ARCADIS U.S., Inc.
100 Montgomery Street
Suite 300
San Francisco
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Tel 415 374 2744
Fax 415 374 2745
**www.arcadis-us.com**

ENVIRONMENT

Mr. Keith Nowell
Hazardous Materials Specialist
Alameda County Environmental Health
1131 Harbor Bay Parkway
Alameda, California 94502

Subject:
**Well Installation and Well Replacement Report**
Former British Petroleum Service Station #11132
3201 35th Avenue
Oakland, California 94619

Date:
April 8, 2016

Contact:
Megan Smoley

Phone:
626.590.1502

Email:
Megan.Smoley@arcadis.com

Our ref:
GP09BPNA.C112.C0000

Dear Mr. Nowell:

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

| ARCO Facility No. | ACEH Site No. | Location |
|---|---|---|
| 11132 | RO0000014 | 3201 35th Avenue<br>Oakland, California |

I declare, to the best of my knowledge at the present time, that the information and/or recommendations contained in the attached document are true and correct. If you have any questions or comments regarding the content of this report, please contact Hollis Phillips by telephone at 626.590.1502 or by e-mail at Megan.Smoley@arcadis.com.

Sincerely,

Arcadis


Megan Smoley, P.G. (No. 8614)
Senior Geologist/Certified Project Manager

Copies:
GeoTracker upload

ARCADIS Design & Consultancy for natural and built assets

Atlantic Richfield Company

# WELL INSTALLATION AND WELL REPLACEMENT REPORT

Former British Petroleum Service Station #11132

3201 35th Avenue

Oakland, California 94619

*Alameda County Local Oversight Program*

*Case #RO0000014*

April 8, 2016

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# WELL INSTALLATION AND WELL REPLACEMENT REPORT

Former BP Station #11132

3201 35th Avenue

Oakland, California

Carl Edwards

Geologist


Megan Smoley, P.G. No. 8614

Senior Geologist/Certified Project Manager

Prepared for:

Atlantic Richfield Company

Prepared by:
Arcadis U.S., Inc.
100 Montgomery Street
Suite 300
San Francisco
California 94104
Tel 415 432 6916
Fax 415 374 2745

Our Ref.:

GP09BPNA.C112

Date:

April 8, 2016

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# FIGURES

# APPENDICES

# ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| ACEH | Alameda County Environmental Health |
| ACPWA | Alameda County Public Works Agency |
| Arcadis | Arcadis U.S., Inc. |
| bgs | below ground surface |
| BP | British Petroleum |
| BTEX | benzene, toluene, ethylbenzene, and total xylenes |
| CDWR | California Department of Water Resources |
| DIPE | di-isopropyl ether |
| ESL | environmental screening level |
| GRO | gasoline range organics |
| HASP | Health and Safety Plan |
| IDW | investigation-derived waste |
| LNAPL | light non-aqueous phase liquid |
| mg/kg | milligrams per kilogram |
| MTBE | methyl tertiary butyl ether |
| PID | photo ionization detector |
| PVC | polyvinyl chloride |
| report | Well Installation and Well Replacement Report |
| RL | reporting limit |
| site | Former BP Station #11132, located at 3201 35$^{th}$ Avenue, Oakland, California |
| SFRWQCB | San Francisco Regional Water Quality Control Board |
| TBA | tertiary butyl alcohol |
| TestAmerica | TestAmerica Laboratories, Inc. |
| USEPA | United States Environmental Protection Agency |
| UST | underground storage tank |
| Work Plan | Work Plan – Additional Site Characterization |

# 1 INTRODUCTION

On behalf of Atlantic Richfield Company, Arcadis U.S., Inc. (Arcadis) prepared this Well Installation and Well Replacement Report (report) for Former British Petroleum (BP) Service Station #11132, located at 3201 35th Avenue in Oakland, California (Site; Figure 1). The scope of work for this project included the destruction of one monitoring (MW) well (MW-10) and the installation of two monitoring wells (MW-10R and MW-11) (Figure 2). MW-10R will serve as a replacement well for MW-10. Well MW-10 has historically contained residual light non-aqueous phase liquid (LNAPL) stuck to the inside of the well casing, which may be an indicator of poor well condition. Additionally the well screen has been submerged during a majority of the time it has been sampled. The wells were installed per Arcadis' June 25, 2014 Work Plan – Additional Site Characterization ("Work Plan"; Arcadis 2014), which was conditionally approved by Alameda County Environmental Health (ACEH) on September 18, 2014 to address the petroleum hydrocarbon impacted groundwater at the Site. The new wells were constructed in accordance with California Department of Water Resources (CDWR) Well Standards (CDWR 1991), the Alameda County Public Works Agency (ACPWA) guidelines for monitoring wells, and technical comments provided by ACEH in their September 18, 2014 correspondence (Appendix A).

## 1.1 Purpose/Remedial Action Objective

This report discusses the construction of wells MW-10R and MW-11, the destruction of well MW-10, and the analytical results for soil samples collected from the newly installed wells.

## 1.2 Report Organization

The remaining sections of this report are listed below:

- Section 2 describes the site geology and hydrogeology.
- Section 3 discusses the field activities associated with the monitoring well installations and well destruction, including health and safety, utility locate, well permits, well installation, well destruction and management of investigation-derived waste (IDW).
- Section 4 summarized the soil analytical results.
- Sections 5 Arcadis' conclusions and recommendations, respectively.
- Section 6 lists the references cited throughout this report.

# 2 SITE DESCRIPTION

The Site is an active gas station located on the northeast corner of the intersection of 35th Avenue and Sutter Street, southwest of Interstate 580, in Oakland, California. Current facility operations consist of gasoline dispensing and retail sales by Energy Mart. The Site has operated as a gasoline service station since at least the early 1970s. It was acquired in 1989 from Mobil Oil Company by BP and operated under the BP brand. BP sold the station in 1994 to Tosco, which was acquired by Conoco Phillips who now operates the 76-branded station.

The previous USTs, installed in 1972, consisted of one 12,000-gallon, one 8,000-gallon, and one 5,000-hallon steel UST (EMCON 1994). The leaking underground storage tanks (USTs) were removed and replaced in 1986. Existing USTs consist of one 12,000-gallon and two 10,000-gallon double-wall fiberglass USTs. Product conveyance lines and fuel dispensing equipment were subsequently replaced in 1990. According to the station manager, these USTs contain regular unleaded, plus unleaded, and super unleaded gasoline and are equipped with an electronic leak detection system. In addition, the station personnel inventory the contents of the USTs by manually gauging the tanks. A review of available historical files indicates that a waste-oil UST has not previously been installed at the Site. Existing site features are shown on Figure 2.

## 2.1 Geology and Hydrogeology

The Site is situated in an alluvial plain generally underlain by Cretaceous and Jurassic metamorphic rocks of the Franciscan Complex. There is considerable spatial variation in the thickness of the Quaternary alluvial valley sediments. The alluvium has generally been derived from erosion and nearby fluvial re-deposition of the underlying Franciscan Complex. Alluvium was deposited as debris flows, mud flows, and by braided streams. The sediments are generally poorly sorted and poorly to moderately bedded (CDWR 2003).

Sediments encountered at the Site consist primarily of interbedded fine to coarse grained soils (silty sand, clayey sand, silty clay and clay) extending from the ground surface to the total depth investigated, approximately 27 feet below ground surface (bgs). A sand interval was encountered at MW-11 from 22 to 26 feet bgs. Boring logs are provided in Appendix B.

The Site is located in the East Bay Plain Subbasin, Groundwater Basin No. 2-9.04 (DWR 2003). The East Bay Plain Subbasin is a northwest trending alluvial basin, bounded on the north by San Pablo Bay, on the east by the contact with Franciscan basement rock, and on the south by the Nile Cone Groundwater Basin. The East Bay Plain Subbasin extends beneath the San Francisco Bay to the west. The East Bay Plain Subbasin aquifer system consists of unconsolidated sediments of Quaternary age. These include the Santa Clara Formation, Alameda Formation, Temescal Formation, and artificial fill.

Groundwater is found principally within the alluvium, but also within the Franciscan bedrock. The largest and deepest wells in this sub-area historically pumped one to two million gallons per day at depths greater than 200 feet. Overall, sustainable yields are low due in part to low recharge potential. The Merritt sand in West Oakland was an important part of the early water supply for the City of Oakland. It is shallow (up to 60 feet), but before the turn of the last century, septic systems contaminated the water supply wells (BAI 2008).

Throughout most of the Alameda County portion of the East Bay Plain from Hayward north to Albany, water level contours show that the general direction of groundwater flow is from east to west or from the Hayward Fault to the San Francisco Bay. Groundwater flow direction generally correlates to topography.

Groundwater depth historically varies across the Site from approximately 11 to 24 feet bgs. During the most recent groundwater monitoring event conducted in August 2015, groundwater depth ranged from approximately 18 to 22 feet bgs. Average seasonal fluctuations are approximately 10 feet. Historically the groundwater gradient has ranged from 0.003 feet per foot (ft/ft) to 0.01 ft/ft. Based on groundwater

elevation data, the groundwater flow direction has varied between southeast and west. Groundwater contour data from the third quarter 2015 monitoring event is included on Figure 3.

# 3 FIELD ACTIVITIES

On February 3, 2016, monitoring well MW-10 was destroyed, and replacement monitoring well MW-10R was installed. MW-11 was installed on February 10, 2016. Both wells were developed on February 15, 2016.

## 3.1 Health and Safety

As required by the Occupational Safety and Health Administration 29, Code of Federal Regulations 1910.120 (Hazardous Waste Operations and Emergency Response), Arcadis prepared a Health and Safety Plan (HASP) to address the proposed well installation and remedial implementation activities at the Site.

## 3.2 Utility Locate

Underground Services Alert was notified a minimum of 72 hours prior to initiating field activities. Safe2Core, Inc. of San Jose, California was contracted to conduct an independent utility locate for subsurface features and utilities near the proposed well locations on January 20, 2016.

## 3.3 Well Permits

Necessary well construction permits were acquired from the ACPWA prior to scheduling the well installation activities. Excavation and encroachment permits were obtained from the City of Oakland to conduct the well installation and destruction activities in the right-of-way. Well and encroachment permits are included in Appendix C.

## 3.4 Well Installation

### 3.4.1 Boring Advancement and Well Construction

Drilling and well construction activities were conducted by Gregg Drilling and Testing, Inc. of Martinez, California, a C-57 licensed driller, under the supervision of an Arcadis geologist. Soil borings were advanced using hollow-stem auger drilling methods and were pre-cleared using a hand auger to a depth of 6.5 feet bgs.

The monitoring wells were completed with a 2-inch-diameter Schedule 40 polyvinyl chloride (PVC) riser and a 0.010-inch slot PVC screen. Both well screens were screened from approximately 11 to 26 feet bgs, based on the observed lithology, depth to water at nearby monitoring wells, and indications of the presence of water observed during drilling. Depth to first encountered water during installation of well MW-11 was not apparent by encountering wet or saturated soils. The augers were removed from the borehole to allow water to enter for approximately 2 hours prior to construction, and the boring remained dry during that time. Well MW-11 construction was determined by lithology, a review of historical cross-

sections, and historical water levels observed in nearby monitoring well MW-5. Water levels observed during well development activities indicate the wells are properly screened to intersect the vadose zone and remain unsubmerged. Additionally, the total depth of the wells encompasses the highest readings from the photo ionization detector (PID) observed during field screening of soil samples.

The annular space was backfilled with sand (#2/12 Monterey sand) from the total depth to 2 feet above the screen, followed by 2 feet of hydrated bentonite chips. The wells were sealed with neat cement grout to 1 foot bgs. A 12-inch-diameter traffic-rated well box was installed within a concrete pad following well installation. Additional details regarding the construction of the wells are presented in Table 1 and the boring logs are provided in Appendix B.

### 3.4.2 Soil Sampling and Screening

The soil from the borehole was continuously logged by a geologist in accordance with the Unified Soil Classification System and screened with a PID during well installation activities. The PID field screening results were recorded on the boring logs.

Soil samples were collected for laboratory analysis based on the highest probable degree of petroleum hydrocarbon concentration, which was determined by PID results and other signs of potential hydrocarbon impacts (e.g., staining, odor). Soil samples were collected using EnCore® samplers and placed in an ice-chilled cooler for transport to a California-licensed laboratory.

Soil samples collected from MW-10R were submitted to TestAmerica Laboratories, Inc. (TestAmerica) of Pleasanton, California. Due to a computer virus which compromised the use of TestAmerica's laboratory equipment, the soil sample collected at MW-11 was sent to Eurofins Calscience, Inc. of Garden Grove, California. Soil samples at both laboratories were submitted for the following analyses:

- Total petroleum hydrocarbons as gasoline (GRO; C6-C12) using United States Environmental Protection Agency (USEPA) Test Method 8015 Modified (MW-11) and 8260B (MW-10R);
- Benzene, toluene, ethylbenzene, and xylenes (collectively BTEX) and fuel additives methyl tertiary butyl ether (MTBE), tertiary butyl alcohol (TBA), and di-isopropyl ether (DIPE) using USEPA Method 8260B.

Soil samples collected from MW-10R arrived at TestAmerica beyond the recommended holding time due to a scheduling change with the courier. Arcadis was notified by TestAmerica of the schedule change the day the samples were scheduled for pick up on February 4, 2015. Additionally, the samples collected from MW-10R were analyzed for GRO using USEPA Method 8260B when TestAmerica indicated that analysis using USEPA Method 8015M would require shipping the samples to their alternate laboratory in Irvine, California. Arcadis concluded immediate analysis using USEPA Method 8260B was preferred to ensure soil samples were analyzed without further delays.

### 3.4.3 Well Development and Survey

On February 15, 2016 MW-10R and MW-11 were developed using a combination of surging, bailing, and pumping. A surge block was moved up and down across the screened interval to remove fine-grained

deposits from the formation near the monitoring well and boring wall and from the filter pack material. After surging the monitoring well, a bailer was used to remove water containing suspended sediments from the casing. Additional purging activities were conducted with a submersible pump placed near the bottom of the well. The final development task consisted of pumping the well at a steady flow rate while monitoring groundwater parameters (including pH, temperature, conductivity, and turbidity) using a water quality meter (Horiba U-52). Pumping continued until at least ten casing-volumes of water were removed, and consecutive groundwater parameter readings were stabilized to within 10%.

During well development activities, the well locations and surface elevations were surveyed by Muir Consulting, Inc. of Oakdale, California. The survey data was uploaded to California State Water Resources Control Board (SWRCB) GeoTracker website and are included as Appendix D.

## 3.5 Well Destruction

The well collar and cover at MW-10R were removed with a jackhammer. The water in the well was displaced by delivering grout to the bottom of the well using tremie pipe. The well was then pressurized at approximately 25 pounds per square inch for 5 minutes. The pressure test was completed by connecting the well casing to an air compressor and monitoring the pressure to allow sufficient setting of the neat cement mixture without any leak or pressure drop. Following the initial pressure test, additional neat cement was added into the well casing as necessary to bring the neat cement level back to the top of the casing. Annular materials were removed within the well box to approximately 3 feet bgs and the casing was subsequently cut. Additional grout was applied above the casing to seal the annular area. The area was resurfaced with concrete underlain by 4 inches of miscellaneous subbase compliant with City of Oakland Public Works standards.

## 3.6 Management of Investigation-Derived Waste

Soil cuttings generated from well installation activities and purge water generated from well development activities were temporarily stored onsite in properly labeled Department of Transportation-approved 55-gallon steel drums pending characterization and disposal. On March 11, 2016, six drums of non-hazardous soil and 1 drum of non-hazardous water were picked up by Integrated Wastestream Management, Inc. of San Jose, California. The soil drums were transported to Republic Services Landfill in Livermore, California for disposal. The drum of water was transported to Seaport Refining and Environmental in Redwood City, California. The waste disposal certificates are included in Appendix E.

## 3.7 Well Completion Reports

As required by Section 13751 of the California Water Code, Well Completion Reports must be filed with the CDWR within 60 days of completion of the well destruction activities. Well Completion Reports were submitted to the CDWR on March 24, 2016. Copies of the Well Completion Reports are included as Appendix F.

# 4 ANALYTICAL RESULTS

Soil analytical results were compared to San Francisco Regional Water Quality Control Board (SFRWQCB) Environmental Screening Levels (ESLs) for direct contact with commercial or construction workers (Table S-1), and the protection of drinking water and nondrinking water (Table S-2; SFRWQCB 2016). Multiple volatile organic compounds were reported in the soil samples collected during drilling activities. Soil analytical results are summarized in Table 2. Laboratory reports are provided in Appendix G. The soil analytical results are summarized below:

- GRO detections were below the SFRWQCB ESLs for the protection of drinking and nondrinking water, and direct contact for commercial and construction workers, with maximum concentrations in a sample collected from MW-10R (180 milligrams per kilogram [mg/kg] at 22 feet bgs).
- Detections of benzene (maximum of 0.57 mg/kg), toluene (maximum of 2.0 mg/kg), ethylbenzene (maximum of 2.9 mg/kg) and xylenes (maximum of 15 mg/kg) were only observed in samples collected from MW-10R. The maximum benzene, ethylbenzene and xylenes detections exceeded the SFRWQCB ESL for the protection of drinking and non-drinking water.
- Concentrations in soil samples collected at MW-10R and MW-11 are not representative of soil concentrations since the samples were submerged.

The remaining constituents (DIPE, MTBE, and TBA) were not detected above the laboratory reporting limits (RLs), however the RL for MTBE and TBA did exceed the SFRWQCB ESLs for the protection of groundwater in samples collected from MW-10R.

# 5 CONCLUSIONS

Concentrations of constituents of potential concern (COPCs) in soil samples indicate the presence of hydrocarbon impacts to soil and groundwater in the vicinity of MW-10R. Although the drinking water ESL is included based on the potential for all water to be a drinking water source, the East Bay Municipal Utility District (EBMUD) currently supplies water to the Site and surrounding properties and is expected to provide water to these areas in the future. On average, 90 percent of the water used by EBMUD comes from the protected watershed of the Mokelumne River (EBMUD 2012). The Bayside groundwater well provides additional storage and Sacramento River water is available when needed during dry years. Groundwater beneath the Site is not currently used as a potable source and is not expected to be used as a drinking water source in the future.

Both MW-10R and MW-11 will be gauged and sampled quarterly for one year and then will be added to the routine semi-annual groundwater sampling program. Groundwater sampling was not conducted following well development activities due to a delay in obstruction permitting associated with the City of Oakland. Results from the initial sampling of MW-10R and MW-11 conducted on March 28, 2016 during the first quarter 2016 semi-annual groundwater sampling event will be reported in the upcoming First Quarter 2016 Groundwater Monitoring Report.

# 6 REFERENCES

Arcadis U.S., Inc. (Arcadis). 2014. Work Plan – Additional Site Characterization, Former BP Service Station No. 11132, 3201 35th Avenue, Oakland, California. June 25.

Broadbent & Associates, Inc. (BAI). 2008. Site Conceptual Model and Feasibility Study Report, Former BP Station No. 11132, July 2008.

California Department of Water Resources (CDWR). 1991. California Well Standards, Bulletin 74-90. June.

CDWR. 2003. California's Groundwater. Sacramento. Bulletin 118, update 2003.

East Bay Municipal Utility District (EBMUD). 2012. Water Supply Management Program 2040 Plan. April.

EMCON Northwest, Inc. (EMCON). 1994. Baseline Assessment Report, Site Number 11132, 3201 35th Avenue, Oakland, California. December 5.

SFRWQCB 2016. Environmental Screening Levels. February. http://www.waterboards.ca.gov/rwqcb2/water_issues/programs/esl.shtml

# TABLES

**Table 1**
**Well Construction Details**
**Former BP Station #11132**
**3201 35th Avenue**
**Oakland, California**

| Well ID | Completion Date | Total Depth (feet bgs) | Well Depth (feet bgs) | Screen Interval (feet bgs) | Borehole Diameter (inches) | Casing Diameter (inches) | Destruction Date |
|---|---|---|---|---|---|---|---|
| AS-1 | 09/08/10 | 47 | 45 | 42 - 45 | 4.25 | 2 | -- |
| MW-1 | 07/30/86 | 45 | 45 | 10 - 45 | 8 | 2 | -- |
| MW-2 | 07/31/86 | 35 | 35 | 10 - 35 | 8 | 2 | -- |
| MW-3 | 07/31/86 | 35 | 35 | 10 - 35 | 8 | 2 | -- |
| MW-4 | 01/29/90 | 41 | 40 | 10 - 40 | 8 | 2 | -- |
| MW-5 | 02/01/90 | 35 | 35 | 10 - 35 | 8 | 2 | -- |
| MW-6 | 02/01/90 | 35 | 35 | 15 - 35 | 8 | 2 | -- |
| MW-7 | 02/01/90 | 35 | 35 | 17 - 35 | 8 | 2 | -- |
| MW-8 | 01/25/91 | 41.5 | 40 | 20 - 40 | 8 | 2 | -- |
| MW-9 | 02/26/91 | 35 | 35 | 15 - 35 | 8 | 2 | -- |
| MW-10 | 02/27/91 | 36 | 35 | 20 - 35 | 8 | 2 | 02/03/16 |
| MW-10R | 02/03/16 | 27 | 26 | 11 - 26 | 8 | 2 | -- |
| MW-11 | 02/10/16 | 28 | 26 | 11 - 26 | 8 | 2 | -- |
| OW-1 | 09/08/10 | 40 | 42 | 20 - 40 | 4.25 | 2 | -- |
| RW-1 | 01/29/90 | 41.5 | 40 | 20 - 40 | 12 | 6 | -- |
| SVE-1 | 09/07/10 | 20 | 20 | 10 - 20 | 4.25 | 2 | -- |
| VM-1 | 09/07/10 | 20 | 20 | 10 - 20 | 4.25 | 2 | -- |
| VM-2 | 09/07/10 | 20 | 22 | 10 - 20 | 4.25 | 2 | -- |

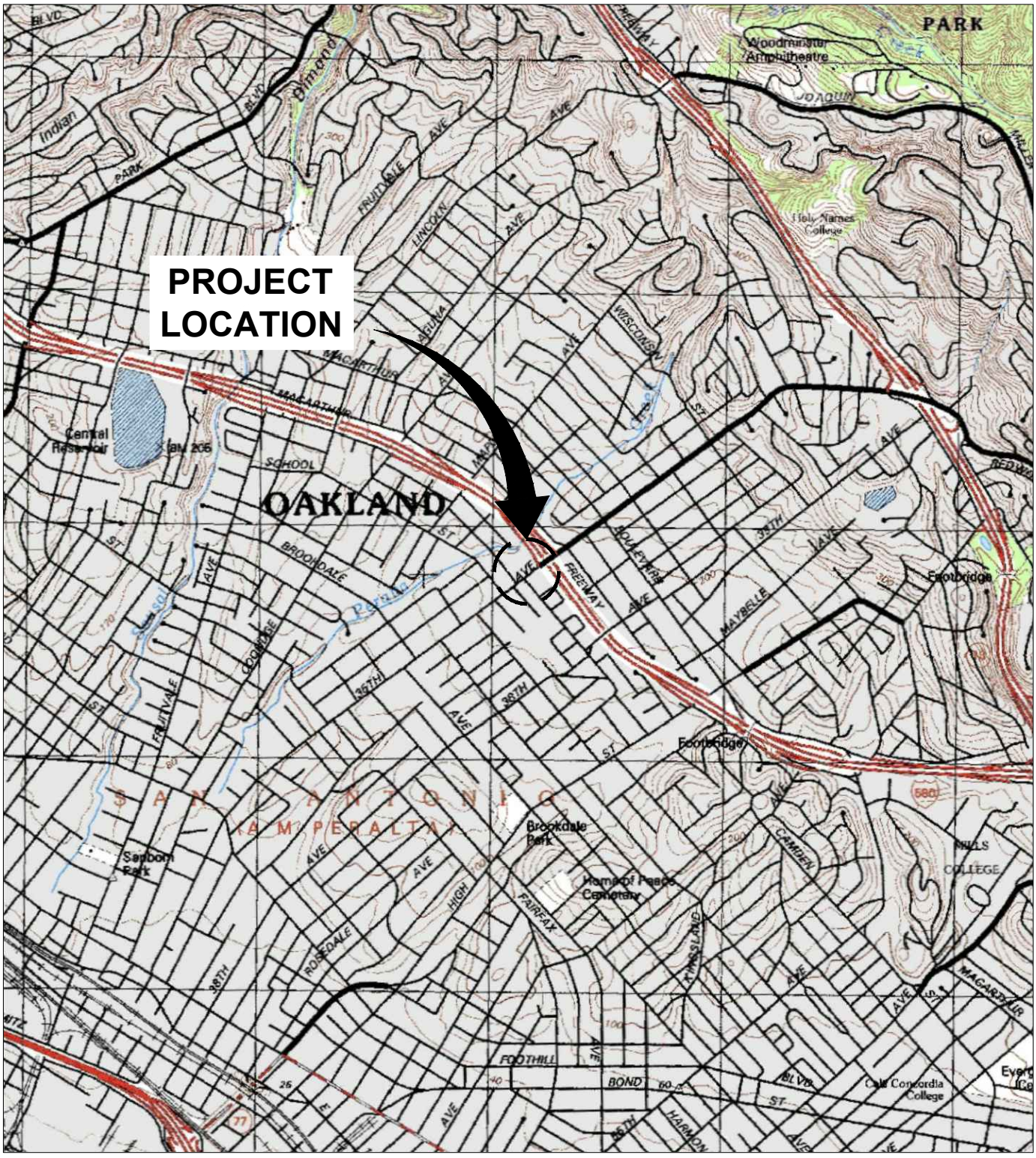
**Notes:**
AS = air sparge well
MW = monitoring Well
OW = observation well
RW = groundwater recovery well
SVE = soil vapor extraction well
VM = soil vapor monitoring well
bgs = below ground surface
-- = not applicable

**Table 2**
**Soil Analytical Results**
**Former BP Station #11132**
**3201 35th Avenue**
**Oakland, California**

| Sample Location | Sample Date | Sample Depth (feet bgs) | USEPA 8015M | USEPA 8260B | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | GRO (mg/kg) | GRO (mg/kg) | Benzene (mg/kg) | Toluene (mg/kg) | Ethylbenzene (mg/kg) | Xylenes (mg/kg) | MTBE (mg/kg) | TBA (mg/kg) | DIPE (mg/kg) |
| MW-10R | 02/03/16 | 20.0 - 20.5 | -- | **120 H** | <0.39 H | <0.39 H | **2.6 H** | **11 H** | <0.39 H | <0.79 H | <0.39 H |
| | | 22.0 - 22.5 | -- | **180 H** | **0.57 H** | **2.0 H** | **2.9 H** | **15 H** | <0.39 H | <0.79 H | <0.39 H |
| MW-11 | 02/10/16 | 23.0 - 23.5 | **0.57** | -- | <0.00086 | <0.00086 | <0.00086 | <0.0017 | <0.0017 | <0.017 | <0.00086 |
| **Commercial Worker Direct Contact ESL** | | | **4,100** | **4,100** | **1.1** | **4,900** | **24** | **2,600** | **200** | **NA** | **NA** |
| **Construction Worker Direct Contact ESL** | | | **2,800** | **2,800** | **26** | **4,300** | **510** | **2,400** | **3,900** | **NA** | **NA** |
| **Drinking Water ESL** | | | **770** | **770** | **0.044** | **2.9** | **1.4** | **2.3** | **0.023** | **0.075** | **NA** |
| **Nondrinking Water ESL** | | | **3,400** | **3,400** | **0.049** | **9.3** | **1.4** | **11** | **0.84** | **110** | **NA** |

**Notes:**
<25 = Not detected above the Reporting Limit (RL).
**BOLD** = Indicates analytical result is above reporting limits.
bgs = below ground surface
NA = not available
mg/kg = milligrams per kilogram
GRO = gasoline range organics
MTBE = methyl tert-butyl ether
TBA = tert-butyl alcohol
DIPE = di-isopropyl ether
USEPA = United States Environmental Protection Agency
H = sample was prepped or analyzed beyond the specified holding time.
Direct contact ESLs are based on incidental soil ingestion, dermal contact with soil and inhalation of outdoor dust and vapors (Table S-1; SFRWQCB 2016).
Protection of drinking water ESL from Table S-2: Summary of soil ESLs leaching to groundwater levels (SFRWQCB 2016).
Protection of nondrinking water ESL from Table S-2: Summary of soil ESLs leaching to groundwater levels (SFRWQCB 2016).
ESLs are based on a target excess lifetime cancer risk of 1E-6 or target hazard quotient of 1.0

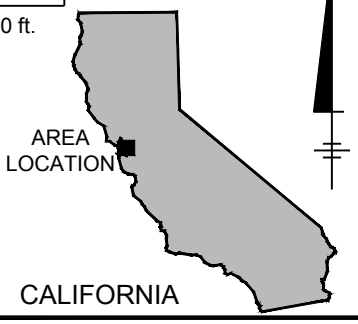
# FIGURES




REFERENCE: BASE MAP USGS 7.5. MIN. TOPO. QUAD., OAKLAND EAST, CALIFORNIA, 1997.

0 2000' 4000'

Approximate Scale: 1 in. = 2000 ft.



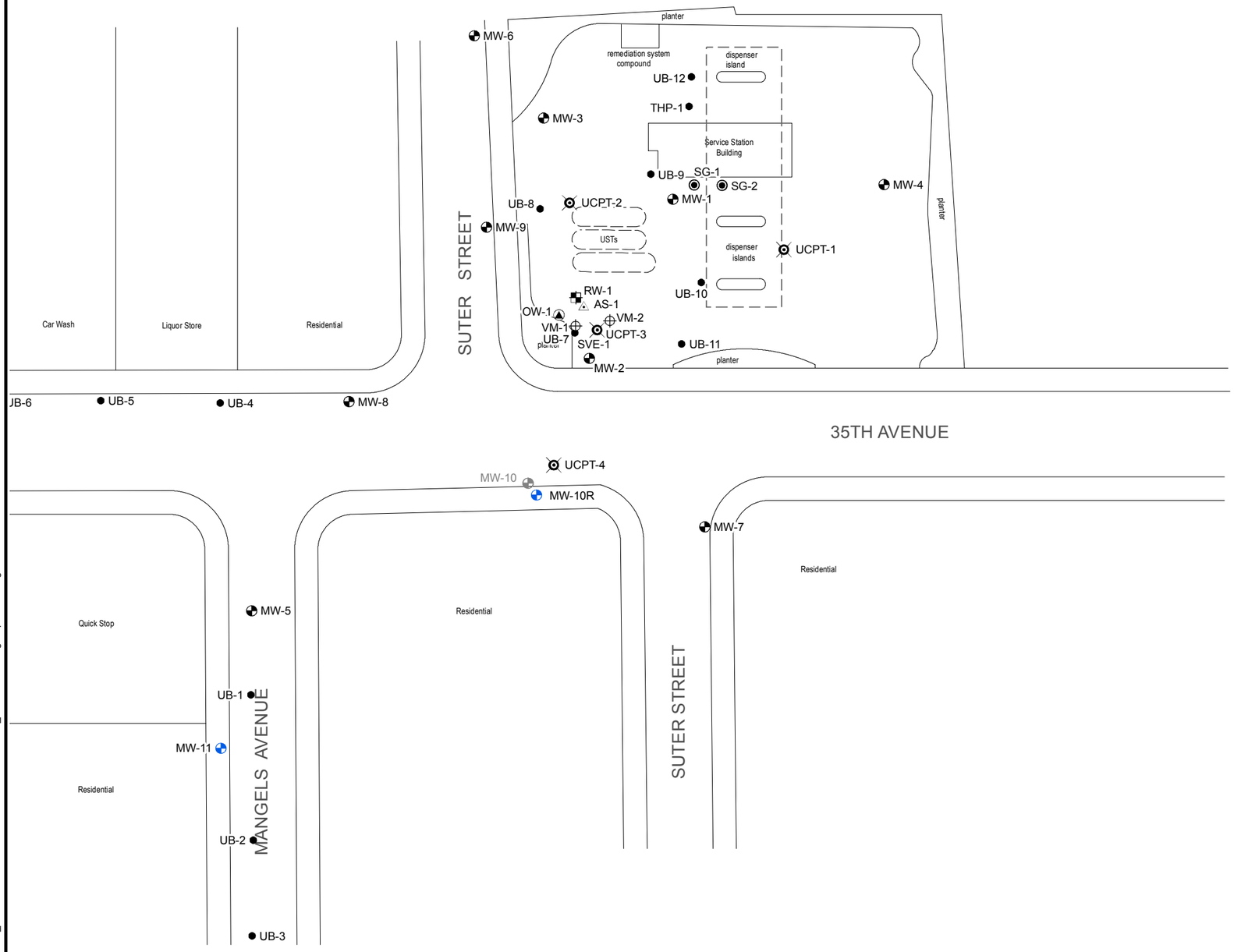

FORMER BP STATION No. 11132
3201 35TH AVENUE
OAKLAND, CALIFORNIA

## SITE LOCATION MAP

ARCADIS Design & Consultancy for natural and built assets

FIGURE 1

CITY: PETALUMA, CA DIV/GROUP: ENV DB: J. HARRIS LD:--- PIC:--- PM: H. PHILLIPS TM: J. PETERSON LYR:(Opt)ON=*;OFF=*REF*
C:\ENVCAD\Emeryville\ACTIGP09BPNAC112\C0000\DWG\GP09BPNAC112-N01.dwg LAYOUT: 1 SAVED: 2/19/2016 1:55 PM ACADVER: 19.1S (LMS TECH) PAGESETUP: --- PLOTSTYLETABLE: ARCADIS.CTB PLOTTED: 2/19/2016 1:58 PM BY: REYES, ALEC
XREFS: IMAGES: PROJECTNAME: ---
USGS TOPO 11132.jpg




LEGEND:

| | |
|---|---|
| MW-11 | GROUNDWATER MONITORING WELL (ARCADIS 2016) |
| MW-1 | GROUNDWATER MONITORING WELL |
| RW-1 | GROUNDWATER RECOVERY WELL |
| OW-1 | OBSERVATION WELL |
| SVE-1 | SOIL VAPOR EXTRACTION WELL |
| VM-1 | SOIL VAPOR MONITORING WELL |
| UB-1 | SOIL BORING |
| UCPT-1 | CPT/UVOST LOCATION |
| SG-1 | SOIL GAS BORING |
| AS-1 | AIR SPARGE WELL |
| MW-10 | ABANDONED MONITORING WELL |
| | CANOPY |

0 50 100

SCALE IN FEET

NOTES:

1. SITE MAP ADAPTED FROM CAMBRIA ENVIRONMENTAL FIGURES. SITE DIMENSIONS AND FIGURES FACILITY LOCATIONS NOT VERIFIED.

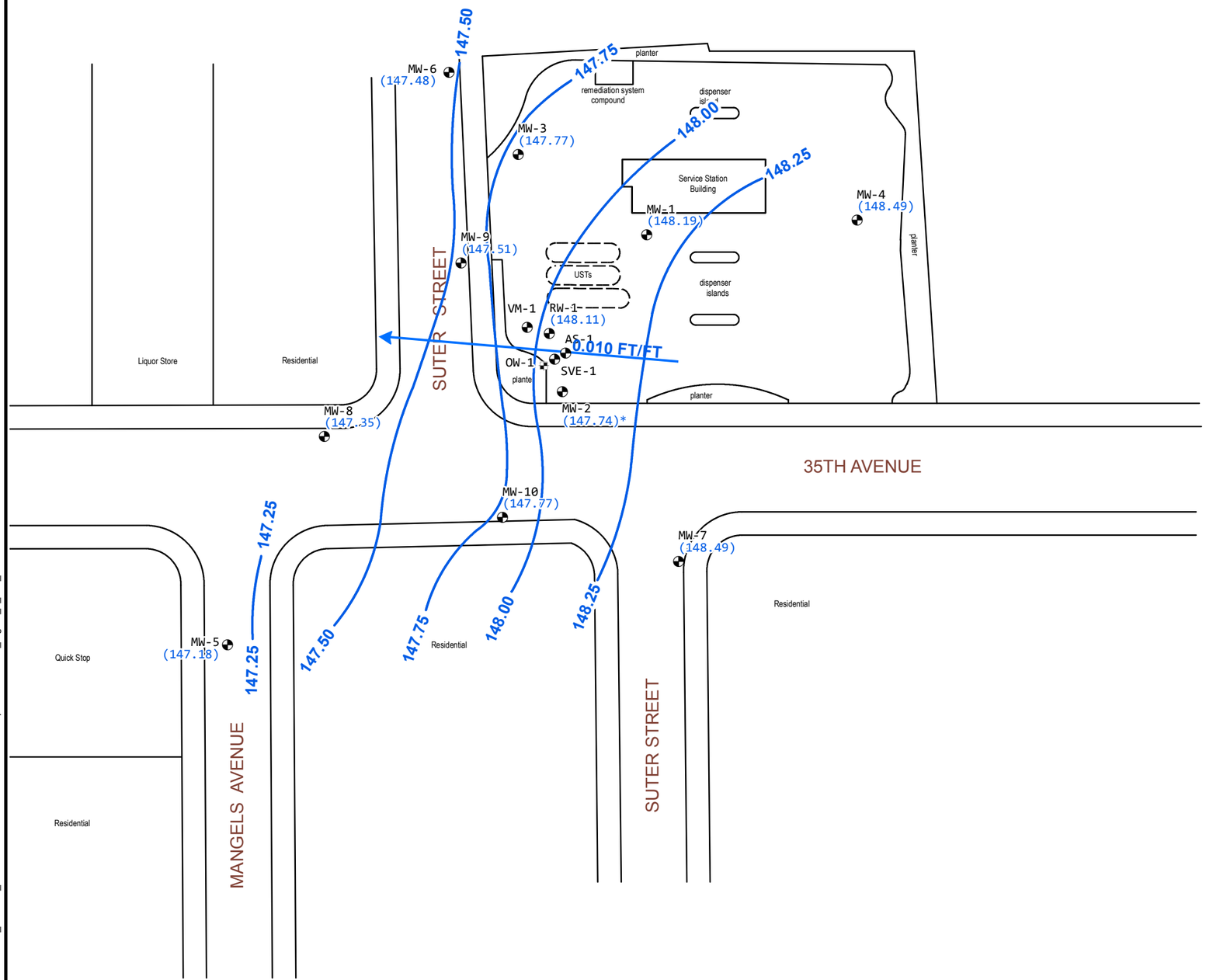
FORMER BP SERVICE STATION #11132
3201 35TH AVENUE
OAKLAND, CALIFORNIA

**SITE PLAN**

ARCADIS Design & Consultancy for natural and built assets

FIGURE 2

CITY: SAN FRANCISCO DIV/GROUP: ENV/IM DB: kgpeters LD: PIC: PM: TM:
PROJECT: PATH: Z:\GIS\PROJECTS_ENV\BP_FOXGLOVE\CA\CA11132\GIS\MXD\CA11132_SitePlanShowingProposedBoringLocations.mxd DATE: 2/26/2016 5:09:15 PM




## LEGEND:

- EXISTING MONITORING WELL
- GROUNDWATER RECOVERY WELL
- (148.49) GROUNDWATER ELEVATION (FEET ABOVE MEAN SEA LEVEL)
- * NOT USED IN CONTOURING
- 147.75 GROUNDWATER ELEVATION CONTOUR LINE (DASHED WHERE INFERRED)
- 0.010 FT/FT GROUNDWATER FLOW DIRECTION (FEET PER FOOT)

## NOTES:

1. SITE MAP ADAPTED FROM CAMBRIA ENVIRONMENTAL FIGURES. SITE DIMENSIONS AND FIGURES FACILITY LOCATIONS NOT VERIFIED.
2. WELL MW-7 AND SUTER STREET LOCATIONS HAVE BEEN CORRECTED FROM PREVIOUS MAPS.

0 50 100

SCALE IN FEET

FORMER BP SERVICE STATION #11132
3201 35TH AVENUE
OAKLAND, CALIFORNIA

**GROUNDWATER ELEVATION CONTOUR MAP AUGUST 27, 2015**

ARCADIS

FIGURE 3

CITY: SAN FRANCISCO DIV/GROUP: ENV/IM DB: msmiller LD: PIC: PM: TM:
PROJECT: PATH: Z:\GISPROJECTS_ENV\BP_FOXGLOVE\CA\CA11132\GIS\MXD\3q2015\CA11132_Figure_2_GW_Elev.mxd DATE: 10/16/2015 9:43:56 AM

# APPENDIX A

## Agency Correspondence

**From:** Nowell, Keith, Env. Health
**Sent:** Thursday, September 18, 2014 4:08 PM
**To:** Phillips, Hollis
**Cc:** Megan.Smoley@arcadis-us.com; Roe, Dilan, Env. Health
**Subject:** Fuel leak case RO14 - BP#11132, 3201 35th Ave., Oakland

Dear Ms. Phillips,

Thank you and Megan Smoley, both of ARCADIS U.S., Inc. (ARCADIS), for participating in the meeting today regarding fuel leak cases BP#11132, located at 3201 35th Avenue in Oakland, Alameda County Environmental Health (ACEH) case number RO14. The purpose of the meeting was to discuss the status of the case and identify action items to move the case forward toward closure under the State Water Resources Control Board's (SWRCBs) Low Threat Underground Storage Tank Case Closure Policy (LTCP), including a discussion of the document entitled, *Work Plan – Additional Site Characterization* (Work Plan), dated June 25, 2014, and prepared by prepared by ARCADIS for the subject site.

As discussed in the meeting, ACEH generally concurs with the scope of work outlined in the Work Plan. The proposed scope of work may be implemented provided that the modifications requested in the technical comments below are addressed and incorporated during the field implementation. Submittal of a revised Work Plan is not required unless an alternate scope of work outside that described in the Work Plan and technical comments below is proposed.

**Technical Comments**

- Well Replacement - ACEH concurs with the replacement of the off-site groundwater monitoring well MW-10, referred to as MW-10R in the Work Plan. This well is located adjacent to a residence, has historically demonstrated measurable thicknesses of separate phase petroleum hydrocarbons (SPH), was most recently (February 6, 2012) reported to contain benzene at a concentration of 1,1000 mg/L, and has experienced a submerged well screen more than seventy-percent of the time. Additionally, the results of a UVOST boring advanced in the vicinity of the well did not reveal the presence of SPH, suggesting petroleum hydrocarbons detected in the well may not be consistent with site conditions. Proper abandonment of well MW-10 and replacing it with a well in the immediate vicinity of MW-10 will aid in the evaluation of the free product and groundwater contaminant plumes in this area.

- Additional Groundwater Monitoring Well – ACEH concurs the leading edge of the contaminant plume has not been defined. Placement of a down gradient monitoring well in front of the residence located at 3519 Mangels Avenue, as depicted on Figure 2 of the WP, is acceptable to ACEH.

- Monitoring Well Construction – Groundwater at well MW-10 has varied from 12.21 feet bgs to 22.00 feet bgs and has a well screen submergence rate of more than 70-percent. Groundwater at well MW-5, the nearest monitoring well to the proposed MW-11 location, has varied from 9.95 feet bgs to 20.94 feet bgs. The well screen length should be sufficient to intersect the vadose zone while not resulting in the submergence of the well screen. The proposed well screen interval, 12 feet to 27 feet bgs, for the two wells does not appear to be adequate for MW-11. Please provide technical justification for the proposed screened interval in the report requested below or submit, via email (attention Keith Nowell), a new screen interval.

- Soil Gas Probe Installation– ACEH is of the opinion that installation of soil gas probe SV-1, located adjacent to the residences (addressed as 3210 and 3214 35th Avenue) on 35th Avenue across from the site as depicted on Figure 2 of the WP, is premature. ACEH recommends the analytical data for MW-10R be reviewed prior to making a determination of the appropriateness of SV-1 installation. Please provide to ACEH the analytical data for MW-10R for review as soon as the data is available for discussion regarding the soil gas probe installation.

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

- **September 30, 2014 - GeoTracker and ACEH FTP Site Electronic Deliverables**

- **October 31, 2014 – Analytical groundwater data for monitoring well MW-10R** -sent via email (attention Keith Nowell at keith.nowell@acgov.org and cc'ing Dilan Roe at dilan.roe@acgov.org). Note the data will be uploaded to GeoTracker as an EDF.

- **TBD– Groundwater (and Soil Gas) Investigation Report** (RO0000014_SWI_R_YYYY-MM-DD)

Thank you for your cooperation. 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,

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

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

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

# APPENDIX B

## Well Construction Completion Logs

**Date Start/Finish:** 02/03/2016
**Drilling Company:** Gregg Drilling & Testing, Inc.
**Driller's Name:** Vince Pokrywka
**Drilling Method:** Hollow Stem Auger
**Sampling Method:** Split Spoon
**Rig Type:** Marl M5T

**Northing:** NA
**Easting:** NA
**Casing Elevation:** NA

**Borehole Depth:** 28'
**Surface Elevation:** NA

**Descriptions By:** M. Elder/ C. Williams

**Well/Boring ID:** **MW-10R**

**Client:** BP FOXGLOVE

**Location:** FORMER BP STATION #11132
3201 35th Avenue
Oakland, California

**Reviewed By:** Megan Smoley

| DEPTH ELEVATION | Sample Run Number | Sample Interval | Recovery (feet) | PID Headspace (ppm) | Analytical Sample | USCS Code | Geologic Column | Stratigraphic Description | Well/Boring Construction |
|---|---|---|---|---|---|---|---|---|---|
| 0 0 | | | | | | PT | | Top Soil. 6" | 12" Flush-mount Traffic Rated Well Box |
| | | | | 0.0 | | SM | | SILTY SAND; Some gravel; Reddish brown (5 YR 4/4); Loose; Dry. | 2" Expandable Locking Well Cap |
| | | | | 0.0 | | | | | Concrete (0-1' bgs) |
| | | | | 0.0 | | ML | | SANDY SILT; Fine-coarse grained sand; Reddish brown (5 YR 4/4); Loose; Dry. | 2-inch Dia. SCH40 PVC Blank Casing (0'-11' bgs) |
| | | | | 0.0 | | | | As above; Trace clay. | |
| 5 -5 | | 5' | | 0.0 | | SC | | SILTY SAND; Some gravel; Reddish brown (5 YR 4/4); Loose; Dry. | Neat Cement Grout (1'-7' bgs) |
| | | | | 0.0 | | | | As above; Trace gravel. | |
| | | | | 0.0 | | ML | | SANDY SILT; Trace gravel; Reddish brown (5 YR 4/4); Loose; Dry; Red staining; No odor. | |
| | | | | 0.0 | | | | | Hydrated Bentonite Pellets (7'-9' bgs) |
| 10 -10 | | 5' | | 0.0 | | | | | |
| | | | | 0.0 | | CL | | SILTY CLAY; Trace gravel; Dull yellow orange (10 YR 7/3); Low Plasticity; Dense; Dry; No odor. | #2/12 Sand (9'-27' bgs) |
| | | | | 0.0 | | | | | |
| Water Level | | | | 0.0 | | | | | 8" Dia. Borehole (0'-27' bgs) |
| 15 -15 | | 5' | | 0.1 | | SC | | CLAYEY SAND; Some gravel; Dull yellowish brown (10 YR 4/3); Low plasticity; Moist; No odor. | |
| | | | | 0.2 | | | | | |
| | | | | 0.0 | | | | | |
| | | | | 0.0 | | | | | |
| | | | | 0.0 | | | | | 2-inch Dia., 0.010" slot SCH40 PVC Well Screen (11'-26' bgs) |
| 20 -20 | | 5' | | | | | | | |

**Remarks:** bgs = below ground surface; NA = not applicable; PID = photoionization detector; ppm = parts per million
' = feet
" = inches

| | | |
|---|---|---|
| **Date Start/Finish:** 02/03/2016<br>**Drilling Company:** Gregg Drilling & Testing, Inc.<br>**Driller's Name:** Vince Pokrywka<br>**Drilling Method:** Hollow Stem Auger<br>**Sampling Method:** Split Spoon<br>**Rig Type:** Marl M5T | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 28'<br>**Surface Elevation:** NA<br><br>**Descriptions By:** M. Elder/ C. Williams | **Well/Boring ID:** **MW-10R**<br><br>**Client:** BP FOXGLOVE<br><br>**Location:** FORMER BP STATION #11132<br>3201 35th Avenue<br>Oakland, California<br><br>**Reviewed By:** Megan Smoley |

| DEPTH ELEVATION | Sample Run Number | Sample Interval | Recovery (feet) | PID Headspace (ppm) | Analytical Sample | USCS Code | Geologic Column | Stratigraphic Description | Well/Boring Construction |
|---|---|---|---|---|---|---|---|---|---|
| 20 -20 | | | | 0.0 | | | | CLAYEY SAND; Some gravel; Brownish black (10 YR 3/2); Wet; Black staining; Strong odor. | |
| | | | | 193.2 | | SM | | SANDY SILT; Trace gravel; Dense; Dry. | |
| | | | | 48.0 | | SC | | CLAYEY SAND; Brownish black (10 YR 3/2); Fine to medium grained sand; Medium plasticity; Loose; Wet; Organic odor. | |
| | | | | 357.0 | | | | | |
| | | | | 11.5 | | | | | |
| 25 -25 | | 5' | | 4.7 | | | | | |
| | | | | 2.8 | | | | | 2" Threaded End Cap |
| | | 2' | | 0.5 | | | | | |
| | | | | | | | | Bottom of boring at 27' bgs. | |
| 30 -30 | | | | | | | | | |

**Remarks:** bgs = below ground surface; NA = not applicable; PID = photoionization detector; ppm = parts per million
' = feet
" = inches

**Date Start/Finish:** 02/10/2016
**Drilling Company:** Gregg Drilling & Testing, Inc.
**Driller's Name:** Salvador Cortes
**Drilling Method:** Hollow Stem Auger
**Sampling Method:** Split Spoon
**Rig Type:** Marl M5T

**Northing:** NA
**Easting:** NA
**Casing Elevation:** NA

**Borehole Depth:** 28'
**Surface Elevation:** NA

**Descriptions By:** Connor Williams

**Well/Boring ID:** **MW-11**

**Client:** BP FOXGLOVE

**Location:** FORMER BP STATION #11132
3201 35th Avenue
Oakland, California

**Reviewed By:** Megan Smoley

| DEPTH / ELEVATION | Sample Run Number | Sample Interval | Recovery (feet) | PID Headspace (ppm) | Analytical Sample | USCS Code | Geologic Column | Stratigraphic Description | Well/Boring Construction |
|---|---|---|---|---|---|---|---|---|---|
| 0 / 0 | | | | | | | | Top Soil. 12". | 12" Flush-mount Traffic Rated Well Box |
| | | | | 0.0 | | SM | | SILTY SAND; Trace gravel; Light reddish brown (5 YR 3/6); Loose; Dry; No odor. | 2" Expandable Locking Well Cap |
| | | | | 0.0 | | | | | Concrete (0-1' bgs) |
| | | | | 0.0 | | | | | 2-inch Dia. SCH40 PVC Blank Casing (0'-11' bgs) |
| 5 / -5 | | 5' | | 0.0 | | | | | Neat Cement Grout (1'-7' bgs) |
| | | | | 0.0 | | | | | |
| | | | | 0.0 | | ML | | SANDY SILT: Light yellowish brown (10 YR 6/6); Very fine to fine grained sand; Moderate cementation; Dry; No odor. | |
| | | | | 0.0 | | CL | | SANDY CLAY; Trace gravel; Yellowish brown (10 YR 5/4); Very fine to fine grained sand; Low plasticity; Dry: No odor. | Hydrated Bentonite Pellets (7'-9' bgs) |
| 10 / -10 | | 5' | | 0.0 | | | | | |
| | | | | 0.0 | | | | | #2/12 Sand (9'-28' bgs) |
| | | | | 0.0 | | | | | |
| | | | | 0.0 | | SC | | CLAYEY SAND; Some gravel; Yellowish brown (10 YR 5/4); Weak cementation; Loose; Dry; No odor. | 8" Dia. Borehole (0'-28' bgs) |
| | | | | 0.0 | | | | | |
| 15 / -15 | | 5' | | 0.0 | | | | | |
| | | | | 0.0 | | CL | | CLAY; Trace sand and gravel; Yellowish brown (10 YR 5/4); Low plasticity; Dry; No odor. | |
| | | | | 0.0 | | | | | |
| | | | | 0.0 | | | | | |
| | | | | 0.0 | | ML | | SANDY SILT; Trace clay and gravel; Dark yellowish brown (10 YR 4/4); Strong cementation; Dense; Dry; No odor. | 2-inch Dia., 0.010" slot SCH40 PVC Well Screen (11'-26' bgs) |
| 20 / -20 | | 5' | | | | | | | |

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**Remarks:** bgs = feet; below ground surface; NA = not applicable; PID = photoionization detector; ppm = parts per million
' = feet
" = inches

| | | |
|---|---|---|
| **Date Start/Finish:** 02/10/2016<br>**Drilling Company:** Gregg Drilling & Testing, Inc.<br>**Driller's Name:** Salvador Cortes<br>**Drilling Method:** Hollow Stem Auger<br>**Sampling Method:** Split Spoon<br>**Rig Type:** Marl M5T | **Northing:** NA<br>**Easting:** NA<br>**Casing Elevation:** NA<br><br>**Borehole Depth:** 28'<br>**Surface Elevation:** NA<br><br>**Descriptions By:** Connor Williams | **Well/Boring ID:** **MW-11**<br><br>**Client:** BP FOXGLOVE<br><br>**Location:** FORMER BP STATION #11132<br>3201 35th Avenue<br>Oakland, California<br><br>**Reviewed By:** Megan Smoley |

| DEPTH ELEVATION | Sample Run Number | Sample Interval | Recovery (feet) | PID Headspace (ppm) | Analytical Sample | USCS Code | Geologic Column | Stratigraphic Description | Well/Boring Construction |
|---|---|---|---|---|---|---|---|---|---|
| 20 -20<br>25 -25<br>30 -30 | MW-11-23.0<br>-23.5 | 5'<br>3' | | 0.0<br>0.0<br>0.0<br>47.7<br>10.6<br>0.0<br>0.0<br>0.0 | | SP<br>OH | | SAND WITH CLAY; Trace gravel; Brown (10 YR 4/3); Weak cementation; Loose; Dry; No odor.<br>CLAY; Trace sand; High plasticity; Moist; No odor.<br>Bottom of boring at 28' bgs. | 2" Threaded End Cap |

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**Remarks:** bgs = feet; below ground surface; NA = not applicable; PID = photoionization detector; ppm = parts per million
' = feet
" = inches

# APPENDIX C

## Permits

# 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: 10/22/2014 By jamesy**

**Permit Numbers: W2014-0986 to W2014-0988**
**Permits Valid from 02/03/2016 to 02/05/2016**

| | | | |
|---|---|---|---|
| **Application Id:** | 1412118039915 | **City of Project Site:** | Oakland |
| **Site Location:** | 3201 35th Avenue, Oakland, CA | | |
| **Project Start Date:** | 10/27/2014 | **Completion Date:** | 11/28/2014 |
| **Assigned Inspector:** | Contact Lindsay Furuyama at (925) 956-2311 or Lfuruyama@groundzonees.com | | |
| **Extension Start Date:** | 02/03/2016 | **Extension End Date:** | 02/05/2016 |
| **Extension Count:** | 3 | **Extended By:** | jamesy |

| | | |
|---|---|---|
| **Applicant:** | ARCADIS U.S., Inc. - Carl Edwards<br>100 Montgomery Street, Suite 300, San Francisco, CA 94104 | **Phone:** 412-825-0759 |
| **Property Owner:** | Atlantic Richfield Corporation<br>201 Helios Way, Houston, TX 77079 | **Phone:** 713-323-4153 |
| **Client:** | ** same as Property Owner ** | |
| **Contact:** | Megan Smoley | **Phone:** 334-215-4461<br>**Cell:** -- |

| | | |
|---|---|---|
| | **Total Due:** | $1191.00 |
| **Receipt Number: WR2014-0427** | **Total Amount Paid:** | $1191.00 |
| **Payer Name : ARCADIS** | Paid By: CHECK | **PAID IN FULL** |

**Works Requesting Permits:**

Well Construction-Monitoring-Monitoring - 1 Wells
Driller: Gregg Drilling and Testing, Inc. - Lic #: 485165 - Method: hstem **Work Total: $397.00**

**Specifications**

| Permit # | Issued Date | Expire Date | Owner Well Id | Hole Diam. | Casing Diam. | Seal Depth | Max. Depth |
|---|---|---|---|---|---|---|---|
| W2014-0986 | 10/22/2014 | 01/25/2015 | MW-10R | 8.00 in. | 2.00 in. | 12.00 ft | 27.00 ft |

**Specific Work Permit Conditions**

1. 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.

2. 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.

3. Prior to any drilling activities, it shall be the applicant's responsibility to contact and coordinate an Underground Service Alert (USA), obtain encroachment permit(s), excavation permit(s) or any other permits or agreements required for that Federal, State, County or City, and follow all City or County Ordinances. No work shall begin until all the permits and requirements have been approved or obtained. It shall also be the applicants responsibilities to provide to the Cities or to Alameda County an 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.

4. Compliance with the well-sealing specifications shall not exempt the well-sealing contractor from complying with

appropriate State reporting-requirements related to well construction or destruction (Sections 13750 through 13755 (Division 7, Chapter 10, Article 3) of the California Water Code). Contractor must complete State DWR Form 188 and mail original to the Alameda County Public Works Agency, Water Resources Section, within 60 days. Include permit number and site map.

5. Applicant shall submit the copies of the approved encroachment permit to this office within 10 days.

6. 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.

7. Wells shall have a Christy box or similar structure with a locking cap or cover. Well(s) shall be kept locked at all times. Well(s) that become damaged by traffic or construction shall be repaired in a timely manner or destroyed immediately (through permit process). No well(s) shall be left in a manner to act as a conduit at any time.

8. Minimum surface seal thickness is two inches of cement grout placed by tremie.

9. Minimum seal (Neat Cement seal) depth for monitoring wells is 5 feet below ground surface(BGS) or the maximum depth practicable or 20 feet.

10. 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.

---

Well Construction-Monitoring-Monitoring - 1 Wells
Driller: Gregg Drilling and Testing, Inc. - Lic #: 485165 - Method: hstem **Work Total: $397.00**

**Specifications**

| Permit # | Issued Date | Expire Date | Owner Well Id | Hole Diam. | Casing Diam. | Seal Depth | Max. Depth |
|---|---|---|---|---|---|---|---|
| W2014-0987 | 10/22/2014 | 01/25/2015 | MW-11 | 8.00 in. | 2.00 in. | 12.00 ft | 27.00 ft |

**Specific Work Permit Conditions**

1. 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.

2. 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.

3. Prior to any drilling activities, it shall be the applicant's responsibility to contact and coordinate an Underground Service Alert (USA), obtain encroachment permit(s), excavation permit(s) or any other permits or agreements required for that Federal, State, County or City, and follow all City or County Ordinances. No work shall begin until all the permits and requirements have been approved or obtained. It shall also be the applicants responsibilities to provide to the Cities or to Alameda County an 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.

4. Compliance with the well-sealing specifications shall not exempt the well-sealing contractor from complying with appropriate State reporting-requirements related to well construction or destruction (Sections 13750 through 13755 (Division 7, Chapter 10, Article 3) of the California Water Code). Contractor must complete State DWR Form 188 and mail original to the Alameda County Public Works Agency, Water Resources Section, within 60 days. Include permit number and site map.

5. Applicant shall submit the copies of the approved encroachment permit to this office within 10 days.

6. 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.

7. Wells shall have a Christy box or similar structure with a locking cap or cover. Well(s) shall be kept locked at all times. Well(s) that become damaged by traffic or construction shall be repaired in a timely manner or destroyed immediately (through permit process). No well(s) shall be left in a manner to act as a conduit at any time.

8. Minimum surface seal thickness is two inches of cement grout placed by tremie.

9. Minimum seal (Neat Cement seal) depth for monitoring wells is 5 feet below ground surface(BGS) or the maximum depth practicable or 20 feet.

10. 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.

---

Well Destruction-Monitoring - 1 Wells

Driller: Gregg Drilling and Testing, Inc. - Lic #: 485165 - Method: hstem **Work Total: $397.00**

**Specifications**

| Permit # | Issued Date | Expire Date | Owner Well Id | Hole Diam. | Casing Diam. | Seal Depth | Max. Depth | State Well # | Orig. Permit # | DWR # |
|---|---|---|---|---|---|---|---|---|---|---|
| W2014-0988 | 10/22/2014 | 01/25/2015 | MW-10 | 8.00 in. | 2.00 in. | 18.00 ft | 36.50 ft | 2S/3W4D | No Records | No Records |

**Specific Work Permit Conditions**

1. Drilling Permit(s) can be voided/ cancelled only in writing. It is the applicant's responsibility to notify Alameda County Public Works Agency, Water Resources Section in writing for an extension or to cancel the drilling permit application. No drilling permit application(s) shall be extended beyond ninety (90) days from the original start date. Applicants may not cancel a drilling permit application after the completion date of the permit issued has passed.

2. Prior to any drilling activities, it shall be the applicant's responsibility to contact and coordinate an Underground Service Alert (USA), obtain encroachment permit(s), excavation permit(s) or any other permits or agreements required for that Federal, State, County or City, and follow all City or County Ordinances. No work shall begin until all the permits and requirements have been approved or obtained. It shall also be the applicants responsibilities to provide to the Cities or to Alameda County an 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.

3. Compliance with the well-sealing specifications shall not exempt the well-sealing contractor from complying with appropriate State reporting-requirements related to well construction or destruction (Sections 13750 through 13755 (Division 7, Chapter 10, Article 3) of the California Water Code). Contractor must complete State DWR Form 188 and mail original to the Alameda County Public Works Agency, Water Resources Section, within 60 days. Include permit number and site map.

4. Applicant shall submit the copies of the approved encroachment permit to this office within 10 days.

5. 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 and liability in connection with or resulting from the exercise of this Permit including, but not limited to, property damage, personal injury and wrongful death.

6. 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.

7. 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.

8. Remove the Christy box or similar structure. Destroy well(s) MW-10 by overdrilling the upper 5ft. BGS & Tremie Grouting with Cement. After the seal has set, backfill the remaining hole with concrete or compacted material to match existing.

9. 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.

Applications for which no permit is issued 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:** X1502897 OPW - Excavation **Filed Date:** 12/24/2015

**Job Site:** 3201 35TH AVE **Schedule Inspection by calling:** 510-238-3444

**Parcel No:** 028 095003701

**District:**

**Project Description:** Install monitoring well MW-11 on MANGELS AVE near 35TH AVE. Contact: M ELDER, 415 205-6584
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.
Beginning 2016 a USA # and date must be provided in order to have an excavation permit issued. Permit valid 90 days. Call PWA INSPECTION prior to start: 510-238-3651. 4th FLOOR.

**Related Permits:** ENMI15052 X1502688 OB1501392 X1502898

| | Name | Applicant | Address | Phone | License # |
|---|---|---|---|---|---|
| **Owner:** | SULL RAJINDER S & SUKHVINDER | | | 2244560168 | |
| **Contractor-Employee:** | ARCADIS U S INC GARY KEYES | X | 630 PLAZA DRIVE STE 200 HIGHLANDS RANCH, CO | 4153742744 | |
| **Contractor:** | ARCADIS U S INC GARY KEYES | | 630 PLAZA DRIVE STE 200 HIGHLANDS RANCH, CO | 4153742744 | 571846 |

**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: $434.91**

| | | | | | |
|---|---|---|---|---|---|
| Application Fee | $70.00 | Excavation - Private Party Type | $309.00 | Records Management Fee | $36.01 |
| Technology Enhancement Fee | $19.90 | | | | |

Applications for which no permit is issued 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:** X1502898 OPW - Excavation **Filed Date:** 12/24/2015

**Job Site:** 3201 35TH AVE **Schedule Inspection by calling:** 510-238-3444

**Parcel No:** 028 095003701

**District:**

**Project Description:** INSTALL monitoring well MW-10R and DESTROY monitoring well MW-10 on 35TH AVE between MANGELS AVE and SUTER ST. Contact: M ELDER, 415 205-6584
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.
Beginning 2016 a USA # and date must be provided in order to have an excavation permit issued. Permit valid 90 days. Call PWA INSPECTION prior to start: 510-238-3651. 4th FLOOR.

**Related Permits:** ENMI15052 X1502688 OB1501392 X1502897

| | Name | Applicant | Address | Phone | License # |
|---|---|---|---|---|---|
| **Owner:** | SULL RAJINDER S & SUKHVINDER | | | 2244560168 | |
| **Contractor-Employee:** | ARCADIS U S INC | X | P O BOX 66 SYRACUSE, NY | (315) 671-9132 | |
| **Contractor:** | ARCADIS U S INC | | P O BOX 66 SYRACUSE, NY | (315) 671-9132 | 571846 |

**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: $434.91**

| | | | | | |
|---|---|---|---|---|---|
| Application Fee | $70.00 | Excavation - Private Party Type | $309.00 | Records Management Fee | $36.01 |
| Technology Enhancement Fee | $19.90 | | | | |

# APPENDIX D

## Survey Data

MUIR CONSULTING, Inc.
SURVEYING • G.P.S. • PLANNING

139 Church Avenue
Oakdale, CA 95361
(209) 845-8630 Fax (209) 845-8639

# TRANSMITTAL

**Date:** March 15, 2016 **Job No.:** **4731-01**

**Copies To:** **File**

**To:** **Arcadis U.S., Inc.**
**Attn: Melissa Elder**
**100 Montgomery St, Suite 300**
**San Francisco, CA 94104**

**From:** Nicole Avants

**Subject:** **3201 35th Ave, Oakland**

**We Are Sending You** ☒ Attached **Via**
☐ California Overnight ☐ A.M. ☐ P.M
☐ US Priority Mail ☐ US Express Mail
☒ US Mail ☐ Hand Delivery

**The Following Items:**
☐ Photocopies ☐ Prints ☒ Originals ☐ Reference ☐ Digital ☐ Other

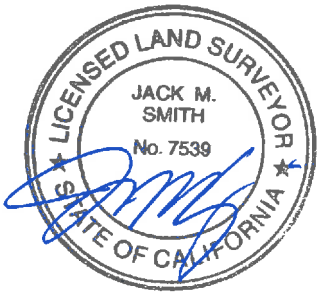
| Copies | Date | No. | Description |
|---|---|---|---|
| 1 | 3/15/16 | 1 | Revised 4731-01 PNEZD.xlsx |
| | | | |
| | | | |
| | | | |
| | | | |

**Remarks:** If you have any questions, please call.

Nicole Avants
Administrative Assistant

*If enclosures are not as noted, kindly notify us at once.*

| Point No. | Northing | Easting | Elevation | Description |
|---|---|---|---|---|
| 3 | 2114902.00 | 6069096.49 | 165.64 | MW-11 |
| 4 | 2115060.72 | 6069119.97 | 166.80 | MW-10R |



MUIR CONSULTING, Inc.
SURVEYING • G.P.S. • PLANNING

139 Church Avenue
Oakdale, CA 95361
(209) 845-8630 Fax (209) 845-8639

# TRANSMITTAL

**Date:** March 14, 2016 **Job No.:** **4731-01**

**Copies To:** **File**

**To:** **Arcadis U.S., Inc.**
**Attn: Melissa Elder**
**100 Montgomery St, Suite 300**
**San Francisco, CA 94104**

**From:** Nicole Avants

**Subject:** **3201 35th Ave, Oakland**

**We Are Sending You** ☒ Attached **Via**
☐ California Overnight ☐ A.M. ☐ P.M
☐ US Priority Mail ☐ US Express Mail
☒ US Mail ☐ Hand Delivery

**The Following Items:**
☐ Photocopies ☐ Prints ☒ Originals ☐ Reference ☐ Digital ☐ Other

| Copies | Date | No. | Description |
|---|---|---|---|
| 1 | 3/14/16 | 5 | Environmental Well Survey |
| | | | |
| | | | |
| | | | |
| | | | |

**Remarks:** If you have any questions, please call.

Nicole Avants
Administrative Assistant

*If enclosures are not as noted, kindly notify us at once.*


**MUIR CONSULTING, INC.**
139 CHURCH AVE.
OAKDALE, CA 95361
(209) 845-8630 FAX (209) 845-8639
www.muirconsulting.com

Subject ENVIRONMENTAL WELL SURVEY
3201 35TH AVENUE
Job No. 4731-01
By PLD Date 03/11/2016 Chkd. JMS
Scale 1 TO 40 Sheet 1 of 1

| Point No. | Northing | Easting | Elevation | Description |
|---|---|---|---|---|
| 3 | 37.790815 | -122.20473 | 165.64 | MW-11 |
| 4 | 37.791252 | -122.20465 | 166.80 | MW-10R |

| GLOBAL_ID | FIELD_PT_NAME | STATUS | GW_MEAS_DATE | DTFPROD | DTW | RISER_HT | TOT_DEPTH | GW_MEAS_DESC |
|---|---|---|---|---|---|---|---|---|
| | MW-11 | | | | | | | |
| | MW-10R | | | | | | | |

| GLOBAL_ID | FIELD_PT_NAME | ELEV_SURVEY_DATE | ELEVATION | ELEV_METHOD | ELEV_DATUM | ELEV_ACC_VAL | ELEV_SURVEY_ORG | RISER_HT | ELEV_DESC |
|---|---|---|---|---|---|---|---|---|---|
| | MW-11 | 2/15/2016 | 165.64 | CGPS | LOC | 0.3 | MUIR CONSULTING, INC. | | TOP OF CASING |
| | MW-10R | 2/15/2016 | 166.80 | CGPS | LOC | 0.3 | MUIR CONSULTING, INC. | | TOP OF CASING |

| GLOBAL_ID | FIELD_PT_NAME | FIELD_PT_CLASS | XY_SURVEY_DATE | LATITUDE | LONGITUDE | XY_METHOD | XY_DATUM | XY_ACC_VAL | XY_SURVEY_ORG | GPS_EQUIP_TYPE | XY_SURVEY_DESC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | MW-11 | MW | 2/15/2016 | 37.7908152 | -122.2047260 | CGPS | NAD83 | 1 | MUIR CONSULTING, INC. | TR | |
| | MW-10R | MW | 2/15/2016 | 37.7912522 | -122.2046547 | CGPS | NAD83 | 1 | MUIR CONSULTING, INC. | TR | |

# APPENDIX E

## Waste Disposal Certificates

*IWM, Inc.*

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

# CERTIFICATE OF DISPOSAL

| | | | |
|---|---|---|---|
| Generator Name: | BP West Coast Products | Facility Name: | BP-11132 |
| Address: | PO Box 80249 | Address: | 3201 35th Avenue |
| | Rancho Santa Margarita, CA 92688 | | Oakland, CA 94619 |
| Contact: | Hollis Philips | Facility Contact: | Conner Williams |
| Phone: | 415-432-6903 | Phone: | 415-520-9361 |

| | |
|---|---|
| IWM Job #: | Bella 740 |
| Description of Waste: | 6 Drum(s) of Non-Hazardous Solids |
| Removal Date: | 3-11-16 |
| Ticket #: | RSVRL03112016 |

## Transporter Information

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

## Disposal Facility Information

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

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

William T. DeLon William T. DeLon — 3-11-16

Authorized Representative (Print Name and Signature) — Date

*IWM, Inc.*

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

# CERTIFICATE OF DISPOSAL

| | | | |
|---|---|---|---|
| Generator Name: | BP West Coast Products LLC | Facility Name: | BP-11132 |
| Address: | PO Box 80249 | Address: | 3201 35th Avenue |
| | Rancho Santa Margarita,CA 92688 | | Oakland, CA 94619 |
| Contact: | Hollis Phillips | Facility Contact: | Connor Williams |
| Phone: | 415-432-6903 | Phone: | 415-520-9361 |

| | |
|---|---|
| IWM Job #: | Bella 740 |
| Description of Waste: | 1 Drum of |
| | Non-Hazardous |
| | Liquid |
| Removal Date: | 3-11-16 |
| Ticket #: | SP03112016-MISC |

## Transporter Information

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

## Disposal Facility Information

| | |
|---|---|
| Name: | Seaport Refining & Environmental |
| Address: | 700 Seaport Blvd |
| | Redwood City, CA 94063 |
| Phone: | (650) 364-1024 |

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

William T. DeLon William T. DeLon — 3-11-16

Authorized Representative (Print Name and Signature) — Date

# APPENDIX F

## CDWR Well Completion Reports

# CONFIDENTIAL

STATE OF CALIFORNIA DWR
WELL COMPLETION REPORT
(WELL LOGS)

# REMOVED

# CONFIDENTIAL

STATE OF CALIFORNIA DWR
WELL COMPLETION REPORT
(WELL LOGS)

# REMOVED

# CONFIDENTIAL

STATE OF CALIFORNIA DWR
WELL COMPLETION REPORT
(WELL LOGS)

# REMOVED

# APPENDIX G

## Laboratory Analytical Reports

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

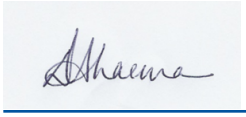
# ANALYTICAL REPORT

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

TestAmerica Job ID: 720-70276-1
Client Project/Site: BP #11132, Oakland

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

Attn: Hollis Phillips



*Authorized for release by:*
*2/16/2016 2:07:52 PM*

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

# Table of Contents

## Qualifiers

### GC/MS VOA

| Qualifier | Qualifier Description |
|---|---|
| H | Sample was prepped or analyzed beyond the specified holding time |

## Glossary

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

# Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: BP #11132, Oakland

TestAmerica Job ID: 720-70276-1

## Client Sample ID: MW-10R-20-20.5 — Lab Sample ID: 720-70276-1

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Ethylbenzene | 2600 | H | 390 | | ug/Kg | 100 | | 8260B | Total/NA |
| Xylenes, Total | 11000 | H | 790 | | ug/Kg | 100 | | 8260B | Total/NA |
| Gasoline Range Organics (GRO) -C6-C12 | 120000 | H | 20000 | | ug/Kg | 100 | | 8260B | Total/NA |

## Client Sample ID: MW-10R-22-22.5 — Lab Sample ID: 720-70276-2

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Benzene | 570 | H | 390 | | ug/Kg | 100 | | 8260B | Total/NA |
| Ethylbenzene | 2900 | H | 390 | | ug/Kg | 100 | | 8260B | Total/NA |
| Toluene | 2000 | H | 390 | | ug/Kg | 100 | | 8260B | Total/NA |
| Xylenes, Total | 15000 | H | 790 | | ug/Kg | 100 | | 8260B | Total/NA |
| Gasoline Range Organics (GRO) -C6-C12 | 180000 | H | 20000 | | ug/Kg | 100 | | 8260B | Total/NA |

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: BP #11132, Oakland

TestAmerica Job ID: 720-70276-1

**Client Sample ID: MW-10R-20-20.5**
**Date Collected: 02/03/16 11:58**
**Date Received: 02/05/16 17:15**

**Lab Sample ID: 720-70276-1**
**Matrix: Solid**

## Method: 8260B - Volatile Organic Compounds (GC/MS)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Methyl tert-butyl ether | ND | H | 390 | | ug/Kg | | 02/12/16 13:51 | 02/12/16 17:20 | 100 |
| Benzene | ND | H | 390 | | ug/Kg | | 02/12/16 13:51 | 02/12/16 17:20 | 100 |
| **Ethylbenzene** | **2600** | **H** | 390 | | ug/Kg | | 02/12/16 13:51 | 02/12/16 17:20 | 100 |
| Toluene | ND | H | 390 | | ug/Kg | | 02/12/16 13:51 | 02/12/16 17:20 | 100 |
| **Xylenes, Total** | **11000** | **H** | 790 | | ug/Kg | | 02/12/16 13:51 | 02/12/16 17:20 | 100 |
| **Gasoline Range Organics (GRO) -C6-C12** | **120000** | **H** | 20000 | | ug/Kg | | 02/12/16 13:51 | 02/12/16 17:20 | 100 |
| TBA | ND | H | 790 | | ug/Kg | | 02/12/16 13:51 | 02/12/16 17:20 | 100 |
| DIPE | ND | H | 390 | | ug/Kg | | 02/12/16 13:51 | 02/12/16 17:20 | 100 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *4-Bromofluorobenzene* | *105* | | *66 - 148* | *02/12/16 13:51* | *02/12/16 17:20* | *100* |
| *1,2-Dichloroethane-d4 (Surr)* | *113* | | *62 - 137* | *02/12/16 13:51* | *02/12/16 17:20* | *100* |
| *Toluene-d8 (Surr)* | *103* | | *65 - 141* | *02/12/16 13:51* | *02/12/16 17:20* | *100* |

Client: ARCADIS U.S., Inc.
Project/Site: BP #11132, Oakland

TestAmerica Job ID: 720-70276-1

**Client Sample ID: MW-10R-22-22.5**
**Date Collected: 02/03/16 12:12**
**Date Received: 02/05/16 17:15**

**Lab Sample ID: 720-70276-2**
**Matrix: Solid**

## Method: 8260B - Volatile Organic Compounds (GC/MS)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Methyl tert-butyl ether | ND | H | 390 | | ug/Kg | | 02/12/16 13:51 | 02/12/16 17:48 | 100 |
| **Benzene** | **570** | **H** | 390 | | ug/Kg | | 02/12/16 13:51 | 02/12/16 17:48 | 100 |
| **Ethylbenzene** | **2900** | **H** | 390 | | ug/Kg | | 02/12/16 13:51 | 02/12/16 17:48 | 100 |
| **Toluene** | **2000** | **H** | 390 | | ug/Kg | | 02/12/16 13:51 | 02/12/16 17:48 | 100 |
| **Xylenes, Total** | **15000** | **H** | 790 | | ug/Kg | | 02/12/16 13:51 | 02/12/16 17:48 | 100 |
| **Gasoline Range Organics (GRO) -C6-C12** | **180000** | **H** | 20000 | | ug/Kg | | 02/12/16 13:51 | 02/12/16 17:48 | 100 |
| TBA | ND | H | 790 | | ug/Kg | | 02/12/16 13:51 | 02/12/16 17:48 | 100 |
| DIPE | ND | H | 390 | | ug/Kg | | 02/12/16 13:51 | 02/12/16 17:48 | 100 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *4-Bromofluorobenzene* | *108* | | *66 - 148* | *02/12/16 13:51* | *02/12/16 17:48* | *100* |
| *1,2-Dichloroethane-d4 (Surr)* | *110* | | *62 - 137* | *02/12/16 13:51* | *02/12/16 17:48* | *100* |
| *Toluene-d8 (Surr)* | *102* | | *65 - 141* | *02/12/16 13:51* | *02/12/16 17:48* | *100* |

# Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: BP #11132, Oakland

TestAmerica Job ID: 720-70276-1

## Method: 8260B - Volatile Organic Compounds (GC/MS)

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

| | | Percent Surrogate Recovery (Acceptance Limits) | | |
|---|---|---|---|---|
| | | BFB | 12DCE | TOL |
| Lab Sample ID | Client Sample ID | (66-148) | (62-137) | (65-141) |
| 720-70276-1 | MW-10R-20-20.5 | 105 | 113 | 103 |
| 720-70276-2 | MW-10R-22-22.5 | 108 | 110 | 102 |
| LCS 720-196988/15 | Lab Control Sample | 104 | 89 | 110 |
| LCS 720-196988/17 | Lab Control Sample | 106 | 98 | 107 |
| LCSD 720-196988/16 | Lab Control Sample Dup | 104 | 90 | 110 |
| LCSD 720-196988/18 | Lab Control Sample Dup | 107 | 96 | 111 |
| MB 720-197019/10 | Method Blank | 101 | 116 | 99 |

**Surrogate Legend**

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

## Method: 8260B - Volatile Organic Compounds (GC/MS)

**Lab Sample ID: LCS 720-196988/15**
**Matrix: Solid**
**Analysis Batch: 196988**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Methyl tert-butyl ether | 5000 | 5200 | | ug/Kg | | 104 | 71 - 146 |
| Benzene | 5000 | 5040 | | ug/Kg | | 101 | 76 - 122 |
| Ethylbenzene | 5000 | 4870 | | ug/Kg | | 97 | 76 - 137 |
| Toluene | 5000 | 4930 | | ug/Kg | | 99 | 77 - 120 |
| m-Xylene & p-Xylene | 5000 | 5080 | | ug/Kg | | 102 | 71 - 142 |
| o-Xylene | 5000 | 4680 | | ug/Kg | | 94 | 71 - 142 |
| TBA | 50000 | 51600 | | ug/Kg | | 103 | 70 - 130 |
| DIPE | 5000 | 5390 | | ug/Kg | | 108 | 70 - 130 |

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *4-Bromofluorobenzene* | *104* | | *66 - 148* |
| *1,2-Dichloroethane-d4 (Surr)* | *89* | | *62 - 137* |
| *Toluene-d8 (Surr)* | *110* | | *65 - 141* |

**Lab Sample ID: LCS 720-196988/17**
**Matrix: Solid**
**Analysis Batch: 196988**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Gasoline Range Organics (GRO) -C6-C12 | 100000 | 106000 | | ug/Kg | | 106 | 61 - 120 |

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *4-Bromofluorobenzene* | *106* | | *66 - 148* |
| *1,2-Dichloroethane-d4 (Surr)* | *98* | | *62 - 137* |
| *Toluene-d8 (Surr)* | *107* | | *65 - 141* |

**Lab Sample ID: LCSD 720-196988/16**
**Matrix: Solid**
**Analysis Batch: 196988**

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

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Methyl tert-butyl ether | 5000 | 5210 | | ug/Kg | | 104 | 71 - 146 | 0 | 20 |
| Benzene | 5000 | 5140 | | ug/Kg | | 103 | 76 - 122 | 2 | 20 |
| Ethylbenzene | 5000 | 4990 | | ug/Kg | | 100 | 76 - 137 | 3 | 20 |
| Toluene | 5000 | 5030 | | ug/Kg | | 101 | 77 - 120 | 2 | 20 |
| m-Xylene & p-Xylene | 5000 | 5080 | | ug/Kg | | 102 | 71 - 142 | 0 | 20 |
| o-Xylene | 5000 | 4760 | | ug/Kg | | 95 | 71 - 142 | 2 | 20 |
| TBA | 50000 | 53100 | | ug/Kg | | 106 | 70 - 130 | 3 | 20 |
| DIPE | 5000 | 5440 | | ug/Kg | | 109 | 70 - 130 | 1 | 20 |

| *Surrogate* | *LCSD %Recovery* | *LCSD Qualifier* | *Limits* |
|---|---|---|---|
| *4-Bromofluorobenzene* | *104* | | *66 - 148* |
| *1,2-Dichloroethane-d4 (Surr)* | *90* | | *62 - 137* |
| *Toluene-d8 (Surr)* | *110* | | *65 - 141* |

## Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

**Lab Sample ID: LCSD 720-196988/18**
**Matrix: Solid**
**Analysis Batch: 196988**

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

| Analyte | | | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Gasoline Range Organics (GRO) -C6-C12 | | | 100000 | 113000 | | ug/Kg | | 113 | 61 - 120 | 6 | 20 |

| *Surrogate* | *LCSD %Recovery* | *LCSD Qualifier* | *Limits* |
|---|---|---|---|
| *4-Bromofluorobenzene* | *107* | | *66 - 148* |
| *1,2-Dichloroethane-d4 (Surr)* | *96* | | *62 - 137* |
| *Toluene-d8 (Surr)* | *111* | | *65 - 141* |

**Lab Sample ID: MB 720-197019/10**
**Matrix: Solid**
**Analysis Batch: 197019**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Methyl tert-butyl ether | ND | | 500 | | ug/Kg | | | 02/12/16 16:25 | 100 |
| Benzene | ND | | 500 | | ug/Kg | | | 02/12/16 16:25 | 100 |
| Ethylbenzene | ND | | 500 | | ug/Kg | | | 02/12/16 16:25 | 100 |
| Toluene | ND | | 500 | | ug/Kg | | | 02/12/16 16:25 | 100 |
| Xylenes, Total | ND | | 1000 | | ug/Kg | | | 02/12/16 16:25 | 100 |
| Gasoline Range Organics (GRO) -C6-C12 | ND | | 25000 | | ug/Kg | | | 02/12/16 16:25 | 100 |
| TBA | ND | | 1000 | | ug/Kg | | | 02/12/16 16:25 | 100 |
| DIPE | ND | | 500 | | ug/Kg | | | 02/12/16 16:25 | 100 |

| *Surrogate* | *MB %Recovery* | *MB Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *4-Bromofluorobenzene* | *101* | | *66 - 148* | | *02/12/16 16:25* | *100* |
| *1,2-Dichloroethane-d4 (Surr)* | *116* | | *62 - 137* | | *02/12/16 16:25* | *100* |
| *Toluene-d8 (Surr)* | *99* | | *65 - 141* | | *02/12/16 16:25* | *100* |

# QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: BP #11132, Oakland

TestAmerica Job ID: 720-70276-1

## GC/MS VOA

### Analysis Batch: 196988

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| LCS 720-196988/15 | Lab Control Sample | Total/NA | Solid | 8260B | |
| LCS 720-196988/17 | Lab Control Sample | Total/NA | Solid | 8260B | |
| LCSD 720-196988/16 | Lab Control Sample Dup | Total/NA | Solid | 8260B | |
| LCSD 720-196988/18 | Lab Control Sample Dup | Total/NA | Solid | 8260B | |

### Prep Batch: 196992

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 720-70276-1 | MW-10R-20-20.5 | Total/NA | Solid | 5035 | |
| 720-70276-2 | MW-10R-22-22.5 | Total/NA | Solid | 5035 | |

### Analysis Batch: 197019

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 720-70276-1 | MW-10R-20-20.5 | Total/NA | Solid | 8260B | 196992 |
| 720-70276-2 | MW-10R-22-22.5 | Total/NA | Solid | 8260B | 196992 |
| MB 720-197019/10 | Method Blank | Total/NA | Solid | 8260B | |

# Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: BP #11132, Oakland

TestAmerica Job ID: 720-70276-1

## Client Sample ID: MW-10R-20-20.5

**Lab Sample ID: 720-70276-1**

**Date Collected: 02/03/16 11:58**

**Matrix: Solid**

**Date Received: 02/05/16 17:15**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 5035 | | | 196992 | 02/12/16 13:51 | LPL | TAL PLS |
| Total/NA | Analysis | 8260B | | 100 | 197019 | 02/12/16 17:20 | YB1 | TAL PLS |

## Client Sample ID: MW-10R-22-22.5

**Lab Sample ID: 720-70276-2**

**Date Collected: 02/03/16 12:12**

**Matrix: Solid**

**Date Received: 02/05/16 17:15**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 5035 | | | 196992 | 02/12/16 13:51 | LPL | TAL PLS |
| Total/NA | Analysis | 8260B | | 100 | 197019 | 02/12/16 17:48 | YB1 | TAL PLS |

**Laboratory References:**

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

# Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: BP #11132, Oakland

TestAmerica Job ID: 720-70276-1

## Laboratory: TestAmerica Pleasanton

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

| Authority | Program | EPA Region | Certification ID | Expiration Date |
|---|---|---|---|---|
| California | State Program | 9 | 2496 | 01-31-17 |

# Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: BP #11132, Oakland

TestAmerica Job ID: 720-70276-1

| Method | Method Description | Protocol | Laboratory |
|---|---|---|---|
| 8260B | Volatile Organic Compounds (GC/MS) | SW846 | TAL PLS |

**Protocol References:**

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

**Laboratory References:**

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

# Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: BP #11132, Oakland

TestAmerica Job ID: 720-70276-1

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received |
|---|---|---|---|---|
| 720-70276-1 | MW-10R-20-20.5 | Solid | 02/03/16 11:58 | 02/05/16 17:15 |
| 720-70276-2 | MW-10R-22-22.5 | Solid | 02/03/16 12:12 | 02/05/16 17:15 |

720-70276 720-70276 PA 2/10

# CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

ARCADIS
Infrastructure Water Environment Buildings

ID#:

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Lab Work Order #: 165999

2/16/2016

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| Send Results to: | | |
|---|---|---|
| Contact & Company Name: Arcadis | Telephone: 415-530-9361 | |
| Address: 2000 Powell Street | Fax: | |
| City: Emeryville State: CA Zip: 94608 | E-mail Address: Connor.williams@arcadis-us.com | |
| Project Name/Location (City, State): CA-11132 Oakland, CA | Project #: | |
| Sampler's Printed Name: MELISSA ELDER | Sampler's Signature: | |

| Sample ID | Collection Date | Collection Time | Type (✓) Comp | Type (✓) Grab | Matrix | Preservative | Filtered (✓) | # of Containers | Container Information | GRO, BTEX, MTBE, TOM, DIPE, methanol, 8260B, LUFT MS |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | E | | 4 | 5/7 | PARAMETER ANALYSIS & METHOD |
| MW-10R-20-20.5-1 | 2/3 | 1155 | | ✓ | SO | | | | | X |
| MW-10R-20-20.5-2 | 2/3 | 1156 | | ✓ | SO | | | | | X |
| MW-10R-20-20.5-3 | 2/3 | 1157 | | ✓ | SO | | | | | X |
| MW-10R-22-22.5-1 | 2/3 | 1208 | | ✓ | SO | | | | | X |
| MW-10R-22-22.5-2 | 2/3 | 1209 | | ✓ | SO | | | | | X |
| MW-10R-22-22.5-3 | 2/3 | 1210 | | ✓ | SO | | | | | X |
| MW-10R-22-22.5 | 2/3 | 1212 | | ✓ | SO | | | | | X |
| MW-10R-20-20.5 | 2/3 | 1156 | | ✓ | SO | | | | | X |

Keys

Preservation Key: A. H2SO4, B. HCL, C. HNO3, D. NaOH, E. None, F. Other: _____, G. Other: _____, H. Other: _____

Container Information Key: 1. 40 ml Vial, 2. 1L Amber, 3. 250 ml Plastic, 4. 500 ml Plastic, 5. Encore, 6. 2 oz. Glass, 7. 4 oz. Glass, 8. 8 oz. Glass, 9. Other: _____, 10. Other: _____

Matrix Key: SO - Soil, SE - Sediment, NL - NAPL/Oil, W - Water, SL - Sludge, SW - Sample Wipe, T - Tissue, A - Air, Other: _____

REMARKS

RUSH

720-70276 Chain of Custody

Special Instructions/Comments:

☐ Special QA/QC Instructions(✓):

4.8°C

| Laboratory Information and Receipt | | Relinquished By | Received By | Relinquished By | Laboratory Received By |
|---|---|---|---|---|---|
| Lab Name: TEST AMERICA | Cooler Custody Seal (✓) ☐ Intact ☐ Not Intact | Printed Name: MELISSA ELDER | Printed Name: Steve Doug | Printed Name: Steven Doug | Printed Name: Mullen |
| ☒ Cooler packed with ice (✓) | | Signature: | Signature: | Signature: | Signature: |
| Specify Turnaround Requirements: 24 Hr TAT | Sample Receipt: | Firm: Arcadis | Firm/Courier: UltraEx | Firm/Courier: UltraEx | Firm: Test America |
| Shipping Tracking # | Condition/Cooler Temp: _____ | Date/Time: 2/3/16 1630 | Date/Time: 2/5/16 338 | Date/Time: 2/5/16 1715 | Date/Time: 2-5-16 |

# Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 720-70276-1

**Login Number: 70276**
**List Number: 1**
**Creator: Arauz, Dennis**

**List Source: TestAmerica Pleasanton**

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

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# WORK ORDER NUMBER: 16-02-0929

*The difference is service*

AIR | SOIL | WATER | MARINE CHEMISTRY

**Analytical Report For**

**Client:** Arcadis, US Inc.

**Client Project Name:** GP09BPNA.C112.C0000

**Attention:** Connor Williams
100 Smith Ranch Road, Suite 329
San Rafael, CA 94903-1925

Approved for release on 02/23/2016 by:
Richard Villafania
Project Manager

ResultLink

Email your PM

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# Contents

Client Project Name: GP09BPNA.C112.C0000
Work Order Number: 16-02-0929

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# Work Order Narrative

Work Order: 16-02-0929 Page 1 of 1

**Condition Upon Receipt:**

Samples were received under Chain-of-Custody (COC) on 02/11/16. They were assigned to Work Order 16-02-0929.

Unless otherwise noted on the Sample Receiving forms all samples were received in good condition and within the recommended EPA temperature criteria for the methods noted on the COC. The COC and Sample Receiving Documents are integral elements of the analytical report and are presented at the back of the report.

**Holding Times:**

All samples were analyzed within prescribed holding times (HT) and/or in accordance with the Calscience Sample Acceptance Policy unless otherwise noted in the analytical report and/or comprehensive case narrative, if required.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of <= 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

**Quality Control:**

All quality control parameters (QC) were within established control limits except where noted in the QC summary forms or described further within this report.

**Subcontractor Information:**

Unless otherwise noted below (or on the subcontract form), no samples were subcontracted.

**Additional Comments:**

Air - Sorbent-extracted air methods (EPA TO-4A, EPA TO-10, EPA TO-13A, EPA TO-17): Analytical results are converted from mass/sample basis to mass/volume basis using client-supplied air volumes.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are always reported on a wet weight basis.

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# Sample Summary

| | | | |
|---|---|---|---|
| Client: | Arcadis, US Inc. | Work Order: | 16-02-0929 |
| | 100 Smith Ranch Road, Suite 329 | Project Name: | GP09BPNA.C112.C0000 |
| | San Rafael, CA 94903-1925 | PO Number: | |
| | | Date/Time Received: | 02/11/16 10:30 |
| | | Number of Containers: | 4 |
| Attn: | Connor Williams | | |

| Sample Identification | Lab Number | Collection Date and Time | Number of Containers | Matrix |
|---|---|---|---|---|
| MW-11-23.0-23.5 | 16-02-0929-1 | 02/10/16 00:00 | 4 | Solid |

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# Analytical Report

Arcadis, US Inc.
100 Smith Ranch Road, Suite 329
San Rafael, CA 94903-1925

Project: GP09BPNA.C112.C0000

Date Received: 02/11/16
Work Order: 16-02-0929
Preparation: EPA 5035
Method: GC/MS / EPA 8260B
Units: mg/kg



| Client Sample Number | Lab Sample Number | Date/Time Collected | Matrix | Instrument | Date Prepared | Date/Time Analyzed | QC Batch ID |
|---|---|---|---|---|---|---|---|
| **MW-11-23.0-23.5** | **16-02-0929-1-C** | **02/10/16 00:00** | **Solid** | **GC/MS UU** | **02/11/16** | **02/15/16 15:49** | **160215L001** |

| Parameter | Result | RL | DF | Qualifiers |
|---|---|---|---|---|
| Benzene | ND | 0.00086 | 1.00 | |
| Ethylbenzene | ND | 0.00086 | 1.00 | |
| Toluene | ND | 0.00086 | 1.00 | |
| p/m-Xylene | ND | 0.0017 | 1.00 | |
| o-Xylene | ND | 0.00086 | 1.00 | |
| Methyl-t-Butyl Ether (MTBE) | ND | 0.0017 | 1.00 | |
| Tert-Butyl Alcohol (TBA) | ND | 0.017 | 1.00 | |
| Diisopropyl Ether (DIPE) | ND | 0.00086 | 1.00 | |
| Gasoline Range Organics (C6-C12) | 0.57 | 0.043 | 1.00 | |

| Surrogate | Rec. (%) | Control Limits | Qualifiers |
|---|---|---|---|
| Dibromofluoromethane | 94 | 79-139 | |
| 1,2-Dichloroethane-d4 | 92 | 71-155 | |
| 1,4-Bromofluorobenzene | 93 | 80-120 | |
| Toluene-d8 | 100 | 80-120 | |
| Toluene-d8-TPPH | 93 | 87-111 | |

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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# Analytical Report

Arcadis, US Inc.
100 Smith Ranch Road, Suite 329
San Rafael, CA 94903-1925

Project: GP09BPNA.C112.C0000

Date Received: 02/11/16
Work Order: 16-02-0929
Preparation: EPA 5035
Method: GC/MS / EPA 8260B
Units: mg/kg



| Client Sample Number | Lab Sample Number | Date/Time Collected | Matrix | Instrument | Date Prepared | Date/Time Analyzed | QC Batch ID |
|---|---|---|---|---|---|---|---|
| **Method Blank** | **099-12-779-1773** | **N/A** | **Solid** | **GC/MS UU** | **02/15/16** | **02/15/16 12:09** | **160215L001** |

| Parameter | Result | RL | DF | Qualifiers |
|---|---|---|---|---|
| Benzene | ND | 0.0010 | 1.00 | |
| Ethylbenzene | ND | 0.0010 | 1.00 | |
| Toluene | ND | 0.0010 | 1.00 | |
| p/m-Xylene | ND | 0.0020 | 1.00 | |
| o-Xylene | ND | 0.0010 | 1.00 | |
| Methyl-t-Butyl Ether (MTBE) | ND | 0.0020 | 1.00 | |
| Tert-Butyl Alcohol (TBA) | ND | 0.020 | 1.00 | |
| Diisopropyl Ether (DIPE) | ND | 0.0010 | 1.00 | |
| Gasoline Range Organics (C6-C12) | ND | 0.050 | 1.00 | |

| Surrogate | Rec. (%) | Control Limits | Qualifiers |
|---|---|---|---|
| Dibromofluoromethane | 96 | 79-139 | |
| 1,2-Dichloroethane-d4 | 93 | 71-155 | |
| 1,4-Bromofluorobenzene | 93 | 80-120 | |
| Toluene-d8 | 95 | 80-120 | |
| Toluene-d8-TPPH | 89 | 87-111 | |

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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# Quality Control - LCS/LCSD

| | | | |
|---|---|---|---|
| Arcadis, US Inc. | | Date Received: | 02/11/16 |
| 100 Smith Ranch Road, Suite 329 | | Work Order: | 16-02-0929 |
| San Rafael, CA 94903-1925 | | Preparation: | EPA 5035 |
| | | Method: | GC/MS / EPA 8260B |
| Project: GP09BPNA.C112.C0000 | | | Page 1 of 1 |

| Quality Control Sample ID | Type | Matrix | Instrument | Date Prepared | Date Analyzed | LCS/LCSD Batch Number |
|---|---|---|---|---|---|---|
| **099-12-779-1773** | **LCS** | **Solid** | **GC/MS UU** | **02/15/16** | **02/15/16 10:47** | **160215L001** |
| **099-12-779-1773** | **LCSD** | **Solid** | **GC/MS UU** | **02/15/16** | **02/15/16 11:14** | **160215L001** |

| Parameter | Spike Added | LCS Conc. | LCS %Rec. | LCSD Conc. | LCSD %Rec. | %Rec. CL | RPD | RPD CL | Qualifiers |
|---|---|---|---|---|---|---|---|---|---|
| Benzene | 0.05000 | 0.05068 | 101 | 0.05131 | 103 | 80-120 | 1 | 0-20 | |
| Ethylbenzene | 0.05000 | 0.05596 | 112 | 0.05596 | 112 | 80-120 | 0 | 0-20 | |
| Toluene | 0.05000 | 0.05242 | 105 | 0.05232 | 105 | 80-120 | 0 | 0-20 | |
| p/m-Xylene | 0.1000 | 0.1203 | 120 | 0.1212 | 121 | 75-125 | 1 | 0-25 | |
| o-Xylene | 0.05000 | 0.05597 | 112 | 0.05620 | 112 | 75-125 | 0 | 0-25 | |
| Methyl-t-Butyl Ether (MTBE) | 0.05000 | 0.04860 | 97 | 0.04926 | 99 | 70-124 | 1 | 0-20 | |
| Tert-Butyl Alcohol (TBA) | 0.2500 | 0.2390 | 96 | 0.2464 | 99 | 73-121 | 3 | 0-20 | |
| Diisopropyl Ether (DIPE) | 0.05000 | 0.04983 | 100 | 0.04988 | 100 | 69-129 | 0 | 0-20 | |

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RPD: Relative Percent Difference. CL: Control Limits

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# Sample Analysis Summary Report

Work Order: 16-02-0929 Page 1 of 1

| Method | Extraction | Chemist ID | Instrument | Analytical Location |
|---|---|---|---|---|
| GC/MS / EPA 8260B | EPA 5035 | 867 | GC/MS UU | 2 |

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# Glossary of Terms and Qualifiers

Work Order: 16-02-0929 Page 1 of 1

| Qualifiers | Definition |
|---|---|
| * | See applicable analysis comment. |
| < | Less than the indicated value. |
| > | Greater than the indicated value. |
| 1 | Surrogate compound recovery was out of control due to a required sample dilution. Therefore, the sample data was reported without further clarification. |
| 2 | Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification. |
| 3 | Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to suspected matrix interference. The associated LCS recovery was in control. |
| 4 | The MS/MSD RPD was out of control due to suspected matrix interference. |
| 5 | The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to suspected matrix interference. |
| 6 | Surrogate recovery below the acceptance limit. |
| 7 | Surrogate recovery above the acceptance limit. |
| B | Analyte was present in the associated method blank. |
| BU | Sample analyzed after holding time expired. |
| BV | Sample received after holding time expired. |
| CI | See case narrative. |
| E | Concentration exceeds the calibration range. |
| ET | Sample was extracted past end of recommended max. holding time. |
| HD | The chromatographic pattern was inconsistent with the profile of the reference fuel standard. |
| HDH | The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but heavier hydrocarbons were also present (or detected). |
| HDL | The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but lighter hydrocarbons were also present (or detected). |
| J | Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated. |
| JA | Analyte positively identified but quantitation is an estimate. |
| ME | LCS Recovery Percentage is within Marginal Exceedance (ME) Control Limit range (+/- 4 SD from the mean). |
| ND | Parameter not detected at the indicated reporting limit. |
| Q | Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater. |
| SG | The sample extract was subjected to Silica Gel treatment prior to analysis. |
| X | % Recovery and/or RPD out-of-range. |
| Z | Analyte presence was not confirmed by second column or GC/MS analysis. |
| | Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are reported on a wet weight basis. |
| | Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of <= 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time. |
| | A calculated total result (Example: Total Pesticides) is the summation of each component concentration and/or, if "J" flags are reported, estimated concentration. Component concentrations showing not detected (ND) are summed into the calculated total result as zero concentrations. |

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Infrastructure · Water · Environment · Buildings

ID#:

# CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

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Lab Work Order #
**16-02-0929**

**Send Results to:**

Contact & Company Name: Connor Williams
Telephone: 415-530-9361
Address:
Fax:
City State Zip
E-mail Address: Connor.williams@arcadis.com
Project Name/Location (City, State): Oakland CA
Project #: GP09BPNA.C112.C0000
Sampler's Printed Name: Connor Williams
Sampler's Signature:

| Sample ID | Collection Date | Collection Time | Type (✓) Comp | Type (✓) Grab | Matrix | Preservative | Filtered (✓) | # of Containers | Container Information | GRO by method 8260B Luft MS | BTEX, MTBE, TBA, DIPE, method 8260B |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MW-1(-23.0-23.5 | 2/10/16 | various | | ✓ | S | E | | 4 | 5/7 | X | X |
| | | | | | | E | | 4 | 5/7 | | |

**PARAMETER ANALYSIS & METHOD**

**Keys**

**Preservation Key:**
A. $H_2SO_4$
B. HCL
C. $HNO_3$
D. NaOH
E. None
F. Other: _____
G. Other: _____
H. Other: _____

**Container Information Key:**
1. 40 ml Vial
2. 1 L Amber
3. 250 ml Plastic
4. 500 ml Plastic
5. Encore
6. 2 oz. Glass
7. 4 oz. Glass
8. 8 oz. Glass
9. Other: _____
10. Other: _____

**Matrix Key:**
SO - Soil
W - Water
T - Tissue
SE - Sediment
SL - Sludge
A - Air
NL - NAPL/Oil
SW - Sample Wipe
Other: _____

**REMARKS**

**Special Instructions/Comments:**

☐ Special QA/QC Instructions(✓):

**Laboratory Information and Receipt**

Lab Name: ~~Eurofins~~ CalScience ~~TestAmerica~~
☐ Cooler packed with ice (✓)
Specify Turnaround Requirements: 10 days
Shipping Tracking #:

Cooler Custody Seal (✓)
☐ Intact ☐ Not Intact
Sample Receipt:
Condition/Cooler Temp: _____

| Relinquished By | Received By | Relinquished By | Laboratory Received By |
|---|---|---|---|
| Printed Name: Connor Williams | Printed Name: J. PATEL | Printed Name: | Printed Name: |
| Signature: | Signature: | Signature: | Signature: |
| Firm: ARCADIS | Firm/Courier: ECI | Firm/Courier: | Firm: |
| Date/Time: 2/10/16 15:30 | Date/Time: 2/11/16 1030 | Date/Time: | Date/Time: |

20730826 CofC AR Form 01.12.2007

**Distribution:** WHITE – Laboratory returns with results YELLOW – Lab copy PINK – Retained by ARCADIS



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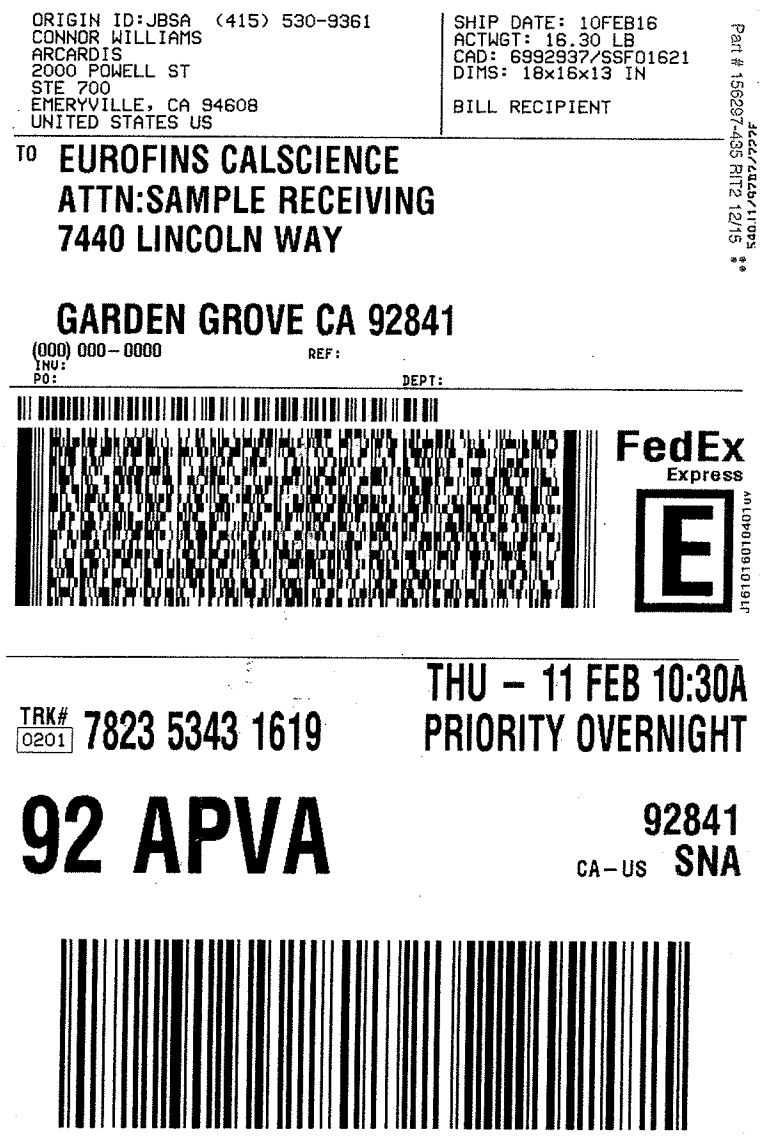

ORIGIN ID:JBSA (415) 530-9361
CONNOR WILLIAMS
ARCARDIS
2000 POWELL ST
STE 700
EMERYVILLE, CA 94608
UNITED STATES US

SHIP DATE: 10FEB16
ACTWGT: 16.30 LB
CAD: 6992937/SSF01621
DIMS: 18x16x13 IN

BILL RECIPIENT

Part # 156287-435 RIT2 12/15

TO EUROFINS CALSCIENCE
ATTN:SAMPLE RECEIVING
7440 LINCOLN WAY

GARDEN GROVE CA 92841

(000) 000-0000 REF:
INV:
PO: DEPT:

FedEx Express

TRK# 0201 7823 5343 1619

THU - 11 FEB 10:30A
PRIORITY OVERNIGHT

92 APVA

92841
CA-US SNA

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eurofins | Calscience

WORK ORDER NUMBER: 16-02- 0929

# SAMPLE RECEIPT CHECKLIST

COOLER 1 OF 1

CLIENT: ARCADIS

DATE: 02 / 11 / 2016

**TEMPERATURE:** (Criteria: 0.0°C – 6.0°C, not frozen except sediment/tissue)

Thermometer ID: SC4B (CF: +0.3°C); Temperature (w/o CF): 3.7 °C (w/ CF): 4.0 °C; ☐ Blank ☑ Sample

☐ Sample(s) outside temperature criteria (PM/APM contacted by: _____)

☐ Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling

☐ Sample(s) received at ambient temperature; placed on ice for transport by courier

Ambient Temperature: ☐ Air ☐ Filter Checked by: LS

**CUSTODY SEAL:**

Cooler ☐ Present and Intact ☐ Present but Not Intact ☑ Not Present ☐ N/A Checked by: LS

Sample(s) ☐ Present and Intact ☐ Present but Not Intact ☑ Not Present ☐ N/A Checked by: SM

| **SAMPLE CONDITION:** | Yes | No | N/A |
|---|---|---|---|
| Chain-of-Custody (COC) document(s) received with samples | ☑ | ☐ | ☐ |
| COC document(s) received complete | ☑ | ☐ | ☐ |
| ☐ Sampling date ☐ Sampling time ☐ Matrix ☐ Number of containers | | | |
| ☐ No analysis requested ☐ Not relinquished ☐ No relinquished date ☐ No relinquished time | | | |
| Sampler's name indicated on COC | ☑ | ☐ | ☐ |
| Sample container label(s) consistent with COC | ☑ | ☐ | ☐ |
| Sample container(s) intact and in good condition | ☑ | ☐ | ☐ |
| Proper containers for analyses requested | ☑ | ☐ | ☐ |
| Sufficient volume/mass for analyses requested | ☑ | ☐ | ☐ |
| Samples received within holding time | ☑ | ☐ | ☐ |
| Aqueous samples for certain analyses received within 15-minute holding time | | | |
| ☐ pH ☐ Residual Chlorine ☐ Dissolved Sulfide ☐ Dissolved Oxygen | ☐ | ☐ | ☑ |
| Proper preservation chemical(s) noted on COC and/or sample container | ☐ | ☐ | ☑ |
| Unpreserved aqueous sample(s) received for certain analyses | | | |
| ☐ Volatile Organics ☐ Total Metals ☐ Dissolved Metals | | | |
| Container(s) for certain analysis free of headspace | ☐ | ☐ | ☑ |
| ☐ Volatile Organics ☐ Dissolved Gases (RSK-175) ☐ Dissolved Oxygen (SM 4500) | | | |
| ☐ Carbon Dioxide (SM 4500) ☐ Ferrous Iron (SM 3500) ☐ Hydrogen Sulfide (Hach) | | | |
| Tedlar™ bag(s) free of condensation | ☐ | ☐ | ☑ |

**CONTAINER TYPE:** (Trip Blank Lot Number: _____)

**Aqueous:** ☐ VOA ☐ VOAh ☐ VOA$na_2$ ☐ 100PJ ☐ 100PJ$na_2$ ☐ 125AGB ☐ 125AGBh ☐ 125AGBp ☐ 125PB

☐ 125PBznna ☐ 250AGB ☐ 250CGB ☐ 250CGBs ☐ 250PB ☐ 250PBn ☐ 500AGB ☐ 500AGJ ☐ 500AGJs

☐ 500PB ☐ 1AGB ☐ 1AGB$na_2$ ☐ 1AGBs ☐ 1PB ☐ 1PBna ☐ _____ ☐ _____ ☐ _____ ☐ _____

**Solid:** ☑ 4ozCGJ ☐ 8ozCGJ ☐ 16ozCGJ ☐ Sleeve (_____) ☑ EnCores® (3) ☐ TerraCores® (_____) ☐ _____

**Air:** ☐ Tedlar™ ☐ Canister ☐ Sorbent Tube ☐ PUF ☐ _____ **Other Matrix** (_____): ☐ _____ ☐ _____

Container: **A** = Amber, **B** = Bottle, **C** = Clear, **E** = Envelope, **G** = Glass, **J** = Jar, **P** = Plastic, and **Z** = Ziploc/Resealable Bag

Preservative: **b** = buffered, **f** = filtered, **h** = HCl, **n** = $HNO_3$, **na** = NaOH, **$na_2$** = $Na_2S_2O_3$, **p** = $H_3PO_4$, **s** = $H_2SO_4$, **u** = ultra-pure, **znna** = $Zn(CH_3CO_2)_2$ + NaOH

Labeled/Checked by: SM

Reviewed by: TB

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ARCADIS Design & Consultancy for natural and built assets

STATE WATER RESOURCES CONTROL BOARD

# GEOTRACKER ESI

UPLOADING A GEO_REPORT FILE

## SUCCESS

**Your GEO_REPORT file has been successfully submitted!**

| | |
|---|---|
| **Submittal Type:** | **GEO_REPORT** |
| **Report Title:** | **CA 11132 160408 BP Well Installation Report FIN** |
| **Report Type:** | **Well Installation Report** |
| **Report Date:** | **4/8/2016** |
| **Facility Global ID:** | **T0600100213** |
| **Facility Name:** | **BP #11132** |
| **File Name:** | **CA 11132 160408 BP Well Installation Report FIN.pdf** |
| **Organization Name:** | **ARCADIS** |
| **Username:** | **ARCADISBP** |
| **IP Address:** | **198.135.125.80** |
| **Submittal Date/Time:** | **4/8/2016 2:37:23 PM** |
| **Confirmation Number:** | **1188948214** |