James P. Kiernan, P.E.
Project Manager

Chevron Environmental Management Company
6001 Bollinger Canyon Road
Room C2102
San Ramon, CA 94583
Tel (925) 842-3220
jkiernan@chevron.com

June 28, 2017

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

RECEIVED
By Alameda County Environmental Health 8:36 am, Jun 29, 2017

Re: Unocal No. 5781 (351640)
Offsite Investigation Report
3535 Pierson Street, Oakland, California
Fuel Leak Case No.: RO0000253
GeoTracker Global ID #T0600101467

I have read and acknowledge the content, recommendations and/or conclusions contained in the attached document or report submitted on my behalf to ACDEH's FTP server and the SWRCB's GeoTracker website.

The information in this report is accurate to the best of my knowledge. This report was prepared by Arcadis, upon whose assistance and advice I have relied.

Sincerely,

James P. Kiernan, P.E.
Project Manager

Attachment: Offsite Investigation Report by Arcadis

ARCADIS Design & Consultancy for natural and built assets

Chevron Environmental Management Company

OFFSITE INVESTIGATION REPORT

Former Unocal No. 5781 (351640)
3535 Pierson Street
Oakland, California
Fuel Leak Case No. RO0000253

June 28, 2017

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OFFSITE INVESTIGATION REPORT

Former Unocal No. 5781 (351640)
3535 Pierson Street
Oakland, California
Fuel Leak Case No. RO0000253

Prepared for:

Chevron Environmental Management Company

Carl Edwards
Environmental Scientist

Tamera Rogers
Project Manager

Katherine Brandt, P.G. (No. 9132)
Principal Geologist

Prepared by:

Arcadis U.S., Inc.
2999 Oak Road
Suite 300
Walnut Creek
California 94597
Tel 925.274.1100

Our Ref.:

B0035135.1640

Date:

June 28, 2017

CONTENTS

FIGURES

ATTACHMENTS

1 INTRODUCTION

On behalf of Chevron Environmental Management Company's (CEMC's) affiliate, Union Oil Company of California (Union Oil), Arcadis U.S., Inc. (Arcadis) has prepared this *Offsite Investigation Report* (report) for Unocal Station No. 5781 located at 3535 Pierson Street in Oakland, California (the site; Figure 1). This report presents the details and results of the drilling of four offsite exploratory borings (SB-16 through SB-19) to further evaluate the extent of petroleum hydrocarbons in groundwater to the east/northeast of the site. The work was performed in general accordance with the January 24, 2017 *Offsite Investigation Work Plan* (work plan) in which the drilling of two borings was proposed. In a letter dated February 10, 2017 (Attachment A), Alameda County Department of Environmental Health (ACDEH) requested two additional borings, and a revised site plan was submitted on March 8, 2017. ACDEH concurred with the revised proposed boring locations in a letter dated April 3, 2017 (Attachment A).

1.1 Site Background

The site is an active Shell-branded service station located at the northwestern corner of the intersection of Pierson Street and MacArthur Boulevard in Oakland, California (Figure 1). The current site configuration includes a station building, two 12,000-gallon gasoline underground storage tanks (USTs), and four dispensers on two islands (Figure 2). The station building consists of a market/deli (formerly a vehicle repair shop) and an office area. The site is located in a primarily residential area, and paved with concrete and asphalt, with exception of planter areas along the perimeter.

1.2 Site Geology/Hydrogeology

The site is located on the western flank of the Oakland Hills which are underlain by the Quaternary San Antonio Formation and Holocene alluvium of the Temescal Formation. The San Antonio Formation consists of gravels with a silt and clay matrix. The Temescal Formation consists of alluvial deposits composed of unconsolidated, moderately sorted permeable silt with coarse sand and gravel (California Geological Survey 2002; 2010). Previous boring logs indicate that the site is underlain by a primarily clay and silt matrix, with interbedded sands and gravels of varying thickness. Prior offsite borings (SB-13 through SB-15) showed more permeable soils (gravel with sand, sandy silt, silt with sand) between 12 and 20 feet below ground surface (bgs). The observed lithology in offsite borings SB-16 through SB-19 was similar to the previous offsite investigation. Clay was observed beginning at approximately 6 feet bgs to approximately 12 to 19 feet bgs, followed by coarser materials including interbedded layers of silt, silty sand and sand.

The most recent groundwater monitoring event was conducted in February 2017. Depth to water ranged from approximately 10 to 16 feet bgs, and the calculated direction of groundwater flow was to the east-northeast with an estimated gradient of 0.046 foot per foot (Arcadis 2017).

1.3 Site Assessment History

A complete summary of assessments conducted at the site is available in the December 16, 2015 *Site Conceptual Model* (AECOM 2015a). This section focuses on the most recent site assessment activities, the results of which prompted ACDEH's concern regarding further investigation of offsite groundwater.

In June 2015, three soil borings (SB-13 through SB-15) were advanced offsite to collect soil and grab groundwater samples at depths ranging from 20 to 24 feet (Figure 2). A 10-foot temporary screen connected to a polyvinyl chloride (PVC) riser was installed to the total boring depth. A grab groundwater sample was only able to be collected from SB-13. Sufficient groundwater did not accumulate in SB-14 and SB-15 to allow for sample collection. Analytical results for the constituents of potential concern (COPCs) are below:

Sample Location	Date	TPH-g	TPH-d	B	T	E	X	MTBE
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
SB-13	6/17/2015	44,000	<2,000	<2.5	<2.5	5.6	<5.0	<2.5

Notes:
BTEX and Oxygenate compounds analyzed by EPA Method 8260B; TPH-d and TPH-g analyzed by EPA Method 8015B.
(µg/L) = micrograms per liter
< = Analyte not detected at or above indicated method detection limit
TPH-g = total petroleum hydrocarbons as gasoline
TPH-d = total petroleum hydrocarbons as diesel
B = benzene
T = toluene
E = ethylbenzene
X = total xylenes
MTBE = methyl tert-butyl ether

The results indicated total petroleum hydrocarbons as gasoline (TPH-g) impacts in groundwater extended offsite to the northeast (AECOM 2015b). The report below presents the work completed to address ACDEH's concerns about offsite impacts by advancing soil borings to collect grab groundwater samples at locations further offsite/downgradient from SB-13 through SB-15.

2 SCOPE OF WORK

2.1 Health and Safety, Permitting, and Utility Clearance

Before field activities were initiated, the site-specific Health and Safety Plan (HASP) was updated in accordance with state and federal requirements for use during field activities. Soil boring permits were obtained from the Alameda County Public Works Agency (ACPWA; Attachment B). Obstruction and excavation permits were also obtained from the City of Oakland (Attachment C).

Arcadis contacted Underground Services Alert (USA) to identify public underground utilities at the offsite boring locations on May 16, 2017. In addition, Pacific Coast Locators conducted a private utility locate on May 16, 2017 to identify/confirm any subsurface utilities in the vicinity of the boring locations. During the utility locate, Arcadis verified the current depth to water onsite at the closest wells (MW-4 through MW-6), which ranged from approximately 11 feet bgs at MW-4 to 12 feet bgs at MW-5.

2.2 Soil and Grab Groundwater Sampling Activities

2.2.1 Soil Sampling

On May 22 and 23, 2017, four soil borings (SB-16 through SB-19) were advanced to an approximate total depth of 24 or 25 feet bgs to the east/northeast of the site in a City of Oakland right-of-way, using direct-push drilling methods. The total depth exceeded the anticipated depth proposed in the work plan (20 feet bgs) due to the lack of moisture content observed in the soil samples. To minimize the potential of damaging underground utilities, the proposed borings were first cleared to approximately 5 feet bgs using a hand auger. The approximate boring locations are shown on Figure 2. Encountered subsurface materials were logged continuously for stratigraphic characteristics (contacts, color, staining, odors, etc.) using the Unified Soil Classification System (USCS) under the supervision of a California Professional Geologist and field screened for volatile organic compounds (VOCs) with a photo-ionization detector (PID). Due to no field evidence of petroleum hydrocarbon impacts, one soil sample was collected from each boring for analytical testing at the likely observed soil/water interface, as requested by ACDEH. The sample depth was determined at each boring location by Arcadis field staff based on the soil moisture content and changes in lithology from fine to coarser soil. Boring logs are included as Attachment D.

Soil samples retained for laboratory analyses were collected using Terra Core® samplers and immediately placed in ice-chilled cooler for transport to BC Laboratories Inc. of Bakersfield, California under chain-of-custody protocol. Soil samples were analyzed for the following constituents:

- TPH-g (C_6-C_{12}) using United States Environmental Protection Agency (USEPA) Method 8015 Modified (8015M);
- Total petroleum hydrocarbons as diesel (C_{12}-C_{24}) (TPH-d) using USEPA Method 8015M;
- Benzene, toluene, ethylbenzene, total xylenes (collectively BTEX) using USEPA Method 8260B;
- Fuel additives methyl tert-butyl ether (MTBE), tert-butyl alcohol (TBA), di-isopropyl ether (DIPE), ethyl tert-butyl ether (ETBE), tert-amyl methyl ether (TAME), ethanol, 1,2-dichloroethane (1,2-DCA), and ethylene dibromide (EDB) using USEPA Method 8260B.
- Naphthalene using USEPA Method 8260B.

2.2.2 Groundwater Sampling

Following the completion of the soil borings to the total depth, 10 feet of 1-inch diameter pre-packed screen was lowered into the boreholes and connected to blank PVC risers extending to the surface to facilitate sample collection and gauging. Boring locations SB-16 and SB-18 were dry during initial gauging following the installation of temporary screen on May 22, 2017. Arcadis verbally requested a variance from the ACPWA inspector to leave the well screens in place overnight; SB-16 and SB-18 were subsequently gauged on May 23, 2017 and remained dry. A similar low soil moisture content was observed in soil samples collected from SB-17 and SB-19 the same day. Arcadis verbally requested a second variance from the ACPWA to leave all temporary well casings in place overnight. Borings SB-16 through SB-19 were gauged the following day on May 24, 2017 and remained dry. In summary, the

temporary screen remained in place for approximately 48 hours at SB-16 and SB-18, and 24 hours at SB-17 and SB-19 with no groundwater available for sampling.

2.2.3 Soil Boring Abandonment

Upon completion of soil sampling activities and attempts to collect grab groundwater samples, the borings were abandoned on May 24, 2017 in accordance with ACPWA requirements. The temporary PVC casings were removed, and the borings were backfilled with neat cement to approximately 4 inches bgs. The surface was restored to match the pre-existing conditions.

2.2.4 Equipment Decontamination Procedures

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

2.2.5 Investigation-Derived Waste

Investigation-derived waste (IDW) generated during investigation activities included soil cuttings, personal protective equipment (PPE), and other disposable sampling materials. Soil cuttings derived from drilling as well as wastewater from decontamination procedures were placed in appropriate containers and temporarily stored at the site pending characterization and disposal. PPE, such as nitrile gloves, and disposable supplies, such as paper and plastic, were treated as municipal waste. A composite soil sample was collected for waste profiling purposes. Transportation and disposal services will be provided by Belshire Environmental Services, Inc. (Belshire) of Foothill Ranch, California. A copy of the waste manifest documenting proper offsite transport and disposal of IDW will be uploaded to the State Water Resources Control Board (SWRCB) GeoTracker Website when it is received from Belshire.

3 SOIL ANALYTICAL RESULTS

The soil sample analytical results are presented in Table 1; a copy of the laboratory analytical report is included as Attachment E. None of the analytes were detected at or above the laboratory reporting limits.

4 CONCLUSIONS AND RECOMMENDATIONS

Four exploratory borings (SB-16 through SB-19) were drilled to the east/northeast of the site during the current investigation to further evaluate the extent of petroleum hydrocarbons in groundwater. The borings were advanced to 24 or 25 feet bgs, deeper than originally proposed in the work plan based on the limited soil moisture content observed between the ground surface and approximately 20 feet bgs. Although groundwater was not encountered in the offsite borings in order to collect samples, the observed lithology and soil moisture content was similar to what was encountered during assessment activities at the site, indicating the borings were advanced sufficiently deep to intercept first groundwater. Based on the presence of groundwater in onsite monitoring wells at the time of this investigation, Arcadis concludes available first groundwater is limited in quantity and likely requires more permanent

infrastructure in order to collect samples; however, this does not appear warranted. In lieu of readily available groundwater for sampling, soil samples were collected at depths interpreted to be the most likely location of the soil/groundwater interface and no petroleum hydrocarbons were detected. Based on the soil analytical results and the lack of elevated PID readings or other evidence of impacts in the offsite borings, constituents of concern do not appear to have migrated across MacArthur Boulevard to the east/northeast of the site. No further investigation is recommended.

5 REFERENCES

AECOM. 2015a. Site Conceptual Model, Unocal No. 5781 (351640), 3535 Pierson Street Oakland, California. December 16.

AECOM. 2015b. Site Assessment Report, Unocal No. 5781 (351640), 3535 Pierson Street Oakland, California. July 13.

Arcadis U.S., Inc. (Arcadis). 2017. Quarterly Status Report, First Quarter 2017, 3535 Pierson Street, Oakland, CA. April 10.

California Geological Survey. 2002. California Geomorphic Provinces – Note 36.

California Geological Survey. 2010. Geologic Map of California at http://www.quake.ca.gov/gmaps/GMC/stategeologicm ap.html

TABLES

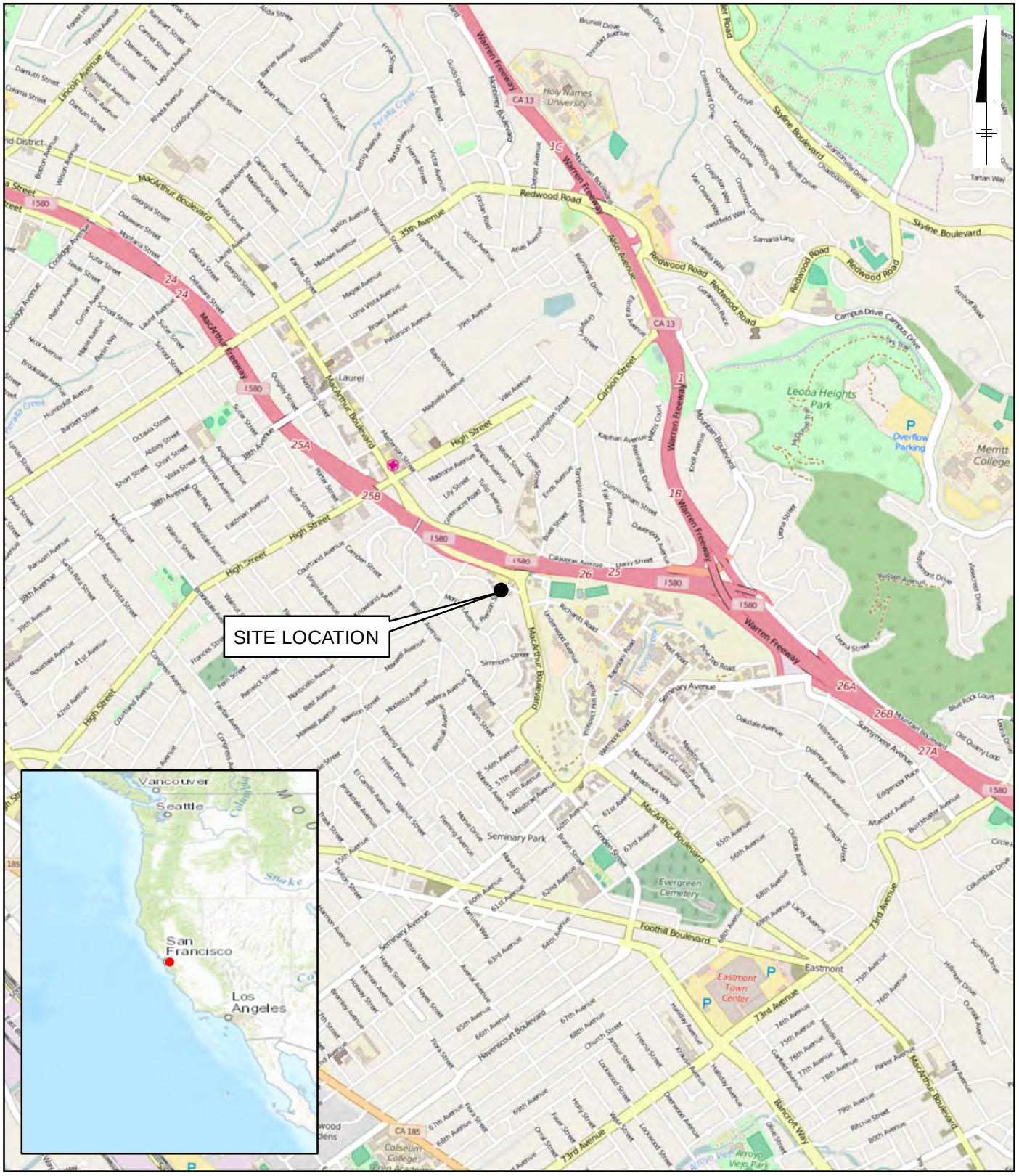
Table 1 - Soil Analytical Results
Unocal Service Station No. 5781
3535 Pierson Street
Oakland, California

Sample Location	Sample Date	Sample Depth (feet bgs)	USEPA 8015B	USEPA 8015B	USEPA 8260B												
			TPH-g (mg/kg)	TPH-d (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)	MTBE (mg/kg)	TBA (mg/kg)	DIPE (mg/kg)	ETBE (mg/kg)	TAME (mg/kg)	EDB (mg/kg)	1,2-DCA (mg/kg)	Naphthalene (mg/kg)	Ethanol (mg/kg)
SB-16	05/22/17	18.0	<1.0	<10	<0.005	<0.005	<0.005	<0.01	<0.005	<0.05	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<1.0
SB-17	05/23/17	15.0	<0.88	<10	<0.005	<0.005	<0.005	<0.01	<0.005	<0.05	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<1.0
SB-18	05/22/17	23.0	<1.0	<10	<0.005	<0.005	<0.005	<0.01	<0.005	<0.05	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<1.0
SB-19	05/23/17	19.0	<1.0	<10	<0.005	<0.005	<0.005	<0.01	<0.005	<0.05	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<1.0
SFRWQCB Tier 1 ESL[1]			**100**	**230**	**0.044**	**2.9**	**1.4**	**2.3**	**0.023**	**0.075**	**--**	**--**	**--**	**0.00033**	**0.0045**	**0.033**	**--**

Notes:
<10 = Not detected above the reporting limit.
bgs = below ground surface
-- = not applicable
mg/kg = milligrams per kilogram
TPH-g = total petroleum hydrocarbons as gasoline
TPH-d = total petroleum hydrocarbons as diesel
MTBE = methyl tert-butyl ether
TBA = tertiary butyl alcohol
DIPE = Di-isopropyl ether
ETBE = Ethyl tert-butyl ether
TAME = Tert-amyl methyl ether
EDB = 1,2-Dibromoethane
1,2-DCA = 1,2 Dichloroethane
SFRWQCB = San Francisco Regional Water Quality Control Board
USEPA = United States Environmental Protection Agency
1 = Tier 1 ESLs are based on residential land use with a shallow drinking water source, and shallow soil exposure (Chapter 2; SFRWQCB 2016 Rev. 3).

Data QA/QC By: MRF

FIGURES



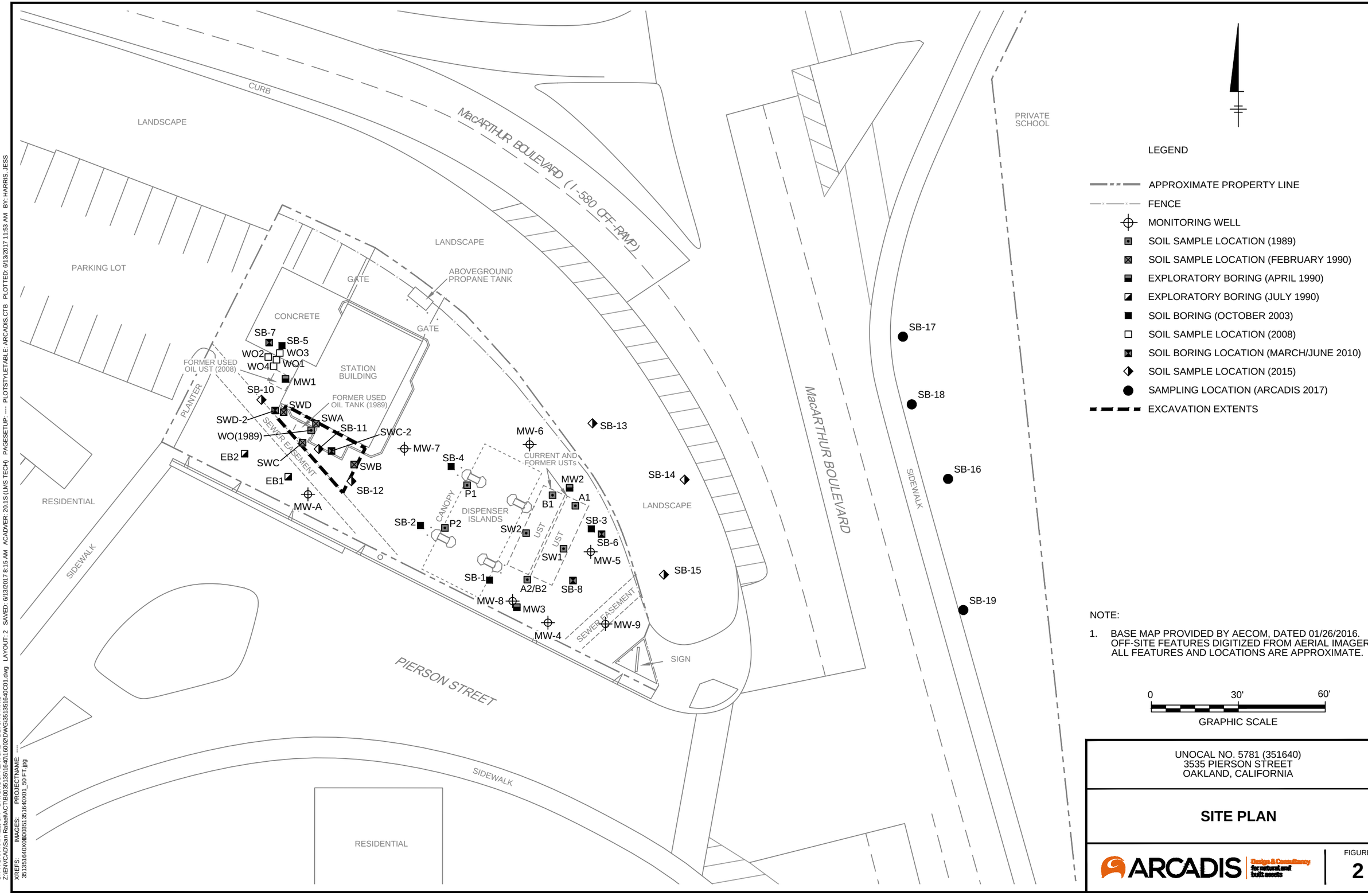
UNOCAL NO. 5781 (351640)
3535 PIERSON STREET
OAKLAND, CALIFORNIA

SITE LOCATION MAP

ARCADIS Design & Consultancy for natural and built assets

FIGURE
1

City:Syr Div/Group:IMDV Created By:A.Schilling Last Saved By: aschilling
Project Unocal
G:\ENVCAD\SYRACUSE\ACTIB0035\135\1640\2QTRR\DWG\Fig 1 - Site Location.mxd 7/14/2016 2:53:08 PM



LEGEND

- APPROXIMATE PROPERTY LINE
- FENCE
- MONITORING WELL
- SOIL SAMPLE LOCATION (1989)
- SOIL SAMPLE LOCATION (FEBRUARY 1990)
- EXPLORATORY BORING (APRIL 1990)
- EXPLORATORY BORING (JULY 1990)
- SOIL BORING (OCTOBER 2003)
- SOIL SAMPLE LOCATION (2008)
- SOIL BORING LOCATION (MARCH/JUNE 2010)
- SOIL SAMPLE LOCATION (2015)
- SAMPLING LOCATION (ARCADIS 2017)
- EXCAVATION EXTENTS

NOTE:

1. BASE MAP PROVIDED BY AECOM, DATED 01/26/2016. OFF-SITE FEATURES DIGITIZED FROM AERIAL IMAGERY. ALL FEATURES AND LOCATIONS ARE APPROXIMATE.

0 30' 60'

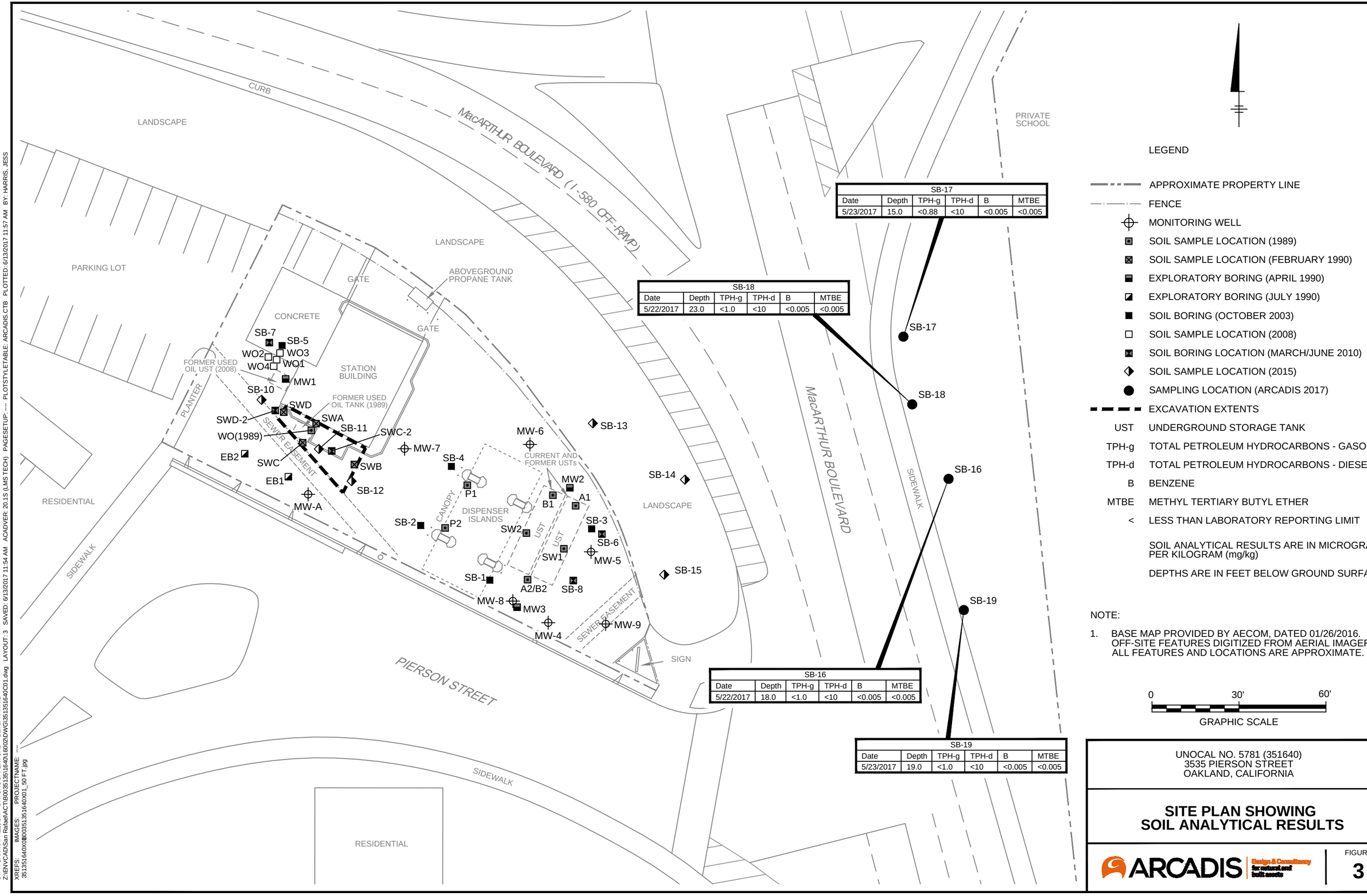
GRAPHIC SCALE

UNOCAL NO. 5781 (351640)
3535 PIERSON STREET
OAKLAND, CALIFORNIA

SITE PLAN

ARCADIS Design & Consultancy for natural and built assets

FIGURE 2



LEGEND

- APPROXIMATE PROPERTY LINE
- FENCE
- MONITORING WELL
- SOIL SAMPLE LOCATION (1989)
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- EXPLORATORY BORING (APRIL 1990)
- EXPLORATORY BORING (JULY 1990)
- SOIL BORING (OCTOBER 2003)
- SOIL SAMPLE LOCATION (2008)
- SOIL BORING LOCATION (MARCH/JUNE 2010)
- SOIL SAMPLE LOCATION (2015)
- SAMPLING LOCATION (ARCADIS 2017)
- EXCAVATION EXTENTS

UST	UNDERGROUND STORAGE TANK
TPH-g	TOTAL PETROLEUM HYDROCARBONS - GASOLINE
TPH-d	TOTAL PETROLEUM HYDROCARBONS - DIESEL
B	BENZENE
MTBE	METHYL TERTIARY BUTYL ETHER
<	LESS THAN LABORATORY REPORTING LIMIT

SOIL ANALYTICAL RESULTS ARE IN MICROGRAMS PER KILOGRAM (mg/kg)

DEPTHS ARE IN FEET BELOW GROUND SURFACE

NOTE:

1. BASE MAP PROVIDED BY AECOM, DATED 01/26/2016. OFF-SITE FEATURES DIGITIZED FROM AERIAL IMAGERY. ALL FEATURES AND LOCATIONS ARE APPROXIMATE.

0 30' 60'

GRAPHIC SCALE

UNOCAL NO. 5781 (351640)
3535 PIERSON STREET
OAKLAND, CALIFORNIA

SITE PLAN SHOWING SOIL ANALYTICAL RESULTS

ARCADIS Design & Consultancy for natural and built assets

FIGURE 3

CITY: SAN RAFAEL, CA DW/GROUP: ENVCAD DB: J. HARRIS
Z:\ENVCAD\San Rafael\ACTIB\0035135164016002\DWG\35135164C01.dwg LAYOUT: 3 SAVED: 6/13/2017 11:54 AM ACADVER: 20.1S (LMS TECH) PAGESETUP: ----
XREFS: IMAGES: PROJECTNAME: ----
35135164OXIB0035135164OX01_50 FT.jpg
PLOTSTYLETABLE: ARCADIS.CTB PLOTTED: 6/13/2017 11:57 AM BY: HARRIS, JESS

ATTACHMENT A

ACDEH Correspondence

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
REBECCA GEBHART, Interim Director

DEPARTMENT OF ENVIRONMENTAL HEALTH
LOCAL OVERSIGHT PROGRAM (LOP) FOR
HAZARDOUS MATERIALS RELEASES
1131 HARBOR BAY PARKWAY, SUITE 250
ALAMEDA, CA 94502
(510) 567-6700
FAX (510) 337-9335

February 10, 2017

Chevron Environmental Management Company
6101 Bollinger Canyon Road, C2102
San Ramon, CA 94583
Attention: James Kiernan
(*Sent via electronic mail to: jkiernan@chevron.com*)

United Brothers Enterprise Inc.
2501 North Main Street
Walnut Creek, CA 94597
Attention: DeLong Liu
(*Sent via electronic mail to: delongisi@yahoo.com*)

Subject: Conditional Work Plan Approval, Fuel Leak Case No. RO0000253 and GeoTracker Global ID T0600101467, Unocal #5781, 3535 Pierson Street, Oakland, CA 94619

Dear Messrs. Kiernan and Liu:

Alameda County Department of Environmental Health (ACDEH) has reviewed the case file, including the recently submitted document entitled *Offsite Investigation Work Plan* (Work Plan), dated January 24, 2017, prepared by Arcadis U.S., Inc. (Arcadis) for the subject site. As presented in the Work Plan, Arcadis proposes to advance two (2) soil bores for the collection of grab groundwater (GGW) samples. The offsite locations of the soil bores are to further define the contaminant plume in the direction of the Julia Morgan School for Girls, situated to the east across MacArthur Boulevard. The locations of the proposed soil bores are presented on Figure 3 of the Work Plan.

In the Work Plan, Arcadis states the GGW samples will be analyzed for total petroleum hydrocarbons (TPH) as gasoline (TPHg), TPH as diesel (TPHd); benzene, toluene, ethylbenzene, and xylenes (collectively BTEX); the fuel oxygenates methyl tertiary butyl ether (MTBE), tertiary butyl alcohol (TBA), di-isopropyl ether (DIPE), ethyl tertiary butyl ether (ETBE), tertiary amyl methyl ether (TAME), and ethanol; and 1,2-dichloroethane (1,2-DCA) and ethylene dibromide (EDB).

Arcadis further states that soil samples will only be collected for analytical testing if there are obvious signs of contamination based on visual and olfactory observations, as well as photoionization detector (PID) readings of volatile organic compounds (VOCs) associated with soil screening.

Based on ACDEH staff review of the referenced document and of the case file, we generally concur with the recently proposed scope of work, provided that the modifications requested in the technical comments below are addressed and incorporated during the field implementation. While the comments below request a number of additional soil bores and additionally requested items, submittal of a revised Work Plan is limited to a revised Figure 3 unless an alternate scope of work outside that described in the Work Plan and technical comments below is proposed. We request that you address the following technical comments, submit the requested document, and upon ACDEH approval, perform the proposed work, and send us the technical reports requested below. Please provide 72-hour advance written notification to this office (electronic mail preferred to: keith.nowell@acgov.org) prior to the start of field activities.

TECHNICAL COMMENTS

1. **Electronic Submittal of Information** – The Work Plan references the most recent groundwater monitoring event as having been conducted in October 2016. As of this writing, ACDEH is not in receipt

of this report. ACDEH requests submittal, by the date specified below, of this and any other documents pertaining to site investigation, monitoring, or cleanup not currently on the ACDEH FTP site. Additionally, ACDEH requests a list of these document submittals to the FTP site be provided to ACDEH via electronic mail, Attention: Keith Nowell, by the date specified below.

2. **Request for additional bore locations –** The placement of the proposed soil bores, identified as SB-16 and SB-17 in the Work Plan, are approximately 90 feet apart. ACDEH is of the opinion this distance between the two bores may be sufficiently great, allowing the contaminant plume to pass between these locations. Therefore, ACDEH requests placement of an additional soil bore approximately equidistant between SB-16 and SB-17. Please indicate the location of this soil bore on the Work Plan Addendum (revised Figure 3) requested below.

   Figure 3 of the Work Plan includes a rose diagram indicating significant variability of groundwater flow. Based on this variability, ACDEH requests an additional soil bore be advanced across MacArthur Boulevard from the subject site, in a southerly direction from the bore SB-16 location. This additional soil bore may increase the likelihood of capturing the contaminant plume should the plume have advanced to the east-southeast toward the school. Please indicate the location of this soil bore on the Work Plan Addendum (revised Figure 3) requested below.

3. **Soil sampling –** As indicated above, Arcadis proposes soil sampling for analytical testing only if there are obvious signs of contamination based on visual, olfactory and PID readings. ACDEH recommends collection and analysis of soil samples at the soil/water interface from each of the soil bores. Additionally, ACDEH requests collection and analysis of soil samples at areas of obvious contamination, and if staining, odor, or elevated PID readings are observed over an interval of several feet, a sufficient number of soil samples from this interval should be submitted for laboratory analyses to characterize the fuel hydrocarbon concentrations within this interval to ensure that the analytical results define the vertical extent of TPH impacts at theses locations.

SUBMITTAL ACKNOWLEDGEMENT STATEMENT

Please note that ACDEH has updated its Attachment 1 with regard to report submittals to ACDEH. ACDEH will now be requiring a Submittal Acknowledgement Statement, replacing the Perjury Statement, as a cover letter signed by the Responsible Party (RP). The language for the Submittal Acknowledgement Statement is as follows:

"I have read and acknowledge the content, recommendations and/or conclusions contained in the attached document or report submitted on my behalf to ACDEH's FTP server and the SWRCB's GeoTracker website."

Please make this change to your submittals to ACDEH.

NOTIFICATION OF FIELDWORK ACTIVITIES

Please schedule and complete the fieldwork activities by the date specified below and provide ACDEH with at least three (3) business days notification prior to conducting the fieldwork.

TECHNICAL REPORT REQUEST

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

- **February 28, 2017** – Electronic Submittal of Information
- **February 28, 2017** – List of documents submitted to ACDEH (Provided via electronic mail to ACDEH Attn.: Keith Nowell)
- **March 10, 2017 – Work Plan Addendum (Figure 3)** (Provided to ACDEH, Attn.: Keith Nowell as an electronic mail attachment)
- **90 Days After Work Plan Addendum Approval –** Soil and Groundwater Investigation Report (file to be named: RO0000253_SWI_R_yyyy-mm-dd)

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

Sincerely,

Keith Nowell

Digitally signed by Keith Nowell
DN: cn=Keith Nowell, o=Alameda County, ou=Department of Environmental Health, email=keith.nowell@acgov.org, c=US
Date: 2017.02.10 12:31:01 -08'00'

Keith Nowell, PG, CHG
Hazardous Materials Specialist

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

cc: Tamera Rogers, Arcadis U.S. Inc., 6296 San Ignacio Ave, Suite C & D, San Jose, CA, 95119 (*Sent via electronic mail to:* Tamera.Rogers@arcadis.com)

Dilan Roe, ACDEH (*Sent via electronic mail to: dilan.roe@acgov.org*)
Paresh Khatri, ACDEH (*Sent via electronic mail to: paresh.khatri@acgov.org*)
Keith Nowell, ACDEH, (*Sent via electronic mail to keith.nowell@acgov.org*)
GeoTracker, file

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
REBECCA GEBHART, Interim Director

DEPARTMENT OF ENVIRONMENTAL HEALTH
LOCAL OVERSIGHT PROGRAM (LOP) FOR
HAZARDOUS MATERIALS RELEASES
1131 HARBOR BAY PARKWAY, SUITE 250
ALAMEDA, CA 94502
(510) 567-6700
FAX (510) 337-9335

April 3, 2017

Chevron Environmental Management Company
6101 Bollinger Canyon Road, C2102
San Ramon, CA 94583
Attention: James Kiernan
(*Sent via electronic mail to: jkiernan@chevron.com*)

United Brothers Enterprise Inc.
2501 North Main Street
Walnut Creek, CA 94597
Attention: DeLong Liu
(*Sent via electronic mail to: delongisi@yahoo.com*)

Subject: Work Plan Approval, Fuel Leak Case No. RO0000253 and GeoTracker Global ID T0600101467, Unocal #5781, 3535 Pierson Street, Oakland, CA 94619

Dear Messrs. Kiernan and Liu:

Alameda County Department of Environmental Health (ACDEH) has reviewed the case file, including the recently submitted documents entitled *Offsite Investigation Work Plan* (Work Plan), dated January 24, 2017, and the Revised Figure 3 submitted to our office on March 8, 2017 as an electronic mail attachment. The Revised Figure 3 depicts locations of two additional soil bores requested by ACDEH in our letter dated February 10, 2017 in response to our review of the Work Plan. Both documents were prepared by Arcadis U.S., Inc. (Arcadis) for the subject site.

Based on ACDEH staff review of the referenced documents and of the case file, we generally concur with the recently proposed scope of work, provided that the modifications requested our February 10, 2017 incorporated during the field implementation. We request that you perform the proposed work and send us the technical report requested below. Please provide 72-hour advance written notification to this office (electronic mail preferred to: keith.nowell@acgov.org) prior to the start of field activities.

SUBMITTAL ACKNOWLEDGEMENT STATEMENT

Please note that ACDEH has updated its Attachment 1 with regard to report submittals to ACDEH. ACDEH will now be requiring a Submittal Acknowledgement Statement, replacing the Perjury Statement, as a cover letter signed by the Responsible Party (RP). The language for the Submittal Acknowledgement Statement is as follows:

"I have read and acknowledge the content, recommendations and/or conclusions contained in the attached document or report submitted on my behalf to ACDEH's FTP server and the SWRCB's GeoTracker website."

Please make this change to your submittals to ACDEH.

NOTIFICATION OF FIELDWORK ACTIVITIES

Please schedule and complete the fieldwork activities by the date specified below and provide ACDEH with at least three (3) business days notification prior to conducting the fieldwork.

TECHNICAL REPORT REQUEST

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

- **July 3, 2017** – Soil and Groundwater Investigation Report (file to be named: RO0000253_SWI_R_yyyy-mm-dd)

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

Sincerely,

Keith Nowell

Digitally signed by Keith Nowell
DN: cn=Keith Nowell, o=Alameda County, ou=Department of Environmental Health, email=keith.nowell@acgov.org, c=US
Date: 2017.04.03 09:34:01 -07'00'

Keith Nowell, PG, CHG
Hazardous Materials Specialist

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

cc: Tamera Rogers, Arcadis U.S. Inc., 6296 San Ignacio Ave, Suite C & D, San Jose, CA, 95119 (*Sent via electronic mail to:* Tamera.Rogers@arcadis.com)

Dilan Roe, ACDEH (*Sent via electronic mail to: dilan.roe@acgov.org*)
Paresh Khatri, ACDEH (*Sent via electronic mail to: paresh.khatri@acgov.org*)
Keith Nowell, ACDEH (*Sent via electronic mail to keith.nowell@acgov.org*)
GeoTracker, file

ATTACHMENT B

Alameda County public Works Agency Drilling Permit

Alameda County Public Works Agency - Water Resources Well Permit

Public Works Agency
Alameda County

399 Elmhurst Street
Hayward, CA 94544-1395
Telephone: (510)670-6633 Fax:(510)782-1939

Application Approved on: 03/29/2017 By jamesy

Permit Numbers: W2017-0280
Permits Valid from 04/10/2017 to 04/12/2017

Application Id: 1489700137657 **City of Project Site:** Oakland
Site Location: 3535 Pierson Street, Oakland, CA

The site is an active Shell-branded service station. The borings will be advanced across the street along MacArthur Blvd.

Project Start Date: 04/10/2017 **Completion Date:** 04/12/2017
Assigned Inspector: Contact Marcelino Vialpando at (510) 670-5760 or Marcelino@acpwa.org

Applicant: Arcadis U.S., Inc. - Carl Edwards **Phone:** 415-825-0759
100 Montgomery Street, Suite 300, San Francisco, CA 94104
Property Owner: United Brothers Enterprise Inc. **Phone:** --
3535 Pierson Street, Oakland, CA 94619
Client: Chevron EMC **Phone:** --
6001 Bollinger Canyon Road, San Ramon, CA 94583

Total Due: $265.00
Receipt Number: WR2017-0149 **Total Amount Paid:** $265.00
Payer Name : Arcadis U.S., Inc. Paid By: CHECK **PAID IN FULL**

Works Requesting Permits:

Borehole(s) for Geo Probes-Sampling 24 to 72 hours only - 4 Boreholes
Driller: Cascade Drilling - Lic #: 938110 - Method: DP **Work Total: $265.00**

Specifications

Permit Number	Issued Dt	Expire Dt	# Boreholes	Hole Diam	Max Depth
W2017-0280	03/29/2017	07/09/2017	4	2.25 in.	25.00 ft

Specific Work Permit Conditions

1. Backfill bore hole by tremie with cement grout or cement grout/sand mixture. Upper two-three feet replaced in kind or with compacted cuttings. All cuttings remaining or unused shall be containerized and hauled off site. The containers shall be clearly labeled to the ownership of the container and labeled hazardous or non-hazardous.

2. Boreholes shall not be left open for a period of more than 24 hours. All boreholes left open more than 24 hours will need approval from Alameda County Public Works Agency, Water Resources Section. All boreholes shall be backfilled according to permit destruction requirements and all concrete material and asphalt material shall be to Caltrans Spec or County/City Codes. No borehole(s) shall be left in a manner to act as a conduit at any time.

3. Permittee shall assume entire responsibility for all activities and uses under this permit and shall indemnify, defend and save the Alameda County Public Works Agency, its officers, agents, and employees free and harmless from any and all expense, cost, liability in connection with or resulting from the exercise of this Permit including, but not limited to, properly damage, personal injury and wrongful death.

4. Applicant shall contact assigned inspector listed on the top of the permit at least five (5) working days prior to starting, once the permit has been approved. Confirm the scheduled date(s) at least 24 hours prior to drilling.

5. Permittee, permittee's contractors, consultants or agents shall be responsible to assure that all material or waters generated during drilling, boring destruction, and/or other activities associated with this Permit will be safely handled,

properly managed, and disposed of according to all applicable federal, state, and local statutes regulating such. In no case shall these materials and/or waters be allowed to enter, or potentially enter, on or off-site storm sewers, dry wells, or waterways or be allowed to move off the property where work is being completed.

6. Copy of approved drilling permit must be on site at all times. Failure to present or show proof of the approved permit application on site shall result in a fine of $500.00.

7. NOTE:
Under California laws, the owner/operator are responsible for reporting the contamination to the governmental regulatory agencies under Section 25295(a). The owner/operator is liable for civil penalties under Section 25299(a)(4) and criminal penalties under Section 25299(d) for failure to report a leak. The owner/operator is liable for civil penalties under Section 25299(b)(4) for knowing failure to ensure compliance with the law by the operator. These penalty provisions do not apply to a potential buyer.

8. Prior to any drilling activities onto any public right-of-ways, it shall be the applicants responsibilities to contact and coordinate a Underground Service Alert (USA), obtain encroachment permit(s), excavation permit(s) or any other permits required for that City or to the County and follow all City or County Ordinances. It shall also be the applicants responsibilities to provide to the Cities or to Alameda County a Traffic Safety Plan for any lane closures or detours planned. No work shall begin until all the permits and requirements have been approved or obtained.

9. Permit is valid only for the purpose specified herein. No changes in construction procedures, as described on this permit application. Boreholes shall not be converted to monitoring wells, without a permit application process.

ATTACHMENT C

City of Oakland Permits

Permits for which no major inspection has been approved within 180 days shall expire by limitation. No refund more than 180 days after expiration or final.

CITY OF OAKLAND

250 FRANK H. OGAWA PLAZA ▪ 2ND FLOOR ▪ OAKLAND, CA 94612

Planning and Building Department
www.oaklandnet.com

PH: 510-238-3891
FAX: 510-238-2263
TDD: 510-238-3254

Permit No: OB1700586 Obstruction **Filed Date:** 5/5/2017

Job Site: 3535 PIERSON ST **Schedule Inspection by calling:** 510-238-3444

Parcel No: 036 250201500

District:

Project Description: per traffic control plan attached. To Have Illegally Parked Vehicle Ticketed Call 510-777-3333. Applicant arranges towing. Comply with terms set forth in CVC Section 22651 (m). For Towed Vehicle: Call 510-238-3021.

Related Permits:

	Name	Applicant	Address	Phone	License #
Owner:	UNITED BROTHERS ENTERPRISE INC		3535 PIERSON ST OAKLAND, CA		
Contractor:	CASCADE DRILLING L P		P O BOX 1184 WOODINVILLE, WA	(425) 485-9802	938110
Contractor:	tamera rogers	X	P O BOX 1184 WOODINVILLE, WA	(425) 485-9802	

PERMIT DETAILS: Building/Public Use/Activity/Obstructions

Work Information

Start Date: 05/22/2017
End Date: 05/24/2017

Obstruction Permit Type: Short Term (Max 14 Days)
Number of Meters (Metered Area): 0
Length Of Obstruction (Unmetered Area): 0

TOTAL FEES TO BE PAID AT FILING: $623.29

Application Fee	$70.00	Inspection	$320.00	Records Management Fee	$37.05
Technology Enhancement Fee	$20.48	Transportation Service	$175.76		

Plans Checked By _____ Date _____ Permit Issued By _____ Date 5.5.17

Finalized By _____ Date _____

Permits for which no major inspection has been approved within 180 days shall expire by limitation. No refund more than 180 days after expiration or final.

CITY OF OAKLAND

Permit No: OB1700586 **Parcel No:** 036 250201500 **Job Site:** 3535 PIERSON ST

LICENSED CONTRACTOR'S DECLARATION

I hereby affirm under penalty of perjury that I am licensed under provisions of Chapter 9 (commencing with Section 7000) of Division 3 of the Business and Professions Code, and my license is in full force and effect.

CONSTRUCTION LENDING AGENCY DECLARATION

I hereby affirm under penalty of perjury that there is a construction lending agency for the performance of the work for which this permit is issued (Section 8172, Civil Code).

Lender's Name _____

Branch Designation _____

Lender's Address _____

WORKERS' COMPENSATION DECLARATION

WARNING: FAILURE TO SECURE WORKERS' COMPENSATION COVERAGE IS UNLAWFUL, AND SHALL SUBJECT AN EMPLOYER TO CRIMINAL PENALTIES AND CIVIL FINES UP TO ONE HUNDRED THOUSAND DOLLARS ($100,000), IN ADDITION TO THE COST OF COMPENSATION, DAMAGES AS PROVIDED FOR IN SECTION 3706 OF THE LABOR CODE, INTEREST, AND ATTORNEY'S FEES.

I hereby affirm under penalty of perjury one of the following declarations:

☐ I have and will maintain a certificate of consent to self-insure for workers' compensation, issued by the Director of Industrial Relations as provided for by Section 3700 of the Labor Code, for the performance of the work for which this permit is issued.

☐ I have and will maintain workers' compensation insurance, as required by Section 3700 of the Labor Code, for the performance of the work for which this permit is issued.

☐ I certify that, in the performance of the work for which this permit is issued, I shall not employ any person in any manner so as to become subject to the workers' compensation laws of California, and agree that, if I should become subject to the workers' compensation provisions of Section 3700 of the Labor Code, I shall forthwith comply with those provisions.

RRP ACKNOWLEDGMENT

EPA's Lead Renovation, Repair and Painting Rule (RRP Rule) requires that firms performing renovation, repair, and painting projects that disturb lead-based paint in homes, child care facilities and pre-schools built before 1978 have their firm certified by EPA or use certified renovators who are trained by EPA-approved training providers and follow lead-safe work practices. As the contractor preparing to do work on a Pre-1978 building, I have read the explanation of the RRP Rule and will ensure that any paint disturbing work will be done by or supervised by an RRP certified individual(s). Failure to follow this rule may result in enforcement action by the EPA. For additional information on complying with lead safety requirements, contact the Alameda County Healthy Homes Department at (510) 567-8280 or 1-800-253-2372 or visit http://www.achhd.org.

HAZARDOUS MATERIALS DECLARATION

I hereby affirm that the intended occupancy ☐WILL ☐ WILL NOT use, handle or store any hazardous, or acutely hazardous, materials. (Checking "WILL" acknowledges that Sections 25505, 25533, and 25534 of the Health and Safety Code, as well as filing instructions were made available to you).

I HEREBY CERTIFY THE FOLLOWING: That I have read this document; that the above information is correct; and that I have truthfully affirmed all applicable declarations contained in this document. I agree to comply with all city and county ordinances and state laws relating to building construction, and hereby authorize representatives of this city to enter upon the above-mentioned property for inspection purposes.

I hereby agree to save, defend, indemnify and keep harmless the City of Oakland and its officials, officers, employees, representatives, agents, and volunteers from all actions, claims, demands, litigation, or proceedings, including those for attorneys' fees, against the City in consequence of the granting of this permit or from the use or occupancy of the public right-of-way, public easement, or any sidewalk, street or sub-sidewalk or otherwise by virtue thereof, and will in all things strictly comply with the conditions under which this permit is granted I further certify that I am the owner of the property involved in this permit or that I am fully authorized by the owner to access the property and perform the work authorized by this permit.

Name _____

Signature _____

☐ Contractor, or ☐Contractor's Agent Date

NOTICE: No activities related to the approved work, including storage/use of materials, is allowed within the public right-of-way without an encroachment permit. Dust control measures shall be used throughout all phases of construction.

Permits for which no major inspection has been approved within 180 days shall expire by limitation. No refund more than 180 days after expiration or final.

CITY OF OAKLAND

250 FRANK H. OGAWA PLAZA ▪ 2ND FLOOR ▪ OAKLAND, CA 94612

Planning and Building Department
www.oaklandnet.com

PH: 510-238-3891
FAX: 510-238-2263
TDD: 510-238-3254

Permit No: X1700483 OPW - Excavation **Filed Date:** 5/5/2017

Job Site: 3535 PIERSON ST **Schedule Inspection by calling:** 510-238-3444

Parcel No: 036 250201500

District:

Project Description: Soil boring(s) on MacArthur Blvd. near Pierson Street. Traffic contractor plan is the companion permit. Ensure that environmental controls are in place to prevent dust/debris/waste water from contaminating environment. Do Not Cut Into Pavement Unless And Until Ready To Complete Project.
If working within 25' feet of a monument you must comply with State Law 8771, contact the Inspector prior to starting excavation: minimum $5,800.00 fine for non-compliance.
Comply with all terms of City of Oakland Public Works Standards, Street Excavation Rules, Revised March 2015 and City Council Ordinance No. 13300 C.M.S. Five day prior notice required for work lasting five days or less in business/commercial districts; 72 hour notice in residential districts. Ten day prior notice required for work lasting six days or more in all districts.
USA # and date must be provided in order to have a permit issued. Permit valid 90 days. Call PWA INSPECTION prior to start: 510-238-3651 or email PWA_inspections@oaklandnet.com.

Related Permits:

	Name	Applicant	Address	Phone	License #
Owner:	UNITED BROTHERS ENTERPRISE INC		3535 PIERSON ST OAKLAND, CA		
Contractor:	CASCADE DRILLING L P		P O BOX 1184 WOODINVILLE, WA	(425) 485-9802	938110
Contractor:	tamera rogers	X	P O BOX 1184 WOODINVILLE, WA	(425) 485-9802	

PERMIT DETAILS: Building/Public Infrastructure/Excavation/NA

General Information

Excavation Type: Private Party
Special Paving Detail Required:
Tree Removal Involved:
Date Street Last Resurfaced:
Holiday Restriction (Nov 1 - Jan 1):
Worker's Compensation Company Name:
Limited Operation Area (7AM-9AM) And (4PM-6PM):
Worker's Compensation Policy #:

Key Dates

Approximate Start Date:
Approximate End Date:

TOTAL FEES TO BE PAID AT FILING: $697.91

Excavation - Private Party Type	$321.36	Inspection - Normal Operating Hours	$286.84	Records Management Fee	$57.78
Technology Enhancement Fee	$31.93				

Permits for which no major inspection has been approved within 180 days shall expire by limitation. No refund more than 180 days after expiration or final.

CITY OF OAKLAND

Permit No: X1700483 **Parcel No:** 036 250201500 **Job Site:** 3535 PIERSON ST

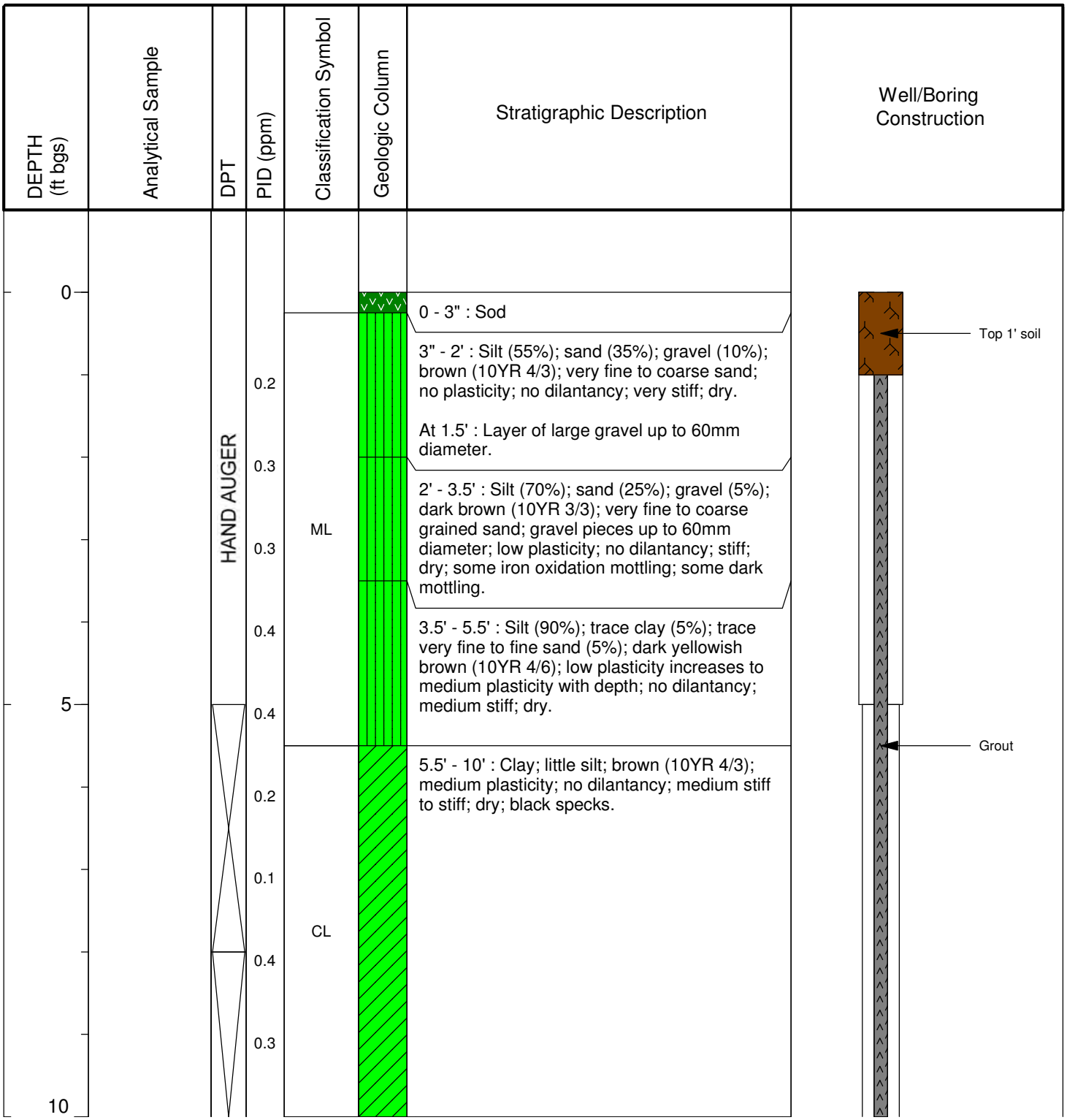
Plans Checked By _____ Date _____ Permit Issued By _____ Date 5/5/17

Finalized By _____ Date _____

ATTACHMENT D

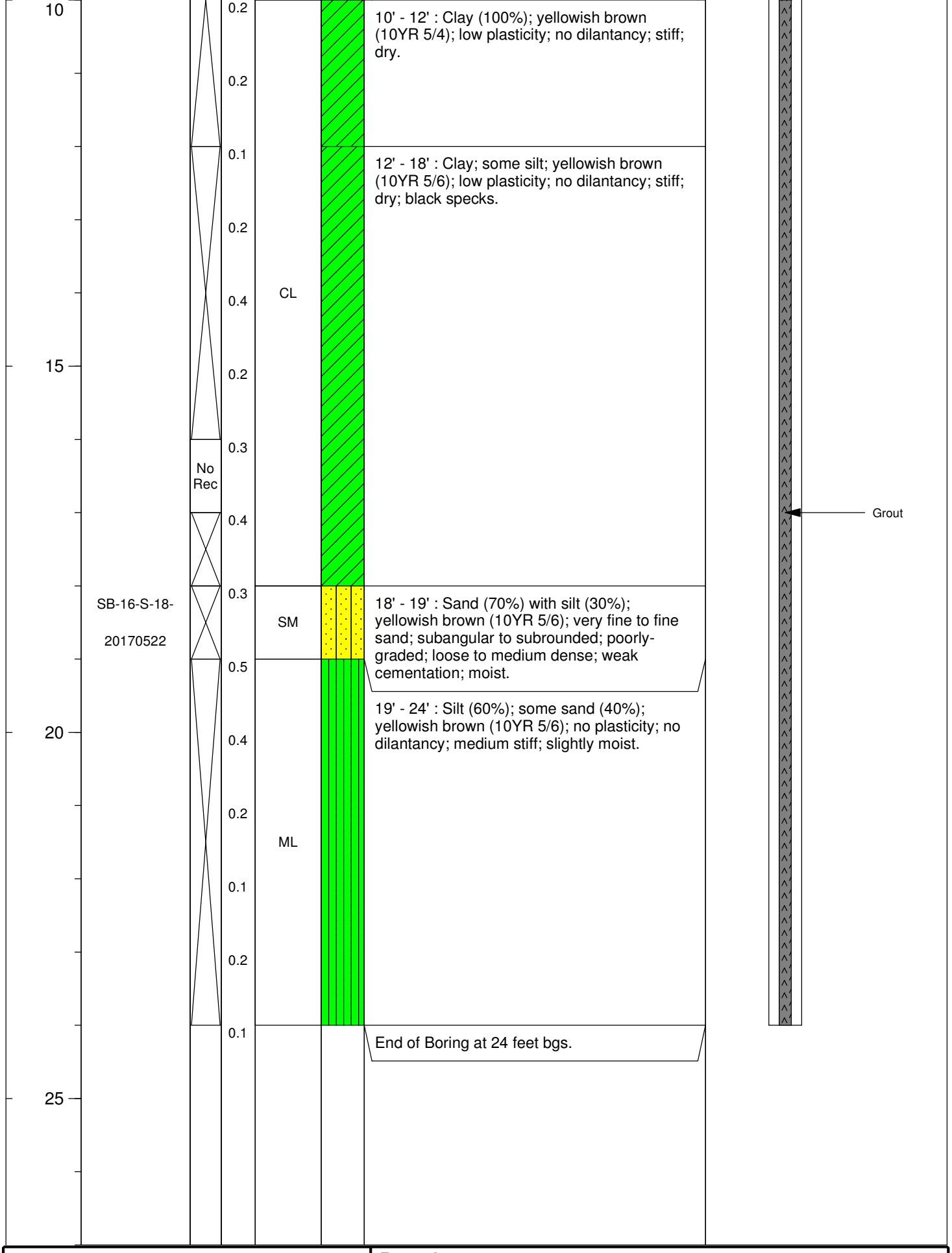
Boring Logs

Date Start/Finish:	05/22/2017	**Latitude:**	NA	**Well/Boring ID: SB-16**	
Drilling Company:	Cascade Drilling	**Longitude:**	NA	**Client:**	Chevron Environmental Management Company
Driller/Helper:	Louis/Fernando	**Casing Elevation:**	NA		
Drilling Method:	Direct Push / HA	**Surface Elevation:**	NA	**Location:**	3535 Pierson street, Oakland, CA
Hole Diameter:	2.75" DPT / 3.25" HA	**Borehole Depth:**	24 ft bgs		
Casing Diameter:	1" PVC	**First Water:**	NA		
Sampling Method:	Hand Auger/ DPT Drilling	**Stable Water:**	DRY		
		Logged By:	K. Rose		



ARCADIS Design & Consultancy for natural and built assets

Remarks:
Abbreviations: bgs = below ground surface, NA = not available; not applicable, PID = photoionization detector, ppm = parts per million, ft = feet, PVC = polyvinyl chloride, % = percent, HA = Hand Auger.



Remarks:
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ARCADIS Design & Consultancy for natural and built assets

Project Number:B0035135.1640.16007
Data File:351640

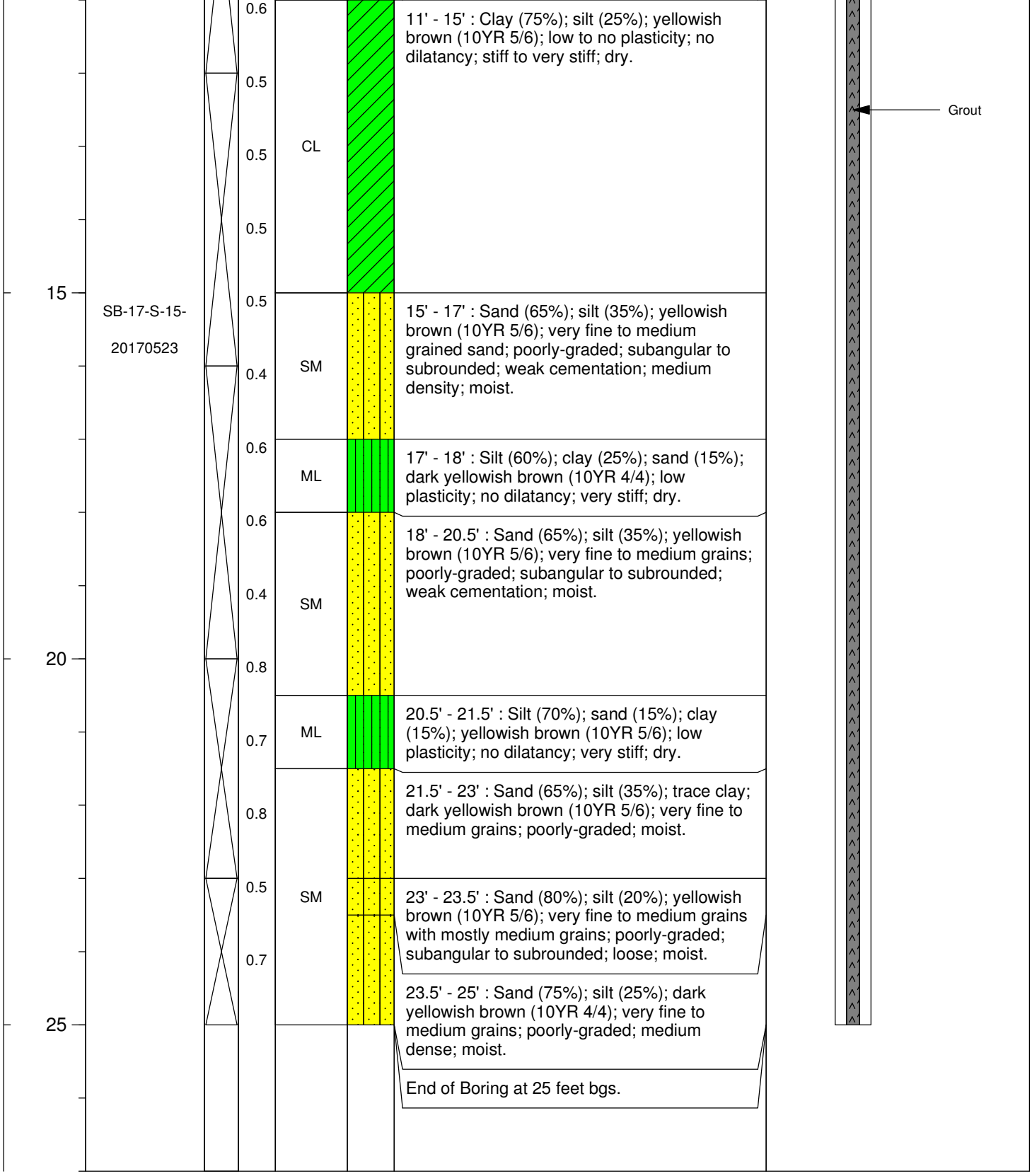
Date:6/27/2017

Date Start/Finish:	05/22/2017-05/23/2017	**Latitude:**	NA	**Well/Boring ID: SB-17**	
Drilling Company:	Cascade Drilling	**Longitude:**	NA	**Client:**	Chevron Environmental Management Company
Driller/Helper:	Louis/Fernando	**Casing Elevation:**	NA		
Drilling Method:	Direct Push / HA	**Surface Elevation:**	NA	**Location:**	3535 Pierson street, Oakland, CA
Hole Diameter:	2.75" DPT / 3.25" HA	**Borehole Depth:**	25 ft bgs		
Casing Diameter:	1" PVC	**First Water:**	NA		
Sampling Method:	Hand Auger/ DPT Drilling	**Stable Water:**	DRY		
		Logged By:	K. Rose		

DEPTH (ft bgs)	Analytical Sample	DPT	PID (ppm)	Classification Symbol	Geologic Column	Stratigraphic Description	Well/Boring Construction
0		HAND AUGER	0.8	SW		0 - 3" : Sod 3" - 2.5' : Sand (55%); gravel (35%); silt (10%); dark grayish brown (10YR 5/2); well-graded; angular to subangular; loose; weak cementation.	Top 1' soil
			0.5				
			0.6			2.5' - 4' : Silt (80%); sand (12%); gravel (3%); clay (5%); dark grayish brown (10YR 4/2); low plasticity; no dilantancy; stiff.	
			0.6	ML		4' - 6' : Silt (82%); sand (5%); gravel (3%); clay (10%); brown (10YR 4/3); very fine to medium sand; gravel up to 6mm; medium plasticity; stiff to very stiff; lenses of darker brown silt. At 5' : Increase in clay; black specks.	
5			0.7				
			0.3			6' - 11' : Clay (90%); silt (10%); yellowish brown (10YR 5/4); low plasticity; no dilatancy; very stiff; dry.	Grout
			0.7				
			0.3	CL			
			0.5				
10			0.4				

ARCADIS Design & Consultancy for natural and built assets

Remarks:
Abbreviations: bgs = below ground surface, NA = not available; not applicable, PID = photoionization detector, ppm = parts per million, ft = feet, PVC = polyvinyl chloride, % = percent, HA = Hand Auger.



Remarks:
Abbreviations: bgs = below ground surface, NA = not available; not applicable, PID = photoionization detector, ppm = parts per million, ft = feet, PVC = polyvinyl chloride, % = percent, HA = Hand Auger.

ARCADIS Design & Consultancy for natural and built assets

Project Number:B0035135.1640.16007
Data File:351640

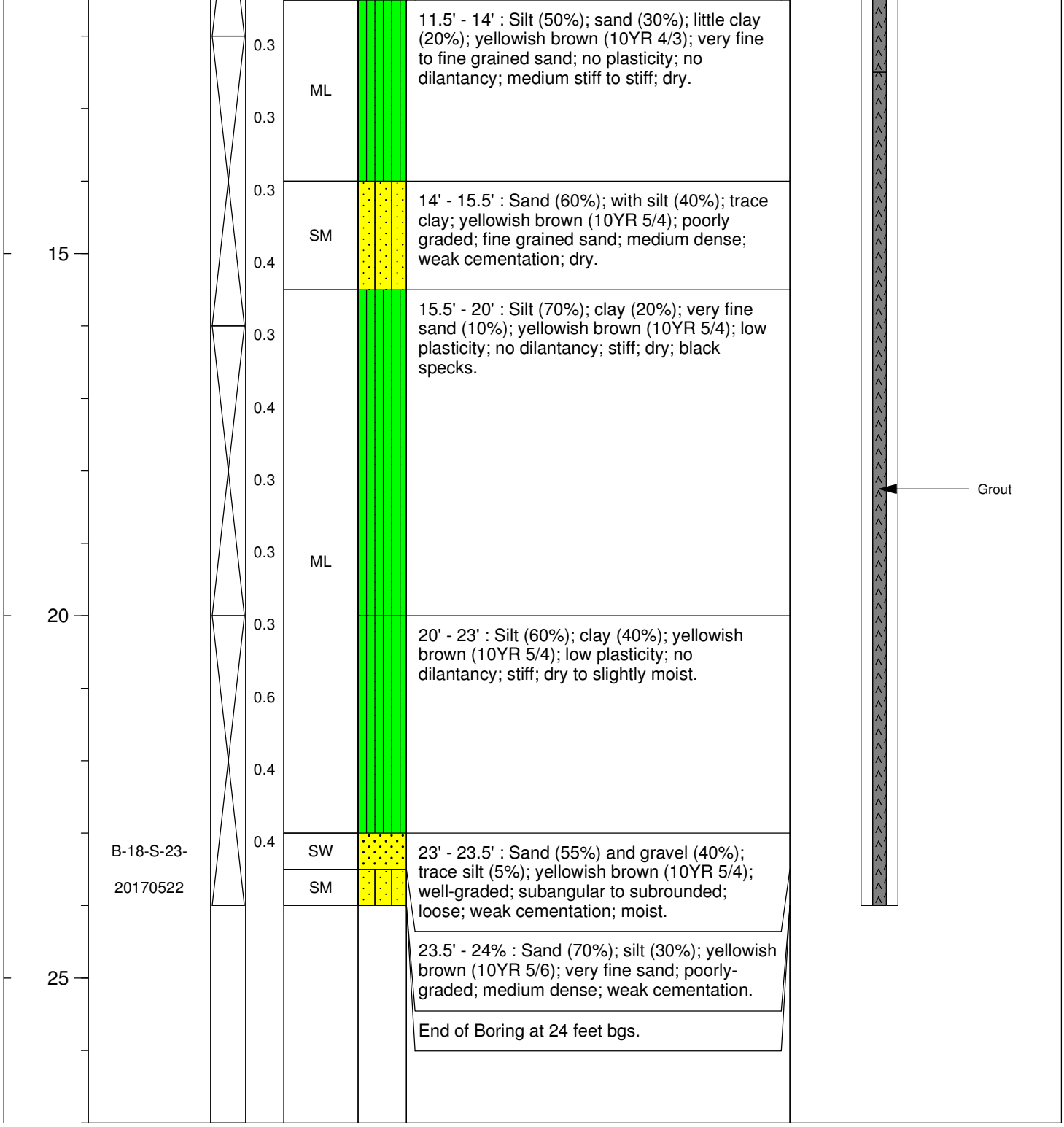
Date:6/27/2017

Date Start/Finish:	05/22/2017	**Latitude:**	NA	**Well/Boring ID: SB-18**	
Drilling Company:	Cascade Drilling	**Longitude:**	NA	**Client:**	Chevron Environmental Management Company
Driller/Helper:	Louis/Fernando	**Casing Elevation:**	NA		
Drilling Method:	Direct Push / HA	**Surface Elevation:**	NA	**Location:**	3535 Pierson street, Oakland, CA
Hole Diameter:	2.75" DPT / 3.25" HA	**Borehole Depth:**	24 ft bgs		
Casing Diameter:	1" PVC	**First Water:**	NA		
Sampling Method:	Hand Auger/ DPT Drilling	**Stable Water:**	DRY		
		Logged By:	K. Rose		

DEPTH (ft bgs)	Analytical Sample	DPT	PID (ppm)	Classification Symbol	Geologic Column	Stratigraphic Description	Well/Boring Construction
0						0 - 3" : Sod	Top 1' soil
		HAND AUGER	0.3	SM		3" - 3' : Sand (50%); some silt (30%); little gravel (20%); brown (10YR 4/3); very fine to coarse sand; gravel up to 50mm diameter; well-graded; angular to subangular; dense; dry.	
			0.7				
			0.9	ML		3' - 5' : Silt (65%); sand (30%); gravel (5%); dark brown (10YR 3/3); no plasticity; no dilantancy; stiff to very stiff; dry.	
			0.6				
5			0.7			At 5' : Large gravel 10mm - 50mm; subangular; hard.	
			0.3	CL		5' - 9' : Clay (90%); silt (10%); brown (10YR 4/3); medium plasticity; no dilatancy; medium stiff to soft; dry.	Grout
			0.1				
			0.3				
			0.3			9' - 11.5' : Clay (70%); silt (30%); yellowish brown (10YR 5/6); low plasticity; no dilatancy; stiff; dry; black specks.	
10			0.3				
			0.3				

ARCADIS Design & Consultancy for natural and built assets

Remarks:
Abbreviations: bgs = below ground surface, NA = not available; not applicable, PID = photoionization detector, ppm = parts per million, ft = feet, PVC = polyvinyl chloride, % = percent, HA = Hand Auger.



Remarks:
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ARCADIS Design & Consultancy for natural and built assets

Project Number:B0035135.1640.16007
Data File:351640

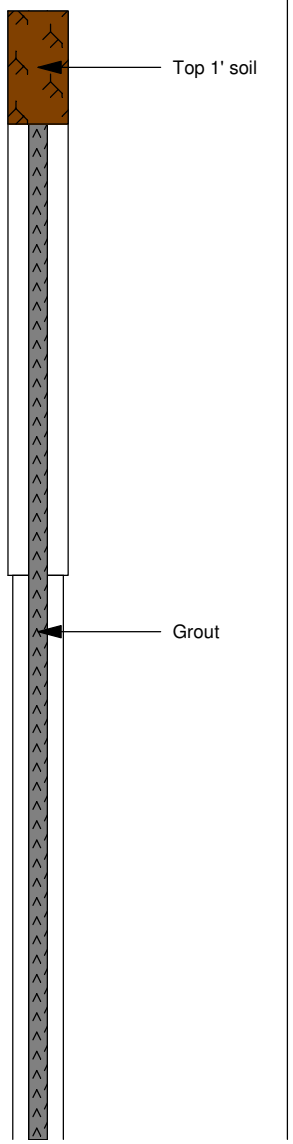
Date:6/27/2017

Date Start/Finish: 05/23/2017
Drilling Company: Cascade Drilling
Driller/Helper: Louis/Fernando
Drilling Method: Direct Push / HA
Hole Diameter: 2.75" DPT / 3.25" HA
Casing Diameter: 1" PVC
Sampling Method: Hand Auger/ DPT Drilling

Latitude: NA
Longitude: NA
Casing Elevation: NA
Surface Elevation: NA
Borehole Depth: 25 ft bgs
First Water: NA
Stable Water: DRY
Logged By: K. Rose

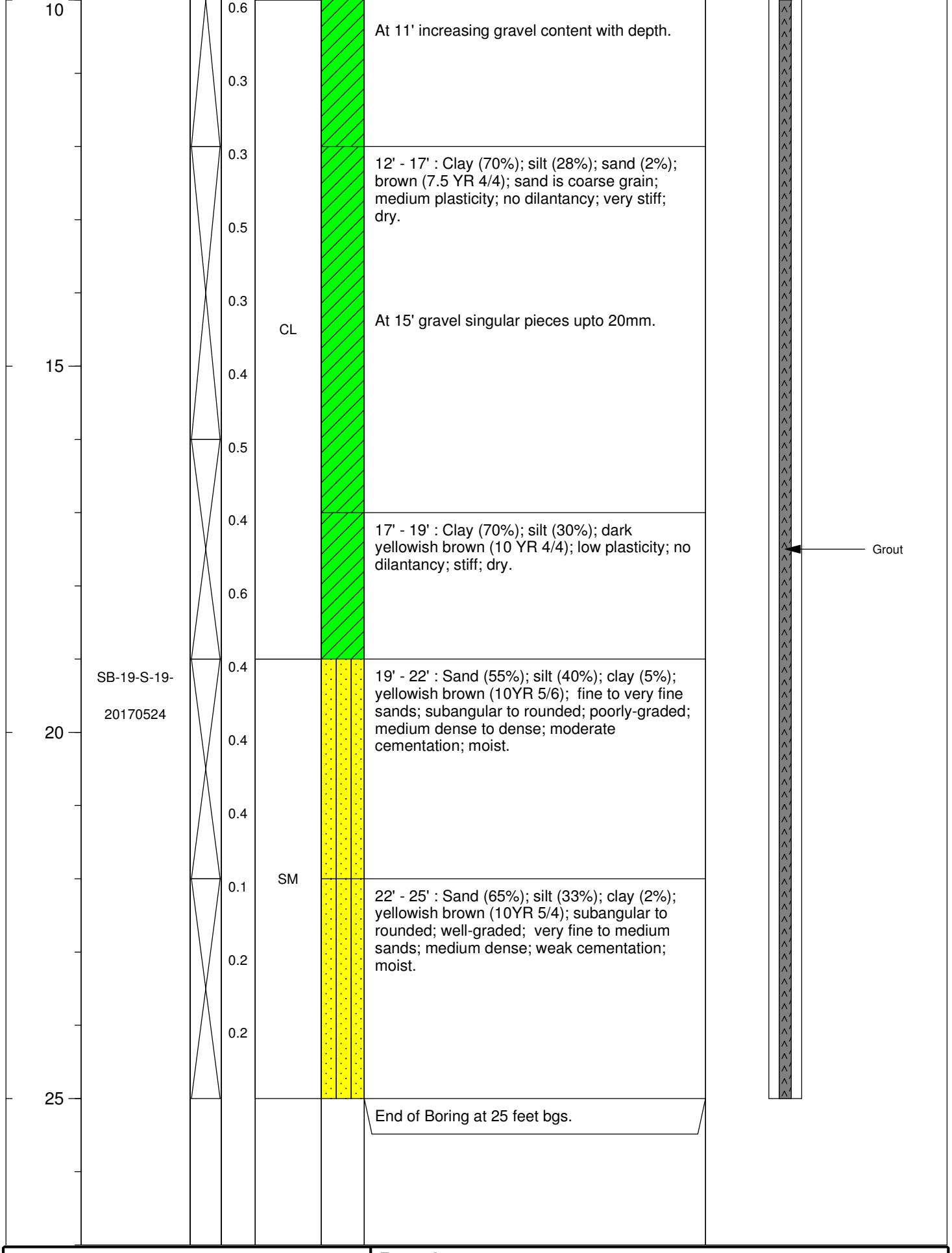
Well/Boring ID: SB-19
Client: Chevron Environmental Management Company
Location: 3535 Pierson street, Oakland, CA

DEPTH (ft bgs)	Analytical Sample	DPT	PID (ppm)	Classification Symbol	Stratigraphic Description
0					0 - 3" : Sod
				GW-GM	3" - 2' : Gravel (70%); sand (20%); silt (10%); dark yellowish brown (10YR 4/6); well-graded; angular to subangular; loose; dry.
				SM	2' - 3' : Sand (50%); gravel (25%); silt (25%); dark yellowish brown (10YR 3/4); fine to very coarse sands, up to 40mm; well-graded; angular to subrounded; loose; weak cementation; dry.
5		HAND AUGER		SM-SC	3' - 6' : Sand (60%); silt (20%); clay (15%); gravel (5%); dark yellowish brown (10YR 3/4); fine to very coarse sands, up to 45mm gravels; sand is well-graded; angular to subrounded; low plasticity; no dilantancy; loose to medium dense; stiff; dry; iron oxidation present.
			0.2 0.1	CL	6' - 9' : Clay (80%); silt (18%); sand (2%); brown (7.5YR 4/4) with black lens; medium plasticity; no dilantancy; stiff; dry; some oxidation. At 8' color changes to very dark brown (7.5YR 5/2).
			0.2		
			0.6		9' - 12' : Clay (60%); sand (20%); silt (19%); gravel (1%); dark brown (7.5 YR 3/3) with single gravels up to 30mm; medium - low plasticity; no dilantancy; very stiff; dry.
10					



ARCADIS Design & Consultancy for natural and built assets

Remarks:
Abbreviations: bgs = below ground surface, NA = not available; not applicable, PID = photoionization detector, ppm = parts per million, ft = feet, PVC = polyvinyl chloride, % = percent, HA = Hand Auger



ARCADIS Design & Consultancy for natural and built assets

Remarks:
Abbreviations: bgs = below ground surface, NA = not available; not applicable, PID = photoionization detector, ppm = parts per million, ft = feet, PVC = polyvinyl chloride, % = percent, HA = Hand Auger

Project Number:B0035135.1640.16007
Data File:351640

Date:6/27/2017

ATTACHMENT E

Laboratory Analytical Report

Date of Report: 06/07/2017

Carl Edwards

Arcadis - San Francisco
100 Montgomery Street, Suite 300
San Francisco, CA 94104

Client Project:	B00351351640
BCL Project:	351640
BCL Work Order:	1714350
Invoice ID:	B269655

Enclosed are the results of analyses for samples received by the laboratory on 5/25/2017. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Molly Meyers

Contact Person: Molly Meyers
Client Service Rep

Authorized Signature

Table of Contents

BC Laboratories, Inc. 17-14350

Chain of Custody Form

Page 1 of 1

Report To: Client: Arcadis	Project #: B0035135.1640
Attn: Carl Edwards	Project Name: 351640
Street Address: 100 Montgomery St	
City, State, Zip: San Francisco, CA 94104	Sampler(s): K. Rose, J. Sanchez
Phone: 415-825-0759 Fax:	
Email Address: carl.edwards@arcadis.com	
Work Order #:	

Analysis Requested

Comments: Unused sample containers included in cooler for disposal

Sample #	Description	Date Sampled	Time Sampled	TPH-g (C_6-C_{12}) (8015M)	TPH-d (C_{12}-C_{24}) (8015M)	BTEX (8260B)	MTBE, TBA (8260B)	DIPE, ETBE, TAME (8260B)	Ethanol (8260B)	1,2-DCA, EDB (8260B)	Sample Matrix: Soil	Sludge	Drinking Water	Ground Water	Waste Water	Other	Turnaround # of work days*	Notes
1	SB-16-S-18-20170522	5/22/17	1355	X	X	X	X	X	X	X	✓						10	
2	SB-18-S-23-20170522	5/22/17	1515	X	X	X	X	X	X	X	✓						10	
3	SB-17-S-15-20170523	5/23/17	1035	X	X	X	X	X	X	X	✓						10	
4	SB-19-S-19-20170523	5/23/17	1415	X	X	X	X	X	X	X	✓						10	

Are there any tests with holding times less than or equal to 48 hours? ☐ Yes ☐ No

* Standard Turnaround = 10 work days

CHK BY JCJ

DISTRIBUTION SUB-OUT

Billing ☐ Same as above

Client:

Address:

City: State Zip

Attn:

PO#:

EDF Required? Geotracker ☒ Yes ☐ No

Send Copy to State of CA? (EDT) ☐ Yes ☒ No

Global ID (Needed for EDF)

System # (Needed for EDT)

Relinquished By	Date	Time	Received By	Date	Time
1. Kaelynn Rose	5/25/17	1110	1. Doug Bogen	5-25-17	1110
2. Doug Bogen	5-25-17	1830	2. [signature]	5/25/17	18:30
3. [signature]	5/25/17	2220	3. [signature]	5/26	2220

BC Laboratories, Inc. – 4100 Atlas Ct. – Bakersfield, CA 93308 – 661.327.4911 – Fax: 661.327.1918 – www.bclabs.com

Chain of Custody and Cooler Receipt Form for 1714350 Page 2 of 2

BC LABORATORIES INC. COOLER RECEIPT FORM Page 1 Of 1

Submission #: 17-14350

SHIPPING INFORMATION	SHIPPING CONTAINER	FREE LIQUID
Fed Ex ☐ UPS ☐ Ontrac ☐ Hand Delivery ☐	Ice Chest ☒ None ☐ Box ☐	YES ☐ NO ☐
BC Lab Field Service ☒ Other ☐ (Specify)_____	Other ☐ (Specify)_____	W / S

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

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

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

COC Received ☒ YES ☐ NO

Emissivity: 0.95 Container: VOA Thermometer ID: 208 Date/Time 5/25 2220

Temperature: (A) 2.3 °C / (C) 2.4 °C Analyst Init GSP

SAMPLE CONTAINERS	SAMPLE NUMBERS 1	2	3	4	5	6	7	8	9	10
QT PE UNPRES										
4oz / 8oz / 16oz PE UNPRES										
2oz Cr^{+6}										
QT INORGANIC CHEMICAL METALS										
INORGANIC CHEMICAL METALS 4oz / 8oz / 16oz										
PT CYANIDE										
PT NITROGEN FORMS										
PT TOTAL SULFIDE										
2oz. NITRATE / NITRITE										
PT TOTAL ORGANIC CARBON										
PT CHEMICAL OXYGEN DEMAND										
PtA PHENOLICS										
40ml VOA VIAL TRAVEL BLANK										
40ml VOA VIAL										
QT EPA 1664										
PT ODOR										
RADIOLOGICAL										
BACTERIOLOGICAL										
40 ml VOA VIAL- 504										
QT EPA 508/608/8080										
QT EPA 515.1/8150										
QT EPA 525										
QT EPA 525 TRAVEL BLANK										
40ml EPA 547										
40ml EPA 531.1										
8oz EPA 548										
QT EPA 549										
QT EPA 8015M										
QT EPA 8270										
8oz / 16oz / 32oz AMBER										
8oz / 16oz / 32oz JAR	A	A	A	A						
SOIL SLEEVE										
PCB VIAL										
PLASTIC BAG										
TEDLAR BAG										
FERROUS IRON										
ENCORE										
SMART KIT	B→E	B→E	B→E	B→E						
SUMMA CANISTER										

Comments:

Sample Numbering Completed By: JM Date/Time: 5-26-12 0952

A = Actual / C = Corrected

Rev 21 05/23/2016

[S:\WPDocs\WordPerfect\LAB_DOCS\FORMS\SAMREC rev 20]

Arcadis - San Francisco
100 Montgomery Street, Suite 300
San Francisco, CA 94104

Reported: 06/07/2017 10:43
Project: 351640
Project Number: B00351351640
Project Manager: Carl Edwards

Laboratory / Client Sample Cross Reference

Laboratory	Client Sample Information			
1714350-01	**COC Number:**	---	**Receive Date:**	05/25/2017 22:20
	Project Number:	---	**Sampling Date:**	05/22/2017 13:55
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	SB-16-S-18-20170522	**Lab Matrix:**	Solids
	Sampled By:	---	**Sample Type:**	Soil
1714350-02	**COC Number:**	---	**Receive Date:**	05/25/2017 22:20
	Project Number:	---	**Sampling Date:**	05/22/2017 15:15
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	SB-18-S-23-20170522	**Lab Matrix:**	Solids
	Sampled By:	---	**Sample Type:**	Soil
1714350-03	**COC Number:**	---	**Receive Date:**	05/25/2017 22:20
	Project Number:	---	**Sampling Date:**	05/23/2017 10:35
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	SB-17-S-15-20170523	**Lab Matrix:**	Solids
	Sampled By:	---	**Sample Type:**	Soil
1714350-04	**COC Number:**	---	**Receive Date:**	05/25/2017 22:20
	Project Number:	---	**Sampling Date:**	05/23/2017 14:15
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	SB-19-S-19-20170523	**Lab Matrix:**	Solids
	Sampled By:	---	**Sample Type:**	Soil

Arcadis - San Francisco
100 Montgomery Street, Suite 300
San Francisco, CA 94104

Reported: 06/07/2017 10:43
Project: 351640
Project Number: B00351351640
Project Manager: Carl Edwards

Volatile Organic Analysis (EPA Method 8260B/5035)

BCL Sample ID: 1714350-01 | **Client Sample Name:** SB-16-S-18-20170522, 5/22/2017 1:55:00PM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Benzene	ND	mg/kg	0.0050	0.0013	EPA-8260B	ND		1
1,2-Dibromoethane	ND	mg/kg	0.0050	0.0010	EPA-8260B	ND		1
1,2-Dichloroethane	ND	mg/kg	0.0050	0.00085	EPA-8260B	ND		1
Ethylbenzene	ND	mg/kg	0.0050	0.0015	EPA-8260B	ND		1
Methyl t-butyl ether	ND	mg/kg	0.0050	0.00050	EPA-8260B	ND		1
Naphthalene	ND	mg/kg	0.0050	0.0014	EPA-8260B	ND		1
Toluene	ND	mg/kg	0.0050	0.0012	EPA-8260B	ND		1
Total Xylenes	ND	mg/kg	0.010	0.0034	EPA-8260B	ND		1
t-Amyl Methyl ether	ND	mg/kg	0.0050	0.00056	EPA-8260B	ND		1
t-Butyl alcohol	ND	mg/kg	0.050	0.017	EPA-8260B	ND		1
Diisopropyl ether	ND	mg/kg	0.0050	0.00080	EPA-8260B	ND		1
Ethanol	ND	mg/kg	1.0	0.066	EPA-8260B	ND		1
Ethyl t-butyl ether	ND	mg/kg	0.0050	0.00022	EPA-8260B	ND		1
1,2-Dichloroethane-d4 (Surrogate)	126	%	70 - 121 (LCL - UCL)		EPA-8260B		S09	1
Toluene-d8 (Surrogate)	104	%	81 - 117 (LCL - UCL)		EPA-8260B			1
4-Bromofluorobenzene (Surrogate)	89.1	%	74 - 121 (LCL - UCL)		EPA-8260B			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-8260B	06/02/17	06/02/17 13:30	ADC	MS-V2	1.046	B[F0150

Arcadis - San Francisco
100 Montgomery Street, Suite 300
San Francisco, CA 94104

Reported: 06/07/2017 10:43
Project: 351640
Project Number: B00351351640
Project Manager: Carl Edwards

Total Petroleum Hydrocarbons

BCL Sample ID: 1714350-01 | **Client Sample Name:** SB-16-S-18-20170522, 5/22/2017 1:55:00PM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Diesel Range Organics (C12 - C24)	ND	mg/kg	10	1.2	EPA-8015B/TPHd	ND		1
Tetracosane (Surrogate)	88.5	%	40 - 130 (LCL - UCL)		EPA-8015B/TPHd			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-8015B/TPHd	06/01/17	06/01/17 14:03	RSM	GC-5	0.990	B[F0091

Arcadis - San Francisco
100 Montgomery Street, Suite 300
San Francisco, CA 94104

Reported: 06/07/2017 10:43
Project: 351640
Project Number: B00351351640
Project Manager: Carl Edwards

Total Petroleum Hydrocarbons (EPA 8015B/5035)

BCL Sample ID: 1714350-01 | **Client Sample Name:** SB-16-S-18-20170522, 5/22/2017 1:55:00PM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Gasoline Range Organics (C6 - C12)	ND	mg/kg	1.0	0.28	EPA-8015B	ND		1
a,a,a-Trifluorotoluene (FID Surrogate)	115	%	70 - 130 (LCL - UCL)		EPA-8015B			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-8015B	06/05/17	06/05/17 15:28	AKM	GC-V8	0.919	B[F0380

Arcadis - San Francisco
100 Montgomery Street, Suite 300
San Francisco, CA 94104

Reported: 06/07/2017 10:43
Project: 351640
Project Number: B00351351640
Project Manager: Carl Edwards

Volatile Organic Analysis (EPA Method 8260B/5035)

BCL Sample ID: 1714350-02 | **Client Sample Name:** SB-18-S-23-20170522, 5/22/2017 3:15:00PM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Benzene	ND	mg/kg	0.0050	0.0013	EPA-8260B	ND		1
1,2-Dibromoethane	ND	mg/kg	0.0050	0.0010	EPA-8260B	ND		1
1,2-Dichloroethane	ND	mg/kg	0.0050	0.00085	EPA-8260B	ND		1
Ethylbenzene	ND	mg/kg	0.0050	0.0015	EPA-8260B	ND		1
Methyl t-butyl ether	ND	mg/kg	0.0050	0.00050	EPA-8260B	ND		1
Naphthalene	ND	mg/kg	0.0050	0.0014	EPA-8260B	ND		1
Toluene	ND	mg/kg	0.0050	0.0012	EPA-8260B	ND		1
Total Xylenes	ND	mg/kg	0.010	0.0034	EPA-8260B	ND		1
t-Amyl Methyl ether	ND	mg/kg	0.0050	0.00056	EPA-8260B	ND		1
t-Butyl alcohol	ND	mg/kg	0.050	0.017	EPA-8260B	ND		1
Diisopropyl ether	ND	mg/kg	0.0050	0.00080	EPA-8260B	ND		1
Ethanol	ND	mg/kg	1.0	0.066	EPA-8260B	ND		1
Ethyl t-butyl ether	ND	mg/kg	0.0050	0.00022	EPA-8260B	ND		1
1,2-Dichloroethane-d4 (Surrogate)	125	%	70 - 121 (LCL - UCL)		EPA-8260B		S09	1
Toluene-d8 (Surrogate)	96.3	%	81 - 117 (LCL - UCL)		EPA-8260B			1
4-Bromofluorobenzene (Surrogate)	95.9	%	74 - 121 (LCL - UCL)		EPA-8260B			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-8260B	06/02/17	06/02/17 13:53	ADC	MS-V2	1.025	B[F0150

Arcadis - San Francisco
100 Montgomery Street, Suite 300
San Francisco, CA 94104

Reported: 06/07/2017 10:43
Project: 351640
Project Number: B00351351640
Project Manager: Carl Edwards

Total Petroleum Hydrocarbons

BCL Sample ID: 1714350-02 | **Client Sample Name:** SB-18-S-23-20170522, 5/22/2017 3:15:00PM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Diesel Range Organics (C12 - C24)	ND	mg/kg	10	1.2	EPA-8015B/TPHd	ND		1
Tetracosane (Surrogate)	102	%	40 - 130 (LCL - UCL)		EPA-8015B/TPHd			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-8015B/TPHd	06/01/17	06/01/17 14:17	RSM	GC-5	1.010	B[F0091

Arcadis - San Francisco
100 Montgomery Street, Suite 300
San Francisco, CA 94104

Reported: 06/07/2017 10:43
Project: 351640
Project Number: B00351351640
Project Manager: Carl Edwards

Total Petroleum Hydrocarbons (EPA 8015B/5035)

BCL Sample ID: 1714350-02 | **Client Sample Name:** SB-18-S-23-20170522, 5/22/2017 3:15:00PM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Gasoline Range Organics (C6 - C12)	ND	mg/kg	1.0	0.28	EPA-8015B	ND		1
a,a,a-Trifluorotoluene (FID Surrogate)	105	%	70 - 130 (LCL - UCL)		EPA-8015B			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-8015B	06/05/17	06/05/17 15:49	AKM	GC-V8	1.048	B[F0380

Arcadis - San Francisco
100 Montgomery Street, Suite 300
San Francisco, CA 94104

Reported: 06/07/2017 10:43
Project: 351640
Project Number: B00351351640
Project Manager: Carl Edwards

Volatile Organic Analysis (EPA Method 8260B/5035)

BCL Sample ID: 1714350-03 | **Client Sample Name:** SB-17-S-15-20170523, 5/23/2017 10:35:00AM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Benzene	ND	mg/kg	0.0050	0.0013	EPA-8260B	ND		1
1,2-Dibromoethane	ND	mg/kg	0.0050	0.0010	EPA-8260B	ND		1
1,2-Dichloroethane	ND	mg/kg	0.0050	0.00085	EPA-8260B	ND		1
Ethylbenzene	ND	mg/kg	0.0050	0.0015	EPA-8260B	ND		1
Methyl t-butyl ether	ND	mg/kg	0.0050	0.00050	EPA-8260B	ND		1
Naphthalene	ND	mg/kg	0.0050	0.0014	EPA-8260B	ND		1
Toluene	ND	mg/kg	0.0050	0.0012	EPA-8260B	ND		1
Total Xylenes	ND	mg/kg	0.010	0.0034	EPA-8260B	ND		1
t-Amyl Methyl ether	ND	mg/kg	0.0050	0.00056	EPA-8260B	ND		1
t-Butyl alcohol	ND	mg/kg	0.050	0.017	EPA-8260B	ND		1
Diisopropyl ether	ND	mg/kg	0.0050	0.00080	EPA-8260B	ND		1
Ethanol	ND	mg/kg	1.0	0.066	EPA-8260B	ND		1
Ethyl t-butyl ether	ND	mg/kg	0.0050	0.00022	EPA-8260B	ND		1
1,2-Dichloroethane-d4 (Surrogate)	129	%	70 - 121 (LCL - UCL)		EPA-8260B		S09	1
Toluene-d8 (Surrogate)	101	%	81 - 117 (LCL - UCL)		EPA-8260B			1
4-Bromofluorobenzene (Surrogate)	96.9	%	74 - 121 (LCL - UCL)		EPA-8260B			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-8260B	06/02/17	06/02/17 14:15	ADC	MS-V2	0.952	B[F0150

Arcadis - San Francisco
100 Montgomery Street, Suite 300
San Francisco, CA 94104

Reported: 06/07/2017 10:43
Project: 351640
Project Number: B00351351640
Project Manager: Carl Edwards

Total Petroleum Hydrocarbons

BCL Sample ID: 1714350-03 | **Client Sample Name:** SB-17-S-15-20170523, 5/23/2017 10:35:00AM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Diesel Range Organics (C12 - C24)	ND	mg/kg	10	1.2	EPA-8015B/TPHd	ND		1
Tetracosane (Surrogate)	106	%	40 - 130 (LCL - UCL)		EPA-8015B/TPHd			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-8015B/TPHd	06/01/17	06/01/17 14:31	RSM	GC-5	1.007	B[F0091

Arcadis - San Francisco
100 Montgomery Street, Suite 300
San Francisco, CA 94104

Reported: 06/07/2017 10:43
Project: 351640
Project Number: B00351351640
Project Manager: Carl Edwards

Total Petroleum Hydrocarbons (EPA 8015B/5035)

BCL Sample ID: 1714350-03 | **Client Sample Name:** SB-17-S-15-20170523, 5/23/2017 10:35:00AM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Gasoline Range Organics (C6 - C12)	ND	mg/kg	0.88	0.25	EPA-8015B	ND		1
a,a,a-Trifluorotoluene (FID Surrogate)	118	%	70 - 130 (LCL - UCL)		EPA-8015B			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-8015B	06/05/17	06/05/17 16:10	AKM	GC-V8	0.876	B[F0380

Arcadis - San Francisco
100 Montgomery Street, Suite 300
San Francisco, CA 94104

Reported: 06/07/2017 10:43
Project: 351640
Project Number: B00351351640
Project Manager: Carl Edwards

Volatile Organic Analysis (EPA Method 8260B/5035)

BCL Sample ID: 1714350-04 | **Client Sample Name:** SB-19-S-19-20170523, 5/23/2017 2:15:00PM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Benzene	ND	mg/kg	0.0050	0.0013	EPA-8260B	ND		1
1,2-Dibromoethane	ND	mg/kg	0.0050	0.0010	EPA-8260B	ND		1
1,2-Dichloroethane	ND	mg/kg	0.0050	0.00085	EPA-8260B	ND		1
Ethylbenzene	ND	mg/kg	0.0050	0.0015	EPA-8260B	ND		1
Methyl t-butyl ether	ND	mg/kg	0.0050	0.00050	EPA-8260B	ND		1
Naphthalene	ND	mg/kg	0.0050	0.0014	EPA-8260B	ND		1
Toluene	ND	mg/kg	0.0050	0.0012	EPA-8260B	ND		1
Total Xylenes	ND	mg/kg	0.010	0.0034	EPA-8260B	ND		1
t-Amyl Methyl ether	ND	mg/kg	0.0050	0.00056	EPA-8260B	ND		1
t-Butyl alcohol	ND	mg/kg	0.050	0.017	EPA-8260B	ND		1
Diisopropyl ether	ND	mg/kg	0.0050	0.00080	EPA-8260B	ND		1
Ethanol	ND	mg/kg	1.0	0.066	EPA-8260B	ND		1
Ethyl t-butyl ether	ND	mg/kg	0.0050	0.00022	EPA-8260B	ND		1
1,2-Dichloroethane-d4 (Surrogate)	127	%	70 - 121 (LCL - UCL)		EPA-8260B		S09	1
Toluene-d8 (Surrogate)	102	%	81 - 117 (LCL - UCL)		EPA-8260B			1
4-Bromofluorobenzene (Surrogate)	97.1	%	74 - 121 (LCL - UCL)		EPA-8260B			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-8260B	06/02/17	06/02/17 14:38	ADC	MS-V2	0.969	B[F0150

Arcadis - San Francisco
100 Montgomery Street, Suite 300
San Francisco, CA 94104

Reported: 06/07/2017 10:43
Project: 351640
Project Number: B00351351640
Project Manager: Carl Edwards

Total Petroleum Hydrocarbons

BCL Sample ID: 1714350-04 | **Client Sample Name:** SB-19-S-19-20170523, 5/23/2017 2:15:00PM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Diesel Range Organics (C12 - C24)	ND	mg/kg	10	1.2	EPA-8015B/TPHd	ND		1
Tetracosane (Surrogate)	83.7	%	40 - 130 (LCL - UCL)		EPA-8015B/TPHd			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-8015B/TPHd	06/01/17	06/01/17 14:45	RSM	GC-5	1.017	B[F0091

Arcadis - San Francisco
100 Montgomery Street, Suite 300
San Francisco, CA 94104

Reported: 06/07/2017 10:43
Project: 351640
Project Number: B00351351640
Project Manager: Carl Edwards

Total Petroleum Hydrocarbons (EPA 8015B/5035)

BCL Sample ID: 1714350-04 | **Client Sample Name:** SB-19-S-19-20170523, 5/23/2017 2:15:00PM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Gasoline Range Organics (C6 - C12)	ND	mg/kg	1.0	0.28	EPA-8015B	ND		1
a,a,a-Trifluorotoluene (FID Surrogate)	113	%	70 - 130 (LCL - UCL)		EPA-8015B			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-8015B	06/05/17	06/05/17 16:31	AKM	GC-V8	0.935	B[F0380

Arcadis - San Francisco
100 Montgomery Street, Suite 300
San Francisco, CA 94104

Reported: 06/07/2017 10:43
Project: 351640
Project Number: B00351351640
Project Manager: Carl Edwards

Volatile Organic Analysis (EPA Method 8260B/5035)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B[F0150						
Benzene	B[F0150-BLK1	ND	mg/kg	0.0050	0.0013	
1,2-Dibromoethane	B[F0150-BLK1	ND	mg/kg	0.0050	0.0010	
1,2-Dichloroethane	B[F0150-BLK1	ND	mg/kg	0.0050	0.00085	
Ethylbenzene	B[F0150-BLK1	ND	mg/kg	0.0050	0.0015	
Methyl t-butyl ether	B[F0150-BLK1	ND	mg/kg	0.0050	0.00050	
Naphthalene	B[F0150-BLK1	ND	mg/kg	0.0050	0.0014	
Toluene	B[F0150-BLK1	ND	mg/kg	0.0050	0.0012	
Total Xylenes	B[F0150-BLK1	ND	mg/kg	0.010	0.0034	
t-Amyl Methyl ether	B[F0150-BLK1	ND	mg/kg	0.0050	0.00056	
t-Butyl alcohol	B[F0150-BLK1	ND	mg/kg	0.050	0.017	
Diisopropyl ether	B[F0150-BLK1	ND	mg/kg	0.0050	0.00080	
Ethanol	B[F0150-BLK1	ND	mg/kg	1.0	0.066	
Ethyl t-butyl ether	B[F0150-BLK1	ND	mg/kg	0.0050	0.00022	
1,2-Dichloroethane-d4 (Surrogate)	**B[F0150-BLK1**	**112**	%	**70 - 121 (LCL - UCL)**		
Toluene-d8 (Surrogate)	**B[F0150-BLK1**	**104**	%	**81 - 117 (LCL - UCL)**		
4-Bromofluorobenzene (Surrogate)	**B[F0150-BLK1**	**105**	%	**74 - 121 (LCL - UCL)**		

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Volatile Organic Analysis (EPA Method 8260B/5035)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits Percent Recovery	Control Limits RPD	Lab Quals
QC Batch ID: B[F0150										
Benzene	B[F0150-BS1	LCS	0.14126	0.12500	mg/kg	113		70 - 130		
Toluene	B[F0150-BS1	LCS	0.13735	0.12500	mg/kg	110		70 - 130		
1,2-Dichloroethane-d4 (Surrogate)	B[F0150-BS1	LCS	0.053220	0.050000	mg/kg	106		70 - 121		
Toluene-d8 (Surrogate)	B[F0150-BS1	LCS	0.054850	0.050000	mg/kg	110		81 - 117		
4-Bromofluorobenzene (Surrogate)	B[F0150-BS1	LCS	0.047510	0.050000	mg/kg	95.0		74 - 121		

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Volatile Organic Analysis (EPA Method 8260B/5035)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: B[F0150	Used client sample: N										
Benzene	MS	**1714329-01**	**ND**	**0.17263**	**0.12231**	**mg/kg**		**141**		**70 - 130**	**Q03**
	MSD	**1714329-01**	**ND**	**0.15314**	**0.11860**	**mg/kg**	**12.0**	**129**	**20**	**70 - 130**	
Toluene	MS	1714329-01	ND	0.13252	0.12231	mg/kg		108		70 - 130	
	MSD	1714329-01	ND	0.11034	0.11860	mg/kg	18.3	93.0	20	70 - 130	
1,2-Dichloroethane-d4 (Surrogate)	MS	**1714329-01**	**ND**	**0.069785**	**0.048924**	**mg/kg**		**143**		**70 - 121**	**A19,S09**
	MSD	**1714329-01**	**ND**	**0.062856**	**0.047438**	**mg/kg**	**10.4**	**133**		**70 - 121**	**A19,S09**
Toluene-d8 (Surrogate)	MS	1714329-01	ND	0.049883	0.048924	mg/kg		102		81 - 117	
	MSD	1714329-01	ND	0.045038	0.047438	mg/kg	10.2	94.9		81 - 117	
4-Bromofluorobenzene (Surrogate)	MS	1714329-01	ND	0.039873	0.048924	mg/kg		81.5		74 - 121	
	MSD	1714329-01	ND	0.041148	0.047438	mg/kg	3.1	86.7		74 - 121	

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Total Petroleum Hydrocarbons

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B[F0091						
Diesel Range Organics (C12 - C24)	B[F0091-BLK1	ND	mg/kg	10	1.2	
Tetracosane (Surrogate)	**B[F0091-BLK1**	**99.1**	%	**40 - 130 (LCL - UCL)**		

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Total Petroleum Hydrocarbons

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits Percent Recovery	Control Limits RPD	Lab Quals
QC Batch ID: B[F0091										
Diesel Range Organics (C12 - C24)	B[F0091-BS1	LCS	75.036	81.967	mg/kg	91.5		58 - 131		
Tetracosane (Surrogate)	B[F0091-BS1	LCS	3.4087	3.2787	mg/kg	104		40 - 130		

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Total Petroleum Hydrocarbons

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: B[F0091	Used client sample: N										
Diesel Range Organics (C12 - C24)	MS	1714418-03	ND	75.821	83.893	mg/kg		90.4		54 - 119	
	MSD	1714418-03	ND	71.617	83.333	mg/kg	5.7	85.9	30	54 - 119	
Tetracosane (Surrogate)	MS	1714418-03	ND	3.4181	3.3557	mg/kg		102		40 - 130	
	MSD	1714418-03	ND	3.3080	3.3333	mg/kg	3.3	99.2		40 - 130	

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Total Petroleum Hydrocarbons (EPA 8015B/5035)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B[F0380						
Gasoline Range Organics (C6 - C12)	B[F0380-BLK1	ND	mg/kg	1.0	0.28	
a,a,a-Trifluorotoluene (FID Surrogate)	**B[F0380-BLK1**	**100**	%	**70 - 130 (LCL - UCL)**		

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Total Petroleum Hydrocarbons (EPA 8015B/5035)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits Percent Recovery	Control Limits RPD	Lab Quals
QC Batch ID: B[F0380										
Gasoline Range Organics (C6 - C12)	B[F0380-BS1	LCS	6.6380	5.0000	mg/kg	133		85 - 115		
a,a,a-Trifluorotoluene (FID Surrogate)	B[F0380-BS1	LCS	0.041000	0.040000	mg/kg	102		70 - 130		

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Total Petroleum Hydrocarbons (EPA 8015B/5035)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: B[F0380	Used client sample: N										
Gasoline Range Organics (C6 - C12)	MS	1713532-39	ND	6.4060	5.0000	mg/kg		128		70 - 130	
	MSD	1713532-39	ND	5.7080	5.0000	mg/kg	11.5	114	20	70 - 130	
a,a,a-Trifluorotoluene (FID Surrogate)	MS	1713532-39	ND	0.038000	0.040000	mg/kg		95.0		70 - 130	
	MSD	1713532-39	ND	0.036000	0.040000	mg/kg	5.4	90.0		70 - 130	

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Notes And Definitions

MDL	Method Detection Limit
ND	Analyte Not Detected
PQL	Practical Quantitation Limit
A19	Surrogate is high due to matrix interference. Interferences verified through second extraction/analysis.
Q03	Matrix spike recovery(s) is(are) not within the control limits.
S09	The surrogate recovery on the sample for this compound was not within the control limits.

STATE WATER RESOURCES CONTROL BOARD

GEOTRACKER ESI

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Facility Name:	**UNOCAL #5781**
File Name:	**351640 Offsite Investigation Rpt FIN 06282017-signed.pdf**
Organization Name:	**ARCADIS**
Username:	**ARCADIS76**
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