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November 9, 2015

Alameda County Environmental Health 1131 Harbor Bay Parkway, Suite 250 Alameda, California 94502-6577 RECEIVED

By Alameda County Environmental Health 2:02 pm, Nov 12, 2015

#### Re: 76 Service Station No. 1156 (351645) 4276 MacArthur Boulevard, Oakland, California

ACEH Case No. RO0000409 RWQCB Case No. 01-2474 GeoTracker Global ID T0600102279

I have reviewed the attached Feasibility Study dated November 10, 2015.

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

This letter is submitted pursuant to the requirements of California Water Code Section 13257(b)(1) and the regulating implementation entitled Appendix A pertaining thereto.

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

Sincerely,

mm

Nicole Arceneaux Project Manager

Attachment: Feasibility Study



Prepared for: Chevron Environmental Management Company San Ramon, CA Prepared by: AECOM Camarillo, CA 60443254 November 2015

Feasibility Study 76 Service Station No. 1156 (351645) 4276 MacArthur Boulevard Oakland, California

ACEH Case No. RO0000409 RWQCB Case No. 01-2474



Prepared for: Chevron Environmental Management Company San Ramon, CA Prepared by: AECOM Camarillo, CA 60443254 November 2015

# Feasibility Study 76 Service Station No. 1156 (351645) 4276 MacArthur Boulevard Oakland, California

## ACEH Case No. RO0000409 RWQCB Case No. 01-2474

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

**Richard Jones**, PE

Project Engineer

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Chad Roper, PhD Senior Project Manager



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#### 1.0 Introduction

On behalf of Chevron Environmental Management Company's (EMC's) affiliate, Union Oil Company of California ("Union Oil")", AECOM is pleased to submit this Feasibility Study (FS) for 76 Service Station No. 1156 (351645), 4276 MacArthur Boulevard, Oakland, California (Alameda County Health Care Services Agency, Environmental Health Services [ACEH] Case No. RO0000409, San Francisco Regional Water Quality Control Board [RWQCB] Case No. 01-2474) (Figure 1) (site). This FS has been prepared in response to the ACEH letter dated August 3, 2015 (Appendix A). AECOM recently conducted agency directed aquifer testing at this site, and the results of that testing were presented in a report dated July 14, 2015.

The ACEH letter dated August 3, 2015, referred to the recommendations in AECOM's aquifer testing report and stated "the results of the aquifer testing indicated that dewatering of the smear zone may be feasible" although this option was not the conclusion of the aquifer testing report. The letter then directed the preparation of this FS as recommended by the report and that the FS would identify data gaps associated with the selection and implementation of a remedial technology at the site.

The following sections summarize the site background, present the FS, and list data gaps, as well as provide conclusions from the current analysis and recommendations for future site activities.

#### 2.0 Site Background

#### 2.1 Site Description

The site is a 76 service station located at the northern corner of the intersection of MacArthur Boulevard and High Street within the city of Oakland, California (**Figure 1**). The station building is in the northern portion of the site. An automotive service bay is in the northern portion of the building and a mini-mart/cashier area is in the southern portion. Two dispenser islands are located on the southern portion of the site: one parallel to MacArthur Boulevard and one parallel to High Street. Previously prepared environmental documents (e.g., Delta Consultants [Delta] 2010a; 2010b) indicate that two 10,000-gallon gasoline underground storage tanks (USTs) are located in the southern portion of the site (**Figure 2**).

#### 2.2 Site Vicinity Use

The site area consists of mixed commercial and residential development, with the following adjacent property uses (**Figure 2**):

- Northwest The Oakland Veterinary Hospital (4258 MacArthur Boulevard) abuts the site to the northwest, beyond which is a pharmacy drug store.
- North and northeast Single-family residences (4257 Masterson Street and 3627 High Street) abut the site to the north and northeast.
- East and southeast High Street borders the site to the southeast, beyond which are a post
  office, apartment building (3618 to 3622 High Street), and commercial businesses (4300 to
  4312 MacArthur Boulevard). Based on a review of the State Water Resources Control
  Board's (SWRCB's) GeoTracker database, a leaking underground storage tank (LUST) site
  was formerly located at 4300 MacArthur Boulevard Chevron gasoline service station
  #93676 (Case No. 01-0371 which was closed in 1999) (SWRCB, 2015a).
- South A vacant lot is located south of the site, beyond the intersection of MacArthur Boulevard and High Street. The GeoTracker database indicates that an open LUST case is located in this area, the former Robert's Tires facility, 4311-4333 MacArthur Boulevard (Case No. 01-3601) (SWRCB 2015b).
- Southwest and west MacArthur Boulevard borders the site to the southwest, beyond which are a vacant lot and commercial businesses. The GeoTracker database indicates that Shell gasoline service station #13-5701 (4255 MacArthur Boulevard) was formerly located at the vacant lot. There is an open LUST case (Case No. 01-1366) associated with the former Shell service station (SWRCB 2015c).

Site and neighboring property uses are not expected to change significantly in the near future. The vacant lots are not expected to be redeveloped without resolution of the open LUST cases.

The property owner has requested permits to expand the convenience store at his location. This expansion will take his building to within 7 feet of the property line to the northwest adjacent to the Oakland Veterinary Hospital. The proposed footprint for the expanded building is shown on **Figure 2**. The property owner has provided plans for the expanded facility which are included as **Appendix B**. This expansion may begin as soon as the middle of 2016.

#### 2.3 Topography and Site Elevation

The site is located in a highly urbanized area of Oakland at the base of the San Leandro Hills. Based on site survey data, surface elevations at the site range from 179.42 feet above mean sea level (amsl) at MW-4B to 173.99 feet amsl at MW-2B (Morrow Surveying 2013). Observations during the area reconnaissance on March 15, 2012, further revealed that the elevation at the northeastern boundary of the site is noticeably higher than at MW-4B. Additionally, the elevation at MW-5 is 169.67 feet amsl. MW-5 is located in the street in front of the Oakland Veterinary Hospital (adjacent to the northwestern portion of the site). To summarize, the southwestern portion of the site is at least 8 feet lower in elevation than the northeastern portion, and the western corner is approximately 4 feet lower in elevation than the southern corner.

Topography is significant for the purposes of feasibility assessment because remedial equipment generally requires level ground for installation or must be constructed to be level.

#### 2.4 Site Geology

Based on a review of boring logs prepared by previous consultants, the site geology consists of unconsolidated deposits in a clay matrix, with some intermixed fine-to-medium-grained gravel (Environmental Resolutions Incorporated 1999; Delta 2007a; 2007b; 2008a; 2008b; 2009a; 2009b; 2010a; 2010b; Conestoga-Rovers & Associates 2011). Clay is predominant in the upper lithology with sandy/silty clay and clayey sand units, between approximately 1 to 15 feet below ground surface (bgs). The clay is underlain by clay interbedded with sandy clay, clayey sand, silty sands, and some gravelly sandy clay observed to the maximum depth explored (50.5 feet bgs). Recent soil borings advanced on-site have indicated the presence of high-plasticity, fatty clays from 1 to 20 feet bgs (AECOM 2014a). Available boring logs are provided in **Appendix C**.

#### 2.5 Site Hydrogeology

Historical site assessments indicated the presence of a confined aquifer under hydrostatic pressure based on the initial depth to water during well installations. Well construction details are presented in **Table 1**. Soil observed during installation of the shallow monitoring wells (MW-9A/B, MW-10A/B, and MW-11A/B) was interpreted to be dry from approximately 11.5 to 16 feet bgs, at which point the soil appeared to be moist.

High-plasticity clays were observed for most soil borings from grade to total depth (15 to 20 feet bgs), which suggests a misinterpretation of static water during drilling activities. Following a review of historical boring logs, shallow depth to water was verified at several locations (SB-1, SB-4, SB-5, and SB-15), and almost all boring logs indicate high moisture content from approximately 5 feet bgs and deeper. Based on historical soil boring logs, and well installation in March 2013, AECOM concluded that the lithology beneath the site is relatively fine-grained; however, the aquifer is generally unconfined (AECOM 2013a).

Based on a review of boring logs (**Appendix C**) and groundwater monitoring data tables prepared by previous consultants, it was determined that discontinuous water-bearing zones may exist within the stratified clay matrices (Environmental Resolutions Incorporated 1999; Delta 2007a; 2007b; 2008a; 2008b; 2009a; 2009b; 2010a; 2010b; Conestoga-Rovers & Associates 2011). Soil boring logs indicate groundwater being encountered first between 4 (SB-1) and 42 (SB-11) feet bgs. During monitoring well installations in 1999, groundwater was encountered at an approximate depth of 23.5 feet bgs (MW-1, MW-2, MW-3, and MW-4). During well installations in 2001, groundwater was encountered at 6 and 5.5 feet bgs in MW-5 and MW-6, respectively. Additionally, groundwater was encountered at 15

feet bgs in MW-7 during installation in 2001. Groundwater was encountered at approximately 23.5 feet bgs in borings MW-1B, MW-2B, MW-3B, and MW-4B in 2010; however, significant moisture content was noted at 5 feet bgs and deeper in MW-1B and MW-2B.

To investigate the existence of shallow, unconfined water-bearing zones, AECOM installed six discreetly screened monitoring wells in March 2013. Following the well installations, it was concluded that the lithology beneath the site is relatively fine-grained; however, the groundwater is generally unconfined. Based on soil moisture observed in historical soil boring logs, the initial hydrogeologic evaluation (i.e., confined aquifer under hydrostatic pressure) was likely inaccurate (AECOM 2013b). This inaccuracy is further evidenced by shallow monitoring wells (MW-9A/B, MW-10A/B, and MW-11A/B) exhibiting a hydraulic head consistent with those installed to 25 feet bgs, and that recharge (although slow) did occur after purging during the most recent monitoring event (AECOM 2015b).

Soils observed during installation of these six wells were interpreted to be dry from approximately 11.5 to 16 feet bgs, at which point the soil appeared to be moist. High-plasticity clays were identified as present in most borings from grade to total depth (15 to 20 feet bgs), which suggests a misinterpretation of static water during drilling activities. Following a review of historical groundwater data, shallow depth to water was observed at most wells associated with the site, and almost all boring logs indicate high moisture content from approximately 5 feet bgs and deeper.

During the groundwater monitoring event conducted on July 21, 2015, the static groundwater elevation ranged from 163.20 feet (MW-2B) to 171.81 feet amsl (MW-4B). The depth to groundwater ranged from 2.58 (MW-5) to 10.35 (MW-2B) feet below the top of well casings (AECOM 2015b). **Table 2** shows groundwater data from the most recent event where a groundwater sample was analyzed (note: because events with chemical data were selected for **Table 2** elevation data from July 21, 2015, is not shown for wells mentioned above). Groundwater flow directions observed in 2015 events are consistent with the predominant historical groundwater flow at the site, which has been to the west (with variations to the southwest) at an average gradient of approximately 0.06 feet per foot.

#### 2.6 Extent of Petroleum Hydrocarbon Impacts to Soil

Soil boring samples collected from 1997 to date indicate that soil contamination is largely confined to the upper 15 feet of the unsaturated zone. **Table 3** details the maximum results from historical soil samples for constituents of concern. A maximum benzene concentration of 7.8 milligrams per kilogram (mg/kg) was detected for soil boring SB-2 at 8.5 feet bgs in 2007. **Table 4** provides historical soil data for constituents of concern. A cross-section is provided as **Figure 4**. Historical cross sections are provided in **Appendix D**. **Figure 5** shows the maximum total petroleum hydrocarbons as gasoline (TPH-g) impacts and the depth at which that maximum was detected for site soil sample locations.

Hydrocarbon impacts at the site, based on the current data appear to be discontinuous. A critical example is the soil data from MW-1 and SB-19. MW-1 had the highest historical detection of TPH-g (6,800 mg/kg at 10.5 feet bgs) and, less than 5 feet away, SB-19 had a maximum TPH-g concentration of 1.6 mg/kg at 10 feet bgs. To the southeast and southwest of MW-1 hydrocarbon concentrations have been inconsistent as well both from location to location, and sometimes even within the same boring (i.e., MW-1B at 10 feet bgs).

#### 2.7 Extent of Petroleum Hydrocarbon Impacts to Groundwater

Groundwater monitoring from 1999 to 2010 included monitoring of MW-1, MW-2, MW-3, and MW-4. These wells were screened from 5 to 25 feet bgs. In 2010, these wells were abandoned and replaced

with monitoring wells screened from 20 to 25 feet bgs (MW-1B, MW-2B, MW-3B, and MW-4B, respectively), located near the former well locations. Differences in groundwater concentrations at the same well locations (but different screen intervals) indicate significant impediments to vertical contaminant transport. Well construction details are provided in **Table 1**.

Groundwater impacts are characterized as limited to the area southwest of the former used-oil UST and southeast of the former gasoline USTs. It is not clear if these two areas of impacted groundwater connect into a single plume or are separate.

Current groundwater analytical data from wells with 5-foot screens (MW-9A/B, MW-10A/B/S, and MW-11A/B/S) indicate a non-uniform vertical distribution of groundwater impacts, likely due to the fine-grained nature of the subsurface soil. Impacts for deep-screened wells (20 to 25 feet bgs) are as much as three orders of magnitude less than those observed for the shallow-screened wells (10 to 15 feet bgs). Although concentrations for wells screened from 10 to 15 feet bgs are the highest, horizontal migration appears to be impeded by the soil type, and the plume appears to be largely contained to the site boundaries. Off-site, downgradient wells (MW-5 and MW-7) are screened from 5 to 25 feet bgs. Both wells have exhibited a declining trend for TPH-g, benzene, and methyl t-butyl ether (MTBE) since installation in 2001, suggesting that plume migration from the site is not occurring.

#### 2.8 History of Remediation

Approximately 1,350 tons of soil was excavated and removed during the gasoline UST removal activities in 1998 (Environmental Resolutions, Inc. 1998). In addition, approximately 4.6 tons of soil was overexcavated and removed during the used-oil UST removal.

Overpurging events were conducted at as many as three wells from 2001 to 2004 (MW-1, TP-1, and MW-7). Approximately 476,015 gallons of water was removed during that period. From available historical data, 1,590 gallons was extracted from MW-7 with the remainder being extracted from TP-1 and MW-1 (AECOM 2013a).

## 3.0 Feasibility Study

Three remedial technologies were evaluated for implementation at the site based on the Environmental Protection Agency's (EPA's) guidance document, *How to Evaluate Alternative Cleanup Technologies for Underground Storage Tank Sites* (EPA 2004). In 2014, AECOM prepared a remedial technology screening and work plan for site assessment which evaluated eight remedial technologies (AECOM 2014b). From the screening report, bioventing and soil vapor extraction (SVE) were eliminated from consideration because they were considered soil-only remedial approaches and impacts at this site are primarily in groundwater and in saturated soil. Groundwater extraction and treatment was eliminated because, although dewatering would be expected to enhance biodegradation of soil impacts, this approach would be limited by the low porosity of the soils and slow rates of hydrocarbon desorption into the liquid phase. Air sparge with SVE was also eliminated due to the potential for air injection to push soil vapor off-site.

Additionally, the feasibility analysis focuses on impacts attributed to the former used-oil UST. This location was chosen as a higher priority based on communication with ACEH and their concern for potential off-site vapor migration.

The technologies carried into this FS are summarized in the Potential Remedial Approaches table (**Table 5**). Each remedial approach explicitly addresses petroleum hydrocarbon concentrations in both soil and groundwater. It is presumed that their application will also reduce or eliminate migration of impacted groundwater and/or soil vapor. This study also intends to identify data gaps and practical considerations that may affect remedial implementation.

#### 3.1 Soil Excavation and Disposal

Soil excavation allows the physical removal of source material from the soil. This method is extremely effective at removing source material from the unsaturated zone; however, at or below the water table, significant challenges exist. Wet soil is heavier than dry soil; therefore, disposal costs would be significantly higher for saturated zone soil removal. Shallow groundwater, such as that present at the site, also presents a challenge and must be dewatered to retrieve deep soil impacts. Furthermore, groundwater impacts are not typically addressed during excavation activities (aside from dewatering) and can re-contaminate backfill material following the cessation of groundwater pumping.

Because the greatest soil impacts are considered to be below groundwater, it is assumed that dewatering will be required for excavation. There are several monitoring wells in the area that could be used for temporary dewatering. A discharge permit could be obtained from the East Bay Municipal Utilities District (EBMUD) for the purposes of dewatering during excavation and a sewer cleanout is available for a temporary connection to the publically owned treatment works (POTW). Dewatering may need to be initiated prior to the beginning of excavation to ensure that impacted soil is adequately dewatered for efficient excavation. Based on the results of aquifer testing at the site, it is estimated that an extraction total of approximately 1 gallons per minute (gpm) achieved from several wells would produce localized dewatering and approximately 1,500 gallons per day for discharge.

The dimensions of a potential excavation are provided on **Figure 2**. As can be seen in the figure, existing utility services including sewer, water and electric run through the area with the soil impacts attributed to the former used-oil UST. The presence of these utilities limits the lateral extent which can be safely excavated and limits the technologies which can be used for excavation. The lateral extent

shown on **Figure 2** sets a limit of within 2 feet of the utility for safety purposes. The planned expansion of the convenience store would also limit the size of the excavation if the excavation could not be completed before the expansion began.

The proposed excavation would be conducted via a combination of vacuum excavation and large-diameter drilling. The use of a backhoe was rejected due to the proximity to utilities and the building foundation and the need for shoring. Vacuum excavation uses compressed air to dislodge soil and a vacuum to lift it into a soil separator tank. This technique involves a vac-truck rig equipped with an air-knife tool to deliver the compressed air. The technique is commonly used to locate utilities and can be extended into the excavation without requiring a person to enter the excavation. If this approach cannot reach to the target depth (approximately 15 feet bgs.), additional excavation will be conducted via large-diameter augers. Large-diameter-auger excavation involves drilling a row of holes to the desired depth and backfilling each day with a slurry material. No shoring is required for this approach and no open hole hazards remain at the end of each drilling day. The excavation is estimated to require approximately 50 days to complete. Off-site disposal of excavated impacted soil is expected to require an additional 45 days.

The excavation shown on **Figure 2** has an area of 441 square feet, and it is estimated that approximately 5 feet of depth would need to be removed (from 10 to 15 feet bgs), resulting in approximately 82 cubic yards of soil for disposal. Prior to disposal, soil would need to be stored on-site in covered bins while it is being profiled for disposal. Soil bins are typically 18 feet by 8 feet and hold 20 yards of soil. The storage of soil in bins on-site would likely require a temporary reduction in the number of operating dispensers. Soil which is not impacted would also need to be stockpiled at the site so that it could be used as fill. Imported fill would also be required. Transport of soil to and from the site would represent an increase in the amount of truck traffic on local streets.

The site is currently an active fueling station. As a result, the excavation area will need to be fenced off to protect pedestrians, station customers, and Oakland Veterinary Hospital customers from the excavation activity. This restriction may further limit station operations. It is not unreasonable to expect that the station would be partially shutdown for the duration of the excavation.

Based on the need to dewater to expose impacted soil, the potential for impacted groundwater to recontaminate backfill material, the limitations on the extent of excavation due to nearby utilities and potential convenience store expansion, and the safety, accessibility, and financial concerns associated with excavation and soil management at an active fueling station, excavation is considered infeasible for implementation at this site.

#### 3.2 Multiphase Extraction

Multiphase extraction (MPE) is an in-situ remedial technique that involves vacuum-enhanced extraction of groundwater, soil vapor, and light non-aqueous phase liquid (if present) through the use of high-vacuum blowers and/or groundwater pumps. This technique is used to maximize extraction rates of both vapor and liquids simultaneously from extraction wells. If effective, MPE may rapidly remove petroleum-impacted groundwater by vacuum-enhanced dewatering to expose the vadose, capillary fringe, and upper saturated zones to SVE. MPE is most effective in the remediation of volatile hydrocarbons that are present in soils of moderate-to-low permeability (e.g., silt or silty sands) where target zone dewatering can be accomplished by extracting water at reasonable flow rates. In addition, dewatering the saturated zone allows oxygenation of impacted soils exposed to airflow induced by SVE, which can improve aerobic biodegradation of hydrocarbons below the water table.

AECOM's "Remedial Technology Screening and Work Plan for Site Assessment" (AECOM 2014b), stated that "Based on the heterogeneity and fine-grained nature of the soil encountered at the depths of highest petroleum impacts, MPE is likely not a feasible technology." Fine-grained, low-permeability soils are expected to limit the effectiveness of any remedial approach involving the extraction of soil vapor or groundwater from the site. In their letter dated November 19, 2014, ACEH disagreed with the conclusion that MPE was infeasible at the site and requested a work plan for evaluation of remedial technologies.

Groundwater pumps can be used in a dual-phase extraction configuration to remove groundwater, or drop tubes (stingers) can be used in a two-phase extraction configuration where the liquids and vapors are removed simultaneously by the vacuum pump. Aquifer testing at the site has indicated that average groundwater extraction rates (0.31 to 0.95 gpm) are feasible for MPE (although this extraction was conducted without vacuum, which would be expected to increase the rate of groundwater extraction); however, the radius of dewatering was inconsistent in that test with some wells which were more distant from the extraction rates without vacuum appear favorable, the results of the aquifer test did not produce a continuous dewatered area, possibly indicating preferential flow paths in the soil. The success of MPE hinges on the ability to effectively dewater the fine-grained soils and sufficient hydrocarbon vapor mass removal rates.

Nothing is currently known about air flow in the subsurface at this site although the prevailing clay soils would be expected to have low air flow. The vacuum radius of influence (ROI) at the site is considered a data gap and would need to be determined prior to the implementation of MPE. The vacuum ROI can affect hydrocarbon mass removal rates, and the spacing of extraction wells. The vacuum-enhanced radius of dewatering should also be considered a data gap for this technology.

MPE is usually conducted on 4-inch or larger diameter wells that are screened across the smear zone. Currently no such wells are available at this site. An appropriately screened and constructed well should be installed for implementing MPE.

MPE is typically applied using liquid ring pumps or positive displacement blowers to apply a high-vacuum on the extraction well. Extracted hydrocarbon vapors are typically destroyed in thermal or catalytic oxidizers. These technologies are relatively noisy and can produce some odors, both of which could be disruptive to businesses such as the adjacent Oakland Veterinary Hospital or the nearby residences.

MPE extracts groundwater for treatment and disposal. For hydrocarbon-impacted sites, groundwater is usually treated with activated carbon and discharged for disposal. EBMUD can provide a temporary POTW discharge permit for periods of up to 2 years. A permit would need to be obtained prior to pilot testing, and EBMUD estimates their review time at approximately 1 month (personal communication).

MPE can be conducted using a fixed-base, permanent system or through temporary events using a mobile system. Each of these applications has distinct advantages and disadvantages which are discussed as follows.

#### 3.2.1 MPE with a Fixed System

A fixed MPE system is designed and built for continuous operations of more than 1 year. Based on the clay soils at this location, long-term operation is considered likely to be required for effectiveness.

Installation of a fixed MPE system requires a fairly large footprint and must be installed on a level foundation. Several potential locations were reviewed at the site based on the property owner's plans for expansion of the convenience store at the property, which is currently in permitting. A 15-foot by 35-foot footprint was selected as typical of other fixed MPE operations. Much of the site was considered infeasible for installation due to the grading at the site and the footprint of the convenience store and fuel dispensers.

Only one location was considered feasible for construction purposes and evaluated further: the northeastern edge of the property adjacent to the residential area (**Figure 3**). This location would require relatively little leveling, but would take up three parking spaces and is adjacent to the sidewalk. This location was chosen so that access to the waste-oil aboveground storage tank (AST) could be maintained. The final location for any remedial system on-site would have to be approved in a building permit from the City of Oakland.

From the treatment system, a trench would need to be run to the area to be remediated on the northwestern side of the site. This trench would need to be installed prior to the planned expansion of the convenience store so that trenching equipment would have adequate clearance. The trench would connect to the extraction well or wells and would transport soil vapor and groundwater to the treatment system. The trench would also carry treated water to the sewer connection. An alternative route for the trench across the front of the station may be feasible, but would cross more utility lines and its installation would cause a greater disruption to station activities.

Air emissions would need to be permitted by the Bay Area Air Quality Management District (BAAQMD). The proposed remediation system location is within 1,000 feet of St. Lawrence O'Toole Catholic School (approximately 450 feet northeast) and would be subject to a public notice requirement. Dedicated electric service to the remedial system would need to be added by Pacific Gas and Electric. They can typically install service to a temporary power pole within 3 to 6 months following the request. Depending on the mass of hydrocarbons that could be extracted from site soils, vapor-phase treatment would likely either be thermal or catalytic oxidation, and gas service may also be required from Pacific Gas and Electric.

Even without knowing the vapor ROI at the site and without having appropriate MPE wells in the target area, the drawbacks of installing an MPE system (proximity to a school, impact on gas station operations, extensive trenching, operating near residences, noise nuisance, etc.) at this site may be substantial enough for it to be considered infeasible.

#### 3.2.2 MPE with a Mobile System

Mobile systems generally operate under various locations permits for air emissions. A various locations permits under BAAQMD for this site would require special authorization to operate within 1,000 feet of a school. Although the permit allows operation up to 12 months at a location, mobile events generally range from 72 hours to 30 days in duration.

Typical equipment for mobile MPE events is truck-mounted and generator-driven. It consists of a liquid-ring vacuum pump, thermal oxidizer for vapor treatment, and a trailer-mounted activated carbon system for water treatment. The equipment used can produce similar in vacuum, vapor flow and treatment, and groundwater flow and treatment as most fixed systems. They are typically manned continuously for the duration of the MPE event. The total footprint of a mobile system is about the same as the fixed system except that the components, such as the trailer-mounted water treatment system can be placed in different configurations to match available space. Temporary hoses and

piping are used for mobile MPE events and so trenching is not required. For the area being considered, it is likely that temporary pipes and hoses could be placed along the northwestern side of the property and fenced off with minimal impact to on-site traffic at the gas dispensers.

Vacuum ROI for this site is considered a data gap and pilot testing to close this data gap would likely be conducted with a mobile MPE unit.

As was stated previously, the ability to dewater fine-grained materials is critical to the success of MPE. In aquifer testing, site soils dewatered slowly and heterogeneously and the same result is considered likely for MPE. Clay soils identified in the impacted area also are expected to require a long time to dewater as well as to desorb hydrocarbons. Based on these two characteristics, short-term events are not expected to produce a lasting reduction in groundwater concentrations for constituents of concern.

#### 3.3 Monitored Natural Attenuation

Natural attenuation refers to a variety of physical, chemical, and/or biological processes that reduce the mass, toxicity, mobility, volume, and/or concentration of contaminants in soil and/or groundwater (EPA 2004). Evaluation of the performance of natural attenuation strategies relies upon monitoring networks that can quantify changes in chemical concentration and/or mass and related geochemistry and hydrology that influence, or are products of, attenuation processes. This remedial approach is often referred to as monitored natural attenuation (MNA) (API 2007).

MNA is a non-intrusive remedial approach that depends upon natural processes to degrade and dissipate petroleum constituents in soil and groundwater. Processes involved in natural attenuation of petroleum products include aerobic and anaerobic biodegradation, dispersion/dilution, volatilization, and adsorption. Petroleum hydrocarbon constituents are generally biodegradable as long as indigenous microorganisms have an adequate supply of electron acceptors and nutrients; and toxic substances do not inhibit biological activity.

MNA may be an acceptable long-term option where data can establish that it is occurring. It is often applied following active remediation when the majority of the source has been removed, or for sites where it can achieve cleanup goals as effectively as other technologies. Given a reasonable timeframe for natural attenuation, the costs may be lower than active remediation.

MNA parameters typically include analysis for electron acceptors (sulfate and nitrate) and metabolites of carbon dioxide and ferric iron (methane and ferrous iron). Analytical results are presented in **Table 6**. Dissolved oxygen concentrations are measured in the field semi-annually. Groundwater samples collected semi-annually have been analyzed since January 2014 for MNA parameters including methane, nitrate, sulfate, ferrous iron, and dissolved manganese, to evaluate if natural attenuation by anaerobic biodegradation is occurring beneath the site. Based on the analytical results for MNA parameters, depleted concentrations of nitrate and sulfate (electron donors for anaerobic reduction) were observed for wells within the dissolved-phase hydrocarbon plume. Additionally, ferrous iron and dissolved manganese concentrations (byproducts of anaerobic reduction) are generally elevated for wells within the dissolved-phase hydrocarbon plume. Within the source area, methane (product of anaerobic hydrocarbon digestion) is also found to be elevated. These geochemical trends are indicative of anaerobic biodegradation occurring within the dissolved-phase hydrocarbon plume.

For MNA, it is important to monitor the site on an ongoing basis to evaluate if site risks change. The site currently possesses sufficient soil vapor and groundwater monitoring wells to determine if site

conditions are changing over time. However, the groundwater and soil vapor monitoring well networks should be evaluated in light of the planned expansion of the convenience store at the site.

Based on the current data, it appears that natural attenuation is occurring at the site and is a feasible remedial approach.

## 4.0 Data and Implementation Gaps

The preceding feasibility evaluation identified several key data and implementation gaps that would need to be addressed prior to a final technology selection.

#### 4.1 Evaluation of Vacuum ROI

Just as the rate of groundwater extraction was determined by the aquifer test, extracting vapor from the subsurface is critical to the effectiveness of MPE. The vacuum ROI for this site is not known. If the vacuum ROI is too short, MPE may not be feasible.

#### 4.2 Hydrocarbon Mass Removal Rates

Similar to the determination of vacuum ROI, the effectiveness of MPE depends on the mass of hydrocarbons that can be removed in the vapor stream over time. Although previous soil vapor testing at the site indicates that high concentrations of hydrocarbons are present in soil vapor, the rate at which vapor can be extracted has yet to be determined. Vapor mass removed is an expression of concentration, volume, and time. Target mass removal rates are in excess of 25 pounds per day.

#### 4.3 Appropriate Wells for MPE

MPE wells are generally screened across the smear zone. Dewatering these wells opens the smear zone for vapor-phase transport of hydrocarbons to the treatment system. Currently, site wells in the area where the highest impacts have been encountered generally have 5-foot-long well screens. If the results of any testing are to be considered reliable, well construction should be appropriate for MPE.

## 5.0 Conclusions and Recommendations

Based on the analysis conducted in the preceding sections, AECOM makes the following conclusions.

- Excavation in the area associated with the former used-oil UST is considered infeasible due the potential for impacted groundwater to re-contaminate backfill material, the limitations on the extent of excavation due to nearby utilities and potential convenience store expansion, and the safety, accessibility, and financial concerns associated with excavation and soil management at an active fueling station.
- Dewatering rates observed in the aquifer test may support MPE.
- The general feasibility of MPE cannot be determined with the existing data, but the site has drawbacks for the implementation of MPE that make it unfavorable:
  - o Site is within 1,000 feet of a school; and
  - Site has residences and a veterinary hospital on adjacent parcels which would be subject to potential noise and odor concerns.
- Vacuum ROI is a data gap at the site. Due to the clay soils, the vacuum ROI is expected to be limited.
- Hydrocarbon mass removal rates using MPE are also unknown and are considered a data gap. High hydrocarbon concentrations and low vapor flow rates are expected which would result in a low mass removal rate.
- Current well diameters and screen intervals are poorly suited for remediation.
- A fixed remedial system would have the following drawbacks:
  - Grading and space requirements at the site limit the number of locations where a fixed system could be located.
  - The proposed location for fixed MPE system is adjacent to a residence.
  - The proposed location may limit parking at the gas station.
  - Trenching would be required to travel from the proposed location for the remedial system to the area associated with the former used-oil UST.
- A mobile remedial system could be employed to close data gaps at this site, but it is considered highly unlikely to produce lasting changes in groundwater concentrations at the site for constituents of concern.
- MNA is a feasible remedial approach at the site.

• The current monitoring and soil vapor well network may be impacted by the planned expansion at the facility.

Based on these conclusions, AECOM makes the following recommendations for future work.

- Existing well network should be evaluated on the basis of the planned convenience store expansion at the site and wells should be destroyed and replaced to maintain the ability to monitor groundwater at the site.
- The drawbacks associated with a fixed MPE system are considered sufficient that MPE should not be implemented at the site. Therefore, pilot testing with a mobile MPE system for the purpose of closing identified data gaps is not necessary.
- MNA should be implemented at the site with a monitoring program sufficient to assure all parties that impacts at the site do not represent an imminent human health risk.

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#### 7.0 Limitations

This report has been prepared for ACEH on behalf of AECOM's client, EMC, and pertains to 76 Service Station No. 1156 (351645), located at 4276 MacArthur Boulevard, Oakland, California. In performing professional services, AECOM has applied present engineering and scientific judgment and used a level of effort consistent with the standard of practice measured on the date of the work and in the locale of the site for similar type studies. AECOM does not guarantee the accuracy or completeness of data collected by previous consultants. AECOM makes no warranty, express or implied, concerning any of the materials or services furnished. The analyses and interpretations in this report have been developed based on review of existing information pertaining to the site and review of analytical results.

Figures









Legend

Storm Drain

(mg/Kg)

ND Not Detected

The highest value is shown.

NOTE:

----- Fence / Block Wall

Ø

Tank Pit Backfill Well



**Tables** 

#### Table 1 Well Construction Details 76 Service Station No. 1156 (351645) 4276 MacArthur Boulevard Oakland, California

	Well	Casing	Boring	Screen	Screen	Filter	Bentonite	Grout
Well ID	Installation	Diameter	Depth	Interval	Size	Pack	Seal	Interval
	Date	(in.)	(ft. bgs)	(ft. bgs)	(in.)	(ft. bgs)	(ft. bgs)	(ft. bgs)
MW-1*	7/16/1999	2	26.5	5-25	0.01	4-26.5	3-4	0-3
MW-1B	8/17/2010	2	25	20-25	0.02	19-25	18-19	0.5-18
MW-2*	7/16/1999	2	26.5	5-25	0.01	4-26.5	3-4	0-3
MW-2B	8/16/2010	2	25	20-25	0.02	19-25	18-19	0.5-18
MW-3*	7/16/1999	2	31.5	5-25	0.01	4-27	3-4; 27-31.5	0-3
MW-3B	8/16/2010	2	25	20-25	0.02	19-25	18-19	0.5-18
MW-4*	7/16/1999	2	26.5	5-25	0.01	4-26.5	3-4	0-3
MW-4B	8/13/2010	2	25	20-25	0.02	19-25	18-19	0.5-18
MW-5	8/29/2001	2	25	5-25	0.02	4-25	3-4	0.5-3
MW-6	8/29/2001	2	25	5-25	0.02	4-25	3-4	0.5-3
MW-7	8/29/2001	2	25	5-25	0.02	4-25	3-4	0.5-3
MW-8	10/30/2007	2	25	15-25	0.01	13-25	11-13	1-11
MW-9A	3/18/2013	2	15	10-15	0.02	8-15	1.5-8	1-1.5
MW-9B	3/18/2013	2	20	15-20	0.02	13-20	1.5-13	1-1.5
MW-10A	3/18/2013	2	15	10-15	0.02	8-15	1.5-8	1-1.5
MW-10B	3/18/2013	2	20	15-20	0.02	13-20	1.5-13	1-1.5
MW-10S	6/12/2014	4	10	6.5-10	0.02	3.5-10	1-3.5	n/a
MW-11A	3/19/2013	2	15	10-15	0.02	8-15	1.5-8	1-1.5
MW-11B	3/19/2013	2	20	15-20	0.02	13-20	1.5-13	1-1.5
MW-11S	6/11/2014	4	10	6.5-10	0.02	3.5-10	1-3.5	n/a

#### NOTES:

\* = Destroyed and replaced with "B" well in 2010

ft. bgs = Feet below ground surface

in. = Inches

ID = Identification

n/a = Not available

# Table 2Current Groundwater Monitoring Data and Analytical Results76 Service Station No. 1156 (351645)4276 MacArthur BoulevardOakland, California

				LNAPL		OIL AND	TPH-DRO						
WELL ID	DATE	TOC*	DTW	THICKNESS	GWE*	GREASE	W/SGC	TPH-GRO	В	т	E	х	COMMENTS
	SAMPLED	(ft)	(ft)	(ft)	(ft)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	
MW-1B	1/27/2015	174.06	6.63	0	167.43		ND<40	ND<50	ND<0.30	ND<0.30	ND<0.30	ND<0.60	
MW-2B	1/27/2015	173.55	4.98	0	168.57		ND<40	ND<50	ND<0.30	ND<0.30	ND<0.30	ND<0.60	
MW-3B	7/21/2015	177.77	7.28	0	170.49		280	4,200	210	100	570	220	
MW-4B	1/27/2015	179.07	5.83	0	173.24		ND<40	ND<50	ND<0.30	ND<0.30	ND<0.30	ND<0.60	
MW-5	1/27/2015	169.18	1.96	0	167.22		ND<40	ND<50	ND<0.30	ND<0.30	ND<0.30	ND<0.60	
MW-7	1/27/2015	172.11	6.93	0	165.18		ND<40	150	ND<0.30	ND<0.30	ND<0.30	ND<0.60	
MW-9A	7/21/2015	173.01	5.87	0	167.14		170	7,100	2,700	22	190	23	
MW-9B	1/27/2015	172.78	5.38	0	167.40		ND<40	ND<50	ND<0.30	ND<0.30	ND<0.30	ND<0.60	
MW-10A	7/21/2015	174.48	7.32	0	167.16		530	22,000	15,000	190	1,000	960	
MW-10B	7/21/2015	174.62	7.58	0	167.04		46	2,600	780	27	100	130	
MW-10S	7/21/2015	175.57	5.92	0	169.65	ND<5,000	ND<40	ND<50	1.6	ND<0.30	6.2	ND<0.60	
MW-11A	7/21/2015	175.37	5.39	0	169.98		700	56,000	11,000	6,900	1,800	12,000	
MW-11B	7/21/2015	174.65	5.37	0	169.28		430	23,000	10,000	770	960	1,200	
MW-11S	7/21/2015	176.09	6.13	0	169.96	ND<5,000	280	5,100	670	18	420	240	
QA	7/21/2015							ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	

NOTES:

\* TOC and GWE are in feet above mean sea level

Oil and grease analyzed by Environmental Protection Agency (EPA) Method 1664A HEM

TPH-DRO with SGC analyzed by EPA Method 8015B/TPHd

TPH-GRO analyzed by EPA Method 8015B

BTEX analyzed by EPA Method 8260B

µg/L = Micrograms per liter

-- = Not available/not sampled

B = Benzene

DTW = Depth to water below TOC

E = Ethylbenzene ft = Feet

IL - Feel

GWE = Groundwater elevation

ID = Identification

LNAPL = Light non-aqueous phase liquid

ND<# = Analyte not detected at or above indicated practical quantitation limit

QA = Trip blank

T = Toluene

TOC = Top of casing

TPH-DRO W/SGC = Total petroleum hydrocarbons-diesel range organics with silica gel cleanup

TPH-GRO = Total petroleum hydrocarbons-gasoline range organics

X = Total xylenes

#### Table 3

#### Maximum Historical Concentrations for Constituents of Concern in Soil 76 Service Station No. 1156 (351645) 4276 MacArthur Boulevard Oakland, California

Constituent	Boring	Sampling Date	Depth (feet bas)	Concentration
		1000	10.5	6 800
тгт-у	B1/10100-1	1999	10.5	0,800
Benzene	SB-2	2007	8.5	7.8
Toluene	SB-2	2007	8.5	51
Ethylbenzene	B1/MW-1	1999	10.5	110
Total Xylenes	B1/MW-1	1999	10.5	470
MTBE	MW-11B	2013	19	7.9

#### NOTES:

mg/kg = milligrams/ kilogram

MTBE = methyl t-butyl ether

bgs = below ground surface

TPH-g = Total petroleum hydrocarbons as gasoline

#### Table 4 Historical Soil Analytical Data 76 Service Station No. 1156 (351645) 4276 MacArthur Boulevard Oakland, California

															TPH	ТРН	ТРН	ТРН	TPH	TPH	TPH	ТРН	ТРН	ТРН	ТРН	TPH		Т
Boring	Depth	Date	Benzene	Toluene	Ethyl-	Total	MTBE	EDB	EDC	ТВА	Ethanol	TPHg	TPHd	TPHmo	C8 -	C10 -	C12 -	C15 -	C17 -	C19 -	C21 -	C23 -	C29 -	C33 -	C37-	C41-	TPH	ТРН
J	(ft)				benzene	Xylenes			_			(8015M)			C9	C11	C14	C16	C18	C20	C22	C28	C32	C36	C40	C43	C44+	(Total)
S-6-T1N	6	3/23/1998	0.9	ND	14	100						1,200																
S-9.5-T1S	9.5	3/23/1998	1.5	ND	5.6	33						590																
S-7-T2S	7	3/23/1998	1	0.74	6.8	51						670																
S-6-T2N	6	3/23/1998	ND	ND	0.15	0.41						83														-		
<del>S-6.5-T35*</del>	6.5	3/23/1998	0.55	1.3	1.2	11						130	78,000															
S-2-D1	2	4/9/1998	ND	ND	ND	ND						ND																
S-3-D2	3	4/9/1998	ND	ND	ND	0.13						16																
S-3-D3	3	4/9/1998	1.6	15	18	99						590																
S-3-D4	3	4/9/1998	ND	ND	ND	0.07						ND																
S-3-PL1	3	4/9/1998	ND	ND	ND	8.4						160																
S-3.5-PL2	3.5	4/9/1998	ND	ND	ND	0.45						63																
S-4.5-T3W	4.5	4/9/1998	ND	0.066	ND	0.011						5	2.3															
S-3-T3S	3	4/9/1998	0.043	ND	0.0091	ND						1.6	ND															
S-6-T3S	6	4/9/1998	0.64	1.4	1.1	5.9						81	560															
S-10.5-B1 (MW-1)	10.5	7/16/1999	2.6	25	110	470	ND					6 800																
S-10.5-B2 (MW-2)	10.5	7/16/1999	ND		ND	ND	ND					ND																
S-10 5-B3 (MW-3)	10.5	7/16/1999	0.32	0.43	0.28	1.8	0.6					16																
S-10 5-B4 (MW-4)	10.5	7/16/1999	11	0.45	0.20	1.0	0.0					22																
S-20 5-B4 (MW-4)	20.5	7/16/1999	ND	ND	0,0060	ND																						
S-5-M/M/5	20.5	8/20/2001	ND <0.005	ND	<0.0009	ND <0.005	ND					10																
S-5-MW6	5	8/29/2001	<0.005	<0.005	<0.005	<0.005	<0.005					<1.0																
S-5-101000	5	8/29/2001	<0.005	<0.005	<0.005	<0.005	<0.005					<1.0																
S-D-IVIV/7	5	8/29/2001	<0.005	<0.005	<0.005	<0.005	<0.005					<1.0																
3-10-101007	10	8/29/2001	0.18	<0.025	0.085	0.234	<0.25					<5.0																
M/M/ 0	10	10/30/2007	< 0.005	<0.005	<0.005	<0.01	<0.005					<0.20		220														
10100-8	15	10/30/2007	< 0.005	<0.005	<0.005	<0.01	<0.005					<0.20		<50														
	20	10/30/2007	<0.005	<0.005	<0.005	<0.01	<0.005					<0.20		<50														
	/	11/6/2007	<0.25	<0.25	4.2	17	<0.25					360		<50														
SB-1	12	11/6/2007	<0.025	<0.025	1.7	2.2	<0.025					20		<50														
	8.5	11/6/2007	< 0.005	< 0.005	0.067	0.3	<0.005					2.3		<50														
	33.5	11/6/2007	<0.005	0.012	0.26	0.14	<0.005					3.1		<50														
	8.5	11/5/2007	7.8	51	24	120	<2.5					1,200		<50														
SB-2	12	11/5/2007	1.2	<0.25	2.3	12	1.2					120		<50														
	20	11/5/2007	0.016	0.011	0.0079	0.029	0.029					0.29		<50														
	25	11/5/2007	<0.005	<0.005	<0.005	<0.01	<0.005					<0.20		<50														
	7	11/2/2007	<0.005	<0.005	<0.005	<0.01	0.015					<0.20		<50														
SB-3	15	11/2/2007	<0.005	<0.005	<0.005	<0.01	<0.005					<0.20		<50														
	20	11/2/2007	<0.005	<0.005	<0.005	<0.01	0.34					0.33		<50														
	25	11/2/2007	<0.005	<0.005	<0.005	<0.01	0.24					0.27		<50														
	8	10/30/2007	<0.005	<0.005	<0.005	<0.01	<0.005					0.96		<50														
SB-4	11	10/30/2007	< 0.005	<0.005	<0.005	<0.01	<0.005					<0.20		<50														
00 4	16	10/30/2007	<0.005	<0.005	<0.005	<0.01	<0.005					<0.20		<50														
	27	10/30/2007	<0.005	<0.005	<0.005	<0.01	<0.005					<0.20		<50														
	7	11/1/2007	0.28	0.31	1.7	8.6	<0.12					150		<50												-		
	12	11/1/2007	<0.025	<0.025	<0.025	<0.05	<0.025					6		<50												-		
SB-5	17	11/1/2007	3	13	28	99	<1.0					1,700		<50												1		
	22	11/1/2007	0.009	<0.005	< 0.005	<0.01	<0.005					<0.20		<50														
	30	11/1/2007	0.0087	<0.005	< 0.005	<0.01	<0.005					<0.20		<50														
	5	10/31/2007	<0.025	<0.025	0.047	<0.01	<0.025					72		<50														
	8.5	10/31/2007	0.016	< 0.005	0.016	<0.01	0.016					2		<50														
05.0	12	10/31/2007	< 0.005	< 0.005	< 0.005	<0.01	0.016					<0.20		<50														
SB-6	15	10/31/2007	< 0.005	< 0.005	< 0.005	<0.01	0.029					<0.20		<50														
	17	10/31/2007	< 0.005	< 0.005	< 0.005	<0.01	< 0.005					<0.20		<50														
	30.5	10/31/2007	< 0.005	< 0.005	< 0.005	<0.01	< 0.005					<0.20		<50														<u> </u>
SV-1-S	4.5	7/7/2009	< 0.005	< 0.005	<0.005	<0.01	< 0.005	<0.005	<0.005	<0.005	<1.0	<0.20																<u> </u>
SV-2-S	3	7/7/2009	<0.005	<0.005	<0.005	<0.01	<0.005	<0.5	<0.005	<0.005	<1.0	<0.20																<u> </u>
5,25	U U	1,1,2000	-0.000	-0.000	-0.000	-0.01	-0.000	-0.0	-0.000	-0.000	\$1.0	-0.20	1	1	1	1						1	1		1			1

#### Table 4 Historical Soil Analytical Data 76 Service Station No. 1156 (351645) 4276 MacArthur Boulevard Oakland, California

Boring	Depth (ft)	Date	Benzene	Toluene	Ethyl- benzene	Total Xylenes	МТВЕ	EDB	EDC	ТВА	Ethanol	TPHg (8015M)	TPHd	TPHmo	TPH C8 - C9	TPH C10 - C11	TPH C12 - C14	TPH C15 - C16	TPH C17 - C18	TPH C19 - C20	TPH C21 - C22	TPH C23 - C28	TPH C29 - C32	TPH C33 - C36	TPH C37- C40	TPH C41- C43	TPH C44+	TPH (Total)
SV-3-S	4.5	7/7/2009	<0.025	<0.025	<0.025	0.15	<0.025	<0.25	<0.025	<0.025	<5.0	17																
SV-4-S	4.5	7/7/2009	0.027	<0.005	<0.005	<0.01	0.02	0.16	<0.005	<0.005	<1.0	0.23																
SV-5-S	4.5	7/7/2009	< 0.05	<0.05	< 0.05	0.15	<0.05	<0.5	<0.50	<0.50	<10	24													1			
SV-6-S	4.5	7/7/2009	<0.005	<0.005	< 0.005	<0.01	<0.005	<0.05	<0.005	<0.005	<1.0	<0.20													<b>_ /</b>			
SV-7-S	4.5	7/7/2009	<0.005	<0.005	< 0.005	<1.0	<0.005	<0.05	<0.005	<0.005	<1.0	4.6													'			
	7.5-8	7/9/2009	<0.50	<0.50	5.7	32	<0.50	<5.0	<0.50	<0.50	<100	260							-						'			
SB-7	15.5-16	7/9/2009	0.008	<0.005	<0.005	0.023	0.0085	<0.05	<0.005	<0.005	<1.0	1.3																
	23-23.5	7/9/2009	<0.005	<0.005	<0.005	<0.01	<0.005	<0.05	<0.005	<0.005	<1.0	<0.20																
SB-8 @ 7.0-7.5	7.0-7.5	7/10/2009	<0.50	<0.50	7.7	<1.0	<0.50	<10	<0.50	<0.50	<250	760													<u> </u>			
SB-9 @ 15.5-16	15.5-16	7/8/2009	<0.005	<0.005	<0.005	<0.01	0.019	<0.05	<0.005	<0.005	<1.0	<0.20													<u> </u>			
SB-9 @ 26	26	7/8/2009	<0.005	<0.005	<0.005	<0.01	<0.005	<0.05	<0.005	<0.005	<1.0	<0.20													<u> </u>			
	12-12.5	7/10/2009	<0.50	<0.50	6.1	46	<0.50	<5.0	<0.50	<0.50	<100	400													/			
SB-10	18-18.5	7/10/2009	<0.50	<0.50	5	34	<0.50	<5.0	<0.50	<0.50	<100	290													<u> </u>			
	22.5-23	7/10/2009	< 0.005	<0.005	< 0.005	0.056	<0.005	<0.05	<0.005	<0.005	<1.0	0.78													<u> </u>			
05.44	7.5-8	7/10/2009	< 0.05	< 0.50	0.5	0.77	< 0.50	< 0.50	<0.50	< 0.50	<10	41													<u> </u>			
SB-11	15.5-16	7/10/2009	0.26	0.0094	< 0.005	0.015	<0.005	< 0.50	<0.005	<0.005	<1.0	200													<u> </u>			
	41-41.5	7/10/2009	<0.005	< 0.005	<0.005	<0.01	< 0.005	< 0.05	< 0.005	<0.005	<1.0	<0.20													<u> </u>	L		
	6	6/15/2010	0.11	<0.0050	0.37	0.44	<0.0050	<0.0050	<0.0050	0.11	<1.0	3.8	<2.0	28											<u>⊢</u> _/			
	10	6/15/2010	0.081	<0.0050	0.43	0.5	<0.0050	<0.0050	<0.0050	0.091	<1.0	<5	<2.0	<10											<u>⊢</u>	— <u> </u>		
	15	6/15/2010	0.29	<0.0050	0.45	0.58	<0.0050	<0.0050	<0.0050	0.062	<1.0	1.7	<100	830											<u>⊢</u>	<u> </u>		
	20	6/15/2010	0.052	<0.0050	0.41	10.010	<0.0050	<0.0050	<0.0050	0.05	<1.0	<5.0	<2.0	-10											<u>⊢</u>	<u> </u>		
SB-12	20	6/15/2010	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0050	<0.050	<1.0	< 3.0	<2.0	<10											<u> </u>		<u> </u>	
	35	6/15/2010	<0.0050	<0.0050	0.0050	<0.010	<0.0050	<0.0050	<0.0050	<0.050	<1.0	<1.0	<2.0	<10											<u> </u>	<u> </u>		
	/1	6/15/2010	<0.0030	<0.0000	<0.000	<0.010	<0.0030	<0.0000	<0.0030	<0.000	<5.0	<1.0	<2.0	12												<u> </u>	<u> </u>	
	45	6/15/2010	<0.025	<0.025	<0.023	<0.000	<0.025	<0.025	<0.020	<0.20	<1.0	<1.0	<2.0	<10														
	50	6/15/2010	<0.0050	<0.0000	<0.0050	<0.010	<0.0000	<0.0000	<0.0000	<0.050	<1.0	<1.0	<2.0	24														
SB-13	6	6/18/2010	<0.50	<0.50	4.4	<1.0	<0.50	<0.50	<0.50	<5.0	<100	680	76	<100												<u> </u>		
	8	6/17/2010	0.073	0.26	1.7	8	0.0088	<0.0050	< 0.0050	<0.050	<1.0	9.9	<2.0	<10														
	10	6/17/2010	0.28	0.21	1.7	7.9	0.033	< 0.0050	< 0.0050	0.093	<1.0	35	<2.0	<10														
	15	6/17/2010	0.097	< 0.0050	0.031	0.051	0.031	< 0.0050	< 0.0050	0.081	<1.0	<1.0	<10	100														
	20	6/17/2010	0.0064	0.0099	0.05	0.24	<0.0050	<0.0050	<0.0050	<0.050	<1.0	<1.0	<2.0	17														
CD 44	26	6/17/2010	0.0076	0.012	0.085	0.36	<0.0050	<0.0050	<0.0050	<0.050	<1.0	<1.0	<2.0	31														
SB-14	30	6/17/2010	<0.0050	<0.0050	<0.0050	< 0.0050	< 0.0050	<0.0050	< 0.0050	<0.050	<1.0	<1.0	<2.0	<10														
	35	6/17/2010	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.050	<1.0	<1.0	<2.0	<10											<b></b>			
	40	6/17/2010	<0.0050	<0.0050	0.014	0.079	<0.0050	<0.0050	<0.0050	<0.050	<1.0	<1.0	<2.0	19											· '			
	45	6/17/2010	0.018	<0.0050	0.27	1	<0.0050	<0.0050	<0.0050	<0.050	<1.0	6.8	<2.0	20											'			
	50	6/17/2010	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.050	<1.0	<1.0	<2.0	<10											'			
	5	6/18/2010	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0050	<0.050	<1.0	<1.0	<2.0	<10				-										
	10	6/18/2010	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0050	<0.050	<1.0	<1.0	<2.0	<10														
	15	6/18/2010	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0050	<0.050	<1.0	<1.0	<2.0	<10											]			
SB-15	21.5	6/18/2010	< 0.0050	<0.0050	< 0.0050	<0.010	<0.0050	<0.0050	< 0.0050	<0.050	<1.0	<1.0	<2.0	<10														
	26.5	6/18/2010	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0050	<0.050	<1.0	<1.0	<2.0	<10														
	30	6/18/2010	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0050	<0.050	<1.0	<1.0	<2.0	<10											<u> </u>			
	35	6/18/2010	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0050	<0.050	<1.0	<1.0	<2.0	<10											<u> </u>			
	40	6/18/2010	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0050	<0.050	<1.0	<1.0	<2.0	<10														

#### Table 4 Historical Soil Analytical Data 76 Service Station No. 1156 (351645) 4276 MacArthur Boulevard Oakland, California

															TPH	TPH	TPH	TPH	TPH	TPH	TPH	TPH	TPH	TPH	TPH	TPH	<u> </u>	T
Boring	Depth (ft)	Date	Benzene	Toluene	Ethyl- benzene	Total Xylenes	MTBE	EDB	EDC	ТВА	Ethanol	TPHg (8015M)	TPHd	TPHmo	C8 -	C10 -	C12 -	C15 -	C17 -	C19 -	C21 -	C23 -	C29 -	C33 -	C37-	C41-	TPH	TPH (Total)
	8	6/16/2010	~0.025	<0.025	<0.025	<0.050	<0.025	<0.025	<0.025	<0.25	<5.0	<10	<20	<10	Ca	UII	014	010	010	020	622	620	032	030	C40	643	644+	(Total)
	10	6/16/2010	<0.023	<0.023	<0.025	<0.030	<0.023	<0.023	<0.023	<0.23	<1.0	<1.0	<2.0	<10													<u> </u>	
	15	6/16/2010	<0.0000	<0.0000	<0.0000	<0.010	<0.0000	<0.0000	<0.0000	<0.000	<2.0	<1.0	<99	<500														
	20	6/16/2010	<0.010	<0.0050	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<1.0	<1.0	<2.0	<10													<u> </u>	
	25	6/16/2010	<0.0050	<0.0050	<0.0050	<0.010	<0.0000	<0.0050	<0.0000	<0.000	<1.0	<1.0	<2.0	30														
SB-16	30	6/16/2010	< 0.0050	<0.0050	<0.0050	<0.010	0.041	<0.0050	<0.0050	<0.050	<1.0	<1.0	<2.0	<10														
	35	6/16/2010	< 0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0050	<0.050	<1.0	<1.0	<2.0	<10														
	40	6/16/2010	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0050	<0.050	<1.0	<1.0	<2.0	<10														
	46	6/16/2010	< 0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0050	<0.050	<1.0	<1.0	<2.0	<10													<u> </u>	
	50	6/16/2010	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0050	<0.050	<1.0	<1.0	<2.0	<10													<u> </u>	
	5	6/16/2010	< 0.0050	< 0.0050	< 0.0050	<0.010	< 0.0050	<0.0050	<0.0050	< 0.050	<1.0	530	<2.0	40													<u> </u>	
	10	6/16/2010	0.021	< 0.0050	0.0081	< 0.010	0.024	< 0.0050	< 0.0050	0.17	<1.0	130	<2.0	<10													<u> </u>	
	15	6/16/2010	< 0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0050	0.13	<1.0	<1.0	<2.0	<10														
	20	6/16/2010	0.11	0.0093	0.5	0.058	0.011	<0.0050	<0.0050	<0.050	<1.0	9.8	<2.0	130													<b>—</b> —	
	25	6/16/2010	<0.0050	< 0.0050	0.031	< 0.010	< 0.0050	< 0.0050	< 0.0050	< 0.050	<1.0	<1.0	<20	<100														
SB-17	30	6/16/2010	< 0.0050	< 0.0050	< 0.0050	<0.010	< 0.0050	<0.0050	<0.0050	<0.050	<1.0	<1.0	<2.0	<10													<u> </u>	
	35	6/16/2010	< 0.0050	< 0.0050	< 0.0050	< 0.010	< 0.0050	< 0.0050	< 0.0050	< 0.050	<1.0	<1.0	<2.0	<10													<u> </u>	
	40	6/16/2010	< 0.0050	< 0.0050	< 0.0050	< 0.010	< 0.0050	< 0.0050	< 0.0050	< 0.050	<1.0	<1.0	<2.0	<10													<u> </u>	
	47	6/16/2010	0.088	< 0.050	0.49	< 0.10	< 0.050	< 0.050	< 0.050	< 0.50	<10	17	<2.0	<10														
	50	6/16/2010	< 0.0050	< 0.0050	< 0.0050	< 0.010	< 0.0050	< 0.0050	< 0.0050	< 0.050	<1.0	<1.0	<2.0	<10														
	7.5	6/15/2010	< 0.0050	< 0.0050	< 0.0050	< 0.010	< 0.0050	< 0.0050	< 0.0050	< 0.050	<1.0	<1.0	<200	<1000														
05.40	10	6/15/2010	<0.0050	< 0.050	0.081	<0.10	< 0.050	< 0.050	< 0.050	< 0.50	<10	2.6	<2.0	<10														
SB-18	15	6/15/2010	5	25	51	210	<0.25	<0.25	<0.25	<2.5	<50	<1.0	6.7	<10														
	20	6/15/2010	< 0.0050	< 0.0050	< 0.0050	<0.010	< 0.0050	< 0.0050	< 0.0050	< 0.050	<1.0	<1.0	<2.0	<10														
	7.5	6/15/2010	< 0.050	< 0.050	< 0.050	<0.10	<0.050	<0.050	<0.050	<0.50	<10	1.5	<2.0	<10														
05.40	10	6/15/2010	< 0.050	< 0.050	< 0.050	<0.10	< 0.050	<0.050	< 0.050	< 0.50	<10	1.6	<2.0	<10														
SB-19	15	6/15/2010	< 0.0050	< 0.0050	< 0.0050	<0.010	0.017	<0.0050	< 0.0050	<0.050	<1.0	<1.0	<2.0	39														
	20	6/15/2010	< 0.0050	< 0.0050	< 0.0050	<0.010	0.013	<0.0050	< 0.0050	<0.050	<1.0	<1.0	<2.0	11														
	5	8/17/2010	1.1	0.054	4.5	0.48	<0.0050	<0.0050	0.031	< 0.050	<1.0	210	31															
	10	8/17/2010	3	9.8	57	220	0.3	<2.5	<2.5	<25	<500	<1.0	2.7															
MW-1B	15	8/17/2010	<2.5	6.2	38	150	<2.5	<2.5	<2.5	<25	<500	270	110															
	20	8/17/2010	0.23	0.15	2.4	0.88	0.061	<0.010	<0.010	<0.10	<2.0	200	<200															
	25	8/17/2010	<0.0050	0.0085	0.012	0.056	<0.0050	<0.0050	<0.0050	<0.050	<1.0	<1.0	<2.0															
	5	8/16/2010	0.009	<0.0050	0.011	0.12	0.03	<0.0050	<0.0050	<0.050	<1.0	<1.0	<200															
	10	8/16/2010	< 0.0050	0.02	0.28	0.84	0.0085	<0.0050	<0.0050	<0.050	<1.0	54	<2.0															
MW-2B	15	8/16/2010	< 0.0050	<0.0050	0.32	0.69	0.25	<0.0050	< 0.0050	<0.050	<1.0	55	<200															
	20	8/16/2010	0.076	0.18	1.1	3.3	0.099	<0.025	<0.025	<0.25	<5	4.4	<1200					-										
	25	8/16/2010	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0050	<0.050	<1.0	<1.0	2															
	5	8/16/2010	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0050	<0.050	<1.0	<1.0	<20															
	10	8/16/2010	0.018	0.075	0.1	0.54	<0.0050	<0.0050	<0.0050	<0.050	<1.0	1.3	<20															
MW-3B	15	8/16/2010	<5	20	33	180	<5	<5	<5	<50	<1000	310	150															
	20	8/16/2010	<0.12	0.46	0.38	2	<0.12	<0.12	<0.12	<1.2	<25	<1.0	<20															
	25	8/16/2010	<0.0050	0.042	0.061	0.37	<0.0050	<0.0050	<0.0050	<0.050	<1.0	4.6	<2.0															
	5	8/13/2010	<0.0050	<0.0050	0.025	<0.010	<0.0050	<0.0050	<0.0050	<0.050	<1.0	<1.0	<20															
	10	8/13/2010	<0.025	<0.025	0.43	0.15	<0.025	<0.025	<0.025	<0.25	<5	15	27	<10														
MW-4B	15	8/13/2010	<0.50	0.89	41	170	<0.50	<0.50	<0.50	<5	100	840	15															
	20	8/13/2010	<0.50	<0.50	0.76	4.3	<0.50	<0.50	<0.50	<5	100	1.1	<2.0															
	25	8/13/2010	<0.12	<0.12	0.39	2.4	<0.12	<0.12	<0.12	<1.2	<25	150	4.4														<u> </u>	
	5	3/18/2013	1	0.32	12	1.1	<0.12	<1.2	<25	<0.12		760			<1.0	<1.0	4.3	4.3	1.5	2	2.2	11	14	7.3			<u> </u>	
MW-9A	5	3/18/2013	0.85	<0.12	10	8.2	<0.12	<1.2	<23	<0.12		720			<1.0	1.9	5	4.7	1.8	2.3	2.7	18	20	11			<u> </u>	
	8.5	3/18/2013	2	0.15	2.5	4.8	<0.10	<1.0	<21	<0.10		280			<1.0	1.4	2.6	2.9	1.4	1.8	2.4	11	6.2	3.2				
	14	3/18/2013	0.18	<0.0044	0.054	<0.0089	<0.0044	0.26	<0.89	<0.0044		1.6			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0				
# Table 4Historical Soil Analytical Data76 Service Station No. 1156 (351645)4276 MacArthur BoulevardOakland, California

Boring	Depth (ft)	Date	Benzene	Toluene	Ethyl- benzene	Total Xylenes	MTBE	EDB	EDC	ТВА	Ethanol	TPHg (8015M)	TPHd	TPHmo	TPH C8 - C9	TPH C10 - C11	TPH C12 - C14	TPH C15 - C16	TPH C17 - C18	TPH C19 - C20	TPH C21 - C22	TPH C23 - C28	TPH C29 - C32	TPH C33 - C36	TPH C37- C40	TPH C41- C43	ТРН С44+	TPH (Total)
	5	3/18/2013	0.013	<0.0050	0.1	0.026	<0.0050	<0.050	<0.99	< 0.0050		1.7			<1.0	<1.0	1.2	<1.0	<1.0	<1.0	<1.0	1.9	<1.0	<1.0				
	9	3/18/2013	<0.0050	<0.0050	<0.0050	<0.0099	<0.0050	<0.050	<0.99	< 0.0050		0.36			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0				
10100-90	14	3/18/2013	<0.0048	<0.0048	<0.0048	<0.0097	<0.0048	0.092	<0.97	<0.0048		<0.19			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0				
	19	3/18/2013	< 0.0043	<0.0043	<0.0043	<0.0086	<0.0043	<0.043	<0.86	< 0.0043		<0.17			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0				
	5	3/18/2013	0.22	<0.0045	0.03	<0.0090	0.013	<0.045	<0.90	<0.0045		59			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.5	<1.0	<1.0				
MW-10A	9	3/18/2013	1	0.093	0.21	0.68	0.018	<0.040	<0.81	<0.0040		41			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0				
	14	3/18/2013	<0.0044	0.42	<0.0044	<0.0089	0.018	<0.044	<0.89	<0.0044		100			<1.0	2.8	3.3	<1.0	<1.0	<1.0	<1.0	2.5	<1.0	<1.0				
	5	3/18/2013	0.35	<0.0043	6.4	8.1	<0.0043	<0.043	<0.86	<0.0043		480			<1.0	1.2	1.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0				
MW-10B	9	3/18/2013	1.3	0.034	0.34	4.4	<0.0040	<0.040	<0.79	<0.0040		60			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0				
	15	3/18/2013	1.7	0.029	0.053	0.13	0.0054	< 0.0043	<0.86	< 0.0043		2			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0				
	20	3/18/2013	<0.0043	< 0.0043	<0.0043	<0.0086	< 0.0043	<0.043	<0.86	< 0.0043		0.51			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0				
N/N/ 11 A	5	3/19/2013	1.6	0.38	34	59	<0.10	<1.0	<21	<0.10		680			<1.0	12	38	46	6.7	6.3	6.3	25	21	12				
IVIVV-TTA	9	3/19/2013	<b>6.5</b>	<b>29</b>	19	97 <0.0042	0.32	<0.99	<20	<0.099		1,200			<1.0	1.3	<b>2.6</b>	<b>3.5</b>	1.5	<b>2.2</b>	1.9	7.4	<b>3.5</b>	<1.0				
	2	6/12/2013	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-1.0	<1.0	-10		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-1.0	-10	-1.0	
	5	6/12/2014	<1.0	20	16	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10		<1.0	20	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10
MW-10S	7	6/12/2014	<1.0	<b>2.0</b>	-1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10		<1.0	<b>2.0</b>	-1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10
	8.5	6/12/2014	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10
	10	6/12/2014	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10
	5	3/19/2013	<0.0043	<0.0043	<0.0043	<0.0087	<0.0043	<0.043	<0.87	<0.0043		<0.17			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0				
	10	3/19/2013	0.3	0.0082	0.18	0.22	0.12	0.3	<0.84	< 0.0042		14			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0				
MW-11B	10	3/19/2013	0.22	0.007	0.16	0.22	0.1	0.28	<0.79	< 0.0040		31			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0				
	14	3/19/2013	0.89	0.13	0.17	0.71	0.19	0.59	<0.99	<0.0050		13			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0				
	19	3/19/2013	< 0.0043	< 0.0043	< 0.0043	<0.0087	7.9	<0.043	<0.87	< 0.0043		0.23			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0				
	2	6/11/2014	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	11	<1.0	<1.0	27		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	4.4	11	5.1	6.4	<1.0	<1.0	27
	4	6/11/2014	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	8	<1.0	<1.0	15		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	3.7	8	3.5	<1.0	<1.0	<1.0	15
MW-11S	6	6/11/2014	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	4.2	<1.0	<1.0	<10		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2.1	4.2	1.3	<1.0	<1.0	<1.0	<10
	8	6/11/2014	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10
	10	6/11/2014	<1.0	1.9	1.9	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10		<1.0	1.9	1.9	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10

#### NOTES:

All results in milligrams per kilogram (mg/kg)

-- = Not analyzed

<# = Analyte not detected at or above indicated laboratory practical quantitation limit</pre>

ft = Feet

ND = Not detected

TPH = Total petroleum hydrocarbons

TPHd = TPH as diesel

TPHg = TPH as gasoline

TPHmo = TPH as motor oil

MTBE = methyl t-butyl ether

EDB = 1,2-dibromoethane

EDC = 1,2-dichloroethane (1,2-DCA)

TBA = tert-butyl alcohol

## Table 5Potential Remedial Approaches76 Service Station No. 1156 (351645)4276 MacArthur BoulevardOakland, California

REMEDIAL ACTION	METHOD DESCRIPTION	SITE-SPECIFIC IMPLEMENTATION	PROTECTION OF HUMAN HEALTH AND ENVIRONMENT	DATA GAPS
Soil Excavation and Disposal	Physically removes impacted soil via excavation.	Remaining source material may be located beneath existing structures, which would limit the extent of excavation. Requires some dewatering because impacted soils appear to be below current water level. Expect a substantial disruption of current business. Requires transportation of excavated soils to an appropriate landfill.	Effectively removes source material within low permeability soils and limits potential groundwater impacts.	Permit for temporary treated water discharge would need to be obtained. Possible re-contamination if all impacted soil is not removed.
Multiphase Extraction (fixed system)	Groundwater is extracted with vacuum enhancement to expose impacted soil for SVE. Water extraction an be accomplished using high vacuums and/or active pumping.	Requires effective dewatering of submersed soils to expose soil containing contaminant. Vacuum enhanced dewatering radius of influence expected to be less than 10 feet based on aquifer test. Installation of extraction and treatment system is necessary in limited space. Air permit needed for treated vapors. Discharge permit needed for water disposal. Long-screened remedial wells (4 inches in diameter or greater) appropriate to MPE are not currently installed at the site.	Provides aggressive contaminant removal but can be limited by preferential pathways.	Vapor radius of influence is unknown. Vapor extraction flow rates are unknown. Clay soils expected to respond more slowly than other soil types. Limited space is available on-site to install a fixed system. Utilities would need to be extended to site. Permits for air and water discharge of treated materials would need to be obtained. Noise and odor may affect nearby businesses and residences. Onsite parking spaces will be taken up with remedial compound.
Multiphase Extraction (mobile events)	Groundwater is extracted with vacuum enhancement to expose impacted soil for SVE. Water extraction an be accomplished using high vacuums and/or active pumping.	Requires effective dewatering of submersed soils to expose soil containing contaminant. Dewatering radius of influence expected to be less than 10 feet based on aquifer test. Discharge permit needed for water disposal. Long-screened remedial wells (4 inches in diameter or greater) appropriate to MPE are not currently installed at the site.	Provides aggressive contaminant removal but can be limited by preferential pathways.	Vapor radius of influence is unknown. Vapor extraction flow rates are unknown. Clay soils expected to respond more slowly than other soil types and may make temporary events ineffective. Permit for treated water discharge needs to be obtained. Noise and odor may affect nearby businesses and residences.
Monitored Natural Attenuation (soil and groundwater)	Passive approach which monitors natural processes that degrade chemical constituents in soil and groundwater.	Historical groundwater concentration trends suggest natural attenuation already occurs at the site.	Concentrations of constituents of concern above Maximum Contaminant Levels are limited vertically and horizontally to the stabilized plume, but should eventually be reduced by natural degradation.	None - Natural attenuation parameters are monitored currently and a monitoring network is in place to observe any changes to site risks.

#### Table 6

#### Historical Groundwater Analytical Results - Monitored Natural Attenuation Parameters 76 Service Station No. 1156 (351645) 4276 MacArthur Boulevard Oakland, California

WELLID	DATE	METHANE				MANGANESE
	DATE	(mg/L)	(mg/L)	JULFATE		WANGANESE
M\A/ 4 D	1/16/2014	0.012	(iiig/L) 7.2	10		(µg/⊏) 120
	1/10/2014	0.013	1.2	19	ND<100	120
MW-2B	1/16/2014	0.0021	ND<0.44	7.9	ND<100	260
MW-3B	1/16/2014	12	ND<0.44	1.0	5,200	3,300
	7/22/2014	13	ND<0.44	1.8	5,900	3,300
	1/27/2015	11	ND<0.44	1.8	1,600	3,700
	7/21/2015	4.3	ND<0.44	ND<1.0	2,600	8.5
MW-4B	1/16/2014	0.0079	12	28	ND<100	70
MW-5	1/16/2014	0.0027	4.5	27	ND<100	5.2
MW-7	1/16/2014	0.081	ND<0.44	4.1	2,200	300
MW-9A	1/16/2014	2.5	ND<0.88	8.6	2,400	1,500
	7/22/2014	1.9	ND<0.88	ND<2.0	6,800	1,600
	1/27/2015	1.7	14	ND<1.0	6,200	1,400
	7/21/2015	0.91	ND<0.44	ND<1.0	6,000	1,300
MW-9B	1/16/2014	0.0017	4.7	18	ND<100	630
MW-10A	1/16/2014	1.7	ND<0.44	ND<1.0	5,800	1,100
	7/22/2014	2.8	ND<0.44	ND<1.0	7,200	1,200
	1/27/2015	2.0				
	7/21/2015	1.0	ND<0.44	ND<1.0	5,500	1,200
MW-10B	1/16/2014	0.63	ND<0.44	ND<1.0	7,300	5,400
	7/22/2014	0.064	ND<0.44	ND<1.0	4,200	5.000
	1/27/2015	0.67	ND<0.44	ND<1.0	6.400	5.000
	7/21/2015	0.20	ND<0.44	ND<1.0	5,300	1,100
MW-10S	1/27/2015	0.25	ND<0.44	72	700	1 200
	7/21/2015	0.50	ND<0.44	51	2,400	1,600
	4 14 0 10 0 4 4				7 000	0 700
WW-11A	1/16/2014	2.3	ND<0.44	ND<1.0	7,900	3,700
	7/22/2014	4.6	ND<0.44	ND<1.0	6,100	4,600
	1/27/2015	3.9	ND<0.44	ND<1.0	7,000	4,100
	7/21/2015	2.7	ND<0.44	ND<1.0	8,400	1,500
MW-11B	1/16/2014	0.31	ND<0.44	5.2	6,600	1,100
	7/22/2014	0.48	ND<0.44	ND<1.0	2,700	1,600
	1/27/2015	0.68	ND<0.44	ND<1.0	8,800	1,500
	7/21/2015	0.48	ND<0.44	ND<1.0	3,100	1,800
MW-11S	7/22/2014	0.50	ND<0.44	30	1,900	1,800
	1/27/2015	0.30	ND<0.44	22	690	1,200
	7/21/2015	0.65	ND<0.44	ND<1.0	5,200	1,700

#### NOTES:

µg/L = Micrograms per liter

-- = Not sampled

ID = Identification

mg/L = Milligrams per liter

ND<# = Analyte not detected at or above indicated practical quantitation limit

## Appendix A

## Agency Correspondence

ALAMEDA COUNTY HEALTH CARE SERVICES AGENCY

ALEX BRISCOE, Director



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

August 3, 2015

Nicole Arceneaux Ed Ralston Chevron Environmental Management Company Phillips 66 Company 6101 Bollinger Canyon Road 76 Broadway San Ramon, CA 94583 Sacramento, CA 95818 (Sent via E-mail to: nicole.arceneaux@Chevron.com)

(Sent via E-mail to: Ed.C.Ralston@p66.com)

Rajan Goswamy 4276 MacArthur Boulevard Oakland, CA 94619 (Sent via E-mail to: rajgoswamy@sbcglobal.net)

Carole Quick and Lorraine Mudget 10214 SW Stuart Court Portland, OR 97224-4304

Subject: Case File Review for Fuel Leak Case No. RO0000409 and GeoTracker Global ID T0600102279, Unocal #1156, 4276 MacArthur Boulevard, Oakland, CA 94619

Dear Ms. Arceneaux, Mr. Ralston, Ms. Quick, Ms. Mudget, and Mr. Goswamy:

Alameda County Environmental Health (ACEH) staff has reviewed the fuel leak case file for the abovereferenced site, including the document entitled, "Aquifer Test Report," dated July 14, 2015 (Report). The Report, which was prepared on behalf of Chevron Environmental Management Company by ACECOM, presents results from aquifer testing. The results of the aquifer testing indicated that dewatering of the smear zone may be feasible. Based on these results, the Report concluded that more data are needed to develop an effective remedial approach and recommended preparation of a feasibility study. The feasibility study would be expected to identify any data gaps related to feasible remedial technologies. We have no objection to the preparation of a feasibility study and request that you submit a Feasibility Study no later than October 8, 2015. Groundwater monitoring is to be continued on a semiannual basis; please present the results in the reports requested below.

#### TECHNICAL REPORT REQUEST

Please upload technical reports to the ACEH ftp site (Attention: Jerry Wickham), and to the State Water Resources Control Board's GeoTracker website according to the following schedule and file-naming convention:

- October 8, 2015 Feasibility Study Report File to be named: SWI\_R\_yyyy-mm-dd RO409
- October 12, 2015 Semi-Annual Groundwater Monitoring Report File to be named: GWM\_R\_yyyy-mm-dd RO409

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

Responsible Parties RO0000409 August 3, 2015 Page 2

If you have any questions, please call me at (510) 567-6791 or send me an electronic mail message at <u>jerry.wickham@acgov.org</u>. Online case files are available for review at the following website: <u>http://www.acgov.org/aceh/index.htm</u>. If your email address does not appear on the cover page of this notification, ACEH is requesting you provide your email address so that we can correspond with you quickly and efficiently regarding your case.

Sincerely,

Jerry Wickham, California PG 3766, CEG 1177, and CHG 297 Senior Hazardous Materials Specialist

Attachment: Responsible Party(ies) Legal Requirements/Obligations

Enclosure: ACEH Electronic Report Upload (ftp) Instructions

cc: Maureen Dorsey, Oakland Veterinary Clinic, 4258 MacArthur Boulevard, Oakland, CA 94619

Chad Roper, AECOM, 1220 Avenida Acaso, Camarillo, CA 93012 (Sent via E-mail to: <u>chad.roper@aecom.com</u>)

Perry Pineda, Shell Oil Products US, 20945 S. Wilmington Ave., Carson, CA 90810-1039 (Sent via (Sent via E-mail to: perry.pineda@shell.com)

Peter Schaefer, Conestoga-Rovers & Associates, 5900 Hollis Street, Suite A Emeryville, CA 94608 (*Sent via E-mail to: <u>pschaefer@craworld.com</u>)* 

Jerry Wickham, ACEH (Sent via E-mail to: jerry.wickham@acgov.org) GeoTracker, e-File

#### Responsible Party(ies) Legal Requirements / Obligations

#### REPORT REQUESTS

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

#### ELECTRONIC SUBMITTAL OF REPORTS

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

#### PERJURY STATEMENT

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

#### PROFESSIONAL CERTIFICATION & CONCLUSIONS/RECOMMENDATIONS

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

#### UNDERGROUND STORAGE TANK CLEANUP FUND

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

#### AGENCY OVERSIGHT

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

Alemeda County Environmental Cleanum	REVISION DATE: May 15, 2014
Alameda County Environmental Cleanup	ISSUE DATE: July 5, 2005
(LOP and SLIC)	PREVIOUS REVISIONS: October 31, 2005; December 16, 2005; March 27, 2009; July 8, 2010, July 25, 2010
SECTION: Miscellaneous Administrative Topics & Procedures	SUBJECT: Electronic Report Upload (ftp) Instructions

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

### REQUIREMENTS

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

RO#\_Report Name\_Year-Month-Date (e.g., RO#5555\_WorkPlan\_2005-06-14)

#### **Submission Instructions**

- 1) Obtain User Name and Password
  - a) Contact the Alameda County Environmental Health Department to obtain a User Name and Password to upload files to the ftp site.
    - i) Send an e-mail to <u>deh.loptoxic@acgov.org</u>
  - b) In the subject line of your request, be sure to include "ftp PASSWORD REQUEST" and in the body of your request, include the Contact Information, Site Addresses, and the Case Numbers (RO# available in Geotracker) you will be posting for.
- 2) Upload Files to the ftp Site
  - a) Using Internet Explorer (IE4+), go to <a href="http://alcoftp1.acgov.org">http://alcoftp1.acgov.org</a>
    - (i) Note: Netscape, Safari, and Firefox browsers will not open the FTP site as they are NOT being supported at this time.
  - b) Click on Page located on the Command bar on upper right side of window, and then scroll down to Open FTP Site in Windows Explorer.
  - c) Enter your User Name and Password. (Note: Both are Case Sensitive.)
  - d) Open "My Computer" on your computer and navigate to the file(s) you wish to upload to the ftp site.
  - e) With both "My Computer" and the ftp site open in separate windows, drag and drop the file(s) from "My Computer" to the ftp window.
- 3) Send E-mail Notifications to the Environmental Cleanup Oversight Programs
  - a) Send email to <u>deh.loptoxic@acgov.org</u> notify us that you have placed a report on our ftp site.
  - b) Copy your Caseworker on the e-mail. Your Caseworker's e-mail address is the entire first name then a period and entire last name @acgov.org. (e.g., firstname.lastname@acgov.org)
  - c) The subject line of the e-mail must start with the RO# followed by **Report Upload**. (e.g., Subject: RO1234 Report Upload) If site is a new case without an RO#, use the street address instead.
  - d) If your document meets the above requirements and you follow the submission instructions, you will receive a notification by email indicating that your document was successfully uploaded to the ftp site.

## Appendix B

### **Proposed Convenience Store Expansion Plans**







Appendix C

**Soil Boring Logs** 



	Project No: C101156 Logged By: Alan Buehler					nt: ation:	COP Oakland	Boring/Well No: MW-1B Page 1 of 2				
	_	Driller:		Gregg Dril	ling	Dat	e Drilleo	l: 8/17/2010	······			
Delt	a	Drilling	Method:	HAS		Hole	e Diame	ter: 8"				
		Samplin	ng Methoo	l: Cala do	Split Spoon		e Depth	: 25'				
Consultar	nts	Casing	Type:	Sch 40		Wei	I Diame	ter: 2"				
		Gravel	e. Pack:	2/12		T Firs	t Water	Denth:				
			2011	<b>D</b> / <b>ZL</b>	∑ Sta	tic Wate	r Depth:					
		Elevatio	n;		Northing	);		Easting:	1			
Completion Casing Casing Casing	Water Level	Moisture Content	PID Reading (ppm)	Sample Identification	Depth (feet)	Recovery Interval	Soil Type	LITHOLOGY / DESCRIPTION				
							┨────	Airknife to 5'				
+							1	Brown and gravish	-sgrren clay			
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					2							
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·····					3	├	4					
							4					
					4		]					
					5_	Star Street						
			299	MW-1B			CL	Greenish-gray san	dy lean clay with gravel, 15%			
20 <sup>-10</sup> /10 100				-5	6			sand, 15%, grave	i, strong odor, damp			
******						1996						
					7		1					
					8		]					
					- <sup>-</sup>	ļ ļ	4					
					9—	<b> </b>	4					
_							-					
			173	MW-1B	10		CL	Black lean clay wit	th sand, mottled with granular			
				-10				black organic mat	erial, 20% sand, strong odor,			
					· · · · · · · · · · · · · · · · · · ·			moist				
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					13 —	+ + -	4					
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			052		15	10000		Descus				
			70Z	1 -1 5				prown sandy clay,	, mie-course sand, 35% sand,			
				10	16			ationg outry damp				
					17_	Pandol.	]					
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					18	<b> </b>	4					
							4					
					19		1	1. J. A. 1. J. M. A. 1. M. A. 1. M.				
							1					
			19	MW-1B	20		CL	Black sandy lean o	clay with gravel, 30% sand, 10			
				-20	21		<u> </u>	gravel, strong odd	or, wet			
							CL	Brn lean clay with	sand, 25% sand, some odor,			
					22 —		-	luamp				
1		1_		L		II	l					

		Project	No:	C101156			Clien	t:	COP	Boring/Well No: MW-1B
		Logged	l By:	Alan Buehl	er		Loca	tion:	Oakland	Page 2 of 2
		Driller:		Gregg Dril	ling		Date	Drilled	l: 8/17/2010	
Den	La I	Drilling	Method:	HAS			Hole	Diame	ter: 8"	
·		Sampli	ng Metho _	d:	Split Spo	on	Hole	Depth	25'	
Environme	ental	Casing	Туре:	Sch 40			Well	Diame	ter: 2"	
Consulta	nts,	SIDE SIZ	ze: Pack	0.02		T	Well	Depth	Donthy 22 El	
Inc.		Glaver	POCK;	2/12		$\overline{\nabla}$	Ctati	water c Mato	r Depth; 23.5	
		Elevatio	on:		Northing	<u></u> :	3.00		Easting:	-
Well	53		<u>م</u>	60	Ω	6.24	nnia		· ·	
Completion	-eve	ure ent	⊆ gin	atio /6")	feet	5ai >	npie	/pe		
kfill ing	G	oist	ppr.	etra	÷	ver	PZ	1	LITH	OLOGY / DESCRIPTION
Bac	Wat	ΣŨ	Ę,	Pen (bl	Cep	e Co	Ite	Š		
						~~~~	<u> </u>			
					23			CL	Brown sandy gray	ely clay 25% sand 10% grave
	▼ I							CC	saturated, mild oc	lor
				ł	24 —			CI	Brown sandy clay	15% samp, mild odor, damp
	•		44	MW-1B				~-		
				-25	25-		10,077h17		Total Depth	= 25'
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			·		44 —					
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Delta	Project No Logged By Driller: Drilling Me	p: C1 γ: Ali Gr etbod: H4	101156 Ian Buehl regg Drill AS	er Ing	Clien Loca Date Hole	it: tion: Drillec Diame	COP Oakland 1: 8/16/2010 ter: 8"	Boring/Well No: <b>MW-2B</b> Page 1 of 2
Consultants	Sampling I Casing Typ Slot Size: Gravel Pac	Method: S pe: Sc 0.1 ck: 2/	d: Split Spoon Sch 40 0.02 2/12		Hole Well Well First Stati	Depth Diame Depth: Water c Wate	25' ter: 2" 25' Depth; r Depth;	
Mell Completion Mater Level	Moisture Content Content	ID Reading (ppm)	Sample dentification	)epth (feet)	Sample Sample	Soil Type	Easting:	OLOGY / DESCRIPTION
			Ă	1		CL	Airknife to 5' Brown and greenis	h lean clay with sand
		1.9.1 M		3				
		181   M	-5	6 		CL	15% sand, strong o	mottled lean clay with sand, odor, damp
		0 M	1W-2B	9 		СН	Greenish fat clay, c	dense, damp, odor
				11 12 13 13				
	1	120 M	IW-2B -15	14 15 16		CL	Green lean clay wil damp, odor	h sand, 15% med-course sand,
				17 18				
		8 M'	W-2B -20	19 20 21		CL	Dark borwn lean cl med sand, damp, c	ay with sand, 15% sand, fine- odor
- Marillon V				22				

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		Project	No: C101156		Clien	t:	COP	Boring/Well No: MW-2B		
		Logged	By: Alan Buehle	r	Local	tion:	Oakland	Page 2 of 2		
	Dalta	Driller:	Gregg Drilli	ng	Date	Drillec	l: 8/16/2010			
	Deita	Drilling	Method: HAS		Hole	Diame	ter: 8"			
	Environmental	Samplin	ig Method: Split S	0000	Hole	Depth	: 25'			
	Consultants	Slot Size	e: 0.02		Weil	Denth	25'			
	Inc.	Gravel P	Pack: 2/12	¥	First	Water	Depth: 23.5'			
				$\nabla$	Stati	c Wate	r Depth:			
	Well	Elevatio	n:	Northing:	<u> </u>		Easting:			
	Completion	. يو ه	eni no (	୍କି Sa	mple	ð				
		tter	pm) trat vs/6	ery (fe		Ţ	LITH	OLOGY / DESCRIPTION		
	ackf asir /ate	U Moi	blovene (p R	cov epti	ter	Soil				
				A A	퉈					
	a we i bit share			23						
					22226	CI	Brown lean clay Wi	th sand, 25% sand, some gravel,		
				24 —			Black/brown mottle	ed clav, damp, mild odor		
			190 MW-2B	T						
			-25	25			Total Depth =	= 25'		
				26						
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Delt	ta	Project No: C101156 Logged By: Alan Buehler Driller: Gregg Drilling Drilling Method: HAS Sampling Method: Split Spoon Casing Type: Sch 40 Slot Size: 0.02 Gravel Pack: 2/12 Elevation: Northir					Client Ocati Date ( Hole ( Hole ( Vell ( Vell ( First V Static	; on; Diame Depth: Diame Diame Diame Vater Water Wate	COP Bor Oakland Pag : 8/16/2010 :er: 8" 25' :er: 2" 25' Depth: r Depth: Easting:	ring/Well No: <b>MW-3B</b> ge 1 of 2
Well Completion Saing Casing Casing Casing	Water Level	Moisture Content	PID Reading (ppm)	Sample Identification	Depth (feet)	Sam Kecovery	Interval a	Soil Type	LITHOL	OGY / DESCRIPTION
			6	MW-3B -5	- 1 - 2 - - 3 - - - - - - - - - - - - - - -			CL	Airknife to 5' Brown lean clay with Light brown/greenish odor	sand, some gravel, no odor mottled clay, moist, slight
			36	MW-3B -10	10			СН	Light brown/green/bl sand, 15% fine sand,	ack mottled lean clay with damp, mild odor
			790	MW-3B -15	15 — 16 — 17 — 18 — 19 —			CL	Light brown/green m 20% fine-med sand,	ottled lean clay with sand, damp, strong odor
 			9	MW-3B -20	20 — 21 — 22 —			CH CL	Light brown fat clay, Dark brown lean clay damp, mild odor	damp, mild odor with sand, 15% fine sand,

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Delta Environmental Consultants, Inc.	Project Logged Driller: Drilling Samplin Casing Slot Siz Gravel Elevatio	No: By: Methong Methon Type: ze: Pack:	C101156 Alan Buehle Gregg Drilli HAS thod: Sch 40 0,02 2/12	er ng Split Spo Northing	C Lu D H H Soon H W W ¥ Fi ∑ S	lient: ocation: ate Drille ole Diame ole Depth /ell Diame /ell Depth irst Water tatic Wate	COP Oakland d: 8/16/2010 eter: 8" 1: 25' eter: 2" 1: 25' Depth: 23.5' er Depth: Easting:	Boring/Well No: <b>MW-3B</b> Page 2 of 2
Backfill Casing unpelduo Water Level	Moisture Content	PID Reading (ppm)	Penetration (blows/6")	Depth (feet)	Samp Gecovery	Interval a	LITH	HOLOGY / DESCRIPTION
		15	MW-3B -25	23			Light brown lean of sand, moist, very Total Depth	lay with sand, 30% fine-med slight odor = 25'

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Project No.: 2235 Boring: B4/MW4 Plate: APPENDIX Site: Tosco 76 Service Station 1156 Date: 7/16/99 ENVIRONMENTAL RESOLUTIONS Drill Contractor: Woodward Drilling Sample Method: Split Spoon .Geologist: Ct A Drill Rig: B57 \_Bore Hole Diameter: <u>6"</u>Signature Location: 18 Feet North of Southernmost Dispenser R.G Registration Logged by: Dylan Crouse Island Parallel High Street 210 (220) COLUM DESIGN **NELD** GEOLOGIC DESCRIPTION 15CE SER 4¥8) 4<u>1/2</u> asphalt Clay, greenish gray, mottled, orange slightly damp, high plasticity 17 309 -5-Portland 22 253 -10-Т CH Grout: trace of medium-grained sand, slightly moist 7 /12 19 -15-4 moist 2 Size: Sand 28 -20 4 brownish yellow, black staining, 20% gravel, 20% medium-grained sand, moist Т 010 <u>.</u> brown, mottled, olive yellow, moist, black staining 36 0 -25-Slze: ÷ Total depth at 26.5 feet. Groundwater encountered at 23.6 feet. Slot 3 **Diameter:** Casing

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			Project	No:	C101156	lor	Clie	nt: ation:	COP	Boring/Well No: MW-48			
			Driller:	Бу,	Gread Dril	lina	Dat	e Drilled	: 8/13/2010				
ID	٥H		Drilling	Method:	HAS		Hole	e Diame	ter: 8"				
		LU	Sampli	ng Method	I: Split Spo	on	Hol	Depth:	25'				
Con	sulta	nts	Casing	Туре:	Sch 40		Wel	l Diame	ter: 2"				
			Slot Siz	ze:	0.02		We	Depth:	25'				
			Gravel	Pack:	2/12		J. Firs	t Water	Depth:				
			Elevatio	on:		Northing	<u>v</u> 566	ic wate	Easting:				
We	ation	1		6	Ę	Ω.	Comple						
Comple	enon	Leve	ent	adin (n	ple cati	(fee	Sample	ype					
kfill sing	n	ter	oist	(ppr	Sam	сц.	ver erva	oil T		OLOGY / DESCRIPTION			
C as		Wa	ΣU	OId	Ider	Del	lnte	Ň					
									Airknife to 5'				
l						-		GC	Brown clavey grav	el with sand,			
						1							
						2							
						3							
								1					
						4		GW	Well graded grave	l with sand, cobbles up to 4"			
					]	5—							
				2.1	MW-4B			SW-	Greenish gray well	graded sand with silt and			
					-5	6			graver, 60% sariu,				
						<u> </u>	5976594						
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						8		4					
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				1401	MW-4B	<b>–</b>		SW-	Black well graded	sand with silt, 60% fine sand,			
					10	11		519	strong odor				
								4					
						<sup>1</sup> 2 —		]					
						13		4					
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						14		1					
						15		1					
				19.5	MW-4B	- 11		CL	Brown/green mott	led lean clay with sand, 15% fine			
					-15	16 —			sana, some odor				
		[				1/		]					
						18							
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						19		-	A 1 10 A 101 10 A 10 A 10 A 10 A 10 A 1				
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					MW-4B	20		CL	Brown/black mottl	led sandy lean clay, 30% fine-			
					-20	21 —			med sand, some c	odor			
	s												
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	Logg	ed By:	Alan Buehle	er		L.oca	tion:	Oakland Page 2 of 2
	Drille	er:	Gregg Drilli	ng		Date	Drilled	d: 8/16/2010
Deita	<b>D</b> rilli	ng Meth	(HAS			Hole	Diame	eter: 8"
	Sam	pling Me	thod:	Split Spo	on	Hole	Depth	ו: 25'
Environmen	t <b>al</b> Casi	пд Туре	Sch 40			Well	Diame	eter: 2"
Consultant	, Slot	Size:	0.02		_	Well	Depth	1: 25'
Inc.	Grav	el Pack:	2/12		<b>_</b>	First	Water	r Depth: 23.5'
	Flow	ation		Northing	<u></u>	Stat	ic Wate	er Depth:
Well			<u> </u>		·			Lasung.
Completion	a e t	i in	6")	eet	San	nple	be	
1 E 2 .	istu r	bm (ea	stra ws/	ц Т	еŊ	val	Ţ	LITHOLOGY / DESCRIPTION
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	•			23				
				24		oficial Maria		
		10	MW-4B	-			CI	Brown loop clay, 10% fine-med sand, some odor
12.117.07 Name		1.5	-25	25 —	266296	202052	CL.	Total Denth = $25'$
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Project No.: 2235 Boring: <u>MW5</u> Plate: <u>Attachment</u> Site: Tosco 76 Service Station 1156 \_Date: <u>8/29/01</u> RESOLUTIONS. Drill Contractor: Woodward Drilling Company, Inc. Sample Method: Split Spoon Geologist: JOHN B. BOBBITT Drill Rig: <u>BK-81</u> Bore Hole Diameter: \_ 8"\_Signature:\_ 61 Location: <u>Eastern side of MacArthur Boulevard</u> R.G. 4313 Registration Logged by: Rob Saur approximately 40 feet north of site PID STA COLUM C.S. DEALLY ALCONT !! DESIG JEC -(E) GEOLOGIC DESCRIPTION 6" Concrete Portland Cement 5 CLAY WITH SAND AND TRACE OF GRAVEL: greenish gray, moist, high plasticity, fine-grained sand, fine-grained poorly-sorted subangular gravel. 8.3⊉ 23 CL -10 SANDY CLAY: orange brown, moist, low plasticity, 27 7.7 Grout: fine-grained sand. ដ -15 SANDY SILT: orange brown, moist, low plasticity, 57 11.2 fine-grained sand. Size: ML 20-30 Sand 0.020 light brown, wet. 38 7.7 -25 Boring Terminated at 25 feet. Size: Boring converted to groundwater monitoring well. Groundwater encountered at 6 feet. b 0 5 N Diameter: Casing



Project No.: 2235 Boring: MW7 Plate: Attachment Site: Tosco 76 Service Station 1156 RESOLUTIONS, Drill Contractor: Woodward Drilling Company, Inc. Sample Method: Split Spoon Geologist: JOHN B. BOBBITT Drill Rig: <u>BK-81</u> Bore Hole Diameter: <u>8"</u> Signature: 16/11hut Location: Western side of MacArthur Boulevard Registration: R.G. 4313 Logged by: Rob Saur approx. 40 feet north of High Street 200 (apro) COLUM -DEP GEOLOGIC DESCRIPTION 6" Concrete Cemen 150 5" SANDY SILT: brown with bluish green mottling, moist, low plasticity, 40% fine-grained sand. 5 25 Portland -10-Grout: 36 236 ML -15 £3 35 8.9 light brown, wet. Size: 20 Sand 25 57 0.020 50 5" reddish brown, 30% medium-grained sand. 19.3 25 Boring terminated at 25 feet. Size: Boring converted to groundwater monitoring well. Groundwater encountered at 15 feet. Slot "N Diameter: Casing 22368007

				Project	No: C10	1156151		С	lient: Cor	ocoPh	illips		Well No: MW-8
[				Logged	By: Tab	bitha Cro	γ	L	ocation: 4	276 M	acArthur Bouleva	rđ	Date Drilled: <b>10/30/07</b>
				Driller:	Gregg D	orilling &	Testing		. 0	akland	I. CA		Page 1 of 2
	٦,		ta	Drilling	Method:	HSA	5	н	ole Diame	eter: 8'	•		
			LU	Samplin	a Metho	d: Split S	Spoon	Hole Depth: 25'					First Water
l c	lor	sulta	ants	Casing	Type: Sc	hedule 4	O PVC	W	ell Diame	ter: 2"	•		
		io une		Slot Siz	e: <b>0.01</b> 0	)"		Ŵ	/ell Depth	: 25'		▼ ==	Static Groundwater
				Gravel F	Pack: #2	2/12		F	irst Water	Depth	: 23'	-	
					Elevatio	n	Northing			I	Easting	* =	Selected for lab
										-		analysis	
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Cor	npi	etion	Static	nte Lite	din (	atic	lee.	Samt	be ed				
E	p	1	Water	nte	Sea pr	L D D	4	e -	रू 🚰 LITHO		LOGY /	DESCRIPTION	
äck	asi		Level	မှိပိ	ē	Sa	ebt	8	Soi te				
ά.	0				E.	PI		Re	드				
		Well B	ox								Concrete = 6	78	
										<u>IC</u>	Silty clay; bla	ck and b	prown; medium soft;
	1										medium to hig	h plastic	ity; low toughness;
						fe					trace orange n	nottling;	moist; (0,0,100)
						Ū.	2-						
						1 È	2						
		Neat C	Cement			Ρ							
							4						
							5—						
				moist	0.1	@ 5	- I				Lean clay; bl	ack; med	dium stiff; medium
						9:46	6—	10000000			plasticity and	toughnes	ss; some fine sand;
							-		▼		some fine to n	nedium s	sub round gravel;
							7—	$\downarrow$			moist; no odo	r; (15,20	),65)
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				moist	0.2	 	10				Tan: some or	ange mot	ttling: trace roots
				moise	0.2	Q·51	-		+-12		some black st	ainina' s	light odor: (5 15 80)
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				moist	0.2	@ 15*	15		A Real	CL	Sandy clay:	tan: orai	nge mottling: trace
I						9:56	-				roots: trace b	lack stair	ning: medium stiff:
					1		16-				medium plast	icity and	toughness; sand fine
											grain; moist;	no odor;	(0,40,60)
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							18						
							10						
I				moist	0.2	@ 20*	19				Soft; medium	to high	plasticity; low
1					l	10:P37	י 1				toughness; (C	,30,70)	
1							20-		<b>+</b>				
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		Project	No: C10	1156151			Clien	t: Con	ocoPh	illips		Well No: MW-8
		Logged	By: Tab	bitha Cro	y		Loca	tion: 4	276 M	acArthur Bouleva	rđ	Date Drilled: 10/30/07
		Driller:	Gregg D	rilling &	Testing			08	akland	i, CA		Page 2 of 2
		Drilling	Method:	HSA	_	Hole Diameter: 8"						
	LU	Samplin	a Metho	d: Split S	ippon Hole Depth: 25'							First Water
Consulta	ints	Casing	Type: Sc	hdule 40	PVC		Well	Diame	ter: 2'	•		
001100110		Slot Siz	e: <b>0.010</b>	n		Well Depth: 25'						Static Groundwater
		Gravel I	Pack: <b>#2</b>			First	Water	Depth	: 23'			
			Elevatio	n	Northing					Easting * = Selected for		
												analysis
Well			6	ц	<u>ت</u>			-				
Completion	Static	ure int	din (	atio	fee	Sar	npie	be /pe				
li l	Water	istu	Rea	Life D		l é	La l	Ê		LITHO	DLOGY /	DESCRIPTION
ack asi	Level	နိုပ်	а Э	Salent	ept	l õ	Iter	Soi				
ы С В			4	Id		Re	5					
	$\nabla$				23							
					2.5							
					24		<b>▲</b>		SC	Clayey sand;	tan; ora	nge mottling; medium
					-					grain; poorly	graded; lo	pose; wet; no odor
					25		<b>↓</b>			(0,65,35)		
						1	<b>İ</b>					
					26		<b> </b>	1				
					1		<b> </b>	ļ		Total Depth	= 25 fee	t bgs
					27	<u> </u>		1				
						<b>_</b>	<b> </b>	1				
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ConsultantsThe Depth: 33 $V = First WaterCompletionNorthingV = First WaterCompletionNorthingLawerV = First WaterWell Depth: MV = First WaterWell Depth: MV = First WaterStaticV = First WaterStaticV = First WaterV = First WaterV = First WaterStaticV = First WaterV = First Water$	$\boldsymbol{\nu}$	191	la	Drilling	Method:	HSA		Hole							
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Solution       Solution <td< td=""><td>e</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>• • • • • •</td><td>no plasticity; high</td><td>toughness</td><td>soft: moist: (45,5,50)</td></td<>	e									• • • • • •	no plasticity; high	toughness	soft: moist: (45,5,50)		
Solution       Solution       Prilestone clay: brown; gravel medium to coarse; sub rounded; some fine sand; moist         wet       6.2       6       0         wet       6.2       6       0         wet       326       0       7       0         wet       105       0       8.42       0         wet       105       0       8.42       0         wet       140       0       12       0         wet       140       0       12       0         wet       13       0       15       0         wet       14       0       0       0         wet       13       0       15       0         wet       14       0       0       0       0         wet       14       0       0       0       0       0         wet       14       0       0       0       0       0       0         wet       14       0	E					<u>.</u>				(···-··	·····		(.0,0,0,0)		
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wet       6.2       6       4       and clay; (90.5; 5)         wet       326       7       7       4       and clay; (90.5; 5)         wet       326       7       7       4       and clay; olve green; some fine to medium sand;         wet       165       8.39       9       5       Some orange mettiling; medium of plasticity and toughness; wet; strong odor         wet       165       8.42       9       5       Some black specs         wet       221       0       10       4       Some black and red staining         wet       140       8:48       11       Some black and red staining         wet       140       12*       12       Some black and red staining         wet       140       13.5       14       Some black and red staining         wet       118       9.13.5       14       Some black and red staining         wet       133       9.15       14       Red brown with orange and olive green mottling; medium stiff; (0,50,50)         wet       1056       18.5*       19       Some black specs; medium stiff; (0,50,50)         wet       148       0.20       20       4       Stiff; trace medium gravel; sand medium gran; (5,35,60)         wet <td></td> <td></td> <td>× ×</td> <td></td> <td></td> <td></td> <td>4</td> <td></td> <td></td> <td><b>.</b></td> <td></td> <td></td> <td></td>			× ×				4			<b>.</b>					
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Wet         6.2           wet         326         0.7*           wet         326         0.7*           wet         165         0.8.5           9         1           wet         221         0.10           8:42         9         10           wet         221         0.10         10           wet         140         0.12*         12           wet         140         0.12*         12           wet         13.3         14         14           wet         13.3         14         14           wet         13.3         14         15           wet         13.3         15         14           wet         13.3         15           16         17         16           wet         13.8         15           16         16         16           wet         13.4         17           17         16         16           wet         1056         18.5*           19         10         10           1056         18.5*         19           1056         18.5*         <		<b>M</b>		Ι.			5				and clay; (90,5,5)				
wet       326       @ 7*       7       •       •       CL       Lean clay; olive green; some fine to medium sand;         wet       165       @ 8.5       8.42       9       •       •       some orange mottling; medium stiff; medium plastoty and toughness; wet; strong odor         wet       165       @ 8.5       8.42       9       •       Some black specs         wet       221       @ 10       •       •       Some black specs         wet       140       @ 12*       12       •       Sand fine to medium grain (0,40,60)         wet       118       @ 13.5       14       •       medium grain; soft; losse; wet; strong odor         wet       133       @ 15       •       •       •         wet       133       @ 15       •       •       •         wet       133       @ 15       •       •       •         wet       133       @ 17       •       •       •       •         wet       1056       @ 18.5*       •       •       •       •         wet       148       @ 20       •       •       •       •       •         wet       148       @ 20       •       <				wet	6.2		-								
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wet140 $(12)^{*}$ $(2)^{*}$ $(3)^{*}$ Sand fine to medium grain (0,40,60)wet14 $(3)^{*}$ $(3)^{*}$ $(3)^{*}$ $(3)^{*}$ $(3)^{*}$ $(3)^{*}$ wet118 $(2)^{*}$ $(3)^{*}$ $(3)^{*}$ $(3)^{*}$ $(3)^{*}$ $(3)^{*}$ wet118 $(2)^{*}$ $(3)^{*}$ $(3)^{*}$ $(3)^{*}$ $(3)^{*}$ $(3)^{*}$ wet133 $(2)^{*}$ $(3)^{*}$ $(3)^{*}$ $(3)^{*}$ $(3)^{*}$ $(3)^{*}$ wet133 $(2)^{*}$ $(3)^{*}$ $(3)^{*}$ $(3)^{*}$ $(3)^{*}$ $(3)^{*}$ wet133 $(2)^{*}$ $(3)^{*}$ $(3)^{*}$ $(3)^{*}$ $(3)^{*}$ $(3)^{*}$ wet149 $(2)^{*}$ $(3)^{*}$ $(3)^{*}$ $(3)^{*}$ $(3)^{*}$ $(3)^{*}$ wet1056 $(3)^{*}$ $(3)^{*}$ $(3)^{*}$ $(3)^{*}$ $(3)^{*}$ $(3)^{*}$ $(3)^{*}$ wet148 $(2)^{*}$ $(2)^{*}$ $(3)^{*}$ $(3)^{*}$ $(3)^{*}$ $(3)^{*}$ $(3)^{*}$ wet148 $(2)^{*}$ $(2)^{*}$ $(3)^{*}$ $(3)^{*}$ $(3)^{*}$ $(3)^{*}$ $(3)^{*}$ wet152 $(2)^{*}$ $(2)^{*}$ $(3)^{*}$ $(3)^{*}$ $(3)^{*}$ $(3)^{*}$ wet152 $(2)^{*}$ $(2)^{*}$ $(3)^{*}$ $(3)^{*}$ $(3)^{*}$ $(3)^{*}$ wet152 $(2)^{*}$ $(2)^{*}$ $(3)^{*}$ $(3)^{*}$ $(3)^{*}$ $(3)^{*}$ wet <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td>- 1</td><td></td><td></td><td></td><td></td><td></td><td></td></t<>							- 1								
Wet140(a) 12* $8:48$ 3SCPoorly graded sand with clay; brown; some olive green mottling and gray staining; sand fine to medium grain; soft; loose; wet; strong odor $(0,70,30)$ Wet118(a) 13.514Image: soft; loose; wet; strong odor $(0,70,30)$ Wet133(a) 15Image: soft; loose; wet; strong odor $(0,70,30)$ Wet133(a) 15Image: soft; loose; wet; strong odor $(0,70,30)$ Wet149(a) 17Image: soft; loose; wet; strong odor $(0,70,30)$ Wet1056(a) 18.5* $8:58$ Image: soft; loose; wet; strong odor $19$ Wet148(a) 20Image: soft; loose; wet; strong $19$ Wet148(a) 20Image: soft; loose; wet; strong $19$ Wet152(a) 22Image: soft; loose; wet; strong $21$ Wet152(a) 22Image: soft; loose; loos					1.10	0.154	12 —				Sand fine to mediu	um grain (C	,40,60)		
wet       118       13       Image: state in the				wet	140	@ 12*	 								
wet118 $\bigcirc$ 13.5 $\checkmark$ $\checkmark$ olive green mottling and gray staining; sand fine to medium grain; soft; loose; wet; strong odor (0,70,30)wet133 $\bigcirc$ 15 $\checkmark$ $\checkmark$ medium grain; soft; loose; wet; strong odor (0,70,30)wet133 $\bigcirc$ 15 $\checkmark$ $\checkmark$ medium grain; soft; loose; wet; strong odor (0,70,30)wet14 $\bigcirc$ 15 $\checkmark$ $\checkmark$ wet419 $\bigcirc$ 17 $\checkmark$ $\checkmark$ 8:5618 $\checkmark$ $\checkmark$ wet1056 $\bigcirc$ 18.5* 8:5819wet148 $\bigcirc$ 20 $\checkmark$ 9:0221 $\checkmark$ wet152 $\bigcirc$ 229:0422 $\checkmark$ Some black staining						8:48	13_			SC	Poorly graded sa	and with c	lay; brown; some		
wet118( $@$ 13.514medlum grain; soft; loose; wet; strong odor (0,70,30)wet133 $@$ 1514medlum grain; soft; loose; wet; strong odor (0,70,30)wet133 $@$ 1514medlum grain; soft; loose; wet; strong odor (0,70,30)wet133 $@$ 1516Red brown with orange and olive green mottling; medium stiff; (0,50,50)wet419 $@$ 1717Image: strong odor (0,70,30)wet1056 $@$ 18.5* 8:5819Image: strong odor; (0,35,65)wet148 $@$ 20Image: strong odor; (0,35,65)wet148 $@$ 20Image: strong odor; (0,35,65)wet148 $@$ 20Image: strong odor; (0,35,65)wet152 $@$ 22Image: strong odor; (0,35,60)wet152 $@$ 22Image: strong odor; (0,35,60)											olive green mottlin	ng and gray	staining; sand fine to		
wet 133 $\begin{pmatrix} 8:50 \\ 15 \\ 8:52 \\ 16 \\ 16 \\ 16 \\ 16 \\ 16 \\ 16 \\ 16 \\ 1$				wet	118	@ 13.5	14.				medium grain; sof	ft; loose; w	et; strong odor		
wet133(a) 1515 $\mathbf{v}$ wet133(a) 1515 $\mathbf{v}$ wet419(a) 17 $\mathbf{v}$ $\mathbf{r}$ wet419(a) 17 $\mathbf{v}$ $\mathbf{r}$ 8:5618 $\mathbf{v}$ $\mathbf{r}$ wet1056 $0$ 18.5*9:0219 $\mathbf{v}$ wet148 $0$ 20 $\mathbf{v}$ Stiff; trace medium gravel; sand medium grain;(5,35,60) $0$ $152$ wet152(a) 229:04 $22$ 9:04 $22$ 9:04 $152$ 9:04 $152$ 9:04 $152$ 9:04 $152$ 9:04 $152$ 9:04 $152$ 9:04 $152$ 9:04 $152$ 9:04 $152$ 9:04 $152$ 9:04 $152$ 9:04 $152$ 9:04 $152$ 9:04 $152$ 9:04 $152$ 9:04 $152$ 9:04 $152$ 9:04 $152$ 9:04 $152$ 9:04 $152$ 9:04 $152$ 9:05 $152$ 9:06 $152$ 9:06 $152$ 9:07 $152$ 9:08 $152$ 9:09 $152$ 9:09 $152$ 9:09 $152$ 9:09 $152$ 9:09 $152$ 9:09 $152$						8:50	1 14				(0,70,30)	••• ••••			
wet133 $\textcircled{@}$ 1515Red brown with orange and olive green mottling; medium stiff; (0,50,50)wet419 $\textcircled{@}$ 17 $\textcircled{V}$ Red brown with orange and olive green mottling; medium stiff; (0,50,50)wet419 $\textcircled{@}$ 17 $\textcircled{V}$ Red brown with orange and olive green mottling; medium stiff; (0,50,50)wet1056 $\textcircled{@}$ 18.5* $\textcircled{V}$ $\textcircled{V}$ wet1056 $\textcircled{@}$ 18.5* $\textcircled{V}$ $\textcircled{V}$ wet148 $\textcircled{@}$ 20 $\textcircled{V}$ $\overbrace{V}$ wet152 $\textcircled{@}$ 22 $\textcircled{V}$ $\overbrace{V}$ wet152 $\textcircled{@}$ 22 $\textcircled{V}$ $\overbrace{V}$ Some black stainingSome black staining								▼ 1							
wet       419       0       17       Red brown with orange and olive green mottling; medium stiff; (0,50,50)         wet       419       0       17       Image: Classifier of the state of				wet	133	@ 15	172	•							
wet       419 <sup>16</sup> <sup>16</sup> <sup>17</sup>					-	8:52				• • • • • • • •	······································		· · · · · · · · · · · · · · · · · · ·		
wet       419       0       17       Image: state of own with orange and onverge an							16				Red brown with a	and and a	live green mottling		
wet419 $@$ 17 $17$ $\bullet$ $CL$ Lean clay; some fine to medium sand; red brown with orange mottling and black specs; medium plasticity and toughness; medium stiff; wet; strong odor; (0,35,65)wet1056 $@$ 18.5* 8:58 $19$ $\bullet$ $\bullet$ wet148 $@$ 20 $\bullet$ $\bullet$ $\bullet$ 9:02 $20$ $\bullet$ $\bullet$ Stiff; trace medium gravel; sand medium grain; (5,35,60)wet152 $@$ 22 $\bullet$ $\bullet$ 9:0422 $\bullet$ Some black staining		-					-			••••	medium ctiffe /0 E	50 501	we green moluing;		
wet $1056 @ 18.5^*$ wet $1056 @ 18.5^*$ $19 @ 17 @ 19 @ 17 @ 18 @ 20 @ 18.5^*$ 19 @ 19 @ 19 @ 19 @ 19 @ 19 @ 19 @ 19 @		·		wot	110	@ 17	17		(Analaro)			<u> </u>			
wet $1056 @ 18.5^*$ Wet $1056 @ 18.5^*$ 19 - 4 Wet $148 @ 20$ 9:02 Wet $152 @ 22$ 9:04 22 - 4 22 - 4 3 3 3 3 3 3 3 3				wet	713	0.56	-				Lean clay; some	nne to mec	ium sand; red brown		
wet $1056$ @ $18.5^*_{8:58}$ $19 - 19$ Plasticity and toughness; medium stiff; wet; strong wet $148$ @ 20 9:02 $20 - 10$ $1000$ $2021 - 1000$ $21$ $1000$ $21$ $1000$ $21$ $1000$ $21$ $1000$ $21$ $1000$ $21$ $1000$ $21$ $1000$ $21$ $1000$ $21$ $1000$ $21$ $1000$ $21$ $1000$ $21$ $1000$ $22$ $22$ $1000$ $22$ $22$ $1000$ $22$ $22$ $20$ $1000$ $20$ $22$ $22$ $20$ $1000$ $20$ $22$ $22$ $20$ $1000$ $20$ $22$ $22$ $20$ $1000$ $20$ $22$ $22$ $20$ $1000$ $20$ $22$ $22$ $20$ $1000$ $20$ $22$ $22$ $20$ $1000$ $22$ $22$ $20$ $1000$ $22$ $22$ $20$ $1000$ $22$ $22$ $20$ $1000$ $22$ $22$ $20$ $1000$ $22$ $22$ $20$ $1000$ $22$ $22$ $20$ $1000$ $20$ $22$ $22$ $20$ $1000$ $20$ $22$ $22$ $20$ $1000$ $20$ $22$ $20$ $20$ $22$ $20$ $20$						0:50	18			ş	with orange mottli	ing and bla	ck specs; medium		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$					1050	6 10 F3	] -				plasticity and toug	hness; me	dium stiff; wet; strong		
wet 148 $\begin{array}{c} 20 \\ 9:02 \\ 21 \\ wet 152 \\ 9:04 \end{array}$ $\begin{array}{c} 20 \\ 21 \\ 22 \\ 22 \\ 9:04 \end{array}$ Stiff; trace medium gravel; sand medium grain; (5,35,60) \\ Some black staining \\ Some black staining \\ \end{array}				wet	1056	@ 18.5*	19			š 	odor; (0,35,65)				
wet 148 $@$ 20 $9:02$ $20$ $\checkmark$ Stiff; trace medium gravel; sand medium grain; (5,35,60) wet 152 $@$ 22 $9:04$ $22$ $\checkmark$ Some black staining						8:58				8					
wet       148       @ 20       20       ▲       Stiff; trace medium gravel; sand medium grain;          9:02       21       (5,35,60)         wet       152       @ 22       22       Some black staining							20-								
wet 152 @ 22 9:04 22				wet	148	@ 20	20				Stiff; trace mediu	m gravel; s	and medium grain:		
wet 152 @ 22 9:04 22 Some black staining						9:02					(5,35,60)				
wet 152 @ 22 9:04 22 Some black staining							21					•••••	· · · · · · · · · · · · · · · · · · ·		
9:04 22				wet	152	@ 22	-				Some black stainin		• • • • • • • • • • • • • • • • • • • •		
					_	9:04	22			g					

	Project	No: C10	1156151		Clie	nt: Con	ocoPhillips	Boring No: SB-1				
	Logged	By: Tab	bitha Cro	ργ	Loca	ation: 4	276 MacArthur Blvd	Date Drilled: 11/6/07				
Dalta	Driller:	Gregg [	Drilling &	Testing	ľ	0	akland, CA	Page 2 of 2				
Della	Drilling	Method:	HSA		Hole	e Diame	ter: 4"					
	Sampli	ng Metho	d: Contir	nuous	Hole	e Depth	: 35'	$\sum$ = First Water				
Consultants	Casing	Type: N/	<b>д</b>		Wel	I Diame	ter: NA					
ł	Gravel	ZE: NA Dack: NA	<b>`</b>		Wei	Deptn	NA Donthe 41	$\underline{\mathbf{V}}$ = Static Groundwater				
	Graver	Elevatio	<u>n</u>	r	Northing		Fasting	* = Selected for lab				
					rtortining		Lasting	analysis				
Well		5	c			Γ		· · · · · · · · · · · · · · · · · · ·				
Completion Statio	ent :	up C	ole	fee	Sample	be						
🗒 🖸 Wate	oist(	Rea	tific	L L	/er/	1	LITHO	LOGY / DESCRIPTION				
Level	žŬ	E,	den Si	Gept	ecov	So						
			Ă.			A SAME USIN STORE		·				
				23								
	wot	61 1		-			(5,40,55)	· · · · · · · · · · · · · · · · · · ·				
Ĕ	wei	01.1		24			A lot of black coo	the second and modiling to				
e e e e e e e e e e e e e e e e e e e		1					coarse: low plasti	sity: high toughness; edor:				
at	wet	78.1	@ 25	25 —			(5.40.55)	city, ingir touginiess, ouor,				
Z S			9:13	-								
				26-			Tan; some black s	specs; trace orange mottling;				
				27_			coarse sand; trac	e fine gravel; sub angular; very				
	wet	41.2	@ 27				stiff; (5,35,60)					
			9:15	28			Red brown with o	Red brown with orange mottling; soft; no plasticity;				
		520					sand fine to medi	um; crumbles easily; (5,40,55)				
	wet	53.9		29			NI					
				-				ig; medium stin; low plasticity;				
	wet	76.8		30			Stiff: red brown:	some tan mottling; a lot of black				
							specs; sand fine of	arain; trace coarse sand: (0.35.65)				
				31-								
	1	1		32	<b>•</b>	]***						
	wet	38.3		<u> </u>			Medium stiff; red	brown with black specs; medium				
				33-		-6.5	plasticity and tou	ghness				
		65.0	6 33 F									
	wet	05.8	@ 33.5	34		- 200	SC Poorly graded s	and with clay; trace fine gravel;				
		1	9.52	-			sand medium to d	bard but crumbles easily and orange;				
	+		+	35			black sposst gray	al sub angularit work adam				
				-	+ $+$	1	(5.65.30)	er sob angular, wet, udur;				
				36		1	······································	·····				
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				J″_			TD	= 35 feet bgs				
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			Project	No: C10	1156151		Clie	ent: Cor	nocoPh	illips		Boring No: SB-2
			Logged	By: Tab	bitha Cro	У	Loc	ation: 4	276 M	acArthur Blvd		Date Drilled: 11/5/07
			Driller:	Gregg [	Drilling &	Testing	ł	o	akland	i, CA		Page 1 of 2
11)	Ωľ	ta	Drilling	Method:	HSA		Hol	e Diame	eter: 4'	•		
		LU	Samplir	ng Metho	d: Contin	uous	Hol	e Depth	: 35'		$\nabla =$	First Water
Con	sulta	ants	Casing	Type: N/	4		We	ll Diame	ter: N/	4		
	10410		Slot Siz	e: NA	•		We	ll Denth	• NA	•	<b>V</b> =	Static Groundwater
			Gravel	Pack: NA			Fire	t Water	· Donth	· 22'		State Stoundwater
1				Flevatio	<u></u>		Northing	it water	I	Fasting	*	Selected for lab
				LICIG	/n		noranng			Lasting	-	analysis
We	11			_							1	
Comple	etion	<b>C1</b> · · ·	ىد ھ	ing	tior	let)	Sample	e e				
		Static	fen	n) gq	la pl	(fe	2					DECODIDETON
sing		level	ion Son	(pp	itif	th	a S			LIINU		DESCRIPTION
C Ba		20101	20		gei	Det	Inte Co	Ň	1			
							<u>~</u> ~			A		
						_				Asphalt - 2"		
<b>3</b> ح						1			CL	Lean clay with g	ravel; tan;	low to medium
ier 🖉										plasticity; high tou	ughness; st	iff; moist; gravel fine
en 📓					fe	2				to medium; (30,0	,70)	
					- S	<u>۔</u>						
eat					Ē	2						
ž					Σi	3-						
										•		· · · · · · · · · · · · · · · · · · ·
						4						· · · · · · · · · · ·
												· · · ·
			moist	932.0	@ 5	5-				Tan with olive gre	en mottlind	: medium plasticity
					8:43				[] · · ·	and toughness: so	ome silt: tra	ace fine sand: moist:
						6				strong odor: (0.10	0,90)	,,
									J		-12.7.7	···- ··· · · ·
	··· ····		moist	1599	@ 7	7			<b></b>	Red brown specs:	some root	s: medium stiff: trace
蕭					8:45					fine gravel: (5.25	70)	
						8					// 9/	······
			moist	1307	@ 8.5*	-			7	(5.40.55)		······································
					8.47	9—		2.5 G. M.S.S.S.S.S.	SC -	Clavey sand: tan	and olive	green: some red
					0.17	-			<u> </u>	brown mottling: r	od chocci s	and fine to medium
	• · · · •		moist	1528	@ 10	10			· · · · · · · · · · · ·	medium stiff: cru	mblos opcili	
	•••			1020	8.40	-				fine grain; crui	ctropa odo	y, no plasticity, gravel
					0.15	11		_		Looco: como blac	k chocct ro	d brown and tan
	• • •					-		Ser la				
			moist	1225	@ 17*	12—				Lean clay, lea Di	own, some	olive green motting;
			moisc	1222	0.51	-		-	g 	stin; silty; some i	rine sand; s	some black specs; low
					0:21	13			Ŋ	plasticity; high to	ughness; n	noist; strong odor;
			maint	1227	a 13 F	- 1			<b> </b>	(0,35,65)		·······
			nnoise	122/	رد ب سا م. ا	14			Į	Sand fine to medi	ium; trace	nne gravel; red brown
				ł	0:53	-				and tan; some oli	ve green; (	5,25,70)
			maint	767	e ir	15-						····
	_		moist	/62		-			<u>.</u>	Medium stiff; med	dium plastic	city and toughness; red
	•				8:55	16				brown; some olive	e green; so	me black specs;
					1	-			<b>.</b>	(0,35,65)		· ···· · · · · · · · · · · · · · · · ·
						17			8 			•••••••••••••••••••••••••••••••••••••••
			moist	308	@ 17				Ŋ	Red brown; some	pink staini	ng; olive green
					8:57	18-			<b>.</b>	mottling; crumble	es easily; s	ome fine gravel;
						]			§	(10,35,55)		enter ante a composition de la composit
			moist	182	@ 18.5	19-						
				1	8:59	<u> </u>				Red brown; doesn	n't crumble	easily; some fine sand;
						20-				odor; (0,40,60)		
			moist	124	@ 20*	20-						·····
					9:04	21_				Medium soft; med	dium sand;	trace fine gravel; some
						21—				black specs; low	plasticity; I	high toughness;
		$\nabla$	wet	228	@ 22					(10,40,50)	·	······································
					9:06	22			SC	Clayey sand; red	d brown wit	h orange mottling;

			Project	No: C10	1156151		Clier	nt: Con	ocoPh	illips	Boring No: SB-2	
			Logged	By: <b>Tab</b>	bitha Cro	y	Loca	tion: 4	276 Ma	acArthur Blvd	Date Drilled: 11/5/07	
		-	Driller:	Gregg D	orilling &	Testing		0	akland	, CA	Page 2 of 2	
	en	ld	Drilling	Method:	HSA du Countin		Hole	Diame	ter: 4"			
6-			Sampiir	ig Metho Tupol NA	a: Contin	uous	HOIE	e Deptn	: 35'		$\underline{V}$ = First Water	
	nsuita	ants	Slot Siz	e'NA	N		Wei	l Diaine I Denth	· NA		V = Static Groundwater	
			Gravel	Pack: NA			First	t Water	Depth:	22'		
				Elevatio	n		Northing			Easting	* = Selected for lab	
							r		analysis			
Well Completion			t G	ing	ion	et)	Sample	Ψ				
= .	הכ	Static	stur	ead om)	nple	(fe	<u>a</u> 1	ŢŢ		і ттно	OGY / DESCRIPTION	
ckfi	Liist	Level	Moi	D R D	Sar	epth		Soil		211110		
Ba	٢		_	Id	Įd	å	Int					
						23				black specs; silty;	sand fine to medium; fine gravel	
Lt I						-				loose; slightly cen	nented; wet; odor; (15,50,35)	
ne			wet	55.1		24			4			
Cei										Cemented; very s	tiff; sand medium grain; red	
at			wet	51.2	@ 25*	25 —			2	brown, some oran	ige motimig, (3,33,40)	
Ne Ne					9:30	-					•••••••••••••••••••••••••••••••••••••••	
						20-			CL	Lean clay; red br	own and tan with orange	
						27	+		P 200	mottling; some bl	ack specs; medium stiff; medium	
			wet	14.6						plasticity and toug	ghness; sand fine grain; wet;	
						28 —				odor; (0,40,60)		
			wet	21.1						Red brown with ta	an mottling	
						29 —						
						30	<b>•</b>					
			wet	13.7		-		- 12.2		Black specs; stiff;	trace fine gravel; low plasticity;	
						31 —				high toughness; (	5,35,60)	
										Some pink stainin	)a	
			wet	2.3		32	A MAR			Medium soft; (5,4	40,55)	
						33-						
				4 4 4			<b>▼</b>			Red brown with b	lack specs; very stiff; some fine	
			wei	41.1		34 —		- 1933		sand; slight odor;	(0,30,70)	
	-									Medium stiff: (0.2	20.80)	
<b></b>						135—		17.749 MOSPEL	1/1	, 、, 、, 、, 、, 、, 、, 、, 、, 、, 、, 、, 、, 、,		
					1	36-			<u> </u>			
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	••••		[			37		-		TR	- 35 feet has	
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						42		1		<u></u>	• • • • • • • • • • • • • • • • • • •	
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		Project	No: C10	1156151		Clie	ent: Cor	ocoPh	illips		Boring No: SB-3
		Logged	By: Tab	bitha Cro	у	Loc	ation: 4	276 M	acArthur Blvd		Date Drilled: 11/2/07
	L	Driller:	Gregg D	Drilling &	Testing		0	akland	, CA		Page 1 of 2
Der	га	Drilling	Method:	HSA		Ho	le Diame	eter: <b>4</b> "			
		Samplir	ig Metho	d: Contin	uous	Ho	le Depth	: 35'		<u></u>	First Water
Consult	ants	Casing '	Type: NA	4		We	ell Diame	ter: NA			
		Slot Siz	e: NA			We	ll Depth	: NA		⊻ =	Static Groundwater
		Gravel I	Pack: NA	\		Firs	st Water Depth: 21'			l	
			Elevatio	n		Northing	ł		Easting	Selected for lab	
Well	<b>I</b>					1	1			L	analysis
Completion	Chabia	يە	ing	tion	et)	Sample	e g				
щ Б	Water	stur	ead om)	npl	(fe	λ Te	ļ Ž		1 TTHC		DESCRIPTION
ickf asin	Level	Moi: Cor	۲ م م	Sar	bt		Oi			2001 /	
န္မာပိ		-	Id	Ide	Ď	Int Rec	0,				
									Concrete - 6	n	
<b>-</b>	1				-			ĒĒ	Silty clay; tannis	h brown; n	nedium plasticity;
Le le					1				medium soft; low	to medium	toughness; moist;
E				لو ا			1		(0,0,100)		er er felfener er elle eller en elle eller e
Ŭ				, i	2—		7				
eat	]			L L	3						
ž 🖌				Σ					@ 3' lean clay; st	iff; mediun	n plasticity; high
					4				toughness; moist	; (0,0,100)	
					· _		- 12				
· · · · · ·					5						
		moist	1.1	@ 5			-		Some black strea	ks; tan; so	me red brown specs;
				8:54	6				some medium sa	nd; no odoi	r; (0,15,85)
	-	i									
		moist	07		7				Some grav streak	(n 20 8)	
	1		0.7	8:57	-				Some gray stream	(3, (0,20,0	
					8—	<b>V</b>			• . • .		
	1	moist	0.4	@ 8.5					Some black spece	s; some wh	ite caliche; trace fine
	]			9:00	9				gravel; sand med	lium to coa	rse; (5,25,70)
	1				10						
		moist	0.6	@ 10					Tan with red brow	wn mottling	)
				9:02	11		- 69	2 	• • • •		
	-				-						· · · · · · · · · · · · · · · · · · ·
		miest	0.8	@ 12	12				Ded brown with t	on, block o	
	ł	most	0.0	9.04	-			3	(10.25.65)	an; Diack S	pecs; trace line gravel;
	1				13						
		moist	0.6	@ 13.5	-				A lot of black spe	cs; crumbl	es easily
	1			9:07	14						
					15	•					
	ļ	moist	0.6	@ 15*					Very stiff; low pl	asticity	
		Į		9:09	16						
-					-		-	M 			
		moist	0.0	@ 17	17 —				More sand; some	e silt; (5,35	with tap mottlings and
	1	moist	0.0	Q·11					some black spor		with tan motuling; soπ;
				2.11	18-		-	S	some black spec	5, (0,35,05	/
	·	moist	2.6	@ 18.5	-				Trace fine gravel	; meidum s	soft: medium palsticity.
				9:15	19-				crumbles easily:	silty; (5.40	),565)
					20 -						
		wet	36.1	@ 20*	20						· · · · · · · · · · · · · · · · · · ·
	$\nabla$			9:21	21-		्रम् स्थितः स्थित् स्थितः स्थित् स्थित् स्थ	SC	Clayey sand; po	orly grade	d with fine gravel; sand
	1				-				fine to medium;	red brown	with tan mottling; soft;
	ļ	wet	8.8		22—	<b>▼</b>			loose; trace blac	k specs; w	et; slight odor; (5,55,40)
		L	ł		1 .						

			Project	No: C10	1156151		Clier	nt: Con	ocoPl	nillips	· · · · · · · · · · · · · · · ·	Boring No: SB-3
			Logged	Ву: <b>Таb</b>	bitha Cro	у	Loca	tion: 4	276 M	lacArthur Blvd		Date Drilled: 11/2/07
	<b>N</b> - 10	t	Driller:	Gregg D	Orilling &	Testing	J	0	aklan	d, CA		Page 2 of 2
	)eli	га	Drilling	Method:	HSA		Hole	Diame	ter: <b>4</b>	**		
			Samplir	ng Metho	d: Contin	uous	Hole	Depth	: 35'		∑ =	First Water
	Consulta	ants	Casing	Type: NA	۱.		Well	Diame	ter: N	A		
			Slot Siz	e: NA			Well	Depth	: NA		⊻ =	Static Groundwater
			Gravel	Pack: NA	۱		First	Water	Depth	: 21'		
				Elevatio	'n	ĺ	Northing			Easting	*=	Selected for lab
	Wall	r	<b></b>				T	<del></del>				analysis
Cor ,≣	mpletion	Static Water	sture ntent	keading pm)	Sample Identification	n (feet)	Sample	Type		LITHO	LOGY /	DESCRIPTION
Back	Casir	Level	မိုပ္ပ	d) d)		Dept	Recov	Soil		<u></u>		
						23				Breaks easily		
ц	酈 —					-						
ne			wet	3./		24 —				Sand mostly medi	um grain;	trace fine sand; red
ษั										brown	•••••	
L L			wot	1.0	@ 25*	25 —		in in the second		l oon clov with c	and fing t	a modiumt rod brown
lei.	· · · ·		wet	1.0	9.48	-				and tan with oran	and, mettling	t' some red spece: stiff:
-	ý —				5.10	26				low plasticity: hig	h toughnes	s: wet: no odor:
										(0,35,65)		
			wet	1.7		2/				· · · · · · · · · · · · · · · · · · ·		······
						20		]		Some black specs	; red brow	n and some tan;
						20	•			medium stiff; trac	e fine grav	/el; (5,40,55)
			wet	0.7		29-					·	
						-				Stiff; sand fine gr	ain; tan wi	th red brown mottling;
	····			0.5		30 —				(0,30,70)		
			wet	0.5		.						
	·					31 —				Ian; some red br	own mottin	ng; trace medium
	<u> </u>	}								sanu, very suir, v	vet; (0,50,	70)
1			wet 1.1 32-			Trace gravel: sand medium to fine g			to fine grain: wet:			
					ļ	-	- WHENEXES	(5.30.65)				
						33				\;/;/;i/ <u>;</u> ; <u>2</u>		
			wet	1.8	1	24	<b>▲</b>			A lot of black spe	cs; red bro	wn with tan mottling;
						34				sand fine grain; s	ome mediu	ım grain; (0,25,75)
						35	*					
						] .						
						36		-				
					·	.		4				
					1	37 —		-		тр	- 35 for	at hac
	_					· ·		-			- 55 186	
						38-		1				
						120		1				
			1			39-		1				
						40-			Ľ			
						<b>_</b>		1	ļ			······
						41 -		4				
						· ·		4				
						42-		-				
1		1				.	+	-				
						43		-	-			
								-				· · · · · · · · · · · · · · · · · · ·
						44 —		-				
L	<u> </u>	<u> </u>		1		1						

: . . .
Delta	Project Logged Driller: Drilling Sampli Casing	No: C10 By: Tab Gregg L Method: ng Metho Type: NA	1156151 bitha Cro Drilling & HSA d: Contin	y Testing uous	Client Locat Hole Hole Well	t: Con ion: 4 Oi Diame Depth Diame	ocoPhi 276 Ma akland, ter: 4" : 35' ter: NA	llips acArthur Blvd , CA	Boring No: <b>SB-4</b> Date Drilled: <b>10/30/07</b> Page <b>1</b> of <b>2</b> $\overline{\nabla} = First Water$
	Slot Siz	e: NA			Well	Depth	: NA	4 <b>- - -</b>	Y = Static Groundwater
- -	Graver	Elevatio	n N	No	rthing	water	Depth:	Easting	* = Selected for lab analysis
Well Completion Stat U Wate Completion Wate Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion Completion	Moisture Content	PID Reading (ppm)	Sample Identification	Depth (feet)	Kecovery Interval ald	Soll Type		LITHO	LOGY / DESCRIPTION
Neat Cement			Air-Knife				ĊĽ	Asphalt - 6" Lean clay; tan to medium toughnes staining; (0,0,100	olive green; medium plasticity; s; stiff; moist; some black )
	moist	7.5	@ 5 3:30	5 6			· · · · · ·	Very stiff; high to medium sand; od	ughness; some red specs; trace or; (0,5,95)
	moist	27.5	@ 8* 3:32	7 — 8 —					
	moist	25.3	@ 9 3:35	9				Orange mottling	
	moist	11.5	@ 11 3:37	10  11			· · · · · ·	Tan some gray st	aining; stiff
	miost	6.5	@ 13.5* 3:39	12 			······	Tan and red brow odor; (0,25,75)	n; some medium sand; slight
	moist	5.5	@ 14 3:40					Trace fine gravel;	(5,30,65)
	moist	0.8	@ 16* 3:43	15			<u>sc</u> -	Clayey sand; rec cemented but cru high toughness; s	l brown and tan; slightly mbles easily; soft; no plasticity; and medium grain; molst; slight
	wet	0.7						odor; (5,60,30) Low plasticity; sa	nd fine to medium; wet; (0,60,40)
	wet	1		19				Trace gray stainir	9
	wet	1.1		20					· · · · · · · · · · · · · · · · · · ·
	wet	0.3		21 — 22 —	V V V			No plasticity; (0,	55,35)

•

Con Kettill Kon Kon Comp	ell letion	static Water Level	Project Logged Driller: Drilling Samplin Casing Slot Siz Gravel f	No: <b>C10</b> By: <b>Tabl</b> <b>Gregg D</b> Method: g Method: g Method: g Method: type: NA e: NA Pack: NA Elevatio	supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple supple su	epth (feet) Innonz	Clier Loca Hole Hole Well Well First Northing	tion: 4 tion: 4 Diame Depth: Diamel Depth: Water	ocoPhillips 276 MacArthur Blvd skland, CA ter: 4" 35' ter: NA NA Depth: 17.5' Easting	Boring No: SB-4         Date Drilled: 10/30/07         Page 2 of 2            \[
Neat Cement			wet wet moist moist moist	0.6 0.6 0.4 0.4 0.5 0.5	@ 27* 4:15	23 — 24 — 25 — 26 — 27 — 28 — 30 — 31 — 32 — 33 — 33 —			CL Lean clay; tan to medium plasticity a moist; no odor; (0, With fine to medium (0,25,75) Olive green and ta Olive green and ta No Recovery Very stiff; trace fir low plasticity; high (5,20,70)	red brown; medium soft; and toughness; some fine sand; ,15,85) m sand; some black specs; n; stiff; (0,0,100) ne gravel; some medium sand; n toughness; tan to red brown;
						35 — 36 — 37 — 38 — 39 — 40 — 41 — 42 — 43 —			(10,30,60) TD =	= 35 feet bgs

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			Project I	No: C10:	1156151			Clier	nt: Con	ocoPhil	llips		Boring No: SB-5
	Project No: C101156151Client: CorLogged By: Tabbitha CroyLocation: 4Driller: Gregg Drilling & TestingODrilling Method: HSAHole DiameSampling Method: ContinuousHole DepthCasing Type: NAWell DiameSlot Size: NAWell DepthGravel Pack: NAFirst WaterElevationNorthing						276 Ma	cArthur Blvd		Date Drilled: 11/1/07			
	_		Logged By: Tabbitha CroyLocation: 4276 MacArthur BlvdDriller: Gregg Drilling & TestingOakland, CADrilling Method: HSAHole Diameter: 4"Sampling Method: ContinuousHole Depth: 35'Casing Type: NAWell Diameter: NASlot Size: NAWell Depth: NAGravel Pack: NAFirst Water Depth: 18'ElevationNorthingEasting							CA		Page 1 of 2	
n	ЛI		Drilling	Mothod:	HCA			Hole	Diame	ter 4"			1
	EII	la	C		lion J. Contin				Donth	· >='		- Σ	- Eirct Mator
			Samplin	g Method	a: Contin	uous		ные	Depth	: 35		=	- First water
Co	nsulta	ants	Casing 1	Type: NA				Well	Diame	ter: NA			
			Slot Size	e: NA				Well	Depth	: NA		_ =	<ul> <li>Static Groundwater</li> </ul>
			Gravel F	ack: NA				First	: Water	Depth:	18'		
				Elevatio	n		North	ing			Easting	* =	<ul> <li>Selected for lab</li> </ul>
				Lievation Northing Leasting a give be a give									analysis
W	ell			ъ.,	ç		6	anla		1			
Comp	letion	Static	2 12	Ξ,	le	eet	San	ipie	Ъ				
= .	<b>"</b>	Water	l te sta	д ей	fica	l (f		le'	L →		LITHO	LOGY /	DESCRIPTION
i K		Level	i i i i i i i i i i i i i i i i i i i	۳ <u>ق</u>	Sar	DT DT	l Š	Ъ	ii				
Ba	۲ د			IId	Ide	De	l 🎽	Int					
							<u> </u>			ļ	Acobalt - 5"		
						-			a and anal				
Lt						1		L		CL	Lean clay; olive g	reen; me	dium stiff; medium
er						l * _				2 5 5	plasticity and toug	hness; so	me medium sand and
					fe						trace fine gravel;	some gray	staining; moist;
Ŭ					(ni	2					strong odor; (10,2	25,65)	
at					×.								
Ve Ve					Air	3-	1						
						-	1	<b>†</b>			· · · · · · · · · · · · ·		
	·					4		<u>├</u> ──					· · · · · · · · · · · · · · · · · · ·
							+						
			maint	469		5	100.262				Troop white colich	ou vonu ct	iff: low placticity, high
			moist	468	<u>@</u> 5	-				8. 	Trace white cance	ie, very st	in; iow plasticity; figh
						6—	Sec.				toucnness; with n	nealum to	coarse sand; trace fine
											gravel; (10,30,60	)	
				I		7		•					
			moist	688	@ 7*	´ _					Tan and olive gre	en; some	red brown mottling;
					11:19	。					some medium sai	nd; (0,20,	80)
						0		¥					
			moist	638	@ 8.5				1000		Low to medium p	lasticity	
					11:20	9							
			1						1.5.5				· · · · · · · · · · · · · · · · · · ·
	g		moist	573	@ 10	10-							
		ł	1	5/5	11.72	-						• • • • • •	
			Į		11.22	11				š			
						-					(0 75 75)		
	<b>1</b>			600	0 13*	12					(0.23,73)	 	
		1	miost	623	@ 12*			Ŧ			Trace fine graver	, low plast	icity; meldum soft;
	<b>.</b>	ł			11:25	13-				¥ ×	(5,25,70)		······
1		Į						*		ġ			
	<b>.</b>	1	moist	570	@ 13.5	14					Crumbles easily;	(5,35,60)	
					11:27	1.				<u>ø</u>		a contrare as	
		ļ	1			15		1 ★					
			moist	532	@ 15	1.7					Red brown with o	olive green	mottling; stiff; (0,35,65)
		1	1		11:30				$\sum_{i=1}^{n} \sum_{j=1}^{n} \sum_{i=1}^{n} \sum_{i$				
					1	170-							
		1	1		1	1 1		1		35 · · · · · · · · · · · · · · · · · · ·			
	<b>1</b>		moist	157	@ 17*	117-		À			•••••••••••••••		
	M ·	5	1	1	11.27	-							
			1	ļ	1	18-							
				100		-			and the second s			d brown a	nd alivet trace enviole
			wet	1 100		19-	2003	┢╀	-		ciayey sanu; re	u prown a	nu onve, trace gravel;
	<b>.</b>			ł		.					green; poorly gra	aded; loos	e; soft; crumbles easily;
	M			1		20-		∎ ¥			medium sand; fi	ne gravel;	wet; odor; (10,50,40)
		1	wet	53.6	@ 20	1~ .		1				··· ·· ····	
			· ·	1	11:41	21 -					Red brown; soft;	sand fine	grain; trace fine gravel;
						21				46	black specs; mee	dium plast	icity and toughness; wet;
		1	wet	57	@ 22*			•			odor; (5,50,45)		
		1		1	11:44								······································

10110-0

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			Project	No: C10	1156151		. (	Clien	t: Con	ocoPh	illips		Boring No: SB-5
			Logged	By: Tabl	bitha Cro	y	ł	Loca	tion: <b>4</b> :	276 M	acArthur Blvd		Date Drilled: 11/1/07
			Driller:	Gregg D	rilling &	Testing	3		Oa	kland	, CA		Page 2 of 2
1)6	<b>2</b> ]1	ra	Drilling	Method:	HSA		1	Hole	Diame	er: <b>4</b> "			
		LU	Samplin	g Metho	d: Contin	uous	I	Hole	Depth:	35'		∑ =	First Water
Con	sulta	ants	Casing <sup>-</sup>	Type: NA	•		,	Well	Diamet	er: NA	N Contraction of the second seco	_	
			Slot Siz	e: NA			1	Well	Depth:	NA		<b>Y</b> =	Static Groundwater
			Gravel I	Pack: NA			4	First	Water	Depth:	: 18'		
				Elevatio	n		North	ing			Easting	* =	Selected for lab
												ł	analysis
We	ll High			ğ	Б	ភ្ន	Sam	مام					
Comple		Static	ent	n) adir	ple	fee	500	ipie	ype				
ling ng		Water	oist ont	Ppr	tific	æ	- e	Sai	11		LITHO	LOGY /	DESCRIPTION
Casi		Level	žŬ	Ū,	den s	Geb	l Og	Itel	So				
шО				ц. 	Й		L R R R R R R R R R R R R R R R R R R R	Ë,					
						23—							
۲ ا						-		*		CL	Lean clay; tan wi	th red brow	wn mottling; black
nel			wet	51.8		24 —					specs; fine sand;	medium so	oft; medium plasticity
en .											and toughness; w	et; odor; (	0,30,70)
t C						25 —		¥.					
ea			moist	1.3		-					Some fine to med	ium sand;	moist; slight odor
	· ···					26		-					
						-							· · · · · · · · · · · · · · · · · · ·
			moist	96		27 —					Stiff; (0,15,85)	a with com	o olivo groop mattling
			moist	0.0	•	-		- <b>T</b>		•	ran and red brow	n with som	e olive green mottling
						28		+		····			
			moist	114		-		¥					· · · · · · · · · · · · · · · · · · ·
			linoise	11.4		29 —		+	166.		Medium stiff: (0 3		
						-		╈					······
			wet	16.8	@ 30*	30 —		Ť.	efee ford	sc	Clavev sand: red	brown: sc	me black specs: trace
同業				10.0	12:07						fine gravel: sand	medium ar	ain: soft: loose: no
						31-		+		•••	plasticity; wet; sli	ight odor;	(10,50,40)
								+		· · · · · · · · ·		. <u></u>	<b>*********</b> ***************************
	••• ••		wet	14.1		32		-			Some olive green	mottling;	medium stiff
	•												
						33-		+					
			moist	13.5		24				CL	Lean clay; light t	an to olive	green; stiff; some
						34					coarse sand; trac	e black spe	ecs; low to medium
						25		+			plasticity; high to	ughness; r	moist; odor; (0,15,85)
						] .							······································
						36-							
									4				······································
					r.	37 —						05 (	
						.			-		1D :	= 35 tee	et bgs
						38-			-		·····		
									4				
						39-			4.	• • •			
			l						1	· · ·	· · · · · · · · · · · · · · · · · · ·		
	· ··-·					40			1				
1						1			1	1			
						41-			1				
			1						1				
						42-		<u> </u>	1				
1									1				
			1			43-	1		1				
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						14							
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D	)e  onsulta	ta	Project Logged Driller: Drilling Samplin Casing Slot Siz Gravel I	No: C10 By: Tab Gregg I Method: og Metho Fype: NA e: NA Pack: NA Elevatio	1156151 bitha Cro Drilling & HSA d: Contin	y Testing uous	Clier Loca Hole Hole Wel Wel First Northing	nt: <b>Con</b> ation: <b>4</b> <b>0</b> e Diame e Depth I Diame I Depth t Water	ocoPhillips 276 MacArthur Bivd akland, CA ter: 4" : 35' ter: NA NA Depth: 17' Easting	Boring No: SB-6 Date Drilled: 10/31/07 Page 1 of 2 $\nabla = \text{First Water}$ $\mathbf{V} = \text{Static Groundwater}$ $* = \text{Selected for lab}$ analysis		
N Backfill Backfill	Vell pletion Casing	Static Water Level	Moisture Content	PID Reading (ppm)	Sample Identification	Depth (feet)	Recovery Interval	Soil Type	LITHO	LOGY / DESCRIPTION		
Neat Cement				· · · · · · · · · · · · · · · · · · ·	Air-Knife				Asphalt - 3" CL Lean clay; olive g plasticity and toug medium sand; me slight odor; (15,2)	reen; medium stiff; medium hness; some tan coloring; some dium to coarse gravel; moist; 5,60)		
			moist	253	@ 5* 1:02	5 6			Strong odor			
	·		moist	47.4	@ 7 1:05	7 			Stiff; sand fine to	medium grain; (0,20,80)		
			moist	96.9	@ 8.5* 1:07	9			Tan with olive gre	en mottling; (0,25,75)		
			moist	33.8	@ 10 1:09	10 			Red brown and ta (0,30,70)	n with olive green mottling;		
	· · · · · · · · · · · · · · · · · · ·		moist	12.7	@ 12* 1:11	12 — 13 —			Low plasticity; hig (0,40,60)	h toughness; medium stiff; odor;		
	· · · · · · · ·		moist	20.6	@ 13.5 1:14	 14			medium soft; slig easily; poorly gra	htly cemented but crumbles ded; no plasticity; high		
			moist	21	@ 15* 1:16	15 — - 16 —			(0,55,45) Red brown with b	lack specs; (0,70,35)		
-		$\nabla$	wet	4.1	@ 17* 1:19			Nan iere	Olive green and ta sand medium to c	an; some gray staining; loose; coarse; wet; (0,65,35)		
			wet	15					specs; sand fine c plasticity and tou	grain; medium stiff; medium ghness; wet; odor; (0,40,60)		
			wet	3.4		20			Moist; slight odor	; (0,30,70)		
			moist	1.8		22	<b>▼</b>		(A) <sup>(1</sup> LL <i>E</i> <sup>(1)</sup> = 1 =			

		Project	No: C10	1156151		Cl	ent: Co	nocoPhillips	Boring No: SB-6	
		Logged	By: Tab	bitha Cro	y	Lo	cation: 4	276 MacArthur Blvd	Date Drilled: 10/31/0	7
		Driller:	Gregg I	Drilling &	Testing		C	akland, CA	Page 2 of 2	
Del	га	Drilling	Method:	HSA		Ho	le Diam	eter: 4"		
		Samplin	ng Metho	d: Contin	uous	Ho	le Depth	a: 35'	💟 = First Water	1
Consulta	ants	Casing <sup>-</sup>	Type: N/	4		w	ell Diame	eter: NA		
		Slot Siz	e: NA			W	ell Depth	i: NA	Static Groundwater	ł
		Gravel I	Pack: NA	\	·	Fi	st Wate	- Depth: 17'		
		· ·	Elevatio	on <sup>.</sup>		Northin	9	Easting	* = Selected for lab	
Well		<u>├</u>	[	-		1	- T		dialysis	
Completion	Ctatic	ы Ч	ling (	tior	set)	Samp	e g			Į
в 11. б	Water	stur	eac Pm	fica	) (fe	2		LITHO	LOGY / DESCRIPTION	
ickf isin	Level	U Q	a a	Sar	ept	Ň	Soil in			l
မီး			Id	, PI	ă	Rec	<b>≣</b>   °′			
					22		2120	plasticity; high to	ughness; moist; (15,35,50)	
lt.	[				23				······································	· · · •
len	}	moist	1.8	@ 24.5	24			2		
en				1:30	27					
					25		<u></u>	Red brown to tan	;some medium sand; trace	
ea -	ļ	moist	1.4					fine gravel; stiff;	low plasticity; high toughness;	
Z					26			moist; no odor; (	5,30,65)	
							-	3		
		moist	1 1		27 —			Tan: como rod br	own speca: modium plasticity.	· • • • •
	}	initiati	1.1		-				own speca, medium plasticity;	
					28 —		,	(0,10,50)	······································	
-		moist	0.8		-			Some black spece	: medium soft; no plasticity; fine	· · · •
					29			to medium red br	own sand; high toughness;	
	1				20 -			(0,25,75)	· · · · · · · · · · · · · · · · · · ·	
		moist	0.6	@ 30.5*	30					
				1:43	31					
								Dark brown and t	an; stiff; some black staining;	
		maint		}	32			no odor; (0,40,60	))	
		moist	0.5		-		H	Olive groop and t	nni fina ta madium anndi tu	
					33		H	fine green and t	an; nne to medium sand; trace	
	1	moist	0.9		-			staining: (5.25.7		
			0.2		34			Stannig, (S)25//	······································	
					-			(0,20,80)		
					35					
					36					
	Į				JU					
					37 —					
				ļ	-	+ +		TD	= 35 feet bgs	
					38	╉━┼	{			
	ł				-	+				
+ a 1	[				39 —	++			· · · · · · · · · · · · · · · · · · ·	
					-	+	-1			
	1				40-		-1			
					-					
	]			1	41					
					42					
					<sup>-</sup> -					
					43	<u> </u>	_			
	l	1			- 1	┥				
				1	44	+			·····	
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Decon	eľ nsult	ta	Project Logged Driller: Drilling Samplin Casing Slot Siz Gravel	No: By: Gregg I Method: ng Method Type: ce: Pack: Elevatio	C101156 S. Mening Drilling Macrocor d: Contine N/A N/A N/A N/A	ger/ C. M re uous	organ Northi	Clier Loca Hole First Stati Well	nt: Con tion: Oakla Diame Depth Water ic Wate Depth	ocoPhillips <b>4276 MacArthur Blvd</b> and, California eter: 3" : 30' Depth: 23.5 ar Depth: 6.21 : N/A Easting	Boring No: SB-7 Date Drilled: 07/09/09 Page 1 of 2
Comple III Yorg	etion	Static Water Level	Moisture Content	PID Reading (ppm)	Sample Identificatior	Depth (feet)	Sam Leover Secover	Analyzed al	Soil Type	LITHOLO	GY / DESCRIPTION
Neat Cement			Moist	3.9 ppm 405 ppm 6.5 ppm 64.1 ppm 64.7 ppm	Air-Knife	1 — 2 2 — 3 3 — 4 4 —			CL CL CL CL	Lean Clay with S dark brown, stiff, carbon odor prese Lean Clay with S moist, medium sti sand, strong hydr contamination, low Lean Clay with S increased stiffnes: and strong petrole Lean Clay with S fine to coarse gra increased sand cc slight hydrocarbo	Sand; light olive green to medium plastic, hydro- ent. Sand; olive green-brown, iff, fine to medium grained ocarbon odor, visible w to medium plastic. Sand; same as above Sand; same as above Sand; same as above, with s; visible contamination, eum hydrocarbon odor. Sand; brown to red brown, ined sand, low plasticity ontent, increasing moisture, n odor, stiff. Sand; same as above with ontent; very stiff to hard.

		Project	No:	C101156		-	Clien	t: Con	ocoPhillips	Boring No: SB-7
		Logged	By:	S. Menin	ger/ C. Mo	orgarL	ocat	ion:	4276 MacArthur Blvd.	Date Drilled: 07/09/09
		Driller:	Gregg D	rilling						Page <b>2</b> of 2
Der	ta	Drilling	Method:	Macrocor	e	F	lole	Diame	ter: 3"	
		Sampli	ng Metho	d: Contin	uous	H	lole	Depth:	30.0'	Z = First Water
Consult	ants	Casing	Type:	N/A		F	rst	Water	Depth: 23.5	
		Gravel	e. Park	N/A N/A		2 V	Moll I	Denth:		_ = Static Groundwater
			Elevatio	n		Northi	ng	Deptit.	Easting	
	· · ·									
Boring			Б	5	ភ្	Sam	nla			
Completion	Static	ent	adir n)	cati	(fee		-	ype		
×fill	Water	oist	Re	am	Ę	ver	λZĢ	Dil T	LITHOLO	GY / DESCRIPTION
Bac	Level		DIG	Ider	Dep	eco	hal	Ň		
						<u>~</u>	~			
		س ا			23		$\overline{\mathbf{A}}$	CI	Lean Clay with Sa	nd' same as above: verv
eut –	<u> </u>	oist				f	$\neg$	SC	strong hydrocarbon	odor.
E	1	Σ	0.5		24				Clayey Sand; brov	vn, medium to coarse
Ŭ –			ppm		25				grained sand with o	lay, medium dense to
eat		et			25-				dense, moist to we	, some olive green
Ž		3			26				smearing.	
					<b>—</b>			SM	Silty Sand; brown,	wet, medium to coarse
I II					27 —			~	grained, strong hyd	roarbon odor.
		list						CL	Lean Clay with Sa	arbon odor
		Ĕ			28—					
					-					
					29			SP	Poorly Graded Sa	nd; light brown.
					30 -					
					] _				Total Depth of Bo	ring = 30' bgs.
					31					
									Soil Sample SB-7@	7.5-8 collected at 15:05
					32—				501 Sample SB-70	15 5-16' collected at 15:10
									7/9/2009.	13.5-10 conected at 15.10
					33				Soil Sample SB-7 @	23-23.5' collected at 15:15
					24				7/9/2009.	
					34					
				1	35	$\square$				
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					36—	┠──┠	_			
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				1	39—	┟┈╻Ӷ				
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					41	╞─┼				
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					42					
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Delta Consultants	Project Logged Driller Drilling Sampl Casing Slot Si Gravel	t No: d By: c <b>Gregg</b> g Method ing Meth i Type: ize: l Pack: Elevati	By: S. Meninger/ C. Morgan <b>Gregg Drilling</b> Method: Macrocore ng Method: Continuous Type: N/A ze: N/A Pack: N/A Elevation Northi Difference for the second				Accophillips 4276 MacArthur Bl and, California eter: 3" 1: 8.5' Depth: N/A er Depth: N/A : N/A Easting	Ivd. Boring No: SB-8 Date Drilled: 07/10/09 Page 1 of 1
Boring Completion E Wat D Lev	ے بے م Moisture Content	PID Reading (ppm)	Sample Identification	Depth (feet) Sau Recovery	Analyzed aid	Soil Type	LITHO	DLOGY / DESCRIPTION
Neat Cement	Very Moist Moist	1453 ppm	Air-Knife & Hand I Augered I			GP	Lean Clay will gravel, with no fines; high pet Gravel with San with presence asphalt; visible Description Note that boring due to drilling co indicated a sligh rig. A sudden pu then recorded w bgs, at which po was felt.	th Sand; thumb to fist sized on-native pumice fill and black roleum hydrocarbon odor.
				14       15       16       17       18       19       20       21       22			Soil sample SE 7/10/2009.	3-8 @ 7-7.5' collected at 13:21

Delta Consultants	Project No: C101 Logged By: S. Me Driller: <b>Gregg Drillin</b> Drilling Method: Macri Sampling Method: Co Casing Type: N/A Slot Size: N/A Gravel Pack: N/A Elevation	)1156 Meninger/ C. Morgan ing crocore Continuous A A A Northin	Client: Cone Location: Oakla Hole Diamed Hole Depth: First Water Static Water Well Depth:	ocoPhillips <b>4276 MacArthur Bl</b> nd, California ter: 3" : 26.5' Depth: 26' r Depth: 24 : N/A Easting	Boring No: SB-9         Date Drilled: 07/08/09         Page 1 of 2         ✓ = First Water         ▼ = Static Groundwater
Boring Completion ╦ Water ♡ B Completion Static Water Level	Moisture Content PID Reading (ppm) Sample	Sample Identification Depth (feet) Recovery Recovery	Analyzed <del>ā</del> Soil Type	LITHO	LOGY / DESCRIPTION
	3.6 ppm 2.5 ppm	1         2         3         4         5         6         7         8         9         10         11         12         13         14         15         16         17         18         19         20         21         22	CL CL CL CL CL	Lean clay wit bronw, medium	h sand; light olive green to n plastidty, thick.

Delta Consultants	Project No: Logged By: S. N Driller: <b>Gregg I</b> Drilling Method: Sampling Method Casing Type: N/ Slot Size: N/A Gravel Pack: N/ Elevatic	C101156 Meninger/ Drilling Macrocor od: Contine (A A	C. Morgan e uous	C H F S V Northin	Location: 4276 MacArthur Blvd. Oakland, CADate Drilled: $07/08/09$ Page 2 of 2Hole Diameter: 3" Hole Depth: 26' $\checkmark$ = First WaterFirst Water Depth: 26' Static Water Depth: 26' $\checkmark$ = Static GroundwaterWell Depth: 26' DorthingEasting						
Boring Completion 	Moisture Content PID Reading (ppm)	Sample Identification	Depth (feet)	Sami Secovery	Analyzed <sup>년</sup>	Soil Type	LITHC	DLOGY / DESCRIPTION			
Veat Cement U			23 24 25 26			CL	Same as abo	ve, with increased sands.			
			27 28 29 30 31 32 33 34 35 36 36 37 38 39 40 41 42 43 44				Total Depth of Soil Sample SI 07/08/09.	of Boring = 26' bgs.         B-9@26' collected @ 18:40			

<b></b>			Project	No:	C101156			Clier	nt: Cor	ocoPhillips		Boring No: SB-10
			Logged	By:	S. Mening	ger/ C. M	organ	Loca	tion:	4276 MacArthur B	lvd.	Date Drilled: 07/08/09
		L	Driller:	Gregg I	Drilling				Oakla	and, California		Page 1 of 2
1D	er'	га	Drilling	Method	Macrocor	e		Hole	Diame	eter: 3"		
-	•		Sampling Method: Continuous     Hole Depth:     23'       Casing Type:     N/A     First Water Depth:     16       Slot Size:     N/A     Static Water Depth:     6.21       Gravel Pack:     N/A     Well Depth:     N/A       Elevation     Northing     Easting							V =	First Water	
Co	onsulta	ants	Casing	Type:	N/A			First	Water	Depth: 16		
			Slot Siz	e:	N/A			Stat	ic Wate	er Depth: 6.21	🗶 =	<ul> <li>Static Groundwater</li> </ul>
1			Gravel	ravel Pack:     N/A     Well Depth: N/A       Elevation     Northing     Easting								
				Elevatio	n		Northir	ng		Easting		
Во	ring		TTHOP									
Com	pletion	Static	TITHOI									
	Ē	Water	stu	pm	fica	L.	∑.	ed	1 <sub>2</sub> 1	LITH	OLOGY	/ DESCRIPTION
	ack	Level	θŨ	ے م	Sa ent	Soil 1 a se epth						
1	Ω Ω		Pili Ide					An				
		Moist	ure Co	ntent				1	CL	Lean clay wit	h sand;	oilve green to
					σ	1				brown, mediur	n plastic	, medium stiff,
					aŭ					mild hydrocart	oon odor	; possible fill material.
	Ø				E H	2						
	. –		ist		e 8			ļ				
	·		θ		Aug	3—						
	- 1				× ۲	-						
					Ai	4		-				
						5			GP	Gravel with S	Sand; gr	ay, fine to medium
			Ъ.			6.	1			gravel with fin	e to med	lium grained sand,
						0				loose, wet, fill	materia	from former UST pit,
			L fc			7_				no odor.		
ヒ						· _						
ле			it.	1.0		8	<u> </u>	<u> </u>				
G			× ⊢	1.0		-		──		· · · · · · · · · · · · · · · · · · ·		
at			US ed	ppm		9—		<u> </u>				
N N			5			-		<u> </u>	SP	Poorly Grade	d Sand	with Gravel: grav to
	· · · · ·		Pe			10				dark gray, fine	e to med	ium grained sand.
			造			11				loose, wet, ve	ry strong	hydrocarbon odor.
			Ň			11 — _						
	l					12-						
				899			<b> </b>	凶	CL	Lean Clay wi	th Sand	; Olive green to brown,
				ppm		13	<u> </u>	-		medium stiff,	low to m	edium plastic, moist,
			ъ			-		$\vdash$	ł	signt nyaroca		or, visible contamination,
			10i			14		<b>†</b>	1			
			2			<b>-</b>	1	1	1			
						15	1	$\square$	1			
		$\nabla$				16_			1			
		_		7.6		10			]			
				ppm		17			1			
							<b> </b>	ļ	sc	Clayey Sand;	Dark gr	ay, loose, wet, fine to
				EAF		18	<b> </b>	$ \downarrow $	4	medium grain	ed sand,	very strong hydrocarbon
				545 nnm		-		Ŕ	•		ontamina	ation, trace fine gravel.
	·		st			19 —	<u>                                      </u>		1			
			٩oi			-	1	+	1			
			~	6.6		20	1	$\square$	CL	Lean Clay wi	th Sand	; brown with olive
				ppm		21			1	green mottling	, stiff, lo	ow to medium plastic,
						<u> </u>			]	fine to coarse	grained	sand, slight odor, trace
						22				fine gravel.		

Del Consult	ta	Project Logged Driller: Drilling Samplir Casing Slot Siz Gravel I	No: By: S. M Gregg D Method: ng Method Type: N/A e: N/A Pack: N/A Elevatio	C101156 eninger/ rilling Macrocor d: Contin A A	C. Morga re uous	n North	Clien Local Oakl Hole First Stati Well	t: <b>Con</b> tion: 42 <b>land, C</b> Diamel Depth: Water c Water Depth:	ocoPhillips 276 MacArthur Blvd. alifornia ter: 3" 28' Depth: 16' r Depth: 28' N/A Easting	∑ = ▼ =	Boring No: SB-10 Date Drilled: Page <b>2</b> of 2 First Water Static Groundwate
Boring Completion	Static Water Level	Moisture Content	PID Reading (ppm)	Sample Identification	Depth (feet)	San Kecovery	Analyzed aldu	Soil Type	LITHO	DLOGY / 1	DESCRIPTION
Neat Cement	¥	moist	1.1 ppm		23— 24— 25— 26—			CL	Same as abov	ve, with in	ncreased sands
					27 28 29 30 31 31 32 33 - 33 - 33 - 34 - 35 - 36 - 37 - 38 - 38 - - 39 - - - - - - - - - - - - -				Soil Sample SE 07/10/09. Soil Sample SE 07/10/09. Soil Sample SE 07/10/09.	B-10@ 12 B-10@ 18 B-10@ 22	-12.5' collected

	)eľ	ta	Project Logged Driller: Drilling Samplir Casing Slot Siz Gravel	No: By: Gregg I Method: ng Method Type: e: Pack: Elevatio	C101156 S. Mening Drilling Macrocore d: Continu N/A N/A N/A D	ger/ C. Mc e Jous	Northin	Clier Loca Hole First Stat Well	nt: <b>Con</b> Ition: Oakla Diame Depth Water ic Water Depth	Accophillips 4276 MacArthur B and, California eter: 3" : 44' Depth: 42' er Depth: N/A : N/A Easting	Ivd.       Boring No: SB-11 Date Drilled: 07/10/09 Page 1 of 2         ☑       = First Water         ☑       = Static Groundwater
Com	pletion	Static Water Level	Moisture Content	PID Reading (ppm)	Sample Identification	Depth (feet)	Samp Lia Samp	Analyzed	Soil Type	LITH	HOLOGY / DESCRIPTION
Neat Cement				405 ppm 6.8 ppm 16.7 ppm 108 ppm 12.1 ppm	Air-Knife & Hand Augered	1			CL CL CL CL	Lean clay wit brown, mediur plasticity.	th sand; light olive green to m stiff to stiff, low to medium th sand; olive green, gray, medium coarse grained sand; hedium grained gravel; low st; strong hydrocarbon odor. th sand; entirely green in color, ard. th sand; brown and olive very stiff to hard, very strong bdor, low to medium plastic. th sand; decreasing sand um to high plasticity, increasing ht hydrocarbon odor, very stiff fine gravel, visible contamination. is very hard direct pushing. th sand; brown with green mottling ic, trace fine gravel, slight odor, siture.

Del <sup>Consult</sup>	tants	Project Logged Driller: Drilling Samplin Casing Slot Siz Gravel	No: By: S. M Gregg D Method: ng Method: Type: N/A re: N/A Pack: N/A Elevation	C101156 eninger/ <b>rilling</b> Macrocor d: Contin A A	C. Morga re uous	n North	Clier Loca Oak Hole First Stati Well	nt: Cond ition: iand, C Diamet Diamet Depth: Water I ic Water Depth:	bcoPhillips 4276 MacArthur Bl A eer: 3" 44' Depth: 42' Depth: 42' Depth: N/A N/A Easting	lvd. ▽ = ▼ =	Boring No: SB-11 Date Drilled: 07/10/09 Page 2 of 2 = First Water = Static Groundwater
Boring Completion	Static Water Level	Moisture Content	PID Reading (ppm)	Sample Identification	Depth (feet)	Recovery Sau	Analyzed a	Soil Type	LITHO	OLOGY	/ DESCRIPTION
		Wet	5.8		23—			CL	Poorly grade	d sand;	brown, wet, no odo
	-		ppm		24				Wetness in sm	all porti	on-Not first water.
	_				25—			CL	Same as above increasing same	<b>ve;</b> less d conter	visible contaminatio
	_				26—						······
<u> </u>	-				27						
	_		67		28				lean clay wit	th cand	hrownand olive are
			ppm		29				increasing moi	isture, le	ess visible contamina
	_				30						
	_				31						
	-				37						
- Jent	-		6.8 ppm		-			CL	Same as above visible contame	<b>ve;</b> incre ination,	easing sand content, red brown.
Cen							-				
Neat	-				34		_				
	-				35				······································		······································
	-		5.7		36			СГ	Same as abo	<b>ve;</b> incr	easing moisture
	-		ppm		37				conent.		
[]					38			]			
					39		<u>}</u>				
	_		7.5		40		-				
	-1		ppm		41		$\overline{\nabla}$	CL	Same as abo	ve; wet	•
	-1	V			42		$\vdash$				
					43	ļ					
					44						·
	1				· · ·				SB-11 samples	of Borir	<b>1g = 44' bgs.</b>

			Project	No:	C101156		(	Clien	t: Con	ocoPhillips		Boring No: SB-12
			Logged	By:	A.Buehler		1	_ocat	tion:	4276 MacArthur Bl	vd.	Date Drilled: 06/14/10
	الم		Driller:	Gregg D	rilling					Oakland, CA		Page 1 of 3
	en	La	Drilling	Method:	Sonic		ł	Hole	Diame	ter:	_	
_	<u> </u>		Samplin	ng Metho	d:		I	lole	Depth	;		= First Water
Cor	nsulta	ants	Casing	Туре:			I	First	Water	Depth:	_	
			Slot Siz	e: Doolu			5	Stati	c Wate	r Depth:	<b>.</b>	= Static Groundwater
			Graver	Flevatio	n	Γ	Northi	na	Depth	Fasting		
				Licvario			Norem	ng		Lasting		
Bori	ng			_	c					·····		
Compl	etion	Static	e t	ding	le atio	eet	Sam	pie	be			
1 U		Water	istu	Rea	ific	р 4	P 2	zed	È	LITHO	LOGY	/ DESCRIPTION
ack		Level	∣ຮິບິ	<u> </u>	Selent	ept	0		Soi			
<u>ш</u>				۹.	Id		Re	۲				
-												
	I					1 1						
	_				- Per							
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	_			5.2	SB-12	۰ I			CL	Sandy lean clay with	gravel	; brown with
	I				@ 12	7—				visible green contam	ination	; moist.
nt	_				9:44		Serie Series					
me	I —					8-						
Cel	-					-						
at						9—						
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· •				30.1	SB-12	110-			CL	Sandy lean clay clay	; light l	brown; wet.
					@ 10	1 1	200				·	
					· 9:58	<u> </u>						
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				NA	SB-12	15-			CL	Same as above. Sat	urated.	
					@ 15	16						
					10:25	L						
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	[					18-	-					
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						19-						
				64.7	SB-12	20 —	-		CI.	Sandy lean clay: bro	own: m	oist.
					@ 20			979793 1				
					10:36	21				x		
					1	22						
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			Project	No:	C101156		Cl	ent: Con	ocoPhillips		Boring No: SB-12
			Logged	By:	A. Buehle	er	Lo	cation:	4276 MacArthur Bl	vd.	Date Drilled:
		I	Driller:	Gregg D	rilling				Oakland, CA	<u> </u>	Page 2 of 3
	ρι	ra	Drilling	Method:	Sonic		Ho	le Diame	ter:		
		<b>L</b> M	Samplin	ng Method	d:		Но	le Depth:		$\nabla$ =	= First Water
Cor	nsulta	ants	Casing '	Туре:			Fir	st Water	Depth:	—	
			Slot Siz	e:			St	atic Wate	r Depth:	▼ =	= Static Groundwater
			Gravel	Pack:			W	ell Depth:			
				Elevatio	n		Northin	)	Easting		
	Bouing Combletion Static Sample Content (ppm) Static feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) feet) f										
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LE S	Backfil Backfil Mois Conf Identifi Cpp Conf Isar Analyze								LITHO	LOGY /	DESCRIPTION
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Več						-		-			
-				10.2	SB-12	26 —			Same as above very	1 stiff wi	th large gravel
				1012	@ 26	_		-1			
					10:45	27 —		-1			
	-				10110			-1			
						28		-			
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						30					
				NA	SB-12			CL	Same as above; dan	np.	
					@ 30	31 —		_			
					10:47			_			
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	I —					33		-			
						· -		-			
						34	1993 A.S.	-			
						-					
				3.5	SB-12	35 —	9283 33		Same as above.		
					@ 35	-					
					10:58	30					
						37					
						38					
						<u> </u>		_			
						39		_			
						-	+ +				
						40	+				
						-	+		into recovery.		
				5.6	SB-12	41		- CL	Sandy clay: <10% s	sands h	prown: moist.
				5.0	@ 41	<sup>-</sup>			slight odor.		
					11:42	42		-1			
						10 -					
						43					
						44					

	Project	t No:	C101156	5	Clier	nt: Con	ocoPhillips	Boring No: SB-12
	Delta       Logged By:       A. Buehler       Location:       4276 MacArthur Blvd.       Dai         Diller:       Gregg Drilling       Oakland, CA       Pag         Drilling Method:       Sonic       Hole Diameter:       Sampling Method:       Sirter Water Denth:							d. Date Drilled:
	Driller	Gregg [	Drilling				Oakland, CA	Page 3 of 3
I)elta	Drilling	Method:	Sonic		Hole	Diame	ter:	
	Sampli	ing Metho	d:		Hole	Depth	:	💭 = First Water
Consultants	Casing	Type:			First	Water	Depth:	
	Slot Si	ze:			Stat	ic Wate	er Depth:	👿 = Static Groundwater
	Gravel	Pack:			Wel	Depth		
		Elevatio	n		Northing		Easting	
Dering		T	r <u> </u>		T			
Completion	0	gu	<u>io</u>	et)	Sample	6		
Sta	ic trut	m (in	ple	(fe	ס - ק	Ž		
		P Re	San ntifi	Ę	vei	iii l		LOGY / DESCRIPTION
Bag	. <u>≥</u> 0	I II	[dei v	Del	ecc	Ň		
						—		
			CP 13	45 —			Same as above with 2	0% graval: 10%
— sup			0 45	-			Same as above with 2	
u u u u u u u u u u u u u u u u u u u			11.45	46 —		1	Sandy clay: light brow	n: 20% sand no
- Ce			11.45			1	odor.	
at				47				
S S								
				48		1		
				40 -		1		
				49-			Same as above, with 1	15% gravel and 15%
				50 —	10 40 A		sand.	
		3.3	SB-12	-	<u> </u>		Boring terminated a	t 50 feet bgs.
			@ 50 11.54	51 —	+			
			11.5 /	52 -		1		
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				65 —	+	1		
				-	+	1	·	
				66—		1		

		Project	No:	C101156		Cli	ent: Cor	nocoPhillips		Boring No: SB-13
		Logged	By:	A.Buehler	-	Loc	ation:	4276 MacArthur B	lvd.	Date Drilled: 06/18/10
		Driller:	Gregg I	Drilling				Oakland, CA		Page 1 of 1
)	ra	Drilling	Method	Sonic		Но	e Diam	eter:		
	CU	Sampli	ng Metho	od:		Ho	e Depth	1:		First Water
Consulta	ants	Casing	Type:			Fir	st Water	r Depth:		
		Slot Siz	e:			Sta	tic Wate	er Depth:	`⊻=	Static Groundwater
		Gravel	Pack:			We	ll Depth	1:		
			Elevatio	on		Northing		Easting	1	
Boring				<u>.                                    </u>		<del> </del>	1			
Completion			þ	5	۲Ţ	Sample				
	Static	ent	adii	e di	(fee	ס' <	λbe			
kfil	Water	ont	ppr	titi	Ę	ver vze		LITHO	LOGY /	DESCRIPTION
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Ne.				SB-13	5		-	Black sandy granu	lar tar-li	ke material verv
				@ 6			1	strong odor		ince material, very
<b>—</b>				8.45	6—		-	Boring termi	nated at	6 feet bas due to
				0.15	-		-	refusal.	nuceu a	to leet bys due to
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	-		Project	No:	C101156		Clier	nt: Con	ocoPhillips		Boring No: SB-14
			Logged	By:	C. Morgar	ı	Loca	tion:	4276 MacArthur Bl	lvd.	Date Drilled: 06/17/10
			Driller:	Gregg D	rilling				Oakland, CA		Page 1 of 3
		ta	Drilling	Method:	Sonic		Hole	Diame	ster' 3"		
		La	Samplir	n Metho	d		Hold	Donth		∽ -	- First Watan
			Sampin	iy Metho	u:		Hore	Depth			- First water
Col	nsuita	ants	Casing	Type:			First	water	Depth:	_	
			Slot Siz	e:			Stat	ic Wate	er Depth:	⊻ =	= Static Groundwater
			Gravel	Pack:			Well	Depth			
				Elevatio	n		Northing		Easting		
Bor	ing			·	I						
Compl	etion			þ	5	Ŧ	Sample				
Compi	cuon	Static	ure int	⊂ gi	atio	fee		,pe			
9		Water	isti nte	pr Sea	ific n	- -	er)	Ê	LITHO	LOGY /	DESCRIPTION
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								CI	Clay: green vi	isible cor	stamination: with
	—							UL.	some tan blac	k and w	hite gravel
					7	1-			some carr, blac		nite graver.
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Ê				3335	SB-14	8-		CL	Lean Clay with	sand: o	ray with visible green
ပီ 📃					@ 8	_			contamination	. strona	odor: moist
at					11:50	9-				, early	
P P											
				5553	SB-14	10-					
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					11.50	11					
					11.50		-				
						12-					
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						13-					
						14					
				107.5	SB-14	15-	1894. 		Same as abov	e, with s	small coarse grained
					@15	10		CL	white and tan	gravel a	t 16.5 to 18 feet bgs;
					11:54	16-			moist.		
						10					
						17_					
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						10			······		
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						1.	365	1	····		· · · · · · · · · · · · · · · · · · ·
						19-		1			
	I −						188	1			
				11.2	SB-14	20-		CL	Same as abov	e with i	ncreased fines at 21
		$\nabla$			@ 2n				feet has		ner casca nines at 21
		<u> </u>			12.01	21		1	Same as abov	o with	continued increased
	-				12.01			1	finect gravel a	den proc	ont Increased
						22		lee l		with an	cill.
				L	L		288.SQ-	اهر		with sar	iu, mump-sized white

	Projec	t No:	C101156		Clier	nt: Con	ocoPhillips		Boring No: SB-14
	Logge	d By:	C.Morgar	ı	Loca	ition:	4276 MacArthur Bl	vd.	Date Drilled: 06/17/10
	Driller	: Gregg D	Drilling				Oakland, CA		Page 2 of 3
	Drilling	Method:			Hole	Diame	ter:		
	Sampl	ing Metho	d:		Hole	Depth		▽ =	= First Water
Consultants	casing	Type:			First	. Water	Depth:		
	Slot Si	ze:			Stat	ic Wate	r Depth:	=	= Static Groundwater
	Grave	Pack:			Well	Depth			
		Elevatio	n		Northing		Easting		
Dering			1	L	· · · · · · · · · · · · · · · · · · ·	r			
Completion		ē	ы	j;	Sample				
Sta	tic In te	m (in the second s	ple	(fee	ס <	, ype			
	ter Isio	Re [ppi	am	Ę	ver	<u> </u>	LITHO	LOGY /	DESCRIPTION
Ba Ba		1 H	der	Dep	eco	Ň			
		+	<u>↓</u>						
				23—			rock present; i	ess odor	then at previous
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u n n n n n n n n n n n n n n n n n n n				24 —					
ଅ –									
at				25					
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		11.9	SB-14	26-		СН	Sandy fat clay	with gra	avel; gray, tan.
			@ 26	27		1	moist.	-	
			12:07	2/					
				28					
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				29		-			
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		ΝΔ	SB-14	30			Same as above	•	
			@ 30	-				<b>.</b> .	
			12:07	31		1 ·			
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				34 —		4			
						4			
		10 5		35	╇╋			+ h	
		10.5	0 35	-			Lean clay; ligh	t brown	to tan; some small
			12.16	36—		1	grameu graver	, 11111, 5	angrit odor, moist.
			12.120			1			
				37—		1			
			:	-		1			
				38-		1			
				39-		1			
						1			
		1 10 -		40					
		18.5	SB-14	-			Same as abov	e, with i	ncreased moisture
				41		-	and softness.		·
			12:22	-		-			
				42		-			
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		Project	No:	C101156	;	Clier	nt: Con	ocoPhillips	Boring No:	SB-14
		Logged	By:	C.Morga	n	Loca	tion:	4276 MacArthur Blv	Date Drille	
	-	Driller:	Gregg [	Drilling				Oakland, CA	Page 3 of	3
	ta	Drilling	Method:			Hole	Diamo	Story	rage 5 01	
	La	Commit		<i>.</i> н.				iter:		
		Sampli	ng metho 	a:		Hole	Depth		$\underline{\mathbf{W}}$ = First Water	r .
Consulta	ants	Casing	Type:			First	Water	Depth:		
		Slot Siz	ze:			Stat	ic Wate	er Depth:	🛄 = Static Grou	undwater
		Gravel	Pack:			Well	Depth			
			Elevatio	n		Northing		Easting		
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Boring			Ð	5	÷	Comple			_	
Completion	Static	it re	⊆ ġ	atio	fee	Sample	, pe			
	Water	istu nte	Sea	цü	с 	ery red	Ē	LITHO	LOGY / DESCRI	PTION
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	$\overline{\nabla}$					323		Possible seco	nd water bearing	7000
	<u> </u>		14 5	SB-14	45—		CI	Sandy lean cl	av with cilt to 48	foot has
	-		11.5	00 I 4 @4E	-			then clay with	ay with sit to 40	leet bys,
				12.20	46		-		i sanu anu gravei	to bottom
- G	-			12:28	_			or boring.		
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ea —									· · · · · · · · · · · · · · · · · · ·	
Z					48					
					49					
					50					
			10.6	SB-14	50					
				@ 50			r — —	Boring term	inated at 50.5 f	eet bas.
				12:28	51		1			
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			Project	No:	C101156		Clie	nt: Con	ocoPhillips	Boring No: SB-15
			Logged	By:	C. Morgar	ו	Loca	ation: 4	276 MacArthur Blvd.	Date Drilled: 06/17/10
	<b>–</b> I-		Driller:	Gregg D	Drilling			Oakla	ind, CA	Page 1 of 2
	er	га	Drilling	Method:	Soni c		Hole	e Diame	ter: 3"	
	<b>U</b> .		Samplir	ng Metho	d:		Hole	e Depth	:	$\nabla$ = First Water
Co	nsulta	ants	Casing	Туре:			First	t Water	Depth:	
			Slot Siz	e:			Stat	ic Wate	r Depth:	👤 = Static Groundwater
			Gravel	Pack:		r	Wel	Depth		
				Lievalit			Northing		Easung	
Bor	ing			<b>D</b>		$\sim$	6			· · · · · · · · · · · · · · · · · · ·
Comp	letion	Static	nt e	din <u>e</u>	atio	feet	Sample	þe		
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		Level	ĔŬ	<u>а</u> )	dent S	Dept	ecol	So		
				ш. 	й		Å Å		·	
						_			Sandy gravel;	brown.
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				14.8	SB-15	-		СН	light fat clay,	with fine grained sand; at
		@ 5 2:01						-	otherwise cons	stant lithology to 11.5 foot
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				63	SB-15	15 —		Сн	Same as abov	e to 16 feet bas
				0.0	@ 15	-			Same as abov	
					2:04	16		ICL -	Sandy lean cla	av; fine grained: increased
						<sub>17</sub> -		1	moisture.	,, <u> </u>
						1/		1		
		$\nabla$				18		GC	Sandy gravel	with clay from 17.5 to 18 feet;
						<sup>10</sup> -		4	moist-saturate	ed.
						19		4		
						-		4		
						20 —	+ $+$	4		
								4		
				12.3	SB-15	21		GC	Same as abov	e, with thumb-sized, angular
					@ 21	<sup>_</sup>		1	to subangular	gravel.
					2:10			1		

		Project	No:	C101156			Clien	t: Con	ocoPhillips		Boring No: SB-15
		Logged	Ву:	C.Morgan	I		Loca	tion:	4276 MacArthur Bl	vd.	Date Drilled: 06/17/10
		Driller:	Gregg D	Drilling					Oakland, CA		Page 2 of 2
l Deľ	га	Drilling	Method:				Hole	Diame	ter:		
		Samplir	ng Metho	d:			Hole	Depth:		∑ =	= First Water
Consulta	ants	Casing	Туре:				First	Water	Depth:	_	
		Slot Siz	e: Doele				Stati	c Wate	r Depth:	⊻ =	<ul> <li>Static Groundwater</li> </ul>
		Graver	Flevatio			North	well	Deptn:	Easting		
			Licialio	/11		11010	ing		Lasting		
Boring			5	Ę	÷						
Completion	Static	a te	din	atio	feet	Sar	nple	/pe			
Ψ.	Water	oistu	Rea	tific	E E	) Š	zed	ii J	LITHO	LOGY /	DESCRIPTION
Sach	Level	ΣŬ	Ę,	den xi	)epi	l õ	ylar	So			
			<u> </u>	н П		a a	Ā				
					23—						
= _					_						
	-				24 —						
- Ü									·		
eat					25						
N N					26						
_					- <sup>-</sup>					·····	
l II			10.9	SB-15	27 —	20		GC	Same as above	е.	
				20.5	_		<u> </u>		· ···· ····		
				2.10	28 —			C	Sandy lean cla	v with w	uith gravel fine
-					_			CL	grained sands	and gra	vel, more saturated
					29				(saturation due	e to sluf	f during
					30				drilling)		<u> </u>
			5.2	SB-15							
				@ 30	31 —						
				2:18							
·					32 —						
					33—	2			· · · · · · · · · · · · · · · · · · ·		
					24						
					54						· · · · · · · · · · · · · · · · · · ·
					35—						
			10.7	SB-15			<u> </u>	CL	Same as above	e, moist	
				2.74	36		<u> </u>				
				2.27			-				
					37				·		
					20 -						
					38						
					39—						
					1						
			26		40				Carra an abay	-	
			2.0	<u> </u>					Same as abov	e	
· · · ·				2:40	41			┝╼╍╼	Boring temin	ated at	41 ft due to
—					-	$\vdash$	1		refusal.	accu di	
					42						
					43			ĺ			
					44	_	ļ				

Delt Consultar	a nts	Project Logged Driller: Drilling Samplir Casing Slot Siz Gravel I	No: By: Gregg D Method: ng Method Type: e: Pack: Elevatic	C101156 A. Buehle <b>brilling</b> Sonic d: Direct P	r Yush	Location: Hole Diam Hole Dept First Wate Static Wai Well Dept Northing			4276 Mac Arthur Blvd. Oakland, CADate Drilled: $6/17/10$ Page 1 ofeter:3" $: 5.5'$ Depth: $: Easting$ $\checkmark = First Water$ Easting $\checkmark = Static Groundwater$		
Backfill	Static Water Level	Moisture Content	PID Readir (ppm)	Sample Identificati	Depth (fee	Recovery	Analyzed	Soil Type	LITHO	DLOGY /	DESCRIPTION
Image: Second		moist moist	53.4 90.1 13.7 12.0	eyiux-viv SB-16 (@) 12:46 SB-16 (@) 10:49 SB-16 (@) 12:55 SB-16 (@) 12:55 SB-16 (@) 12:55 SB-16 (@) 12:55	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$			CL CL CL GC	Lean clay; bro sand, moist, st Lean clay; ligh sand, very der Same as above mottling to 16 Same as above Clayey gravel	wn with trong odd t brown, nse/firm, e, with li feet bgs e to 21 f with san	green mottling, 5% or. <5% fine grained moist, strong odor. ght brown and orange eet bgs.

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Del consult	ta <sup>ants</sup>	Project Logged Driller: Drilling Samplir Casing Slot Siz Gravel	No: By: Gregg D Method: ng Method Type: e: Pack: Elevatio	C101156 A. Buehle Drilling Sonic d: Direct f	er Push	Cli Lo Ho Fir Sta We Northing	Location:4276 Mac Arthur Blvd. Oakland, CADate Drilled: $6/17/10$ Page 2 of 3Hole Diameter:3" Hole Depth: $5.5'$ First Water Depth: Static Water Depth: Well Depth: $\checkmark =$ First WaterWell Depth: $\blacksquare =$ Static GroundwaterTthingEasting				
Completion	Static Water Level	Moisture Content	PID Reading (ppm)	Sample Identificatior	Depth (feet)	Sampl Recovery	Soil Type	LITHO	)LOGY / DESCRIPTION		
			9.3	SB-16 @ 25' 1:10	23 — 24 — 25 — 26 — 27 — 28 —		CL	Sandy Lean cla Sandy lean cla At 25' bgs, cla is more firm, c	ay, brown, 15% sand, damp iy; brown, wet. y contains more gravels, and damp.		
	-		12.3	SB-16 @ 30' 1:10	29 — 30 — 31 — 32 —						
			7.7	SB-16 @ 34' 1:25	34 — 34 — 35 — 36 — 37 —		CL	Sandy lean cla some orange r <15% sand, d	ay with gravel; brown and mottling; <5% gravel and lamp.		
			12.2	B-16 @ 40' 1:37	38 — 39 — 40 — 41 — 42 — 43 —			Same as abov	e		

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		Project	No:	C101156	5	Clier	nt: Con	ocoPhillips			Boring No: SB-16
		Logged	By:	A. Buehl	er	Loca	tion:	4276 Ma	ac Arthur Blv	d.	Date Drilled: 6/17/10
		Driller:	Gregg [	Drilling				Oakland, (	CA		Page 3 of 3
	ta	Drilling	Method:	Sonic		Hole	Diame	ter:	3"		
	ιu	Sampli	na Metho	d' Direct	Push	Hole	Denth		~ קקי	<u> </u>	First Water
Consulta	ante	Casing	Type:	a. Direct	1 usii	Firet	Water	Donth:	5.5		
Consulta	ints	Slot Si-	1990.			Ctoti		r Donth		<b>.</b>	Static Craw I
		Gravel	Dack:			Woll	Donth	i Deptii.			- Static Gloundwater
			Flovatio	n	1	Northing	Depth		Eacting		
			Licitatio	••		Noranng			Lasting		
Boring			ľ	-		Г					
Completion		ىب بە	ing	ig "	et)	Sample	ψ				
_	Water	ten	m (n	icat	(fe	<u>ज</u> ्र	Γγρ		LITUO		
kfil		siol Son	a d	fil	닱	vei yze	-		LIIHO	LUGY /	DESCRIPTION
Bac	20101	20		gev i	Dep	eco nal	Ň	1			
				H		R A					
					45						
			11.5								
en 📃					46						
ынары —				SB-16			CL		Clay; brown v	with <5	% coarse grained sand
Ŭ				©	47				very dense; r	noist.	
lat				46'	4/				······		
Ne _				1:46	-						
					48		CL		Clay; tan wit	h orang	e mottling <10% sand
					-				with some ar	avel: m	oist: verv dense/firm
			8.3	SB-16	49						
				ദ	-						
· · · · · · · · · · · · · · · · · · ·					50	2020 2200	┝		Bowing Townsi		
				1.40	-				boring remin	nateu u	50 bys.
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					52	+ +					
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Delt Consulta Boring Completion	Static Water	Project Logged Driller: Drilling Samplin Casing Slot Siz Gravel	No: By: Gregg D Method: ng Method: Type: ce: Pack: Elevatio	C101156 C. Morgar <b>Frilling</b> Sonic d: Direct P	th (feet)	Clie Loca Oal Hold Firs Stat Wel Northing Sample	nt: <b>Con</b> ation: <b>cland, C</b> e Diame e Depth: t Water cic Water l Depth:	ocoPhillips 4276 Mac Arthur B taliforn ia ter: 3" Depth: r Depth: Easting LITHO	Ivd.Boring No: SB-17 Date Drilled: 06/16/10 Page 1 of 3 $\bigtriangledown$ $\bigtriangledown$ $\bigtriangledown$ $\blacksquare$ $\checkmark$ = First Water $\checkmark$ = Static GroundwaterLOGY / DESCRIPTION
Bac	Levei	ΣŬ	DId	S	Dep	Reco	Š		· · · · · · · · · · · · · · · · · · ·
Neat Cement           I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I <td< td=""><td></td><td></td><td>259.0 239.0<sup>,</sup></td><td>SB-17 @ 5 10:25 SB-17 @ 10 10:28</td><td></td><td></td><td>CL</td><td>Sandy lean cla contamination; chips and coars thumb sized gr Same as above fine grained. C coloring with h Strong petrole</td><td>y; gray with visible green ; trace ammount of wood se grained sand, pea to ravel from 6-8 feet bgs. e, however sand becomes lay has more tan and orange ints of green contamination. um hydrocarbon odor.</td></td<>			259.0 239.0 <sup>,</sup>	SB-17 @ 5 10:25 SB-17 @ 10 10:28			CL	Sandy lean cla contamination; chips and coars thumb sized gr Same as above fine grained. C coloring with h Strong petrole	y; gray with visible green ; trace ammount of wood se grained sand, pea to ravel from 6-8 feet bgs. e, however sand becomes lay has more tan and orange ints of green contamination. um hydrocarbon odor.
	V		19.4 79.4	SB-17 @ 15 10:30 SB-17 @ 20 10:11	13 — 14 — 15 — 16 — 17 — 18 — 19 — 20 — 21 — 22 —		CL	Sandy lean cla sized gravel, g hydrocarbon o Lean Clay with white and red more coarse g Sandy lean cla white trace roo thumb sized g Same as above becomes orang	y with gravel, pea to thumb reen and gray, moist, strong dor. sand; tan, orange and some mottling; more firm, and rained sand; moist. y with gravel, green, and ots; rounded to subrounded, ravel, very moist. e, however sandy clay ge to tan; still very moist.

	Project	No:	C101156			Clier	it: Con	ocoPhillips	Boring No: SB-1	.7
	Logged	l By:	C. Morga	n		Loca	tion:	4276 Mac Arthur B	vd. Date Drilled: 06/1	.6/10
	Driller:	Gregg [	Drilling			Oak	land, C	aliforn ia	Page 2 of <b>3</b>	
Deila	Drilling	Method:	Sonic			Hole	Diame	ter: 3"	_	
	Sampli	ng Metho	d: Direct I	Push		Hole	Depth:		📡 = First Water	
Consultants	Casing	Туре:				First	Water	Depth:	—	
	SIOT SIZ	ze: Doeki				Stati	c Wate	r Depth:	$\mathbf{V}$ = Static Groundwate	er
	Graver	Flevatic		r	Nort	weil	Deptn:	Easting		
		Elevatio	///		NOT	mig		Lasting		
Boring		6	c							
Completion Static	ut re	din (	atio	feet	Sa	mple	pe			
🔁 Water	bistu	Rea	tific	ت ج	ې ک	zed	Ĺ,	LITHO	LOGY / DESCRIPTIO	N
Level	žΰ	i g <sup>i j</sup>	fent Si	ept	00	Jaly	Soi			
		<u>م</u>	Ц		Re	AL				
				23—			CL	Same as above	, with increased firmne	SS.
1 H - H										
ц — ц				24						
				-						
at		NA	SB-17	25—				· .		
No			@ 25	-	-				······································	
			10:17	26—						
				<sub>27</sub> -						
				2/						
· ·				28						
				29—	_					
				_						
	125		12.5 SB-17	30 —				Same as above		
		12.5	@ 30			1.49			•	
			10:20	31	1.1988656					
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		10 5	CB 17	40 —				Como no altar	· · · · · · · · · · · · · · · · · · ·	
		10.5		-				Same as above	· · · · · · · · · · · · · · · · · · ·	
			10:44	41 —			1			
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		l		42			1			
				42.			1			
				44			l			

		Project	No:	C101156	;	С	ient: <b>Co</b>	ocoPhillips		Boring No: SB-17
		Logged	By:	C. Morga	in	Le	cation:	4276 Mac Arthur Blv	d.	Date Drilled: 06/16/10
		Driller:	Gregg [	Drilling		o	akland,	Californ ia		Page 3 of 3
1)011	ra	Drilling	Method:	Sonic		н	ole Diam	eter: 3"		
	LU	Sampli	ng Metho	d: Direct	Push	н	ole Depth	:	∽ =	First Water
Consulta	ints	Casing	Type:			Fi	rst Water	Depth:		
		Slot Siz	e:			S	atic Wat	er Depth:	<b>X</b> =	Static Groundwater
		Gravel	Pack:			Ŵ	ell Depth	:		
			Elevatio	n		Northin	g	Easting		
Boring			þ	5	С С					
Compretion	Static	ent	n) adir	ble	fee					
cfill	Water	bit i	ppr	titic	EP ()	/er/	II T	LITHO	LOGY /	DESCRIPTION
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Cen –							_			
t			26	0.0 4 7	47 —					
lea –			36	SB-17	_			same as abov	ve.	
Z		· · · ·		@ 4/	48—					
				11:02	_		_			
					49	+	-			
					-		-		····	
			9.2	SB-17	50					
				@ 50				Boring term	inated	at 50.5 feet bas
				11:03	51					
					52					
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			Project	No:	C101156		Cli	ent: Cor	ocoPhillips		Boring No: SB-18
			Logged	By:	C. Morgar	า	Loc	ation:	4276 MacArthur B	lvd.	Date Drilled: 06/14/10
	_ []		Driller:	Gregg D	Prilling				Oakland, California		Page 1 of 1
	eľ	га	Drilling	Method:	Soni c		Ho	e Diame	eter:		
		C M	Samplir	ng Metho	d:		Ho	e Depth	:		First Water
Co	nsulta	ants	Casing <sup>-</sup>	Type:			Fir	st Water	Depth:		
			Slot Siz	e:			Sta	tic Wate	er Depth:	▼ =	Static Groundwater
			Gravel	Pack:			We	ll Depth	:		
				Elevatio	on		Northing		Easting		
Bor	ing		· · · ·		r			<u> </u>			
Comp	letion		<b>a</b>	δ	lon	ţ;	Sample				
	-	Static	ture	n) adi	ple	(fee		, av			
a a		Water	oist	P B	am	£	ver		LITHO	DLOGY /	DESCRIPTION
	Dad	Level	ΣΟ	OI4	der	Dep	ecc	N N			
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Jer				12.5	SB-18	8—		<u> </u>			
en (					@ 7.5	-			Fat clay, gray	and gree	en, some thumb sized
					3:05	9—		_	white gravel/r	ock, moi	st
lea						-	+	-			
2		-		25 1	CP. 10	10		-			
				25.1		-					
					3.13	11		-		~ ~ ~	
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						13		-			
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						14					
						16		1	Fine grained s	ilty sand	; black, saturated,
				476.0	SB-18	112-		SM	very strong oc	dor	
					@ 15	16_		СН	Fat clay with s	sand, tan	and gray, visible
					3:19				contamination		
						17_					
						ļ · ·					
						18-					
						· · ·		4	Clay with silt a	and sand	; tan to gray;
						19-		4	increased moi	sture; fir	ne grained sand more
					5B-18	- 1			abundant in b	ottom of	sample with tan and
				11.1	@ 20	20-			orange colorin	<u>ig.</u>	
	_				3:26	-	+	4	Boring termi	nated a	t 20 feet bgs.
						21-	+ +	-			
	_					-	+ +	-			
						22 —		-			
<u> </u>					L	L		1	_1		

		Project	No:	C101156			Clier	t: Con	ocoPhillips		Boring No: SB-19
		Logged	By:	C. Morgar	1		Loca	tion:	4276 MacArthur Bl	lvd.	Date Drilled: 06/15/10
	1+-	Driller:	Gregg D	Drilling					Oakland, California		Page <b>1</b> of <b>1</b>
	ILd	Drilling	Method:	Sonic			Hole	Diame	ter: 3"	$\nabla$	
Consi	iltante	Casing	Tyne:	u.			First	Water	Denth:	<u> </u>	- Filst Water
Const	ntunts	Slot Siz	e:				Stati	c Wate	r Depth:	▼ :	= Static Groundwater
		Gravel	Pack:				Well	Depth	•		
			Elevatio	n		North	ing		Easting		
Boring	1		r			1					
Completio	n Chat	y the last	ing	etion	set)	Sam	nple	e			
Ē	Wate	stur	ead pm)	fica	l €	Σ	fed	Тур			DESCRIPTION
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t					′ _						
nei			33.7	SB-19	8			CL	Lean clay; gra	y with v	isible green
Cer				2.30	-				contamination	, some g	gravel.
at (				2.50	9						
Ze					-						
_			26.9	SB-19	10			CL	Same as abov	e.	
				@ 10	11-						
				2:30	-	02036	<u> </u>				······
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					13-						
	_			SB-19							
			55 2	2.30	15 —				Sandy lean da	av light	brown to tany some
	-			2.50	-				green contami	ination r	present; verv firm:
-					16				moist.	· - · · r	, , , , , , , , , , , , , , , , , , , ,
					17						
					- <sup>1</sup>		<u> </u>				
- 10					18						
				SB-19	-		<u> </u>				
	-1			@20	19			СН	Fat clay with o	gravel; d	gray and some orange
			58.4	2:52	20.				increased moi	sture; s	light odor.
					20				Boring termi	nated a	at 20 feet bgs.
-	_				21 —	_	<u> </u>				
	_				-	-					
-					22	1					

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<b></b>			Project No	o: C1011	56203		Client: ConocoPhillips Boring: SV-1					
			Longed B	v S. Men	inger/C	. Morgan		Loca	tion · O	akland CA	D	age 1 of 1
			Driller: C	,. 01	inger/ c			Data				
				legg				Date	Drinec		Location Map	
	-	ld	Drilling M	ethod: Ha	nd Aug	er		Hole	Diame	ter: <b>3.5</b> "		
			Sampling	Method: I	Hand D	rive		Hole	Depth	: 5'		
Con	sulta	ints	Casing Ty	pe:	N/A			Well	Diame	ter: N/A		
			Slot Size:		N/A			Well	Depth	N/A		
			Gravel Pa	ck:	3.5' - !	5'	T	First	Water	Depth: N/A		
							$\nabla$	Stati	ic Wate	r Depth: N/A		
We	1				_		T					
Comple	etion	vel	பப	gui	L LO	G	San	nple	e			
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Ξ		E	ont	PP PP	an lititi	£	- Sei	Za	Ē	LIIH		ESCRIPTION
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		-		<u>а</u>	<sup>≍</sup>		2	5				
Asphalt										Sand with G	Gravel (SM)	- Possible fill
	_								SM	material, bro	wn to red bi	rown, moist, medium
Bent			Moist			1				dense to den	se medium	to coarse sand
Grout			1 10100			-		· · · ·			oc, mealann	
Grout						2						
Bont												
China						3	-		SM	Silty Sand (	SM) - Light	brown, moist,
Chips						_				medium den	se, fine to co	parse grained sand
#2/12			Moist			4	<u> </u>				,	
Sand	_				1	· _						
Julia				S	<u>V-1-S</u>	5_						
						<sup>_</sup> _				Boring Terminated	at 5' bgs.	
						6				Groundwater Not E	Enountered	
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	Γ									Soil Sample SV-1-	S collected a	at 10:15 7/7/2009
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			Project No	o: C1011!	56203		Client: ConocoPhillips Boring: SV-2					Boring: SV-2
			Logged B	v: <b>S. Men</b>	inger/C	. Morgan	1	L ocat	tion: O	akland. CA	P	
		_	Driller: G	, rega		_	1	Date	Drilled	: 7/7/2009	Location Map	uge 1 0. 2
	зH	hal	Drilling M	ethod: Ha	nd Aua	er		Hole	Diame	hor: <b>3.5</b> "		
		La	Sampling	Method:	Hand Dr	rive	•	Hole	Denth	E'		
Cons	rulta	nte	Cacing Ty	ma.		IVC	,	FIDIC Mall	Diamo			
Cona	Suita	IIIIIS	Clat Size	pe:	N/A N/A		,	Wen	Dante	er: N/A		
			Cravel Da	ale	א/א י - <b>ג</b> י		•	Wen	Water			
			Glaverra	CK.	3 - 4			Chati	Water	Deptn: N/A		
Well			[	r	1	1		διαιι	C Wait	r Depuit <b>N/A</b>		
Complet	tion	e.		อ็น	loi	et)	Sam	ple	a			
		Le	Cent	n) adi	cat	(fe		_	УÞ			
Kfill		ter	oist	PP Re	am	Ē	Yer	Š	ii T	LITH	OLOGY / L	DESCRIPTION
Jac		Vat	ΣU	۲ B C	der	Jep	S S	fe	Sc			
ш 				<u>с</u> ,	Ä	<u> </u>	۲ ۳	٦				
Asphalt												
Bont					· ·	1						
Crout			Moist			1				City Cond y	the Gravel	
Grout									~~	Silty Sanu v	Vitn Grave	(SM) - Brown, moist,
Bent.						2			SМ	mealum aen	se, no oaor,	fine to coarse sand,
Chips										well graded t	ine to medi	um grained gravel
#2/12			Moist			3	t					
Sand	-1			S	v-2-s							
C G.L.C					<u> </u>	4				Boring Terminated	at 4' bas.	
								_		Groundwater Not F	-nountered	
1						5—	┼───╁				mounter ce	
	-					-	╞──╁			Soil Sample SV-2-	S collected :	at 11.05 7/7/2000
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Del	ta	Project No: C101156203 Logged By: S. Meninger/C. Morgan Driller: Gregg Drilling Method: Hand Auger Sampling Method: Hand Drive Casing Type: N/A Slot Size: N/A Gravel Pack: 3.5' - 5'					Clier Loca Date Hole Hole Well Well First	nt: <b>Con</b> tion: <b>C</b> Diame Depth Diame Depth Water ic Water	ocoPhillips akland, CA I: 7/7/2009 ter: 3.5" : 5' ter: N/A : N/A Depth: N/A r Depth: N/A	Boring: SV-3 Page 1 of 1 Location Map			
	Water Level	Moisture Content	PID Reading (ppm)	Sample Identification	Depth (feet)	Sar Kecovery	Interval aldu	Soil Type	LIT	HOLOGY / DESCRIPTION			
Asphalt Bent Grout		Moist	17.2					SM	Silty Sand medium de medium gra	with Gravel (SM) - Dark brown, nse, moist, no odor, fine to ained sand, possible fill material			
Bent. Chips #2/12 Sand		Moist	78.9 <b>S</b>	<u>v-3-s</u>	3 4 5			CL	Lean Clay moist, med lenses of ol	with Sand (CL) - Dark brown, ium plastic, stiff, hydrocarbon odor, ive green			
·					6 — 7 — 8 —				Groundwater Not	B-S collected at 13:25 7/7/2009			
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			Project No	o: C1011!	56203			Clier	t: Con	ocoPhillips	Boring: SV-4
			Logged B	y: S. Men	inger/C	C. Morgan	1	Loca	tion: O	akland, CA	Page 1 of 1
_			Driller: G	regg				Date	Drilled	7/7/2009	Location Map
	۵ŀ	ta	Drilling M	ethod: Ha	nd Aua	er		Hole	Diame	ter: 3.5"	
ישן		ιa	Sampling	Method: I	land D	rive		Hole	Depth	5'	
l Con	sulta	ants	Casing Ty	me:	N/A			Well	Diame	ter N/A	
	04110		Slot Size:		N/A			Well	Denth	N/A	
			Gravel Pa	ck:	3.5' - !	5'	▼	First	Water	Depth: N/A	
							$\nabla$	Stati	c Wate	r Depth: <b>N/A</b>	
We		_			c						
Comple	etion	eve	말보	din (	atio	eet	San	nple	be		
₩		ب ت	istu nte	pm	mp	ן (f		al	Ţ	LITH	OLOGY / DESCRIPTION
gckt		ate	Ω	۲ a	Sa	epti	ĮŽ	E	Soil		
ä		3		E	PI	Ď	Rec	In	•,		
Asphalt											
									~	Lean Clay (	<b>CL)</b> - Dark brown with black
Bent.			Moist	14.8		1			CL	mottling, mo	ist, stiff, medium plastic
Grout											
						2				Sandy Lean	Clay (CL) - Dark olivo groon to
Bent.						3				black moist	modium stiff modium plastic
Chips	_					<sup>_</sup> _			CL	slight hydroc	arbon odor
#2/12			Moist	21.6		4				signe riyuroc	
Sand						_				Clayey Silt	(ML) - light brown with black
				S	<u>v-4-s</u>	5—		1208	ML	mottling, mo	ist, very dense, non-plastic
						-				Boring Terminated	at 5' bgs.
						6—				Groundwater Not t	znountered
						-				Soil Sample SV-4-	S collected at 12:40 7/7/2000
						7—				Son Sumple SV-4-	5 conceled at 12.40 ////2009
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			Project No	o: C1011	56203			Clier	it: Con	ocoPhillins Boring: SV-5	
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:			Logged B	S. Men	inger/(	Morgan		Loca	tion O	akland CA Page 1 of 1	
	_		Driller: G	reaa			•	Date			
	$\neg$		Drilling M	negg athad u				Date	Diaman	Location Map	
ーレ	ピリ	la			na Aug	er		ное	Diame		
			Sampling	Method: I	Hand D	rive		Hole	Depth	: 5'	
Con:	sulta	ints	Casing Ty	pe:	N/A			Well	Diame	ter: N/A	
			Slot Size:		N/A		_	Well	Depth	N/A	
			Gravel Pa	ck:	3.5' - !	5'	T	First	Water	Depth: N/A	
					-		$\Sigma$	Stati	ic Wate	er Depth: N/A	
We	II 	-		σ	c c		c				
Comple	etion	eve	rt e	din	atio	eet	San	npie	be		
.≓			stu	pm	fic:	L L		al		LITHOLOGY / DESCRIPT	ION .
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Ba		3	_	Id	pī	Ľ۵	l Š	Int			
A				-				<u> </u>		Wall Craded Cravel with Sand (	
Asphait	-					-			GW	weil-Graded Graver with Sand (	GW) - light
Dant			Maint	27 2		1				prown, dense, medium grained, mo	list,
Bent.			Moist	27.3		-				possible fill material	
Grout						2 —	ļ				
Bent.				Lean Clay (CL) - Gray/black to oliv	ve green,						
Chips_						<u> </u>		ļ	<b></b>	moist, medium stiff, medium, plast	ic,
#2/12			Moist	237				hydrocarbon odor			
F 2/ 12											
Sanu	and sv-5-s 5										
						] 3				Boring Terminated at 5' bgs.	
									1	Groundwater Not Enountered	·
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									1	Soil Sample SV-5-S collected at 11:00 7/	7/2009
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			Project No	. C1011	6203			Clier	t' Con	ocoPhillins
			Logged B	S Moni	inder/C	Moraan		Loca	tion: O	Decornings Boing: 5V-6
			Driller C	y. Of Men	inger/ c	. Horgan		Date	Drillod	
			Drilling M	othod: Un	nd Aug	<b>~</b> r			Diamo	
ישו		ια	Compline	Mothody I	land D				Danth	. E
			Sampling	Method: r		rive		поје	Depth	
Con	suita	ints	Casing Ty	pe:	N/A			weil	Diame	
			Gravel Ba	cky	N/A	-'	▼	Vien	Water	Conthi N/A
			Glaverra	CR.	5.5	,	$\overline{\nabla}$	Stati	water c Wate	ar Depth: N/A
We	li j					<u> </u>	T	Stat		
Comple	etion	vel	чю	ing	l a l	et)	San	nple	υ	
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ξ		ater	10is Con	a d	San	bt	N N	Ž	oil	
Ba		Ŵ	20	PII	Ide	De	Sec	Int	S	
Aanhalt	sphalt									Well-Graded Gravel with Sand (GW) - light
Asphaic									GW	brown dense medium grained dry to moist
Bent			Moist			1				nossible fill material
Grout			110100			-				
Groue						2				
Bent.	-									Lean Clay with Sand (CL) - light olive green.
Chips						3—			CL	moist, soft to stiff, low plastic, strong
" 2/12			Moist							hydrocarbon odor
# 2/12 C===d							1			
Sand				S	v-6-5					
						]				Boring Terminated at 5' bgs.
						6—				Groundwater Not Enountered
						7—		<u> </u>		Soil Sample SV-6-S collected at 9:45 7/7/2009
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			Project No	: C1011!	56203		(	Clien	t: Con	ocoPhillins	Boring: SV-7				
			Logged B	V'S Men	inger/C	Morgan		Locat		akland CA	Bage 1 of 1				
			Drillor: C		inger/ c	. Horgan	1	Data	Drillod	akianu, CA					
	<u>– H</u>		Duilling M	legg					Drined	2009	Location Map				
יטו	21	Ld		ethod: Ha	nd Aug	er	I	Hole	Diame	ter: 3.5"					
	<u> </u>		Sampling	Method: I	land Di	rive	I	Hole	Depth	: 5'					
Con	sulta	ints	Casing Ty	pe:	N/A		,	Well	Diame	ter: N/A					
			Slot Size:		N/A			Well	Depth:	N/A					
			Gravel Pa	ck:	3.5' - !	5'	<b>T</b> 1	First	Water	Depth: <b>N/A</b>					
							$\nabla$ :	Stati	c Wate	r Depth: N/A					
. We Comple	ll etion	/ater Level	Moisture Content	ID Reading (ppm)	Sample entification	epth (feet)	Sam Lavo	terval ald	Soil Type	LITH	OLOGY / DESCRIPTION				
۵ Acobalt		>		<u>م</u>	PI		a a	Ë							
Asphale							┥			Gravelly Sa	nd with Clay (SM) - Brown to				
Bent. Grout	 		Moist	25.9		1 —  2 —			SM	black, moist, grained grav	medium dense to dense, medium el, possible fill material				
Bent.							┼──┼		•••••						
Chins						3—	┼───┼			l ean Clay (	<b>CL)</b> - Blue-gray to light olive				
Chips			Moist	54 5			<u> </u>		CI	aroon moist	stiff modium plastic clicht				
#2/12			MUISC	54.5		4		_	UL		, sun, medium plastic, slight				
Sand	_					-				nydrocarbon	odor				
				5	<u>v-/-5</u>	5—		22.11.1		Denin - Tenneticeter					
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		Project	No:	C101156			Clier	nt:	COP Boring/Well No: SVW-1
1		Logaed	l By:	Alan Bueh	ler		Loca	tion	Oakland Page 1 of 2
		Driller:		Grega Dri	llinn		Date	Drillar	led: 8/9/2010
	<b>~ &gt;</b>	Drilling	Methody	Hand Aug			Lala	Diana	
	LU	Sampli	na Mathad	nana Aag	CI		FILLE	Dambh	
Consultar	nts	Casing	пу метноа Туре:	1/4" Tubir	ng		Well	Depth Diame	th: 5' neter: 1/4"
		Slot Si	ze:				Well	Depth	th: 5'
		Gravel	Pack:	#30		T	First	Water	er Depth:
						$\nabla$	Stati	c Wate	iter Depth:
	·	Elevati	on:		Northing	:			Easting:
Well Completion	-		5	c			,		
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Construction					<sup>-</sup> _				
Detail					2			CI	Brown loan clay with cand and gravel maint
					<sup>2</sup>			UL.	- brown lear day with sand and graver, moist
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							_	CH	Green/gray fat clay
					5—				Total Depth = $5'$
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		Project	No:	C101156 C			Clier	it:	COP Boring/Well No: SVW-2
		Logaed	1 Bv:	Alan Bueh	ler		Loca	tion	Oakland Page 1 of 2
		Driller	,.	Green Dril	lling		Data	Driffor	
1100lt	- 2	Drilling	Mathada		ning 		Date	Drmet	ed: 8/9/2010
		Commit		nanu Augi	er		Hole	Diame	heter: 36"
		Sampi	ng methoa				Hole	Depth	:h: 5'
Consultar	Its	Casing	Type:	1/4" Tubir	ıg		Well	Diame	neter: 1/4"
		SIOT SI	ze:			_	Well	Depth	h: 5'
		Gravel	Pack:	#30		<u> </u>	First	Water	er Depth:
		Flouoti			182 a vikila 144 a	<u></u>	Stati	c Wate	ter Depth:
		Elevad	on: T	r	INORTHING	: r			Easting:
Well Completion	ē		p	5	କ୍ଳ	Sar	nole		
	Lev	ent	ц g ip	ple	fe			уре	
fing fill	Ŀ,	oist	ppi Re	titi a	÷	١.	2	=	LITHOLOGY / DESCRIPTION
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See									
Construction									
Detail								~	Brown/green lean clay with sand and gravel, 20%
					2			CL	sand, some gravel, cobbles, moist
					3-				
					4				
								CH	Green/gray clay
					5				Total Depth = 5'
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		Project	No:	C101156		Client:			COP Boring/Well No: SVW-3
		Logged	By:	Alan Bueł	nler		Loca	tion:	Oakland Page 1 of 2
	1	Driller:		Gread Dri	llina		Date	Driller	ed: 8/9/2010
11)011		Drilling	Method	Hand Aug	or		Hole	Diame	octor: 36"
	LU	Samnli	na Method					Dooth	Hereit, 50
Consulta	nte	Casing	Type:	1/4" Tubi	na.		Walt	Diama	
Consulta		Slot Si	1790.	1/4 1000	ng		Wall	Denth	by 51
		Gravel	Pack:	#30		T	Firet	Water	n: S
		0.0101		1 50		$\overline{\nabla}$	Stati	Water Ic Wate	ter Depth
		Elevatio	 วก:		Northing	<u> </u>	Stat	ic wate	Fasting
Wall Completion	Γ		T			i –			Lasting,
wen competion	vel	40	ing	io i	et)	Sar	nple	e v	
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sing	iter	si oi	ar a d	utit.	멅	Š	ŝ	oit	LITHOLOGY / DESCRIPTION
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See					1				
Construction					•••	<u> </u>		CI	Brown/green lean clay with sand and gravel, strong
Detail					2	ļ		00	odor
					3				
					4			СН	Grav/green clay, strong odor
					_			••••	
					5				
									Total Depth = 5'
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A.V. (11)					_				
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	Project No:	C101156	Clien	it:	COP	Boring/Well No: SVW-4
	Logged By:	Alan Buehler	Loca	tion	Oakland	Page 1 of 2
	Driller	Grego Drilling	Data	Drillor		
	Drilling Mathada		Date	Drilled	a: 8/10/2010	
	Drining Methou:	Hand Auger	Hole	Diame	ter: 36"	
	Sampling Metho	d:	Hole	Depth	: 5'	
Consultants	Casing Type:	1/4" Tubing	Well	Diame	ter: 1/4"	
	Slot Size:		Well	Depth	5'	
	Gravel Pack:	#30	🗴 First	Water	Depth:	
			Stati	c Wate	r Depth:	
	Elevation:	No	rthing:		Easting:	
Well Completion	5					
N N N N N N N N N N N N N N N N N N N	et É,	eet stio	Sample	e S		
	Dagi jeti		ਤ ਤੁ	ž	1774	ININGY / DESCRIPTION
ate si ct		bt ga		oil		
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See		·  ·				
Construction				CL	Dark brown/greeni	ish lean clay with sand, strong
Detail			,	~-	odor	
1.000						
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				011	Orean/harris -1	
		4		CH	Green/brown clay, sto	ong odor
		5	,		Total Depth :	= 5'
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		Project	No:	C101156			Client:		COP Boring/Well No: SVW-5
		Logaed	By:	Alan Bueh	ler		Loca	tion	Dakland Page 1 of 2
		Driller	-,.	Grego Dri	llina		Date	Driller	
		Drilling	Mothody	Unad Aug	nnerg or		Date	Dinnet	
	La	Compli	Mechou.	nana Aug	er .		Hole	Diame	eter: 36"
Consulta	nts	Casing	пу меспоа Туре:	1/4" Tubir	ng		Well	Diame	1: 5' eter: 1/4"
		Slot Siz	e:			-	Well	Depth	n: 5'
		Gravei	Раск:	#30		<u> </u>	First	Water	r Depth:
		Elevatio	on:		Northing	<u>. v</u>	Stati	c wate	Fasting:
Miell Completies	Γ			l'	inor ching	, 	1		Lasting.
well completion	pletion v v v v v v v v v v v v v v v v v v v								
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sing sing	fer	lois	b R K	lan ar	Ę	Ş	Ş	L Eio	LITHOLOGY / DESCRIPTION
Cas	Ma	ΣΟ	Q,	der	Dep	្ត្រ	nte	й	
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See					1				
Construction					<sup>_</sup> _			CI	Green/gray/black lean clay with sand, some gravel,
Detail					2				wood debris, strong odor
					l ~ _				
					3				
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					4			СН	Graenish aray clay, strong odor
					4			ŲΠ	Greenish gray clay, shong odor
					3				Total Depth = $5'$
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		Project	No:	C101156 (		Clier	it:	COP Boring/Well No: SVW-6					
		Logaed	Bv:	Alan Bueh	ler		Loca	tion:	Oakland Page 1 of 2				
		Driller	-,.	Greao Dri	lling		Date	Drilloc	d: 8/0/2010				
IDAI	- 2	Drilling	Mathadi	Linnd Aug				Dinnet	d: 0/9/2010				
		Canali		natio Aug	er		noie	Diame					
Consultar	nte	Casing	ng Methoa Type	1/4" Tubi	20		Hole	Depth	1: 5'				
Consulta	11.5	Slot Siz	rype. ze:	1/4 1000	ıy		Well	Denth	(0)				
		Gravel	Pack:	#30		¥	First	Water	r Denth				
						$\overline{\nabla}$	Stati	r Mate	er Denth				
		Elevatio	on:		Northing	¥	5.00		Easting:				
Wall Completion					1	ŕ							
wen completion	vel		ing	i j	l <del>(</del>	Sar	nple	Ŷ					
	لو ل	ten	n ga	De la	l a	5		ſ					
sing Kfi	ter	Si D	Pp Re	itit	tt.	2 S	Ž	10	LITHOLOGY / DESCRIPTION				
Ca Ma	Ma	20		de la	Dep	S S	nte	Ϋ́,					
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See					1								
Construction					<u> </u>								
Detail								CI	Green/gray lean clay with sand, some gravel, some				
					2			CL	odor, asphault debris				
					3-				Υ. Υ.				
					4								
								СН	Green/brown clay, strong odor				
					5				Total Depth = $5'$				
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				4	Clie Pro	ent: oject N	lumber:	Chevron Enviornmental Mana 60287515	agement Company		Вс	oring No. MW-9A	
	AECOM Environment 1220 Avenida Acaso Camarillo CA 93012 AECOM Environment 1220 Avenida Acaso Camarillo CA 93012 Coordinates: Not Surveyed Elevation: Datum:											eading: 0.0	
A 1	ECOM En 220 Aveni	vironme da Aca	ent so		Co	ordina	tes:	Not Surveyed	Elevation: Datum:		Sheet: 1 or	f 1	
C	2amarillo, 0 (805) 38	CA 930 3-3775	12		Drii	lling E	quipmer	t/Method: /Hollow Stem Auge	weather:60* Clear		Monitoring We	ll Installed: Yes	
	www.aeco	om.con	ı		Sai	mple ī	Type(s):	Split Spoon	Boring Diameter: 8 IN.		Screened Inter	<i>val:</i> 10-15 ft.	
Approve	ed By:							Logged By: J.Harms	Date/Time Started: 03-18-13 / 13:	05	Depth of Boring: 15 FT BGS		
Drilling	Contracto	r: AB	c		Ê	1	1	Backfill: grout	Date/Time Finished: 03-18-13 / 13:	20	Water Level: Not Encountered		
DEPTH (ft)	Sample ID	Sample Depth (ft	Blows per 6"/RQI	Recovery (ft)	PID Reading (ppm	nscs	Graphic Log	MATERIAL IDENTI grained material (s grained material (sand features, density or stiffr	Well Diagram				
								(0-5") ASPHALT	(Crov (EV 2/1) modium plantia 000			2" Diameter Sched. 40	
······					242	CH		(5'- 2.5') LEAN CLAY, Dan 5% silt, 5% fine-grain (2.5-6') FAT CLAY, Olive C 5% fine-grained grav	k Gray (5Y 3/1), medium-plastic, 90% led gravel, stiff, dry, Hydrocarbon oc Gray (5Y4/2), high-plastic, 90% clay, el, very stiff, dry, Hydrocarbon odor	% clay, dor 5% silt,		PVC Concrete Slurry	
5	5.0, 5.0Dup	Å			3770	CI			ray (5Y4/2) medium-plastic 80% d	av 10%		Hydrated Bentonite Chips	
	8.5		8 0	2	1005	ΟL		silt, 10% fine-grained	gravel, very stiff, dry, Hydrocarbon	odor			
10		X	9 12 13	1.5		СН		(9-12.5') FAT CLAY, Olive silt, 10% fine-grained	Gray (5Y4/2), high-plastic, 80% clay gravel, very stiff, dry, Hydrocarbon	y, 10% odor		Monterey No. 3 Sand	
			13 14 15	1.5	1347	CL		, Dark Reddish Gray (4/2) (12.5- 15') LEAN CLAY, Da 6/6) mottled, medium fine-grained gravel, 5	Vlive Yellow (5Y 6/6), mottled ark Reddish Gray (4/2) / Olive Yellow h-plastic, 70% clay, 10% silt, 15% % fine to coarse-grained sand, very	v (5Y stiff,		0.020" Slotted Screen	
	14	$\times$	8 10 12, 14	1	237			ory, iron staining star					
Notes.	· Continu	Jous S	Split Sp	Doon 1	from 8	Feet							

			_	_	Clie	ent:		Chevron Enviornmental Man	agement Company		В	oring No. MW-9B
			$) \wedge$	1	Pro	oject N	umber:	60287515				
A	ECOM En	vironme	ent	Deturn	Ambient PID R	Reading: 0.0						
1	1220 Aveni Camarillo, (	da Aca CA 930	so 12		Co	oraina Ilina E	tes:	t/Mathad: /Hallow Stom Augo	Elevation:	* Closr	Sheet: 1 0	t 1
	(805) 38 www.aec	8-3775 om.com	ı		Sa	mnle 1	yupmen vne(s):	Split Spoon	Boring Diameter	8 IN	Screened Inter	$n/al^2$ 15-20 ft
Approv	ed Bv <sup>.</sup>				00	npie i	<i>jp</i> o(o).	Logged By: J Harms	Date/Time Started	03-15-13 / 13:20	Depth of Boring	a: 20 FT BGS
Drilling	Contracto	or: AB	С					Backfill: grout	Date/Time Finished	: 03-15-13 / 14:00	Water Level:	Not Encountered
		(ft)	ΔC		(mo				•			
DEPTH (ft)	Sample ID	Sample Depth	Blows per 6"/R(	Recovery (ft)	PID Reading (p	NSCS	Graphic Log	MATERIAL IDENTI grained material (sand features, density or stiffr	IFICATION, color, c silt and clay), descr and gravel), struct ness, moisture cont	description of fine iption of coarse ural or mineralogical ent, odors or staining.		Well Diagram
								(0-6") ASPHALT				2" Diameter Sched. 40
						CL		(6"-2.5') LEAN CLAY, very clay, 5% silt, 5% grav (stronger at 4')	dark gray (5Y 3/1), r vel, medium dense, c	nedium-plastic, 90% Iry, Hydrocarbon odor		PVC Concrete Slurry
					3247	СН		(2.5-7.0') FAT CLAY, olive silt, 5% gravel, stiff, c	gray (5Y 4/2), high-p lry, Hydrocarbon odd	olastic, 90% clay, 5% or	-	
5												
	5.0				2416							
						CL					-	
			6			UL		gray (5Y 4/2), mediu fine-grained gravel, v laminations	m-plastic, 80% clay, very stiff, dry, Mn nod	10% silt, 10% ules, fine sand		Hydrated Bentonite Chips
	9.0	$\left \right\rangle$	8 9, 11	2	41.2							
10				1.5	573							
			6 8 12									
	-		6 8 9. 11			CL		(12-13.5') LEAN CLAY, Da mottled, medium-pla coarse-grained grave decreasing at 13 feel , brownish yellow (10YR 6/	rk Reddish Gray (4/2 stic , 80% clay, 10% el, very stiff, dry, Iron t (6)	2) / Olive Yellow (5Y 6/6) silt, 10% fine to staining at 12 feet, odor		
	14.0	$\mathbb{A}$		1.5 2	7.9 128	IVIL		silt, 30% fine-grained	I sand, 10% clay, dei	nse, dry		Monterey No. 3 Sand
			6 8 9			SM		(15-18') SILTY SAND WIT fine to medium-grain coarse-grained grave moist	H GRAVEL, light bro ed sand, 40% silt, 20 el (max size 0.5 inche	wn (7.5YR 6/4), 40% )% fine to es), medium dense,		
			6 9 0	1.5		N 41					-	0.020" Slotted Screen
	19.0		6 8 10,12	2	0.7	ML		(18-20) SILI WITH SAND low-plastic, 50% silt, fine-coarse grained g medium dense, mois coarse gravel	AND GRAVEL, red 20% fine to medium gravel (max size 0.5 i t, slight odor at 18.5-	orown (51K 4/4), -grained sand, 20% nches), 10% clay, -18.8 feet in layer of		
Notes	: Contin	Jous S	Split Si	boon	from 8	Feet						
			,									
L												

			Clie	ent:		Chevron Enviornmental Mana	agement Company	Borin	g No. MW-10A	
	ON	1		line 0.0						
AECOM Enviro	nment		Co	Sheet: 1 of	1					
Camarillo, CA 9	Acaso 93012		Dril	lina Fa	ouiomen	t/Method: /Hollow Stem Auger	Weather:60* Clear	Monitoring Well In:	stalled. Yes	
(805) 388-37 www.aecom.o	com		Sai	mple T	vpe(s):	Split Spoon	Boring Diameter: 8 IN.	Screened Interval:	10-15 ft	
Approved Bv:				1	<b>7</b> 1(-)	Logged By: J.Harms	Date/Time Started: 03-18-13 / 10:40	Depth of Boring:	15 FT BGS	
Drilling Contractor:	ABC					Backfill: grout	Date/Time Finished: 03-18-13 / 11:00	Water Level: Not Encountered		
Ę			(m			Ŭ				
(ft) (ft) Sample ID	Blows per 6"/RC	Recovery (ft)	PID Reading (pp	NSCS	Graphic Log	MATERIAL IDENTI grained material (s grained material (sand features, density or stiffn	We	ell Diagram		
				ML		(0-2")ASPHALT (2"-2.0')SILT WITH CLAY / silt, 20% fine-grained medium dense, dry, H	AND GRAVEL, red brown (5YR 5/4), 70% gravel (max sixe 0.25 inches), 10% clay, Hydrocarbon odor		2" Diameter Sched. 40 PVC	
			-	Siuny						
			0.10	СН		subangular, medium (3-8.5') FAT CLAY WITH 5/1), high-plastic, 90%	dense, dry TRACE OF SAND AND SILT, gray (2.5Y % clay, 5% fine-grained sand, 5% silt, stiff,	-		
5 5.0		1	夏 4')		Hydrated Bentonite Chips					
	6 8 9, 10			CL		, medium-plastic, 80% clay (8.5-13') LEAN CLAY WITH	, 10% fine-grained sand, 10% silt @ 7.5' H SAND, olive (5 Y 5/3), medium-plastic,			
	X	2	325			70% clay, 20% fine-g from 12 to 15 feet	rained sand, 10% silt, stiff, dry, Iron staining		Monterey No. 3 Sand	
	9 11 12	1.5								
	8 11 13	1.5	1011	NAL					0.020" Slotted Screen	
14.0	9	2	3222	IVIL		20% fine to medium- dry-(13.8 - 14 feet de grained sand)	grained savel, 5% clay, 5% gravel, stiff, creased silt increase from fine to medium			
15	10					-(moist at 14')				
Notes: Continuou	ıs Split Sp	boon f	rom 8	Feet						

Clien						ent:		Chevron Enviornmental Mana	Boring No. MW-10B		
			Project Number					60287515			
A	ECOM En	vironme	ent		Site	) Desc	cription/L	ocation: 351645 Oakland, O	Ambient PID Reading: 0.0		
1 C	220 Aveni Camarillo, (	da Acas	so 12		Coo	ordina	tes:	Not Surveyed	Elevation: Datum:	Sheet: 1 of 1	
	(805) 38 www.aec	3-3775 pm.com	1		Dni	IING EC	<u>quipmen</u> Type(s):	Split Speep Pering Diameter: 8 IN		Monitoring Weil Installed:	res
Approve	od By:				Jai	npie i	ype(3).		Date/Time Started: 03 18 13 / 08:50	Denth of Boring: 22 FT B	29
Drilling	ей by. Contracto	r AR	n.					Backfill: grout	Date/Time Staned: 03-18-13 / 09:45	Water Level: 19 FT B	GS
Drining		Ê.	D		Ê		1	grout			
DEPTH (ft)	Sample ID	Sample Depth (	Blows per 6"/RC	Recovery (ft)	PID Reading (pp	nscs	Graphic Log	MATERIAL IDENTI grained material ( grained material (sand features, density or stiffr	FICATION, color, description of fine silt and clay), description of coarse and gravel), structural or mineralogical less, moisture content, odors or staining.	Well Diagr	am
						ML CL		(0-2") ASPHALT (2"-2') LEAN CLAY WITH 5 5/4), low plastic, 70% 10% fine-grained gra dry (2-5') LEAN CLAY, olive gr silt, stiff, dry, hydroca	SAND AND GRAVEL, reddish brown (5 YR 6 clay, 20% fine to medium-grained sand, vel (max size 0.25 inches), medium dense, ray (5Y 5/2), medium-plastic, 90% clay, 10% rbon odor at 4 feet		2" Diameter Sched. 40 PVC Concrete Slurry
5 	5.0	X			593	СН		(5-11.5') FAT CLAY, olive ( 10% silt, stiff, dry, hy	gray (5Y 5/2), medium-plastic, 90% clay, drocarbon odor		Hydrated Bentonite
10	9.0		6 8 9, 11 9 12 14	2 1.5	255			, increase in silt, odor decr	eased at 10 feet to 12 feet		Chips
	-	$\bigtriangledown$	9 12 14 9 11 12, 14	1.5 1.5		CL		(11.5-13) LEAN CLAY WI mottled at 7 feet, low (13-16') LEAN CLAY WITH low plastic, 70% clay fine-grained gravel, v	I H SIL I , light yellowish brown (10YR 6/4), -plastic, 80% clay, 20% silt, very stiff, dry I SAND, light yellowish brown (10YR 6/4), , 20% fine to coarse-grained sand, 10% ery stiff, dry		Monterey No.
15	15.0	$\square$	9 11 15	2				, (Iron staining and deposit	s at 15 to 20 feet)		3 Sand
			8 9 13 10	1.5		ML SM SW CL		(16-16.5') SILT WITH CLA 5% clay, medium der (16.5-16.8') SILTY SAND, 20% silt, 5% clay, m (16.8-17') WELL GRADED fine to medium-crain	Y, brown (10YR 4/3), 80% silt, 15% sand, nse, moist brown (10YR 4/3), 75% fine-grained sand, ledium dense, moist V SAND, brownish yellow (10YR 6/6), 80% ed sand 10% silt 10% fine-grained gravel		0.020" Slotted Screen
20	20.0	X	11 13,17	2	7.7	SM		(max size 0.25 inche (17-18.8') LEAN CLAY WIT (10YR 6/6), low-plast medium-grained san dry-(clay, odor decre. (18.8-20')SILTY SAND WIT to coarse-grained san size 0.25 inches), me	s), medium dense, moist, odor decreases TH SILT AND GRAVEL, brownish yellow tic, 70% clay, 10% silt, 10% fine to d, 10% fine-grained gravel, very stiff, ases 18.5 - 18.8 feet) TH GRAVEL, dark gray (10YR 4/1), 50%fine nd, 40% silt, 10% fine-grained gravel (max ddium dense, wet-(coarse gravel 19 -20 feet)		
Notes:	GW at	19Ft, (	Cont.	SS af	ter 8 F						
1											

				_	Clie	ent:		Chevron Enviornmental Mana	agement Company	Во	ring No. MW-11A	
ACCOM Project Number: Site Description/I							umper:	00287515	akland California	Ambient PID Reading: 0.0		
A	ECOM En	vironme	ent	Coordinates:				Not Surveyed	Flevation: Datum:	Sheet: 1 of	Sheet: 1 of 1	
1 C	amarillo, (	da Aca CA 930	so 12		Dril	llina Fi	auinmer	nt/Method: /Hollow Stem Auge	r Weather:60* Clear	Monitoring Well	Installed: Yes	
	(805) 38 www.aec	5-3775 om.com	ı		Sai	mple 7	vpe(s):	Split Spoon	Boring Diameter: 8 IN.	Screened Interv	/al: 10-15 ft	
Approve	ed Bv:							Logged By: J.Harms	Date/Time Started: 03-19-13 / 10:15	Depth of Boring	: 15 FT BGS	
Drilling	Contracto	r: AB	C / Ke	enny				Backfill: grout	Date/Time Finished: 03-19-13 / 10:35	Water Level:	Not Encountered	
		(ft)	D		(m							
DEPTH (ft)	Sample ID	Sample Depth (	Blows per 6"/RC	Recovery (ft)	PID Reading (pp	nscs	Graphic Log	MATERIAL IDENTI grained material (s grained material (sand features, density or stiffr	FICATION, color, description of fine silt and clay), description of coarse and gravel), structural or mineralogical less, moisture content, odors or staining.	Well Diagram		
								(0-10") ASPHALT AND BA	SE		2" Diameter Sched. 40	
					4.3	ML		(10"-10')SILT WITH SAND 4/6), Iow-plastic, 60 10% clay, 10% fine to medium dense, dry, I feet)	AND GRAVEL, dark yellowish brown (10YR % silt, 20% fine to medium-grained sand, o coarse-grained gravel (max size 3 inches), Hydrocarbon odor-(large cobbles at 2-2.5	-	PVC Concrete Slurry	
5	5.0	$\bigtriangleup$			1380			-(gray staining at 4.5 feet)			Hydrated Bentonite Chips	
	9.0		6 8 10, 14 6	2	4557	0		(10,11,5') I FAN CLAY, day	rk vollowich brown (10VD 4/6)	_	Monterey No. 3 Sand	
			8 10			SM		(11.5-12.5') SILTY SAND, sand, 30% silt, 10% f Hydrocarbon odor	olive (5Y 5/3), 60% fine to coarse-grained ine-grained gravel, medium dense, wet,	-		
			4 6 13	1.5	2530	СН		(12.5-15')FAT CLAY, dark 6/6), mottled, high-pl sand, very stiff, dry, o nodules)	reddish gray (5YR 4/2)/ olive yellow (5Y astic, 80% clay, 20% silt, 20% fine-grained dor decreases, (Fe and Mn staining and		Screen	
15	14	$\mathbf{X}$	6 8 8, 13	2	116							
Notes:	Continu	Juous S	Split Sp	ooon t	from 8	Feet						

					Clie	ent:	t: Chevron Enviornmental Management Company			Boring No. MW-11B		
	Δ = (	77	X	A	Project Number: 60287515							
					Site Description/Location: 351645 Oakland, Oakland, California Ambient PID Reading: 0.0					ading: 0.0		
	1220 Aveni	da Aca	S0		Coordinates: Not Surveyed Elevation: Datum: Sheet: 1 of 1						1	
	(805) 38	3-3775	12		Dri	lling E	quipmer	t/Method: /Hollow Stem Auge	r Weather:60* Clear	Monitoring Well	Installed: Yes	
	www.aeco	JIII.COII	1		Sa	mple ī	Type(s):	Split Spoon	Boring Diameter: 8 IN.	Screened Interv	al: 15-20 ft.	
Approv	ed By:							Logged By: J.Harms	Date/Time Started: 03-19-13 / 08:05	Depth of Boring	20 FT BGS	
Drilling	Contracto	r: AB		enny	Ê			Backfill: grout	Date/Time Finished: 03-19-13 / 09:00	Water Level:	Not Encountered	
DEPTH (ft)	Sample ID	Sample Depth (ft	Blows per 6"/RQI	Recovery (ft)	PID Reading (ppm	NSCS	Graphic Log	MATERIAL IDENTI grained material (s grained material (sand features, density or stiffr	IFICATION, color, description of fine silt and clay), description of coarse and gravel), structural or mineralogical ness, moisture content, odors or staining.	Well Diagram		
								(0-9") ASPHALT AND BAS	SE		2" Diameter Sched. 40	
······					5.1	ML		(0.9"-7.5') SILT WITH SAN (10YR 4/6), Iow-plas sand, 10% clay, 10% medium dense, dry, n	ID AND GRAVEL, dark yellowish brown tic, 60% silt, 20% fine to medium grained fine-grained gravel (max size .25 inches), no odor	-	Concrete Slurry	
	5.0	X			2.6			-(decreased gravel, fine-gr	ained sand at 3 feet)			
	•				0.0					_	Hydrated Bentonite	
		7	6 8		202	CL		(7.5-8.5') LEAN CLAY WIT 70% clay, 20% silt, 1 no odor	0% fine-grained sand, medium dense, dry,		Chips	
	•	X	10, 12	2		ML		(8.5-10.5')SILT WITH SAN medium-grained san medium dense, dry, o	ID, brown (10YR 5/3), 60% silt, 25% fine to d, 10% clay, 5% fine-grained gravel, odor/gray hydrocarbon staining			
10	10, Dup	<u> </u>		2	1047							
			6 6 8	1.5	3519	CH SM		(10.5-11') FAT CLAY, brow silt, 10% fine to medi coarse-grained grave hydrocarbon odor	vn (7.5YR 5/4), high-plastic, 70% clay,10% ium-grained sand, 10% fine to el (max size 0.5 inches), stiff, dry,			
			6 8 10	1.5	3991	СН		(11-12) SILTY SAND, Olive sand, 20% silt, 20% inches), medium den (12-16.5') FAT CLAY, brow	e gray (5Y 5/2), 60% tine to medium-grained fine to coarse-grained gravel (max size 0.5 ise, dry, hydrocarbon odor vnish yellow (10YR 6/6), high-plastic, 80%			
	. 14.0	$\bigvee$	8, 8 10 12	2	842			odor, iron staining	a sand, 10% siit, very stin, dry, nydrocardon		Monterey No.	
15	-	$\square$	8 10 10	1.5	32.2			-(odor decreases at 14.5 fe	eet)			
	•		8 8 8	1.5		CL		, (70% clay, 10% silt, 20% (16.5-18') LEAN CLAY WI <sup>-</sup> medium-plastic, 70% 5% silt, 5% fine-grain	fine to medium-grained sand) at 16 Feet TH SAND, brownish yellow (10YR 6/6), 6 clay, 20% fine to medium-grained sand, ned gravel (max size 0.25 inches), stiff, dry	-	0.020" Slotted	
	. 19.0	$\mathbf{\nabla}$	6 8 10 11	2	5.1	SM CL		(18-18.5') SILTY SAND, br coarse-grained sand gravel (max size 0.2 hydrocarbon odor (18.5-20') LEAN CLAY WI	rownish yellow (10YR 6/6), 60% fine to , 20% silt, 10% fine-grained subangular 5 inches), medium dense, moist, // TH SAND, brownish yellow (10YR 6/6),			
20	]		10, 11	<u> </u>	<u> </u>		<u>V/////</u>	low-plastic, 70% clay 5% fine-grained grav decreased hydrocart	7, 20% fine to medium-grained sand, 5% silt, rel (max size 0.25 inches), stiff, moist, son odor/	)		
Notes	: Continu	Jous S	Split S	poon	from 8	3 Feet						

					Clie	ent:		Chevron EMC		Bo	ring No. M	W_10S
		~	)/	<b>/</b>	Project Number: 60314377							
					Site Description/Location: 4276 MacArthur Blvd, Oakland, California Ambient PID Reading:NS							
,	1220 Aveni	da Aca	S0		Coordinates: See Survey Elevation: Datum: Sheet: 1 of 1							
	(805) 388	A 930 3-3775	12		Dri	lling E	quipme	nt/Method:DPT Combo Rig/HS	Monitoring Well Installed: Yes			
	www.aeco	m.com	1		Sa	mple 1	Type(s):	Direct Push	Boring Diameter: 10 IN.	Screened Inter	rval:6.5-10 ft.	
Approv	red By:							Logged By:J. Harms	Date/Time Started: 06-12-14 / 10:15	Depth of Borin	g: 10 FT BGS	3
Drilling	Contracto	or: Pe	necore	;	Ê			Backfill: NA	Date/Time Finished: 06-12-14 / 10:45	Water Level:	dry FT BG	S
DEPTH (ft)	Sample ID	Sample Depth (ft	Blows per 6"/RQI	Recovery (ft)	PID Reading (ppm	nscs	Graphic Log	MATERIAL IDENTII grained material (s grained material (sand features, density or stiffn	FICATION, color, description of fine silt and clay), description of coarse and gravel), structural or mineralogical ess, moisture content, odors or staining.		Well Diagra	ım
					0.4	ML		3 INCH ASPHALT LEAN CLAY WITH SAND A low-plastic clay, 20% fine-grained gravel (n dry, HC odor	ND GRAVEL, brown (5YR 5/4), 70% fine-to medium-grained sand, 10% ax size 0.25"), subangular, medium dense,			Concrete
	MW-10S-2			1	2.6	СН		FAT CLAY, olive gray (5Y5/ clay, 10% silt, stiff, dr	2) with orange mottling, 90% medium-plastic y, HC odor			Bentonite Chips
					0.7							
					4.1	CL		LEAN CLAY, olive gray (5Y) medium-grained sanc	5/2), 80% low-plastic clay, 10% fine-to l, 10% silt, stiff, dry, HC odor			
5	MW-10S-5			1	8.1	ML		SILT WITH SAND, olive gra 60% silt, 20% low-pla- dozeo dru codor doze	ay and brown mottled (5Y 5/2 and 5YR 5/4), stic clay, 20% fine-to coarse-grained sand,			Sand - Montery #3
					0.4							· · ·
	MW-10S-7			1	28.1	СН		FAT CLAY, brown (10 YR 6 clay, 10% silt, stiff, dr	/4) with grey staining, 90% medium-plastic y, HC odor and staining	-		
	MW-10S-8			1	2.9							0.020 Slot size
10	MW-10S- 10			1	3.5			, 85% medium-plastic clay,	10% silt, 5% gravel			
Notes												

					Clie	ent:		Chevron EMC		Bo	ring No. MW/ 11S		
	Δ = (	~	77	A	Project Number: 60314377								
					Site	e Des	cription/	Location: 4276 MacArthur Blv	d, Oakland, California	Ambient PID Reading:NS			
· ·	1220 Avenio	la Aca	so		Co	ordina	ites:	See Survey	Elevation: Datum:	Sheet: 1 of 1			
	(805) 388	3-3775	12		Dri	lling E	quipme	nt/Method:DPT Combo Rig/HS	A Weather:	Monitoring We	ll Installed: Yes		
	www.aeco	m.com	1		Sa	mple	Type(s):	Direct Push	Boring Diameter: 10 IN.	Screened Inter	rval:6.5-10 ft.		
Approv	/ed By:							Logged By:J. Harms	Date/Time Started: 06-11-14 / 13:40	Depth of Borin	g: 10 FT BGS		
Drilling	Contracto	or: Pe	necore	9		1	1	Backfill: NA	Date/Time Finished: 06-11-14 / 13:40	Water Level:	8.68 FT BGS		
DEPTH (ft)	Sample ID	Sample Depth (ft)	Blows per 6"/RQD	Recovery (ft)	PID Reading (ppm)	nscs	Graphic Log	MATERIAL IDENTII grained material (s grained material (sand features, density or stiffn	FICATION, color, description of fine silt and clay), description of coarse and gravel), structural or mineralogical ess, moisture content, odors or staining		Well Diagram		
								6 INCH ASPHALT					
					0.0	SM		FILL, SILTY GRAVEL, brow coarse-grained grave sand, subangular, dry	nish yellow (10YR 6/6), 60% fine-to I (max size 2"), 30% silt, 10% fine-grained , no odor	-	Concrete		
	MW-11S-2			1	0.0			, 60% fine-to coarse-graine	d gravel (max size 1.5"), 20% silt, 10%		Bentonite Chips		
					0.0	ML		fine-grained sand, 10	% clay own (10YR 5/3), 70% low-plastic clay, 20% sand, medium dense, dry	_	হিম হিম		
	MW-11S-4			1	0.4			, slight HC odor					
5	_				4.6			, moist at 5'-5.5'			Sand - Montery #3		
	MW-11S-6			1	16.0	CL		LEAN CLAY WITH SILT AN low-plastic clay, 25% fine-grained gravel (n	ID TRACE GRAVEL, gray HC stained, 60% fine-to medium-grained sand,10% silt, 5% nax size 0.25"), medium dense, dry, HC odor	_			
					15.8	ML		LEAN CLAY WITH SILT, gr fine-to medium-graine	ay HC stained, 55% low-plastic clay, 35% ed sand,10% silt, medium dense, dry, HC odor	-			
	MW-11S-8			1	47.5	ML		SILT WITH SAND, brown (7 medium-grained sand (max size 0.25"), med	7.5YR 5/4), 60% silt, 30% fine-to I, 5% non-plastic clay, 5% fine-grained gravel lium dense, dry, HC odor	-	0.020 Slot size		
10	MW-11S- 10			1	325								
Notes	5.												

## Appendix D

## **Historical Cross Sections**





•	LEGEND
	MONITORING WELL/SOIL BORING
	WELL CASING/EXPLORATORY BORING
25' /84)	WELL SCREEN TOTAL DEPTH (DRILLING DATE)
_	DEPTH TO FIRST WATER
	DEPTH TO GROUNDWATER (STATIC)
2 ● 4	SOIL SAMPLE LOCATION WITH ANALYTICAL DATA: TPPH, BENZENE, MTBE (mg/kg) GROUNDWATER SAMPLE LOCATION WITH ANALYTICAL DATA: TPPH, BENZENE, MTBE (ug/L) MONITORING WELL GROUNDWATER SAMPLE DATE
≪1	Q=QUARTERLY SAMPLE
8	ASPHALT
4	CONCRETE
7	CLAY AND/OR SILT (CH,CL,ML)
	SAND WITH CLAY (SC)
	UST FILL MATERIAL
>	APPROXIMATE STRATIGRAPHIC BOUNDARY
	FIGURE 3 GEOLOGIC CROSS SECTION A-A'
	76 SERVICE STATION 1156 4276 MACARTHUR BOULEVARD OAKLAND, CALIFORNIA

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	UANDA	IND, CALIF	ORNIA
JECT NO.	PREPARED BY	DRAWN BY	
156	мн	ЈН	
	REVIEWED BY	FILE NAME	
26/07		1156-CrosA	DELTA



LE	GEND	

MONITORING WELL/SOIL BORING

WELL CASING/EXPLORATORY BORING

WELL SCREEN TOTAL DEPTH (DRILLING DATE)

DEPTH TO FIRST WATER

DEPTH TO GROUNDWATER (STATIC)

SOIL SAMPLE LOCATION WITH ANALYTICAL DATA: TPPH, BENZENE, MTBE (mg/kg) GROUNDWATER SAMPLE LOCATION WITH ANALYTICAL DATA: TPPH, BENZENE, MTBE (ug/L) MONITORING WELL GROUNDWATER SAMPLE DATE Q=QUARTERLY SAMPLE

ASPHALT

CONCRETE

CLAY AND/OR SILT (CH,CL,ML)

SAND WITH CLAY (SC)

APPROXIMATE STRATIGRAPHIC BOUNDARY

<0.50=BELOW LABORATORY REPORTING LIMITS TPPH=TOTAL PURGEABLE PETROLEUM HYDROCARBONS MTBE=METHYL TERT BUTYL ETHER ug/L=MICROGRAMS PER LITER mg/kg=MILLIGRAMS PER KILOGRAM

- 2) STRATIGRAPHY BETWEEN BORINGS IS INTERPRETIVE.
- GROUNDWATER SAMPLES FROM BORINGS WERE COLLECTED ON THE DRILLING DATE.

DEPTH TO FIRST WATER IN WELLS WAS MEASURED ON THE DRILLING DATE. DEPTH TO STATIC WATER IN WELLS MEASURED DURING MOST RECENT QUARTERLY SAMPLING EVENT.

## FIGURE 4 GEOLOGIC CROSS SECTION B-B'

## 76 SERVICE STATION 1156 4276 MACARTHUR BOULEVARD OAKLAND, CALIFORNIA

CT NO.	PREPARED BY	DRAWN BY	
56	мн	JH	
	REVIEWED BY	FILE NAME	
6/07		1156-CrosB	DELTA