CONESTOGA-ROVERS & ASSOCIATES

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RECEIVED

9:03 am, Jul 29, 2009

Alameda County
Environmental Health

July 24, 2009

Reference No. 311956

Mr. Steven Plunkett
Alameda County Environmental Health Services
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

Re: Work Plan for Additional Onsite Investigation
Former Chevron Service Station 9-0020
1633 Harrison Street
Oakland, California
Fuel Leak Case RO0000143

Dear Mr. Plunkett:

Conestoga-Rovers & Associates (CRA) is submitting this *Work Plan for Additional Onsite Investigation* on behalf of Chevron Environmental Management Company (Chevron) for the site referenced above. Alameda County Environmental Health Services (ACEH) and Chevron agreed to the proposed work in a meeting on May 6, 2009 between ACEH, Chevron, CRA, Oakland Housing Authority (OHA), including their consultants, and Christian Church Homes. CRA proposes to install two soil borings in the vicinity of the second generation underground storage tanks (USTs) and one multi-level soil vapor well in the vicinity of former well MW-7. On June 11, 2009, under a separate cover, CRA submitted to ACEH the *Work Plan for Monitoring Well Installation and Offsite Investigation*. Presented below are a summary of the site background and the proposed scope of work.

SITE BACKGROUND

The site is a former Chevron service station located on the southwest corner at the intersection of Harrison Street and 17th Street in Oakland, California. The site is located in downtown Oakland in an area of commercial and multi-unit residential land use (Figure 1). Chevron operated a service station on the site until 1972. There have been at least two different configurations of the facilities at the site (Figure 2). All facilities were removed at the time of station closure. Since December 1, 1975, the site has been used as a parking lot, which is currently operated by Central Parking. A future redevelopment as a multi-story senior housing facility is proposed at the site.

A total of 21 soil borings, 16 groundwater monitoring wells and 6 soil vapor wells have been installed at the site. A summary of environmental investigations conducted at the site is included as Attachment A.

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SITE GEOLOGY AND HYDROGEOLOGY

The site is located along the eastern margin of the San Francisco Bay and is within the East Bay Plain. The East Bay Plain lies within the Coast Range Geomorphic Province and is characterized by broad alluvium fan margins slopping westward towards the San Francisco Bay. The eastern part of the plain in the Oakland area is marked by the Hayward fault, which runs along the base of the Diablo Range escarpment. The site is underlain by the upper Holocene alluvial fan deposits that overlay Pleistocene alluvial fan deposits. Franciscan Formation bedrock underlies the alluvial deposits at depth. The site is underlain by Holocene and Pleistocene Merritt sands. Unconsolidated sediments beneath the site and site vicinity consist primarily of silty sands with some intermittent sandy, clayey and gravelly silts to approximately 30 feet below grade (fbg).

Local topography is flat and the site is approximately 40 feet above mean sea level. Historical depth to groundwater onsite has ranged from approximately 11 to 22 fbg. Groundwater flow direction is typically east to northeast at a gradient of 0.008 to 0.01. The regional groundwater flow direction, based on the topography and natural drainage patterns in the area, appears to be towards Lake Merritt, located approximately 1,600 feet east of the site.

PROPOSED SCOPE OF WORK

In the meeting on May 6, 2009, ACEH requested further onsite work prior to redevelopment onsite by OHA. ACEH requested additional delineation in the vicinity of the second generation UST pit and one additional nested soil vapor probe in the vicinity of former well MW-7, outside of the area previously excavated by CRA in 2008 (Figure 2). To accomplish the scope of work, CRA proposes to conduct the following:

Health and Safety Plan: CRA will prepare a health and safety plan to protect site workers. The plan will be reviewed and signed by all site workers and visitors. The plan will remain onsite during all field activities.

Permits: CRA will obtain the necessary permits from Alameda County Public Works Agency prior to beginning field operations.

***Underground Utility Location*:** CRA will contact Underground Services Alert (USA) and use a private utility locator to confirm that no utilities are present at or near the boring locations. Per Chevron safety standards, each boring will be cleared to 8 fbg using an air-knife assisted vacuum rig or hand auger.

Direct Push Soil Borings: Soil borings SB7 and SB8 will be advanced in the vicinity of the second generation UST pit in the southern portion of the site to a depth of approximately 25 fbg or first encountered groundwater. After clearing to 8 fbg using a hand auger or air-knife assisted vacuum rig, borings will be advanced using hydraulic push rods lined with 4-foot acetate liners into undisturbed sediments. Upon completion, the borings will be backfilled to grade with Portland Type I/II grout using a tremie pipe and patched to match the existing surface. CRA's Standard Filed Procedures for Soil Borings is presented as Attachment B.

***Soil and Grab-Groundwater Sampling Protocol*:** Soil samples will be collected for laboratory analysis at approximately 5-foot intervals, at obvious changes in soils, at depth intervals where hydrocarbon concentrations have been previously detected, and where indicators of petroleum hydrocarbons are observed, to the bottom of the boring. CRA geologists will log collected soils using the modified Unified Soil Classification System. Soil will be field-screened using a photo-ionization detector (PID) and visual observations. Grab-groundwater samples will be collected at first encountered groundwater. All samples will be sealed, capped, labeled, logged on a chain-of-custody form, placed on ice and transported to a Chevron and State-approved laboratory for analysis.

Vapor Well Installation: CRA will install nested vapor probes at 5 fbg and 10 fbg in one vapor well in the vicinity of former well MW-7 in the northeastern part of the site. It is estimated that the total depth of the boring will not exceed 11 fbg. Soil samples will be collected using a hand-auger and described as disturbed samples.

Vapor Probe Construction: Vapor probes will be constructed of a permeable porcelain filter with a ¼-inch push-to-connect fitting to ¼-inch Teflon tubing. Each probe will be placed at approximately 5 fbg and 10 fbg and surrounded by a 12-inch sand pack. Above the sand pack, 12-inches of dry granulated bentonite will be topped with at least 12-inches of hydrated granular bentonite. Each probe will be separated from the others by a bentonite grout mixture. The soil vapor well will be finished at the surface using a traditional well vault.

Soil Vapor Sampling Protocol: Vapor samples will be collected at least 48 hours after the placement of the probes using 1-liter Summa™ canisters in a manifold system, connected to the sampling tubing at each vapor point. Using the same flow rate as is used during sampling, approximately three purge volumes will be purged from the sampling tubing before sampling begins. While sampling, the vacuum of the Summa™ canister will be used to draw the soil vapor through the flow controller until a negative pressure of approximately 5-inches of Hg is observed on the vacuum gauge. In accordance with the Department of Toxic Substances Control (DTSC) *Advisory-Active Soil Gas Investigations* guidance document, dated January 28, 2003, leak testing using laboratory grade helium will be performed during sampling. After sampling, the Summa™ canisters will be packaged and sent to the Air Toxics laboratory

under chain-of-custody for analysis. Standard Field Procedures for Soil Vapor Probe Installation and Sampling are presented as Attachment C.

***Chemical Analysis*:** Select soil and grab-groundwater samples will be analyzed for the following:

- Total Petroleum Hydrocarbons as diesel (TPHd) with silica gel cleanup and Total Petroleum Hydrocarbons as gasoline (TPHg) by EPA Method 8015 modified
- Benzene, toluene, ethylbenzene and xylenes (BTEX), methyl tert-butyl ether (MTBE), di-isopropyl ether (DIPE), ethyl tertiary butyl ether (ETBE), tertiary amyl methyl ether (TAME) and tertiary butyl alcohol (TBA) by EPA Method 8260B

Vapor samples will be analyzed for the following:

- TPHg, BTEX, MTBE and naphthalene by EPA Method TO-15
- O_2, CO_2, N_2, CH_4 and helium by ASTM D-1946 (GC/TCD)

Waste Disposal: Soil cuttings generated will be placed in drums and labeled appropriately. These wastes will be transported to the appropriate Chevron-approved disposal facility following receipt of analytical profile results.

Reporting: Upon completion of field activities and review of the analytical results, CRA will prepare an investigation report that, at a minimum, will contain:

- Descriptions of the drilling and sampling methods
- Boring logs
- Tabulated soil, grab-groundwater and vapor analytical results with comparison to environmental screening levels from the 2007 *Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater* by the California Regional Water Quality Control Board, San Francisco Bay Region Interim Final November 2007, revised May 2008
- Analytical reports and chain-of-custody forms
- Soil disposal details
- An evaluation of the extent of hydrocarbons in the subsurface, including an update of the previously submitted risk assessment, if necessary
- Conclusions and recommendations

CLOSING

CRA will proceed with the proposed scope of work upon receipt of written approval from ACEH and prior to the start of redevelopment activities. After approval, CRA will obtain the necessary drilling permits, access agreements, and schedule the subcontractors at their earliest availability. We will submit our investigation report approximately 8 weeks after completion of field activities.

All other necessary work onsite, including destruction of the soil vapor wells, excavation and sampling of the second generation UST pit, and additional over-excavation of the used oil UST pit will be completed at the time of redevelopment construction.

CONESTOGA-ROVERS & ASSOCIATES

July 24, 2009 Reference No. 311956

We appreciate the opportunity to work with you on this project. If you have any additional questions or comments, please contact Ms. Charlotte Evans at (510) 420-3351 or Mr. Aaron Costa at (925) 543-2961.

Sincerely,

CONESTOGA-ROVERS & ASSOCIATES

Charlotte Evans Brandon S. Wilken, P.G. # 7564

CE/doh/4

Enc.

Figure 1	Site Vicinity Map
Figure 2	Site Plan with Proposed Onsite Soil Borings and Soil Vapor Well Locations
Attachment A	Summary of Previous Environmental Work
Attachment B	Standard Field Procedures for Soil Borings
Attachment C	Standard Field Procedures for Soil Probe Installation and Sampling

cc: Mr. Aaron Costa, Chevron Environmental Management Company
Mr. Shad Small, Oakland Housing Authority
Mr. Karl Lauff, Christian Church Homes
Ms. Jeriann Alexander, FugroWest

FIGURES

04/23/07

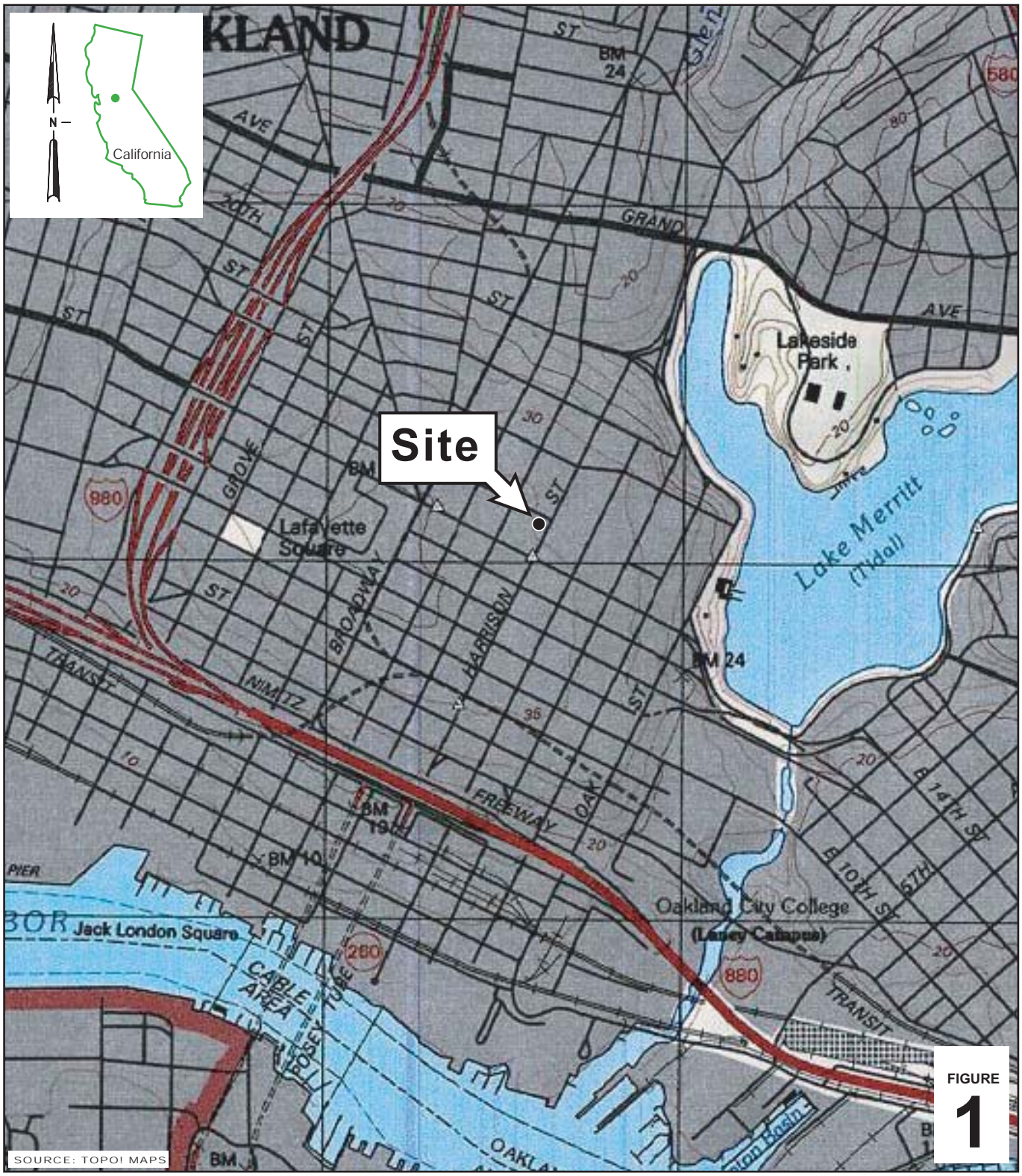

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FIGURE 1

0 1/8 1/4 1/2 1

SCALE : 1" = 1/4 MILE

Former Chevron Station 9-0020

1633 Harrison Street

Oakland, California

CONESTOGA-ROVERS & ASSOCIATES

Vicinity Map

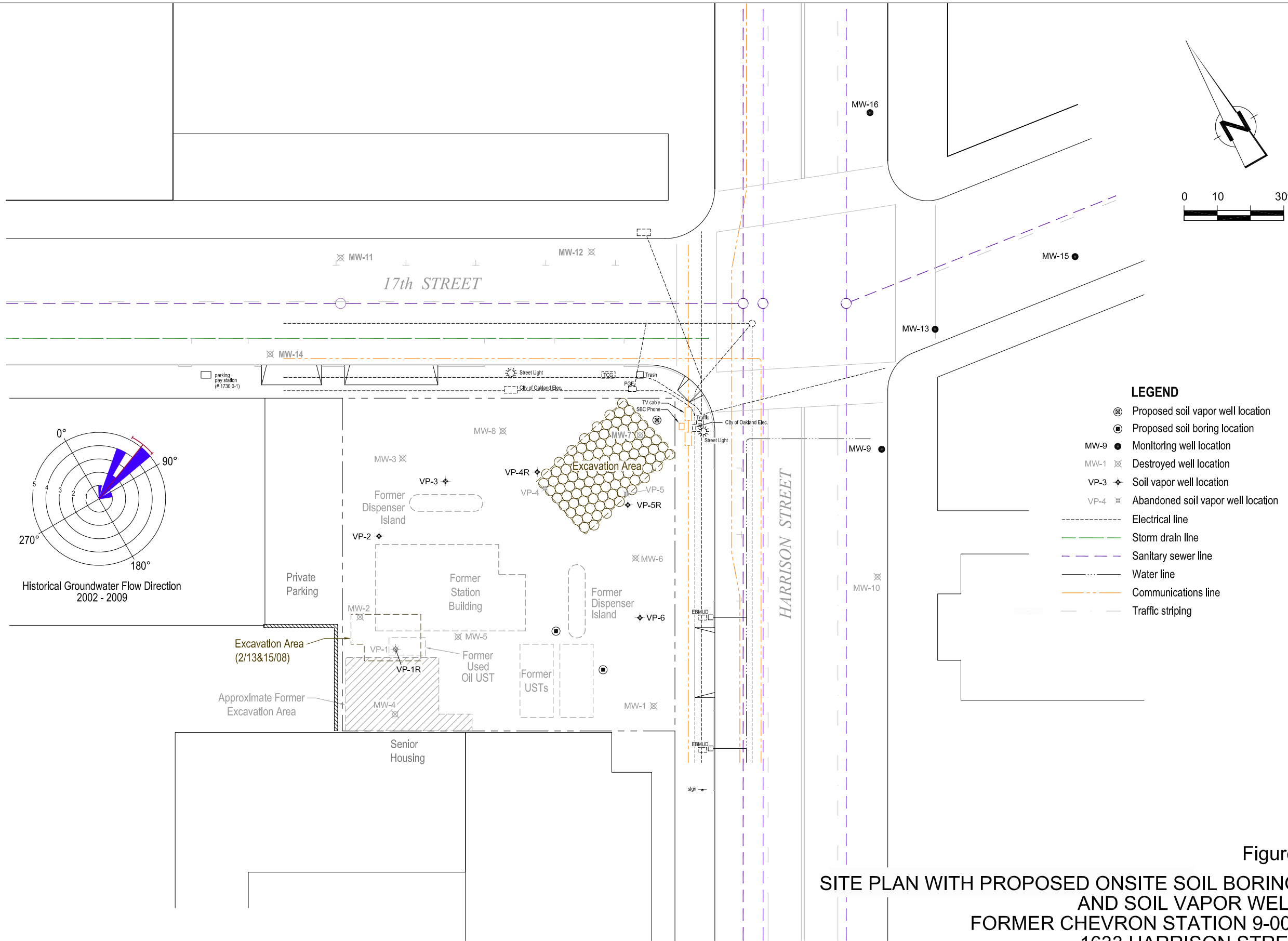

Figure 2

SITE PLAN WITH PROPOSED ONSITE SOIL BORINGS AND SOIL VAPOR WELLS
FORMER CHEVRON STATION 9-0020
1633 HARRISON STREET
Oakland, California

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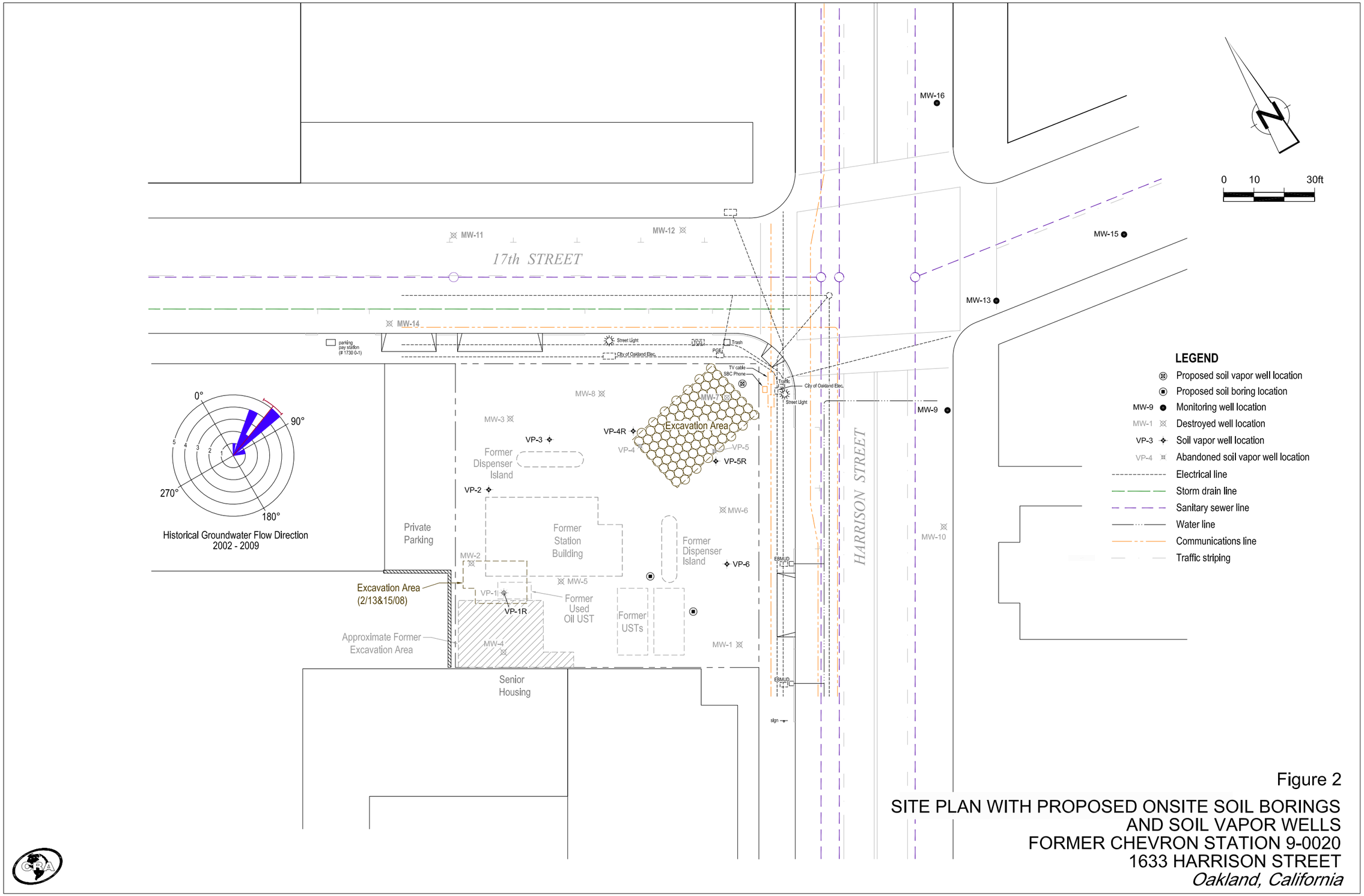

Figure 2

SITE PLAN WITH PROPOSED ONSITE SOIL BORINGS AND SOIL VAPOR WELLS
FORMER CHEVRON STATION 9-0020
1633 HARRISON STREET
Oakland, California

I:\CHEVRON\3119--\311956 9-0020 OAKLAND\311956-FIGURES\311956-EM002_PROPOSED-ONSITE.DWG

ATTACHMENT A

SUMMARY OF PREVIOUS ENVIRONMENTAL WORK

SUMMARY OF PREVIOUS ENVIRONMENTAL WORK

1988 Soil Vapor Survey Investigation: EA Engineering, Science, and Technology, Inc. (EA) conducted a soil vapor survey in January 1988. Twenty two samples were collected at 11 locations throughout the site. The highest hydrocarbon concentrations were detected in the vicinity of the former used-oil underground storage tank (UST) in the southwestern section of the site. Additional information is available in EA's January 27, 1988 *Soil Vapor Contaminant Assessment Report of Investigation*.

1988 Monitoring Well Installation: Western Geologic Resources (WGR) installed wells MW-1 through MW-3 in October 1988. No benzene, toluene, ethylbenzene, and xylenes (BTEX) or total fuel hydrocarbons were detected in groundwater samples from the three wells. However, halogenated volatile organic compounds (HVOCs) were detected. Additional information is available in WGR's January 24, 1989 *Soil Sampling and Monitoring Well Installation Letter*.

1989 Soil Boring and Monitoring Well Installation: WGR completed five soil borings as wells MW-4 through MW-8. Total petroleum hydrocarbons as diesel (TPHd) were detected in soil up to 600 milligrams per kilogram (mg/kg) at 9.6 feet below grade (fbg) near the former used-oil UST. Total petroleum hydrocarbons as gasoline (TPHg) were detected at a concentration of 50,000 mg/kg at 23.5 fbg in well MW-7, near the northeastern corner of the property. Additional information is available in WGR's June 1989 *Subsurface Investigation*.

June 1990 Offsite Well Installation: In June 1990, WGR installed offsite wells MW-9 through MW-12 to delineate the extent of hydrocarbons downgradient and crossgradient of the site. No hydrocarbons were detected in any soil samples. A grab-groundwater sample from well MW-9 contained 5,700 micrograms per liter (µg/L) TPHg and 47 µg/L benzene. Offsite wells MW-10 through MW-12 contained HVOC concentrations. Additional information is available in WGR's July 1990 *Off-Site Subsurface Investigation*.

October 1991 Offsite Well Installation: Pacific Environmental Group (PEG) installed well MW-13 to further evaluate the dissolved hydrocarbon plume's extent, and upgradient monitoring well MW-14 to investigate the suspected offsite origin of HVOCs. Additionally, soil borings B-A through B-D were advanced to assess the extent of elevated hydrocarbons detected in well MW-7. Hydrocarbon concentrations were only detected in boring B-D at 120 mg/kg TPHg and up to 1.8 mg/kg benzene. Additional information is available in PEG's January 14, 1992 *Subsurface Investigation Report*.

December 1991 Soil Vapor Extraction Feasibility Test: PEG applied positive and negative pressures to well MW-4 using a regenerative blower and measured pressure in surrounding wells. Soil vapor measurements and samples were collected. PEG recommended evaluating

additional remedial technologies. Additional information is available in PEG's April 1, 1992 *Soil Vapor Extraction Feasibility Test Letter*.

November December 1992 Offsite Well Installation: Groundwater Technology Inc. (GTI) installed offsite wells MW-15 and MW-16 to further delineate the dissolved hydrocarbon plume downgradient. No hydrocarbons were detected in soil samples. Additional information is available in GTI's February 18, 1993 *Additional Environmental Assessment Report*.

January 1992 Soil Excavation: PEG oversaw the excavation of hydrocarbon impacted soil from the vicinity of well MW-4 and a trench excavation 30 foot in length by 5 foot deep across the former USTs to confirm that the USTs had been removed from the site. Removal of the USTs was confirmed; however, construction debris, such as concrete slabs and piping, were observed beneath the surface in the area of the former USTs. Additional information is available is available in PEG's June 2, 1992 *Soil Excavation Letter Report*.

1992 Chlorinated Hydrocarbon Investigation: Geraghty & Miller, Inc. (G-M) evaluated the HVOC distribution pattern based on existing monitoring well data and analytical data from remedial activity. The report concluded that that HVOCs detected in groundwater beneath the site were emanating from an offsite source. Additional information is available in G-M's October 5, 1992 *Evaluation of Chlorinated Hydrocarbon Distribution*.

July to December 1993 SVE Remediation System Installation and Operation: A soil vapor extraction (SVE) system was installed and operated at the site from July 1, 1993 through December 12, 1993. Evaluation of the system showed minimal effectiveness. Augmentation of the system with additional wells was evaluated and, due to low permeability soils, it was determined that efficiency would not be appreciably enhanced. The system was shut down in December 1993, and all system equipment was removed in December 1996. Additional information is available in G-M's *Quarterly Groundwater Treatment System Compliance Report*.

June 2004 Additional Subsurface Investigation: In anticipation of future site development, which was proposed to include subsurface parking, Cambria Environmental Technology, Inc., (Cambria) advanced soil borings B-17 through B-25 to further define residual hydrocarbon impacts in soils beneath the site and to pre-profile soils for appropriate disposal options. Results confirmed hydrocarbon impacts in soil in the vicinity of well MW-7 that appeared to have originated from the first generation dispenser island, previously located approximately 15 feet upgradient of the well. Additional information is available in Cambria's October 14, 2004 *Subsurface Investigation Report*.

April 2007 Onsite Subsurface Investigation: Conestoga-Rovers & Associates (CRA) advanced soil borings SB1 through SB4 up gradient of well MW-7 to define the extent of petroleum

hydrocarbons associated with a first generation dispenser island. TPHg and benzene concentrations were detected in soil at 19.5 fbg in borings SB1, SB2, and SB3, with maximum concentrations of 140 mg/kg TPHg and 0.002 mg/kg benzene. TPHg and benzene were detected in grab-groundwater samples from borings SB1, SB2, and SB3, with maximum concentrations of 11,000 micrograms per liter (µg/L) and 10 µg/L, respectively. Additional information is available in CRA's May 25, 2007 *Onsite Subsurface Investigation Report*.

June 2007 Soil Vapor Survey Installation and Investigation: CRA installed six nested soil vapor probes onsite. Vapor samples were collected from all probes and the highest hydrocarbon concentrations were detected in probe VP-1 at 10 fbg in the vicinity of the former used oil UST in the southwestern section of the site. TPHg and benzene were detected in soil vapor from all vapor points with maximum concentrations in VP-1 at 10 fbg were 2,600,000 micrograms per meter cubed (µg/m3) and 2,600 µg/m3, respectively. Additional information is available in CRA's June 28, 2007 *Vapor Probe Survey Report*.

January – March 2008 Soil Excavation: CRA oversaw the excavation of hydrocarbon impacted soil from the vicinity of well MW-7 and in the area of the formerly removed used-oil UST. The soil excavation in the vicinity of well MW-7 used large diameter bucket augers and the resulting boreholes were immediately grouted. Additional soil in the vicinity of the former used-oil UST was excavated with a backhoe. Approximately 922 cubic yards of soil were removed. Well MW-7 and VP-1 were destroyed during the excavations. VP-1R was installed to replace VP-1. Additional information is available in CRA's July 11, 2008 *Remedial Activities Report*.

ATTACHMENT B

STANDARD FIELD PROCEDURES FOR SOIL BORINGS

Conestoga-Rovers & Associates

STANDARD FIELD PROCEDURES FOR GEOPROBE® SOIL AND GROUNDWATER SAMPLING

This document describes Conestoga-Rovers & Associates' standard field methods for GeoProbe® soil and groundwater sampling. These procedures are designed to comply with Federal, State and local regulatory guidelines. Specific field procedures are summarized below.

Objectives

Soil samples are collected to characterize subsurface lithology, assess whether the soils exhibit obvious hydrocarbon or other compound vapor odor or staining, estimate ground water depth and quality and to submit samples for chemical analysis.

Soil Classification/Logging

All soil samples are classified according to the Unified Soil Classification System by a trained geologist or engineer working under the supervision of a California Professional Geologist (PG) or a Certified Engineering Geologist (CEG). The following soil properties are noted for each soil sample:

- Principal and secondary grain size category (i.e., sand, silt, clay or gravel)
- Approximate percentage of each grain size category,
- Color,
- Approximate water or separate-phase hydrocarbon saturation percentage,
- Observed odor and/or discoloration, and
- Other significant observations (i.e., cementation, presence of marker horizons, mineralogy)
- Estimated permeability

Soil Sampling

GeoProbe® soil samples are collected from borings driven using hydraulic push technologies. A minimum of one and one half ft of the soil column is collected for every five ft of drilled depth. Additional soil samples can be collected near the water table and at lithologic changes. Samples are collected using samplers lined with polyethylene or brass tubes driven into undisturbed sediments at the bottom of the borehole. The ground surface immediately adjacent to the boring is used as a datum to measure sample depth. The horizontal location of each boring is measured in the field relative to a permanent on-site reference using a measuring wheel or tape measure.

Drilling and sampling equipment is steam-cleaned or washed prior to drilling and between borings to prevent cross-contamination. Sampling equipment is washed between samples with trisodium phosphate or an equivalent EPA-approved detergent.

Sample Storage, Handling and Transport

Sampling tubes chosen for analysis are trimmed of excess soil and capped with Teflon® tape and plastic end caps. Soil samples are labeled and stored at or below 4°C on either crushed or dry ice, depending upon local regulations. Samples are transported under chain-of-custody to a State-certified analytic laboratory.

Field Screening

After a soil sample has been collected, soil from the remaining tubing is placed inside a sealed plastic bag and set aside to allow hydrocarbons to volatilize from the soil. After ten to fifteen minutes, a portable GasTech® or photoionization detector measures volatile hydrocarbon vapor concentrations in the bag's headspace, extracting the vapor through a slit in the plastic bag. The measurements are used along with the field observations, odors, stratigraphy and ground water depth to select soil samples for analysis.

Grab Groundwater Sampling

Groundwater samples are collected from the open borehole using bailers, advancing disposable Tygon® tubing into the borehole and extracting ground water using a diaphragm pump, or using a hydro-punch style sampler with a bailer or tubing. The ground water samples are decanted into the appropriate containers supplied by the analytic laboratory. Samples are labeled, placed in protective foam sleeves, stored on crushed ice at or below 4° C, and transported under chain-of-custody to the laboratory.

Duplicates and Blanks

Blind duplicate water samples are usually collected only for monitoring well sampling programs, at a rate of one blind sample for every 10 wells sampled. Laboratory-supplied trip blanks accompany samples collected for all sampling programs to check for cross-contamination caused by sample handling and transport. These trip blanks are analyzed if the internal laboratory quality assurance/quality control (QA/QC) blanks contain the suspected field contaminants. An equipment blank may also be analyzed if non-dedicated sampling equipment is used.

Grouting

If the borings are not completed as wells, the borings are filled to the ground surface with cement grout poured or pumped through a tremie pipe.

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ATTACHMENT C

STANDARD FIELD PROCEDURES FOR SOIL PROBE INSTALLATION AND SAMPLING

Conestoga-Rovers & Associates

STANDARD FIELD PROCEDURES FOR SOIL VAPOR PROBE INSTALLATION AND SAMPLING

VAPOR POINT METHODS

This document describes Conestoga-Rovers & Associates' standard field methods for soil vapor sampling. These procedures are designed to comply with Federal, State and local regulatory guidelines. Specific field procedures are summarized below.

Objectives

Soil vapor samples are collected and analyzed to assess whether vapor-phase subsurface contaminants pose a threat to human health or the environment.

Shallow Soil Vapor Point Installation

The shallow soil vapor point method for soil vapor sampling utilizes a hand auger or drill rig to advance a boring for the installation of a soil vapor sampling point. Once the boring is hand augered to the final depth, a probe, connected with Swagelok fittings to nylon or Teflon tubing of ¼-inch outer-diameter, is placed within 12-inches of number 2/16 filter sand. A 12-inch layer of dry granular bentonite is placed on top of the filter pack. Pre-hydrated granular bentonite is then poured to fill the borehole. The tube is coiled and placed within a wellbox finished flush to the surface. Soil vapor samples will be collected no sooner than 48 hours after installation of the soil vapor points to allow adequate time for representative soil vapors to accumulate. Soil vapor sample collection will not be scheduled until after a minimum of three consecutive precipitation-free days and irrigation onsite has ceased. A measured volume of air will be purged from the tubing using a different Summa purge canister. Immediately after purging, soil vapor samples will be collected using the appropriate size Summa canister with attached flow regulator and sediment filter. The soil vapor points will be preserved until they are no longer needed for risk evaluation purposes. At that time, they will be destroyed by extracting the tubing, hand augering to remove the sand and bentonite, and backfilling the boring with neat cement. The boring will be patched with asphalt or concrete, as appropriate.

Sampling of Soil Vapor Points

Samples will be collected using a SUMMA™ canister connected to sampling tubing at each vapor point. Prior to collecting soil vapor samples, the initial vacuum of the canisters is measured and recorded on the chain-of-custody. The vacuum of the SUMMA™ canister is used to draw the soil

vapor through the flow controller until a negative pressure of approximately 5-inches of Hg is observed on the vacuum gauge and recorded on the chain-of-custody. The flow controllers should be set to 100-200 ml/minute. Field duplicates should be collected for every day of sampling and/or for every 10 samples collected.

Prior to sample collection, stagnant air in the sampling apparatus should be removed by purging approximately 3 purge volumes. The purge volume is defined as the amount of air within the probe and tubing.

In accordance with the DTSC Advisory-Active Soil Gas Investigations guidance document, dated January 28, 2003, leak testing needs to be performed during sampling. Helium is recommended, although shaving cream is acceptable.

Vapor Sample Storage, Handling, and Transport

Samples are stored and transported under chain-of-custody to a state-certified analytic laboratory. Samples should never be cooled due to the possibility of condensation within the canister.