residential well sampling: During the investigation of January 2008, a groundwater sample was obtained from residential well located at 1573 153rd Avenue. At that time TBA was detected in this well at 21 µg/L. Subsequently, groundwater samples were collected from this well during July 2008 and October 2008 with results showing that all contaminants of concern (including TBA) were below laboratory-reporting limits. SOMA also contacted the owner of this well early this year (April 2013) in attempt of collecting another groundwater sample. In response, the well owner informed SOMA that the pump in his well is broken and that there is no way to extract groundwater water from the well. However, SOMA field crew will personally inspect this well and try to retrieve a groundwater sample.

Report Preparation

Upon completion of field activities SOMA will prepare a report. The report will document boring advancement and all related activities, discuss results of soil and groundwater sample analyses, lateral extent of plume, results of fingerprinting analysis and soil vapor analysis. Results of the MPE event and

residential well sampling will be documented in the Fourth Quarter 2013 groundwater monitoring report.

If you have any questions or comments concerning the above, please do not hesitate to call me at (925) 734-6400.

Sincerely,

Mansour Sepehr, PhD, PE
Principal

Attachments:
General Field Procedures
Figure 1: Proposed Boring/Sampling Locations

PERJURY STATEMENT

Site Location: 15101 Freedom Avenue, San Leandro, California

"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".

Mohammad Pazdel
1770 Pistacia Court
Fairfield, California 94533
Responsible Party

GENERAL FIELD PROCEDURES

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.

DPT 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.

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.

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.

Crawl Space Vapor Sampling

Air within a crawl space can be sampled as a method to evaluate vapor intrusion. Crawl space air should be less affected than indoor air by lifestyle choices of the building's occupants, such as household product use and smoking. Hence, the results of crawl space air sampling should be easier to interpret than indoor air sampling results. To use contaminant concentrations in crawl space air for evaluating vapor intrusion, an attenuation factor of 1.0 should be used, which is consistent with USEPA guidance. Thus, for evaluation purposes, the contaminant concentration in indoor air is assumed to be equal to the concentration in crawl space air. *(DTSC 2011)*

Indoor Air Sampling

Indoor air sampling should be conducted under conservative conditions. In general, the windows of the building should be closed. However, certain exceptions may be necessary if sampling is done in the summer in a building that is not air conditioned. Likewise, ingress and egress activities should be minimized. Heating, ventilation, and air conditioning (HVAC) systems should be operated normally for the season and time of day. During colder months, heating systems should be operating for at least twenty-four hours prior to the scheduled sampling event to maintain normal indoor temperatures above 65°F before and during sampling.

DTSC recommends the following when conducting indoor air sampling:

1) Sampling Duration. For the first sampling event, indoor air samples should be collected over a 24-hour period to ensure diurnal fluctuations in vapor intrusion and indoor air concentrations are included in the sampling period. After vapor intrusion is confirmed, sampling events should be conducted to produce representative concentrations of the monitored compounds over the anticipated daily exposure period for building occupants. Hence, air samples should be collected over a 24-hour period for residential structures, over an 8-hour period for non-residential structures, and over a typical school day for students. When feasible, 24-hour and 8-hour sampling may be conducted during the same sampling event. In some cases, indoor air samples may be collected with passive samplers for longer sampling periods.

2) Number of Sampling Events. One indoor air sampling event is not representative of continuous long-term exposure within a building. Multiple sampling events should be conducted to characterize exposure over the long-term. Numerous sampling events may be required within a building before DTSC would consider "no further action" for the exposure pathway. At a minimum, sampling data should be obtained over two seasons; late summer/early autumn and late winter/early spring. The data evaluation and contingency plan for the site should guide decisions regarding the objective and number of sampling events.

3) Number of Samples and Locations. All floors of a residential structure potentially subject to vapor intrusion should be sampled for indoor air quality. All occupied areas, as well as basements, should be sampled. Based on site-specific conditions, it may be necessary to sample all units of an apartment building. Sampling devices should be located in the breathing zone, approximately 3 to 5 feet off the ground for adults and at lower sampling heights if the receptors of concern are children as in a daycare center or school. Samples should be collected in the center of the room, away from doors. At a minimum, it is recommended that sampling points include the primary living area and likely locations for subsurface vapor entry (typically the bathroom or kitchen). For multi-storied residential buildings, at least one sample should be collected on each floor. When sampling an office building, the number and locations of samples should be based on site-specific conditions. In office buildings, samples should be collected from primary work areas and near the points of vapor entry (such as sumps, elevator shafts or floor drains) to help define the potential routes of entry.

4) Sampling Equipment. When sampling indoor air with evacuated canisters, extra canisters,

pressure gauges, and flow regulators should be taken into the field in case the integrity of some of the canisters is compromised or if some flow regulators and pressure gauges malfunction. Each sampling canister should have a dedicated vacuum gauge. The gauge is needed to verify the canister is properly evacuated prior to initiation of sampling and to demonstrate that the canister is slightly depressurized upon completion of the sampling. Likewise, the gauge will indicate whether the canister's flow regulator is functioning properly during sample collection. Flow regulators should be configured to produce a constant sampling rate. Sampling canisters, along with all flow regulators and pressure gauges, should be certified clean to the laboratory's method reporting limit.

Collecting air samples in canisters is currently the predominant sampling method used for indoor air investigations. Canisters provide quantitative analytical data and achieve the low detection limits needed to support risk assessments. USEPA Region 9 is currently evaluating the use of passive air samplers for indoor air investigations by conducting comparison studies with canisters at several sites in California. Other researchers have also conducted comparison studies. Passive samplers offer several advantages over canisters, including lower cost, simplicity and versatility of use, small size, unobtrusive appearance, and potential to collect samples over longer time periods than canister samplers. At present, passive samplers appear to have potential as a reliable alternative to canister sampling in certain applications, particularly as a screening tool for identifying structures for further indoor air evaluation. The use of passive samplers for screening or as a supplement to canister sampling should be based on the contaminants, site conditions, and project DQOs. As passive sampler technology becomes further developed, and high quality, quantitatively accurate results for contaminant concentrations in indoor air can be achieved, data from passive samplers may be used in quantitative risk assessments. *(DTSC 2011)*

Groundwater Well Sampling

Water Level and Free-Product Measurements

Prior to measurement of groundwater depth at each well, equalization with the surrounding aquifer must be achieved. Initially, the well cap is removed and the pressure is allowed to dissipate, creating a more stable water table level within the well. After about 10-15 minutes, once the water level in the well stabilizes, the depth to groundwater is measured from the top of the casing to the nearest 0.01 foot using an electric sounder.

For free-product (FP) measurement, an oil-water interface probe is used. When the probe is lowered into the FP, the oil/water light and beeper are continuously on at which point a reading for depth to FP is noted. The probe is lowered further into the well until the water signal is given (light flashes and beeps intermittently). Then the probe is carefully raised until the FP signal is given and the reading is noted. This gives the depth to interface of product and water.

Purging and Field Measurements

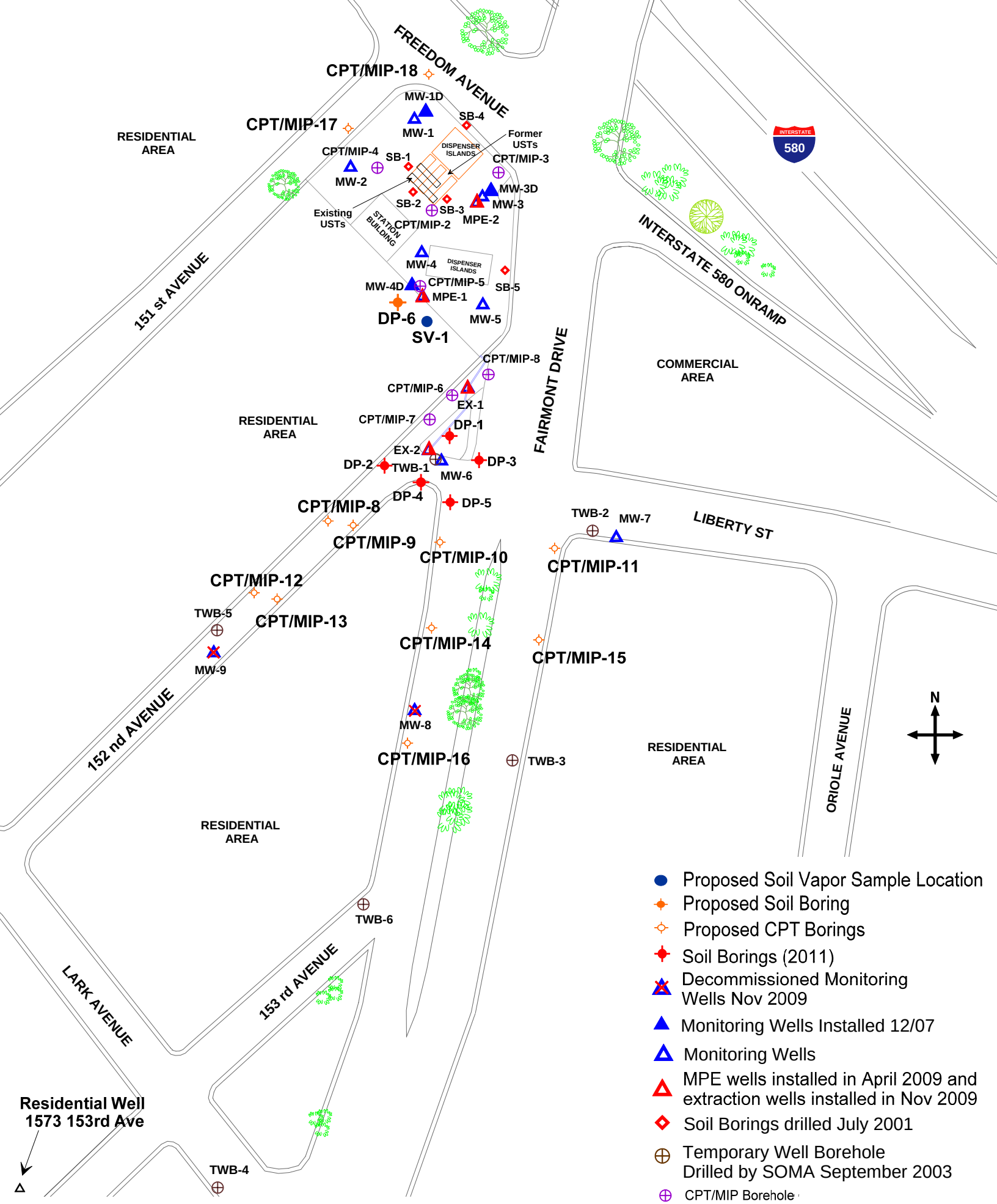
Prior to sample collection, each well is purged using a battery-operated, 2-inch-diameter pump (Model ES-60 DC). During purging, groundwater is measured for parameters such as dissolved oxygen (DO), pH, temperature, electrical conductivity (EC), and oxygen-reduction potential (ORP) using a Hanna HI-9828 multi-parameter instrument. Turbidity is measured using a Hanna HI-98703 portable turbidimeter. The equipment is calibrated at the site using standard solutions and procedures provided by the manufacturer.

Sampling

For sampling purposes, after purging a disposable polyethylene bailer is used to collect sufficient samples from each well for laboratory analyses. Groundwater samples are transferred into 40-mL VOA vials and preserved with hydrochloric acid. The vials are sealed to prevent air bubbles from developing within the headspace. For TPH-d analysis, groundwater samples are collected using 1-L, amber, non-preserved glass containers. Samples are placed in an ice-filled cooler and maintained at 4°C. A chain of custody form for all samples is prepared to accompany the samples, which are promptly delivered to a California state-certified analytical laboratory.

Free-product Sampling

Free product was sampled from MW-6 using a Geotech pump. Depth to free product/groundwater was measured, then poly tubing was attached to the pump and the other end of the tubing was lowered into the well until it reached the top of the water column. The geotech pump was then started up and the free product that was floating at the top of the water column was pulled up through the tubing and collected in the appropriate sampling bottles.



approximate scale in feet

0 50 100

Figure 1: Proposed Boring/Sampling Locations

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