CONESTOGA-ROVERS & ASSOCIATES

5900 Hollis St., Suite A
Emeryville, California 94608
Telephone: (510) 420-0700 Fax: (510) 420-9170
www.CRAworld.com

TRANSMITTAL

DATE: 9/14/12

REFERENCE NO.: 311977

PROJECT NAME: Chevron Station 90076
RO 0000427

TO: Mark Detterman
Alameda County Environmental Health Services
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502

RECEIVED
5:01 pm, Sep 17, 2012
Alameda County
Environmental Health

Please find enclosed:
- ☐ Draft
- ☐ Originals
- ☐ Prints
- ☒ Final
- ☐ Other

Sent via:
- ☐ Mail
- ☐ Overnight Courier
- ☐ Same Day Courier
- ☒ Other Alameda County FTP Upload and Geotracker

QUANTITY	DESCRIPTION
1	Soil Vapor Sampling, Preferential Pathway Study, and Work Plan

- ☐ As Requested
- ☐ For Your Use
- ☒ For Review and Comment
- ☐
- ☐

COMMENTS:

Copy to: Catalina Espino Devine (Chevron)
electronic copy

Completed by: Nathan Lee Signed: Nathan Lee
[Please Print]

Filing: **Correspondence File**

Catalina Espino Devine
Project Manager
Marketing Business Unit

Chevron Environmental Management Company
6101 Bollinger Canyon Road
San Ramon, CA 94583
Tel (925) 790-3949
espino@chevron.com

Alameda County Health Care Services
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Re: Chevron Service Station No. 9-0076
4265 Foothill Boulevard
Oakland, CA

I have reviewed the attached report dated September 14, 2012.

I agree with the conclusions and recommendations presented in the referenced report. The information in this report is accurate to the best of my knowledge and all local Agency/Regional Board guidelines have been followed. This report was prepared by Conestoga-Rovers & Associates, upon whose assistance and advice I have relied.

This letter is submitted pursuant to the requirements of California Water Code Section 13267(b)(1) and the regulating implementation entitled Appendix A pertaining thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge.

Sincerely,

Catalina Espino Devine
Project Manager

Attachment: Report

SOIL VAPOR SAMPLING, PREFERENTIAL PATHWAY STUDY, AND WORK PLAN

Former Chevron Station 90076
4265 Foothill Boulevard
Oakland, California
Fuel Leak Case RO0000427

Prepared For:

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

Prepared by:
Conestoga-Rovers & Associates

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SEPTEMBER 14, 2012
REF. NO. 311977 (10)
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SOIL VAPOR SAMPLING, PREFERENTIAL PATHWAY STUDY, AND WORK PLAN

Former Chevron Station 90076
4265 Foothill Boulevard
Oakland, California
Fuel Leak Case RO0000427

Nathan S. Lee PG# 8486

Prepared by:
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SEPTEMBER 14, 2012
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TABLE OF CONTENTS

LIST OF FIGURES
(Following Text)

LIST OF TABLE S
(Following Text)

LIST OF APPENDICES
(Following Text)

1.0 INTRODUCTION

Conestoga-Rovers & Associates (CRA) is submitting this *Soil Vapor Sampling, Preferential Pathway Study, and Work Plan* on behalf of Chevron Environmental Management Company (Chevron) for former Chevron Station 90076 located at 4265 Foothill Boulevard, Oakland, California (Figure 1). In a letter dated May 30, 2012 (Appendix A), Alameda County Environmental Health Services (ACEH) requested Chevron:

- Provide an update on status of existing site vapor wells;
- Upload missing reports to the ACEH ftp and Geotracker websites;
- Prepare a work plan for soil vapor assessment;
- Prepare a work plan to investigate free-phase hydrocarbons reported historically in boring C-A and in a 1987 sign footing excavation, and address submerged well screens in offsite wells C-6, C-7, and C-9; include results in an updated Site Conceptual Model (SCM); and
- Perform a utility preferential pathway study that incorporates past utility survey information associated with the nearby service station.

An extension request for submittal of this *Soil Vapor Sampling, Preferential Pathway Study, and Work Plan* was granted by ACEH in a correspondence dated July 26, 2012 (Appendix A). Site background information, responses to ACEH's technical comments, results of recent soil vapor sampling, preferential pathway study, and a work plan for additional investigation are presented below.

2.0 SITE BACKGROUND

2.1 SITE DESCRIPTION

The site is an active Chevron-branded service station located on the southwest corner of Foothill Boulevard and High Street in Oakland, California (Figure 2). A former BP station (Fuel Leak Case RO426) is located north (upgradient), across Foothill Boulevard. A former Shell station (Fuel Leak Case RO415) is located east (crossgradient) across High Street. Foothill High School is located northeast across the intersection of Foothill Boulevard and High Street. Surrounding land use is mixed commercial and residential.

Chevron purchased the subject property, developed it into a service station, and began operations in 1966. The station and all site facilities were reconstructed in 1987 into its current configuration. Product line and dispenser upgrade activities occurred in 1997. Current site facilities consist of a kiosk, five dispenser islands beneath a common canopy and a building which appears to be a rest room. Three 10,000-gallon double-walled fiberglass gasoline underground storage tanks (USTs) are located in a common excavation directly southwest of the kiosk. The previous USTs were located in the same location. A former used-oil UST was located southwest of the kiosk and adjacent to the gasoline UST complex and was removed in 1987 and was not replaced.

2.2 PREVIOUS ENVIRONMENTAL WORK

Since 1987, a total of one soil boring, three vapor probes, and 10 monitoring wells have been advanced or installed. Previous environmental work is summarized in Appendix B.

2.3 SITE GEOLOGY

The site is predominantly underlain by clays and silts to maximum depth explored of approximately 59 feet below grade (fbg). A sand unit with an average thickness of 5 feet is encountered at depths ranging from 10 to 20 fbg, and a gravel unit is encountered between 45 to 55 fbg. Geologic cross-sections are shown on Figures 4 and 5.

2.4 SITE HYDROLOGY

The site elevation is approximately 30 to 38 feet above mean sea level and topography slopes gently to the southwest, towards San Francisco Bay. The nearest surface water body is the Oakland Inner Harbor approximately 0.9 miles southwest. Groundwater monitoring has been ongoing since 1989. Historically, depth to groundwater has ranged from approximately 5to 45 fbg, but is typically between 10 to 20 fbg. Groundwater flow is typically south-southwest with a gradient of 0.04 to 0.1.

3.0 RESPONSE TO ACEH COMMENTS

3.1 STATUS OF VAPOR SAMPLING

Existing vapor wells VP-1 through VP-3 located between well C-2 and the adjacent residence to the south were sampled in August 2012. Vapor sampling methodology and results are described in section 3.3 below.

3.2 REQUEST FOR MISSING REPORTS AND DATA

On July 12, 2012, CRA uploaded the following documents which were not on ACEH ftp website:

- Soil Sampling during Product Dispenser Upgrade and Partial Product Line Replacement Report, September 24, 1997, Gettler-Ryan, Inc.
- 2005/2006 subsurface investigation information, Cambria Environmental Technologies, Inc.
- Fourth Quarter 2008 Groundwater Report, January 9, 2009, Gettler-Ryan, Inc.

3.3 RESULTS OF SOIL VAPOR SAMPLING

With ACEH concurrence and as outlined in CRA's July 24, 2012 email correspondence, vapor probes VP-1 through VP-3 were sampled to assess soil vapor conditions in the area downgradient of well C-2, along the southern property boundary. The vapor probes are screened from approximately 5 to 5.5 fbg. No groundwater was noted in the probes during sampling.

CRA collected soil vapor samples from vapor probes VP-1, VP-2, and VP-3 on August 13, 2012. Soil vapor samples were collected using current Department of Toxic Substances Control (DTSC) sampling protocols and analyzed for total petroleum hydrocarbons as gasoline (TPHg), benzene, toluene, ethylbenzene, and xylene (BTEX), methyl tertiary butyl ether (MTBE), naphthalene, aromatic hydrocarbons, aliphatic hydrocarbons, and atmospheric gases. Vapor samples were collected in one-liter Summa™ canisters connected directly to the vapor probe tubing. A closed circuit sampling train was created by attaching the sample Summa™ canister in a series with

the purge Summa™ canister via a steam-cleaned stainless steel manifold. A flow rate of 167 milliliters per minute (mL/min) was used to collect the sample.

A "shut-in" test was performed prior to connecting the sampling equipment to the vapor probe tubing. This test was performed by sealing all openings to ambient air, opening the purge Summa™ canister to establish a vacuum inside the sampling train and waiting to ensure the vacuum remained stable for 10 minutes. The "shut-in" test reduces the potential for ambient air to infiltrate into the sample.

After the "shut-in" test was completed, the probe tubing was connected to the sampling train and approximately three probe tubing volumes of stagnant air were purged. After purging, the sample Summa™ canister valve was opened. The Summa™ canister vacuum was used to draw soil vapor through the flow controller and into the sample canister until a negative pressure of approximately 5-inches of mercury was observed on the vacuum gauge.

In accordance with the DTSC *Advisor-Active Soil Gas Investigations* guidance document, leak testing was performed during sampling. Laboratory grade helium was utilized to determine if ambient air was entering the Summa™ canisters during sampling. A shroud was used to surround the vapor sampling equipment and the connections between the sampling equipment and the vapor probe tubing. A helium detector was also placed inside the shroud to quantify helium concentrations inside the shroud. An atmosphere of approximately 40 percent helium was created and maintained for the duration of vapor sampling.

All samples were labeled, logged on a chain-of-custody, stored at ambient temperature, and shipped to Air Toxics LTD. (Air Toxics), of Folsom, California for analysis. A summary of the results from the soil vapor sampling is presented in Table A below. No analytes were reported in vapor samples above the shallow soil gas ESLs. [1] The laboratory analytical reports for vapor are included in Appendix D and all analytical data are presented in Table 1.

[1] Table E-2 Shallow Soil Gas Screening Levels for Evaluation of Potential Vapor Intrusion Concerns from *Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater* prepared by the California Regional Water Quality Control Board – San Francisco Bay Region, Interim Final November 2007, revised May 2008.

TABLE A: SOIL VAPOR ANALYTICAL DATA (HYDROCARBONS) CHEVRON STATION 90076, 4265 FOOTHILL BOULEVARD, OAKLAND									
Sample ID	*Depth (fbg)*	*TPHg*	*Benzene*	*Toluene*	*Ethyl-benzene*	*m,p-Xylene*	*o-Xylene*	*MTBE*	*Naphtha-lene*
		Reported in microgram per cubic meter (ug/m³)							
ESLs Shallow Soil Gas (C/I)		***29,000***	***280***	***180,000***	***3,300***	***58,000***	***58,000***	***31,000***	***240***
ESLs Shallow Soil Gas (R)		***10,000***	***84***	***63,000***	***980***	***21,000***	***21,000***	***9,400***	***72***
VP-1	5.5	650	<2.7	12	29	96	69	<3.1	<18
VP-2	5.5	<3,400	<54	<63	<73	<73	<73	<60	<350
VP-3	5.5	<160	<2.5	<3.0	<3.4	<3.4	<3.4	<2.8	<16
VP-3[a]	5.5	<160	<2.5	<3.0	<3.4	<3.4	<3.4	<2.8	<16
C/I = Commercial/Industrial R = Residential [a] = Field duplicate collected simultaneously with original sample									

No helium was detected in any of vapor probe samples. The absence of helium indicates that no ambient air entered the canisters during the sampling process. Methane was detected at trace concentrations.

3.4 REQUEST FOR INVESTIGATION WORK PLAN

ACEH notes that well screens in monitoring wells C-6, C-7, and C-9, used to delineate the downgradient extent of the hydrocarbon plume, may be submerged seasonally. Upon review of historical groundwater data and preparation of cross-sections, additional wells with a shallower screen interval in the areas of the offsite wells seem appropriate. Also a soil boring will be advanced in the area of boring C-A as well as the installation of vapor probes. A work plan for additional investigation is outlined in section 4.0 below.

3.5 PREFERENTIAL PATHWAY STUDY

CRA conducted a preferential pathway study to evaluate potential conduits for migration of dissolved hydrocarbons from the site. CRA contacted individual utility companies and local agencies to acquire plans of subsurface utilities in the vicinity. Pacific Gas & Electric (PG&E) provided maps of their underground facilities; however, AT&T and MCI were not willing to provide copies of their subsurface maps due to

company policy. The City of Oakland and East Bay Municipal Utility District (EBMUD) provided subsurface maps for their storm drain, water, and sanitary sewer lines.

CRA notified Underground Service Alert (USA) to have the utility companies, including AT&T and MCI, mark their utility locations. CRA contracted NorCAL Geophysical Consultants, Inc. (NorCal) of Cotati, California to verify and locate any utilities on site. Norcal's August 1, 2012 *Geophysical Investigation* report is presented in Appendix C. Figure 3 presents the approximate location of all known utilities, including those previously reported on utility study maps associated with the nearby Shell and BP sites (Fuel Leak Case Numbers RO0000415 and RO0000426). Utility conduits are also shown on the cross-sections presented as Figures 4 and 5. Major utilities in the area include electric, natural gas, water, communication, storm drain, and sanitary sewer lines.

3.5.1 SANITARY SEWER

Sanitary sewer information was gathered from City of Oakland figures and the geophysical survey. Sanitary sewer lines with a diameter of 8-inch, 16-inch, and 18-inch are located to the east along High Street. The 8-inch and 16-inch lines are approximately 8 fbg and the 18-inch line is approximately 12 fbg. These sewer lines connect with 8-inch, 15-inch, and 18-inch sewer lines, which run along the westbound lane of Foothill Boulevard (Figure 3). The shallower sewer lines along Foothill Boulevard are approximately 6 to 7 fbg. Sanitary sewer lines from the station building and the building on the southwest corner connect to the 16-inch sanitary sewer line along High Street. The sewer line depth onsite is unknown. The type of sewer pipe and backfill materials used for backfilling trenching, were not available.

3.5.2 STORM DRAIN

Storm drain information was obtained from City of Oakland figures. A 24-inch diameter storm line runs beneath Foothill Boulevard to the north. A 12-inch diameter storm drain line begins at the corner of High Street and Bond Street, running beneath High Street toward the south. Storm drain catch basins are located onsite; two along the Foothill Boulevard side, and two along the High Street side. These catch basins connect with the storm lines beneath Foothill Boulevard and High Street (Figure 5). Information on the storm drain line depths, pipe construction, and backfill materials was not available.

3.5.3 WATER

Information regarding the water utility was obtained from EBMUD and during the geophysical survey. Two water line run beneath High Street east of the site and connect to water lines beneath Foothill Boulevard. Water lines from the station building and the building on the southwest corner connect to the water line beneath High Street (Figure 3). Information related to water line depth, pipe construction, and backfill materials used was not available; however, a typical depth is approximately 3 fbg.

3.5.4 ELECTRICAL

Information related to the electrical utility was obtained from PG&E and during the geophysical survey. An electrical line runs beneath the eastern sidewalk along High Street .Electrical lines onsite connect to the kiosk, other site building, light posts, dispenser pumps, and USTs (Figure 3). Several electrical lines were identified generating from a transformer west of the station building. An electrical line not identified on PG&E's map was located beneath the southern sidewalk along Foothill Boulevard. Information associated with line depth, construction, and backfill materials was not available.

3.5.5 NATURAL GAS

Information associated with the natural gas utility was obtained from USA markings and field observations during the geophysical survey. The PG&E map did not provide natural gas line information. A 6-inch diameter, steel, natural gas line runs along both High Street and Foothill Boulevard (Figure 3). A 16-inch and a 2-inch diameter gas line were also noted beneath the centerline of Foothill Boulevard and appear to connect to the gas line along High Street. Information on gas line depth and backfill materials was not available.

3.5.6 COMMUNICATION

Communication utility information was obtained from USA markings and the geophysical survey. Telecommunication lines were marked adjacent to the gas utility along Foothill Boulevard (Figure 3). A telecommunications utility box was noted on the southern sidewalk along Foothill Boulevard, just to the north. No communication lines were noted beneath High Street. Information related to telecommunication line depth, construction, and backfill materials was not available.

3.5.7 PREFERENTIAL PATHWAY CONCLUSIONS

Based on historic groundwater monitoring and sampling data, depth to groundwater has been measured between approximately 5 to 45 fbg, but groundwater typically ranges from 10 to 20 fbg. Occasionally depth to groundwater has been measured between 5 to 10 fbg, but this is uncommon. Based on regional construction practices for utilities it is unlikely that water, electrical, natural gas, and telecommunication utilities would have been installed deeper than 10 fbg. Since depth to water is typically deeper than the likely depth of the utilities, it is unlikely that these utilities serve as preferential pathways.

Sanitary sewer and storm drain lines are generally gravity feed, installed at depths deeper than 10 fbg, and backfilled with native material (permeability likely similar to native soils). Based on this, although it is possible that the deeper sanitary sewer and/or storm drain lines may act as a preferential pathway during high groundwater conditions, these conditions are not typical.

4.0 WORK PLAN FOR ADDITIONAL INVESTIGATION

CRA proposes installing two shallow groundwater monitoring wells downgradient of wells C-2 and C-4, and adjacent to existing wells C-6 and C-7. CRA also proposed to install three vapor probes, one vapor probe at the southern property boundary and two at the western property boundary, and advancement off one boring in the area of former soil boring C-A. Proposed locations are shown on Figure 6. Details of the proposed scope of work are discussed below.

Permits and Inspection

CRA will obtain the necessary permits and coordinate inspection with Alameda County Public Works (ACPW) and the City of Oakland prior to beginning field operations.

Site Specific Health and Safety Plan

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

Utility Location and Borehole Clearance

CRA will contact Underground Services Alert (USA) to coordinate location of subsurface utilities no less than 48 hours prior to the start of field activities. CRA will hire a utility locating contractor to confirm the locations of underground utilities. In accordance with Chevron and CRA safety standards, an air knife-assisted vacuum rig or hand auger will be utilized to clear the locations to a depth of 8 fbg to ensure the absence of utilities prior to drilling.

Soil Boring

After clearing 8 fbg, one boring will be advanced using direct push technology. The boring will be advanced to a total depth of approximately 30 fbg.

Well Installation

After clearing to 8 fbg, the wells will be advanced using 8-inch diameter hollow-stem auger to a maximum depth of approximately 25 fbg. The wells will be constructed using 2-inch diameter Schedule 40 PVC casing with a 0.020-inch slotted screen from approximately 15 to 25 fbg. The filter pack will consist of #3 Monterey sand from the bottom of the boring to approximately 2 feet above the screen interval. The well annulus will have a 2-foot bentonite seal above the sand pack, with the remainder backfilled with Portland Type I/II cement to approximately 1-foot below grade and finished with a traffic rated well vault flush with the ground surface.

Well construction may be altered based upon field observations. Well locations and top of casing elevation will be surveyed by a licensed surveyor and as required survey data will be uploaded to the State's Geotracker database. CRA's standard operating procedures for monitoring well installation are presented in Appendix E.

Soil Sampling

CRA will collect soil samples at a minimum of 5-foot intervals, at the soil/groundwater interface, at obvious changes in soil types, and where indications of hydrocarbons are observed to the total depth explored. Soil samples collected above 8 fbg will be collected by driving steel tubes into disturbed sediments removed by the hand auger bucket. Soil samples below 8 fbg will be collected by either driving a modified California split-spoon sampler lined with three 6-inch brass sleeves or acetate liners using direct push technology. Soils will be logged using the ASTM D2488-06 Unified Soil Classification System. Soil samples will be screened with a photo ionization detector (PID) and all PID measurements will be recorded on a boring log. All samples will be sealed, labeled, logged on a chain-of-custody, placed on ice, and transported to a Chevron and California State-approved laboratory for analysis.

Chemical Analysis

Select soil and groundwater samples will be analyzed for the following:

- TPHg by EPA Method 8015M
- BTEX and MTBE by EPA Method 8260B

Well Development, Well Survey, and Groundwater Sampling

The wells will be properly developed at least 48 hours after installation and sampled at least 72 hours after the well is developed. The wells will be part of the existing well network monitored and sampled in accordance with the established schedule.

Soil Vapor Probe Installation

Soil vapor probes will be installed using hand auger equipment. Nested vapor probes will be installed at 5 and 15 fbg. It is estimated that groundwater elevation will be below 15 fbg. If groundwater is present above 15 fbg, the deeper probe will be placed approximately 1 foot above the groundwater surface. Standard Field Procedures for Soil Vapor Probe Installation and Sampling are presented as Attachment E.

Soil Vapor Probe Construction

Vapor probes will be constructed of a permeable stainless steel filter with a ¼-inch push-to-connect fitting to ¼-inch Teflon tubing. Each probe will be placed at approximately 5 and 15 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 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) *Advisor-Active Soil Gas Investigations* guidance document, leak testing using laboratory grade helium and a shroud will be performed during sampling. After sampling, the Summa™ canisters will be packaged and sent to Air Toxics laboratory under chain-of-custody for analysis.

Soil Vapor Chemical Analysis

Vapor samples will be analyzed for the following by Air Toxics:

- TPHg, BTEX, MTBE and naphthalene by EPA Method TO-15
- O2, CO2, N2, CH4 and helium by ASTM D-1946 (GC/TCD)
- Air Phase Hydrocarbon (APH) Fractions (Sp) Aromatics C8-C12 Modified TO-15 GC/MS Full Scan
- APH Fractions (Sp) Aliphatics C5-C12 Modified TO-15 GC/MS Full Scan

Waste Disposal

All waste generated will be placed in Department of Transportation (DOT) approved drums, labeled appropriately, and temporarily stored onsite. The waste will be transported by licensed waste haulers to a Chevron and State of California-approved disposal facility following receipt of the analytical profile.

Reporting and Schedule

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

- Description of the drilling and sampling methods
- Well boring logs
- Tabulated soil analytical results
- Analytical reports and chain-of-custody forms
- Waste disposal details
- An evaluation of the extent of hydrocarbons in the subsurface
- Conclusions and recommendations

CRA will proceed with the proposed scope of work upon receipt of written approval from ACEH. CRA will then obtain all required drilling and encroachment permits, obtain offsite access and schedule the subcontractors at their earliest availability. CRA will submit an updated SCM approximately twelve weeks after receipt of all final soil and groundwater analytical data.

FIGURES

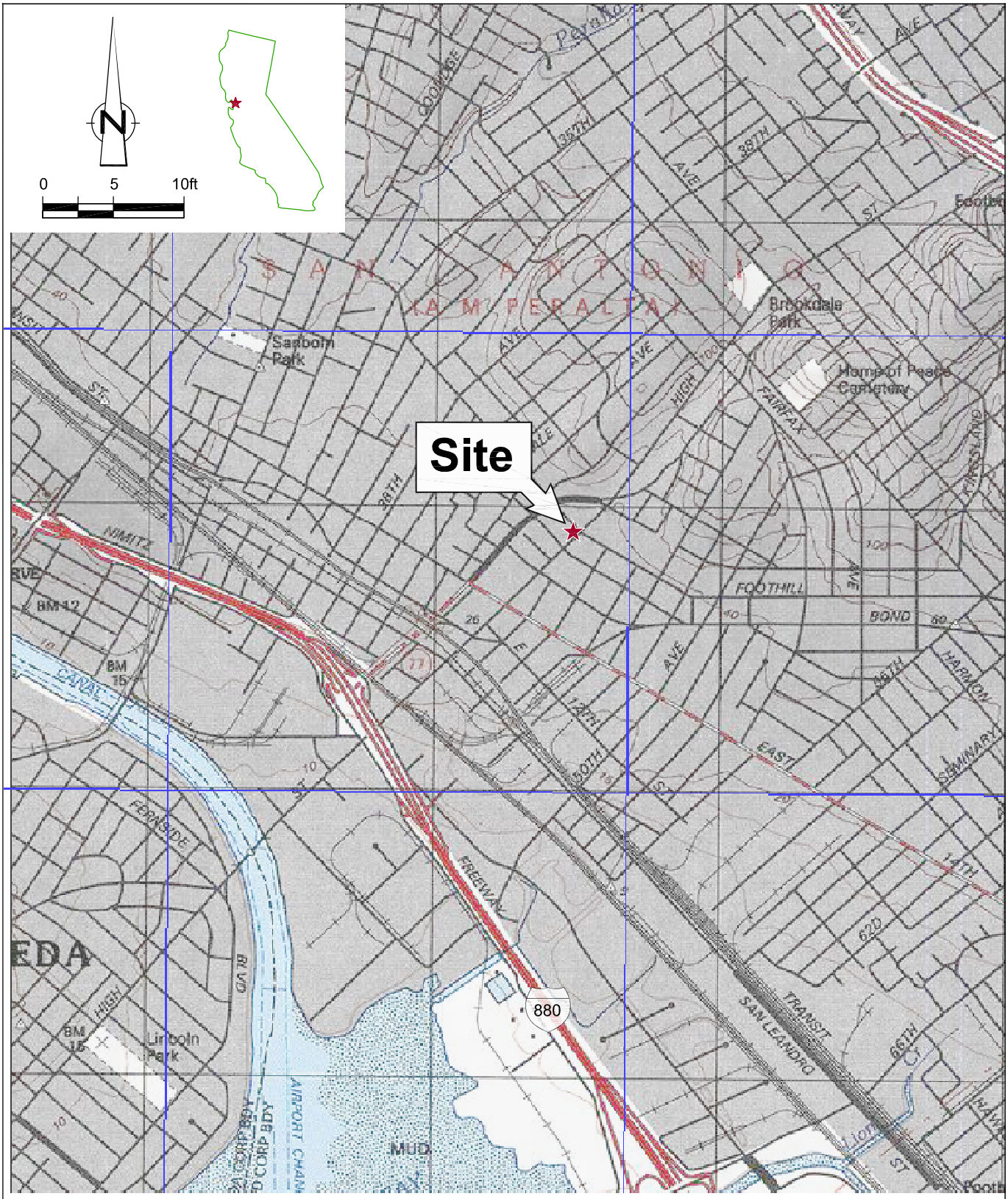


Figure 1

VICINITY MAP
CHEVRON SERVICE STATION 90076
4265 FOOTHILL BOULEVARD
Oakland, California

311977-95(010)GN-EM001 AUG 30/2012

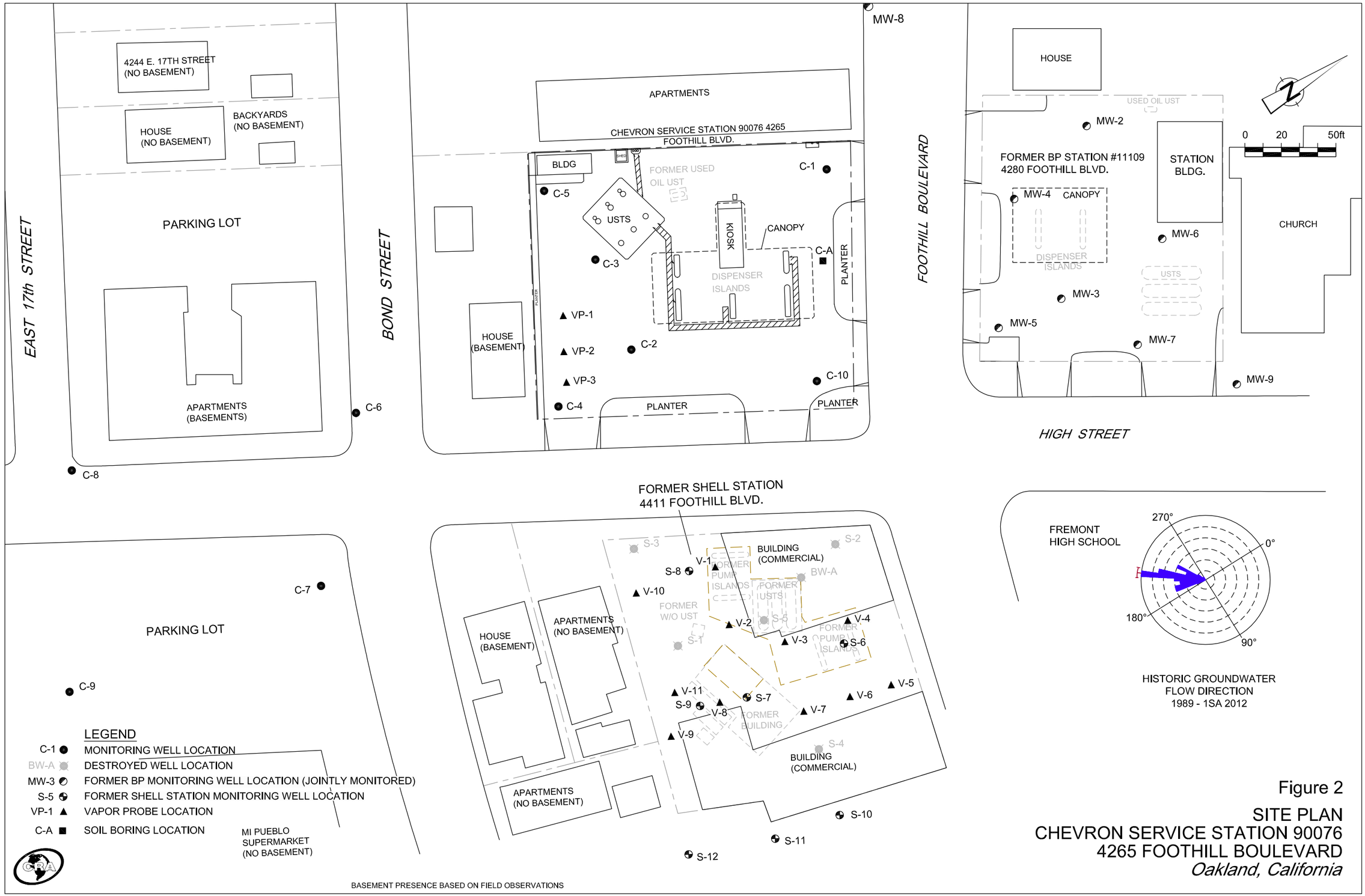


Figure 2

SITE PLAN
CHEVRON SERVICE STATION 90076
4265 FOOTHILL BOULEVARD
Oakland, California

311977-2012(010)GN-EM002 SEPT 13/2012

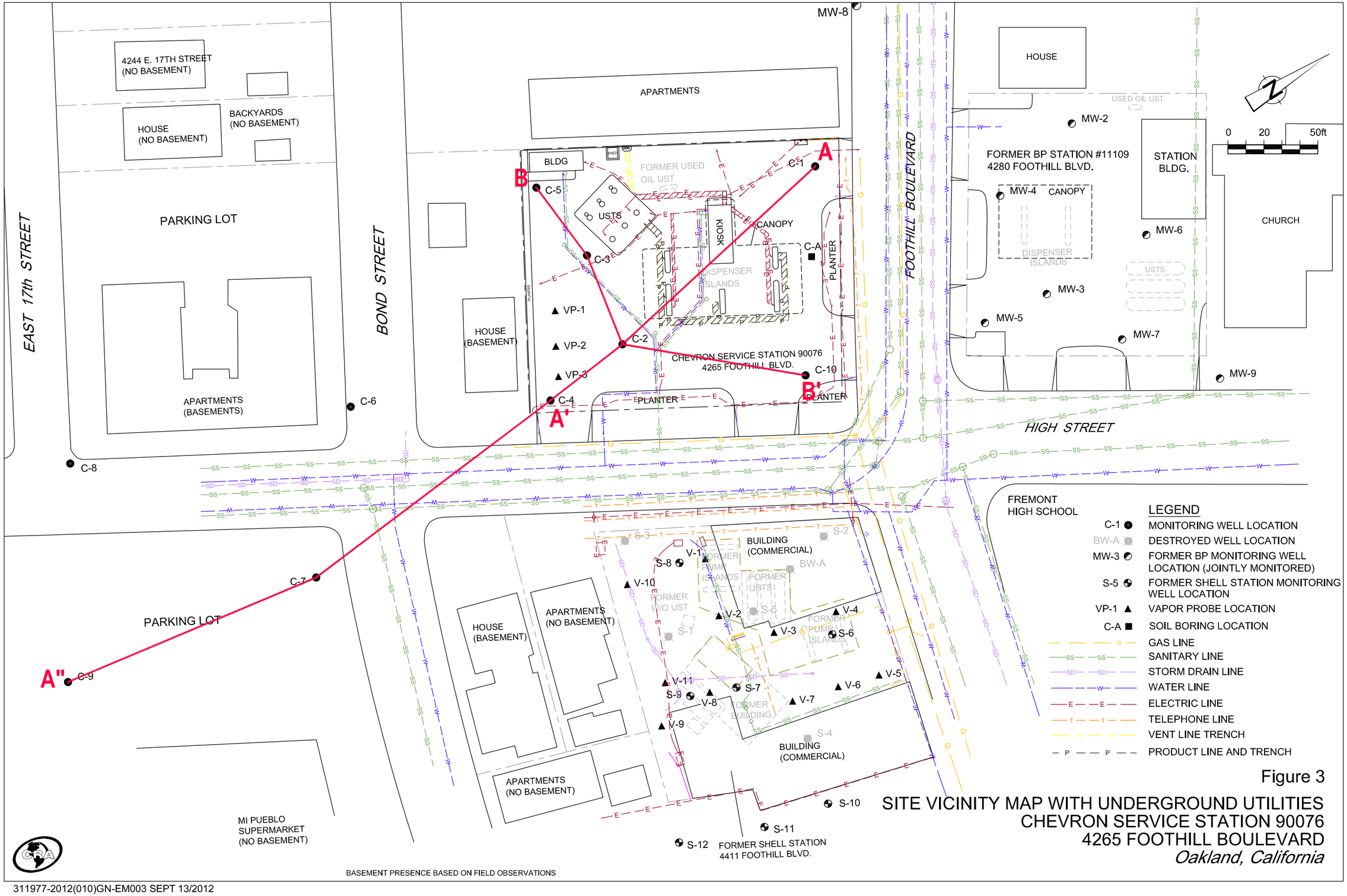
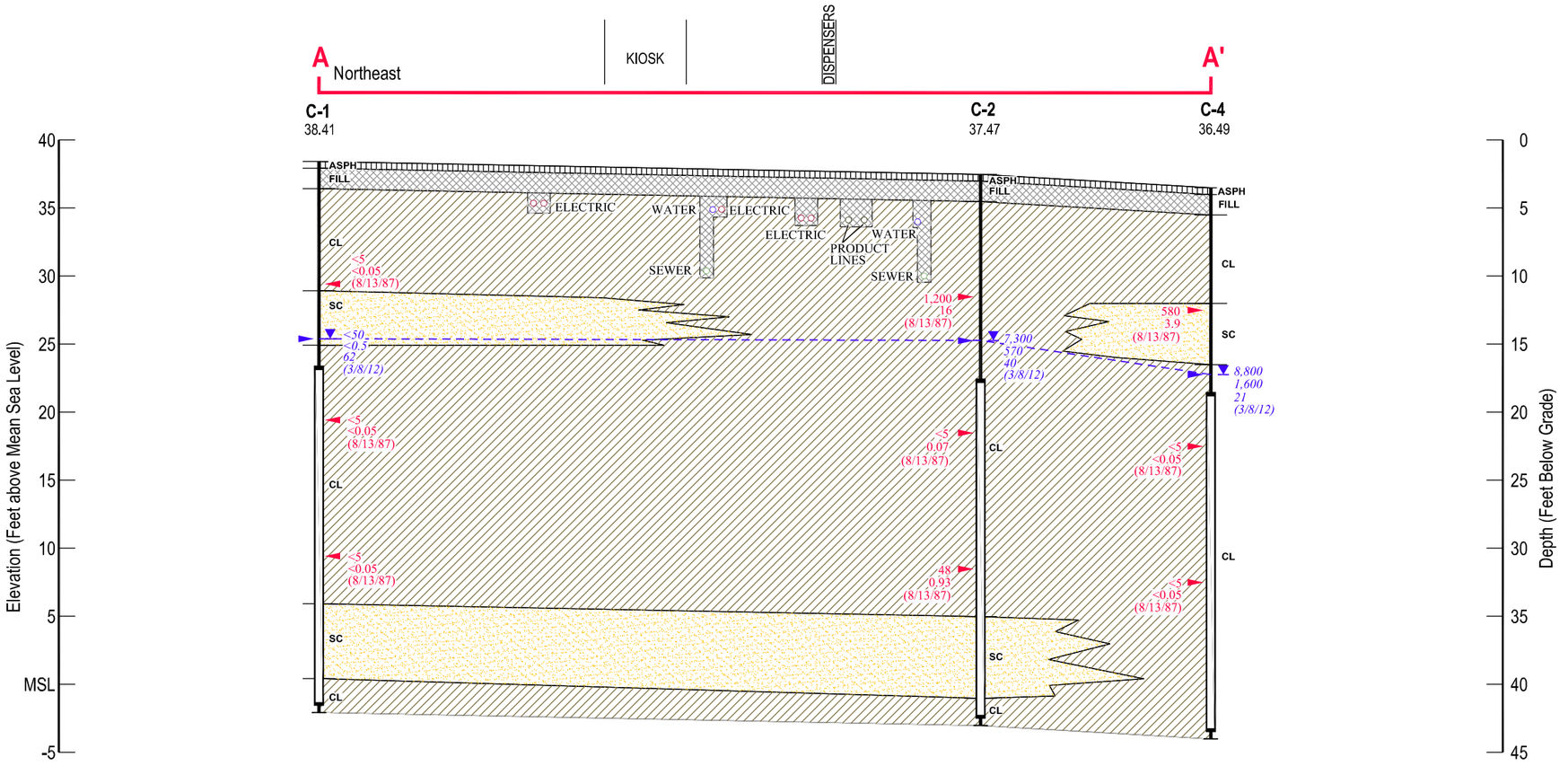


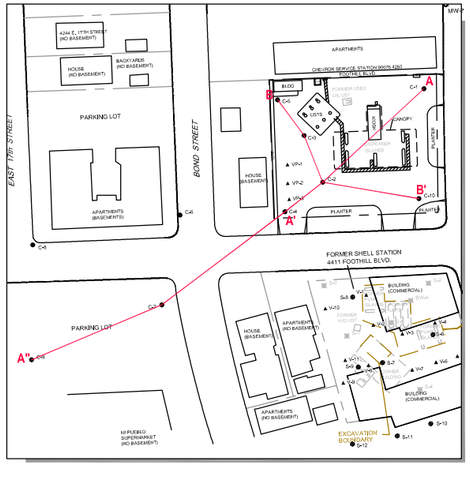
Figure 3

SITE VICINITY MAP WITH UNDERGROUND UTILITIES
CHEVRON SERVICE STATION 90076
4265 FOOTHILL BOULEVARD
Oakland, California

BASEMENT PRESENCE BASED ON FIELD OBSERVATIONS

311977-2012(010)GN-EM003 SEPT 13/2012





EXPLANATION

- FILL
- CL - Inorganic clay of low to medium plasticity, gravelly, sandy, and silty clays, lean clay
- GW - Well graded gravel, gravel-sand mixture, little or no fines
- GC - Clayey gravels >12% fines
- ML - Inorganic silt and very fine sand, silty sand of slight plasticity
- SC - Clayey sand, sand-clay mixtures
- Approximate groundwater sample location
- Approximate soil sample location
- Approximate potentiometric surface
- NOTE: Depth of utilities approximate

Well ID — Well Designation
Elev. — Top of Casing Elevation
Boring / Well
Well Screen Interval
Bottom of Boring
Static Groundwater Level (Date as noted)
TPHg / Benzene / MTBE / (Date) — Hydrocarbon concentrations in groundwater samples, in micrograms per liter (µg/L)
TPHg / Benzene / (Date) — Hydrocarbon concentrations in soil, in milligrams per kilogram (mg/kg)

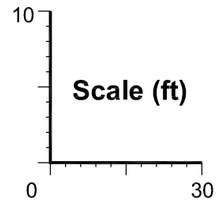
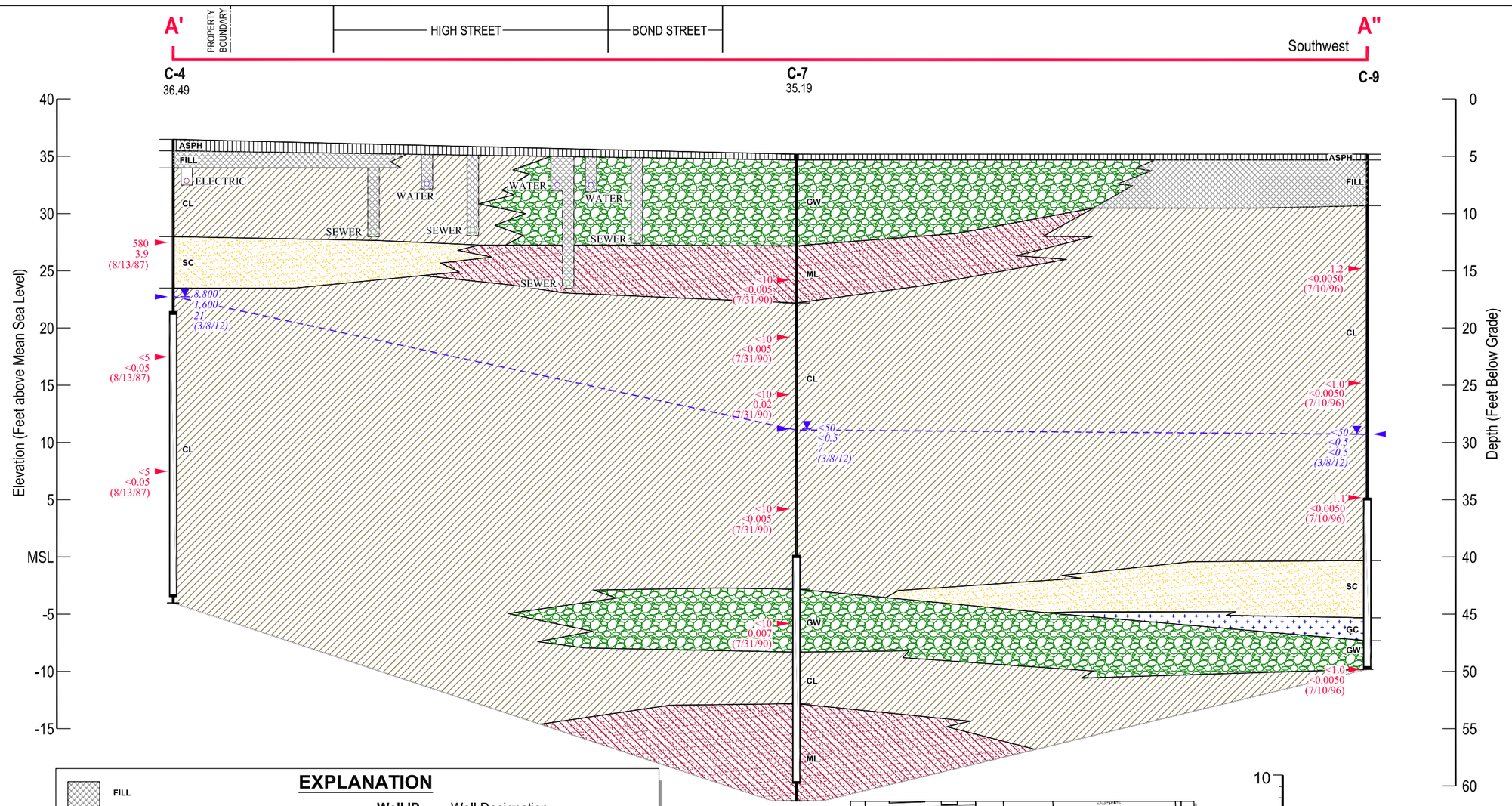


Figure 4A

GEOLOGIC CROSS-SECTION A-A'
CHEVRON SERVICE STATION 90076
4265 FOOTHILL BOULEVARD
Oakland, California



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- FILL
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- Approximate potentiometric surface
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Well ID — Well Designation
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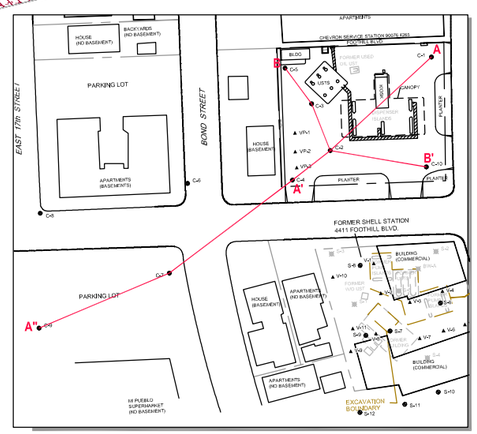
Bottom of Boring
Static Groundwater Level (Date as noted)
TPHg Benzene MTBE (Date) — Hydrocarbon concentrations in groundwater samples, in micrograms per liter (µg/L)
TPHg Benzene (Date) — Hydrocarbon concentrations in soil, in milligrams per kilogram (mg/kg)



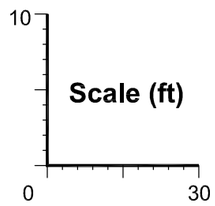
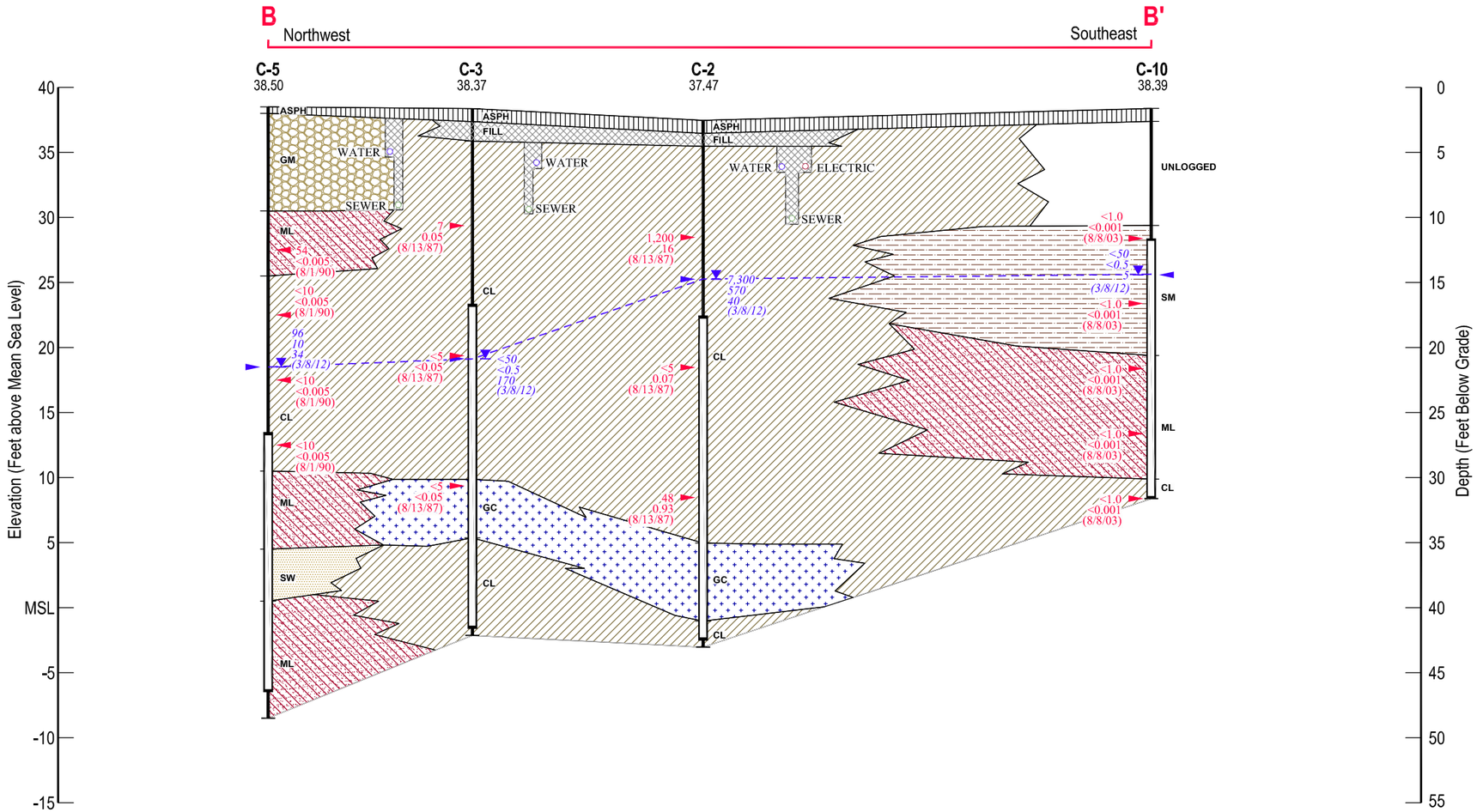
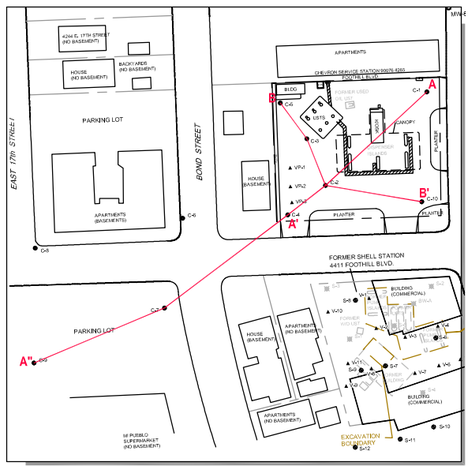


Figure 4B

GEOLOGIC CROSS-SECTION A-A'
CHEVRON SERVICE STATION 90076
4265 FOOTHILL BOULEVARD
Oakland, California





EXPLANATION

- FILL
- ML - Inorganic silt and very fine sand, silty sand of slight plasticity
- CL - Inorganic clay of low to medium plasticity, gravelly, sandy, and silty clays, lean clay
- GM - Silty gravels, >12% fines
- GC - Clayey gravels >12% fines
- SW - Well graded sand, gravelly sand, little or no fines
- SM - Silty sands, sand-silt mixtures, >15% fines

Approximate groundwater sample location

Approximate soil sample location

TPHg / Benzene / (Date) — Hydrocarbon concentrations in soil, in milligrams per kilogram (mg/kg)

Well ID — Well Designation

Elev. — Top of Casing Elevation

Boring / Well

Well Screen Interval

Bottom of Boring

Static Groundwater Level (Date as noted)

TPHg / Benzene / MTBE / (Date) — Hydrocarbon concentrations in groundwater samples, in micrograms per liter (µg/L)

Approximate potentiometric surface

NOTE: Depth of utilities approximate

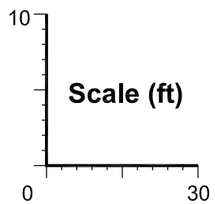
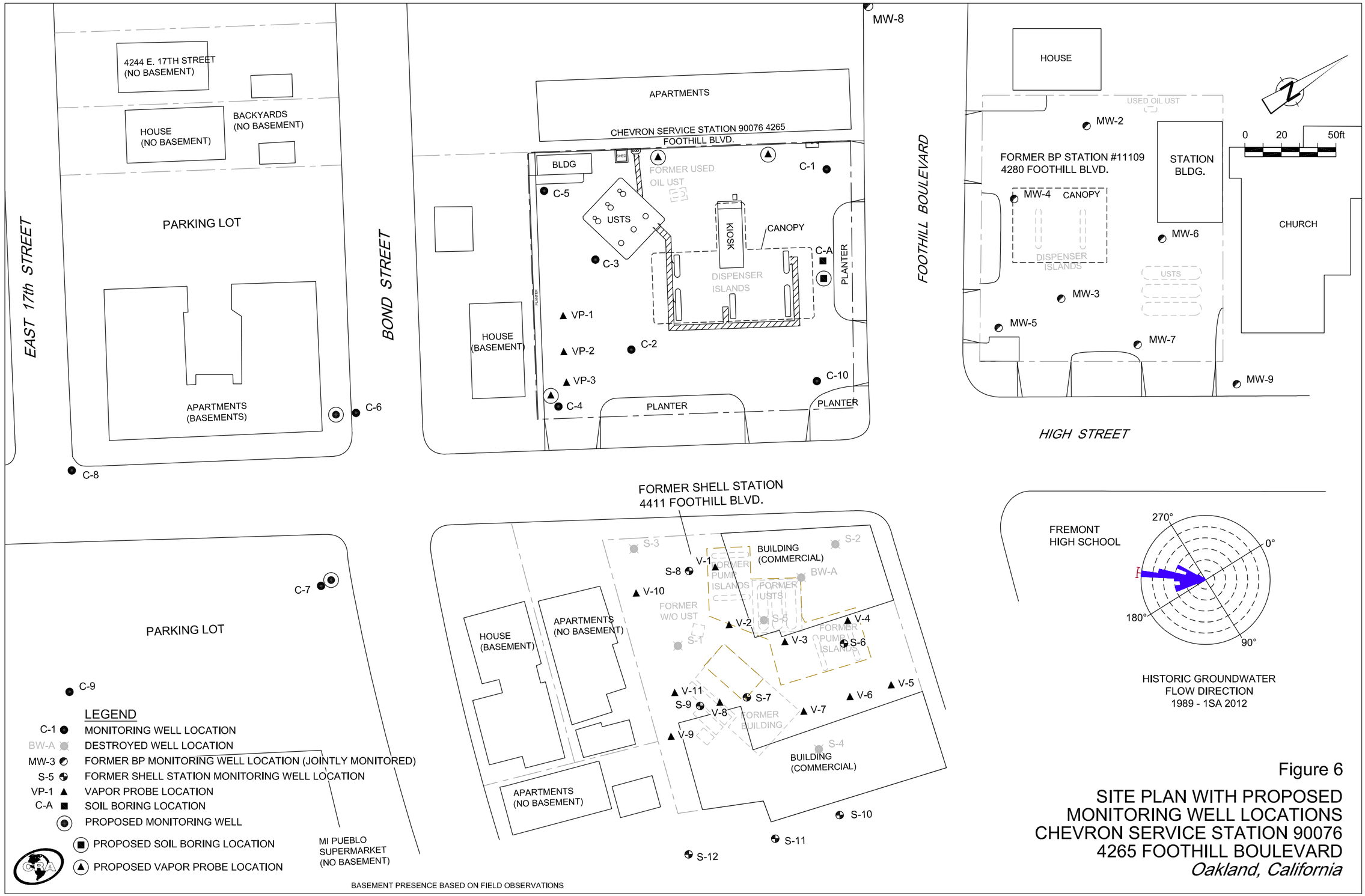


Figure 5

GEOLOGIC CROSS-SECTION B-B'
CHEVRON SERVICE STATION 90076
4265 FOOTHILL BOULEVARD
Oakland, California



BASEMENT PRESENCE BASED ON FIELD OBSERVATIONS

311977-2012(010)GN-EM006 SEPT 14/2012

Figure 6

SITE PLAN WITH PROPOSED
MONITORING WELL LOCATIONS
CHEVRON SERVICE STATION 90076
4265 FOOTHILL BOULEVARD
Oakland, California

TABLES

TABLE 1
VAPOR ANALYTICAL DATA
CHEVRON STATION 90076
4265 FOOTHILL BOULEVARD,
OAKLAND, CALIFORNIA

											Aliphatic Hydrocarbons				*Aromatic Hydrocarbons*						
Sample ID	*Date*	*Probe Depth (fbg)*	*TPHg*	*Benzene*	*Toluene*	*Ethyl-benzene*	*m,p-Xylenes*	*o-Xylenes*	*MTBE*	*Naphtha-lene*	*C5 - C6*	*>C6 - C8*	*>C8 - C10*	*>C10 - C12*	*>C8 - C10*	*>C10 - C12*	O_2	*Nitrogen*	CO_2	CH_4	*He*
			Concentrations are in micrograms per cubic meter ($\mu g/m^3$)														*Reported in % Volume*				
ESLs - Soil Gas, Residential [a]			***10,000***	***84***	***63,000***	***980***	***21,000***	***21,000***	***9,400***	***72***	***NE***	***NE***	***NE***	***NE***	***NE***	***NE***	***NE***	***NE***	***NE***	***NE***	***NE***
ESLs - Soil Gas, Commercial/Industria			***29,000***	***280***	***180,000***	***3,300***	***58,000***	***58,000***	***31,000***	***240***	***NE***	***NE***	***NE***	***NE***	***NE***	***NE***	***NE***	***NE***	***NE***	***NE***	***NE***
Vapor samples collected from permanent soil vapor probes																					
2012 CRA Vapor Sampling																					
VP-1	08/13/12	5.5	650	<2.7	12	29	96	69	<3.1	<18	<55	<70	<100	<120	410	<94	1.7	81	17	0.00020	<0.086
VP-2	08/13/12	5.5	<3,400	<54	<63	<73	<73	<73	<60	<350	<1,100	6,600	<2,000	<2,300	<1,600	<1,800	1.9	82	15	0.77	<0.084
VP-3	08/13/12	5.5	<160	<2.5	<3.0	<3.4	<3.4	<3.4	<2.8	<16	<51	<65	<92	<110	<78	<87	3.1	84	13	0.00016	<0.079
VP-3[b]	08/13/12	5.5	<160	<2.5	<3.0	<3.4	<3.4	<3.4	<2.8	<16	<51	<65	<92	<110	<78	<87	2.8	84	13	<0.00016	<0.079

Notes:

TPHg, Benzene, toluene, ethylbenzene, m,p-xylene, o-xylene, MTBE, and naphthalene by Modified EPA Method TO-15
Oxygen (O2), methane (CH4), and carbon dioxide (CO2) analyzed by ASTM D-1946M
Aliphathic Hydrocarbons (C5-C6 Pentane + Hexane; >C6-C8 Heptane; >C-8-C10 Decane; and >C10-C12 Dodecane) by Modified EPA Method TO-15 APH
Aromatic Hydrocarbons (>C8-C10 1,2,3-TMB and >C10-C12 1,2,4,5-TMB) by Modified EPA Method TO-15 APH
TPHg = Totally petroleum hydrocarbons as gasoline
MTBE = Methyl tertiary butyl ether
ESL = Environmental screening levels
<x = Not detected above method detection limit
fbg = Feet below grade
FLD DUP = Field duplicate
bold = concentrations detected at or above Soil Gas ESLs

a = Table E-2 - Shallow Soil Gas Screening Levels for Evaluation of Potential Vapor Intrusion Concerns from Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater prepared by the California Regional Water Quality Control Board - San Francisco Bay Region, Interim Final November 2007, revised May 2008.
b = Field duplicate collected simultaneously with original sample

TABLE 2

CUMMULATIVE SOIL ANALYTICAL DATA
CHEVRON STATION 90076
4265 FOOTHILL BOULEVARD,
OAKLAND, CALIFORNIA

Sample ID	*Date*	*Depth (fbg)*	*TOG*	*TPHmo*	*TPHg*	*Benzene*	*Toluene*	*Ethyl-benzene*	*Total Xylenes*	*MTBE*	*DIPE*	*TAME*	*TBA*	*ETBE*	*1,2-DCA*	*EDB*
			← *Concentrations reported in milligrams per kilogram (mg/kg)* →													
Soil Leaching, Current or Potential Groundwater Resource (mg/kg)			NE	NE	83	0.044	2.9	3.3	2.3	0.023	NE	NE	0.075	NE	NE	NE
Direct Exposure: Commerical/Industrial Worker			3,700	NE	450	0.27	210	5.0	100	65	NE	NE	320,000	NE	NE	NE
Direct Exposure: Construction/Trench Worker (mg/kg)			12,000	NE	4,200	12	650	210	420	2,800	NE	NE	320,000	NE	NE	NE
2003 Well Installation Sampling																
C-10	08/08/03	10	--	--	<1.0	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.020	<0.001	<0.001	<0.001
C-10	08/08/03	15	--	--	<1.0	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.020	<0.001	<0.001	<0.001
C-10	08/08/03	20	--	--	<1.0	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.020	<0.001	<0.001	<0.001
C-10	08/08/03	25	--	--	<1.0	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.020	<0.001	<0.001	<0.001
C-10	08/08/03	30	--	--	<1.0	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.020	<0.001	<0.001	<0.001
1997 Dispenser Island Upgrade and Product Piping Replacement Sampling																
PL1	07/21/97	4	--	--	1.8	0.031	0.016	0.023	0.19	2.5	--	--	--	--	--	--
PL2	07/21/97	4	--	--	**210**	**0.64**	0.90	**3.6**	**11**	<2.5	--	--	--	--	--	--
PL3	07/21/97	4	--	--	34	**0.20**	0.15	0.88	**4.4**	**10**	--	--	--	--	--	--
PL4	07/21/97	4	--	--	45	<0.0050	<0.0050	0.87	**3.5**	**10**	--	--	--	--	--	--
PL5	07/21/97	4	--	--	**130**	**0.64**	0.25	0.71	0.51	**6.9**	--	--	--	--	--	--
1987 - 1996 Well Installation and Soil Boring Sampling																
C-9	07/10/96	10	--	--	1.2	<0.0050	<0.0050	<0.0050	<0.0050	--	--	--	--	--	--	--
C-9	07/10/96	20	--	--	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	--	--	--	--	--	--	--
C-9	07/10/96	30	--	--	1.1	<0.0050	<0.0050	<0.0050	<0.0050	--	--	--	--	--	--	--
C-9	07/10/96	45	--	--	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	--	--	--	--	--	--	--

TABLE 2

CUMMULATIVE SOIL ANALYTICAL DATA
CHEVRON STATION 90076
4265 FOOTHILL BOULEVARD,
OAKLAND, CALIFORNIA

Sample ID	*Date*	*Depth (fbg)*	*TOG*	*TPHmo*	*TPHg*	*Benzene*	*Toluene*	*Ethyl-benzene*	*Total Xylenes*	*MTBE*	*DIPE*	*TAME*	*TBA*	*ETBE*	*1,2-DCA*	*EDB*
			← *Concentrations reported in milligrams per kilogram (mg/kg)* →													
Soil Leaching, Current or Potential Groundwater Resource (mg/kg)			NE	NE	83	0.044	2.9	3.3	2.3	0.023	NE	NE	0.075	NE	NE	NE
Direct Exposure: Commerical/Industrial Worker			3,700	NE	450	0.27	210	5.0	100	65	NE	NE	320,000	NE	NE	NE
Direct Exposure: Construction/Trench Worker (mg/kg)			12,000	NE	4,200	12	650	210	420	2,800	NE	NE	320,000	NE	NE	NE
C-8 (BH-H)	11/01/90	5.5	--	--	<10	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--	--
C-8 (BH-H)	11/01/90	40	--	--	<10	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--	--
C-8 (BH-H)	11/01/90	45	--	--	<10	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--	--
C-6 (BH-F)	08/01/90	16	--	--	<10	<0.005	<0.005	<0.005	<0.015	--	--	--	--	--	--	--
C-6 (BH-F)	08/01/90	21	--	--	<10	<0.005	<0.005	<0.005	<0.015	--	--	--	--	--	--	--
C-6 (BH-F)	08/01/90	31	--	--	42	**0.2**	<0.005	0.1	0.3	--	--	--	--	--	--	--
C-6 (BH-F)	08/01/90	41	--	--	<10	<0.005	<0.005	<0.005	<0.015	--	--	--	--	--	--	--
C-5 (BH-E)	08/01/90	11	--	--	54	**0.5**	1.7	0.8	**4.5**	--	--	--	--	--	--	--
C-5 (BH-E)	08/01/90	16	--	--	<10	<0.005	<0.005	<0.005	0.02	--	--	--	--	--	--	--
C-5 (BH-E)	08/01/90	21	--	--	<10	<0.005	<0.005	<0.005	<0.015	--	--	--	--	--	--	--
C-5 (BH-E)	08/01/90	26	--	--	<10	<0.005	<0.005	<0.005	<0.015	--	--	--	--	--	--	--
C-7 (BH-G)	07/31/90	11	--	--	<10	<0.005	<0.005	<0.005	<0.015	--	--	--	--	--	--	--
C-7 (BH-G)	07/31/90	16	--	--	<10	<0.005	<0.005	<0.005	<0.015	--	--	--	--	--	--	--
C-7 (BH-G)	07/31/90	21	--	--	<10	0.02	<0.005	<0.005	<0.015	--	--	--	--	--	--	--
C-7 (BH-G)	07/31/90	31	--	--	<10	<0.005	<0.005	<0.005	<0.015	--	--	--	--	--	--	--
C-7 (BH-G)	07/31/90	41	--	--	<10	0.007	<0.005	<0.005	<0.015	--	--	--	--	--	--	--
C-4	08/13/87	9	--	--	**580**	**3.9**	**23**	--	**46**	--	--	--	--	--	--	--
C-4	08/13/87	19	--	--	<5	<0.05	<0.1	--	<0.4	--	--	--	--	--	--	--
C-4	08/13/87	29	--	--	<5	<0.05	<0.1	--	<0.4	--	--	--	--	--	--	--

TABLE 2

CUMMULATIVE SOIL ANALYTICAL DATA
CHEVRON STATION 90076
4265 FOOTHILL BOULEVARD,
OAKLAND, CALIFORNIA

Sample ID	*Date*	*Depth (fbg)*	*TOG*	*TPHmo*	*TPHg*	*Benzene*	*Toluene*	*Ethyl-benzene*	*Total Xylenes*	*MTBE*	*DIPE*	*TAME*	*TBA*	*ETBE*	*1,2-DCA*	*EDB*
			← *Concentrations reported in milligrams per kilogram (mg/kg)* →													
Soil Leaching, Current or Potential Groundwater Resource (mg/kg)			NE	NE	83	0.044	2.9	3.3	2.3	0.023	NE	NE	0.075	NE	NE	NE
Direct Exposure: Commerical/Industrial Worker			3,700	NE	450	0.27	210	5.0	100	65	NE	NE	320,000	NE	NE	NE
Direct Exposure: Construction/Trench Worker (mg/kg)			12,000	NE	4,200	12	650	210	420	2,800	NE	NE	320,000	NE	NE	NE
C-3	08/13/87	9	--	--	7	**0.05**	<0.1	--	0.4	--	--	--	--	--	--	--
C-3	08/13/87	19	--	--	<5	<0.05	<0.1	--	<0.4	--	--	--	--	--	--	--
C-3	08/13/87	29	--	--	<5	<0.05	<0.1	--	<0.4	--	--	--	--	--	--	--
C-2	08/13/87	9	--	--	**1,200**	**16**	**54**	--	**120**	--	--	--	--	--	--	--
C-2	08/13/87	19	--	--	<5	**0.07**	0.8	--	<0.4	--	--	--	--	--	--	--
C-2	08/13/87	29	--	--	48	**0.93**	0.1	--	**3**	--	--	--	--	--	--	--
C-1	08/13/87	9	--	--	<5	<0.05	<0.1	--	<0.4	--	--	--	--	--	--	--
C-1	08/13/87	19	--	--	<5	<0.05	<0.1	--	<0.4	--	--	--	--	--	--	--
C-1	08/13/87	29	--	--	<5	<0.05	<0.1	--	<0.4	--	--	--	--	--	--	--
C-A	08/13/87	8.5	--	--	**3,600**	**33**	**12**	--	**350**	--	--	--	--	--	--	--
C-A	08/13/87	19	--	--	63	**2.0**	0.1	--	2.0	--	--	--	--	--	--	--
C-A	08/13/87	23.5	--	--	52	**1.8**	<0.1	--	0.4	--	--	--	--	--	--	--
1987 Underground Storage Tank Removal Sampling																
#1	05/22/87		--	--	<1	<0.005	<0.005	--	<0.005	--	--	--	--	--	--	--
#2	05/22/87		--	--	<1	<0.005	<0.005	--	<0.005	--	--	--	--	--	--	--
#3	05/22/87		--	--	<1	<0.005	<0.005	--	<0.005	--	--	--	--	--	--	--
#4	05/22/87		--	--	<1	0.014	0.038	--	0.020	--	--	--	--	--	--	--
#5	05/22/87		--	--	<1	**0.057**	0.092	--	0.029	--	--	--	--	--	--	--

TABLE 2

CUMMULATIVE SOIL ANALYTICAL DATA
CHEVRON STATION 90076
4265 FOOTHILL BOULEVARD,
OAKLAND, CALIFORNIA

Sample ID	*Date*	*Depth (fbg)*	*TOG*	*TPHmo*	*TPHg*	*Benzene*	*Toluene*	*Ethyl-benzene*	*Total Xylenes*	*MTBE*	*DIPE*	*TAME*	*TBA*	*ETBE*	*1,2-DCA*	*EDB*
			← *Concentrations reported in milligrams per kilogram (mg/kg)* →													
Soil Leaching, Current or Potential Groundwater Resource (mg/kg)			NE	NE	83	0.044	2.9	3.3	2.3	0.023	NE	NE	0.075	NE	NE	NE
Direct Exposure: Commerical/Industrial Worker			3,700	NE	450	0.27	210	5.0	100	65	NE	NE	320,000	NE	NE	NE
Direct Exposure: Construction/Trench Worker (mg/kg)			12,000	NE	4,200	12	650	210	420	2,800	NE	NE	320,000	NE	NE	NE
#6	05/22/87		--	--	<1	0.010	<0.005	--	<0.005	--	--	--	--	--	--	--
#7	05/21/87		63	100	--	--	--	--	--	--	--	--	--	--	--	--
#8	05/21/87		<5	<100	--	--	--	--	--	--	--	--	--	--	--	--

Abbreviations/Notes:

TOG = Total oil and grease analyzed by EPA Method 8015, unless otherwise noted
TPHmo = Total petroleum hydrocarbons as motor oil by EPA Method
TPHg = Total petroleum hydrocarbons as gasoline analyzed by EPA Method 8015 unless otherwise noted
Benzene, toluene, ethylbenzene, and total xylenes analyzed by EPA Method 8260B; before 2003, analyzed by EPA Method 8020 unless otherwise noted
MTBE = Methyl tertiary-butyl ether analyzed by EPA Method 8260B, unless otherwise noted
DIPE = di-isopropyl ether, TAME = t-amyl methyl ether, TBA = tert-butyl alcohol and ETBE = ethyl tertiary butyl ether analyzed by EPA Method 8260B, unless otherwise
fbg = feet below grade
-- = not analyzed or not applicable
<x = Not detected at or above stated laboratory method detection limits
NE = Not established
bold = Concentrations detected at or above established ESLs

APPENDIX A

REGULATORY CORRESPONDENCE

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
ALEX BRISCOE, Agency Director

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

May 30, 2012

Mr. Dave Patten
Chevron Corporation
6101 Bollinger Canyon Rd.
San Ramon, CA 94583
(sent via electronic mail to:
drpatten@chevron.com)

Mr. Mark Horne
Chevron Corporation
6101 Bollinger Canyon Rd.
San Ramon, CA 94583
(sent via electronic mail to:
MarkHorne@chevron.com)

Loi & Josephine Le
Loi V Le et al.
4265 Foothill Bvd.
Oakland, CA 94601

Subject: Request for Site Status and Revised Work Plan; Fuel Leak Case No. RO0000427 and GeoTracker Global ID T0600100339, Chevron #9-0076, 4265 Foothill Blvd, Oakland, CA 94601

Dear Messrs. Horne, Patten, and Mr. and Ms. Le:

Alameda County Environmental Health (ACEH) staff has reviewed the case file for the above referenced site including the *Soil Vapor Assessment Workplan,* dated August 26, 2004, the *Vapor Sampling 1st and 2nd Quarters 2006,* dated August 25, 2006, and the *2012 Annual Groundwater Monitoring Report,* dated March 23, 2012. The reports were prepared and submitted on your behalf by Cambria Environmental Technology, Inc. and Conestoga-Rovers & Associates (CRA). Thank you for submitting the documents. The referenced work plan proposed the installation of three vapor wells onsite. A July 6, 2005 directive letter approved the installation of the three soil vapor probes. The document entitled *Vapor Sampling 1st and 2nd Quarters 2006* indicates that vapor sampling had not been conducted in the first and second quarters of 2006 due to rain and submerged vapor wells; however, ACEH notes an EDF analytical report that was submitted to Geotracker for vapor samples that were collected on November 28, 2005. A report of this data does not appear to have been previously submitted to the ACEH ftp or Geotracker websites. Based on ACEH staff review of the case file, we request that you address the following technical comments and send us the reports described below.

TECHNICAL COMMENTS

1) **Status of Overdue Deliverables** – As indicated above, it appears that vapor sampling may have occurred at the subject site; however, an associated report does not appear to have been submitted to either the ACEH ftp site or to Geotracker. Based on the correspondence, the wells would appear to have been permanent wells; however, they also do not appear to have been surveyed to Geotracker standards, and bore logs do not appear to have been submitted. As a consequence, ACEH requests a status update on the vapor wells, their condition of repair, and requests the submittal of all associated reports and data to the ACEH ftp and Geotracker websites, by the date identified below.

2) **Request for Missing Reports and Data –** In reviewing the case file ACEH noted that several reports that were cited in various documents were not in the ACEH case file, nor on Geotracker. Also included in this list, but certainly not limited to it, is the 1997 product line replacement report (analytical data from this event was cited in the October 2003 *Well Installation Report / Site Summary* report). As a consequence, ACEH requests that the ACEH ftp site case file be reviewed for missing reports and that the reports be uploaded to the ACEH ftp site and to Geotracker by the date identified below. ACEH requests a list of the missing reports and other data at the time of the upload.

3) **Request for Soil Vapor Work Plan** – Based on the referenced correspondence, it would appear that the vapor wells may have been installed to a depth greater than 5 feet bgs as depth-to-water levels ranged between approximately 10 to 12 feet in well C-4 (in proximity to the proposed vapor well locations) during the early 2005 – 2006 time period, and the vapor wells were reported to have been submerged. As a consequence, ACEH request a soil vapor work plan, using current methodologies and protocols, to install an appropriate number of soil vapor points at appropriate locations at, or near, the site. In particular, the residential house immediately "south" of the subject site, is reported to be constructed with a half-basement, and should be considered in the work plan; however, that location should not be the sole focus of the work plan. ACEH notes that additional houses with basements are reported to be located further downgradient. Vadose zone vapor characterization is an important data gap due to the consistent detection of unmonitored hydrocarbons in a generally granular zone at an approximate depth of 10 feet bgs in wells C-2, C-3, C-4, and C-5. In conjunction with soil vapor wells that appear to have been submerged as noted in Technical Comment 1, this may also indicate the migration of not insubstantial (periodic?) contaminants through unmonitored shallow granular zones. Please submit the work plan by the date identified below.

4) **Request for a Remedial Investigation Work Plan and Updated SCM** – It appears that the existing SCM from 2000 is fairly limited and requires updating. Release mechanisms to account for free-phase in bore C-A and the sign footing excavation in 1987 do not appear to have been accounted for, nor do migration pathways. ACEH notes that a minimum of three (downgradient) wells can be argued to be submerged (offsite wells C-6, C-7, and C-9) and the limited data on the installation depths of the vapor wells also indicates periodic inundation onsite. Critically, these offsite potentially underwater wells provide downgradient definition of the groundwater plume. ACEH does note that an argument has been advanced that these are transitory, seasonal events migrating through discontinuous granular zones in the vadose zone; however, ACEH also notes that up to 580 mg/kg TPHg was detected (well C-4) at a depth of 9 to 10.5 feet bgs in granular soils. Additional data gaps that are identified will require a data gap work plan.

5) **Request for Utility Preferential Pathway Study** – As you are aware, the purpose of a preferential pathway study is to locate potential migration pathways and conduits and determine the probability of a groundwater plume encountering preferential pathways and conduits that could spread contamination. We request that you perform a preferential pathway study that details the potential migration pathways and potential conduits (utilities, utility laterals, pipelines, foundational, and etc.) for vertical and lateral migration that may be present in the vicinity of the site.

   Specifically, while a preferential pathway survey has not been generated for the site, utility conduit surveys (including invert depths) have been generated for the neighboring Shell and BP service station sites. ACEH requests that this available information be utilized and that it be augmented with onsite, or site vicinity, utility lateral locations, including utility invert depths. ACEH has found that the location of utility laterals can be of import in vadose zone contaminant migration.

   Discuss your analysis and interpretation of the results of the preferential pathway study and report your results in the report requested below. The results of your study shall contain all information required by California Code of Regulations, Title 23, Division 3, Chapter 16, §2654(b).

   a. **Utility Survey** - An evaluation of all utility lines, utility laterals, and trenches (including sewers, storm drains, pipelines, trench backfill, foundation backfill, etc.) within and near the site and plume area(s) is required as part of your study. Please reduce, and synthesize available information and maps, and generate appropriate (vicinity and / or site specific) maps and cross-sections illustrating the location and depth of all utility lines and trenches within and near the site and plume areas(s) as part of your study.

TECHNICAL REPORT REQUEST

Please submit technical reports to Alameda County Environmental Health (Attention: Mr. Mark Detterman), according to the following schedule:

- **July 13, 2012** – Overdue Deliverable Submittals to the ACEH and Geotracker websites (and documentation of)
- **August 3, 2012** –Vapor Investigation Work Plan (and utility conduit survey)
- **60 Days After Work Plan Approval** – Soil and Groundwater (Vapor) Investigation Report
- **November 30, 2012** – Second Semiannual 2012 Groundwater Monitoring Report
- **May 24, 2013** – First Semiannual 2013 Groundwater Monitoring Report

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

Should you have any questions, please contact me at (510) 567--6876 or send me an electronic mail message at mark.detterman@acgov.org.

Sincerely,

Digitally signed by Mark E. Detterman
DN: cn=Mark E. Detterman, o, ou, email, c=US
Date: 2012.05.30 14:22:28 -07'00'

Mark E. Detterman, PG, CEG
Senior Hazardous Materials Specialist

Enclosures: Attachment 1 – Responsible Party (ies) Legal Requirements / Obligations
Electronic Report Upload (ftp) Instructions

cc: Nathan Lee, Conestoga-Rovers & Assoc., 5900 Hollis Street, Suite A, Emeryville, CA 94608 (sent via electronic mail to NLee@craworld.com)

Tina Hariu, Conestoga-Rovers & Assoc., 5900 Hollis Street, Suite A, Emeryville, CA 94608 (sent via electronic mail to THariu@craworld.com)

Donna Drogos, ACEH, (sent via electronic mail to donna.drogos@acgov.org)
Mark Detterman, ACEH, (sent via electronic mail to mark.detterman@acgov.org)
Geotracker, Electronic File

Attachment 1

Responsible Party(ies) Legal Requirements/Obligations

REPORT REQUESTS

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

ELECTRONIC SUBMITTAL OF REPORTS

ACEH's Environmental Cleanup Oversight Programs (LOP and SLIC) require submission of reports in electronic form. The electronic copy replaces paper copies and is expected to be used for all public information requests, regulatory review, and compliance/enforcement activities. Instructions for submission of electronic documents to the Alameda County Environmental Cleanup Oversight Program FTP site are provided on the attached "Electronic Report Upload Instructions." Submission of reports to the Alameda County FTP site is an addition to existing requirements for electronic submittal of information to the State Water Resources Control Board (SWRCB) GeoTracker website. In September 2004, the SWRCB adopted regulations that require electronic submittal of information for all groundwater cleanup programs. For several years, responsible parties for cleanup of leaks from underground storage tanks (USTs) have been required to submit groundwater analytical data, surveyed locations of monitoring wells, and other data to the GeoTracker database over the Internet. Beginning July 1, 2005, these same reporting requirements were added to Spills, Leaks, Investigations, and Cleanup (SLIC) sites. Beginning July 1, 2005, electronic submittal of a complete copy of all reports for all sites is required in GeoTracker (in PDF format). Please visit the SWRCB website for more information on these requirements (http://www.waterboards.ca.gov/water_issues/programs/ust/electronic_submittal/).

PERJURY STATEMENT

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

PROFESSIONAL CERTIFICATION & CONCLUSIONS/RECOMMENDATIONS

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

UNDERGROUND STORAGE TANK CLEANUP FUND

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

AGENCY OVERSIGHT

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

Alameda County Environmental Cleanup Oversight Programs (LOP and SLIC)	**REVISION DATE:** July 20, 2010
	ISSUE DATE: July 5, 2005
	PREVIOUS REVISIONS: October 31, 2005; December 16, 2005; March 27, 2009; July 8, 2010
SECTION: Miscellaneous Administrative Topics & Procedures	**SUBJECT:** Electronic Report Upload (ftp) Instructions

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

REQUIREMENTS

- **Please do not submit reports as attachments to electronic mail.**
- Entire report including cover letter must be submitted to the ftp site as **a single portable document format (PDF) with no password protection**.
- It is **preferable** that reports be converted to PDF format from their original format, (e.g., Microsoft Word) rather than scanned.
- **Signature pages and perjury statements must be included and have either original or electronic signature.**
- **Do not password protect the document**. Once indexed and inserted into the correct electronic case file, the document will be secured in compliance with the County's current security standards and a password. **Documents with password protection will not be accepted**.
- Each page in the PDF document should be rotated in the direction that will make it easiest to read on a computer monitor.
- Reports must be named and saved using the following naming convention:

  RO#_Report Name_Year-Month-Date (e.g., RO#5555_WorkPlan_2005-06-14)

Submission Instructions

1) Obtain User Name and Password
   a) Contact the Alameda County Environmental Health Department to obtain a User Name and Password to upload files to the ftp site.
      i) Send an e-mail to deh.loptoxic@acgov.org
   b) In the subject line of your request, be sure to include **"ftp PASSWORD REQUEST"** and in the body of your request, include the **Contact Information, Site Addresses**, and the **Case Numbers (RO# available in Geotracker) you will be posting for**.

2) Upload Files to the ftp Site
   a) Using Internet Explorer (IE4+), go to ftp://alcoftp1.acgov.org
      (i) Note: Netscape, Safari, and Firefox browsers will not open the FTP site as they are NOT being supported at this time.
   b) Click on Page located on the Command bar on upper right side of window, and then scroll down to Open FTP Site in Windows Explorer.
   c) Enter your User Name and Password. (Note: Both are Case Sensitive.)
   d) Open "My Computer" on your computer and navigate to the file(s) you wish to upload to the ftp site.
   e) With both "My Computer" and the ftp site open in separate windows, drag and drop the file(s) from "My Computer" to the ftp window.

3) Send E-mail Notifications to the Environmental Cleanup Oversight Programs
   a) Send email to deh.loptoxic@acgov.org notify us that you have placed a report on our ftp site.
   b) Copy your Caseworker on the e-mail. Your Caseworker's e-mail address is the entire first name then a period and entire last name @acgov.org. (e.g., firstname.lastname@acgov.org)
   c) The subject line of the e-mail must start with the RO# followed by **Report Upload**. (e.g., Subject: RO1234 Report Upload) If site is a new case without an RO#, use the street address instead.
   d) If your document meets the above requirements and you follow the submission instructions, you will receive a notification by email indicating that your document was successfully uploaded to the ftp site.

Lee, Nathan

From: Detterman, Mark, Env. Health [Mark.Detterman@acgov.org]
Sent: Thursday, July 26, 2012 4:40 PM
To: Lee, Nathan
Cc: Espino Devine, Catalina
Subject: RE: RO 0427 Chevron Service Station 90077 4265 Foothill Boulevard - Extension Request

Nat,
Thanks for the update for the site. Please use this email to document general ACEH concurrence with a resampling event of the vapor wells, and inclusion of the data in the requested work plan; however, I've utilized a September 14th deliverable date (6 weeks further out, rather than 8 weeks). I'll update Geotracker shortly.
Regards,

Mark Detterman
Senior Hazardous Materials Specialist, PG, CEG
Alameda County Environmental Health
1131 Harbor Bay Parkway
Alameda, CA 94502
Direct: 510.567.6876
Fax: 510.337.9335
Email: mark.detterman@acgov.org

PDF copies of case files can be downloaded at:

http://www.acgov.org/aceh/lop/ust.htm

From: Lee, Nathan [mailto:nlee@craworld.com]
Sent: Tuesday, July 24, 2012 3:48 PM
To: Detterman, Mark, Env. Health
Cc: Espino Devine, Catalina
Subject: RO 0427 Chevron Service Station 90077 4265 Foothill Boulevard - Extension Request

Mark,

Conestoga-Rovers and Associates (CRA) on behalf of Chevron Environmental Management Company (EMC) would like to request an extension for the Vapor Investigation Work Plan (and conduit Study) which was requested by Alameda County Environmental Health (ACEH) in their letter dated May 30, 2012 and due on August 3, 2012. The reason for this extension request is, CRA would like to sample the existing soil vapor probes and use the soil gas analytical data to assist in completion of the vapor investigation work plan. Also the geophysical survey for the utility conduit was conducted on site on July 19, 2012. CRA is awaiting the report from the geophysical subcontractor. Also, CRA has requested from Pacific Gas and Electric (PG&E) their electrical and natural gas utility location map, CRA has yet to receive PG&E's utility map. PG&E's utility map will help tie in their utilities to the adjacent sites. Therefore an extension request of **September 28, 2012** for the submittal of the Vapor Investigation Work Plan (and utility conduit study) is requested.

Thanks,

Nathan Lee, P.G.
Conestoga-Rovers & Associates (CRA)
5900 Hollis Street, Suite A
Emeryville, CA 94608

Phone: 510.420.3333

Fax: 510.420.9170
Cell: 510.385.2499
Email: nlee@CRAworld.com

APPENDIX B

SUMMARY OF ENVIRONMENTAL INVESTIGATION AND REMEDIATION

SUMMARY OF ENVIRONMENTAL INVESTIGATION AND REMEDATION
CHEVRON STATION 90076

May 1987 Tank Removal and Replacement

In May 1987, Blaine Tech Services removed three steel fuel underground storage tanks (USTs) and one fiberglass used-oil UST. An unknown volume of excavated backfill material was aerated and reused onsite. Additional impacted soil was disposed of at a Chevron approved, non-hazardous landfill. Three 10,000-gallon double-walled fiberglass USTs were installed in the same excavation in June 1987. Soil samples were collected beneath the former fuel USTs and use-oil UST. Details are available in Blaine Tech's June 4, 1987 Sampling Report.

July 1987 Excavation

On July 8, 1987, during excavation work to install a sign along Foothill Boulevard, petroleum hydrocarbon odors and a small amount of water with product sheen was reported in the excavated pit at 11 feet below grade (fbg). Details are available in Weiss Associates' (Weiss) December 18, 1990 Subsurface Investigation Report.

August 1987 Well Installation

In August 1987, Pacific Environmental Group, Inc. (PEG) advanced soil boring C-A and drilled and installed 3-inch diameter groundwater monitoring wells C-1 through C-4. Light non-aqueous phase liquid at a measured thickness of greater than 2.0 feet was reported in well C-2. As a result, well C-2 was not sampled. Details are available in PEG's September 23, 1987 Soil and Groundwater Investigation Report.

July/August 1990 Monitoring Well Installation

In July and August 1990, Weiss drilled and installed 2-inch diameter wells C-5 through C-7. Well C-8 was subsequently installed in November 1990. No hydrocarbons were detected in soil samples collected from C-8. Weiss also conducted a well survey within a one-half mile radius of the site. Forty wells were identified within the search area. Of these, two were cathodic protection wells, one was identified as irrigation well and one other identified as industrial. The remaining 36 wells were identified as monitoring wells. The irrigation well was reported less than 0.75 miles upgradient of the site. No domestic or municipal water supply wells were identified within the search area. Based on depth to water measurements, Weiss suggested that groundwater beneath the site may be perched. Depth to water in onsite well C-4 and offsite well C-6 differed by approximately 14 feet in 1990. Details are available in Weiss's December 18, 1990 Subsurface Investigation Report.

November 1991 Groundwater Extraction

In an attempt to achieve hydraulic control of dissolved-phase hydrocarbons, Weiss began operating a groundwater extraction system in well C-2 in November 1991. The system operated until October of 1993 and extracted approximately 10,200 gallons of impacted groundwater. System operations were terminated due to noise complaints from the neighbors and low flow rates. Details were obtained from Weiss's July 30, 1993 Monthly Monitoring Report.

July 1996 Well Installation

PEG installed 2-inch diameter well C-9 on July 10, 1996, downgradient of C-7, in the Albertson's supermarket parking lot (currently, a Mi Pueblo Supermarket). Details are available in PEG's October 2, 1996 Off-Site Monitoring Well Installation Report.

July 1997 Product Line Upgrades

In July 1997, Gettler-Ryan (G-R) collected soil samples during partial product piping replacement in conjunction with dispenser and UST containment upgrades. Soil was excavated beneath the dispensers to accommodate new containment requirements and beneath the product piping. Compliance soil samples PL1 through PL5 were collected at approximately 4 fbg. Approximately 46 tons of soil were excavated and disposed of offsite. Details are available in G-R's September 24, 1997, Soil Sampling During Product Dispenser Upgrade and Partial Product Line Replacement Report.

1998-2000 Site Conceptual Model and Risk-Based Corrective Action (RBCA) Plan

In May 1998, Delta Environmental Consultants, Inc. (Delta) completed a RBCA evaluation using analytic results from previous soil and groundwater assessment activities. This was followed by a site conceptual model (SCM) and proposed RBCA plan. The SCM indicated that the primary potential exposure receptors are current and future residents of properties near the intersection of High and Bond Streets and, possibly, workers and customers in the Albertson's parking lot. The only complete exposure pathway would be hydrocarbon volatilization from groundwater to outdoor and indoor air. Secondary potential exposure pathways are hydrocarbon volatilization from soil or direct dermal contact. A Tier 2 RBCA analysis was performed and showed that onsite and offsite representative concentrations exceeded the site-specific target levels for benzene. Delta concluded the adjacent residence with a basement may be at risk for benzene inhalation and recommended that site specific soil vapor samples be collected to evaluate current soil vapor levels. Delta also recommended continued use of oxygen releasing compound to enhance bioremediation and a continuation of over-purging C-1 through C-4. Details are available in Delta's July 28, 2000 Site Conceptual Model and Risk-Based Corrective Action Plan.

August 2003 Well Installation

In August 2003, Cambria installed monitoring well C-10 in the eastern corner of the site to further evaluate subsurface conditions onsite and possible offsite impacts from the adjacent station. Details are available in Cambria's October 8, 2003 Well Installation Report/Site Summary.

November 2005 Vapor Probe Installation

In November 2005, Cambria installed soil vapor probes VP-1, VP-2, and VP-3 on the southern corner of the site to determine soil vapor concentrations along the downgradient property boundary. No formal report was submitted to the agency, detailing the work; however details of this investigation were submitted to ACEH on July 12, 2012.

APPENDIX C

GEOPHYSICAL SURVEY DATA

NORCAL GEOPHYSICAL CONSULTANTS, INC.

August 1, 2012

Mr. Oliver Yan
Conestoga-Rovers & Associates
5900 Hollis Street, Suite A
Emeryville, CA 94608

Subject: Geophysical Investigation
Chevron Station #90076, 4265 Foothill Blvd, Oakland, CA
NORCAL Job No. 12-462.129

Dear Mr. Yan:

This report presents the findings of a geophysical survey performed by NORCAL Geophysical Consultants, Inc. at the subject Chevron gas station in Oakland, CA. The field survey was conducted on July 19, 2012 by NORCAL California Professional Geophysicist Donald J. Kirker and geophysical technician Anna G. Brody. Site information and logistical support were provided by Oliver Yan of Conestoga-Rovers & Associates (CRA).

1.0 PURPOSE AND SITE DESCRIPTION

The geophysical investigation was conducted at an active Chevron gas station located on the northwest corner of Foothill Boulevard and High Street. The survey area, as designated by CRA, measures approximately 174- by 146-ft and covers the entire property. The pump islands and associated reinforced concrete (RC) pads, and the Chevron station building are located in the center, as shown on Plate 1. Additional site features include planters around the perimeter, and a restroom building in the northwest corner. Underground storage tanks (USTs) are located west of the building and pump islands. The remaining site is open and covered with asphalt paving.

As part of ongoing work at the property, CRA is gathering information to assess potential groundwater movement beneath the site. Therefore, the purpose of the geophysical survey is to investigate for detectable underground utilities and other features that may act as preferential pathways for this groundwater movement.

2.0 FIELD INVESTIGATIONS

2.1 EQUIPMENT

We investigated the designated survey area using the electromagnetic line locating/metal detection (EMLL) and ground penetrating radar (GPR) methods. The EMLL method was used in the electromagnetic conduction, ambient, and metal detection (MD) modes. The conduction mode was used to locate metal utilities that are accessible from the surface in at least one location. This is typically done by applying a current to a line by directly connecting the transmitter to the exposed utility through a vault or a hose bib. The ambient procedure was used to locate utilities that exhibit currents already flowing on the line (passive signals). The most common passive signals are generated by live electric lines, water lines acting as electrical grounds, and metal pipes re-radiating radio signals.

The MD mode was used to locate metal utilities that are not accessible at the surface, and isolated buried objects such as USTs, utility vaults, and other debris. This is done by holding the transmitter-receiver unit above the ground and continuously scanning over the surface. Metallic utilities and isolated objects will produce a response indicating when the unit is directly over the metal object.

The GPR method was used to confirm the location of the utilities detected with the EMLL, and to locate possible non-metallic utilities. Since GPR depth of detection is based on site specific soil conditions, not all subsurface features are detectable. Descriptions of the MD, EMLL, and GPR methods are provided in Appendix A.

2.2 SITE SURVEY

We investigated the designated survey area for detectable underground utilities and other potential subsurface features. A brief description of our field procedures are presented below:

A. Site Reconnaissance: We visually inspected the area to locate visible utility vaults, valves, clean-outs, meters, and hose bibs.

B. EMLL Direct Connect and Induction Survey: We traced accessible utilities using the EMLL direct connect and induction methods, as described above.

C. EMLL Ambient Survey: We used the EMLL ambient procedure to investigate the survey area for non-accessible utilities emitting a passive signal, as described above.

D. EMLL Metal Detection (MD) Survey: We scanned the survey area with the MD to investigate for metal utilities that were not accessible at the surface. Since the specific type of utility (i.e. water, gas, etc.) cannot be determined by this method, they are referred to as undifferentiated utilities. We also used the MD method to investigate the survey area for possible buried metal objects.

E. GPR Survey: We obtained GPR data throughout the survey area. We examined the GPR records for reflection patterns characteristic of underground utilities and other potential subsurface objects, as well as change in fill material.

F. Field Documentation: Upon completion of the area survey, we drafted a scaled site diagram showing the limits of the designated survey area, structures or above ground cultural features that are in close proximity to the site, and the locations of detected subsurface objects and utility alignments.

3.0 LIMITATIONS

3.1 ELECTROMAGNETIC LINE LOCATING

The detection of underground utilities is dependent upon the composition and construction of the line of interest, as well as depth. Utilities detectable with standard line location techniques include any continuously connected metal pipes, cables/wires or utilities with tracer wires. Unless carrying a passive current these utilities must be exposed at the surface or accessible in utility vaults. These generally include water, electric, natural gas, telephone, and other conduits related to facility operations. Utilities that may not be detectable using standard electromagnetic line location techniques may include certain abandoned utilities, utilities not exposed at the ground surface, or those made of non-electrically conductive materials such as PVC, fiberglass, vitrified clay, and metal pipes with insulating joints. Also, pipes generally deeper than about five to seven feet may not be detected.

3.2 GROUND PENETRATING RADAR

The ability to detect subsurface targets is dependent on site specific conditions. These conditions include depth of burial, the size or diameter of the target, the condition of the specific target in question, the type of backfill material associated with the target, and the surface conditions over the target. Under ideal conditions, the GPR can generally detect objects buried to approximately six feet. However, as the clay content in the subsurface increases, the GPR depth of detection decreases. Therefore, it is possible that on-site soil conditions and target features may limit the depth of detection to the upper two to four feet below ground surface.

4.0 RESULTS

The results of the geophysical investigation are presented on the Geophysical Survey Map, Plate 1. This map shows the limits of the designated survey areas, structures or above ground cultural features that are in close proximity, and the locations of the detected utility alignments and subsurface features.

The results of the EMLL, MD, and GPR surveys defined the location of numerous utility alignments. As shown on Plate 1, we detected UST associated vent and product lines, and electric, water, sanitary sewer, storm drain, and undifferentiated utilities. Plate 1 also shows telecommunication and natural gas lines that were defined by others.

The UST associated utilities (vent and product) were defined in two trenches. The vent lines trend from a rack along the north property boundary south to the USTs. The product lines trend from the USTs south alongside the near pump islands, then east across the front of the pump area to the center and far pump islands.

The electric lines were defined throughout the property. Some represent isolated lines that trend to the various light poles, air dispenser, and telephone booth. Others comprise trenches that extend from the station building to the USTs and pump islands.

The water and sanitary sewer lines were defined adjacent to each other in two common trenches. The first extends from the restroom building in the northwest corner south towards High Street. This trench passes in close proximity to the USTs and western-most pump islands. The second trench extends from the building in the center through the pump area. Both trenches meet south of the pump area and extend to High Street.

The storm drain lines are very shallow lines that trend from catch basins near the sidewalks to the street gutters. They are no deeper than approximately 6-inches. The undifferentiated utility is located in the west half and parallels the water and sewer trench. It should be noted that the specific type of utility is unknown. The telecommunication line enters the property in the northeast corner and trends down Foothill Boulevard in close proximity to the curb. The natural gas lines trend down Foothill Boulevard and High Street. As mentioned above, the telecommunication and natural gas lines were located and marked by others.

5.0 STANDARD CARE AND WARRANTY

The scope of NORCAL's services for this project consisted of using geophysical methods to explore the area of investigation for underground utilities. The accuracy of our findings is subject to specific site conditions and limitations inherent to the techniques used. We performed our services in a manner consistent with the level of skill ordinarily exercised by members of the profession currently employing similar methods. No warranty, with respect to the performance of services or products delivered under this agreement, expressed or implied, is made by NORCAL.

We appreciate having the opportunity to provide our geophysical services to Conestoga-Rovers & Associates. If you have any questions, or require additional geophysical services, please do not hesitate to call.

Respectfully,

NORCAL Geophysical Consultants, Inc.

Donald J. Kirker

Donald J. Kirker
Professional Geophysicist, PGp-997

DJK/tt

Enclosure: Plate 1
Appendix A: GEOPHYSICAL METHODOLOGY

Appendix A

GEOPHYSICAL METHODOLOGY

Appendix A

ELECTROMAGNETIC LINE LOCATION/METAL DETECTION (EMLL/MD)

METHODOLOGY

Electromagnetic line location techniques (EMLL) are used to locate the magnetic field resulting from an electric current flowing on a line. These magnetic fields can arise from currents already on the line (passive) or currents applied to a line with a transmitter (active). The most common passive signals are generated by live electric lines and re-radiated radio signals. Active signals can be introduced by connecting the transmitter to the line at accessible locations or by induction.

The detection of underground utilities is affected by the composition and construction of the line in question. Utilities detectable with standard line location techniques include any continuously connected metal pipes, cables/wires or utilities with tracer wires. Unless the utilities carry a passive current, they must be exposed at the surface or in accessible utility vaults. These generally include water, electric, natural gas, telephone, and other conduits related to facility operations. Utilities that are not detectable using standard electromagnetic line location techniques include those made of non-electrically conductive materials such as PVC, fiberglass, vitrified clay, and pipes with insulated connections.

Buried objects can also be detected, without direct contact, by using the metal detection technique (MD). This is used to detect buried near surface metal objects such as rebar, manhole covers, USTs, and various metallic debris. The MD transmitter-receiver unit is held above the ground and continuously scanned over the surface. The unit utilizes two orthogonal coils that are separated by a specified distance. One of the coils transmits an electromagnetic signal (primary magnetic field) which in turn produces a secondary magnetic field about the subsurface metal object. Since the receiver coil is orthogonal to the transmitter coil, it is unaffected by the primary field. Therefore, the secondary magnetic fields produced by buried metal object will generate an audible response from the unit. The peak of this response indicates when the unit is directly over the metal object.

The instrumentation we used for the EMLL and MD survey consists of a Radio Detection RD-400 and a Fisher TW-6 inductive pipe and cable locator.

DATA ANALYSIS

The EMLL/MD instrumentation indicates the presence of buried metal by emitting an audible tone; there are no recorded data to analyze. Therefore, the locations of buried objects detected with these methods are marked on the ground surface during the survey.

LIMITATION

The detection of underground utilities is dependent upon the composition and construction of the line of interest, as well as depth. Utilities detectable with standard line location techniques include any continuously connected metal pipes, cables/wires or utilities with tracer wires. Unless carrying a passive current these utilities must be exposed at the surface or accessible in utility vaults. These generally include water, electric, natural gas, telephone, and other conduits

related to facility operations. Utilities that may not be detectable using standard electromagnetic line location techniques include certain abandoned utilities, utilities not exposed at the ground surface, or those made of non-electrically conductive materials such as PVC, fiberglass, vitrified clay, and metal pipes with insulating joints. Pipes generally deeper than about five to seven feet may not be detected.

GROUND PENETRATING RADAR (GPR)

METHODOLOGY

Ground penetrating radar is a method that provides a continuous, high resolution cross-section depicting variations in the electrical properties of the shallow subsurface. The method is particularly sensitive to variations in electrical conductivity and electrical permittivity (the ability of a material to hold a charge when an electrical field is applied).

The GPR system operates by radiating electromagnetic pulses into the ground from a transducer (antenna) as it is moved along a traverse. Since most earth materials are transparent to electromagnetic energy, the signal spreads downward into the subsurface. However, when the signal encounters a variation in electrical permittivity, a portion of the electromagnetic energy is reflected back to the surface. When the signal encounters a metal object, all of the incident energy is reflected. The reflected signals are received by the same transducer and are printed in cross-section form on a graphical recorder. Changes in subsurface reflection character on the GPR records can provide information regarding the location of USTs, sumps, buried debris, underground utilities, and variations in the shallow stratigraphy.

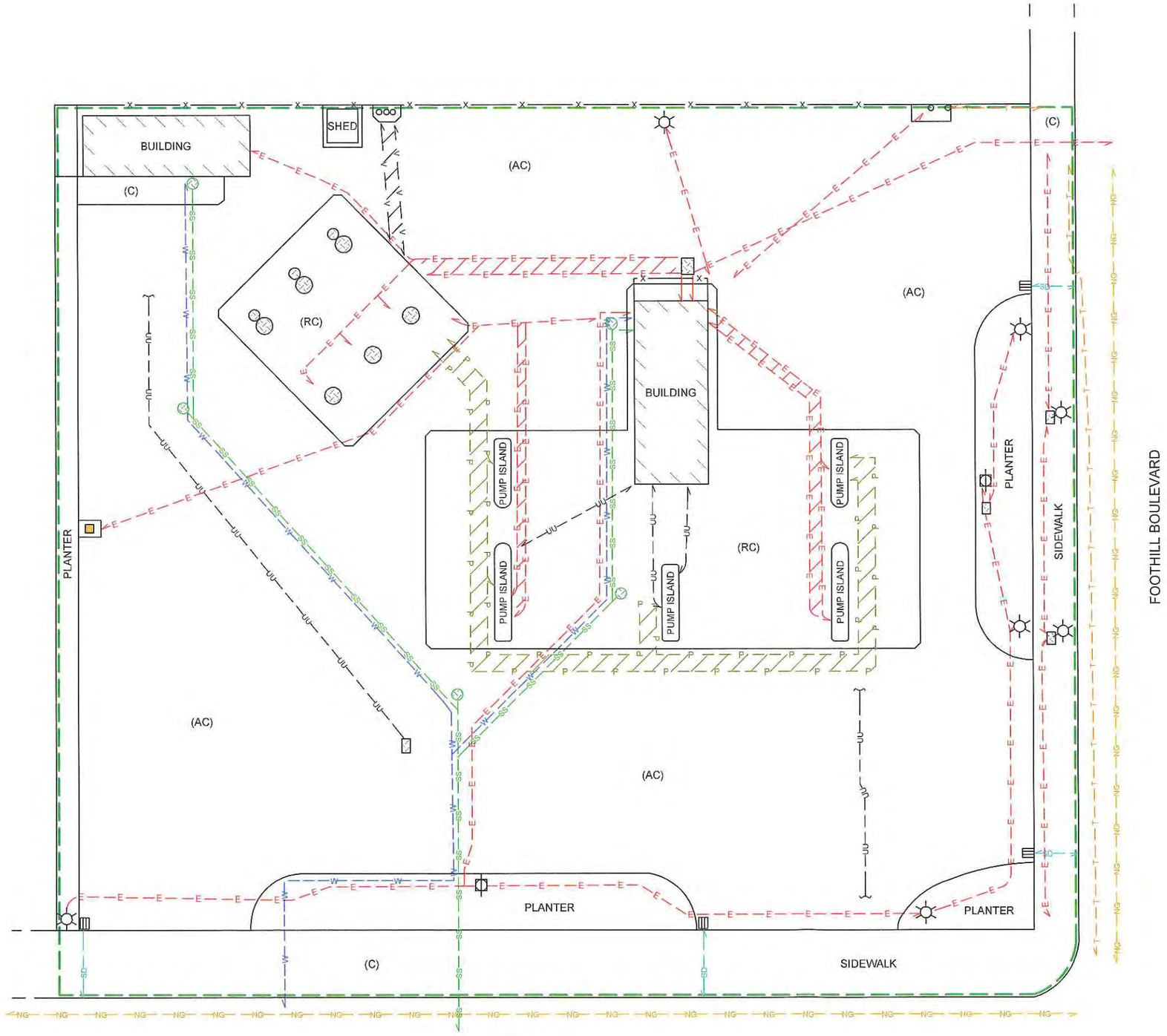
The GPR system used was a Geophysical Survey Systems, Inc. SIR-3000 Subsurface Interface Radar Systems equipped with a 400 megahertz (MHz) transducer, respectively. This transducer is used to provide high resolution at shallow depths.

DATA ANALYSIS

GPR records are examined to identify reflection patterns characteristic of USTs, utilities, septic tanks, and other buried debris. Typically, USTs are manifested by broad localized hyperbolic (upside-down "U" shape) reflection patterns that vary in intensity. The intensity of a reflection pattern is usually dependent upon the condition of the respective UST, its burial depth, and the type of fill over the UST. Utilities and other buried debris are typically manifested by narrow localized hyperbolic reflections that also vary in intensity.

LIMITATIONS

The ability to detect subsurface targets is dependent on site specific conditions. These conditions include depth of burial, the size or diameter of the target, the condition of the specific target in question, the type of backfill material associated with the target, and the surface conditions over the target. Under ideal conditions, the GPR can generally detect objects buried to approximately six feet. However, as the clay content in the subsurface increases, the GPR depth of detection decreases. Therefore, it is possible that on-site soil conditions and target features may limit the depth of detection to the upper one to two feet below ground surface.



SCALE

0 10 20 40

(1 inch = 20 feet)

LEGEND	
	DESIGNATED SURVEY LIMITS
E	ELECTRIC LINE
E	ELECTRIC LINE TRENCH
NG	NATURAL GAS LINE (MARKED BY OTHERS)
P	PRODUCT LINES & ASSOCIATED UTILITIES TRENCH
SS	SANITARY SEWER LINE
SD	STORM DRAIN LINE
T	TELECOMMUNICATIONS LINE (MARKED BY OTHERS)
V	VENT LINE TRENCH
W	WATER LINE
X	FENCE
	APPARENT UTILITY LINE TERMINATION
	SUSPECTED UTILITY LINE CONTINUATION BEYOND DETECTED LOCATION
	AIR DISPENSER
	LIGHT POLE
	SANITARY SEWER UTILITY ACCESS
	SIGN POLE
	STORM DRAIN CATCH BASIN
	UST MANWAY/ACCESS PORT
	UTILITY BOX/VAULT
(AC)	ASPHALT
(C)	CONCRETE
(RC)	REINFORCED CONCRETE

NOTE: SEE REPORT FOR INSTRUMENTATION LIMITATIONS REGARDING DETECTION OF CERTAIN UTILITIES AND OTHER SUBSURFACE FEATURES.

NORCAL

GEOPHYSICAL SURVEY MAP
CHEVRON STATION 90076
4265 FOOTHILL BOULEVARD

LOCATION: OAKLAND, CALIFORNIA

CLIENT: CRA

JOB #: 12-462.129

NORCAL GEOPHYSICAL CONSULTANTS INC.

DATE: AUG. 2012

DRAWN BY: G.RANDALL

APPROVED BY: DJK

PLATE 1

APPENDIX D

LABORATORY ANALYTICAL REPORT

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9/11/2012
Mr. Nathan Lee
Conestoga-Rovers Associates (CRA)
5900 Hollis Street
Suite A
Emeryville CA 94608

Project Name: Chevron 90076, Oakland, CA
Project #: 311977
Workorder #: 1208345AR1

Dear Mr. Nathan Lee

The following report includes the data for the above referenced project for sample(s) received on 8/16/2012 at Air Toxics Ltd.

The data and associated QC analyzed by Modified TO-15 are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Air Toxics Ltd. for your air analysis needs. Air Toxics Ltd. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Kyle Vagadori at 916-985-1000 if you have any questions regarding the data in this report.

Regards,

Kyle Vagadori

Project Manager

eurofins | Air Toxics

WORK ORDER #: 1208345AR1

Work Order Summary

CLIENT:	Mr. Nathan Lee Conestoga-Rovers Associates (CRA) 5900 Hollis Street Suite A Emeryville, CA 94608	**BILL TO:**	Mr. Nathan Lee Conestoga-Rovers Associates (CRA) 5900 Hollis Street Suite A Emeryville, CA 94608
PHONE:	510-420-0700	**P.O. #**	TBD
FAX:	510-420-9170	**PROJECT #**	311977 Chevron 90076, Oakland, CA
DATE RECEIVED:	08/16/2012	**CONTACT:**	Kyle Vagadori
DATE COMPLETED:	08/23/2012		
DATE REISSUED:	09/11/2012		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	VP-1	Modified TO-15	6.5 "Hg	5 psi
02A	VP-2	Modified TO-15	6.0 "Hg	5 psi
03A	VP-3	Modified TO-15	4.5 "Hg	5 psi
04A	VP-3-DUP	Modified TO-15	4.5 "Hg	5 psi
05A	TRIP BLANK	Modified TO-15	27.5 "Hg	5 psi
06A	Lab Blank	Modified TO-15	NA	NA
07A	CCV	Modified TO-15	NA	NA
08A	LCS	Modified TO-15	NA	NA
08AA	LCSD	Modified TO-15	NA	NA

CERTIFIED BY: Heidi Rayos DATE: 09/11/12

Technical Director

Certfication numbers: AZ Licensure AZ0775, CA NELAP - 12282CA, NY NELAP - 11291,
TX NELAP - T104704434-12-5, UT NELAP CA009332012-3, WA NELAP - C935
Name of Accrediting Agency: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005, Effective date: 10/18/2011, Expiration date: 10/17/2012.
Eurofins Air Toxics Ltd. certifies that the test results contained in this report meet all requirements of the NELAC standards

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 9563
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

LABORATORY NARRATIVE
EPA Method TO-15
Conestoga-Rovers Associates (CRA)
Workorder# 1208345AR1

Five 1 Liter Summa Canister (100% Certified) samples were received on August 16, 2012. The laboratory performed analysis via EPA Method TO-15 using GC/MS in the full scan mode.

This workorder was independently validated prior to submittal using 'USEPA National Functional Guidelines' as generally applied to the analysis of volatile organic compounds in air. A rules-based, logic driven, independent validation engine was employed to assess completeness, evaluate pass/fail of relevant project quality control requirements and verification of all quantified amounts.

Receiving Notes

There were no receiving discrepancies.

PER CLIENT'S REQUEST THE WORK ORDER WAS REISSUED ON 09/11/12 TO CHANGE THE PROJECT NAME TO CHEVRON 90076, OAKLAND, CA.

Analytical Notes

A single point calibration for TPH referenced to Gasoline was performed for each daily analytical batch. Recovery is reported as 100% in the associated results for each CCV.

Dilution was performed on sample VP-2 due to matrix interference.

The recovery of surrogate 1,2-Dichloroethane-d4 in sample VP-2 was outside laboratory control limits due to high level hydrocarbon matrix interference. The surrogate recovery is flagged.

Definition of Data Qualifying Flags

Eight qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).
J - Estimated value.
E - Exceeds instrument calibration range.
S - Saturated peak.
Q - Exceeds quality control limits.
U - Compound analyzed for but not detected above the reporting limit.
UJ- Non-detected compound associated with low bias in the CCV and/or LCS.
N - The identification is based on presumptive evidence.

File extensions may have been used on the data analysis sheets and indicates as follows:
a-File was requantified
b-File was quantified by a second column and detector
r1-File was requantified for the purpose of reissue

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Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: VP-1

Lab ID#: 1208345AR1-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Ethyl Benzene	0.86	6.6	3.7	29
Toluene	0.86	3.3	3.2	12
m,p-Xylene	0.86	22	3.7	96
o-Xylene	0.86	16	3.7	69
TPH ref. to Gasoline (MW=100)	43	160	170	650

Client Sample ID: VP-2

Lab ID#: 1208345AR1-02A

No Detections Were Found.

Client Sample ID: VP-3

Lab ID#: 1208345AR1-03A

No Detections Were Found.

Client Sample ID: VP-3-DUP

Lab ID#: 1208345AR1-04A

No Detections Were Found.

Client Sample ID: TRIP BLANK

Lab ID#: 1208345AR1-05A

No Detections Were Found.

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Client Sample ID: VP-1

Lab ID#: 1208345AR1-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3082210**	**Date of Collection:**	**8/13/12 12:55:00 PM**
Dil. Factor:	**1.71**	**Date of Analysis:**	**8/22/12 04:48 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	0.86	Not Detected	2.7	Not Detected
Ethyl Benzene	0.86	6.6	3.7	29
Toluene	0.86	3.3	3.2	12
m,p-Xylene	0.86	22	3.7	96
o-Xylene	0.86	16	3.7	69
Methyl tert-butyl ether	0.86	Not Detected	3.1	Not Detected
Naphthalene	3.4	Not Detected	18	Not Detected
TPH ref. to Gasoline (MW=100)	43	160	170	650

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	129	70-130
Toluene-d8	103	70-130
4-Bromofluorobenzene	111	70-130

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Client Sample ID: VP-2

Lab ID#: 1208345AR1-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3082214**	**Date of Collection: 8/13/12 12:15:00 PM**	
Dil. Factor:	**33.6**	**Date of Analysis: 8/22/12 07:11 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	17	Not Detected	54	Not Detected
Ethyl Benzene	17	Not Detected	73	Not Detected
Toluene	17	Not Detected	63	Not Detected
m,p-Xylene	17	Not Detected	73	Not Detected
o-Xylene	17	Not Detected	73	Not Detected
Methyl tert-butyl ether	17	Not Detected	60	Not Detected
Naphthalene	67	Not Detected	350	Not Detected
TPH ref. to Gasoline (MW=100)	840	Not Detected	3400	Not Detected

Q = Exceeds Quality Control limits of 70% to 130%, due to matrix effects.

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	140 Q	70-130
Toluene-d8	102	70-130
4-Bromofluorobenzene	107	70-130

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Client Sample ID: VP-3

Lab ID#: 1208345AR1-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3082212**	**Date of Collection:**	**8/13/12 11:05:00 AM**
Dil. Factor:	**1.58**	**Date of Analysis:**	**8/22/12 06:09 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	0.79	Not Detected	2.5	Not Detected
Ethyl Benzene	0.79	Not Detected	3.4	Not Detected
Toluene	0.79	Not Detected	3.0	Not Detected
m,p-Xylene	0.79	Not Detected	3.4	Not Detected
o-Xylene	0.79	Not Detected	3.4	Not Detected
Methyl tert-butyl ether	0.79	Not Detected	2.8	Not Detected
Naphthalene	3.2	Not Detected	16	Not Detected
TPH ref. to Gasoline (MW=100)	40	Not Detected	160	Not Detected

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	127	70-130
Toluene-d8	102	70-130
4-Bromofluorobenzene	112	70-130

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Client Sample ID: VP-3-DUP

Lab ID#: 1208345AR1-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3082213**	**Date of Collection:**	**8/13/12 11:05:00 AM**
Dil. Factor:	**1.58**	**Date of Analysis:**	**8/22/12 06:42 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	0.79	Not Detected	2.5	Not Detected
Ethyl Benzene	0.79	Not Detected	3.4	Not Detected
Toluene	0.79	Not Detected	3.0	Not Detected
m,p-Xylene	0.79	Not Detected	3.4	Not Detected
o-Xylene	0.79	Not Detected	3.4	Not Detected
Methyl tert-butyl ether	0.79	Not Detected	2.8	Not Detected
Naphthalene	3.2	Not Detected	16	Not Detected
TPH ref. to Gasoline (MW=100)	40	Not Detected	160	Not Detected

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	127	70-130
Toluene-d8	103	70-130
4-Bromofluorobenzene	114	70-130

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Client Sample ID: TRIP BLANK

Lab ID#: 1208345AR1-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3082211**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/22/12 05:27 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	0.50	Not Detected	1.6	Not Detected
Ethyl Benzene	0.50	Not Detected	2.2	Not Detected
Toluene	0.50	Not Detected	1.9	Not Detected
m,p-Xylene	0.50	Not Detected	2.2	Not Detected
o-Xylene	0.50	Not Detected	2.2	Not Detected
Methyl tert-butyl ether	0.50	Not Detected	1.8	Not Detected
Naphthalene	2.0	Not Detected	10	Not Detected
TPH ref. to Gasoline (MW=100)	25	Not Detected	100	Not Detected

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	122	70-130
Toluene-d8	106	70-130
4-Bromofluorobenzene	103	70-130

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Client Sample ID: Lab Blank

Lab ID#: 1208345AR1-06A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3082207**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/22/12 02:45 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	0.50	Not Detected	1.6	Not Detected
Ethyl Benzene	0.50	Not Detected	2.2	Not Detected
Toluene	0.50	Not Detected	1.9	Not Detected
m,p-Xylene	0.50	Not Detected	2.2	Not Detected
o-Xylene	0.50	Not Detected	2.2	Not Detected
Methyl tert-butyl ether	0.50	Not Detected	1.8	Not Detected
Naphthalene	2.0	Not Detected	10	Not Detected
TPH ref. to Gasoline (MW=100)	25	Not Detected	100	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	119	70-130
Toluene-d8	104	70-130
4-Bromofluorobenzene	101	70-130

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Client Sample ID: CCV

Lab ID#: 1208345AR1-07A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3082202**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/22/12 12:13 PM**	

Compound	%Recovery
Benzene	90
Ethyl Benzene	97
Toluene	96
m,p-Xylene	100
o-Xylene	100
Methyl tert-butyl ether	98
Naphthalene	94
TPH ref. to Gasoline (MW=100)	100

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	122	70-130
Toluene-d8	104	70-130
4-Bromofluorobenzene	109	70-130

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Client Sample ID: LCS

Lab ID#: 1208345AR1-08A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3082203**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/22/12 12:42 PM**	

Compound	**%Recovery**
Benzene	101
Ethyl Benzene	106
Toluene	106
m,p-Xylene	110
o-Xylene	110
Methyl tert-butyl ether	109
Naphthalene	98
TPH ref. to Gasoline (MW=100)	Not Spiked

Container Type: NA - Not Applicable

Surrogates	**%Recovery**	**Method Limits**
1,2-Dichloroethane-d4	125	70-130
Toluene-d8	105	70-130
4-Bromofluorobenzene	105	70-130

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Client Sample ID: LCSD

Lab ID#: 1208345AR1-08AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3082204**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/22/12 01:03 PM**	

Compound	**%Recovery**
Benzene	100
Ethyl Benzene	104
Toluene	106
m,p-Xylene	109
o-Xylene	109
Methyl tert-butyl ether	105
Naphthalene	100
TPH ref. to Gasoline (MW=100)	Not Spiked

Container Type: NA - Not Applicable

Surrogates	**%Recovery**	**Method Limits**
1,2-Dichloroethane-d4	118	70-130
Toluene-d8	108	70-130
4-Bromofluorobenzene	107	70-130

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9/11/2012
Mr. Nathan Lee
Conestoga-Rovers Associates (CRA)
5900 Hollis Street
Suite A
Emeryville CA 94608

Project Name: Chevron 90076, Oakland, CA
Project #: 311977
Workorder #: 1208345BR1

Dear Mr. Nathan Lee

The following report includes the data for the above referenced project for sample(s) received on 8/16/2012 at Air Toxics Ltd.

The data and associated QC analyzed by Modified TO-15 APH are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Air Toxics Ltd. for your air analysis needs. Air Toxics Ltd. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Kyle Vagadori at 916-985-1000 if you have any questions regarding the data in this report.

Regards,

Kyle Vagadori

Project Manager

eurofins | Air Toxics

WORK ORDER #: 1208345BR1

Work Order Summary

CLIENT:	Mr. Nathan Lee Conestoga-Rovers Associates (CRA) 5900 Hollis Street Suite A Emeryville, CA 94608	**BILL TO:**	Mr. Nathan Lee Conestoga-Rovers Associates (CRA) 5900 Hollis Street Suite A Emeryville, CA 94608
PHONE:	510-420-0700	**P.O. #**	TBD
FAX:	510-420-9170	**PROJECT #**	311977 Chevron 90076, Oakland, CA
DATE RECEIVED:	08/16/2012	**CONTACT:**	Kyle Vagadori
DATE COMPLETED:	08/23/2012		
DATE REISSUED:	09/11/2012		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	VP-1	Modified TO-15 APH	6.5 "Hg	5 psi
01B	VP-1	Modified TO-15 APH	6.5 "Hg	5 psi
02A	VP-2	Modified TO-15 APH	6.0 "Hg	5 psi
02B	VP-2	Modified TO-15 APH	6.0 "Hg	5 psi
03A	VP-3	Modified TO-15 APH	4.5 "Hg	5 psi
03B	VP-3	Modified TO-15 APH	4.5 "Hg	5 psi
04A	VP-3-DUP	Modified TO-15 APH	4.5 "Hg	5 psi
04B	VP-3-DUP	Modified TO-15 APH	4.5 "Hg	5 psi
05A	TRIP BLANK	Modified TO-15 APH	27.5 "Hg	5 psi
05B	TRIP BLANK	Modified TO-15 APH	27.5 "Hg	5 psi
06A	Lab Blank	Modified TO-15 APH	NA	NA
06B	Lab Blank	Modified TO-15 APH	NA	NA
07A	CCV	Modified TO-15 APH	NA	NA
07B	CCV	Modified TO-15 APH	NA	NA

CERTIFIED BY: Heidi Mayo DATE: 09/11/12

Technical Director

Certfication numbers: AZ Licensure AZ0775, CA NELAP - 12282CA, NY NELAP - 11291,
TX NELAP - T104704434-12-5, UT NELAP CA009332012-3, WA NELAP - C935
Name of Accrediting Agency: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005, Effective date: 10/18/2011, Expiration date: 10/17/2012.
Eurofins Air Toxics Ltd. certifies that the test results contained in this report meet all requirements of the NELAC standards

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 9563
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

LABORATORY NARRATIVE
Modified TO-15 & VPH Fractions
Conestoga-Rovers Associates (CRA)
Workorder# 1208345BR1

Five 1 Liter Summa Canister (100% Certified) samples were received on August 16, 2012. The laboratory performed analysis via EPA Method TO-15 and Air Toxics VPH (Volatile Petroleum Hydrocarbon) methods for the Determination of VPH Fractions using GC/MS in the full scan mode. The method involves concentrating up to 0.5 liters of air. The concentrated aliquot is then flash vaporized and swept through a water management system to remove water vapor. Following dehumidification, the sample passes directly into the GC/MS for analysis. This method is designed to measure gaseous phase aliphatic and aromatic compounds in ambient air and soil gas collected in stainless steel Summa canisters. Air Toxics VPH method is a hybrid of EPA TO-15, MADEP APH and WSDE VPH methods. Chromatographic peaks were identified via mass spectrum as either aliphatic or aromatic petroleum hydrocarbons and included in the appropriate range as defined by the method. The volatile Aliphatic hydrocarbons are collectively quantified within the C5 to C6 range, C6 to C8 range, C8 to C10 range and the C10 to C12 range. Additionally, the volatile Aromatic hydrocarbons are collectively quantified within the C8 to C10 range and the C10 to C12 range. The Aromatic ranges refer to the equivalent carbon (EC) ranges.

Aliphatic data is calculated from the Total Ion chromatogram which has been reprocessed in a duplicate file differentiated from the original by the addition of an alphanumeric extension. The Aromatic calculation also uses the information contained in the associated Extracted Ion file.

Receiving Notes

There were no receiving discrepancies.

PER CLIENT'S REQUEST THE WORK ORDER WAS REISSUED ON 09/11/12 TO CHANGE THE PROJECT NAME TO CHEVRON 90076, OAKLAND, CA.

Analytical Notes

Dilution was performed on sample VP-2 due to matrix interference.

Definition of Data Qualifying Flags

Eight qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit.

UJ- Non-detected compound associated with low bias in the CCV and/or LCS.

N - The identification is based on presumptive evidence.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified
b-File was quantified by a second column and detector
r1-File was requantified for the purpose of reissue

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Summary of Detected Compounds
MODIFIED METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: VP-1

Lab ID#: 1208345BR1-01A

No Detections Were Found.

Client Sample ID: VP-1

Lab ID#: 1208345BR1-01B

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
>C8-C10 Aromatic Hydrocarbons (ref. to 1,2,3-TMB)	17	84	84	410

Client Sample ID: VP-2

Lab ID#: 1208345BR1-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
>C6-C8 Aliphatic Hydrocarbons (ref. to Heptane)	340	1600	1400	6600

Client Sample ID: VP-2

Lab ID#: 1208345BR1-02B

No Detections Were Found.

Client Sample ID: VP-3

Lab ID#: 1208345BR1-03A

No Detections Were Found.

Client Sample ID: VP-3

Lab ID#: 1208345BR1-03B

No Detections Were Found.

Client Sample ID: VP-3-DUP

Lab ID#: 1208345BR1-04A

No Detections Were Found.

Client Sample ID: VP-3-DUP

Lab ID#: 1208345BR1-04B

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Summary of Detected Compounds
MODIFIED METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: VP-3-DUP

Lab ID#: 1208345BR1-04B

No Detections Were Found.

Client Sample ID: TRIP BLANK

Lab ID#: 1208345BR1-05A

No Detections Were Found.

Client Sample ID: TRIP BLANK

Lab ID#: 1208345BR1-05B

No Detections Were Found.

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Client Sample ID: VP-1

Lab ID#: 1208345BR1-01A

MODIFIED METHOD TO-15 GC/MS FULL SCAN

File Name:	**3082210a**	**Date of Collection: 8/13/12 12:55:00 PM**	
Dil. Factor:	**1.71**	**Date of Analysis: 8/22/12 04:48 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
C5-C6 Aliphatic Hydrocarbons (ref. to Pentane + Hexane)	17	Not Detected	55	Not Detected
>C6-C8 Aliphatic Hydrocarbons (ref. to Heptane)	17	Not Detected	70	Not Detected
>C8-C10 Aliphatic Hydrocarbons (ref. to Decane)	17	Not Detected	100	Not Detected
>C10-C12 Aliphatic Hydrocarbons (ref. to Dodecane)	17	Not Detected	120	Not Detected

Container Type: 1 Liter Summa Canister (100% Certified)

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Client Sample ID: VP-1

Lab ID#: 1208345BR1-01B

MODIFIED METHOD TO-15 GC/MS FULL SCAN

File Name:	**3082210c**	**Date of Collection: 8/13/12 12:55:00 PM**	
Dil. Factor:	**1.71**	**Date of Analysis: 8/22/12 04:48 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
>C8-C10 Aromatic Hydrocarbons (ref. to 1,2,3-TMB)	17	84	84	410
>C10-C12 Aromatic Hydrocarbons (ref. to 1,2,4,5-TMB)	17	Not Detected	94	Not Detected

Container Type: 1 Liter Summa Canister (100% Certified)

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Client Sample ID: VP-2

Lab ID#: 1208345BR1-02A

MODIFIED METHOD TO-15 GC/MS FULL SCAN

File Name:	**3082214a**	**Date of Collection: 8/13/12 12:15:00 PM**	
Dil. Factor:	**33.6**	**Date of Analysis: 8/22/12 07:11 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
C5-C6 Aliphatic Hydrocarbons (ref. to Pentane + Hexane)	340	Not Detected	1100	Not Detected
>C6-C8 Aliphatic Hydrocarbons (ref. to Heptane)	340	1600	1400	6600
>C8-C10 Aliphatic Hydrocarbons (ref. to Decane)	340	Not Detected	2000	Not Detected
>C10-C12 Aliphatic Hydrocarbons (ref. to Dodecane)	340	Not Detected	2300	Not Detected

Container Type: 1 Liter Summa Canister (100% Certified)

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Client Sample ID: VP-2

Lab ID#: 1208345BR1-02B

MODIFIED METHOD TO-15 GC/MS FULL SCAN

File Name:	**3082214c**	**Date of Collection:**	**8/13/12 12:15:00 PM**
Dil. Factor:	**33.6**	**Date of Analysis:**	**8/22/12 07:11 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
>C8-C10 Aromatic Hydrocarbons (ref. to 1,2,3-TMB)	340	Not Detected	1600	Not Detected
>C10-C12 Aromatic Hydrocarbons (ref. to 1,2,4,5-TMB)	340	Not Detected	1800	Not Detected

Container Type: 1 Liter Summa Canister (100% Certified)

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Client Sample ID: VP-3

Lab ID#: 1208345BR1-03A

MODIFIED METHOD TO-15 GC/MS FULL SCAN

File Name:	**3082212a**	**Date of Collection: 8/13/12 11:05:00 AM**	
Dil. Factor:	**1.58**	**Date of Analysis: 8/22/12 06:09 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
C5-C6 Aliphatic Hydrocarbons (ref. to Pentane + Hexane)	16	Not Detected	51	Not Detected
>C6-C8 Aliphatic Hydrocarbons (ref. to Heptane)	16	Not Detected	65	Not Detected
>C8-C10 Aliphatic Hydrocarbons (ref. to Decane)	16	Not Detected	92	Not Detected
>C10-C12 Aliphatic Hydrocarbons (ref. to Dodecane)	16	Not Detected	110	Not Detected

Container Type: 1 Liter Summa Canister (100% Certified)

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Client Sample ID: VP-3

Lab ID#: 1208345BR1-03B

MODIFIED METHOD TO-15 GC/MS FULL SCAN

File Name:	**3082212c**	**Date of Collection: 8/13/12 11:05:00 AM**	
Dil. Factor:	**1.58**	**Date of Analysis: 8/22/12 06:09 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
>C8-C10 Aromatic Hydrocarbons (ref. to 1,2,3-TMB)	16	Not Detected	78	Not Detected
>C10-C12 Aromatic Hydrocarbons (ref. to 1,2,4,5-TMB)	16	Not Detected	87	Not Detected

Container Type: 1 Liter Summa Canister (100% Certified)

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Client Sample ID: VP-3-DUP

Lab ID#: 1208345BR1-04A

MODIFIED METHOD TO-15 GC/MS FULL SCAN

File Name:	**3082213a**	**Date of Collection: 8/13/12 11:05:00 AM**	
Dil. Factor:	**1.58**	**Date of Analysis: 8/22/12 06:42 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
C5-C6 Aliphatic Hydrocarbons (ref. to Pentane + Hexane)	16	Not Detected	51	Not Detected
>C6-C8 Aliphatic Hydrocarbons (ref. to Heptane)	16	Not Detected	65	Not Detected
>C8-C10 Aliphatic Hydrocarbons (ref. to Decane)	16	Not Detected	92	Not Detected
>C10-C12 Aliphatic Hydrocarbons (ref. to Dodecane)	16	Not Detected	110	Not Detected

Container Type: 1 Liter Summa Canister (100% Certified)

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Client Sample ID: VP-3-DUP

Lab ID#: 1208345BR1-04B

MODIFIED METHOD TO-15 GC/MS FULL SCAN

File Name:	**3082213c**	**Date of Collection: 8/13/12 11:05:00 AM**	
Dil. Factor:	**1.58**	**Date of Analysis: 8/22/12 06:42 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
>C8-C10 Aromatic Hydrocarbons (ref. to 1,2,3-TMB)	16	Not Detected	78	Not Detected
>C10-C12 Aromatic Hydrocarbons (ref. to 1,2,4,5-TMB)	16	Not Detected	87	Not Detected

Container Type: 1 Liter Summa Canister (100% Certified)

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Client Sample ID: TRIP BLANK

Lab ID#: 1208345BR1-05A

MODIFIED METHOD TO-15 GC/MS FULL SCAN

File Name:	**3082211a**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/22/12 05:27 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
C5-C6 Aliphatic Hydrocarbons (ref. to Pentane + Hexane)	10	Not Detected	32	Not Detected
>C6-C8 Aliphatic Hydrocarbons (ref. to Heptane)	10	Not Detected	41	Not Detected
>C8-C10 Aliphatic Hydrocarbons (ref. to Decane)	10	Not Detected	58	Not Detected
>C10-C12 Aliphatic Hydrocarbons (ref. to Dodecane)	10	Not Detected	70	Not Detected

Container Type: 1 Liter Summa Canister (100% Certified)

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Client Sample ID: TRIP BLANK

Lab ID#: 1208345BR1-05B

MODIFIED METHOD TO-15 GC/MS FULL SCAN

File Name:	**3082211c**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/22/12 05:27 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
>C8-C10 Aromatic Hydrocarbons (ref. to 1,2,3-TMB)	10	Not Detected	49	Not Detected
>C10-C12 Aromatic Hydrocarbons (ref. to 1,2,4,5-TMB)	10	Not Detected	55	Not Detected

Container Type: 1 Liter Summa Canister (100% Certified)

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Client Sample ID: Lab Blank

Lab ID#: 1208345BR1-06A

MODIFIED METHOD TO-15 GC/MS FULL SCAN

File Name:	**3082207a**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/22/12 02:45 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
C5-C6 Aliphatic Hydrocarbons (ref. to Pentane + Hexane)	10	Not Detected	32	Not Detected
>C6-C8 Aliphatic Hydrocarbons (ref. to Heptane)	10	Not Detected	41	Not Detected
>C8-C10 Aliphatic Hydrocarbons (ref. to Decane)	10	Not Detected	58	Not Detected
>C10-C12 Aliphatic Hydrocarbons (ref. to Dodecane)	10	Not Detected	70	Not Detected

Container Type: NA - Not Applicable

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Client Sample ID: Lab Blank

Lab ID#: 1208345BR1-06B

MODIFIED METHOD TO-15 GC/MS FULL SCAN

File Name:	**3082207c**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/22/12 02:45 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
>C8-C10 Aromatic Hydrocarbons (ref. to 1,2,3-TMB)	10	Not Detected	49	Not Detected
>C10-C12 Aromatic Hydrocarbons (ref. to 1,2,4,5-TMB)	10	Not Detected	55	Not Detected

Container Type: NA - Not Applicable

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Client Sample ID: CCV

Lab ID#: 1208345BR1-07A

MODIFIED METHOD TO-15 GC/MS FULL SCAN

File Name:	**3082205a**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/22/12 01:54 PM**	

Compound	%Recovery
C5-C6 Aliphatic Hydrocarbons (ref. to Pentane + Hexane)	108
>C6-C8 Aliphatic Hydrocarbons (ref. to Heptane)	100
>C8-C10 Aliphatic Hydrocarbons (ref. to Decane)	107
>C10-C12 Aliphatic Hydrocarbons (ref. to Dodecane)	121

Container Type: NA - Not Applicable

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Client Sample ID: CCV

Lab ID#: 1208345BR1-07B

MODIFIED METHOD TO-15 GC/MS FULL SCAN

File Name:	**3082205c**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/22/12 01:54 PM**	

Compound	%Recovery
>C8-C10 Aromatic Hydrocarbons (ref. to 1,2,3-TMB)	110
>C10-C12 Aromatic Hydrocarbons (ref. to 1,2,4,5-TMB)	112

Container Type: NA - Not Applicable

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9/5/2012

Mr. Nathan Lee
Conestoga-Rovers Associates (CRA)
5900 Hollis Street
Suite A
Emeryville CA 94608

Project Name: Chevron 90076, Oakland, CA
Project #: 311977
Workorder #: 1208345CR1

Dear Mr. Nathan Lee

The following report includes the data for the above referenced project for sample(s) received on 8/16/2012 at Air Toxics Ltd.

The data and associated QC analyzed by Modified ASTM D-1946 are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Air Toxics Ltd. for your air analysis needs. Air Toxics Ltd. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Kyle Vagadori at 916-985-1000 if you have any questions regarding the data in this report.

Regards,

Kyle Vagadori

Project Manager

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WORK ORDER #: 1208345CR1

Work Order Summary

CLIENT:	Mr. Nathan Lee Conestoga-Rovers Associates (CRA) 5900 Hollis Street Suite A Emeryville, CA 94608	**BILL TO:**	Mr. Nathan Lee Conestoga-Rovers Associates (CRA) 5900 Hollis Street Suite A Emeryville, CA 94608
PHONE:	510-420-0700	**P.O. #**	TBD
FAX:	510-420-9170	**PROJECT #**	311977 Chevron 90076, Oakland, CA
DATE RECEIVED:	08/16/2012	**CONTACT:**	Kyle Vagadori
DATE COMPLETED:	08/23/2012		
DATE REISSUED:	09/05/2012		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	VP-1	Modified ASTM D-1946	6.5 "Hg	5 psi
02A	VP-2	Modified ASTM D-1946	6.0 "Hg	5 psi
03A	VP-3	Modified ASTM D-1946	4.5 "Hg	5 psi
04A	VP-3-DUP	Modified ASTM D-1946	4.5 "Hg	5 psi
05A	TRIP BLANK	Modified ASTM D-1946	27.5 "Hg	5 psi
06A	Lab Blank	Modified ASTM D-1946	NA	NA
06B	Lab Blank	Modified ASTM D-1946	NA	NA
07A	LCS	Modified ASTM D-1946	NA	NA
07AA	LCSD	Modified ASTM D-1946	NA	NA

CERTIFIED BY: Heidi Mayo DATE: 09/05/12

Technical Director

Certfication numbers: AZ Licensure AZ0775, CA NELAP - 12282CA, NY NELAP - 11291,
TX NELAP - T104704434-12-5, UT NELAP CA009332012-3, WA NELAP - C935
Name of Accrediting Agency: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005, Effective date: 10/18/2011, Expiration date: 10/17/2012.
Eurofins Air Toxics Ltd. certifies that the test results contained in this report meet all requirements of the NELAC standards

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 9563
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

LABORATORY NARRATIVE
Modified ASTM D-1946
Conestoga-Rovers Associates (CRA)
Workorder# 1208345CR1

Five 1 Liter Summa Canister (100% Certified) samples were received on August 16, 2012. The laboratory performed analysis via Modified ASTM Method D-1946 for Methane and fixed gases in air using GC/FID or GC/TCD. The method involves direct injection of 1.0 mL of sample.

On the analytical column employed for this analysis, Oxygen coelutes with Argon. The corresponding peak is quantitated as Oxygen.

Since Nitrogen is used to pressurize samples, the reported Nitrogen values are calculated by adding all the sample components and subtracting from 100%.

Method modifications taken to run these samples are summarized in the table below. Specific project requirements may over-ride the ATL modifications.

Requirement	***ASTM D-1946***	***ATL Modifications***
Calibration	A single point calibration is performed using a reference standard closely matching the composition of the unknown.	A 3-point calibration curve is performed. Quantitation is based on a daily calibration standard which may or may not resemble the composition of the associated samples.
Reference Standard	The composition of any reference standard must be known to within 0.01 mol % for any component.	The standards used by ATL are blended to a >/= 95% accuracy.
Sample Injection Volume	Components whose concentrations are in excess of 5 % should not be analyzed by using sample volumes greater than 0.5 mL.	The sample container is connected directly to a fixed volume sample loop of 1.0 mL on the GC. Linear range is defined by the calibration curve. Bags are loaded by vacuum.
Normalization	Normalize the mole percent values by multiplying each value by 100 and dividing by the sum of the original values. The sum of the original values should not differ from 100% by more than 1.0%.	Results are not normalized. The sum of the reported values can differ from 100% by as much as 15%, either due to analytical variability or an unusual sample matrix.
Precision	Precision requirements established at each concentration level.	Duplicates should agree within 25% RPD for detections > 5 X's the RL.

Receiving Notes

There were no receiving discrepancies.

PER CLIENT'S REQUEST THE WORK ORDER WAS REISSUED ON 09/05/12 TO CHANGE THE PROJECT NAME TO CHEVRON 90076, OAKLAND, CA.

Analytical Notes

The trip blank sample TRIP BLANK has reportable levels of Oxygen present. Reanalysis confirm initial result.

Definition of Data Qualifying Flags

Seven qualifiers may have been used on the data analysis sheets and indicate as follows:
B - Compound present in laboratory blank greater than reporting limit.
J - Estimated value.
E - Exceeds instrument calibration range.
S - Saturated peak.
Q - Exceeds quality control limits.
U - Compound analyzed for but not detected above the detection limit.
M - Reported value may be biased due to apparent matrix interferences.
File extensions may have been used on the data analysis sheets and indicates as follows:
a-File was requantified
b-File was quantified by a second column and detector
r1-File was requantified for the purpose of reissue

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Summary of Detected Compounds
NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

Client Sample ID: VP-1

Lab ID#: 1208345CR1-01A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.17	1.7
Nitrogen	0.17	81
Carbon Dioxide	0.017	17
Methane	0.00017	0.00020

Client Sample ID: VP-2

Lab ID#: 1208345CR1-02A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.17	1.9
Nitrogen	0.17	82
Carbon Dioxide	0.017	15
Methane	0.00017	0.77

Client Sample ID: VP-3

Lab ID#: 1208345CR1-03A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.16	3.1
Nitrogen	0.16	84
Carbon Dioxide	0.016	13
Methane	0.00016	0.00016

Client Sample ID: VP-3-DUP

Lab ID#: 1208345CR1-04A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.16	2.8
Nitrogen	0.16	84
Carbon Dioxide	0.016	13

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Summary of Detected Compounds
NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

Client Sample ID: TRIP BLANK

Lab ID#: 1208345CR1-05A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.10	0.88
Nitrogen	0.10	99

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Client Sample ID: VP-1

Lab ID#: 1208345CR1-01A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**9081721**	**Date of Collection: 8/13/12 12:55:00 PM**	
Dil. Factor:	**1.71**	**Date of Analysis: 8/17/12 03:44 PM**	

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.17	1.7
Nitrogen	0.17	81
Carbon Dioxide	0.017	17
Methane	0.00017	0.00020
Helium	0.086	Not Detected

Container Type: 1 Liter Summa Canister (100% Certified)

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Client Sample ID: VP-2

Lab ID#: 1208345CR1-02A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**9081722**	**Date of Collection: 8/13/12 12:15:00 PM**	
Dil. Factor:	**1.68**	**Date of Analysis: 8/17/12 04:13 PM**	

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.17	1.9
Nitrogen	0.17	82
Carbon Dioxide	0.017	15
Methane	0.00017	0.77
Helium	0.084	Not Detected

Container Type: 1 Liter Summa Canister (100% Certified)

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Client Sample ID: VP-3

Lab ID#: 1208345CR1-03A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**9081723**	**Date of Collection: 8/13/12 11:05:00 AM**	
Dil. Factor:	**1.58**	**Date of Analysis: 8/17/12 04:34 PM**	

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.16	3.1
Nitrogen	0.16	84
Carbon Dioxide	0.016	13
Methane	0.00016	0.00016
Helium	0.079	Not Detected

Container Type: 1 Liter Summa Canister (100% Certified)

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Client Sample ID: VP-3-DUP

Lab ID#: 1208345CR1-04A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**9081724**	**Date of Collection: 8/13/12 11:05:00 AM**	
Dil. Factor:	**1.58**	**Date of Analysis: 8/17/12 04:59 PM**	

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.16	2.8
Nitrogen	0.16	84
Carbon Dioxide	0.016	13
Methane	0.00016	Not Detected
Helium	0.079	Not Detected

Container Type: 1 Liter Summa Canister (100% Certified)

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Client Sample ID: TRIP BLANK

Lab ID#: 1208345CR1-05A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**9081726**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/17/12 06:21 PM**	

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.10	0.88
Nitrogen	0.10	99
Carbon Dioxide	0.010	Not Detected
Methane	0.00010	Not Detected
Helium	0.050	Not Detected

Container Type: 1 Liter Summa Canister (100% Certified)

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Client Sample ID: Lab Blank

Lab ID#: 1208345CR1-06A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**9081720**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/17/12 02:01 PM**	

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.10	Not Detected
Nitrogen	0.10	Not Detected
Carbon Dioxide	0.010	Not Detected
Methane	0.00010	Not Detected

Container Type: NA - Not Applicable

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Client Sample ID: Lab Blank

Lab ID#: 1208345CR1-06B

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**9081719b**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/17/12 01:34 PM**	

Compound	**Rpt. Limit (%)**	**Amount (%)**
Helium	0.050	Not Detected

Container Type: NA - Not Applicable

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Client Sample ID: LCS

Lab ID#: 1208345CR1-07A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**9081717**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/17/12 12:15 PM**	

Compound	%Recovery
Oxygen	100
Nitrogen	100
Carbon Dioxide	103
Methane	98
Helium	100

Container Type: NA - Not Applicable

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Client Sample ID: LCSD

Lab ID#: 1208345CR1-07AA

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**9081740**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/18/12 12:07 AM**	

Compound	%Recovery
Oxygen	100
Nitrogen	100
Carbon Dioxide	103
Methane	97
Helium	100

Container Type: NA - Not Applicable

Air Toxics LTD.

CHAIN-OF-CUSTODY RECORD

Sample Transportation Notice
Relinquishing signature on this document indicates that sample is being shipped in compliance with all applicable local, State, Federal, national, and international laws, regulations and ordinances of any kind. Air Toxics Limited assumes no liability with respect to the collection, handling or shipping of these samples. Relinquishing signature also indicates agreement to hold harmless, defend, and indemnify Air Toxics Limited against any claim, demand, or action, of any kind, related to the collection, handling, or shipping of samples. D.O.T. Hotline (800) 467-4922

180 BLUE RAVINE ROAD, SUITE B
FOLSOM, CA 95630-4719
(916) 985-1000 FAX (916) 985-1020

Project Manager NATHAN LEE

Collected by: (Print and Sign) OLIVER YAN

Company CONESTOGA-ROVERS & ASSOCIATES Email NLEE@CRAWORLD.COM

Address 5900 HOLLIS ST. STE A City EMERYVILLE State CA Zip 94608

Phone 510 420-0700 Fax 510 420 9170

Project Info:
P.O. # TBD
Project # 311977
Project Name CHEVRON 91851

Turn Around Time:
☑ Normal 5-DAY TAT
☐ Rush
specify

Lab Use Only
Pressurized by:
Date:
Pressurization Gas: N_2 He

Lab I.D.	Field Sample I.D. (Location)	Can #	Date of Collection	Time of Collection	Analyses Requested	Canister Pressure/Vacuum Initial	Final	Receipt	Final (psi)
01A	VP-1	3043	8-13-12	12:55	For all samples:	-30	-6		
02A	VP-2	3399	8-13-12	12:15	•TO-15: TPHg; BTEX;	-29	-6		
03A	VP-3	31778	8-13-12	11:05	MTBE; Naphthalene	-30	-5		
04A	VP-3-DUP	37388	8-13-12	11:05	•TO-15 APH Full Scan	-30	-5		
05A	TRIP BLANK	3010	—	—	for Aromatics and				
					Aliphatics				
					•ASTM D-1946:				
					N_2, O_2, CO_2, CH_4,				
					Helium				

Relinquished by: (signature)	Date/Time	Received by: (signature)	Date/Time
	8-13-12 1600	SECURE LOCATION	8/13/12 1600
SECURE LOCATION	8-14-12 10:00	Fed Ex	8-14-12 10:00
		AFL	08/16/12 0920

Notes: Please report results in PPbV and ug/m³
- email results and EDF to nlee@craworld.com
global ID: T0600102238

Lab Use Only	Shipper Name	Air Bill #	Temp (°C)	Condition	Custody Seals Intact?	Work Order #
	FedEx	4061 6046 3846	NA	good	Yes No (None)	1208345

Form 1293 rev.11

APPENDIX E

STANDARD FIELD PROCEDURES

STANDARD FIELD PROCEDURES FOR SOIL BORING AND MONITORING WELL INSTALLATION

This document presents standard field methods for drilling and sampling soil borings and installing, developing and sampling groundwater monitoring wells. These procedures are designed to comply with Federal, State and local regulatory guidelines. Specific field procedures are summarized below.

SOIL BORINGS

Objectives
Soil samples are collected to characterize subsurface lithology, assess whether the soils exhibit obvious hydrocarbon or other compound vapor or staining, and to collect samples for analysis at a State-certified laboratory. All borings are logged using the ASTM D2488-06 Unified Soil Classification System by a trained geologist working under the supervision of a California Professional Geologist (PG).

Soil Boring and Sampling
Prior to drilling, the first 8 feet of the boring are cleared using an air or water knife and vacuum extraction or hand auger. This minimizes the potential for impacting utilities. Soil borings are typically drilled using hollow-stem augers or direct-push technologies such as the Geoprobe®. Soil samples are collected at least every five ft to characterize the subsurface sediments and for possible chemical analysis. Additional soil samples are collected near the water table and at lithologic changes. Samples are collected using lined split-barrel or equivalent samplers driven into undisturbed sediments at the bottom of the borehole.

Drilling and sampling equipment is steam-cleaned 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 Analysis
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
One of the remaining tubes is partially emptied leaving about one-third of the soil in the tube. The tube is capped with plastic end caps and set aside to allow hydrocarbons to volatilize from the soil. After ten to fifteen minutes, a portable volatile vapor analyzer measures volatile hydrocarbon vapor concentrations in the tube headspace, extracting the vapor through a slit in the cap. Volatile vapor analyzer measurements are used along with the field observations, odors, stratigraphy and groundwater depth to select soil samples for analysis.

Water Sampling
Water samples, if they are collected from the boring, are either collected using a driven Hydropunch® type sampler or are collected from the open borehole using bailers. The groundwater 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. Laboratory-supplied trip blanks accompany the samples and are analyzed to check for cross-contamination. An equipment blank may 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.

MONITORING WELL INSTALLATION, DEVELOPMENT AND SAMPLING

Well Construction and Surveying
Groundwater monitoring wells are installed to monitor groundwater quality and determine the groundwater elevation, flow direction and gradient. Well depths and screen lengths are based on groundwater depth, occurrence of hydrocarbons or other compounds in the borehole, stratigraphy and State and local regulatory guidelines. Well screens typically extend 10 to 15 feet below and 5 feet above the static water level at the time of drilling. However, the well screen will generally not extend into or through a clay layer that is at least three feet thick.

Well casing and screen are flush-threaded, Schedule 40 PVC. Screen slot size varies according to the sediments screened, but slots are generally 0.010 or 0.020 inches wide. A rinsed and graded sand occupies the annular space between the boring and the well screen to about one to two feet above the well screen. A two feet thick hydrated bentonite seal separates the sand from the overlying sanitary surface seal composed of Portland type I, II cement.

Well-heads are secured by locking well-caps inside traffic-rated vaults finished flush with the ground surface. A stovepipe may be installed between the well-head and the vault cap for additional security.

The well top-of-casing elevation is surveyed with respect to mean sea level and the well is surveyed for horizontal location with respect to an onsite or nearby offsite landmark.

Well Development

Wells are generally developed using a combination of groundwater surging and extraction. Surging agitates the groundwater and dislodges fine sediments from the sand pack. After about ten minutes of surging, groundwater is extracted from the well using bailing, pumping and/or reverse air-lifting through an eductor pipe to remove the sediments from the well. Surging and extraction continue until at least ten well-casing volumes of groundwater are extracted and the sediment volume in the groundwater is negligible. This process usually occurs prior to installing the sanitary surface seal to ensure sand pack stabilization. If development occurs after surface seal installation, then development occurs 24 to 72 hours after seal installation to ensure that the Portland cement has set up correctly.

All equipment is steam-cleaned prior to use and air used for air-lifting is filtered to prevent oil entrained in the compressed air from entering the well. Wells that are developed using air-lift evacuation are not sampled until at least 24 hours after they are developed.

Groundwater Sampling

Depending on local regulatory guidelines, three to four well-casing volumes of groundwater are purged prior to sampling. Purging continues until groundwater pH, conductivity, and temperature have stabilized. Groundwater samples are collected using bailers or pumps and 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. Laboratory-supplied trip blanks accompany the samples and are analyzed to check for cross-contamination. An equipment blank may be analyzed if non-dedicated sampling equipment is used.

Waste Handling and Disposal

Soil cuttings from drilling activities are usually stockpiled onsite and covered by plastic sheeting. At least three individual soil samples are collected from the stockpiles and composited at the analytic laboratory. The composite sample is analyzed for the same constituents analyzed in the borehole samples in addition to any analytes required by the receiving disposal facility. Soil cuttings are transported by licensed waste haulers and disposed in secure, licensed facilities based on the composite analytic results.

Groundwater removed during development and sampling is typically stored onsite in sealed 55-gallon drums. Each drum is labeled with the drum number, date of generation, suspected contents, generator identification and consultant contact. Upon receipt of analytic results, the water is either pumped out using a vacuum truck for transport to a licensed waste treatment/disposal facility or the individual drums are picked up and transported to the waste facility where the drum contents are removed and appropriately disposed.

STANDARD FIELD PROCEDURES FOR SOIL VAPOR PROBE INSTALLATION AND SAMPLING AT CHEVRON SITES

This document describes Conestoga-Rovers & Associates' standard field procedures for soil vapor probe installation and 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 Probe Installation

The shallow soil vapor probe method for soil vapor sampling utilizes a hand auger or drill rig to advance a boring for the installation of a soil vapor sampling probe. Soil vapor probes facilitate the collection of in-situ vapor samples. Once the boring is advanced to the final depth, #2/12 filter pack is poured through a tremie pipe to fill the bottom 6 inches of the boring. A permeable, stainless-steel probe tip is connected to ¼-inch outside diameter Teflon tubing via a push-to-connect fitting. The probe tip is then placed approximately 6 inches from the bottom of the boring and covered by 6 inches of #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 labeled, capped, and placed within a traditional well box finished flush to grade. Soil vapor samples will be collected no sooner than 48 hours after installation of the soil vapor probe 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.

Purging

At least three purge volumes of vapor are removed from the soil vapor probe prior to sampling. The purge volume is defined as the amount of air within the probe and tubing. Purging is performed using the vacuum of a dedicated Summa canister, a flow regulator set to the same flow rate used for sampling, and vacuum gauges. Immediately after purging, soil vapor samples will be collected using the appropriate size Summa canister with attached flow regulator and sediment filter.

Sampling Soil Vapor Probes

Samples will be collected using a SUMMA™ canister connected to the sampling tube of each vapor probe. 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 mercury is observed on the vacuum gauge and recorded on the chain-of-custody.

The flow controllers should be set to 100-200 milliliters per minute. Field duplicates should be collected for every day of sampling and/or for every 10 samples collected.

In accordance with the DTSC guidance document titled *Advisory-Active Soil Gas Investigations*, dated March 2010, leak testing is necessary during sampling. Helium is recommended, although shaving cream is acceptable. Helium is pumped into a shroud that contains the entire sampling apparatus and the soil vapor probe well vault. A helium meter is used to quantify the percentage helium in the shroud during sampling.

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.

Soil Vapor Probe Destruction

The soil vapor probes 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.