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ENVIRONMENT

Mr. Mark Detterman
Senior Hazardous Materials Specialist, PG, CEG
Alameda County Environmental Health
1131 Harbor Bay Parkway
Alameda, California 94502

Subject:
Site Investigation Report
Former ARCO Service Station No. 4931
731 West MacArthur Boulevard
Oakland, California 94609

Date:
June 26, 2015

Contact:
Hollis Phillips

Phone:
415.432.6903

Email:
hollis.phillips@arcadis-us.com

Our ref:
GP09BPNA.C110.C0000

Dear Mr. Detterman:

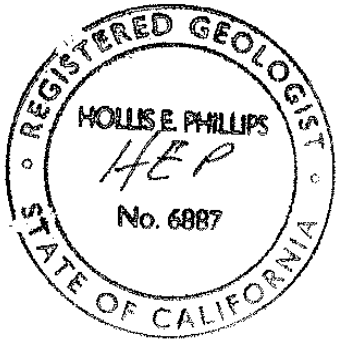
ARCADIS U.S., Inc. (ARCADIS) has prepared this report on behalf of the Atlantic Richfield Company, a BP affiliated company (ARCO), for the former ARCO service station listed below.

ARCO Facility No.	ACEH Site No.	Location
4931	RO0000076	731 West MacArthur Boulevard Oakland, California

I declare, to the best of my knowledge at the present time, that the information and/or recommendations contained in the attached document are true and correct. If you have any questions or comments regarding the content of this report, please contact Hollis Phillips by telephone at 415.432.6903 or by e-mail at hollis.phillips@arcadis-us.com.

Sincerely,

ARCADIS U.S., Inc.



Hollis E. Phillips, P.G. (No. 6887)
Principal Geologist/Project Manager

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Imagine the result

Atlantic Richfield Company,
a BP affiliated company

Site Investigation Report

Former ARCO Service Station No. 4931
731 W. MacArthur Boulevard
Oakland, California 94609
ACEH Site No.: RO0000076

June 26, 2015

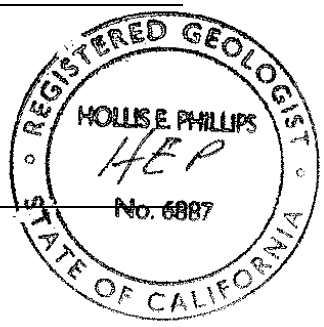
ARCADIS

Site Investigation Report

Former ARCO Service Station
No. 4931
731 West MacArthur Boulevard,
Oakland, California
ACEH Site No.: RO0000076

Jamey Peterson
Project Geologist

Hollis E. Phillips, P.G. (No. 6887)
Principal Geologist/Project Manager



Prepared for:
BP Remediation Management,
a BP affiliated company

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Our Ref.:
GP09BPNA.C110.C0000

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ARCADIS

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1. Introduction

ARCADIS U.S., Inc. (ARCADIS) prepared this Site Investigation Report for the former Atlantic Richfield Company (ARCO) service station No. 4931 located at 731 W. MacArthur Boulevard in Oakland, California ("the Site"; Figure 1). This Site Investigation Report was prepared in response to the Alameda County Environmental Health (ACEH) letter dated October 13, 2014, which recommended that additional site investigation be conducted to generate data that can be used to address ACEH's technical comments (ACEH 2014). A *Response to Comments to Work Plan for Additional Site Investigation* (work plan) was submitted to ACEH on December 22, 2014 (ARCADIS 2014). ACEH sent ARCADIS a Conditional Work Plan Approval letter dated February 11, 2015, which contained technical comments regarding the specific Work Plan Modifications necessary for permit approval (ACEH 2015). The technical comments were included in the work.

2. Background

2.1 Site Location and Description

The Site is located at the southeastern corner of the intersection of West MacArthur Boulevard and West Street in Oakland, California. Currently, the Site is an active Westco Gasoline-branded retail fuel dispensing facility. Site features include a service station building, three dispenser islands, and four 10,000-gallon doubled-wall fiberglass gasoline underground storage tanks (USTs; Figure 2). With the exception of landscaped planters along portions of the property boundary and the station building, the Site is covered with asphalt and/or concrete.

Commercial and residential properties surround the Site. The Site is bound by West MacArthur Boulevard to the north-northeast and West Street to the west-northwest. Residential dwellings are located adjacent to the Site along the southern and eastern property boundaries. An automotive repair facility known as Auto Mechs and residential dwellings are located directly west and southwest of the Site beyond West Street. A Big-O Tires-branded service center is located on the northwestern corner of the intersection of West MacArthur Boulevard and West Street. An oil change service center known as Insta Lube is located on the northeastern corner of the intersection of West MacArthur Boulevard and West Street. Interstate 580 is located approximately 600 feet south-southwest of the Site, and Highway 24 is located approximately 1,000 feet east of the Site (Figure 1).

As shown on Figure 2, the Site and vicinity currently have 15 groundwater monitoring wells (A-2 through A-13 and AR-1 through AR-3), one soil vapor extraction well (AV-1), six soil vapor monitoring probes (SV-1 through SV-6), and three sub-slab vapor probes (SS-SV-1 through SS-SV-3). Available records indicate that the groundwater monitoring wells are screened at depths ranging from 5 to 40 feet below ground surface (bgs).

2.2 Regional Geology and Hydrogeology

According to the *East Bay Plain Groundwater Basin Beneficial Use Evaluation Report,* the Site is located within the Oakland Sub-Area of the East Bay Plain of the San Francisco Basin (California Regional Water Quality Control Board, San Francisco Bay Region [SF-RWQCB] 1999). The Oakland Sub-Area contains a sequence of alluvial fans. The alluvial fill thickness ranges from 300 to 700 feet bgs.

There are no well-defined aquitards such as estuarine muds. The largest and deepest wells in this sub-area historically pumped one to two million gallons per day from depths greater than 200 feet. Overall, sustainable yields are low due in part to low recharge potential. The Merritt Sand in West Oakland was an important part of the early water supply for the City of Oakland. It is shallow (up to 60 feet), but, before the turn of the last century, septic systems contaminated the water supply wells (SF-RWQCB 1999).

Throughout most of the Alameda County portion of the East Bay Plain, from Hayward north to Albany, water level contours show that the general direction of groundwater flow is from east to west or from the Hayward Fault to the San Francisco Bay. Groundwater flow direction generally correlates to topography. Flow direction and velocity are also influenced by buried stream channels that typically are oriented in an east to west direction. Historical groundwater flow direction at the Site has been predominantly toward the west or west-southwest. The nearest natural drainage is Glen Echo Creek, located approximately 4,600 feet southeast of the Site. However, this creek is predominantly an underground culvert with only a few exposed, non-culverted sections. Glen Echo Creek flows generally northeast to southwest into Lake Merritt.

2.3 Geology and Hydrogeology

The Site is approximately 60 feet above mean sea level (msl) and gently slopes toward the west. A nearly continuous clay layer (clay, clayey sand, and gravelly clay) extends

from the surface to approximately 16.5 to 20 feet bgs. The clay layer is typically underlain by an approximately 4-foot-thick intermittent sand/gravel layer that has been encountered between 18 and 23 feet bgs.

Groundwater is first encountered during drilling events between approximately 20 and 25 feet bgs and roughly correlates to the intermittent sand/gravel layer that underlies the clay layer. Boring logs from the most recent site investigation are available in Appendix A. Historical boring logs are available in Appendix C of the *ACEH Low Threat Closure Policy Checklist and Site Conceptual Model* (ARCADIS 2013).

Since 2000, groundwater elevation at the Site has historically ranged from 42.37 to 57.76 feet above msl. Depth to water (DTW) recordings have ranged in site monitoring wells from 1.82 feet below top of casing (btoc) at groundwater monitoring well AR-2 on February 28, 2008 to 12.11 feet btoc at groundwater monitoring well A-2 on August 28, 2014. The average site DTW since 2000 is approximately 8 feet btoc. DTW during the most recent groundwater monitoring event on February 27, 2015 ranged from 4.41 feet btoc at A-2 to 8.09 feet btoc at wells A-10 and A-12. The more permeable fill material at AR-2 likely facilitates the observed shallower DTW readings and corresponding higher groundwater elevations, compared to DTW and groundwater elevation recordings at nearby monitoring wells A-2 and A-3.

Groundwater flow at the Site has been predominantly to the west measured during 49 monitoring events conducted between the Second Quarter of 2000 and the First Quarter of 2015. Groundwater flow during the groundwater monitoring for the Fourth Quarter 2014 and First Quarter 2015 was to the southwest at an approximate gradient of 0.02 foot per foot (ft/ft).

2.4 Summary of Past Investigations

Previous investigation information and site history can be found in Appendix A of the *Fourth Quarter 2014 and First Quarter 2015 Semi-Annual Groundwater Monitoring Report,* dated April 16, 2015 (ARCADIS 2015).

2.5 Summary of ACEH Directives

In its October 13, 2014 letter, ACEH summarized data gaps that it contends persist at the Site and must be understood in order to provide a complete site conceptual model and to facilitate the evaluation of site conditions relevant to the State Water Resources Control Board (SWRCB) *Low-Threat Underground Storage Tank Case Closure Policy*

(LTC Policy) adopted by the SWRCB on May 1, 2012 (SWRCB 2012b) and effective on August 17, 2012. In its October 13, 2014 letter (ACEH 2014), ACEH recommended the following be evaluated at the Site:

- Downgradient Extent of Groundwater Plume;
- Groundwater Plume Stability;
- Declining Groundwater Concentrations;
- Distance to Nearest Well;
- Neighborhood Sensitive Receptors;
- Soil Vapor Concentrations Proximal to Upgradient Residential Property Line; and
- Addition of groundwater monitoring wells AR-1, AR-2, and AR-3 to the groundwater sampling program.

3. Objectives

The primary objective of the site investigation activities was to further characterize the soil, groundwater, and soil vapor at the Site, and evaluate if the Site qualifies for low-threat closure in accordance with the LTC Policy.

4. Field Investigation

4.1 Pre-Field Activities

As required by the Occupational Safety and Health Administration (OSHA) 29 Code of Federal Regulations (CFR) 1910.120 (Hazardous Waste Operations and Emergency Responses), ARCADIS prepared a site-specific Environmental Health and Safety Plan addressing the health and safety issues related to field activities conducted at the Site.

All necessary permits and licenses were obtained prior to the initiation of the subsurface investigation, including drilling permit numbers W2015-0406 to W2015-0407 from the Alameda County Public Works Agency (ACPWA). Additionally, an excavation permit was obtained from the City of Oakland (permit #X1500469) for work conducted in West Street, a City of Oakland right-of-way. Access agreements were in place with the current property owner prior to field mobilization.

ARCADIS personnel marked the boring location using white paint and obtained Underground Service Alert (USA-North) ticket numbers 0215053 and 0215059, which were posted on May 8, 2015. On May 6, 2015, a private third-party utility locator, Cruz Brothers Locators of Soquel, California, screened the proposed locations to determine the location(s) of nearby underground utilities.

4.2 Field Activities

4.2.1 Soil Borings

Site investigation activities were conducted from May12 through May 15, 2015. On May 12, 2015, ARCADIS supervised the installation of soil vapor probes SV-7 and SV-8, and advancement of off-site soil boring SB-7. Statewide Traffic Safety and Signs of Sacramento, California, provided traffic control during off-site drilling activities at SB-7.

A Pacific Gas and Electric Company (PG&E) supervisor arrived on site and requested that ARCADIS advance SB-7 in the sidewalk bordering West Street to remain a safe distance from a 115 kilovolt (Kv) underground transmission line located in the parking lane. Gregg Drilling & Testing, Inc., of Martinez, California (Gregg) used a hand auger to remove soil to a depth of approximately 6 feet 2 inches bgs in an effort to minimize the potential for damage to subsurface utilities. A MARL Technologies M2.5 truck-mounted direct-push rig operated by Gregg was used to advance the soil borings from 6 feet 2 inches bgs to approximately 23 feet bgs, the total depth of the borehole. Soil samples were collected continuously in 4-foot sections using acetate sleeves that were placed inside the 1.5-inch-diameter macrocore barrel.

Soil was logged by an ARCADIS field geologist in accordance with the Unified Soil Classification System (USCS) protocol. Soil samples were field-screened for volatile organic compounds (VOCs) with a photoionization detector (PID). Wet formation materials indicating groundwater levels were observed at approximately 22 feet bgs during advancement of SB-7. The boring logs are included in Appendix A.

4.2.1.1 Soil Sampling and Laboratory Analysis

Three soil samples were collected from SB-7 for analytical testing at the following depth intervals: 4.5 to 5.0 feet bgs, 9.5 to 10.0 feet bgs, and 22.5 to 23 feet bgs. Samples designated for laboratory analysis were collected in direct-push acetate liners in an effort to collect relatively undisturbed soil samples.

Soil samples were retained in the acetate sleeves in 6-inch sections that were cut and then sealed on both ends using Teflon liners and caps. The soil samples were labeled, placed on ice, and transported to TestAmerica Laboratories of Pleasanton, California (TestAmerica) under chain-of-custody protocol.

Soil samples were submitted for the following analyses:

- Gasoline range organics (GRO) by United States Environmental Protection Agency (EPA) Method 8260B.
- Benzene, toluene, ethylbenzene, and total xylenes (collectively BTEX) by EPA Method 8260B.
- Diisopropyl ether (DIPE), ethyl tert-butyl ether (ETBE), methyl tert-butyl ether (MTBE), tert-amyl-methyl ether (TAME), tert-butyl alcohol (TBA), 1,2-dichloroethane (1,2-DCA), 1,2-dibromoethane (EDB), and ethanol by EPA Method 8260B.
- Naphthalene by EPA Method 8260B.

4.2.1.2 Grab-Groundwater Sample Collection

Following the completion of the borehole, a grab groundwater sample was collected by placing a 1-inch-diameter polyvinyl chloride (PVC) casing with a 5-foot screened interval of 0.010-inch slotted PVC set from 18 feet to 23 feet bgs. Blank PVC riser pipe was connected to the PVC screen to facilitate sample collection at the surface. Prior to grab groundwater sample collection, the static water level was 8.04 feet bgs.

Approximately 6.5 liters of water were purged from the well before sampling. The grab groundwater sample was collected from the screened interval, sealed, labeled, and placed in an ice-chilled cooler for delivery to TestAmerica under proper chain-of-custody protocol. Grab groundwater samples were analyzed for the following:

- GRO by EPA Method 8260B.
- BTEX by EPA Method 8260B.
- DIPE, ETBE, MTBE, TAME, TBA, 1,2-DCA, EDB, and ethanol by EPA Method 8260B.

4.2.2 Soil Boring Abandonment

Upon completion of grab groundwater sampling activities, the boring was abandoned in accordance with the ACPWA requirements. PVC casing was removed, and the boring was grouted through a tremie pipe from the total depth to ground surface using neat cement (composed of one sack [94 pounds] of Portland Type II/V and approximately 6 gallons of water). The ground surface was restored to its existing condition using concrete, as required by the City of Oakland.

4.2.3 Soil Vapor Assessment

At the request of ACEH, ARCADIS installed two soil vapor probes (SV-7 and SV-8) along the eastern property boundary of the Site in order to assess the potential for off-site migration of soil vapor to the nearby upgradient residential property (ACEH 2014). The installation and sampling were completed in accordance with the *Advisory - Active Soil Gas Investigations* guidance (Soil Gas Advisory; Department of Toxic Substances Control [DTSC] 2012). The soil vapor probe locations are shown on Figure 2.

In its directive letter dated February 11, 2015, ACEH requested the soil vapor probes be installed at a depth 5 feet below the adjacent residential foundations, which appear to include half basements. However, based on the historical DTW measured at nearby groundwater monitoring well A-2 between first quarter 2010 and first quarter 2014, DTW has ranged from 2.89 to 12.11 feet btoc with DTW greater than 5.3 feet btoc during eight of those 12 monitoring events (ARCADIS 2015). Therefore, the soil vapor probes were installed to 5 feet bgs to avoid being submerged in groundwater, which was originally proposed in the work plan (ARCADIS 2014).

4.2.3.1 Soil Boring and Sampling

Soil borings for the installation of SV-7 and SV-8 were advanced using a hand auger to a total depth of 5 feet bgs. Soil from SV-7 and SV-8 was logged as described in Section 4.2.1. The boring logs are included in Appendix A.

Soil samples were collected at SV-7 and SV-8 from 2.5 to 3 feet bgs and 4.5 to 5.0 feet bgs for laboratory analysis. Samples were collected directly inside a brass sleeve through a hand auger, capped, and placed in an ice-chilled cooler for delivery to TestAmerica, under proper chain-of-custody protocol. Soil samples were submitted for the following analyses:

- GRO using USEPA Method 8260B

An additional soil sample was collected at SV-7 from 4 to 4.5 feet bgs for geotechnical analysis. The geotechnical sample was analyzed in the event a geotechnical vapor transport model may be useful for better understanding soil vapor conditions beneath the Site. Since a model of that nature is not required at this time, the laboratory results will not be included in this report. The geotechnical soil sample was analyzed for site-specific physical properties, such as soil dry bulk density, grain density, and soil moisture content, and soil grain size distribution to interpret the moisture content data and soil type.

The following California Environmental Protection Agency-recommended analytical methods were used for these parameters (DTSC 2011):

- Dry bulk soil density by ASTM International (ASTM) D2937;
- Grain density by ASTM D854;
- Soil moisture by ASTM D2216; and
- Grain size distribution (Sieve Method) by ASTM D422.

Results from grain density and dry bulk soil density are available to calculate total soil porosity if it is required in the future.

4.2.3.2 Soil Vapor Probe Installation

Once the target depth was reached, a 6-inch-long stainless steel soil vapor screen was set in a 1-foot interval of standard sand pack, allowing approximately 3 inches of sand above and below the screen. Teflon tubing was connected to the soil vapor screen and capped with a vapor-tight 2-way valve and cap at the surface to eliminate the potential for barometric pressure fluctuations to induce vapor transport between the subsurface and the atmosphere. The 2-way valve and cap were installed in the closed position to allow equilibration of soil vapor concentrations to commence immediately after installation. A 1-foot interval of dry granular bentonite was placed above the sand pack followed by hydrated granular bentonite to approximately 1.0 foot bgs. The boreholes were completed to grade with 12 inches of concrete and a flush-mounted, traffic-rated well box.

4.2.3.3 Soil Vapor Sampling

Due to the introduction of atmospheric oxygen into the vadose zone during soil vapor probe installation, an equilibration time was required to allow the sand pack and tubing to equilibrate with the subsurface prior to sampling. A minimum of 72 hours was allowed for equilibration following soil vapor probe installation.

Soil vapor sampling was performed using laboratory-supplied 1-liter SUMMA canisters. Using small (1-liter, or similar) SUMMA canisters is desirable to minimize the potential for breakthrough of ambient air into the samples as described in Section 3.6 of the Soil Gas Advisory (DTSC 2012). The laboratory-supplied SUMMA canisters were batch certified by the laboratory prior to field receipt. Naphthalene soil vapor samples were collected with sorbent tubes per USEPA Method TO-17 procedures.

As described in Section 4.2 of the Soil Gas Advisory, the soil vapor assembly train was tested at each probe prior to sample collection. These pre-sampling tests include shut-in, leak, and purge volume tests that are completed before soil gas samples are collected after the soil gas well has equilibrated (DTSC 2012).

4.2.3.4 Shut-in Tests

Prior to purging or sampling, a shut-in test was conducted to check for leaks in the aboveground sampling train (valves, tubing, fittings, gauges, and SUMMA canister). To conduct a shut-in test, the aboveground SUMMA canister sampling train was connected via a 3-way valve to the tubing of the soil vapor probe, and to a 'waste' SUMMA canister providing vacuum for the purge. The vacuum provided by the sampling SUMMA canister exceeded 30 inches of mercury (in. Hg), which was sustained for over 10 minutes. After the shut-in test was validated, the sampling train was not altered.

4.2.3.5 Leak Tests

A leak test was used to evaluate whether ambient air was introduced into the soil gas sample during the collection process and to determine the integrity of the sampling system. Atmospheric leakage can occur in three ways, according to the Soil Gas Advisory (DTSC 2012):

1. Advection through voids in the probe packing material and along the borehole sidewall;

2. Advection directly through the soil column; and

3. Advection through the fittings in the sampling train at the surface.

A leak test was conducted at each soil gas probe prior to collection of a soil gas sample to evaluate the integrity of the sample. As stated in the Soil Gas Advisory, introducing ambient air may result in an underestimation of actual site contaminant concentrations or, alternatively, may introduce external contaminants into samples from ambient air (DTSC 2012).

The well head and entire sampling train were placed in a sampling shroud. Commercial grade helium was used as a tracer compound for the leak test. The tracer compound was added to the airspace within the shroud and monitored for concentration stability using a helium detector. Helium concentrations were maintained at approximately 10 to 20 percent (%) for the duration of purging and sampling at each location. A helium detector was also placed inline on the purge tubing, and no helium was detected during the purge.

4.2.3.6 Purging

Purging consisted of removing approximately three volumes of stagnant soil gas from the sampling system to ensure that samples are representative of subsurface conditions (DTSC 2012). A SUMMA canister dedicated to purging activities purged each vapor probe at a flow rate of approximately 100 milliliters per minute (mL/min). A purge volume of 50 mL was calculated based on the dimensions of the internal volume of the probe and tubing.

4.2.3.7 Soil Vapor Sample Collection

Following purging, the soil vapor sample was collected using an evacuated 1-liter SUMMA canister with a laboratory-provided flow regulator (combined with a laboratory-provided soil vapor sampling manifold) set to approximately 100 mL/min. The valve on the sampling train was opened, allowing soil gas to flow into the SUMMA canisters until the vacuum gauge read approximately -5 in. Hg. Initial and final vacuum gauge readings were taken and recorded on the chain-of-custody form and on the laboratory-supplied sample labels included on each SUMMA canister. Passivated stainless steel canisters, such as SUMMA canisters, have minimal problems associated with their handling. Therefore, no additional precautions or safeguards are needed (DTSC 2012).

Additional air samples were collected using sorbent tubes, which were connected directly to the pre-purged soil vapor probe tubing, and a 60 mL sample was collected through the sorbent tube using a syringe. Following sample collection, the sorbent tubes were sealed, labeled, and placed in a chilled cooler.

The soil vapor samples and sorbent tubes were delivered under proper chain-of-custody protocol to Curtis and Thompkins Laboratories of Berkeley, California, a California Department of Public Health certified analytical laboratory. The soil gas samples were analyzed for the presence of the following constituents:

- GRO using USEPA Method TO-3
- MTBE and BTEX, using USEPA Method TO-15; and TBA as a tentatively identified compound (TIC)
- Naphthalene using USEPA Method TO-17
- Fixed gases, including oxygen, helium, carbon dioxide, and methane, using ASTM Method D1946.

4.3 Decontamination

All down-hole drilling and sampling equipment was steam-cleaned prior to deployment and following completion of each sampling location. Decontamination of non-dedicated or non-disposable field equipment was conducted using a Liquinox® solution and deionized water rinse to prevent potential cross-contamination.

4.4 Investigation-Derived Waste Disposal

Soil cuttings generated during drilling operations were placed in one 55-gallon drum and temporarily stored on site pending characterization and disposal. A composite sample of investigation-derived waste was collected for waste profiling purposes. Following the receipt of waste characterization analytical data, investigation-derived waste was transported to an appropriate disposal facility. A copy of the certificate of disposal is included as Appendix B.

4.5 Quality Assurance and Quality Control Procedures

To verify that the analytical data collected during the investigation is valid and usable, the data were evaluated using a standard quality assurance and quality control (QA/QC) program.

Field QA/QC procedures included calibration of sampling equipment (including the PID and water quality parameter meter), the use of standard chain-of-custody procedures for sample control, and written and visual documentation of field activities in daily field logs and by photograph.

The degree of laboratory accuracy and precision was established by evaluating method blanks, laboratory control samples, matrix spike samples, and surrogate quality control sample results. All comments reported by the laboratory were reviewed during this evaluation and incorporated into the summary report as necessary.

5. Soil, Grab Groundwater, and Soil Vapor Analytical Results

5.1 Soil Analytical Results

Concentrations of tested constituents were not detected above respective laboratory reporting limits in any of the soil samples collected from SB-7, SV-7, and SV-8. All laboratory reporting limits were significantly below SF-RWQCB's environmental screening levels (ESLs) for direct exposure to a commercial/industrial worker or a construction/trench worker (SF-RWQCB 2013; Tables K-2 and K-3). Additionally, reporting limits did not exceed the screening levels included in the LTC Policy for direct contact to constituents of concern (COCs) through ingestion, dermal contact with soil, or inhalation of volatile soil emissions and inhalation of particulate emissions (SWRCB 2012b).

The analytical results for the confirmation soil samples are summarized in Table 1 and depicted on Figure 3. The laboratory analytical reports and chain-of-custody documentation are provided in Appendix C.

5.2 Grab Groundwater Analytical Results

Concentrations of tested constituents were not detected above respective laboratory reporting limits in the grab groundwater sample collected from soil boring SB-7 with the exception of MTBE and TAME. MTBE was detected at 4.3 micrograms per liter (µg/L)

and TAME was detected at 1.4 µg/L. The detected concentrations of MTBE in the groundwater sample collected from soil boring SB-7 did not exceed the SF-RWQCB's Maximum Concentration Level (MCL) for drinking water (SF-RWQCB; Table F-3). These results indicate that the COC groundwater plume is defined downgradient (to the west and southwest) of the Site and in the vicinity of residential properties.

Groundwater analytical results are presented in Table 2 and Figure 4. The laboratory analytical reports and chain-of-custody documentation are provided in Appendix C.

5.3 Soil Vapor Analytical Results

A total of two soil gas samples was collected from two locations (SV-7 and SV-8), at a depth of approximately 5 feet bgs.

GRO (460 micrograms per cubic meter [µg/m^3]), benzene (13 µg/m^3), toluene (9.7 µg/m^3), and total xylenes (6.1 µg/m^3) were detected in the sample collected from SV-7. No COCs exceed the SF-RWQCB's screening levels for residential and commercial properties, or the SWRCB's LTC Policy ESLs for soil gas at commercial and residential properties at SV-7.

GRO (490,000 µg/m^3) was the only COC detected above laboratory reporting limits in the sample collected from SV-8. The GRO concentration at SV-8 exceeded the SF-RWQCB's screening levels for potential vapor intrusion at residential properties (300,000 µg/m^3). Additionally, the laboratory reporting limit for benzene (<180 µg/m^3) exceeded the SF-RWQCB's ESL and the SWRCB's LTC Policy screening levels for residential properties. All other COCs tested for at SV-8 were below laboratory reporting limits and the laboratory reporting limits were below the SF-RWQCB's ESLs and the SWRCB's LTC Policy screening levels for commercial and residential properties.

Helium was not detected in samples collected from SV-7 and SV-8. Therefore, it is expected that there were no significant leaks in the sample train during soil vapor sampling.

Soil vapor sample results are presented in Table 3 and Figure 5. The laboratory analytical reports and chain-of-custody documentation are provided in Appendix D.

6. Sensitive Receptor Survey

As noted in the report *ACEH Low Threat Closure Policy Checklist and Site Conceptual Model* (ARCADIS 2013), no water–producing wells or sensitive ecological receptors were identified within 0.5 mile of the Site. Per ACEH's request in its letter dated October 13, 2014 (ACEH 2014), ARCADIS executed an updated sensitive receptor survey with a 1,000-foot search radius around the Site for water wells (residential, municipal, industrial, etc.) and surface water bodies. Review of previous well searches for the Site and copies of available well reports from the California Department of Water Resources (DWR) and ACPWA were reviewed. The survey also included residential properties (basements, sumps, and private wells) within 500 feet of the Site. ARCADIS conducted a formal investigation of public records and distributed questionnaires to residents and owners of properties within the 500-foot search radius to identify "The potential existence of wells, groundwater pumping sumps, basements, and sensitive groups and land use" in that area. An example of the questionnaire is included as Appendix E. The findings of the sensitive receptor survey are presented below.

6.1 Parcel Survey

The assessor's parcel number of the Site is 12-965-24. The parcel's survey information is included as Assessor's Map, Page 965.

Commercial and residential properties primarily surround the Site. Three commercial vehicle repair garages are located at the northwestern, northeastern, and southwestern corners of the intersection of West MacArthur Boulevard and West Street. Four motels are located within a 500-foot radius of the Site; one is located west of the Site on West MacArthur Boulevard between Market Street and West Street, and three are located north and east of the Site along West MacArthur Boulevard between West Street and Martin Luther King Jr. Way. Three warehouses are located southeast of the Site, along 37th Street between West Street and Martin Luther King Jr. Way. A church is located southwest of the Site on 37th Street. Two one-story stores are located northwest of the Site, along Apgar Street. Single- and multiple-dwelling residential buildings comprise the majority of the remainder of the properties located within a 500-foot radius of the Site. A site map illustrating the types of properties located within a 500-foot radius of the Site is included as Figure 6.

6.2 Well, Basement, and Building Sump Survey

In May 2015, ARCADIS conducted a well survey to locate water supply wells within a 1,000-foot radius of the Site. ARCADIS obtained electronic files from the DWR for the 1,000-foot search radius. No active domestic, irrigation, industrial, or public water supply wells within the study area were identified in the data obtained from the DWR (DWR 2015). A site map showing the 1,000-foot radius around the Site is included as Figure 7.

Additionally, an Excel file containing a well completion report for all wells located within 1,000 feet of the Site was obtained from the ACPWA. No active domestic, irrigation, industrial, or public water supply wells within the study area were identified in the data obtained from the ACPWA (ACPWA 2015).

ARCADIS attempted to contact property owners within a 500-foot radius of the Site to identify the potential presence of private water wells, basements, and building sumps. On May 22, 2015, surveys with self- addressed, stamped return envelopes were sent to owners with property within the search radius. Properties within the 500-foot search radius included single-family homes and condominiums, duplexes, triplexes, fourplexes, multi-unit apartment complexes, a church, commercial repair garages, warehouses, motels, public agencies, stores, and miscellaneous commercial spaces. The majority of property owners did not respond to the initial request. On June 8, 2015, surveys were re-sent to properties that did not respond to the initial survey request.

Two inactive water wells were reported at a commercial warehouse located at 675 37th Street. The warehouse owner indicated that the two wells would be used for irrigation water at some point in the future (Barron Family Trust 2015). Four basements were reported at four separate residential properties within the 500-foot radius of the Site. One sump pump, located at 3 feet bgs, was also reported by the owner of 681 Apgar Street. Table 4 summarizes the results of the survey.

ARCADIS contacted the East Bay Municipal Utility District (EBMUD), which serves the City of Oakland, to determine if the Site is within 1,000 feet of water supply or water production wells. A Water District supervisor at EBMUD stated in a phone conversation that EBMUD does not use water supply or water production wells to supply water to the East Bay service area (EBMUD 2015b). Additionally, a water manager at the City of Oakland Public Works Agency stated that there are no drinking water wells in the City of Oakland or specifically in the vicinity of the Site (City of Oakland Public Works Agency 2015).

6.3 Surface Water

6.3.1 Glen Echo Creek

The nearest surface water body is Glen Echo Creek, which runs approximately 1.25 miles southwest from the Upper Rockridge area of Oakland, through Mountain View Cemetery, southwest along Broadway Avenue, and into Lake Merritt (Alameda County Flood Control & Water Conservation District 2011). While portions of the creek flow aboveground, most of the creek is enclosed as an underground culvert or storm drain (Alameda County Flood Control & Water Conservation District 2011). The section of Glen Echo Creek that is closest to the Site is located at West Macarthur Boulevard and Broadway Avenue, approximately 3,700 feet east (upgradient) of the Site; most of that section of creek is enclosed as an underground culvert, but a small section flows aboveground (Google Earth Pro 2015; Alameda County Flood Control & Water Conservation District 2011).

Glen Echo Creek is assigned the beneficial uses of warm freshwater habitat (WARM), wildlife habitat (WILD), water contact recreation (REC-1), and noncontact water recreation (REC-2) (SF-RWQCB 2015). These designations identify Glen Echo Creek as a water body that is potentially used by aquatic life, wildlife, and human receptors (SF-RWQCB 2015). Although the REC-1 beneficial use designation takes into account that human receptors may incidentally ingest water from the creek, a water manager at the City of Oakland Public Works Agency confirmed that Glen Echo Creek is not used as a supply of drinking water (SF-RWQCB 2015; City of Oakland Public Works Agency 2015).

6.3.2 San Francisco Bay

San Francisco Bay is approximately 1.4 miles west (downgradient) of the Site (Google Earth Pro 2015). EBMUD does not currently develop or distribute desalinated water from the San Francisco Bay; however, it has begun exploring the installation of one or more desalination plants as part of the Bay Area Regional Desalination Project (BARDP) led in conjunction with the Contra Costa Water District, San Francisco Public Utilities Commission, Santa Clara Valley Water District, and Alameda County Flood Control & Water Conservation District – Zone 7 (EBMUD 2011). Under the BARDP, one or more regional desalination plants will be established in order to supply desalinated water to the San Francisco Bay Area (EBMUD 2011). A feasibility study for the BARDP was completed in 2007 and concluded that the project was technically feasible (EBMUD 2011). A pilot study was conducted in 2009 at the East Contra Costa

site - the Mallard Slough Pump Station - and the five water districts continue to develop plans for the project (EBMUD 2011; BARDP no date).

6.4 Beneficial Uses

Existing beneficial uses of groundwater at the Site include municipal and domestic supply (Geotracker 2015). However, available resources indicate that native groundwater in the East Bay Plain Groundwater Basin is not currently used as a source of water for the EBMUD service area (EBMUD 2011; City of Oakland Public Works Agency 2015).

6.5 Local Water Supply

The City of Oakland water supply is provided by EBMUD, which acquires about 90 percent of the water that it supplies to the East Bay Area from the Mokelumne River watershed (EBMUD 2011). EBMUD's water rights allow for it to channel approximately 325 million gallons of water per day (MGD) from the Mokelumne River watershed to the East Bay service area, subject to other water use priorities and other factors (EBMUD 2011). Water from the Mokelumne River watershed that is eventually transported to Oakland is first stored in the Pardee Reservoir; it is then transported through the 65- to 87-inch-wide Mokelumne Aqueducts to the Orinda water treatment plant (WTP) in Orinda, California (EBMUD 2011, 2015a, 2015b). From the Orinda WTP, the water is transported by gravity method to the lower elevations of Oakland, including the Site (EBMUD 2015b). Water intended for use in Oakland may be stored in Oakland's Central Reservoir before use (EBMUD 2015a).

EBMUD's secondary source of drinking water is local runoff from the East Bay watersheds, which is determined by the amount of runoff present in the local watersheds as well as the available storage space in the existing water supply infrastructure (EBMUD 2011). On average, 15 to 25 MGD of local runoff is sent to the East Bay during years with normal rainfall, and virtually none is sent during drought years (EBMUD 2011).

7. Site Investigation Conclusions

From May 12 to May 15, 2015, ARCADIS conducted a site investigation that included the collection of soil, groundwater, and soil vapor samples at the Site. The purpose of the recent sampling was to collect data necessary to fill data gaps existing at the Site in order to further assess whether the Site meets the case closure criteria for the SWRCB

LTC Policy. Site data from the recent investigation are summarized in the following sections.

7.1 Soil and Groundwater

The soil and groundwater samples collected from soil boring SB-7 did not contain concentrations of any sampled constituents above their respective laboratory reporting limits with the exception of MTBE and TAME in the groundwater sample. The detected concentration of MTBE (4.3 µg/L) was below the SF-RWQCB ESL for a drinking water resource, and the concentration of TAME (1.4 µg/L) was only slightly above the laboratory reporting limit. Additionally, the soil samples collected from soil vapor probes SV-7 and SV-8 did not contain detectable concentrations of GRO above laboratory reporting limits. These results indicate that the COC-affected groundwater plume is defined and does not significantly extend downgradient from the Site beyond West Street.

7.2 Soil Vapor

The soil vapor data from SV-7 and SV-8 indicate that constituent concentrations in soil vapor in the proximity of the upgradient residential property are either non-detect or significantly below health-based screening criteria that regulatory agencies consider to be protective of human health from potential vapor intrusion exposures for residents and commercial workers with the exception of GRO, which exceeded the SF-RWQCB ESL for residential exposure at SV-8. Additionally, although benzene was not detected above the laboratory reporting limit in the soil vapor samples collected from SV-8, the laboratory reporting limit for benzene exceeds the residential exposure ESL of 42 µg/m^3. Although the GRO concentrations detected at SV-8 exceed residential exposure ESLs, they are not expected to pose a vapor intrusion risk to human receptors as there are no living quarters or occupied indoor dwellings adjacent to SV-8. The area adjacent to SV-8 on the residential property is a driveway used for parking. The nearest structure to SV-8 on the residential property is a garage, which is likely used for storage based on observations made during the site investigation. Soil vapor results at SV-7 are more likely to be representative for evaluating potential vapor intrusion to the adjacent residential dwelling as SV-7 is located approximately 15 feet from the residential building. Furthermore, SV-7 is proximal to the portion of the residential dwelling that includes a half-basement.

Additionally, the Site meets the required characteristics for a bioattenuation zone for sites with oxygen soil gas data. According to the SWRCB LTC Policy, a bioattenuation

zone is an area of soil with conditions that support biodegradation of petroleum hydrocarbon vapors. If the subsurface conditions are met according to the SWRCB LTC Policy, a bioattenuation zone will ensure that exposure to petroleum vapors in indoor air will not pose unacceptable health risks. In many petroleum release cases, potential human exposures to vapors are mitigated by bioattenuation processes as vapors migrate toward the ground surface (SWRCB 2012b). A bioattenuation zone is present beneath the Site according to *Scenario 3 - Dissolved Phase Benzene Concentrations in Groundwater, Defining the Bioattenuation Zone With Oxygen ≥ 4%* of the SWRCB LTC Policy (SWRCB 2012b):

- The detected concentration of oxygen at SV-7 was at 11%v, which is above the required 4%v (Table 3). Of the two soil vapor probes completed during the recent investigation, SV-7 is located nearest to the residential dwelling and half-basement.

- Current benzene concentrations in groundwater as measured during the most recent groundwater sampling event on February 27, 2015 are less than 1,000 µg/L (ARCADIS 2015).

- A continuous zone that provides a separation of least 5 feet vertically between the dissolved phase benzene and the foundation of existing or potential buildings is present beneath the Site as depth to groundwater in site groundwater monitoring wells over the past 2 years has averaged approximately 8 feet bgs. Moreover, although the water table may be less than 5 vertical feet below the foundation of the residential dwelling's half-basement, the dissolved phase benzene plume associated with the Site does not extend beneath the residential dwelling on the adjacent upgradient property (ARCADIS 2015). The residential dwelling's half-basement is likely completed at 3 to 5 feet bgs based on observations made during the recent site investigation.

- GRO concentrations in soil from the most recent soil sampling were not detected above respective laboratory reporting limits (<0.22 to <0.25) throughout the entire depth of the bioattenuation zone (0 to 5 feet bgs). To meet the bioattenuation zone criteria according to *Scenario 3 - Dissolved Phase Benzene Concentrations in Groundwater, Defining the Bioattenuation Zone With Oxygen ≥ 4%* of the SWRCB LTC Policy, GRO concentrations must be less than 100 milligrams per kilogram (mg/kg) throughout the entire depth of the bioattenuation zone.

Based on the soil vapor results and evaluation of potential vapor migration into current on-site commercial and off-site residential buildings, the Site satisfies the LTC Policy's Petroleum Vapor Intrusion to Indoor Air Criteria.

7.3 Sensitive Receptor Survey

ARCADIS conducted a well survey by obtaining well records from DWR and ACPWA, and through direct contact with the City of Oakland, EBMUD, and property owners within 500 feet of the Site. No active private domestic, irrigation, industrial, or public water supply wells were identified within 1,000 feet of the Site. Two inactive domestic irrigation water wells were identified approximately 500 feet to the southeast and cross-gradient from the Site. Four properties are identified as having basements, with the closest located at 3710 West Street, which is the property bordering the southern site boundary. Please note that the owner of the adjacent residential property at 721 West MacArthur Boulevard (located immediately upgradient from the Site) did not respond to the questionnaire requests.

Historical and recent groundwater sampling results from site monitoring wells suggest that existing groundwater impacts associated with the Site are not a risk to adjacent and nearby residential properties. Concentrations of site COCs above SF-RWQCB ESLs are contained on site and are generally limited to groundwater monitoring wells A-4 and A-8. Furthermore, results from recent groundwater samples (SB-7, A-11, and A-12) collected downgradient from the Site indicate residential receptors are not expected to be exposed to the site COCs as the petroleum hydrocarbon-affected groundwater plume does not extend to or beneath residential properties located in the vicinity of the Site.

The nearest surface water feature was identified as Glen Echo Creek, which is located approximately 3,700 feet to the east and upgradient from the Site. The nearest surface water body downgradient from the Site is San Francisco Bay, located approximately 1.4 miles west of the Site. Existing groundwater impacts at the Site do not present a risk to the nearest surface water bodies.

8. Site Condition Assessment Relative to the Low-Threat Closure Policy

On August 17, 2012, the LTC Policy issued by the SWRCB was adopted by the Office of Administrative Law. This policy outlines eight General Criteria to assess whether sites are candidates for low-threat case closure and three categories of Media-Specific Criteria that also must be met. Current site conditions provided herein are evaluated

against the corresponding General Criteria and Media-Specific Criteria. Based on this evaluation, ARCADIS concludes that the Site meets the General and Media-Specific Criteria requirements for low-threat case closure.

8.1 Evaluation of LTC General Criteria

This section evaluates the site conditions related to each of the eight General Criteria.

8.1.1 Criteria A – The unauthorized release is located within the service area of a public water system - YES

As stated above in Section 6.5, the City of Oakland water supply is provided by EBMUD.

8.1.2 Criteria B – The unauthorized release consists only of petroleum - YES

Soil and groundwater impacts occurred as a result of a super unleaded gasoline product leak, which was reported to have occurred at the Site in November 1982 (ARCADIS 2013). COCs at the Site include GRO, BTEX, and MTBE. Non-petroleum impacts or releases have not been documented at the Site.

8.1.3 Criteria C – The unauthorized ("primary") release from the UST system has been stopped - YES

All site USTs and associated conveyance piping were replaced between November 1991 and April 1992 (Roux Associates 1992).

8.1.4 Criteria D – Free product has been removed to the maximum extent practicable - YES

Available groundwater monitoring data indicate that measurable separate-phase hydrocarbons (SPH) were last observed at the Site in November 1994, suggesting that the petroleum system repairs/upgrades, soil excavation, remediation, and natural attenuation processes have reduced the source area mass (ARCADIS 2013).

8.1.5 Criteria E – A conceptual site model that assesses the nature, extent, and mobility of the release has been developed - YES

An updated site conceptual model that includes a comprehensive site assessment history, regional and site-specific geology and hydrogeology, review of the soil and

groundwater conditions at the Site, and evaluation of human health exposure from site-related COPCs was presented in the *ACEH Low Threat Closure Policy Checklist and Site Conceptual Model*, dated June 28, 2013 (ARCADIS 2013) and is further updated with the data presented in this document.

8.1.6 Criteria F – Secondary source has been removed to the extent practicable - YES

The LTC Policy defines a "secondary source" as petroleum-impacted soil or groundwater located at or immediately beneath the point of release from the primary source. The original unauthorized release was stopped and the causative UST was removed from the Site. Portions of the petroleum-affected soil and groundwater have been removed from the Site, which likely removed the secondary source beneath the point of release from the primary source, including:

- Between November 1991 and April 1992, approximately 1,900 cubic yards of soil were excavated as a result of the removal of the former USTs and conveyance piping and the excavation of the current UST pit (Roux Associates 1992);

- The groundwater extraction treatment system (GWETS) operated from November 1992 to July 1995 and included SPH-product and groundwater extraction. The GWETS removed approximately 4,643,696 gallons of groundwater and approximately 2.74 pounds (0.45 gallon) of GRO and 0.46 pound (0.06 gallon) of benzene during system operation. As of December 31, 1995, 23 pounds (3.75 gallons) of SPH had been removed from the Site either by the GWETS or by hand bailing (Pacific Environmental Group, Inc. 1996).

- In October 2002, an unknown volume of soil was removed during the product conveyance lines upgrades at the Site. The product lines were excavated, removed, inspected, and replaced. No observable cracks or deterioration of the former product lines were reported. The new product lines were replaced within the same trenches. Available records do not indicate the volume of soil removed during these activities (ARCADIS 2010).

8.1.7 Criteria G – Soil and groundwater have been tested for methyl tert-butyl ether and results reported in accordance with Health and Safety Code Section 25296.15 - YES

MTBE has been analyzed in groundwater samples collected from site monitoring wells since at least 2000. MTBE analysis has generally been completed by EPA Method 8260B.

8.1.8 Criteria H – Nuisance as defined by Water Code Section 13050 does not exist at the site - YES

No nuisance exists at the Site, as defined by Water Code Section 13050. Site conditions and the treatment and disposal of site wastes are not injurious to health, are not indecent or offensive to the senses, and do not obstruct free use of property or interfere with the comfortable enjoyment of life or property. Site conditions and the treatment and disposal of site wastes do not affect an entire community or neighborhood or any considerable number of persons. Site impacts are restricted to the subsurface and are present in a limited area that does not adversely affect the community at large.

8.2 Evaluation of LTC: Media-Specific Criteria

This section evaluates the site conditions related to each of the three categories of Media-Specific Criteria.

8.2.1 Groundwater

Groundwater at the Site does not currently pose a risk to existing or anticipated future beneficial uses of groundwater and meets the groundwater-specific criteria outlined in the LTC Policy (SWRCB 2012b). The LTC Policy states that “the contaminant plume that exceeds water quality objectives must be stable or decreasing in areal extent, and meet all of the additional characteristics of one of the five classes of sites.”

8.2.1.1 Plume Stability

According to the *Technical Justification for Groundwater Media-Specific Criteria* (SWRCB 2012a), plume stability can be demonstrated in two ways:

1. “Routinely observed non-detect values for groundwater parameters in down-gradient wells”
2. “Stable or decreasing concentration levels in down-gradient wells.”

To evaluate if the contaminant plume that exceeds water quality objectives is stable or decreasing in areal extent, a linear regression analysis was performed for all site groundwater monitoring wells and constituent pairs to demonstrate plume stability. Results of the linear regression were presented in the *Response to Comments to Work*

Plan for Additional Site Investigation, dated December 22, 2014, and concluded that significant attenuation of the groundwater impacts is observed at the Site.

Concentrations of GRO, benzene, MTBE, and TBA showed either declining or stable trends for all groundwater monitoring well locations, with predicted times to reach the cleanup goals between 2 and 19 years. Although no apparent trend could be derived from benzene concentrations at A-8, MTBE concentrations at A-2, and TBA concentrations at A-4, visual observations of the monitoring data indicate a stable or decreasing trend. These analyses suggested that the groundwater plumes at the Site are stable and not migrating (ARCADIS 2014).

The results of the recent site investigation activities further confirm the findings of the linear regression. Laboratory analysis of the grab groundwater sample collected from SB-7 (located downgradient from the Site, and specifically immediately downgradient from groundwater monitoring well A-8) show decreasing constituent concentrations that are consistent with the linear regression, indicating decreasing concentration trends and attenuation of groundwater impacts.

8.2.1.2 Additional Groundwater-Specific Criteria

As described in the LTC Policy (SWRCB 2012b), a site can meet the groundwater media-specific criteria through one of five main classes. This Site falls into ***Class 2*** as described in detail below.

2a. The contaminant plume that exceeds water quality objectives is less than 250 feet in length

To determine the classification of groundwater impacts, the length of the plume exceeding water quality objectives (SF-RWQCB ESLs) for each of the current site constituents of potential concern (COPCs) was measured from the most recent isoconcentration maps included on Figures 8 through 10:

- The GRO plume exceeding 100 µg/L is approximately 140 feet long.
- The benzene plume exceeding 1 µg/L is approximately 80 feet long.
- The MTBE plume exceeding 5 µg/L is approximately 175 feet long.

2b. There is no free product

Free product is not present at the Site according to historical and current results and observations. No free product has been observed in site monitoring wells since November 1994, as detailed in General Criteria (D). Free product was not observed during the recent site investigation activities (ARCADIS 2015).

2c. The nearest existing water supply well or surface water body is greater than 1,000 feet from the defined plume boundary.

As described in General Criteria (A), no active water supply wells were identified within a 0.5-mile radius of the Site.

The nearest surface water feature was identified as Glen Echo Creek, which is located approximately 3,700 feet to the east and upgradient from the Site. The nearest surface water body downgradient from the Site is San Francisco Bay, located approximately 1.4 miles west of the Site. Existing groundwater impacts at the Site do not present a risk to the nearest surface water bodies.

2d. The dissolved concentration of benzene is less than 3,000 µg/L, the dissolved concentration of MTBE is less than 1,000 µg/L.

Current benzene and MTBE concentrations are below 3,000 µg/L and 1,000 µg/L, respectively, in groundwater samples collected from site groundwater monitoring wells. The most recent results (February 2015) indicate the maximum benzene and MTBE concentrations in groundwater samples collected from groundwater monitoring wells were 70 µg/L (A-8) and 25 µg/L (AR-1), respectively (ARCADIS 2015).

8.2.2 Petroleum Vapor Intrusion to Indoor Air

As described in the LTC Policy (SWRCB 2012b), exposures to petroleum vapors associated with historical fuel system releases are comparatively insignificant relative to exposures from small surface spills and fugitive vapor releases that typically occur at active fueling facilities. Therefore, satisfaction of the media-specific criteria for petroleum vapor intrusion to indoor air is not required at active commercial petroleum facilities, except in cases where release characteristics can be reasonably believed to pose an unacceptable health risk. Because the Site is an active commercial petroleum facility, this criteria is satisfied. Moreover, as described in Sections 5.3 and 7.2, soil vapor data from SV-7 and SV-8 indicate that constituent concentrations in soil vapor at

the Site in the vicinity of the upgradient residential property are either non-detect or below health-based screening criteria that regulatory agencies consider to be protective of human health from potential vapor intrusion exposures for residents and commercial workers, with the exception of GRO at SV-8. Based on the soil vapor results, likely presence of a bioattenuation zone, and evaluation of potential vapor migration into current on-site commercial and off-site residential buildings, the Site satisfies the LTC Policy's Petroleum Vapor Intrusion to Indoor Air Criteria.

8.2.3 Direct Contact and Outdoor Air Exposure

As described in the LTC Policy (SWRCB 2012b), sites will meet the Media-Specific Criteria for direct contact with contaminated soil or inhalation of contaminants volatilized to outdoor air if:

1. The maximum concentrations of COCs in soil are less than or equal to those listed in Table 1 of the LTC Policy (SWRCB 2012b).
2. A site-specific risk assessment shows that COCs present in soil will not adversely affect human health.
3. Exposure to COCs is mitigated through engineering controls.

Site data were evaluated with respect to the Commercial/Industrial screening levels presented in *Table 1 – Concentrations of Petroleum Constituents in Soil That Will Have No Significant Risk of Adversely Affecting Human Health* of the LTC Policy (SWRCB 2012b). Utility Worker screening levels were used as necessary when evaluation was required for hypothetical receptors.

Based on an evaluation of site data, the Site qualifies as a low-threat petroleum UST site under the Direct Contact and Outdoor Air Exposure criteria. The requirements of the soil 0 to 5 feet bgs and 5 to 10 feet bgs scenarios and Volatilization to Outdoor Air scenario are fulfilled. An evaluation with respect to the LTC Policy Direct Contact and Outdoor Air Exposure Criteria is provided below.

- Because the Site is completely covered with a building and pavement, there is little or no potential for direct human contact with site soils or for off-site wind dispersion of soils. Therefore, direct contact exposure pathways (i.e., ingestion, dermal contact, and inhalation of particulates) with soils are considered incomplete or insignificant and are expected to remain the same in the future.

As shown in the table below, the Site meets the *Direct Contact and Outdoor Air Exposure* criteria as maximum concentrations of COPCs in soil are less than LTC Policy soil screening levels:

Chemical	Commercial/Industrial				Utility Worker	
	0 to 5 feet bgs mg/kg		Volatilization to outdoor air (5 to 10 feet bgs) mg/kg		0 to 10 feet bgs mg/kg	
	LTC Policy Table 1	Site Maximum	LTC Policy Table 1	Site Maximum	LTC Policy Table 1	Site Maximum
Benzene	8.2	3.1	12	1.2	14	3.1
Ethylbenzene	89	40	134	6.5	314	40
Naphthalene	45	<0.0090	45	<0.0096	219	<0.0096
PAHs	0.68	<0.0050	NA	<0.0050	4.5	<0.0050

- Note: NA = Not available; PAHs = Polycyclic aromatic hydrocarbons

Given the comparison of historical maximum constituent soil concentrations and LTC Policy screening criteria, residual concentrations of petroleum hydrocarbon constituents in soil at the Site are not expected to pose adverse health effects to current and future on-site commercial and utility workers based on volatilization to outdoor air and direct contact exposures.

9. Recommendations

ARCADIS respectfully requests that ACEH grant low-threat site closure because site conditions meet the General and Media-Specific Criteria established in the LTC Policy (SWRCB 2012); therefore, the Site poses a low threat to human health, safety, and the environment, and satisfies the case closure requirements of Health and Safety Code Section 25296.10. In addition, case closure is consistent with Resolution 92-49, which requires that cleanup goals be met within a reasonable time frame.

ARCADIS recommends that a status of no further action be granted, and the Site be granted regulatory closure. Suspension of groundwater monitoring and reporting is also recommended during the low-threat case closure evaluation process. A work plan for monitoring well destruction and decommissioning will be prepared following the case closure evaluation process and upon site closure approval from ACWD.

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Tables

Table 1. Soil Analytical Results
Former ARCO Service Station No. 4931
731 W MacArthur Blvd, Oakland, CA

Sample ID	Depth (ft bgs)	Date Sampled	GRO (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	MTBE (mg/kg)	TBA (mg/kg)	DIPE (mg/kg)	TAME (mg/kg)	ETBE (mg/kg)	Ethanol (mg/kg)	1,2 DCA (mg/kg)	EDB (mg/kg)	Naphthalene (mg/kg)
EPA Analytical Method			8260B													
SB-7	4.5-5.0	5/12/2015	<0.23	<0.0045	<0.0045	<0.0045	<0.009	<0.0045	<0.09	<0.0045	<0.0045	<0.0045	<0.90	<0.0045	<0.0045	<0.0090
	9.5-10.0		<0.24	<0.0048	<0.0048	<0.0048	<0.0096	<0.0048	<0.096	<0.0048	<0.0048	<0.0048	<0.96	<0.0048	<0.0048	<0.0096
	22.5-23.0		<0.22	<0.0043	<0.0043	<0.0043	<0.0087	<0.0043	<0.087	<0.0043	<0.0043	<0.0043	<0.87	<0.0043	<0.0043	<0.0087
SV-7	2.5-3.0	5/12/2015	<0.23	--	--	--	--	--	--	--	--	--	--	--	--	--
	4.5-5.0		<0.25	--	--	--	--	--	--	--	--	--	--	--	--	--
SV-8	2.5-3.0	5/12/2015	<0.24	--	--	--	--	--	--	--	--	--	--	--	--	--
	4.5-5.0		<0.22	--	--	--	--	--	--	--	--	--	--	--	--	--
Commercial direct exposure screening level[1] (mg/kg)			4,000	3.7	4,900	24	2,600	190	--	--	--	--	--	2.2	0.53	15
Construction worker direct exposure soil screening level[2] (mg/kg)			2,700	71	4,300	490	2,500	3,800	--	--	--	--	--	40	5.2	370
LTC Policy Commercial/Industrial [0-5 ft bgs][3] (mg/kg)			--	8.2	--	89	--	--	--	--	--	--	--	--	--	45
LTC Policy Commercial/Industrial [5-10 ft bgs][3] (mg/kg)			--	12	--	134	--	--	--	--	--	--	--	--	--	45
LTC Policy Utility Worker [0-10 ft bgs][3] (mg/kg)			--	14	--	314	--	--	--	--	--	--	--	--	--	219

Notes:

1. Commercial direct exposure soil screening level (Table K-2 Direct Exposure Soil Screening Levels Commercial/Industrial Worker Exposure Scenario, SF-RWQCB [Interim Final – December 2013]).
2. Construction worker direct exposure screen level (Table K-3 Direct Exposure Soil Screening Levels Construction/Trench Worker Exposure Scenario, SF-RWQCB [Interim Final – December 2013]).
3. State Water Resources Control Board LTC Policy, Table 1 - Concentrations of Petroleum Constituents in Soil That Will Have No Significant Risk of Adversely Affecting Human Health. Available at: http://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2012/rs2012_0016.pdf.

LTC = Low-Threat Closure
SF-RWQCB = San Francisco Bay-Regional Water Quality Control Board
EPA = Environmental Protection Agency
ft bgs = Feet below ground surface
mg/kg = Milligrams per kilogram
< = Analyte was not detected above the specified method reporting limit
-- = not sampled
Bold indicates values detected above laboratory reporting limits.

GRO = Gasoline range organics (C6-C12)
MTBE = Methyl tert-butyl ether
TBA = Tert-butyl alcohol
DIPE = Di-isopropyl ether
ETBE = Ethyl tert-butyl ether
TAME = Tert-amyl methyl ether
1,2-DCA = 1,2-Dichloroethane
EDB = 1,2-Dibromoethane

Table 2. Groundwater Analytical Results
Former ARCO Service Station No. 4931
731 W MacArthur Blvd, Oakland, CA

Sample ID	Depth (ft bgs)	Date Sampled	GRO (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	TBA (µg/L)	DIPE (µg/L)	TAME (µg/L)	ETBE (µg/L)	Ethanol (µg/L)	1,2,DCA (µg/L)	EDB (µg/L)
EPA Analytical Method			8260B												
SB-07	23	5/12/2015	<50.0	<0.50	<0.50	<0.50	<1.0	4.3	<20.0	<0.50	1.4	<0.50	<500	<0.50	<0.50
SF-RWQCB Drinking water screening levels[1]			100	1	150	300	1,800	5	12	--	--	--	--	0.5	0.05

Notes:

1. Drinking water screening levels (Table F-3 Summary of Drinking Water Screening Levels, *Final Screening Level Maximum Concentration Level(MCL) Priority* , SF-RWQCB [Interim Final – December 2013]).

SF-RWQCB = San Francisco - Regional Water Quality Control Board

EPA = Environmental Protection Agency

ft bgs= feet below ground surface

µg/L = Micrograms per liter

SB= soil boring

< = Analyte was not detected above the specified method reporting limit

-- = Not applicable, not analyzed, or not present

Bold indicates values detected above the SF_RWQCB screening levels

GRO = Gasoline range organics

MTBE = Methyl tert-butyl ether

TBA = Tert-butyl alcohol

DIPE = Di-isopropyl ether

ETBE = Ethyl tert-butyl ether

TAME = Tert-amyl methyl ether

1,2-DCA = 1,2-Dichloroethane

EDB = 1,2-Dibromoethane

Table 3. Soil Vapor Analytical Results
Former ARCO Service Station No. 4931
731 W MacArthur Blvd, Oakland, CA

Sample ID	Depth (ft bgs)	Date Sampled	GRO (µg/m^3)	Benzene (µg/m^3)	Toluene (µg/m^3)	Ethylbenzene (µg/m^3)	Total Xylenes (µg/m^3)	MTBE (µg/m^3)	TBA (µg/m^3)	Naphthalene (µg/m^3)	Helium (%v)	Carbon Dioxide (%v)	Oxygen (%v)	Methane (%v)
EPA Analytical Method			TO-3	TO-15	TO-15	TO-15	TO-15	TO-15	TO-15	TO-17	D1946			
SV-7	5	5/15/2015	460	13	9.7	<4.0	6.1	<3.3	ND (TIC)	<17	<0.19	0.25	11.0	<0.19
SV-8	5	5/15/2015	**490,000**	<180	<210	<240	<240	<200	ND (TIC)	<17	<0.19	3.4	1.3	1.4
LTC No Bioattenuation Zone Soil Gas Criteria (µg/m3) Residential[1]			--	<85	--	<1100	--	--	--	<93	--	--	--	--
LTC No Bioattenuation Zone Soil Gas Criteria (µg/m3) Commercial[1]			--	<280	--	<3600	--	--	--	<310	--	--	--	--
LTC with Bioattenuation Zone Soil Gas Criteria (µg/m3) Residential[1]			--	<85,000	--	<1,100,000	--	--	--	<93,000	--	--	--	--
LTC with Bioattenuation Zone Soil Gas Criteria (µg/m3) Commercial[1]			--	<280,000	--	<3,600,000	--	--	--	<310,000	--	--	--	--
SF-RWQCB ESL (Res)[2] (µg/m3)			300,000	42	160,000	490	52,000	4,700	--	36	--	--	--	--
SF-RWQCB ESL (C/I) [3] (µg/m3)			2,500,000	420	1,300,000	4,900	440,000	47,000	--	360	--	--	--	--

Notes:

1.SWRCB- State Water Resources Control Board- Low-Threat Closure Policy Environmental Screening Levels (ESLs) for soil gas samples, commercial land use

2.Residential Exposure ESL - (Table E-2 Soil Gas Screening Levels for Evaluation of Potential Vapor Intrusion [volatile chemicals only], Lowest Residential, SF-RWQCB [Interim Final - December 2013]).

3.Commercial/ Industrial (C/I) Exposure ESL - (Table E-2 Soil Gas Screening Levels for Evaluation of Potential Vapor Intrusion [volatile chemicals only], Lowest C/I, SF-RWQCB [Interim Final - December 2013]).

All soil vapor sample concentrations and ESLs given in micrograms per cubic meter (µg/m^3) with the exception of fixed gases (helium, carbon dioxide, oxygen, nitrogen, and methane), which are given in percent by volume (%v).

Bold indicates detected values exceed appropriate SF-RWQCB ESLs.

ESL = Environmental Screening Level

ESLs for xylenes applied to m,p-Xylenes and o-Xylene.

SF-RWQCB = San Francisco Bay Regional Water Quality Control Board

EPA = Environmental Protection Agency

ND (TIC)= Non Detect as a Tentatively Identified Compounds

µg/m^3 = micrograms per cubic meter

%v = percent by volume

< = Analyte was not detected above the specified method reporting limit

-- = Not applicable or not available

ft bgs= Feet below ground surface

SV = Soil vapor

GRO = Gasoline range organics (C6-C12)

MTBE = Methyl tertiary-butyl ether

TBA = Tertiary-butyl alcohol

Table 4. Neighborhood Basement, Sump, and Water Well Survey
May/June 2015 (500-Foot Radius)
Former ARCO Service Station No. 4931
731 W MacArthur Blvd, Oakland, CA

Assessor's Parcel Number	Type	Property Address	City	State	Zip	Respondent	Water Well?	Sump Pump?	Basement?
12-947-16-2	Residential- 4 Units	714 36th Street	Oakland	CA	94609	No Response	--	--	--
12-947-17-2	Residential- Single Family Home	720 36th Street	Oakland	CA	94609	No Response	--	--	--
12-947-18-2	Residential- Single Family Home	724 36th Street	Oakland	CA	94609	No Response	--	--	--
12-947-19-3	Residential- Home	732 36th Street	Oakland	CA	94609	No Response	--	--	--
12-947-19-4	Residential- Single Family Home	728 36th Street	Oakland	CA	94609	No Response	--	--	--
12-947-20-2	Residential- 2 Units	740 36th Street	Oakland	CA	94609	No Response	--	--	--
12-947-23	Residential- Single Family Home	3612 West Street	Oakland	CA	94609	Tenant (Name not provided)	No	No	No
12-947-24	Residential- Single Family Home	3616 West Street	Oakland	CA	94609	No Response	--	--	--
12-947-25	Residential- 5 Or More Units	3620 West Street	Oakland	CA	94609	Eva J. King	No	No	No
12-947-26	Residential- 4 Units	3640 West Street	Oakland	CA	94609	No Response	--	--	--
12-947-27	Residential- Single Family Home	3646 West Street	Oakland	CA	94609	Peter Frye	No	No	No
12-947-28	Residential- 2 Units	3650 West Street	Oakland	CA	94609	No Response	--	--	--
12-947-29	Residential- 2 Units	3656 West Street	Oakland	CA	94609	No Response	--	--	--
12-947-31	Exempt Public Agency	727 37th Street	Oakland	CA	94609	No Response	--	--	--
12-947-32	Residential- Single Family Home	719 37th Street	Oakland	CA	94609	No Response	--	--	--
12-947-33	Residential- Single Family Home	715 37th Street	Oakland	CA	94609	No Response	--	--	--
12-947-34	Residential- 2 Units	711 37th Street	Oakland	CA	94609	No Response	--	--	--
12-947-35	Residential- Single Family Home	707 37th Street	Oakland	CA	94609	No Response	--	--	--
12-947-36	Warehouse	705 37th Street	Oakland	CA	94609	No Response	--	--	--
12-947-37	Warehouse	695 37th Street	Oakland	CA	94609	No Response	--	--	--
12-947-38	Residential- 4 Units	685 37th Street	Oakland	CA	94609	No Response	--	--	--
12-947-39	Residential- Single Family Home	681 37th Street	Oakland	CA	94609	No Response	--	--	--
12-947-42-1	Warehouse	675 37th Street	Oakland	CA	94609	Barron Family Trust (Greg Barron)	Yes, one well is in the center of the building and one towards the west side	No	No
12-947-43	Residential- 3 Units	749 37th Street.	Oakland	CA	94609	Ali Mohamed	No	No	No
12-947-44	Residential- Single Family Home	733 37th Street.	Oakland	CA	94609	No Response	--	--	--
12-948-1-1	Residential- 3 Units	3655 West Street	Oakland	CA	94609	No Response	--	--	--
12-948-2-1	Residential- 4 Units	3647 West Street	Oakland	CA	94609	No Response	--	--	--
12-948-3-2	Residential- Single Family Home	3637 West Street	Oakland	CA	94609	No Response	--	--	--
12-948-35	Residential- Single Family Home	837 37th Street	Oakland	CA	94609	No Response	--	--	--
12-948-36	Residential- Single Family Home	833 37th Street	Oakland	CA	94609	No Response	--	--	--
12-948-37	Residential- Home	829 37th Street	Oakland	CA	94609	No Response	--	--	--
12-948-40	Residential- Single Family Home	815 37th Street	Oakland	CA	94609	No Response	--	--	--
12-948-4-1	Residential- 4 Units	3633 West Street	Oakland	CA	94609	No Response	--	--	--
12-948-41-2	Church	817 37th Street	Oakland	CA	94609	No Response	--	--	--
12-948-4-2	Residential- Single Family Home	3611 West Street	Oakland	CA	94609	No Response	--	--	--

Table 4. Neighborhood Basement, Sump, and Water Well Survey
May/June 2015 (500-Foot Radius)
Former ARCO Service Station No. 4931
731 W MacArthur Blvd, Oakland, CA

Assessor's Parcel Number	Type	Property Address	City	State	Zip	Respondent	Water Well?	Sump Pump?	Basement?
12-948-43	Condominium - Single Unit	3665 West Street	Oakland	CA	94609	Christine & John Brogan	No	No	No
12-948-44	Condominium - Single Unit	3665 West Street	Oakland	CA	94609	Christine & John Brogan	No	No	No
12-948-45	Condominium - Single Unit	3665 West Street	Oakland	CA	94609	Christine & John Brogan	No	No	No
12-948-46	Condominium - Single Unit	3665 West Street	Oakland	CA	94609	Christine & John Brogan	No	No	No
12-948-47	Condominium Common Area	3666 West Street	Oakland	CA	94609	No Response	--	--	--
12-948-5-1	Residential- 2 Units	3609 West Street	Oakland	CA	94609	No Response	--	--	--
12-948-6-3	Vacant residential land	816 36th Street	Oakland	CA	94609	No Response	--	--	--
12-948-7-2	Residential- 5 Or More Units	818 36th Street	Oakland	CA	94609	No Response	--	--	--
12-948-8-2	Residential- 3 Units	822 36th Street	Oakland	CA	94609	No Response	--	--	--
12-958-10	Residential- Single Family Home	822 37th Street	Oakland	CA	94609	No Response	--	--	--
12-958-11	Residential- Single Family Home	824 37th Street	Oakland	CA	94609	No Response	--	--	--
12-958-12	Residential- Single Family Home	830 37th Street	Oakland	CA	94609	No Response	--	--	--
12-958-13	Residential- 4 Units	836 37th Street	Oakland	CA	94609	No Response	--	--	--
12-958-14	Residential- 4 Units	840 37th Street	Oakland	CA	94609	Mr. Thomas	No	No	--
12-958-15-2	Residential- 3 Units	846 37th Street	Oakland	CA	94609	No Response	--	--	--
12-958-16	Residential- 3 Units	850 37th Street	Oakland	CA	94609	No Response	--	--	--
12-958-3	Residential- Home	3725 West Street	Oakland	CA	94609	No Response	--	--	--
12-958-36	Residential- 3 Units	857 W MacArthur Boulevard	Oakland	CA	94609	No Response	--	--	--
12-958-37-1	Residential- 4 Units	849 W MacArthur Boulevard	Oakland	CA	94609	No Response	--	--	--
12-958-38	Residential- Single Family Home	835 W MacArthur Boulevard	Oakland	CA	94609	No Response	--	--	--
12-958-4	Residential- Single Family Home	3719 West Street	Oakland	CA	94609	No Response	--	--	--
12-958-40-1	Motel	829 W MacArthur Boulevard	Oakland	CA	94609	Manubai L. Patel and Ashvin Patel (tenant): Palms Motel	No	No	No
12-958-41-1	Commercial repair garage	825 W MacArthur Boulevard	Oakland	CA	94609	No Response	--	--	--
12-958-5	Residential- Single Family Home	3715 West Street	Oakland	CA	94609	No Response	--	--	--
12-958-6	Residential- 4 Units	3707 West Street	Oakland	CA	94609	No Response	--	--	--
12-958-7	Residential- 4 Units	3701 West Street	Oakland	CA	94609	No Response	--	--	--
12-958-8	Residential- Single Family Home	812 37th Street	Oakland	CA	94609	No Response	--	--	--
12-958-9	Residential- 5 Or More Units	816 37th Street	Oakland	CA	94609	No Response	--	--	--
12-959-11	Residential- 2 Units	828 W MacArthur Boulevard	Oakland	CA	94609	No Response	--	--	--
12-959-1-1	One Story Store	3839 West Street	Oakland	CA	94609	No Response	--	--	--
12-959-12	Residential- Single Family Home	836 W MacArthur Boulevard	Oakland	CA	94609	No Response	--	--	--
12-959-1-2	Residential- Single Family Home	805 Apgar Street	Oakland	CA	94609	No Response	--	--	--
12-959-14	Residential- 2 Units	846 W MacArthur Boulevard	Oakland	CA	94609	Steve Zhou	No	No	No
12-959-15	Residential- Single Family Home	850 W MacArthur Boulevard	Oakland	CA	94609	Michael and Vicki Larrick	No	No	No
12-959-2	Residential- Single Family Home	3831 West Street	Oakland	CA	94609	Shayne Martinez	No	No	No
12-959-3	Residential- 3 Units	3827 West Street	Oakland	CA	94609	No Response	--	--	--

Table 4. Neighborhood Basement, Sump, and Water Well Survey
May/June 2015 (500-Foot Radius)
Former ARCO Service Station No. 4931
731 W MacArthur Blvd, Oakland, CA

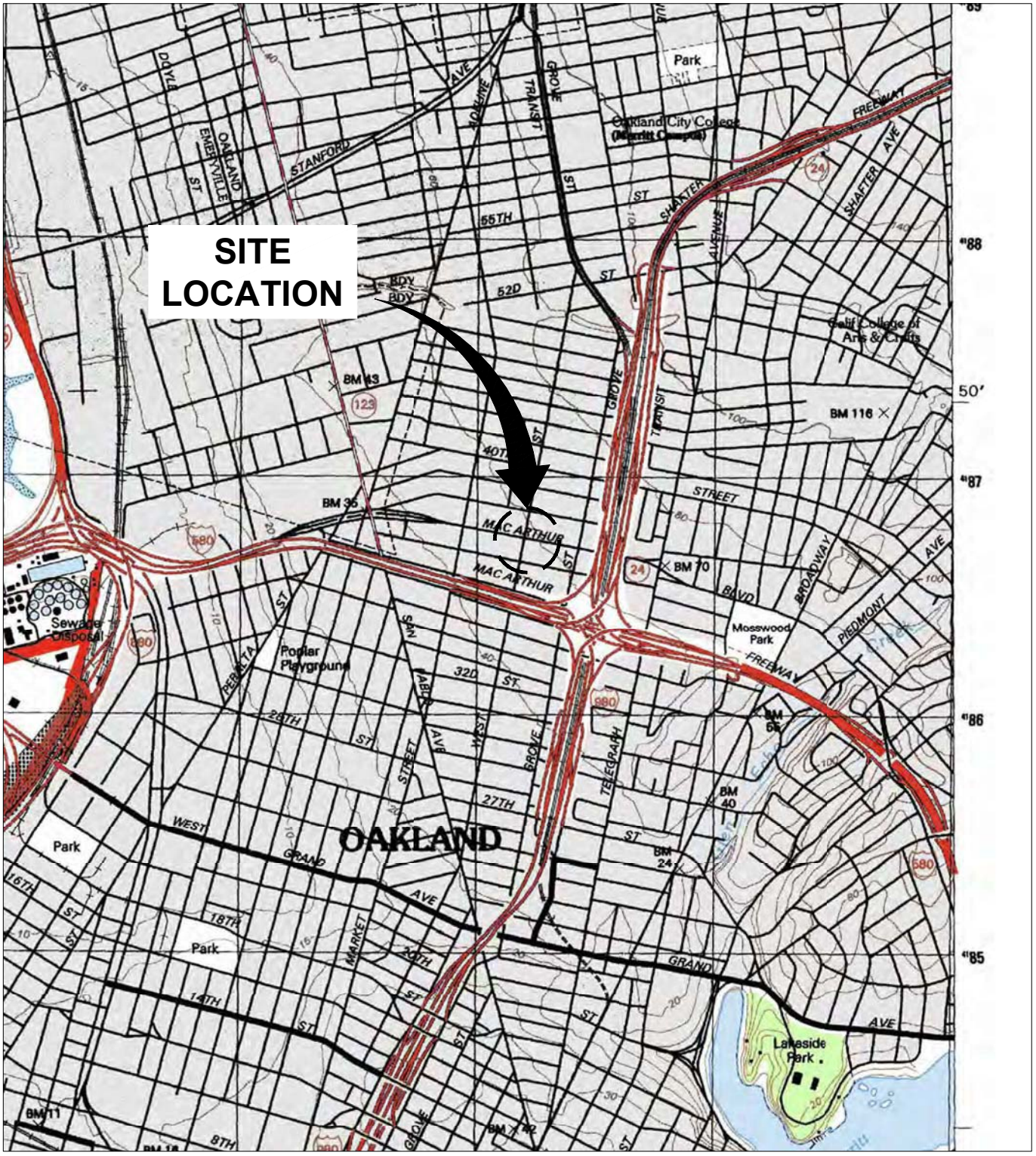
Assessor's Parcel Number	Type	Property Address	City	State	Zip	Respondent	Water Well?	Sump Pump?	Basement?
12-959-35-1	Residential- 4 Units	845 Apgar Street	Oakland	CA	94609	Adriana Cardenas	No	No	No
12-959-36	Residential- Single Family Home	841 Apgar Street	Oakland	CA	94609	No Response	--	--	--
12-959-37	Residential- Home	835 Apgar Street	Oakland	CA	94609	No Response	--	--	--
12-959-38	Residential- 3 Units	831 Apgar Street	Oakland	CA	94609	No Response	--	--	--
12-959-39	Residential- Single Family Home	827 Apgar Street	Oakland	CA	94609	Margaret F. Ester	No	No	Yes
12-959-4	Residential- Single Family Home	3823 West Street	Oakland	CA	94609	Erica Garcia	No	No	No
12-959-40	Residential- Single Family Home	823 Apgar Street	Oakland	CA	94609	No Response	--	--	--
12-959-41	Residential- Single Family Home	821 Apgar Street	Oakland	CA	94609	No Response	--	--	--
12-959-42-1	Residential- 5 Or More Units	811 Apgar Street	Oakland	CA	94609	No Response	--	--	--
12-959-44	Condominium - Single Unit	838 W MacArthur Boulevard	Oakland	CA	94609	No Response	--	--	--
12-959-45	Condominium - Single Unit	840 W MacArthur Boulevard	Oakland	CA	94609	No Response	--	--	--
12-959-46	Condominium - Single Unit	842 W MacArthur Boulevard	Oakland	CA	94609	No Response	--	--	--
12-959-47	Condominium - Single Unit	844 W MacArthur Boulevard	Oakland	CA	94609	No Response	--	--	--
12-959-48	Condominium Common Area	840 W MacArthur Boulevard	Oakland	CA	94609	Diana Roman	Unknown	Unknown	Unknown
12-959-5	Residential- 2 Units	3819 West Street	Oakland	CA	94609	No Response	--	--	--
12-959-9-3	Commercial repair garage	820 W MacArthur Boulevard	Oakland	CA	94609	No Response	--	--	--
12-964-10	Residential- Single Family Home	674 W MacArthur Boulevard	Oakland	CA	94609	No Response	--	--	--
12-964-11	Residential- 4 Units	678 W MacArthur Boulevard	Oakland	CA	94609	No Response	--	--	--
12-964-12	Residential- 5 Or More Units	684 W MacArthur Boulevard	Oakland	CA	94609	No Response	--	--	--
12-964-13	Residential- 2 Units	690 W MacArthur Boulevard	Oakland	CA	94609	No Response	--	--	--
12-964-14	Residential- Single Family Home	696 W MacArthur Boulevard	Oakland	CA	94609	No Response	--	--	--
12-964-15	Residential- Single Family Home	700 W MacArthur Boulevard	Oakland	CA	94609	Unknown	No	No	No
12-964-16	Residential- Home	704 W MacArthur Boulevard	Oakland	CA	94609	No Response	--	--	--
12-964-17	Residential- 2 Units	708 W MacArthur Boulevard	Oakland	CA	94609	No Response	--	--	--
12-964-20-1	Motel	722 W MacArthur Boulevard	Oakland	CA	94609	No Response	--	--	--
12-964-21	Commercial repair garage	W MacArthur Boulevard	Oakland	CA	94609	No Response	--	--	--
12-964-22	Residential- Single Family Home	3810 West Street	Oakland	CA	94609	No Response	--	--	--
12-964-23	Residential- Single Family Home	3814 West Street	Oakland	CA	94609	No Response	--	--	--
12-964-24	Residential- 2 Units	3818 West Street	Oakland	CA	94609	No Response	--	--	--
12-964-25	Exempt Public Agency	3824 West Street	Oakland	CA	94609	No Response	--	--	--
12-964-26	Residential- Single Family Home	3826 West Street	Oakland	CA	94609	No Response	--	--	--
12-964-27	Residential- Single Family Home	3830 West Street	Oakland	CA	94609	No Response	--	--	--
12-964-28	Residential- Single Family Home	3834 West Street	Oakland	CA	94609	No Response	--	--	--
12-964-29	One Story Store	733 Apgar Street	Oakland	CA	94609	No Response	--	--	--
12-964-30	Residential- Single Family Home	735 Apgar Street	Oakland	CA	94609	Nathan Racklyette	No	No	No
12-964-31	Residential- Single Family Home	729 Apgar Street	Oakland	CA	94609	Jeri Loso	No	No	Yes
12-964-32	Residential- 2 Units	723 Apgar Street	Oakland	CA	94609	Ruby Darrough	No	No	No

Table 4. Neighborhood Basement, Sump, and Water Well Survey
May/June 2015 (500-Foot Radius)
Former ARCO Service Station No. 4931
731 W MacArthur Blvd, Oakland, CA

Assessor's Parcel Number	Type	Property Address	City	State	Zip	Respondent	Water Well?	Sump Pump?	Basement?
12-964-33	Residential- Single Family Home	719 Apgar Street	Oakland	CA	94609	Lesa Fontaine	No	No	No
12-964-34	Residential- Single Family Home	715 Apgar Street	Oakland	CA	94609	No Response	--	--	--
12-964-35	Residential- Single Family Home	707 Apgar Street	Oakland	CA	94609	No Response	--	--	--
12-964-36	Residential- 2 Units	703 Apgar Street	Oakland	CA	94609	No Response	--	--	--
12-964-37	Residential- 5 Or More Units	697 Apgar Street	Oakland	CA	94609	No Response	--	--	--
12-964-38	Residential- 2 Units	689 Apgar Street	Oakland	CA	94609	No Response	--	--	--
12-964-39	Residential- 3 Units	681 Apgar Street	Oakland	CA	94609	Michael Williams	No	Yes	Yes
12-964-9	Residential- Single Family Home	670 W MacArthur Boulevard	Oakland	CA	94609	No Response	--	--	--
12-965-1	Commercial	657 W MacArthur Boulevard	Oakland	CA	94609	No Response	--	--	--
12-965-10-1	Residential- 4 Units	682 37th Street	Oakland	CA	94609	Hary Lu	No	No	No
12-965-12-1	Vacant residential land	37th Street	Oakland	CA	94609	No Response	--	--	--
12-965-13-1	Vacant residential land	37th Street	Oakland	CA	94609	No Response	--	--	--
12-965-14	Residential- Single Family Home	702 37th Street	Oakland	CA	94609	No Response	--	--	--
12-965-15	Residential- 2 Units	706 37th Street	Oakland	CA	94609	No Response	--	--	--
12-965-16	Residential- Single Family Home	710 37th Street	Oakland	CA	94609	No Response	--	--	--
12-965-17	Residential- Single Family Home	714 37th Street	Oakland	CA	94609	David Aanenson	No	No	No
12-965-18	Residential- 2 Units	716 37th Street	Oakland	CA	94609	No Response	--	--	--
12-965-2	Vacant Commercial Land	M L KING JR WAY	Oakland	CA	94609	No Response	--	--	--
12-965-20-2	Residential- 2 Units	776 37th Street	Oakland	CA	94609	No Response	--	--	--
12-965-21-1	Vacant residential land	3700 West Street	Oakland	CA	94609	No Response	--	--	--
12-965-22	Residential- 2 Units	3704 West Street	Oakland	CA	94609	Ross C. Paratone	No	No	No
12-965-23	Residential- Single Family Home	3710 West Street	Oakland	CA	94609	Michael and Vicki Larrick	No	No	Yes
12-965-25	Residential- Single Family Home	721 W MacArthur Boulevard	Oakland	CA	94609	No Response	--	--	--
12-965-26	Residential- 2 Units	717 W MacArthur Boulevard	Oakland	CA	94609	No Response	--	--	--
12-965-27	Residential- 4 Units	709 W MacArthur Boulevard	Oakland	CA	94609	No Response	--	--	--
12-965-28	Residential- 2 Units	705 W MacArthur Boulevard	Oakland	CA	94609	No Response	--	--	--
12-965-29-1	Residential- 4 Units	699 W MacArthur Boulevard	Oakland	CA	94609	No Response	--	--	--
12-965-3	Residential- 3 Units	3725 M L KING JR WAY	Oakland	CA	94609	No Response	--	--	--
12-965-30-2	Motel	683 W MacArthur Boulevard	Oakland	CA	94609	No Response	--	--	--
12-965-31	Motel	669 W MacArthur Boulevard	Oakland	CA	94609	No Response	--	--	--
12-965-32	Residential- 3 Units	665 W MacArthur Boulevard	Oakland	CA	94609	No Response	--	--	--
12-965-6	Residential- Single Family Home	666 37th Street	Oakland	CA	94609	No Response	--	--	--
12-965-7	Residential- Single Family Home	670 37th Street	Oakland	CA	94609	No Response	--	--	--
12-965-9-1	Residential- 5 Or More Units	678 37th Street	Oakland	CA	94609	N/A	Unknown	No	No

ARCADIS

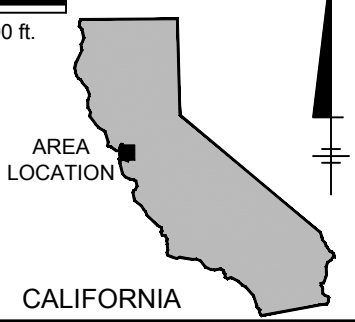
Figures



REFERENCE: BASE MAP USGS 7.5. MIN. TOPO. QUAD., OAKLAND WEST, CALIFORNIA, 1993.

0 2000' 4000'

Approximate Scale: 1 in. = 2000 ft.



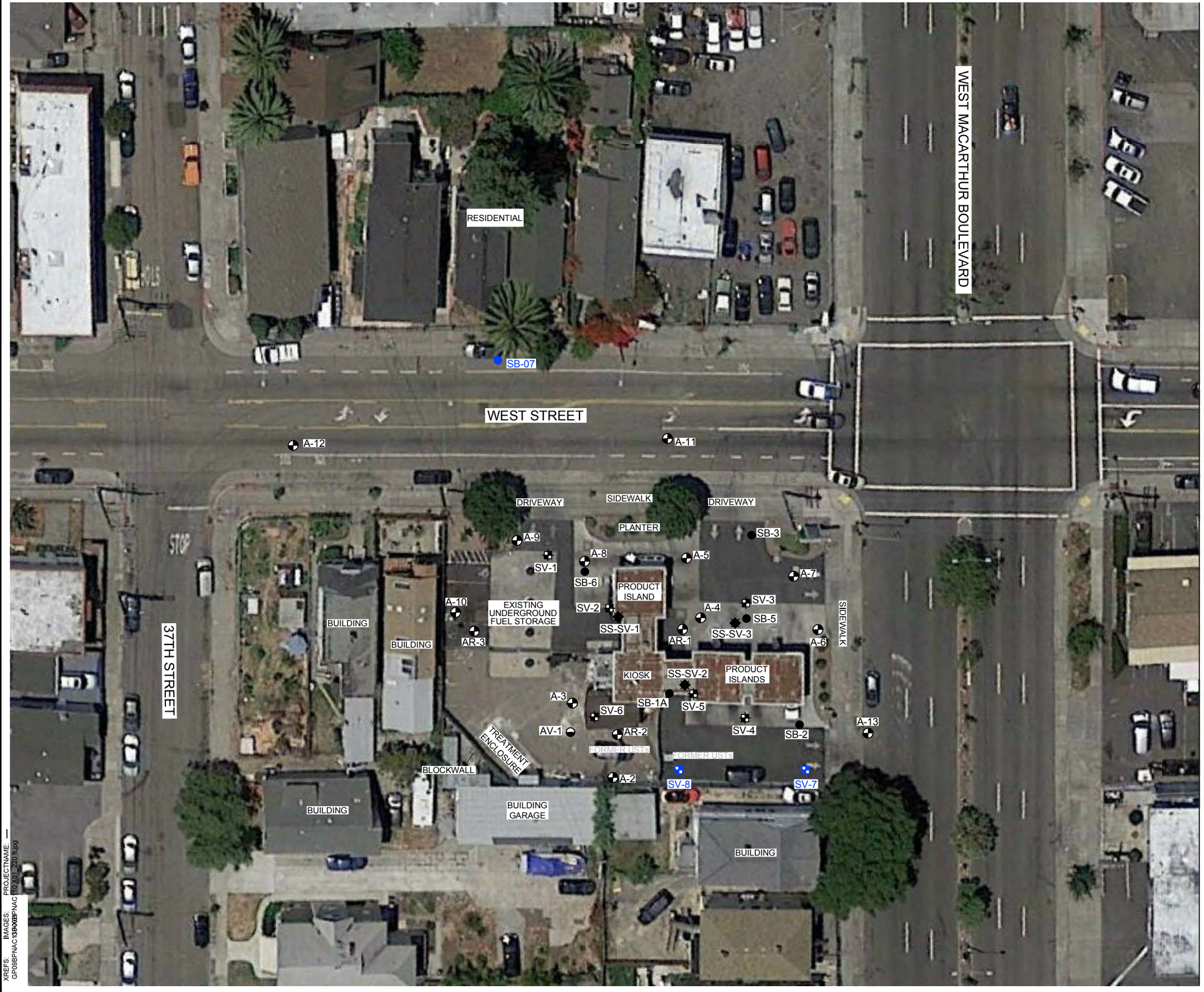
FORMER ARCO STATION #4931
731 WEST MACARTHUR BOULEVARD
OAKLAND, CALIFORNIA

SITE LOCATION MAP

ARCADIS

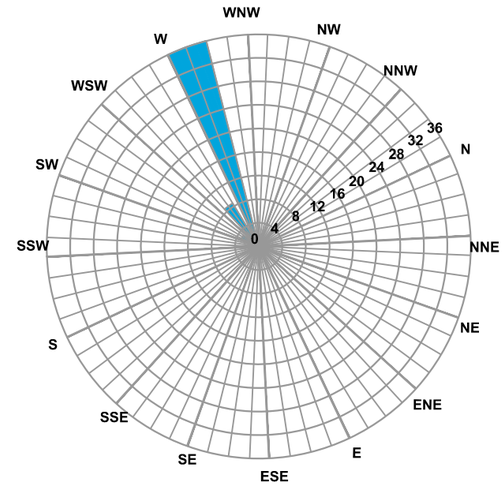
FIGURE
1

CITY: PETALUMA, CA DIV/GROUP: ENV DB: J. HARRIS
C:\Users\jharris\Desktop\ENVCAD\RETURN-TO\EMERYVILLE, CA\GP09BPNA\C110N000003Q12\DWG\GP09BPNAC110-N01.dwg LAYOUT: 1 SAVED: 10/1/2012 11:40 AM ACADVER: 18.1S (LMS TECH) PAGESETUP: SETUP1 PLOTSTYLETABLE: ARCADIS.CTB PLOTTED: 10/1/2012 11:59 AM BY: HARRIS, JESSICA
XREFS: IMAGES: PROJECTNAME: —
Oakland West.jpg



LEGEND

- MONITORING WELL
- SOIL BORING (ARCADIS, OCTOBER 2010)
- SOIL VAPOR EXTRACTION WELL
- SOIL VAPOR PROBE (ARCADIS, MAY-JUNE 2011)
- SUB-SLAB SOIL VAPOR PROBE (ARCADIS, DECEMBER 2012)
- SOIL VAPOR PROBE (ARCADIS, MAY 2015)
- SOIL BORING PROBE (ARCADIS, MAY 2015)

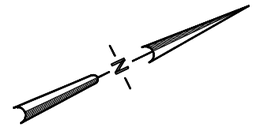


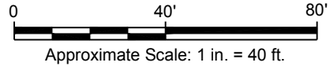
CONCENTRIC CIRCLES REPRESENT 49 MONITORING EVENTS CONDUCTED BETWEEN THE SECOND QUARTER 2000 THROUGH THE FIRST QUARTER 2015

GROUNDWATER FLOW DIRECTION

NOTE:

SITE MAP ADAPTED FROM FIGURES BY OTHERS.
ALL FEATURES AND LOCATIONS ARE APPROXIMATE.
IMAGE SOURCE: GOOGLE™ EARTH, 6/9/2014.





Approximate Scale: 1 in. = 40 ft.

FORMER ARCO STATION No. 4391
731 WEST MACARTHUR BOULEVARD
OAKLAND, CALIFORNIA

SITE VICINITY AND SAMPLE LOCATIONS

ARCADIS

FIGURE
2

CITY: EMERYVILLE, CA DIV/GROUP: ENVCAD DB: A. REYES, J. HARRIS
G:\ENVCAD\Emeryville\ACTGP08BPNAC110\N0000\2Q2015\DWG\GP08BPNAC110 B02.dwg LAYOUT: 2 SAVED: 6/24/2015 2:18 PM ACADVER: 19.1S (LMS TECH) PAGESETUP: SETUP1 PLOTSTYLETABLE: ARCADIS.CTB PLOTTED: 6/25/2015 4:57 PM BY: REYES, ALEC
XREFS: IMAGES: PROJECTNAME: —
GP08BPNAC110X01_2200.tiff

RESIDENTIAL

SB-07

SB-7			
Depth (ft bgs)	4.5-5.0	9.5-10.0	22.5-23.0
GRO	<0.23	<0.24	<0.22
Benzene	<0.0045	<0.0048	<0.0043
MTBE	<0.0045	<0.0048	<0.0043
TBA	<0.09	<0.096	<0.087

WEST STREET

A-12

A-11

37TH STREET

BUILDING

BUILDING

BUILDING

DRIVEWAY

SIDEWALK

DRIVEWAY

D.I.

IRR.

PLANTER

C.B.

A-9

SB-3

SV-1

A-8

A-5

SB-6

PRODUCT ISLAND

L13

L12

L1

L11

L10

L9

L2

L8

L3

A-7

L7

S12

S11

S10

S9

SV-3

SV-2

SS-SV-1

SB-5

A-4

A-10

AR-3

AR-1

SS-SV-3

A-6

EXISTING UNDERGROUND FUEL STORAGE

PRODUCT ISLANDS

S8

S7

S6

L4

L6

L5

L4

S5

L2

L11

L7

S4

S3

S2

S1

L3A

L5

L3

L1

L6/L9/L10

KIOSK

SS-SV-2

SB-1A

SV-5

SV-4

SW20

SB-2

SIDEWALK

A-3

SW7

SW8

SW9

SW21

L8/L12

SW1

SV-6

AV-1

AR-2

ST-A

SW18

FT-A

SW17

SW15

SW10

SW11

SW16

SW2

FORMER USTs

T1A

FORMER UST

T1B

SW12

SW19

ST-B

SW3

SW14

SW4

SW5

A-2

SW6

SW13

SV-8

SV-7

A-13

BLOCKWALL

TREATMENT ENCLOSURE

BUILDING GARAGE

BUILDING

WEST MACARTHUR BOULEVARD

SV-8		
Depth (ft bgs)	2.5-3.0	4.5-5.0
GRO	<0.24	<0.22

SV-7		
Depth (ft bgs)	2.5-3.0	4.5-5.0
GRO	<0.23	<0.25

LEGEND

- MONITORING WELL
- SOIL BORING (ARCADIS, OCTOBER 2010)
- SOIL SAMPLE LOCATION
- SOIL VAPOR EXTRACTION WELL
- SOIL VAPOR PROBE (ARCADIS, MAY-JUNE 2011)
- SUB-SLAB SOIL VAPOR PROBE (ARCADIS, DECEMBER 2012)
- SOIL VAPOR PROBE (ARCADIS, MAY 2015)
- SOIL BORING PROBE (ARCADIS, MAY 2015)
- PRODUCT/VENT LINE
- WATER
- SANITARY SEWER
- STORM DRAIN

NOTES:

GRO	= Gasoline range organics (C6-C12)
MTBE	= Methyl tert-butyl ether
TBA	= Tert-butyl alcohol
ft bgs	= Feet below ground surface
<	= Analyte not detected above reporting limit analyzed by EPA Method 8260B

SITE MAP ADAPTED FROM FIGURES BY OTHERS.
ALL FEATURES AND LOCATIONS ARE APPROXIMATE.

RESULTS ARE SHOWN IN MILLIGRAMS PER KILOGRAM (mg/kg)

N

0 25' 50'

Approximate Scale: 1 in. = 25 ft.

FORMER ARCO STATION No. 4391
731 WEST MACARTHUR BOULEVARD
OAKLAND, CALIFORNIA

SOIL ANALYTICAL RESULTS MAY 12, 2015

ARCADIS

FIGURE 3

SB-7	
Depth (ft bgs)	18-23
GRO	<50.0
Benzene	<0.50
MTBE	4.3
TBA	<20.0

RESIDENTIAL

SB-07

WEST STREET

A-12

A-11

DRIVEWAY

SIDEWALK

DRIVEWAY

D.I.

D.I.

IRR.

PLANTER

IRR.

C.B.

D.I.

A-9

SV-1

A-8

SB-6

L13

PRODUCT ISLAND

L12 L1 L11 L10 L9 L2

L8 L3

S12 S11 S10 S9

A-7

L7

SB-3

A-10

AR-3

SV-2

SS-SV-1

EXISTING UNDERGROUND FUEL STORAGE

A-4

AR-1

SV-3

SB-5

SS-SV-3

A-6

PRODUCT ISLANDS

S8 S7 S6

L4 L6 L5 L4

PRODUCT ISLANDS

S4 S3 S2

L3A L5 L3 L1

SIDEWALK

KIOSK

SS-SV-2

SB-1A

SV-5

A-3

SW7 SW8 SW9

L8/L12

SW21

S5 L7 L2 L11

SV-4

SW20

S1

L6/L9/L10

IRR.

SB-2

A-13

SW1

SV-6

AV-1

AR-2

ST-A

SW18

FT-A

SW17

SW15

D.I.

SW2

FORMER USTs

SW10

SW11

SW16

T1A

FORMER UST

T1B

SW12

SW19

ST-B

SW3

SW14

SV-8

SV-7

SW4 SW5 A-2 SW6

SW13

BLOCKWALL

TREATMENT ENCLOSURE

BUILDING

BUILDING

BUILDING

BUILDING GARAGE

BUILDING

37TH STREET

WEST MACARTHUR BOULEVARD

LEGEND

- MONITORING WELL
- SOIL BORING (ARCADIS, OCTOBER 2010)
- SOIL SAMPLE LOCATION
- SOIL VAPOR EXTRACTION WELL
- SOIL VAPOR PROBE (ARCADIS, MAY-JUNE 2011)
- SUB-SLAB SOIL VAPOR PROBE (ARCADIS, DECEMBER 2012)
- SOIL VAPOR PROBE (ARCADIS, MAY 2015)
- SOIL BORING PROBE (ARCADIS, MAY 2015)
- PRODUCT/VENT LINE
- WATER
- SANITARY SEWER
- STORM DRAIN

NOTES:

GRO	= Gasoline range organics (C6-C12)
MTBE	= Methyl tert-butyl ether
TBA	= Tert-butyl alcohol
ft bgs	= Feet below ground surface
<	= Analyte not detected above reporting limit analyzed by EPA Method 8260B

SITE MAP ADAPTED FROM FIGURES BY OTHERS.
ALL FEATURES AND LOCATIONS ARE APPROXIMATE.

RESULTS ARE SHOWN IN MICROGRAMS PER LITER (µg/L)

N

0 25' 50'

Approximate Scale: 1 in. = 25 ft.

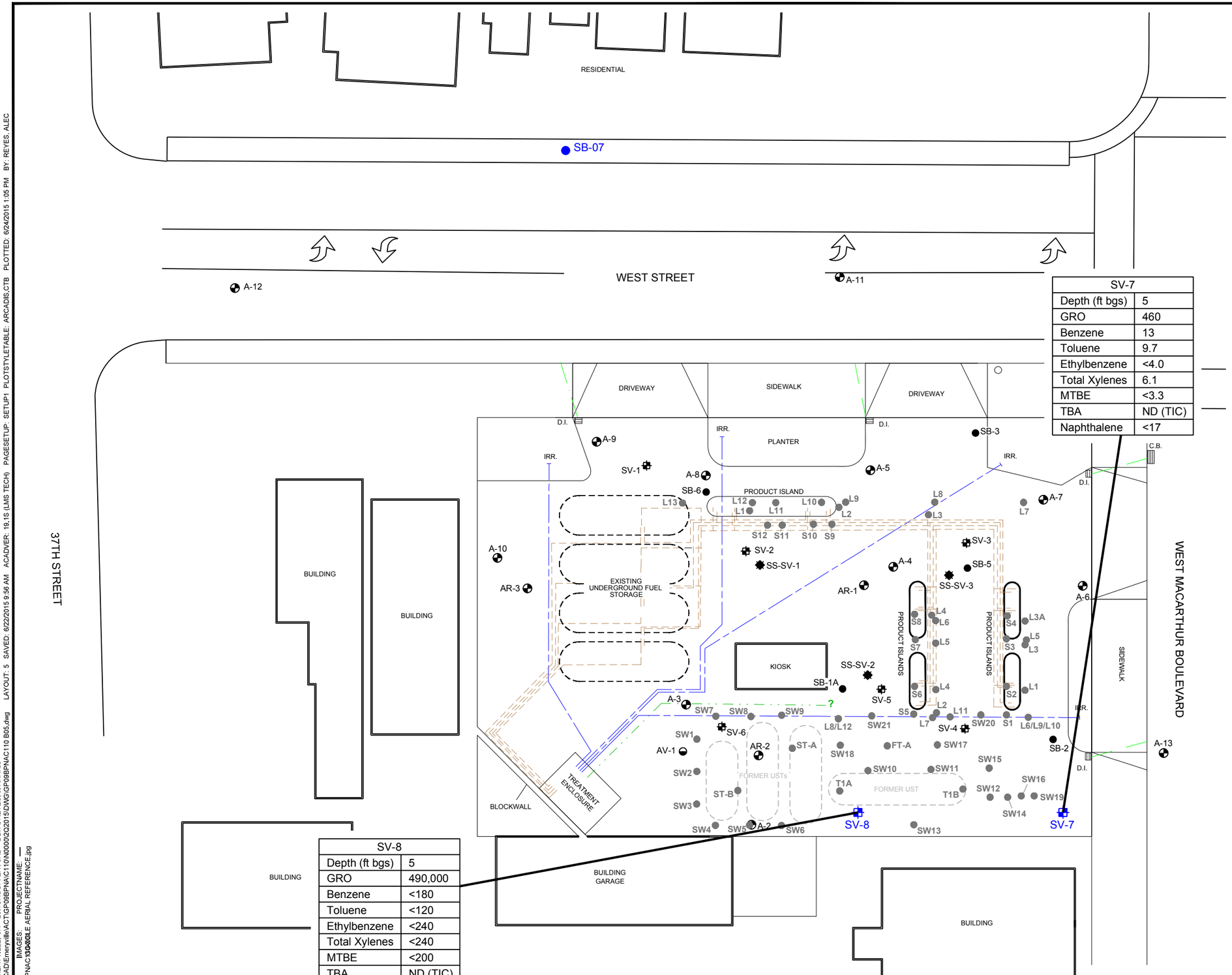
FORMER ARCO STATION No. 4391
731 WEST MACARTHUR BOULEVARD
OAKLAND, CALIFORNIA

GRAB GROUNDWATER ANALYTICAL RESULTS MAY 12, 2015

ARCADIS

FIGURE 4

CITY: EMERYVILLE, CA DIV/GROUP: ENVCAD DB: A. REYES, J. HARRIS
G:\ENVCAD\Emeryville\ACT\GP09BPNA\C110\N0000\Q2\2015\DWG\GP09BPNAC110B04.dwg LAYOUT: 4 SAVED: 6/22/2015 9:53 AM ACADVER: 19.1S (LMS TECH) PAGESETUP: SETUP1 PLOTSTYLETABLE: ARCADIS.CTB PLOTTED: 6/24/2015 1:03 PM BY: REYES, ALEC
XREFS: IMAGES: PROJECTNAME: ---
GP09BPNAC110X0001 SITE AERIAL REFERENCE.jpg



SV-7	
Depth (ft bgs)	5
GRO	460
Benzene	13
Toluene	9.7
Ethylbenzene	<4.0
Total Xylenes	6.1
MTBE	<3.3
TBA	ND (TIC)
Naphthalene	<17

SV-8	
Depth (ft bgs)	5
GRO	490,000
Benzene	<180
Toluene	<120
Ethylbenzene	<240
Total Xylenes	<240
MTBE	<200
TBA	ND (TIC)
Naphthalene	<17

LEGEND

- MONITORING WELL
- SOIL BORING (ARCADIS, OCTOBER 2010)
- SOIL SAMPLE LOCATION
- SOIL VAPOR EXTRACTION WELL
- SOIL VAPOR PROBE (ARCADIS, MAY-JUNE 2011)
- SUB-SLAB SOIL VAPOR PROBE (ARCADIS, DECEMBER 2012)
- SOIL VAPOR PROBE (ARCADIS, MAY 2015)
- SOIL BORING PROBE (ARCADIS, MAY 2015)
- PRODUCT/VENT LINE
- WATER
- SANITARY SEWER
- STORM DRAIN

NOTES:

GRO	= Gasoline range organics (C6-C12)
MTBE	= Methyl tert-butyl ether
TBA	= Tert-butyl alcohol
ND(TIC)	= non detect tentatively identified compound
<	= Analyte not detected above reporting limit
ft bgs	= feet below ground surface
<	= Analyte not detected above reporting limit

Analytical Method: To-15, T0-3, T0-17, D1946 analysis in micrograms per meter cubed.

SITE MAP ADAPTED FROM FIGURES BY OTHERS. ALL FEATURES AND LOCATIONS ARE APPROXIMATE.

N

0 25' 50'

Approximate Scale: 1 in. = 25 ft.

FORMER ARCO STATION No. 4391
731 WEST MACARTHUR BOULEVARD
OAKLAND, CALIFORNIA

SOIL VAPOR ANALYTICAL RESULTS MAY 15, 2015

ARCADIS

FIGURE 5

CITY: EMERYVILLE, CA DIV/GROUP: ENVCAD DB: A. REYES, J. HARRIS
G:\ENVCAD\Emeryville\ACTIGP09BPNAC110\N0000\Q2\2015\DWG\GP09BPNAC110 B05.dwg LAYOUT: 5 SAVED: 6/22/2015 9:56 AM ACADVER: 19.1S (LMS TECH) PAGESETUP: SETUP1 PLOTSTYLETABLE: ARCADIS.CTB PLOTTED: 6/24/2015 1:05 PM BY: REYES, ALEC
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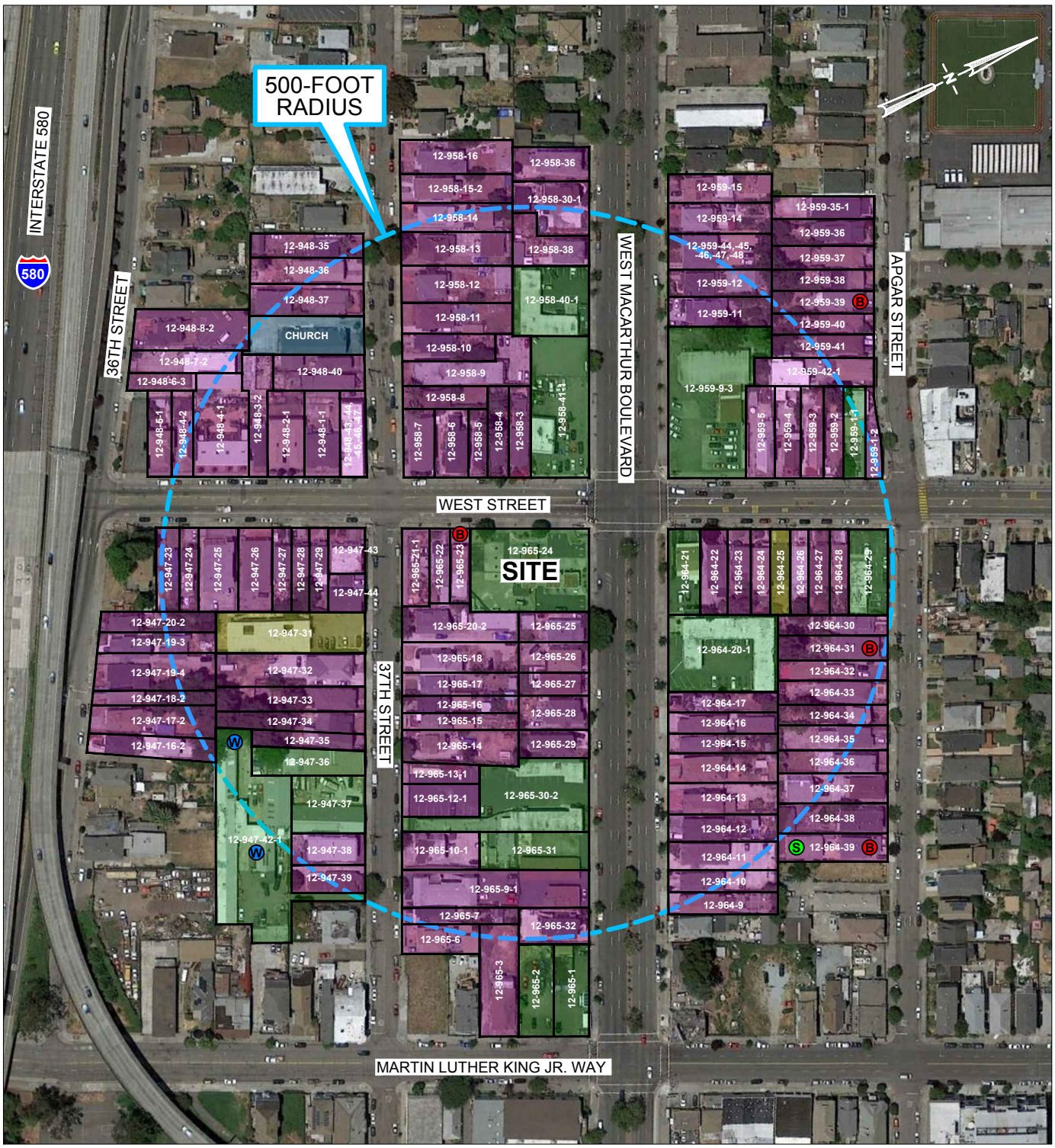
GP09BPNAC110B05GLE AERIAL REFERENCE.jpg



REFERENCE: GOOGLE™ EARTH PRO, IMAGE DATE 6/9/2014.

0 200' 400'

Approximate Scale: 1 in. = 200 ft.

LEGEND

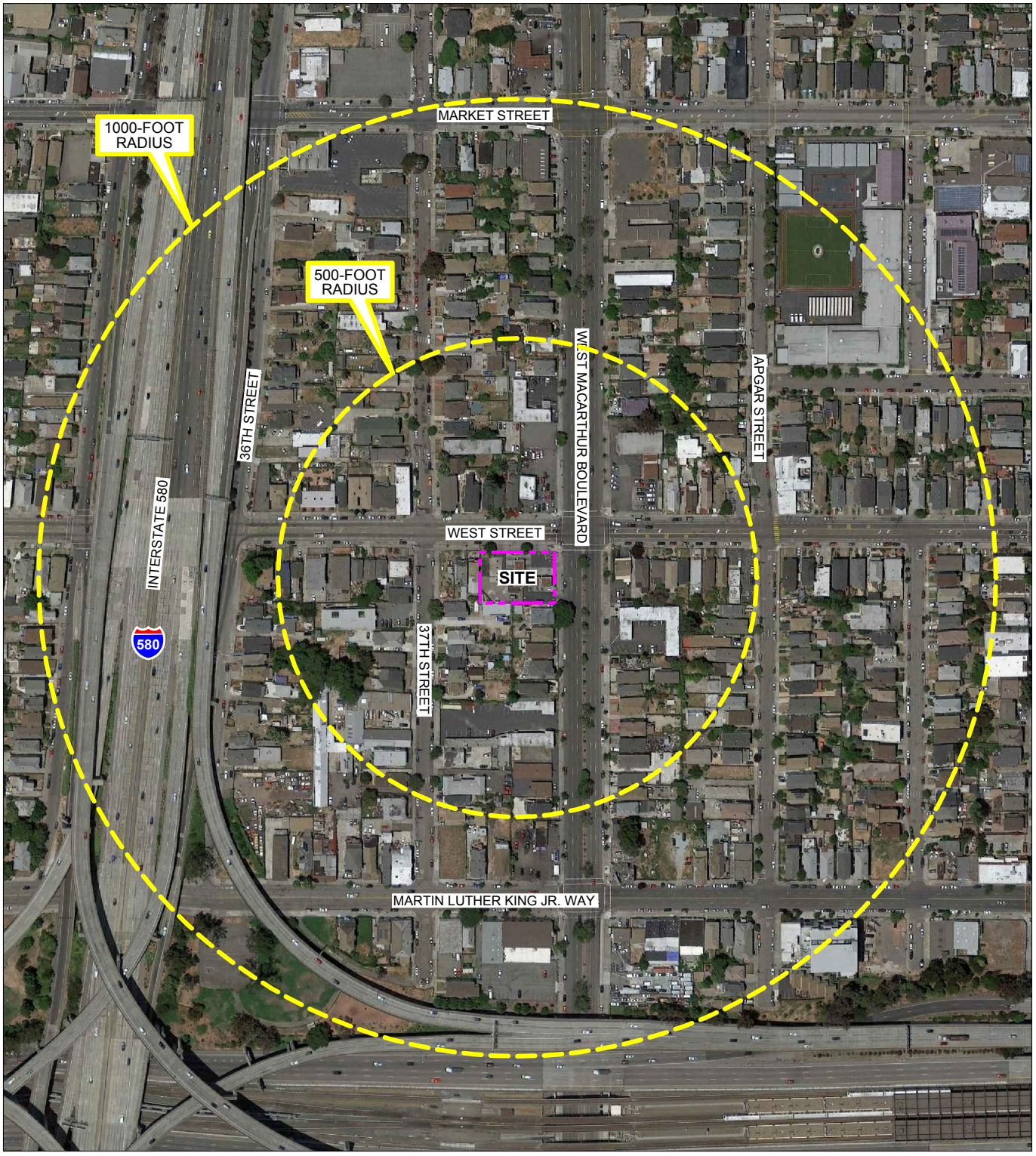
- 500-FOOT RADIUS FROM SITE
- RESIDENTIAL
- COMMERCIAL
- EXEMPT PUBLIC AGENCY
- CHURCH
- (B) BASEMENT
- (W) WELL LOCATION
- (S) SUMP LOCATION
- **12-947-37** ASSESSOR'S PARCEL NUMBER (APN)

FORMER ARCO STATION No. 4391
731 WEST MACARTHUR BOULEVARD
OAKLAND, CALIFORNIA
SITE INVESTIGATION REPORT

SENSITIVE RECEPTOR SURVEY
500-FOOT RADIUS SITE MAP

ARCADIS

FIGURE
6



REFERENCE: GOOGLE™ EARTH PRO, IMAGE DATE 6/9/2014.

0 300' 600'

Approximate Scale: 1 in. = 300 ft.

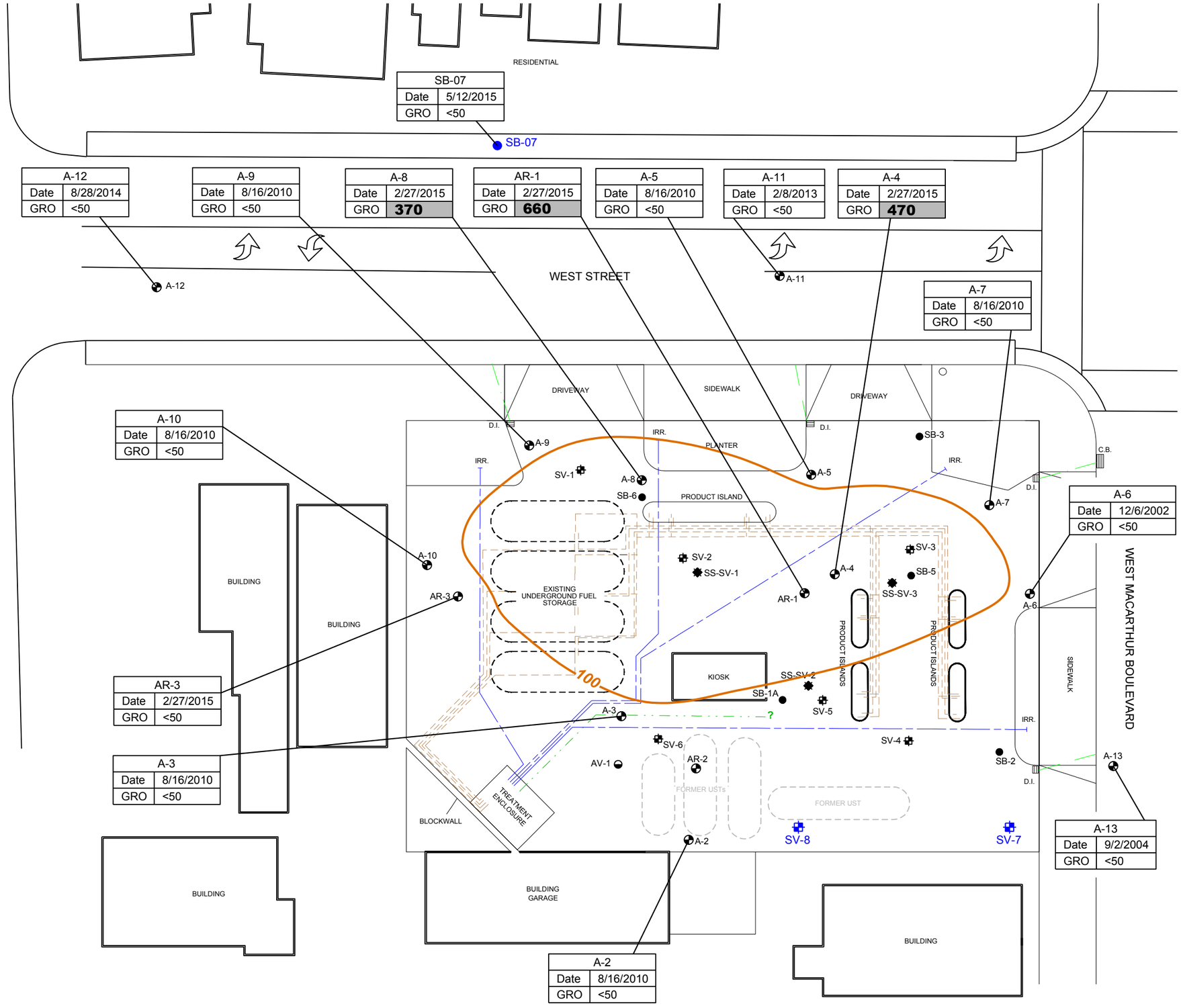
N

FORMER ARCO STATION No. 4391
731 WEST MACARTHUR BOULEVARD
OAKLAND, CALIFORNIA
SITE INVESTIGATION REPORT

SITE RECEPTOR SURVEY MAP

ARCADIS

FIGURE
7



LEGEND

- MONITORING WELL
- SOIL BORING (ARCADIS, OCTOBER 2010)
- SOIL VAPOR EXTRACTION WELL
- SOIL VAPOR PROBE (ARCADIS, MAY-JUNE 2011)
- SUB-SLAB SOIL VAPOR PROBE (ARCADIS, DECEMBER 2012)
- SOIL VAPOR PROBE (ARCADIS, MAY 2015)
- SOIL BORING PROBE (ARCADIS, MAY 2015)
- PRODUCT/VENT LINE
- WATER
- SANITARY SEWER
- STORM DRAIN
- 100 GRO CONCENTRATION IN µg/L

SAMPLE LOCATION		ESL (1)
GRO	GASOLINE RANGE ORGANICS (µg/L)	100

NOTES:

1. DRINKING WATER SCREENING LEVELS (TABLE F-3 SUMMARY OF DRINKING WATER SCREENING LEVELS. FINAL SCREENING LEVEL MCL PRIORITY, SF-RWQCB [INTERIM FINAL - DECEMBER 2013]).

< = NOT DETECTED AT OR ABOVE STATED LABORATORY REPORTING LIMIT

µg/L = MICROGRAMS PER LITER

ESL = ENVIRONMENTAL SCREENING LEVEL

BOLD = VALUE INDICATES THE ANALYTE WAS DETECTED ABOVE THE ESL

DATE = MOST RECENT GROUNDWATER SAMPLE IS PRESENTED ON THIS FIGURE

SITE MAP ADAPTED FROM FIGURES BY OTHERS. ALL FEATURES AND LOCATIONS ARE APPROXIMATE

N

0 25' 50'

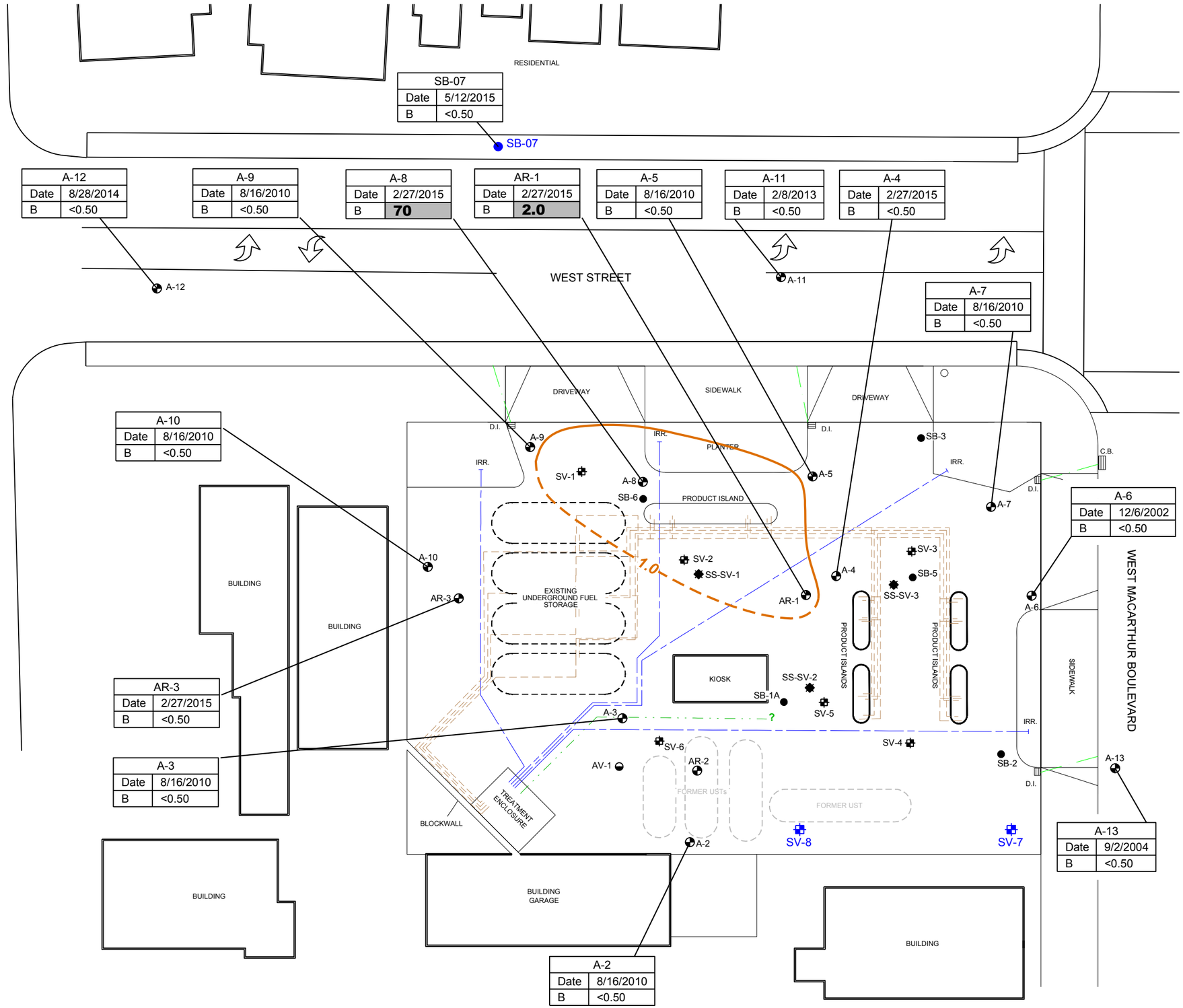
Approximate Scale: 1 in. = 25 ft.

FORMER ARCO STATION No. 4391
731 WEST MACARTHUR BOULEVARD
OAKLAND, CALIFORNIA

GRO CONCENTRATION CONTOUR MAP

ARCADIS

FIGURE 8



LEGEND

- MONITORING WELL
- SOIL BORING (ARCADIS, OCTOBER 2010)
- SOIL VAPOR EXTRACTION WELL
- SOIL VAPOR PROBE (ARCADIS, MAY-JUNE 2011)
- SUB-SLAB SOIL VAPOR PROBE (ARCADIS, DECEMBER 2012)
- SOIL VAPOR PROBE (ARCADIS, MAY 2015)
- SOIL BORING PROBE (ARCADIS, MAY 2015)
- PRODUCT/VENT LINE
- WATER
- SANITARY SEWER
- STORM DRAIN
- 1.0 BENZENE CONCENTRATION IN µg/L (DASHED WHERE INFERRED)

SAMPLE LOCATION		ESL [1]
B	BENZENE (µg/L)	1.0

NOTES:

1. DRINKING WATER SCREENING LEVELS (TABLE F-3 SUMMARY OF DRINKING WATER SCREENING LEVELS. FINAL SCREENING LEVEL MCL PRIORITY, SF-RWQCB [INTERIM FINAL - DECEMBER 2013]).

< = NOT DETECTED AT OR ABOVE STATED LABORATORY REPORTING LIMIT

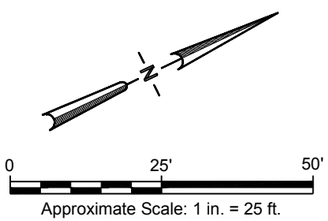
µg/L = MICROGRAMS PER LITER

ESL = ENVIRONMENTAL SCREENING LEVEL

BOLD = VALUE INDICATES THE ANALYTE WAS DETECTED ABOVE THE ESL

DATE = MOST RECENT GROUNDWATER SAMPLE IS PRESENTED ON THIS FIGURE

SITE MAP ADAPTED FROM FIGURES BY OTHERS. ALL FEATURES AND LOCATIONS ARE APPROXIMATE



Approximate Scale: 1 in. = 25 ft.

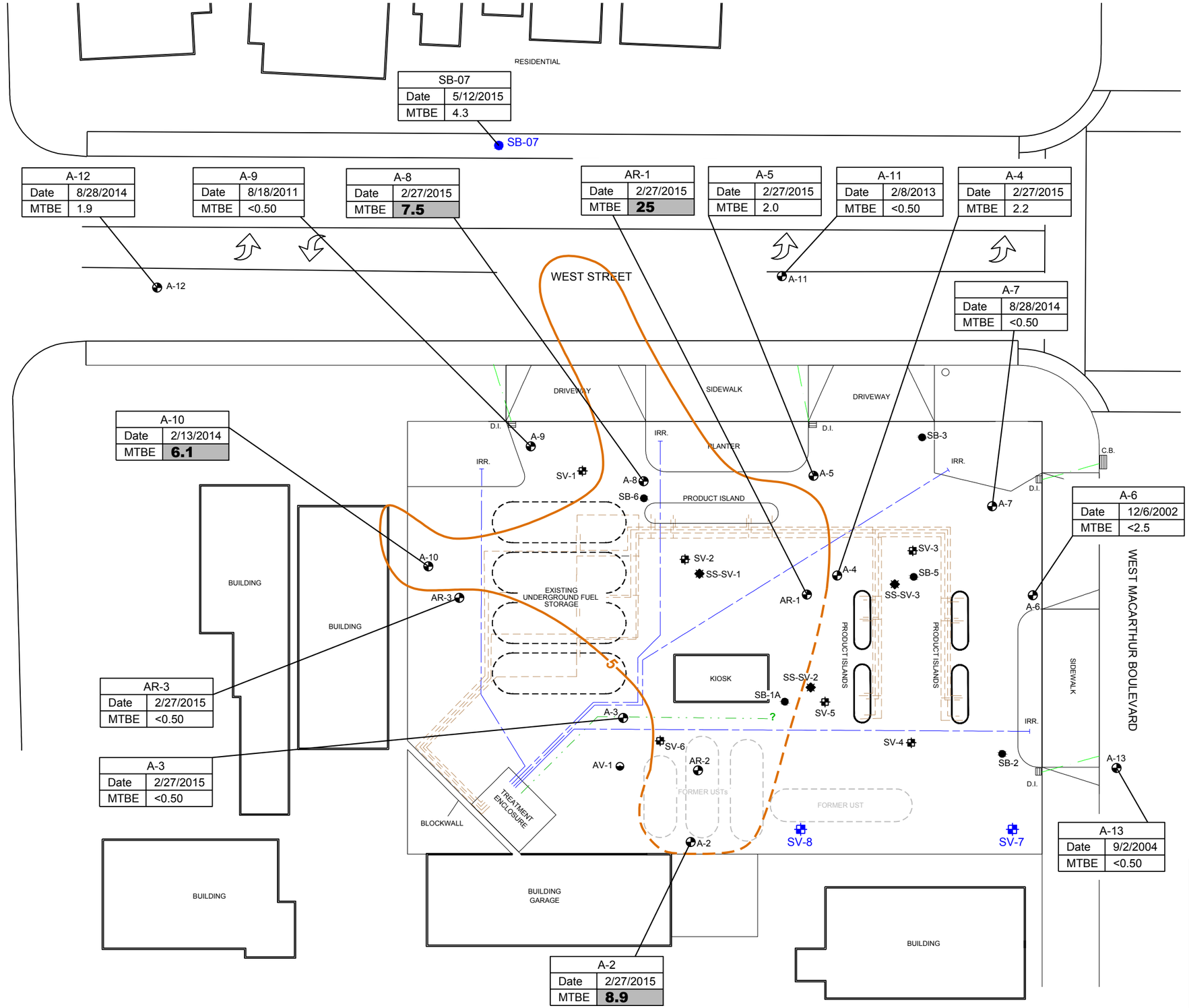
FORMER ARCO STATION No. 4391
731 WEST MACARTHUR BOULEVARD
OAKLAND, CALIFORNIA

BENZENE CONCENTRATION CONTOUR MAP

ARCADIS

FIGURE 9

CITY: EMERYVILLE, CA DIV/GROUP: ENVCAD DB: A. REYES, J. HARRIS
G:\ENVCAD\Emeryville\ACT\GP09BPNA\C110\N0000\CummulativeAnalyteData\DWG\GP09BPNAC110 C09.dwg LAYOUT: 9 SAVED: 6/23/2015 1:12 PM ACADVER: 19.1S (LMS TECH) PAGESETUP: SETUP1 PLOTSTYLETABLE: ARCADIS.CTB PLOTTED: 6/23/2015 2:22 PM BY: REYES, ALEC
XREFS: IMAGES: PROJECTNAME:
GP09BPNAC110X01GOOGLE AERIAL REFERENCE.jpg



LEGEND

- MONITORING WELL
- SOIL BORING (ARCADIS, OCTOBER 2010)
- SOIL VAPOR EXTRACTION WELL
- SOIL VAPOR PROBE (ARCADIS, MAY-JUNE 2011)
- SUB-SLAB SOIL VAPOR PROBE (ARCADIS, DECEMBER 2012)
- SOIL VAPOR PROBE (ARCADIS, MAY 2015)
- SOIL BORING PROBE (ARCADIS, MAY 2015)
- PRODUCT/VENT LINE
- WATER
- SANITARY SEWER
- STORM DRAIN
- 5 — MTBE CONCENTRATION IN µg/L (DASHED WHERE INFERRED)

SAMPLE LOCATION		ESL [1]
MTBE	METHYL TERTIARY BUTYL ETHER (µg/L)	5

NOTES:

1. DRINKING WATER SCREENING LEVELS (TABLE F-3 SUMMARY OF DRINKING WATER SCREENING LEVELS. FINAL SCREENING LEVEL MCL PRIORITY, SF-RWQCB [INTERIM FINAL - DECEMBER 2013]).

< = NOT DETECTED AT OR ABOVE STATED LABORATORY REPORTING LIMIT

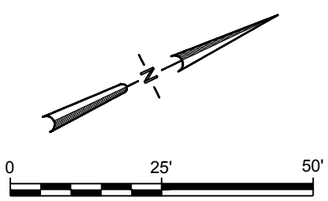
µg/L = MICROGRAMS PER LITER

ESL = ENVIRONMENTAL SCREENING LEVEL

BOLD = VALUE INDICATES THE ANALYTE WAS DETECTED ABOVE THE ESL

DATE = MOST RECENT GROUNDWATER SAMPLE IS PRESENTED ON THIS FIGURE

SITE MAP ADAPTED FROM FIGURES BY OTHERS. ALL FEATURES AND LOCATIONS ARE APPROXIMATE



Approximate Scale: 1 in. = 25 ft.

FORMER ARCO STATION No. 4391
731 WEST MACARTHUR BOULEVARD
OAKLAND, CALIFORNIA

MTBE CONCENTRATION CONTOUR MAP

ARCADIS

FIGURE 10

CITY: EMERYVILLE, CA DIV/GROUP: ENVCAD DB: A. REYES, J. HARRIS
G:\ENVCAD\Emeryville\ACTGP09BPNAC110N0000\CumulativeAnalyteData\DWG\GP09BPNAC110 C10.dwg LAYOUT: 10 SAVED: 6/23/2015 1:37 PM ACADVER: 19.1S (LMS TECH) PAGESETUP: SETUP1 PLOTSTYLETABLE: ARCADIS.CTB PLOTTED: 6/23/2015 2:27 PM BY: REYES, ALEC
XREFS: IMAGES: PROJECTNAME: ---
GP09BPNAC110X0001 AERIAL REFERENCE.jpg

Appendix A

Soil Boring Logs

ARCADIS

EXPLORATORY BORING LOG

project no:	GP09BPNA.C110.C0000	date: 05-12-15	boring number: SV-7
client:	Former ARCO Station 4931		
location:	731 W. MacArthur Blvd. Oakland, CA.		
logged by:	C. Hollister		
driller/helper:	German Garcia		page 1 of 1

field location of boring: SV-7

drilling method: Hand auger
hole diameter: 3.5 inches
casing diameter:
well completion data: 6 inch well box
2 way valve on end of tubing

ground elevation: datum:

water level: Not encountered
time:
date:

boring/well construction	headspace: gastech/PID/FID ppm	sample number	blows per foot or pressure in psi	depth	sample	soil group symbol (USCS)	
Concrete well Box	0.0						0-4" bgs asphalt
Hydrated Bentonite	0.0			1			0.5 ft bgs Concrete
		SV-7_Soil_2.5-3.0		2			2.5 ft bgs Sample grey/orange clayey w/sand
Dry Bentonite				3	X		
Sand	0.0	SV-7_Soil_4.0-4.5		4	X		Sample grey/orange Sand w/clay
	0.0	SV-7_Soil_4.5-5.0		5	X		Sample grey orange Sand w/clay
				6			TD @ 5.0 ft bgs
				7			
				8			
				9			
				10			
				11			
				12			
				13			
				14			
				15			
				16			
				17			
				18			
				19			
				20			

Tefzel tubing 1/4" S.S. screen

USCS lithology; Munsell color; sorting; grain size; lith. %s; modifiers; consistency; moisture.

ARCADIS

EXPLORATORY BORING LOG

project no: GP09BPNA.C110.C0000
client: Former ARCO Station 4931
location: 731 W. MacArthur Blvd. Oakland, CA.
logged by: C. Hollister
driller/helper: German Garcia
date: 05-12-15
boring number: SV-8
page 1 of 1

field location of boring: SV-8

ground elevation: datum:

drilling method: Hand Auger
hole diameter: 3.5 inches
casing diameter:
well completion data: 6-inch Well box
2 way valve on end of tubing

water level: Not encountered
time:
date:

boring/well construction	headspace: gastech/PID/FID ppm	sample number	blows per foot or pressure in psi	depth	sample	soil group symbol (USCS)	
Concrete well box	0.0	SV-8 Soil		1			0-4" Asphalt, some fill
hydrated Bentonite				2			Dark Brown silt & clay
Dry Bentonite	0.0	SV-8_Soil_2.5-3.0		3	X		Sample
Sand	2.1	SV-8_Soil_4.5-5.0		4			Brown, mottles, grey clay some Sand
				5	X		Grey, Sandy, some clay Sample
				6			TD @ 5.0 ft bgs
				7			
				8			
				9			
				10			
				11			
				12			
				13			
				14			
				15			
				16			
				17			
				18			
				19			
				20			

1.5' Screen Kite Clay Tubing

USCS lithology; Munsell color; sorting; grain size; lith. %s; modifiers; consistency; moisture.

ARCADIS

EXPLORATORY BORING LOG

project no: GP09BPNA.C110.C0000
client: Former ARCO Station 4931
location: 731 W. MacArthur Blvd. Oakland, CA.
logged by:
driller/helper:
date: 05-12-15
boring number: SB-07
page 1 of 2

field location of boring: SB-07

drilling method: hand auger / direct push.
hole diameter: 3 inches
casing diameter: 1-inch PVC
well completion data: PVC removed, filled with grout

ground elevation: datum:

water level 8.04 ftbgs
time 13:15
date 5/12/15

boring/well construction	headspace: gastech/PID/FID ppm	sample number	blows per foot or pressure in psi	depth	sample	soil group symbol (USCS)	
Concrete							0-3 inches - Sidewalk Concrete Slab
PVC removed	0.0			1			2 inches gravel
Filled with grout				2			2 inches Clay
							Orange Sand w/ some clay
				3			
				4			
	0.0						Brown Sand + some gravel, some clay
		SB-07-Soil-4.5-5.0		5	X		[Sample
	0.0			6			Brown Sand + gravel, some clay
			0% recovery	7			Lt. Brown clay, mottles, little some Sand
				8			
	0.0		100%	9			8.04 ▽ @13:15 Lt brown clay, some grey, mottles some Sand
		SB-07-Soil-9.5-10.0		10	X		[Sample
				11			Moist, Lt brown clay, mottles, Some Sand
			100% recovery	12			Light Brown grey clay, mottles little Sand
	0.0			13			Brown/grey Clay, mottles, little Sand & gravel
				14			
				15			Light Brown Clay with fine Sand
			0% recovery	16			
	0.0			17			Coarse gravel, Moist, Sandy
				18			Light brown clay, fine sand, Soft
	0.0		100% recovery	19			light brown clay fine Sand, Soft
				20			fine sand, moist, on top of gravel

USCS lithology; Munsell color; sorting; grain size; lith. %s; modifiers; consistency; moisture.

boring/well construction	headspace: gastech/PID/FID ppm	sample number	blows per foot or pressure in psi	depth	sample	soil group symbol (USCS)	project number: GP09BPNA.C110.C0000	boring number: page 2 of 2
Pipe Removed / Grout	0.0		100% recovery	21			Brown, red, orange gravel	
				22			Fine gravel, moist w/water, fine sand	
	0.0		75% recovery	23	X		Hard layer, fine gravel, sand, refusal	
				24			→ Sample: SB-07_Soil_22.5-23.0	
				25				
				26				
				27				
				28				
				29				
				30				
				31				
				32				
				33				
				34				
				35				
				36				
				37				
				38				
				39				
				40				
				41				
				42				
				43				
				44				
				45				
				46				

USCS lithology; Munsell color; sorting; grain size; lith. %s; modifiers; consistency; moisture.

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Appendix B

Certificate of Disposal

IWM, Inc.

INTEGRATED WASTESTREAM MANAGEMENT, INC.
1945 CONCOURSE DRIVE, SAN JOSE, CA 95131
PHONE: 408.433.1990 FAX: 408.433.9521

CERTIFICATE OF DISPOSAL

Generator Name:	BP West Coast Products	Facility Name:	BP-4931
Address:	PO Box 80249	Address:	731 W MacArthur Blvd
	Rancho Santa Margarita, CA 92688		Oakland, CA 94609
Contact:	Hollis Philips	Facility Contact:	Jamey Peterson
Phone:	415-432-6903	Phone:	707-776-0865

IWM Job #:	Bella 563
Description of Waste:	1 Drum of Non-Hazardous Solids
Removal Date:	6-1-15
Ticket #:	RSVRL06012015

Transporter Information

Name:	IWM, Inc.
Address:	1945 Concourse Drive
	San Jose, CA 95131
Phone:	(408) 433-1990

Disposal Facility Information

Name:	Republic Services Vasco Road Landfill
Address:	4001 N. Vasco Road
	Livermore, CA 94550
Phone:	(925) 447-0491

IWM, INC. CERTIFIES THAT THE ABOVE LISTED NON-HAZARDOUS WASTE WILL BE TREATED AND DISPOSED AT THE DESIGNATED FACILITY IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS.

William T. DeLon William T. DeLon — 6-1-15

Authorized Representative (Print Name and Signature) — Date

ARCADIS

Appendix C

Laboratory Analytical Report – Soil and Grab Groundwater

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pleasanton
1220 Quarry Lane
Pleasanton, CA 94566
Tel: (925)484-1919

TestAmerica Job ID: 720-64747-1
Client Project/Site: BP #4931, Oakland

For:
ARCADIS U.S., Inc.
100 Montgomery Street
Suite 300
San Francisco, California 94104

Attn: Hollis Phillips

Authorized for release by:
5/27/2015 10:41:55 AM

Dimple Sharma, Senior Project Manager
(925)484-1919
dimple.sharma@testamericainc.com

Table of Contents

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: BP #4931, Oakland

TestAmerica Job ID: 720-64747-1

Client Sample ID: SB-07_GW_18.0-23.0 — Lab Sample ID: 720-64747-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
MTBE	4.3		0.50		ug/L	1		8260B/CA_LUFT MS	Total/NA
TAME	1.4		0.50		ug/L	1		8260B/CA_LUFT MS	Total/NA

Client Sample ID: SV-7_SOIL_2.5-3.0 — Lab Sample ID: 720-64747-4

No Detections.

Client Sample ID: SV-7_SOIL_4.0-4.5 — Lab Sample ID: 720-64747-5

No Detections.

Client Sample ID: SV-7_SOIL_4.5-5.0 — Lab Sample ID: 720-64747-6

No Detections.

Client Sample ID: SV-8_SOIL_2.5-3.0 — Lab Sample ID: 720-64747-7

No Detections.

Client Sample ID: SV-8_SOIL_4.5-5.0 — Lab Sample ID: 720-64747-8

No Detections.

Client Sample ID: SB-7_SOIL_4.5-5.0 — Lab Sample ID: 720-64747-9

No Detections.

Client Sample ID: SB-7_SOIL_9.5-10.0 — Lab Sample ID: 720-64747-10

No Detections.

Client Sample ID: SB-7_SOIL_22.5-23.0 — Lab Sample ID: 720-64747-11

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: BP #4931, Oakland

TestAmerica Job ID: 720-64747-1

Client Sample ID: SB-07_GW_18.0-23.0
Date Collected: 05/12/15 13:30
Date Received: 05/12/15 18:45

Lab Sample ID: 720-64747-1
Matrix: Water

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
MTBE	**4.3**		0.50		ug/L			05/16/15 01:59	1
Benzene	ND		0.50		ug/L			05/16/15 01:59	1
EDB	ND		0.50		ug/L			05/16/15 01:59	1
1,2-DCA	ND		0.50		ug/L			05/16/15 01:59	1
Ethylbenzene	ND		0.50		ug/L			05/16/15 01:59	1
Toluene	ND		0.50		ug/L			05/16/15 01:59	1
Xylenes, Total	ND		1.0		ug/L			05/16/15 01:59	1
Gasoline Range Organics (GRO) -C6-C12	ND		50		ug/L			05/16/15 01:59	1
TBA	ND		20		ug/L			05/16/15 01:59	1
Ethanol	ND		500		ug/L			05/16/15 01:59	1
DIPE	ND		0.50		ug/L			05/16/15 01:59	1
TAME	**1.4**		0.50		ug/L			05/16/15 01:59	1
Ethyl t-butyl ether	ND		0.50		ug/L			05/16/15 01:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*102*		*67 - 130*		*05/16/15 01:59*	*1*
1,2-Dichloroethane-d4 (Surr)	*112*		*72 - 130*		*05/16/15 01:59*	*1*
Toluene-d8 (Surr)	*101*		*70 - 130*		*05/16/15 01:59*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: BP #4931, Oakland

TestAmerica Job ID: 720-64747-1

Client Sample ID: SV-7_SOIL_2.5-3.0
Date Collected: 05/12/15 08:45
Date Received: 05/12/15 18:45

Lab Sample ID: 720-64747-4
Matrix: Solid

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (GRO) -C6-C12	ND		230		ug/Kg		05/16/15 12:33	05/16/15 15:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*103*		*45 - 131*	*05/16/15 12:33*	*05/16/15 15:01*	*1*
1,2-Dichloroethane-d4 (Surr)	*105*		*60 - 140*	*05/16/15 12:33*	*05/16/15 15:01*	*1*
Toluene-d8 (Surr)	*101*		*58 - 140*	*05/16/15 12:33*	*05/16/15 15:01*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: BP #4931, Oakland

TestAmerica Job ID: 720-64747-1

Client Sample ID: SV-7_SOIL_4.5-5.0
Date Collected: 05/12/15 09:00
Date Received: 05/12/15 18:45

Lab Sample ID: 720-64747-6
Matrix: Solid

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (GRO) -C6-C12	ND		250		ug/Kg		05/16/15 12:33	05/16/15 15:30	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*105*		*45 - 131*	*05/16/15 12:33*	*05/16/15 15:30*	*1*
1,2-Dichloroethane-d4 (Surr)	*116*		*60 - 140*	*05/16/15 12:33*	*05/16/15 15:30*	*1*
Toluene-d8 (Surr)	*103*		*58 - 140*	*05/16/15 12:33*	*05/16/15 15:30*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: BP #4931, Oakland

TestAmerica Job ID: 720-64747-1

Client Sample ID: SV-8_SOIL_2.5-3.0
Date Collected: 05/12/15 10:30
Date Received: 05/12/15 18:45

Lab Sample ID: 720-64747-7
Matrix: Solid

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (GRO) -C6-C12	ND		240		ug/Kg		05/16/15 12:33	05/16/15 15:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*101*		*45 - 131*	*05/16/15 12:33*	*05/16/15 15:58*	*1*
1,2-Dichloroethane-d4 (Surr)	*113*		*60 - 140*	*05/16/15 12:33*	*05/16/15 15:58*	*1*
Toluene-d8 (Surr)	*99*		*58 - 140*	*05/16/15 12:33*	*05/16/15 15:58*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: BP #4931, Oakland

TestAmerica Job ID: 720-64747-1

Client Sample ID: SV-8_SOIL_4.5-5.0
Date Collected: 05/12/15 10:45
Date Received: 05/12/15 18:45

Lab Sample ID: 720-64747-8
Matrix: Solid

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (GRO) -C6-C12	ND		220		ug/Kg		05/16/15 12:33	05/16/15 16:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*102*		*45 - 131*	*05/16/15 12:33*	*05/16/15 16:26*	*1*
1,2-Dichloroethane-d4 (Surr)	*111*		*60 - 140*	*05/16/15 12:33*	*05/16/15 16:26*	*1*
Toluene-d8 (Surr)	*103*		*58 - 140*	*05/16/15 12:33*	*05/16/15 16:26*	*1*

Client Sample ID: SB-7_SOIL_4.5-5.0

Date Collected: 05/12/15 12:05
Date Received: 05/12/15 18:45

Lab Sample ID: 720-64747-9

Matrix: Solid

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methyl tert-butyl ether	ND		4.5		ug/Kg		05/16/15 12:33	05/16/15 16:54	1
Benzene	ND		4.5		ug/Kg		05/16/15 12:33	05/16/15 16:54	1
EDB	ND		4.5		ug/Kg		05/16/15 12:33	05/16/15 16:54	1
1,2-DCA	ND		4.5		ug/Kg		05/16/15 12:33	05/16/15 16:54	1
Ethylbenzene	ND		4.5		ug/Kg		05/16/15 12:33	05/16/15 16:54	1
Toluene	ND		4.5		ug/Kg		05/16/15 12:33	05/16/15 16:54	1
Xylenes, Total	ND		9.0		ug/Kg		05/16/15 12:33	05/16/15 16:54	1
Gasoline Range Organics (GRO) -C6-C12	ND		230		ug/Kg		05/16/15 12:33	05/16/15 16:54	1
TBA	ND		90		ug/Kg		05/16/15 12:33	05/16/15 16:54	1
Ethanol	ND		900		ug/Kg		05/16/15 12:33	05/16/15 16:54	1
DIPE	ND		4.5		ug/Kg		05/16/15 12:33	05/16/15 16:54	1
TAME	ND		4.5		ug/Kg		05/16/15 12:33	05/16/15 16:54	1
Ethyl t-butyl ether	ND		4.5		ug/Kg		05/16/15 12:33	05/16/15 16:54	1
Naphthalene	ND		9.0		ug/Kg		05/16/15 12:33	05/16/15 16:54	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*103*		*45 - 131*	*05/16/15 12:33*	*05/16/15 16:54*	*1*
1,2-Dichloroethane-d4 (Surr)	*113*		*60 - 140*	*05/16/15 12:33*	*05/16/15 16:54*	*1*
Toluene-d8 (Surr)	*102*		*58 - 140*	*05/16/15 12:33*	*05/16/15 16:54*	*1*

Method: 8270C SIM - PAHs by GCMS (SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 20:39	1
Acenaphthylene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 20:39	1
Anthracene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 20:39	1
Benzo[a]anthracene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 20:39	1
Benzo[a]pyrene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 20:39	1
Benzo[b]fluoranthene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 20:39	1
Benzo[g,h,i]perylene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 20:39	1
Benzo[k]fluoranthene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 20:39	1
Chrysene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 20:39	1
Dibenz(a,h)anthracene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 20:39	1
Fluoranthene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 20:39	1
Fluorene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 20:39	1
Indeno[1,2,3-cd]pyrene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 20:39	1
Naphthalene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 20:39	1
Phenanthrene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 20:39	1
Pyrene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 20:39	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl	*69*		*33 - 120*	*05/18/15 09:52*	*05/18/15 20:39*	*1*
Terphenyl-d14	*84*		*35 - 146*	*05/18/15 09:52*	*05/18/15 20:39*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: BP #4931, Oakland

TestAmerica Job ID: 720-64747-1

Client Sample ID: SB-7_SOIL_9.5-10.0

Date Collected: 05/12/15 12:35
Date Received: 05/12/15 18:45

Lab Sample ID: 720-64747-10

Matrix: Solid

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methyl tert-butyl ether	ND		4.8		ug/Kg		05/16/15 12:33	05/16/15 17:22	1
Benzene	ND		4.8		ug/Kg		05/16/15 12:33	05/16/15 17:22	1
EDB	ND		4.8		ug/Kg		05/16/15 12:33	05/16/15 17:22	1
1,2-DCA	ND		4.8		ug/Kg		05/16/15 12:33	05/16/15 17:22	1
Ethylbenzene	ND		4.8		ug/Kg		05/16/15 12:33	05/16/15 17:22	1
Toluene	ND		4.8		ug/Kg		05/16/15 12:33	05/16/15 17:22	1
Xylenes, Total	ND		9.6		ug/Kg		05/16/15 12:33	05/16/15 17:22	1
Gasoline Range Organics (GRO) -C6-C12	ND		240		ug/Kg		05/16/15 12:33	05/16/15 17:22	1
TBA	ND		96		ug/Kg		05/16/15 12:33	05/16/15 17:22	1
Ethanol	ND		960		ug/Kg		05/16/15 12:33	05/16/15 17:22	1
DIPE	ND		4.8		ug/Kg		05/16/15 12:33	05/16/15 17:22	1
TAME	ND		4.8		ug/Kg		05/16/15 12:33	05/16/15 17:22	1
Ethyl t-butyl ether	ND		4.8		ug/Kg		05/16/15 12:33	05/16/15 17:22	1
Naphthalene	ND		9.6		ug/Kg		05/16/15 12:33	05/16/15 17:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*105*		*45 - 131*	*05/16/15 12:33*	*05/16/15 17:22*	*1*
1,2-Dichloroethane-d4 (Surr)	*112*		*60 - 140*	*05/16/15 12:33*	*05/16/15 17:22*	*1*
Toluene-d8 (Surr)	*102*		*58 - 140*	*05/16/15 12:33*	*05/16/15 17:22*	*1*

Method: 8270C SIM - PAHs by GCMS (SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 21:03	1
Acenaphthylene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 21:03	1
Anthracene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 21:03	1
Benzo[a]anthracene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 21:03	1
Benzo[a]pyrene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 21:03	1
Benzo[b]fluoranthene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 21:03	1
Benzo[g,h,i]perylene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 21:03	1
Benzo[k]fluoranthene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 21:03	1
Chrysene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 21:03	1
Dibenz(a,h)anthracene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 21:03	1
Fluoranthene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 21:03	1
Fluorene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 21:03	1
Indeno[1,2,3-cd]pyrene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 21:03	1
Naphthalene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 21:03	1
Phenanthrene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 21:03	1
Pyrene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 21:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl	*62*		*33 - 120*	*05/18/15 09:52*	*05/18/15 21:03*	*1*
Terphenyl-d14	*75*		*35 - 146*	*05/18/15 09:52*	*05/18/15 21:03*	*1*

Client Sample ID: SB-7_SOIL_22.5-23.0

Lab Sample ID: 720-64747-11

Date Collected: 05/12/15 13:05

Matrix: Solid

Date Received: 05/12/15 18:45

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methyl tert-butyl ether	ND		4.3		ug/Kg		05/19/15 10:00	05/19/15 11:32	1
Benzene	ND		4.3		ug/Kg		05/19/15 10:00	05/19/15 11:32	1
EDB	ND		4.3		ug/Kg		05/19/15 10:00	05/19/15 11:32	1
1,2-DCA	ND		4.3		ug/Kg		05/19/15 10:00	05/19/15 11:32	1
Ethylbenzene	ND		4.3		ug/Kg		05/19/15 10:00	05/19/15 11:32	1
Toluene	ND		4.3		ug/Kg		05/19/15 10:00	05/19/15 11:32	1
Xylenes, Total	ND		8.7		ug/Kg		05/19/15 10:00	05/19/15 11:32	1
Gasoline Range Organics (GRO) -C6-C12	ND		220		ug/Kg		05/19/15 10:00	05/19/15 11:32	1
TBA	ND		87		ug/Kg		05/19/15 10:00	05/19/15 11:32	1
Ethanol	ND		870		ug/Kg		05/19/15 10:00	05/19/15 11:32	1
DIPE	ND		4.3		ug/Kg		05/19/15 10:00	05/19/15 11:32	1
TAME	ND		4.3		ug/Kg		05/19/15 10:00	05/19/15 11:32	1
Ethyl t-butyl ether	ND		4.3		ug/Kg		05/19/15 10:00	05/19/15 11:32	1
Naphthalene	ND		8.7		ug/Kg		05/19/15 10:00	05/19/15 11:32	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*99*		*45 - 131*	*05/19/15 10:00*	*05/19/15 11:32*	*1*
1,2-Dichloroethane-d4 (Surr)	*119*		*60 - 140*	*05/19/15 10:00*	*05/19/15 11:32*	*1*
Toluene-d8 (Surr)	*98*		*58 - 140*	*05/19/15 10:00*	*05/19/15 11:32*	*1*

Method: 8270C SIM - PAHs by GCMS (SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 21:26	1
Acenaphthylene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 21:26	1
Anthracene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 21:26	1
Benzo[a]anthracene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 21:26	1
Benzo[a]pyrene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 21:26	1
Benzo[b]fluoranthene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 21:26	1
Benzo[g,h,i]perylene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 21:26	1
Benzo[k]fluoranthene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 21:26	1
Chrysene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 21:26	1
Dibenz(a,h)anthracene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 21:26	1
Fluoranthene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 21:26	1
Fluorene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 21:26	1
Indeno[1,2,3-cd]pyrene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 21:26	1
Naphthalene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 21:26	1
Phenanthrene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 21:26	1
Pyrene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 21:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl	*74*		*33 - 120*	*05/18/15 09:52*	*05/18/15 21:26*	*1*
Terphenyl-d14	*88*		*35 - 146*	*05/18/15 09:52*	*05/18/15 21:26*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: BP #4931, Oakland

TestAmerica Job ID: 720-64747-1

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)		
		BFB	12DCE	TOL
Lab Sample ID	Client Sample ID	(45-131)	(60-140)	(58-140)
720-64747-4	SV-7_SOIL_2.5-3.0	103	105	101
720-64747-6	SV-7_SOIL_4.5-5.0	105	116	103
720-64747-7	SV-8_SOIL_2.5-3.0	101	113	99
720-64747-8	SV-8_SOIL_4.5-5.0	102	111	103
720-64747-9	SB-7_SOIL_4.5-5.0	103	113	102
720-64747-10	SB-7_SOIL_9.5-10.0	105	112	102
720-64747-11	SB-7_SOIL_22.5-23.0	99	119	98
720-64747-11 MS	SB-7_SOIL_22.5-23.0	98	110	101
720-64747-11 MSD	SB-7_SOIL_22.5-23.0	106	110	100
LCS 720-181846/5	Lab Control Sample	105	109	102
LCS 720-181846/7	Lab Control Sample	105	112	104
LCS 720-181976/5	Lab Control Sample	110	109	101
LCS 720-181976/7	Lab Control Sample	110	119	101
LCSD 720-181846/6	Lab Control Sample Dup	104	111	102
LCSD 720-181846/8	Lab Control Sample Dup	106	112	103
LCSD 720-181976/6	Lab Control Sample Dup	101	112	101
LCSD 720-181976/8	Lab Control Sample Dup	111	116	101
MB 720-181846/4	Method Blank	104	109	102
MB 720-181976/4	Method Blank	111	116	100

Surrogate Legend

BFB = 4-Bromofluorobenzene
12DCE = 1,2-Dichloroethane-d4 (Surr)
TOL = Toluene-d8 (Surr)

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)		
		BFB	12DCE	TOL
Lab Sample ID	Client Sample ID	(67-130)	(72-130)	(70-130)
720-64747-1	SB-07_GW_18.0-23.0	102	112	101
LCS 720-181814/5	Lab Control Sample	102	103	103
LCS 720-181814/7	Lab Control Sample	104	105	102
LCSD 720-181814/6	Lab Control Sample Dup	101	105	102
LCSD 720-181814/8	Lab Control Sample Dup	105	109	103
MB 720-181814/4	Method Blank	102	109	102

Surrogate Legend

BFB = 4-Bromofluorobenzene
12DCE = 1,2-Dichloroethane-d4 (Surr)
TOL = Toluene-d8 (Surr)

Method: 8270C SIM - PAHs by GCMS (SIM)

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)	
		FBP	TPH
Lab Sample ID	Client Sample ID	(33-120)	(35-146)
720-64747-9	SB-7_SOIL_4.5-5.0	69	84

Method: 8270C SIM - PAHs by GCMS (SIM) (Continued)

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)									
Lab Sample ID	Client Sample ID	FBP (33-120)	TPH (35-146)								
720-64747-10	SB-7_SOIL_9.5-10.0	62	75								
720-64747-11	SB-7_SOIL_22.5-23.0	74	88								
LCS 720-181893/2-A	Lab Control Sample	77	98								
MB 720-181893/1-A	Method Blank	76	95								

Surrogate Legend

FBP = 2-Fluorobiphenyl
TPH = Terphenyl-d14

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS

Lab Sample ID: MB 720-181814/4
Matrix: Water
Analysis Batch: 181814

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
MTBE	ND		0.50		ug/L			05/15/15 17:35	1
Benzene	ND		0.50		ug/L			05/15/15 17:35	1
EDB	ND		0.50		ug/L			05/15/15 17:35	1
1,2-DCA	ND		0.50		ug/L			05/15/15 17:35	1
Ethylbenzene	ND		0.50		ug/L			05/15/15 17:35	1
Toluene	ND		0.50		ug/L			05/15/15 17:35	1
Xylenes, Total	ND		1.0		ug/L			05/15/15 17:35	1
Gasoline Range Organics (GRO) -C6-C12	ND		50		ug/L			05/15/15 17:35	1
TBA	ND		20		ug/L			05/15/15 17:35	1
Ethanol	ND		500		ug/L			05/15/15 17:35	1
DIPE	ND		0.50		ug/L			05/15/15 17:35	1
TAME	ND		0.50		ug/L			05/15/15 17:35	1
Ethyl t-butyl ether	ND		0.50		ug/L			05/15/15 17:35	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*102*		*67 - 130*		*05/15/15 17:35*	*1*
1,2-Dichloroethane-d4 (Surr)	*109*		*72 - 130*		*05/15/15 17:35*	*1*
Toluene-d8 (Surr)	*102*		*70 - 130*		*05/15/15 17:35*	*1*

Lab Sample ID: LCS 720-181814/5
Matrix: Water
Analysis Batch: 181814

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
MTBE	25.0	25.4		ug/L		102	62 - 130
Benzene	25.0	25.0		ug/L		100	79 - 130
EDB	25.0	26.2		ug/L		105	70 - 130
1,2-DCA	25.0	26.3		ug/L		105	61 - 132
Ethylbenzene	25.0	25.6		ug/L		102	80 - 120
Toluene	25.0	25.3		ug/L		101	78 - 120
TBA	250	242		ug/L		97	70 - 130
Ethanol	1250	1220		ug/L		98	31 - 216
DIPE	25.0	25.1		ug/L		101	69 - 134
TAME	25.0	26.5		ug/L		106	79 - 130
Ethyl t-butyl ether	25.0	25.3		ug/L		101	70 - 130

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene	*102*		*67 - 130*
1,2-Dichloroethane-d4 (Surr)	*103*		*72 - 130*
Toluene-d8 (Surr)	*103*		*70 - 130*

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS (Continued)

Lab Sample ID: LCS 720-181814/7
Matrix: Water
Analysis Batch: 181814

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Gasoline Range Organics (GRO) -C6-C12			500	512		ug/L		102	58 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene	*104*		*67 - 130*
1,2-Dichloroethane-d4 (Surr)	*105*		*72 - 130*
Toluene-d8 (Surr)	*102*		*70 - 130*

Lab Sample ID: LCSD 720-181814/6
Matrix: Water
Analysis Batch: 181814

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
MTBE			25.0	25.1		ug/L		100	62 - 130	1	20
Benzene			25.0	25.1		ug/L		100	79 - 130	0	20
EDB			25.0	26.1		ug/L		105	70 - 130	0	20
1,2-DCA			25.0	25.7		ug/L		103	61 - 132	3	20
Ethylbenzene			25.0	26.0		ug/L		104	80 - 120	1	20
Toluene			25.0	25.7		ug/L		103	78 - 120	2	20
TBA			250	240		ug/L		96	70 - 130	1	20
Ethanol			1250	1230		ug/L		99	31 - 216	1	30
DIPE			25.0	24.8		ug/L		99	69 - 134	1	20
TAME			25.0	26.0		ug/L		104	79 - 130	2	20
Ethyl t-butyl ether			25.0	24.9		ug/L		100	70 - 130	1	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene	*101*		*67 - 130*
1,2-Dichloroethane-d4 (Surr)	*105*		*72 - 130*
Toluene-d8 (Surr)	*102*		*70 - 130*

Lab Sample ID: LCSD 720-181814/8
Matrix: Water
Analysis Batch: 181814

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Gasoline Range Organics (GRO) -C6-C12			500	528		ug/L		106	58 - 120	3	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene	*105*		*67 - 130*
1,2-Dichloroethane-d4 (Surr)	*109*		*72 - 130*
Toluene-d8 (Surr)	*103*		*70 - 130*

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS (Continued)

Lab Sample ID: MB 720-181846/4
Matrix: Solid
Analysis Batch: 181846

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methyl tert-butyl ether	ND		5.0		ug/Kg			05/16/15 10:48	1
Benzene	ND		5.0		ug/Kg			05/16/15 10:48	1
EDB	ND		5.0		ug/Kg			05/16/15 10:48	1
1,2-DCA	ND		5.0		ug/Kg			05/16/15 10:48	1
Ethylbenzene	ND		5.0		ug/Kg			05/16/15 10:48	1
Toluene	ND		5.0		ug/Kg			05/16/15 10:48	1
Xylenes, Total	ND		10		ug/Kg			05/16/15 10:48	1
Gasoline Range Organics (GRO) -C6-C12	ND		250		ug/Kg			05/16/15 10:48	1
TBA	ND		100		ug/Kg			05/16/15 10:48	1
Ethanol	ND		1000		ug/Kg			05/16/15 10:48	1
DIPE	ND		5.0		ug/Kg			05/16/15 10:48	1
TAME	ND		5.0		ug/Kg			05/16/15 10:48	1
Ethyl t-butyl ether	ND		5.0		ug/Kg			05/16/15 10:48	1
Naphthalene	ND		10		ug/Kg			05/16/15 10:48	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*104*		*45 - 131*		*05/16/15 10:48*	*1*
1,2-Dichloroethane-d4 (Surr)	*109*		*60 - 140*		*05/16/15 10:48*	*1*
Toluene-d8 (Surr)	*102*		*58 - 140*		*05/16/15 10:48*	*1*

Lab Sample ID: LCS 720-181846/5
Matrix: Solid
Analysis Batch: 181846

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Methyl tert-butyl ether	50.0	57.7		ug/Kg		115	70 - 144
Benzene	50.0	51.7		ug/Kg		103	70 - 130
EDB	50.0	58.4		ug/Kg		117	70 - 140
1,2-DCA	50.0	57.4		ug/Kg		115	70 - 130
Ethylbenzene	50.0	52.0		ug/Kg		104	80 - 137
Toluene	50.0	51.2		ug/Kg		102	80 - 128
m-Xylene & p-Xylene	50.0	52.5		ug/Kg		105	70 - 146
o-Xylene	50.0	53.0		ug/Kg		106	70 - 140
TBA	500	492		ug/Kg		98	63 - 130
Ethanol	2500	2420		ug/Kg		97	49 - 162
DIPE	50.0	54.8		ug/Kg		110	70 - 131
TAME	50.0	59.1		ug/Kg		118	70 - 145
Ethyl t-butyl ether	50.0	56.4		ug/Kg		113	70 - 130
Naphthalene	50.0	55.7		ug/Kg		111	60 - 147

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene	*105*		*45 - 131*
1,2-Dichloroethane-d4 (Surr)	*109*		*60 - 140*
Toluene-d8 (Surr)	*102*		*58 - 140*

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS (Continued)

Lab Sample ID: LCS 720-181846/7
Matrix: Solid
Analysis Batch: 181846

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Gasoline Range Organics (GRO) -C6-C12			1000	1070		ug/Kg		107	64 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene	*105*		*45 - 131*
1,2-Dichloroethane-d4 (Surr)	*112*		*60 - 140*
Toluene-d8 (Surr)	*104*		*58 - 140*

Lab Sample ID: LCSD 720-181846/6
Matrix: Solid
Analysis Batch: 181846

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Methyl tert-butyl ether			50.0	59.1		ug/Kg		118	70 - 144	2	20
Benzene			50.0	52.0		ug/Kg		104	70 - 130	1	20
EDB			50.0	59.4		ug/Kg		119	70 - 140	2	20
1,2-DCA			50.0	58.1		ug/Kg		116	70 - 130	1	20
Ethylbenzene			50.0	52.1		ug/Kg		104	80 - 137	0	20
Toluene			50.0	51.5		ug/Kg		103	80 - 128	1	20
m-Xylene & p-Xylene			50.0	52.6		ug/Kg		105	70 - 146	0	20
o-Xylene			50.0	53.0		ug/Kg		106	70 - 140	0	20
TBA			500	488		ug/Kg		98	63 - 130	1	20
Ethanol			2500	2380		ug/Kg		95	49 - 162	1	20
DIPE			50.0	55.5		ug/Kg		111	70 - 131	1	20
TAME			50.0	60.1		ug/Kg		120	70 - 145	2	20
Ethyl t-butyl ether			50.0	57.1		ug/Kg		114	70 - 130	1	20
Naphthalene			50.0	56.1		ug/Kg		112	60 - 147	1	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene	*104*		*45 - 131*
1,2-Dichloroethane-d4 (Surr)	*111*		*60 - 140*
Toluene-d8 (Surr)	*102*		*58 - 140*

Lab Sample ID: LCSD 720-181846/8
Matrix: Solid
Analysis Batch: 181846

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Gasoline Range Organics (GRO) -C6-C12			1000	1080		ug/Kg		108	64 - 120	1	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene	*106*		*45 - 131*
1,2-Dichloroethane-d4 (Surr)	*112*		*60 - 140*
Toluene-d8 (Surr)	*103*		*58 - 140*

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS (Continued)

Lab Sample ID: MB 720-181976/4
Matrix: Solid
Analysis Batch: 181976

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methyl tert-butyl ether	ND		5.0		ug/Kg			05/19/15 08:51	1
Benzene	ND		5.0		ug/Kg			05/19/15 08:51	1
EDB	ND		5.0		ug/Kg			05/19/15 08:51	1
1,2-DCA	ND		5.0		ug/Kg			05/19/15 08:51	1
Ethylbenzene	ND		5.0		ug/Kg			05/19/15 08:51	1
Toluene	ND		5.0		ug/Kg			05/19/15 08:51	1
Xylenes, Total	ND		10		ug/Kg			05/19/15 08:51	1
Gasoline Range Organics (GRO) -C6-C12	ND		250		ug/Kg			05/19/15 08:51	1
TBA	ND		100		ug/Kg			05/19/15 08:51	1
Ethanol	ND		1000		ug/Kg			05/19/15 08:51	1
DIPE	ND		5.0		ug/Kg			05/19/15 08:51	1
TAME	ND		5.0		ug/Kg			05/19/15 08:51	1
Ethyl t-butyl ether	ND		5.0		ug/Kg			05/19/15 08:51	1
Naphthalene	ND		10		ug/Kg			05/19/15 08:51	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*111*		*45 - 131*		*05/19/15 08:51*	*1*
1,2-Dichloroethane-d4 (Surr)	*116*		*60 - 140*		*05/19/15 08:51*	*1*
Toluene-d8 (Surr)	*100*		*58 - 140*		*05/19/15 08:51*	*1*

Lab Sample ID: LCS 720-181976/5
Matrix: Solid
Analysis Batch: 181976

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Methyl tert-butyl ether	50.0	54.2		ug/Kg		108	70 - 144
Benzene	50.0	52.8		ug/Kg		106	70 - 130
EDB	50.0	50.3		ug/Kg		101	70 - 140
1,2-DCA	50.0	55.9		ug/Kg		112	70 - 130
Ethylbenzene	50.0	54.7		ug/Kg		109	80 - 137
Toluene	50.0	53.8		ug/Kg		108	80 - 128
m-Xylene & p-Xylene	50.0	55.1		ug/Kg		110	70 - 146
o-Xylene	50.0	54.5		ug/Kg		109	70 - 140
TBA	500	490		ug/Kg		98	63 - 130
Ethanol	2500	2660		ug/Kg		107	49 - 162
DIPE	50.0	61.0		ug/Kg		122	70 - 131
TAME	50.0	58.5		ug/Kg		117	70 - 145
Ethyl t-butyl ether	50.0	58.9		ug/Kg		118	70 - 130
Naphthalene	50.0	49.7		ug/Kg		99	60 - 147

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene	*110*		*45 - 131*
1,2-Dichloroethane-d4 (Surr)	*109*		*60 - 140*
Toluene-d8 (Surr)	*101*		*58 - 140*

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS (Continued)

Lab Sample ID: LCS 720-181976/7
Matrix: Solid
Analysis Batch: 181976

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Gasoline Range Organics (GRO) -C6-C12			1000	851		ug/Kg		85	64 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene	*110*		*45 - 131*
1,2-Dichloroethane-d4 (Surr)	*119*		*60 - 140*
Toluene-d8 (Surr)	*101*		*58 - 140*

Lab Sample ID: LCSD 720-181976/6
Matrix: Solid
Analysis Batch: 181976

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Methyl tert-butyl ether			50.0	55.0		ug/Kg		110	70 - 144	1	20
Benzene			50.0	53.8		ug/Kg		108	70 - 130	2	20
EDB			50.0	51.5		ug/Kg		103	70 - 140	2	20
1,2-DCA			50.0	56.5		ug/Kg		113	70 - 130	1	20
Ethylbenzene			50.0	51.3		ug/Kg		103	80 - 137	6	20
Toluene			50.0	50.3		ug/Kg		101	80 - 128	7	20
m-Xylene & p-Xylene			50.0	51.5		ug/Kg		103	70 - 146	7	20
o-Xylene			50.0	50.9		ug/Kg		102	70 - 140	7	20
TBA			500	475		ug/Kg		95	63 - 130	3	20
Ethanol			2500	2690		ug/Kg		107	49 - 162	1	20
DIPE			50.0	62.0		ug/Kg		124	70 - 131	2	20
TAME			50.0	59.4		ug/Kg		119	70 - 145	1	20
Ethyl t-butyl ether			50.0	60.0		ug/Kg		120	70 - 130	2	20
Naphthalene			50.0	51.9		ug/Kg		104	60 - 147	4	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene	*101*		*45 - 131*
1,2-Dichloroethane-d4 (Surr)	*112*		*60 - 140*
Toluene-d8 (Surr)	*101*		*58 - 140*

Lab Sample ID: LCSD 720-181976/8
Matrix: Solid
Analysis Batch: 181976

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Gasoline Range Organics (GRO) -C6-C12			1000	927		ug/Kg		93	64 - 120	9	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene	*111*		*45 - 131*
1,2-Dichloroethane-d4 (Surr)	*116*		*60 - 140*
Toluene-d8 (Surr)	*101*		*58 - 140*

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS (Continued)

Lab Sample ID: 720-64747-11 MS
Matrix: Solid
Analysis Batch: 181976

Client Sample ID: SB-7_SOIL_22.5-23.0
Prep Type: Total/NA
Prep Batch: 182023

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Methyl tert-butyl ether	ND		48.4	48.5		ug/Kg		100	69 - 130
Benzene	ND		48.4	48.0		ug/Kg		99	70 - 130
EDB	ND		48.4	43.3		ug/Kg		90	66 - 135
1,2-DCA	ND		48.4	49.5		ug/Kg		102	70 - 130
Ethylbenzene	ND		48.4	47.5		ug/Kg		98	65 - 130
Toluene	ND		48.4	46.9		ug/Kg		97	70 - 130
m-Xylene & p-Xylene	ND		48.4	48.0		ug/Kg		99	70 - 130
o-Xylene	ND		48.4	47.4		ug/Kg		98	68 - 130
TBA	ND		484	469		ug/Kg		97	70 - 130
Ethanol	ND		2420	2510		ug/Kg		104	70 - 130
DIPE	ND		48.4	56.1		ug/Kg		116	70 - 130
TAME	ND		48.4	52.7		ug/Kg		106	70 - 130
Ethyl t-butyl ether	ND		48.4	53.6		ug/Kg		111	70 - 130
Naphthalene	ND		48.4	39.2		ug/Kg		81	45 - 146

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
4-Bromofluorobenzene	*98*		*45 - 131*
1,2-Dichloroethane-d4 (Surr)	*110*		*60 - 140*
Toluene-d8 (Surr)	*101*		*58 - 140*

Lab Sample ID: 720-64747-11 MSD
Matrix: Solid
Analysis Batch: 181976

Client Sample ID: SB-7_SOIL_22.5-23.0
Prep Type: Total/NA
Prep Batch: 182023

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Methyl tert-butyl ether	ND		46.1	51.4		ug/Kg		111	69 - 130	6	20
Benzene	ND		46.1	47.9		ug/Kg		104	70 - 130	0	20
EDB	ND		46.1	45.4		ug/Kg		98	66 - 135	5	20
1,2-DCA	ND		46.1	50.6		ug/Kg		110	70 - 130	2	20
Ethylbenzene	ND		46.1	50.5		ug/Kg		110	65 - 130	6	20
Toluene	ND		46.1	50.4		ug/Kg		109	70 - 130	7	20
m-Xylene & p-Xylene	ND		46.1	50.7		ug/Kg		110	70 - 130	5	20
o-Xylene	ND		46.1	50.7		ug/Kg		110	68 - 130	7	20
TBA	ND		461	428		ug/Kg		93	70 - 130	9	20
Ethanol	ND		2310	2400		ug/Kg		104	70 - 130	4	20
DIPE	ND		46.1	56.8		ug/Kg		123	70 - 130	1	20
TAME	ND		46.1	55.4		ug/Kg		117	70 - 130	5	20
Ethyl t-butyl ether	ND		46.1	55.6		ug/Kg		120	70 - 130	4	20
Naphthalene	ND		46.1	41.9		ug/Kg		91	45 - 146	7	20

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
4-Bromofluorobenzene	*106*		*45 - 131*
1,2-Dichloroethane-d4 (Surr)	*110*		*60 - 140*
Toluene-d8 (Surr)	*100*		*58 - 140*

Method: 8270C SIM - PAHs by GCMS (SIM)

Lab Sample ID: MB 720-181893/1-A
Matrix: Solid
Analysis Batch: 181924

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 181893

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 18:59	1
Acenaphthylene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 18:59	1
Anthracene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 18:59	1
Benzo[a]anthracene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 18:59	1
Benzo[a]pyrene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 18:59	1
Benzo[b]fluoranthene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 18:59	1
Benzo[g,h,i]perylene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 18:59	1
Benzo[k]fluoranthene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 18:59	1
Chrysene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 18:59	1
Dibenz(a,h)anthracene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 18:59	1
Fluoranthene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 18:59	1
Fluorene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 18:59	1
Indeno[1,2,3-cd]pyrene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 18:59	1
Naphthalene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 18:59	1
Phenanthrene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 18:59	1
Pyrene	ND		5.0		ug/Kg		05/18/15 09:52	05/18/15 18:59	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl	*76*		*33 - 120*	*05/18/15 09:52*	*05/18/15 18:59*	*1*
Terphenyl-d14	*95*		*35 - 146*	*05/18/15 09:52*	*05/18/15 18:59*	*1*

Lab Sample ID: LCS 720-181893/2-A
Matrix: Solid
Analysis Batch: 181924

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 181893

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acenaphthene	330	277		ug/Kg		84	43 - 120
Acenaphthylene	330	294		ug/Kg		89	46 - 120
Anthracene	330	264		ug/Kg		80	55 - 120
Benzo[a]anthracene	330	307		ug/Kg		93	65 - 120
Benzo[a]pyrene	330	296		ug/Kg		90	62 - 120
Benzo[b]fluoranthene	330	293		ug/Kg		89	60 - 120
Benzo[g,h,i]perylene	330	284		ug/Kg		86	42 - 120
Benzo[k]fluoranthene	330	292		ug/Kg		88	63 - 120
Chrysene	330	301		ug/Kg		91	54 - 120
Dibenz(a,h)anthracene	330	312		ug/Kg		95	51 - 120
Fluoranthene	330	262		ug/Kg		79	59 - 120
Fluorene	330	290		ug/Kg		88	47 - 120
Indeno[1,2,3-cd]pyrene	330	296		ug/Kg		90	50 - 120
Naphthalene	330	248		ug/Kg		75	42 - 120
Phenanthrene	330	254		ug/Kg		77	51 - 120
Pyrene	330	289		ug/Kg		87	63 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2-Fluorobiphenyl	*77*		*33 - 120*
Terphenyl-d14	*98*		*35 - 146*

GC/MS VOA

Analysis Batch: 181814

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-64747-1	SB-07_GW_18.0-23.0	Total/NA	Water	8260B/CA_LUFT MS	
LCS 720-181814/5	Lab Control Sample	Total/NA	Water	8260B/CA_LUFT MS	
LCS 720-181814/7	Lab Control Sample	Total/NA	Water	8260B/CA_LUFT MS	
LCSD 720-181814/6	Lab Control Sample Dup	Total/NA	Water	8260B/CA_LUFT MS	
LCSD 720-181814/8	Lab Control Sample Dup	Total/NA	Water	8260B/CA_LUFT MS	
MB 720-181814/4	Method Blank	Total/NA	Water	8260B/CA_LUFT MS	

Analysis Batch: 181846

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-64747-4	SV-7_SOIL_2.5-3.0	Total/NA	Solid	8260B/CA_LUFT MS	181867
720-64747-6	SV-7_SOIL_4.5-5.0	Total/NA	Solid	8260B/CA_LUFT MS	181867
720-64747-7	SV-8_SOIL_2.5-3.0	Total/NA	Solid	8260B/CA_LUFT MS	181867
720-64747-8	SV-8_SOIL_4.5-5.0	Total/NA	Solid	8260B/CA_LUFT MS	181867
720-64747-9	SB-7_SOIL_4.5-5.0	Total/NA	Solid	8260B/CA_LUFT MS	181867
720-64747-10	SB-7_SOIL_9.5-10.0	Total/NA	Solid	8260B/CA_LUFT MS	181867
LCS 720-181846/5	Lab Control Sample	Total/NA	Solid	8260B/CA_LUFT MS	
LCS 720-181846/7	Lab Control Sample	Total/NA	Solid	8260B/CA_LUFT MS	
LCSD 720-181846/6	Lab Control Sample Dup	Total/NA	Solid	8260B/CA_LUFT MS	
LCSD 720-181846/8	Lab Control Sample Dup	Total/NA	Solid	8260B/CA_LUFT MS	
MB 720-181846/4	Method Blank	Total/NA	Solid	8260B/CA_LUFT MS	

Prep Batch: 181867

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-64747-4	SV-7_SOIL_2.5-3.0	Total/NA	Solid	5030B	
720-64747-6	SV-7_SOIL_4.5-5.0	Total/NA	Solid	5030B	
720-64747-7	SV-8_SOIL_2.5-3.0	Total/NA	Solid	5030B	
720-64747-8	SV-8_SOIL_4.5-5.0	Total/NA	Solid	5030B	
720-64747-9	SB-7_SOIL_4.5-5.0	Total/NA	Solid	5030B	
720-64747-10	SB-7_SOIL_9.5-10.0	Total/NA	Solid	5030B	

Analysis Batch: 181976

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-64747-11	SB-7_SOIL_22.5-23.0	Total/NA	Solid	8260B/CA_LUFT MS	182023
720-64747-11 MS	SB-7_SOIL_22.5-23.0	Total/NA	Solid	8260B/CA_LUFT MS	182023
720-64747-11 MSD	SB-7_SOIL_22.5-23.0	Total/NA	Solid	8260B/CA_LUFT MS	182023

GC/MS VOA (Continued)

Analysis Batch: 181976 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 720-181976/5	Lab Control Sample	Total/NA	Solid	8260B/CA_LUFT MS	
LCS 720-181976/7	Lab Control Sample	Total/NA	Solid	8260B/CA_LUFT MS	
LCSD 720-181976/6	Lab Control Sample Dup	Total/NA	Solid	8260B/CA_LUFT MS	
LCSD 720-181976/8	Lab Control Sample Dup	Total/NA	Solid	8260B/CA_LUFT MS	
MB 720-181976/4	Method Blank	Total/NA	Solid	8260B/CA_LUFT MS	

Prep Batch: 182023

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-64747-11	SB-7_SOIL_22.5-23.0	Total/NA	Solid	5030B	
720-64747-11 MS	SB-7_SOIL_22.5-23.0	Total/NA	Solid	5030B	
720-64747-11 MSD	SB-7_SOIL_22.5-23.0	Total/NA	Solid	5030B	

GC/MS Semi VOA

Prep Batch: 181893

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-64747-9	SB-7_SOIL_4.5-5.0	Total/NA	Solid	3546	
720-64747-10	SB-7_SOIL_9.5-10.0	Total/NA	Solid	3546	
720-64747-11	SB-7_SOIL_22.5-23.0	Total/NA	Solid	3546	
LCS 720-181893/2-A	Lab Control Sample	Total/NA	Solid	3546	
MB 720-181893/1-A	Method Blank	Total/NA	Solid	3546	

Analysis Batch: 181924

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-64747-9	SB-7_SOIL_4.5-5.0	Total/NA	Solid	8270C SIM	181893
720-64747-10	SB-7_SOIL_9.5-10.0	Total/NA	Solid	8270C SIM	181893
720-64747-11	SB-7_SOIL_22.5-23.0	Total/NA	Solid	8270C SIM	181893
LCS 720-181893/2-A	Lab Control Sample	Total/NA	Solid	8270C SIM	181893
MB 720-181893/1-A	Method Blank	Total/NA	Solid	8270C SIM	181893

Client Sample ID: SB-07_GW_18.0-23.0 — Lab Sample ID: 720-64747-1

Date Collected: 05/12/15 13:30 — **Matrix: Water**
Date Received: 05/12/15 18:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B/CA_LUFTMS		1	181814	05/16/15 01:59	ASC	TAL PLS

Client Sample ID: SV-7_SOIL_2.5-3.0 — Lab Sample ID: 720-64747-4

Date Collected: 05/12/15 08:45 — **Matrix: Solid**
Date Received: 05/12/15 18:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5030B			181867	05/16/15 12:33	LPL	TAL PLS
Total/NA	Analysis	8260B/CA_LUFTMS		1	181846	05/16/15 15:01	ASC	TAL PLS

Client Sample ID: SV-7_SOIL_4.5-5.0 — Lab Sample ID: 720-64747-6

Date Collected: 05/12/15 09:00 — **Matrix: Solid**
Date Received: 05/12/15 18:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5030B			181867	05/16/15 12:33	LPL	TAL PLS
Total/NA	Analysis	8260B/CA_LUFTMS		1	181846	05/16/15 15:30	ASC	TAL PLS

Client Sample ID: SV-8_SOIL_2.5-3.0 — Lab Sample ID: 720-64747-7

Date Collected: 05/12/15 10:30 — **Matrix: Solid**
Date Received: 05/12/15 18:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5030B			181867	05/16/15 12:33	LPL	TAL PLS
Total/NA	Analysis	8260B/CA_LUFTMS		1	181846	05/16/15 15:58	ASC	TAL PLS

Client Sample ID: SV-8_SOIL_4.5-5.0 — Lab Sample ID: 720-64747-8

Date Collected: 05/12/15 10:45 — **Matrix: Solid**
Date Received: 05/12/15 18:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5030B			181867	05/16/15 12:33	LPL	TAL PLS
Total/NA	Analysis	8260B/CA_LUFTMS		1	181846	05/16/15 16:26	ASC	TAL PLS

Client Sample ID: SB-7_SOIL_4.5-5.0 — Lab Sample ID: 720-64747-9

Date Collected: 05/12/15 12:05 — **Matrix: Solid**
Date Received: 05/12/15 18:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5030B			181867	05/16/15 12:33	LPL	TAL PLS
Total/NA	Analysis	8260B/CA_LUFTMS		1	181846	05/16/15 16:54	ASC	TAL PLS
Total/NA	Prep	3546			181893	05/18/15 09:52	DFR	TAL PLS

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: BP #4931, Oakland

TestAmerica Job ID: 720-64747-1

Client Sample ID: SB-7_SOIL_4.5-5.0

Lab Sample ID: 720-64747-9

Date Collected: 05/12/15 12:05

Matrix: Solid

Date Received: 05/12/15 18:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8270C SIM		1	181924	05/18/15 20:39	MQL	TAL PLS

Client Sample ID: SB-7_SOIL_9.5-10.0

Lab Sample ID: 720-64747-10

Date Collected: 05/12/15 12:35

Matrix: Solid

Date Received: 05/12/15 18:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5030B			181867	05/16/15 12:33	LPL	TAL PLS
Total/NA	Analysis	8260B/CA_LUFTMS		1	181846	05/16/15 17:22	ASC	TAL PLS
Total/NA	Prep	3546			181893	05/18/15 09:52	DFR	TAL PLS
Total/NA	Analysis	8270C SIM		1	181924	05/18/15 21:03	MQL	TAL PLS

Client Sample ID: SB-7_SOIL_22.5-23.0

Lab Sample ID: 720-64747-11

Date Collected: 05/12/15 13:05

Matrix: Solid

Date Received: 05/12/15 18:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5030B			182023	05/19/15 10:00	PRD	TAL PLS
Total/NA	Analysis	8260B/CA_LUFTMS		1	181976	05/19/15 11:32	PRD	TAL PLS
Total/NA	Prep	3546			181893	05/18/15 09:52	DFR	TAL PLS
Total/NA	Analysis	8270C SIM		1	181924	05/18/15 21:26	MQL	TAL PLS

Laboratory References:

SC0146 = Cooper Testing Labs, 937 Commercial Street, Palo Alto, CA 94303

TAL PLS = TestAmerica Pleasanton, 1220 Quarry Lane, Pleasanton, CA 94566, TEL (925)484-1919

Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: BP #4931, Oakland

TestAmerica Job ID: 720-64747-1

Laboratory: TestAmerica Pleasanton

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
California	State Program	9	2496	01-31-16

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: BP #4931, Oakland

TestAmerica Job ID: 720-64747-1

Method	Method Description	Protocol	Laboratory
8260B/CA_LUFTMS	8260B / CA LUFT MS	SW846	TAL PLS
8270C SIM	PAHs by GCMS (SIM)	SW846	TAL PLS
Bulk Density	General Sub Contract Method	NONE	SC0146
Sieve & Hydrometer-ASTM D422	General Sub Contract Method	NONE	SC0146
Soil Moisture-ASTM D2216	General Sub Contract Method	NONE	SC0146

Protocol References:

NONE = NONE

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

SC0146 = Cooper Testing Labs, 937 Commercial Street, Palo Alto, CA 94303

TAL PLS = TestAmerica Pleasanton, 1220 Quarry Lane, Pleasanton, CA 94566, TEL (925)484-1919

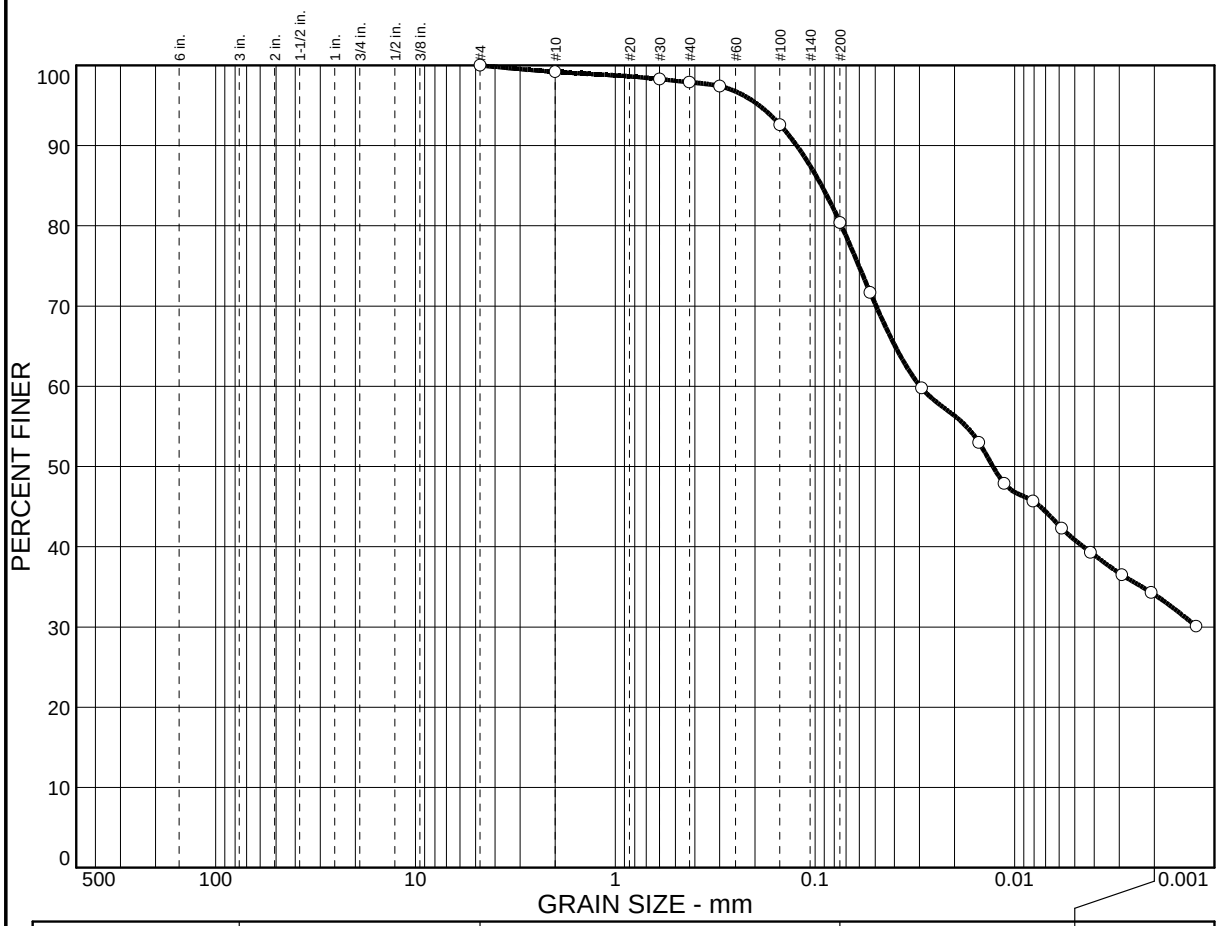
Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: BP #4931, Oakland

TestAmerica Job ID: 720-64747-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
720-64747-1	SB-07_GW_18.0-23.0	Water	05/12/15 13:30	05/12/15 18:45
720-64747-4	SV-7_SOIL_2.5-3.0	Solid	05/12/15 08:45	05/12/15 18:45
720-64747-5	SV-7_SOIL_4.0-4.5	Solid	05/12/15 08:50	05/12/15 18:45
720-64747-6	SV-7_SOIL_4.5-5.0	Solid	05/12/15 09:00	05/12/15 18:45
720-64747-7	SV-8_SOIL_2.5-3.0	Solid	05/12/15 10:30	05/12/15 18:45
720-64747-8	SV-8_SOIL_4.5-5.0	Solid	05/12/15 10:45	05/12/15 18:45
720-64747-9	SB-7_SOIL_4.5-5.0	Solid	05/12/15 12:05	05/12/15 18:45
720-64747-10	SB-7_SOIL_9.5-10.0	Solid	05/12/15 12:35	05/12/15 18:45
720-64747-11	SB-7_SOIL_22.5-23.0	Solid	05/12/15 13:05	05/12/15 18:45

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	19.6	46.4	34.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	99.2		
#30	98.3		
#40	97.9		
#50	97.4		
#100	92.6		
#200	80.4		
#270	71.7		
0.0293 mm.	59.8		
0.0151 mm.	53.0		
0.0113 mm.	47.9		
0.0081 mm.	45.7		
0.0058 mm.	42.3		
0.0042 mm.	39.3		
0.0029 mm.	36.5		
0.0021 mm.	34.3		
0.0012 mm.	30.1		

* (no specification provided)

Soil Description

Yellowish Brown CLAY w/ Sand

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.0927 D_{60}= 0.0297 D_{50}= 0.0129
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Sample No.: (720-64747-5) **Source of Sample:** SV-7_SOIL_4.0-4.5 **Date:** 5/19/15
Location: **Elev./Depth:**

COOPER TESTING LABORATORY

Client: Test America
Project: BP #4931, Oakland - 720-64747-1

Project No: 634-125 **Figure**

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

720-64747

TESTAMERICA Pleasanton Chain of Custody
1220 Quarry Lane • Pleasanton CA 94566-4756
Phone: (925) 484-1919 • Fax: (925) 600-3002

Reference #: 161090

Date 5/12/15 Page 1 of 2

5/27/2015

Report To

Attn. Hollis Phillips
Company ARCADIS
Address 100 Montgomery St. Suite 300
Email. on file
Bill To: Below
Sampled By: CCH
Attn
Phone: 4133298084

Analysis Request

Sample ID	Date	Time	Matrix	Preserv.	Volatile Organics GC/MS (VOCs) ☐ EPA 8260B	EPA 8260B: BTEX MTBE Gas ☐ 5 Oxygenates ☐ TBA ☐ DIPE ☐ ETBE ☐ TAME ☐ Ethanol	TEPH EPA 8015B ☐ Silica Gel ☐ Diesel ☐ Motor Oil ☐ Other	SemiVolatile Organics GC/MS ☐ EPA 8270C	PNA/PAH's by ☐ 8270C ☐ 8270C SIM	Oil and Grease (EPA 1664/9071) ☐ Petroleum ☐ Total	Pesticides ☐ EPA 8081 PCBs ☐ EPA 8082	CAM17 Metals (EPA 6010/7470/7471)	Metals: ☐ 6010B ☐ 200.7 ☐ Lead ☐ LUFT ☐ RCRA ☐ Other	Metals: ☐ 6020 ☐ 200.8 (ICP-MS):	☐ W.E.T (STLC) ☐ W.E.T (DI) ☐ TCLP	Hex. Chrom by ☐ EPA 7196 ☐ or EPA 7199	pH ☐ 9040 ☐ SM4500	☐ Spec. Cond. ☐ Alkalinity ☐ TSS ☐ SS ☐ TDS	Anions: ☐ Cl ☐ SO_4 ☐ NO_3 ☐ F ☐ Br ☐ NO_2 ☐ PO_4	☐ Perchlorate by EPA 314.0	COD ☐ EPA 410.4 ☐ SM5220D ☐ Turbidity	Bulk Density-ASTM D3937 Grain Density-ASTM D854-14 Soil moisture-ASTM D2216 Sieve size dist. ASTM D422	Number of Containers
SB-07_GW_18.0-23.0	5/12/15	13:30	GW	HCl			X																	6
TAL-SRTB_40315A	5/12/15	—	—	HCl																				1
TAL-SFTB_40315B		—	—	HCl																				1
SV-7_Soil_2.5-3.0		8:45	soil	none		X																		1
SV-7_Soil_4.0-4.5		8:50																			X	X	X	
SV-7_Soil_4.5-5.0		9:00				X																		
SV-8_Soil_2.5-3.0		10:30				X																		
SV-8_Soil_4.5-5.0	↓	10:45	↓	↓		X																		

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Project Info

Project Name/ #: ARCO # 4931
PO# GPOPBNA.C110C0000
Credit Card Y/N.

Sample Receipt

# of Containers: 13
Head Space:
Temp: 2.4°C

If yes, please call with payment information ASAP

TAT	10 Day	5 Day	4 Day	3 Day	2 Day	1 Day	Other:
							Regular

Report: ☐ Routine ☐ Level 3 ☐ Level 4 ☐ EDD ☐ EDF
Special Instructions / Comments: ☐ Global ID _____

See Terms and Conditions on reverse

1) Relinquished by:	Time	2) Relinquished by:	Time	3) Relinquished by:	Time
Signature	14:22	Signature	1845	Signatur	
Printed Name Colin Hollister	Date 5/12/15	Printed Name Ed Mantzos	Date 5-12-15	Printed N	Date
Company ARCADIS		Company TA		Company	
1) Received by:	Time	2) Received by:	Time	3) Receive	
Signature	1422	Signature	1845	Signature	Time
Printed Name Ed Mantzos	Date	Printed Name John Hollis	Date 5/12/15	Printed Name	Date
Company TA		Company TAT		Company	

720-64747 Chain of Custody

Rev 10/2012

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

720-64747

TESTAMERICA Pleasanton Chain of Custody
1220 Quarry Lane • Pleasanton CA 94566-4756
Phone: (925) 484-1919 • Fax: (925) 600-3002

Reference #: _____

Date 5/12/15 Page 2 of 2

5/27/2015

Report To

Attn. Hollis Phillips
Company: ARCADIS
Address 100 Montgomery Street Suite 300
Email. On File
Bill To Below
Sampled By: Colin Holliday
Attn:
Phone 413-329-8084

Analysis Request

Sample ID	Date	Time	Matrix	Preserv.	Volatile Organics GC/MS (VOCs) ☐ EPA 8260B	HVOCs by ☐ EPA 8260B	EPA 8260B: ☐ Gas ☒ BTEX MTBE ☐ 5 Oxygenates ☐ DCA, EDB ☐ Ethanol	TEPH EPA 8015B ☐ Silica Gel ☐ Diesel ☐ Motor Oil ☐ Other	SemiVolatile Organics GC/MS ☐ EPA 8270C	PNA/PAH's by ☐ 8270C ☒ 8270C SIM	Oil and Grease (EPA 1664/9071) ☐ Petroleum ☐ Total	Pesticides ☐ EPA 8081 PCBs ☐ EPA 8082	CAM17 Metals (EPA 6010/7470/7471)	Metals: ☐ 6010B ☐ 200.7 ☐ Lead ☐ LUFT ☐ RCRA ☐ Other	Metals: ☐ 6020 ☐ 200.8 (ICP-MS):	☐ W.E.T (STLC) ☐ W.E.T (DI) ☐ TCLP	Hex Chrom by ☐ EPA 7196 ☐ or EPA 7199	pH ☐ 9040 ☐ SM4500	☐ Spec. Cond ☐ Alkalinity ☐ TSS ☐ SS ☐ TDS	Anions: ☐ Cl ☐ SO_4 ☐ NO_3 ☐ F ☐ Br ☐ NO_2 ☐ PO_4	☐ Perchlorate by EPA 314.0	COD ☐ EPA 410.4 ☐ SM5220D ☐ Turbidity			Number of Containers
SB-07_Soil_4.5-5.0	5/12/15	12:05	Soil	None			X			X																1
SB-07_Soil_9.5-10.0	↓	12:35	↓	↓			X			X																1
SB-07_Soil_22.5-23.0	↓	13:05	↓	↓			X			X																1

TBA, MTBE, BTEX, TPH-G, MADH

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Project Info

Project Name/ #: ARCO #4931
PO#: GR09BPMA.0110.0000
Credit Card Y/N.
# of Containers: 3
Head Space:
Temp.
If yes, please call with payment information ASAP

TAT: 10 Day | 5 Day | 4 Day | 3 Day | 2 Day | 1 Day | Other: Regular

Report. ☐ Routine ☐ Level 3 ☐ Level 4 ☐ EDD ☐ EDF
Special Instructions / Comments. ☐ Global ID _____

See Terms and Conditions on reverse

Sample Receipt

	1) Relinquished by:	2) Relinquished by:	3) Relinquished by:
Signature			
Time	14:20	845	
Printed Name	Colin Holliday	Ed Mahoney	
Date	5/12/15	5.12.15	
Company	ARCADIS	TA	

	1) Received by:	2) Received by:	3) Received by:
Signature			
Time	1422	1845	
Printed Name	Ed Mahoney	[illegible]	
Date	5/12/15	5/12/15	
Company	TA	TAP	

Rev 10/2012

Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 720-64747-1

Login Number: 64747
List Number: 1
Creator: Bullock, Tracy

List Source: TestAmerica Pleasanton

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Appendix D

Laboratory Analytical Report – Soil Vapor


Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

Laboratory Job Number 266850
ANALYTICAL REPORT

Arcadis	Project : GP09BPNA.C110.N0000
100 Montgomery St.	Location : Former Arco #4391
San Francisco, CA 94104	Level : II

Sample ID	Lab ID
SV-7_2015-05-15	266850-001
SV-8_2015-05-15	266850-002

This data package has been reviewed for technical correctness and completeness. Release of this data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature. The results contained in this report meet all requirements of NELAC and pertain only to those samples which were submitted for analysis. This report may be reproduced only in its entirety.

Signature: Mikelle Chong Date: 05/22/2015

Mikelle Chong
Project Manager
mikelle.chong@ctberk.com

CA ELAP# 2896, NELAP# 4044-001

Curtis & Tompkins, Ltd.

CASE NARRATIVE

Laboratory number:	**266850**
Client:	**Arcadis**
Project:	**GP09BPNA.C110.N0000**
Location:	**Former Arco #4391**
Request Date:	**05/15/15**
Samples Received:	**05/15/15**

This data package contains sample and QC results for two air samples, requested for the above referenced project on 05/15/15. The samples were received intact.

Volatile Organics in Air by MS (EPA TO-15):
SV-8_2015-05-15 (lab # 266850-002) was diluted due to high non-target analytes. No other analytical problems were encountered.

Volatile Organics in Air GC (ASTM D1946 and EPA TO-3):
No analytical problems were encountered.

Curtis & Tompkins, Ltd.
Analytical Laboratory Since 1878
2323 Fifth Street

Berkeley, CA 94710
(510)486-0900 Phone
(510)486-0532 Fax

AIR TESTING CHAIN OF CUSTODY
& PURCHASE ORDER

Page 1 of 1

Chain of Custody # : 1

C&T LOGIN # 266850

Project No: G809BPNA.C110.V0000
Project Name: Former Arco #4391
EDD Format: _____ Rpt Level: II III IV
Turnaround Time: ☐ RUSH _____ ☒ Standard

Sampler: Colin Hollister
Report To: Holli Phillips
Company : ARCADIS
Telephone: on file
Email: on file

Lab No.	Sample ID.	Sampling Information					TESTING REQUESTED				
		Date Collected	Time Collected	Canister ID (Bar Code #)	Flow Controller ID	Sample Volume (Gauge Reading)	TO-15	TO-3: C6-C12 GRO	TO-3M: C1-C6 Hydrocarbons	D1946: (Please Circle Targets) H_2 He N_2 O_2 CO CO_2 CH_4	
1	SV-7-2015-05-15	5/15/15	8:58	270	40036	-5 in.Hg	See Notes			X	
2	SV-8-2015-05-15	"	9:45	424	A00151	-5 in.Hg	See Notes			X	

Notes:
TO-15
TPHg, BTEX, MTBE, TBA only

RELINQUISHED BY: [signature] 5/15/15 12:30 DATE/TIME

RECEIVED BY: [signature] 5/15/15 12:30 DATE/TIME

DATE/TIME

DATE/TIME

DATE/TIME

DATE/TIME

COOLER RECEIPT CHECKLIST Curtis & Tompkins, Ltd.

Login # 266852 Date Received 5/15/15 Number of coolers 0
Client Arcadis Project Former Arco

Date Opened 5/15/15 By (print) AJ (sign)
Date Logged in 5/18/15 By (print) (sign)

1. Did cooler come with a shipping slip (airbill, etc) YES (NO)
   Shipping info
2A. Were custody seals present? .... ☐ YES (circle) on cooler on samples ☑ NO
   How many Name Date
2B. Were custody seals intact upon arrival? YES NO (N/A)
3. Were custody papers dry and intact when received? (YES) NO
4. Were custody papers filled out properly (ink, signed, etc)? (YES) NO
5. Is the project identifiable from custody papers? (If so fill out top of form) (YES) NO
6. Indicate the packing in cooler: (if other, describe)

   ☐ Bubble Wrap ☐ Foam blocks ☐ Bags ☐ None
   ☐ Cloth material ☐ Cardboard ☐ Styrofoam ☐ Paper towels
7. Temperature documentation: * Notify PM if temperature exceeds 6°C

   Type of ice used: ☐ Wet ☐ Blue/Gel ☐ None Temp(°C)

   ☐ Samples Received on ice & cold without a temperature blank; temp. taken with IR gun

   ☐ Samples received on ice directly from the field. Cooling process had begun
8. Were Method 5035 sampling containers present? YES (NO)
   If YES, what time were they transferred to freezer?
9. Did all bottles arrive unbroken/unopened? (YES) NO
10. Are there any missing / extra samples? YES (NO)
11. Are samples in the appropriate containers for indicated tests? (YES) NO
12. Are sample labels present, in good condition and complete? (YES) NO
13. Do the sample labels agree with custody papers? (YES) NO
14. Was sufficient amount of sample sent for tests requested? (YES) NO
15. Are the samples appropriately preserved? YES NO (N/A)
16. Did you check preservatives for all bottles for each sample? YES NO (N/A)
17. Did you document your preservative check? YES NO (N/A)
18. Did you change the hold time in LIMS for unpreserved VOAs? YES NO (N/A)
19. Did you change the hold time in LIMS for preserved terracores? YES NO (N/A)
20. Are bubbles > 6mm absent in VOA samples? YES NO (N/A)
21. Was the client contacted concerning this sample delivery? YES (NO)
   If YES, Who was called? By Date:

COMMENTS

Rev 10, 9/12

Curtis & Tompkins, Ltd.

Detections Summary for 266850

Results for any subcontracted analyses are not included in this summary.

Client : Arcadis
Project : GP09BPNA.C110.N0000
Location : Former Arco #4391

Client Sample ID : SV-7_2015-05-15 Laboratory Sample ID : 266850-001

Analyte	Result	Flags	RL	MDL	Units	Basis	IDF	Method	Prep Method
Benzene	3.9		0.93		ppbv	As Recd	1.850	EPA TO-15	METHOD
Toluene	2.6		0.93		ppbv	As Recd	1.850	EPA TO-15	METHOD
m,p-Xylenes	1.4		0.93		ppbv	As Recd	1.850	EPA TO-15	METHOD
Carbon Dioxide	2,500		1,900		ppmv	As Recd	1.850	ASTM D1946	METHOD
Oxygen	110,000		1,900		ppmv	As Recd	1.850	ASTM D1946	METHOD
Gasoline Range Organics C6-C12	110		93	10	ppbv	As Recd	1.850	EPA TO-3	METHOD

Client Sample ID : SV-8_2015-05-15 Laboratory Sample ID : 266850-002

Analyte	Result	Flags	RL	MDL	Units	Basis	IDF	Method	Prep Method
Carbon Dioxide	34,000		1,900		ppmv	As Recd	1.870	ASTM D1946	METHOD
Oxygen	13,000		1,900		ppmv	As Recd	1.870	ASTM D1946	METHOD
Methane	14,000		1,900		ppmv	As Recd	1.870	ASTM D1946	METHOD
Gasoline Range Organics C6-C12	120,000		1,900	210	ppbv	As Recd	37.40	EPA TO-3	METHOD

Curtis & Tompkins, Ltd.

Volatile Organics in Air

Lab #:	266850	Location:	Former Arco #4391
Client:	Arcadis	Prep:	METHOD
Project#:	GP09BPNA.C110.N0000	Analysis:	EPA TO-15
Matrix:	Air	Sampled:	05/15/15
Units (V):	ppbv	Received:	05/15/15

Field ID:	SV-7_2015-05-15	Diln Fac:	1.850
Type:	SAMPLE	Batch#:	223249
Lab ID:	266850-001	Analyzed:	05/18/15

Analyte	Result (V)	RL	Result (M)	RL	Units (M)
MTBE	ND	0.93	ND	3.3	ug/m3
Benzene	3.9	0.93	13	3.0	ug/m3
Toluene	2.6	0.93	9.7	3.5	ug/m3
Ethylbenzene	ND	0.93	ND	4.0	ug/m3
m,p-Xylenes	1.4	0.93	6.1	4.0	ug/m3
o-Xylene	ND	0.93	ND	4.0	ug/m3

Tentatively Identified Compounds	Result (M)	Units (M)
No TICs found.	ND	

Surrogate	%REC	Limits	Units (M)
Bromofluorobenzene	95	80-121	ug/m3

Field ID:	SV-8_2015-05-15	Diln Fac:	112.2
Type:	SAMPLE	Batch#:	223294
Lab ID:	266850-002	Analyzed:	05/19/15

Analyte	Result (V)	RL	Result (M)	RL	Units (M)
MTBE	ND	56	ND	200	ug/m3
Benzene	ND	56	ND	180	ug/m3
Toluene	ND	56	ND	210	ug/m3
Ethylbenzene	ND	56	ND	240	ug/m3
m,p-Xylenes	ND	56	ND	240	ug/m3
o-Xylene	ND	56	ND	240	ug/m3

Tentatively Identified Compounds	Result (M)	Units (M)
No TICs found.	ND	

Surrogate	%REC	Limits	Units (M)
Bromofluorobenzene	103	80-121	ug/m3

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Volatile Organics in Air

Lab #:	266850	Location:	Former Arco #4391
Client:	Arcadis	Prep:	METHOD
Project#:	GP09BPNA.C110.N0000	Analysis:	EPA TO-15
Matrix:	Air	Sampled:	05/15/15
Units (V):	ppbv	Received:	05/15/15

Type: BLANK Batch#: 223249
Lab ID: QC788288 Analyzed: 05/18/15
Diln Fac: 1.000

Analyte	Result (V)	RL	Result (M)	RL	Units (M)
MTBE	ND	0.50	ND	1.8	ug/m3
Benzene	ND	0.50	ND	1.6	ug/m3
Toluene	ND	0.50	ND	1.9	ug/m3
Ethylbenzene	ND	0.50	ND	2.2	ug/m3
m,p-Xylenes	ND	0.50	ND	2.2	ug/m3
o-Xylene	ND	0.50	ND	2.2	ug/m3

Tentatively Identified Compounds	Result (M)	Units (M)
No TICs found.	ND	

Surrogate	%REC	Limits	Units (M)
Bromofluorobenzene	91	70-130	ug/m3

Type: BLANK Batch#: 223294
Lab ID: QC788467 Analyzed: 05/19/15
Diln Fac: 1.000

Analyte	Result (V)	RL	Result (M)	RL	Units (M)
MTBE	ND	0.50	ND	1.8	ug/m3
Benzene	ND	0.50	ND	1.6	ug/m3
Toluene	ND	0.50	ND	1.9	ug/m3
Ethylbenzene	ND	0.50	ND	2.2	ug/m3
m,p-Xylenes	ND	0.50	ND	2.2	ug/m3
o-Xylene	ND	0.50	ND	2.2	ug/m3

Tentatively Identified Compounds	Result (M)	Units (M)
No TICs found.	ND	

Surrogate	%REC	Limits	Units (M)
Bromofluorobenzene	92	70-130	ug/m3

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	266850	Location:	Former Arco #4391
Client:	Arcadis	Prep:	METHOD
Project#:	GP09BPNA.C110.N0000	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	223249
Units (V):	ppbv	Analyzed:	05/18/15
Diln Fac:	1.000		

Type: BS Lab ID: QC788286

Analyte	Spiked	Result (V)	%REC	Limits
MTBE	10.00	8.745	87	70-130
Benzene	10.00	10.24	102	70-130
Toluene	10.00	9.568	96	70-130
Ethylbenzene	10.00	8.553	86	70-130
m,p-Xylenes	20.00	17.33	87	70-130
o-Xylene	10.00	8.952	90	70-130

Surrogate	%REC	Limits
Bromofluorobenzene	98	70-130

Type: BSD Lab ID: QC788287

Analyte	Spiked	Result (V)	%REC	Limits	RPD	Lim
MTBE	10.00	8.597	86	70-130	2	25
Benzene	10.00	10.38	104	70-130	1	25
Toluene	10.00	9.682	97	70-130	1	25
Ethylbenzene	10.00	8.467	85	70-130	1	25
m,p-Xylenes	20.00	17.41	87	70-130	0	25
o-Xylene	10.00	9.110	91	70-130	2	25

Surrogate	%REC	Limits
Bromofluorobenzene	99	70-130

RPD= Relative Percent Difference
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	266850	Location:	Former Arco #4391
Client:	Arcadis	Prep:	METHOD
Project#:	GP09BPNA.C110.N0000	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	223294
Units (V):	ppbv	Analyzed:	05/19/15
Diln Fac:	1.000		

Type: BS Lab ID: QC788465

Analyte	Spiked	Result (V)	%REC	Limits
MTBE	10.00	8.704	87	70-130
Benzene	10.00	9.999	100	70-130
Toluene	10.00	8.962	90	70-130
Ethylbenzene	10.00	8.334	83	70-130
m,p-Xylenes	20.00	17.48	87	70-130
o-Xylene	10.00	9.161	92	70-130

Surrogate	%REC	Limits
Bromofluorobenzene	103	70-130

Type: BSD Lab ID: QC788466

Analyte	Spiked	Result (V)	%REC	Limits	RPD	Lim
MTBE	10.00	8.635	86	70-130	1	25
Benzene	10.00	9.831	98	70-130	2	25
Toluene	10.00	8.358	84	70-130	7	25
Ethylbenzene	10.00	7.982	80	70-130	4	25
m,p-Xylenes	20.00	16.61	83	70-130	5	25
o-Xylene	10.00	8.556	86	70-130	7	25

Surrogate	%REC	Limits
Bromofluorobenzene	104	70-130

RPD= Relative Percent Difference
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Fixed Gas Analysis

Lab #:	266850	Location:	Former Arco #4391
Client:	Arcadis	Prep:	METHOD
Project#:	GP09BPNA.C110.N0000	Analysis:	ASTM D1946
Matrix:	Air	Sampled:	05/15/15
Units:	ppmv	Received:	05/15/15
Units (Mol %):	MOL %	Analyzed:	05/18/15
Batch#:	223248		

Field ID: SV-7_2015-05-15 Lab ID: 266850-001
Type: SAMPLE Diln Fac: 1.850

Analyte	Result	RL	Result (Mol %)	RL
Helium	ND	1,900	ND	0.19
Carbon Dioxide	2,500	1,900	0.25	0.19
Oxygen	110,000	1,900	11	0.19
Methane	ND	1,900	ND	0.19

Field ID: SV-8_2015-05-15 Lab ID: 266850-002
Type: SAMPLE Diln Fac: 1.870

Analyte	Result	RL	Result (Mol %)	RL
Helium	ND	1,900	ND	0.19
Carbon Dioxide	34,000	1,900	3.4	0.19
Oxygen	13,000	1,900	1.3	0.19
Methane	14,000	1,900	1.4	0.19

Type: BLANK Diln Fac: 1.000
Lab ID: QC788285

Analyte	Result	RL	Result (Mol %)	RL
Helium	ND	1,000	ND	0.10
Carbon Dioxide	ND	1,000	ND	0.10
Oxygen	ND	1,000	ND	0.10
Methane	ND	1,000	ND	0.10

ND= Not Detected
RL= Reporting Limit
Result Mol %= Result in Mole Percent

Curtis & Tompkins, Ltd.

Aromatic / Petroleum Hydrocarbons in Air

Lab #:	266850	Location:	Former Arco #4391
Client:	Arcadis	Prep:	METHOD
Project#:	GP09BPNA.C110.N0000	Analysis:	EPA TO-3
Analyte:	Gasoline Range Organics C6-C12	Batch#:	223252
Matrix:	Air	Sampled:	05/15/15
Units (V):	ppbv	Received:	05/15/15
Units (M):	ug/m3	Analyzed:	05/18/15

Field ID	Type	Lab ID	Result (V)	RL	MDL	Result (M)	RL	MDL	Diln Fac
SV-7_2015-05-15	SAMPLE	266850-001	110	93	10	460	380	42	1.850
SV-8_2015-05-15	SAMPLE	266850-002	120,000	1,900	210	490,000	7,600	860	37.40
	BLANK	QC788310	ND	50	5.6	ND	200	23	1.000

ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Batch QC Report

Fixed Gas Analysis

Lab #:	266850	Location:	Former Arco #4391
Client:	Arcadis	Prep:	METHOD
Project#:	GP09BPNA.C110.N0000	Analysis:	ASTM D1946
Matrix:	Air	Batch#:	223248
Units:	ppmv	Analyzed:	05/18/15
Diln Fac:	1.000		

Type: BS Lab ID: QC788282

Analyte	Spiked	Result	%REC	Limits
Helium	100,000	95,450	95	70-130
Carbon Dioxide		NA		
Oxygen		NA		
Methane		NA		

Type: BSD Lab ID: QC788283

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Helium	100,000	95,530	96	70-130	0	30
Carbon Dioxide		NA				
Oxygen		NA				
Methane		NA				

NA= Not Analyzed
RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

Fixed Gas Analysis

Lab #:	266850	Location:	Former Arco #4391
Client:	Arcadis	Prep:	METHOD
Project#:	GP09BPNA.C110.N0000	Analysis:	ASTM D1946
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC788284	Batch#:	223248
Matrix:	Air	Analyzed:	05/18/15
Units:	ppmv		

Analyte	Spiked	Result	%REC	Limits
Helium		NA		
Carbon Dioxide	2,000	2,009	100	70-130
Oxygen	2,000	1,927	96	70-130
Methane	2,000	2,025	101	70-130

NA= Not Analyzed

Curtis & Tompkins, Ltd.

Batch QC Report

Fixed Gas Analysis

Lab #:	266850	Location:	Former Arco #4391
Client:	Arcadis	Prep:	METHOD
Project#:	GP09BPNA.C110.N0000	Analysis:	ASTM D1946
Field ID:	SV-7_2015-05-15	Units (Mol %):	MOL %
Type:	SDUP	Diln Fac:	1.850
MSS Lab ID:	266850-001	Batch#:	223248
Lab ID:	QC788307	Sampled:	05/15/15
Matrix:	Air	Received:	05/15/15
Units:	ppmv	Analyzed:	05/18/15

Analyte	MSS Result	Result	RL	Result (Mol %)	RL	RPD	Lim
Helium	<1,850	ND	1,850	ND	0.1850	NC	30
Carbon Dioxide	2,539	2,535	1,850	0.2535	0.1850	0	30
Oxygen	107,600	107,500	1,850	10.75	0.1850	0	30
Methane	<1,850	ND	1,850	ND	0.1850	NC	30

NC= Not Calculated
ND= Not Detected
RL= Reporting Limit
RPD= Relative Percent Difference
Result Mol %= Result in Mole Percent

Curtis & Tompkins, Ltd.

Batch QC Report

Aromatic / Petroleum Hydrocarbons in Air

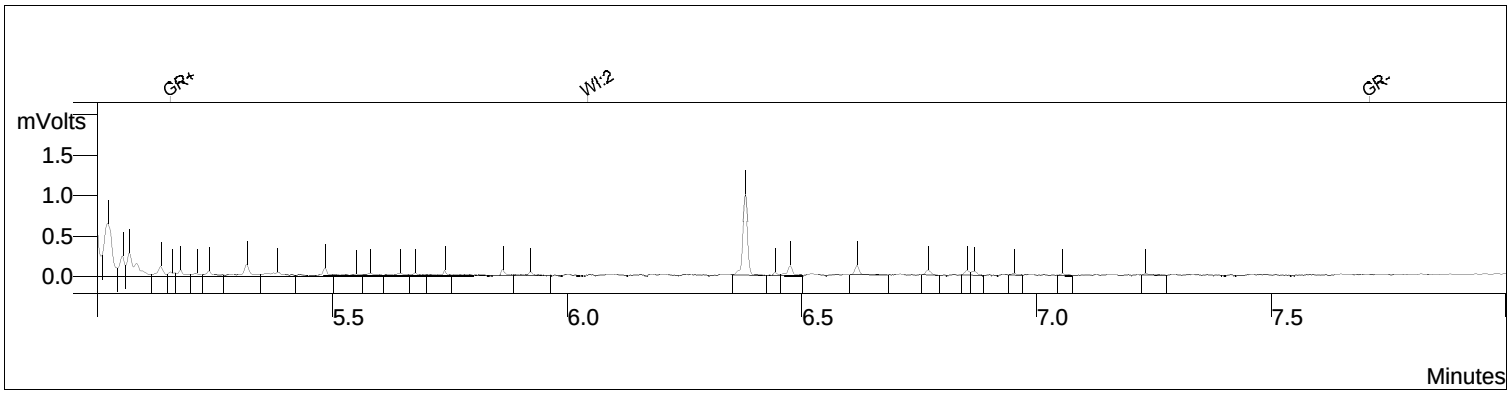
Lab #:	266850	Location:	Former Arco #4391
Client:	Arcadis	Prep:	METHOD
Project#:	GP09BPNA.C110.N0000	Analysis:	EPA TO-3
Analyte:	Gasoline Range Organics C6-C12	Diln Fac:	1.000
Matrix:	Air	Batch#:	223252
Units (V):	ppbv	Analyzed:	05/18/15

Type	Lab ID	Spiked	Result (V)	%REC	Limits	RPD	Lim
BS	QC788308	210.0	238.4	114	70-130		
BSD	QC788309	210.0	239.8	114	70-130	1	25

RPD= Relative Percent Difference
Result V= Result in volume units

GRO by TO-3

Sample ID:	266850-001,223252		
Data File:	c:\varianws\data\051815\138_005.run		
Sample List:	c:\varianws\051815.smp		
Method:	c:\varianws\to3_103114.mth		
Acquisition Date:	05/18/2015 16:33:24		
Calculation Date:	05/18/2015 16:45:27		
Instrument ID:	MSAIR03	Operator:	TO-3
Injection Notes:	1.85x,c00270		
Multiplier:	1.000	Divisor:	1.000



Channel: **Front = FID** **RESULTS**

#	RT (min)	Peak Name	Area	Result (ppbv)
1	6.431	GRO:6-12	2247	60.483
		Totals	**2247**	**60.483**

Integration Parameters

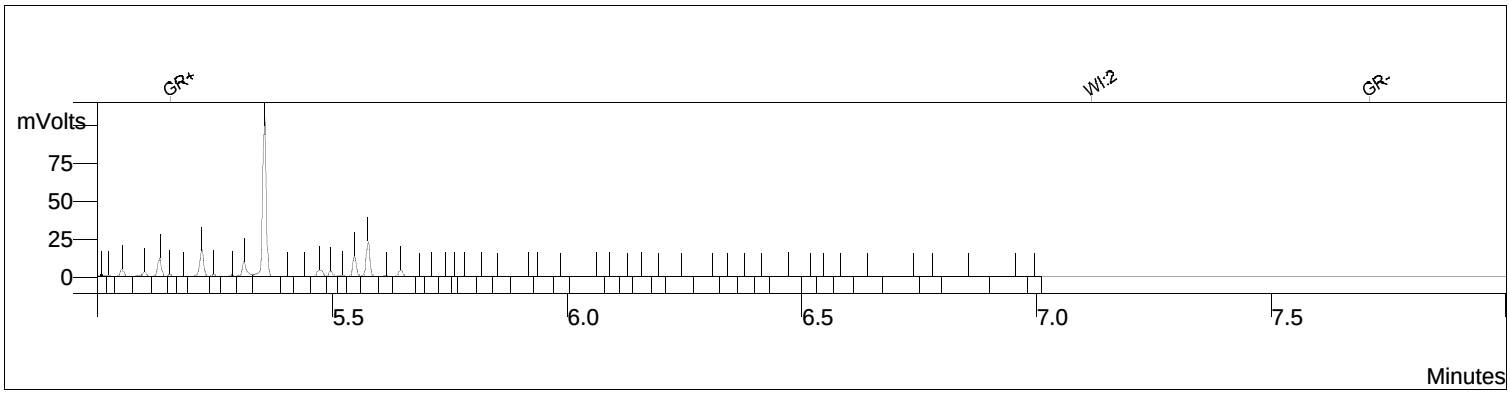
Initial Tangent %:	0
Initial Peak Width (sec):	4
Initial Peak Reject Value:	50.000
Initial S/N Ratio:	5

Data Handling Time Events

Time (min)	Event
0.009	II on
4.801	II off
5.155	GR on
6.044	WI 2.0 sec
7.708	GR off

GRO by TO-3

Sample ID:	266850-002,223252		
Data File:	c:\varianws\data\051815\138_008.run		
Sample List:	c:\varianws\051815.smp		
Method:	c:\varianws\to3_103114.mth		
Acquisition Date:	05/18/2015 17:38:10		
Calculation Date:	05/18/2015 17:50:12		
Instrument ID:	MSAIR03	Operator:	TO-3
Injection Notes:	37.4x,c00090=c00424/20		
Multiplier:	1.000	Divisor:	1.000



Channel: **Front = FID** **RESULTS**

#	RT (min)	Peak Name	Area	Result (ppbv)
1	6.431	GRO:6-12	119527	3217.413
		Totals	**119527**	**3217.413**

Integration Parameters

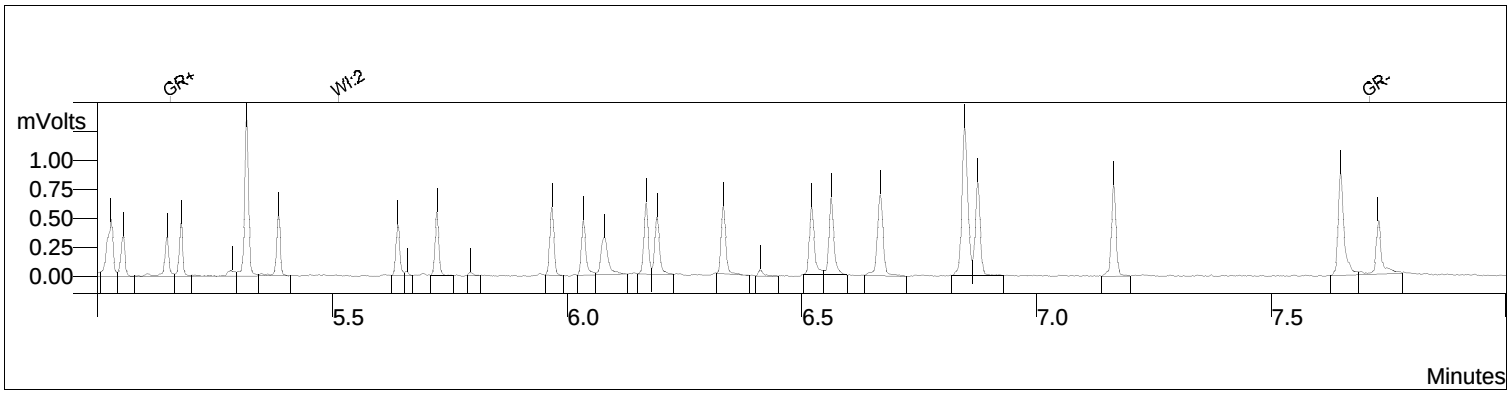
Initial Tangent %:	0
Initial Peak Width (sec):	4
Initial Peak Reject Value:	50.000
Initial S/N Ratio:	5

Data Handling Time Events

Time (min)	Event
0.009	II on
4.801	II off
5.155	GR on
7.116	WI 2.0 sec
7.708	GR off

GRO by TO-3

Sample ID:	ccv/bs,qc788308		
Data File:	c:\varianws\data\051815\138_002.run		
Sample List:	c:\varianws\051815.smp		
Method:	c:\varianws\to3_103114.mth		
Acquisition Date:	05/18/2015 15:45:22		
Calculation Date:	05/18/2015 15:57:25		
Instrument ID:	MSAIR03	Operator:	TO-3
Injection Notes:	223252,s27287,1x		
Multiplier:	1.000	Divisor:	1.000



Channel: **Front = FID** **RESULTS**

#	RT (min)	Peak Name	Area	Result (ppbv)
1	6.431	GRO:6-12	8856	238.386
		Totals	**8856**	**238.386**

Integration Parameters

Initial Tangent %:	0
Initial Peak Width (sec):	4
Initial Peak Reject Value:	50.000
Initial S/N Ratio:	5

Data Handling Time Events

Time (min)	Event
0.009	II on
4.801	II off
5.155	GR on
5.513	WI 2.0 sec
7.708	GR off


Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

Laboratory Job Number 266828
ANALYTICAL REPORT

Arcadis	Project : GP09BPNA.C110.N0000
100 Montgomery St.	Location : Former Arco #4391
San Francisco, CA 94104	Level : II

Sample ID	Lab ID
SV-7_2015-05-15	266828-001
SV-8_2015-05-15	266828-002

This data package has been reviewed for technical correctness and completeness. Release of this data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature. The results contained in this report meet all requirements of NELAC and pertain only to those samples which were submitted for analysis. This report may be reproduced only in its entirety.

Signature: _____ Date: 06/01/2015

Will Rice
Project Manager
will.rice@ctberk.com

CA ELAP# 2896, NELAP# 4044-001

Curtis & Tompkins, Ltd.

CASE NARRATIVE

Laboratory number:	**266828**
Client:	**Arcadis**
Project:	**GP09BPNA.C110.N0000**
Location:	**Former Arco #4391**
Request Date:	**05/15/15**
Samples Received:	**05/15/15**

This data package contains sample and QC results for two air samples, requested for the above referenced project on 05/15/15. The samples were received cold and intact.

Semi-Volatile Organics in Air (EPA TO-17):

Air Toxics in Folsom, CA performed the analysis (NELAP certified). Please see the Air Toxics case narrative.

TO-17 SAMPLE COLLECTION

266828

Air Toxics LTD.

CHAIN-OF-CUSTODY RECORD

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

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

Page 1 of 1

Project Manager Holly Phillips

Collected by: (Print and Sign) Colin Hollister

Company ARCADIS Email on file

Address 100 Montgomery St. Suite 300 City San Francisco State CA Zip 94114

Phone 413-324-8084 Fax

Project Info:
P.O. # —
Project # GP09BPNA.C110.N000
Project Name Former Arco #4391

Turn Around Time:
☒ Normal
☐ Rush
specify

Reporting Units:
☒ ppmv
☐ ppbv
☒ µg/m3
☐ mg/m3

Lab I.D.	Field Sample I.D. (Location)	Engraved or Stamped Tube #	Date of Collection (mm/dd/yy)	Start Time (hr:min)	End Time (hr:min)	Pre-Test Flow Rate	Post-Test Flow Rate	Volume	Indoor/Outdoor % RH	Indoor/Outdoor Temp	Indoor Air	Outdoor Air	Soil Vapor	Other ( )
1	SV-7_2015-05-15	C01477 61	05/15/15	10:20	10:20	N/A	N/A	60ml	N/A	N/A	☐	☐	☒	☐
2	SV-8_2015-05-15	C015 4148	05/15/15	10:05	10:05	N/A	N/A	60ml	N/A	N/A	☐	☐	☒	☐
											☐	☐	☐	☐
											☐	☐	☐	☐
											☐	☐	☐	☐
											☐	☐	☐	☐
											☐	☐	☐	☐
											☐	☐	☐	☐
											☐	☐	☐	☐
											☐	☐	☐	☐
											☐	☐	☐	☐

Relinquished by: (signature)	Date/Time	Received by: (signature)	Date/Time
Colin Hollister	5/15/15 12:22	Pat Hongala	5/15/15 12:21
Relinquished by: (signature)	Date/Time	Received by: (signature)	Date/Time
Relinquished by: (signature)	Date/Time	Received by: (signature)	Date/Time

Notes:
Naphthalene only

Lab Use Only	Shipper Name	Air Bill #	Temp (°C)	Condition	Custody Seals Intact? Yes No None	Work Order #

3 of 21

COOLER RECEIPT CHECKLIST

Curtis & Tompkins, Ltd.

Login # 266828 Date Received 5/15/15 Number of coolers 1
Client ARCADIS Project Former Arco # 4391

Date Opened 5/15/15 By (print) KARI MARTINEZ (sign)
Date Logged in ± By (print) BL (sign)

1. Did cooler come with a shipping slip (airbill, etc) YES (NO)
   Shipping info
2A. Were custody seals present? .... ☐ YES (circle) on cooler on samples ☒ NO
   How many Name Date
2B. Were custody seals intact upon arrival? YES NO (N/A)
3. Were custody papers dry and intact when received? (YES) NO
4. Were custody papers filled out properly (ink, signed, etc)? (YES) NO
5. Is the project identifiable from custody papers? (If so fill out top of form) (YES) NO
6. Indicate the packing in cooler: (if other, describe)

☒ Bubble Wrap ☐ Foam blocks ☒ Bags ☐ None
☐ Cloth material ☐ Cardboard ☐ Styrofoam ☐ Paper towels

7. Temperature documentation: * Notify PM if temperature exceeds 6°C
   TEMP BLANK present but not checked. -Kari
   Type of ice used: ☐ Wet ☒ Blue/Gel ☐ None Temp(°C)
   ☐ Samples Received on ice & cold without a temperature blank; temp. taken with IR gun
   ☐ Samples received on ice directly from the field. Cooling process had begun
8. Were Method 5035 sampling containers present? YES (NO)
   If YES, what time were they transferred to freezer?
9. Did all bottles arrive unbroken/unopened? (YES) NO
10. Are there any missing / extra samples? YES (NO)
11. Are samples in the appropriate containers for indicated tests? YES (NO)
12. Are sample labels present, in good condition and complete? (YES) NO
13. Do the sample labels agree with custody papers? (YES) NO
14. Was sufficient amount of sample sent for tests requested? YES (NO)
15. Are the samples appropriately preserved? YES NO N/A
16. Did you check preservatives for all bottles for each sample? YES NO N/A
17. Did you document your preservative check? YES NO N/A
18. Did you change the hold time in LIMS for unpreserved VOAs? YES NO N/A
19. Did you change the hold time in LIMS for preserved terracores? YES NO N/A
20. Are bubbles > 6mm absent in VOA samples? YES NO N/A
21. Was the client contacted concerning this sample delivery? (YES) NO
   If YES, Who was called? By Date:

COMMENTS
Samples are "SORBENT TUBES" can not run for TO15 with LOTUS front end.

Rev 10, 9/12

Curtis & Tompkins, Ltd.

Detections Summary for 266828

Results for any subcontracted analyses are not included in this summary.

Client : Arcadis
Project : GP09BPNA.C110.N0000
Location : Former Arco #4391

Client Sample ID : SV-7_2015-05-15 Laboratory Sample ID : 266828-001

No Detections

Client Sample ID : SV-8_2015-05-15 Laboratory Sample ID : 266828-002

No Detections

Laboratory Job Number 266828

Subcontracted Products

Air Toxics

eurofins | Air Toxics

5/29/2015
Mr. Will Rice
Curtis & Tompkins, Ltd.
2323 Fifth Street

Berkeley CA 94710

Project Name: Arco #4391
Project #: 266828
Workorder #: 1505271

Dear Mr. Will Rice

The following report includes the data for the above referenced project for sample(s) received on 5/16/2015 at Air Toxics Ltd.

The data and associated QC analyzed by Modified TO-17 VI are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

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

Regards,

Kyle Vagadori

Project Manager

eurofins | Air Toxics

WORK ORDER #: 1505271

Work Order Summary

CLIENT:	Mr. Will Rice Curtis & Tompkins, Ltd. 2323 Fifth Street Berkeley, CA 94710	**BILL TO:**	Accounts Payables Curtis & Tompkins, Ltd. 2323 Fifth Street Berkeley, CA 94710
PHONE:	510-486-0925	**P.O. #**	266828
FAX:	510-486-0532	**PROJECT #**	266828 Arco #4391
DATE RECEIVED:	05/16/2015	**CONTACT:**	Kyle Vagadori
DATE COMPLETED:	05/29/2015		

FRACTION #	NAME	TEST
01A	SV-7_2015-05-15	Modified TO-17 VI
02A	SV-8_2015-05-15	Modified TO-17 VI
03A	Lab Blank	Modified TO-17 VI
03B	Lab Blank	Modified TO-17 VI
04A	CCV	Modified TO-17 VI
04B	CCV	Modified TO-17 VI
05A	LCS	Modified TO-17 VI
05AA	LCSD	Modified TO-17 VI
05B	LCS	Modified TO-17 VI
05BB	LCSD	Modified TO-17 VI

CERTIFIED BY: Heidi Rayos DATE: 05/29/15

Technical Director

Certification numbers: AZ Licensure AZ0775, NJ NELAP - CA016, NY NELAP - 11291,
TX NELAP - T104704343-14-7, UT NELAP CA009332014-5, VA NELAP - 460197, WA NELAP - C935
Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005, Effective date: 10/18/2014, Expiration date: 10/17/2015.
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 - 956
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

LABORATORY NARRATIVE
Modified EPA Method TO-17 (VI Tubes)
Curtis & Tompkins, Ltd.
Workorder# 1505271

Two TO-17 VI Tube samples were received on May 16, 2015. The laboratory performed the analysis via modified EPA Method TO-17 using GC/MS in the full scan mode. TO-17 'VI' sorbent tubes are thermally desorbed onto a secondary trap. The trap is thermally desorbed to elute the components into the GC/MS system for compound separation and detection.

A modification that may be applied to EPA Method TO-17 at the client's discretion is the requirement to transport sorbent tubes at 4 deg C. Laboratory studies demonstrate a high level of stability for VOCs on the TO-17 'VI' tube at room temperature for periods of up to 14 days. Tubes can be shipped to and from the field site at ambient conditions as long as the 14-day sample hold time is upheld. Trip blanks and field surrogate spikes are used as additional control measures to monitor recovery and background contribution during tube transport.

Since the TO-17 VI application significantly extends the scope of target compounds addressed in EPA Method TO-15 and TO-17, the laboratory has implemented several method modifications outlined in the table below. Specific project requirements may over-ride the laboratory modifications.

Requirement	***TO-17***	***ATL Modifications***
Initial Calibration	%RSD</=30% with 2 allowed out up to 40%	VOC list: %RSD</=30% with 2 allowed out up to 40% SVOC list: %RSD</=30% with 2 allowed out up to 40%
Daily Calibration	%D for each target compound within +/-30%.	Fluorene, Phenanthrene, Anthracene, Fluoranthene, and Pyrene within +/-40%D
Audit Accuracy	70-130%	Second source recovery limits for Fluorene, Phenanthrene, Anthracene, Fluoranthene, and Pyrene = 60-140%.
Distributed Volume Pairs	Collection of distributed volume pairs required for monitoring ambient air to insure high quality.	If site is well-characterized or performance previously verified, single tube sampling may be appropriate. Distributed pairs may be impractical for soil gas collection due to configuration and volume constraints.
Analytical Precision	</=20% RPD	<30% RPD for Fluorene, Phenanthrene, Anthracene, Fluoranthene, and Pyrene.

Receiving Notes

Sample collection date was incomplete on the Chain of Custody for all samples. The year of collection was assumed to be 2015.

Analytical Notes

A sampling volume of 0.060 L was used to convert ng to ug/m3 for the associated Lab Blank.

Definition of Data Qualifying Flags

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

B - Compound present in blank (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-17

Client Sample ID: SV-7_2015-05-15

Lab ID#: 1505271-01A

No Detections Were Found.

Client Sample ID: SV-8_2015-05-15

Lab ID#: 1505271-02A

No Detections Were Found.

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Client Sample ID: SV-7_2015-05-15

Lab ID#: 1505271-01A

EPA METHOD TO-17

File Name:	**18052225**	**Date of Extraction: NA**	**Date of Collection: 5/15/15 10:20:00 AM**
Dil. Factor:	**1.00**		**Date of Analysis: 5/22/15 10:22 PM**

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
Naphthalene	1.0	17	Not Detected	Not Detected

Air Sample Volume(L): 0.0600
Container Type: TO-17 VI Tube

Surrogates	%Recovery	Method Limits
Naphthalene-d8	112	50-150

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Client Sample ID: SV-8_2015-05-15

Lab ID#: 1505271-02A

EPA METHOD TO-17

File Name:	**18052614**	**Date of Extraction: NA**	**Date of Collection: 5/15/15 10:05:00 AM**
Dil. Factor:	**1.00**		**Date of Analysis: 5/26/15 07:06 PM**

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
Naphthalene	1.0	17	Not Detected	Not Detected

Air Sample Volume(L): 0.0600
Container Type: TO-17 VI Tube

Surrogates	%Recovery	Method Limits
Naphthalene-d8	88	50-150

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Client Sample ID: Lab Blank

Lab ID#: 1505271-03A

EPA METHOD TO-17

File Name:	**18052211**	**Date of Extraction: NA**	**Date of Collection: NA**
Dil. Factor:	**1.00**		**Date of Analysis: 5/22/15 10:31 AM**

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
Naphthalene	1.0	17	Not Detected	Not Detected

Air Sample Volume(L): 0.0600
Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Naphthalene-d8	71	50-150

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Client Sample ID: Lab Blank

Lab ID#: 1505271-03B

EPA METHOD TO-17

File Name:	**18052608**	**Date of Extraction: NA**	**Date of Collection: NA**
Dil. Factor:	**1.00**		**Date of Analysis: 5/26/15 02:10 PM**

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
Naphthalene	1.0	17	Not Detected	Not Detected

Air Sample Volume(L): 0.0600

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Naphthalene-d8	97	50-150

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Client Sample ID: CCV
Lab ID#: 1505271-04A
EPA METHOD TO-17

File Name:	**18052207**	**Date of Extraction: NA**	**Date of Collection: NA**
Dil. Factor:	**1.00**		**Date of Analysis: 5/22/15 02:52 AM**

Compound	%Recovery
Naphthalene	94

Air Sample Volume(L): 1.00
Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Naphthalene-d8	91	50-150

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Client Sample ID: CCV
Lab ID#: 1505271-04B
EPA METHOD TO-17

File Name:	**18052605**	**Date of Extraction: NA**	**Date of Collection: NA**
Dil. Factor:	**1.00**		**Date of Analysis: 5/26/15 12:03 PM**

Compound	%Recovery
Naphthalene	108

Air Sample Volume(L): 1.00
Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Naphthalene-d8	98	50-150

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Client Sample ID: LCS
Lab ID#: 1505271-05A
EPA METHOD TO-17

File Name:	**18052208**	**Date of Extraction: NA**	**Date of Collection: NA**
Dil. Factor:	**1.00**		**Date of Analysis: 5/22/15 03:34 AM**

Compound	%Recovery	Method Limits
Naphthalene	97	70-130

Air Sample Volume(L): 1.00
Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Naphthalene-d8	100	50-150

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Client Sample ID: LCSD

Lab ID#: 1505271-05AA

EPA METHOD TO-17

File Name:	**18052209**	**Date of Extraction: NA**	**Date of Collection: NA**
Dil. Factor:	**1.00**		**Date of Analysis: 5/22/15 04:15 AM**

Compound	%Recovery	Method Limits
Naphthalene	96	70-130

Air Sample Volume(L): 1.00

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Naphthalene-d8	97	50-150

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Client Sample ID: LCS
Lab ID#: 1505271-05B
EPA METHOD TO-17

File Name:	**18052606**	**Date of Extraction: NA**	**Date of Collection: NA**
Dil. Factor:	**1.00**		**Date of Analysis: 5/26/15 12:46 PM**

Compound	%Recovery	Method Limits
Naphthalene	114	70-130

Air Sample Volume(L): 1.00
Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Naphthalene-d8	114	50-150

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Client Sample ID: LCSD

Lab ID#: 1505271-05BB

EPA METHOD TO-17

File Name:	**18052607**	**Date of Extraction: NA**	**Date of Collection: NA**
Dil. Factor:	**1.00**		**Date of Analysis: 5/26/15 01:28 PM**

Compound	%Recovery	Method Limits
Naphthalene	112	70-130

Air Sample Volume(L): 1.00

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Naphthalene-d8	114	50-150

Appendix E

Example Sensitive Receptor Survey Questionnaire

ARCADIS U.S., Inc.
100 Montgomery Street
Suite 300
San Francisco
California 94104
Tel 415 374 2744
Fax 415 374 2745

PROPERTY OWNER OR CURRENT RESIDENT
3823 West Street
Oakland, California
APN: 12-959-4

ENVIRONMENTAL

Subject:
Public Health Assessment - Neighborhood Basement, Sump, and Water Well Survey

Date:
June 26, 2015

Contact:
Hollis E. Phillips

Phone:
415.432.6903

Email:
hollis.phillips@arcadis-us.com

Our ref:
GP09BPNA.C110.Q0000

Dear PROPERTY OWNER OR CURRENT RESIDENT:

At the request of the Alameda County Environmental Health (ACEH), ARCADIS U.S., Inc. (ARCADIS) is conducting a door-to-door survey of homes and properties in your neighborhood. The purpose is to identify any potential contact with contaminates that could be due to the historic fuel released from the former ARCO service station located at 731 West MacArthur Boulevard in Oakland. The attached map shows the location of the service station in relation to your neighborhood.

Please complete and return the survey so that we may better assist the ACEH monitor and protect your groundwater. You may write “unknown” if you simply don’t know.

Once completed, please send the survey form back to our San Francisco office in the enclosed self-addressed and stamped envelope. It may also be scanned or photographed and emailed to hollis.phillips@arcadis-us.com.

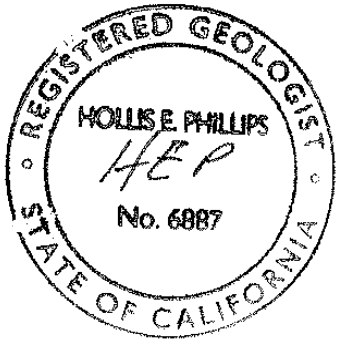
If you have any questions or comments regarding the content of this letter, please contact Hollis E. Phillips by telephone (415.432.6903) or by e-mail (hollis.phillips@arcadis-us.com), or contact Jamey Peterson by telephone (707.889.6739) or by e-mail (jamey.peterson@arcadis-us.com). You may also contact Mr. Mark E. Detterman of the ACEH by telephone (510.567.6876) or by email (mark.detterman@acgov.org).

Sincerely,
ARCADIS U.S., Inc.

Prepared by:

Jamey Peterson
Project Geologist

Approved by:



Project Manager/ Principal Geologist

Attachments:
Figure 1 Site Vicinity Map
Self-Addressed Stamped Envelope

Property Information

Street Address: 3823 West Street, Oakland APN: 12-959-4

Name of property owner (and your name of tenant if applicable):

_____

Owner address: _____

Does the property have a *water well*? **Yes or No**

A Sump pump? **Yes or No**

A Basement? **Yes or No**

Please continue below only if you have answered Yes to any of the above questions.

Owner telephone number: _____

Residence's telephone number: _____

What is the property used for (Circle one): C**ommercial or Residential**

Is there currently a multi-family complex at the property (e.g. apartment building)? **Yes or No**

SECTION A – ***Please complete if a well exists at the subject site***

Number of wells: _____ Well Diameter(s):_____

Well Depth(s): _____ Pump Depth(s): _____

Material used for the well casing: _____

Date(s) the well(s) were installed: _____

How frequently are the well(s) used? _____

(Continues on other side of sheet)

Approximate gallons of water pumped during each well cycle: _____

What is the well water used for?

_____

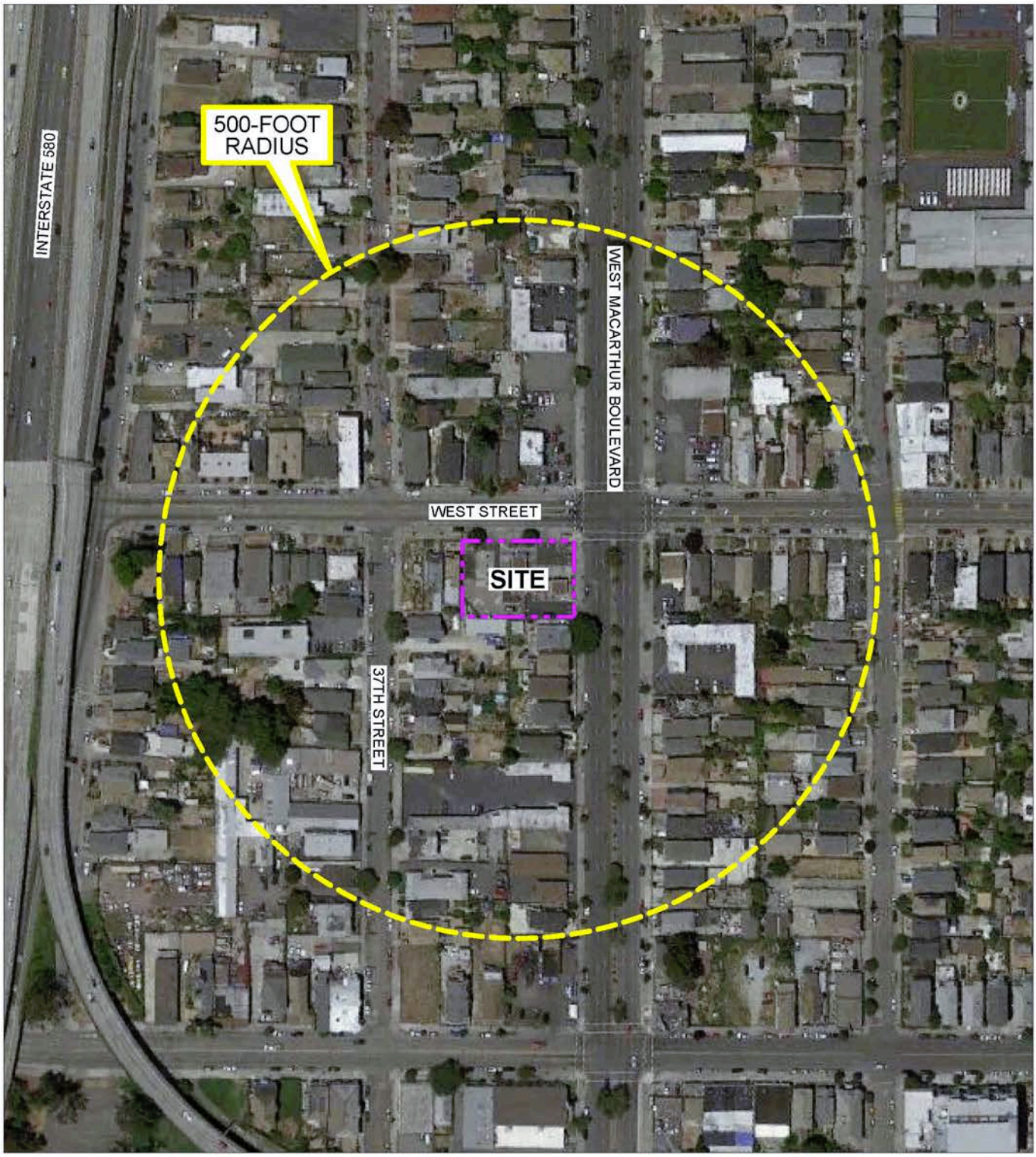
SECTION B – ***Please complete if you have a sump which pumps groundwater***

Frequency of Use: _____

Approximate gallons of water pumped from the sump each day: _____

Where is the sump water discharged? _____

Thank you again for you time.



REFERENCE: GOOGLE™ EARTH, IMAGE DATE 6/9/2014.

0 200' 400'

Approximate Scale: 1 in. = 200 ft.

FORMER ARCO STATION No. 4391
731 WEST MACARTHUR BOULEVARD
OAKLAND, CALIFORNIA

SITE VICINITY MAP

ARCADIS

FIGURE
1