SENSITIVE RECEPTOR SURVEY AND SUBSURFACE INVESTIGATION WORK PLAN

FORMER SHELL SERVICE STATION
2350 (2368) HARRISON STREET
OAKLAND, CALIFORNIA

SAP CODE 173318
INCIDENT NO. 97743969
AGENCY NO. RO0000505

Prepared by:
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TABLE OF CONTENTS

Page

LIST OF FIGURES
(Following Text)

LIST OF TABLES
(Following Text)

LIST OF APPENDICES

1.0 INTRODUCTION

Conestoga-Rovers & Associates, Inc. (CRA) prepared this report and work plan on behalf of Equilon Enterprises LLC dba Shell Oil Products US (Shell) as requested in Alameda County Health Care Services Agency's (ACHCSA's) September 12, 2008 letter. The letter requested a work plan for investigation of 1,1,2,2-tetrachloroethane in soil, a sensitive receptor survey, a work plan for investigation of possible impacts to surface water, a work plan for investigation of heavy fraction petroleum hydrocarbons in soil, a well survey, and a work plan for quarterly groundwater monitoring. This document includes the receptor survey and the work plans. The well survey will be submitted under separate cover.

The subject property is a former Shell service station located on the southern corner of the Harrison Street and Bay Place intersection in Oakland, California (Figure 1). The former station, whose address was 2368 Harrison Street, layout included underground fuel storage tanks (USTs), a waste oil tank, three dispenser islands, and a station building (Figure 2). The site is currently occupied by a 7-Eleven Store, whose address is 2350 Harrison Street, and the area surrounding the station is predominantly a mix of commercial and residential use (Figure 3). Glen Echo Creek runs in an underground culvert along Harrison Street and flows into a concrete lined channel approximately 280 feet south of the site. The creek then flows into Lake Merritt which is approximately 650 feet south of the site.

2.0 SENSITIVE RECEPTOR SURVEY

ACHCSA's September 12, 2008 letter to Shell requested a sensitive receptor survey of the area within 500 feet of the site to identify any schools, day care centers, or medical care facilities.

CRA identified one potential sensitive receptor within 500 feet of the site: St. Paul's Towers Retirement Community, a residential care facility, is located approximately 245 feet to the southeast. Saint Paul's Episcopal School (kindergarten through eighth grade) is located outside the survey area, approximately 550 feet southeast of the site.

Potential sensitive receptors are listed in Table 1, and the locations are shown on Figure 3.

3.0 WORK PLAN

3.1 PERMIT

CRA will obtain an appropriate drilling permit from Alameda County Public Works Agency.

3.2 HEALTH AND SAFETY PLAN (HASP)

CRA will prepare a HASP to protect site workers. The plan will be kept on site during field activities and will be reviewed and signed by each site worker.

3.3 UTILITY CLEARANCE

CRA will mark proposed drilling locations, and the locations will be cleared through Underground Service Alert and a private line locator service prior to drilling.

3.4 SUBSURFACE INVESTIGATIONS

The following subsurface investigations are proposed to address the specific concerns expressed in ACHCSA's September 12, 2008 letter to Shell. CRA's standard field procedures for soil borings are included as Appendix A, and those for soil vapor monitoring are included as Appendix B. The proposed scope of work described will be performed under the supervision of a professional geologist or engineer.

3.4.1 1,1,2,2-TETRACHLOROETHANE IN SOIL

In June 2008 1,1,2,2-tetrachloroethane was detected in soil samples from well boring S-2 at concentrations up to 18 milligrams per kilogram (mg/kg). The most likely source of 1,1,2,2-tetrachloroethane is the former waste oil UST. CRA proposes to drill and sample three soil borings (B-1 through B-3) using a Geoprobe rig to 15 feet below grade (fbg) around the former waste oil UST to investigate the source of 1,1,2,2-tetrachloroethane.

A CRA geologist will supervise the drilling and describe encountered soils using the Unified Soil Classification System and Munsell Soil Color Charts. After clearing each of the soil borings to a depth of 5 fbg with an air/water-knife, the borings will be continuously sampled for soil description and petroleum vapor screening using a

photoionization detector (PID). Soil samples selected for chemical analysis will be retained in 6-inch sections of plastic Geoprobe sample tubing, covered on both ends with Teflon sheets and plastic end caps, labeled, entered onto a Chain-of-Custody record (COC), and placed into a cooler with ice for transport to a State of California-certified laboratory for analysis. Selected samples will be submitted for chemical analysis for 1,1,2,2-tetrachloroethane by EPA Method 8260B. CRA will prepare a boring log for each boring, and PID measurements will be recorded on the boring log.

In addition, CRA proposes to install three soil vapor probes (SVP-1 through SVP-3) at 5 fbg along the north side of the 7-Eleven store near the location of the former waste oil tank to evaluate the potential risk for vapor intrusion into indoor air. The soil borings for the installation of the vapor probes will be advanced to 5 fbg using air/water-knife equipment. Following boring installation, a fixed vapor-sampling point will be installed in each boring using ¼-inch diameter Teflon tubing. Each point will have a 3-inch length of screen and will be placed approximately 4.2 to 4.5 fbg. A clean, fine-grained silica sand filter pack will be installed approximately 3 to 6 inches below and above the screened interval, followed by a 2-inch base of pre-hydrated bentonite pellets and neat grout to grade. Each probe will then be secured under a traffic-rated well box at grade. At least one week following probe installation, CRA will collect soil vapor samples from each sampling point in Summa canisters. Soil vapor samples will be labeled, entered onto a COC, and transported to a State of California-certified laboratory for analyses. Soil vapor samples will be analyzed for 1,1,2,2-tetrachloroethane by EPA Method TO-15.

3.4.2 POTENTIAL DISCHARGE TO SURFACE WATER

A concrete-lined channel in communication with Lake Merritt is located approximately 280 feet south of the site. The north end of the channel is connected to an underground concrete culvert or storm water drain which runs to the north up Harrison Street, past the site, and a portion of the culvert system connects to Glen Echo Creek (see Figure 3). ACHCSA's September 12, 2008 letter to Shell requested a work plan to determine if dissolved petroleum hydrocarbons in groundwater were reaching surface waters. CRA proposes to drill four Hydropunch borings on the City of Oakland property located along the east side of Harrison Street and adjacent to the channel to determine if dissolved hydrocarbons in groundwater may be reaching the channel. The proposed Hydropunch locations are shown in Figure 3. CRA will collect grab groundwater samples at first-encountered groundwater (7 to 10 fbg) using Hydropunch sampling equipment or a temporary casing and Teflon bailer. Samples will be transferred into vials containing hydrochloric acid preservative and unpreserved amber glass jars with no headspace. The samples will be labeled, entered onto a COC, and placed into a

cooler with ice for transport to a California-certified laboratory for analysis for oil and grease (O+G) by EPA Method 418.1; for total petroleum hydrocarbons as diesel (TPHd) by EPA Method 8015 (modified); and for total petroleum hydrocarbons as gasoline (TPHg), benzene, toluene, ethylbenzene, xylenes (BTEX), methyl tertiary-butyl ether (MTBE), di-isopropyl ether (DIPE), ethyl tertiary-butyl ether (ETBE), tertiary-amyl methyl ether (TAME), and tertiary-butyl alcohol (TBA) by EPA Method 8260B.

3.4.3 TOTAL PETROLEUM HYDROCARBONS AS MOTOR OIL (TPHMO) IN SOIL

TPHmo was detected in soil samples from four of the six well borings drilled at the site. The highest concentration was 23,000 mg/kg found in well boring S-5 at 6 fbg. This sample also contained 22,000 mg/kg TPHd. Chromatograms for this sample and for laboratory standards for TPHd, TPHmo and hydraulic fluid were reviewed by Dr. Ileana Rhodes, an environmental chemist with Shell Global Solutions. The chromatograms from the sample did not match the laboratory's diesel standards. The chromatogram is similar to the laboratory's hydraulic oil standard, but motor oil can not be ruled out. A letter from Dr. Rhodes as well as chromatograms for the sample and for TPHd, TPHmo, and hydraulic fluid laboratory standards are included in Appendix C.

In order to determine if a release of hydraulic fluid occurred beneath the former station building, CRA proposes to drill two soil borings (B-4 and B-5) to 15 fbg at the locations show in Figure 2. A CRA geologist will supervise the drilling and describe encountered soils using the Unified Soil Classification System and Munsell Soil Color Charts. After clearing each of the soil borings to a depth of 5 fbg with an air/water-knife, the borings will be continuously sampled for soil description and petroleum vapor screening using a PID. Soil samples selected for chemical analysis will be retained in a 6-inch sections of plastic Geoprobe tubing, covered on both ends with Teflon sheets and plastic end caps, labeled, entered onto a COC, and placed into a cooler with ice for transport to a State of California-certified laboratory for analysis for O+G by EPA Method 418.1 and TPHd and TPHmo by EPA Method 8015 (modified). CRA will prepare a boring log for each boring, and PID measurements will be recorded on the boring log.

3.5 QUARTERLY GROUNDWATER MONITORING

CRA proposes that the six existing groundwater monitoring wells on the site be gauged and sampled quarterly for O+G, TPHd, TPHg, and BTEX.

3.6 REPORT PREPARATION

Following receipt of analytical results from the laboratory, CRA will submit a report documenting the activities, which will include field procedures, laboratory results, and boring logs.

4.0 SCHEDULE

CRA will implement the proposed work upon approval of this work plan by ACHCSA and receipt of appropriate permits.

All of Which is Respectfully Submitted,
CONESTOGA-ROVERS & ASSOCIATES

Peter Schaefer, CEG, CHG
Project Manager

Aubrey K. Cool, PG
Professional Geologist

FIGURES

10/31/08

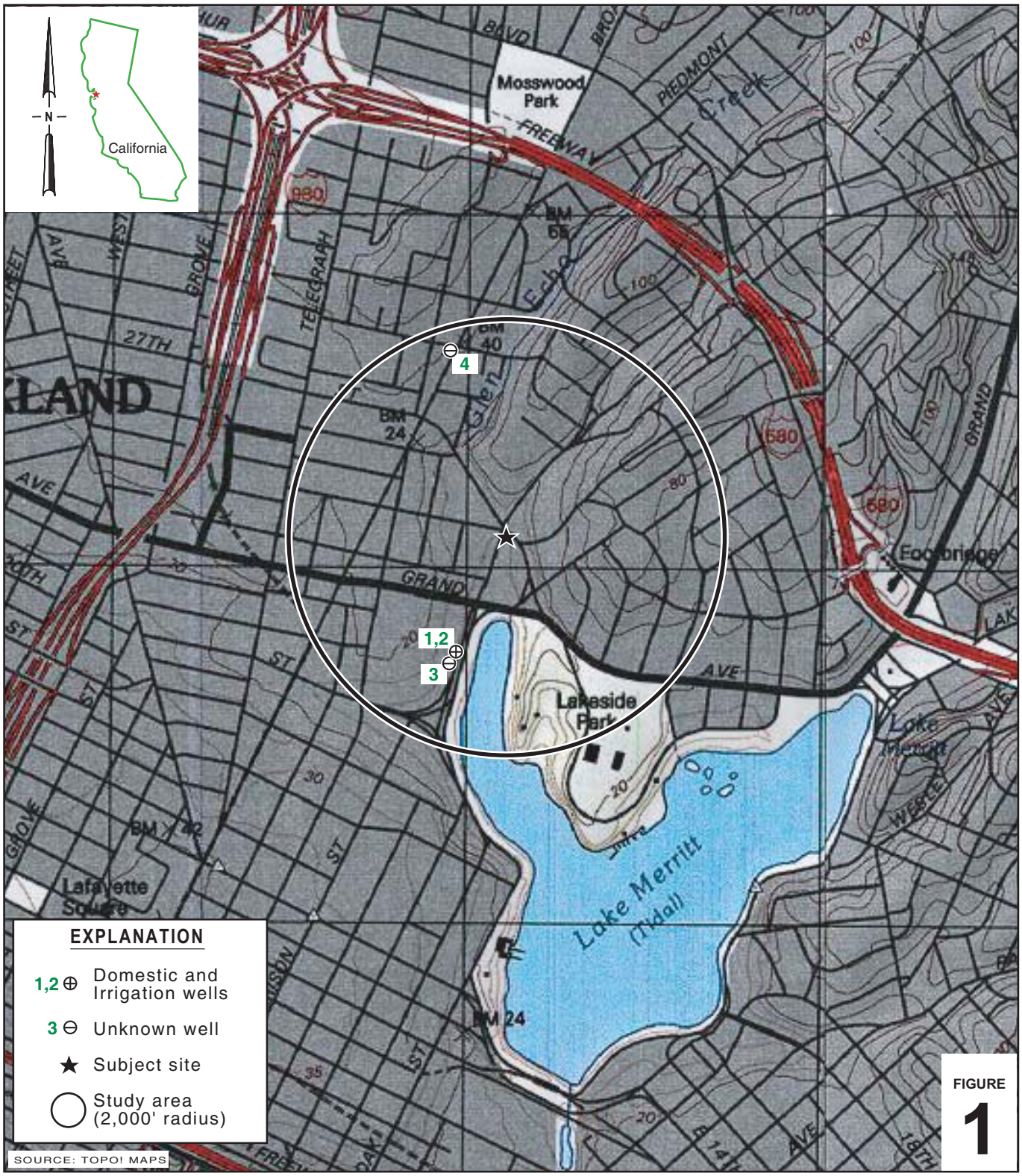

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FIGURE
1

0 1/8 1/4 1/2 1

SCALE : 1" = 1/4 MILE

Former Shell Service Station

2350 (2368) Harrison Street

Oakland, California

CONESTOGA-ROVERS & ASSOCIATES

Vicinity Map

10/27/08

Site Plan

EXPLANATION

- B-4 — Proposed angle boring location
- B-1 — Proposed soil boring location
- SVP-1 — Proposed soil vapor probe location
- S-1 — Monitoring well location
- Storm drain (SD)
- Sanitary sewer line (SS)
- Water line (W)
- Electrical line (E)
- Gas line (G)
- Telecommunications line (T)

Wheelworks Auto Repair Shop

median

Underground Culvert & Storm Drain (Approx.)

HARRISON STREET

Street Light (typ.)

planter

sign

light pole

driveway

Former Dispenser Islands

S-3

Former Shell Station
2368 Harrison St.

Former Dispenser Island

sidewalk

S-2

S-6

S-4

Former Waste Oil UST

Former USTs

B-3

SVP-3

B-4

SVP-1

B-1

B-2

SVP-2

lamp post

Former Station Building

S-5

7-11 Store Building
2350 Harrison St.

fenced enclosure

B-5

S-1

Former Tire/Wheel Hoist

Former Drive-on Hoist

SS
SD
W

Beck BMW

Parking Lot

BAY PLACE

0 10 20 40

Scale (ft)

Basemap modified from aerial photo

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CONESTOGA-ROVERS & ASSOCIATES

Former Shell Service Station

2350 (2368) Harrison Street
Oakland, California

FIGURE

2

10/27/08

Extended Site Plan

EXPLANATION

- B-1 — Proposed soil boring location
- SVP-1 — Proposed soil vapor probe location
- HP-1 — Proposed Hydropunch location
- S-1 — Monitoring well location
- Storm drain (SD)
- Sanitary sewer line (SS)
- Water line (W)
- Electrical line (E)
- Gas line (G)
- Telecommunications line (T)

VALDEZ STREET
24th STREET
23rd STREET
27th STREET
HARRISON STREET
ORIN DRIVE
VERNON TERRACE
VERNON STREET
BAY PLACE
MONTECITO AVENUE
PARK VIEW TERRACE
Glen Echo Creek
Underground Culvert & Storm Drain (Approx.)
crosswalk
median

First Congregational Church
2501 Harrison St.

Acura Auto Dealership
Whole Foods Market
Discount Market
MWM Architect's Office
2333 Harrison
Rouse Tire
Rouse Tire
Offices
Merritt Hotel
Oakland Senior Center
Adam's Park
St. Paul's Towers Retirement Community
St. Paul's Towers
St. Paul's Episcopal School
116 Montecito Ave.
St. Paul's Episcopal Church
114 Montecito Ave.
Parking Garage
Parking Lot
Offices
Res.
Apts.

HP-1
HP-2
HP-3
HP-4

N

0 50 100 200
Scale (ft)

- Basemap modified from aerial photo
- Approximate location of underground culvert/storm drain based on "Creek & Watershed Map of Oakland & Berkeley (Sowers, 2000)
- Res. = Single family residential home

J:\Shell\6-chars\0601--\060119-Oakland 2350 Harrison St\060119-FIGURES\060119 EXT SITE PLAN.DWG

CONESTOGA-ROVERS & ASSOCIATES

Former Shell Service Station
2350 (2368) Harrison Street
Oakland, California

FIGURE
3

TABLES

TABLE 1

POTENTIAL SENSITIVE RECEPTORS WITHIN 500 FEET OF FORMER SHELL SERVICE STATION 2350 (2368) HARRISON STREET, OAKLAND, CALIFORNIA

Potential Sensitive Receptor	*Address*	*Distance From Site*
St. Paul's Towers Retirement Community	100 Bay Place, Oakland, CA	245 feet
St. Paul's Episcopal School (K-8)	116 Montecito Avenue, Oakland, CA	550 feet

APPENDIX A

STANDARD FIELD PROCEDURES FOR SOIL BORINGS

CONESTOGA-ROVERS & ASSOCIATES

STANDARD FIELD PROCEDURES FOR SOIL BORINGS

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

Objectives

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

Soil Classification/Logging

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

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

Soil Boring and Sampling

Soil borings are typically drilled using hollow-stem augers or hydraulic push technologies. Prior to drilling, the first 8 ft of the boring are cleared using an air or water knife and vacuum extraction. This minimizes the potential for impacting utilities.

At least one and one half ft of the soil column is collected for every five ft of drilled depth. 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 beyond the bottom of the borehole. The vertical location of each soil sample is determined by measuring the distance from the middle of the soil sample tube to the end of the drive rod used to advance the split barrel sampler. All sample depths use the ground surface immediately adjacent to the boring as a datum. The horizontal location of each boring is measured in the field from an onsite permanent reference using a measuring wheel or tape measure.

APPENDIX B

STANDARD FIELD PROCEDURES FOR SOIL VAPOR MONITORING

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 Storage, Handling and Transport

Sampling tubes chosen for analysis are trimmed of excess soil and capped with Teflon tape and plastic end caps. Soil samples are labeled and stored at or below 4oC 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 photoionization detector (PID) measures volatile hydrocarbon vapor concentrations in the tube headspace, extracting the vapor through a slit in the cap. PID measurements are used along with the field observations, odors, stratigraphy and ground water 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 ground water samples are decanted into the appropriate containers supplied by the analytic laboratory. Samples are labeled, placed in protective foam sleeves, stored on crushed ice at or below 4oC, and transported under chain-of-custody to the laboratory.

Duplicates and Blanks

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

Grouting

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

Waste Handling and Disposal

Soil cuttings from drilling activities are usually stockpiled onsite on top of and covered by plastic sheeting. At least four individual soil samples are collected from the stockpiles for later compositing at the analytic laboratory. The composite sample is analyzed for the same constituents analyzed in the borehole samples. Soil cuttings are transported by licensed waste haulers and disposed in secure, licensed facilities based on the composite analytic results.

Ground water removed during sampling and/or rinsate generated during decontamination procedures are 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. Disposal of the water is based on the analytic results for the well samples. 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.

Conestoga-Rovers & Associates

STANDARD FIELD PROCEDURES FOR SOIL VAPOR PROBE INSTALLATION AND SAMPLING

VAPOR POINT METHODS

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

Objectives

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

Shallow Soil Vapor Point Method for Soil Vapor Sampling

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

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.

APPENDIX C

REVIEW OF RESULTS FROM ANALYSIS OF SOIL SAMPLE S-5-6.0

Shell Global Solutions

Shell Global Solutions (US) Inc.
Westhollow Technology Center
3333 Highway 6 South
Houston, TX 77082-3101
USA
Tel +1 281-544 8215
Fax +1 281-544 8727
Email: Ileana.Rhodes@Shell.com

Denis Brown
Shell Oil Products US
20945 S. Wilmington Ave.
Carson, CA 90810-1039
USA

October 22, 2008

Re: Review of Results from Analysis of Soil Sample S-5-6.0 – 2350 Harrison St., Oakland, CA

Dear Denis:

As per your request, I reviewed the gas chromatogram obtained from analysis by Calscience of a soil sample (S-5-6.0) for extractable TPH. The sample was collected June 5, 2008. This chromatogram was compared to those provided by Calscience for samples of diesel, motor oil and hydraulic oil analyzed under the same conditions in the same instrument. As shown in Figure 1, the material found in sample S-5-6.0 is similar to the hydraulic oil reference, however, motor oil cannot be ruled out as there are variations in the different types of lubricating oils. The sample does not contain diesel.

Please let me know if you wish to discuss.

Best regards,

Ileana Rhodes, Ph.D.

Team Lead – Environmental Chemistry

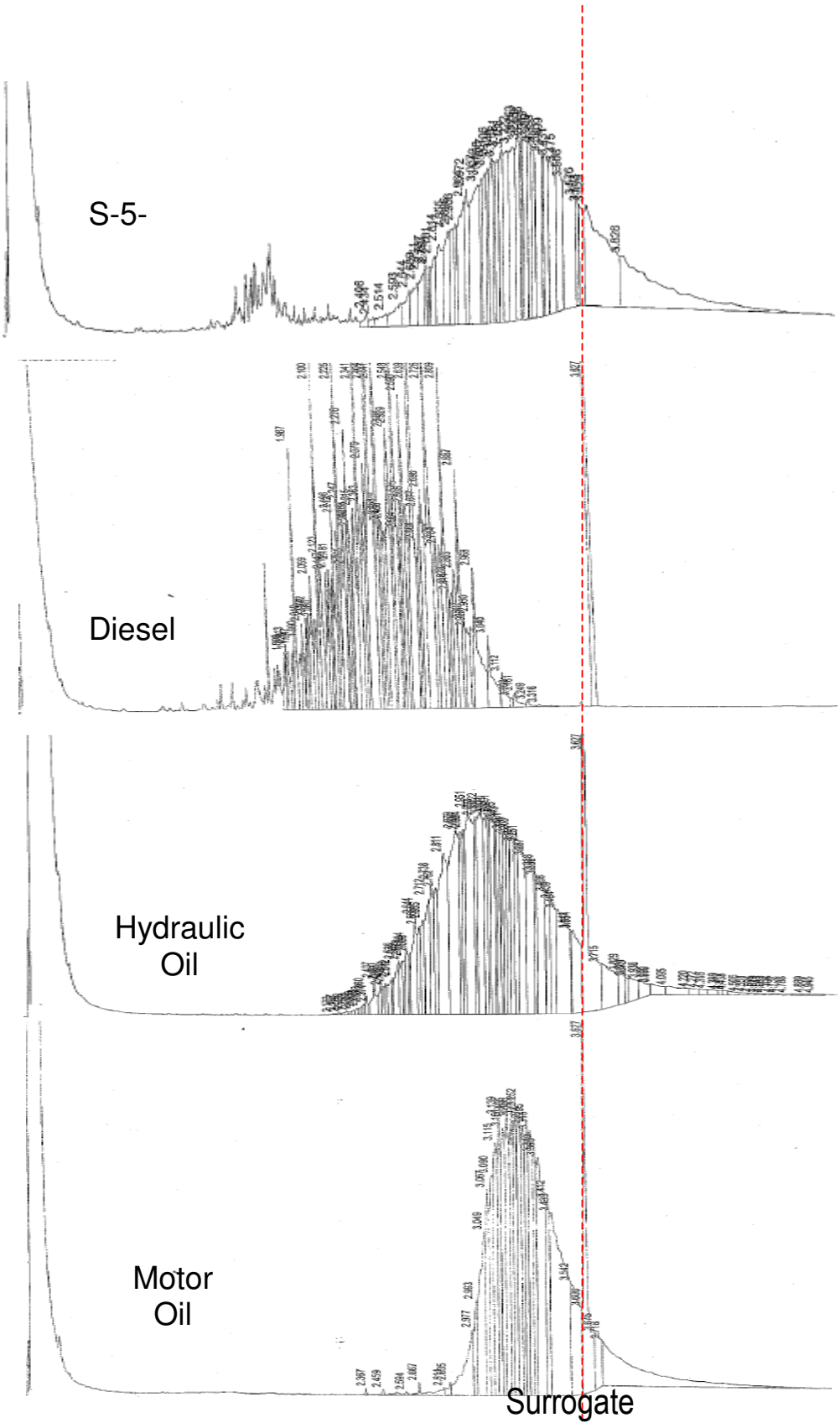

Figure 1