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September 12, 2014

Alameda County Health Care Services Agency
Environmental Health Services
Environmental Protection
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

RECEIVED
By Alameda County Environmental Health at 2:31 pm, Sep 12, 2014

Re: **Unocal No. 5484 (351812)**
18950 Lake Chabot Road, Castro Valley, California
ACEH Fuel Leak Case No. RO0000352
GeoTracker Global ID T0600101453

I have reviewed the attached report dated September 12, 2014.

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 AECOM, upon whose assistance and advice I have relied.

This letter is submitted pursuant to the requirements of California Water Code Section 13257(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,

Jillian Holloway

Jillian Holloway
Project Manager

Attachment: Soil, Groundwater, and Soil Gas Investigation Report by AECOM

Prepared for:
EMC
San Ramon, California

Prepared by:
AECOM
Sacramento, California
September 2014

Report on Soil, Groundwater, and Soil Gas Investigation

ACEH Case No. RO0000352
RWQCB Case No. 01-1578

Unocal No. 5484 (351812)
18950 Lake Chabot Road
Castro Valley, California

Prepared for:
EMC
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Unocal No. 5484 (351812)
18950 Lake Chabot Road
Castro Valley, California

This report was prepared consistent with currently and generally accepted environmental consulting principles and practices. The material and data in this report were prepared by and/or under the supervision and direction of the undersigned.

Prepared By: James Harms
Project Manager

Reviewed By: Jessica Law, PG#8840
Project Geologist
Stamped: 09/12/2014

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1.0 Introduction

At the request of the Alameda County Environmental Health Department (ACEH) and on behalf of Chevron Environmental Management Company's (EMC's) affiliate, Union Oil Company of California ("Union Oil"), AECOM is pleased to submit this report on the soil, groundwater, and soil vapor investigation performed for ACEH Case No. RO0000352, Unocal No. 5484 (351645), located at 18950 Lake Chabot Road in Castro Valley, California (**Figure 1**).

1.1 Background and Objectives

On July 22, 2014 Chevron, ACEH, and AECOM met to discuss the Case Closure Summary (AECOM 2014a) and Site Conceptual Model (SCM) (AECOM 2014b) submitted in February 2014. ACEH responded to the documents on May 30, 2014, draft responses to the directive comments were also discussed in the meeting (**Appendix A**). The conclusion of the meeting with ACEH was to perform a soil vapor investigation to address potential indoor vapor intrusion concern posed by naphthalene in groundwater. Naphthalene has always been below the environmental screening level (ESL) for indoor vapor intrusion; however, those ESLs are only applicable when the groundwater is deeper than 10 feet below ground surface (bgs). Site groundwater levels have been observed as high as 2.99 feet bgs.

The investigation consisted of installing and sampling two soil vapor wells. The sample locations are shown on **Figure 2**.

The scope of work was developed using EMC protocols and regulatory guidance documents, including the California Environmental Protection Agency (CalEPA) Department of Toxic Substances Control's (DTSC's) *Final Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air* (CalEPA 2011a), the DTSC and Regional Water Quality Control Board (RWQCB), Los Angeles Region's *Advisory – Active Soil Gas Investigation* (CalEPA 2012), and the American Petroleum Institute's *Collecting and Interpreting Soil Gas Samples from the Vadose Zone: A Practical Strategy for Assessing the Subsurface Vapor-to-Indoor Air Migration Pathway at Petroleum Hydrocarbon Sites* (American Petroleum Institute 2005).

1.2 Site Location and Description

The site is an active service station (Sunny's 76) located on the southeastern corner of the intersection of Lake Chabot Road and Quail Road in Castro Valley, California (**Figure 1**). The current site configuration includes two 12,000-gallon, fiberglass, double-walled, gasoline USTs, a 520-gallon waste-oil UST, four dispensers, and a station building (**Figure 2**). The station building consists of a service center for car smog testing and general auto care.

The site is located in a primarily residential area. To the north of the site are single-family residences, to the east and south of the site is the Castro Valley Community Park and Community Center, and to the west of the site are multiple adjoined single-family residences. The entire site, with the exception of limited planter areas along the perimeter, is paved with concrete and asphalt.

Based on site survey data, the surface elevations at the site ranges from 245 feet above mean sea level (amsl) to 232 feet amsl (Morrow Surveying 2009). The site topography in the area slopes generally to the southwest.

Based on the lithology observed during previous investigations, the geology underlying the site is described as silty clay and sandy clay with gravel from the ground surface to between 10 and 20 feet bgs, which is underlain by weathered mudstone and fractured siltstone.

2.0 Soil Sampling

AECOM oversaw the installation of two soil vapor monitoring wells to investigate potential vapor intrusion to nearby residences as specified in AECOM's work plan (AECOM 2014c). The locations of the newly installed wells are shown on **Figure 2**. The well locations were moved slightly from the proposed locations to avoid subsurface utilities identified at the site.

2.1 Soil Vapor Well Installation

AECOM contracted Confluence Environmental, Inc. (Confluence), a State of California C-57-licensed drilling contractor, to advance the boreholes and install the soil vapor monitoring wells.

2.1.1 Soil Borings and Soil Sample Collection

AECOM oversaw Confluence advance two soil borings (SV-1 and SV-2) using hand auger techniques that were converted into soil vapor monitoring wells. The soil borings were continuously logged for lithology from the surface to the total depths of the borings.

One soil sample was collected from each soil boring at five feet bgs. No photoionization detector (PID) readings above 10 parts per million were observed, therefore additional soil samples were not submitted for analysis. The proposed total depth for each soil boring was 8 feet bgs. However, refusal was encountered at each location, SV-1 and SV-2, at 6.5 and 5 feet bgs, respectively. Prior boring logs indicated a weathered bedrock layer may be present near the refusal depths therefore additional soil borings at each location were not attempted. Moisture or indication of shallow groundwater was not observed in either soil boring location.

Soil was collected in new stainless steel sleeves and the ends were sealed and capped with Teflon. The samples were labeled, recorded on a chain-of-custody form, and placed in a cooler with ice pending delivery to the analytical laboratory (**Appendix B**).

2.1.2 Soil Lithology Observations

The lithology observed during this investigation was generally consistent with previous investigations. The surface consisted of asphalt between 3-inches and 5-inches thick. Silty gravel fill was then observed to approximately 1-foot bgs, very stiff silt with up to 20% clay from 2 to 3-feet bgs, stiff silt with up to 25% gravel and trace clay from 3 feet bgs to the total depth of each soil boring (**Appendix C**).

SV-1 met refusal at 6.5 feet bgs. MW-7 is located about 3 feet from SV-1, moderately to highly weathered shale bedrock was noted beginning at 4 feet bgs. SV-2 met refusal at 5 feet bgs and is less than 5 feet from SV-1. Weathered siltstone was observed beginning at 5 feet bgs in MW-2.

2.1.3 Vapor Well Installation

Following completion of the soil sampling, each soil boring was completed as a soil vapor monitoring well. Due to the refusal depth each well was only completed as a single vapor well instead of a dual-nested well, as originally proposed.

Each well had a 6-inch-long, 0.25-inch-diameter stainless-steel screen with a pore size of 0.0057 inch (0.14 millimeter). The screen was connected to a length of 0.25-inch outside diameter (OD) nylon

tubing to the ground surface. Tubing was capped at the surface with a nylon valve installed in the closed position to allow equilibration of soil vapor concentrations. A 1-foot-thick Lonestar #2/12 sand pack was placed with the screen centered within it. Above each sand pack, 6-inches to 1-foot of dry granular bentonite was placed as a transitional seal. Hydrated bentonite was then placed from above the dry bentonite to the ground surface (**Appendix C**). Each soil vapor monitoring well was completed with a traffic-rated well box set in concrete. The Alameda County Public Works Agency (ACPWA) was contacted for inspection and approved the well construction by phone during the installation.

2.1.4 Soil Sample Analytical Results

The soil samples were analyzed by BC Laboratories, a State of California-certified laboratory, for the following constituents:

- Total Petroleum Hydrocarbons (TPH) gasoline TPHg, TPH diesel (TPHd), and TPH motor oil (TPHmo) using Environmental Protection Agency (EPA) Method 8015B/FFFP with silica gel treatment;
- Benzene, toluene, ethylbenzene, and total xylenes (BTEX) and methyl t-butyl ether (MTBE) using EPA Method 8260B;
- Naphthalene and carcinogenic poly-aromatic hydrocarbons (PAHs) using EPA Method 8270C-SIM;
- Physical analysis including fraction organic carbon, total porosity, dry bulk density (ASTM Method D2937), air and water-filled porosity, and grain size distribution (ASTM Method D422).TPH carbon chain (TPHCC) by EPA Method 8015CC.

No concentrations of TPHg, BTEX, MTBE, or naphthalene were detected in the soil samples. TPHd and TPHmo were detected below the screening levels. No PAHs were detected in SV-1. PAHs were detected in SV-2, that were below the 2012 Low Threat Closure Policy (LTCP) screening levels with a calculated toxicity equivalent of benzo(a)pyrene of 0.008792 mg/kg. The soil sample chemical analytical results are presented in **Table 1** and **Table 2**.

Physical analysis was performed at each location at depths corresponding to the soil vapor well screens for possible use in risk assessment, if required. The physical analysis results are presented in **Table 3**.

3.0 Groundwater Investigation

Groundwater was not encountered in either of the soil vapor monitoring wells installed. Depth to groundwater at MW-7, near SV-1, was 9.02 feet below the top of casing (bTOC), approximately 9.5 feet bgs. The depth to water in MW-2, near SV-2, was 6.63 feet bTOC, approximately 7 feet bgs.

AECOM also performed an inspection of foundation types down gradient of the site in the direction of groundwater flow. The foundations were predominately a vented crawl-space. The ground surface slopes upward approximately 650 feet southwest of the site, foundations as you go up in elevation are typically first floor slab on grade garages with living spaces above them.

A detailed list of foundation types and down gradient receptors will be presented in the updated Site Conceptual Model to be submitted under a separate cover.

4.0 Soil Vapor Sampling

Per DTSC guidance the wells were allowed to equilibrate for at least 48 hour prior to sampling.

4.1 Soil Vapor Sampling Procedures

The following subsections provide general information regarding the procedures followed during collection of the soil vapor samples. Sampling methods followed EMC protocols and regulatory guidance documents, including those sited in Section 1.1 from CalEPA, DTSC, RWQCB, and American Petroleum Institute.

4.1.1 Sampling Equipment

All gauges and flow control manifolds were supplied by Eurofins Air Toxics, Inc. of Folsom, California (Air Toxics). The gauges and manifolds were connected by chromatography-grade, stainless steel tubing and dedicated airtight, flexible, Teflon® tubing, supplied by the laboratory, that have a low capacity for adsorbing VOCs. Samples were collected in 1-liter Summa® canisters provided by Air Toxics. Each canister was field-verified to have a vacuum of at least 25 inches of mercury (inHg) prior to sampling.

4.1.2 Leak Testing

Leakage of atmospheric air into the equipment during sampling can compromise sample integrity and provide either a false positive or false negative result. Sampling equipment was thoroughly inspected to ensure tight fittings between all components. To minimize the potential for leakage, the soil vapor sampling rate was kept at less than (<) 200 milliliters per minute (mL/min) using a flow controller supplied by Air Toxics. Prior to sampling, the Summa® canister valve was opened to the still-closed Swagelok® valve for 10 minutes and the initial vacuum pressure recorded. Purging and sampling were not commenced until the sample train passed the leak test by maintaining constant vacuum for 10 minutes.

Laboratory-grade helium was used as the tracer gas to test for air leakage into the sampling system for the purpose of sample integrity verification, in general accordance with the CalEPA guidance document (2012). A clear plastic chamber was placed over the soil vapor monitoring well location and sealed to the ground surface with a rubber mat. Helium from a cylinder was discharged into the chamber, and a helium detector was used to determine the percentage of helium inside the chamber. The values measured ranged from approximately 25.7% to 49.7% helium during sampling. Laboratory analysis for helium was used to assess if leakage occurred during sampling. The laboratory report indicated that no helium was detected in the samples collected from SV-2. The samples collected from SV-1 contained 15% helium, above the acceptable leakage of 10%; therefore, only the sample results from SV-2 are considered valid (CalEPA 2012).

4.1.3 Purging

Prior to collecting each vapor sample, the sampling tube was purged using a 6-liter Summa® canister with a flow controller to ensure that the vapor sample collected would be representative of actual vapor concentration at depth. Field notes containing dimensions and specifications of the above- and below-ground tubing lengths inner diameter, the sand pack, and the unhydrated bentonite were used to calculate the purge volume. The flow rate for purging was the same as the flow rate used for the sampling (<200 mL/min). For this vapor sampling event, three volumes were purged before sampling.

Calculated purge volumes and durations were recorded on the vapor sampling field sheets included as **Appendix D**.

4.1.4 Vapor Sample Collection

To draw the soil vapor to the surface, a vacuum was created using an evacuated Summa® canister, supplied by Air Toxics. A valve was used to isolate the purging canister from a separate tube that was connected to the vapor sample canister.

Sample collection from the vapor wells was started immediately after purging. Sample train integrity testing was performed by enclosing the sampling train in a helium-enriched atmosphere concurrent with sampling, as described above. To begin sampling, the valve on the Summa® canister was opened and the time and initial pressure were documented. As the canister filled, the pressure gauge on the flow controller was observed to ensure that the vacuum in the canister was decreasing over time. Each canister was allowed to fill until the canister vacuum gauge indicated the vacuum had decreased to below 5 inHg.

Once the samples were collected, the Summa® canisters were closed and sealed using brass caps supplied by Air Toxics. Samples were labeled following standard chain-of-custody (COC) protocols, including noting the final canister vacuums and the serial numbers of all canisters and flow controllers. AECOM documented the sampling activities, such as sampling times and conditions, in the field sheets included in **Appendix D**. Samples were delivered directly to the analytical laboratory under COC protocols within 24 hours of sampling.

4.2 Laboratory Analysis

Air Toxics analyzed a total of four samples including one equipment blank.

Soil vapor samples were analyzed for TPHg, BTEX, MTBE, and naphthalene using USEPA Method (Modified) TO-15 APH Fractions (Sp)-Full list + Naph + APH. Samples were also analyzed for oxygen, carbon dioxide, helium, nitrogen and methane by ASTM Method D1946 modified.

4.3 Analytical Results

The soil vapor analytical results are summarized in **Table 4**, with references to California Human Health Screening Levels (CHHSLs), Environmental Screening Levels (ESLs), and Low Threat Closure Policy, for residential and commercial/industrial locations. Atmospheric gas results are presented in **Table 5**. TPH Carbon chain analyses are presented in **Table 6**. The laboratory analytical reports, including COC documentation, are included in **Appendix B**.

4.3.1 **Chemical Results**

TPHg, BTEX, and MTBE were detected above laboratory reporting limits in the vapor samples however, the concentrations were all below the screening levels.

Naphthalene was not detected in either soil vapor sample. Naphthalene was the key driver for the soil vapor investigation. Since helium was detected in the results from SV-1, the data is not being considered in the evaluation of vapor intrusion to nearby residences. However, the soil vapor monitoring well SV-2, located downgradient and nearest to residential properties, results are valid and were non-detect for naphthalene.

4.3.2 **Oxygen**

Vapor samples were analyzed for Oxygen. Oxygen was measured at 17% in the down gradient vapor well SV-2. According to the LTCP oxygen greater than 4% creates an assumed 1000-fold attenuation for migrating vapor as described in Appendix 4, Scenario 4 (SWRCB 2012).

4.3.3 **Methane**

Vapor samples were analyzed for methane. Methane was below 1% in SV-1 and was not detected above laboratory RLs (i.e., approximately 0.0002%) in SV-2. These levels are several orders of magnitude below the lower explosive limit (i.e., 10%) for methane, which is used as an “action level” above which mitigation of methane is recommended (DTSC 2005). Therefore, the methane results in the soil vapor are not of concern and do not require mitigation.

4.3.4 **Leak Detection**

Helium was added as necessary to the clear plastic chamber used as a shroud during the soil vapor sampling procedures in order to maintain a relatively uniform (above 20%) concentration of gas for leak testing. The helium concentration in the shroud ranged from 25.7% to 49.7% during sampling. Helium was not detected in the SV-2 and the equipment blank, with an RL of 0.11% and 0.12%. Helium was detected at 15% in SV-1 and the duplicate sample [Note: the duplicate and equipment blank samples were quality control samples, discussed below]. A sample is considered valid and acceptable for risk evaluation if the concentrations of the tracer gas (helium) in the sample are 10% or less (New York State Department of Health 2006); thus, these results for SV-2 are considered not to be affected by leakage and are considered valid. The results for SV-1 and the duplicate are not considered valid for use in risk evaluation.

4.3.5 **Quality Control Sample Results**

Quality control samples for this event included a duplicate sample from SV-1 (SV-1-V-Y-5-20140826) and an equipment blank sample (EB-1-V-N-20140827). The primary and the duplicate sample agreed within 5% for all constituents tested. No constituents were detected in the equipment blank.

5.0 Conclusions and Recommendations

The results of soil and soil vapor sampling conducted at the ACEH Site RO352,Unocal No. 5484 (351812) in August 2014 were evaluated to determine if there is an onsite risk for vapor intrusion posed by residual hydrocarbons soils and whether there is a potential vapor intrusion risk to offsite down gradient residential properties.

The soil samples collected at 5 and 6.5 feet bgs indicated that there are hydrocarbon impacted soil remaining at the site. The concentrations for the constituents of concern are below residential exposure levels for all scenarios.

Analytical results for TPHg, BTEX, and MTBE in soil vapor were detected above laboratory reporting limits at the site boundary but at concentrations below the residential screening levels. Naphthalene was the primary constituent of concern for vapor intrusion based on the concentrations in shallow groundwater, however, naphthalene was not detected in any of the vapor samples. There was leakage observed in the upgradient vapor sample, SV-1, therefore those results were not considered for this evaluation. However the downgradient sample, SV-2, is valid and is the true indicator for potential off site vapor intrusion risk.

Oxygen was measured at 17% in SV-2 which according to the LTCP Appendix 4, Scenario 4 creates an assumed “1000-fold bioattenuation of petroleum vapors” for the bioattenuation zone.

The sample results indicate that there is no vapor intrusion risk to the downgradient residences posed by groundwater migrating from the site. Additionally the high subsurface oxygen content provides an effect barrier to vapor migration.

6.0 References

Alameda County Environmental Health Services. 2014. Email Directive to conduct Soil Gas Investigation. *July 25*.

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Department of Toxic Substances Control. 2005. Advisory on Methane Assessment and Common Remedies at School Sites. June 16.

New York State Department of Health. 2006. Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York. October.

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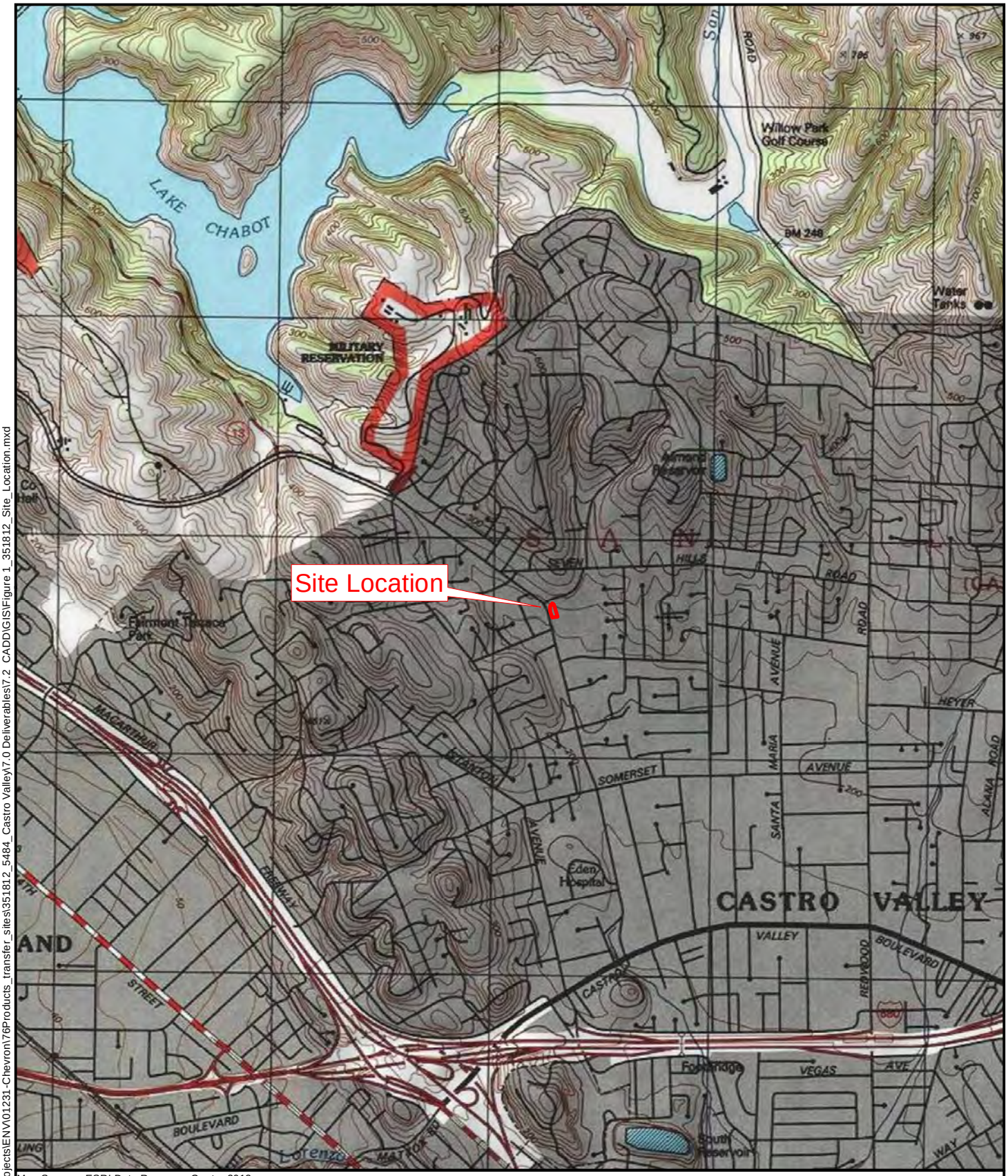
——. 2011. Background Indoor Air Concentrations of Volatile Organic Compounds in North American Residences (1990-2005): A Compilation of Statistics for Assessing Vapor Intrusion. Office of Solid Waste and Emergency Response. EPA 530-R-10-001. June.

Figures



Map Source: ESRI Data Resource Center 2013.

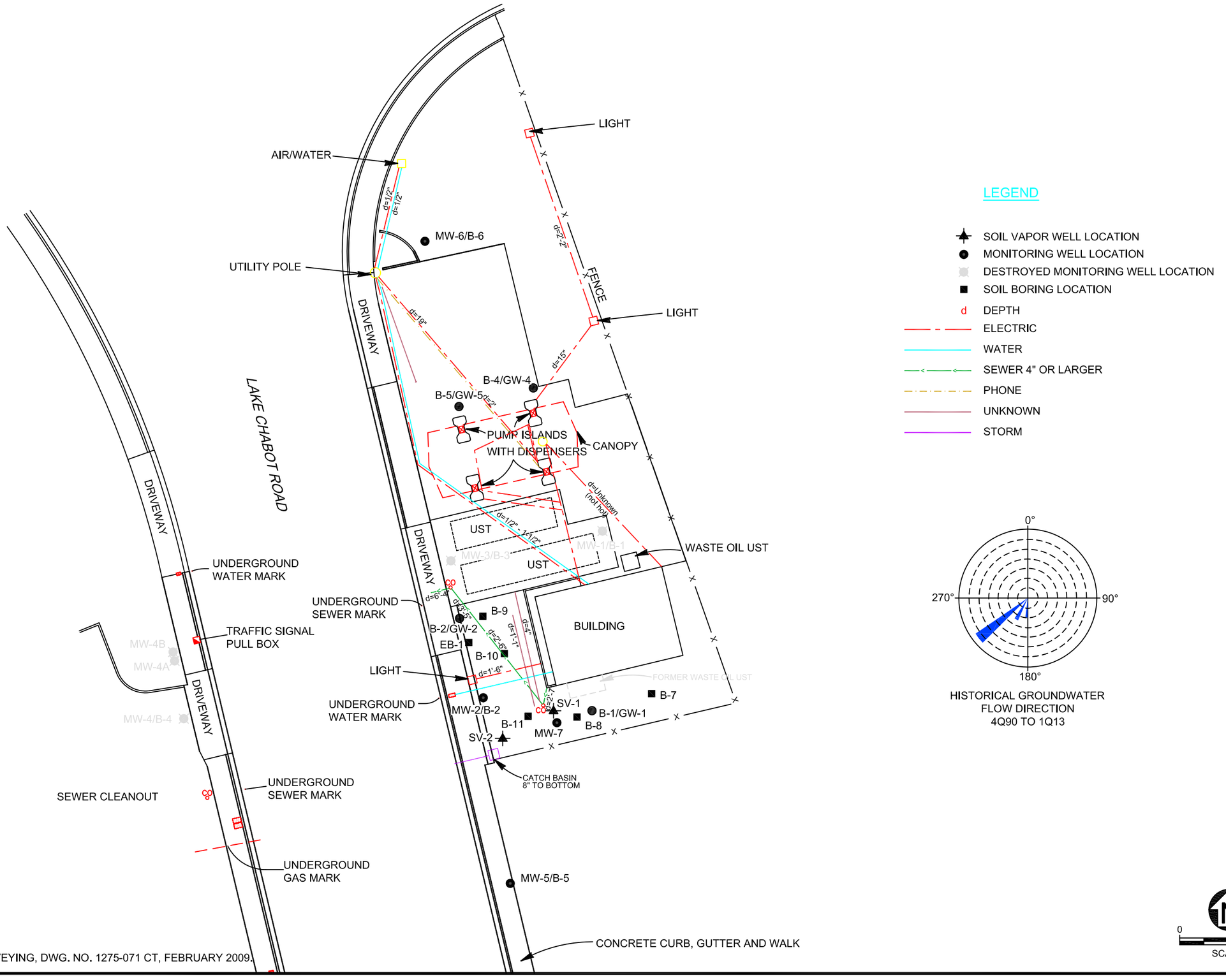
AECOM
10461 Old Placervillle Rd, Suite 170
Sacramento, CA 95827
916.361.6400

0 0.25 0.5 Miles

Figure 1: Site Location Map

RO352, Unocal No. 5484 (351812)
18950 Lake Chabot Road
Castro Valley, California

Path: \\usscr1fs001\prod\Projects\ENV\01231-Chevron\76Products_transfer_sites\351812_5484_Castro Valley\7.0 Deliverables\7.2 CADD\GIS\Figure 1_351812_Site_Location.mxd



SOURCE: MORROW SURVEYING, DWG. NO. 1275-071 CT, FEBRUARY 2009.

LEGEND

- SOIL VAPOR WELL LOCATION
- MONITORING WELL LOCATION
- DESTROYED MONITORING WELL LOCATION
- SOIL BORING LOCATION
- d DEPTH
- ELECTRIC
- WATER
- SEWER 4" OR LARGER
- PHONE
- UNKNOWN
- STORM

HISTORICAL GROUNDWATER
FLOW DIRECTION
4Q90 TO 1Q13

0 30'
SCALE

REVISIONS			
NO.:	DESCRIPTION:	DATE:	BY:

DESIGNED BY:	DRAWN BY:	CHECKED BY:	APPROVED BY:
	JH	JL	JH

AECOM TECHNICAL SERVICES
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Soil Vapor Sample Locations
Unocal No. 5484 (351812), RO352
18950 Lake Chabot Road
Castro Valley, California

SCALE:	DATE:	PROJECT NUMBER:
1" = 30'	09/08/2014	60267030

FIGURE NUMBER:
2

SHEET NUMBER:
1 of 1

P:\ENV\01231-Chevron\76Products_transfer_sites\351812_5484_Castro Valley\7.0 Deliverables\7.2 CADD\Vapor Investigation\Report\Figure 2_Site_Plan_Utilities_351812.dwg Sep 08, 2014 - 11:22am harmsj

Tables

Table 1
Soil Chemical Analytical Results
RO352, Unocal No. 5484 (351812)
18950 Lake Chabot Road
Castro Valley, California

Sample ID	Date	Benzene	Ethylbenzene	Toluene	Xylenes (Total)	MTBE	TPH-Gasoline (C6-C12)	TPH-Diesel (C6-C12)	TPH-Motor Oil (C6-C12)	Napthalene	PAH[1]
0 to 5 feet bgs											
LTCP Residential		**1.9**	**21**	**--**	**--**	**--**	**--**	**--**	**--**	**9.7**	**0.063**
LTCP Commercial		**8.2**	**89**	**--**	**--**	**--**	**--**	**--**	**--**	**45**	**0.68**
LTCP Utility Worker		**14**	**314**	**--**	**--**	**--**	**--**	**--**	**--**	**219**	**4.5**
Shallow Soil ESL		**0.044**	**3.3**	**2.9**	**2.3**	**0.023**	**100**	**100**	**100**	**1.2**	--
SV-1-S-N-5-20140820	8/20/2014	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<4.0	<2.0	**4.7**	<0.0030	<0.0030
SV-2-S-N-5-20140820	8/20/2014	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<4.0	<2.0	**4.7**	<0.0030	**0.008792**
5 to 10 feet bgs											
LTCP Residential		2.8	32	**--**	**--**	**--**	**--**	**--**	**--**	**9.7**	**NA**
LTCP Commercial		12	134	**--**	**--**	**--**	**--**	**--**	**--**	**45**	**NA**
LTCP Utility Worker		**14**	**314**	**--**	**--**	**--**	**--**	**--**	**--**	**219**	**4.5**
Soil ESL		**0.044**	**3.3**	**2.9**	**2.3**	**0.023**	**100**	**100**	**100**	**1.2**	--
SV-1-S-N-6.5-20140820	8/20/2014	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<4.0	**2.3**	**13**	<0.0030	<0.0030

Notes:

Analyses were conducted by USEPA methods 8260 and 8015B modified.

Non-detected analytes are reported as less than (<) practical quantitation limits.

Bold = Analyte detected above practical quantitation limits

All results are in milligrams per kilogram (mg/kg)

[1]Calculated Toxcity Equivalent of benzo(a)pyrene, see Table 2 for calculation.

ESL - Environmental Screening Levels, California Regional Water Quality Control Board, San Francisco Bay Region, February 2013 update

NA = Not Applicable

ND = Not Detected

MTBE = Methyl t-butyl ether.

-- = none specified

Table 2
Soil Chemical Analytical Results - PAHs
RO352, Unocal No. 5484 (351812)
18950 Lake Chabot Road
Castro Valley, California

Sample ID	SV-1-S-N-5-20140820	SV-1-S-N-6.5-20140820	SV-2-S-N-5-20140820	PEF
Benzo(a)pyrene	<0.0030	**0.0062**	<0.0030	*1*
Benzo(a)anthracene	<0.0030	**0.0072**	<0.0030	*0.1*
Benzo(b)fluoranthene	<0.0030	**0.0081**	<0.0030	*0.1*
Benzo(k)fluoranthene	<0.0030	**0.0033**	<0.0030	*0.1*
Chrysene	<0.0030	**0.0072**	<0.0030	*0.01*
Dibenz(a,h)anthracene	<0.0030	<0.0030	<0.0030	*0.34*
Indeno(1,2,3-cd)pyrene	<0.0030	<0.0030	<0.0030	*0.1*
BaPe	<0.0030	**0.008792**	<0.0030	

Notes:

Analyses were conducted by USEPA methods 82670-SIM

Non-detected analytes are reported as less than (<) practical quantitation limits.

Bold = Analyte detected above practical quantitation limits

All results are in milligrams per kilogram (mg/kg)

BaPe = Toxicity equivalent for benzo(a)pyrene calculated as the sum of the 7 carcinogenic PAHs, factors taken from the 3-15-2012 Technical Justification for Soil Screening Levels for Direct Contact and Outdoor Air Exposure Pathways.

PEF = OEHHA Potency Equivalent Factor for carcinogenic PAHs.

PAHs = Poly-aromatic Hydrocarbons.

Table 3
Soil Physical Analytical Results
RO352, Unocal No. 5484 (351812)
18950 Lake Chabot Road
Castro Valley, California

			Porosity (%)			Organic Carbon				Particle Size Distribution (weight %)				
Sample ID	Depth (ft)	Dry Bulk Density (g/cc)	Total	Air-Filled	Water Filled	Total	Fraction	Mean Grain Size Description	Median Grain Size (mm)	Gravel	Coarse Sand	Medium Sand	Fine Sand	Silt/Clay
SV-1-S-N-4.5-20140820	4.5	1.50	43.4	9.4	34	3700	3.70E-03	medium sand	0.856	9.83	10.44	46.58	22.64	10.51
SV-2-S-N-4.5-20140820	4.5	1.53	43.3	30.6	12.6	3200	3.20E-03	medium sand	1.159	10.94	20.20	42.01	19.15	7.70

Notes:
% = percent
ft = feet
g/cc = grams per cubic centimeter
mm = millimeters

Table 4
Soil Vapor Analytical Results and Comparison to CHHSLs and ESLs
RO352, Unocal No. 5484 (351812)
18950 Lake Chabot Road
Castro Valley, California

SAMPLE ID	DATE	DEPTH (feet)	TPH-g ($\mu g/m^3$)	Benzene ($\mu g/m^3$)	Toluene ($\mu g/m^3$)	Ethylbenzene ($\mu g/m^3$)	MTBE ($\mu g/m^3$)	Total Xylenes ($\mu g/m^3$)	Naphthalene ($\mu g/m^3$)
Screening Levels									
Soil Vapor CHHSLs (a)									
future commercial/industrial (AF=0.0005)			*NA*	*280*	*890,000*	*3,600*	*29,000*	*2,100,000*	*310*
future residential (AF=0.001)			*NA*	*85*	*320,000*	*1,100*	*8,600*	*740,000*	*93*
Soil Vapor ESLs (b)									
Commercial/industrial Default AF=0.001			*2,496,600*	*423*	*1,314,000*	*4,906*	*47,169*	*438,000*	*361*
Future commercial/industrial (adjusted; AF=0.0005)(c)			*4,993,200*	*846*	*2,628,000*	*9,811*	*94,338*	*876,000*	*721*
Residential Default AF=0.002			*297,214*	*42*	*156,429*	*487*	*4,679*	*52,143*	*36*
Future residential (adjusted; AF=0.001)(c)			*594,429*	*84*	*312,857*	*973*	*9,359*	*104,286*	*72*
LTCP Soil Gas Criteria - No Bioattentuation Zone									
Residential			*NA*	*85*	*NA*	*1,100*	*NA*	*NA*	*93*
Commercial			*NA*	*280*	*NA*	*3,600*	*NA*	*NA*	*310*
LTCP Soil Gas Criteria - With Bioattentuation Zone									
Residential			*NA*	*85,000*	*NA*	*1,100,000*	*NA*	*NA*	*93,000*
Commercial			*NA*	*280,000*	*NA*	*3,600,000*	*NA*	*NA*	*310,000*
Soil Vapor Results									
SV-1-V-N-5-20140826	8/26/2014	5	**42,000**	**5.9**	**19**	**5.6**	<4.2	24.5	**<24**
SV-1-V-Y-5-20140826	8/26/2014	5	**42,000**	**6.1**	**22**	**6.7**	<4.2	**27.8**	<24
SV-2-V-N-5-20140826	8/26/2014	5	**1,500**	**11**	**130**	**28**	**6.4**	**128**	<25
EB-V-N-20140827	8/27/2014	--	<230	<3.6	<4.2	<4.9	<4.0	<9.8	**<23**

Notes:

bgs = Below ground surface

TPH-GRO = Total Petroleum Hydrocarbons as Gasoline Range Organics

B = Benzene

T = Toluene

E = Ethylbenzene

X = Total xylenes

MTBE = Methyl t-butyl ether.

$\mu g/m^3$ = Micrograms per cubic meter

ND<# = Analyte was not detected at or above indicated laboratory method detection limit

J = Laboratory estimated value

Bold values indicate concentration is above the laboratory method detection limit

ID = Identification

(a) OEHHA Soil Gas Screening Numbers. Updated 9/23/10. Table 2. Values for buildings constructed with engineered fill below sub-slab gravel (i.e., representative of a future scenario and based on soil vapor to indoor air AFs of approximately 0.001 (residential) and 0.0005 (commercial/industrial), consistent with CalEPA (2011) Vapor Intrusion Guidance.

(b) SFRWQCB, 2013 = San Franciso Bay Regional Water Quality Control Board, December 2013 update to Environmental Screening Levels. Summary Table E.

(c) Values adjusted based on CalEPA's (2011) recommended attenuation factors for a future use scenario.

Table 5
Soil Vapor Analytical Results and Comparison to CHHSLs and ESLs - Air Phase Hydrocarbon (APH) Fractions
RO352, Unocal No. 5484 (351812)
18950 Lake Chabot Road
Castro Valley, California

SAMPLE ID	DATE	DEPTH (ft.)	C5-C6 Aliphatic Hydrocarbons ($\mu g/m^3$)	>C6-C8 Aliphatic Hydrocarbons ($\mu g/m^3$)	>C8-C10 Aliphatic Hydrocarbons ($\mu g/m^3$)	>C10-C12 Aliphatic Hydrocarbons ($\mu g/m^3$)	>C8-C10 Aromatic Hydrocarbons ($\mu g/m^3$)	>C10-C12 Aromatic Hydrocarbons ($\mu g/m^3$)
Screening Levels								
Soil Vapor CHHSLs			***NA***	***NA***	***NA***	***NA***	***NA***	***NA***
Soil Vapor ESLs			***NA***	***NA***	***NA***	***NA***	***NA***	***NA***
Soil Vapor Results								
SV-1-V-N-5-20140826	8/26/2014	5	15,000	20,000	980	<160	<110	<130
SV-1-V-Y-5-20140826	8/26/2014	5	16,000	20,000	990	<160	<120	<130
SV-2-V-N-5-20140826	8/26/2014	5	<77	<98	<140	<160	**240**	<130
EB-V-N_20140827	8/27/2014	--	<72	<92	<130	<160	<110	<120

Notes:

< = Analyte was not detected above indicated laboratory reporting limit.

CHHSL = California Human Health Screening Levels, CalEPA, 2010. OEHHA Soil Gas Screening Numbers. Updated 9/23/10.

ESL - Environmental Screening Levels, California Regional Water Quality Control Board, San Francisco Bay Region, February 2013 update

NA = Not available.

OEHHA - Office of Environmental Health Hazard Assessment.

($\mu g/m^3$) = Micrograms per cubic meter.

Table 6
Atmospheric Gas Analytical Results
RO352, Unocal No. 5484 (351812)
18950 Lake Chabot Road
Castro Valley, California

SAMPLE ID	DATE	OXYGEN *(%)*	METHANE *(%)*	CARBON DIOXIDE *(%)*	HELIUM *(%)*	NITROGEN *(%)*
SV-1-V-N-5-20140826	8/26/2014	17	0.00068	0.44	15	68
SV-1-V-Y-5-20140826	8/26/2014	17	0.00068	0.46	15	68
SV-2-V-N-5-20140826	8/26/2014	17	<0.00024	4.1	<0.12	79
EB-V-N_20140827	8/27/2014	0.42	<0.00022	<0.022	<0.11	100

Notes

(%) = Percentage of gas detected in sample canister by modified ASTM D-1946.

< = Gas not detected above indicated laboratory reporting limit.

Appendix A

Agency Correspondence

Nowell, Keith, Env. Health

From: Nowell, Keith, Env. Health
Sent: Friday, May 30, 2014 12:50 PM
To: 'JillianHolloway@chevron.com'
Cc: 'jim.harms@aecom.com'; Roe, Dilan, Env. Health
Subject: RO352 - Lake Chabot Unocal, 18950 Lake Chabot Rd, Castro Valley

Dear Ms. Holloway,

Alameda County Environmental Health (ACEH) staff has reviewed the case file including the recently submitted documents *Site Conceptual Model* and *Case Closure Summary*, both dated February 20, 2014 and prepared by AECOM for the subject site. ACEH acknowledges the case may be a candidate for closure in the near future under the State Water Resources Control Board's (SWRCBs) Low Threat Underground Storage Tank Case Closure Policy (LTCP) provided concerns identified in the Technical Comments below are addressed. However, based on our review of the data in the case file, it is ACEHs opinion that the case does not meet the State Water Resources Control Board's (SWRCBs) Low Threat Underground Storage Tank Case Closure Policy (LTCP) General Criteria e (Site Conceptual Model); the Media Specific Groundwater criteria for plume length, distance to the nearest surface water body from the plume boundary and distance to the nearest supply well from the plume boundary; Media Specific Vapor Intrusion to Indoor Air; and the Media Specific Direct Contact and Outdoor Air Exposure.

Therefore at this juncture, ACEH requests that you evaluate the site data against the LTCP Media Specific criteria.

Technical Comments

1. General Criteria e- It is ACEHs opinion that the site does not meet the LTCP General Criteria e. General Criteria e has not been satisfied until a site is considered closable by ACEH.

2. Media Specific Groundwater criteria - Groundwater monitoring well MW-7, located near the southern property boundary, demonstrates the highest contaminant concentrations reported for the existing monitoring well network. Historic analytical data for well MW-7 indicate persistent fluctuations of total petroleum hydrocarbons as gasoline (TPHg) concentrations range from 450 micrograms per liter (µg/L) to 2,800 µg/L, most recently reported at 1,900 µg/L. These concentrations indicate residual source material may reside beneath the station building. Plotting groundwater flow, which has been consistently been to the southwest, through well MW-7 suggests the plume is passing between well MW-5 and previously abandoned well MW-4. ACEH is of the opinion that the contaminant plume has not been defined, there by the Media Specific Groundwater criteria for plume length, distance to the nearest surface water body from the plume boundary and distance to the nearest supply well from the plume boundary are not met.

   Therefore, please review the well search data from both the California Department of Water Resources (DWR) and the Alameda County Public Works Agency (ACPWA) well databases, having a well search radius of at least 2,000 feet. Include in the report requested below a table and a figure presenting the DWR and ACPWA well search and other sensitive receptor data. The table should include the well identification, location, type and depth of the well, and distance from the well to the site. Please prepare a figure using a aerial photographic base showing the maximum distance of the projected plume boundary, using the SWRCBs LTCP *Technical Justification for Groundwater Plume Length, Indicator Constituents, Concentrations, Buffer Distances (Separation Distances) to Receptors* (LTCP Guidance; SWRCB 2012), as a circle whose center is at the location of the station building and a second circle projecting the 1,000-foot buffer from the potential leading edge of the contaminant plume to the receptors (e.g. wells and nearest surface water bodies). Receptors within the 2,000-foot radius of the station building location should be depicted on the figure.

3. Media Specific Vapor Intrusion to Indoor Air- The site is situated in a residential neighborhood. Based on the reported depth to groundwater beneath the site, as shallow as 2.99 feet below the ground surface (bgs). ACEH is of the opinion that the site does meet the bioattenuation zone criteria. It is unclear to ACEH that the waste oil underground storage tank, in the vicinity of MW-7, has been analyzed for the appropriate analysis suite and that MW-7 has most recently been reported to contain 41 µg/L naphthalene, with recent concentrations varying up to

150 µg/L. The San Francisco Bay Region Regional Water Quality Control Board (SFRWQCB) Environmental Screening Levels (ESL) concentration for naphthalene presented in Table E-1 (Groundwater Screening Levels for Evaluation of Potential Vapor Intrusion) is 160 µg/L. Based on our review, it is unclear to ACEH that the Media Specific Vapor Intrusion to Indoor Air criteria has been met.

Therefore, please review existing soil and groundwater data to evaluate vapor intrusion risk to the residential neighborhood. Review existing site data to identify the source of the naphthalene at the site and evaluate the risk of naphthalene vapor intrusion to nearby residences. Please include details of down gradient foundations.

4. Media Specific Direct Contact and Outdoor Air Exposure- It is unclear to ACEH that the waste oil underground storage tank has been analyzed for the appropriate analyses suit as limited sampling for chemicals listed in Table 1 of the LTCP at the appropriate depths has been performed.

   Therefore, please review existing soil data to evaluate the Media Specific Direct Contact and Outdoor Air Exposure criteria. Include in the report requested below a table summarizing the concentrations in the 0 to 5-foot bgs and 5 to10-foot bgs zones for chemicals listed in Table 1 of the LTCP.

Technical Report Request

Please upload technical reports to the ACEH ftp site (Attention: Keith Nowell), and to the State Water Resources Control Board's Geotracker website, in accordance with the following specified file naming convention and schedule:

- **July 28, 2014– Focused Site Conceptual Model and Data Gap Identification Work Plan** (file name: RO0000352_WP_R_yyyy-mm-dd)

Thank you for your cooperation. ACEH looks forward to working with you and your consultants to advance the case toward closure. Should you have any questions regarding this correspondence or your case, please call me at (510) 567-6764 or send an electronic mail message at keith.nowell@acgov.org.

Regards,
Keith Nowell

From Keith Nowell PG, CHG
Hazardous Materials Specialist
Alameda County Environmental Health
1131 Harbor Bay Parkway
Alameda , CA 94502-6540
phone: 510 / 567 - 6764
fax: 510 / 337 - 9335
email: keith.nowell@acgov.org

PDF copies of case files can be reviewed/downloaded at:

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

Harms, James

From: Nowell, Keith, Env. Health <Keith.Nowell@acgov.org>
Sent: Wednesday, August 13, 2014 12:15 PM
To: 'Holloway, Jillian R'
Cc: Fischer, Alexis N; Harms, James; Roe, Dilan, Env. Health
Subject: RE: Fuel Leak Case RO0000352 - Unocal #5484, 18950 Lake Chabot Rd., Castro Valley, CA 94546

Jillian,

Thank you for providing Alameda County Environmental Health (ACEH) the schedule for performing the soil gas investigation. ACEH looks forward to reviewing the results of the investigation and approves the extension request for report submittal to September 12, 2014.

As indicated in ACEH's Directive dated July 25, 2014, diesel has been identified as a potential chemical of concern at the subject site. Until ACEH has had an opportunity to review the updated Site Conceptual Model, which will identify of all sensitive receptors identified within 2,000 feet, including foundation types, wells and surface water bodies, ACEH requests that groundwater monitoring continue on its current schedule.

Thank you for your cooperation. ACEH looks forward to working with you and your consultants to advance the case toward closure. Should you have any questions regarding this correspondence or your case, please call me at (510) 567-6764 or send an electronic mail message at keith.nowell@acgov.org.

Respectfully,

Keith Nowell

Keith Nowell PG, CHG
Hazardous Materials Specialist
Alameda County Environmental Health
1131 Harbor Bay Parkway
Alameda , CA 94502-6540
phone: 510 / 567 - 6764
fax: 510 / 337 - 9335
email: keith.nowell@acgov.org

PDF copies of case files can be reviewed/downloaded at:

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

From: Holloway, Jillian R [mailto:JillianHolloway@chevron.com]
Sent: Tuesday, August 12, 2014 4:18 PM
To: Nowell, Keith, Env. Health
Cc: Fischer, Alexis N; 'Jim Harms'; Roe, Dilan, Env. Health
Subject: RE: Fuel Leak Case RO0000352 - Unocal #5484, 18950 Lake Chabot Rd., Castro Valley, CA 94546

Hi Keith and Dilan,

I wanted to send you an update on the schedule for the soil gas sampling:

Work Plan- August 15

Installation- August 20
Sampling- August 26
Final Report- September 12

We have put a rush on the soil and vapor samples so we should receive those by September 1. If you would like to see the results before we submit the formal report please let us know and we can send those to you as soon as we receive them.

I also wanted to follow-up on my email sent July 29, 2014 requesting clarification on the item "Resume analyzing for diesel in well MW-7 for future groundwater monitoring events." It was our impression that the presentation of the maximum groundwater plume length with the additional 1,000 foot buffer supported the cessation of groundwater monitoring at the site. The intent to cease groundwater monitoring was communicated in the 2/24/14 email after the SCM and Case Closure Summary were submitted.

Please let me know if you have any comments or concerns.

Thanks,

Jillian Holloway
Project Manager

Chevron Environmental Management Company
6101 Bollinger Canyon Road, 5338B
San Ramon, CA 94583
Office: (925) 790-3513
Mobile: (510) 359-0261
JillianHolloway@chevron.com

From: Holloway, Jillian R
Sent: Tuesday, July 29, 2014 3:34 PM
To: 'Nowell, Keith, Env. Health'
Cc: Fischer, Alexis N; 'Jim Harms'; Roe, Dilan, Env. Health
Subject: RE: Fuel Leak Case RO0000352 - Unocal #5484, 18950 Lake Chabot Rd., Castro Valley, CA 94546

Dear Mr. Nowell,

I appreciate the time and effort ACEH has spent working with us on moving towards closure on this site. I did want to clarify one of the items below. You mentioned "Resume analyzing for diesel in well MW-7 for future groundwater monitoring events". It was our impression that the presentation of the maximum groundwater plume length with the additional 1,000 foot buffer supported the cessation of groundwater monitoring at the site. The intent to cease groundwater monitoring was communicated in the 2/24/14 email after the SCM and Case Closure Summary were submitted.

AECOM looked into the location of Chabot Creek and the one water supply well with the questionable location information.

The closest section of Chabot Creek is over one-mile to the south. There are noted drained or buried sections of Chabot Creek to the east and west of the site within 1,000 feet There is a noted length of greater than 24" culvert or storm drain that is approximately 750 feet downgradient of the site to the southwest, it connects to an engineered channel and then finally to Chabot Creek, information was taken from the Creek and Watershed Map of Hayward & San Leandro, 2011. The entire length of Chabot Creek that is downgradient of the site is in a culvert. In the unlikely event that groundwater from the site is entering the culvert, the site maximum concentration of benzene and MTBE are below the aquatic receptor ESL. The concentration of naphthalene in MW-7 exceeds the aquatic receptor ESL (24 ug/L), MW-2 and MW-5 are further from the source area (though not directly downgradient of MW-7 at all times) and have always been non-detect for naphthalene.

ACPW responded that the well in question was over ½ mile away.

Thanks,

Jill

Jillian Holloway
Project Manager

Chevron Environmental Management Company
6101 Bollinger Canyon Road, 5338B
San Ramon, CA 94583
Office: (925) 790-3513
Mobile: (510) 359-0261
JillianHolloway@chevron.com

From: Nowell, Keith, Env. Health [mailto:Keith.Nowell@acgov.org]
Sent: Friday, July 25, 2014 9:07 AM
To: Holloway, Jillian R
Cc: Fischer, Alexis N; 'Jim Harms'; Roe, Dilan, Env. Health
Subject: Fuel Leak Case RO0000352 - Unocal #5484, 18950 Lake Chabot Rd., Castro Valley, CA 94546

Dear Ms. Holloway,

Thank you and Alexis Fischer of Chevron Environmental Management Company and Jim Harms of AECOM for participating in the meeting on July 22, 2014 regarding fuel leak case for Unocal #5484, 18950 Lake Chabot Rd., Castro Valley, CA, Alameda County Environmental Health (ACEH) case number RO00000352. The purpose of the meeting was to discuss the status of the case and identify action items to move the case forward toward closure under the State Water Resources Control Board's (SWRCBs) Low Threat Underground Storage Tank Case Closure Policy (LTCP), including a discussion of the draft Focused Site Conceptual Model (SCM) dated July 21, 2014 and prepared by AECOM for the subject site.

In its May 30, 2014 Directive, ACEH expressed its opinion that the case does not meet the LTCP General Criteria e (Site Conceptual Model); the Media Specific Groundwater criteria for plume length, distance to the nearest surface water body from the plume boundary and distance to the nearest supply well from the plume boundary; Media Specific Vapor Intrusion to Indoor Air; and the Media Specific Direct Contact and Outdoor Air Exposure. The draft SCM discussed at the meeting addressed these items.

As agreed upon in the meeting, additional evaluation is required in order to assess data gaps and risk associated with shallow groundwater.

- Identification of all sensitive receptors identified within 2,000 feet, including foundation types, wells and surface water bodies.

- Evaluation of depth to water in wells and correlation to vadose zone thickness and the effect of shallow bedrock beneath the site on the depth to groundwater.

- Expanded trend analysis for naphthalene in groundwater monitoring well MW-7 to include all repeated spikes in concentration over time, ranging to 130 micrograms per liter (µg/L) on March 3, 1994, 120 µg/L on March 1, 1995, and 150 µg/L on January 13, 2010. Please include all historical naphthalene concentration data for the concentration trend graph for groundwater monitoring well MW-7.

- Resume analyzing for diesel in well MW-7 for future groundwater monitoring events.

- There is the potential of naphthalene vapor intrusion risk due to shallow groundwater (shallowest reported as less than 3 feet bgs). Due to the uncertainty in depth of the vadose zone, the use of Environmental Screening Levels (ESLs) for groundwater to vapor intrusion are not appropriate (i.e. requires depth to water greater than 10 feet).

Therefore, please recover soil gas samples from two on site locations; one near the waste oil tank pit, the suspected source area, and one near the property boundary down gradient of the pit.

- Naphthalene was not an analyte in the analysis suite for the former waste oil tank; however, naphthalene concentrations are observed in groundwater from well MW-7 indicating the former waste oil tank location is a source of naphthalene. Please recover soil samples near the waste oil tank pit from within the upper five feet and from the interval of five- to 10 feet below the ground surface to evaluate against the LTCP Direct Contact criterial.

Please address the aforementioned technical comments and submit the reports by the dates specified below:

Technical Report Request

Please upload technical reports to the ACEH ftp site (Attention: Keith Nowell), and to the State Water Resources Control Board's Geotracker website, in accordance with the following specified file naming convention and schedule below. Please provide ACEH (Attention: Keith Nowell), the draft figure depicting proposed hydropunch and temporary well locations. After review and approval of the draft figure by ACEH, please prepare a work plan for the soil and groundwater investigations.

- **August 28, 2014 – Updated Site Conceptual Model** (file name: RO0000352_SCM_R_yyyy-mm-dd)
- **August 28, 2014 – Soil, Groundwater and Soil Gas Investigation Work Plan** (file name: RO0000352_WP_R_yyyy-mm-dd)

Thank you for your cooperation. ACEH looks forward to working with you and your consultants to advance the case toward closure. Should you have any questions regarding this correspondence or your case, please call me at (510) 567-6764 or send an electronic mail message at keith.nowell@acgov.org.

Respectfully,

Keith Nowell

Keith Nowell PG, CHG
Hazardous Materials Specialist
Alameda County Environmental Health
1131 Harbor Bay Parkway
Alameda , CA 94502-6540
phone: 510 / 567 - 6764
fax: 510 / 337 - 9335
email: keith.nowell@acgov.org

PDF copies of case files can be reviewed/downloaded at:

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

Appendix B

Laboratory Analytical Reports

Date of Report: 09/12/2014

Jim Harms

AECOM
2020 L St, Suite 400
Sacramento, CA 95811

Client Project:	351812
BCL Project:	5484
BCL Work Order:	1419460
Invoice ID:	B183050

Enclosed are the results of analyses for samples received by the laboratory on 8/21/2014. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Molly Meyers

Contact Person: Molly Meyers
Client Service Rep

Authorized Signature

Table of Contents

CHAIN OF CUSTODY

Page 1 of 1

AECOM

Lab: BC Laboratories

TAT: 5 day

Report results to:

Name	James Harms (james.harms@aecom.com)
Company	AECOM
Mailing Address	2020 L Street, suite 400
City, State, Zip	Sacramento, CA 95811
Telephone No.	916.414.5800
Fax No.	916.414.5850

Project Information

Chevron Facility:	351812
Site Address:	18950 Lake Chabot Road, Castro Valley CA
AECOM No.	60318102

A-19960

Special instructions and/or specific regulatory requirements:

SHORT TURN AROUND TIME - 5 DAYS!

Sample Identification	Date Sampled	Time Sampled	Matrix/ Media	No. of Conts.	TPHg, TPHd, TPHmo 8015M w/SG cleanup	BTEX, MTBE 8260b	fraction organic carbon	total porosity (ASTM D2937)	dry bulk density (ASTM D2937)	air & water filled porosity	grain size distribution (ASTM D422)	Naphthalen and PAHs by 8270c-SIM	Sample Condition/Comments	Preservative
SV-1-S-N-4.5-20140820	20-Aug-14	1105	Soil	1 sleeve			X	X	X	X	X			none
SV-1-S-N-5-20140820	20-Aug-14	1105	Soil	1 sleeve	X	X						X		none
SV-1-S-N-6.5-20140820	20-Aug-14	1130	Soil	1 sleeve	X	X						X		none
SV-2-S-N-4.5-20140820	20-Aug-14	1310	Soil	1 sleeve			X	X	X	X	X			none
SV-2-S-N-5-20140820	20-Aug-14	1315	Soil	1 sleeve	X	X						X		none

CHK BY DISTRIBUTION SUB OUT

Relinquished by:	Date/Time 8-21-14 1255	*Received by:*	Date/Time 8-21-14 1255
Relinquished by:	Date/Time 8-21-14 1955	*Received by:*	Date/Time 8/21/14 19:55
Method of Shipment: COURIER		*Sample Condition on Receipt:*	

REL. 8/21/14 2320 8-21-14 2320

Chain of Custody and Cooler Receipt Form for 1419460 Page 2 of 2

BC LABORATORIES INC. **COOLER RECEIPT FORM** Rev. No. 17 06/05/14 Page 1 Of 1

Submission #: 14.19460

SHIPPING INFORMATION
Federal Express ☐ UPS ☐ Hand Delivery ☐
BC Lab Field Service ☒ Other ☐ (Specify)_____

SHIPPING CONTAINER
Ice Chest ☒ None ☐ Box ☐
Other ☐ (Specify)_____

FREE LIQUID
YES ☐ NO ☐

Refrigerant: Ice ☒ Blue Ice ☐ None ☐ Other ☐ Comments:

Custody Seals Ice Chest ☐ Intact? Yes ☐ No ☐ Containers ☐ Intact? Yes ☐ No ☐ None ☒ Comments:

All samples received? Yes ☒ No ☐ All samples containers intact? Yes ☒ No ☐ Description(s) match COC? Yes ☒ No ☐

COC Received
☒ YES ☐ NO

Emissivity: 0.98 Container: Sleeve Thermometer ID: 207
Temperature: (A) 4.0 °C / (C) 4.0 °C

Date/Time 8.21.14 1320
Analyst Init M

SAMPLE CONTAINERS	SAMPLE NUMBERS 1	2	3	4	5	6	7	8	9	10
QT GENERAL MINERAL/ GENERAL										
PT PE UNPRESERVED										
QT INORGANIC CHEMICAL METALS										
PT INORGANIC CHEMICAL METALS										
PT CYANIDE										
PT NITROGEN FORMS										
PT TOTAL SULFIDE										
2oz. NITRATE / NITRITE										
PT TOTAL ORGANIC CARBON										
PT TOX										
PT CHEMICAL OXYGEN DEMAND										
PtA PHENOLICS										
40ml VOA VIAL TRAVEL BLANK										
40ml VOA VIAL	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
QT EPA 413.1, 413.2, 418.1										
PT ODOR										
RADIOLOGICAL										
BACTERIOLOGICAL										
40 ml VOA VIAL- 504										
QT EPA 508/608/8080										
QT EPA 515.1/8150										
QT EPA 525										
QT EPA 525 TRAVEL BLANK										
40ml EPA 547										
40ml EPA 531.1										
8oz Amber EPA 548										
QT EPA 549										
QT EPA 632										
QT EPA 8015M										
QT AMBER										
8 OZ. JAR										
32 OZ. JAR										
SOIL SLEEVE	A	A	A	A	A					
PCB VIAL										
PLASTIC BAG										
FERROUS IRON										
ENCORE										
SMART KIT										
Summa Canister										

Comments:
Sample Numbering Completed By: M Date/Time 8/21/14 2335 [S:\WPDoc\WordPerfect\LAB_DOCS\FORMS\SAMREC16
A = Actual / C = Corrected

AECOM
2020 L St, Suite 400
Sacramento, CA 95811

Reported: 09/12/2014 8:55
Project: 5484
Project Number: 351812
Project Manager: Jim Harms

Laboratory / Client Sample Cross Reference

Laboratory	Client Sample Information		
1419460-01	**COC Number:**	---	**Receive Date:** 08/21/2014 23:20
	Project Number:	5484	**Sampling Date:** 08/20/2014 11:05
	Sampling Location:	---	**Sample Depth:** ---
	Sampling Point:	SV-1-S-N-4.5-20140820	**Lab Matrix:** Solids
	Sampled By:	AECS	**Sample Type:** Soil
			Delivery Work Order:
			Global ID:
			Location ID (FieldPoint): SV-1
			Matrix: SO
			Sample QC Type (SACode): CS
			Cooler ID:
1419460-02	**COC Number:**	---	**Receive Date:** 08/21/2014 23:20
	Project Number:	5484	**Sampling Date:** 08/20/2014 11:05
	Sampling Location:	---	**Sample Depth:** ---
	Sampling Point:	SV-1-S-N-5-20140820	**Lab Matrix:** Solids
	Sampled By:	AECS	**Sample Type:** Soil
			Delivery Work Order:
			Global ID:
			Location ID (FieldPoint): SV-1
			Matrix: SO
			Sample QC Type (SACode): CS
			Cooler ID:
1419460-03	**COC Number:**	---	**Receive Date:** 08/21/2014 23:20
	Project Number:	5484	**Sampling Date:** 08/20/2014 11:30
	Sampling Location:	---	**Sample Depth:** ---
	Sampling Point:	SV-1-S-N-6.5-20140820	**Lab Matrix:** Solids
	Sampled By:	AECS	**Sample Type:** Soil
			Delivery Work Order:
			Global ID:
			Location ID (FieldPoint): SV-1
			Matrix: SO
			Sample QC Type (SACode): CS
			Cooler ID:

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Reported: 09/12/2014 8:55
Project: 5484
Project Number: 351812
Project Manager: Jim Harms

Laboratory / Client Sample Cross Reference

Laboratory	Client Sample Information		
1419460-04	**COC Number:**	---	**Receive Date:** 08/21/2014 23:20
	Project Number:	5484	**Sampling Date:** 08/20/2014 13:10
	Sampling Location:	---	**Sample Depth:** ---
	Sampling Point:	SV-2-S-N-4.5-20140820	**Lab Matrix:** Solids
	Sampled By:	AECS	**Sample Type:** Soil
			Delivery Work Order:
			Global ID:
			Location ID (FieldPoint): SV-2
			Matrix: SO
			Sample QC Type (SACode): CS
			Cooler ID:
1419460-05	**COC Number:**	---	**Receive Date:** 08/21/2014 23:20
	Project Number:	5484	**Sampling Date:** 08/20/2014 13:15
	Sampling Location:	---	**Sample Depth:** ---
	Sampling Point:	SV-2-S-N-5-20140820	**Lab Matrix:** Solids
	Sampled By:	AECS	**Sample Type:** Soil
			Delivery Work Order:
			Global ID:
			Location ID (FieldPoint): SV-2
			Matrix: SO
			Sample QC Type (SACode): CS
			Cooler ID:
1419460-06	**COC Number:**	---	**Receive Date:** 08/21/2014 23:20
	Project Number:	5484	**Sampling Date:** 08/20/2014 13:15
	Sampling Location:	---	**Sample Depth:** ---
	Sampling Point:	Composite-S-140820	**Lab Matrix:** Solids
	Sampled By:	AECS	**Sample Type:** Soil
			Delivery Work Order:
			Global ID:
			Location ID (FieldPoint): Composite
			Matrix: SO
			Sample QC Type (SACode): CS
			Cooler ID:

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Reported: 09/12/2014 8:55
Project: 5484
Project Number: 351812
Project Manager: Jim Harms

Volatile Organic Analysis (EPA Method 8260B)

BCL Sample ID: 1419460-02 | **Client Sample Name:** 5484, SV-1-S-N-5-20140820, 8/20/2014 11:05:00AM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Benzene	ND	mg/kg	0.0050		EPA-8260B	ND		1
Ethylbenzene	ND	mg/kg	0.0050		EPA-8260B	ND		1
Methyl t-butyl ether	ND	mg/kg	0.0050		EPA-8260B	ND		1
Toluene	ND	mg/kg	0.0050		EPA-8260B	ND		1
Total Xylenes	ND	mg/kg	0.010		EPA-8260B	ND		1
1,2-Dichloroethane-d4 (Surrogate)	103	%	70 - 121 (LCL - UCL)		EPA-8260B			1
Toluene-d8 (Surrogate)	99.3	%	81 - 117 (LCL - UCL)		EPA-8260B			1
4-Bromofluorobenzene (Surrogate)	95.1	%	74 - 121 (LCL - UCL)		EPA-8260B			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-8260B	08/22/14	08/26/14 11:08	ADC	MS-V3	1	BXH2173

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Reported: 09/12/2014 8:55
Project: 5484
Project Number: 351812
Project Manager: Jim Harms

Polynuclear Aromatic Hydrocarbons (EPA Method 8270C-SIM)

BCL Sample ID: 1419460-02 | **Client Sample Name:** 5484, SV-1-S-N-5-20140820, 8/20/2014 11:05:00AM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Acenaphthene	ND	mg/kg	0.0030		EPA-8270C-SIM	ND		1
Acenaphthylene	ND	mg/kg	0.0030		EPA-8270C-SIM	ND		1
Anthracene	ND	mg/kg	0.0030		EPA-8270C-SIM	ND		1
Benzo[a]anthracene	ND	mg/kg	0.0030		EPA-8270C-SIM	ND		1
Benzo[b]fluoranthene	ND	mg/kg	0.0030		EPA-8270C-SIM	ND		1
Benzo[k]fluoranthene	ND	mg/kg	0.0030		EPA-8270C-SIM	ND		1
Benzo[a]pyrene	ND	mg/kg	0.0030		EPA-8270C-SIM	ND		1
Benzo[g,h,i]perylene	ND	mg/kg	0.0030		EPA-8270C-SIM	ND		1
Chrysene	ND	mg/kg	0.0030		EPA-8270C-SIM	ND		1
Dibenzo[a,h]anthracene	ND	mg/kg	0.0030		EPA-8270C-SIM	ND		1
Fluoranthene	ND	mg/kg	0.0030		EPA-8270C-SIM	ND		1
Fluorene	ND	mg/kg	0.0030		EPA-8270C-SIM	ND		1
Indeno[1,2,3-cd]pyrene	ND	mg/kg	0.0030		EPA-8270C-SIM	ND		1
Naphthalene	ND	mg/kg	0.0030		EPA-8270C-SIM	ND		1
Phenanthrene	ND	mg/kg	0.0030		EPA-8270C-SIM	ND		1
Pyrene	ND	mg/kg	0.0030		EPA-8270C-SIM	ND	V01	1
Nitrobenzene-d5 (Surrogate)	95.8	%	30 - 110 (LCL - UCL)		EPA-8270C-SIM		V01	1
2-Fluorobiphenyl (Surrogate)	65.4	%	40 - 120 (LCL - UCL)		EPA-8270C-SIM			1
p-Terphenyl-d14 (Surrogate)	47.5	%	34 - 120 (LCL - UCL)		EPA-8270C-SIM			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-8270C-SIM	08/26/14	09/01/14 23:13	MK1	MS-B7	0.993	BXH2637

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Reported: 09/12/2014 8:55
Project: 5484
Project Number: 351812
Project Manager: Jim Harms

Purgeable Aromatics and Total Petroleum Hydrocarbons (Silica Gel Treated)

BCL Sample ID: 1419460-02 | **Client Sample Name:** 5484, SV-1-S-N-5-20140820, 8/20/2014 11:05:00AM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
TPH - Gasoline	ND	mg/kg	4.0		EPA-8015B/FFP	ND		1
TPH - Diesel (FFP)	ND	mg/kg	2.0		EPA-8015B/FFP	ND		1
TPH - Motor Oil	**4.7**	**mg/kg**	**4.0**		**EPA-8015B/FFP**	ND		1
Tetracosane (Surrogate)	71.3	%	20 - 120 (LCL - UCL)		EPA-8015B/FFP			1
Capric acid (Reverse Surrogate)	0	%	0 - 1 (LCL - UCL)		EPA-8015B/FFP			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-8015B/FFP	08/26/14	08/28/14 14:39	MWB	GC-13	1	BXH2875

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Reported: 09/12/2014 8:55
Project: 5484
Project Number: 351812
Project Manager: Jim Harms

Volatile Organic Analysis (EPA Method 8260B)

BCL Sample ID: 1419460-03 | **Client Sample Name:** 5484, SV-1-S-N-6.5-20140820, 8/20/2014 11:30:00AM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Benzene	ND	mg/kg	0.0050		EPA-8260B	ND		1
Ethylbenzene	ND	mg/kg	0.0050		EPA-8260B	ND		1
Methyl t-butyl ether	ND	mg/kg	0.0050		EPA-8260B	ND		1
Toluene	ND	mg/kg	0.0050		EPA-8260B	ND		1
Total Xylenes	ND	mg/kg	0.010		EPA-8260B	ND		1
1,2-Dichloroethane-d4 (Surrogate)	107	%	70 - 121 (LCL - UCL)		EPA-8260B			1
Toluene-d8 (Surrogate)	99.9	%	81 - 117 (LCL - UCL)		EPA-8260B			1
4-Bromofluorobenzene (Surrogate)	90.8	%	74 - 121 (LCL - UCL)		EPA-8260B			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-8260B	08/22/14	08/26/14 11:34	ADC	MS-V3	1	BXH2173

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Reported: 09/12/2014 8:55
Project: 5484
Project Number: 351812
Project Manager: Jim Harms

Polynuclear Aromatic Hydrocarbons (EPA Method 8270C-SIM)

BCL Sample ID: 1419460-03 | **Client Sample Name:** 5484, SV-1-S-N-6.5-20140820, 8/20/2014 11:30:00AM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Acenaphthene	ND	mg/kg	0.0030		EPA-8270C-SIM	ND		1
Acenaphthylene	ND	mg/kg	0.0030		EPA-8270C-SIM	ND		1
Anthracene	ND	mg/kg	0.0030		EPA-8270C-SIM	ND		1
Benzo[a]anthracene	**0.0072**	**mg/kg**	**0.0030**		**EPA-8270C-SIM**	ND		1
Benzo[b]fluoranthene	**0.0081**	**mg/kg**	**0.0030**		**EPA-8270C-SIM**	ND		1
Benzo[k]fluoranthene	**0.0033**	**mg/kg**	**0.0030**		**EPA-8270C-SIM**	ND		1
Benzo[a]pyrene	**0.0062**	**mg/kg**	**0.0030**		**EPA-8270C-SIM**	ND		1
Benzo[g,h,i]perylene	**0.0036**	**mg/kg**	**0.0030**		**EPA-8270C-SIM**	ND		1
Chrysene	**0.0072**	**mg/kg**	**0.0030**		**EPA-8270C-SIM**	ND		1
Dibenzo[a,h]anthracene	ND	mg/kg	0.0030		EPA-8270C-SIM	ND		1
Fluoranthene	**0.012**	**mg/kg**	**0.0030**		**EPA-8270C-SIM**	ND		1
Fluorene	ND	mg/kg	0.0030		EPA-8270C-SIM	ND		1
Indeno[1,2,3-cd]pyrene	ND	mg/kg	0.0030		EPA-8270C-SIM	ND		1
Naphthalene	ND	mg/kg	0.0030		EPA-8270C-SIM	ND		1
Phenanthrene	**0.0033**	**mg/kg**	**0.0030**		**EPA-8270C-SIM**	ND		1
Pyrene	**0.012**	**mg/kg**	**0.0030**		**EPA-8270C-SIM**	ND	**V01**	1
Nitrobenzene-d5 (Surrogate)	83.7	%	30 - 110 (LCL - UCL)		EPA-8270C-SIM		V01	1
2-Fluorobiphenyl (Surrogate)	55.8	%	40 - 120 (LCL - UCL)		EPA-8270C-SIM			1
p-Terphenyl-d14 (Surrogate)	44.6	%	34 - 120 (LCL - UCL)		EPA-8270C-SIM			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-8270C-SIM	08/26/14	09/01/14 23:37	MK1	MS-B7	0.977	BXH2637

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Reported: 09/12/2014 8:55
Project: 5484
Project Number: 351812
Project Manager: Jim Harms

Purgeable Aromatics and Total Petroleum Hydrocarbons (Silica Gel Treated)

BCL Sample ID: 1419460-03 | **Client Sample Name:** 5484, SV-1-S-N-6.5-20140820, 8/20/2014 11:30:00AM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
TPH - Gasoline	ND	mg/kg	4.0		EPA-8015B/FFP	ND		1
TPH - Diesel (FFP)	**2.3**	**mg/kg**	**2.0**		**EPA-8015B/FFP**	ND		1
TPH - Motor Oil	**13**	**mg/kg**	**4.0**		**EPA-8015B/FFP**	ND		1
Tetracosane (Surrogate)	64.5	%	20 - 120 (LCL - UCL)		EPA-8015B/FFP			1
Capric acid (Reverse Surrogate)	0	%	0 - 1 (LCL - UCL)		EPA-8015B/FFP			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-8015B/FFP	08/26/14	08/28/14 12:43	MWB	GC-13	1.010	BXH2875

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Reported: 09/12/2014 8:55
Project: 5484
Project Number: 351812
Project Manager: Jim Harms

Volatile Organic Analysis (EPA Method 8260B)

BCL Sample ID: 1419460-05 | **Client Sample Name:** 5484, SV-2-S-N-5-20140820, 8/20/2014 1:15:00PM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Benzene	ND	mg/kg	0.0050		EPA-8260B	ND		1
Ethylbenzene	ND	mg/kg	0.0050		EPA-8260B	ND		1
Methyl t-butyl ether	ND	mg/kg	0.0050		EPA-8260B	ND		1
Toluene	ND	mg/kg	0.0050		EPA-8260B	ND		1
Total Xylenes	ND	mg/kg	0.010		EPA-8260B	ND		1
1,2-Dichloroethane-d4 (Surrogate)	113	%	70 - 121 (LCL - UCL)		EPA-8260B			1
Toluene-d8 (Surrogate)	96.5	%	81 - 117 (LCL - UCL)		EPA-8260B			1
4-Bromofluorobenzene (Surrogate)	90.5	%	74 - 121 (LCL - UCL)		EPA-8260B			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-8260B	08/22/14	08/25/14 15:15	ADC	MS-V3	1	BXH2173

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Reported: 09/12/2014 8:55
Project: 5484
Project Number: 351812
Project Manager: Jim Harms

Polynuclear Aromatic Hydrocarbons (EPA Method 8270C-SIM)

BCL Sample ID: 1419460-05 | **Client Sample Name:** 5484, SV-2-S-N-5-20140820, 8/20/2014 1:15:00PM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Acenaphthene	ND	mg/kg	0.0030		EPA-8270C-SIM	ND		1
Acenaphthylene	ND	mg/kg	0.0030		EPA-8270C-SIM	ND		1
Anthracene	ND	mg/kg	0.0030		EPA-8270C-SIM	ND		1
Benzo[a]anthracene	ND	mg/kg	0.0030		EPA-8270C-SIM	ND		1
Benzo[b]fluoranthene	ND	mg/kg	0.0030		EPA-8270C-SIM	ND		1
Benzo[k]fluoranthene	ND	mg/kg	0.0030		EPA-8270C-SIM	ND		1
Benzo[a]pyrene	ND	mg/kg	0.0030		EPA-8270C-SIM	ND		1
Benzo[g,h,i]perylene	ND	mg/kg	0.0030		EPA-8270C-SIM	ND		1
Chrysene	ND	mg/kg	0.0030		EPA-8270C-SIM	ND		1
Dibenzo[a,h]anthracene	ND	mg/kg	0.0030		EPA-8270C-SIM	ND		1
Fluoranthene	ND	mg/kg	0.0030		EPA-8270C-SIM	ND		1
Fluorene	ND	mg/kg	0.0030		EPA-8270C-SIM	ND		1
Indeno[1,2,3-cd]pyrene	ND	mg/kg	0.0030		EPA-8270C-SIM	ND		1
Naphthalene	ND	mg/kg	0.0030		EPA-8270C-SIM	ND		1
Phenanthrene	ND	mg/kg	0.0030		EPA-8270C-SIM	ND		1
Pyrene	ND	mg/kg	0.0030		EPA-8270C-SIM	ND	V01	1
Nitrobenzene-d5 (Surrogate)	89.3	%	30 - 110 (LCL - UCL)		EPA-8270C-SIM		V01	1
2-Fluorobiphenyl (Surrogate)	59.4	%	40 - 120 (LCL - UCL)		EPA-8270C-SIM			1
p-Terphenyl-d14 (Surrogate)	48.8	%	34 - 120 (LCL - UCL)		EPA-8270C-SIM			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-8270C-SIM	08/26/14	09/02/14 00:00	MK1	MS-B7	0.980	BXH2637

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Reported: 09/12/2014 8:55
Project: 5484
Project Number: 351812
Project Manager: Jim Harms

Purgeable Aromatics and Total Petroleum Hydrocarbons (Silica Gel Treated)

BCL Sample ID: 1419460-05 | **Client Sample Name:** 5484, SV-2-S-N-5-20140820, 8/20/2014 1:15:00PM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
TPH - Gasoline	ND	mg/kg	4.0		EPA-8015B/FFP	ND		1
TPH - Diesel (FFP)	ND	mg/kg	2.0		EPA-8015B/FFP	ND		1
TPH - Motor Oil	**4.7**	**mg/kg**	**4.0**		**EPA-8015B/FFP**	ND		1
Tetracosane (Surrogate)	61.5	%	20 - 120 (LCL - UCL)		EPA-8015B/FFP			1
Capric acid (Reverse Surrogate)	0	%	0 - 1 (LCL - UCL)		EPA-8015B/FFP			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-8015B/FFP	08/26/14	08/28/14 15:02	MWB	GC-13	1.017	BXH2875

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Reported: 09/12/2014 8:55
Project: 5484
Project Number: 351812
Project Manager: Jim Harms

Total Concentrations (TTLC)

BCL Sample ID: 1419460-06 | **Client Sample Name:** 5484, Composite-S-140820, 8/20/2014 1:15:00PM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Lead	**10**	**mg/kg**	**2.5**		**EPA-6010B**	ND		1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-6010B	08/29/14	09/03/14 19:12	JRG	PE-OP1	0.943	BXH2958

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Reported: 09/12/2014 8:55
Project: 5484
Project Number: 351812
Project Manager: Jim Harms

Volatile Organic Analysis (EPA Method 8260B)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: BXH2173						
Benzene	BXH2173-BLK1	ND	mg/kg	0.0050		
Ethylbenzene	BXH2173-BLK1	ND	mg/kg	0.0050		
Methyl t-butyl ether	BXH2173-BLK1	ND	mg/kg	0.0050		
Toluene	BXH2173-BLK1	ND	mg/kg	0.0050		
Total Xylenes	BXH2173-BLK1	ND	mg/kg	0.010		
1,2-Dichloroethane-d4 (Surrogate)	**BXH2173-BLK1**	**108**	%	**70 - 121 (LCL - UCL)**		
Toluene-d8 (Surrogate)	**BXH2173-BLK1**	**96.9**	%	**81 - 117 (LCL - UCL)**		
4-Bromofluorobenzene (Surrogate)	**BXH2173-BLK1**	**91.9**	%	**74 - 121 (LCL - UCL)**		

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Reported: 09/12/2014 8:55
Project: 5484
Project Number: 351812
Project Manager: Jim Harms

Volatile Organic Analysis (EPA Method 8260B)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits Percent Recovery	Control Limits RPD	Lab Quals
QC Batch ID: BXH2173										
Benzene	BXH2173-BS1	LCS	0.10586	0.12500	mg/kg	84.7		70 - 130		
Toluene	BXH2173-BS1	LCS	0.11560	0.12500	mg/kg	92.5		70 - 130		
1,2-Dichloroethane-d4 (Surrogate)	BXH2173-BS1	LCS	0.052340	0.050000	mg/kg	105		70 - 121		
Toluene-d8 (Surrogate)	BXH2173-BS1	LCS	0.049620	0.050000	mg/kg	99.2		81 - 117		
4-Bromofluorobenzene (Surrogate)	BXH2173-BS1	LCS	0.053060	0.050000	mg/kg	106		74 - 121		

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Reported: 09/12/2014 8:55
Project: 5484
Project Number: 351812
Project Manager: Jim Harms

Volatile Organic Analysis (EPA Method 8260B)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: BXH2173	Used client sample: N										
Benzene	MS	1418901-18	ND	0.10927	0.12500	mg/kg		87.4		70 - 130	
	MSD	1418901-18	ND	0.11267	0.12500	mg/kg	3.1	90.1	20	70 - 130	
Toluene	MS	1418901-18	ND	0.12455	0.12500	mg/kg		99.6		70 - 130	
	MSD	1418901-18	ND	0.12398	0.12500	mg/kg	0.5	99.2	20	70 - 130	
1,2-Dichloroethane-d4 (Surrogate)	MS	1418901-18	ND	0.052910	0.050000	mg/kg		106		70 - 121	
	MSD	1418901-18	ND	0.051710	0.050000	mg/kg	2.3	103		70 - 121	
Toluene-d8 (Surrogate)	MS	1418901-18	ND	0.049820	0.050000	mg/kg		99.6		81 - 117	
	MSD	1418901-18	ND	0.049250	0.050000	mg/kg	1.2	98.5		81 - 117	
4-Bromofluorobenzene (Surrogate)	MS	1418901-18	ND	0.054690	0.050000	mg/kg		109		74 - 121	
	MSD	1418901-18	ND	0.050780	0.050000	mg/kg	7.4	102		74 - 121	

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Reported: 09/12/2014 8:55
Project: 5484
Project Number: 351812
Project Manager: Jim Harms

Polynuclear Aromatic Hydrocarbons (EPA Method 8270C-SIM)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: BXH2637						
Acenaphthene	BXH2637-BLK1	ND	mg/kg	0.0030		
Acenaphthylene	BXH2637-BLK1	ND	mg/kg	0.0030		
Anthracene	BXH2637-BLK1	ND	mg/kg	0.0030		
Benzo[a]anthracene	BXH2637-BLK1	ND	mg/kg	0.0030		
Benzo[b]fluoranthene	BXH2637-BLK1	ND	mg/kg	0.0030		
Benzo[k]fluoranthene	BXH2637-BLK1	ND	mg/kg	0.0030		
Benzo[a]pyrene	BXH2637-BLK1	ND	mg/kg	0.0030		
Benzo[g,h,i]perylene	BXH2637-BLK1	ND	mg/kg	0.0030		
Chrysene	BXH2637-BLK1	ND	mg/kg	0.0030		
Dibenzo[a,h]anthracene	BXH2637-BLK1	ND	mg/kg	0.0030		
Fluoranthene	BXH2637-BLK1	ND	mg/kg	0.0030		
Fluorene	BXH2637-BLK1	ND	mg/kg	0.0030		
Indeno[1,2,3-cd]pyrene	BXH2637-BLK1	ND	mg/kg	0.0030		
Naphthalene	BXH2637-BLK1	ND	mg/kg	0.0030		
Phenanthrene	BXH2637-BLK1	ND	mg/kg	0.0030		
Pyrene	BXH2637-BLK1	ND	mg/kg	0.0030		
Nitrobenzene-d5 (Surrogate)	**BXH2637-BLK1**	**111**	%	**30 - 110 (LCL - UCL)**		**S09**
2-Fluorobiphenyl (Surrogate)	**BXH2637-BLK1**	**80.3**	%	**40 - 120 (LCL - UCL)**		
p-Terphenyl-d14 (Surrogate)	**BXH2637-BLK1**	**105**	%	**34 - 120 (LCL - UCL)**		

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Reported: 09/12/2014 8:55
Project: 5484
Project Number: 351812
Project Manager: Jim Harms

Polynuclear Aromatic Hydrocarbons (EPA Method 8270C-SIM)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits Percent Recovery	Control Limits RPD	Lab Quals
QC Batch ID: BXH2637										
Acenaphthene	BXH2637-BS1	LCS	0.025893	0.033445	mg/kg	77.4		52 - 130		
Acenaphthylene	BXH2637-BS1	LCS	0.026221	0.033445	mg/kg	78.4		52 - 130		
Anthracene	BXH2637-BS1	LCS	0.026548	0.033445	mg/kg	79.4		52 - 130		
Benzo[a]anthracene	BXH2637-BS1	LCS	0.022943	0.033445	mg/kg	68.6		60 - 130		
Benzo[b]fluoranthene	BXH2637-BS1	LCS	0.014749	0.033445	mg/kg	44.1		55 - 130		L01
Benzo[k]fluoranthene	BXH2637-BS1	LCS	0.021960	0.033445	mg/kg	65.7		47 - 130		
Benzo[a]pyrene	BXH2637-BS1	LCS	0.017699	0.033445	mg/kg	52.9		40 - 130		
Benzo[g,h,i]perylene	BXH2637-BS1	LCS	0.019993	0.033445	mg/kg	59.8		50 - 130		
Chrysene	BXH2637-BS1	LCS	0.025565	0.033445	mg/kg	76.4		50 - 130		
Dibenzo[a,h]anthracene	BXH2637-BS1	LCS	0.013766	0.033445	mg/kg	41.2		50 - 130		L01
Fluoranthene	BXH2637-BS1	LCS	0.027204	0.033445	mg/kg	81.3		60 - 130		
Fluorene	BXH2637-BS1	LCS	0.026876	0.033445	mg/kg	80.4		50 - 130		
Indeno[1,2,3-cd]pyrene	BXH2637-BS1	LCS	0.014421	0.033445	mg/kg	43.1		50 - 130		L01
Naphthalene	BXH2637-BS1	LCS	0.025237	0.033445	mg/kg	75.5		50 - 130		
Phenanthrene	BXH2637-BS1	LCS	0.025565	0.033445	mg/kg	76.4		50 - 130		
Pyrene	BXH2637-BS1	LCS	0.027860	0.033445	mg/kg	83.3		50 - 130		
Nitrobenzene-d5 (Surrogate)	BXH2637-BS1	LCS	0.13209	0.13378	mg/kg	98.7		30 - 110		
2-Fluorobiphenyl (Surrogate)	BXH2637-BS1	LCS	0.097672	0.13378	mg/kg	73.0		40 - 120		
p-Terphenyl-d14 (Surrogate)	BXH2637-BS1	LCS	0.099311	0.13378	mg/kg	74.2		34 - 120		

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Project: 5484
Project Number: 351812
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Polynuclear Aromatic Hydrocarbons (EPA Method 8270C-SIM)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: BXH2637	Used client sample: Y - Description: SV-1-S-N-5-20140820, 08/20/2014 11:05										
Acenaphthene	MS	1419460-02	ND	0.023695	0.032787	mg/kg		72.3		50 - 130	
	MSD	1419460-02	ND	0.021477	0.033557	mg/kg	9.8	64.0	30	50 - 130	
Acenaphthylene	MS	1419460-02	ND	0.023695	0.032787	mg/kg		72.3		52 - 130	
	MSD	1419460-02	ND	0.021141	0.033557	mg/kg	11.4	63.0	30	52 - 130	
Anthracene	MS	1419460-02	ND	0.023046	0.032787	mg/kg		70.3		52 - 130	
	MSD	1419460-02	ND	0.021477	0.033557	mg/kg	7.0	64.0	30	52 - 130	
Benzo[a]anthracene	MS	1419460-02	0.0013243	0.026292	0.032787	mg/kg		76.2		52 - 130	
	MSD	1419460-02	0.0013243	0.020134	0.033557	mg/kg	26.5	56.1	30	52 - 130	
Benzo[b]fluoranthene	MS	**1419460-02**	**ND**	**0.024344**	**0.032787**	**mg/kg**		**74.3**		**40 - 130**	
	MSD	**1419460-02**	**ND**	**0.014094**	**0.033557**	**mg/kg**	**53.3**	**42.0**	**30**	**40 - 130**	**Q02**
Benzo[k]fluoranthene	MS	**1419460-02**	**ND**	**0.025643**	**0.032787**	**mg/kg**		**78.2**		**40 - 130**	
	MSD	**1419460-02**	**ND**	**0.016779**	**0.033557**	**mg/kg**	**41.8**	**50.0**	**30**	**40 - 130**	**Q02**
Benzo[a]pyrene	MS	**1419460-02**	**ND**	**0.022721**	**0.032787**	**mg/kg**		**69.3**		**40 - 130**	
	MSD	**1419460-02**	**ND**	**0.016443**	**0.033557**	**mg/kg**	**32.1**	**49.0**	**30**	**40 - 130**	**Q02**
Benzo[g,h,i]perylene	MS	**1419460-02**	**ND**	**0.017852**	**0.032787**	**mg/kg**		**54.4**		**20 - 130**	
	MSD	**1419460-02**	**ND**	**0.012081**	**0.033557**	**mg/kg**	**38.6**	**36.0**	**30**	**20 - 130**	**Q02**
Chrysene	MS	1419460-02	0.0013243	0.025318	0.032787	mg/kg		73.2		40 - 130	
	MSD	1419460-02	0.0013243	0.018792	0.033557	mg/kg	29.6	52.1	30	40 - 130	
Dibenzo[a,h]anthracene	MS	**1419460-02**	**ND**	**0.018177**	**0.032787**	**mg/kg**		**55.4**		**40 - 130**	
	MSD	**1419460-02**	**ND**	**0.012752**	**0.033557**	**mg/kg**	**35.1**	**38.0**	**30**	**40 - 130**	**Q02,Q03**
Fluoranthene	MS	**1419460-02**	**0.0016554**	**0.029538**	**0.032787**	**mg/kg**		**85.0**		**40 - 130**	
	MSD	**1419460-02**	**0.0016554**	**0.021812**	**0.033557**	**mg/kg**	**30.1**	**60.1**	**30**	**40 - 130**	**Q02**
Fluorene	MS	1419460-02	ND	0.024344	0.032787	mg/kg		74.3		40 - 130	
	MSD	1419460-02	ND	0.021812	0.033557	mg/kg	11.0	65.0	30	40 - 130	
Indeno[1,2,3-cd]pyrene	MS	**1419460-02**	**ND**	**0.018177**	**0.032787**	**mg/kg**		**55.4**		**30 - 130**	
	MSD	**1419460-02**	**ND**	**0.011409**	**0.033557**	**mg/kg**	**45.7**	**34.0**	**30**	**30 - 130**	**Q02**
Naphthalene	MS	1419460-02	ND	0.024020	0.032787	mg/kg		73.3		50 - 130	
	MSD	1419460-02	ND	0.022148	0.033557	mg/kg	8.1	66.0	30	50 - 130	
Phenanthrene	MS	1419460-02	ND	0.024993	0.032787	mg/kg		76.2		40 - 130	
	MSD	1419460-02	ND	0.021141	0.033557	mg/kg	16.7	63.0	30	40 - 130	
Pyrene	MS	**1419460-02**	**ND**	**0.028889**	**0.032787**	**mg/kg**		**88.1**		**40 - 130**	
	MSD	**1419460-02**	**ND**	**0.020805**	**0.033557**	**mg/kg**	**32.5**	**62.0**	**30**	**40 - 130**	**Q02**
Nitrobenzene-d5 (Surrogate)	MS	1419460-02	ND	0.12270	0.13115	mg/kg		93.6		30 - 110	
	MSD	1419460-02	ND	0.11611	0.13423	mg/kg	5.5	86.5		30 - 110	
2-Fluorobiphenyl (Surrogate)	MS	1419460-02	ND	0.089911	0.13115	mg/kg		68.6		40 - 120	
	MSD	1419460-02	ND	0.082215	0.13423	mg/kg	8.9	61.2		40 - 120	

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Reported: 09/12/2014 8:55
Project: 5484
Project Number: 351812
Project Manager: Jim Harms

Polynuclear Aromatic Hydrocarbons (EPA Method 8270C-SIM)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: BXH2637	Used client sample: Y - Description: SV-1-S-N-5-20140820, 08/20/2014 11:05										
p-Terphenyl-d14 (Surrogate)	MS	1419460-02	ND	0.084393	0.13115	mg/kg		64.3		34 - 120	
	MSD	1419460-02	ND	0.073490	0.13423	mg/kg	13.8	54.7		34 - 120	

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Reported: 09/12/2014 8:55
Project: 5484
Project Number: 351812
Project Manager: Jim Harms

Purgeable Aromatics and Total Petroleum Hydrocarbons (Silica Gel Treated)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: BXH2875						
TPH - Gasoline	BXH2875-BLK1	ND	mg/kg	4.0		
TPH - Diesel (FFP)	BXH2875-BLK1	ND	mg/kg	2.0		
TPH - Motor Oil	BXH2875-BLK1	ND	mg/kg	4.0		
Tetracosane (Surrogate)	**BXH2875-BLK1**	**66.3**	%	**20 - 120 (LCL - UCL)**		
Capric acid (Reverse Surrogate)	BXH2875-BLK1	0	%	0 - 1 (LCL - UCL)		

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Project: 5484
Project Number: 351812
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Purgeable Aromatics and Total Petroleum Hydrocarbons (Silica Gel Treated)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits Percent Recovery	Control Limits RPD	Lab Quals
QC Batch ID: BXH2875										
TPH - Diesel (FFP)	BXH2875-BS1	LCS	11.587	16.502	mg/kg	70.2		20 - 110		
Tetracosane (Surrogate)	BXH2875-BS1	LCS	0.47871	0.66007	mg/kg	72.5		20 - 120		
Capric acid (Reverse Surrogate)	BXH2875-BS1	LCS	ND	3.3003	mg/kg	0		0 - 1		

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Reported: 09/12/2014 8:55
Project: 5484
Project Number: 351812
Project Manager: Jim Harms

Purgeable Aromatics and Total Petroleum Hydrocarbons (Silica Gel Treated)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: BXH2875	Used client sample: Y - Description: SV-1-S-N-6.5-20140820, 08/20/2014 11:30										
TPH - Diesel (FFP)	MS	1419460-03	2.3263	12.551	16.667	mg/kg		61.3		20 - 110	
	MSD	1419460-03	2.3263	11.567	16.667	mg/kg	8.2	55.4	30	20 - 110	
Tetracosane (Surrogate)	MS	1419460-03	ND	0.50400	0.66667	mg/kg		75.6		20 - 120	
	MSD	1419460-03	ND	0.43780	0.66667	mg/kg	14.1	65.7		20 - 120	
Capric acid (Reverse Surrogate)	MS	1419460-03	ND	ND	3.3333	mg/kg		0		0 - 1	
	MSD	1419460-03	ND	ND	3.3333	mg/kg		0		0 - 1	

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Project Manager: Jim Harms

Total Concentrations (TTLC)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: BXH2958						
Lead	BXH2958-BLK1	ND	mg/kg	2.5		

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Reported: 09/12/2014 8:55
Project: 5484
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Total Concentrations (TTLC)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits Percent Recovery	Control Limits RPD	Lab Quals
QC Batch ID: BXH2958										
Lead	BXH2958-BS1	LCS	103.13	100.00	mg/kg	103		75 - 125		

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Total Concentrations (TTLC)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: BXH2958	Used client sample: N										
Lead	DUP	1419826-01	10.011	9.8866		mg/kg	1.2		20		
	MS	1419826-01	10.011	102.25	99.010	mg/kg		93.2		75 - 125	
	MSD	1419826-01	10.011	105.64	99.010	mg/kg	3.3	96.6	20	75 - 125	

PTS Laboratories, Inc.

8100 Secura Way • Santa Fe Springs, CA 90670
Telephone (562) 347-2500 • Fax (562) 907-3610

September 11, 2014

Molly Meyers
BC Laboratories, Inc.
4100 Atlas Court
Bakersfield, CA 93308

Re: PTS File No: 44528
Physical Properties Data
1419460

Dear Ms. Meyers:

Please find enclosed report for Physical Properties analyses conducted upon samples received from your 1419460 project. All analyses were performed by applicable ASTM, EPA, or API methodologies. An electronic version of the report has previously been sent to your attention via the internet. The samples are currently in storage and will be retained for thirty days past completion of testing at no charge. Please note that the samples will be disposed of at that time. You may contact me regarding storage, disposal, or return of the samples.

PTS Laboratories Inc. appreciates the opportunity to be of service. If you have any questions or require additional information, please contact Morgan Richards at (562) 347-2509.

Sincerely,
PTS Laboratories, Inc.

Michael Mark Brady, P.G.
Laboratory Director

Encl.

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PTS Laboratories

Project Name: N/A
Project Number: 1419460

PTS File No: 44528
Client: BC Laboratories, Inc.

TEST PROGRAM - 20140827

CORE ID	Depth ft.	Core Recovery ft.	Grain Size Analysis ASTM D422	TOC/foc Walkley-Black	Dry Bulk Density API RP40	Total/Air/Water Porosity API RP 40			Comments
		Plugs:	Grab	Grab	Vert. 1.5"	Vert. 1.5"			
Date Received: 20140827									
1419460-01	N/A	**0.50**	X	X	X	X			
1419460-04	N/A	**0.50**	X	X	X	X			
TOTALS:	**2 cores**	**1.00**	**2**	**2**	**2**	**2**			

Laboratory Test Program Notes

Contaminant identification:

Standard TAT for basic analysis is 10 business days.

ASTM D422: Dry Sieve only, Hydrometer analysis must be requested prior to initiating tests. Additional costs would apply.

Substitute dry bulk density by API RP40 method for dry bulk density - ASTM D2937; approved per M. Meyers/BC Laboratories 20140221

CLIENT CONFIDENTIAL

Page 2 of 8

PTS Laboratories

PTS File No: 44528
Client: BC Laboratories, Inc.
Report Date: 09/11/14

PHYSICAL PROPERTIES DATA

Project Name: N/A
Project No: 1419460

		METHODS:	API RP 40 / ASTM D2216	API RP 40		API RP 40		
		SAMPLE	MOISTURE	DENSITY		POROSITY, %Vb (2)		
SAMPLE ID.	DEPTH, ft.	ORIENTATION (1)	CONTENT, % weight	DRY BULK, g/cc	GRAIN, g/cc	TOTAL	AIR-FILLED	WATER-FILLED
1419460-01	NA	V	- -	1.50	- -	43.4	9.4	34.0
1419460-04	NA	V	- -	1.53	- -	43.3	30.6	12.6

(1) Sample Orientation: H = horizontal; V = vertical; R = remold
(2) Total Porosity = all interconnected pore channels; Air Filled = pore channels not occupied by pore fluids.
Vb = Bulk Volume, cc; - - = Analysis not requested.

PTS Laboratories, Inc.

BC Laboratories, Inc.
PTS File No: 44528

PARTICLE SIZE SUMMARY

(METHODOLOGY: ASTM D422M)

PROJECT NAME: N/A
PROJECT NO: 1419460

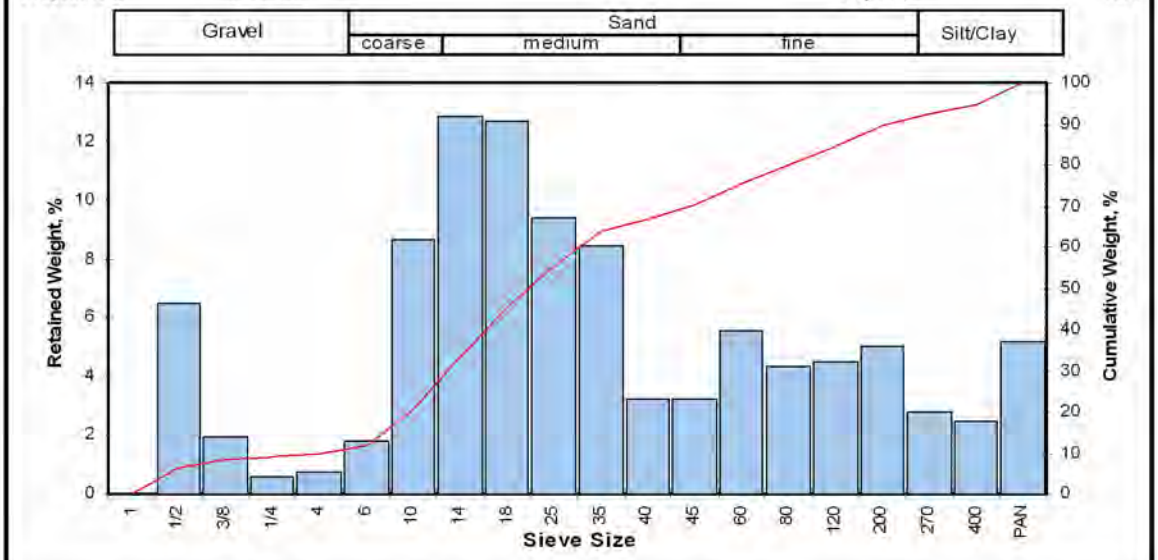
Sample ID	Depth, ft.	Mean Grain Size Description USCS/ASTM (1)	Median Grain Size, mm	Particle Size Distribution, wt. percent				
				Gravel	Sand Size			Silt/Clay
					Coarse	Medium	Fine	
1419460-01	N/A	Medium sand	0.856	9.83	10.44	46.58	22.64	10.51
1419460-04	N/A	Medium sand	1.159	10.94	20.20	42.01	19.15	7.70

(1) Based on Mean fromTrask

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D422M

Client:	BC Laboratories, Inc.	**PTS File No:**	44528
Project:	N/A	**Sample ID:**	1419460-01
Project No:	1419460	**Depth, ft:**	N/A



Opening Inches	Opening Millimeters	Phi of Screen	U.S. Sieve No.	Sample Weight grams	Incremental Weight, percent	Cumulative Weight, percent
0.9844	25.002	-4.64	1	0.00	0.00	0.00
0.4922	12.501	-3.64	1/2	6.36	6.50	6.50
0.3740	9.500	-3.25	3/8	1.92	1.96	8.46
0.2500	6.351	-2.67	1/4	0.59	0.60	9.06
0.1873	4.757	-2.25	4	0.75	0.77	9.83
0.1324	3.364	-1.75	6	1.74	1.78	11.60
0.0787	2.000	-1.00	10	8.48	8.66	20.26
0.0557	1.414	-0.50	14	12.56	12.83	33.09
0.0394	1.000	0.00	18	12.41	12.67	45.77
0.0278	0.707	0.50	25	9.21	9.41	55.17
0.0197	0.500	1.00	35	8.30	8.48	63.65
0.0166	0.420	1.25	40	3.13	3.20	66.85
0.0139	0.354	1.50	45	3.17	3.24	70.08
0.0098	0.250	2.00	60	5.45	5.57	75.65
0.0070	0.177	2.50	80	4.23	4.32	79.97
0.0049	0.125	3.00	120	4.39	4.48	84.46
0.0029	0.074	3.75	200	4.93	5.04	89.49
0.0021	0.053	4.25	270	2.75	2.81	92.30
0.0015	0.037	4.75	400	2.45	2.50	94.80
			PAN	5.09	5.20	100.00
TOTALS				97.91	100.00	100.00

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5	-3.87	0.5773	14.665
10	-2.20	0.1810	4.598
16	-1.37	0.1017	2.583
25	-0.82	0.0693	1.760
40	-0.23	0.0461	1.171
50	0.23	0.0337	0.856
60	0.78	0.0229	0.580
75	1.94	0.0102	0.260
84	2.95	0.0051	0.129
90	3.84	0.0027	0.070
95	4.57	0.0017	0.042

Measure	Trask	Inman	Folk-Ward
Median, phi	0.23	0.23	0.23
Median, in.	0.0337	0.0337	0.0337
Median, mm	0.856	0.856	0.856
Mean, phi	-0.01	0.79	0.60
Mean, in.	0.0398	0.0228	0.0259
Mean, mm	1.010	0.578	0.659
Sorting	2.600	2.159	2.359
Skewness	0.791	0.262	0.145
Kurtosis	0.166	0.956	1.255
Grain Size Description (ASTM-USCS Scale)		Medium sand (based on Mean from Trask)	

Description	Retained on Sieve #	Weight Percent
Gravel	4	9.83
Coarse Sand	10	10.44
Medium Sand	40	46.58
Fine Sand	200	22.64
Silt/Clay	<200	10.51
	Total	100

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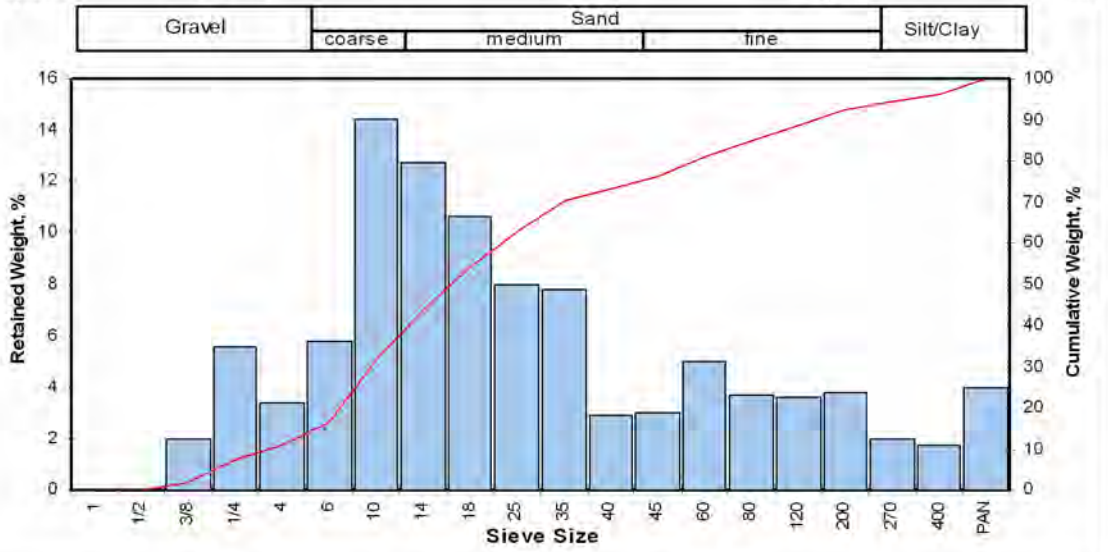
Page 5 of 8

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D422M

Client:	BC Laboratories, Inc.	**PTS File No:**	44528
Project:	N/A	**Sample ID:**	1419460-04
Project No:	1419460	**Depth, ft:**	N/A



Opening Inches	Opening Millimeters	Phi of Screen	U.S. Sieve No.	Sample Weight grams	Incremental Weight, percent	Cumulative Weight, percent
0.9844	25.002	-4.64	1	0.00	0.00	0.00
0.4922	12.501	-3.64	1/2	0.00	0.00	0.00
0.3740	9.500	-3.25	3/8	3.09	1.98	1.98
0.2500	6.351	-2.67	1/4	8.70	5.57	7.55
0.1873	4.757	-2.25	4	5.30	3.39	10.94
0.1324	3.364	-1.75	6	9.04	5.79	16.73
0.0787	2.000	-1.00	10	22.50	14.41	31.14
0.0557	1.414	-0.50	14	19.90	12.74	43.88
0.0394	1.000	0.00	18	16.60	10.63	54.51
0.0278	0.707	0.50	25	12.45	7.97	62.49
0.0197	0.500	1.00	35	12.13	7.77	70.25
0.0166	0.420	1.25	40	4.52	2.89	73.15
0.0139	0.354	1.50	45	4.75	3.04	76.19
0.0098	0.250	2.00	60	7.78	4.98	81.17
0.0070	0.177	2.50	80	5.79	3.71	84.88
0.0049	0.125	3.00	120	5.66	3.62	88.51
0.0029	0.074	3.75	200	5.93	3.80	92.30
0.0021	0.053	4.25	270	3.11	1.99	94.29
0.0015	0.037	4.75	400	2.73	1.75	96.04
			PAN	6.18	3.96	100.00
TOTALS				156.16	100.00	100.00

Cumulative Weight Percent greater than

Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5	-2.93	0.3007	7.637
10	-2.37	0.2030	5.155
16	-1.81	0.1384	3.514
25	-1.32	0.0983	2.496
40	-0.65	0.0619	1.572
50	-0.21	0.0456	1.159
60	0.34	0.0310	0.788
75	1.40	0.0149	0.378
84	2.38	0.0076	0.192
90	3.30	0.0040	0.102
95	4.45	0.0018	0.046

Measure	Trask	Inman	Folk-Ward
Median, phi	-0.21	-0.21	-0.21
Median, in.	0.0456	0.0456	0.0456
Median, mm	1.159	1.159	1.159
Mean, phi	-0.52	0.28	0.12
Mean, in.	0.0566	0.0323	0.0363
Mean, mm	1.437	0.821	0.921
Sorting	2.568	2.097	2.168
Skewness	0.839	0.237	0.250
Kurtosis	0.210	0.761	1.112
Grain Size Description (ASTM-USCS Scale)		Medium sand (based on Mean from Trask)	

Description	Retained on Sieve #	Weight Percent
Gravel	4	10.94
Coarse Sand	10	20.20
Medium Sand	40	42.01
Fine Sand	200	19.15
Silt/Clay	<200	7.70
	Total	100

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PTS Laboratories

PTS File No: 44528
Client: BC Laboratories, Inc.
Report Date: 09/11/14

ORGANIC CARBON DATA - TOC (foc)

(Methodology: Walkley-Black)

Project Name: N/A
Project No: 1419460

SAMPLE ID.	DEPTH, ft.	ANALYSIS DATE	ANALYSIS TIME	SAMPLE MATRIX	TOTAL ORGANIC CARBON, mg/kg	FRACTION ORGANIC CARBON, g/g
1419460-01	N/A	20140911	1000	SOIL	3700	3.70E-03
1419460-04	N/A	20140911	1000	SOIL	3200	3.20E-03
Blank	N/A	20140911	1000	BLANK	ND	ND
SRM D085-542	N/A	20140911	1000	SRM	5290	5.29E-03
				Reporting Limit:	100	1.00E-04

QC DATA

SRM ID/Lot No.	REC (%)	Control Limits	Certified Concentration mg/kg	QC Performance Acceptance Limits, mg/kg Lower	Upper
SRM D085-542	100	75-125	5290	3968	6613

ND = Not Detected

SUBCONTRACT ORDER
BC Laboratories
1419460

44528

SENDING LABORATORY:

BC Laboratories
4100 Atlas Court
Bakersfield, CA 93308
Phone: 661-327-4911
FAX: 661-327-1918
Project Manager: Molly Meyers

RECEIVING LABORATORY: **PTSLB**

PTS Laboratories, Inc.
8100 Secura Way
Santa Fe Springs, CA 90670
Phone: (562) 907-3607
FAX: (562) 907-3610

Analysis	Due	Expires	Comments
Sample ID: 1419460-01 Solids	**Sampled:**	**08/20/14 11:05**	
ASTM D2937 - Bulk Density	08/28/14 17:00	08/19/15 11:05	
ASTM D422M - Grain Size Distribution	08/28/14 17:00	08/19/15 11:05	
API RP40 - Total Porosity	08/28/14 17:00	08/19/15 11:05	report total, air & water fillled porosity
Walkley-Black - Total Organic Carbon	08/28/14 17:00	08/19/15 11:05	report FOC
Containers supplied: sleeve			
Sample ID: 1419460-04 Solids	**Sampled:**	**08/20/14 13:10**	
ASTM D2937 - Bulk Density	08/28/14 17:00	08/19/15 13:10	
ASTM D422M - Grain Size Distribution	08/28/14 17:00	08/19/15 13:10	
API RP40 - Total Porosity	08/28/14 17:00	08/19/15 13:10	report total, air & water fillled porosity
Walkley-Black - Total Organic Carbon	08/28/14 17:00	08/19/15 13:10	report FOC
Containers supplied:			

Released By	Date	Received By	Date
[signature]	8/26/14	[signature] PTS LABS	8/27/14 09:00 607
Released By	Date	Received By	Date
[signature]			

PTSLB

Page 1 of 1
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AECOM
2020 L St, Suite 400
Sacramento, CA 95811

Reported: 09/12/2014 8:55
Project: 5484
Project Number: 351812
Project Manager: Jim Harms

Notes And Definitions

MDL	Method Detection Limit
ND	Analyte Not Detected at or above the reporting limit
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
L01	The Laboratory Control Sample Water (LCSW) recovery is not within laboratory established control limits.
Q02	Matrix spike precision is not within the control limits.
Q03	Matrix spike recovery(s) is(are) not within the control limits.
S09	The surrogate recovery on the sample for this compound was not within the control limits.
V01	The Initial Calibration Verification (ICV) recovery is not within established control limits.

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9/2/2014
Mr. Jim Harms
AECOM Environment
2020 L Street
4th Floor Suite 400
Sacramento CA 95811

Project Name: 351812
Project #: 60318102-08.01
Workorder #: 1408428C

Dear Mr. Jim Harms

The following report includes the data for the above referenced project for sample(s) received on 8/27/2014 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: Kelly Buettner at 916-985-1000 if you have any questions regarding the data in this report.

Regards,

Kelly Buettner

Project Manager

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WORK ORDER #: 1408428C

Work Order Summary

CLIENT:	Mr. Jim Harms AECOM Environment 2020 L Street 4th Floor Suite 400 Sacramento, CA 95811	**BILL TO:**	Mr. Jim Harms AECOM Environment 2020 L Street 4th Floor Suite 400 Sacramento, CA 95811
PHONE:	916-362-7100	**P.O. #**	55944ACM
FAX:	916-362-8100	**PROJECT #**	60318102-08.01 351812
DATE RECEIVED:	08/27/2014	**CONTACT:**	Kelly Buettner
DATE COMPLETED:	09/02/2014		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	SV-1-V-N-5-20140826	Modified TO-15 APH	4.3 "Hg	14.7 psi
01B	SV-1-V-N-5-20140826	Modified TO-15 APH	4.3 "Hg	14.7 psi
02A	SV-1-V-Y-5-20140826	Modified TO-15 APH	4.3 "Hg	14.8 psi
02B	SV-1-V-Y-5-20140826	Modified TO-15 APH	4.3 "Hg	14.8 psi
03A	SV-2-V-N-5-20140826	Modified TO-15 APH	4.5 "Hg	15.1 psi
03B	SV-2-V-N-5-20140826	Modified TO-15 APH	4.5 "Hg	15.1 psi
04A	EB-V-N-20140827	Modified TO-15 APH	3.3 "Hg	14.6 psi
04B	EB-V-N-20140827	Modified TO-15 APH	3.3 "Hg	14.6 psi
05A	Lab Blank	Modified TO-15 APH	NA	NA
05B	Lab Blank	Modified TO-15 APH	NA	NA
06A	CCV	Modified TO-15 APH	NA	NA
06B	CCV	Modified TO-15 APH	NA	NA

CERTIFIED BY: Heidi Hayes DATE: 09/02/14

Technical Director

Certification numbers: AZ Licensure AZ0775, NJ NELAP - CA016, NY NELAP - 11291,
TX NELAP - T104704434-13-6, UT NELAP CA009332014-5, VA NELAP - 460197, WA NELAP - C935
Name of Accrediting Agency: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005, Effective date: 10/18/2013, Expiration date: 10/17/2014.
Eurofins Air Toxics Inc.. 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
AECOM Environment
Workorder# 1408428C

Three 1 Liter Summa Canister samples and one 1 Liter Summa Canister (100% Certified) sample were received on August 27, 2014. 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.

Analytical Notes

There were no analytical discrepancies.

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

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: SV-1-V-N-5-20140826

Lab ID#: 1408428C-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
C5-C6 Aliphatic Hydrocarbons (ref. to Pentane + Hexane)	23	4700	75	15000
>C6-C8 Aliphatic Hydrocarbons (ref. to Heptane)	23	4800	95	20000
>C8-C10 Aliphatic Hydrocarbons (ref. to Decane)	23	170	140	980

Client Sample ID: SV-1-V-N-5-20140826

Lab ID#: 1408428C-01B

No Detections Were Found.

Client Sample ID: SV-1-V-Y-5-20140826

Lab ID#: 1408428C-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
C5-C6 Aliphatic Hydrocarbons (ref. to Pentane + Hexane)	23	4800	76	16000
>C6-C8 Aliphatic Hydrocarbons (ref. to Heptane)	23	4900	96	20000
>C8-C10 Aliphatic Hydrocarbons (ref. to Decane)	23	170	140	990

Client Sample ID: SV-1-V-Y-5-20140826

Lab ID#: 1408428C-02B

No Detections Were Found.

Client Sample ID: SV-2-V-N-5-20140826

Lab ID#: 1408428C-03A

No Detections Were Found.

Client Sample ID: SV-2-V-N-5-20140826

Lab ID#: 1408428C-03B

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
>C8-C10 Aromatic Hydrocarbons	24	49	120	240

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

Client Sample ID: EB-V-N-20140827

Lab ID#: 1408428C-04A

No Detections Were Found.

Client Sample ID: EB-V-N-20140827

Lab ID#: 1408428C-04B

No Detections Were Found.

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Client Sample ID: SV-1-V-N-5-20140826

Lab ID#: 1408428C-01A

MODIFIED METHOD TO-15 GC/MS FULL SCAN

File Name:	**3082921a**	**Date of Collection: 8/26/14 12:19:00 PM**	
Dil. Factor:	**2.33**	**Date of Analysis: 8/30/14 12:27 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
C5-C6 Aliphatic Hydrocarbons (ref. to Pentane + Hexane)	23	4700	75	15000
>C6-C8 Aliphatic Hydrocarbons (ref. to Heptane)	23	4800	95	20000
>C8-C10 Aliphatic Hydrocarbons (ref. to Decane)	23	170	140	980
>C10-C12 Aliphatic Hydrocarbons (ref. to Dodecane)	23	Not Detected	160	Not Detected

Container Type: 1 Liter Summa Canister

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Client Sample ID: SV-1-V-N-5-20140826

Lab ID#: 1408428C-01B

MODIFIED METHOD TO-15 GC/MS FULL SCAN

File Name:	**3082921c**	**Date of Collection: 8/26/14 12:19:00 PM**	
Dil. Factor:	**2.33**	**Date of Analysis: 8/30/14 12:27 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
>C8-C10 Aromatic Hydrocarbons	23	Not Detected	110	Not Detected
>C10-C12 Aromatic Hydrocarbons	23	Not Detected	130	Not Detected

Container Type: 1 Liter Summa Canister

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Client Sample ID: SV-1-V-Y-5-20140826

Lab ID#: 1408428C-02A

MODIFIED METHOD TO-15 GC/MS FULL SCAN

File Name:	**3082920a**	**Date of Collection: 8/26/14 12:19:00 PM**	
Dil. Factor:	**2.34**	**Date of Analysis: 8/29/14 11:59 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
C5-C6 Aliphatic Hydrocarbons (ref. to Pentane + Hexane)	23	4800	76	16000
>C6-C8 Aliphatic Hydrocarbons (ref. to Heptane)	23	4900	96	20000
>C8-C10 Aliphatic Hydrocarbons (ref. to Decane)	23	170	140	990
>C10-C12 Aliphatic Hydrocarbons (ref. to Dodecane)	23	Not Detected	160	Not Detected

Container Type: 1 Liter Summa Canister

eurofins | Air Toxics

Client Sample ID: SV-1-V-Y-5-20140826

Lab ID#: 1408428C-02B

MODIFIED METHOD TO-15 GC/MS FULL SCAN

File Name:	**3082920c**	**Date of Collection: 8/26/14 12:19:00 PM**	
Dil. Factor:	**2.34**	**Date of Analysis: 8/29/14 11:59 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
>C8-C10 Aromatic Hydrocarbons	23	Not Detected	120	Not Detected
>C10-C12 Aromatic Hydrocarbons	23	Not Detected	130	Not Detected

Container Type: 1 Liter Summa Canister

eurofins | Air Toxics

Client Sample ID: SV-2-V-N-5-20140826

Lab ID#: 1408428C-03A

MODIFIED METHOD TO-15 GC/MS FULL SCAN

File Name:	**3082919a**	**Date of Collection: 8/26/14 1:10:00 PM**	
Dil. Factor:	**2.38**	**Date of Analysis: 8/29/14 11:32 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
C5-C6 Aliphatic Hydrocarbons (ref. to Pentane + Hexane)	24	Not Detected	77	Not Detected
>C6-C8 Aliphatic Hydrocarbons (ref. to Heptane)	24	Not Detected	98	Not Detected
>C8-C10 Aliphatic Hydrocarbons (ref. to Decane)	24	Not Detected	140	Not Detected
>C10-C12 Aliphatic Hydrocarbons (ref. to Dodecane)	24	Not Detected	160	Not Detected

Container Type: 1 Liter Summa Canister

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Client Sample ID: SV-2-V-N-5-20140826

Lab ID#: 1408428C-03B

MODIFIED METHOD TO-15 GC/MS FULL SCAN

File Name:	**3082919c**	**Date of Collection: 8/26/14 1:10:00 PM**	
Dil. Factor:	**2.38**	**Date of Analysis: 8/29/14 11:32 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
>C8-C10 Aromatic Hydrocarbons	24	49	120	240
>C10-C12 Aromatic Hydrocarbons	24	Not Detected	130	Not Detected

Container Type: 1 Liter Summa Canister

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Client Sample ID: EB-V-N-20140827

Lab ID#: 1408428C-04A

MODIFIED METHOD TO-15 GC/MS FULL SCAN

File Name:	**3082918a**	**Date of Collection: 8/27/14 10:02:00 AM**	
Dil. Factor:	**2.24**	**Date of Analysis: 8/29/14 11:04 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
C5-C6 Aliphatic Hydrocarbons (ref. to Pentane + Hexane)	22	Not Detected	72	Not Detected
>C6-C8 Aliphatic Hydrocarbons (ref. to Heptane)	22	Not Detected	92	Not Detected
>C8-C10 Aliphatic Hydrocarbons (ref. to Decane)	22	Not Detected	130	Not Detected
>C10-C12 Aliphatic Hydrocarbons (ref. to Dodecane)	22	Not Detected	160	Not Detected

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

eurofins | Air Toxics

Client Sample ID: EB-V-N-20140827

Lab ID#: 1408428C-04B

MODIFIED METHOD TO-15 GC/MS FULL SCAN

File Name:	**3082918c**	**Date of Collection: 8/27/14 10:02:00 AM**	
Dil. Factor:	**2.24**	**Date of Analysis: 8/29/14 11:04 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
>C8-C10 Aromatic Hydrocarbons	22	Not Detected	110	Not Detected
>C10-C12 Aromatic Hydrocarbons	22	Not Detected	120	Not Detected

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

eurofins | Air Toxics

Client Sample ID: Lab Blank

Lab ID#: 1408428C-05A

MODIFIED METHOD TO-15 GC/MS FULL SCAN

File Name:	**3082908a**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/29/14 01:53 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

eurofins | Air Toxics

Client Sample ID: Lab Blank

Lab ID#: 1408428C-05B

MODIFIED METHOD TO-15 GC/MS FULL SCAN

File Name:	**3082908c**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/29/14 01:53 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
>C8-C10 Aromatic Hydrocarbons	10	Not Detected	49	Not Detected
>C10-C12 Aromatic Hydrocarbons	10	Not Detected	55	Not Detected

Container Type: NA - Not Applicable

eurofins | Air Toxics

Client Sample ID: CCV

Lab ID#: 1408428C-06A

MODIFIED METHOD TO-15 GC/MS FULL SCAN

File Name:	**3082907a**	**Date of Collection: NA**
Dil. Factor:	**1.00**	**Date of Analysis: 8/29/14 01:05 PM**

Compound	%Recovery
C5-C6 Aliphatic Hydrocarbons (ref. to Pentane + Hexane)	109
>C6-C8 Aliphatic Hydrocarbons (ref. to Heptane)	105
>C8-C10 Aliphatic Hydrocarbons (ref. to Decane)	107
>C10-C12 Aliphatic Hydrocarbons (ref. to Dodecane)	76

Container Type: NA - Not Applicable

eurofins | Air Toxics

Client Sample ID: CCV

Lab ID#: 1408428C-06B

MODIFIED METHOD TO-15 GC/MS FULL SCAN

File Name:	**3082907c**	**Date of Collection: NA**
Dil. Factor:	**1.00**	**Date of Analysis: 8/29/14 01:05 PM**

Compound	%Recovery
>C8-C10 Aromatic Hydrocarbons	103
>C10-C12 Aromatic Hydrocarbons	87

Container Type: NA - Not Applicable

eurofins | Air Toxics

9/3/2014
Mr. Jim Harms
AECOM Environment
2020 L Street
4th Floor Suite 400
Sacramento CA 95811

Project Name: 351812
Project #: 60318102-08.01
Workorder #: 1408428B

Dear Mr. Jim Harms

The following report includes the data for the above referenced project for sample(s) received on 8/27/2014 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: Kelly Buettner at 916-985-1000 if you have any questions regarding the data in this report.

Regards,

Kelly Buettner

Project Manager

eurofins | Air Toxics

WORK ORDER #: 1408428B

Work Order Summary

CLIENT:	Mr. Jim Harms AECOM Environment 2020 L Street 4th Floor Suite 400 Sacramento, CA 95811	**BILL TO:**	Mr. Jim Harms AECOM Environment 2020 L Street 4th Floor Suite 400 Sacramento, CA 95811
PHONE:	916-362-7100	**P.O. #**	55944ACM
FAX:	916-362-8100	**PROJECT #**	60318102-08.01 351812
DATE RECEIVED:	08/27/2014	**CONTACT:**	Kelly Buettner
DATE COMPLETED:	09/02/2014		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	SV-1-V-N-5-20140826	Modified ASTM D-1946	4.3 "Hg	14.7 psi
02A	SV-1-V-Y-5-20140826	Modified ASTM D-1946	4.3 "Hg	14.8 psi
03A	SV-2-V-N-5-20140826	Modified ASTM D-1946	4.5 "Hg	15.1 psi
04A	EB-V-N-20140827	Modified ASTM D-1946	3.3 "Hg	14.6 psi
05A	Lab Blank	Modified ASTM D-1946	NA	NA
05B	Lab Blank	Modified ASTM D-1946	NA	NA
06A	LCS	Modified ASTM D-1946	NA	NA
06AA	LCSD	Modified ASTM D-1946	NA	NA

CERTIFIED BY:  DATE: 09/02/14

Technical Director

Certification numbers: AZ Licensure AZ0775, NJ NELAP - CA016, NY NELAP - 11291,
TX NELAP - T104704434-13-6, UT NELAP CA009332014-5, VA NELAP - 460197, WA NELAP - C935
Name of Accrediting Agency: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005, Effective date: 10/18/2013, Expiration date: 10/17/2014.
Eurofins Air Toxics Inc.. 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
AECOM Environment
Workorder# 1408428B

Three 1 Liter Summa Canister and one 1 Liter Summa Canister (100% Certified) samples were received on August 27, 2014. 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 minimum of 5-point calibration curve is performed. Quantitation is based on average Response Factor.
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.

Analytical Notes

There were no analytical discrepancies.

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: SV-1-V-N-5-20140826

Lab ID#: 1408428B-01A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.23	17
Nitrogen	0.23	68
Carbon Dioxide	0.023	0.44
Methane	0.00023	0.00068
Helium	0.12	15

Client Sample ID: SV-1-V-Y-5-20140826

Lab ID#: 1408428B-02A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.23	17
Nitrogen	0.23	68
Carbon Dioxide	0.023	0.46
Methane	0.00023	0.00068
Helium	0.12	15

Client Sample ID: SV-2-V-N-5-20140826

Lab ID#: 1408428B-03A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.24	17
Nitrogen	0.24	79
Carbon Dioxide	0.024	4.1

Client Sample ID: EB-V-N-20140827

Lab ID#: 1408428B-04A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.22	0.42
Nitrogen	0.22	100

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Client Sample ID: SV-1-V-N-5-20140826

Lab ID#: 1408428B-01A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10082813**	**Date of Collection: 8/26/14 12:19:00 PM**	
Dil. Factor:	**2.33**	**Date of Analysis: 8/28/14 12:04 PM**	

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.23	17
Nitrogen	0.23	68
Carbon Dioxide	0.023	0.44
Methane	0.00023	0.00068
Helium	0.12	15

Container Type: 1 Liter Summa Canister

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Client Sample ID: SV-1-V-Y-5-20140826

Lab ID#: 1408428B-02A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10082814**	**Date of Collection: 8/26/14 12:19:00 PM**	
Dil. Factor:	**2.34**	**Date of Analysis: 8/28/14 12:35 PM**	

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.23	17
Nitrogen	0.23	68
Carbon Dioxide	0.023	0.46
Methane	0.00023	0.00068
Helium	0.12	15

Container Type: 1 Liter Summa Canister

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Client Sample ID: SV-2-V-N-5-20140826

Lab ID#: 1408428B-03A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10082815**	**Date of Collection: 8/26/14 1:10:00 PM**	
Dil. Factor:	**2.38**	**Date of Analysis: 8/28/14 01:26 PM**	

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.24	17
Nitrogen	0.24	79
Carbon Dioxide	0.024	4.1
Methane	0.00024	Not Detected
Helium	0.12	Not Detected

Container Type: 1 Liter Summa Canister

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Client Sample ID: EB-V-N-20140827

Lab ID#: 1408428B-04A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10082816**	**Date of Collection:**	**8/27/14 10:02:00 AM**
Dil. Factor:	**2.24**	**Date of Analysis:**	**8/28/14 02:44 PM**

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.22	0.42
Nitrogen	0.22	100
Carbon Dioxide	0.022	Not Detected
Methane	0.00022	Not Detected
Helium	0.11	Not Detected

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

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Client Sample ID: Lab Blank

Lab ID#: 1408428B-05A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10082805**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/27/14 10:12 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#: 1408428B-05B

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10082804c**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/27/14 09:50 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#: 1408428B-06A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10082802**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/27/14 08:48 PM**	

Compound	%Recovery	Method Limits
Oxygen	100	85-115
Nitrogen	93	85-115
Carbon Dioxide	99	85-115
Methane	104	85-115
Helium	98	85-115

Container Type: NA - Not Applicable

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Client Sample ID: LCSD

Lab ID#: 1408428B-06AA

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10082824**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/28/14 07:39 PM**	

Compound	%Recovery	Method Limits
Oxygen	101	85-115
Nitrogen	93	85-115
Carbon Dioxide	99	85-115
Methane	105	85-115
Helium	98	85-115

Container Type: NA - Not Applicable

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9/2/2014
Mr. Jim Harms
AECOM Environment
2020 L Street
4th Floor Suite 400
Sacramento CA 95811

Project Name: 351812
Project #: 60318102-08.01
Workorder #: 1408428A

Dear Mr. Jim Harms

The following report includes the data for the above referenced project for sample(s) received on 8/27/2014 at Air Toxics Ltd.

The data and associated QC analyzed by 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: Kelly Buettner at 916-985-1000 if you have any questions regarding the data in this report.

Regards,

Kelly Buettner

Project Manager

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WORK ORDER #: 1408428A

Work Order Summary

CLIENT:	Mr. Jim Harms AECOM Environment 2020 L Street 4th Floor Suite 400 Sacramento, CA 95811	**BILL TO:**	Mr. Jim Harms AECOM Environment 2020 L Street 4th Floor Suite 400 Sacramento, CA 95811
PHONE:	916-362-7100	**P.O. #**	60318102-08.01
FAX:	916-362-8100	**PROJECT #**	60318102-08.01 351812
DATE RECEIVED:	08/27/2014	**CONTACT:**	Kelly Buettner
DATE COMPLETED:	09/02/2014		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	SV-1-V-N-5-20140826	TO-15	4.3 "Hg	14.7 psi
02A	SV-1-V-Y-5-20140826	TO-15	4.3 "Hg	14.8 psi
03A	SV-2-V-N-5-20140826	TO-15	4.5 "Hg	15.1 psi
04A	EB-V-N-20140827	TO-15	3.3 "Hg	14.6 psi
05A	Lab Blank	TO-15	NA	NA
06A	CCV	TO-15	NA	NA
07A	LCS	TO-15	NA	NA
07AA	LCSD	TO-15	NA	NA

CERTIFIED BY:  DATE: 09/02/14

Technical Director

Certification numbers: AZ Licensure AZ0775, NJ NELAP - CA016, NY NELAP - 11291,
TX NELAP - T104704434-13-6, UT NELAP CA009332014-5, VA NELAP - 460197, WA NELAP - C935
Name of Accrediting Agency: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005, Effective date: 10/18/2013, Expiration date: 10/17/2014.
Eurofins Air Toxics Inc.. 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
AECOM Environment
Workorder# 1408428A

Three 1 Liter Summa Canister and one 1 Liter Summa Canister (100% Certified) samples were received on August 27, 2014. 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.

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.

The recovery of surrogate 1,2-Dichloroethane-d4 in sample SV-1-V-Y-5-20140826 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, LOD, or MDL value. See data page for project specific U-flag definition.

UJ- Non-detected compound associated with low bias in the CCV

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: SV-1-V-N-5-20140826

Lab ID#: 1408428A-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	1.2	1.8	3.7	5.9
Ethyl Benzene	1.2	1.3	5.0	5.6
Toluene	1.2	5.1	4.4	19
m,p-Xylene	1.2	4.2	5.0	18
o-Xylene	1.2	1.5	5.0	6.5
TPH ref. to Gasoline (MW=100)	58	10000	240	42000

Client Sample ID: SV-1-V-Y-5-20140826

Lab ID#: 1408428A-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	1.2	1.9	3.7	6.1
Ethyl Benzene	1.2	1.5	5.1	6.7
Toluene	1.2	5.7	4.4	22
m,p-Xylene	1.2	4.8	5.1	21
o-Xylene	1.2	1.6	5.1	6.8
TPH ref. to Gasoline (MW=100)	58	10000	240	42000

Client Sample ID: SV-2-V-N-5-20140826

Lab ID#: 1408428A-03A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	1.2	3.4	3.8	11
Ethyl Benzene	1.2	6.4	5.2	28
Toluene	1.2	33	4.5	130
m,p-Xylene	1.2	24	5.2	100
o-Xylene	1.2	6.4	5.2	28
Methyl tert-butyl ether	1.2	1.8	4.3	6.4
TPH ref. to Gasoline (MW=100)	60	370	240	1500

Client Sample ID: EB-V-N-20140827

Lab ID#: 1408428A-04A

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

Client Sample ID: EB-V-N-20140827

Lab ID#: 1408428A-04A

No Detections Were Found.

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Client Sample ID: SV-1-V-N-5-20140826

Lab ID#: 1408428A-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3082921**	**Date of Collection: 8/26/14 12:19:00 PM**	
Dil. Factor:	**2.33**	**Date of Analysis: 8/30/14 12:27 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	1.2	1.8	3.7	5.9
Ethyl Benzene	1.2	1.3	5.0	5.6
Toluene	1.2	5.1	4.4	19
m,p-Xylene	1.2	4.2	5.0	18
o-Xylene	1.2	1.5	5.0	6.5
Methyl tert-butyl ether	1.2	Not Detected	4.2	Not Detected
Naphthalene	4.7	Not Detected	24	Not Detected
TPH ref. to Gasoline (MW=100)	58	10000	240	42000

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	127	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	100	70-130

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Client Sample ID: SV-1-V-Y-5-20140826

Lab ID#: 1408428A-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3082920**	**Date of Collection: 8/26/14 12:19:00 PM**	
Dil. Factor:	**2.34**	**Date of Analysis: 8/29/14 11:59 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	1.2	1.9	3.7	6.1
Ethyl Benzene	1.2	1.5	5.1	6.7
Toluene	1.2	5.7	4.4	22
m,p-Xylene	1.2	4.8	5.1	21
o-Xylene	1.2	1.6	5.1	6.8
Methyl tert-butyl ether	1.2	Not Detected	4.2	Not Detected
Naphthalene	4.7	Not Detected	24	Not Detected
TPH ref. to Gasoline (MW=100)	58	10000	240	42000

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

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	136 Q	70-130
Toluene-d8	99	70-130
4-Bromofluorobenzene	98	70-130

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Client Sample ID: SV-2-V-N-5-20140826

Lab ID#: 1408428A-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3082919**	**Date of Collection:**	**8/26/14 1:10:00 PM**
Dil. Factor:	**2.38**	**Date of Analysis:**	**8/29/14 11:32 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	1.2	3.4	3.8	11
Ethyl Benzene	1.2	6.4	5.2	28
Toluene	1.2	33	4.5	130
m,p-Xylene	1.2	24	5.2	100
o-Xylene	1.2	6.4	5.2	28
Methyl tert-butyl ether	1.2	1.8	4.3	6.4
Naphthalene	4.8	Not Detected	25	Not Detected
TPH ref. to Gasoline (MW=100)	60	370	240	1500

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	122	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	98	70-130

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Client Sample ID: EB-V-N-20140827

Lab ID#: 1408428A-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3082918**	**Date of Collection:**	**8/27/14 10:02:00 AM**
Dil. Factor:	**2.24**	**Date of Analysis:**	**8/29/14 11:04 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	1.1	Not Detected	3.6	Not Detected
Ethyl Benzene	1.1	Not Detected	4.9	Not Detected
Toluene	1.1	Not Detected	4.2	Not Detected
m,p-Xylene	1.1	Not Detected	4.9	Not Detected
o-Xylene	1.1	Not Detected	4.9	Not Detected
Methyl tert-butyl ether	1.1	Not Detected	4.0	Not Detected
Naphthalene	4.5	Not Detected	23	Not Detected
TPH ref. to Gasoline (MW=100)	56	Not Detected	230	Not Detected

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

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	113	70-130
Toluene-d8	97	70-130
4-Bromofluorobenzene	98	70-130

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Client Sample ID: Lab Blank

Lab ID#: 1408428A-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3082908**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/29/14 01:53 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	116	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	94	70-130

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Client Sample ID: CCV

Lab ID#: 1408428A-06A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3082903**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/29/14 10:59 AM**	

Compound	%Recovery
Benzene	91
Ethyl Benzene	94
Toluene	89
m,p-Xylene	94
o-Xylene	91
Methyl tert-butyl ether	89
Naphthalene	80
TPH ref. to Gasoline (MW=100)	100

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	115	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	102	70-130

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Client Sample ID: LCS

Lab ID#: 1408428A-07A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3082904**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/29/14 11:25 AM**	

Compound	%Recovery	Method Limits
Benzene	86	70-130
Ethyl Benzene	86	70-130
Toluene	83	70-130
m,p-Xylene	90	70-130
o-Xylene	85	70-130
Methyl tert-butyl ether	88	70-130
Naphthalene	87	60-140
TPH ref. to Gasoline (MW=100)	Not Spiked	

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	119	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	102	70-130

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Client Sample ID: LCSD

Lab ID#: 1408428A-07AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3082905**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/29/14 11:50 AM**	

Compound	%Recovery	Method Limits
Benzene	85	70-130
Ethyl Benzene	86	70-130
Toluene	82	70-130
m,p-Xylene	88	70-130
o-Xylene	82	70-130
Methyl tert-butyl ether	86	70-130
Naphthalene	89	60-140
TPH ref. to Gasoline (MW=100)	Not Spiked	

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	111	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	101	70-130

Appendix C

Boring Logs and Well Construction Diagrams

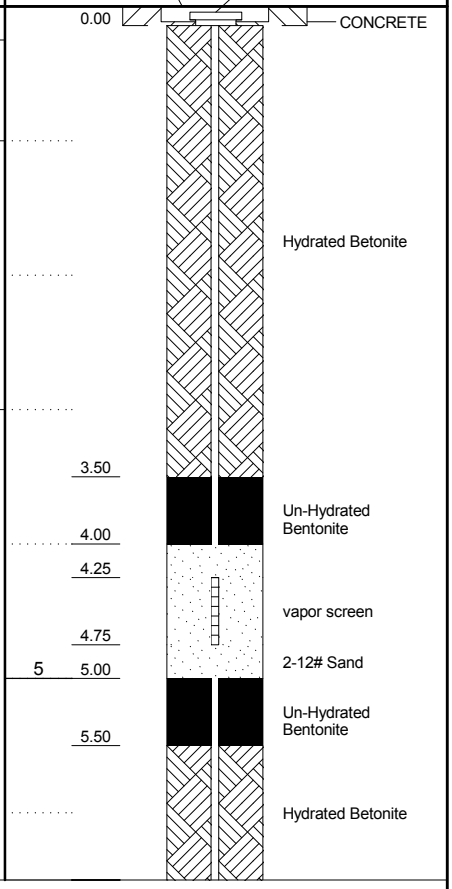
AECOM

AECOM
10461 Old Placerville Road
Sacramento, CA 95827
(916) 361-6400
www.aecom.com

Client: Chevron		**Boring No. SV-1**
Project Number: 60318102 351812		
Site Description/Location: 18950 Lake Chabot Road, Castro Valley, CA		*Project Manager:* Jim Harms
Coordinates: Not Surveyed	*Elevation:* *Datum:*	*Sheet:* 1 *of* 1
Drilling Equipment/Method: Hand Auger		*Well Installed:* No
Sample Type(s): Grab	*Boring Diameter:* 3 IN.	*Screened Interval:* 4.25 - 4.75 feet bgs
Approved By: Jessica Law	*Logged By:* Jim Harms *Date/Time Started:* 08-20-14	*Depth of Boring:* 6.5 ft bgs
Drilling Contractor: Confluence / Jesus Morales	*Backfill:* *Date/Time Finished:* 08-20-14	*Water Level:* Not Encountered

Depth (ft)	Sample ID	Sample Depth (ft)	Sample Time	Recovery (ft)	Blow Counts/PSI	PID Reading (ppm)	USCS	Graphic Log	Soil Boundary (ft bgs)	Visual Description Soil Type (USCS Class) - [gr%,sd%,st%,cl%]
									0.3	Asphalt.
									1.0	SILTY GRAVEL Fill.
							ML		3.0	SILT (ML) - [5,5,90,0] dark brown (7.5YR 3/2); dry; very stiff; fine sand; fine gravel no odor.
						0.2				SILTY WITH GRAVEL (ML) - [15,0,80,5] brown (7.5YR 5/3); dry; stiff; non-plastic; subangular; fine gravel no odor.
5	SV-1-S-N-5-20140820			0.5		1.6	ML			
	SV-1-S-N-6.5-20140820			0.5		3.4			6.5	

Geologist terminated boring due to refusal.



Notes:

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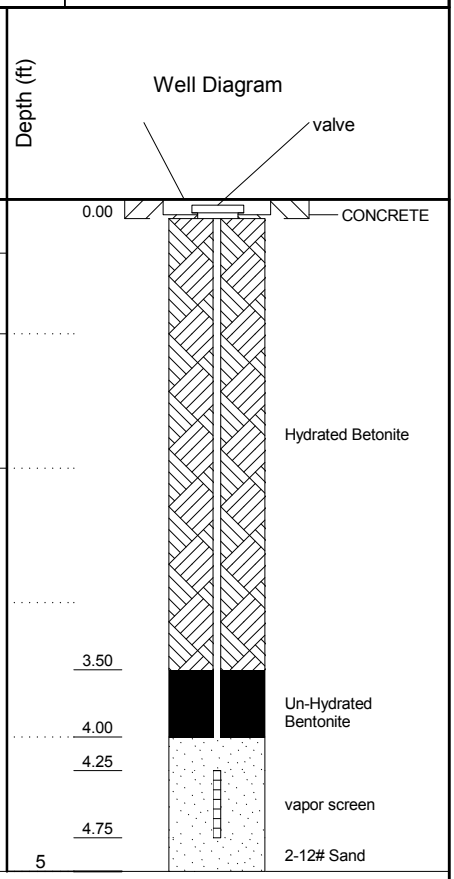
Client: Chevron		**Boring No. SV-2**
Project Number: 60318102 351812		
Site Description/Location: 18950 Lake Chabot Road, Castro Valley, CA		*Project Manager:* Jim Harms
Coordinates: Not Surveyed	*Elevation:* *Datum:*	*Sheet:* 1 *of* 1
Drilling Equipment/Method: Hand Auger		*Well Installed:* No
Sample Type(s): Grab	*Boring Diameter:* 3 IN.	*Screened Interval:* 4.25 - 4.75 feet bgs
Approved By: Jessica Law	*Logged By:* Jim Harms *Date/Time Started:* 08-20-14	*Depth of Boring:* 5 ft bgs
Drilling Contractor: Confluence / Jesus Morales	*Backfill:* *Date/Time Finished:* 08-20-14	*Water Level:* Not Encountered

Depth (ft)	Sample ID	Sample Depth (ft)	Sample Time	Recovery (ft)	Blow Counts/PSI	PID Reading (ppm)	USCS	Graphic Log	Soil Boundary (ft bgs)	Visual Description Soil Type (USCS Class) - [gr%,sd%,st%,cl%]
									0.4	Asphalt.
									1.0	SILTY GRAVEL dry; Fill.
							ML		2.0	SILT WITH CLAY (ML) - [0,0,80,20] dark brown (7.5YR 3/2); dry; very stiff; non-plastic; no odor.
						7.8	ML			SILT WITH GRAVEL (ML) - [25,0,75,0] brown (7.5YR 5/3); dry; stiff; subangular; fine to coarse gravel no odor.
5	SV-2-S-N-5-20140820			0.5		1.8			5.0	

Geologist terminated boring due to refusal.



Notes:

Appendix D

Soil Vapor Sampling Field Sheets

Field Data Sheet: Soil Gas Sample Collection with He Tracer Gas

AECOM
2020 L Street
Sacramento, CA 95811

Project No.: 351812 | Date: 8/26/14
Client: Chevron
Site Location: 18950 Lake Chabot Rd, Castro Valley
Field Personnel: Jim Harms
Canister Size: 1 liter
Weather: 70° Clear
Page 1 of 1

Sample Data	Sample ID	SV-1-5	SV-1-5 Dup				
	Sample Depth (Ft)	5'	5'				
	Canister Serial No.:	33394	33394				
	Flow Controller No.:	20913	30477				
	Sample Train Length (Ft)	5'	—				
1-Min Shut-In Test	Time Shut-In Test Begins	1130	1138				
	Initial Vacuum Gauge Reading (inches Hg)	-26.5	-25.5				
	Time Shut-In Test Ends:	1131	1148				
	Vacuum Gauge Reading (in. Hg):	-18	-25.5				
Purge Data	Purge Vol. Factor: 1 (3) or 10 (choose one)	10·7.2 = 1.5·1370·.5 =	22 1043 = 1115×3 = 3345				
	Calculated Purge Vol.* and Purge Rate	3345 @ 166					
	Calculated Duration of Purge:	20.15 min	20m 15s				
	Time at Beginning of Purge:	1149					
	Time at End of Purge:	1209					
	Actual Duration of Purge:	20m 10s					
	Vacuum Reading During Purging	-27 to -14					
	Perform Leak Test						
Sample Collection and Tracer Gas Monitoring	Initial Canister Vacuum (in. Hg):	-30	-30				
	Time Canister Valve Opened:	1210	1210				
	Helium Concentration (%) - Initial	26.9					
	1 min.	26.3					
	3 min.	26.1					
	5 min.	26.1					
	7m.n	25.8					
	9m.n	25.7					
	Time Canister Valve Closed	1219	1219				
	Final Canister Vacuum (in. Hg)	-3.5	-4.0				
	Comments:						

notes: Purge Vol Multipliers mL/foot (ID/Bore): 1/8"=2.4, 1/4"=7.2, 1"=154, 2"=618, 3"=1,390, 4"=2,471
Average sand pack porosity = 50%

Sample Type: SG=Soil Gas; SS=Sub-Slab; IA=Indoor Air; OA=Outdoor Air; D=Duplicate

Field Data Sheet: Soil Gas Sample Collection with He Tracer Gas

AECOM

2020 L Street
Sacramento, CA 95811

Project No.: 351812 | Date: 5/26/14

Client: Chevron

Site Location: 18950 Lake Chabot Rd, Castro Valley

Field Personnel: Jim Herms

Canister Size: 1 liter

Weather: 70° clear

Page 1 of 1

Section	Field					
Sample Data	Sample ID	SV-2-5				
	Sample Depth (Ft)	5'				
	Canister Serial No.:	8001				
	Flow Controller No.:	30511				
	Sample Train Length (Ft)	4				
1-Min Shut-In Test	Time Shut-In Test Begins	1227				
	Initial Vacuum Gauge Reading (inches Hg)	-28.5				
	Time Shut-In Test Ends:	1237				
	Vacuum Gauge Reading (in. Hg):	-28.5				
Purge Data	Purge Vol. Factor: 1, (3) or 10 (choose one)	3				
	Calculated Purge Vol.* and Purge Rate	4 · ~~2.25~~ 5.5 = ~~65~~ 4.75 5n 1.5 · 1390 · 0.5 = 1043 = ~~1408~~ 1093 × 3 = ~~3324~~ 3279 JH				
	Calculated Duration of Purge:	~~20.02 m~~ JH 19.75 m (45 s)				
	Time at Beginning of Purge:	1238				
	Time at End of Purge:	1258				
	Actual Duration of Purge:	20 m				
	Vacuum Reading During Purging	-28.5 to -18.5				
	Perform Leak Test					
Sample Collection and Tracer Gas Monitoring	Initial Canister Vacuum (in. Hg):	-27				
	Time Canister Valve Opened:	1259				
	Helium Concentration (%) - Initial	49.7				
	1 min.	47.9				
	3 min.	46.7				
	5 min.	44.8				
	7 min	42.5				
	9 min	40.5				
	11 min	39.9				
	Time Canister Valve Closed	1310				
	Final Canister Vacuum (in. Hg)	-4.5				
	Comments:					

notes: Purge Vol Multipliers mL/foot (ID/Bore): 1/8"=2.4, 1/4"=7.2, 1"=154, 2"=618, 3"=1,390, 4"=2,471
Average sand pack porosity = 50%.

Sample Type: SG=Soil Gas; SS=Sub-Slab; IA=Indoor Air; OA=Outdoor Air; D=Duplicate

Field Data Sheet: Soil Gas Sample Collection with He Tracer Gas

AECOM
2020 L Street
Sacramento, CA 95811

Project No.: 351812 | Date: 8-26-14
Client: Chevron
Site Location: 18950 Lake Chabot Rd, Castro Valley
Field Personnel: Jim Harms
Canister Size: 1 liter | Weather:

Page 1 of 1

Sample Data	Sample ID	EB					
	Sample Depth (Ft)	—					
	Canister Serial No.:	37380					
	Flow Controller No.:	20261					
	Sample Train Length (Ft)	2'					
1-Min Shut-In Test	Time Shut-In Test Begins	0946					
	Initial Vacuum Gauge Reading (inches Hg)	-20.5					
	Time Shut-In Test Ends:	0956					
	Vacuum Gauge Reading (in. Hg):	-20.5					
Purge Data	Purge Vol. Factor: 1, 3, or 10 (choose one)	3					
	Calculated Purge Vol.* and Purge Rate	2x5.5 = 11.					
	Calculated Duration of Purge:	4sec					
	Time at Beginning of Purge:	0957					
	Time at End of Purge:	0957					
	Actual Duration of Purge:	4sec					
	Vacuum Reading During Purging	-20.5					
	Perform Leak Test						
Sample Collection and Tracer Gas Monitoring	Initial Canister Vacuum (in. Hg):	-30					
	Time Canister Valve Opened:	0957					
	Helium Concentration (%) - Initial	NA					
	1 min.						
	3 min.						
	5 min.						
	Time Canister Valve Closed	1002					
	Final Canister Vacuum (in. Hg)	-4					
	Comments:						

notes: Purge Vol Multipliers mL/foot (ID/Bore): 1/8"=2.4, 1/4"=7.2, 1"=154, 2"=618, 3"=1,390, 4"=2,471
Average sand pack porosity = 50%.

Sample Type: SG=Soil Gas; SS=Sub-Slab; IA=Indoor Air; OA=Outdoor Air; D=Duplicate