



September 19, 2016

Mr. Keith Nowell
Hazardous Materials Specialist
Alameda County Environmental Health
1131 Harbor Way Parkway
Alameda, California 94501-6540

RECEIVED

By Alameda County Environmental Health 9:04 am, Sep 20, 2016

Subject: Soil and Groundwater Investigation Report, Former Kaiser Steel Shipyard Underground Storage Tank Site, Berth 30, RO0000101, 2801 Seventh Street, Port of Oakland, Oakland, California

Dear Mr. Nowell:

Please find enclosed, a Soil and Groundwater Investigation Report, Former Kaiser Steel Shipyard Underground Storage Tank Site, Berth 30, RO0000101, 2801 Seventh Street, Port of Oakland, Oakland, California ("the Report"), prepared on behalf of the Port of Oakland ("the Port") by Terraphase Engineering Inc. ("Terraphase"). The Report was prepared to summarize the soil and groundwater investigation activities completed under the direction of the Alameda County Environmental Health for an underground storage tank ("UST") site located in the present day Berth 30 Container Terminal due to UST removal activities in April 1992. The removal action was preparatory for the then redevelopment of Port land for the present day Berth 30 Container Terminal. The site investigation was implemented in accordance with the November 24, 2015, Revised Soil and Groundwater Investigation Work Plan, Former Kaiser Yard Underground Storage Tank Site, Port of Oakland, Oakland, California.

I declare, under the penalty of perjury, that the information and/or recommendations contained in the attached document or report is true and correct to the best of my knowledge. If you have any questions or comments about the RTC letter or Revised Work Plan, contact me at jprall@portoakland.com or at (510) 627-1373.

Sincerely,

John Prall, P.G.
Port Associate Environmental Scientist

cc: Anne Whittington – Port of Oakland
Michele Heffes, Port of Oakland

Enclosure noted in text

**SOIL AND GROUNDWATER INVESTIGATION REPORT
FORMER KAISER STEEL SHIPYARD YARD
UNDERGROUND STORAGE TANK SITE, BERTH 30
RO000101, 2801 SEVENTH STREET
PORT OF OAKLAND, OAKLAND, CALIFORNIA**

Prepared for

Port of Oakland
Environmental Programs & Planning Division
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Prepared by

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September 19, 2016

Project Number 0059.007.001



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CONTENTS

ACRONYMS AND ABBREVIATIONS	III
CERTIFICATION	V
1.0 INTRODUCTION	1
2.0 SITE INVESTIGATION AND REMEDIATION HISTORY	2
2.1 Current Site Use	3
3.0 REGULATORY BACKGROUND	4
4.0 OBJECTIVES	5
5.0 SOIL AND GROUNDWATER INVESTIGATION	6
5.1 Pre-Field Activities	6
5.1.1 Health and Safety Plan	6
5.1.2 Permitting	6
5.1.3 Utility Survey	6
5.2 Investigation Strategy and Sample Locations	6
5.3 Sampling Methodology	8
5.3.1 Soil Sampling	8
5.3.2 Grab Groundwater Sampling	8
5.3.3 Sample Preservation and Handling	9
5.4 Field Screening	9
5.5 Equipment Decontamination	9
5.6 Borehole Abandonment.....	9
5.7 Sample Documentation and Handling	9
5.8 Sample Analyses.....	10
6.0 INVESTIGATION-DERIVED WASTE	11
7.0 SCREENING CRITERIA	12
7.1.1 Soil Screening Criteria	12
7.1.2 Groundwater Screening Criteria	12
8.0 ANALYTICAL RESULTS	14
8.1 Soil Analytical Results.....	14
8.1.1 TPHd and TPH-g	14
8.1.2 Naphthalene, BTEX and MTBE	14
8.2 Groundwater Analytical Results.....	14
8.2.1 TPHd and TPH-g	14
8.2.2 Naphthalene, BTEX and MTBE	15

9.0 CONCLUSIONS AND RECOMENDATIONS 16

10.0 REFERENCES 17

TABLES

- 1 Concentrations of TPH in Soil
- 2 Concentrations of TPH in Groundwater
- 3 Concentrations of BTEX, MTBE, and Naphthalene in Soil
- 4 Concentrations of BTEX, MTBE, and Naphthalene in Groundwater

FIGURES

- 1 Site Location
- 2 Soil Boring Locations
- 3 Concentrations of TPH in Soil
- 4 Concentrations of TPH in Groundwater
- 5 Concentrations of BTEX, MTBE and Naphthalene in Soil
- 6 Concentrations of BTEX, MTBE and Naphthalene in Groundwater

APPENDICES

- A Soil Boring Permit
- B Soil Boring Logs
- C Analytical Laboratory Reports
- D RO000101 – Revised Soil and Groundwater Investigation Work Plan, Former Kaiser Underground Storage Tank Site, 2801 Seventh Street, Berth 30, Port of Oakland
- E Removal of Underground Storage Tanks, Kaiser Yard, 2801 Seventh Street, Oakland, California

ACRONYMS AND ABBREVIATIONS

µg/L	micrograms per liter
ACEH	Alameda County Environmental Health
bgs	below ground surface
BTEX	benzene, toluene, ethylene, and xylene
EPA	Environmental Protection Agency
ESL	Environmental Screening Level
GPS	Global Positioning System
HASP	Health and Safety Plan
Kaiser	Kaiser Steel Corporation
LTCP	Low-Threat Underground Storage Tank Case Closure Policy
mg/kg	milligrams per kilogram
MTBE	methyl tertiary butyl ether
OSHA	Occupational Safety and Health Administration
PID	photoionization detector
the Port	Port of Oakland
ppm	parts per million
the Report	Investigation Summary Report
RWQCB	San Francisco Bay Regional Water Quality Control Board
SGC	silica gel cleanup
the Site	Berth 30, Port of Oakland, California
Terraphase	Terraphase Engineering Inc.
TPH	total petroleum hydrocarbons
TPHg	TPH as gasoline
TPHd	TPH as diesel

TPHmo	TPH as motor oil
µg/L	micrograms per liter
USA	Underground Service Alert
UST	underground storage tank
VOC	volatile organic compounds

CERTIFICATION

Information, conclusions, and recommendations in this document have been prepared by a California Professional Geologist.



Andrew M. Lojo
Principal Geologist
California Professional Geologist (6034)



9/19/16

Date

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1.0 INTRODUCTION

Terraphase Engineering Inc. (Terraphase) has prepared this *Draft Soil and Groundwater Investigation Report*, (“the Report”) on behalf of the Port of Oakland (“the Port”) for the former Kaiser Steel Shipyard Yard Underground Storage Tank (UST) Site, located on Berth 30 of the Port of Oakland, Oakland, California (“the Site”; Figure 1). The report summarizes results of the soil and groundwater sampling conducted as requested by Alameda County Environmental Health Department (ACEH) on March 20, 2015 following the Port’s request on April 4, 2014 for low-threat closure.

The field investigation was conducted between April 2 and 9, 2016, in accordance with the *Soil and Groundwater Investigation Work Plan, Kaiser Yard UST, Berth 30* (“the Work Plan;”), prepared by Terraphase on July 1, 2015 (Terraphase 2015a), see Appendix D and subsequent comments from ACEH, which were incorporated into the *Revised Soil and Groundwater Investigation Work Plan, Kaiser Yard UST, Berth 30*, prepared by Terraphase on November 24, 2015 (Terraphase, 2015b; “The Revised Work Plan”). ACEH provided conditional approval of the work plan on February 23, 2016.

2.0 SITE INVESTIGATION AND REMEDIATION HISTORY

The Site is located in present-day Berth 30 of the Port of Oakland in an area formerly occupied from 1965 to 1985 by Kaiser Steel Corporation (Kaiser). During that time, Kaiser utilized three USTs for equipment refueling. The tanks included one 5,000-gallon gasoline (CF-16) UST, one 3,000-gallon gasoline UST (CF-15), and one 5,000-gallon diesel (CF-14) UST. Ancillary equipment including vent piping, two fuel dispenser islands, and product conveyance piping, were located under a concrete pad in the immediate vicinity of the USTs. During redevelopment of Berth 30 on April 14 to April 16, 1992, the three USTs and associated equipment were removed from the Site (ARCADIS 2014).

The removal of the USTs was documented by Geomatrix (June 1992) in a report submitted to ACEH (Appendix E). The follow narrative is derived from this report.

Prior to removal, the USTs were inspected for fuel content. The diesel UST contained no residual liquid, whereas both of the gasoline USTs contained approximately 1.5 inches of residual liquid, which was pumped out. The USTs were also inspected for integrity following removal; no holes or cracks were identified (ARCADIS 2014).

During removal of the USTs and associated piping, approximately 120 cubic yards of soil was excavated and stockpiled at the Site. Figure 2 presents the approximate locations of the USTs and excavation footprint. The excavation was approximately 38 feet by 17 feet and extended to a depth of approximately 9.5 to 11 feet. Groundwater was encountered at a depth of approximately 9 feet below ground surface (bgs). There were no odors or obvious signs of staining on the excavated soil or sidewalls of the excavation. Groundwater underneath the USTs contained a film of petroleum product up to approximately 0.25 inch thick. No holes or cracks were observed in the tanks.

Groundwater and product was pumped from the excavation then allowed to recharge, and a similar film was observed. This process of pump and recharge was repeated twice. A total of approximately 800 gallons was pumped from the excavation. At this time, a grab groundwater sample was collected from the excavation, and soil samples were collected from six locations along the sidewalls of the excavation at a depth of approximately 8.5 feet bgs, just above the observed water table. The grab groundwater and sidewall soil samples were analyzed for total petroleum hydrocarbons (TPH) as gasoline (TPHg), TPH as diesel (TPHd), benzene, toluene, ethylbenzene, and xylenes (BTEX), and total lead.

TPHg, TPHd, and BTEX were not detected above the laboratory reporting limits in the six sidewall soil samples, and lead was detected at low levels within reported regional background concentrations (Geomatrix 1992).

In the grab groundwater sample, TPHg, benzene, ethylbenzene, toluene, and total xylenes were detected at concentrations of 4,100 micrograms per liter ($\mu\text{g/L}$), 3.4 $\mu\text{g/L}$, 62 $\mu\text{g/L}$, 1.4 $\mu\text{g/L}$, and 860 $\mu\text{g/L}$, respectively. TPHd and total lead were not detected above laboratory reporting limits (Geomatrix 1992).

Following sample collection, the excavation was backfilled with import soil and clean stockpile soil as approved by the ACEH.

2.1 Current Site Use

The UST Site, along with the adjacent Berths 31 and 32, is currently an active container terminal comprised of ocean-going vessel berths, container cranes, container storage yard, and trucking gates for accessing and exiting the terminal. The UST Site is located within the container storage yard which is a temporary storage area for shipping containers pending loading or offloading to/from ships. Site investigation activities were closely coordinated with the terminal operator so the work area was cleared of containers and trucks.

3.0 REGULATORY BACKGROUND

Following removal of the USTs in 1992, ACEH requested that the Port submit a work plan to install groundwater monitoring wells in the vicinity of the former USTs. The work plan was submitted March 22, 1992.

In response to the State Water Resources Control Board's resolution 2012-0016, the Low-Threat Underground Storage Tank Case Closure Policy (LTCP), the Port submitted a Low Threat Closure request to the ACEH in 2014. The request included a summary of investigation and remedial actions conducted at the Site. ACEH did not concur that all LTCP criteria had been met, and requested this additional investigation to support their consideration to close the Site under the LTCP criteria.

4.0 OBJECTIVES

The purpose of the investigation was to investigate for residual impact by petroleum hydrocarbons to soil and groundwater from the three USTs formerly located at the Site. The Scope of Work included the advancement of soil borings in the vicinity of the former USTs for the purpose of collecting soil and groundwater samples.

The objectives of the investigations were to:

- Assess current concentrations of petroleum hydrocarbons as gasoline and diesel constituents in soil and groundwater in the vicinity of the former USTs by analyzing soil and groundwater samples;
- Delineate the current lateral and vertical extent of gasoline and diesel constituents, in soil and groundwater in the area of the former UST area by analyzing soil and groundwater samples; and
- Assess the potential for the presence of floating petroleum hydrocarbon product in the former UST area by analyzing soil and groundwater samples and by visual observation for sheen or floating product.

5.0 SOIL AND GROUNDWATER INVESTIGATION

5.1 Pre-Field Activities

5.1.1 Health and Safety Plan

A site-specific Health and Safety Plan (HASP) was prepared and followed by the onsite project personnel during the field activities. The HASP was prepared in accordance with Occupational Safety and Health Administration (OSHA) 29 Code of Federal Regulations 1910.120 and California OSHA Title 8 Section 5192(e). Site personnel, including onsite subcontractors, were required to familiarize themselves with and sign the HASP to reduce safety hazards. The HASP identified the specific chemical compounds that have been previously encountered at the Site and presented the chemical properties and a task-specific health and safety risk analysis. The HASP also included the Port Guidelines for Working in Active Marine Terminals. Health and safety meetings were conducted in the field at the start of the field investigation and continuing at the beginning of each work day. A copy of the HASP was kept onsite during field activities.

5.1.2 Permitting

A soil boring permit was obtained from Alameda County Public Works Agency. A copy of the permit is included in Appendix A.

5.1.3 Utility Survey

Soil boring locations were marked with white paint. The soil boring locations were surveyed using a Trimble GeoXH handheld Global Positioning System (GPS) device with sub-meter accuracy.

Prior to drilling, Subdynamic Locating Services utility locating company screened for underground utilities within a 10-by-10 square foot area surrounding each of the proposed soil boring using a combination of radio-detection, ground penetrating radar, and electro-magnetic induction methods. Underground Service Alert was also notified more than 48 hours before drilling activities commenced, so that they could mark the location of public underground utility lines within drilling area.

5.2 Investigation Strategy and Sample Locations

The sampling locations are shown on Figure 2. Each location and sampling strategy was selected to achieve the investigation objectives as described below:

- Boring SB-7 was advanced within the approximate extent of the previously excavated and backfilled former UST pit. Multiple borings were advanced in the vicinity of B-7 but hit refusal in a gravelly layer prior to encountering the target “native” (artificial sand fill)

material. The boring locations were moved in 5-foot increments until a boring could be advanced through the gravel layer into the “native” material. Gray sandy gravel believed to be tank excavation backfill material was encountered between 5 and 10 feet bgs. This was underlain by sand that was similar to the presumed “native” material encountered in other borings, and as defined in the Work Plan. A soil sample was collected at 10 feet bgs to assess the vertical extent of hydrocarbon constituents underneath the former tank pit. The boring was advanced to 15 feet bgs where refusal was again encountered, the groundwater infiltration was very slow and dewatering following the collection of a sample to be analyzed for TPH, BTEX, and MTBE. The groundwater did not recover to a level where another sample could be collected for the analysis of TPHd. No hydrocarbon sheen or odors were observed in the boring, though photoionization detector (PID) readings were not collected due to equipment malfunction. Although the location of boring SB-7 appeared to fall outside of the original estimated excavation footprint to remove the former USTs, the lithology encountered in the boring indicates this boring was likely advanced within the excavation footprint. Therefore, the estimated northern boundary of the UST footprint has been expanded to the north (Figure 2).

- Borings SB-1, SB-2, and SB-3 were advanced northeast, north, and northwest of the former UST excavation area, respectively. Soil samples were collected from these borings to assess the northern extent of petroleum hydrocarbon constituent in the former UST area. Borings at these three locations were advanced to 12 to 16 feet bgs. Shallow soil samples were collected at 3.0 and 6.0 bgs at each of the locations. Because groundwater depth varied between locations, the deeper soil samples varied between 9.0 and 15.0 feet bgs. Groundwater samples were collected from these borings to assess hydrocarbon constituent concentrations and were collected at approximately 12.0 or 13.0 feet bgs. No hydrocarbon sheen or odors were observed in the boring. No elevated PID readings were measured.
- Borings SB-4, SB-5, and SB-6 were advanced southwest, south, and southeast of the former UST area, respectively, to assess the lateral extent of petroleum hydrocarbon constituents in soil and groundwater south of the UST area. Each of these three borings was advanced to 15 or 16 feet bgs. Soil samples were collected at 2.0, 9.0, and 12.0 feet bgs; 3.0, 6.0, and 12.0 feet bgs; and 3.0, 6.0, and 10.0 feet bgs for SB-4, SB-5, and SB-6, respectively. Groundwater samples were also collected from these borings at approximately 15.0 feet bgs. No hydrocarbon sheen or odors were observed in the boring. No elevated PID readings were measured.

The soil boring locations were surveyed using a Trimble GeoXH GPS device with sub-meter accuracy.

5.3 Sampling Methodology

5.3.1 Soil Sampling

Soil samples were collected using a hydraulic direct-push drill rig operated by Gregg Drilling & Testing, a California-licensed drilling contractor, to advance the soil borings. The soil boring activities were performed under the supervision of Terraphase field staff working under the direction of a California Professional Geologist. The core barrel was lined with a clear plastic liner to facilitate lithological logging. Soil cores were screened for volatile organic compounds (VOCs) using a RAE Systems miniRAE 3000 PID instrument. Soil samples were then placed in laboratory-provided glass jars for non-volatile compounds. Terracore sub-samplers were used for TPHg, BTEX, and methyl tertiary butyl ether (MTBE) analyses.

Boring logs were prepared in the field and completed under the direction of a California Professional Geologist. The borings were logged in accordance with the Unified Soil Classification System. In addition to standard descriptors (e.g., soil types, moisture, grain size), other pertinent field observations were recorded, presence of hydrocarbon sheen if observed, soil color, odors encountered, and visual observations of unusual conditions. Boring logs are provided in Appendix B.

Samples were collected in accordance with the Work Plan. A total of 19 samples were collected on April 2 and 9, 2016, from the seven soil borings and analyzed for the analysis outlined in the Work Plan. In accordance with the Work Plan (Appendix D), soil samples were taken at approximately 3 feet bgs, 6 feet bgs, and at the contact of first groundwater. Because no elevated PID readings or obvious signs of contamination were observed, additional samples were not taken per the Work Plan.

Equipment decontamination procedures are discussed in Section 5.5.

5.3.2 Grab Groundwater Sampling

Grab groundwater samples were collected from each soil boring. Soil borings were advanced to approximately 2 to 4 feet below the groundwater table. A temporary, 2-inch-diameter, slotted polyvinyl chloride casing was placed in the boring to keep the boring from collapsing and to allow groundwater to enter the casing. The casing remained in the boring until sufficient water was collected for sampling. Once sufficient water had entered the boring, a stainless-steel bailer was used to collect a grab groundwater sample for all locations. The groundwater was poured from the bailer directly into laboratory-supplied sample containers.

Groundwater recharge rates at the soil boring locations were relatively slow, making the collection of sufficient sample volume difficult. Water was collected from some borings multiple times throughout the day to obtain the necessary volume. Boring SB-7 produced only enough

water to collect a sample for TPHg, MTBE, and BTEX, which were extracted from three 30-milliliter vials of water.

5.3.3 Sample Preservation and Handling

Samples for TPHd were collected in unpreserved laboratory-supplied containers. Samples for TPHg, MTBE, and BTEX analysis were preserved using hydrochloric acid. Samples were labeled and placed on water ice in an insulated cooler and submitted under strict chain-of-custody control to Curtis and Tompkins, a California state-certified laboratory.

5.4 Field Screening

Soil was screened in the field using a RAE Systems miniRAE 3000 PID to assess areas potentially impacted with petroleum hydrocarbons. No elevated PID readings were observed during the investigation. The highest PID reading measured during this investigation was 3.5 ppm at a depth of 1.5 feet bgs in boring SB-2.

5.5 Equipment Decontamination

To prevent potential cross-contamination between sample locations, non-disposable equipment that came into contact with soil, solids, or water was decontaminated before work was initiated at each subsequent sampling location and depth interval. Equipment was decontaminated using a three-step process: (1) non-phosphate detergent wash, (2) potable water rinse, and (3) distilled water rinse.

5.6 Borehole Abandonment

After soil and groundwater sampling was complete, the borings were abandoned by using a neat cement grout in accordance with Alameda County boring permit requirements.

5.7 Sample Documentation and Handling

Samples were tracked using chain-of-custody forms. Copies of these documents are maintained in the project files, as well as annotated in the applicable field log. The field log provided a means of recording data collection activities performed at the Site. The sample containers were labeled with the following information:

- project name;
- sample identification (location and depth interval);
- date and time of sample collection;
- sampler's initials; and
- requested analyses.

Sample labels were completed in waterproof, permanent ink and have a self-adhesive backing that allowed for attachment to the sample container. Sample containers were labeled and

placed in a cooler for transportation to a California-certified analytical laboratory following chain-of custody protocols.

5.8 Sample Analyses

Soil and groundwater samples were submitted to Curtis and Tompkins Ltd., an analytical laboratory certified by the California Department of Health Services through the Environmental Laboratory Accreditation Program, for hydrocarbon constituent analysis using the following analytical methods:

- TPHd using Environmental Protection Agency (EPA) Method 8015 with and without silica gel cleanup (SGC; EPA Method 3630C);
- TPHg using EPA Method 8015;
- BTEX and MTBE using EPA Method 8260;
- Naphthalene using EPA Method 8270C.

The laboratory analytical reports are provided in Appendix C.

6.0 INVESTIGATION-DERIVED WASTE

Soil cuttings and decontamination water generated during this investigation were containerized in separate 55-gallon drums. The drums were temporarily staged at the Site while awaiting characterization. A composite soil sample was collected from the drums and analyzed for the following:

- pH using the EPA Method 9040B;
- TPHd and TPH as motor oil by EPA Method 8015 with SGC (EPA Method 3630C);
- Title 22 metals by EPA Method 6010B/EPA Method 7470/7471.

7.0 SCREENING CRITERIA

The Environmental Screening Levels (ESLs) RWQCB, 2016 were applied to the relevant data. The screening criteria are summarized on Tables 1 through 4.

7.1.1 Soil Screening Criteria

Soil data were screened against the following ESLs:

- Direct Exposure Human Health Risk Levels (Table S-1) for both Commercial/Industrial Shallow Soil Exposure and Any Land Use/Any Depth Soil Exposure: Construction Worker (RWQCB 2016). These criteria were selected to be protective of human health related to site maintenance and construction activities where workers could be exposed to the soil at the Site.
- Leaching to Groundwater Levels (Table S-2), nondrinking water (RWQCB 2016). This criterion was selected to be protective of ecological receptors associated with the San Francisco Bay located immediately adjacent to the Site. The nondrinking water scenario was selected because the groundwater in and downgradient of the Site is not suitable as a drinking water source due to high total dissolved solids concentrations.

7.1.2 Groundwater Screening Criteria

Groundwater data were screened against the following ESLs:

- Groundwater Vapor Intrusion Human Health Risk Levels (Table GW-3) for shallow groundwater, commercial/industrial land use (RWQCB 2016). This criterion was selected to be protective of human health for occupants of buildings located at the Site and to assess the risk of vapor intrusion into the buildings.
- Direct Exposure Human Health Risk Levels (Table GW-1), Human Health Risk Based Only (RWQCB 2016). This criterion was selected to be protective of human health related to site maintenance and construction activities where workers could be exposed to the groundwater at the Site.
- Aquatic Habitat Goal Levels (Table GW-2) for Saltwater Ecotox (RWQCB 2016). This criteria were selected to be protective of aquatic habitats associated with the San Francisco Bay located immediately adjacent to the Site. It is anticipated that the wetlands and San Leandro Bay located to the northeast and west of the Site are generally brackish, but to be conservative, the Site data was compared to the Ecotox criteria for both freshwater and saltwater because there is likely mixing of groundwater and bay water at areas adjacent to the Site.

Only concentrations of TPHd analyzed with SGC in both soil and groundwater were compared to the screening criteria, because as stated in the Work Plan, ESLs for TPHd are based upon quantification of non-polar TPH fractions only. Both sets of data are shown in the tables for comparison.

8.0 ANALYTICAL RESULTS

8.1 Soil Analytical Results

8.1.1 TPHd and TPH-g

Concentrations of TPHd and TPHg in soil are presented in Table 1 and on Figure 3. Nineteen soil samples were analyzed for TPHd (with and without SGC) and TPHg. None of the 19 samples had detectable TPHg above laboratory reporting limits. Twelve of 19 samples had detectable TPHd above reporting limits; however, they were low concentrations. The highest TPHd concentration with SGC reported (96 milligrams per kilogram [mg/kg]) was at 2 feet bgs from boring SB-4. None of the 19 samples had reported concentrations exceeding the construction worker soil and shallow soil exposure ESLs of 1,100 and 880 mg/kg for TPHd or TPHg, respectively. The TPHd without SGC results are also shown in Table 1, and were also below ESLs.

8.1.2 Naphthalene, BTEX and MTBE

Concentrations of naphthalene, BTEX, and MTBE are presented in Table 3 and on Figure 5. BTEX or MTBE were not detected above laboratory reporting limits in the 19 soil samples collected during this investigation. Reporting limits of BTEX and MTBE for each sample analyzed are presented in Table 3.

Only one of the 19 soil samples collected had naphthalene above reporting limits. Sample SB-4-2 had a reported concentration of 1.1 mg/kg, which is below the construction worker soil exposure, shallow soil exposure, and groundwater leaching ESL concentrations of 330 mg/kg, 14 mg/kg, and 3.9 mg/kg for naphthalene, respectively (Table 3).

8.2 Groundwater Analytical Results

8.2.1 TPHd and TPH-g

Concentrations of TPHg and TPHd in groundwater are presented in Table 2 and on Figure 4. Seven grab groundwater samples were analyzed for TPHd (with and without SGC) and TPHg. Three of seven groundwater samples had TPHg reported above reporting limits. The highest TPHg concentration reported (88 µg/L) was from boring SB-6. Two of seven groundwater samples had TPHd (with SGC) detected above laboratory reporting limits. The highest TPHd concentration with SGC was 66 µg/L from boring SB-5. TPHd and TPHg concentrations were below their respective ESLs in all seven samples. The TPHd without SGC results are also represented in Table 2. Two of the non-SGC samples had detections above the Ecotox ESL but below the Human Health Risk ESL.

8.2.2 Naphthalene, BTEX and MTBE

Toluene was detected at a concentration of 8.5 µg/L in the sample collected at SB-6, significantly below the ESLs (Table 4). BTEX and MTBE were not detected above the analytical laboratory reporting limits in the other six samples. The reporting limits and ESLs for BTEX and MTBE are presented in Table 4 and are shown on Figure 6.

None of the groundwater samples collected had naphthalene reported above analytical laboratory reporting limits. However, samples taken at SB-3, SB-5, and SB-6 had elevated laboratory reporting limits above the ESLs (Table 2).

9.0 CONCLUSIONS AND RECOMENDATIONS

Based on a review of the historical site information presented in Section 2.0, it has been 24 years since the three USTs were removed from the Site. The sidewall soil samples collected from the UST excavation pit at the time of removal indicated that soil above the groundwater table had not been affected by petroleum hydrocarbons. Approximately 800 gallons of hydrocarbon-affected groundwater, which included hydrocarbon sheen (reported as “film up to ¼ inch thick”), was removed from the excavation pit prior to backfilling. A sample collected from the water contained low concentrations of gasoline constituents but did not contain TPHd above 200 µg/L, indicating that the product was probably gasoline, not diesel fuel.

The results of the current investigation confirmed the presence of a historical release from the area. Analytical results from groundwater and soil samples collected at and below the groundwater table show, however, that the residual gasoline constituents have undergone significant degradation resulting in much lower concentrations. The current analytical results show that gasoline and BTEX compounds are now significantly below ESLs. They are also below analytical detection limits now, with the exception of three detections of TPHg very close to the analytical detection limit. BTEX, MTBE, and naphthalene were all not detected, with the exception of 8.5 µg/L of toluene detected in the groundwater sample from SB-6. This indicates that the original release has almost completely degraded to non-detect levels in and around the former UST area. The very low detections of TPHd, which mostly disappear using SGC, is further evidence that the former gasoline release is fully degraded. In addition, no floating product, sheen, or petroleum odors were observed in any of the samples or soil cuttings observed in the seven borings in and surrounding the former UST area.

The objectives of the investigation have been met. The extent of residual TPH and VOCs in soil and groundwater have adequately been assessed. The field observations and laboratory analytical results show that free product is not present in the vicinity of the former USTs and that the residual TPH and VOCs have undergone significant degradation. Therefore, Terraphase believes that no further investigations are necessary. In addition, the investigation data show that the residual TPH and VOC concentrations detected in soil and groundwater do not present a risk to the site occupants or the surrounding aquatic habitat. We therefore recommend that the Site be considered for closure under the LTCP.

10.0 REFERENCES

- ARCADIS. 2014. Low Threat Closure Request, Kaiser Yard UST, Berth 30, Port of Oakland, 2801 7th Street, Oakland, California. March 27.
- Geomatrix. 1992. Removal of Underground Storage Tanks, Kaiser Yard, 2801 Seventh Street, Oakland, California. June.
- Regional Water Quality Control Board (RWQCB), San Francisco Bay Region. 2016. Environmental Screening Levels Lookup Tables. February.
http://www.swrcb.ca.gov/rwqcb2/water_issues/programs/esl.shtml
- Terraphase Engineering Inc. 2015a. Soil and Groundwater Investigation Work Plan, Kaiser Yard UST, Berth 30, Port of Oakland, Oakland, California. July 1.
- _____. 2015b. Revised Soil and Groundwater Investigation Work Plan, Kaiser Yard UST, Berth 30, Port of Oakland, Oakland, California. November 24.

TABLES

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Table 1

Concentrations of TPH in Soil

Soil and Groundwater Investigation Report

Kaiser Yard UST, Berth 30, Port of Oakland, Oakland, California



Location	Sample ID	Sample Depth (ft bgs)	Sample Date	TPH as Diesel (analyzed without Silica Gel Cleanup)	TPH as Diesel (analyzed with Silica Gel Cleanup)	TPH as Gasoline
				mg/kg	mg/kg	mg/kg
SB-1	SB-1-3	3-3.5	4/2/2016	24Y	50Y	<0.18
	SB-1-6	6-6.5	4/2/2016	<1.0	<1.0	<0.20
	SB-1-9	9-9.5	4/2/2016	1.7Y	<0.99	<0.15
SB-2	SB-2-3	3-3.5	4/2/2016	7.8Y	10Y	<0.20
	SB-2-6	6-6.5	4/2/2016	28Y	28Y	<0.18
	SB-2-9.5	9.5-10	4/2/2016	<1.0	<1.0	<0.16
SB-3	SB-3-3	3-3.5	4/9/2016	96Y	93Y	<0.17
	SB-3-6	6-6.5	4/9/2016	2.1Y	<1.0	<0.18
	SB-3-11	11-11.5	4/9/2016	2YZ	<1.0	<0.15
SB-4	SB-4-2	2-2.5	4/2/2016	61Y	96Y	<0.18
	SB-4-9	9-9.5	4/2/2016	1.2Y	<1.0	<0.16
	SB-4-12	12-12.5	4/2/2016	4.4Y	3.6Y	<0.22
SB-5	SB-5-3	3-3.5	4/9/2016	100Y	81Y	<0.19
	SB-5-6	6-6.5	4/9/2016	<0.99	<0.99	<0.15
	SB-5-12	12-12.5	4/9/2016	12Y	13Y	<0.14
SB-6	SB-6-3	3-3.5	4/9/2016	98Y	5.6Y	<0.15
	SB-6-6	6-6.5	4/9/2016	5.3Y	5.3Y	<0.14
	SB-6-10	10-10.5	4/9/2016	21Y	21Y	<0.21
SB-7	SB-7-10	10-10.5	4/9/2016	12Y	12Y	<0.16
Shallow Soil Exposure: Commerical/Industrial ESL				NA	1100	3900
Soil: Construction Worker ESL				NA	880	2800
Soil: Leaching to Groundwater (Non-Drinking Water) ESL				NA	3600	3400

Notes:

Detected concentrations are **bold-faced**

< = analyte not detected above laboratory reporting limit

ESL = Environmental Screening Level

ft bgs = feet below ground surface

J = estimated below laboratory reporting limit

mg/kg = milligrams per kilogram

NA = Not Available

SFRWQCB - San Francisco Regional Water Quality Control Board

SFRWQCB, Interim Environmental Screening Levles; February 2016 - Revision 3

http://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/esl.shtml

SGC = silica gel cleanup

TPH= Total Petroleum Hydrocarbons

Y = Sample exhibits chromatographic pattern which does not resemble standard

Table 2

Concentrations of TPH in Groundwater

Soil and Groundwater Investigation Report

Kaiser Yard UST, Berth 30, Port of Oakland, Oakland, California



Location	Sample ID	Sample Depth (ft bgs)	Sample Date	TPH as Diesel (analyzed without Silica Gel Cleanup)	TPH as Diesel (analyzed with Silica Gel Cleanup)	TPH as Gasoline
				µg/L	µg/L	µg/L
SB-1	SB-1-12-GW	12 - 12.5	4/2/2016	290Y	<54	<50
SB-2	SB-2-12-GW	12 - 12.5	4/2/2016	180Y	<57	55Y
SB-3	SB-3-13-GW	13 - 13.5	4/9/2016	470Y	<60	57Y
SB-4	SB-4-12-GW	12 - 12.5	4/2/2016	110Y	54Y	<50
SB-5	SB-5-15-GW	15 - 15.5	4/9/2016	910Y	66Y	<50
SB-6	SB-6-15-GW	15 - 15.5	4/9/2016	1,400Y	<71	88Y
SB-7	SB-7-15-GW	15 - 15.5	4/9/2016	-	-	<50
QC	EB-040216		4/2/2016	<52	<52	<50
Groundwater: Saltwater Ecotoxicity ESL				NA	640	3700
Groundwater: Human Health Risk ESL				NA	150	220
Vapor Intrusion (Shallow Groundwater) Com/Ind ESL				NA	NA	NA

Notes:

Detected concentrations are **bold-faced**

- = Not analyzed

< = analyte not detected above laboratory reporting limit

ESL = Environmental Screening Level

ft bgs = feet below ground surface

NA = Not Available

QC = quality control

SFRWQCB - San Francisco Regional Water Quality Control Board

SFRWQCB, Interim Environmental Screening Levels, February 2016 - Revision 3

http://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/esl.shtml

µg/L = micrograms per liter

Y= Sample exhibits chromatographic pattern which does not resemble standard

Table 3

Concentrations of BTEX, MTBE, and Naphthalene in Soil
 Soil and Groundwater Investigation Report
 Kaiser Yard UST, Berth 30, Port of Oakland, Oakland, California



Location	Sample ID	Sample Depth (ft bgs)	Sample Date	Naphthalene	Benzene	Ethylbenzene	MTBE	Toluene	Xylene (o)	Xylene Total
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
SB-1	SB-1-3	3-3.5	4/2/2016	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047
	SB-1-6	6-6.5	4/2/2016	<0.0054	<0.0054	<0.0054	<0.0054	<0.0054	<0.0054	<0.0054
	SB-1-9	9-9.5	4/2/2016	<0.0036	<0.0036	<0.0036	<0.0036	<0.0036	<0.0036	<0.0036
SB-2	SB-2-3	3-3.5	4/2/2016	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037
	SB-2-6	6-6.5	4/2/2016	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049
	SB-2-9.5	9.5-10	4/2/2016	<0.0039	<0.0039	<0.0039	<0.0039	<0.0039	<0.0039	<0.0039
SB-3	SB-3-3	3-3.5	4/9/2016	<3.3	<0.0042	<0.0042	<0.0042	<0.0042	<0.0042	<0.0042
	SB-3-6	6-6.5	4/9/2016	<0.067	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047
	SB-3-11	11-11.5	4/9/2016	<0.067	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
SB-4	SB-4-2	2-2.5	4/2/2016	1.1	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24
	SB-4-9	9-9.5	4/2/2016	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037
	SB-4-12	12-12.5	4/2/2016	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032
SB-5	SB-5-3	3-3.5	4/9/2016	<10	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045
	SB-5-6	6-6.5	4/9/2016	<0.066	<0.0035	<0.0035	<0.0035	<0.0035	<0.0035	<0.0035
	SB-5-12	12-12.5	4/9/2016	<0.2	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048
SB-6	SB-6-3	3-3.5	4/9/2016	<3.4	<0.0036	<0.0036	<0.0036	<0.0036	<0.0036	<0.0036
	SB-6-6	6-6.5	4/9/2016	<0.067	<0.0036	<0.0036	<0.0036	<0.0036	<0.0036	<0.0036
	SB-6-10	10-10.5	4/9/2016	<1.3	<0.0062	<0.0062	<0.0062	<0.0062	<0.0062	<0.0062
SB-7	SB-7-10	10-10.5	4/9/2016	<0.33	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Shallow Soil Exposure: Commerical/Industrial ESL				14	1	22	180	4600	NA	2400
Soil: Construction Worker ESL				350	24	480	3700	4100	NA	2400
Soil: Leaching to GW Non-Drinking Water ESL				3.9	0.049	1.4	0.84	9.3	NA	11

Notes:

Detected concentrations are **bold-faced**

< = analyte not detected above laboratory reporting limit

ESL = Environmental Screening Level

feet bgs = feet below ground surface

mg/kg = milligrams per kilogram

MTBE = Methyl Tertiary Butyl Ether

SFRWQCB - San Francisco Regional Water Quality Control Board

SFRWQCB, Interim Environmental Screening Levles; February 2016 - Revision 3

http://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/esl.shtml

Y= Sample exhibits chromatographic pattern which does not resemble standard

Table 4

Concentrations of BTEX, MTBE, and Naphthalene in Groundwater

Soil and Groundwater Investigation Report

Kaiser Yard UST, Berth 30, Port of Oakland, Oakland, California



Location	Sample ID	Sample Depth (ft bgs)	Sample Date	Naphthalene	Benzene	Ethylbenzene	MTBE	Toluene	Xylene (o)	Xylene Total
				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
SB-1	SB-1-12-GW	12 - 12.5	4/2/2016	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
SB-2	SB-2-12-GW	12 - 12.5	4/2/2016	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
SB-3	SB-3-13-GW	13 - 13.5	4/9/2016	<1,000	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
SB-4	SB-4-12-GW	12 - 12.5	4/2/2016	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
SB-5	SB-5-15-GW	15 - 15.5	4/9/2016	<500	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
SB-6	SB-6-15-GW	15 - 15.5	4/9/2016	<1,500	<0.5	<0.5	<0.5	8.5	<0.5	<0.5
SB-7	SB-7-15-GW	15 - 15.5	4/9/2016	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
QC	EB-040216		4/2/2016	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	TB-040216		4/2/2016	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	TB-040916		4/9/2016	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Groundwater: Saltwater Ecotoxicity ESL				240	350	43	8000	2500	NA	100
Groundwater: Human Health Risk ESL				0.17	0.15	1.5	13	150	NA	190
Vapor Intrusion (Shallow Groundwater) Com/Ind ESL				170	9.7	110	11000	30000	NA	11000

Notes:

Detected concentrations are **bold-faced**

- = Not analyzed

< = analyte not detected above laboratory reporting limit

ESL = Environmental Screening Level

ft bgs = feet below ground surface

MTBE = Methyl Tertiary Butyl Ether

NA = Not Available

SFRWQCB = San Francisco Regional Water Quality Control Board

SFRWQCB, Interim Environmental Screening Levles; February 2016 - Revision 3

http://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/esl.shtml

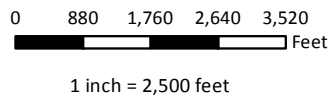
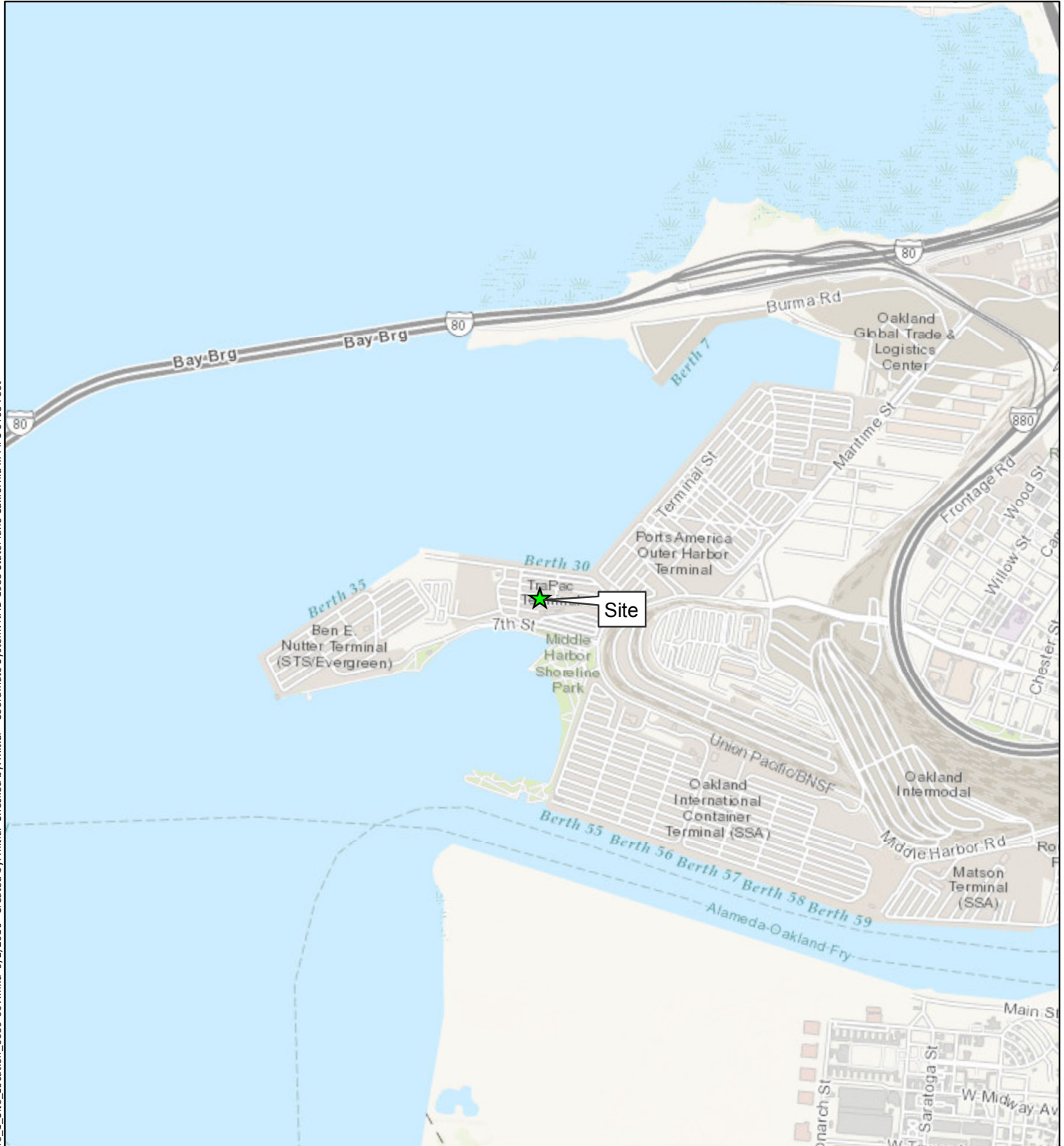
µg/L = micrograms per liter

Y= Sample exhibits chromatographic pattern which does not resemble standard

FIGURES

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File: C:\GIS_Local\Projects\0059-Port of Oakland\Berth 30\Figure_1_Site_Location_0059-007.mxd 9/2/2016 Created by: Initial Checked by: Initial Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet



Legend
★ Site Location

SAFETY FIRST

terraphase
engineering

CLIENT: Port of Oakland

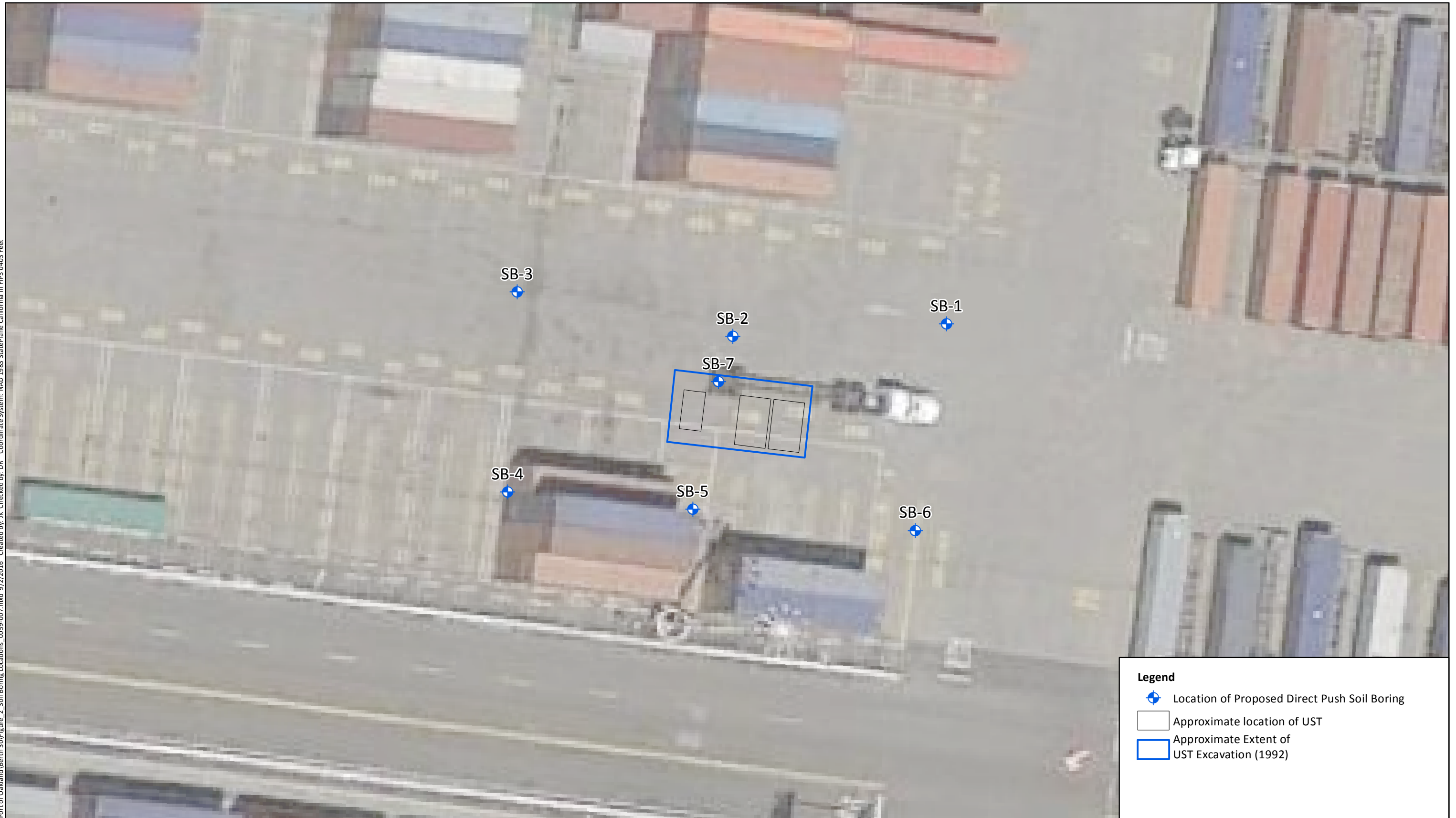
PROJECT: Kaiser Yard UST, Berth 30

PROJECT NUMBER: 0059.007.001




Site Location

FIGURE 1

File: C:\GIS_Local\Projects\0059_Port of Oakland\Berth 30\Figure 2_Soil Boring Locations_0059-007.mxd 9/7/2016 Created by: JK Checked by: DR Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet




Legend

-  Location of Proposed Direct Push Soil Boring
-  Approximate location of UST
-  Approximate Extent of UST Excavation (1992)

Notes: Aerial imagery source - USGS 2011

0 10 20 30 40
Feet

1 inch = 25 feet




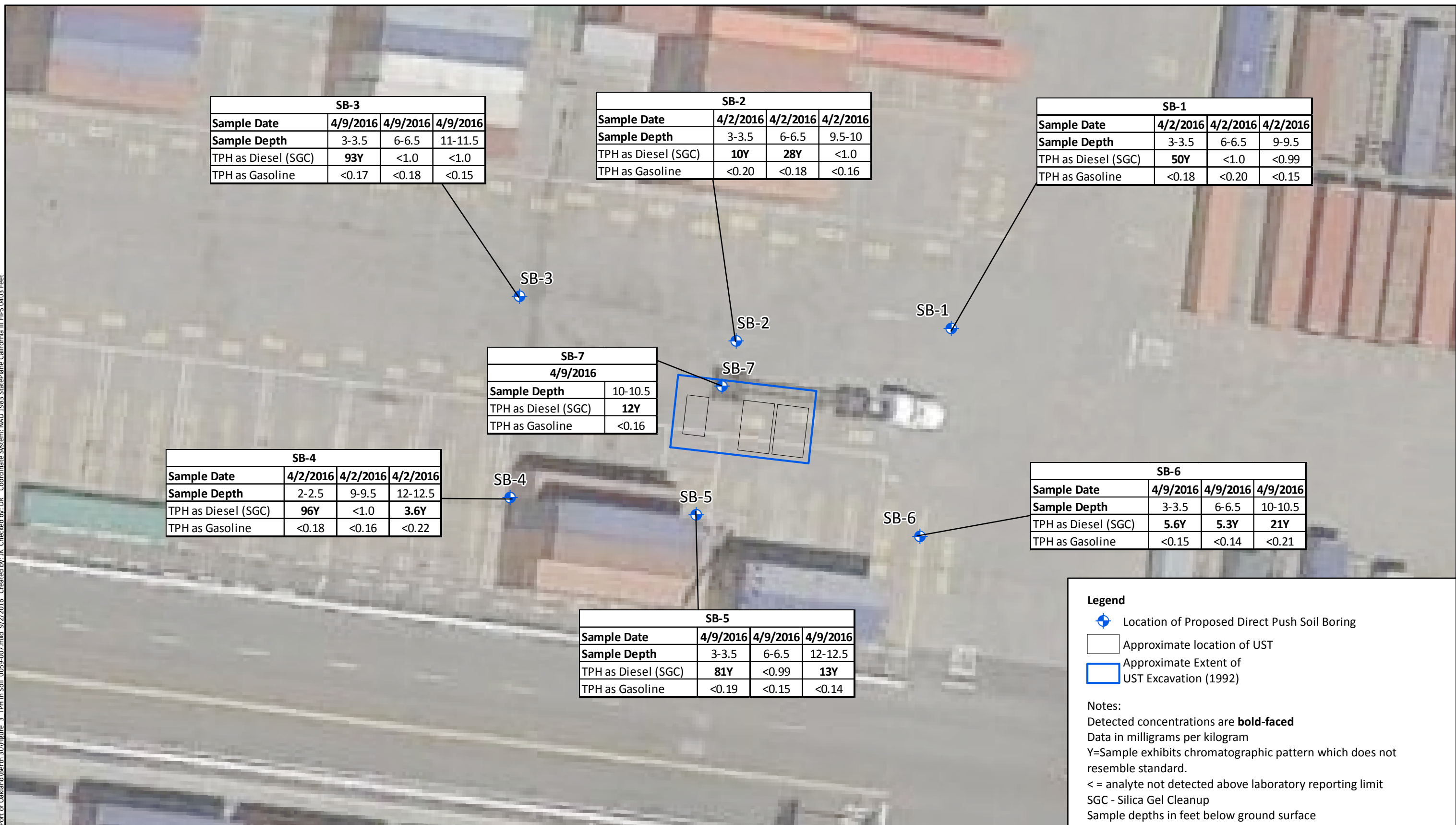
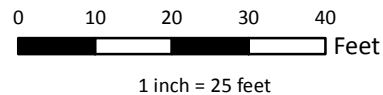
SAFETY FIRST	CLIENT: Port of Oakland	Soil Boring Locations
	PROJECT: Kaiser Yard UST, Berth 30	
	PROJECT NUMBER: 0059.007.001	

FIGURE 2

File: C:\GIS_Local\Projects\0059_Port of Oakland\Berth 30\Figure 3_TPH in Soil_0059-007.mxd 9/2/2016 Created by: JK Checked by: DR Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet

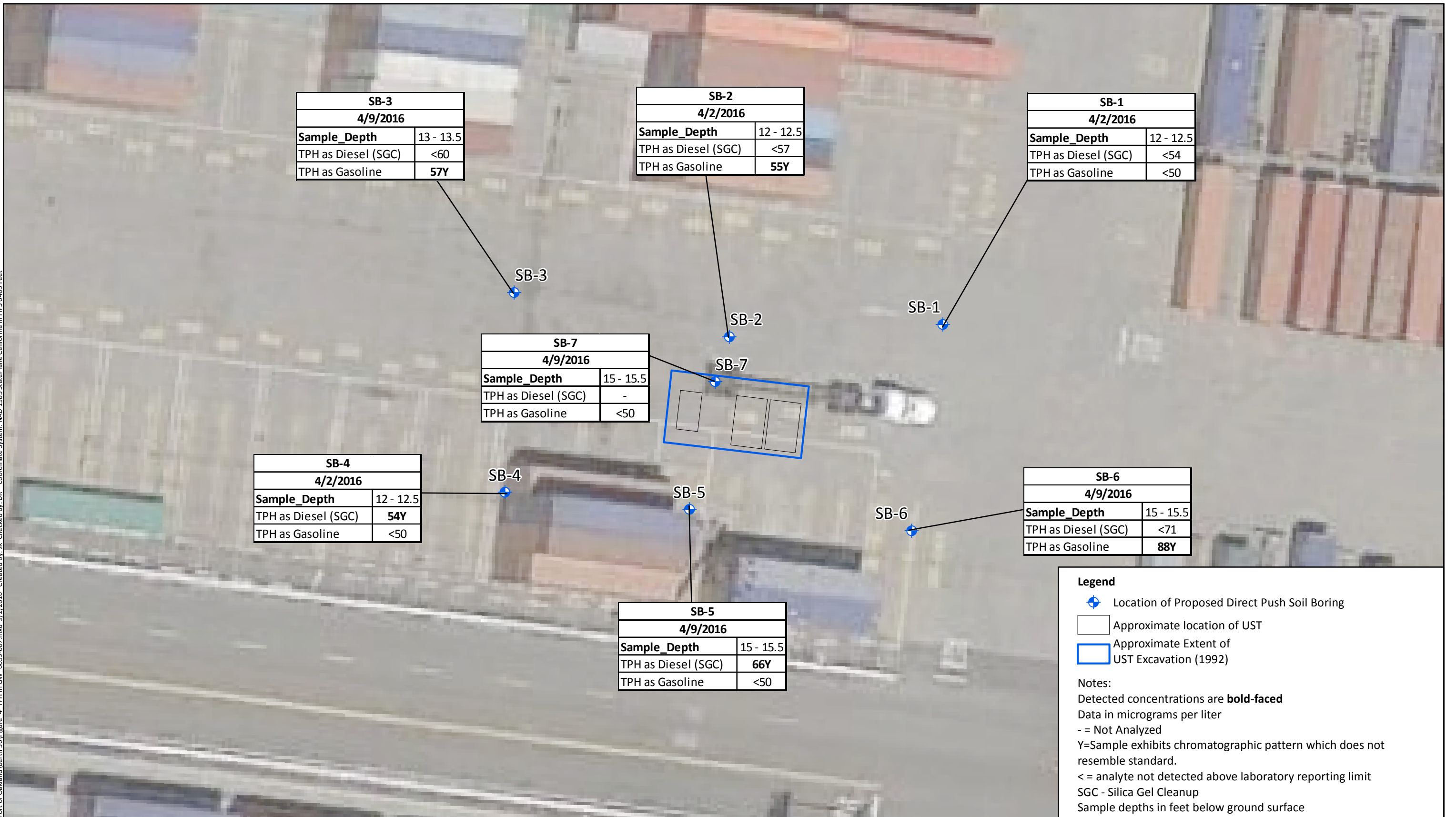


Notes: Aerial imagery source - USGS 2011

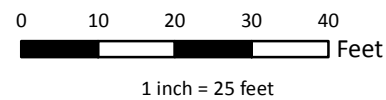


 	CLIENT: Port of Oakland	Concentrations of TPH in Soil FIGURE 3
	PROJECT: Kaiser Yard UST, Berth 30	
	PROJECT NUMBER: 0059.007.001	

File: C:\GIS_Local\Projects\0059_Port of Oakland\Berth 30\Figure 4_TPH in GW_0059-007.mxd 9/2/2016 Created by: JK Checked by: DR Coordinate System: NAD_1983_StatePlane_California III FIPS 0403 Feet



Notes: Aerial imagery source - USGS 2011



SAFETY FIRST 	CLIENT: Port of Oakland	Concentrations of TPH in Groundwater
	PROJECT: Kaiser Yard UST, Berth 30	
PROJECT NUMBER: 0059.007.001		

FIGURE 4

File: C:\GIS\Local\Projects\0059\Port of Oakland\Berth 30\Figure 5 - BTEX+ in Soil_0059-007.mxd 9/2/2016 Created by: JK Checked by: DR Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet

SB-3			
Sample Date	4/9/2016	4/9/2016	4/9/2016
Sample Depth	3-3.5	6-6.5	11-11.5
Benzene	<0.0042	<0.0047	<0.004
Ethylbenzene	<0.0042	<0.0047	<0.004
Toluene	<0.0042	<0.0047	<0.004
Total Xylenes	<0.0042	<0.0047	<0.004
Methyl Tertiary Butyl Ether	<0.0042	<0.0047	<0.004
Naphthalene	<3.3	<0.067	<0.067

SB-2			
Sample Date	4/2/2016	4/2/2016	4/2/2016
Sample Depth	3-3.5	6-6.5	9.5-10
Benzene	<0.0037	<0.0049	<0.0039
Ethylbenzene	<0.0037	<0.0049	<0.0039
Toluene	<0.0037	<0.0049	<0.0039
Total Xylenes	<0.0037	<0.0049	<0.0039
Methyl Tertiary Butyl Ether	<0.0037	<0.0049	<0.0039
Naphthalene	<0.0037	<0.0049	<0.0039

SB-1			
Sample Date	4/2/2016	4/2/2016	4/2/2016
Sample Depth	3-3.5	6-6.5	9-9.5
Benzene	<0.0047	<0.0054	<0.0036
Ethylbenzene	<0.0047	<0.0054	<0.0036
Toluene	<0.0047	<0.0054	<0.0036
Total Xylenes	<0.0047	<0.0054	<0.0036
Methyl Tertiary Butyl Ether	<0.0047	<0.0054	<0.0036
Naphthalene	<0.0047	<0.0054	<0.0036




SB-7	
4/9/2016	
Sample Depth	10-10.5
Benzene	<0.004
Ethylbenzene	<0.004
Toluene	<0.004
Total Xylenes	<0.004
Methyl Tertiary Butyl Ether	<0.004
Naphthalene	<0.33

SB-6			
Sample Date	4/9/2016	4/9/2016	4/9/2016
Sample Depth	3-3.5	6-6.5	10-10.5
Benzene	<0.0036	<0.0036	<0.0062
Ethylbenzene	<0.0036	<0.0036	<0.0062
Toluene	<0.0036	<0.0036	<0.0062
Total Xylenes	<0.0036	<0.0036	<0.0062
Methyl Tertiary Butyl Ether	<0.0036	<0.0036	<0.0062
Naphthalene	<3.4	<0.067	<1.3

SB-4			
Sample Date	4/2/2016	4/2/2016	4/2/2016
Sample Depth	2-2.5	9-9.5	12-12.5
Benzene	<0.24	<0.0037	<0.0032
Ethylbenzene	<0.24	<0.0037	<0.0032
Toluene	<0.24	<0.0037	<0.0032
Total Xylenes	<0.24	<0.0037	<0.0032
Methyl Tertiary Butyl Ether	<0.24	<0.0037	<0.0032
Naphthalene	1.1	<0.0037	<0.0032

SB-5			
Sample Date	4/9/2016	4/9/2016	4/9/2016
Sample Depth	3-3.5	6-6.5	12-12.5
Benzene	<0.0045	<0.0035	<0.0048
Ethylbenzene	<0.0045	<0.0035	<0.0048
Toluene	<0.0045	<0.0035	<0.0048
Total Xylenes	<0.0045	<0.0035	<0.0048
Methyl Tertiary Butyl Ether	<0.0045	<0.0035	<0.0048
Naphthalene	<10	<0.066	<0.2

Legend

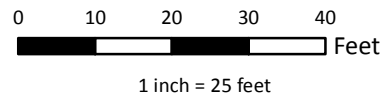
-  Location of Proposed Direct Push Soil Boring
-  Approximate location of UST
-  Approximate Extent of UST Excavation (1992)

Notes:

Detected concentrations are **bold-faced**
 Data in milligrams per kilogram
 Y=Sample exhibits chromatographic pattern which does not resemble standard.
 < = analyte not detected above laboratory reporting limit
 Sample depths in feet below ground surface

Concentrations which exceed the SFRWQCB Leaching to GW Non-Drinking Water Soil ESL are **red font**
 SFRWQCB - San Francisco Regional Water Quality Control Board
 All Screening Criteria are revision #3, May 2016

Notes: Aerial imagery source - USGS 2011



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CLIENT: Port of Oakland

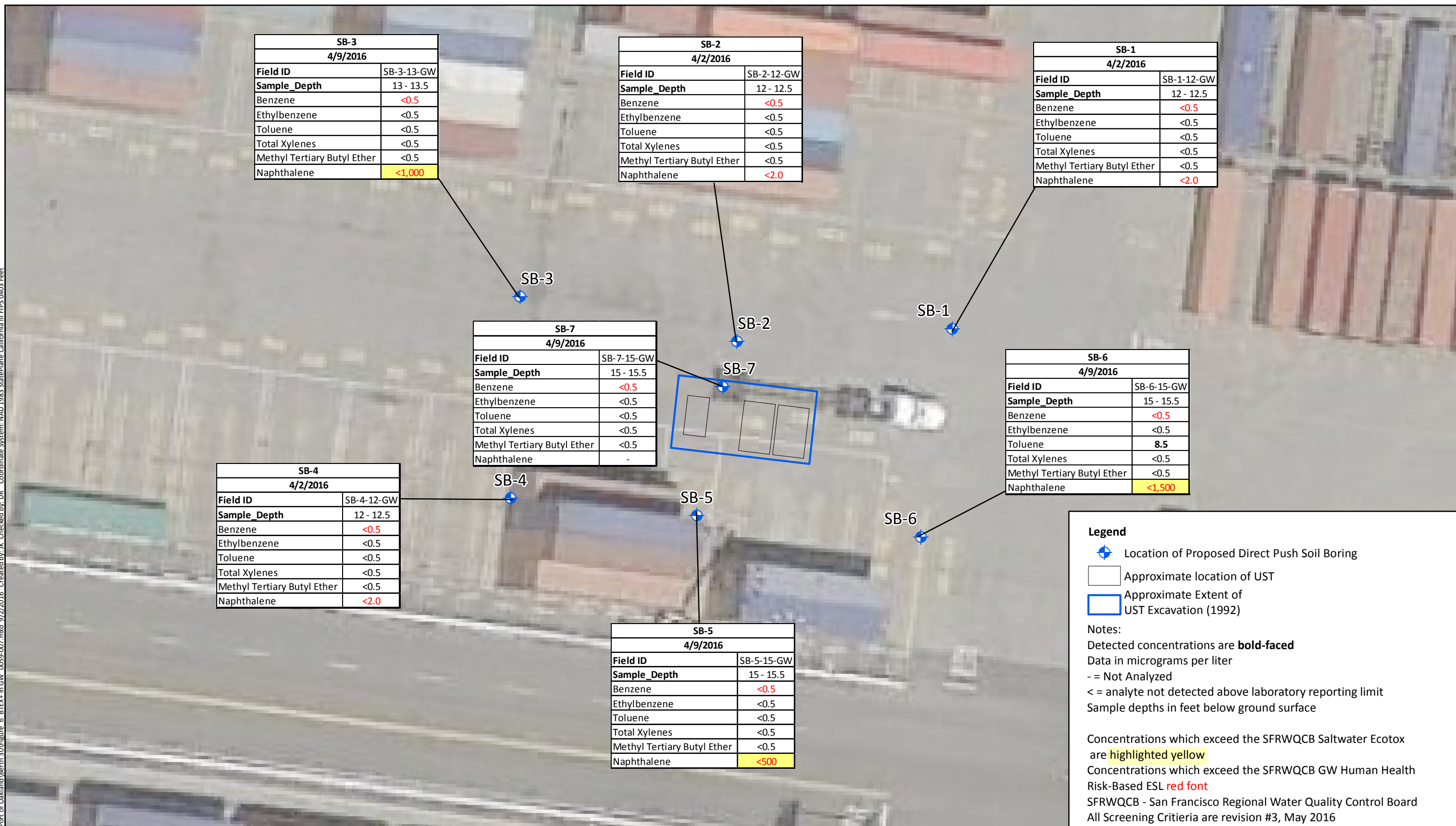
PROJECT: Kaiser Yard UST, Berth 30

PROJECT NUMBER: 0059.007.001

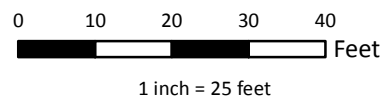
Concentrations of BTEX, MTBE, and Naphthalene in Soil

FIGURE 5

File: C:\GIS\Local\Projects\0059\Port of Oakland\Berth 30\Figure 6 BTEX+ in GW_0059-007.mxd 9/2/2016 Created by: JK Checked by: DR Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet



Notes: Aerial imagery source - USGS 2011



SAFETY FIRST



CLIENT: Port of Oakland

PROJECT: Kaiser Yard UST, Berth 30

PROJECT NUMBER: 0059.007.001

Concentrations of BTEX, MTBE, and Naphthalene in Groundwater

FIGURE 6

APPENDIX A
Soil Boring Permit

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Alameda County Public Works Agency - Water Resources Well Permit



Public Works Agency
—Alameda County—

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

Application Approved on: 03/24/2016 By jamesy

Permit Numbers: W2016-0192
Permits Valid from 03/26/2016 to 04/02/2016

Application Id: 1457979863107
Site Location: Berth 30, Port of Oakland
2801 7th Street
Oakland, CA 94607

City of Project Site:Oakland

Project Start Date: 03/26/2016
Assigned Inspector: Contact Lindsay Furuyama at (925) 956-2311 or Lfuruyama@groundzonees.com
Completion Date:04/02/2016

Applicant: Terraphase Engineering - Seth Stroika
1404 Franklin Street, Oakland, CA 94612
Property Owner: Port of Oakland c/o Justin Taschek
530 Water Street, Oakland, CA 94607
Client: ** same as Property Owner **

Phone: 510-645-1850 x55
Phone: 510-627-1309

Receipt Number: WR2016-0129 Total Due: \$265.00
Payer Name : Seth Stroika Total Amount Paid: \$265.00
Paid By: MC PAID IN FULL

Works Requesting Permits:

Borehole(s) for Investigation-Environmental/Monitoring Study - 7 Boreholes
Driller: Gregg Drilling - Lic #: 485165 - Method: DP

Work Total: \$265.00

Specifications

Permit Number	Issued Dt	Expire Dt	# Boreholes	Hole Diam	Max Depth
W2016-0192	03/24/2016	06/24/2016	7	3.00 in.	15.00 ft

Specific Work Permit Conditions

1. Backfill bore hole by tremie with cement grout or cement grout/sand mixture. Upper two-three feet replaced in kind or with compacted cuttings. All cuttings remaining or unused shall be containerized and hauled off site. The containers shall be clearly labeled to the ownership of the container and labeled hazardous or non-hazardous.
2. Boreholes shall not be left open for a period of more than 24 hours. All boreholes left open more than 24 hours will need approval from Alameda County Public Works Agency, Water Resources Section. All boreholes shall be backfilled according to permit destruction requirements and all concrete material and asphalt material shall be to Caltrans Spec or County/City Codes. No borehole(s) shall be left in a manner to act as a conduit at any time.
3. Permittee shall assume entire responsibility for all activities and uses under this permit and shall indemnify, defend and save the Alameda County Public Works Agency, its officers, agents, and employees free and harmless from any and all expense, cost, liability in connection with or resulting from the exercise of this Permit including, but not limited to, properly damage, personal injury and wrongful death.
4. Applicant shall contact assigned inspector listed on the top of the permit at least five (5) working days prior to starting, once the permit has been approved. Confirm the scheduled date(s) at least 24 hours prior to drilling.
5. 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.

Alameda County Public Works Agency - Water Resources Well Permit

6. Electronic Reporting Regulations (Chapter 30, Division 3 of Title 23 & Division 3 of Title 27, CCR) require electronic submission of any report or data required by a regulatory agency from a cleanup site. Submission dates are set by a Regional Water Board or by a regulatory agency. Once a report/data is successfully uploaded, as required, you have met the reporting requirement (i.e. the compliance measure for electronic submittals is the actual upload itself). The upload date should be on or prior to the regulatory due date.

7. NOTE:

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

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

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

APPENDIX B
Soil Boring Logs

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Project: **Kaiser UST**
 Project Location: **Oakland, CA**
 Project Number: **0059.007.001**

Log of Boring SB-1
Sheet 1 of 2


Date(s) Drilled 4/2/16	Logged By Seth Stroika	Checked By Daren Roth
Drilling Method Direct Push	Drill Bit Size/Type 3" Macrocore	Total Depth of Borehole 16 feet bgs
Drill Rig Type Geoprobe DPT	Drilling Contractor Gregg Drilling	Approximate Surface Elevation
Groundwater Level and Date Measured 9 ft bgs ATD 4/2/16	Sampling Method(s) Acetate Liner, Grab	Hammer Data N/A
Borehole Backfill Neat cement Grout	Location	

Depth (feet)	Sample Type	Sample Number	USCS Symbol	Graphic Log	Munsell Soil-Color	MATERIAL DESCRIPTION	Recovered (in) / Total (in)	PID Reading, ppm	REMARKS AND OTHER TESTS
0			Concrete			0-3": concrete brick pavers			
		SB-1-3	SM		7.5YR -4/1	FILL - SILTY SAND; with concrete, asphalt, and debris with some clay. Debris includes glass, bricks, and organics. Dark grey. Dry to moist. Well Graded.	80%	0.7	
5		SB-1-6	SP		2.5Y -7/1	SAND; grey; dry to moist; fine to medium grained; contains shell fragments. Poorly Graded.	95%	0.2	
			SP		2.5Y-4/2	As above; greyish brown; moist to wet.			About 8" of fill collapsed at top.
10		SB-1-9					90%		

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Project: **Kaiser UST**
 Project Location: **Oakland, CA**
 Project Number: **0059.007.001**

Log of Boring SB-1
Sheet 2 of 2

Depth (feet)	Sample Type	Sample Number	USCS Symbol	Graphic Log	Munsell Soil-Color	MATERIAL DESCRIPTION	Recovered (in) / Total (in)	PID Reading, ppm	REMARKS AND OTHER TESTS
10		SB-1-9	SP		2.5Y-4/2	As above; greyish brown; moist to wet.	90%	0.2	Temp well screened 10-15 feet
15		SB-1-15					100%		
20									
25									
30									
35									
40									
45									

Project: **Kaiser UST**
 Project Location: **Oakland, CA**
 Project Number: **0059.007.001**

Key to Log of Boring Sheet 1 of 1

Depth (feet)	Sample Type	Sample Number	USCS Symbol	Graphic Log	Munsell Soil-Color	MATERIAL DESCRIPTION	Recovered (in) / Total (in)	PID Reading, ppm	REMARKS AND OTHER TESTS
1	2	3	4	5	6	7	8	9	10

COLUMN DESCRIPTIONS

- | | |
|--|---|
| <p>1 Depth (feet): Depth in feet below the ground surface.</p> <p>2 Sample Type: Type of soil sample collected at the depth interval shown.</p> <p>3 Sample Number: Sample identification number.</p> <p>4 USCS Symbol: USCS symbol of the subsurface material.</p> <p>5 Graphic Log: Graphic depiction of the subsurface material encountered.</p> | <p>6 Munsell Soil-Color: Color of subsurface material according to Munsell soil-color charts.</p> <p>7 MATERIAL DESCRIPTION: Description of material encountered. May include consistency, moisture, color, and other descriptive text.</p> <p>8 Recovered (in) / Total (in): Inches of recovery / total inches of boring tubing.</p> <p>9 PID Reading, ppm: The reading from a photo-ionization detector, in parts per million.</p> <p>10 REMARKS AND OTHER TESTS: Comments and observations regarding drilling or sampling made by driller or field personnel.</p> |
|--|---|











FIELD AND LABORATORY TEST ABBREVIATIONS

- | | |
|---|--|
| <p>CHEM: Chemical tests to assess corrosivity</p> <p>COMP: Compaction test</p> <p>CONS: One-dimensional consolidation test</p> <p>LL: Liquid Limit, percent</p> | <p>PI: Plasticity Index, percent</p> <p>SA: Sieve analysis (percent passing No. 200 Sieve)</p> <p>UC: Unconfined compressive strength test, Qu, in ksf</p> <p>WA: Wash sieve (percent passing No. 200 Sieve)</p> |
|---|--|









MATERIAL GRAPHIC SYMBOLS

- | | |
|---|---|
| <p> Portland Cement Concrete</p> | <p> Silty SAND (SM)</p> <p> Poorly graded SAND (SP)</p> |
|---|---|

TYPICAL SAMPLER GRAPHIC SYMBOLS

- | | |
|---|---|
| <p> Hard plastic (acetate) liner (2-inch OD)</p> <p> Auger sampler</p> <p> Bulk Sample</p> <p> 3-inch-OD California w/ brass rings</p> <p> CME Sampler</p> | <p> Grab Sample</p> <p> Hand auger sampler</p> <p> 2.5-inch-OD Modified California w/ brass liners</p> <p> Pitcher Sample</p> <p> Soft plastic sleeve, 4-inch-OD</p> |
|---|---|

OTHER GRAPHIC SYMBOLS

- | | |
|--|---|
| <p> Soil collected from sampler and sent for laboratory analysis.</p> <p> 2-inch-OD unlined split spoon (SPT)</p> <p> Shelby Tube (Thin-walled, fixed head)</p> | <p> Water level (at time of drilling, ATD)</p> <p> Water level (after waiting)</p> <p> Minor change in material properties within a stratum</p> <p> Inferred/gradational contact between strata</p> <p> Queried contact between strata</p> |
|--|---|

GENERAL NOTES

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Project: **Kaiser UST**
 Project Location: **Oakland, CA**
 Project Number: **0059.007.001**

Log of Boring SB-2
Sheet 1 of 2



Date(s) Drilled 4/2/16	Logged By Seth Stroika	Checked By Daren Roth
Drilling Method Direct Push	Drill Bit Size/Type 3" Macrocore	Total Depth of Borehole 12 feet bgs
Drill Rig Type Geoprobe DPT	Drilling Contractor Gregg Drilling	Approximate Surface Elevation
Groundwater Level and Date Measured 9.5 ft bgs ATD 4/2/16	Sampling Method(s) Acetate Liner, Grab	Hammer Data N/A
Borehole Backfill Neat cement Grout	Location	

Depth (feet)	Sample Type	Sample Number	USCS Symbol	Graphic Log	Munsell Soil-Color	MATERIAL DESCRIPTION	Recovered (in) / Total (in)	PID Reading, ppm	REMARKS AND OTHER TESTS
0			Concrete			0-3"; concrete brick pavers			
			SM		7/5YR -4/1	FILL - SILTY SAND; with concrete, asphalt, and debris with some clay. Debris includes glass, bricks, and organics. Dark grey. Dry to moist. Well Graded.	70%	3.5	
		SB-2-3							
5			SP		2.5Y -6/1	SAND; grey; dry to moist; fine to medium grained; contains shell fragments. Poorly Graded.	80%	1.8	
		SB-2-6							
			SP		2.5Y-4/2	SAND; greyish brown; dry; fine grained. Poorly graded.		1.9	
		SB-2-9.5							
10									

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Project: **Kaiser UST**
 Project Location: **Oakland, CA**
 Project Number: **0059.007.001**

Log of Boring SB-2
Sheet 2 of 2

Depth (feet)	Sample Type	Sample Number	USCS Symbol	Graphic Log	Munsell Soil-Color	MATERIAL DESCRIPTION	Recovered (in) / Total (in)	PID Reading, ppm	REMARKS AND OTHER TESTS
10		B-2-12-GW	SP			As above	80%	1.2	Hydropunch 9 to 12 feet
15									
20									
25									
30									
35									
40									
45									

Project: **Kaiser UST**
 Project Location: **Oakland, CA**
 Project Number: **0059.007.001**

Key to Log of Boring Sheet 1 of 1

Depth (feet)	Sample Type	Sample Number	USCS Symbol	Graphic Log	Munsell Soil-Color	MATERIAL DESCRIPTION	Recovered (in) / Total (in)	PID Reading, ppm	REMARKS AND OTHER TESTS
1	2	3	4	5	6	7	8	9	10

COLUMN DESCRIPTIONS

- | | |
|--|---|
| <p>1 Depth (feet): Depth in feet below the ground surface.</p> <p>2 Sample Type: Type of soil sample collected at the depth interval shown.</p> <p>3 Sample Number: Sample identification number.</p> <p>4 USCS Symbol: USCS symbol of the subsurface material.</p> <p>5 Graphic Log: Graphic depiction of the subsurface material encountered.</p> | <p>6 Munsell Soil-Color: Color of subsurface material according to Munsell soil-color charts.</p> <p>7 MATERIAL DESCRIPTION: Description of material encountered. May include consistency, moisture, color, and other descriptive text.</p> <p>8 Recovered (in) / Total (in): Inches of recovery / total inches of boring tubing.</p> <p>9 PID Reading, ppm: The reading from a photo-ionization detector, in parts per million.</p> <p>10 REMARKS AND OTHER TESTS: Comments and observations regarding drilling or sampling made by driller or field personnel.</p> |
|--|---|











FIELD AND LABORATORY TEST ABBREVIATIONS

- | | |
|---|--|
| <p>CHEM: Chemical tests to assess corrosivity</p> <p>COMP: Compaction test</p> <p>CONS: One-dimensional consolidation test</p> <p>LL: Liquid Limit, percent</p> | <p>PI: Plasticity Index, percent</p> <p>SA: Sieve analysis (percent passing No. 200 Sieve)</p> <p>UC: Unconfined compressive strength test, Qu, in ksf</p> <p>WA: Wash sieve (percent passing No. 200 Sieve)</p> |
|---|--|









MATERIAL GRAPHIC SYMBOLS

- | | |
|---|---|
| <p> Portland Cement Concrete</p> | <p> Silty SAND (SM)</p> <p> Poorly graded SAND (SP)</p> |
|---|---|

TYPICAL SAMPLER GRAPHIC SYMBOLS

- | | |
|---|---|
| <p> Hard plastic (acetate) liner (2-inch OD)</p> <p> Auger sampler</p> <p> Bulk Sample</p> <p> 3-inch-OD California w/ brass rings</p> <p> CME Sampler</p> | <p> Grab Sample</p> <p> Hand auger sampler</p> <p> 2.5-inch-OD Modified California w/ brass liners</p> <p> Pitcher Sample</p> <p> Soft plastic sleeve, 4-inch-OD</p> |
|---|---|

OTHER GRAPHIC SYMBOLS

- | | |
|--|---|
| <p> Soil collected from sampler and sent for laboratory analysis.</p> <p> 2-inch-OD unlined split spoon (SPT)</p> <p> Shelby Tube (Thin-walled, fixed head)</p> | <p> Water level (at time of drilling, ATD)</p> <p> Water level (after waiting)</p> <p> Minor change in material properties within a stratum</p> <p> Inferred/gradational contact between strata</p> <p> Queried contact between strata</p> |
|--|---|








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- 2: Descriptions on these logs apply only at the specific boring locations and at the time the borings were advanced. They are not warranted to be representative of subsurface conditions at other locations or times.

Project: **Kaiser UST**
 Project Location: **Oakland, CA**
 Project Number: **0059.007.001**

Log of Boring SB-3
Sheet 1 of 2


Date(s) Drilled 4/9/16	Logged By Seth Stroika	Checked By Daren Roth
Drilling Method Direct Push	Drill Bit Size/Type 3" Macrocore	Total Depth of Borehole 13 feet bgs
Drill Rig Type Geoprobe DPT	Drilling Contractor Gregg Drilling	Approximate Surface Elevation
Groundwater Level and Date Measured 11 ft bgs ATD 4/9/16	Sampling Method(s) Acetate Liner, Grab	Hammer Data N/A
Borehole Backfill Neat cement Grout	Location	

Depth (feet)	Sample Type	Sample Number	USCS Symbol	Graphic Log	Munsell Soil-Color	MATERIAL DESCRIPTION	Recovered (in) / Total (in)	PID Reading, ppm	REMARKS AND OTHER TESTS
0			Concrete			concrete brick pavers 0-3"			
			SM			FILL - SILTY SAND; with gravel with debris; moist. Well graded.		0.5	
		SB-3-3							
			SP		2.5Y -6/1	SAND; grey; fine to medium; dry to moist; contains shell fragments. Poorly graded.		0.7	
5		SB-3-6					75%		
			SW		2.5Y 5/2	SAND; brown; moist to wet; medium to coarse grained. Well Graded.		0.2	
		SB-3-11					75%	0.2	
10									

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Project: **Kaiser UST**
 Project Location: **Oakland, CA**
 Project Number: **0059.007.001**

Log of Boring SB-3
Sheet 2 of 2

Depth (feet)	Sample Type	Sample Number	USCS Symbol	Graphic Log	Munsell Soil-Color	MATERIAL DESCRIPTION	Recovered (in) / Total (in)	PID Reading, ppm	REMARKS AND OTHER TESTS
10		SB-3-11	SW			As above	75%	0.2	Hydropunch 10 - 13 feet
		B-3-11-GW							
15									
20									
25									
30									
35									
40									
45									

Project: **Kaiser UST**
 Project Location: **Oakland, CA**
 Project Number: **0059.007.001**

Key to Log of Boring Sheet 1 of 1

Depth (feet)	Sample Type	Sample Number	USCS Symbol	Graphic Log	Munsell Soil-Color	MATERIAL DESCRIPTION	Recovered (in) / Total (in)	PID Reading, ppm	REMARKS AND OTHER TESTS
1	2	3	4	5	6	7	8	9	10


COLUMN DESCRIPTIONS

- | | |
|--|---|
| <p>1 Depth (feet): Depth in feet below the ground surface.</p> <p>2 Sample Type: Type of soil sample collected at the depth interval shown.</p> <p>3 Sample Number: Sample identification number.</p> <p>4 USCS Symbol: USCS symbol of the subsurface material.</p> <p>5 Graphic Log: Graphic depiction of the subsurface material encountered.</p> | <p>6 Munsell Soil-Color: Color of subsurface material according to Munsell soil-color charts.</p> <p>7 MATERIAL DESCRIPTION: Description of material encountered. May include consistency, moisture, color, and other descriptive text.</p> <p>8 Recovered (in) / Total (in): Inches of recovery / total inches of boring tubing.</p> <p>9 PID Reading, ppm: The reading from a photo-ionization detector, in parts per million.</p> <p>10 REMARKS AND OTHER TESTS: Comments and observations regarding drilling or sampling made by driller or field personnel.</p> |
|--|---|











FIELD AND LABORATORY TEST ABBREVIATIONS

- | | |
|---|--|
| <p>CHEM: Chemical tests to assess corrosivity</p> <p>COMP: Compaction test</p> <p>CONS: One-dimensional consolidation test</p> <p>LL: Liquid Limit, percent</p> | <p>PI: Plasticity Index, percent</p> <p>SA: Sieve analysis (percent passing No. 200 Sieve)</p> <p>UC: Unconfined compressive strength test, Qu, in ksf</p> <p>WA: Wash sieve (percent passing No. 200 Sieve)</p> |
|---|--|









MATERIAL GRAPHIC SYMBOLS

- | | |
|--|---|
| <p> Portland Cement Concrete</p> <p> Silty SAND (SM)</p> | <p> Poorly graded SAND (SP)</p> <p> Well graded SAND (SW)</p> |
|--|---|

TYPICAL SAMPLER GRAPHIC SYMBOLS

- | | |
|---|---|
| <p> Hard plastic (acetate) liner (2-inch OD)</p> <p> Auger sampler</p> <p> Bulk Sample</p> <p> 3-inch-OD California w/ brass rings</p> <p> CME Sampler</p> | <p> Grab Sample</p> <p> Hand auger sampler</p> <p> 2.5-inch-OD Modified California w/ brass liners</p> <p> Pitcher Sample</p> <p> Soft plastic sleeve, 4-inch-OD</p> |
|---|---|

OTHER GRAPHIC SYMBOLS

- | | |
|--|---|
| <p> Soil collected from sampler and sent for laboratory analysis.</p> <p> 2-inch-OD unlined split spoon (SPT)</p> <p> Shelby Tube (Thin-walled, fixed head)</p> | <p> Water level (at time of drilling, ATD)</p> <p> Water level (after waiting)</p> <p> Minor change in material properties within a stratum</p> <p> Inferred/gradational contact between strata</p> <p> Queried contact between strata</p> |
|--|---|

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Project: **Kaiser UST**
 Project Location: **Oakland, CA**
 Project Number: **0059.007.001**

Log of Boring SB-4
Sheet 1 of 2




Date(s) Drilled 4/2/16	Logged By Seth Stroika	Checked By Daren Roth
Drilling Method Direct Push	Drill Bit Size/Type 3" Macrocore	Total Depth of Borehole 15 feet bgs
Drill Rig Type Geoprobe DPT	Drilling Contractor Gregg Drilling	Approximate Surface Elevation
Groundwater Level and Date Measured 11.5 ft bgs ATD 4/2/16	Sampling Method(s) Acetate Liner, Grab	Hammer Data N/A
Borehole Backfill Neat cement Grout	Location	

Depth (feet)	Sample Type	Sample Number	USCS Symbol	Graphic Log	Munsell Soil-Color	MATERIAL DESCRIPTION	Recovered (in) / Total (in)	PID Reading, ppm	REMARKS AND OTHER TESTS
0			Concrete			concrete brick pavers			
			SM		7.5YR -4/1	FILL - SILTY SAND; with concrete, asphalt, and debris with some clay. Debris includes glass, bricks, and organics. Dark grey. Dry to moist. Well Graded.	75%	3.4	
		SB-4-2							
5			CL		7.5YR-4/1	SANDY CLAY with some gravel; dark grey; moist; Soft. Medium plasticity.	100%	1.0	
			CL		10YR-4/4	As Above; dark yellowish brown; less gravel.	100%	1.1	
			CL		7.5YR-4/1	As above; dark grey.	100%	1.7	
			CL		10YR-4/4	As above; dark yellowish brown.	100%	1.1	
		SB-4-9							
			CL		GLE Y 2,4/1,10B	SANDY CLAY; bluish grey; moist. Soft. Medium plasticity.	100%	1.5	
10									

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Project: **Kaiser UST**
 Project Location: **Oakland, CA**
 Project Number: **0059.007.001**

Log of Boring SB-4
Sheet 2 of 2

Depth (feet)	Sample Type	Sample Number	USCS Symbol	Graphic Log	Munsell Soil-Color	MATERIAL DESCRIPTION	Recovered (in) / Total (in)	PID Reading, ppm	REMARKS AND OTHER TESTS
10			CL		10YR-4/4	As above	100%	1.5	Hydropunch 12-15 feet
			GW			GRAVEL; sub-angular to sub-rounded; with sand and some clay; dark yellowish brown; wet. Well graded.	100%	0.8	
15									
20									
25									
30									
35									
40									
45									

Project: **Kaiser UST**
 Project Location: **Oakland, CA**
 Project Number: **0059.007.001**

Key to Log of Boring Sheet 1 of 1

Depth (feet)	Sample Type	Sample Number	USCS Symbol	Graphic Log	Munsell Soil-Color	MATERIAL DESCRIPTION	Recovered (in) / Total (in)	PID Reading, ppm	REMARKS AND OTHER TESTS
1	2	3	4	5	6	7	8	9	10

COLUMN DESCRIPTIONS

- | | |
|--|---|
| <p>1 Depth (feet): Depth in feet below the ground surface.</p> <p>2 Sample Type: Type of soil sample collected at the depth interval shown.</p> <p>3 Sample Number: Sample identification number.</p> <p>4 USCS Symbol: USCS symbol of the subsurface material.</p> <p>5 Graphic Log: Graphic depiction of the subsurface material encountered.</p> | <p>6 Munsell Soil-Color: Color of subsurface material according to Munsell soil-color charts.</p> <p>7 MATERIAL DESCRIPTION: Description of material encountered. May include consistency, moisture, color, and other descriptive text.</p> <p>8 Recovered (in) / Total (in): Inches of recovery / total inches of boring tubing.</p> <p>9 PID Reading, ppm: The reading from a photo-ionization detector, in parts per million.</p> <p>10 REMARKS AND OTHER TESTS: Comments and observations regarding drilling or sampling made by driller or field personnel.</p> |
|--|---|

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- | | |
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|---|--|

MATERIAL GRAPHIC SYMBOLS

- | | |
|--|---|
| <p> Lean CLAY, CLAY w/SAND, SANDY CLAY (CL)</p> <p> Portland Cement Concrete</p> | <p> Well graded GRAVEL (GW)</p> <p> Silty SAND (SM)</p> |
|--|---|

TYPICAL SAMPLER GRAPHIC SYMBOLS

- | | |
|--|--|
| <p> Hard plastic (acetate) liner (2-inch OD)</p> <p> Auger sampler</p> <p> Bulk Sample</p> <p> 3-inch-OD California w/ brass rings</p> <p> CME Sampler</p> | <p> Grab Sample</p> <p> Hand auger sampler</p> <p> 2.5-inch-OD Modified California w/ brass liners</p> <p> Pitcher Sample</p> <p> Soft plastic sleeve, 4-inch-OD</p> |
|--|--|

OTHER GRAPHIC SYMBOLS

- | | |
|---|--|
| <p> Soil collected from sampler and sent for laboratory analysis.</p> <p> 2-inch-OD unlined split spoon (SPT)</p> <p> Shelby Tube (Thin-walled, fixed head)</p> | <p> Water level (at time of drilling, ATD)</p> <p> Water level (after waiting)</p> <p> Minor change in material properties within a stratum</p> <p> Inferred/gradational contact between strata</p> <p> Queried contact between strata</p> |
|---|--|

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Project: **Kaiser UST**
 Project Location: **Oakland, CA**
 Project Number: **0059.007.001**

Log of Boring SB-5
Sheet 1 of 2



Date(s) Drilled 4/9/16	Logged By Seth Stroika	Checked By Daren Roth
Drilling Method Direct Push	Drill Bit Size/Type 3" Macrocore	Total Depth of Borehole 16 feet bgs
Drill Rig Type Geoprobe DPT	Drilling Contractor Gregg Drilling	Approximate Surface Elevation
Groundwater Level and Date Measured 12 ft bgs ATD 4/9/16	Sampling Method(s) Acetate Liner, Grab	Hammer Data N/A
Borehole Backfill Neat cement Grout	Location	

Depth (feet)	Sample Type	Sample Number	USCS Symbol	Graphic Log	Munsell Soil-Color	MATERIAL DESCRIPTION	Recovered (in) / Total (in)	PID Reading, ppm	REMARKS AND OTHER TESTS
0			Concrete			concrete brick pavers 0-3"			
			SM		7/5YR -4/1	FILL - SILTY SAND and gravel with debris; moist. Well graded.	75%	1.5	
		SB-5-3							
5			CL		10YR 4/2	CLAY with some sand and gravel; dark greyish brown; moist. High plasticity; soft.	60%	0.2	
		SB-5-6							
						no recovery from 8 - 12'			
10									

J:\Projects\0059 Port of Oakland\007 - Kaiser UST\Draft Deliverables\Investigation Report\digitized boring logs\Kaiser UST.bg4[no well recovery & pid shallow.tbl]

Project: **Kaiser UST**
 Project Location: **Oakland, CA**
 Project Number: **0059.007.001**

Log of Boring SB-5
Sheet 2 of 2

Depth (feet)	Sample Type	Sample Number	USCS Symbol	Graphic Log	Munsell Soil-Color	MATERIAL DESCRIPTION	Recovered (in) / Total (in)	PID Reading, ppm	REMARKS AND OTHER TESTS
10						no recovery from 8 - 12'			
11		SB-5-12	CL		10YR 4/2	As Above; wet; high plasticity. Soft.			
15		B-5-15-GW					60%	0.1	Hydropunch 11 to 15 feet.
20									
25									
30									
35									
40									
45									

Project: **Kaiser UST**
 Project Location: **Oakland, CA**
 Project Number: **0059.007.001**

Key to Log of Boring Sheet 1 of 1

Depth (feet)	Sample Type	Sample Number	USCS Symbol	Graphic Log	Munsell Soil-Color	MATERIAL DESCRIPTION	Recovered (in) / Total (in)	PID Reading, ppm	REMARKS AND OTHER TESTS
1	2	3	4	5	6	7	8	9	10

COLUMN DESCRIPTIONS

- | | |
|--|---|
| <p>1 Depth (feet): Depth in feet below the ground surface.</p> <p>2 Sample Type: Type of soil sample collected at the depth interval shown.</p> <p>3 Sample Number: Sample identification number.</p> <p>4 USCS Symbol: USCS symbol of the subsurface material.</p> <p>5 Graphic Log: Graphic depiction of the subsurface material encountered.</p> | <p>6 Munsell Soil-Color: Color of subsurface material according to Munsell soil-color charts.</p> <p>7 MATERIAL DESCRIPTION: Description of material encountered. May include consistency, moisture, color, and other descriptive text.</p> <p>8 Recovered (in) / Total (in): Inches of recovery / total inches of boring tubing.</p> <p>9 PID Reading, ppm: The reading from a photo-ionization detector, in parts per million.</p> <p>10 REMARKS AND OTHER TESTS: Comments and observations regarding drilling or sampling made by driller or field personnel.</p> |
|--|---|

FIELD AND LABORATORY TEST ABBREVIATIONS

- | | |
|---|--|
| <p>CHEM: Chemical tests to assess corrosivity</p> <p>COMP: Compaction test</p> <p>CONS: One-dimensional consolidation test</p> <p>LL: Liquid Limit, percent</p> | <p>PI: Plasticity Index, percent</p> <p>SA: Sieve analysis (percent passing No. 200 Sieve)</p> <p>UC: Unconfined compressive strength test, Qu, in ksf</p> <p>WA: Wash sieve (percent passing No. 200 Sieve)</p> |
|---|--|

MATERIAL GRAPHIC SYMBOLS

- | | |
|---|--|
| <p> Lean CLAY, CLAY w/SAND, SANDY CLAY (CL)</p> | <p> Portland Cement Concrete</p> <p> Silty SAND (SM)</p> |
|---|--|

TYPICAL SAMPLER GRAPHIC SYMBOLS

- | | |
|--|--|
| <p> Hard plastic (acetate) liner (2-inch OD)</p> <p> Auger sampler</p> <p> Bulk Sample</p> <p> 3-inch-OD California w/ brass rings</p> <p> CME Sampler</p> | <p> Grab Sample</p> <p> Hand auger sampler</p> <p> 2.5-inch-OD Modified California w/ brass liners</p> <p> Pitcher Sample</p> <p> Soft plastic sleeve, 4-inch-OD</p> |
|--|--|

OTHER GRAPHIC SYMBOLS

- | | |
|---|--|
| <p> Soil collected from sampler and sent for laboratory analysis.</p> <p> 2-inch-OD unlined split spoon (SPT)</p> <p> Shelby Tube (Thin-walled, fixed head)</p> | <p> Water level (at time of drilling, ATD)</p> <p> Water level (after waiting)</p> <p> Minor change in material properties within a stratum</p> <p> Inferred/gradational contact between strata</p> <p> Queried contact between strata</p> |
|---|--|

GENERAL NOTES

- 1: Soil classifications are based on the Unified Soil Classification System. Descriptions and stratum lines are interpretive, and actual lithologic changes may be gradual. Field descriptions may have been modified to reflect results of lab tests.
- 2: Descriptions on these logs apply only at the specific boring locations and at the time the borings were advanced. They are not warranted to be representative of subsurface conditions at other locations or times.

Project: **Kaiser UST**
 Project Location: **Oakland, CA**
 Project Number: **0059.007.001**

Log of Boring SB-6
Sheet 1 of 2

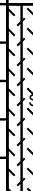

Date(s) Drilled 4/9/16	Logged By Seth Stroika	Checked By Daren Roth
Drilling Method Direct Push	Drill Bit Size/Type 3" Macrocore	Total Depth of Borehole 15 feet bgs
Drill Rig Type Geoprobe DPT	Drilling Contractor Gregg Drilling	Approximate Surface Elevation
Groundwater Level and Date Measured 9.5 ft bgs ATD 4/9/16	Sampling Method(s) Acetate Liner, Grab	Hammer Data N/A
Borehole Backfill Neat cement Grout	Location	

Depth (feet)	Sample Type	Sample Number	USCS Symbol	Graphic Log	Munsell Soil-Color	MATERIAL DESCRIPTION	Recovered (in) / Total (in)	PID Reading, ppm	REMARKS AND OTHER TESTS
0			Concrete			concrete brick pavers			
			SM		7/5YR -4/1	FILL - SILTY SAND; with gravel, concrete, asphalt, and glass debris; moist. Well graded.	80%	1.9	
5		SB-6-6	CL		10YR 4/2	CLAY; dark greyish brown; moist; trace coarse sand. Medium plasticity. Firm to soft.	80%	1.0	
			CL			As above; wet; with sand and gravel. soft	20%	0.8	
10		SB-6-10							

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Project: **Kaiser UST**
 Project Location: **Oakland, CA**
 Project Number: **0059.007.001**

Log of Boring SB-6
Sheet 2 of 2

Depth (feet)	Sample Type	Sample Number	USCS Symbol	Graphic Log	Munsell Soil-Color	MATERIAL DESCRIPTION	Recovered (in) / Total (in)	PID Reading, ppm	REMARKS AND OTHER TESTS
10		B-6-15-GW	CL			As above; wet; with sand and gravel. soft	20%	0.8	Poor groundwater recharge. Screen was set 10-15 feet bgs. Water is turbid.
15									
20									
25									
30									
35									
40									
45									

Project: **Kaiser UST**
 Project Location: **Oakland, CA**
 Project Number: **0059.007.001**

Key to Log of Boring Sheet 1 of 1

Depth (feet)	Sample Type	Sample Number	USCS Symbol	Graphic Log	Munsell Soil-Color	MATERIAL DESCRIPTION	Recovered (in) / Total (in)	PID Reading, ppm	REMARKS AND OTHER TESTS
1	2	3	4	5	6	7	8	9	10

COLUMN DESCRIPTIONS

- | | |
|--|---|
| <p>1 Depth (feet): Depth in feet below the ground surface.</p> <p>2 Sample Type: Type of soil sample collected at the depth interval shown.</p> <p>3 Sample Number: Sample identification number.</p> <p>4 USCS Symbol: USCS symbol of the subsurface material.</p> <p>5 Graphic Log: Graphic depiction of the subsurface material encountered.</p> | <p>6 Munsell Soil-Color: Color of subsurface material according to Munsell soil-color charts.</p> <p>7 MATERIAL DESCRIPTION: Description of material encountered. May include consistency, moisture, color, and other descriptive text.</p> <p>8 Recovered (in) / Total (in): Inches of recovery / total inches of boring tubing.</p> <p>9 PID Reading, ppm: The reading from a photo-ionization detector, in parts per million.</p> <p>10 REMARKS AND OTHER TESTS: Comments and observations regarding drilling or sampling made by driller or field personnel.</p> |
|--|---|

FIELD AND LABORATORY TEST ABBREVIATIONS

- | | |
|---|--|
| <p>CHEM: Chemical tests to assess corrosivity</p> <p>COMP: Compaction test</p> <p>CONS: One-dimensional consolidation test</p> <p>LL: Liquid Limit, percent</p> | <p>PI: Plasticity Index, percent</p> <p>SA: Sieve analysis (percent passing No. 200 Sieve)</p> <p>UC: Unconfined compressive strength test, Qu, in ksf</p> <p>WA: Wash sieve (percent passing No. 200 Sieve)</p> |
|---|--|

MATERIAL GRAPHIC SYMBOLS

- | | |
|---|--|
| <p> Lean CLAY, CLAY w/SAND, SANDY CLAY (CL)</p> | <p> Portland Cement Concrete</p> <p> Silty SAND (SM)</p> |
|---|--|

TYPICAL SAMPLER GRAPHIC SYMBOLS

- | | |
|--|--|
| <p> Hard plastic (acetate) liner (2-inch OD)</p> <p> Auger sampler</p> <p> Bulk Sample</p> <p> 3-inch-OD California w/ brass rings</p> <p> CME Sampler</p> | <p> Grab Sample</p> <p> Hand auger sampler</p> <p> 2.5-inch-OD Modified California w/ brass liners</p> <p> Pitcher Sample</p> <p> Soft plastic sleeve, 4-inch-OD</p> |
|--|--|

OTHER GRAPHIC SYMBOLS

- | | |
|---|--|
| <p> Soil collected from sampler and sent for laboratory analysis.</p> <p> 2-inch-OD unlined split spoon (SPT)</p> <p> Shelby Tube (Thin-walled, fixed head)</p> | <p> Water level (at time of drilling, ATD)</p> <p> Water level (after waiting)</p> <p> Minor change in material properties within a stratum</p> <p> Inferred/gradational contact between strata</p> <p> Queried contact between strata</p> |
|---|--|




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- 2: Descriptions on these logs apply only at the specific boring locations and at the time the borings were advanced. They are not warranted to be representative of subsurface conditions at other locations or times.

Project: **Kaiser UST**
 Project Location: **Oakland, CA**
 Project Number: **0059.007.001**



Log of Boring SB-7
Sheet 1 of 2

Date(s) Drilled 4/9/16	Logged By Seth Stroika	Checked By Daren Roth
Drilling Method Direct Push	Drill Bit Size/Type 3" Macrocore	Total Depth of Borehole 15 feet bgs
Drill Rig Type Geoprobe DPT	Drilling Contractor Gregg Drilling	Approximate Surface Elevation
Groundwater Level and Date Measured	Sampling Method(s) Acetate Liner, Grab	Hammer Data N/A
Borehole Backfill Neat cement Grout	Location	

Depth (feet)	Sample Type	Sample Number	USCS Symbol	Graphic Log	Munsell Soil-Color	MATERIAL DESCRIPTION	Recovered (in) / Total (in)	PID Reading, ppm	REMARKS AND OTHER TESTS
0			Concrete			concrete brick pavers 0-3"			
			SM		7/5YR -4/1	FILL - SILTY SAND; with gravel with concrete, asphalt, and glass debris.	60%	NM	
5			GW-GM		10Y/R -5/1	GRAVEL with silt and sand. Grey; Well graded; moist. Angular to sub-angular.	80%		
10							80%		

Project: **Kaiser UST**
 Project Location: **Oakland, CA**
 Project Number: **0059.007.001**

Log of Boring SB-7
Sheet 2 of 2

Depth (feet)	Sample Type	Sample Number	USCS Symbol	Graphic Log	Munsell Soil-Color	MATERIAL DESCRIPTION	Recovered (in) / Total (in)	PID Reading, ppm	REMARKS AND OTHER TESTS
10	B-7-15-GW		SP		2.5Y -6/1	SAND with some gravel; grey; contains shell fragments.	80%		PVC well screened 10 -15 feet. Refusal at 15 feet bgs.
15			GP		10YR -2/1	Large gravel. Trace silt and sand; Sub-angular to sub-rounded. Poorly graded. Black. Wet.	90%		
20									
25									
30									
35									
40									
45									

Project: **Kaiser UST**
 Project Location: **Oakland, CA**
 Project Number: **0059.007.001**

Key to Log of Boring Sheet 1 of 1

Depth (feet)	Sample Type	Sample Number	USCS Symbol	Graphic Log	Munsell Soil-Color	MATERIAL DESCRIPTION	Recovered (in) / Total (in)	PID Reading, ppm	REMARKS AND OTHER TESTS
1	2	3	4	5	6	7	8	9	10


COLUMN DESCRIPTIONS

- | | |
|--|---|
| <p>1 Depth (feet): Depth in feet below the ground surface.</p> <p>2 Sample Type: Type of soil sample collected at the depth interval shown.</p> <p>3 Sample Number: Sample identification number.</p> <p>4 USCS Symbol: USCS symbol of the subsurface material.</p> <p>5 Graphic Log: Graphic depiction of the subsurface material encountered.</p> | <p>6 Munsell Soil-Color: Color of subsurface material according to Munsell soil-color charts.</p> <p>7 MATERIAL DESCRIPTION: Description of material encountered. May include consistency, moisture, color, and other descriptive text.</p> <p>8 Recovered (in) / Total (in): Inches of recovery / total inches of boring tubing.</p> <p>9 PID Reading, ppm: The reading from a photo-ionization detector, in parts per million.</p> <p>10 REMARKS AND OTHER TESTS: Comments and observations regarding drilling or sampling made by driller or field personnel.</p> |
|--|---|











FIELD AND LABORATORY TEST ABBREVIATIONS

<p>CHEM: Chemical tests to assess corrosivity</p> <p>COMP: Compaction test</p> <p>CONS: One-dimensional consolidation test</p> <p>LL: Liquid Limit, percent</p>	<p>PI: Plasticity Index, percent</p> <p>SA: Sieve analysis (percent passing No. 200 Sieve)</p> <p>UC: Unconfined compressive strength test, Qu, in ksf</p> <p>WA: Wash sieve (percent passing No. 200 Sieve)</p>
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




MATERIAL GRAPHIC SYMBOLS

- | | |
|--|---|
| <p> Portland Cement Concrete</p> <p> Poorly graded GRAVEL (GP)</p> | <p> Well graded GRAVEL with Silt (GW-GM)</p> <p> Silty SAND (SM)</p> <p> Poorly graded SAND (SP)</p> |
|--|---|

TYPICAL SAMPLER GRAPHIC SYMBOLS

- | | |
|---|---|
| <p> Hard plastic (acetate) liner (2-inch OD)</p> <p> Auger sampler</p> <p> Bulk Sample</p> <p> 3-inch-OD California w/ brass rings</p> <p> CME Sampler</p> | <p> Grab Sample</p> <p> Hand auger sampler</p> <p> 2.5-inch-OD Modified California w/ brass liners</p> <p> Pitcher Sample</p> <p> Soft plastic sleeve, 4-inch-OD</p> |
|---|---|

OTHER GRAPHIC SYMBOLS

- | | |
|--|---|
| <p> Soil collected from sampler and sent for laboratory analysis.</p> <p> 2-inch-OD unlined split spoon (SPT)</p> <p> Shelby Tube (Thin-walled, fixed head)</p> | <p> Water level (at time of drilling, ATD)</p> <p> Water level (after waiting)</p> <p> Minor change in material properties within a stratum</p> <p> Inferred/gradational contact between strata</p> <p> Queried contact between strata</p> |
|--|---|

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APPENDIX C
Analytical Laboratory Reports

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Curtis & Tompkins, Ltd.

Analytical Laboratories, Since 1878



Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878

2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

Laboratory Job Number 275680
ANALYTICAL REPORT

Terraphase Engineering
1404 Franklin Street
Oakland, CA 94612

Project : 0059.007.001
Location : Kaiser UST
Level : II

Table with 2 columns: Sample ID and Lab ID. Lists 15 sample and lab identifiers.

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

Signature: [Handwritten Signature]
Tracy Babjar
Project Manager
tracy.babjar@ctberk.com
(510) 204-2226

Date: 04/11/2016

CASE NARRATIVE

Laboratory number: 275680
Client: Terraphase Engineering
Project: 0059.007.001
Location: Kaiser UST
Request Date: 04/04/16
Samples Received: 04/04/16

This data package contains sample and QC results for nine soil samples and five water samples, requested for the above referenced project on 04/04/16. The samples were received cold and intact.

TPH-Purgeables and/or BTXE by GC (EPA 8015B) Water:

No analytical problems were encountered.

TPH-Purgeables and/or BTXE by GC (EPA 8015B) Soil:

No analytical problems were encountered.

TPH-Extractables by GC (EPA 8015B) Water:

No analytical problems were encountered.

TPH-Extractables by GC (EPA 8015B) Soil:

A number of samples were diluted due to the dark and viscous nature of the sample extracts. No other analytical problems were encountered.

Volatile Organics by GC/MS (EPA 8260B) Water:

No analytical problems were encountered.

Volatile Organics by GC/MS (EPA 8260B) Soil:

High surrogate recoveries were observed in SB-1-3 (lab # 275680-001) and SB-4-9 (lab # 275680-011) due to poor internal standard recovery confirmed by reanalysis; no target analytes were detected in these samples so there is no affect on the data quality. SB-4-2 (lab # 275680-009) was diluted due to high non-target analytes. No other analytical problems were encountered.



Curtis & Tompkins Laboratories
ENVIRONMENTAL ANALYTICAL TESTING LABORATORY
In Business Since 1878

2323 Fifth Street
 Berkeley, CA 94710

Phone (510) 486-0900
 Fax (510) 486-0532

Project No: 0059.007.001

Sampler: Seth Stricker

Project Name: Kaiser UST

Report To: Daren Roth

Project P. O. No:

Company: TerraPhase

EDD Format:

Telephone: (510) 445-1850

Turnaround Time: RUSH Standard

Email: Daren.Roth@terraPhase.com

Chain of Custody #

C&T LOGIN # 275680

ANALYTICAL REQUEST

Lab No.	Sample ID	Date Collected	Time Collected	Matrix	Chemical Preservative	TPH _o (8015)	TPH _g W/SG-CU (8015)	BTEX and MTBE (8260)	TPH _d (8015)	Organic Matter Content (2974)	Hold
1	SB-1-3	4/2/16	1035	Water	HCl	X	X	X	X	X	
2	SB-1-6		1045	Water	HNO ₃	X	X	X	X	X	
3	SB-1-9		1050	Water	HNO ₃	X	X	X	X	X	
4	SB-1-15		1100	Water	HNO ₃	X	X	X	X	X	
5	SB-2-3		1425	Water	HNO ₃	X	X	X	X	X	
6	SB-2-6		1445	Water	HNO ₃	X	X	X	X	X	
7	SB-2-9.5		1455	Water	HNO ₃	X	X	X	X	X	
8	SB-1-12-GW		1145	Water	HCl	X	X	X	X	X	
9	SB-4-2		1650	Water	HCl	X	X	X	X	X	
10	SB-2-12-GW		1515	Water	HCl	X	X	X	X	X	
11	SB-4-9		1650	Water	HCl	X	X	X	X	X	
12	SB-4-12		1720	Water	HCl	X	X	X	X	X	

Notes:
 *Hold all 2 oz soil
 jars Organic Matter
 Content (D2974) - Pending
 Analysis
 Hold SB-1-15

RELINQUISHED BY: *Seth Stricker* DATE: 4/4/16 TIME: 1055
 RECEIVED BY: *Daren Roth* DATE: 4/9/16 TIME: 1055

CHAIN OF CUSTODY

Chain of Custody # _____



2323 Fifth Street
Berkeley, CA 94710
Phone (510) 486-0900
Fax (510) 486-0532

C&T LOGIN # 275680

Project No: 0059.007.001 Sampler: Seth Stroika
 Project Name: Kaiser UST Report To: Daren Roth
 Project P. O. No.: _____ Company: Terraphase
 EDD Format: Report Level II III IV Telephone: (510) 645-1850
 Turnaround Time: RUSH Standard Email: Daren.Roth@terraphase.com

ANALYTICAL REQUEST	
TPH _g (8015)	X
TPH _i W/SCU (8015)	X
TPH _i (8015)	X
BTEX and MRE (8260)	X
Organic Matter Content (02974)	X

Lab No.	Sample ID.	SAMPLING		MATRIX		# of Containers	CHEMICAL PRESERVATIVE								
		Date Collected	Time Collected	Water	Solid		HCl	H2SO4	HNO3	NaOH	None				
13	SB-4-12 SB-4-15-GW	4/2/16	1730X			10	X								
14	EB-040216	4/2/16	1800X			10	X								
15	TB-040216	4/2/16	1830X			30	X								

Notes: _____

SAMPLE RECEIPT <input checked="" type="checkbox"/> Intact <input checked="" type="checkbox"/> Cold <input checked="" type="checkbox"/> On Ice <input type="checkbox"/> Ambient	RELINQUISHED BY: _____ DATE: <u>4/16/16</u> TIME: <u>1055</u> DATE: <u>4/16/16</u> TIME: <u>1650</u>	RECEIVED BY: _____ DATE: <u>4/16/16</u> TIME: <u>1055</u> DATE: <u>4/16/16</u> TIME: <u>1650</u>
--	--	--

COOLER RECEIPT CHECKLIST



Curtis & Tompkins, Ltd.

Login # 275680 Date Received 4/4/16 Number of coolers 2
 Client Terraphase Project Kaiser UST

Date Opened 4/4 By (print) CJN (sign) [Signature]
 Date Logged in 4/5 By (print) SL (sign) [Signature]

1. Did cooler come with a shipping slip (airbill, etc) _____ YES NO

2A. Were custody seals present? YES (circle) on cooler on samples NO
 How many _____ Name _____ Date _____

2B. Were custody seals intact upon arrival? _____ YES NO N/A

3. Were custody papers dry and intact when received? _____ YES NO

4. Were custody papers filled out properly (ink, signed, etc)? _____ YES NO

5. Is the project identifiable from custody papers? (If so fill out top of form) _____ YES NO

6. Indicate the packing in cooler: (if other, describe) _____

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

7. Temperature documentation: * Notify PM if temperature exceeds 6°C

Type of ice used: Wet Blue/Gel None Temp(°C) 4.1°, 2.5

Temperature blank(s) included? Thermometer# _____ IR Gun# B

Samples received on ice directly from the field. Cooling process had begun

8. Were Method 5035 sampling containers present? _____ YES NO

If YES, what time were they transferred to freezer? 21:15 on 4/4

9. Did all bottles arrive unbroken/unopened? _____ YES NO

10. Are there any missing / extra samples? _____ YES NO

11. Are samples in the appropriate containers for indicated tests? _____ YES NO

12. Are sample labels present, in good condition and complete? _____ YES NO

13. Do the sample labels agree with custody papers? _____ YES NO

14. Was sufficient amount of sample sent for tests requested? _____ YES NO

15. Are the samples appropriately preserved? _____ YES NO N/A

16. Did you check preservatives for all bottles for each sample? _____ YES NO N/A

17. Did you document your preservative check? (pH strip lot# _____) YES NO N/A

18. Did you change the hold time in LIMS for unpreserved VOAs? _____ YES NO N/A

19. Did you change the hold time in LIMS for preserved terracores? _____ YES NO N/A

20. Are bubbles > 6mm absent in VOA samples? _____ YES N/A

21. Was the client contacted concerning this sample delivery? _____ YES NO

If YES, Who was called? _____ By _____ Date: _____

COMMENTS

2e.) Bubbles > 6mm present in 2/3 VOA for Sample 15

Client Sample ID : SB-4-2

Laboratory Sample ID :

275680-009

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Diesel C10-C24	61	Y	10	mg/Kg	As Recd	10.00	EPA 8015B	EPA 3550B
Diesel C10-C24	96	Y	1.0	mg/Kg	As Recd	1.000	EPA 8015B	EPA 3550B
Naphthalene	1,100		240	ug/Kg	As Recd	48.64	EPA 8260B	EPA 5035

Client Sample ID : SB-2-12-GW

Laboratory Sample ID :

275680-010

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Gasoline C7-C12	55	Y	50	ug/L	As Recd	1.000	EPA 8015B	EPA 5030B
Diesel C10-C24	180	Y	57	ug/L	As Recd	1.000	EPA 8015B	EPA 3520C

Client Sample ID : SB-4-9

Laboratory Sample ID :

275680-011

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Diesel C10-C24	1.2	Y	1.0	mg/Kg	As Recd	1.000	EPA 8015B	EPA 3550B

Client Sample ID : SB-4-12

Laboratory Sample ID :

275680-012

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Diesel C10-C24	4.4	Y	0.99	mg/Kg	As Recd	1.000	EPA 8015B	EPA 3550B
Diesel C10-C24	3.6	Y	0.99	mg/Kg	As Recd	1.000	EPA 8015B	EPA 3550B

Client Sample ID : SB-4-15-GW

Laboratory Sample ID :

275680-013

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Diesel C10-C24	110	Y	51	ug/L	As Recd	1.000	EPA 8015B	EPA 3520C
Diesel C10-C24	54	Y	51	ug/L	As Recd	1.000	EPA 8015B	EPA 3520C

Client Sample ID : EB-040216

Laboratory Sample ID :

275680-014

No Detections

Client Sample ID : TB-040216

Laboratory Sample ID :

275680-015

No Detections

Y = Sample exhibits chromatographic pattern which does not resemble standard

Batch QC Report

Total Volatile Hydrocarbons			
Lab #:	275680	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 5030B
Project#:	0059.007.001	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC830309	Batch#:	233783
Matrix:	Water	Analyzed:	04/06/16
Units:	ug/L		

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	1,000	941.3	94	80-120

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	107	80-132

Batch QC Report

Total Volatile Hydrocarbons			
Lab #:	275680	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 5030B
Project#:	0059.007.001	Analysis:	EPA 8015B
Field ID:	SB-1-12-GW	Batch#:	233783
MSS Lab ID:	275680-008	Sampled:	04/02/16
Matrix:	Water	Received:	04/04/16
Units:	ug/L	Analyzed:	04/06/16
Diln Fac:	1.000		

Type: MS Lab ID: QC830311

Analyte	MSS Result	Spiked	Result	%REC	Limits
Gasoline C7-C12	36.27	2,000	1,991	98	76-120

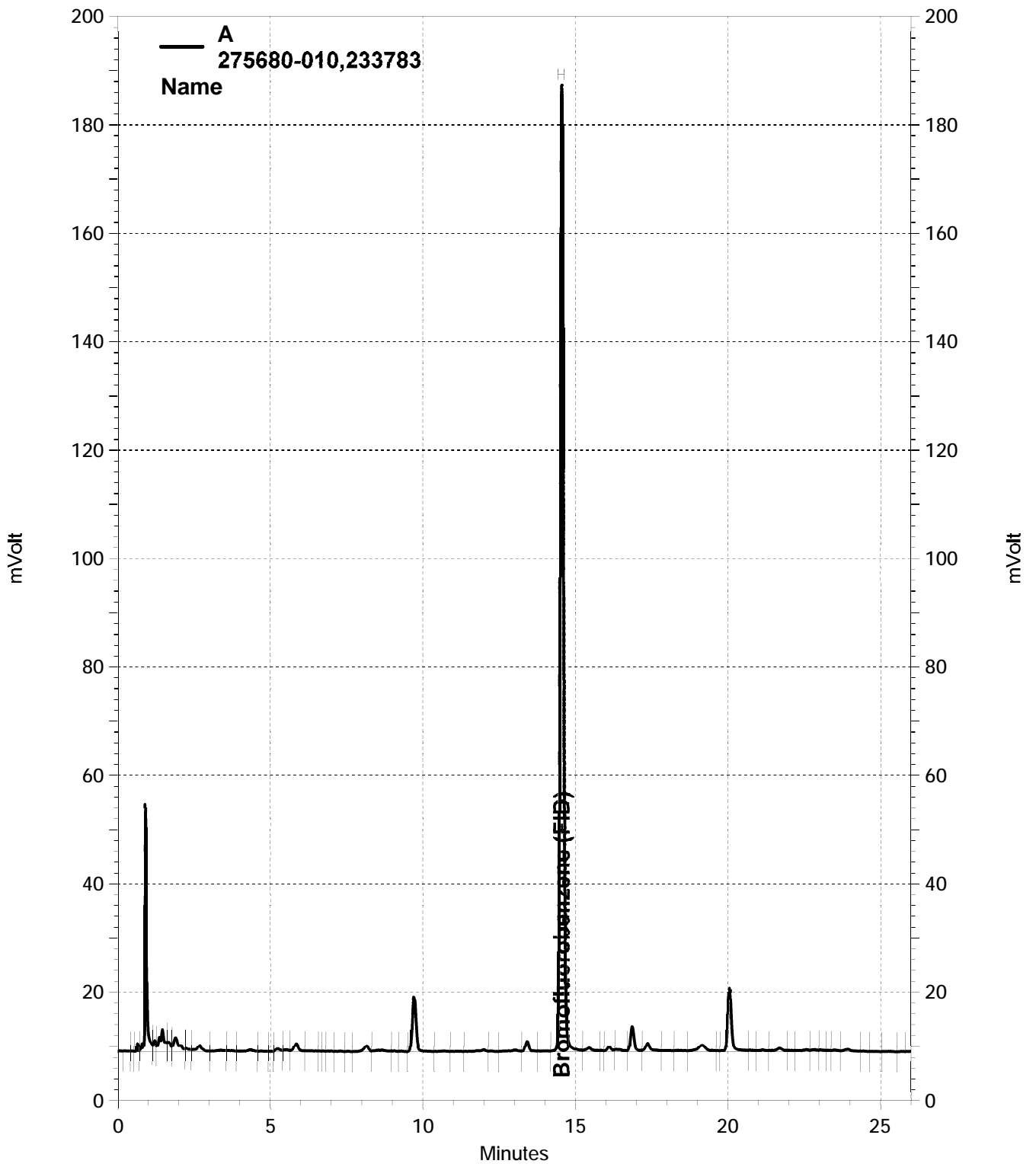
Surrogate	%REC	Limits
Bromofluorobenzene (FID)	109	80-132

Type: MSD Lab ID: QC830312

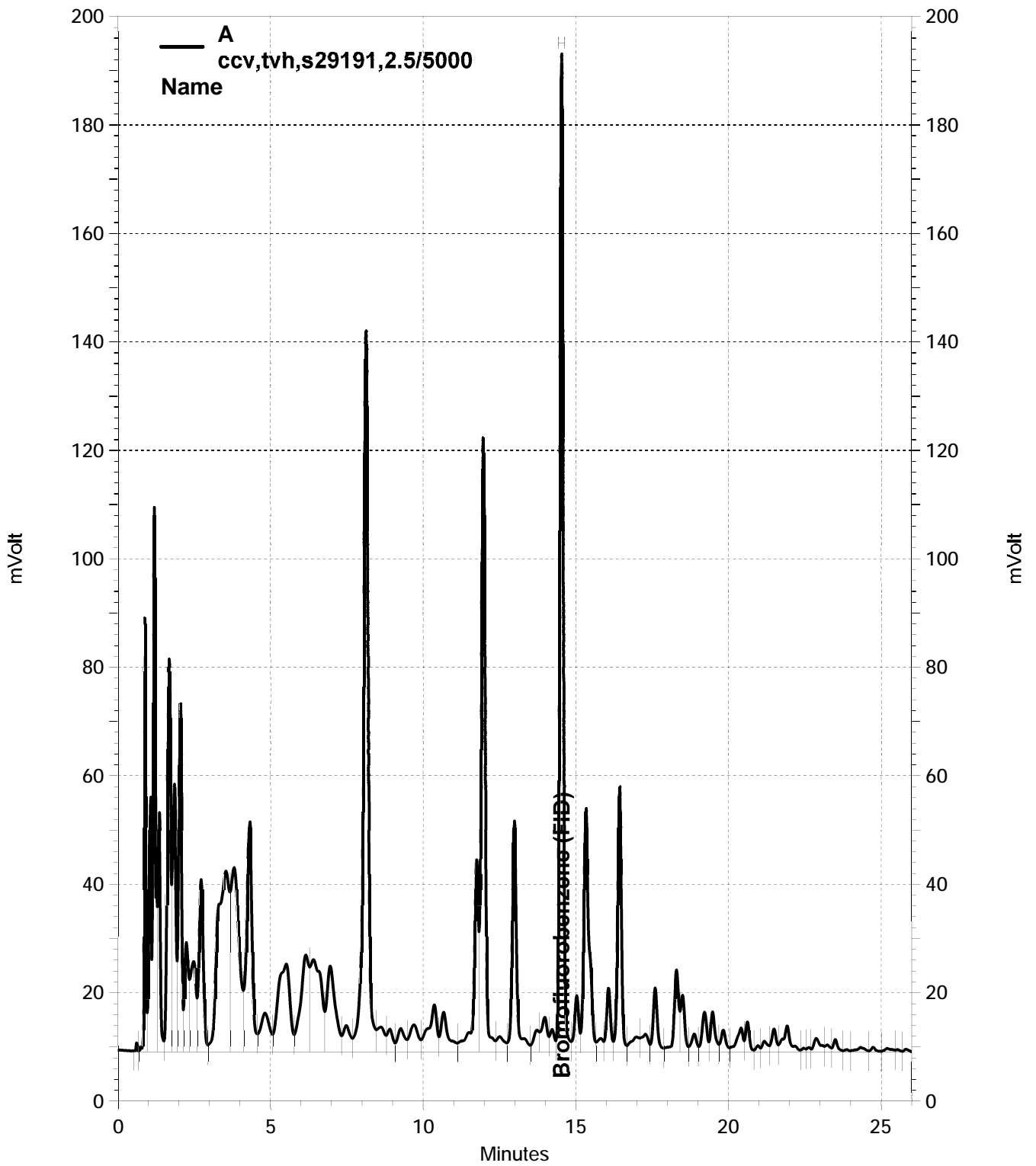
Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	2,000	2,005	98	76-120	1	20

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	106	80-132

RPD= Relative Percent Difference



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Gasoline by GC/FID (5035 Prep)

Lab #:	275680	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 5035
Project#:	0059.007.001	Analysis:	EPA 8015B
Matrix:	Soil	Diln Fac:	1.000
Units:	mg/Kg	Sampled:	04/02/16
Basis:	as received	Received:	04/04/16

Field ID:	SB-4-12	Batch#:	233749
Type:	SAMPLE	Analyzed:	04/06/16
Lab ID:	275680-012		

Analyte	Result	RL
Gasoline C7-C12	ND	0.22

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	99	78-138

Type:	BLANK	Batch#:	233749
Lab ID:	QC830153	Analyzed:	04/05/16

Analyte	Result	RL
Gasoline C7-C12	ND	0.20

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	94	78-138

Type:	BLANK	Batch#:	233835
Lab ID:	QC830520	Analyzed:	04/07/16

Analyte	Result	RL
Gasoline C7-C12	ND	0.20

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	99	78-138

ND= Not Detected
 RL= Reporting Limit
 Page 3 of 3

Batch QC Report

Gasoline by GC/FID (5035 Prep)			
Lab #:	275680	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 5035
Project#:	0059.007.001	Analysis:	EPA 8015B
Matrix:	Soil	Batch#:	233749
Units:	mg/Kg	Analyzed:	04/05/16
Diln Fac:	1.000		

Type: BS Lab ID: QC830302

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	1.000	0.8888	89	80-121

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	95	78-138

Type: BSD Lab ID: QC830303

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	2.000	1.811	91	80-121	2	20

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	97	78-138

RPD= Relative Percent Difference

Batch QC Report

Gasoline by GC/FID (5035 Prep)			
Lab #:	275680	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 5035
Project#:	0059.007.001	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC830519	Batch#:	233835
Matrix:	Soil	Analyzed:	04/07/16
Units:	mg/Kg		

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	1.000	0.9989	100	80-121

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	104	78-138

Batch QC Report

Gasoline by GC/FID (5035 Prep)			
Lab #:	275680	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 5030B
Project#:	0059.007.001	Analysis:	EPA 8015B
Field ID:	ZZZZZZZZZZ	Diln Fac:	1.000
MSS Lab ID:	275740-001	Batch#:	233835
Matrix:	Soil	Sampled:	04/06/16
Units:	mg/Kg	Received:	04/06/16
Basis:	as received	Analyzed:	04/07/16

Type: MS Lab ID: QC830521

Analyte	MSS Result	Spiked	Result	%REC	Limits
Gasoline C7-C12	0.1092	9.901	5.170	51	50-120

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	98	78-138

Type: MSD Lab ID: QC830522

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	9.709	5.340	54	50-120	5	31

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	105	78-138

RPD= Relative Percent Difference

Total Extractable Hydrocarbons			
Lab #:	275680	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 3520C
Project#:	0059.007.001	Analysis:	EPA 8015B
Matrix:	Water	Sampled:	04/02/16
Units:	ug/L	Received:	04/04/16
Diln Fac:	1.000	Prepared:	04/05/16
Batch#:	233771		

Field ID: SB-1-12-GW
 Type: SAMPLE
 Lab ID: 275680-008

Analyzed: 04/08/16
 Cleanup Method: EPA 3630C

Analyte	Result	RL
Diesel C10-C24	290 Y	54
Diesel C10-C24 (SGCU)	ND	54

Surrogate	%REC	Limits
o-Terphenyl	95	67-136
o-Terphenyl (SGCU)	84	67-136

Field ID: SB-2-12-GW
 Type: SAMPLE
 Lab ID: 275680-010

Analyzed: 04/08/16
 Cleanup Method: EPA 3630C

Analyte	Result	RL
Diesel C10-C24	180 Y	57
Diesel C10-C24 (SGCU)	ND	57

Surrogate	%REC	Limits
o-Terphenyl	99	67-136
o-Terphenyl (SGCU)	89	67-136

Field ID: SB-4-15-GW
 Type: SAMPLE
 Lab ID: 275680-013

Analyzed: 04/08/16
 Cleanup Method: EPA 3630C

Analyte	Result	RL
Diesel C10-C24	110 Y	51
Diesel C10-C24 (SGCU)	54 Y	51

Surrogate	%REC	Limits
o-Terphenyl	81	67-136
o-Terphenyl (SGCU)	80	67-136

Y= Sample exhibits chromatographic pattern which does not resemble standard
 ND= Not Detected
 RL= Reporting Limit
 SGCU= Silica gel cleanup

Total Extractable Hydrocarbons			
Lab #:	275680	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 3520C
Project#:	0059.007.001	Analysis:	EPA 8015B
Matrix:	Water	Sampled:	04/02/16
Units:	ug/L	Received:	04/04/16
Diln Fac:	1.000	Prepared:	04/05/16
Batch#:	233771		

Field ID: EB-040216 Analyzed: 04/08/16
 Type: SAMPLE Cleanup Method: EPA 3630C
 Lab ID: 275680-014

Analyte	Result	RL
Diesel C10-C24	ND	52
Diesel C10-C24 (SGCU)	ND	52

Surrogate	%REC	Limits
o-Terphenyl	87	67-136
o-Terphenyl (SGCU)	95	67-136

Type: BLANK Cleanup Method: EPA 3630C
 Lab ID: QC830243

Analyte	Result	RL	Analyzed
Diesel C10-C24	ND	50	04/08/16
Diesel C10-C24 (SGCU)	ND	50	04/07/16

Surrogate	%REC	Limits	Analyzed
o-Terphenyl	95	67-136	04/08/16
o-Terphenyl (SGCU)	84	67-136	04/07/16

Y= Sample exhibits chromatographic pattern which does not resemble standard
 ND= Not Detected
 RL= Reporting Limit
 SGCU= Silica gel cleanup

Batch QC Report

Total Extractable Hydrocarbons			
Lab #:	275680	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 3520C
Project#:	0059.007.001	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC830244	Batch#:	233771
Matrix:	Water	Prepared:	04/05/16
Units:	ug/L	Analyzed:	04/07/16

Cleanup Method: EPA 3630C

Analyte	Spiked	Result	%REC	Limits
Diesel C10-C24	2,500	2,242	90	60-121
Diesel C10-C24 (SGCU)	2,500	1,738	70	60-121

Surrogate	%REC	Limits
o-Terphenyl	111	67-136
o-Terphenyl (SGCU)	90	67-136

SGCU= Silica gel cleanup

Batch QC Report

Total Extractable Hydrocarbons			
Lab #:	275680	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 3520C
Project#:	0059.007.001	Analysis:	EPA 8015B
Field ID:	ZZZZZZZZZZ	Batch#:	233771
MSS Lab ID:	275492-001	Sampled:	03/28/16
Matrix:	Water	Received:	03/28/16
Units:	ug/L	Prepared:	04/05/16
Diln Fac:	1.000	Analyzed:	04/07/16

Type: MS Cleanup Method: EPA 3630C
 Lab ID: QC830245

Analyte	MSS Result	Spiked	Result	%REC	Limits
Diesel C10-C24 (SGCU)	93.28	2,451	2,131	83	55-122

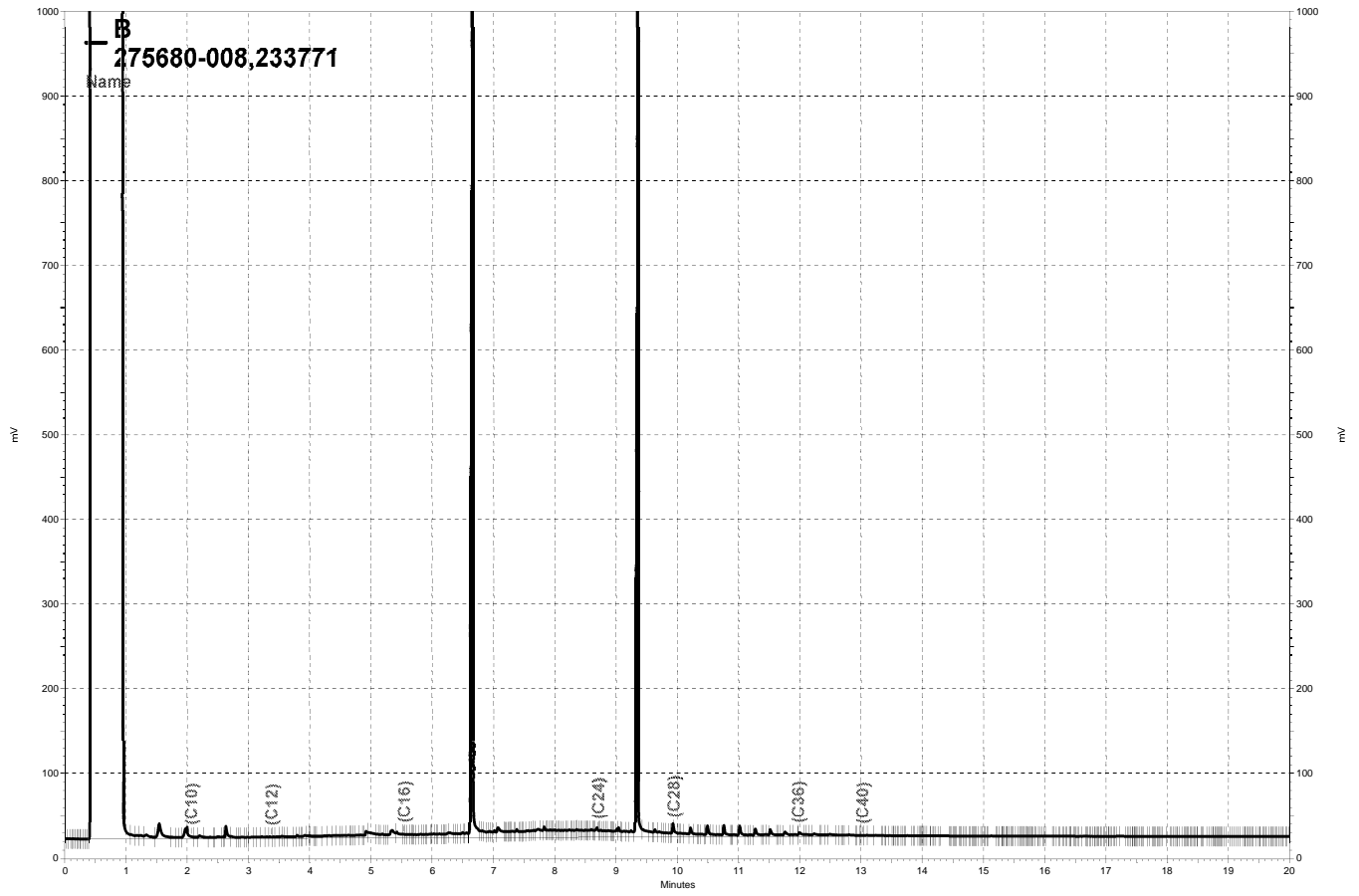
Surrogate	%REC	Limits
o-Terphenyl (SGCU)	104	67-136

Type: MSD Cleanup Method: EPA 3630C
 Lab ID: QC830246

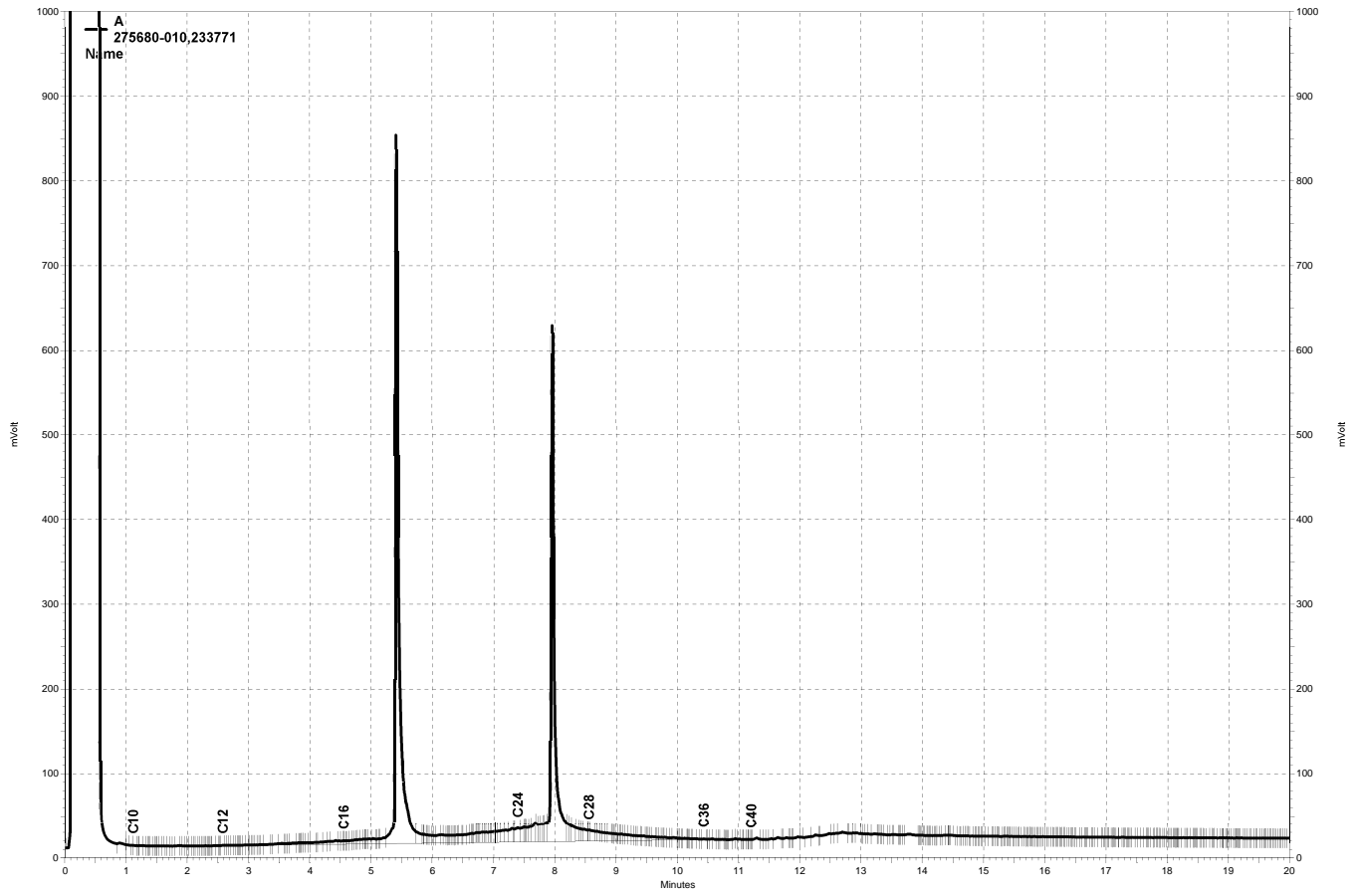
Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Diesel C10-C24 (SGCU)	2,500	2,064	79	55-122	5	53

Surrogate	%REC	Limits
o-Terphenyl (SGCU)	98	67-136

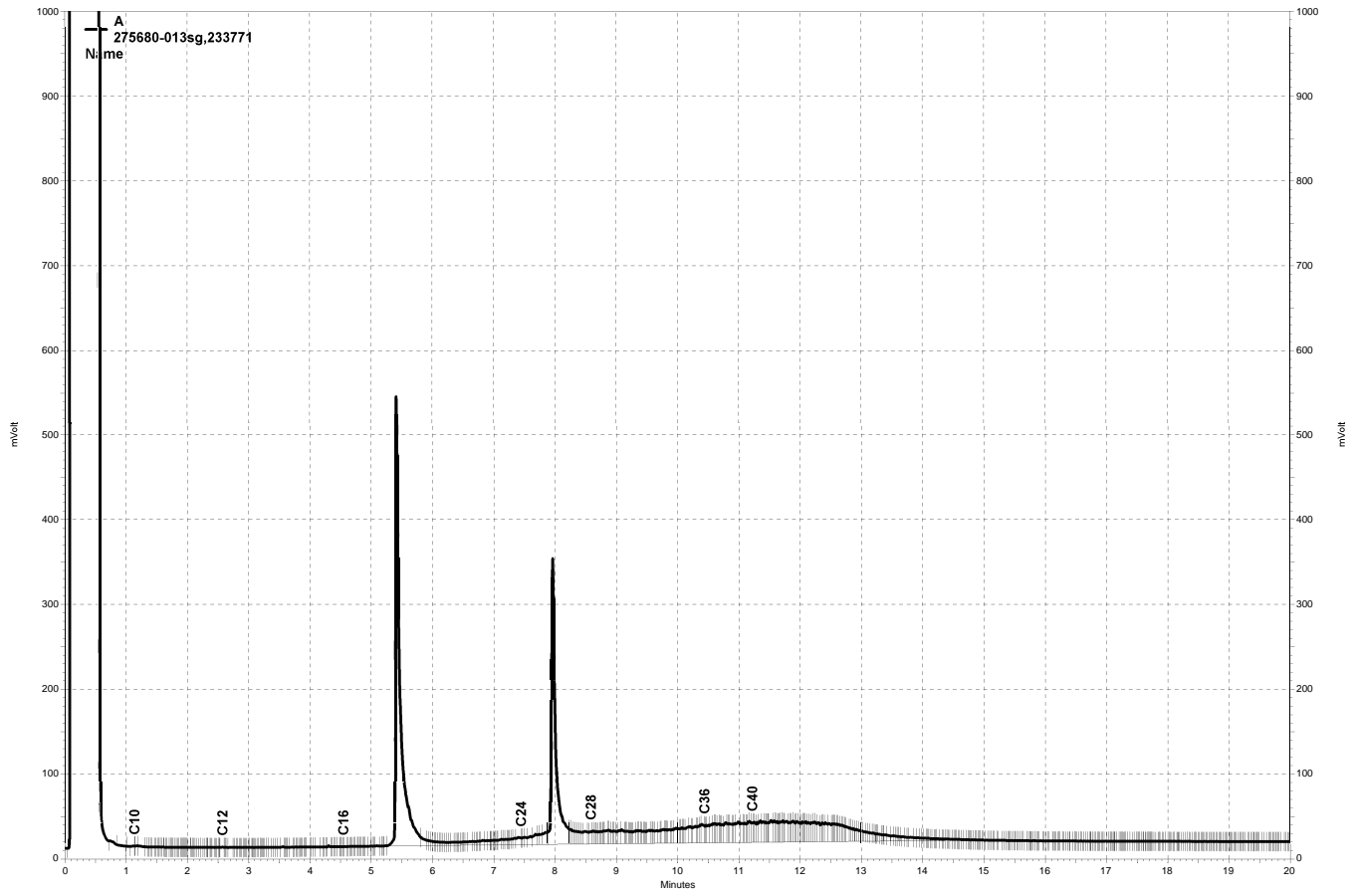
RPD= Relative Percent Difference
 SGCU= Silica gel cleanup



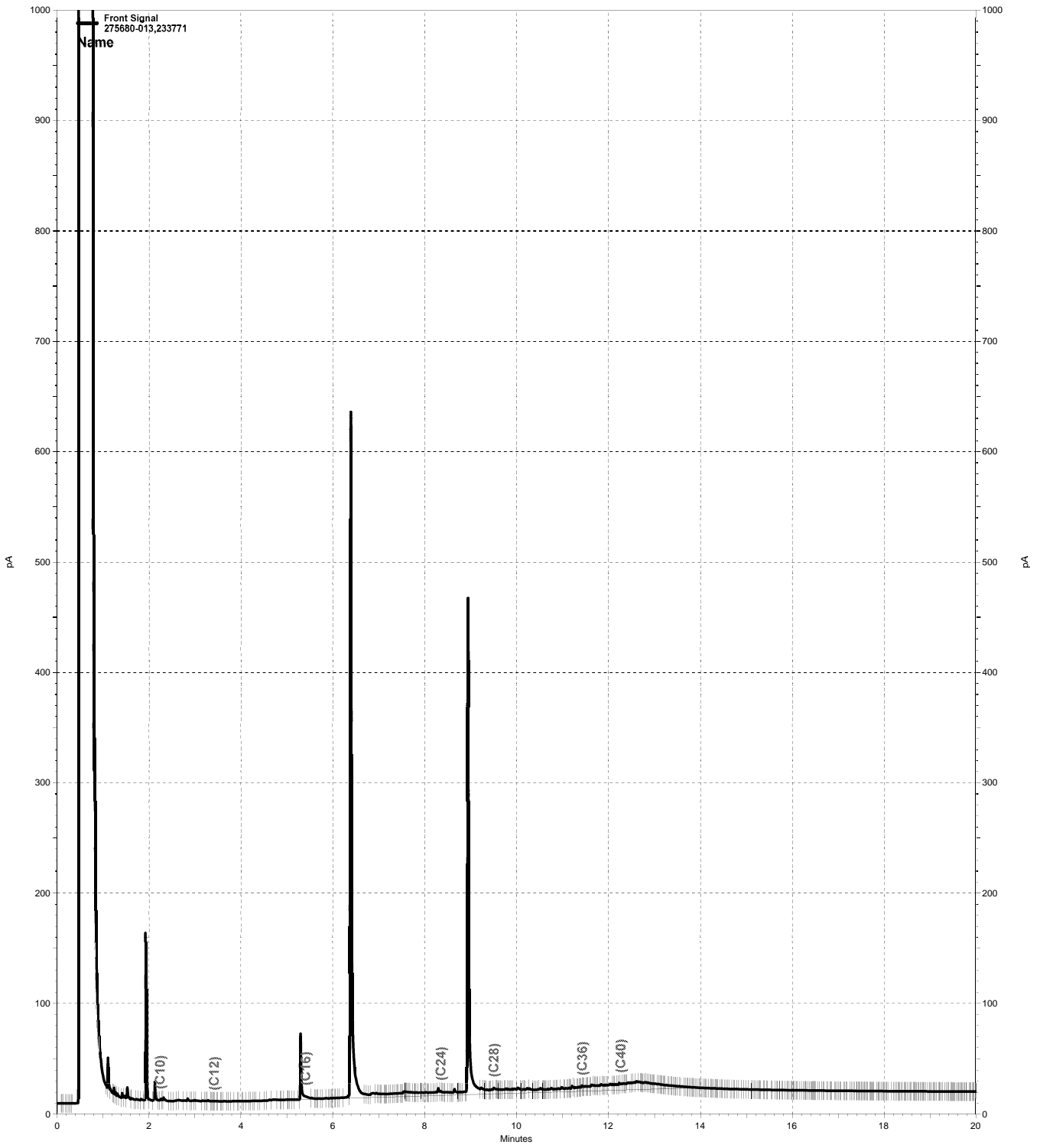
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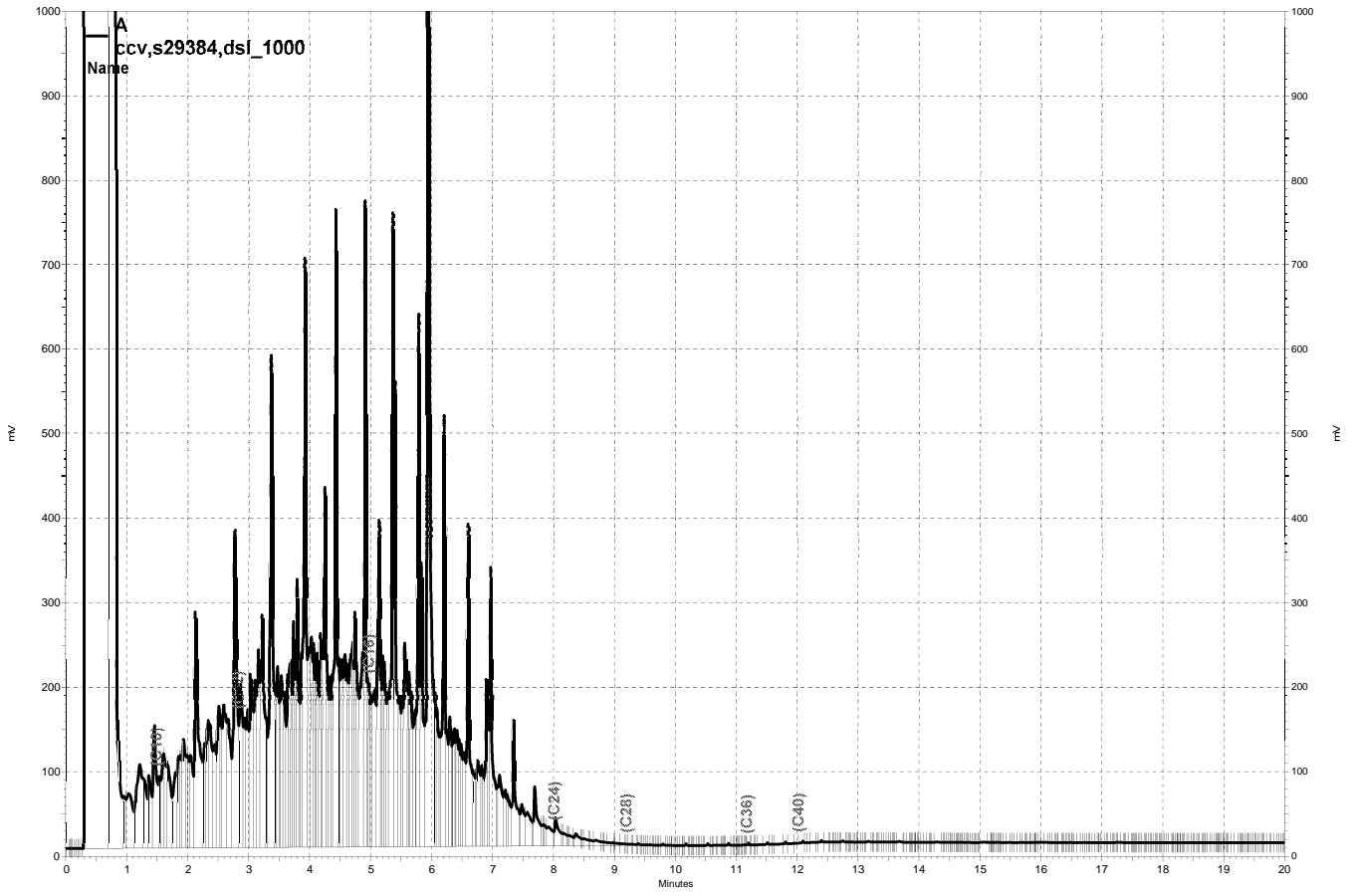
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Total Extractable Hydrocarbons			
Lab #:	275680	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 3550B
Project#:	0059.007.001	Analysis:	EPA 8015B
Matrix:	Soil	Sampled:	04/02/16
Units:	mg/Kg	Received:	04/04/16
Basis:	as received	Prepared:	04/06/16
Batch#:	233824		

Field ID: SB-1-3
 Type: SAMPLE
 Lab ID: 275680-001

Analyzed: 04/07/16
 Cleanup Method: EPA 3630C

Analyte	Result	RL	Diln Fac
Diesel C10-C24	24 Y	20	20.00
Diesel C10-C24 (SGCU)	50 Y	1.0	1.000

Surrogate	%REC	Limits	Diln Fac
o-Terphenyl	DO	59-140	20.00
o-Terphenyl (SGCU)	66	59-140	1.000

Field ID: SB-1-6
 Type: SAMPLE
 Lab ID: 275680-002

Diln Fac: 1.000
 Analyzed: 04/07/16
 Cleanup Method: EPA 3630C

Analyte	Result	RL
Diesel C10-C24	ND	1.0
Diesel C10-C24 (SGCU)	ND	1.0

Surrogate	%REC	Limits
o-Terphenyl	100	59-140
o-Terphenyl (SGCU)	71	59-140

Field ID: SB-1-9
 Type: SAMPLE
 Lab ID: 275680-003

Diln Fac: 1.000
 Analyzed: 04/07/16
 Cleanup Method: EPA 3630C

Analyte	Result	RL
Diesel C10-C24	1.7 Y	0.99
Diesel C10-C24 (SGCU)	ND	0.99

Surrogate	%REC	Limits
o-Terphenyl	131	59-140
o-Terphenyl (SGCU)	92	59-140

Y= Sample exhibits chromatographic pattern which does not resemble standard
 DO= Diluted Out
 ND= Not Detected
 RL= Reporting Limit
 SGCU= Silica gel cleanup

Total Extractable Hydrocarbons			
Lab #:	275680	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 3550B
Project#:	0059.007.001	Analysis:	EPA 8015B
Matrix:	Soil	Sampled:	04/02/16
Units:	mg/Kg	Received:	04/04/16
Basis:	as received	Prepared:	04/06/16
Batch#:	233824		

Field ID: SB-4-2 Analyzed: 04/07/16
 Type: SAMPLE Cleanup Method: EPA 3630C
 Lab ID: 275680-009

Analyte	Result	RL	Diln Fac
Diesel C10-C24	61 Y	10	10.00
Diesel C10-C24 (SGCU)	96 Y	1.0	1.000

Surrogate	%REC	Limits	Diln Fac
o-Terphenyl	DO	59-140	10.00
o-Terphenyl (SGCU)	60	59-140	1.000

Field ID: SB-4-9 Diln Fac: 1.000
 Type: SAMPLE Analyzed: 04/07/16
 Lab ID: 275680-011 Cleanup Method: EPA 3630C

Analyte	Result	RL
Diesel C10-C24	1.2 Y	1.0
Diesel C10-C24 (SGCU)	ND	1.0

Surrogate	%REC	Limits
o-Terphenyl	122	59-140
o-Terphenyl (SGCU)	94	59-140

Field ID: SB-4-12 Diln Fac: 1.000
 Type: SAMPLE Analyzed: 04/07/16
 Lab ID: 275680-012 Cleanup Method: EPA 3630C

Analyte	Result	RL
Diesel C10-C24	4.4 Y	0.99
Diesel C10-C24 (SGCU)	3.6 Y	0.99

Surrogate	%REC	Limits
o-Terphenyl	137	59-140
o-Terphenyl (SGCU)	103	59-140

Y= Sample exhibits chromatographic pattern which does not resemble standard
 DO= Diluted Out
 ND= Not Detected
 RL= Reporting Limit
 SGCU= Silica gel cleanup

Total Extractable Hydrocarbons			
Lab #:	275680	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 3550B
Project#:	0059.007.001	Analysis:	EPA 8015B
Matrix:	Soil	Sampled:	04/02/16
Units:	mg/Kg	Received:	04/04/16
Basis:	as received	Prepared:	04/06/16
Batch#:	233824		

Type: BLANK Analyzed: 04/07/16
 Lab ID: QC830477 Cleanup Method: EPA 3630C
 Diln Fac: 1.000

Analyte	Result	RL
Diesel C10-C24	ND	1.0
Diesel C10-C24 (SGCU)	ND	1.0

Surrogate	%REC	Limits
o-Terphenyl	115	59-140
o-Terphenyl (SGCU)	69	59-140

Y= Sample exhibits chromatographic pattern which does not resemble standard
 DO= Diluted Out
 ND= Not Detected
 RL= Reporting Limit
 SGCU= Silica gel cleanup

Batch QC Report

Total Extractable Hydrocarbons			
Lab #:	275680	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 3550B
Project#:	0059.007.001	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC830478	Batch#:	233824
Matrix:	Soil	Prepared:	04/06/16
Units:	mg/Kg	Analyzed:	04/07/16

Cleanup Method: EPA 3630C

Analyte	Spiked	Result	%REC	Limits
Diesel C10-C24	49.98	55.62	111	58-137
Diesel C10-C24 (SGCU)	49.98	33.28	67	58-137

Surrogate	%REC	Limits
o-Terphenyl	112	59-140
o-Terphenyl (SGCU)	66	59-140

SGCU= Silica gel cleanup

Batch QC Report

Total Extractable Hydrocarbons			
Lab #:	275680	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 3550B
Project#:	0059.007.001	Analysis:	EPA 8015B
Field ID:	ZZZZZZZZZZ	Batch#:	233824
MSS Lab ID:	275694-001	Sampled:	04/04/16
Matrix:	Soil	Received:	04/04/16
Units:	mg/Kg	Prepared:	04/06/16
Basis:	as received	Analyzed:	04/08/16
Diln Fac:	1.000		

Type: MS Lab ID: QC830479

Analyte	MSS Result	Spiked	Result	%REC	Limits
Diesel C10-C24	17.26	49.87	63.88	93	46-154

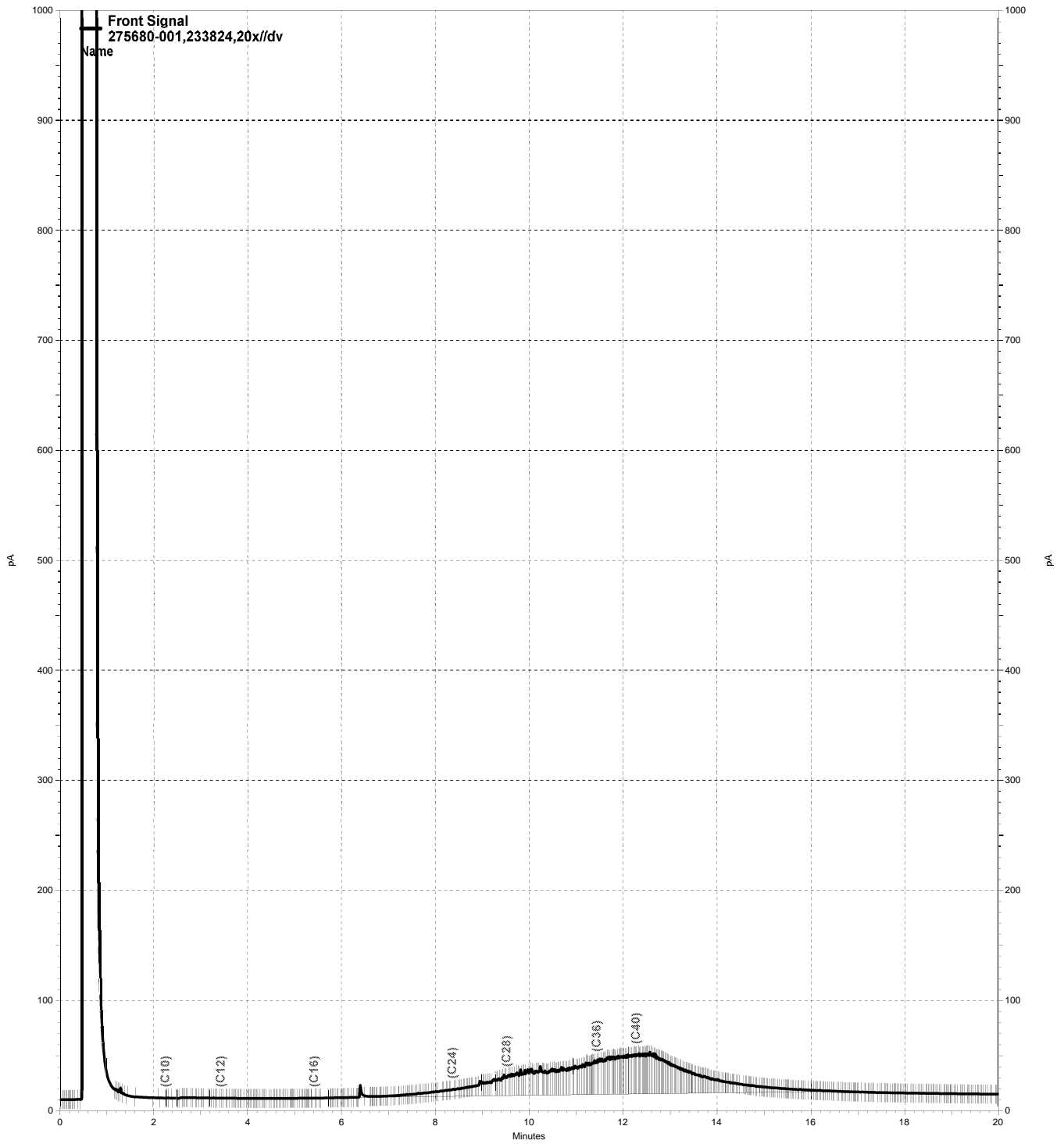
Surrogate	%REC	Limits
o-Terphenyl	99	59-140

Type: MSD Lab ID: QC830480

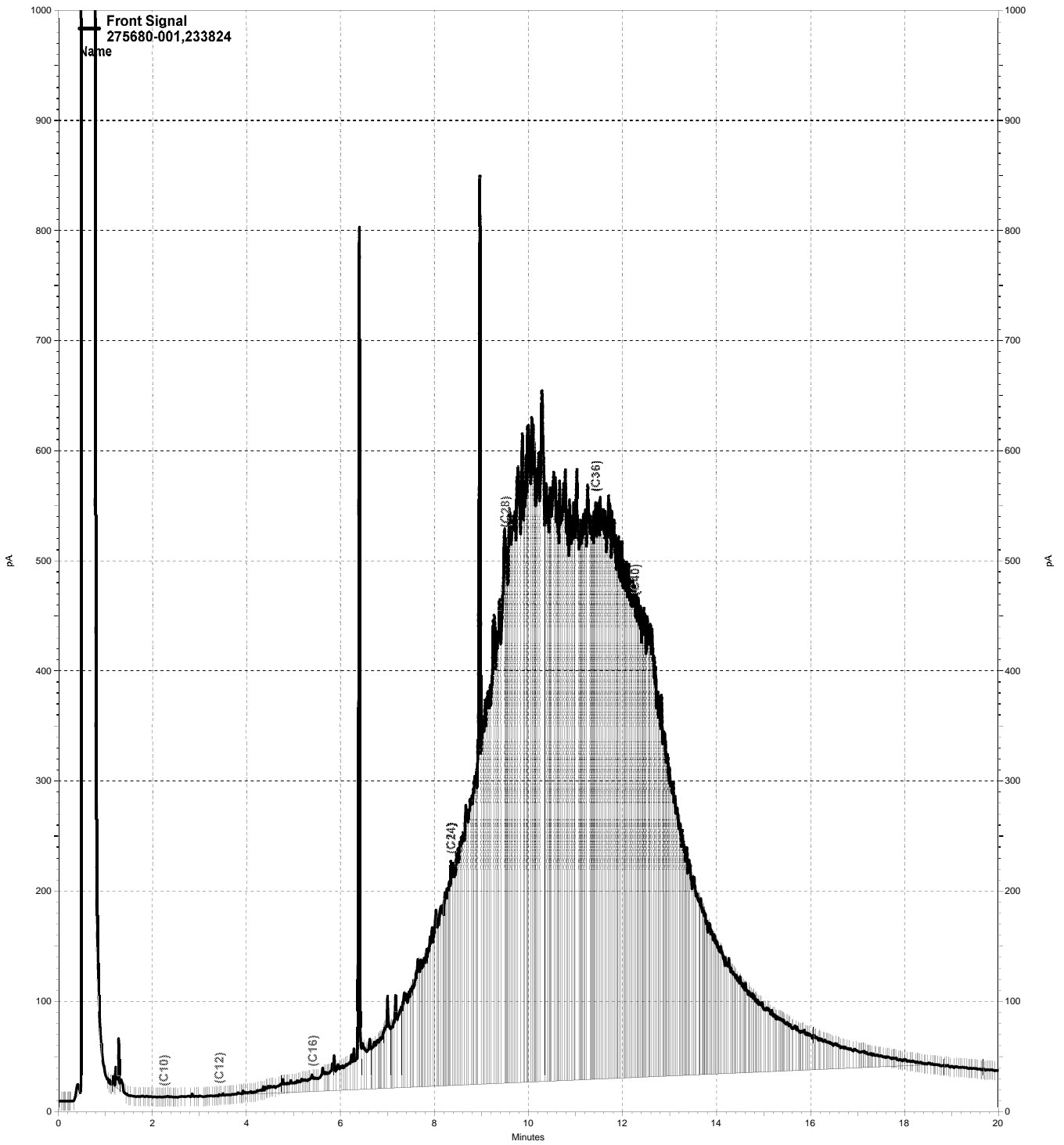
Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Diesel C10-C24	50.06	43.74	53	46-154	38	50

Surrogate	%REC	Limits
o-Terphenyl	79	59-140

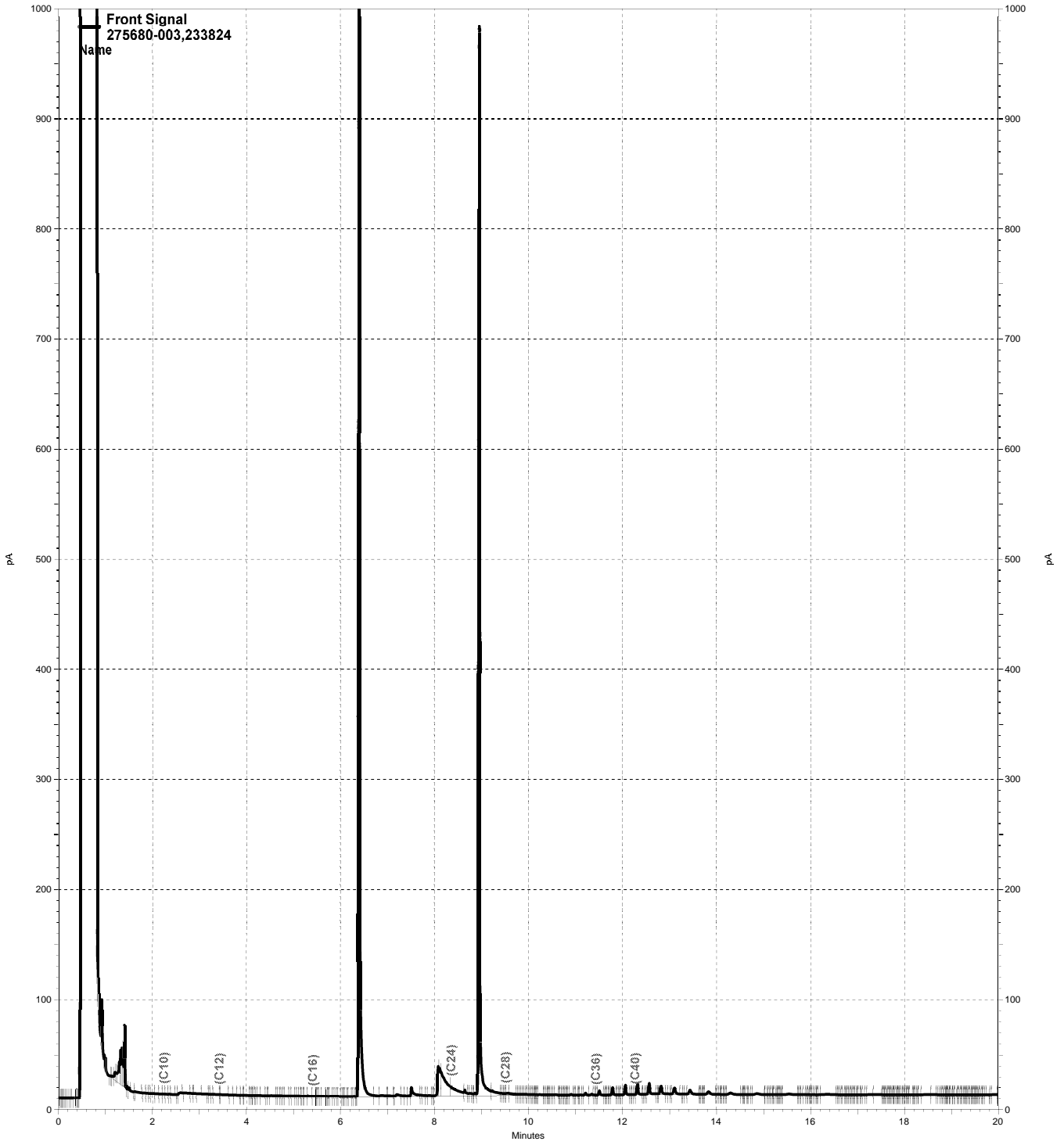
RPD= Relative Percent Difference



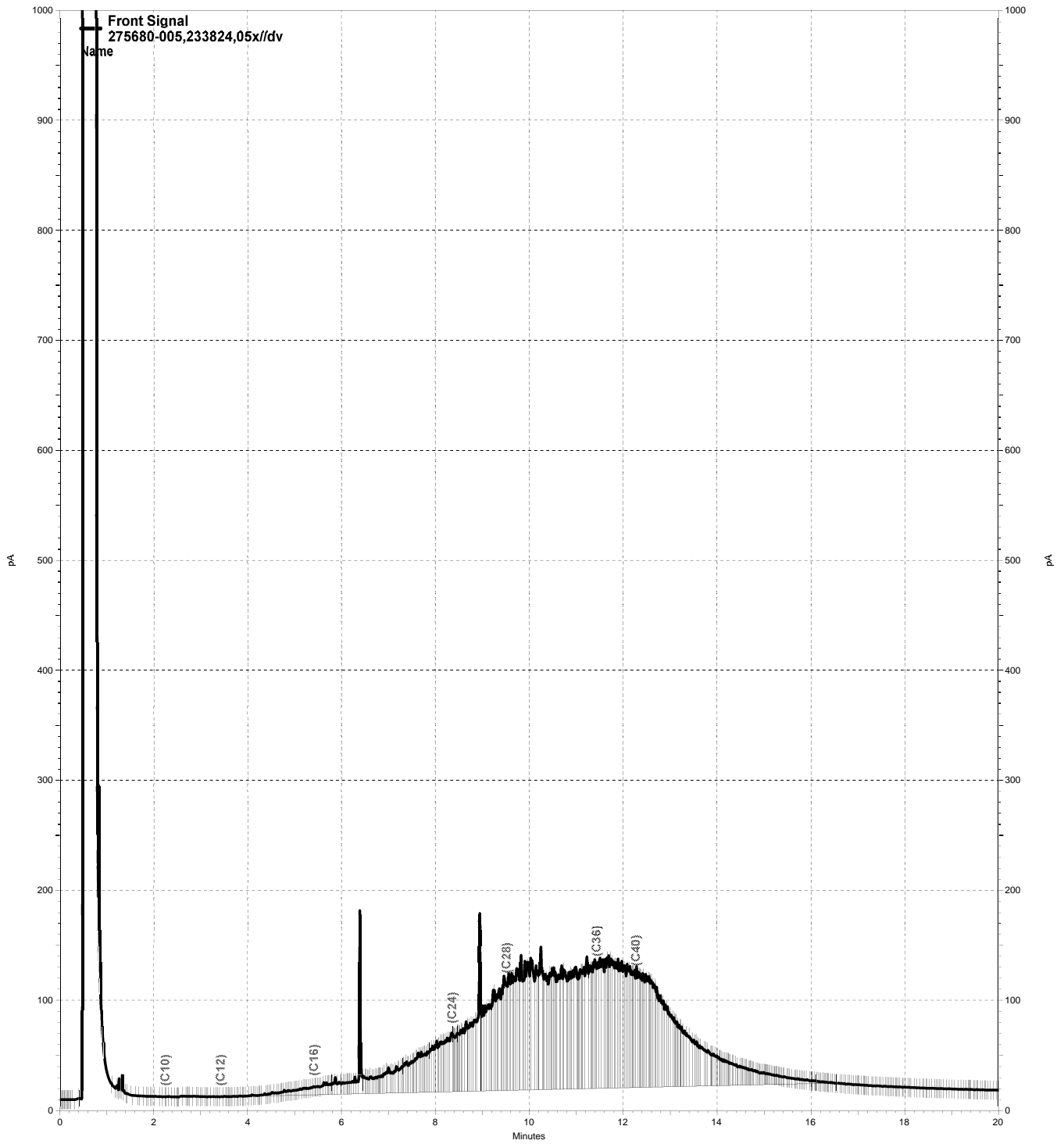
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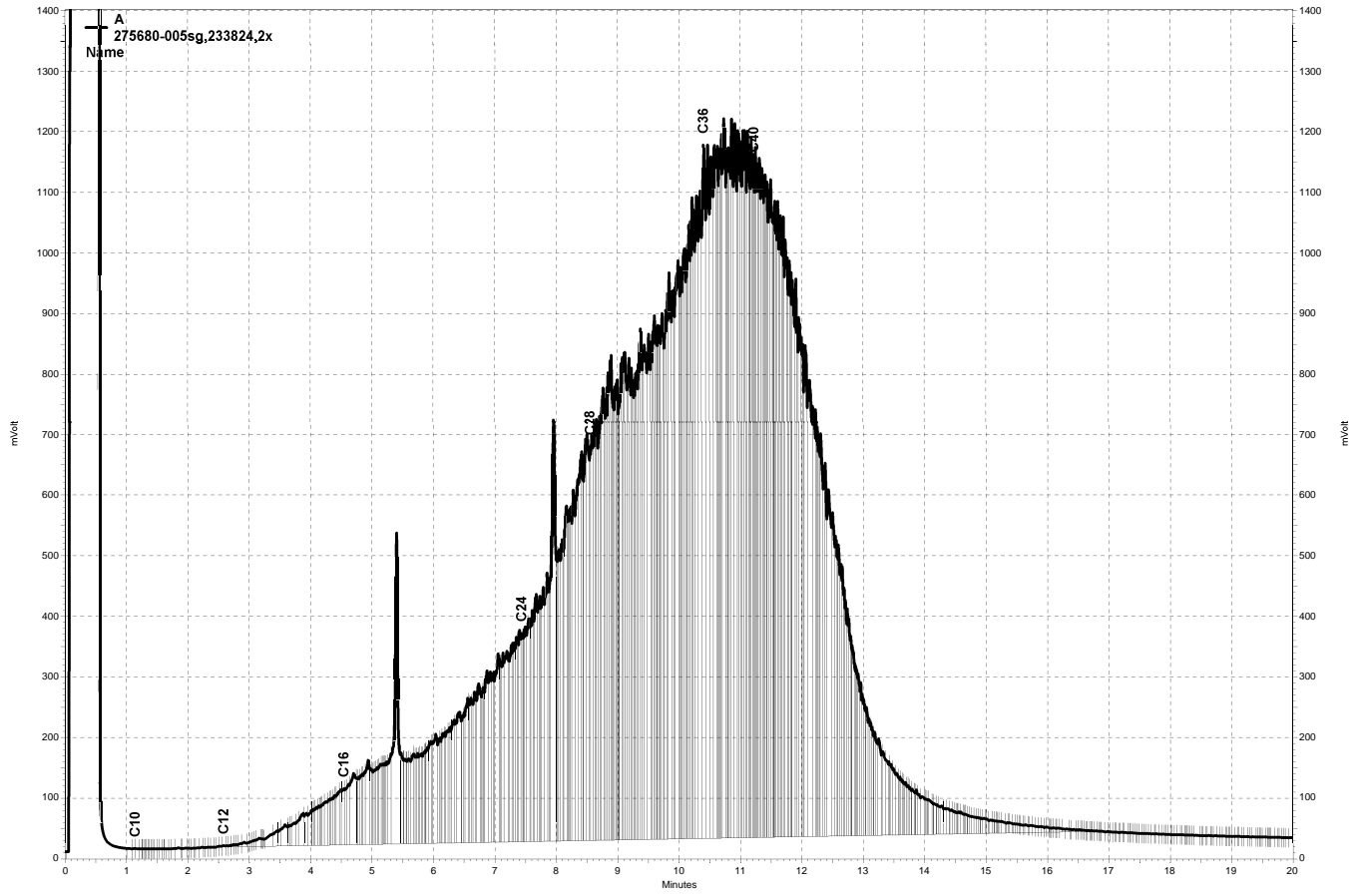
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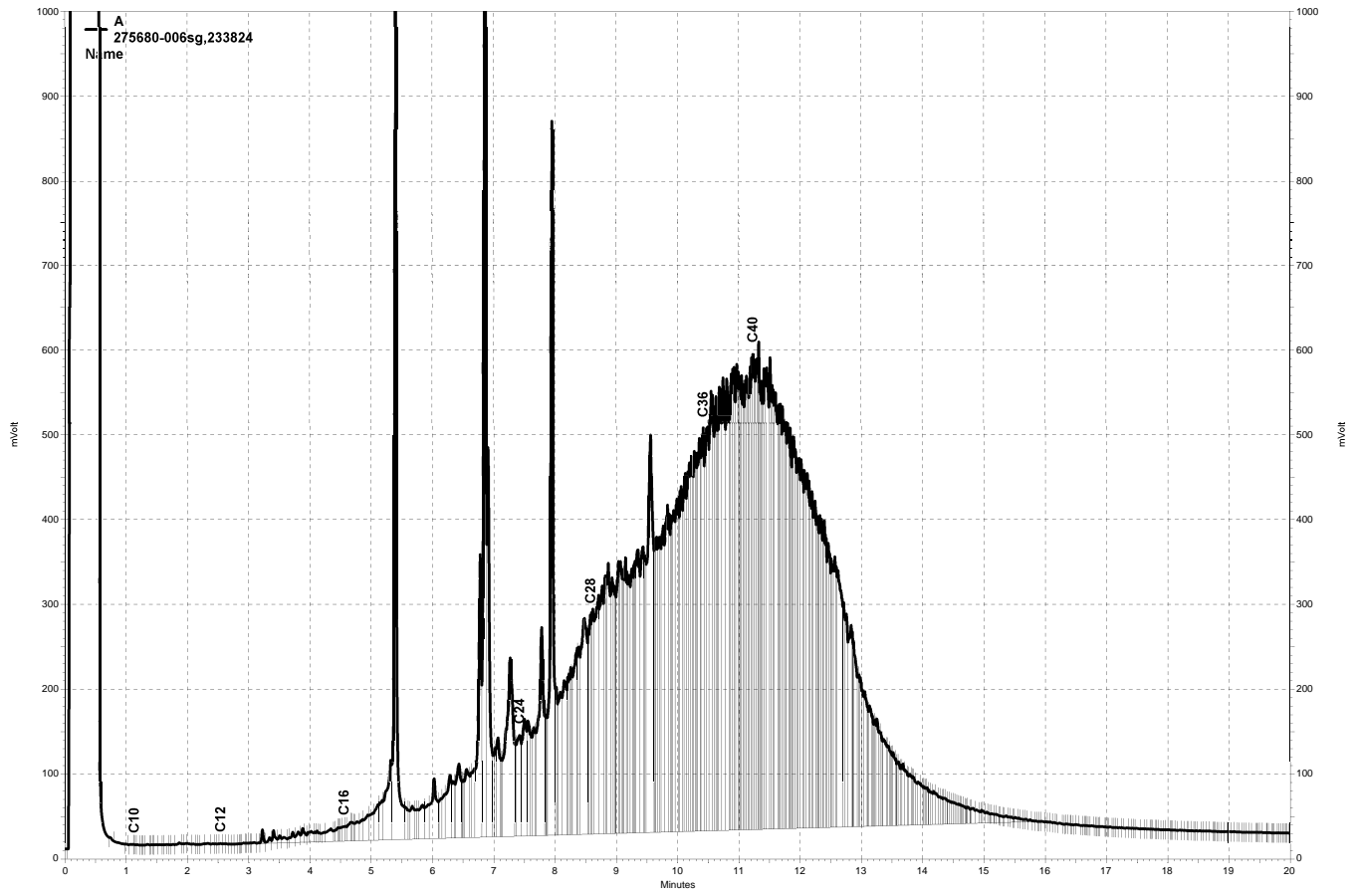
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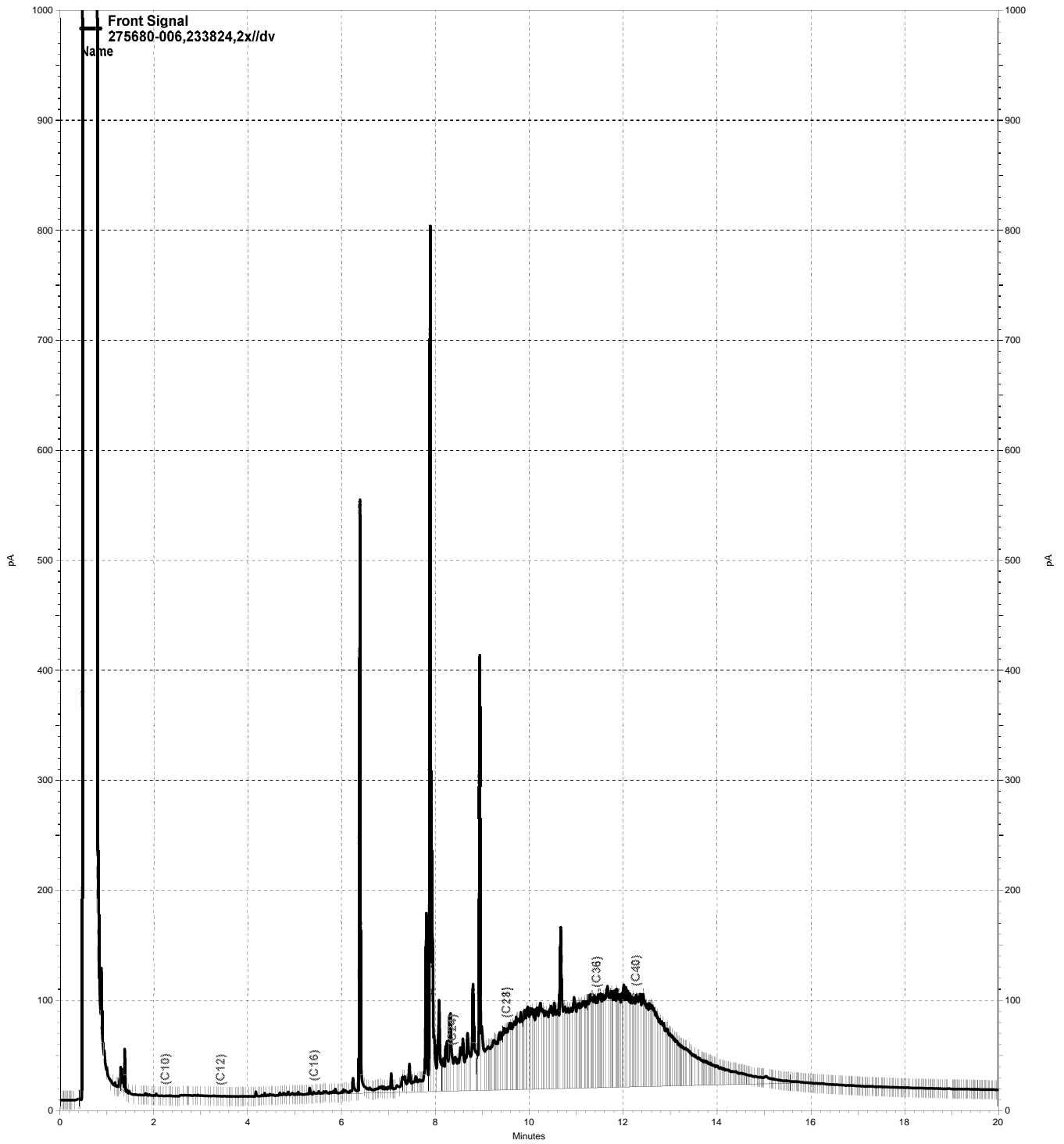
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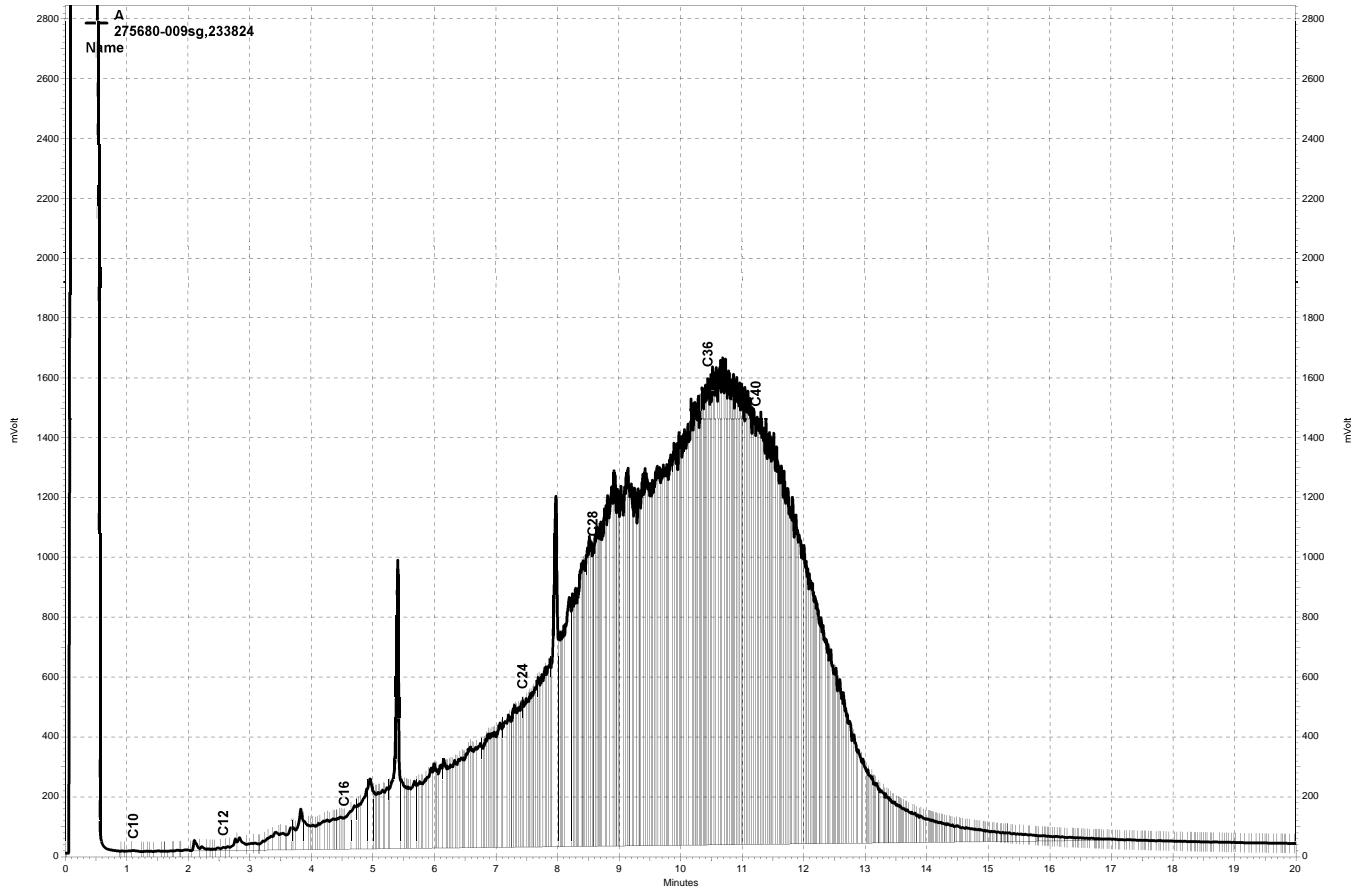
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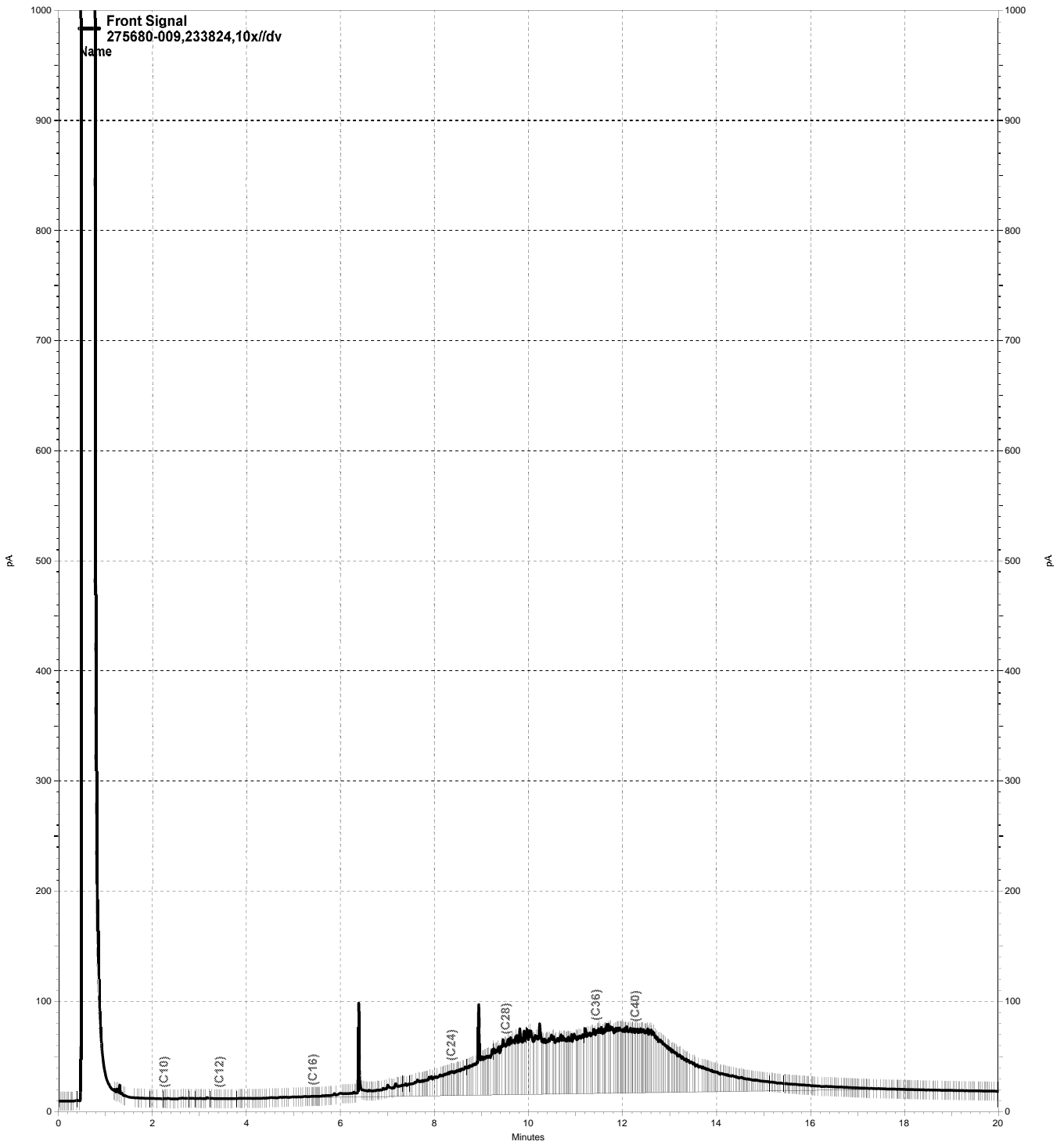
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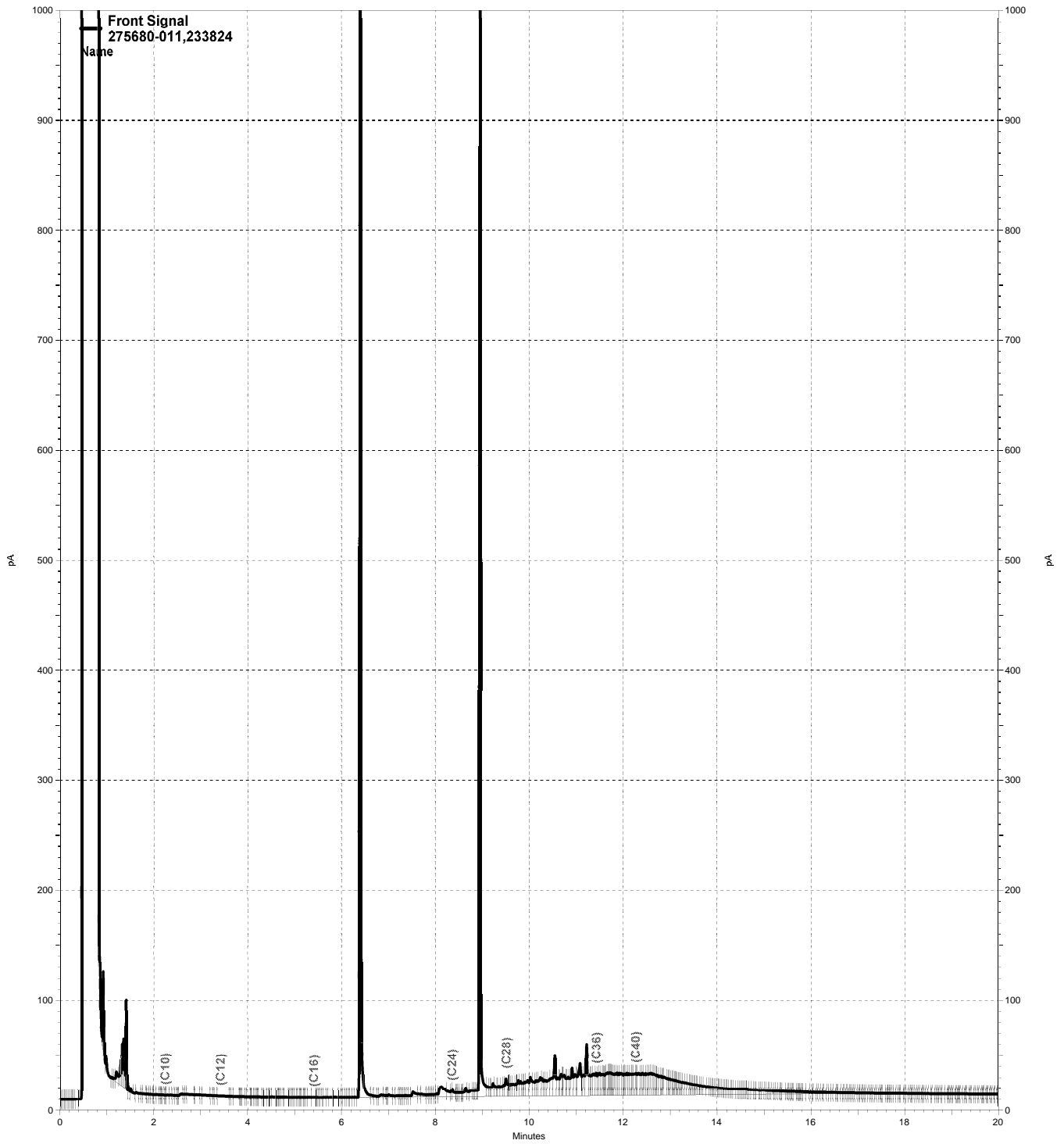
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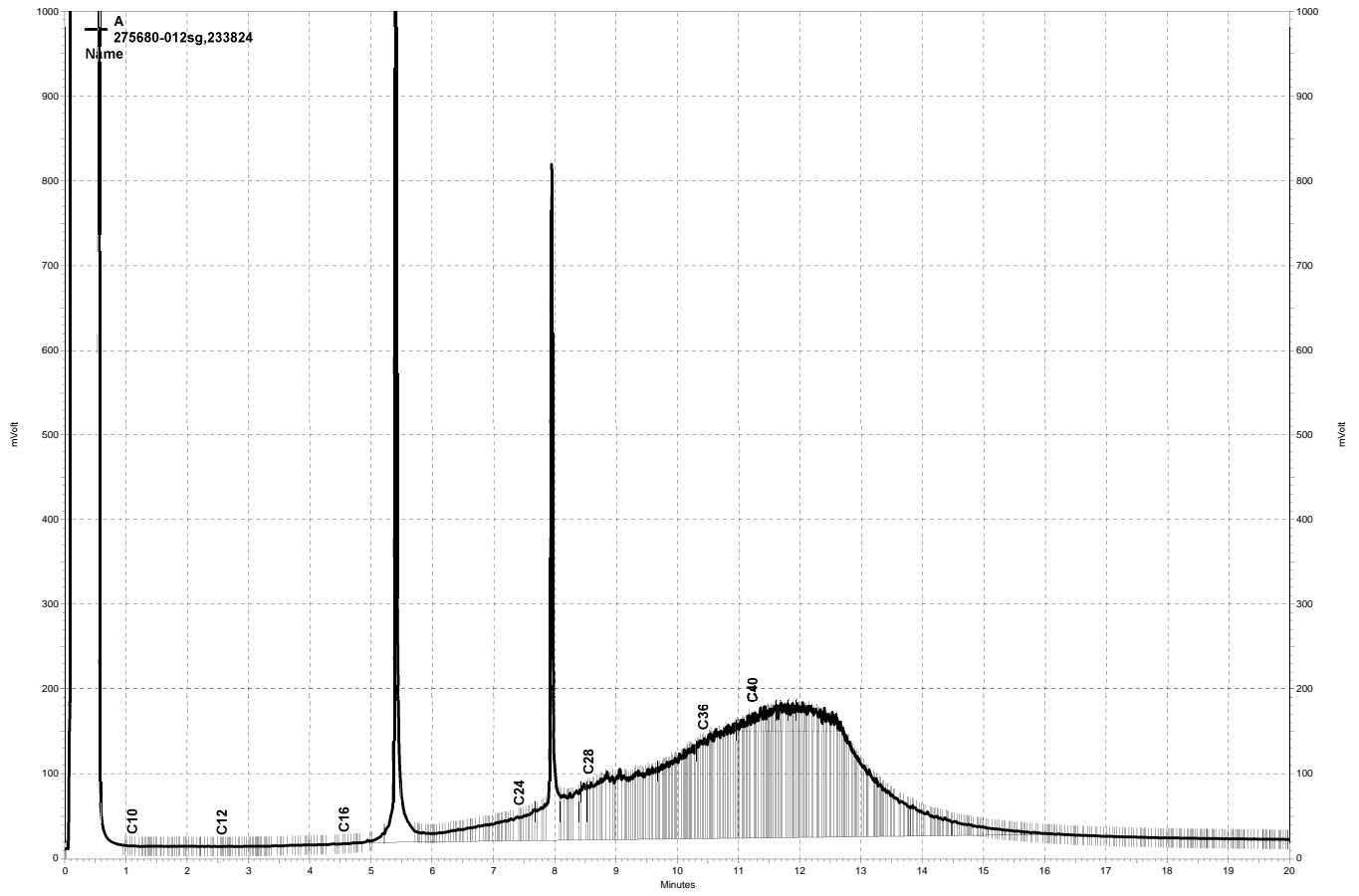
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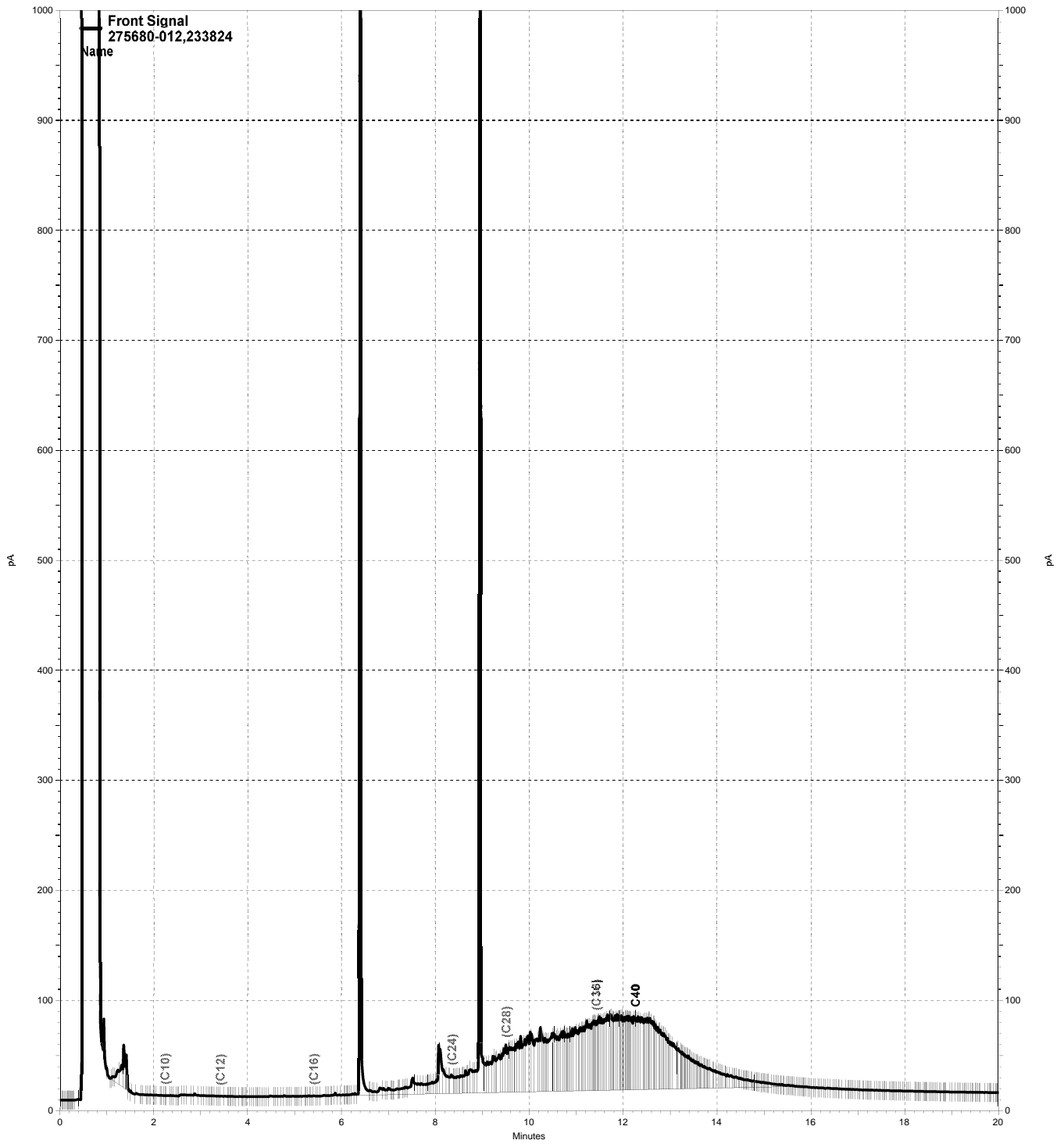
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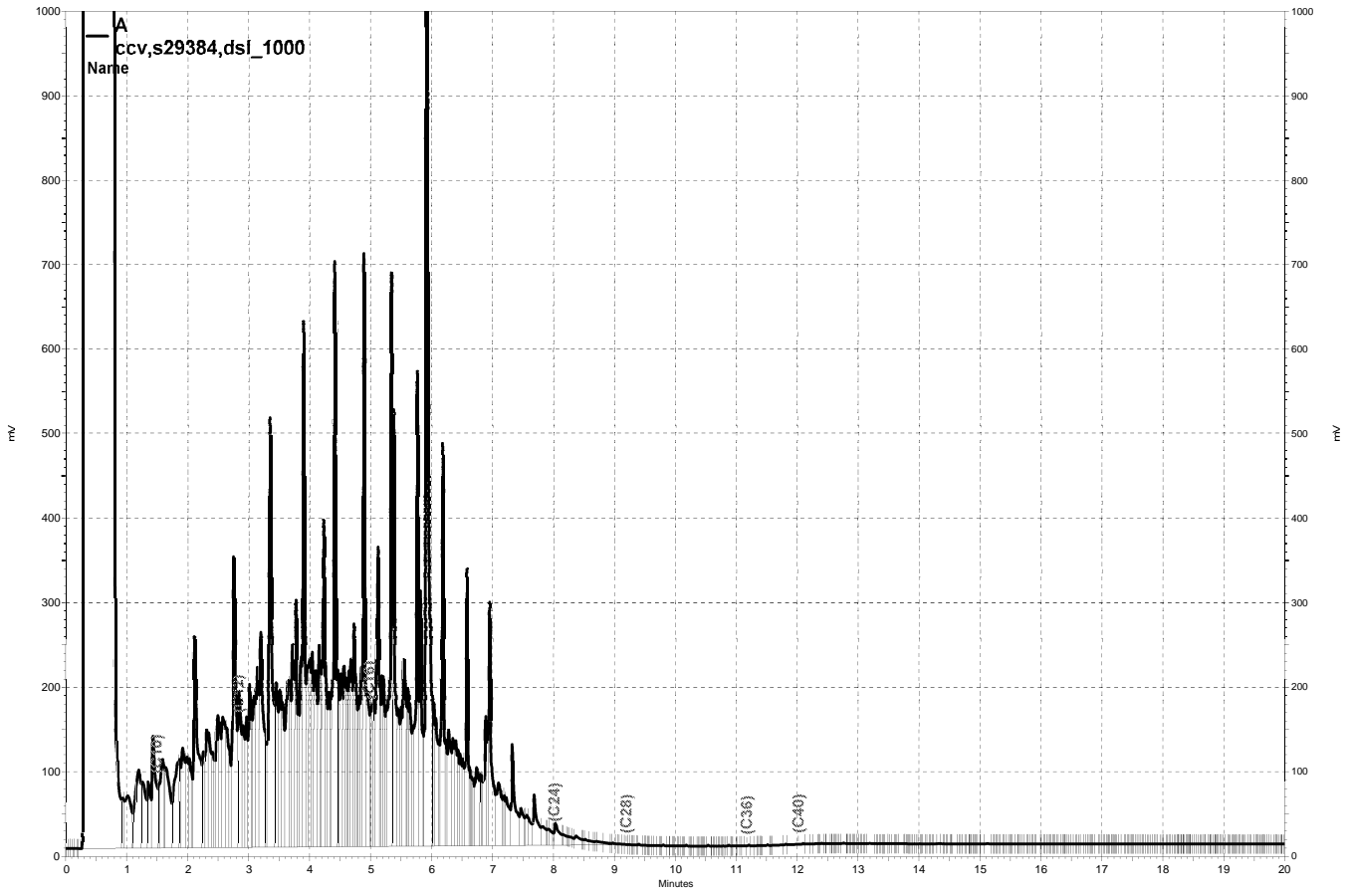
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— \\lms\gdrive\ezchrom\Projects\GC27\Data\098a016.dat, Front Signal



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Purgeable Aromatics by GC/MS

Lab #:	275680	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 5030B
Project#:	0059.007.001	Analysis:	EPA 8260B
Field ID:	SB-1-12-GW	Batch#:	233790
Lab ID:	275680-008	Sampled:	04/02/16
Matrix:	Water	Received:	04/04/16
Units:	ug/L	Analyzed:	04/06/16
Diln Fac:	1.000		

Analyte	Result	RL
MTBE	ND	0.5
Benzene	ND	0.5
Toluene	ND	0.5
Ethylbenzene	ND	0.5
m,p-Xylenes	ND	0.5
o-Xylene	ND	0.5
Naphthalene	ND	2.0

Surrogate	%REC	Limits
Dibromofluoromethane	105	80-128
1,2-Dichloroethane-d4	98	75-139
Toluene-d8	97	80-120
Bromofluorobenzene	101	80-120

ND= Not Detected
 RL= Reporting Limit

Purgeable Aromatics by GC/MS

Lab #:	275680	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 5030B
Project#:	0059.007.001	Analysis:	EPA 8260B
Field ID:	SB-2-12-GW	Batch#:	233790
Lab ID:	275680-010	Sampled:	04/02/16
Matrix:	Water	Received:	04/04/16
Units:	ug/L	Analyzed:	04/06/16
Diln Fac:	1.000		

Analyte	Result	RL
MTBE	ND	0.5
Benzene	ND	0.5
Toluene	ND	0.5
Ethylbenzene	ND	0.5
m,p-Xylenes	ND	0.5
o-Xylene	ND	0.5
Naphthalene	ND	2.0

Surrogate	%REC	Limits
Dibromofluoromethane	106	80-128
1,2-Dichloroethane-d4	99	75-139
Toluene-d8	97	80-120
Bromofluorobenzene	100	80-120

ND= Not Detected
 RL= Reporting Limit

Purgeable Aromatics by GC/MS

Lab #:	275680	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 5030B
Project#:	0059.007.001	Analysis:	EPA 8260B
Field ID:	SB-4-15-GW	Batch#:	233790
Lab ID:	275680-013	Sampled:	04/02/16
Matrix:	Water	Received:	04/04/16
Units:	ug/L	Analyzed:	04/06/16
Diln Fac:	1.000		

Analyte	Result	RL
MTBE	ND	0.5
Benzene	ND	0.5
Toluene	ND	0.5
Ethylbenzene	ND	0.5
m,p-Xylenes	ND	0.5
o-Xylene	ND	0.5
Naphthalene	ND	2.0

Surrogate	%REC	Limits
Dibromofluoromethane	106	80-128
1,2-Dichloroethane-d4	99	75-139
Toluene-d8	97	80-120
Bromofluorobenzene	100	80-120

ND= Not Detected
 RL= Reporting Limit

Purgeable Aromatics by GC/MS

Lab #:	275680	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 5030B
Project#:	0059.007.001	Analysis:	EPA 8260B
Field ID:	EB-040216	Batch#:	233790
Lab ID:	275680-014	Sampled:	04/02/16
Matrix:	Water	Received:	04/04/16
Units:	ug/L	Analyzed:	04/06/16
Diln Fac:	1.000		

Analyte	Result	RL
MTBE	ND	0.5
Benzene	ND	0.5
Toluene	ND	0.5
Ethylbenzene	ND	0.5
m,p-Xylenes	ND	0.5
o-Xylene	ND	0.5
Naphthalene	ND	2.0

Surrogate	%REC	Limits
Dibromofluoromethane	107	80-128
1,2-Dichloroethane-d4	98	75-139
Toluene-d8	97	80-120
Bromofluorobenzene	101	80-120

ND= Not Detected
 RL= Reporting Limit

Purgeable Aromatics by GC/MS

Lab #:	275680	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 5030B
Project#:	0059.007.001	Analysis:	EPA 8260B
Field ID:	TB-040216	Batch#:	233790
Lab ID:	275680-015	Sampled:	04/02/16
Matrix:	Water	Received:	04/04/16
Units:	ug/L	Analyzed:	04/06/16
Diln Fac:	1.000		

Analyte	Result	RL
MTBE	ND	0.5
Benzene	ND	0.5
Toluene	ND	0.5
Ethylbenzene	ND	0.5
m,p-Xylenes	ND	0.5
o-Xylene	ND	0.5
Naphthalene	ND	2.0

Surrogate	%REC	Limits
Dibromofluoromethane	106	80-128
1,2-Dichloroethane-d4	99	75-139
Toluene-d8	97	80-120
Bromofluorobenzene	101	80-120

ND= Not Detected
 RL= Reporting Limit

Batch QC Report

Purgeable Aromatics by GC/MS			
Lab #:	275680	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 5030B
Project#:	0059.007.001	Analysis:	EPA 8260B
Matrix:	Water	Batch#:	233790
Units:	ug/L	Analyzed:	04/06/16
Diln Fac:	1.000		

Type: BS Lab ID: QC830341

Analyte	Spiked	Result	%REC	Limits
MTBE	12.50	11.85	95	65-120
Benzene	12.50	12.22	98	80-123
Toluene	12.50	11.88	95	80-121
Ethylbenzene	12.50	11.84	95	80-123
m,p-Xylenes	25.00	24.29	97	80-126
o-Xylene	12.50	12.02	96	80-126
Naphthalene	12.50	11.90	95	53-139

Surrogate	%REC	Limits
Dibromofluoromethane	101	80-128
1,2-Dichloroethane-d4	96	75-139
Toluene-d8	98	80-120
Bromofluorobenzene	100	80-120

Type: BSD Lab ID: QC830342

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
MTBE	12.50	11.95	96	65-120	1	22
Benzene	12.50	12.13	97	80-123	1	20
Toluene	12.50	11.76	94	80-121	1	20
Ethylbenzene	12.50	11.82	95	80-123	0	21
m,p-Xylenes	25.00	23.97	96	80-126	1	21
o-Xylene	12.50	11.93	95	80-126	1	20
Naphthalene	12.50	11.71	94	53-139	2	25

Surrogate	%REC	Limits
Dibromofluoromethane	102	80-128
1,2-Dichloroethane-d4	98	75-139
Toluene-d8	97	80-120
Bromofluorobenzene	100	80-120

RPD= Relative Percent Difference

Batch QC Report

Purgeable Aromatics by GC/MS			
Lab #:	275680	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 5030B
Project#:	0059.007.001	Analysis:	EPA 8260B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC830343	Batch#:	233790
Matrix:	Water	Analyzed:	04/06/16
Units:	ug/L		

Analyte	Result	RL
MTBE	ND	0.5
Benzene	ND	0.5
Toluene	ND	0.5
Ethylbenzene	ND	0.5
m,p-Xylenes	ND	0.5
o-Xylene	ND	0.5
Naphthalene	ND	2.0

Surrogate	%REC	Limits
Dibromofluoromethane	105	80-128
1,2-Dichloroethane-d4	99	75-139
Toluene-d8	96	80-120
Bromofluorobenzene	101	80-120

ND= Not Detected
 RL= Reporting Limit

Purgeable Aromatics by GC/MS

Lab #:	275680	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 5035
Project#:	0059.007.001	Analysis:	EPA 8260B
Matrix:	Soil	Sampled:	04/02/16
Units:	ug/Kg	Received:	04/04/16
Basis:	as received		

Field ID:	SB-1-3	Diln Fac:	0.9452
Type:	SAMPLE	Batch#:	233800
Lab ID:	275680-001	Analyzed:	04/06/16

Analyte	Result	RL
MTBE	ND	4.7
Benzene	ND	4.7
Toluene	ND	4.7
Ethylbenzene	ND	4.7
m,p-Xylenes	ND	4.7
o-Xylene	ND	4.7
Naphthalene	ND	4.7

Surrogate	%REC	Limits
Dibromofluoromethane	89	78-134
1,2-Dichloroethane-d4	80	80-138
Toluene-d8	129 *	80-120
Bromofluorobenzene	137 *	78-123

Field ID:	SB-1-6	Diln Fac:	1.085
Type:	SAMPLE	Batch#:	233800
Lab ID:	275680-002	Analyzed:	04/06/16

Analyte	Result	RL
MTBE	ND	5.4
Benzene	ND	5.4
Toluene	ND	5.4
Ethylbenzene	ND	5.4
m,p-Xylenes	ND	5.4
o-Xylene	ND	5.4
Naphthalene	ND	5.4

Surrogate	%REC	Limits
Dibromofluoromethane	92	78-134
1,2-Dichloroethane-d4	96	80-138
Toluene-d8	109	80-120
Bromofluorobenzene	103	78-123

*= Value outside of QC limits; see narrative
 ND= Not Detected
 RL= Reporting Limit

Purgeable Aromatics by GC/MS

Lab #:	275680	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 5035
Project#:	0059.007.001	Analysis:	EPA 8260B
Matrix:	Soil	Sampled:	04/02/16
Units:	ug/Kg	Received:	04/04/16
Basis:	as received		

Field ID:	SB-1-9	Diln Fac:	0.7215
Type:	SAMPLE	Batch#:	233850
Lab ID:	275680-003	Analyzed:	04/07/16

Analyte	Result	RL
MTBE	ND	3.6
Benzene	ND	3.6
Toluene	ND	3.6
Ethylbenzene	ND	3.6
m,p-Xylenes	ND	3.6
o-Xylene	ND	3.6
Naphthalene	ND	3.6

Surrogate	%REC	Limits
Dibromofluoromethane	106	78-134
1,2-Dichloroethane-d4	114	80-138
Toluene-d8	100	80-120
Bromofluorobenzene	106	78-123

Field ID:	SB-2-3	Diln Fac:	0.7418
Type:	SAMPLE	Batch#:	233800
Lab ID:	275680-005	Analyzed:	04/06/16

Analyte	Result	RL
MTBE	ND	3.7
Benzene	ND	3.7
Toluene	ND	3.7
Ethylbenzene	ND	3.7
m,p-Xylenes	ND	3.7
o-Xylene	ND	3.7
Naphthalene	ND	3.7

Surrogate	%REC	Limits
Dibromofluoromethane	95	78-134
1,2-Dichloroethane-d4	99	80-138
Toluene-d8	126 *	80-120
Bromofluorobenzene	145 *	78-123

*= Value outside of QC limits; see narrative
 ND= Not Detected
 RL= Reporting Limit

Purgeable Aromatics by GC/MS			
Lab #:	275680	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 5035
Project#:	0059.007.001	Analysis:	EPA 8260B
Matrix:	Soil	Sampled:	04/02/16
Units:	ug/Kg	Received:	04/04/16
Basis:	as received		

Field ID: SB-2-6 Diln Fac: 0.9881
 Type: SAMPLE Batch#: 233850
 Lab ID: 275680-006 Analyzed: 04/07/16

Analyte	Result	RL
MTBE	ND	4.9
Benzene	ND	4.9
Toluene	ND	4.9
Ethylbenzene	ND	4.9
m,p-Xylenes	ND	4.9
o-Xylene	ND	4.9
Naphthalene	ND	4.9

Surrogate	%REC	Limits
Dibromofluoromethane	111	78-134
1,2-Dichloroethane-d4	123	80-138
Toluene-d8	96	80-120
Bromofluorobenzene	103	78-123

Field ID: SB-2-9.5 Diln Fac: 0.7764
 Type: SAMPLE Batch#: 233800
 Lab ID: 275680-007 Analyzed: 04/06/16

Analyte	Result	RL
MTBE	ND	3.9
Benzene	ND	3.9
Toluene	ND	3.9
Ethylbenzene	ND	3.9
m,p-Xylenes	ND	3.9
o-Xylene	ND	3.9
Naphthalene	ND	3.9

Surrogate	%REC	Limits
Dibromofluoromethane	98	78-134
1,2-Dichloroethane-d4	104	80-138
Toluene-d8	110	80-120
Bromofluorobenzene	106	78-123

*= Value outside of QC limits; see narrative
 ND= Not Detected
 RL= Reporting Limit

Purgeable Aromatics by GC/MS			
Lab #:	275680	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 5035
Project#:	0059.007.001	Analysis:	EPA 8260B
Matrix:	Soil	Sampled:	04/02/16
Units:	ug/Kg	Received:	04/04/16
Basis:	as received		

Field ID:	SB-4-2	Diln Fac:	48.64
Type:	SAMPLE	Batch#:	233806
Lab ID:	275680-009	Analyzed:	04/06/16

Analyte	Result	RL
MTBE	ND	240
Benzene	ND	240
Toluene	ND	240
Ethylbenzene	ND	240
m,p-Xylenes	ND	240
o-Xylene	ND	240
Naphthalene	1,100	240

Surrogate	%REC	Limits
Dibromofluoromethane	99	78-134
1,2-Dichloroethane-d4	95	80-138
Toluene-d8	100	80-120
Bromofluorobenzene	98	78-123

Field ID:	SB-4-9	Diln Fac:	0.7485
Type:	SAMPLE	Batch#:	233850
Lab ID:	275680-011	Analyzed:	04/07/16

Analyte	Result	RL
MTBE	ND	3.7
Benzene	ND	3.7
Toluene	ND	3.7
Ethylbenzene	ND	3.7
m,p-Xylenes	ND	3.7
o-Xylene	ND	3.7
Naphthalene	ND	3.7

Surrogate	%REC	Limits
Dibromofluoromethane	128	78-134
1,2-Dichloroethane-d4	154 *	80-138
Toluene-d8	100	80-120
Bromofluorobenzene	150 *	78-123

*= Value outside of QC limits; see narrative
 ND= Not Detected
 RL= Reporting Limit

Purgeable Aromatics by GC/MS			
Lab #:	275680	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 5035
Project#:	0059.007.001	Analysis:	EPA 8260B
Matrix:	Soil	Sampled:	04/02/16
Units:	ug/Kg	Received:	04/04/16
Basis:	as received		

Field ID:	SB-4-12	Diln Fac:	0.6305
Type:	SAMPLE	Batch#:	233850
Lab ID:	275680-012	Analyzed:	04/07/16

Analyte	Result	RL
MTBE	ND	3.2
Benzene	ND	3.2
Toluene	ND	3.2
Ethylbenzene	ND	3.2
m,p-Xylenes	ND	3.2
o-Xylene	ND	3.2
Naphthalene	ND	3.2

Surrogate	%REC	Limits
Dibromofluoromethane	106	78-134
1,2-Dichloroethane-d4	110	80-138
Toluene-d8	101	80-120
Bromofluorobenzene	103	78-123

Type:	BLANK	Batch#:	233800
Lab ID:	QC830387	Analyzed:	04/06/16
Diln Fac:	1.000		

Analyte	Result	RL
MTBE	ND	5.0
Benzene	ND	5.0
Toluene	ND	5.0
Ethylbenzene	ND	5.0
m,p-Xylenes	ND	5.0
o-Xylene	ND	5.0
Naphthalene	ND	5.0

Surrogate	%REC	Limits
Dibromofluoromethane	107	78-134
1,2-Dichloroethane-d4	107	80-138
Toluene-d8	107	80-120
Bromofluorobenzene	107	78-123

*= Value outside of QC limits; see narrative
 ND= Not Detected
 RL= Reporting Limit

Batch QC Report

Purgeable Aromatics by GC/MS			
Lab #:	275680	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 5035
Project#:	0059.007.001	Analysis:	EPA 8260B
Matrix:	Soil	Batch#:	233800
Units:	ug/Kg	Analyzed:	04/06/16
Diln Fac:	1.000		

Type: BS Lab ID: QC830385

Analyte	Spiked	Result	%REC	Limits
MTBE	25.00	23.79	95	61-122
Benzene	25.00	24.17	97	80-123
Toluene	25.00	25.02	100	80-120
Ethylbenzene	25.00	24.93	100	80-122
m,p-Xylenes	50.00	54.13	108	80-127
o-Xylene	25.00	24.05	96	80-125
Naphthalene	25.00	24.19	97	63-135

Surrogate	%REC	Limits
Dibromofluoromethane	104	78-134
1,2-Dichloroethane-d4	104	80-138
Toluene-d8	105	80-120
Bromofluorobenzene	101	78-123

Type: BSD Lab ID: QC830386

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
MTBE	25.00	23.41	94	61-122	2	26
Benzene	25.00	24.54	98	80-123	1	21
Toluene	25.00	25.75	103	80-120	3	20
Ethylbenzene	25.00	25.46	102	80-122	2	20
m,p-Xylenes	50.00	54.74	109	80-127	1	20
o-Xylene	25.00	24.71	99	80-125	3	20
Naphthalene	25.00	24.10	96	63-135	0	21

Surrogate	%REC	Limits
Dibromofluoromethane	104	78-134
1,2-Dichloroethane-d4	102	80-138
Toluene-d8	106	80-120
Bromofluorobenzene	100	78-123

RPD= Relative Percent Difference

Batch QC Report

Purgeable Aromatics by GC/MS			
Lab #:	275680	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 5035
Project#:	0059.007.001	Analysis:	EPA 8260B
Matrix:	Soil	Batch#:	233806
Units:	ug/Kg	Analyzed:	04/06/16
Diln Fac:	1.000		

Type: BS Lab ID: QC830403

Analyte	Spiked	Result	%REC	Limits
MTBE	25.00	22.24	89	61-122
Benzene	25.00	22.70	91	80-123
Toluene	25.00	22.83	91	80-120
Ethylbenzene	25.00	23.70	95	80-122
m,p-Xylenes	50.00	48.31	97	80-127
o-Xylene	25.00	23.14	93	80-125
Naphthalene	25.00	22.40	90	63-135

Surrogate	%REC	Limits
Dibromofluoromethane	103	78-134
1,2-Dichloroethane-d4	107	80-138
Toluene-d8	100	80-120
Bromofluorobenzene	96	78-123

Type: BSD Lab ID: QC830404

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
MTBE	25.00	22.23	89	61-122	0	26
Benzene	25.00	22.72	91	80-123	0	21
Toluene	25.00	22.57	90	80-120	1	20
Ethylbenzene	25.00	22.99	92	80-122	3	20
m,p-Xylenes	50.00	46.60	93	80-127	4	20
o-Xylene	25.00	22.74	91	80-125	2	20
Naphthalene	25.00	22.30	89	63-135	0	21

Surrogate	%REC	Limits
Dibromofluoromethane	103	78-134
1,2-Dichloroethane-d4	108	80-138
Toluene-d8	99	80-120
Bromofluorobenzene	97	78-123

RPD= Relative Percent Difference

Batch QC Report

Purgeable Aromatics by GC/MS			
Lab #:	275680	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 5035
Project#:	0059.007.001	Analysis:	EPA 8260B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC830664	Batch#:	233850
Matrix:	Soil	Analyzed:	04/07/16
Units:	ug/Kg		

Analyte	Spiked	Result	%REC	Limits
MTBE	25.00	23.03	92	61-122
Benzene	25.00	24.06	96	80-123
Toluene	25.00	23.00	92	80-120
Ethylbenzene	25.00	22.85	91	80-122
m,p-Xylenes	50.00	46.84	94	80-127
o-Xylene	25.00	22.75	91	80-125
Naphthalene	25.00	21.54	86	63-135

Surrogate	%REC	Limits
Dibromofluoromethane	101	78-134
1,2-Dichloroethane-d4	108	80-138
Toluene-d8	99	80-120
Bromofluorobenzene	99	78-123

Batch QC Report

Purgeable Aromatics by GC/MS			
Lab #:	275680	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 5030B
Project#:	0059.007.001	Analysis:	EPA 8260B
Field ID:	ZZZZZZZZZZ	Batch#:	233850
MSS Lab ID:	275741-001	Sampled:	04/06/16
Matrix:	Soil	Received:	04/06/16
Units:	ug/Kg	Analyzed:	04/07/16
Basis:	as received		

Type: MS Diln Fac: 0.9747
 Lab ID: QC830692

Analyte	MSS Result	Spiked	Result	%REC	Limits
MTBE	<0.9349	48.73	45.17	93	49-120
Benzene	<0.8433	48.73	49.14	101	57-120
Toluene	<0.6648	48.73	43.51	89	51-120
Ethylbenzene	<0.6344	48.73	45.30	93	45-120
m,p-Xylenes	<1.169	97.47	87.99	90	45-123
o-Xylene	<0.5851	48.73	41.75	86	44-122
Naphthalene	<0.9346	48.73	20.98	43	16-120

Surrogate	%REC	Limits
Dibromofluoromethane	105	78-134
1,2-Dichloroethane-d4	113	80-138
Toluene-d8	101	80-120
Bromofluorobenzene	98	78-123

Type: MSD Diln Fac: 0.8666
 Lab ID: QC830693

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
MTBE	43.33	36.85	85	49-120	9	40
Benzene	43.33	38.57	89	57-120	12	44
Toluene	43.33	33.06	76	51-120	16	47
Ethylbenzene	43.33	33.50	77	45-120	18	55
m,p-Xylenes	86.66	62.21	72	45-123	23	53
o-Xylene	43.33	30.09	69	44-122	21	55
Naphthalene	43.33	10.81	25	16-120	53	59

Surrogate	%REC	Limits
Dibromofluoromethane	104	78-134
1,2-Dichloroethane-d4	112	80-138
Toluene-d8	101	80-120
Bromofluorobenzene	98	78-123

RPD= Relative Percent Difference



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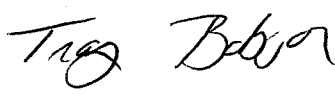
Laboratory Job Number 275900
ANALYTICAL REPORT

Terraphase Engineering
1404 Franklin Street
Oakland, CA 94612

Project : 0059.007.001
Location : Kaiser UST
Level : II

<u>Sample ID</u>	<u>Lab ID</u>
SB-6-3	275900-001
SB-6-6	275900-002
SB-6-10	275900-003
SB-6-15-GW	275900-004
SB-3-3	275900-005
SB-3-6	275900-006
SB-3-11	275900-007
SB-3-13-GW	275900-008
SB-5-3	275900-009
SB-5-6	275900-010
SB-5-12	275900-011
SB-5-15-GW	275900-012
SB-7-10	275900-013
SB-7-15-GW	275900-014
TB-040916	275900-015

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

Signature: 
Tracy Babjar
Project Manager
tracy.babjar@ctberk.com
(510) 204-2226

Date: 04/28/2016

CASE NARRATIVE

Laboratory number: 275900
Client: Terraphase Engineering
Project: 0059.007.001
Location: Kaiser UST
Request Date: 04/11/16
Samples Received: 04/11/16

This data package contains sample and QC results for ten soil samples and five water samples, requested for the above referenced project on 04/11/16. The samples were received cold and intact.

TPH-Purgeables and/or BTXE by GC (EPA 8015B) Water:

SB-6-15-GW (lab # 275900-004) was analyzed with more than 1 mL of headspace in the VOA vial. No other analytical problems were encountered.

TPH-Purgeables and/or BTXE by GC (EPA 8015B) Soil:

No analytical problems were encountered.

TPH-Extractables by GC (EPA 8015B) Water:

No analytical problems were encountered.

TPH-Extractables by GC (EPA 8015B) Soil:

A number of samples were diluted due to the dark and viscous nature of the sample extracts. No other analytical problems were encountered.

Volatile Organics by GC/MS (EPA 8260B) Water:

SB-6-15-GW (lab # 275900-004) and SB-7-15-GW (lab # 275900-014) had pH greater than 2. No other analytical problems were encountered.

Volatile Organics by GC/MS (EPA 8260B) Soil:

Matrix spikes were not performed for this analysis in batch 234051 due to insufficient sample amount. High recovery was observed for benzene in the MSD for batch 234040; the parent sample was not a project sample, the LCS was within limits, the associated RPD was within limits, and this analyte was not detected at or above the RL in the associated samples. SB-6-10 (lab # 275900-003) was not diluted; the low sample weight is due to 5035 packaging. No other analytical problems were encountered.

Semivolatile Organics by GC/MS (EPA 8270C) Water:

SB-6-15-GW (lab # 275900-004), SB-3-13-GW (lab # 275900-008), and SB-5-15-GW (lab # 275900-012) were diluted due to the dark and viscous nature of the sample extracts. No other analytical problems were encountered.

Semivolatile Organics by GC/MS (EPA 8270C) Soil:

Matrix spikes QC831625, QC831626 (batch 234108) were not reported because the parent sample required a dilution that would have diluted out the spikes. Many samples were diluted due to the dark and viscous nature of the sample extracts. No other analytical problems were encountered.

CHAIN OF CUSTODY



2323 Fifth Street
Berkeley, CA 94710

Phone (510) 486-0900
Fax (510) 486-0532

Page 1 of 2

Chain of Custody # _____

C&T LOGIN # 275900

Project No: 0059.007.001 Sampler: Seth Strulka
 Project Name: Kaiser UST Report To: Daren Rotz
 Project P. O. No.: _____ Company: Ferraphase
 EDD Format: Report Level II III IV Telephone: (510) 645-1850
 Turnaround Time: RUSH Standard Email: Daren.Rotz@ferraphase.com

ANALYTICAL REQUEST	
TRHg (8015)	X
TRHg W/Secu (8015)	X
TRHD (8015)	X
BTEX and MRE (826)	X
Organic Matter Content (232)	X
Naphthalene (82709)	X

Lab No.	Sample ID.	SAMPLING		MATRIX		# of Containers	CHEMICAL PRESERVATIVE													
		Date Collected	Time Collected	Water	Solid		HCl	H2SO4	HNO3	NaOH	None									
1	SB-6-3	4/9/16	0825	X	X	7														
2	SB-6-6		0340	X	X	7														
3	SB-6-10		0850	X	X	7														
4	SB-6-15-GW		0145	X	X	10					X									
5	SB-3-3		1100	X	X	7														
6	SB-3-6		1120	X	X	7														
7	SB-3-11		1135	X	X	7														
8	SB-3-13-GW		1145	X	X	10					X									
9	SB-5-3		1350	X	X	7														
10	SB-5-6		1405	X	X	7														
11	SB-5-12		1450	X	X	7														
12	SB-5-15-GW		1420	X	X	10					X									

Notes: *Please HOLD all 2oz. soil jars. Organic Matter Content - Pending Analysis

SAMPLE RECEIPT
 Intact
 Cold
 On Ice
 Ambient

RELINQUISHED BY: _____ DATE: 4/16/16 TIME: 1050
 DATE: 4/16/16 TIME: 619

RECEIVED BY: _____ DATE: 4/16/16 TIME: 1050
 DATE: 4/17/16 TIME: 1620
 DATE: 4/17/16 TIME: 1045

CHAIN OF CUSTODY

Page 2 of 2

Chain of Custody # _____



ENVIRONMENTAL ANALYTICAL TESTING LABORATORY

In Business Since 1978

2323 Fifth Street
Berkeley, CA 94710

C&T LOGIN # 215402

Project No: 0059.007.001 Sampler: Seth Straska

Project Name: Kaiser UST Report To: Daren Roth

Project P. O. No: _____ Company: Terrapass

EDD Format: _____ Report Level: II III IV Telephone: (510) 645-1850

Turnaround Time: RUSH Standard Email: Daren.Roth@terrapass.com

Lab No.	Sample ID.	SAMPLING		MATRIX		# of Containers	CHEMICAL PRESERVATIVE													
		Date Collected	Time Collected	Water	Solid		HCl	H2SO4	HNO3	NaOH	None									
13	SB-7-10	4/9/16	1645	X		7														
14	SB-7-15-GW	4/9/16	1700	X		3	X													
15	FB-04016	4/9/16	1745	X		3	X													

ANALYTICAL REQUEST	
XX	TPH _g (8015)
X	TPH _g w/SCM (8015)
X	TPH _g (8015)
XX	GREX and MRE (8260)
	Organic Matter Content (0293)
X	Naphthalene (8270C)

Notes: Please Hold all 2oz. Soil Jars. Organic Matter Content Pending Analysis.

SAMPLE RECEIPT	RELINQUISHED BY:	RECEIVED BY:
<input checked="" type="checkbox"/> Intact	<u>[Signature]</u> DATE: <u>4/16/16</u> TIME: <u>1050</u>	<u>[Signature]</u> DATE: <u>4/16/16</u> TIME: <u>1050</u>
<input checked="" type="checkbox"/> Cold	<u>[Signature]</u> DATE: <u>4/16/16</u> TIME: <u>1614</u>	<u>[Signature]</u> DATE: <u>4/16/16</u> TIME: <u>1620</u>
<input checked="" type="checkbox"/> On Ice	<u>[Signature]</u> DATE: <u>4/16/16</u> TIME: <u>1050</u>	<u>[Signature]</u> DATE: <u>4/16/16</u> TIME: <u>1645</u>
<input type="checkbox"/> Ambient		

COOLER RECEIPT CHECKLIST



Curtis & Tompkins, Ltd.

Login # 275900 Date Received 4/11/16 Number of coolers 2

Client Terraphase Project KaiserUST

Date Opened 4/11 By (print) CJN (sign) [Signature]

Date Logged in 4 By (print) CJN (sign) [Signature]

1. Did cooler come with a shipping slip (airbill, etc) YES NO Shipping info

2A. Were custody seals present? ... YES (circle) on cooler on samples NO How many Name Date

2B. Were custody seals intact upon arrival? YES NO N/A

3. Were custody papers dry and intact when received? YES NO

4. Were custody papers filled out properly (ink, signed, etc)? YES NO

5. Is the project identifiable from custody papers? (If so fill out top of form) YES NO

6. Indicate the packing in cooler: (if other, describe)

- Bubble Wrap, Foam blocks, Bags, None, Cloth material, Cardboard, Styrofoam, Paper towels

7. Temperature documentation: * Notify PM if temperature exceeds 6°C

Type of ice used: Wet Blue/Gel None Temp(°C) 2, 3, 3.8

Temperature blank(s) included? Thermometer# IR Gun# A

Samples received on ice directly from the field. Cooling process had begun

8. Were Method 5035 sampling containers present? YES NO If YES, what time were they transferred to freezer? 4/11/16 2130

9. Did all bottles arrive unbroken/unopened? YES NO

10. Are there any missing / extra samples? YES NO

11. Are samples in the appropriate containers for indicated tests? YES NO

12. Are sample labels present, in good condition and complete? YES NO

13. Do the sample labels agree with custody papers? YES NO

14. Was sufficient amount of sample sent for tests requested? YES NO

15. Are the samples appropriately preserved? YES NO N/A

16. Did you check preservatives for all bottles for each sample? YES NO N/A

17. Did you document your preservative check? (pH strip lot#) YES NO N/A

18. Did you change the hold time in LIMS for unpreserved VOAs? YES NO N/A

19. Did you change the hold time in LIMS for preserved terracores? YES NO N/A

20. Are bubbles > 6mm absent in VOA samples? YES NO N/A

21. Was the client contacted concerning this sample delivery? YES NO

If YES, Who was called? By Date:

COMMENTS

20. 213 VOAs received w/ bubble > 6mm for sample 14

20. 13 VOAs received w/ bubble > 6mm for sample 15

Client Sample ID : SB-3-11

Laboratory Sample ID :

275900-007

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Diesel C10-C24	2.0	Y,Z	1.0	mg/Kg	As Recd	1.000	EPA 8015B	EPA 3550B

Client Sample ID : SB-3-13-GW

Laboratory Sample ID :

275900-008

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Gasoline C7-C12	57	Y	50	ug/L	As Recd	1.000	EPA 8015B	EPA 5030B
Diesel C10-C24	470	Y	60	ug/L	As Recd	1.000	EPA 8015B	EPA 3520C

Client Sample ID : SB-5-3

Laboratory Sample ID :

275900-009

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Diesel C10-C24	100	Y	10	mg/Kg	As Recd	10.00	EPA 8015B	EPA 3550B
Diesel C10-C24	81	Y	5.0	mg/Kg	As Recd	5.000	EPA 8015B	EPA 3550B

Client Sample ID : SB-5-6

Laboratory Sample ID :

275900-010

No Detections

Client Sample ID : SB-5-12

Laboratory Sample ID :

275900-011

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Diesel C10-C24	12	Y	1.0	mg/Kg	As Recd	1.000	EPA 8015B	EPA 3550B
Diesel C10-C24	13	Y	3.0	mg/Kg	As Recd	3.000	EPA 8015B	EPA 3550B

Client Sample ID : SB-5-15-GW

Laboratory Sample ID :

275900-012

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Diesel C10-C24	910	Y	56	ug/L	As Recd	1.000	EPA 8015B	EPA 3520C
Diesel C10-C24	66	Y	56	ug/L	As Recd	1.000	EPA 8015B	EPA 3520C

Client Sample ID : SB-7-10

Laboratory Sample ID :

275900-013

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Diesel C10-C24	12	Y	0.99	mg/Kg	As Recd	1.000	EPA 8015B	EPA 3550B
Diesel C10-C24	12	Y	0.99	mg/Kg	As Recd	1.000	EPA 8015B	EPA 3550B

Client Sample ID : SB-7-15-GW

Laboratory Sample ID :

275900-014

No Detections

Client Sample ID : TB-040916

Laboratory Sample ID :

275900-015

No Detections

Y = Sample exhibits chromatographic pattern which does not resemble standard
Z = Sample exhibits unknown single peak or peaks

Total Volatile Hydrocarbons			
Lab #:	275900	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 5030B
Project#:	0059.007.001	Analysis:	EPA 8015B
Matrix:	Water	Sampled:	04/09/16
Units:	ug/L	Received:	04/11/16
Diln Fac:	1.000		

Field ID: SB-6-15-GW Batch#: 234089
 Type: SAMPLE Analyzed: 04/14/16
 Lab ID: 275900-004

Analyte	Result	RL
Gasoline C7-C12	88 Y	50

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	98	80-132

Field ID: SB-3-13-GW Batch#: 234089
 Type: SAMPLE Analyzed: 04/14/16
 Lab ID: 275900-008

Analyte	Result	RL
Gasoline C7-C12	57 Y	50

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	96	80-132

Field ID: SB-5-15-GW Batch#: 234089
 Type: SAMPLE Analyzed: 04/14/16
 Lab ID: 275900-012

Analyte	Result	RL
Gasoline C7-C12	ND	50

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	96	80-132

Y= Sample exhibits chromatographic pattern which does not resemble standard
 ND= Not Detected
 RL= Reporting Limit

Total Volatile Hydrocarbons			
Lab #:	275900	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 5030B
Project#:	0059.007.001	Analysis:	EPA 8015B
Matrix:	Water	Sampled:	04/09/16
Units:	ug/L	Received:	04/11/16
Diln Fac:	1.000		

Field ID: SB-7-15-GW Batch#: 234132
 Type: SAMPLE Analyzed: 04/16/16
 Lab ID: 275900-014

Analyte	Result	RL
Gasoline C7-C12	ND	50

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	109	80-132

Type: BLANK Batch#: 234089
 Lab ID: QC831545 Analyzed: 04/14/16

Analyte	Result	RL
Gasoline C7-C12	ND	50

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	83	80-132

Type: BLANK Batch#: 234132
 Lab ID: QC831713 Analyzed: 04/15/16

Analyte	Result	RL
Gasoline C7-C12	ND	50

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	106	80-132

Y= Sample exhibits chromatographic pattern which does not resemble standard
 ND= Not Detected
 RL= Reporting Limit

Batch QC Report

Total Volatile Hydrocarbons			
Lab #:	275900	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 5030B
Project#:	0059.007.001	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC831544	Batch#:	234089
Matrix:	Water	Analyzed:	04/14/16
Units:	ug/L		

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	1,000	913.0	91	80-120

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	93	80-132

Batch QC Report

Total Volatile Hydrocarbons			
Lab #:	275900	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 5030B
Project#:	0059.007.001	Analysis:	EPA 8015B
Field ID:	ZZZZZZZZZZ	Batch#:	234089
MSS Lab ID:	275907-001	Sampled:	04/11/16
Matrix:	Water	Received:	04/11/16
Units:	ug/L	Analyzed:	04/14/16
Diln Fac:	1.000		

Type: MS Lab ID: QC831546

Analyte	MSS Result	Spiked	Result	%REC	Limits
Gasoline C7-C12	113.9	2,000	2,020	95	76-120

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	110	80-132

Type: MSD Lab ID: QC831547

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	2,000	1,994	94	76-120	1	20

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	106	80-132

RPD= Relative Percent Difference

Batch QC Report

Total Volatile Hydrocarbons			
Lab #:	275900	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 5030B
Project#:	0059.007.001	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC831712	Batch#:	234132
Matrix:	Water	Analyzed:	04/15/16
Units:	ug/L		

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	1,000	1,153	115	80-120

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	114	80-132

Batch QC Report

Total Volatile Hydrocarbons			
Lab #:	275900	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 5030B
Project#:	0059.007.001	Analysis:	EPA 8015B
Field ID:	ZZZZZZZZZZ	Batch#:	234132
MSS Lab ID:	275804-012	Sampled:	04/06/16
Matrix:	Water	Received:	04/07/16
Units:	ug/L	Analyzed:	04/15/16
Diln Fac:	1.000		

Type: MS Lab ID: QC831744

Analyte	MSS Result	Spiked	Result	%REC	Limits
Gasoline C7-C12	16.62	2,000	1,889	94	76-120

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	110	80-132

Type: MSD Lab ID: QC831745

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	2,000	1,873	93	76-120	1	20

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	122	80-132

RPD= Relative Percent Difference

Batch QC Report

Total Volatile Hydrocarbons			
Lab #:	275900	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 5030B
Project#:	0059.007.001	Analysis:	EPA 8015B
Field ID:	ZZZZZZZZZZ	Batch#:	234132
MSS Lab ID:	275804-005	Sampled:	04/06/16
Matrix:	Water	Received:	04/07/16
Units:	ug/L	Analyzed:	04/15/16
Diln Fac:	1.000		

Type: MS Lab ID: QC831746

Analyte	MSS Result	Spiked	Result	%REC	Limits
Gasoline C7-C12	21.80	2,000	1,924	95	76-120

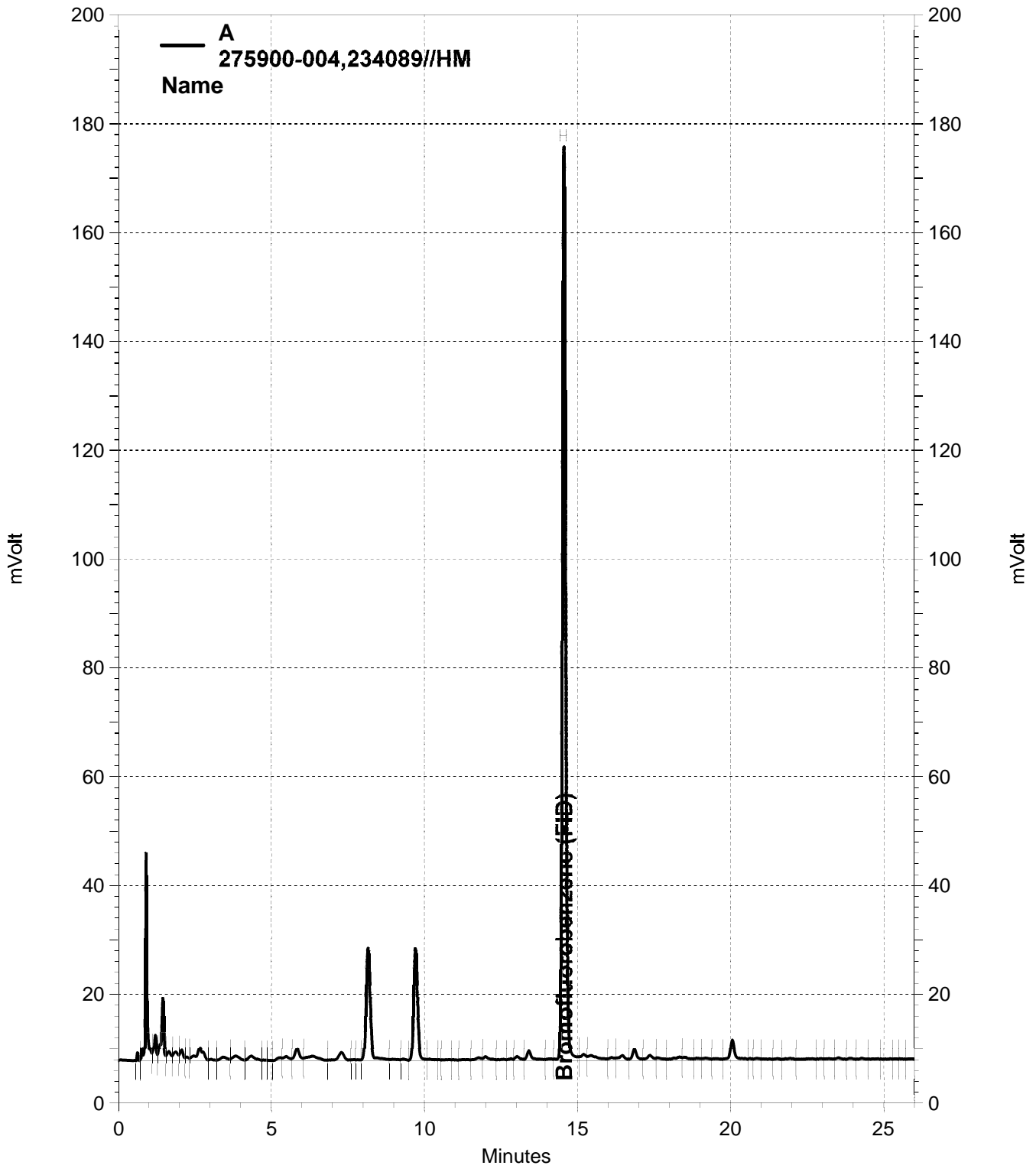
Surrogate	%REC	Limits
Bromofluorobenzene (FID)	115	80-132

Type: MSD Lab ID: QC831747

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	2,000	1,809	89	76-120	6	20

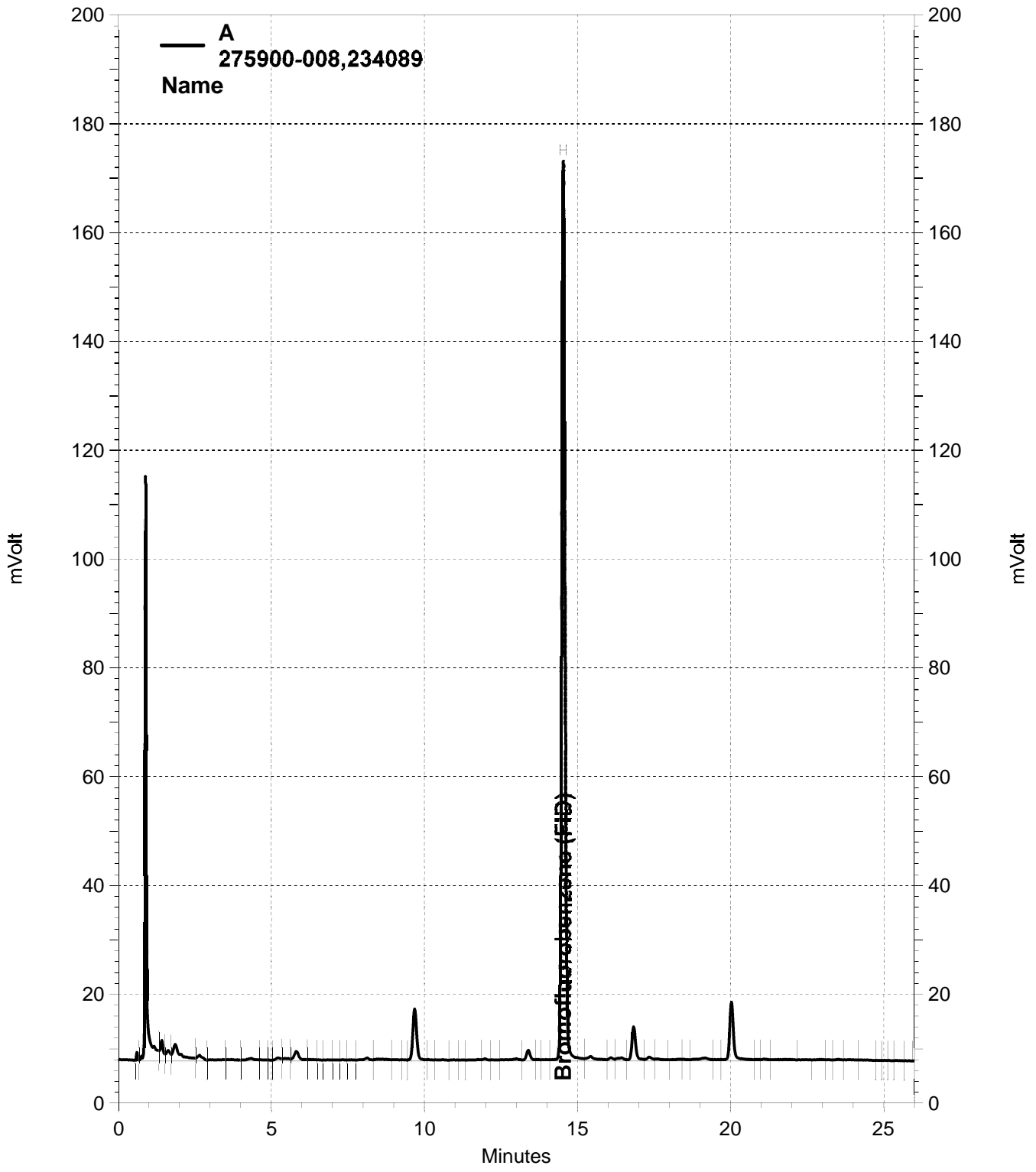
Surrogate	%REC	Limits
Bromofluorobenzene (FID)	110	80-132

RPD= Relative Percent Difference



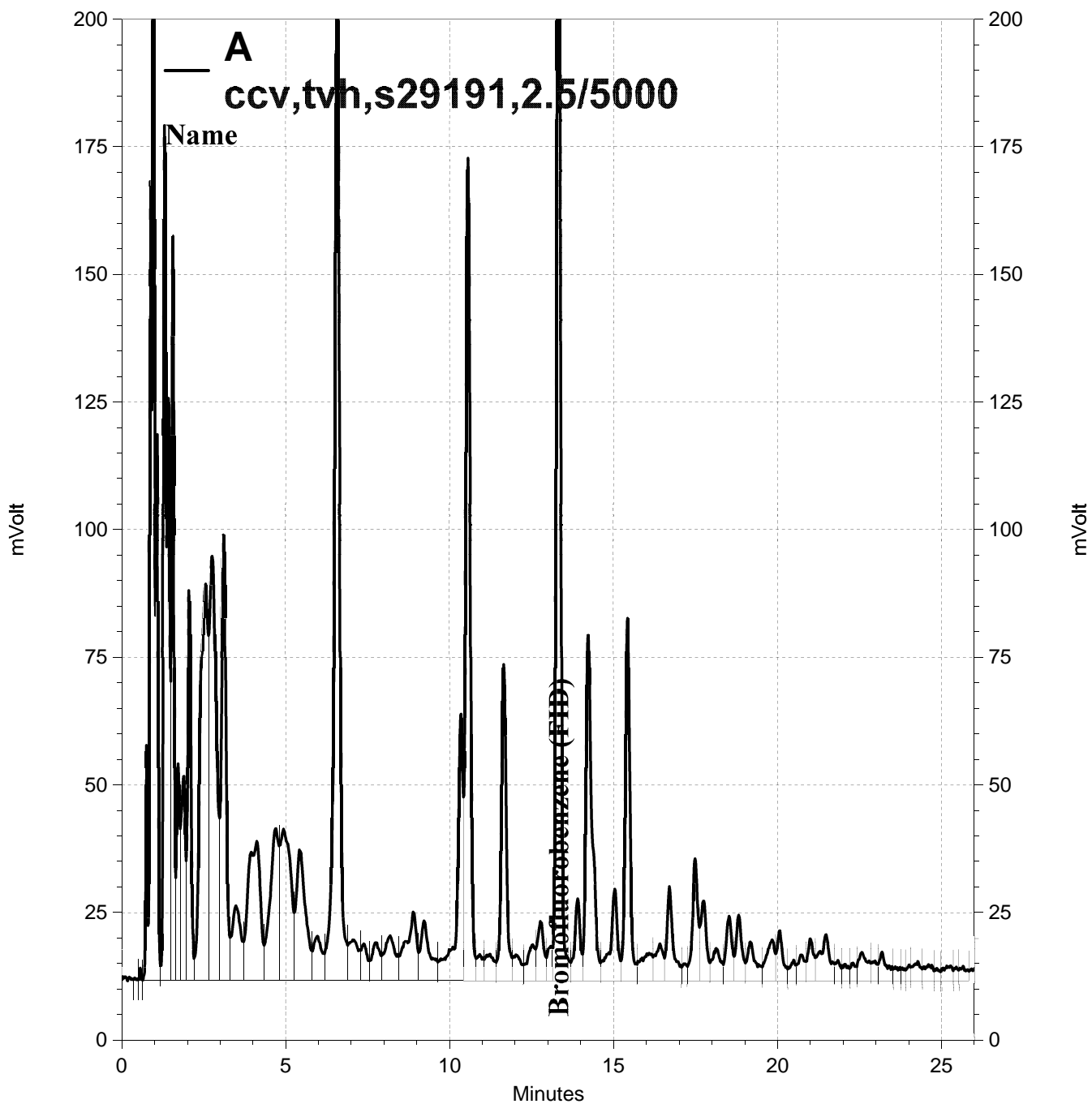
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Gasoline by GC/FID (5035 Prep)			
Lab #:	275900	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 5035
Project#:	0059.007.001	Analysis:	EPA 8015B
Matrix:	Soil	Batch#:	234020
Units:	mg/Kg	Sampled:	04/09/16
Basis:	as received	Received:	04/11/16
Diln Fac:	1.000		

Type: BLANK Analyzed: 04/12/16
 Lab ID: QC831316

Analyte	Result	RL
Gasoline C7-C12	ND	0.20

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	95	78-138

Batch QC Report

Gasoline by GC/FID (5035 Prep)			
Lab #:	275900	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 5035
Project#:	0059.007.001	Analysis:	EPA 8015B
Matrix:	Soil	Diln Fac:	1.000
Units:	mg/Kg	Batch#:	234020

Type: BS Analyzed: 04/12/16
 Lab ID: QC831261

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	2.000	1.827	91	80-121

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	98	78-138

Type: BSD Analyzed: 04/13/16
 Lab ID: QC831262

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	2.000	1.908	95	80-121	4	20

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	99	78-138

RPD= Relative Percent Difference

Total Extractable Hydrocarbons			
Lab #:	275900	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 3520C
Project#:	0059.007.001	Analysis:	EPA 8015B
Matrix:	Water	Sampled:	04/09/16
Units:	ug/L	Received:	04/11/16
Diln Fac:	1.000		

Field ID:	SB-6-15-GW	Prepared:	04/19/16
Type:	SAMPLE	Analyzed:	04/22/16
Lab ID:	275900-004	Cleanup Method:	EPA 3630C
Batch#:	234251		

Analyte	Result	RL
Diesel C10-C24	1,400 Y	71
Diesel C10-C24 (SGCU)	ND	71

Surrogate	%REC	Limits
o-Terphenyl	92	67-136
o-Terphenyl (SGCU)	126	67-136

Field ID:	SB-3-13-GW	Prepared:	04/22/16
Type:	SAMPLE	Analyzed:	04/26/16
Lab ID:	275900-008	Cleanup Method:	EPA 3630C
Batch#:	234380		

Analyte	Result	RL
Diesel C10-C24	470 Y	60
Diesel C10-C24 (SGCU)	ND	60

Surrogate	%REC	Limits
o-Terphenyl	100	67-136
o-Terphenyl (SGCU)	84	67-136

Field ID:	SB-5-15-GW	Prepared:	04/12/16
Type:	SAMPLE	Analyzed:	04/16/16
Lab ID:	275900-012	Cleanup Method:	EPA 3630C
Batch#:	233969		

Analyte	Result	RL
Diesel C10-C24	910 Y	56
Diesel C10-C24 (SGCU)	66 Y	56

Surrogate	%REC	Limits
o-Terphenyl	88	67-136
o-Terphenyl (SGCU)	80	67-136

Y= Sample exhibits chromatographic pattern which does not resemble standard
 ND= Not Detected
 RL= Reporting Limit
 SGCU= Silica gel cleanup

Batch QC Report

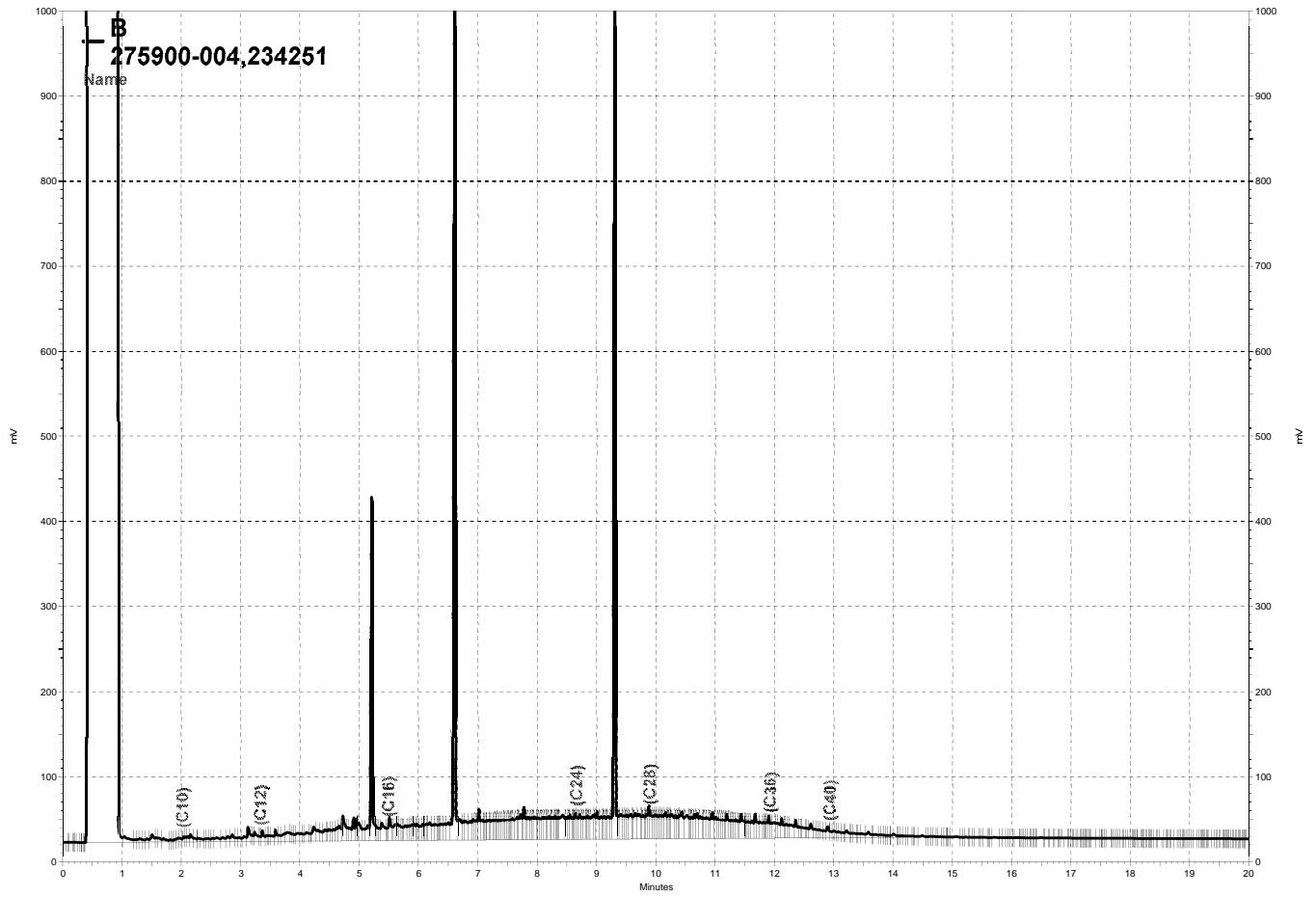
Total Extractable Hydrocarbons			
Lab #:	275900	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 3520C
Project#:	0059.007.001	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC832212	Batch#:	234251
Matrix:	Water	Prepared:	04/19/16
Units:	ug/L		

Cleanup Method: EPA 3630C

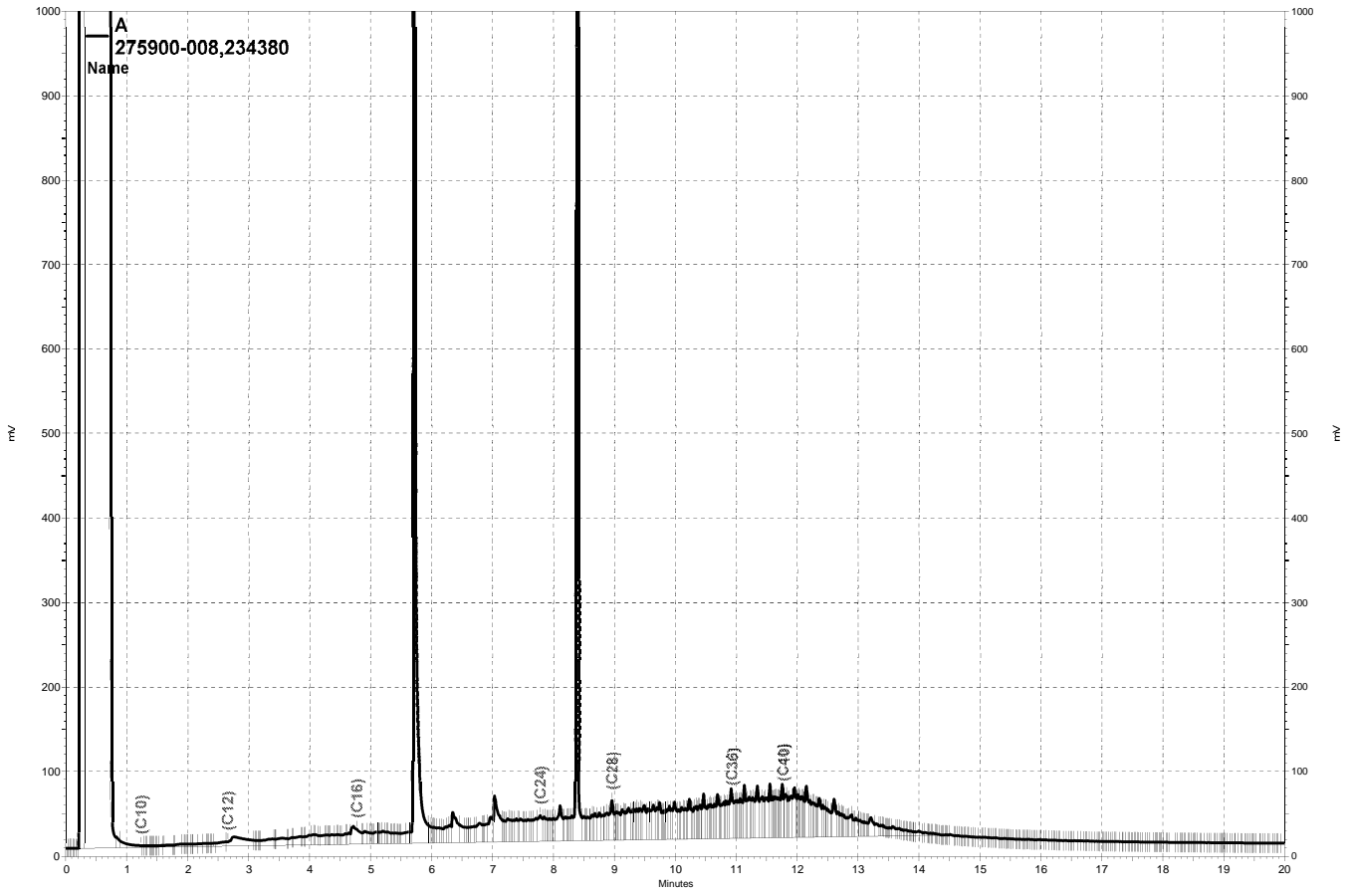
Analyte	Spiked	Result	%REC	Limits	Analyzed
Diesel C10-C24	2,500	2,453	98	60-121	04/21/16
Diesel C10-C24 (SGCU)	2,500	2,937	117	60-121	04/22/16

Surrogate	%REC	Limits	Analyzed
o-Terphenyl	106	67-136	04/21/16
o-Terphenyl (SGCU)	126	67-136	04/22/16

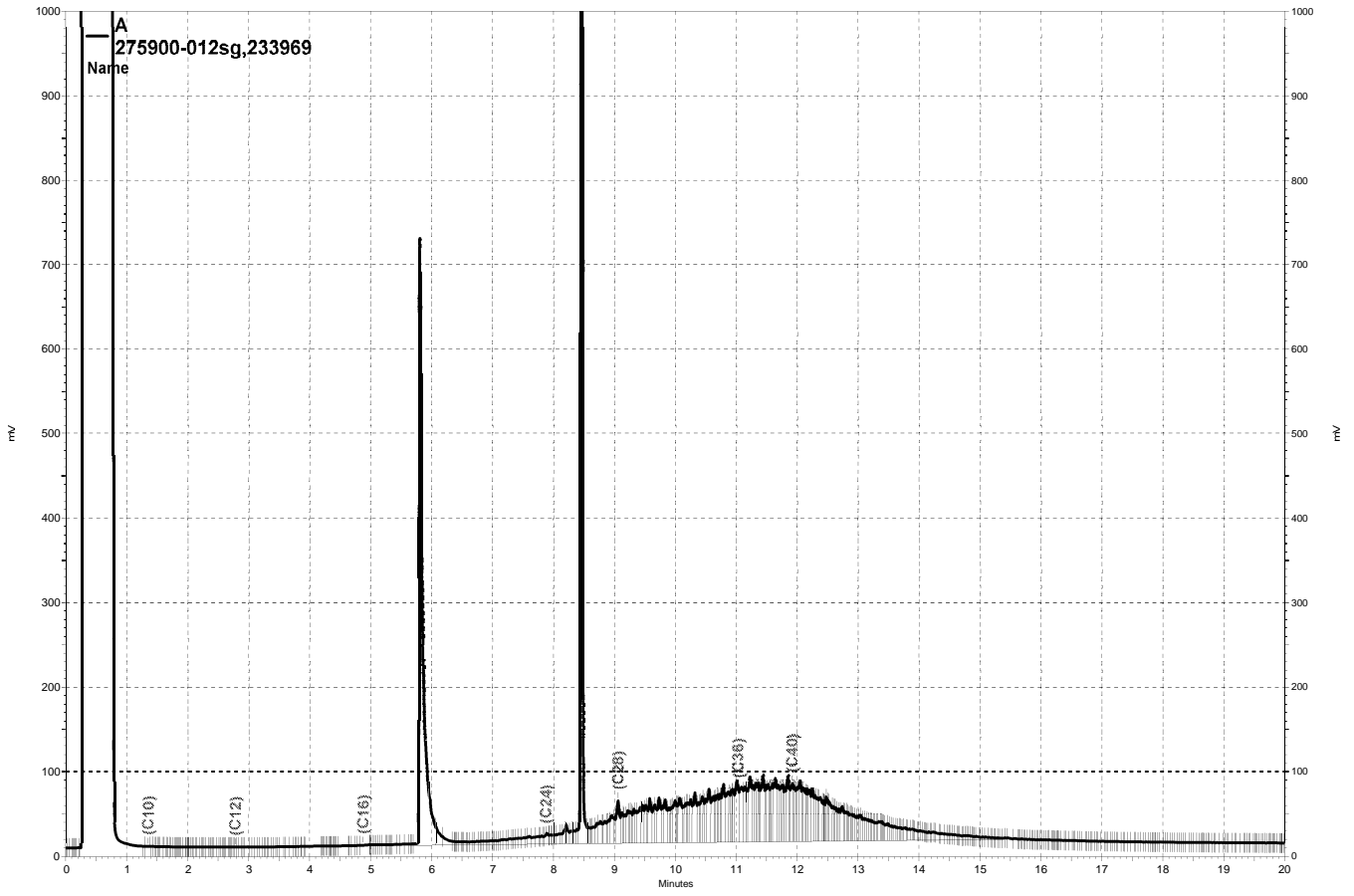
SGCU= Silica gel cleanup



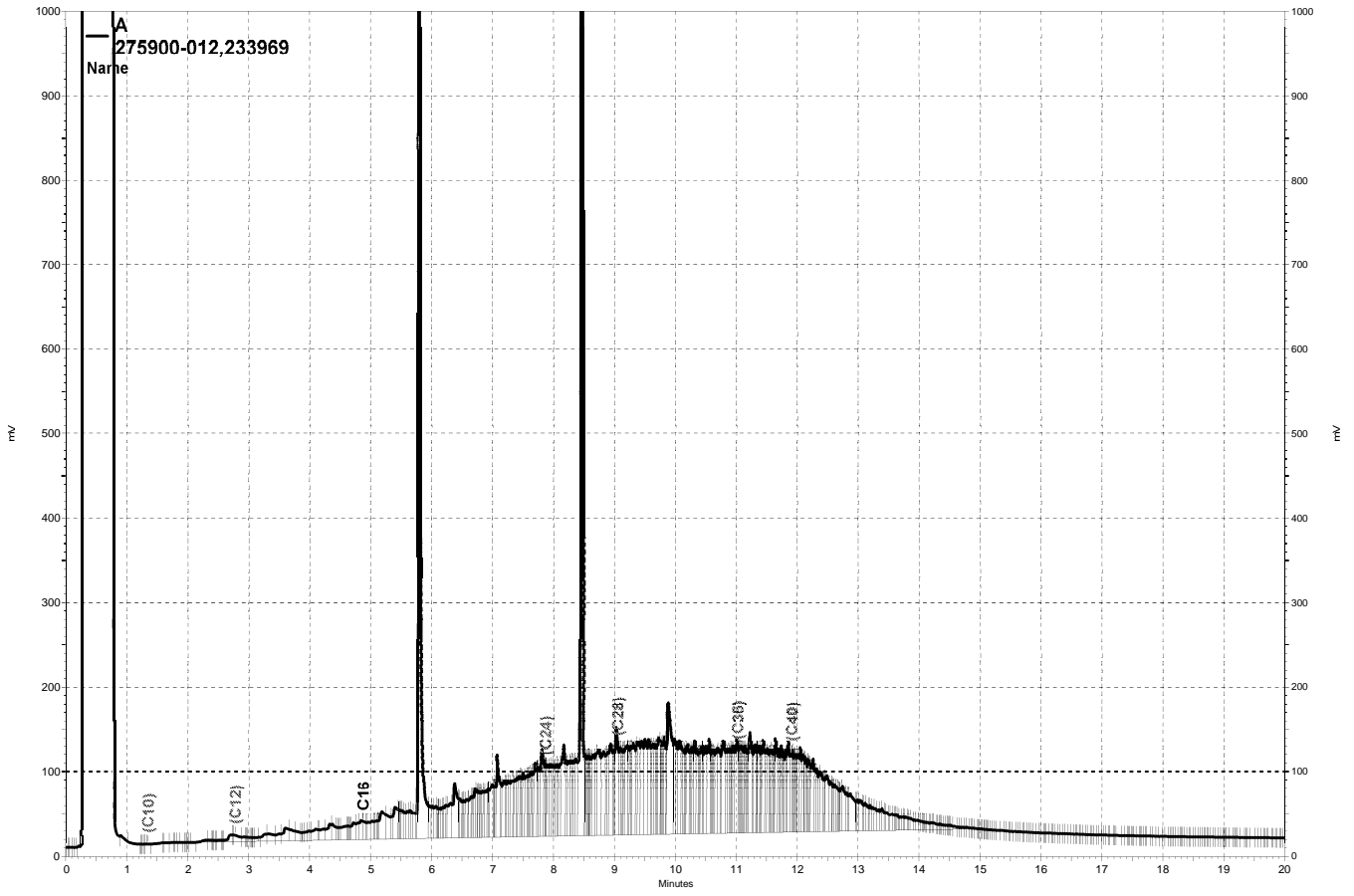
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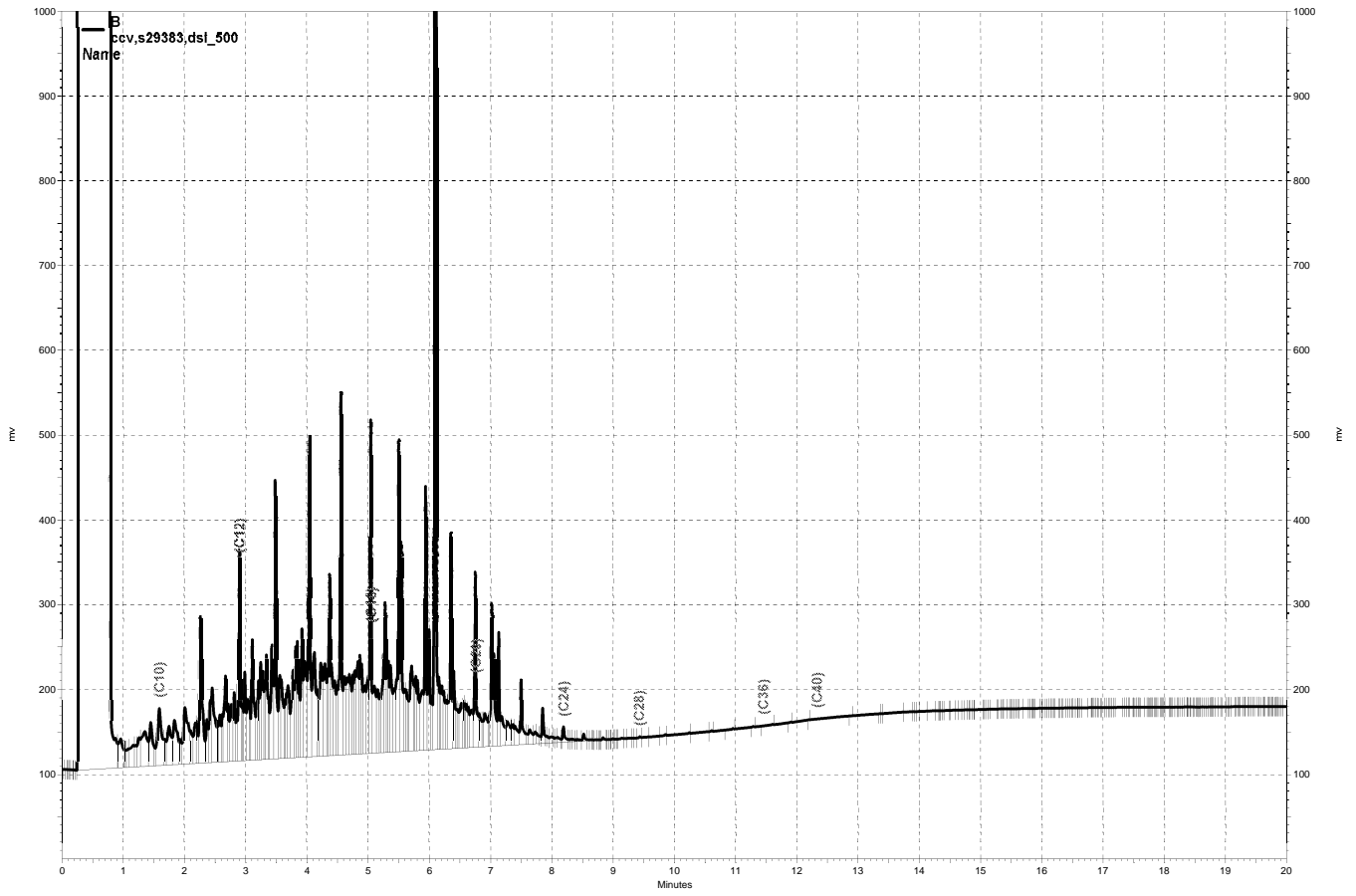
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— \\Lims\gdrive\ezchrom\Projects\GC17A\Data\106a047, A



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Total Extractable Hydrocarbons			
Lab #:	275900	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 3550B
Project#:	0059.007.001	Analysis:	EPA 8015B
Matrix:	Soil	Sampled:	04/09/16
Units:	mg/Kg	Received:	04/11/16
Basis:	as received	Prepared:	04/13/16
Batch#:	234067		

Field ID: SB-7-10 Diln Fac: 1.000
 Type: SAMPLE Analyzed: 04/22/16
 Lab ID: 275900-013 Cleanup Method: EPA 3630C

Analyte	Result	RL
Diesel C10-C24	12 Y	0.99
Diesel C10-C24 (SGCU)	12 Y	0.99

Surrogate	%REC	Limits
o-Terphenyl	87	59-140
o-Terphenyl (SGCU)	98	59-140

Type: BLANK Analyzed: 04/14/16
 Lab ID: QC831464 Cleanup Method: EPA 3630C
 Diln Fac: 1.000

Analyte	Result	RL
Diesel C10-C24	ND	1.0
Diesel C10-C24 (SGCU)	ND	1.0

Surrogate	%REC	Limits
o-Terphenyl	118	59-140
o-Terphenyl (SGCU)	129	59-140

Y= Sample exhibits chromatographic pattern which does not resemble standard
 Z= Sample exhibits unknown single peak or peaks
 DO= Diluted Out
 ND= Not Detected
 RL= Reporting Limit
 SGCU= Silica gel cleanup

Batch QC Report

Total Extractable Hydrocarbons			
Lab #:	275900	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 3550B
Project#:	0059.007.001	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC831465	Batch#:	234067
Matrix:	Soil	Prepared:	04/13/16
Units:	mg/Kg		

Cleanup Method: EPA 3630C

Analyte	Spiked	Result	%REC	Limits	Analyzed
Diesel C10-C24	50.09	46.61	93	58-137	04/21/16
Diesel C10-C24 (SGCU)	50.09	55.10	110	58-137	04/14/16

Surrogate	%REC	Limits	Analyzed
o-Terphenyl	113	59-140	04/21/16
o-Terphenyl (SGCU)	123	59-140	04/14/16

SGCU= Silica gel cleanup

Batch QC Report

Total Extractable Hydrocarbons			
Lab #:	275900	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 3550B
Project#:	0059.007.001	Analysis:	EPA 8015B
Field ID:	SB-6-10	Batch#:	234067
MSS Lab ID:	275900-003	Sampled:	04/09/16
Matrix:	Soil	Received:	04/11/16
Units:	mg/Kg	Prepared:	04/13/16
Basis:	as received	Analyzed:	04/21/16
Diln Fac:	3.000		

Type: MS
Lab ID: QC831466

Cleanup Method: EPA 3630C

Analyte	MSS Result	Spiked	Result	%REC	Limits
Diesel C10-C24	20.95	50.42	58.61	75	46-154
Diesel C10-C24 (SGCU)	20.82	50.42	64.81	87	46-154

Surrogate	%REC	Limits
o-Terphenyl	77	59-140
o-Terphenyl (SGCU)	87	59-140

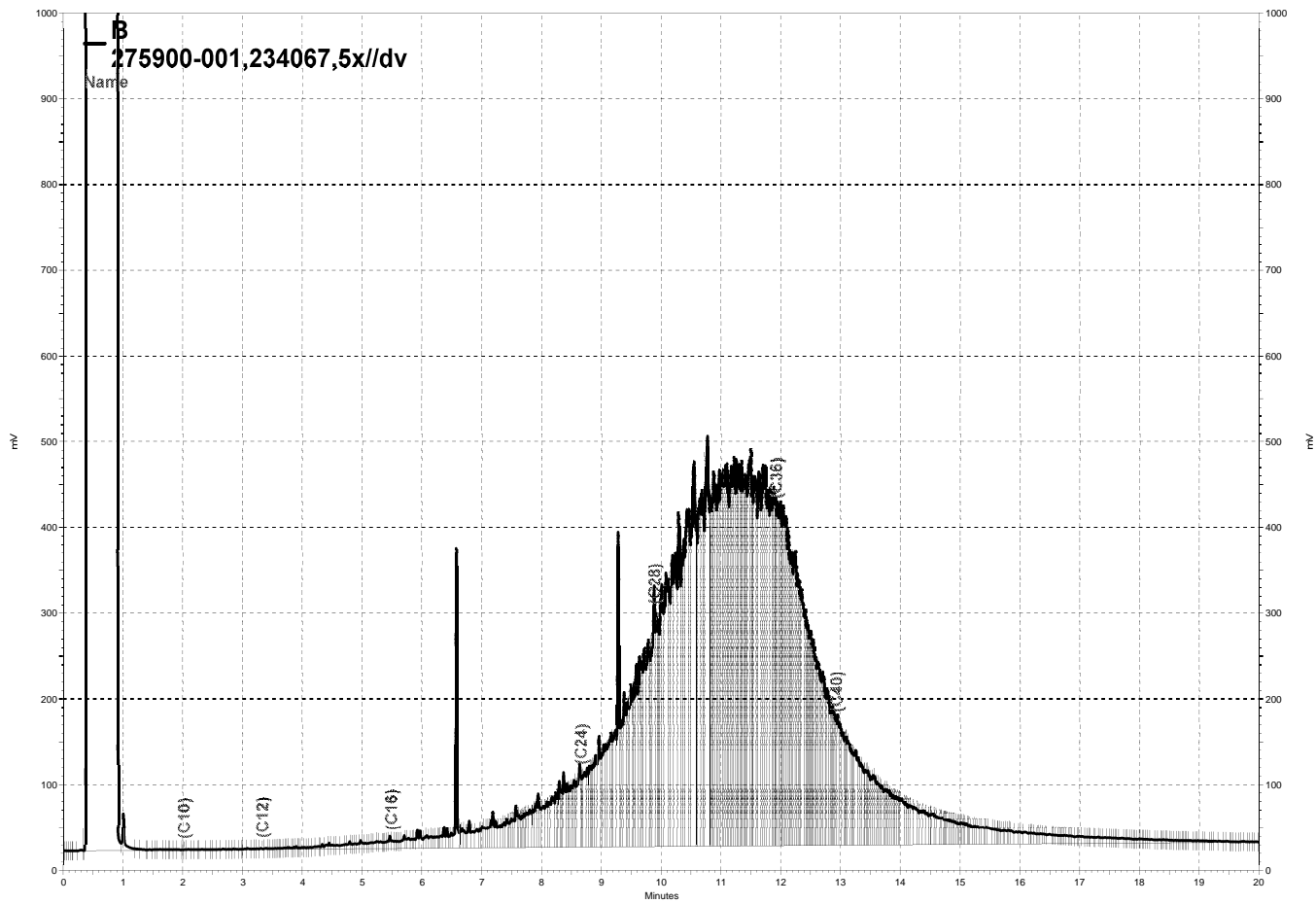
Type: MSD
Lab ID: QC831467

Cleanup Method: EPA 3630C

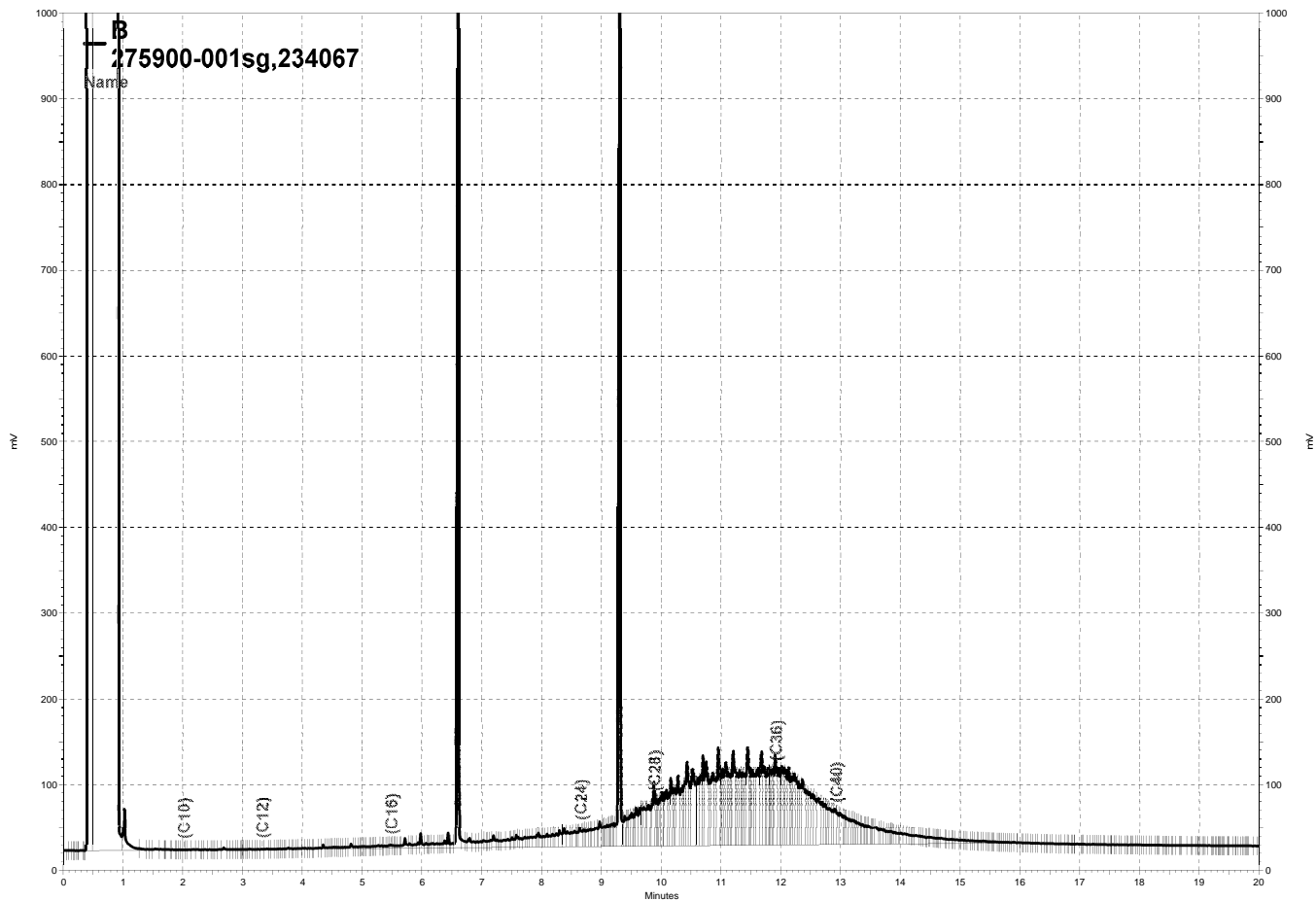
Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Diesel C10-C24	50.26	77.14	112	46-154	28	50
Diesel C10-C24 (SGCU)	50.26	79.38	117	46-154	20	50

Surrogate	%REC	Limits
o-Terphenyl	102	59-140
o-Terphenyl (SGCU)	109	59-140

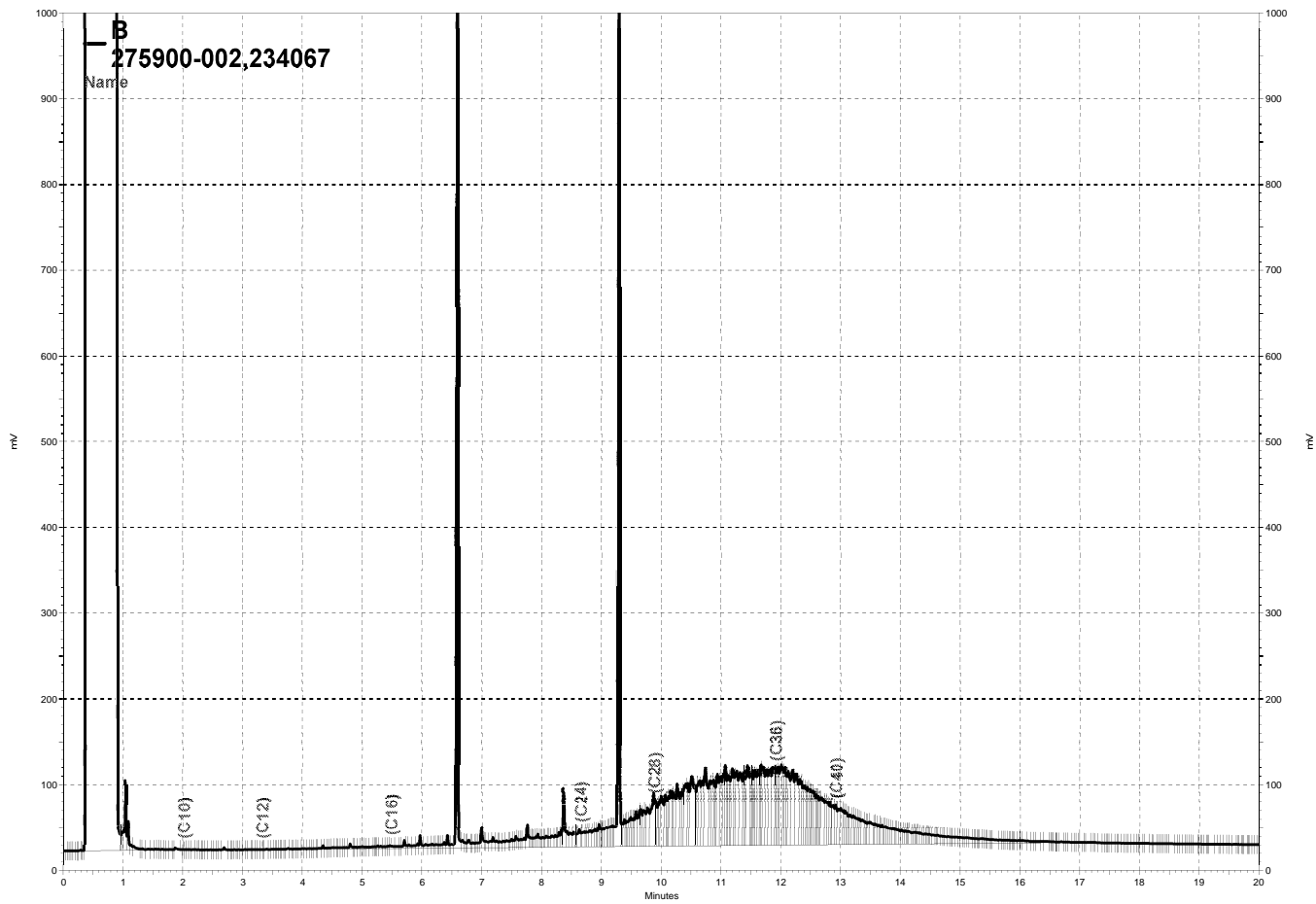
RPD= Relative Percent Difference
SGCU= Silica gel cleanup



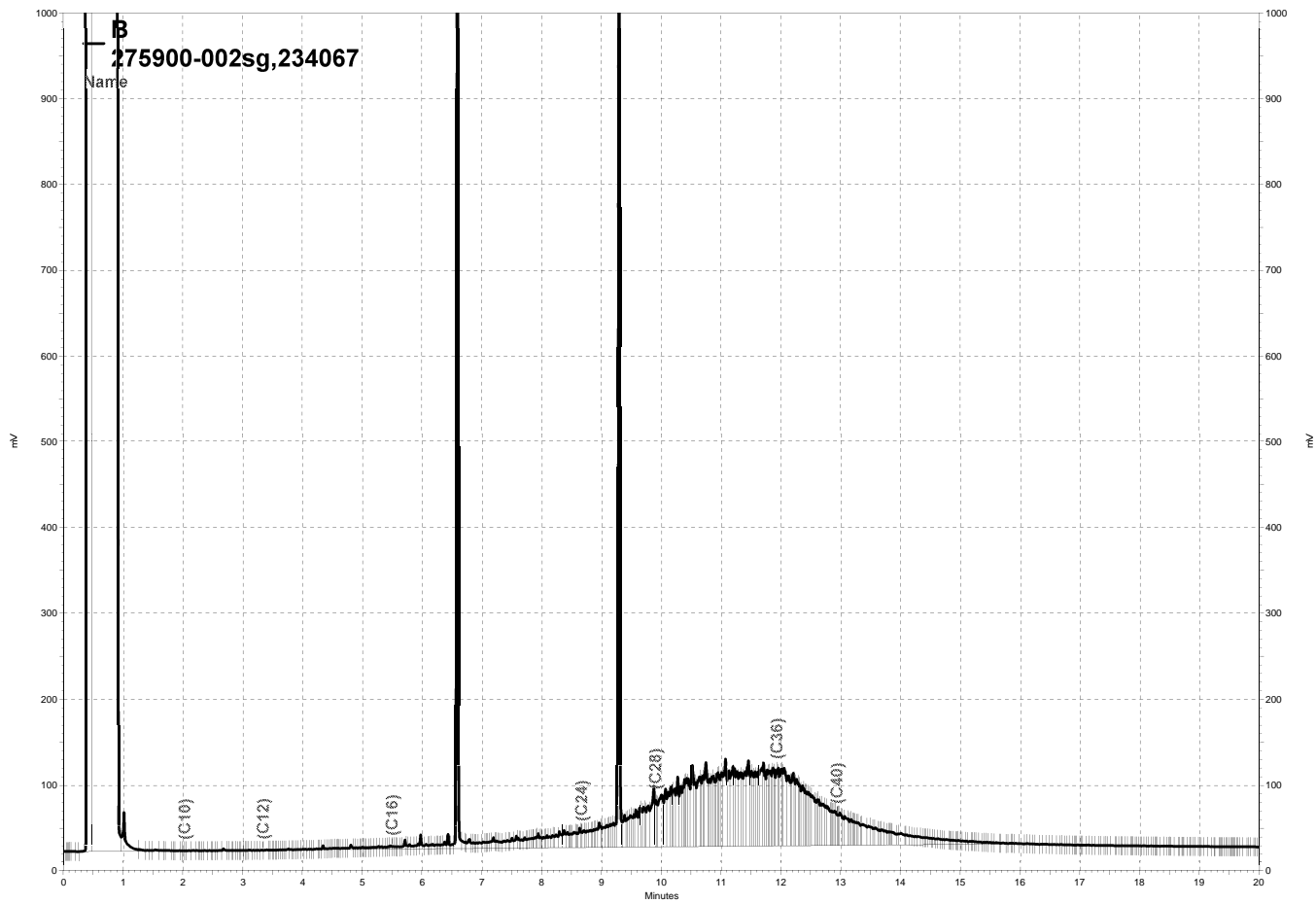
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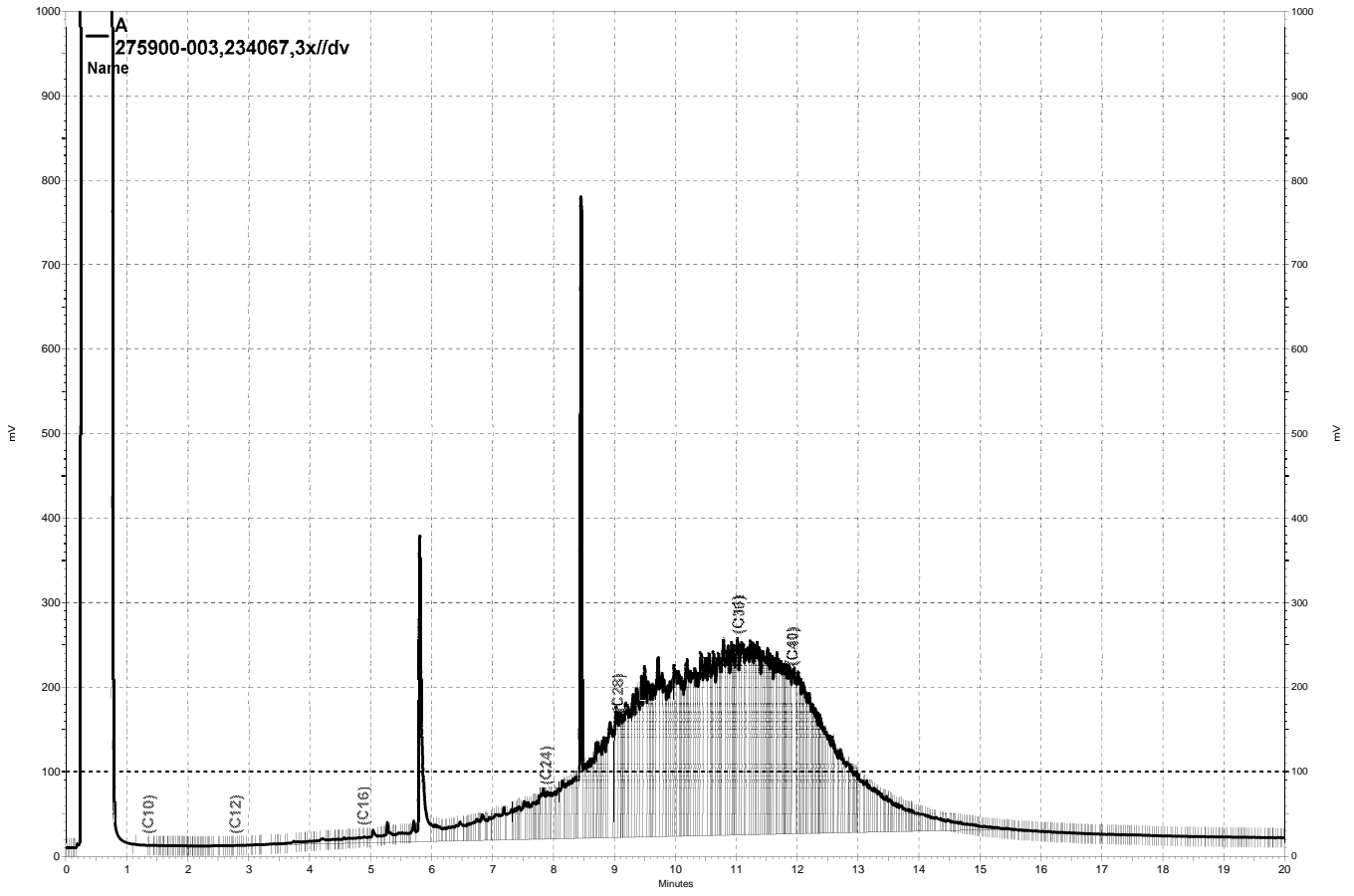
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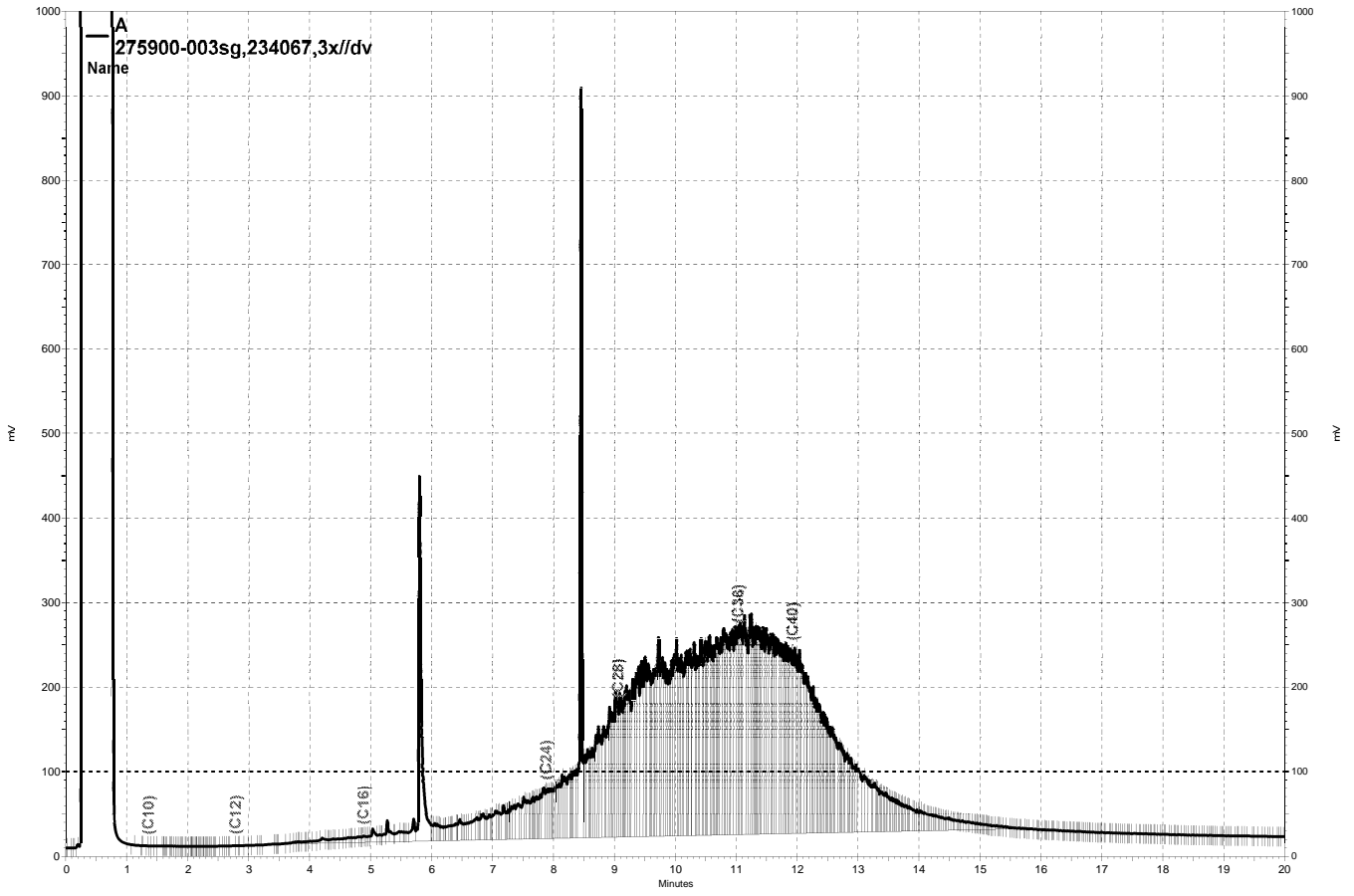
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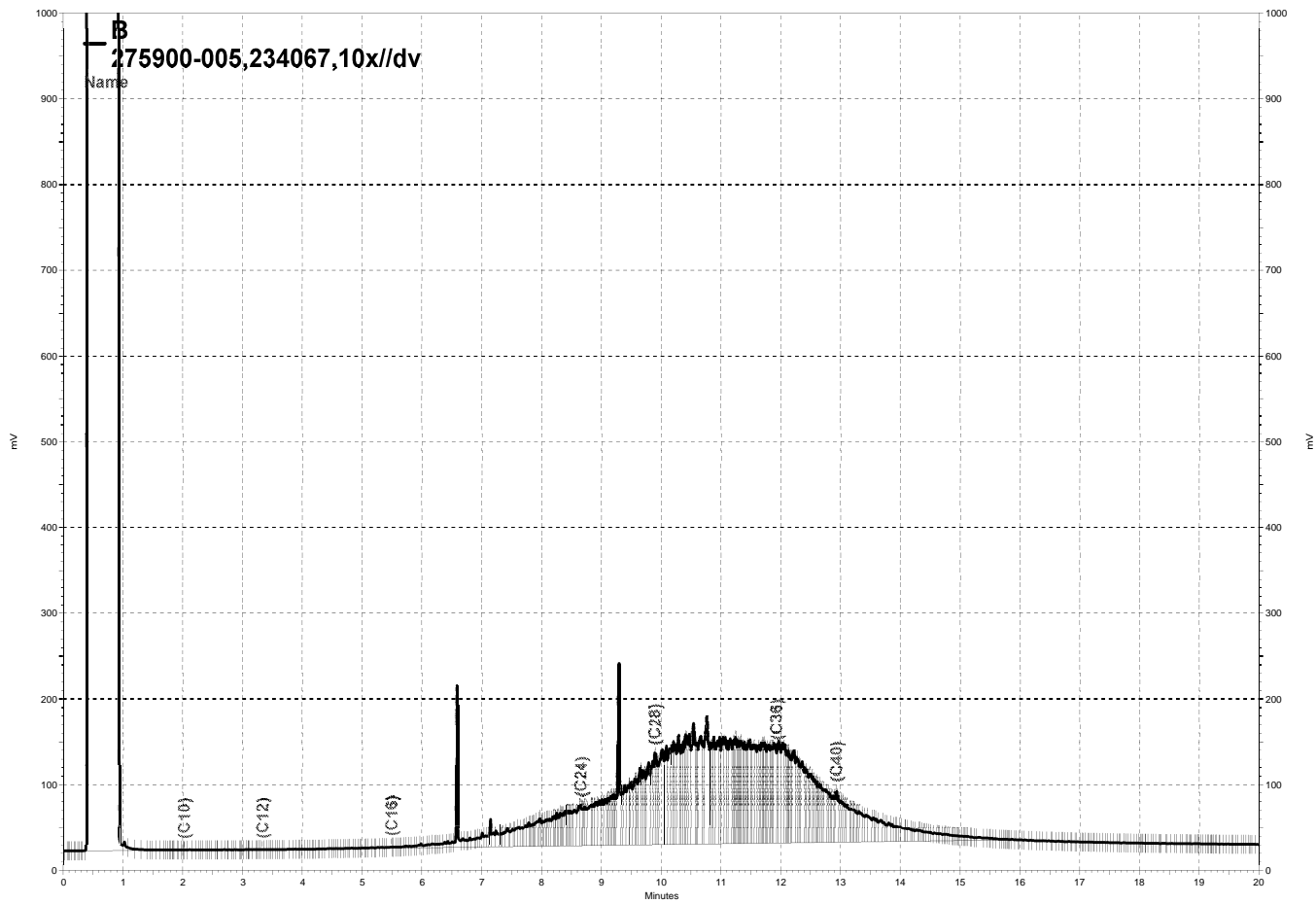
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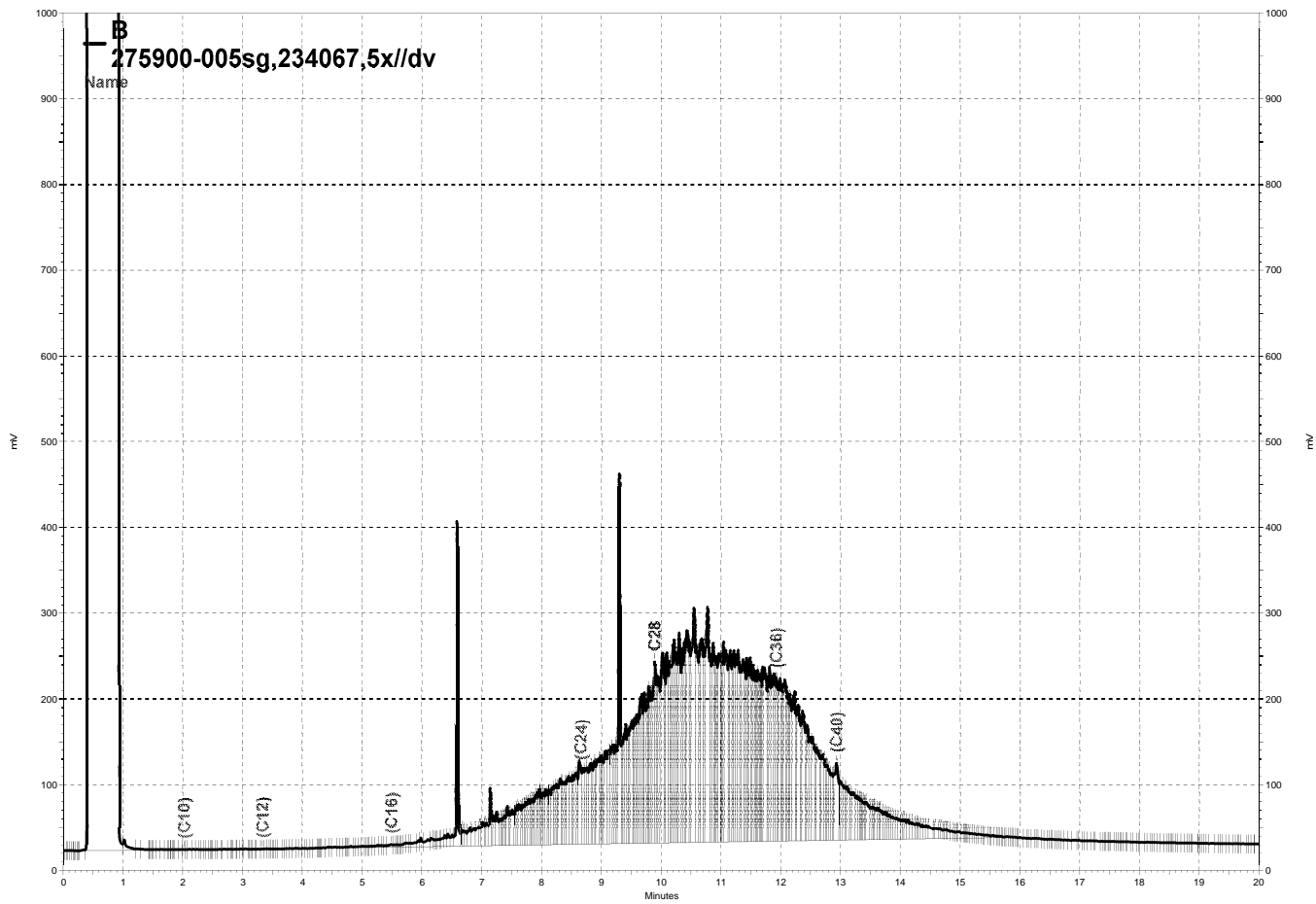
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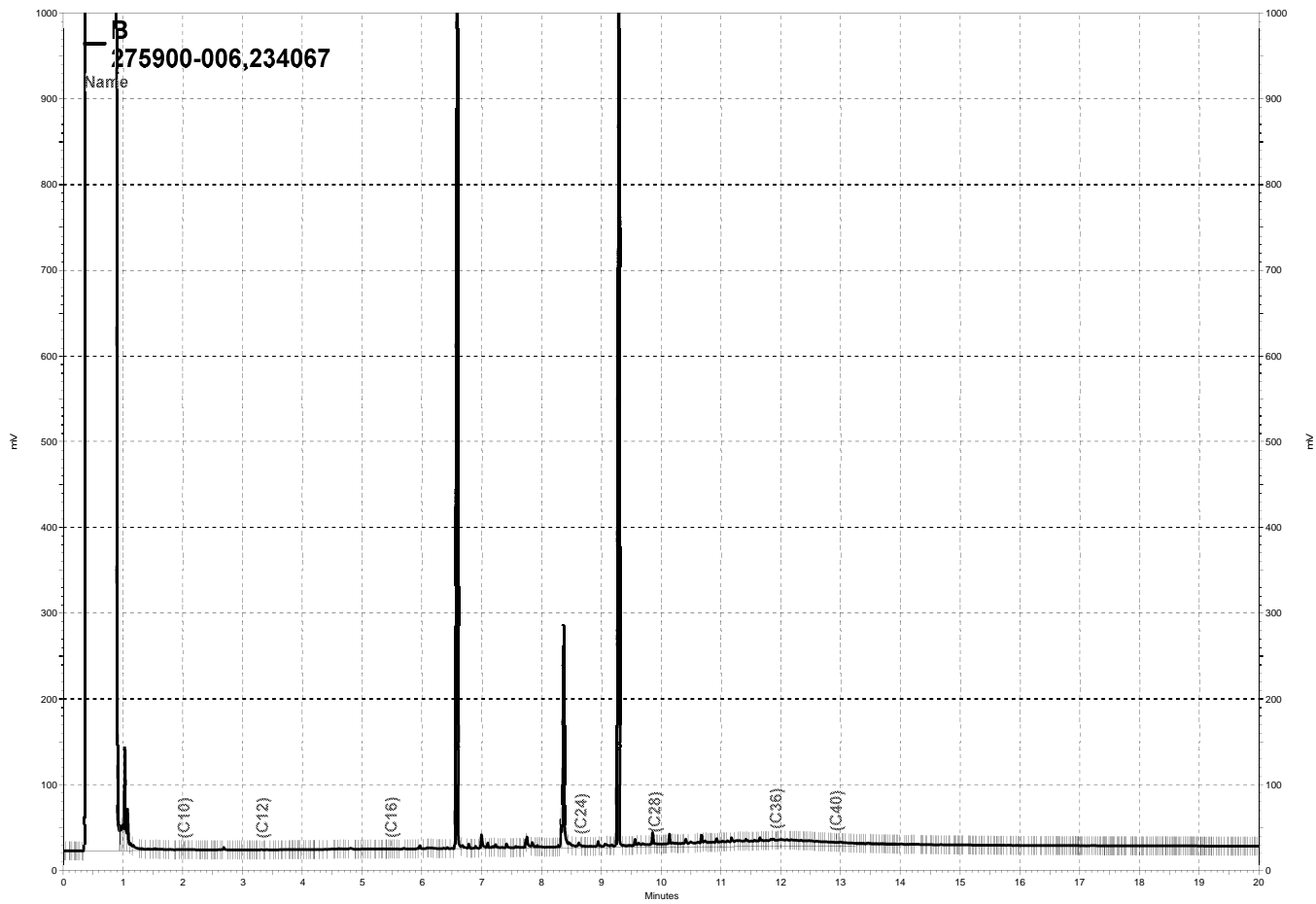
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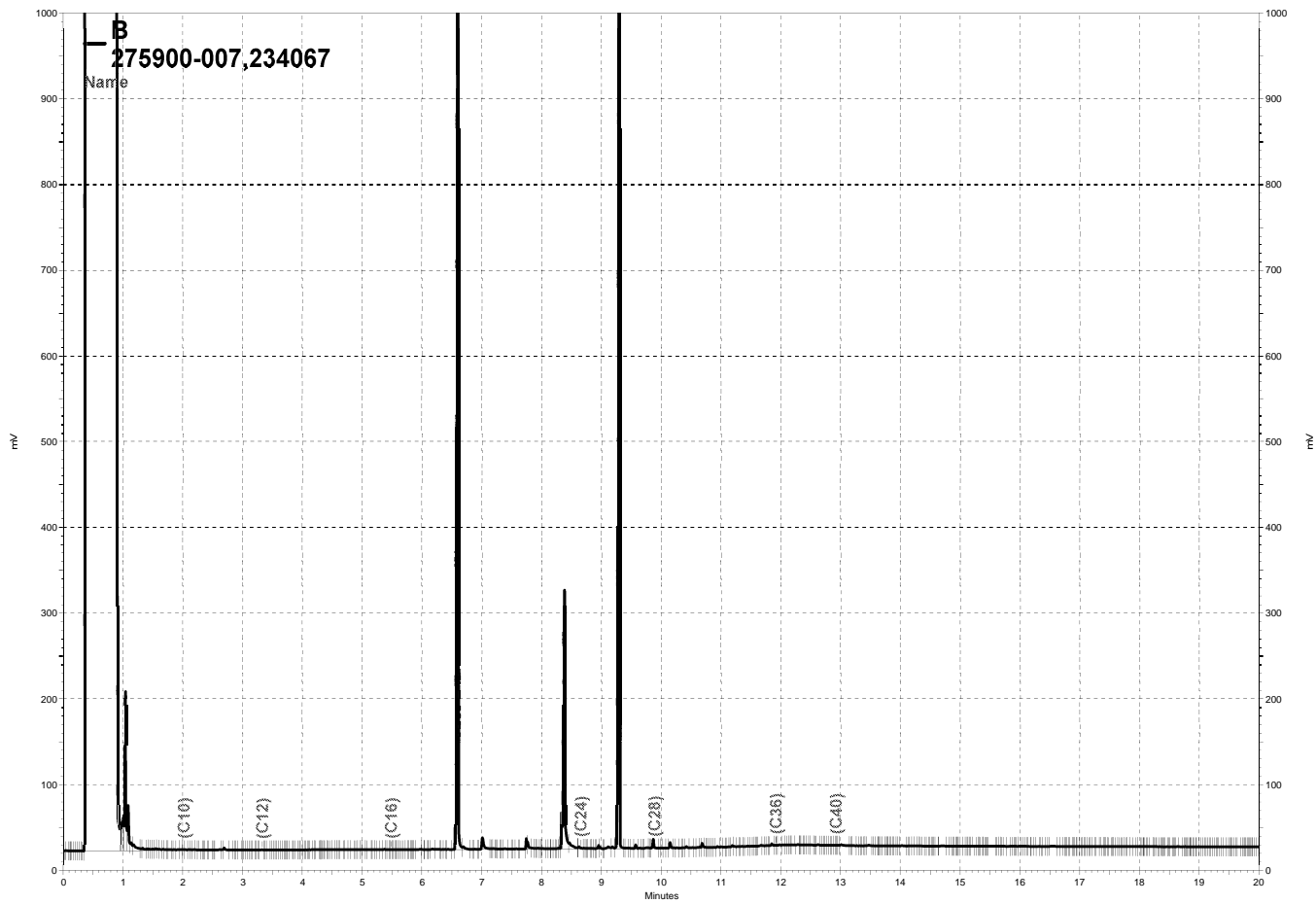
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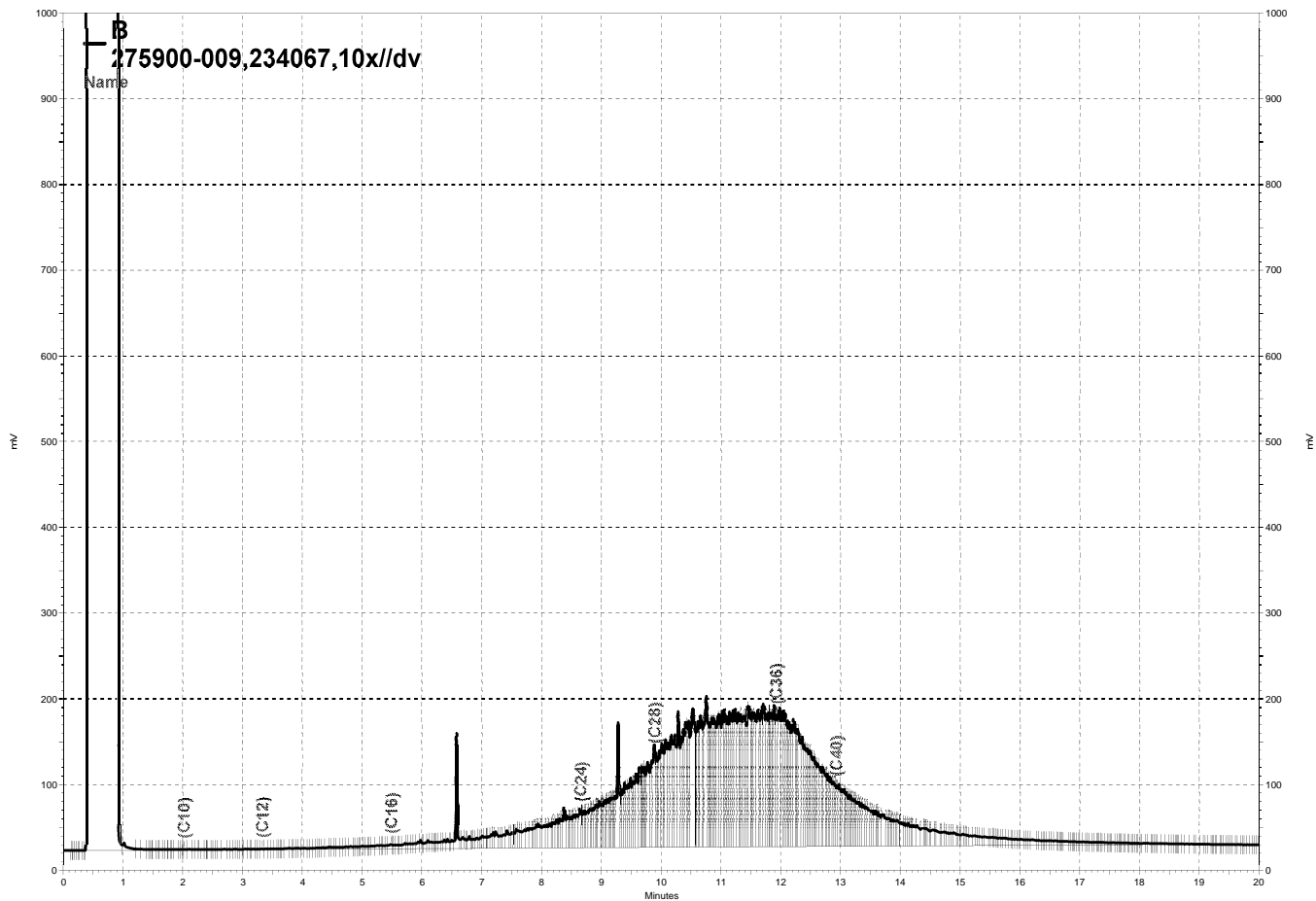
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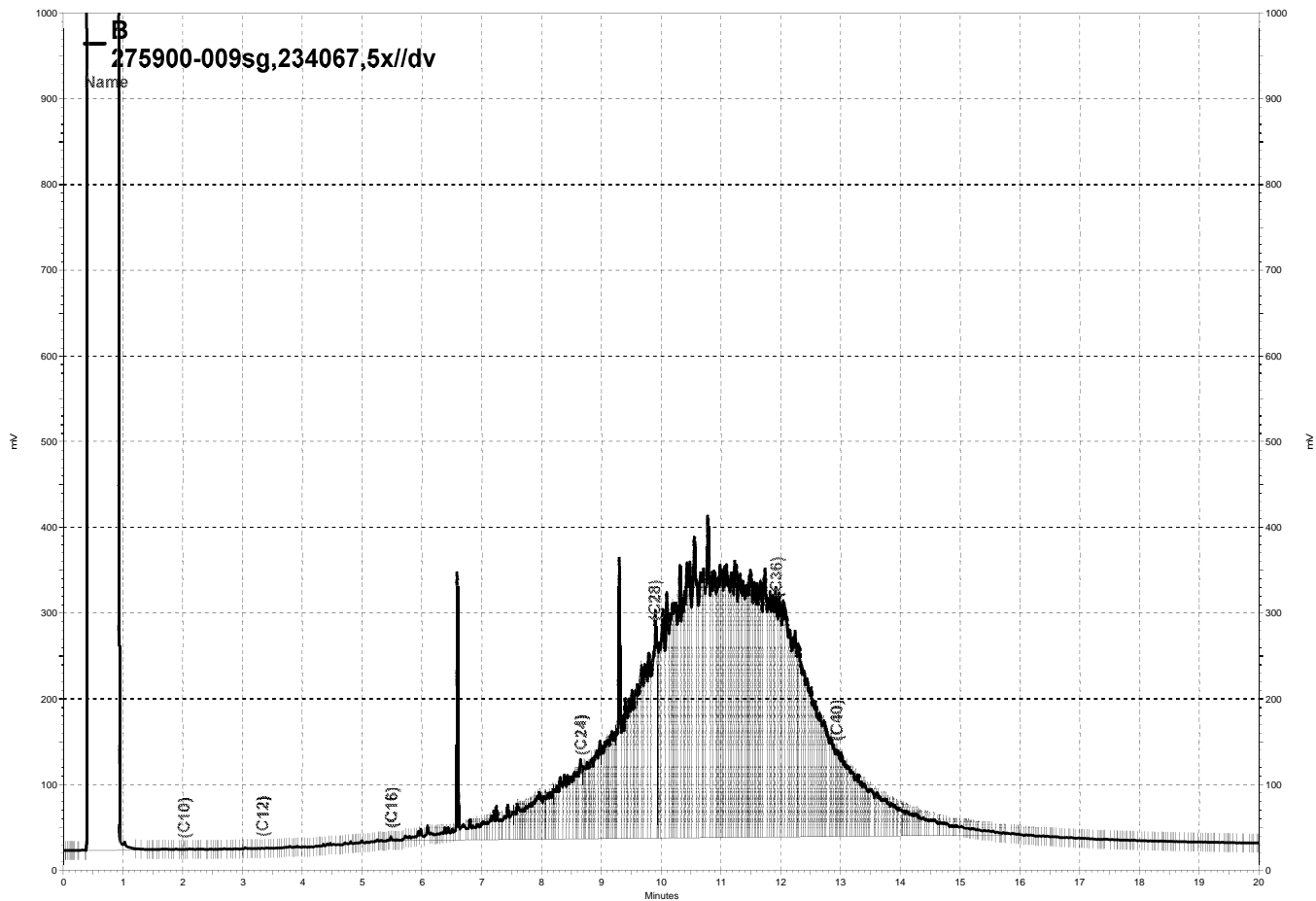
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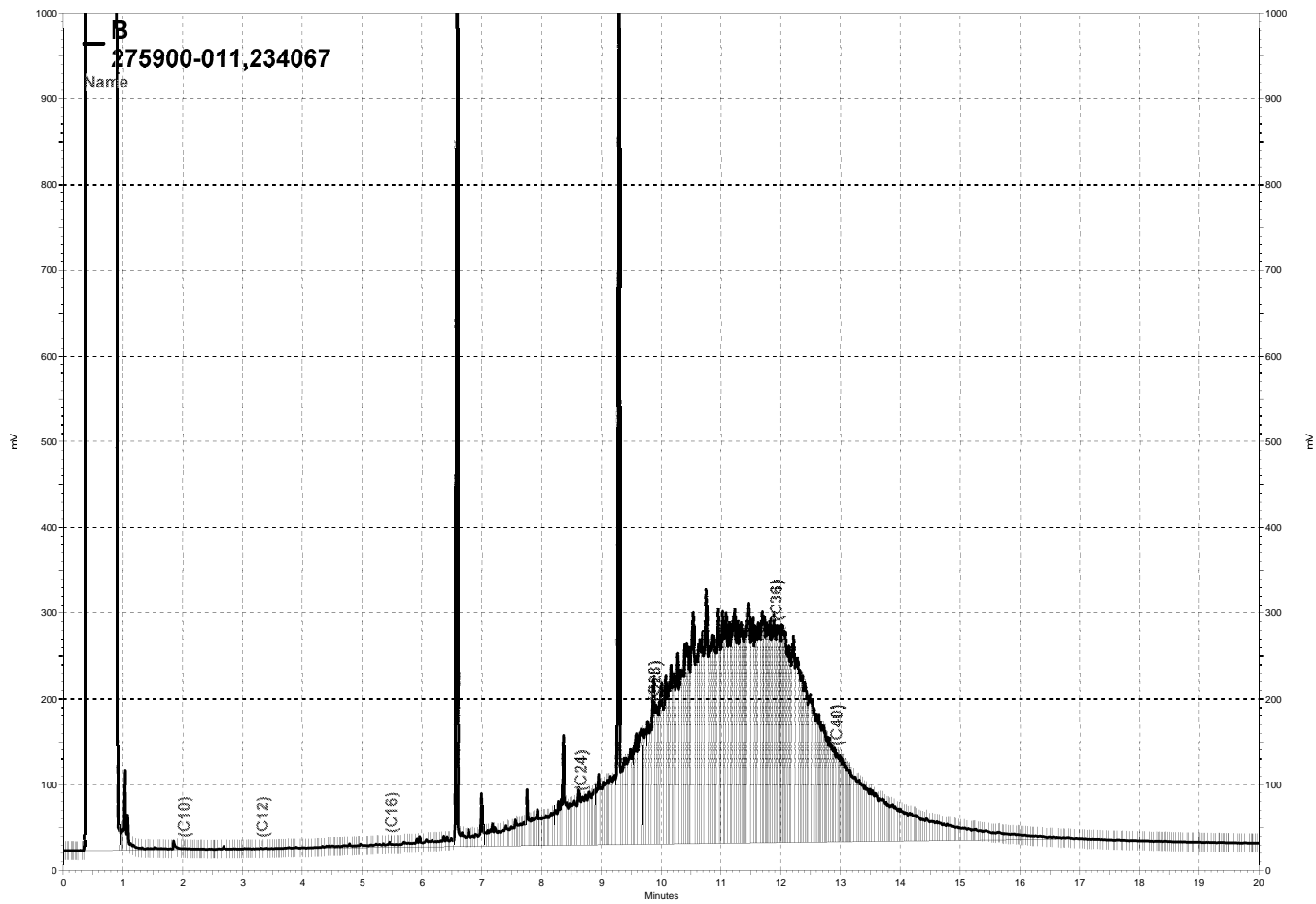
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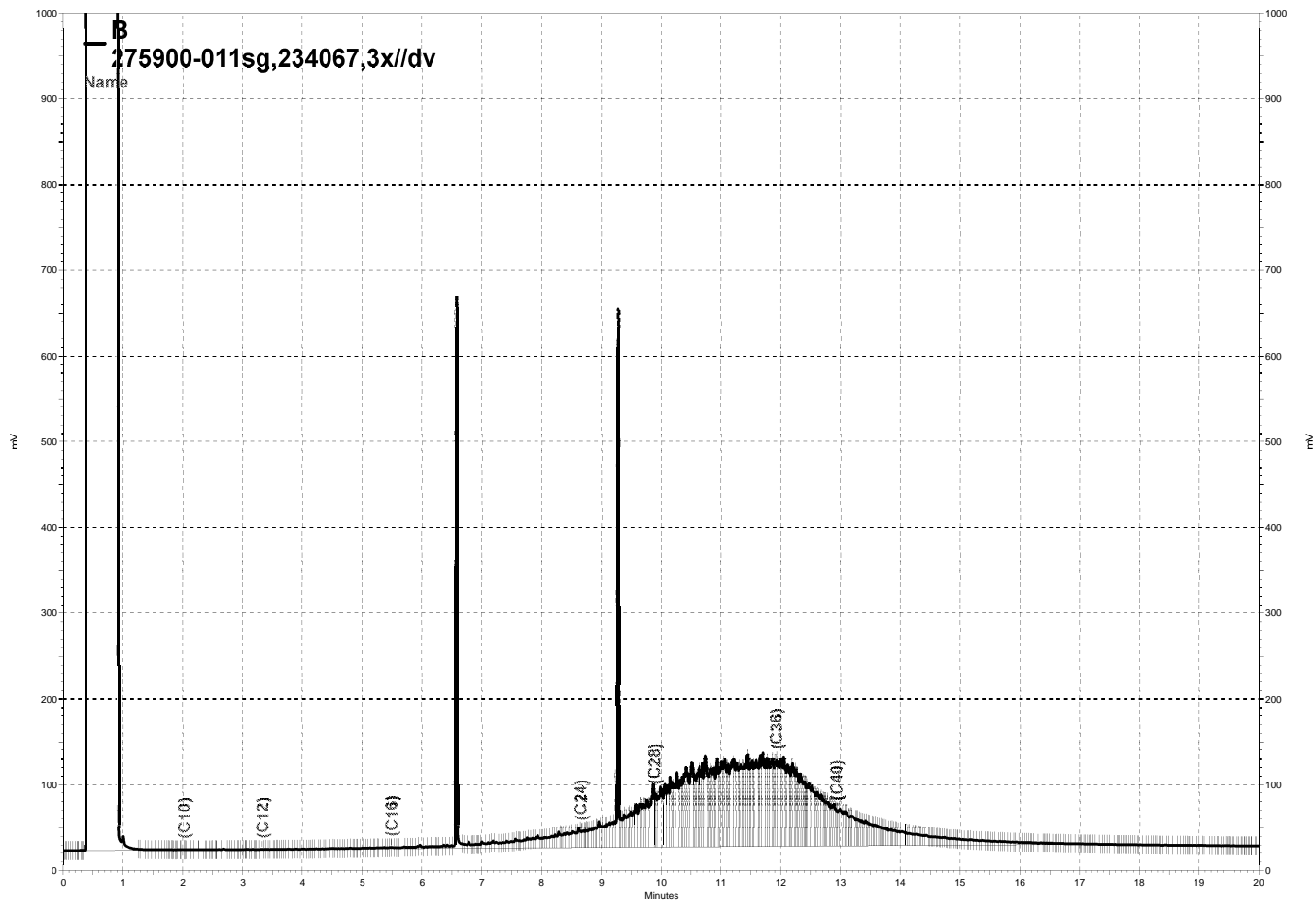
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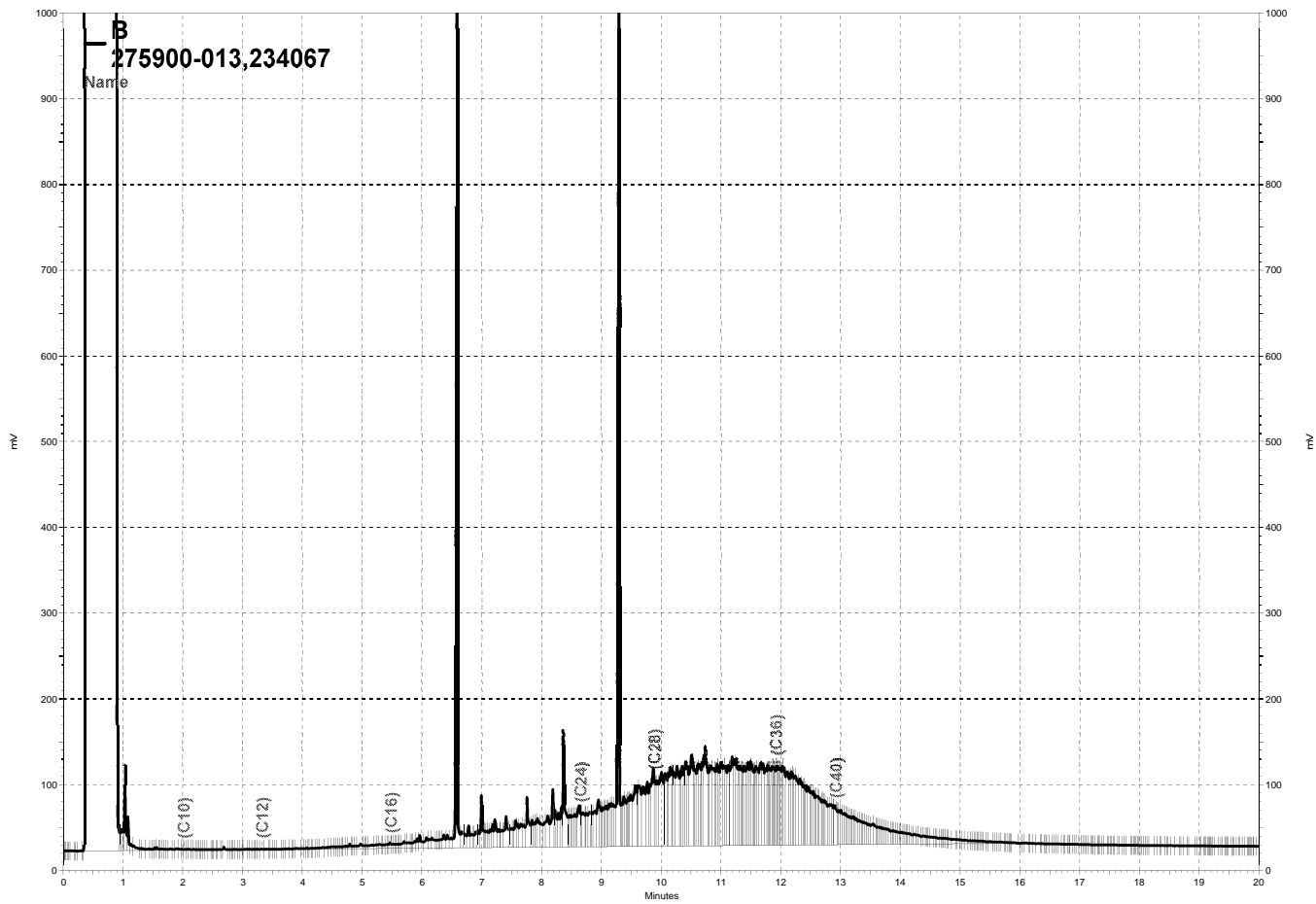
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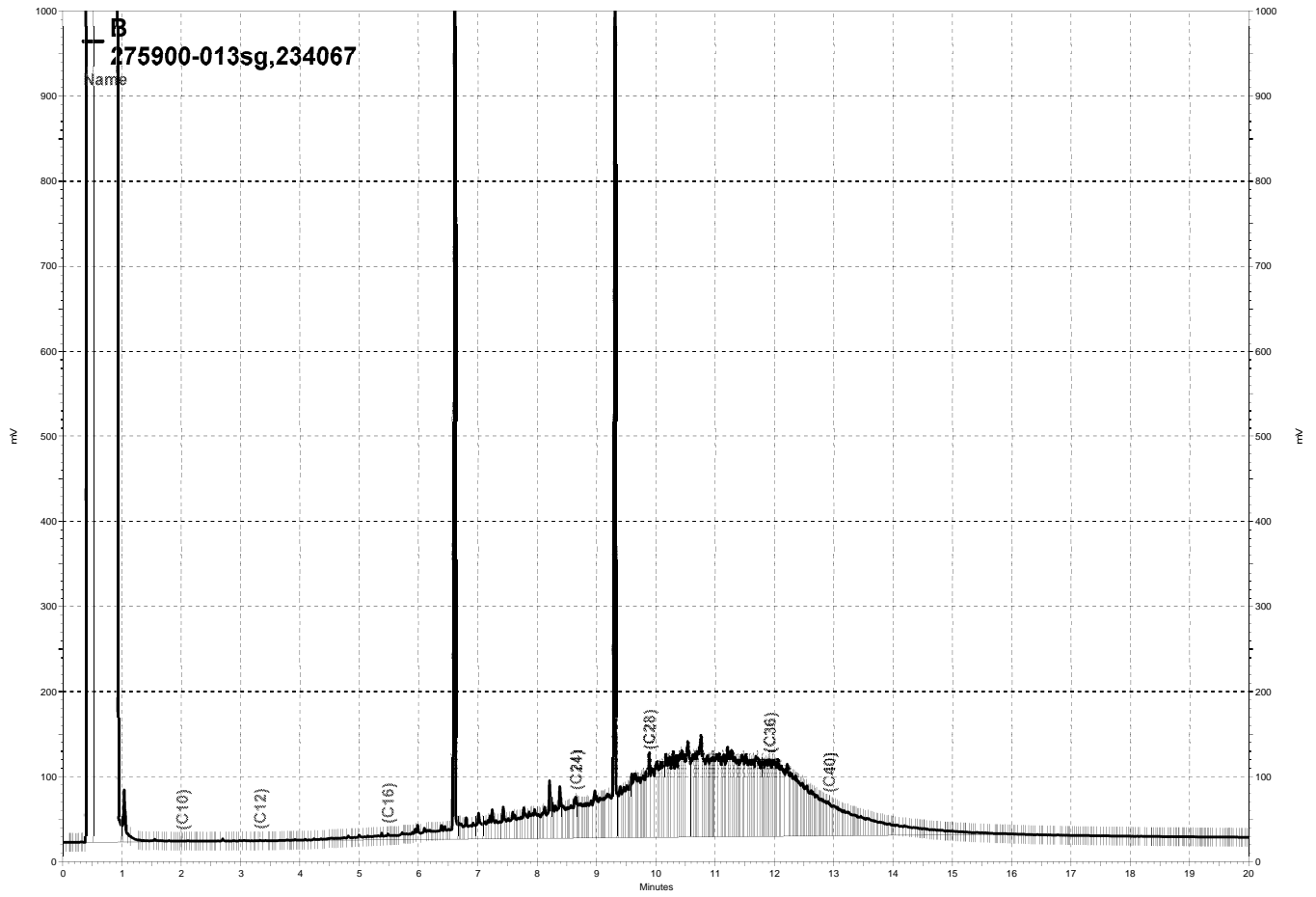
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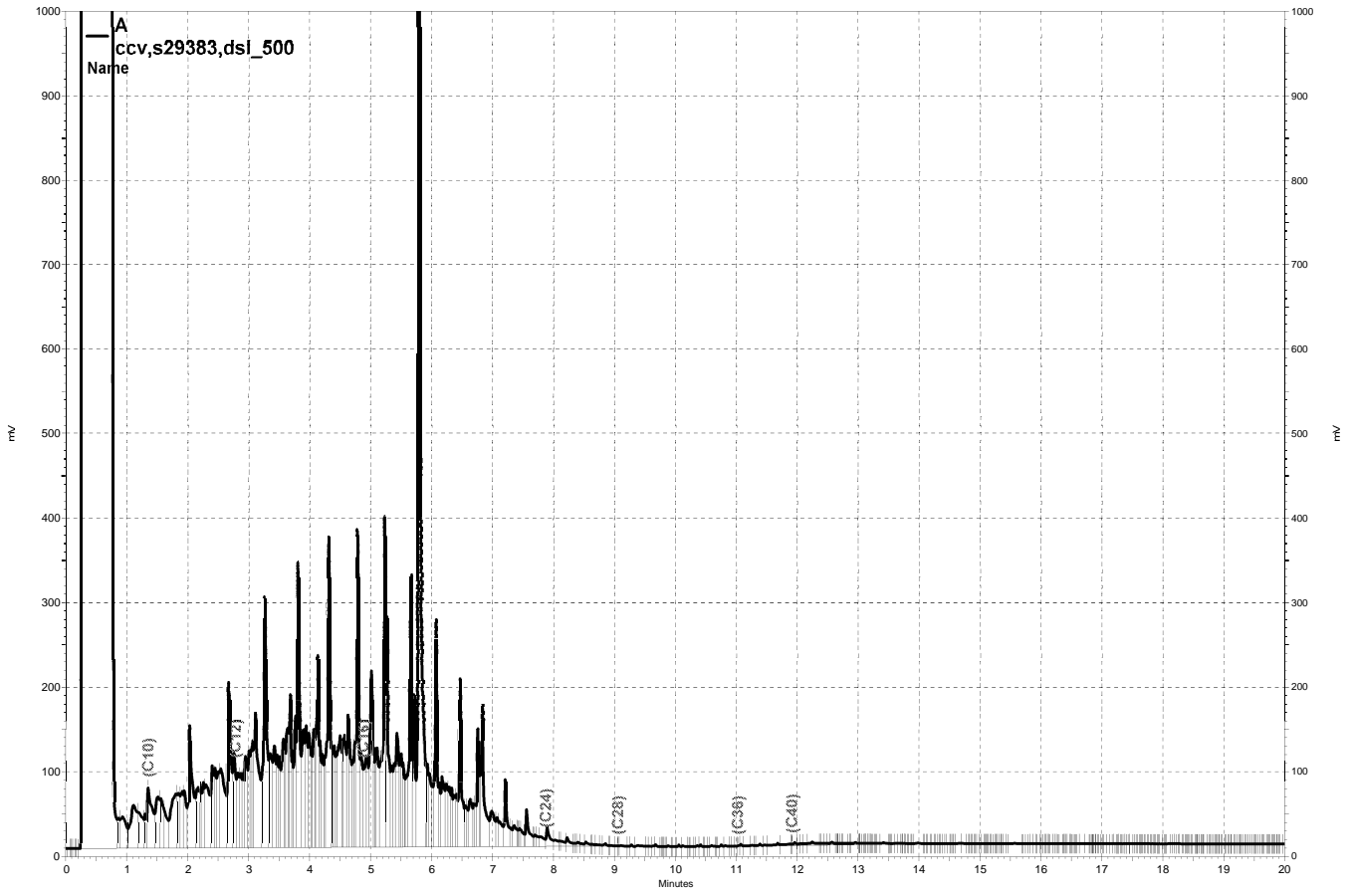
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— \\Lims\gdrive\ezchrom\Projects\GC14B\Data\112b043, B



— \\Lims\gdrive\ezchrom\Projects\GC17A\Data\104a046, A

Purgeable Aromatics by GC/MS

Lab #:	275900	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 5030B
Project#:	0059.007.001	Analysis:	EPA 8260B
Field ID:	SB-6-15-GW	Batch#:	234113
Lab ID:	275900-004	Sampled:	04/09/16
Matrix:	Water	Received:	04/11/16
Units:	ug/L	Analyzed:	04/14/16
Diln Fac:	1.000		

Analyte	Result	RL
MTBE	ND	0.5
Benzene	ND	0.5
Toluene	8.5	0.5
Ethylbenzene	ND	0.5
m,p-Xylenes	ND	0.5
o-Xylene	ND	0.5

Surrogate	%REC	Limits
Dibromofluoromethane	110	80-128
1,2-Dichloroethane-d4	98	75-139
Toluene-d8	97	80-120
Bromofluorobenzene	100	80-120

ND= Not Detected
 RL= Reporting Limit

Purgeable Aromatics by GC/MS

Lab #:	275900	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 5030B
Project#:	0059.007.001	Analysis:	EPA 8260B
Field ID:	SB-3-13-GW	Batch#:	234113
Lab ID:	275900-008	Sampled:	04/09/16
Matrix:	Water	Received:	04/11/16
Units:	ug/L	Analyzed:	04/14/16
Diln Fac:	1.000		

Analyte	Result	RL
MTBE	ND	0.5
Benzene	ND	0.5
Toluene	ND	0.5
Ethylbenzene	ND	0.5
m,p-Xylenes	ND	0.5
o-Xylene	ND	0.5

Surrogate	%REC	Limits
Dibromofluoromethane	107	80-128
1,2-Dichloroethane-d4	100	75-139
Toluene-d8	98	80-120
Bromofluorobenzene	102	80-120

ND= Not Detected
 RL= Reporting Limit

Purgeable Aromatics by GC/MS

Lab #:	275900	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 5030B
Project#:	0059.007.001	Analysis:	EPA 8260B
Field ID:	SB-5-15-GW	Batch#:	234113
Lab ID:	275900-012	Sampled:	04/09/16
Matrix:	Water	Received:	04/11/16
Units:	ug/L	Analyzed:	04/14/16
Diln Fac:	1.000		

Analyte	Result	RL
MTBE	ND	0.5
Benzene	ND	0.5
Toluene	ND	0.5
Ethylbenzene	ND	0.5
m,p-Xylenes	ND	0.5
o-Xylene	ND	0.5

Surrogate	%REC	Limits
Dibromofluoromethane	109	80-128
1,2-Dichloroethane-d4	99	75-139
Toluene-d8	98	80-120
Bromofluorobenzene	103	80-120

ND= Not Detected
 RL= Reporting Limit

Purgeable Aromatics by GC/MS

Lab #:	275900	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 5030B
Project#:	0059.007.001	Analysis:	EPA 8260B
Field ID:	SB-7-15-GW	Batch#:	234113
Lab ID:	275900-014	Sampled:	04/09/16
Matrix:	Water	Received:	04/11/16
Units:	ug/L	Analyzed:	04/14/16
Diln Fac:	1.000		

Analyte	Result	RL
MTBE	ND	0.5
Benzene	ND	0.5
Toluene	ND	0.5
Ethylbenzene	ND	0.5
m,p-Xylenes	ND	0.5
o-Xylene	ND	0.5

Surrogate	%REC	Limits
Dibromofluoromethane	108	80-128
1,2-Dichloroethane-d4	99	75-139
Toluene-d8	99	80-120
Bromofluorobenzene	101	80-120

ND= Not Detected
 RL= Reporting Limit

Purgeable Aromatics by GC/MS

Lab #:	275900	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 5030B
Project#:	0059.007.001	Analysis:	EPA 8260B
Field ID:	TB-040916	Batch#:	234039
Lab ID:	275900-015	Sampled:	04/09/16
Matrix:	Water	Received:	04/11/16
Units:	ug/L	Analyzed:	04/13/16
Diln Fac:	1.000		

Analyte	Result	RL
MTBE	ND	0.5
Benzene	ND	0.5
Toluene	ND	0.5
Ethylbenzene	ND	0.5
m,p-Xylenes	ND	0.5
o-Xylene	ND	0.5

Surrogate	%REC	Limits
Dibromofluoromethane	108	80-128
1,2-Dichloroethane-d4	95	75-139
Toluene-d8	101	80-120
Bromofluorobenzene	101	80-120

ND= Not Detected
 RL= Reporting Limit

Batch QC Report

Purgeable Aromatics by GC/MS			
Lab #:	275900	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 5030B
Project#:	0059.007.001	Analysis:	EPA 8260B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC831341	Batch#:	234039
Matrix:	Water	Analyzed:	04/13/16
Units:	ug/L		

Analyte	Result	RL
MTBE	ND	0.5
Benzene	ND	0.5
Toluene	ND	0.5
Ethylbenzene	ND	0.5
m,p-Xylenes	ND	0.5
o-Xylene	ND	0.5

Surrogate	%REC	Limits
Dibromofluoromethane	107	80-128
1,2-Dichloroethane-d4	94	75-139
Toluene-d8	100	80-120
Bromofluorobenzene	101	80-120

ND= Not Detected

RL= Reporting Limit

Batch QC Report

Purgeable Aromatics by GC/MS			
Lab #:	275900	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 5030B
Project#:	0059.007.001	Analysis:	EPA 8260B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC831645	Batch#:	234113
Matrix:	Water	Analyzed:	04/14/16
Units:	ug/L		

Analyte	Result	RL
MTBE	ND	0.5
Benzene	ND	0.5
Toluene	ND	0.5
Ethylbenzene	ND	0.5
m,p-Xylenes	ND	0.5
o-Xylene	ND	0.5

Surrogate	%REC	Limits
Dibromofluoromethane	111	80-128
1,2-Dichloroethane-d4	99	75-139
Toluene-d8	99	80-120
Bromofluorobenzene	105	80-120

ND= Not Detected
 RL= Reporting Limit

Batch QC Report

Purgeable Aromatics by GC/MS			
Lab #:	275900	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 5030B
Project#:	0059.007.001	Analysis:	EPA 8260B
Field ID:	ZZZZZZZZZZ	Batch#:	234113
MSS Lab ID:	275804-005	Sampled:	04/06/16
Matrix:	Water	Received:	04/07/16
Units:	ug/L	Analyzed:	04/14/16
Diln Fac:	1.000		

Type: MS Lab ID: QC831664

Analyte	MSS Result	Spiked	Result	%REC	Limits
MTBE	1.464	25.00	26.75	101	71-120
Benzene	<0.1000	25.00	24.72	99	80-120
Toluene	<0.1000	25.00	23.46	94	80-120
Ethylbenzene	<0.1000	25.00	23.44	94	80-120
m,p-Xylenes	<0.1309	50.00	47.63	95	80-121
o-Xylene	<0.1000	25.00	23.78	95	80-120

Surrogate	%REC	Limits
Dibromofluoromethane	109	80-128
1,2-Dichloroethane-d4	101	75-139
Toluene-d8	100	80-120
Bromofluorobenzene	96	80-120

Type: MSD Lab ID: QC831665

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
MTBE	25.00	25.67	97	71-120	4	20
Benzene	25.00	23.65	95	80-120	4	20
Toluene	25.00	22.63	91	80-120	4	21
Ethylbenzene	25.00	22.52	90	80-120	4	25
m,p-Xylenes	50.00	46.19	92	80-121	3	23
o-Xylene	25.00	23.13	93	80-120	3	25

Surrogate	%REC	Limits
Dibromofluoromethane	109	80-128
1,2-Dichloroethane-d4	100	75-139
Toluene-d8	98	80-120
Bromofluorobenzene	98	80-120

RPD= Relative Percent Difference

Batch QC Report

Purgeable Aromatics by GC/MS			
Lab #:	275900	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 5030B
Project#:	0059.007.001	Analysis:	EPA 8260B
Field ID:	ZZZZZZZZZZ	Diln Fac:	1.000
MSS Lab ID:	275804-012	Batch#:	234113
Matrix:	Water	Sampled:	04/06/16
Units:	ug/L	Received:	04/07/16

Type: MS Analyzed: 04/14/16
 Lab ID: QC831666

Analyte	MSS Result	Spiked	Result	%REC	Limits
MTBE	<0.1000	25.00	23.97	96	71-120
Benzene	<0.1000	25.00	24.23	97	80-120
Toluene	<0.1000	25.00	23.02	92	80-120
Ethylbenzene	<0.1000	25.00	22.98	92	80-120
m,p-Xylenes	<0.1309	50.00	47.00	94	80-121
o-Xylene	<0.1000	25.00	23.38	94	80-120

Surrogate	%REC	Limits
Dibromofluoromethane	107	80-128
1,2-Dichloroethane-d4	98	75-139
Toluene-d8	97	80-120
Bromofluorobenzene	97	80-120

Type: MSD Analyzed: 04/15/16
 Lab ID: QC831667

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
MTBE	25.00	24.80	99	71-120	3	20
Benzene	25.00	23.61	94	80-120	3	20
Toluene	25.00	22.43	90	80-120	3	21
Ethylbenzene	25.00	22.34	89	80-120	3	25
m,p-Xylenes	50.00	45.72	91	80-121	3	23
o-Xylene	25.00	22.73	91	80-120	3	25

Surrogate	%REC	Limits
Dibromofluoromethane	107	80-128
1,2-Dichloroethane-d4	99	75-139
Toluene-d8	97	80-120
Bromofluorobenzene	98	80-120

RPD= Relative Percent Difference

Purgeable Aromatics by GC/MS

Lab #:	275900	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 5035
Project#:	0059.007.001	Analysis:	EPA 8260B
Matrix:	Soil	Sampled:	04/09/16
Units:	ug/Kg	Received:	04/11/16
Basis:	as received		

Field ID:	SB-6-3	Diln Fac:	0.7143
Type:	SAMPLE	Batch#:	234040
Lab ID:	275900-001	Analyzed:	04/13/16

Analyte	Result	RL
MTBE	ND	3.6
Benzene	ND	3.6
Toluene	ND	3.6
Ethylbenzene	ND	3.6
m,p-Xylenes	ND	3.6
o-Xylene	ND	3.6

Surrogate	%REC	Limits
Dibromofluoromethane	100	78-134
1,2-Dichloroethane-d4	101	80-138
Toluene-d8	93	80-120
Bromofluorobenzene	106	78-123

Field ID:	SB-6-6	Diln Fac:	0.7205
Type:	SAMPLE	Batch#:	234040
Lab ID:	275900-002	Analyzed:	04/13/16

Analyte	Result	RL
MTBE	ND	3.6
Benzene	ND	3.6
Toluene	ND	3.6
Ethylbenzene	ND	3.6
m,p-Xylenes	ND	3.6
o-Xylene	ND	3.6

Surrogate	%REC	Limits
Dibromofluoromethane	103	78-134
1,2-Dichloroethane-d4	103	80-138
Toluene-d8	91	80-120
Bromofluorobenzene	107	78-123

ND= Not Detected
 RL= Reporting Limit

Purgeable Aromatics by GC/MS

Lab #:	275900	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 5035
Project#:	0059.007.001	Analysis:	EPA 8260B
Matrix:	Soil	Sampled:	04/09/16
Units:	ug/Kg	Received:	04/11/16
Basis:	as received		

Field ID: SB-6-10 Diln Fac: 1.241
 Type: SAMPLE Batch#: 234086
 Lab ID: 275900-003 Analyzed: 04/14/16

Analyte	Result	RL
MTBE	ND	6.2
Benzene	ND	6.2
Toluene	ND	6.2
Ethylbenzene	ND	6.2
m,p-Xylenes	ND	6.2
o-Xylene	ND	6.2

Surrogate	%REC	Limits
Dibromofluoromethane	104	78-134
1,2-Dichloroethane-d4	99	80-138
Toluene-d8	92	80-120
Bromofluorobenzene	107	78-123

Field ID: SB-3-3 Diln Fac: 0.8460
 Type: SAMPLE Batch#: 234051
 Lab ID: 275900-005 Analyzed: 04/13/16

Analyte	Result	RL
MTBE	ND	4.2
Benzene	ND	4.2
Toluene	ND	4.2
Ethylbenzene	ND	4.2
m,p-Xylenes	ND	4.2
o-Xylene	ND	4.2

Surrogate	%REC	Limits
Dibromofluoromethane	104	78-134
1,2-Dichloroethane-d4	113	80-138
Toluene-d8	99	80-120
Bromofluorobenzene	104	78-123

ND= Not Detected
 RL= Reporting Limit

Purgeable Aromatics by GC/MS

Lab #:	275900	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 5035
Project#:	0059.007.001	Analysis:	EPA 8260B
Matrix:	Soil	Sampled:	04/09/16
Units:	ug/Kg	Received:	04/11/16
Basis:	as received		

Field ID:	SB-3-6	Diln Fac:	0.9452
Type:	SAMPLE	Batch#:	234051
Lab ID:	275900-006	Analyzed:	04/13/16

Analyte	Result	RL
MTBE	ND	4.7
Benzene	ND	4.7
Toluene	ND	4.7
Ethylbenzene	ND	4.7
m,p-Xylenes	ND	4.7
o-Xylene	ND	4.7

Surrogate	%REC	Limits
Dibromofluoromethane	109	78-134
1,2-Dichloroethane-d4	115	80-138
Toluene-d8	99	80-120
Bromofluorobenzene	107	78-123

Field ID:	SB-3-11	Diln Fac:	0.7987
Type:	SAMPLE	Batch#:	234051
Lab ID:	275900-007	Analyzed:	04/13/16

Analyte	Result	RL
MTBE	ND	4.0
Benzene	ND	4.0
Toluene	ND	4.0
Ethylbenzene	ND	4.0
m,p-Xylenes	ND	4.0
o-Xylene	ND	4.0

Surrogate	%REC	Limits
Dibromofluoromethane	106	78-134
1,2-Dichloroethane-d4	116	80-138
Toluene-d8	98	80-120
Bromofluorobenzene	105	78-123

ND= Not Detected
 RL= Reporting Limit

Purgeable Aromatics by GC/MS

Lab #:	275900	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 5035
Project#:	0059.007.001	Analysis:	EPA 8260B
Matrix:	Soil	Sampled:	04/09/16
Units:	ug/Kg	Received:	04/11/16
Basis:	as received		

Field ID:	SB-5-3	Diln Fac:	0.9009
Type:	SAMPLE	Batch#:	234051
Lab ID:	275900-009	Analyzed:	04/13/16

Analyte	Result	RL
MTBE	ND	4.5
Benzene	ND	4.5
Toluene	ND	4.5
Ethylbenzene	ND	4.5
m,p-Xylenes	ND	4.5
o-Xylene	ND	4.5

Surrogate	%REC	Limits
Dibromofluoromethane	103	78-134
1,2-Dichloroethane-d4	122	80-138
Toluene-d8	101	80-120
Bromofluorobenzene	102	78-123

Field ID:	SB-5-6	Diln Fac:	0.7052
Type:	SAMPLE	Batch#:	234051
Lab ID:	275900-010	Analyzed:	04/13/16

Analyte	Result	RL
MTBE	ND	3.5
Benzene	ND	3.5
Toluene	ND	3.5
Ethylbenzene	ND	3.5
m,p-Xylenes	ND	3.5
o-Xylene	ND	3.5

Surrogate	%REC	Limits
Dibromofluoromethane	106	78-134
1,2-Dichloroethane-d4	129	80-138
Toluene-d8	98	80-120
Bromofluorobenzene	104	78-123

ND= Not Detected
 RL= Reporting Limit

Purgeable Aromatics by GC/MS

Lab #:	275900	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 5035
Project#:	0059.007.001	Analysis:	EPA 8260B
Matrix:	Soil	Sampled:	04/09/16
Units:	ug/Kg	Received:	04/11/16
Basis:	as received		

Field ID:	SB-5-12	Diln Fac:	0.9615
Type:	SAMPLE	Batch#:	234051
Lab ID:	275900-011	Analyzed:	04/13/16

Analyte	Result	RL
MTBE	ND	4.8
Benzene	ND	4.8
Toluene	ND	4.8
Ethylbenzene	ND	4.8
m,p-Xylenes	ND	4.8
o-Xylene	ND	4.8

Surrogate	%REC	Limits
Dibromofluoromethane	109	78-134
1,2-Dichloroethane-d4	121	80-138
Toluene-d8	99	80-120
Bromofluorobenzene	104	78-123

Field ID:	SB-7-10	Diln Fac:	0.7987
Type:	SAMPLE	Batch#:	234057
Lab ID:	275900-013	Analyzed:	04/13/16

Analyte	Result	RL
MTBE	ND	4.0
Benzene	ND	4.0
Toluene	ND	4.0
Ethylbenzene	ND	4.0
m,p-Xylenes	ND	4.0
o-Xylene	ND	4.0

Surrogate	%REC	Limits
Dibromofluoromethane	94	78-134
1,2-Dichloroethane-d4	92	80-138
Toluene-d8	101	80-120
Bromofluorobenzene	110	78-123

ND= Not Detected
 RL= Reporting Limit

Batch QC Report

Purgeable Aromatics by GC/MS			
Lab #:	275900	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 5035
Project#:	0059.007.001	Analysis:	EPA 8260B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC831342	Batch#:	234040
Matrix:	Soil	Analyzed:	04/13/16
Units:	ug/Kg		

Analyte	Spiked	Result	%REC	Limits
MTBE	25.00	24.28	97	61-122
Benzene	25.00	26.76	107	80-123
Toluene	25.00	23.92	96	80-120
Ethylbenzene	25.00	24.59	98	80-122
m,p-Xylenes	50.00	48.41	97	80-127
o-Xylene	25.00	23.35	93	80-125

Surrogate	%REC	Limits
Dibromofluoromethane	99	78-134
1,2-Dichloroethane-d4	95	80-138
Toluene-d8	93	80-120
Bromofluorobenzene	98	78-123

Batch QC Report

Purgeable Aromatics by GC/MS			
Lab #:	275900	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 5030B
Project#:	0059.007.001	Analysis:	EPA 8260B
Field ID:	ZZZZZZZZZZ	Batch#:	234040
MSS Lab ID:	275815-013	Sampled:	04/06/16
Matrix:	Soil	Received:	04/07/16
Units:	ug/Kg	Analyzed:	04/13/16
Basis:	as received		

Type: MS Diln Fac: 0.9597
 Lab ID: QC831371

Analyte	MSS Result	Spiked	Result	%REC	Limits
MTBE	<0.4627	47.98	44.64	93	49-120
Benzene	<0.6668	47.98	51.67	108	57-120
Toluene	<0.7304	47.98	44.44	93	51-120
Ethylbenzene	<0.6821	47.98	46.72	97	45-120
m,p-Xylenes	<1.318	95.97	91.45	95	45-123
o-Xylene	<0.5691	47.98	46.06	96	44-122

Surrogate	%REC	Limits
Dibromofluoromethane	99	78-134
1,2-Dichloroethane-d4	96	80-138
Toluene-d8	92	80-120
Bromofluorobenzene	93	78-123

Type: MSD Diln Fac: 0.9747
 Lab ID: QC831372

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
MTBE	48.73	51.50	106	49-120	13	40
Benzene	48.73	60.03	123 *	57-120	13	44
Toluene	48.73	51.97	107	51-120	14	47
Ethylbenzene	48.73	54.24	111	45-120	13	55
m,p-Xylenes	97.47	105.3	108	45-123	13	53
o-Xylene	48.73	52.79	108	44-122	12	55

Surrogate	%REC	Limits
Dibromofluoromethane	96	78-134
1,2-Dichloroethane-d4	97	80-138
Toluene-d8	92	80-120
Bromofluorobenzene	94	78-123

*= Value outside of QC limits; see narrative

RPD= Relative Percent Difference

Batch QC Report

Purgeable Aromatics by GC/MS			
Lab #:	275900	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 5035
Project#:	0059.007.001	Analysis:	EPA 8260B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC831415	Batch#:	234057
Matrix:	Soil	Analyzed:	04/13/16
Units:	ug/Kg		

Analyte	Spiked	Result	%REC	Limits
MTBE	25.00	19.78	79	61-122
Benzene	25.00	23.12	92	80-123
Toluene	25.00	24.41	98	80-120
Ethylbenzene	25.00	25.14	101	80-122
m,p-Xylenes	50.00	53.74	107	80-127
o-Xylene	25.00	24.24	97	80-125

Surrogate	%REC	Limits
Dibromofluoromethane	95	78-134
1,2-Dichloroethane-d4	93	80-138
Toluene-d8	99	80-120
Bromofluorobenzene	99	78-123

Batch QC Report

Purgeable Aromatics by GC/MS			
Lab #:	275900	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 5030B
Project#:	0059.007.001	Analysis:	EPA 8260B
Field ID:	ZZZZZZZZZZ	Batch#:	234057
MSS Lab ID:	275935-001	Sampled:	04/11/16
Matrix:	Soil	Received:	04/12/16
Units:	ug/Kg	Analyzed:	04/13/16
Basis:	as received		

Type: MS Diln Fac: 0.9346
 Lab ID: QC831445

Analyte	MSS Result	Spiked	Result	%REC	Limits
MTBE	<0.6508	46.73	33.73	72	49-120
Benzene	<0.4641	46.73	38.57	83	57-120
Toluene	<0.3819	46.73	39.31	84	51-120
Ethylbenzene	1.658	46.73	40.12	82	45-120
m,p-Xylenes	9.846	93.46	89.86	86	45-123
o-Xylene	2.220	46.73	40.11	81	44-122

Surrogate	%REC	Limits
Dibromofluoromethane	92	78-134
1,2-Dichloroethane-d4	85	80-138
Toluene-d8	101	80-120
Bromofluorobenzene	102	78-123

Type: MSD Diln Fac: 0.9488
 Lab ID: QC831446

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
MTBE	47.44	32.64	69	49-120	5	40
Benzene	47.44	36.98	78	57-120	6	44
Toluene	47.44	37.35	79	51-120	7	47
Ethylbenzene	47.44	37.41	75	45-120	8	55
m,p-Xylenes	94.88	85.55	80	45-123	6	53
o-Xylene	47.44	37.56	74	44-122	8	55

Surrogate	%REC	Limits
Dibromofluoromethane	90	78-134
1,2-Dichloroethane-d4	83	80-138
Toluene-d8	100	80-120
Bromofluorobenzene	102	78-123

RPD= Relative Percent Difference

Batch QC Report

Purgeable Aromatics by GC/MS			
Lab #:	275900	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 5035
Project#:	0059.007.001	Analysis:	EPA 8260B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC831532	Batch#:	234086
Matrix:	Soil	Analyzed:	04/14/16
Units:	ug/Kg		

Analyte	Spiked	Result	%REC	Limits
MTBE	25.00	23.46	94	61-122
Benzene	25.00	26.27	105	80-123
Toluene	25.00	23.14	93	80-120
Ethylbenzene	25.00	24.13	97	80-122
m,p-Xylenes	50.00	47.56	95	80-127
o-Xylene	25.00	23.23	93	80-125

Surrogate	%REC	Limits
Dibromofluoromethane	99	78-134
1,2-Dichloroethane-d4	94	80-138
Toluene-d8	92	80-120
Bromofluorobenzene	97	78-123

Batch QC Report

Purgeable Aromatics by GC/MS			
Lab #:	275900	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 5030B
Project#:	0059.007.001	Analysis:	EPA 8260B
Field ID:	ZZZZZZZZZZ	Batch#:	234086
MSS Lab ID:	276005-001	Sampled:	04/13/16
Matrix:	Soil	Received:	04/13/16
Units:	ug/Kg	Analyzed:	04/14/16
Basis:	as received		

Type: MS Diln Fac: 0.9766
 Lab ID: QC831579

Analyte	MSS Result	Spiked	Result	%REC	Limits
MTBE	<0.4727	48.83	45.20	93	49-120
Benzene	<0.6811	48.83	51.76	106	57-120
Toluene	<0.7461	48.83	44.37	91	51-120
Ethylbenzene	1.837	48.83	47.39	93	45-120
m,p-Xylenes	9.842	97.66	99.56	92	45-123
o-Xylene	3.570	48.83	47.88	91	44-122

Surrogate	%REC	Limits
Dibromofluoromethane	101	78-134
1,2-Dichloroethane-d4	97	80-138
Toluene-d8	91	80-120
Bromofluorobenzene	95	78-123

Type: MSD Diln Fac: 0.9709
 Lab ID: QC831580

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
MTBE	48.54	47.19	97	49-120	5	40
Benzene	48.54	52.35	108	57-120	2	44
Toluene	48.54	44.88	92	51-120	2	47
Ethylbenzene	48.54	48.44	96	45-120	3	55
m,p-Xylenes	97.09	101.3	94	45-123	2	53
o-Xylene	48.54	48.99	94	44-122	3	55

Surrogate	%REC	Limits
Dibromofluoromethane	97	78-134
1,2-Dichloroethane-d4	98	80-138
Toluene-d8	92	80-120
Bromofluorobenzene	97	78-123

RPD= Relative Percent Difference

Semivolatile Organics by GC/MS			
Lab #:	275900	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 3520C
Project#:	0059.007.001	Analysis:	EPA 8270C
Matrix:	Water	Sampled:	04/09/16
Units:	ug/L	Received:	04/11/16
Batch#:	234026	Prepared:	04/12/16

Field ID: SB-6-15-GW Diln Fac: 150.0
 Type: SAMPLE Analyzed: 04/14/16
 Lab ID: 275900-004

Analyte	Result	RL
Naphthalene	ND	1,500

Surrogate	%REC	Limits
Nitrobenzene-d5	DO	51-120

Field ID: SB-3-13-GW Diln Fac: 100.0
 Type: SAMPLE Analyzed: 04/14/16
 Lab ID: 275900-008

Analyte	Result	RL
Naphthalene	ND	1,000

Surrogate	%REC	Limits
Nitrobenzene-d5	DO	51-120

Field ID: SB-5-15-GW Diln Fac: 50.00
 Type: SAMPLE Analyzed: 04/14/16
 Lab ID: 275900-012

Analyte	Result	RL
Naphthalene	ND	500

Surrogate	%REC	Limits
Nitrobenzene-d5	DO	51-120

Type: BLANK Diln Fac: 1.000
 Lab ID: QC831280 Analyzed: 04/13/16

Analyte	Result	RL
Naphthalene	ND	10

Surrogate	%REC	Limits
Nitrobenzene-d5	64	51-120

DO= Diluted Out
 ND= Not Detected
 RL= Reporting Limit

Batch QC Report

Semivolatile Organics by GC/MS			
Lab #:	275900	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 3520C
Project#:	0059.007.001	Analysis:	EPA 8270C
Matrix:	Water	Batch#:	234026
Units:	ug/L	Prepared:	04/12/16
Diln Fac:	2.000	Analyzed:	04/13/16

Type: BS Lab ID: QC831281

Analyte	Spiked	Result	%REC	Limits
Naphthalene	30.00	21.79	73	62-120

Surrogate	%REC	Limits
Nitrobenzene-d5	68	51-120

Type: BSD Lab ID: QC831282

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Naphthalene	30.00	22.41	75	62-120	3	24

Surrogate	%REC	Limits
Nitrobenzene-d5	69	51-120

RPD= Relative Percent Difference

Semivolatile Organics by GC/MS			
Lab #:	275900	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 3550B
Project#:	0059.007.001	Analysis:	EPA 8270C
Matrix:	Soil	Sampled:	04/09/16
Units:	ug/Kg	Received:	04/11/16
Basis:	as received	Prepared:	04/14/16
Batch#:	234108		

Field ID: SB-6-3 Diln Fac: 50.00
 Type: SAMPLE Analyzed: 04/20/16
 Lab ID: 275900-001

Analyte	Result	RL
Naphthalene	ND	3,400

Surrogate	%REC	Limits
Nitrobenzene-d5	DO	44-120

Field ID: SB-6-6 Diln Fac: 1.000
 Type: SAMPLE Analyzed: 04/20/16
 Lab ID: 275900-002

Analyte	Result	RL
Naphthalene	ND	67

Surrogate	%REC	Limits
Nitrobenzene-d5	63	44-120

Field ID: SB-6-10 Diln Fac: 20.00
 Type: SAMPLE Analyzed: 04/20/16
 Lab ID: 275900-003

Analyte	Result	RL
Naphthalene	ND	1,300

Surrogate	%REC	Limits
Nitrobenzene-d5	DO	44-120

Field ID: SB-3-3 Diln Fac: 50.00
 Type: SAMPLE Analyzed: 04/20/16
 Lab ID: 275900-005

Analyte	Result	RL
Naphthalene	ND	3,300

Surrogate	%REC	Limits
Nitrobenzene-d5	DO	44-120

DO= Diluted Out
 ND= Not Detected
 RL= Reporting Limit

Semivolatile Organics by GC/MS			
Lab #:	275900	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 3550B
Project#:	0059.007.001	Analysis:	EPA 8270C
Matrix:	Soil	Sampled:	04/09/16
Units:	ug/Kg	Received:	04/11/16
Basis:	as received	Prepared:	04/14/16
Batch#:	234108		

Field ID: SB-3-6 Diln Fac: 1.000
 Type: SAMPLE Analyzed: 04/20/16
 Lab ID: 275900-006

Analyte	Result	RL
Naphthalene	ND	67

Surrogate	%REC	Limits
Nitrobenzene-d5	71	44-120

Field ID: SB-3-11 Diln Fac: 1.000
 Type: SAMPLE Analyzed: 04/20/16
 Lab ID: 275900-007

Analyte	Result	RL
Naphthalene	ND	67

Surrogate	%REC	Limits
Nitrobenzene-d5	62	44-120

Field ID: SB-5-3 Diln Fac: 150.0
 Type: SAMPLE Analyzed: 04/20/16
 Lab ID: 275900-009

Analyte	Result	RL
Naphthalene	ND	10,000

Surrogate	%REC	Limits
Nitrobenzene-d5	DO	44-120

Field ID: SB-5-6 Diln Fac: 1.000
 Type: SAMPLE Analyzed: 04/22/16
 Lab ID: 275900-010

Analyte	Result	RL
Naphthalene	ND	66

Surrogate	%REC	Limits
Nitrobenzene-d5	76	44-120

DO= Diluted Out
 ND= Not Detected
 RL= Reporting Limit

Semivolatile Organics by GC/MS			
Lab #:	275900	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 3550B
Project#:	0059.007.001	Analysis:	EPA 8270C
Matrix:	Soil	Sampled:	04/09/16
Units:	ug/Kg	Received:	04/11/16
Basis:	as received	Prepared:	04/14/16
Batch#:	234108		

Field ID: SB-5-12 Diln Fac: 3.000
 Type: SAMPLE Analyzed: 04/22/16
 Lab ID: 275900-011

Analyte	Result	RL
Naphthalene	ND	200

Surrogate	%REC	Limits
Nitrobenzene-d5	65	44-120

Field ID: SB-7-10 Diln Fac: 5.000
 Type: SAMPLE Analyzed: 04/22/16
 Lab ID: 275900-013

Analyte	Result	RL
Naphthalene	ND	330

Surrogate	%REC	Limits
Nitrobenzene-d5	58	44-120

Type: BLANK Diln Fac: 1.000
 Lab ID: QC831623 Analyzed: 04/15/16

Analyte	Result	RL
Naphthalene	ND	66

Surrogate	%REC	Limits
Nitrobenzene-d5	79	44-120

Batch QC Report

Semivolatile Organics by GC/MS			
Lab #:	275900	Location:	Kaiser UST
Client:	Terraphase Engineering	Prep:	EPA 3550B
Project#:	0059.007.001	Analysis:	EPA 8270C
Type:	LCS	Diln Fac:	2.000
Lab ID:	QC831624	Batch#:	234108
Matrix:	Soil	Prepared:	04/14/16
Units:	ug/Kg	Analyzed:	04/15/16

Analyte	Spiked	Result	%REC	Limits
Naphthalene	1,003	910.7	91	52-120

Surrogate	%REC	Limits
Nitrobenzene-d5	78	44-120

APPENDIX D

**RO000101 - Revised Soil and Groundwater Investigation Work Plan,
Former Kaiser Underground Storage Tank Site, 2801 Seventh Street, Berth
30, Port of Oakland**

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November 24, 2015

Mr. Keith Nowell
Hazardous Materials Specialist
Alameda County Environmental Health
1131 Harbor Way Parkway
Alameda, California 94501-6540

**Subject: R0000101 – Revised Soil and Groundwater Investigation Work Plan,
Former Kaiser Underground Storage Tank Site,
2801 Seventh Street, Berth 30,
Port of Oakland**

Dear Mr. Nowell:

Please find enclosed, a letter responding to the comments provided by the Alameda County Department of Environmental Health (“ACDEH”) on October 2, 2015, on the Soil and Groundwater Investigation Work Plan, Kaiser Yard UST, Berth 30, Port of Oakland, Oakland, California, dated July 1, 2015, and the Revised Soil and Groundwater Investigation Work Plan, Former Kaiser Yard Underground Storage Tank Site, Port of Oakland, Oakland, California (“the Revised Work Plan”) prepared on behalf of the Port of Oakland (“Port”) by Terraphase Engineering Inc. (“Terraphase”). The Revised Work Plan was prepared under a directive of the Alameda County Environmental Health to investigate an underground storage tank (“UST”) site located in the present day Berth 30 Container Terminal due to UST removal activities in April 1992. The removal action was preparatory for the then redevelopment of Port land for the present day Berth 30 Container Terminal. The Revised Work Plan was prepared to investigate the UST site for residual petroleum hydrocarbons noted upon the 1992 UST removal. Terraphase will implement the Revised Work Plan upon obtaining approval of the plan from ACDEH.

I declare, under the penalty of perjury, that the information and/or recommendations contained in the attached document or report is true and correct to the best of my knowledge. If you have any questions or comments about the RTC letter or Revised Work Plan, contact me at jprall@portoakland.com or at (510) 627-1373.

Sincerely,

John Prall, P.G.
Port Associate Environmental Scientist

Enclosure noted in text

cc: Anne Whittington – Port of Oakland
Michele Heffes, Port of Oakland



November 24, 2015

Mr. Keith Nowell
Alameda County Environmental Health Services
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Subject: Response to Conditional Work Plan Approval; Fuel Leak Case No. RO0000101 and GeoTracker Global ID T0600101099, Port of Oakland/Kaiser & Powerline Oil/Berth 30, 2800-2801 7th Street, Oakland, CA 94607

Dear Mr. Nowell:

On behalf of the Port of Oakland (“the Port”), Terraphase Engineering Inc. (“Terraphase”) is pleased to provide responses to comments provided by the Alameda County Environmental Health Services (“ACEH”) on October 2, 2015, on the *Soil and Groundwater Investigation Work Plan, Kaiser Yard UST, Berth 30, Port of Oakland, Oakland, California* (“the Work Plan”), dated July 1, 2015, for the former Kaiser Yard located on Berth 30 of the Port (“the Site”). The comment responses are presented below. The Work Plan has been revised accordingly, and is attached to this letter.

Technical Comment 1: LTCP General Criteria d (Free Product)

This comment summarizes the LTCP requirements for free product removal. The comment includes the statement that “ACEH’s review of the case files indicates that insufficient data and analysis has been presented to assess FP at the site.” It does not specifically comment on the proposed investigation activities.

Response to Technical Comment 1

Comment noted. As discussed below in the response to Comment 3, a boring will be advanced at the location of the former underground storage tank (UST) pit, and soil and groundwater samples will be collected and analyzed for petroleum hydrocarbons. The groundwater that collects within this boring, and all other borings advanced around the former UST pit, will be assessed for the presence of free product.

Technical Comment 2: LTCP General Criteria e (Site Conceptual Model)

This comment summarizes the elements of a CSM as described in the LTCP. The comment includes the statement that the ACEH’s “review of the case files indicates that insufficient data collection and analysis has been presented to assess the nature, extent, and mobility of the release and to support compliance with the General Criteria...” addressed in other comments in the ACEH’s letter. It does not specifically comment on the proposed investigation activities.

Response to Technical Comment 2

Comment noted. The location of the proposed soil borings, including the additional boring to be advanced in response to Comment 3, and the soil sampling strategy proposed in Comment 7, should provide the necessary data to assess the nature, extent, and potential mobility of the release. The sampling strategy is designed to provide vertical and horizontal delineation of potential impacts related to the former USTs.

Technical Comment 3: General Criteria f – Secondary Source Has Been Removed to the Extent Practicable

This comment summarizes the residual petroleum hydrocarbons as a potential secondary source of contamination. The comment notes that evidence of a release remained after the removal action was completed, i.e. odors and staining. ACEH requests a boring be advanced in the location of the UST pit for the sampling and analysis of groundwater and a native soil, as discussed further in Technical Comment 7 below.

Response to Technical Comment 3

A boring will be advanced in the approximate center of the former UST pit. One grab-groundwater sample will be collected from the first encountered water-bearing zone within the boring. One soil sample will be collected at a depth below the observed UST excavation backfill material. It should be noted that the soil sample may not represent native soil, because the Site elevation was raised multiple times over its history using engineered fill. Drilling to a depth of true native soil could require a deep boring and the sample may not be representative of conditions at the Site immediately below the former UST excavation. The Port assumes that ACEH's definition of "native soil" in the context of this investigation is equivalent to the soil encountered below the import soil used to backfill the UST excavation.

The soil and groundwater sample will be analyzed for the complete analytical suite presented in the Revised Work Plan.

Please note that the Port will make their best effort to identify the exact location of the former UST pit using historical maps and documents, although this will be very difficult given the past redevelopment work that resulted in loss of reference points, including two relocations of Seventh Street.

Technical Comment 4: General Criteria g – Soil and Groundwater Have Been Tested for MTBE

This comment requests that MTBE be added to the analytical testing scope for soil and groundwater samples that are collected as part of this investigation.

Response to Technical Comment 4

The USTs at the Site were utilized by the Kaiser Steel Corporation from 1965 to 1985 and removed in 1992. MTBE was used in gasoline at low levels since 1979 to replace lead as an octane enhancer. Between 1992 and 2005, MTBE was used at higher concentrations in gasoline to fulfill the oxygenate requirements of the 1990 Clean Air Act Amendments.

Although MTBE is not anticipated, the soil and groundwater samples will be analyzed for MTBE. The work plan has been revised to reflect this change.

Technical Comment 5: LTCP Media-Specific Criteria for Groundwater

This comment discusses the characterization of groundwater, and states that "...insufficient data collection and analysis has been presented to support the requisite characteristics of plume stability or plume classification." However, at this time, ACEH has determined that the installation of monitoring wells is unnecessary.

Response to Technical Comment 5

Comment noted.

Technical Comment 6: LTCP Media-Specific Criteria for Direct Contact and Outdoor Air Criteria

This comment discusses the potential volatilization of residual contaminants into outdoor air and the potential human-health risk from inhalation. The comment states:

"Our review of the case files indicates that insufficient data collection and analysis has been collected to satisfy the media-specific criteria for direct contact and outdoor air exposure. Specifically, naphthalene has not been analyzed at this site. In order to satisfy the LTCP, please include naphthalene as an analyte in the analysis suite. Please recover the samples at the depths described in Technical Comment 7 below."

Response to Technical Comment 6

Naphthalene will be added to the analytical testing scope for soil and groundwater samples that are collected as part of this investigation.

Technical Comment 7: Soil Sampling

"The proposed soil sampling is based solely on PID readings, so conceivably no soil samples will be recovered for analysis should the PID readings be less than 25 ppm."

In order to satisfy the LTCP, ACEH requests at least one soil sample be recovered and analyzed from each boring from the 0- to 5-foot and 5- to 10 foot intervals, as measured from the ground surface. Additionally, ACEH requests that soil samples be collected and analyzed at intervals of not more than five feet, signs of obvious contamination, such as odor, discoloration, free product, etc., the soil/groundwater interface, and at significant changes in lithology. Please ensure that the analytical results define the vertical and horizontal extent of TPH impacts in soil and groundwater at the site."

Response to Technical Comment 7

The work plan has been revised to reflect the requested soil sampling strategy.

Technical Comment 8: Extractable Range Petroleum Hydrocarbons (Diesel) Analysis

"As previously stated above, the site was the location of gasoline and diesel USTs. Therefore, ACEH requests the addition of TPH as diesel (TPHD), using EPA Test Method 8015, to the scope of analysis. In

regards to silica gel cleanup, it is the policy of the San Francisco Bay Region, Regional Water Quality Control Board (SFBR-RWQCB) that extractable range petroleum hydrocarbon samples be analyzed both with and without silica gel cleanup. In order to be consistent with the SFBR-RWQCB policy, ACEH requests that these samples be analyzed both with and without silica gel cleanup and have a determination performed for organic matter content using ASTM test method D2974."

Response to Technical Comment 8

Although TPHd was not previously detected in soil or groundwater samples following the removal of the USTs, the soil and groundwater samples collected during the proposed investigation will be analyzed for TPHd by EPA Method 8015. It should be noted that heavier fractions of gasoline (in the C10-C12 carbon range) may be detected in the analysis for TPHd by EPA Method 8015B. Therefore, TPHd detection using this method may not provide a conclusive determination regarding the nature of the release.

As requested, the soil and groundwater samples will be analyzed with and without the silica gel cleanup (SGC). However, only soil and groundwater analyzed with SGC will be compared to the proposed Environmental Screening Levels (ESLs) for TPHd, because RWQCB ESLs are based upon quantification of non-polar TPH fractions only. In addition, soil samples will be analyzed for organic matter content by ASTM Method D2974.

CLOSING

We appreciate ACEH's review of the Work Plan. If you have any questions, please feel free to contact me at 510-645-1850 ext. 38 or by email at daren.roth@terraphase.com or Peter Zawislanski at 510-645-1858 or by email at peter.zawislanski@terraphase.com.

Sincerely,

For Terraphase Engineering Inc.



Daren Roth
Senior Project Geologist



Peter Zawislanski, P.G., C.H.G.
Principal Hydrogeologist

cc: John Prall, Port of Oakland
Anne Whittington, Port of Oakland
Michele Heffes, Port of Oakland

Attachments: Revised Soil and Groundwater Investigation Work Plan, Kaiser Yard UST, Berth 30, Port of Oakland, Oakland, California

**REVISED SOIL AND GROUNDWATER INVESTIGATION
WORK PLAN
KAISER YARD UST, BERTH 30
PORT OF OAKLAND, OAKLAND, CALIFORNIA**

Prepared for

Port of Oakland
530 Water Street
Oakland, California 94607

Prepared by

Terraphase Engineering Inc.
1404 Franklin Street, Suite 600
Oakland, California 94612

November 24, 2015

Project Number 0059.007.001



CONTENTS

ACRONYMS AND ABBREVIATIONS	III
CERTIFICATION	IV
1.0 INTRODUCTION	1
1.1 Background.....	1
2.0 SOIL AND GROUNDWATER INVESTIGATION	3
2.1 Pre-Field Activities	3
2.1.1 Health and Safety Plan	3
2.1.2 Permitting.....	3
2.2 Utility Survey	3
2.3 Sampling Methodology	4
2.3.1 Soil Sampling	4
2.3.2 Grab Groundwater Sampling.....	5
2.3.3 Sample Handling and Documentation.....	5
2.3.4 Field Quality Control Samples	5
2.4 Equipment Decontamination	6
2.5 Borehole Abandonment	6
2.6 Sample Analysis	6
2.7 Investigation-Derived Waste	6
2.8 Soil Boring Survey	7
3.0 QUALITY CONTROL	8
4.0 DATA EVALUTION AND REPORTING	9
4.1 Screening Criteria	9
4.2 Investigation Summary Report.....	9
5.0 SCHEDULE	11
6.0 REFERENCES	12

TABLES

- 1 Analytical Laboratory Methods, Sample Requirements, and Reporting Limits

FIGURES

- 1 Site Location Map

2 Proposed Soil Boring Locations

APPENDICES

- A ACEH Technical Report Request and Response to Inquiry About Test Method D2974
- B Guidelines for Working in Active Marine Terminals

Acronyms and Abbreviations

ACEH	Alameda County Environmental Health
ACPWA	Alameda County Public Works Agency
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, xylenes
ESLs	Environmental Screening Levels
GPS	global positioning system
HASP	Health and Safety Plan
PID	photoionization detector
PPM	parts per million
QC	quality control
RWQCB	Regional Water Quality Control Board
Terraphase	Terraphase Engineering Inc.
TPH	total petroleum hydrocarbons
TPHd	total petroleum hydrocarbons as diesel
TPHg	total petroleum hydrocarbons as gasoline
TPHmo	total petroleum hydrocarbons as motor oil
ug/L	micrograms per liter
USA	Underground Service Alert
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank

Certification

Information, conclusions, and recommendations in this document have been prepared by a California Professional Geologist.



11/24/15

Peter T. Zawislanski
California Professional Geologist (7210)
California Certified Hydrogeologist (925)

Date



1.0 INTRODUCTION

Terraphase Engineering Inc. (Terraphase) has prepared this *Revised Soil and Groundwater Investigation Work Plan* (“the Work Plan”) on behalf of the Port of Oakland (“the Port”) for the former Kaiser Yard, Underground Storage Tank (UST) Site, located in Berth 30 of the Port of Oakland, Oakland, California (“the Site”; Figure 1).

The soil and groundwater investigation was requested by the Alameda County Environmental Health (ACEH) in their March 20, 2015 and November 13, 2015 emails from Mr. Keith Nowell (ACEH) to Mr. John Prall of the Port (Appendix A). This request was issued following a review of the Site prompted by the submittal of the *Low Threat Closure Request, Kaiser Yard UST, Berth 30, Port of Oakland, 2801 7th Street, Oakland, California* on March 27, 2014.

The purpose of the Work Plan is to describe the methods planned to investigate the potential residual impact to soil and groundwater from three USTs formerly located at the Site. The Work Plan proposes the advancement of soil borings in the vicinity of the former USTs for the purpose of collecting soil and groundwater samples.

1.1 Background

The Site is located in Berth 30 of the Port of Oakland and in an area formerly occupied by Kaiser Steel Corporation (“Kaiser”) from 1965 to 1985. During that time, Kaiser used three USTs for equipment refueling. The tanks included one 5,000-gallon gasoline, UST, one 3,000-gallon gasoline UST, and one 5,000-gallon diesel UST. Ancillary equipment, including vent piping, two fuel dispenser islands, and product conveyance piping, were all located under a concrete pad. During redevelopment activities for the then future Berth 30, the three USTs and associated facilities were removed from the Site in 1992 (ARCADIS 2014).

Prior to removal, the USTs were inspected for fuel content. The diesel UST contained no residual liquid, whereas both of the gasoline USTs contained approximately 1.5 inches of residual liquid, which was pumped out. The USTs were also inspected for integrity following removal; no holes or cracks were identified (ARCADIS 2014).

During the removal of the USTs and associated piping, approximately 120 cubic yards of soil were excavated and stockpiled at the Site. Figure 2 presents the approximate locations of the UST site and excavation footprint. The excavation was approximately 38 feet by 17 feet and extended to a depth of approximately 9.5 to 11 feet below ground surface (bgs). Groundwater was encountered at a depth of approximately 9 feet bgs. There were no odors or obvious signs of staining on the excavated soil or sidewalls of the excavation, although a potential film of free product was observed on the groundwater. A similar film was observed after the water was pumped from the excavation and allowed to recharge. This process of pump-and-recharge was repeated until a total of approximately 800 gallons of water were pumped from the excavation. Subsequently, a grab groundwater sample was collected from the excavation, and soil samples

were collected from six locations along the sidewalls of the excavation at a depth of approximately 8.5 feet bgs, just above the apparent water table. The grab groundwater and sidewall soil samples were analyzed for total petroleum hydrocarbons (TPH) as gasoline (TPHg), TPH as diesel (TPHd), benzene, toluene, ethylbenzene, and xylenes (BTEX), and total lead.

TPHg, TPHd, and BTEX were not detected above the laboratory reporting limits in the six sidewall soil samples, and lead was detected at very low levels equivalent to regional background concentrations (Geomatrix 1992).

In the grab groundwater sample, TPHg, benzene, ethylbenzene, toluene, and total xylenes were detected at concentrations of 4,100 micrograms per liter (ug/L), 3.4 ug/L, 62 ug/L, 1.4 ug/L, and 860 ug/L, respectively. TPHd and total lead were not detected above laboratory reporting limits (Geomatrix 1992).

Following sample collection, the excavation was backfilled with import soil and clean stockpile soil as approved by the ACEH.

At the request of the ACEH, the Port submitted a work plan in 1993 to install groundwater monitoring wells in the vicinity of the former USTs. The ACEH did not approve the work plan until 1996, at which point the Port notified the ACEH that it was not feasible to safely complete an investigation in this area of Berth 30 due to the location of the site within the truck gate driveway.

In 2008, the Port responded to a request by ACEH to upload the site groundwater monitoring data to GeoTracker, by providing a summary of the site history and remedial activities, and presenting the rationale provided in 1996 for not installing monitoring wells. The Port also expressed interest in working with ACEH to gain closure at the Site in this summary.

The Port submitted a closure request to ACEH in 2014 under the Low Threat Closure Policy. During their review, the new ACEH case officer noted that monitoring wells had not been installed, which prompted the request for the preparation of this Work Plan and subsequent investigation.

2.0 SOIL AND GROUNDWATER INVESTIGATION

The proposed investigation comprises the advancement of seven soil borings for the collection of soil and grab groundwater samples in the vicinity of the former UST Site. The proposed soil boring locations are shown on Figure 2. The borings will be advanced in all four compass directions of the former UST excavation zone and in the approximate center of the former UST pit. The methods and procedures of this soil and groundwater investigation are discussed further below.

The Port will make their best effort to identify the exact location of the former UST pit using historical maps and documents, although this will be very difficult given the past redevelopment work that resulted in loss of reference points, including two relocations of Seventh Street.

2.1 Pre-Field Activities

2.1.1 Health and Safety Plan

A Site-specific Health and Safety Plan (HASP) will be prepared and will be followed by the on-site project personnel during the Site activities. The HASP will be prepared in accordance with OSHA 29 CFR 1910.120 and Cal OSHA Title 8 Section 5192(e). Site personnel, including on-site subcontractors, will be required to familiarize themselves with, and sign, the HASP to minimize safety hazards. The HASP will identify the specific chemical compounds that have been encountered at the Site and will present the chemical properties and a task-specific health-and-safety risk analysis. The HASP will also include the Port Guidelines for Working in Active Marine Terminals (Appendix B).

2.1.2 Permitting

A parcel soil boring permit application will be prepared and submitted to Alameda County Public Works Agency (ACPWA). Any other pertinent permits, access agreements, or approvals will be obtained, as required.

2.2 Utility Survey

Proposed soil boring locations will be marked out with white paint. The soil boring locations will be confirmed using a portable Global Positioning System device with sub-meter accuracy.

A private subsurface utility locating company will mark out any potential subsurface structures within a 10-by-10 foot area surrounding each of the proposed soil boring locations. Utility location will be performed with a combination of radio-detection, ground penetrating radar and electro-magnetic induction methods, as necessary. Underground Services Alert (USA) will be notified a minimum of 48 hours prior to commencing drilling activities.

2.3 Sampling Methodology

2.3.1 Soil Sampling

Soil samples will be collected using both a hand auger and a hydraulic -actuated, direct-push drill rig. Terraphase will subcontract a California-licensed drilling contractor to advance the soil borings under the supervision of Terraphase field staff working under the direction of a California Professional Geologist. Prior to drilling, each location will be hand-cleared to a depth of 5 feet bgs to confirm the absence of underground utilities at the location. The direct-push rig will advance borings from 5 feet bgs to the target depth (approximately 12 feet bgs). The core barrel will be lined with a clear plastic liner to facilitate lithological logging. Soil from borings advanced using a hand auger will be logged using cuttings extracted directly from the auger bucket.

Boring logs will be prepared in the field and completed under the direction of a California Professional Geologist. The borings will be logged in general accordance with the Unified Soil Classification System. In addition to standard descriptors (e.g., soil types, moisture, grain size), other pertinent field observations will be recorded, including color, odors encountered, and visual observations of unusual conditions.

The soil cores will be field-screened using a photoionization detector (PID) to assess the potential impact from fuels associated with the former USTs. At a minimum, the soil cores will be screened using the PID every 3 feet and when changes in soil characteristics are observed. The field screening procedure will be as follows:

- Fill a Ziploc® baggie approximately one-half full of soil and seal completely;
- Vigorously shake the bag for 30 seconds twice in a 10-minute period to allow for headspace development;
- Unzip the corner of the bag and quickly insert the PID probe approximately 1 to 2 inches;
- Record the maximum meter response.

Soil with headspace readings greater than 25 parts per million (ppm) will be collected and submitted to the analytical laboratory for analysis. If it is determined that a soil sample should be collected, the soil will be extracted from a relatively undisturbed portion of the core using a laboratory-provided TerraCore sampling kit. Soil samples will not be collected below the water table.

At least one soil sample be recovered and analyzed from each boring from the 0- to 5-foot and 5- to 10 foot intervals, as measured from the ground surface. Additionally, soil samples be collected and analyzed at intervals of not more than five feet. Soil samples will be collected from

depth intervals with signs of obvious contamination, such as odor, discoloration, free product, etc., the soil/groundwater interface, and at significant changes in lithology.

2.3.2 Grab Groundwater Sampling

Grab groundwater samples will be collected from each soil boring. Soil borings will be advanced to approximately 2 feet below the groundwater table. It is anticipated that groundwater will be encountered at approximately 10 feet bgs. A temporary, 1-inch slotted PVC casing will be placed in the boring to keep the boring from collapsing and to allow groundwater to enter the casing. The casing will remain in the boring until sufficient water is collected for sampling. An electronic depth-to-water meter will be used to measure the depth to water in the boring. Once sufficient water has entered the boring, a disposable Teflon bailer will be used to collect a grab groundwater sample. The sample will be transferred to laboratory-supplied sample containers. A new bailer will be used at each boring location. Observations of potential free product or petroleum-related sheen will be documented in the field logs.

Water quality parameters, including temperature, pH and specific conductance, will be measured in the field using a calibrated water quality meter and recorded on the field forms.

2.3.3 Sample Handling and Documentation

Samples will be placed in laboratory-supplied and appropriately preserved containers. Sample containers will be labeled, logged on chain-of-custody forms, and placed in an ice-chilled cooler for transport to a California-certified laboratory for analysis.

Samples will be tracked using chain-of-custody forms. Copies of these documents will be maintained in the project files, as well as annotated in the applicable field logbook. The field logbook provides a means of recording data collection activities performed at the Site.

Sample labels will be completed in waterproof, permanent ink, and will have a self-adhesive backing to allow for attachment to the sample container.

2.3.4 Field Quality Control Samples

Field quality control (QC) samples will include the collection of an equipment blank during the soil boring advancement of soil borings.

One equipment blank will be collected per day by pouring distilled water over the decontaminated equipment used for sampling and collecting the resulting water for analysis. The equipment blank will be analyzed for the same constituents as the soil and groundwater samples to ensure that proper decontamination procedures were followed during the field activities.

In addition, one trip blank will be included in each cooler that contains samples for BTEX and MTBE analyses.

2.4 Equipment Decontamination

To prevent potential cross-contamination between sample locations, non-disposable equipment that comes into contact with soil, solids or groundwater will be decontaminated prior to initiating work at each subsequent sampling location. Equipment will be decontaminated using a three-step process: (1) non-phosphate detergent wash, (2) potable water rinse, and (3) distilled water rinse.

2.5 Borehole Abandonment

After soil and groundwater sampling is complete, the borings will be abandoned by using a neat cement grout in accordance with ACPWA boring permit requirements. The temporary casing will be removed, and the boreholes will be filled with the neat-cement grout to the surface.

2.6 Sample Analysis

Soil and groundwater samples collected from the borings during this field investigation will be submitted to an analytical laboratory certified by the California Department of Health Services through the Environmental Laboratory Accreditation Program, for the analysis of:

- TPHg by EPA Method 8015
- TPHd by EPA Method 8015, with and without silica gel cleanup (EPA Method 3630C)
- BTEX by EPA Method 8260
- MTBE by EPA Method 8260
- Organic Matter Content by American Society for Testing and Materials (ASTM) Test Method D2974 (soil samples only)

The required volumes, preservation methods, holding times, and analytical reporting limits for the analytical methods are presented in Table 1.

The samples collected for organic matter content will be placed on hold and only analyzed if the associated TPHd result without silica gel exceeds the site screening criteria for TPHd.

2.7 Investigation-Derived Waste

Equipment wash water and waste soil generated during this investigation will be stored in separate 55-gallon drums and handled and disposed of in accordance with state and federal requirements. The drums will be temporarily staged at the Site in a location approved by the Port.

Terraphase will collect a four-point composite sample (four sub-samples) of the waste soil generated during the drilling. One sample will also be collected from the waste water drum. The waste samples will be collected in laboratory supplied containers, properly labeled, placed into an ice-chilled chest, and submitted to an analytical laboratory for chemical analysis of the following analytes:

- Title 22 metals (CAM 17): antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, mercury, molybdenum, nickel, selenium, silver, thallium, vanadium, and zinc, by EPA Method 6010/7470
- TPHg, TPHd and TPH as motor oil (TPHmo) by EPA Method 8015 [TPH-d and TPHmo should be analyzed with and without a silica gel cleanup procedure.]
- BTEX by EPA Method 8260

The required volumes, preservation methods, holding times, and analytical reporting limits for the analytical methods are presented in Table 1.

Following characterization, the waste to be transported and disposed of at an appropriate facility. Waste manifests will be signed by a Port representative.

2.8 Soil Boring Survey

Following the advancement of the soil borings, the elevation, northings, and eastings of the soil will be surveyed using a hand-held GPS unit with sub-meter accuracy.

3.0 QUALITY CONTROL

Analytical data will be reviewed and data validation reports will be prepared in general accordance with the principles for data validation presented in the U.S. Environmental Protection Agency (U.S. EPA) National Functional Guidelines for Inorganic Laboratory Data Review (U.S. EPA 2010).

4.0 DATA EVALUTION AND REPORTING

4.1 Screening Criteria

Upon receipt, the analytical results will be compared with the following screening criteria for soil and groundwater.

Soil. The soil analytical results will be compared with the Regional Water Quality Control Board (RWQCB) Environmental Screening Levels (ESLs), Direct Exposure Screening Levels, Construction/Trench Worker Exposure Scenario (RWQCB 2013; Table K-3). Based on the impermeable site cover limiting surface water infiltration, the exposure of potentially impacted shallow soil is greatest to site workers completing maintenance activities that involve trenching.

Groundwater. The groundwater analytical results will be compared with the RWQCB ESLs for Groundwater (groundwater is not a current or potential drinking water resource; RWQCB 2013; Table F-1b). This criterion is appropriate because the groundwater in the area is generally not suitable as a drinking water source due to high total dissolved solids concentrations, and ESLs are typically protective of human health and ecological receptors.

As requested by ACEH, the soil and groundwater samples will be analyzed for TPHd with and without the silica gel cleanup (SGC). However, only soil and groundwater analyzed with SGC will be compared to the proposed Environmental Screening Levels (ESLs) for TPHd, as RWQCB ESLs are based upon quantification of non-polar TPH fractions only.

4.2 Investigation Summary Report

A report will be prepared summarizing the results of the field investigation. The report will include:

- brief site history including the number and type of USTs
- description of the current site use
- summary of sampling activities
- analytical results
- data validation reports
- boring logs
- survey data
- field sampling forms
- discussion of findings and the interpretation of the analytical results

- recommendations for site closure or further investigation.

The report will be reviewed and signed by a California Professional Geologist.

5.0 SCHEDULE

The work will commence upon approval of the Work Plan by ACEH. Due to the high traffic associated with the Berth 30 site use, the soil and groundwater sampling activities may need to occur at night, on weekends, or during the scheduled monthly safety stand down practiced by the Port terminals. The work will be scheduled with the Port and Berth 30 tenant at time that will maximize the safety of the field staff conducting the investigation and minimize the impact on Port operations. Field activities will be conducted in accordance with the Port Guidelines for Working in Active Marine Terminals (Appendix B).

In addition, the investigation may need to be conducted in phases if shipping containers are blocking access to the proposed sample locations.

It is anticipated that the summary report will be submitted to ACEH within 60 days of the receipt of analytical data.

6.0 REFERENCES

ARCADIS. 2014. Low Threat Closure Request, Kaiser Yard UST, Berth 30, Port of Oakland, 2801 7th Street, Oakland, California. March 27.

Geomatrix. 1992. Removal of Underground Storage Tanks, Kaiser Yard, 2801 Seventh Street, Oakland, California. June.

San Francisco Bay Regional Water Quality Control Board (RWQCB). 2013. Environmental Screening Levels. December.

U.S. Environmental Protection Agency. 2010. U.S. EPA Contract Laboratory Program National Functional Guidelines for Superfund Inorganic Data Review. Office of Solid Waste and Emergency Response. EPA 540-R-08-01. January.

TABLES

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Table 1
Analytical Laboratory Methods, Sample Requirements, and Reporting Limits
Kaiser Yard UST, Berth 30
Port of Oakland, Oakland, California

Analyte	Matrix	Method	Container	Minimum Sample Volume	Preservation	Hold Time (days)	Reporting Limits ¹
TPH as gasoline	solids	EPA 8015	TerraCore	5 grams	methanol; chill to 4 ± 2°C	14	1 mg/kg
TPH as gasoline	water	EPA 8015	3 x 40mL VOA	40 mL	hydrochloric acid; chill to 4 ± 2°C	14	50 ug/L
BTEX	solids	EPA 8260	TerraCore	5 grams	methanol; chill to 4 ± 2°C	14	5 ug/kg
BTEX	water	EPA 8260	3 x 40mL VOA	40 mL	hydrochloric acid; chill to 4 ± 2°C	14	0.5 ug/L
MTBE	solids	EPA 8260	TerraCore	5 grams	methanol; chill to 4 ± 2°C	14	5 ug/kg
MTBE	water	EPA 8260	3 x 40mL VOA	40 mL	hydrochloric acid; chill to 4 ± 2°C	14	0.5 ug/L
TPH as diesel ²	solids	EPA 8015B	glass jar	50 grams	chill to 4 ± 2°C	14	1 - 5 mg/kg
TPH as diesel ²	water	EPA 8015B	amber glass	500 mL	chill to 4 ± 2°C	14	50 - 300 ug/L
Naphthalene	solids	EPA 8270C	glass jar	30 grams	chill to 4 ± 2°C	14	67 ug/L
Naphthalene	water	EPA 8270C	amber glass	1000 mL	chill to 4 ± 2°C	7	10 ug/L
Organic Matter Content ³	solids	ASTM Method D2974	glass jar	100 grams	None	NA	NA

Table 1
Analytical Laboratory Methods, Sample Requirements, and Reporting Limits
Kaiser Yard UST, Berth 30
Port of Oakland, Oakland, California

Analyte	Matrix	Method	Container	Minimum Sample Volume	Preservation	Hold Time (days)	Reporting Limits ¹
Additional Analyses for Waste Characterization Purposes Only							
TPH as motor oil ⁴	solids	EPA 8015B	glass jar	50 grams	chill to 4 ± 2°C	14	1 - 5 mg/kg
TPH as motor oil ⁴	water	EPA 8015B	amber glass	500 mL	chill to 4 ± 2°C	14	50 - 300 ug/L
Metals ²	solids	EPA 6010B	glass jar	2 grams	chill to 4 ± 2°C	180	0.25 - 1 mg/kg
Metals ²	water	EPA 6010B	polyethylene bottle	100 mL	nitric acid; chill to 4 ± 2°C	28	3 to 20 ug/L

Note:

1 = reporting limits may vary depending on matrix interference and dilution

2 = TPH as diesel samples will be analyzed both with and without silica gel cleanup

3 = samples for organic matter content will be placed on hold and only analyzed if the associated TPHd result without silica gel cleanup exceeds the site screening criteria

4 = analyses completed only for the characterization of investigation derived waste

BTEX = benzene, toluene, ethylbenzene, and xylenes

°C = degrees Celsius

EPA = Environmental Protection Agency

mg/kg = milligrams per kilogram

mL = milliliter

MTBE = Methyl t-butyl ether

NA = not applicable

TPH = total petroleum hydrocarbons

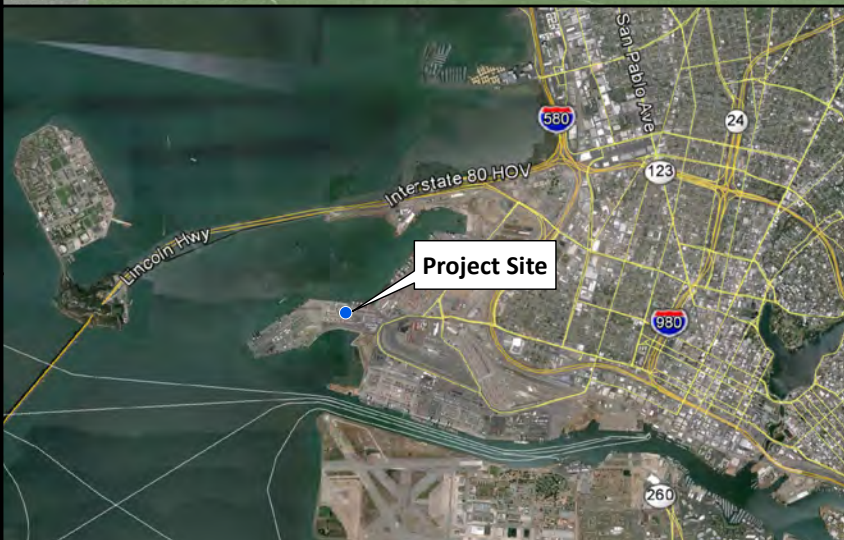
ug/kg = micrograms per kilogram

ug/L = micrograms per liter

FIGURES

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Approximate Location
of UST Excavation



0 500 1,000 1,500 2,000
Feet
1 inch = 1,000 feet



SAFETY FIRST



CLIENT: Port of Oakland

PROJECT: Berth 30




PROJECT NUMBER: 0059.00X.00X

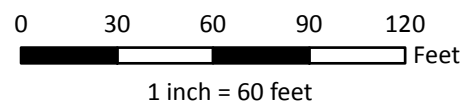
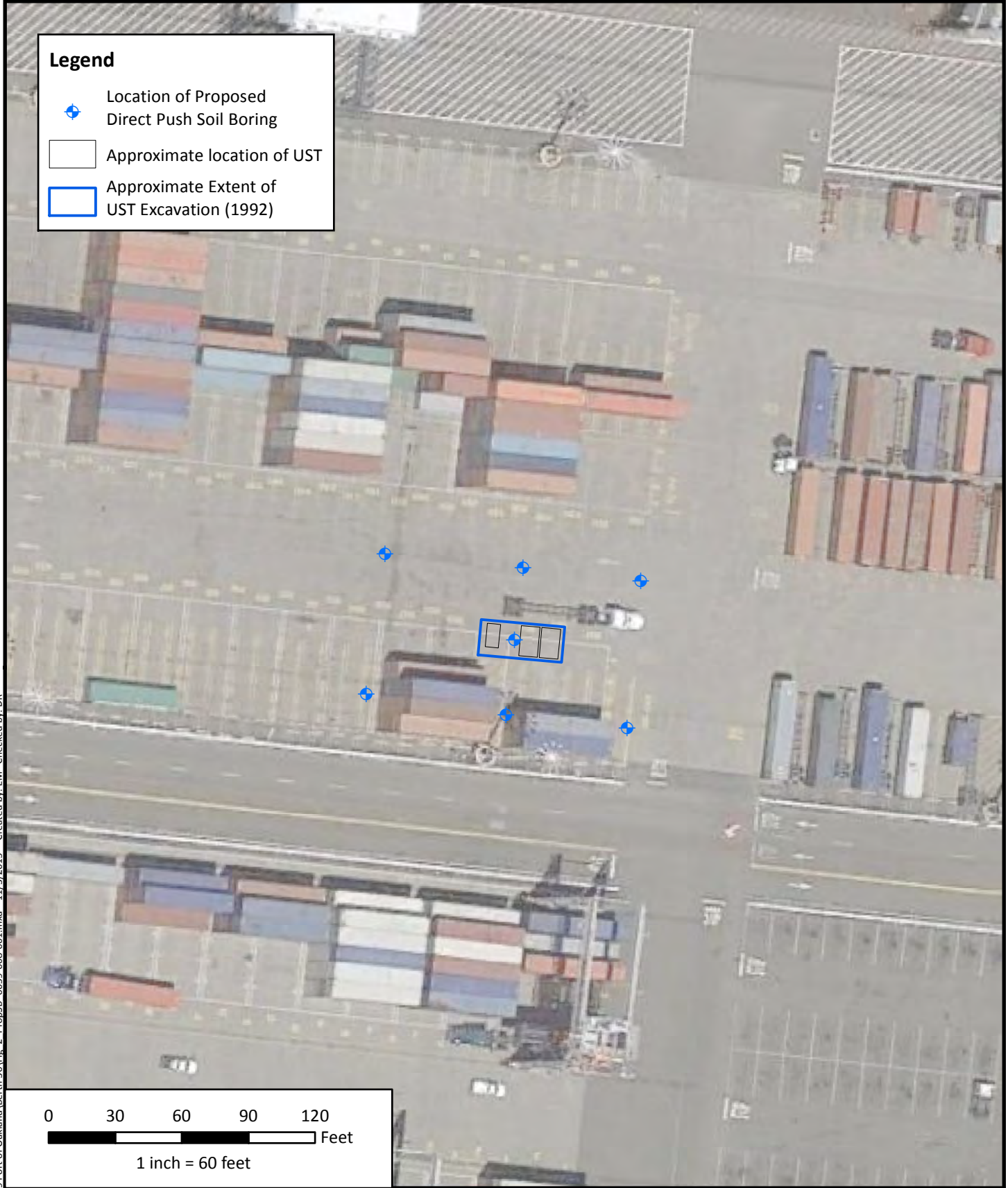
Site Location Map


FIGURE 1

File: J:\GIS Backup\GIS Data\0059 Port of Oakland\Berth 30\Fig. 2 - PropSB. 0059-008-001.mxd 11/3/2015 Created by: EM Checked by: DR

Legend

-  Location of Proposed Direct Push Soil Boring
-  Approximate location of UST
-  Approximate Extent of UST Excavation (1992)



	SAFETY FIRST	CLIENT: Port of Oakland
		PROJECT: Berth 30
		PROJECT NUMBER: 0059.007.001

Proposed Soil Boring Locations

FIGURE 2

APPENDIX A
ACEH TECHNICAL REPORT REQUEST AND RESPONSE TO INQUIRY
ABOUT TEST METHOD D2974

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John Prall

From: Nowell, Keith, Env. Health <Keith.Nowell@acgov.org>
Sent: Friday, March 20, 2015 7:56 AM
To: John Prall
Cc: Diane Heinze; Roe, Dilan, Env. Health
Subject: Fuel leak case RO101, Port of Oakland / Kaiser & Powerine Oil / Berths 30, 2800-2801
7th Street

Dear Mr. Prall,

Alameda County Environmental Health (ACEH) staff has reviewed the case file for the subject fuel leak case. The Berth 30 site includes the location of three former underground storage tanks (USTs) which were removed in April, 1992. The tanks consisted of one 3,000- and one 5,000-gallon USTs used for the storage of gasoline and one 5,000-gallon UST used for the storage of diesel fuel. The three tanks occupied a shared pit. Though no visible holes were apparent in the USTs, visible staining was reported in the soil beneath the two 5,000-gallon USTs and petroleum hydrocarbon odors emanated from the tank pit upon their removal. A quarter-inch-thick layer of free phase product was observed on the groundwater infiltrating into the tank pit.

Approximately 800 gallons of groundwater infiltrating into the pit was pumped out and disposed offsite. Following evacuation of the pit water, a grab-groundwater sample was recovered from tank pit recharge water and found to include 4,100 micrograms per liter ($\mu\text{g/L}$) total petroleum hydrocarbons as gasoline (TPHg) and 3.4 $\mu\text{g/L}$ benzene. The presence of groundwater in the pit precluded the recovery of soil samples from beneath the base of the tanks.

On June 30, 1993 and again on June 10, 1996, ACEH requested monitoring wells be installed for this fuel release site. Recent conversations between ACEH and Port of Oakland staff members have indicated the wells have not been installed.

Therefore, at this juncture, ACEH requests preparation of a work plan for a soil and groundwater investigation of this area.

Technical Report Request

Please upload technical reports to the ACEH ftp site (Attention: Keith Nowell), and to the SWRCB Geotracker website, in accordance with the following specified file naming convention and schedule:

- **May 4, 2015 – Work Plan for Soil and Groundwater Investigation** (file name: RO0000101_WP_R_yyyy-mm-dd)

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

Regards,
Keith Nowell

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>

John Prall

From: Nowell, Keith, Env. Health <Keith.Nowell@acgov.org>
Sent: Friday, November 13, 2015 9:44 AM
To: John Prall
Cc: Roe, Dilan, Env. Health
Subject: RO#101, Inquiry About Test Method D2974

John,

The standard test method for total extractable range petroleum hydrocarbon (TEPH- which includes diesel and motor oil range petroleum hydrocarbons) analysis is EPA Test Method 8015. The 8015 analysis reports both polar and non-polar compounds. Non-polar compounds include diesel and motor oil. Sources of polar compounds include naturally occurring organics, e.g. plant matter, and TEPH degradation by-products (referred to as metabolites). Silica gel cleanup (SGC- EPA Method 3630C) removes the polar compounds, hence the 8015 analysis with SGC may provide a more accurate determination of the actual concentration of TEPH.

The San Francisco Bay Region, Regional Water Quality Control Board (SFBR-RWQCB) guidance is to perform the 8015 analysis with and without SGC. SFBR-RWQCB rationale for performing the analysis with and without SGC is that it provides a line of evidence when evaluating the occurrence of bioattenuation. The toxicity of most polar metabolite compounds has not been established and many regulatory agencies request the 8015 analysis be evaluated against the non-SGC TEPH concentrations. This is agency specific, and ACEH follows the SFBR-RWQCB for consistency in our evaluation of a site. The Environmental Screening Levels (ESLs) prepared by the SFBR-RWQCB (Interim Final 2013) states the inclusion of polars provides some protection from their likely adverse effects by assuming that the toxicity of the metabolites present in a TPH sample is, on average, similar to that of the parent hydrocarbons.

As stated previously, sources of polar compounds include naturally occurring organics. Locales in Alameda County, such as bay margin environments, may contain significant quantities of naturally occurring organics and/or organic material present in fill. One method of evaluating the amount of organic material in a soil sample is by performing ASTM Test Method D2974, entitled Standard Test Methods for Moisture, Ash, and Organic Matter of Peat and Other Organic Soils. Unless soil is heavily contaminated, quantities of organic matter found in soil typically vastly exceeds the concentrations of TEPH and polar metabolites. Better yet are soil samples from uncontaminated areas of the site (up gradient, or other). Thus the D2974 analysis may provide a line of evidence regarding the disposition of naturally occurring organics and polar metabolites.

By evaluating and comparing the results of ASTM D2974 and EPA 8015 with and without SGC, a determination might be made regarding the presence of TEPH and the state of degradation at the site.

Regards,
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/top/ust.htm>

On Nov 10, 2015, at 12:29 PM, John Prall <jprall@portoakland.com<<mailto:jprall@portoakland.com>>> wrote:

Keith & Dilan-

The County comment letter of October 2, 2015 for Fuel Leak Case #RO0000101, Port of Oakland/Kaiser & Powerine Oil/Berth 30, 2800-2801 7th Street, Oakland, Ca requested test method D2974 to be used in conjunction with and without silica gel cleanup for TPH-diesel testing, see Comment #8, top of page 4. Test method D2974 is apparently used to determine carbon content of organic soils for classification purposes. Reading about the method also indicates the test requires heating to 440 degrees Centigrade overnight (which drives off the volatiles), if this description of the test method is correct what kind of correlation is expected when the results of D2974 method are compared to the with and without silica gel cleanup test results? How are the results interpreted? Where can one read how the two test methods have been used in conjunction at other UST sites?

John Prall, PG
Port Associate Environmental Scientist
Environmental Programs & Planning Division

Port of Oakland
530 Water Street
Oakland, CA 94607

jprall@portoakland.com<<mailto:jprall@portoakland.com>>
(510) 627-1373

APPENDIX B

GUIDELINES FOR WORKING IN ACTIVE MARINE TERMINALS

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PORT OF OAKLAND CONTRACTOR SAFETY

WORKING IN ACTIVE MARINE TERMINALS

The Port Wharfinger Department coordinates Port-sponsored access to the marine terminals. Before entering terminals, contact the appropriate Wharfinger. Any deviation from established procedures or work schedules should be cleared at least 24 hours in advance (or as soon as feasible).

The primary issues when working in marine terminals are:

- The safety of contractor, terminal, trucking, terminal employees, and Port employees.
- Minimizing interference with terminal and vessel operations.
- Security: Vehicle inspection & personnel identification (valid California Driver's license or equal).

VEHICLES

Vehicles brought into the terminal must be equipped with identifying signs on each side. Vehicles not so equipped will not be admitted.

Limit on-terminal vehicles to those necessary to perform the work. Park others outside.

Minimize the need to drive around the terminal. Stage operations and remain there. Enter and exit the terminal only via company vehicle.

Obey terminal driving rules, including speed limits. Terminal equipment has the right-of-way.

SITE OF OPERATIONS

The area of operations shall encumber no more space than is required to perform the work safely.

Delineate the area of operation using traffic cones, K-rail, caution tape, or other high-visibility method. Park vehicles to form a protective barrier.

Workers must wear hard hats, hard-toed shoes, and high visibility clothing (with reflective elements at night).

Individuals must remain in the area of operations.

Use a "spotter" where workers are exposed to traffic.

APPENDIX E

Removal of Underground Storage Tanks, Kaiser Yard, 2801 Seventh Street, Oakland, California

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CF 14, 15, 16



REMOVAL OF UNDERGROUND STORAGE TANKS

**Kaiser Yard
2801 Seventh Street
Oakland, California**

Prepared for

**Port of Oakland
530 Water Street
Oakland, California**

Prepared by

**Geomatrix Consultants, Inc.
100 Pine Street, 10th Floor
San Francisco, California 94111**

**June 1992
Project No. 2026.01**

Geomatrix Consultants

TABLE OF CONTENTS

	<u>Page</u>
1.0 INTRODUCTION	1
2.0 TANK REMOVAL ACTIVITIES	1
2.1 Site Preparation	2
2.2 Tank Stabilization	2
2.3 Tank Removal and Disposal/Field Observations	3
3.0 SOIL AND GROUNDWATER SAMPLING	4
4.0 ANALYTICAL METHODS AND RESULTS	5
4.1 Soil Samples from Excavation Sidewalls	5
4.2 Soil Samples from Stockpiles	6
4.3 Grab Groundwater Sample	6
5.0 CONCLUSIONS AND RECOMMENDATIONS	7

LIST OF TABLES

Table 1	Analytical Results for Soil Samples
Table 2	Analytical Results for Grab Groundwater Sample

LIST OF FIGURES

Figure 1	Site Location Map
Figure 2	Site Plan
Figure 3	Locations of Excavation, Tanks, and Soil Samples

LIST OF APPENDICES

Appendix A	Tank Closure Plan, Tank Removal Permit, and Uniform Hazardous Waste Manifests
Appendix B	Chain-of-Custody Records and Analytical Laboratory Reports

REMOVAL OF UNDERGROUND STORAGE TANKS
Kaiser Yard
2801 Seventh Street
Oakland, California

1.0 INTRODUCTION

This report describes tank removal activities conducted from 14 to 16 April 1992 at the former Kaiser Yard at 2801 Seventh Street in Oakland, California (Figure 1). This report describes removal and disposal of three underground fuel storage tanks, soil and groundwater sampling, laboratory analytical results, and conclusions and recommendations.

One 3000-gallon-capacity steel tank and one 5000-gallon capacity steel tank, reportedly used for gasoline storage, and one 5000-gallon-capacity steel tank, reportedly used for diesel storage, were removed from the site. It is unknown when these tanks, which were inactive at the time work was performed, were installed or taken out of use.

2.0 TANK REMOVAL ACTIVITIES

The Port of Oakland retained Envirotex Technologies, Inc. (Envirotex), an earthwork contractor of Sacramento, California, to remove and dispose of the tanks. Tank removal was performed from 14 to 16 April 1992, under a closure plan approved by the Alameda County Department of Environmental Health (ACDEH). A permit also was obtained from the Oakland Fire Marshall. A copy of the closure plan and permit are included in Appendix A.

The Port of Oakland retained Geomatrix to observe tank removal and to collect soil and grab groundwater samples from the tank excavation and soil samples from stockpiles generated during tank removal. Both ACDEH and Oakland Fire Department (OFD)

representatives were on site during tank removal. The ACDEH representative remained on site during excavation and soil sampling.

2.1 SITE PREPARATION

In preparation for tank removal, Envirotex reportedly performed the following activities (Geomatrix was not on site to observe these activities).

- An underground utility check was performed in the vicinity of the tanks.
- At the request of the Port of Oakland, several trees were removed to allow access to the northern part of the tank area (Figure 3).
- 25 cubic yards of concrete overlying the tanks was removed and temporarily stockpiled on site. The concrete was transported off site by Trident Trucking of Hayward, California and disposed of at Landfill Management's facility in Hayward, California.
- The fuel pumps and appurtenant piping for the tanks were removed and stored temporarily on site following removal of the concrete. The fuel pumps and appurtenant piping were transported off site by Trident Trucking (see Section 2.3).

2.2 TANK STABILIZATION

On 14 April 1992, Envirotex excavated soil to expose the three underground storage tanks. The excavated soil, stockpiled at two on-site locations, was placed on plastic sheeting, then covered with plastic sheeting.

The 5000-gallon diesel tank contained no residual liquid; the two gasoline tanks each contained approximately 1 to 1.5 inches of residual liquid. The residual liquid was not pumped from the tanks before the tanks were rendered inert. The tanks were rendered inert by inserting approximately 100 pounds of dry ice into each tank to remove organic vapors and oxygen. Explosivity meter readings that Envirotex took in the tanks before they were removed indicated that vapor concentrations were 0 to 0.01 percent of the Lower Explosive

Limit; oxygen was measured at 10 to 10.9 percent. The OFD representative approved removal of the tanks based on these measurements.

2.3 TANK REMOVAL AND DISPOSAL/FIELD OBSERVATIONS

A Geomatrix field engineer observed tank removal activities, noting sediment types encountered and the occurrence of petroleum product in soil and groundwater, if any. The former tank locations and excavation boundary are shown on Figure 3.

The top of the 3000-gallon tank was approximately 3.5 feet below ground surface. The tank measured approximately 10.5 feet long and 6 feet in diameter. The top of each 5000-gallon tank was approximately 3 feet below ground surface; these tanks measured approximately 14 feet long and 8 feet in diameter. The bottom of the 3000-gallon tank was approximately 9.5 feet below ground surface; the bottoms of the 5000-gallon tanks were approximately 11 feet below ground surface.

Fill material immediately surrounding the tanks consisted of a fine to medium, well-sorted sand. Soil outside the tank excavation area was also a sandy material and contained shells. Groundwater was observed at a depth of approximately 8.5 to 9 feet below ground surface.

Geomatrix personnel made visual and olfactory observations and used a photoionization detector to measure concentrations of volatile organic compounds (VOCs) in order to identify any petroleum product in the soil or groundwater. No staining or petroleum odor was observed in the soil removed from the tops of the tanks, or in that from between the tanks. In addition, no staining was observed on the sidewalls of the excavation.

Petroleum odors and staining were observed in the soil beneath the two 5000-gallon tanks, below the groundwater table. In addition, groundwater near these tanks was observed to contain a film of petroleum product as much as approximately 0.25 inches thick.

After the tanks had been removed from the excavation, the Geomatrix field engineer examined them for holes and for indications of leakage. All three tanks were wrapped in

tar paper; no visible holes or cracks were observed. Loose sand was removed from the tanks. The tanks, fuel pumps, and appurtenant piping were transported by a licensed hazardous waste transporter (Trident Trucking) to a licensed receiving facility (Erickson, Inc.) in Richmond, California, for disposal under a Uniform Hazardous Waste Manifest. A copy of the manifest is included in Appendix A.

At the recommendation of the ACDEH representative, the Port of Oakland requested that groundwater and floating petroleum product be pumped from the excavation before a grab groundwater sample was collected. Erickson pumped groundwater from the tank excavation into a truck, then groundwater was allowed to recharge; this process was repeated twice. Petroleum product was observed on the surface of the groundwater after each recharge. A total of approximately 800 gallons of product and water was removed from the tank excavation and transported under a Uniform Hazardous Waste Manifest to Erickson's receiving facility in Richmond, California. A copy of the manifest is included in Appendix A.

It is our understanding that on 22 April 1992 Envirotex backfilled the tank excavation with reported fill and some of the tank backfill that had been stockpiled on site. The Port of Oakland forwarded the analytical data for the soil samples from the excavation and stockpiles to the ACDEH. Based on analytical results, we understand that the ACDEH approved backfilling the excavation with the portion of stockpiled soil that contained no detectable concentrations of hydrocarbons. Analytical results of soil samples collected from the stockpiled material are discussed in Section 4.2 of this report.

3.0 SOIL AND GROUNDWATER SAMPLING

Soil sample locations in the tank excavation were selected based on field discussions with the ACDEH representative (Figure 3). Soil samples were collected on 15 April 1992 from the sidewalls of the excavation at depths of 8 to 8.5 feet below ground surface, which was about 0.5 to 1.0 feet above groundwater level. A backhoe bucket was used to collect soil;

after approximately 6 inches of soil was removed from the top of the bucket, a clean, thin-walled brass tube was driven into the soil.

The stockpiled soil was sampled for chemical analysis. Four soil samples were collected from each of the two stockpiles. Approximately 6 inches of soil was removed from the surface of each stockpile at the sampling location, and a clean, thin-walled brass tube was driven into the soil. The full sample tubes were sealed at each end with aluminum foil, duct tape, and plastic end caps, then labeled.

A grab groundwater sample was collected from the tank excavation on 16 April 1992 after groundwater had been pumped from the excavation as described in Section 2.3. The grab groundwater sample was collected by lowering a container into the excavation and allowing the container to fill with water. The groundwater was decanted into 40-milliliter volatile organic analysis vials and 1-liter amber bottles. The bottles were then sealed and labeled.

The soil and grab groundwater samples were placed in an ice-cooled chest for delivery under Geomatrix chain-of-custody procedures to Clayton Environmental Consultants (Clayton), of Pleasanton, California, a state-certified analytical laboratory retained by the Port of Oakland to perform the analytical testing. Analytical methods and results for the soil and grab groundwater samples are discussed in Section 4.3 of this report. Analytical laboratory reports and chain-of-custody records are included in Appendix B.

4.0 ANALYTICAL METHODS AND RESULTS

4.1 SOIL SAMPLES FROM EXCAVATION SIDEWALLS

At the request of the ACDEH, the soil samples collected from the excavation sidewalls were analyzed for total petroleum hydrocarbons as diesel (TPHd) by U.S. Environmental Protection Agency (EPA) Method 8015; total petroleum hydrocarbons as gasoline (TPHg) by modified EPA Method 8015; and benzene, toluene, ethylbenzene, and xylenes (BTEX) by EPA Method 8020. The ACDEH also requested that four of the six soil samples (POK-

EX-1 through POK-EX-4) be analyzed for total lead; these analyses were performed in accordance with EPA Method 6010. Analytical results are summarized in Table 1.

TPHd, TPHg, and BTEX were not reported above the laboratory detection limits. Total lead was detected in each sample at concentrations ranging from 2 to 9 milligrams per kilogram (mg/kg).

4.2 SOIL SAMPLES FROM STOCKPILES

Each set of four soil samples collected from the stockpiled material was composited by the analytical laboratory before analysis. The composited soil samples were analyzed for TPHd by EPA Method 8015; TPHg by modified EPA Method 8015; BTEX by EPA Method 8020; and total lead by EPA Method 6010. Analytical results are summarized in Table 1.

Benzene and TPHd were not reported above the laboratory detection limits in the composited soil samples. One set of composited samples (POK-SP-5 through -8) also contained no TPHg, toluene, ethylbenzene, or xylenes above the laboratory detection limits. TPHg, toluene, ethylbenzene, and xylenes were detected in the sample composited from POK-SP-1 through -4 at concentrations of 0.5, 0.033, 0.007, and 0.044 mg/kg, respectively. Total lead was detected in the composited samples at concentrations of 10 and 17 mg/kg.

4.3 GRAB GROUNDWATER SAMPLE

The grab groundwater sample was analyzed for TPHd by EPA Method 8015; TPHg by modified EPA Method 8015; BTEX by EPA Method 8020; and total lead by EPA Method 6010. The sample collected for total lead was filtered and acidified by the analytical laboratory. The analytical results are summarized in Table 2.

The grab groundwater sample contained TPHg at a concentration of 4100 micrograms per liter ($\mu\text{g/l}$). The sample also contained benzene, toluene, ethylbenzene, and xylenes at

concentrations of 3.4, 1.4, 62, and 860 $\mu\text{g/l}$, respectively. TPHd and total lead were not reported above the laboratory detection limits.

5.0 CONCLUSIONS AND RECOMMENDATIONS

Analytical results from the excavation soil samples indicate that near the former location of three underground storage tanks, soil above the groundwater table has not been affected by petroleum hydrocarbons. Although all the tanks appeared to be in good condition and contained no visible holes, observations made during tank removal, including staining of soil and petroleum odor, suggest that soil beneath the 5000-gallon gasoline and diesel tanks, and below the groundwater table, may contain petroleum hydrocarbons.

The analytical results of the composited stockpile soil samples indicated low concentrations of TPHg, toluene, ethylbenzene, and xylenes in some of the stockpiled soil. The ACDEH reportedly approved use of some of the stockpiled soil in which hydrocarbons were not detected for backfill in the excavation.

Analytical results for the grab groundwater sample indicated that groundwater in the tank excavation contained TPHg and BTEX.

Based on the analytical results and field observations, we recommend that a work plan be developed to assess groundwater quality in the former underground storage tank area. In addition, we recommend that the stockpiled soil containing low concentrations of TPHg and BTEX be disposed of appropriately.

TABLE 1
ANALYTICAL RESULTS FOR SOIL SAMPLES¹
 Kaiser Yard
 Port of Oakland
 Oakland, California

Concentrations in milligrams per kilogram (mg/kg)

Sample I.D.	TPH ² as Diesel	TPH ² as Gasoline	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total Lead
Excavation Samples							
POK-EX-1	<1.0	<0.3	<0.005	<0.005	<0.005	<0.005	2
POK-EX-2	<1.0	<0.3	<0.005	<0.005	<0.005	<0.005	9
POK-EX-3	<1.0	<.03	<0.005	<0.005	<0.005	<0.005	2
POK-EX-4	<1.0	<0.3	<0.005	<0.005	<0.005	<0.005	8
POK-EX-5	<5.0	<0.3	<0.005	<0.005	<0.005	<0.005	NA ³
POK-EX-6	<2.0	<0.3	<0.005	<0.005	<0.005	<0.005	NA
Stockpile Samples							
POK-SP-1 through -4	<2.0	0.5	<0.005	0.033	0.007	0.044	10
POK-SP-5 through -8	<2.0	<0.3	<0.005	<0.005	<0.005	<0.005	17

¹ Soil samples collected by Geomatrix Consultants, Inc., and analyzed by Clayton Environmental Consultants of Pleasanton, California for TPH as diesel by EPA Method 8015; TPH as gasoline by modified EPA Method 8015; benzene, toluene, ethylbenzene, and xylenes by EPA Method 8020; and total lead by EPA Method 6010. Stockpile soil samples composited by laboratory before analysis.

² TPH - total petroleum hydrocarbons.

³ NA - not analyzed for compound indicated.

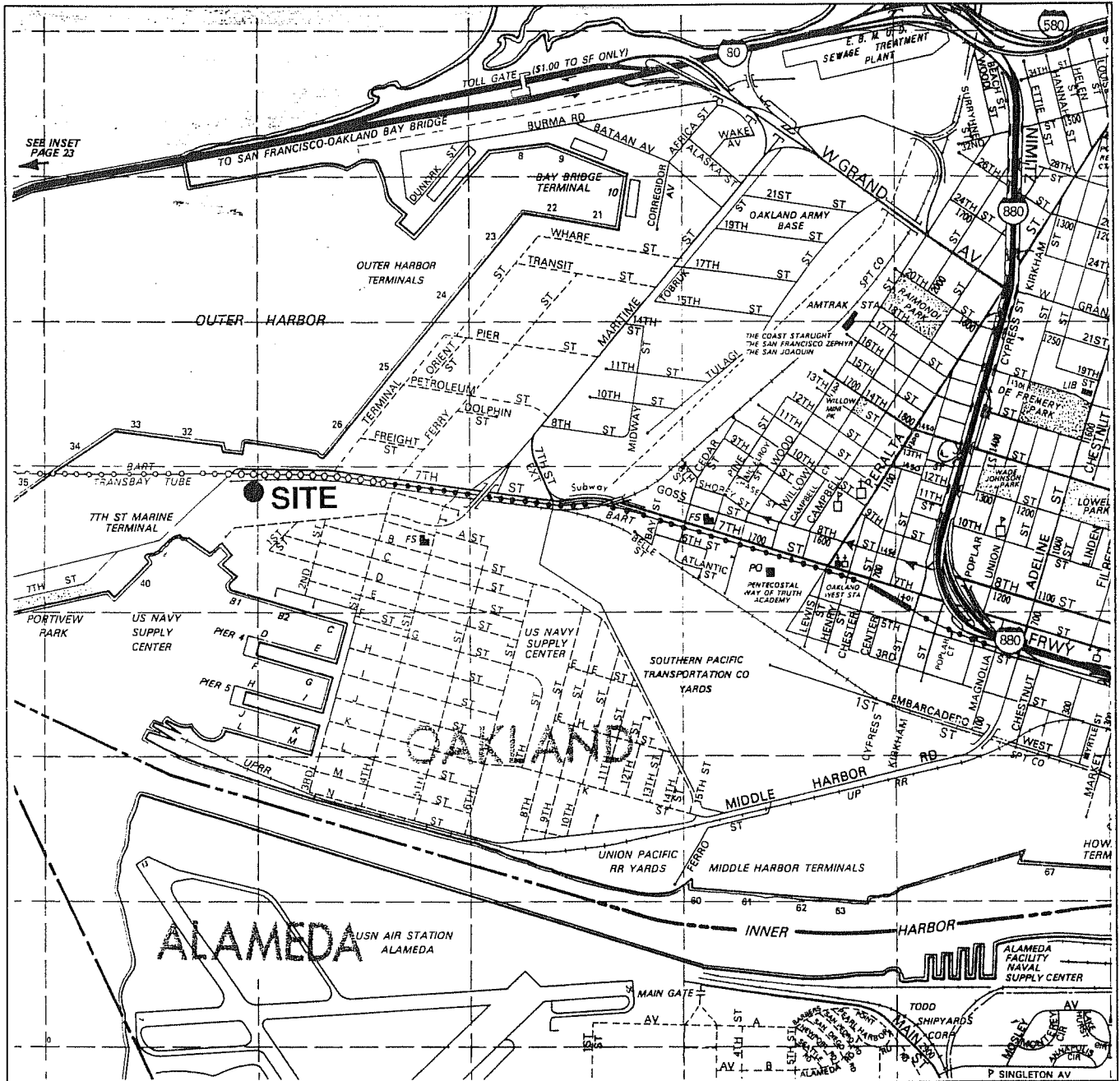
TABLE 2
ANALYTICAL RESULTS FOR GRAB GROUNDWATER SAMPLE¹
 Kaiser Yard
 Port of Oakland
 Oakland, California

Sample I.D.	Concentrations in micrograms per liter (µg/l)						Total Lead
	TPH ² as Diesel	TPH ² as Gasoline	Benzene	Toluene	Ethylbenzene	Total Xylenes	
POK-GW-1	<200	4100	3.4	1.4	62	860	ND ³

¹ Grab groundwater sample collected by Geomatrix Consultants, Inc., and analyzed by Clayton Environmental Consultants of Pleasanton, California, for TPH as diesel by EPA Method 8015; TPH as gasoline by modified EPA Method 8015; benzene, toluene, ethylbenzene, and xylenes by EPA Method 8020; and total lead by EPA Method 6010.

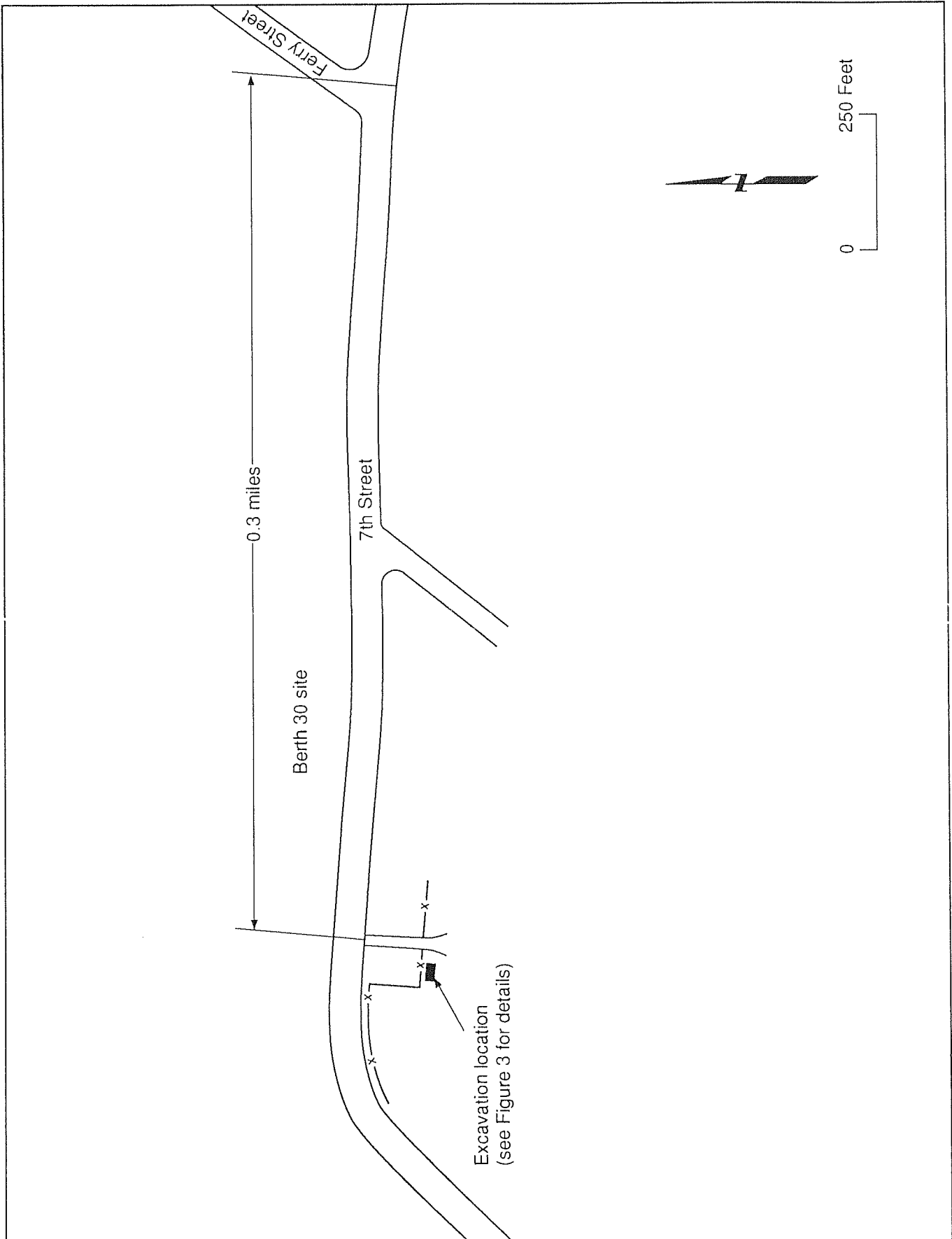
² TPH - total petroleum hydrocarbons.

³ ND - indicates total lead not detected above laboratory detection limit of 0.05 milligrams per liter (mg/l).



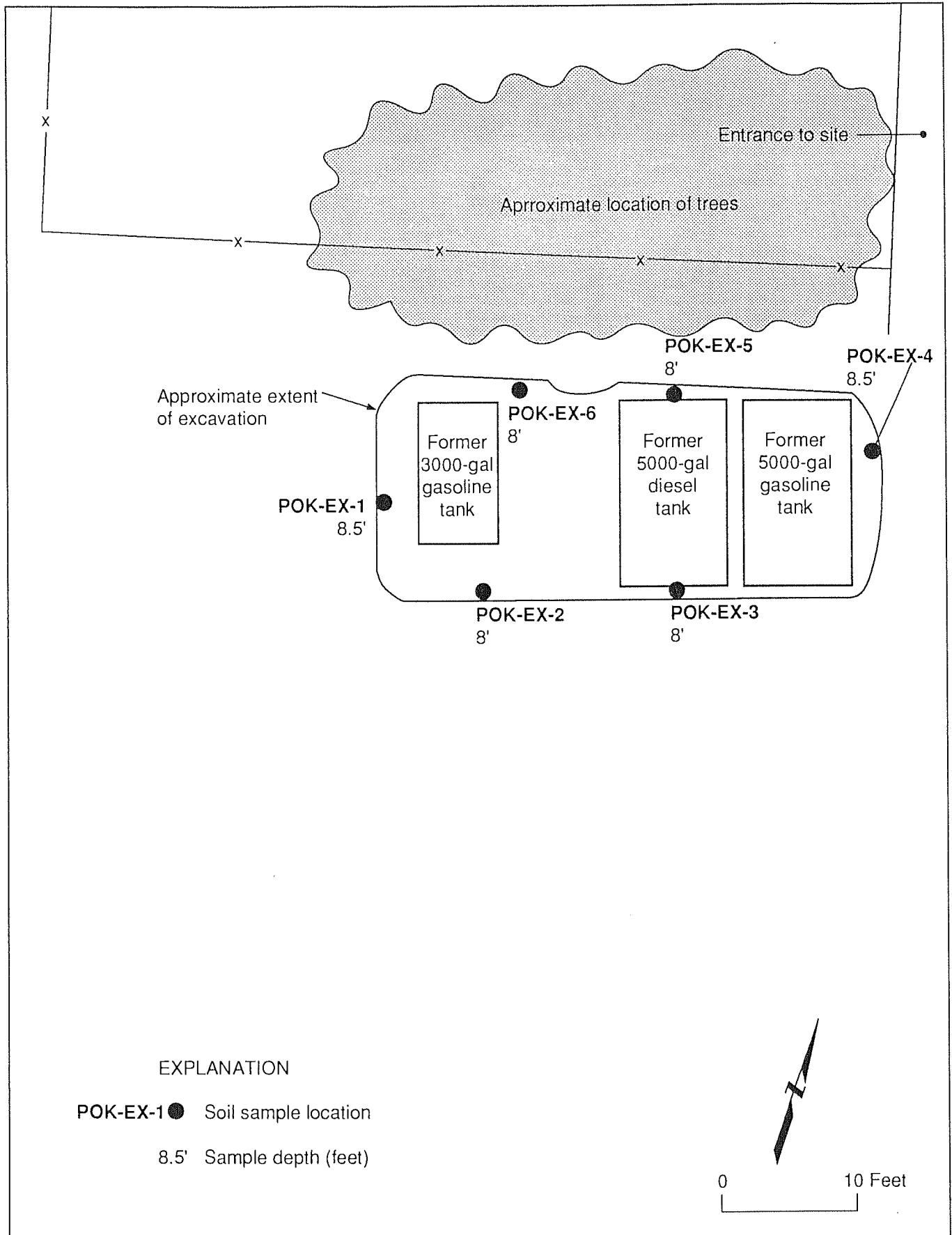
SITE LOCATION MAP
 Port of Oakland - Kaiser Yard
 2801 Seventh Street
 Oakland, California

Figure
 1
 Project No.
 2026.01



SITE PLAN
 Port of Oakland - Kaiser Yard
 2801 Seventh Street
 Oakland, California

Figure 2
Project No. 2026.01



EXPLANATION

POK-EX-1 ● Soil sample location

8.5' Sample depth (feet)



LOCATIONS OF EXCAVATION, TANKS, AND SOIL SAMPLES
 Port of Oakland - Kaiser Yard
 2801 Seventh Street
 Oakland, California

Figure
 3

Project No.
 2026.01

APPENDIX A

Tank Closure Plan, Tank Removal Permit,
and Uniform Hazardous Waste Manifests

Project Specialist (print) SUSAN L. HUGO

ALAMEDA COUNTY HEALTH CARE SERVICES AGENCY
DEPARTMENT OF ENVIRONMENTAL HEALTH
HAZARDOUS MATERIALS DIVISION
80 SWAN WAY, ROOM 200
OAKLAND, CA 94621
PHONE NO. 415/271-4320
510

ACCEPTED

DEPARTMENT OF ENVIRONMENTAL HEALTH
470 - 27th Street, Third Floor
Oakland, CA 94612
Telephone: (415) 874-7237

These plans have been reviewed and found to be acceptable and essentially meet the requirements of State and local health laws. Changes to your plans indicated by this Department are to assure compliance with State and local laws. The project proposed herein is now released for issuance of any required building permits for construction.

One copy of these approved plans must be on the job and available to all contractors and craftsmen involved with the removal.

Any changes or alterations of these plans and specifications must be submitted to this Department and to the Fire and Building Inspection Department to determine if such changes meet the requirements of State and local laws. Notify this Department at least 48 hours prior to the following required inspections:

- Removal of Tank and Piping
- Sampling
- Final Inspection

Issuance of a permit to operate is dependent on compliance with accepted plans and all applicable laws and regulations.

THERE IS A FINANCIAL PENALTY FOR NOT OBTAINING THESE INSPECTIONS.

Susan L. Hugo
4/06/92

UNDERGROUND TANK CLOSURE PLAN

*** Complete according to attached instructions ***

1. Business Name PORT OF OAKLAND
Business Owner PORT OF OAKLAND
2. Site Address 2801 Seventh Street
city OAKLAND zip 94607 Phone (510) 272-1100
3. Mailing Address 530 WATER STREET
city OAKLAND zip 94607 Phone (510) 272-1100
4. Land Owner PORT OF OAKLAND
Address 530 WATER STREET city, State OAKLAND, CA zip 94607
5. Generator name under which tank will be manifested PORT OF OAKLAND
EPA I.D. No. under which tank will be manifested CAC 000707408

6. Contractor ENVIRO TOX TECHNOLOGIES INC.
Address 1336 DIXIEANNE AVE
City SACRAMENTO Phone 916 9200664
License Type _____ ID# SEE ATTACHED

*Effective January 1, 1992, Business and Professional Code Section 7058.7 requires prime contractors to also hold Hazardous Waste Certification issued by the State Contractors License Board. Indicate that the certificate has been received, in addition, to holding the appropriate contractors license type.

7. Consultant GEOMATRIX CONSULTANTS
Address 100 PINE STREET, 10th FLOOR
City SAN FRANCISCO, CA Phone (415) 434-9400
94111

8. Contact Person for Investigation
Name JON AMDUR Title ENVIRONMENTAL SCIENTIST
Phone (510) 272-1184

9. Number of tanks being closed under this plan 3
Length of piping being removed under this plan 40'
Total number of tanks at facility 3

10. State Registered Hazardous Waste Transporters/Facilities (see instructions).

** Underground tanks are hazardous waste and must be handled **
as hazardous waste

a) Product/Residual Sludge/Rinsate Transporter

Name ERICKSON, INC. EPA I.D. No. CAD009466392
Hauler License No. 0019 License Exp. Date 5/31/92
Address 255 PARR BLVD.
City RICHMOND State CA Zip 94801

b) Product/Residual Sludge/Rinsate Disposal Site

Name ERICKSON, INC. EPA I.D. No. CAD009466392
Address 255 PARR BLVD.
City RICHMOND State CA Zip 94801

State of California

Contractors State License Board

Pursuant to Chapter 9 of Division 3 of the Business and Professions Code and the Rules and Regulations of the Contractors State License Board, the Registrar of Contractors does hereby issue this license to:

ENVIROTON TECHNOLOGIES INCORPORATED

to engage in the business or act in the capacity of a contractor in the following classification(s):

- C21 - Building Moving, Wrecking, C61/D06 - Concrete Related Services, C61/D40 - Service Station Equipment & Maintenance, A - General Engineering Contractor, HAZ - Hazardous Substances Removal, B - General Building Contractor

Witness my hand and seal this day.

June 22, 1989

Issued October 7, 1985
Replacement



David R. Phillips
Registrar of Contractors

480497

License Number

Joseph J. ...
Signature of Licensee

Therese ...
Signature of License Qualifier

This license is the property of the Registrar of Contractors, is not transferable, and shall be returned to the Registrar upon demand when suspended, revoked, or invalidated for any reason. It becomes void if not renewed.

No 224028

c) Tank and Piping Transporter

Name ERICKSON, INC. EPA I.D. No. CAD009466392
Hauler License No. 0019 License Exp. Date 5-31-92
Address 255 PARR BLVD.
city RICHMOND State CA zip 94801

d) Tank and Piping Disposal Site

Name ERICKSON, INC. EPA I.D. No. _____
Address 255 PARR BLVD.
city RICHMOND State CA zip 94801

11. Experienced Sample Collector

Name ELIZABETH WELLS
Company GEOMATRIX CONSULTANTS
Address 100 PINE STREET, 10th FLOOR
city SAN FRANCISCO State CA zip 94111 Phone (415) 434-9400

12. Laboratory

Name CLAYTON
Address 1252 QUARRY LANE, PO BOX 9019
city PLEASANTON State CA zip 94566
State Certification No. 1196

13. Have tanks or pipes leaked in the past? Yes [] No [✓]

If yes, describe. Not detected

14. Describe methods to be used for rendering tank inert

20 LBS. OF DRY ICE PER 1000 GALS

Before tanks are pumped out and inerted, all associated piping must be flushed out into the tanks. All accessible associated piping must then be removed. Inaccessible piping must be plugged.

The Bay Area Air Quality Management District (771-6000), along with local Fire and Building Departments, must also be contacted for tank removal permits. Fire departments typically require the use of explosion proof combustible gas meters to verify tank inertness. It is the contractor's responsibility to bring a working combustible gas meter on site to verify tank inertness.

15. Tank History and Sampling Information

Tank		Material to be sampled (tank contents, soil, ground-water, etc.)	Location and Depth of Samples
Capacity (Gallons)	Use History (see instructions)		
3,000	Gasoline	SOIL	From the wall of the pit at each end of the tank. Collected at the soil/water interface, or not greater than 2 ft. into native soil
5,000	Gasoline	Groundwater, if present	
5,000	Diesel (installation dates unknown)		

One soil sample must be collected for every 20 feet of piping that is removed. A ground water sample must be collected should any ground water be present in the excavation.

Excavated/Stockpiled Soil	
Stockpiled Soil Volume (Estimated) 260-300 CUBIC YARDS	Sampling Plan ONE SAMPLE EVERY 20 Y ³ MAXIMUM OR ONE SAMPLE EVERY 50 Y ³ MINIMUM. ANALYZE FOR TPH-6, TPH-7, BTEX, AND TOTAL LEAD.

Stockpiled soil must be placed on bermed plastic and must be completely covered by plastic sheeting.

16. Chemical methods and associated detection limits to be used for analyzing samples

The Tri-Regional Board recommended minimum verification analyses and practical quantitation reporting limits should be followed. See attached Table 2.

Contaminant Sought	EPA, DHS, or Other Sample Preparation Method Number	EPA, DHS, or Other Analysis Method Number	Method Detection Limit
TPH GASOLINE	5030	GCFID	SOIL 1 ppm WATER 50 ppb
TPH DIESEL	3550 / 3510	GCFID	SOIL 1 ppm WATER 50 ppb
BTEX	5030	8020 or 8240	SOIL 5 ppb WATER .5 ppb
TOTAL LEAD	AA		3 ppm

17. Submit Site Health and Safety Plan (See Instructions)

18. Submit Worker's Compensation Certificate copy (Form coming)

Name of Insurer TRANSAMERICA / Policy No. 80482858 / 1/1/92 to 1/1/93

19. Submit Plot Plan (See Instructions)

20. Enclose Deposit (See Instructions)

21. Report any leaks or contamination to this office within 5 days of discovery. The report shall be made on an Underground Storage Tank Unauthorized Leak/Contamination Site Report form. (see Instructions)

22. Submit a closure report to this office within 60 days of the tank removal. This report must contain all the information listed in item 22 of the instructions.

I declare that to the best of my knowledge and belief the statements and information provided above are correct and true.

I understand that information in addition to that provided above may be needed in order to obtain an approval from the Department of Environmental Health and that no work is to begin on this project until this plan is approved.

I understand that any changes in design, materials or equipment will void this plan if prior approval is not obtained.

I understand that all work performed during this project will be done in compliance with all applicable OSHA (Occupational Safety and Health Administration) requirements concerning personnel health and safety. I understand that site and worker safety are solely the responsibility of the property owner or his agent and that this responsibility is not shared nor assumed by the County of Alameda.

Once I have received my stamped, accepted closure plan, I will contact the project Hazardous Materials Specialist at least three working days in advance of site work to schedule the required inspections.

Signature of Contractor ENVIROTOX TECHNOLOGIES, INCORPORATED

Name (please type) Joyce L. Sherwood, President

Signature *Joyce L. Sherwood*

Date March 5, 1992

Signature of Site Owner or Operator

Name (please type) Port of Oakland Andrew Clark-Clough

Signature *Andrew Clark-Clough*, authorized agent for Port of Oakland

Date 3/11/92

INSTRUCTIONS

General Instructions

- * Three (3) copies of this plan plus attachments and deposit must be submitted to this Department.
- * Any cutting into tanks requires local fire department approval.
- * One complete copy of your approved plan must be at the construction site at all times; a copy of your approved plan must also be sent to the landowner.

Item Specific Instructions

2. SITE ADDRESS
Address at which closure is taking place.
5. EPA I.D. NO. under which the tanks will be manifested
EPA I.D. numbers may be obtained from the State Department of Health Services, 916/324-1781.
6. CONTRACTOR
Prime contractor for the project.
10. STATE REGISTERED HAZARDOUS WASTE TRANSPORTERS/FACILITIES
 - a) All residual liquids and sludges are to be removed from tanks before tanks are inerted.
 - c) Tanks must be hauled as hazardous waste.
 - d) This is the place where tanks will be taken for cleaning.
15. TANK HISTORY AND SAMPLING INFORMATION
Use History - This information is essential and must be accurate. Include tank installation date, products stored in the tank, and the date when the tank was last used.

Material to be sampled - e.g. water, oil, sludge, soil, etc.

Location and depth of samples - e.g. beneath the tank a maximum of two feet below the native soil/backfill interface, side wall at the high water mark, etc.

17. SITE HEALTH AND SAFETY PLAN

A site specific Health and Safety plan must be submitted. We advocate the site health and safety plan include the following items, at a minimum:

- a) The name and responsibilities of the site health and safety officer;
- b) Identification of health and safety hazards of each work task. Include potential fire, explosion, physical, and chemical hazards;
- c) An outline of briefings to be held before work each day to appraise employees of site health and safety hazards;
- d) Frequency and types of air and personnel monitoring to be used - along with the environmental sampling techniques and instrumentation. Include instrumentation maintenance and calibration methods and frequencies;
- e) Specific personal protective equipment and procedures to be used by workers to protect themselves from the identified hazards. Also state the contaminant concentrations in air - or other conditions - which will trigger changes in work or work habits to ensure workers are not exposed to high levels of hazardous chemicals or to other unsafe conditions;
- f) Confined space entry procedures (if applicable);
- g) Decontamination procedures;
- h) Measures to be taken to secure the site, excavation and stockpiled soil during and after work hours (e.g. barricades, caution tape, fencing, trench plates, security guards, etc.);
- i) Spill containment and emergency/contingency plan. Be sure to include emergency phone numbers, the location of the phone nearest the site, and directions to the hospital nearest the site;
- j) Documentation that all site workers have received the appropriate OSHA approved trainings and participate in appropriate medical surveillance per 29 CFR 1910.120; and
- k) Page for employees to sign indicating they have read and will comply with the site health and safety plan.

The safety plan must be distributed to all employees and contractors working in hazardous waste operations on site. A complete copy of the site health and safety plan along with any standard operating procedures shall be on site and accessible at all times.

NOTE: These requirements are excerpts from 29 CFR Part 1910.120, Hazardous Waste Operations and Emergency Response; Final Rule, March 6, 1989. Safety plans of certain underground tank sites may need to meet the complete requirements of this Rule.

19. PLOT PLAN

The plan should consist of a scaled view of the facility at which the tank(s) are located and should include the following information:

- a) Scale;
- b) North Arrow;
- c) Property Lines;
- d) Location of all Structures;
- e) Location of all relevant existing equipment including tanks and piping to be removed and dispensers;
- f) Streets;
- g) Underground conduits, sewers, water lines, utilities;
- h) Existing wells (drinking, monitoring, etc.);
- i) Depth to ground water; and
- j) All existing tanks and piping in addition to the ones being pulled.

20. DEPOSIT

A deposit, payable to Alameda County for the amount indicated on the Alameda County Underground Storage Tank Fee Schedule, must accompany the plans.

21. Blank Unauthorized Leak/Contamination Site Report forms may be obtained in limited quantities from our office and from the San Francisco Bay Regional Water Quality Control Board (415/464-1255). Larger quantities may be obtained directly from the State Water Resources Control Board at (916) 739-2421.

22. TANK CLOSURE REPORT

The tank closure report should contain the following information:

- a) General description of the closure activities;
- b) Description of tank, fittings and piping conditions. Indicate tank size and former contents; note any corrosion, pitting, holes, etc.;

- c) Description of the excavation itself. Include the tank and excavation depth, a log of the stratigraphic units encountered within the excavation, a description of root holes or other potential contaminant pathways, the depth to any observed ground water, descriptions and locations of stained or odor-bearing soil, and descriptions of any observed free product or sheen;
- d) Description of sampling methods;
- e) Description of any remedial measures conducted at the time of tank removal;
- f) To-scale figures showing the excavation size and depth, nearby buildings, sample locations and depths, and tank and piping locations. Include a copy of the plot plan prepared for the Tank Closure Plan under item 19;
- g) Chain of custody records;
- h) Copies of signed laboratory reports;
- i) Copies of "TSDF to Generator" Manifests for all hazardous wastes hauled offsite (sludge, rinsate, tanks and piping, contaminated soil, etc.); and
- j) Tabulation of the volume and final destination of all non-manifested contaminated soil hauled offsite.

TABLE #2
RECOMMENDED MINIMUM VERIFICATION ANALYSES FOR
UNDERGROUND TANK LEAKS

<u>HYDROCARBON LEAK</u>	<u>SOIL ANALYSIS</u>		<u>WATER ANALYSIS</u>	
Unknown Fuel	TPH G	GCFID(5030)	TPH G	GCFID(5030)
	TPH D	GCFID(3550)	TPH D	GCFID(3510)
	BTX&E	8020 or 8240	BTX&E	602, 624 or 8260
	TPH AND BTX&E	8260		
Leaded Gas	TPH G	GCFID(5030)	TPH G	GCFID(5030)
	BTX&E	8020 OR 8240	BTX&E	602 or 624
	TPH AND BTX&E	8260	TOTAL LEAD AA	
	TOTAL LEAD AA			
	-----Optional-----			
	TEL	DHS-LUFT	TEL	DHS-LUFT
	EDB	DHS-AB1803	EDB	DHS-AB1803
Unleaded Gas	TPH G	GCFID(5030)	TPH G	GCFID(5030)
	BTX&E	8020 or 8240	BTX&E	602, 624 or 8260
	TPH AND BTX&E	8260		
Diesel, Jet Fuel and Kerosene	TPH D	GCFID(3550)	TPH D	GCFID(3510)
	BTX&E	8020 or 8240	BTX&E	602, 624 or 8260
	TPH AND BTX&E	8260		
Fuel/Heating Oil	TPH D	GCFID(3550)	TPH D	GCFID(3510)
	BTX&E	8020 or 8240	BTX&E	602, 624 or 8260
	TPH AND BTX&E	8260		
Chlorinated Solvents	CL HC	8010 or 8240	CL HC	601 or 624
	BTX&E	8020 or 8240	BTX&E	602 or 624
	CL HC AND BTX&E	8260	CL HC AND BTX&E	8260
Non-chlorinated Solvents	TPH D	GCFID(3550)	TPH D	GCFID(3510)
	BTX&E	8020 or 8240	BTX&E	602 or 624
	TPH AND BTX&E	8260	TPH and BTX&E	8260
Waste and Used Oil or Unknown (All analyses must be completed and submitted)	TPH G	GCFID(5030)	TPH G	GCFID(5030)
	TPH D	GCFID(3550)	TPH D	GCFID(3510)
	TPH AND BTX&E	8260		
	O & G	5520 D & F	O & G	5520 C & F
	BTX&E	8020 or 8240	BTX&E	602, 624 or 8260
	CL HC	8010 or 8240	CL HC	601 or 624
	ICAP or AA TO DETECT METALS: Cd, Cr, Pb, Zn, Ni			
	METHOD 8270 FOR SOIL OR WATER TO DETECT:			
	PCB*		PCB	
	PCP*		PCP	
	PNA		PNA	
	CREOSOTE		CREOSOTE.	

* If found, analyze for dibenzofurans (PCBs) or dioxins (PCP)

Reference: Tri-Regional Board Staff Recommendations for Preliminary Evaluation and Investigation of Underground Tank Sites, 10 August 1990

EXPLANATION FOR TABLE #2: MINIMUM VERIFICATION ANALYSIS

1. OTHER METHODOLOGIES are continually being developed and as methods are accepted by EPA or DHS, they also can be used.
2. For DRINKING WATER SOURCES, EPA recommends that the 500 series for volatile organics be used in preference to the 600 series because the detection limits are lower and the QA/QC is better.
3. APPROPRIATE STANDARDS for the materials stored in the tank are to be used for all analyses on Table #2. For instance, seasonally, there may be five different jet fuel mixtures to be considered.
4. To AVOID FALSE POSITIVE detection of benzene, benzene-free solvents are to be used.
5. TOTAL PETROLEUM HYDROCARBONS (TPH) as gasoline (G) and diesel (D) ranges (volatile and extractable, respectively) are to be analyzed and characterized by GCFID with a fused capillary column and prepared by EPA method 5030 (purge and trap) for volatile hydrocarbons, or extracted by sonication using 3550 methodology for extractable hydrocarbons. Fused capillary columns are preferred to packed columns; a packed column may be used as a "first cut" with "dirty" samples or once the hydrocarbons have been characterized and proper QA/QC is followed.
6. TETRAETHYL LEAD (TEL) analysis may be required if total lead is detected unless the determination is made that the total lead concentration is geogenic (naturally occurring).
7. CHLORINATED HYDROCARBONS (CL HC) AND BENZENE, TOLUENE, XYLENE AND ETHYLBENZENE (BTX&E) are analyzed in soil by EPA methods 8010 and 8020 respectively, (or 8240) and in water, 601 and 602, respectively (or 624).
8. OIL AND GREASE (O & G) may be used when heavy, straight chain hydrocarbons may be present. Infrared analysis by method 418.1 may also be acceptable for O & G if proper standards are used. "Standard Methods" 17th Edition, 1989, has changed the 503 series to 5520.
9. PRACTICAL QUANTITATION REPORTING LIMITS are influenced by matrix problems and laboratory QA/QC procedures. Following are the Practical Quantitation Reporting Limits:

	<u>SOIL PPM</u>	<u>WATER PPM</u>
TPH G	1.0	50.0
TPH D	1.0	50.0
BTX&E	0.005	0.5
O & G	50.0	5,000.0

EXPLANATION FOR TABLE #2: MINIMUM VERIFICATION ANALYSIS

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TPH G	1.0	50.0
TPH D	1.0	50.0
BTX&E	0.005	0.5
O & G	50.0	5,000.0

Based upon a Regional Board survey of Department of Health Services Certified Laboratories, the Practical Quantitation Reporting Limits are attainable by a majority of laboratories with the exception of diesel fuel in soils. The Diesel Practical Quantitation Reporting Limits, shown by the survey, are:

ROUTINE	MODIFIED PROTOCOL
≤ 10 ppm (42%)	≤ 10 ppm (10%)
≤ 5 ppm (19%)	≤ 5 ppm (21%)
≤ 1 ppm (35%)	≤ 1 ppm (60%)

When the Practical Quantitation Reporting Limits are not achievable, an explanation of the problem is to be submitted on the laboratory data sheets.

10. LABORATORY DATA SHEETS are to be signed and submitted and include the laboratory's assessment of the condition of the samples on receipt including temperature, suitable container type, air bubbles present/absent in VOA bottles, proper preservation, etc. The sheets are to include the dates sampled, submitted, prepared for analysis, and analyzed.

11. IF PEAKS ARE FOUND, when running samples, that do not conform to the standard, laboratories are to report the peaks, including any unknown complex mixtures that elute at times varying from the standards. Recognizing that these mixtures may be contrary to the standard, they may not be readily identified; however, they are to be reported. At the discretion of the LIA or Regional Board the following information is to be contained in the laboratory report:

The relative retention time for the unknown peak(s) relative to the reference peak in the standard, copies of the chromatogram(s), the type of column used, initial temperature, temperature program is C/minute, and the final temperature.

12. REPORTING LIMITS FOR TPH are: gasoline standard ≤ 20 carbon atoms, diesel and jet fuel (kerosene) standard ≤ 50 carbon atoms. It is not necessary to continue the chromatography beyond the limit, standard, or EPA/DHS method protocol (whichever time is greater).

EPILOGUE

ADDITIVES: Major oil companies are being encouraged or required by the federal government to reformulate gasoline as cleaner burning fuels to reduce air emissions. MTBE (Methyl-tertiary butyl ether), ETHANOL (ethyl alcohol), and other chemicals may be added to reformulate gasolines to increase the oxygen content in the fuel and thereby decrease undesirable emissions (about four percent with MTBE). MTBE and ethanol are, for practical purposes, soluble in water. The removal

Regional Board Staff Recommendations
Preliminary Site Investigation

10 August 1990

from the water column will be difficult. Other compounds are being added by the oil companies for various purposes. The refinements for detection and analysis for all of these additives are still being worked out. If you have any questions about the methodology, please call your Regional Board representative.

ALAMEDA COUNTY HAZARDOUS MATERIALS DIVISION
Acknowledgement of Refund Recipient for Site Account
DEPOSITOR FILLS OUT PER SITE
-- REQUIRED --

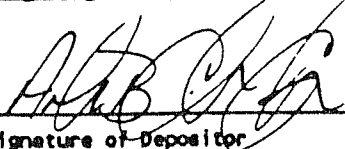
The depositor will use this form to acknowledge that the property owner or his or her designee will receive any refund due at the completion of all deposit/refund projects at the site listed below.

SITE NUMBER/ADDRESS:

REFUND RECIPIENT-PROPERTY OWNER

Site Number	Port of Oakland	Port of Oakland
Company Name		Owner's Name
Street Address	2801 Seventh St.	530 Water St.
City	Oakland	Oakland
Zip Code	94607	CA 94607
		State Zip

I have read the description of the project Deposit/Refund Procedure, and have had an opportunity to ask questions about it. I understand that regardless of who deposits money into the site account, any deposit money remaining at the completion of all projects being conducted at this site will be refunded solely to the property owner or his or her designee.


Signature of Depositor

3/11/92
Date

Andrew Clark-Clough
Depositor Name

Port of Oakland
Company Name

530 Water St.
Street Address

Oakland, CA 94607
City / Zip

SITE SAFETY PLAN
Underground Storage Tank Removal
at
PORT OF OAKLAND
Oakland CA

INTRODUCTION

This Site Safety Plan describes basic safety requirements for the underground storage tank removal project at Port of Oakland, Oakland CA.

The provisions set forth in this Plan apply to the employees of ENVIROTOX TECHNOLOGIES, INCORPORATED (Envirotox) and its subcontractors working on this project. The subcontractors may elect to modify these provisions, but only to upgrade or increase the safety requirements, and only with the concurrence of Envirotox, as designated and accepted in writing.

This Site Safety Plan will address the expected potential hazards that may be encountered on the worksite for this project. Work is scheduled to begin at the site on _____ with the duration estimated at _____. If changes in site or working conditions occur as activities progress, addenda to this plan will be provided by Envirotox.

AUTHORITY FOR SITE SAFETY

The Envirotox personnel responsible for project safety are the Project Manager and the field superintendent. The Health and Safety Coordinator is responsible for the overall Envirotox Health and Safety Program and may choose to audit the site for compliance and take appropriate action to correct deficiencies. The Project Manager is responsible for implementing the provisions of this Plan, for providing a copy of this Plan to field personnel and subcontractors, and for advising the field superintendent on health and safety matters. The Project Manager and field superintendent have the authority to audit site activities for compliance with the provisions of this Plan. They may suspend or modify work practices or dismiss subcontractors whose conduct does not meet the requirements specified in this Plan.

The field superintendent is responsible for communicating the information contained in this Plan to the Envirotox personnel assigned to the project and to the responsible representative of each subcontractor working for Envirotox on the project.

Envirotox Technologies, Inc.

Port of Oakland Site Safety Plan

March 3, 1992

The field superintendent will also act as the Site Safety Officer. As such, the field superintendent is responsible for addressing the following items:

- Implementing the Site Safety Plan, Company policy, and procedures
- Requiring and maintaining adequate safety supplies and equipment inventory onsite
- Conducting daily safety meeting and advising workers regarding hazards
- Site control, decontamination, and contamination-reduction procedures
- Reporting accidents or incidents

The field superintendent has the authority to suspend work any time he or she finds that the provisions of the Plan are inadequate for worker safety. The field superintendent will inform the Project Manager and the Health and Safety Coordinator promptly of deficiencies within the Plan or individuals or subcontractors whose conduct is not consistent with the requirements of this Plan.

MEDICAL SURVEILLANCE

Envirotox personnel and subcontractors engaged in project activities must participate in a medical surveillance program and must be cleared by the examining physicians(s) to wear respiratory protection devices and protective clothing for working with hazardous materials. The applicable requirements of Title 8, Section 5216, of the California Administrative Code will be observed. The applicable requirements under 29CFR 1910.120 of the Federal Administrative Code will also be observed.

SAFETY AND ORIENTATION MEETING

Field personnel from Envirotox and its subcontractors will attend a project-specific training meeting for safety issues and review the project tasks before beginning work. The meeting will be led by the field superintendent. In addition, fit-testing of respiratory protective devices will be conducted as part of the safety orientation meeting when the use of a respirator may be required. We do not anticipate that respiratory devices will be required on this job.

Envirotox Technologies, Inc.

Port of Oakland Site Safety Plan

March 3, 1992

HAZARD ASSESSMENT

The major contaminants expected to be encountered on the project are gasoline and its hydrocarbon constituents, diesel fuel and gasoline. The anticipated contaminants and their exposure standards are listed in Table 1. It is not anticipated that the potential levels of exposure will reach the permissible exposure limits (PEL) or threshold limit values (TLV). Inhalation and dermal contact are the potential exposure pathways. Protective clothing will be mandatory for field personnel specified in this Plan. In addition, respiratory protective devices are required to be worn by each person onsite or to be within easy reach should irritating odors be detected or irritation of the respiratory tract occur.

**TABLE 1
EXPOSURE LIMITS OF ANTICIPATED CHEMICAL
CONTAMINANTS**

(PAGE 1 OF 2)

Contaminant	PEL	EL	ED	CL	TWA	STEL
Benzene	1*	---	-----	---	10*	5*
Ethylbenzene	100*	---	-----	---	100*	125*
Gasoline	300*	---	-----	---	300*	500*
Toluene (Skin)	100*	---	10 min per 8 hrs	---	100*	150*
Xylene (o,m, & p isomers) (skin)	100*	200*	30 min per 8 hrs	500*	100*	150*
See notes on page 2. of 2.						

Environex Technologies, Inc.

Port of Oakland Site Safety Plan

March 3, 1992

**TABLE 2
EXPOSURE LIMITS OF ANTICIPATED CHEMICAL
CONTAMINANTS**

(PAGE 1 OF 1)

Contaminant	PEL	EL	ED	CL	TWA	STEL
PEL	-	Permissible exposure limit: 8 hour, time-weighted average, California Occupational Safety and Health Administration Standard (CAL-OSHA)				
EL	-	Excursion limit: maximum concentration of an airborne contaminant to which an employee may be exposed without regard to duration provided the 8 hour time-weighted average for PEL is not exceeded (CAL-OSHA)				
ED	-	Excursion duration: maximum time period permitted for an exposure above the excursion limit but not exceeding the ceiling limit (CAL-OSHA)				
CL	-	Ceiling limit: maximum concentration of airborne contaminant which employees may be exposed permitted (CAL-OSHA)				
TWA	-	Time-weighted average: 8 hour, [(same as threshold limit value (TLV)], American Conference of Governmental Industrial Hygienists (ACGIH)				
STEL	-	Short-term exposure limit: 15 minute time-weighted average (ACGIH)				
#	-	Milligrams of substance per cubic meter of air				
*	-	Parts of gas or vapor per million parts air				
(CARC)	-	Substance identified as a suspected or confirmed carcinogen				
(SKIN)	-	Substance may be absorbed into the bloodstream through the skin, mucous membranes, or eyes				
1	-	Federal OSHA benzene limits given for PEL and STEL; STEL has a 50 minute duration limit				
2	-	Federal OSHA gasoline limit given for PEL; STEL is the same for FED-OSHA and ACGIH				

A brief description of the physical characteristics, incompatibilities, toxic effects, routes of entry, and target organs has been summarized from the NIOSH Pocket Guide to Chemical Hazards for the contaminants anticipated to be encountered. This information is used in onsite safety meeting to alert personnel to the hazards associated with the expected contaminants.

Envirotox Technologies, Inc.

Port of Oakland Site Safety Plan

March 3, 1992

Benzene

Benzene is a colorless, aromatic liquid. Benzene may create any explosion hazard. Benzene is incompatible with strong oxidizers, chlorine, and bromine with iron. Benzene is irritating to the eyes, nose, and respiratory system. Prolonged exposure may result in giddiness, headache, nausea, staggering gait, fatigue, bone marrow depression, or abdominal pain. Routes of entry include inhalation, absorption, ingestion, and skin or eye contact. The target organs are blood, the central nervous system (CNS), skin, bone marrow, eyes and respiratory system. Benzene is carcinogenic.

Ethylbenzene

Ethylbenzene is a colorless, aromatic liquid. Ethylbenzene may create an explosion hazard. Ethylbenzene is incompatible with strong oxidizers. Ethylbenzene is irritating to the eyes and mucous membranes. Prolonged exposure may result in headache, dermatitis, narcosis, or coma. Routes of entry include inhalation, ingestion, and skin or eye contact. The target organs are the eyes, upper respiratory system, skin, and the CNS.

Toluene

Toluene is a colorless, aromatic liquid. Toluene may create an explosion hazard. Toluene is incompatible with strong oxidizers. Prolonged exposure may result in fatigue, confusion, euphoria, dizziness, headache, dilation of pupils, lacrimation, insomnia, dermatitis, photophobia. Routes of entry are inhalation, absorption, ingestion, and skin or eye contact. The target organs are the CNS, liver, kidneys, and skin.

Xylene Isomers

Xylene is a colorless, aromatic liquid. Xylene may create an explosion hazard. Xylene is incompatible with strong oxidizers. Xylene is irritating to the eyes, nose, and throat. Prolonged exposure may result in dizziness, excitement, drowsiness, staggering gait, corneal vacuolization, vomiting, abdominal pain, or dermatitis. Routes of entry are inhalation, absorption, ingestion, and skin or eye contact. The target organs are the CNS eyes, gastrointestinal tract, blood, liver, kidneys, and skin.

GENERAL PROJECT SAFETY REQUIREMENTS

Project activities will be conducted in accordance with the following minimum safety requirements and procedures specified in EM 385-1-1, US Army Corp of Engineers Safety and Health Requirements Manual.

- Eating, drinking, and smoking will be restricted to a designated area.
- Gross decontamination and removal of all personal protective equipment will be performed before leaving the site. Contaminated clothing will be removed and collected in a drum for disposal.
- Shaking or blowing dust or other materials off potentially contaminated clothing or equipment to remove dust or other materials is not permitted.
- The field superintendent will be responsible for taking steps to protect employees from physical hazards including:
 - * Falling objects, such as tools or equipment
 - * Fall from elevations
 - * Tripping over hoses, pipes, tools, or equipment
 - * Slipping on wet or oily surfaces
 - * Insufficient or faulty protective equipment
 - * Inaufficient or faulty equipment or tools
- All personnel will be required to wash hands and faces before eating, drinking, or smoking in the aforementioned designated areas.
- Field personnel will be cautioned to inform each other of the non-visual effects of the presence of toxics, such as;
 - * Headaches
 - * Dizziness
 - * Nausea
 - * Blurred vision
 - * Cramps
 - * Irritation of eyes, skin, or respiratory tract
 - * Changes in complexion or skin discoloration
 - * Changes in apparent motor coordination
 - * Changes in personality or demeanor
 - * Excessive salivation or changes in pupillary response
 - * Changes in speech ability or pattern

Envirotox Technologies, Inc.

Port of Oakland Site Safety Plan

March 3, 1992

PROTECTIVE EQUIPMENT REQUIREMENTS

Field personnel and visitors are required to wear the following protective clothing and equipment, as a minimum, while in the work area at: Port of Oakland, CA

- Hard hat
- Safety Glasses
- Steel-toed boots

Field personnel engaged in work are required to wear the following equipment:

- Hard hat
- Safety glasses
- Steel-toed chemical resistant boots (rubber, neoprene, or polyvinyl chloride [PVC])
- Gloves (rubber, neoprene, PVC, or nitrile)
- Orange or red safety vest (if equipment or motor vehicles are operating onsite or nearby)
- Standard Tyvek coveralls (when required by field superintendent)
- Respirator with organic vapor and acid gas cartridge (if lowest PEL or TLV is exceeded in the breathing zone or field superintendent decides respirators should be worn)

RESPIRATORY PROTECTION PROGRAM

This section summarizes Envirotox's Respiratory Protection Program. Envirotox's subcontractors must have company medical surveillance and respiratory protection programs including adequate training of their employees. Subcontractors must provide personal protective equipment as required in this Site Safety Plan for their employees. Envirotox will attempt to verify worker training but does not assume the responsibility of the employer in any way. The following sections outline the Envirotox Respiratory Protection Program.

Respirators are not issued to employees until the Company physician conducts a complete physical and decides the employee can 1) wear personal protective equipment and 2) wear a respirator. After the physician has issued written approval to Envirotox, the Health and Safety Coordinator conducts the required training including these basic topics:

- Applicable OSHA regulation 1910.134 and 1910.120

Evirotex Technologies, Inc.

Port of Oakland Site Safety Plan

March 3, 1992

RESPIRATORY PROTECTION PROGRAM (Continued)

- Nature of respiratory hazards to be encountered in the work environment and how to select proper respiratory equipment
- Use of respirators and proper fitting
- Functions and limitations of respirators
- Cleaning, disinfection, inspection, maintenance, and storage of respirators

Functions and Limitations of Respirators

Respirators are not intended for and may not be used in atmospheres which are, or may become immediately dangerous to life or health (IDLH) or in atmospheres where the identity or concentration of the contaminant(s) is unknown. Respirators may not be used in atmospheres containing less than 19.5 percent oxygen.

Cartridges or canisters for respirators are selected and supplied to employees by the Health and Safety Coordinator. The failure to choose or use a respirator equipped with cartridges or filters suitable for the contaminant(s) in the atmosphere or likely to be released in the atmosphere may result in the respirator providing little or no protection against the contaminated atmosphere. The Site Safety Plan specifies the contaminant(s) to be encountered and type of cartridge or canister appropriate for personal protection.

Assuming that the respirator is properly fitted in good condition, free from leaks, and has the proper cartridges for the contaminant(s) present, the length of time the respirator will provide protection also depends on the conditions of use.

The conditions of use include but are not limited to the following:

- The concentration of contaminant(s) in the atmosphere
- The temperature and humidity of the ambient atmosphere
- Any previous use of the cartridges and filters
- The elapsed time since the removal of the cartridges or filters from their protective packaging
- The emotional state of the wearer
- The level of physical activity of the wearer

Envirotox Technologies, Inc.

Port of Oakland Site Safety Plan

March 3, 1992

Cartridges designed and specified to protect the wearer against airborne particles are not appropriate for protection against gases and vapors. Cartridges designed and specified for protections against specific gases and vapors are not appropriate for protection against airborne particles or other gases or vapors beyond the scope of that type of cartridge. Every cartridge is labeled with specific instructions defining the use and limitations of that particular type of cartridge. If the label is missing or the type of cartridge is inappropriate then it may not be used under any circumstances; it will provide little or not protection to the wearer.

Danger Signals Indicating Possible Respirator Failure

If any of the danger signals in the following list are experienced while wearing a respirator, immediately return to a fresh air environment. The cartridges or filters may be inappropriate or used up or abnormal conditions may be creating vapor concentrations which are beyond the limits of the cartridges or filters. Danger is indicated when the individual subject to exposure:

- Smells or tastes chemicals, or if eyes, nose, or throat become irritated;
- Has difficulty breathing;
- Notices that the breathing air becomes uncomfortably warm;
- Experiences headaches, dizziness, cramps, nausea, or blurred vision;
- Experiences changes in complexion or skin discoloration;
- Experiences changes in motor coordination, personality, or demeanor;
- Experiences changes in speech ability or pattern;
- Experiences excessive salivation or changes in pupillary response.

Qualitative Respirator Fit Test

Qualitative fit testing of each respirator must be conducted before the respirator may be used to check that a good fit is still obtained. The following steps should be taken in qualitative fit test of the respirator.

1. Don the face piece with cartridge or filters in place. Pull straps together and equally to avoid distorting the mask.
2. Adjust the face piece. Do not over tighten it.
3. Negative Pressure Leak Check: Close off the inlet connections with palms of hands, inhale slowly, and hold breath momentarily. No leakage should be detected and the face piece should be drawn slightly to the face.

*Envirotox Technologies, Inc.***Port of Oakland Site Safety Plan
Qualitative Respirator Fit Test (Continued)**

March 3, 1992

4. **Positive Pressure Leak Check:** Close opening in the exhalation valve guard by placing palm of one hand over face of guard; exhale slowly maintaining slight positive pressure. No leakage should be detected between the face seal and the face.
5. **Should any leakage be noted:**
 - a) Adjust the headstraps and face piece slightly; recheck for leakage.
 - b) Check condition of exhalation valve and seat. Check that both inlet gaskets are present and in proper condition.
 - c) In the event the face piece cannot be adjusted so there is no leakage, **DO NOT ENTER THE AREA REQUIRING PROTECTION.** Due to your particular facial features, a different style or size face piece may be required to obtain a proper facial fit.

NOTE: Failure to perform a qualitative fit test of the respirator each time the respirator is donned may result in little or no respiratory protection.

Inspection Cleaning and Storage

The respirator should be inspected, cleaned, and properly stored after use each day. The following steps are the basic elements of each procedure:

A. Inspection

1. Examine face seal for rips, tears, holes, deformation, or stiffness.
2. Examine face piece plastic center shell for cracks, missing components, or damaged threads.
3. Examine harness for breaks, cuts, frays, tears, and missing or damaged hardware.
4. Examine inhalation and exhalation valves and valve seats for cuts, cracks, or foreign matter which may not allow the valve to close completely. Check that valves are properly installed and are not distorted.
5. Examine cartridges for signs of abuse or damage. discard damaged items.

Envirotox Technologies, Inc.**Part of Oakland Site Safety Plan
Inspection Cleaning and Storage (Continued)**

March 3, 1992

6. Any respirator malfunction or deficiencies noted must be reported to the Health and Safety coordinator who will issue a new respirator or correct the deficiencies using only approved spare parts from the manufacturer of the specific model in need of repair. Spare parts from any other manufacturer may not be used under any conditions. Instructions in the manual provided by the manufacturer should be followed when the respirator needs repairing or replacing.

B. Cleaning

1. Unthread cartridges or filters.
2. Wash the face piece after use, with warm water and a mild detergent.
3. Disinfect the face piece if it was used by another person. The mask should routinely (once per month) be disinfected even if respirator is used solely by one individual. A hypochlorite solution may be used (i.e., 2 tablespoons chlorine bleach per gallon of water for an acceptable solution).
4. After cleaning and air-drying, check that the face piece is not damaged and that components removed prior to cleaning have been installed properly.

C. Storage

1. Place the respirator in its storage box in a heat-sealed or resealable plastic bag. Store flat, with the face piece and exhalation valve in an approximately normal position, to prevent the face seal from taking a permanent "set."
2. Replacement components should be stored in sealed packages in a cool, clean, low-humidity location until ready for use.

The Health and Safety Coordinator will explain Envirotox's Repertoire Protection Program to each new employee who must wear a respirator. The employee will be asked whether or not he or she understands the information provided. If the Company physician has cleared the employee for respirator use and the Health and Safety Coordinator or Branch Safety Officer has checked the fit of the respirator then the employee will be issued a respirator. A written record is signed and dated by the employee and Health and Safety Coordinator and kept in the new employee's Safety Record.

Envirotox Technologies, Inc.

Port of Oakland Site Safety Plan

March 3, 1992

WORK ZONES AND SECURITY MEASURES

The Envirotox Technologies, Inc. project Manager will call Underground Services Alert (USA) for locating underground utilities. These will be marked before any excavation is conducted on site and the excavations will be done at safe as possible distances from utilities. When moving equipment under or near energized lines, a designated person shall assure that required clearance is maintained.

Each of the areas where the tanks are to be removed will be designated as Exclusion Zones. Only essential personnel will be allowed into an Exclusion Zone. When it is practical and local topography allows, approximately 25 to 75 feet of space surrounding those Exclusion Zones will be designed as Contamination Reduction Zones.

Cones, wooden barricades, or a suitable alternative will be used to deny public access to these Contamination Reduction Zones. The general public will not be allowed close to the work area under any conditions. If for any reason the safety of the public (e.g., motorist or pedestrian) may be endangered, work will cease until the situation is remedied. Cones and warning signs will be used when necessary to redirect motorists or pedestrians.

Envirotox shall use explosive proof devices in accordance with 29 CFR Part 1910, Subpart 5, when pumping out tank contents to avoid fire hazards from possible generation of static electricity.

Buried Tanks, receiving tankers, nozzles, pumps, and other equipment amenable to accumulating static electricity shall be temporarily grounded during the transfer operation.

Envirotox shall have portable fire extinguishing control equipment sufficient in quantities and types as are needed for extinguishing fire when handling flammable or combustible liquids.

Envirotox Technologies, Inc.

Port of Oakland Site Safety Plan

March 3, 1992

WORK ZONES AND SECURITY MEASURES (Continued)

Envirotox shall render all tanks inert to prepare them for disposal using the following method: Purge tanks of all combustible vapors by adding solid carbon dioxide (CO₂, dry ice) in the amount of 20 pounds per 1,000 gallons of tank capacity. The dry ice shall be crushed and distributed evenly over the greatest possible area to secure rapid evaporation. Incorporate a ground strap while purging. Avoid skin contact with dry ice because it may produce burns. As the dry ice vaporizes, flammable vapors will flow out of the tank and may surround the area. Hence, observe all normal safety precautions regarding flammable vapors. Repeat process as required to purge flammable vapors to levels that would preclude an explosion. All confined space and purging operations are to be conducted in accordance with NAVSEA S6470-AA-SAF-010 and Bay Area Quality Management District Regulation 8, 40.

When vapors cease to be forcibly emitted from the openings, such openings are to be plugged using either an approved pressure vacuum relief device or wadded paper or rags. Leave at least the equivalent of a 1/8 inch opening to allow pressure equalization between the tank and the atmosphere.

SHORING

It will not be necessary to employ SHORING and SHEETING (H-PILE, BRIDGE BEAMS, TRENCH BOX, HYDRAULIC SHORING, Etc.) for any of the Tank sites within the scope of this Contract, per the plans and specifications provided by the Port of Oakland, and subsequent site examination performed by ENVIROTOX TECHNOLOGIES, INC.'s Project Management.

Should site conditions change due to unknown discoveries, (ie. Discovery of Hazardous Contamination, unknown underground obstacles/equipment, Archaeological objects of historical significance, etc.) the specific circumstances will dictate the type and amount of shoring necessary.

This will constitute an additional consideration, (as spelled out in #6. - page 1-28 "Changes in character of work"). Since the contract does not specifically call for and Envirotox does not foresee any shoring requirement, such discovery would be subject to negotiation and/or a "change order" or Port of Oakland may decide to furnish all or portions of labor, material, and equipment.

Envirotox Technologies, Inc.

Port of Oakland Site Safety Plan

March 3, 1992

RIGGING AND HOISTING

All Rigging and Hoisting equipment and their operations shall comply with CAL/OSHA regulations.

EXPOSURE MONITORING PLAN

It is not anticipated that project personnel exposure will exceed the TLVs or PELs of the materials; however, proper personal protective equipment will be worn while working at the site. In addition, the work area will be monitored using a direct-reading combustible gas analyzer or a photoionization detector to detect the concentration of the volatile hydrocarbons in the ambient atmosphere.

If the lowest TLV or PEL is consistently being exceeded in the breathing zone, then a respirator must be worn. If the concentration exceeds 1,000 parts per million (ppm), the use of a respirator is inappropriate and personnel must withdraw from the site.

POSSIBLE EXPLOSIVE ATMOSPHERES

Smoking shall be prohibited in all areas where flammable, combustible, or similar hazardous materials are stored, except in those locations specifically provided for such purpose and approved by the designated authority. NO SMOKING or OPEN FLAME signs will be posted in all prohibited areas.

All Flammable/Combustible liquids, sources of ignition, tools and electric and/or battery operated equipment, lighting sources, drums, barrels, storage tanks, and other storage containers and structures, dispensers, trucks/vehicles will follow the safety procedures set forth in US ARMY CORP of ENGINEERS, Safety and Health Requirements Manual - EM 385-1-1, Rev Oct 1987 (REF 12.D.01 Thru 12.D.40) and shall be directed by qualified persons.

A safe clearance procedure shall be maintained for all sites regarding; Electrical lines and equipment, pressure systems, mechanical equipment, movement of equipment, dangerous or hazardous materials, rotating equipment, switches, gears and agitators. This includes procedures regarding authorization qualified personnel only to oversee, operate and maintain these safety procedures in compliance with US ARMY CORP of ENGINEERS, Safety and Health Requirements Manual - EM 385-1-1, Rev Oct 1987 (REF 28.A.1 thru 28.A.5)

Envirotox Technologies, Inc.

Port of Oakland Site Safety Plan

March 3, 1992

POSSIBLE EXPLOSIVE ATMOSPHERES (Continued)

Gasoline has a flammable range from approximately 1.4 to 7.6 percent in air. One percent in air is equivalent to 10,000 ppm; thus the lower explosive limit (LEL) is 14,000 ppm. Normally explosive levels may be reached in tanks, pits, or other confined spaces. Any area suspected of containing potentially explosive levels of gasoline will be evaluated with an intrinsically safe or explosion-proof combustible gas indicator (CGI). Personal response will be based on the following action levels from CGI readings:

-	Less than 10 percent of LEL*	then	Continue activities and monitoring
-	10 to 25 percent of LEL	then	Continue monitoring with extreme caution as higher levels are found
-	Greater than 25 percent of LEL	then	Explosion hazard, Cease activities and vacate area immediately

* CGI readings in percent of lower explosive limit

If an explosion potential is present onsite beyond 25 percent of the LEL then all Envirotox' personnel and subcontractors must immediately withdraw from the site. The hazard potential will be evaluated by Envirotox's management and a plan of action will be assessed.

DECONTAMINATION PROCEDURES

Equipment and personal protective equipment will undergo gross decontamination onsite. This gross decontamination will include washing contaminated equipment with Alconox or trisodium phosphate (TSP) solution. Steam-cleaning is an acceptable alternative.

EMERGENCY RESPONSE PROCEDURES

In the event of a fire, explosion, or property damage, the Envirotox office will be immediately notified. If necessary, local fire or response agencies will be called.

Environex Technologies, Inc.

Port of Oakland Site Safety Plan

March 3, 1992

EMERGENCY RESPONSE PROCEDURES (Continued)

In the event of an accident resulting in physical injury, first aid will be administered and the injured worker will be transported to the nearest hospital or emergency medical clinic for emergency treatment. A physician's attention is required regardless of the severity of the injury.

Overt Personnel Exposure

If overt personnel exposure occurs during the project, typical responses should include the following:

Skin or Eye Wash and rinse affected area thoroughly with copious amounts of soap and water, then provide appropriate medical attention. Eyes and skin should be rinsed for a minimum of 15 minutes upon chemical contamination.

Inhalation: Move to fresh air and, if necessary, decontaminate and transport to emergency hospital

Ingestion: Decontaminate and transport to emergency hospital

Puncture Wound Decontaminate and transport to emergency hospital

SITE AND PERSONNEL INFORMATION

Site Address: 2801 -7th Street, Oakland, CA 94607 (Port of Oakland, Outer Harbour Terminal at Berth 30)

ETI Responsible Site Personnel:

Vern L. Peden, Project Superintendant

Wk. Tel.# (916) 920-0664

Hm. Tel.# (916) 721-3261

Mbl. Tel.# (916) 531-9472

Thomas Sherwood, Equip. Operator

Wk. Tel.# (916) 920-0664

Hm. Tel.# (916) 721-4780

Ron Titus, Supervisor

Wk. Tel.# (916) 920-0664

Hm. Tel.# (916) 344-6906

Port of Oakland contact:

John Stewart, R.E.

Wk. Tel#(510) 272-1585

Oakland Fire Department:

Steven Hallert, Inspector

Wk. Tel.#(510) 444-3322

Alameda County Health Department:

Paul Smith, Inspector (Haz Mat)

Wk. Tel.# (510) 271-4320

SUSAN HUGO

271-4530

Envirotox Technologies, Inc.

Port of Oakland Site Safety Plan

March 3, 1992

EMERGENCY TELEPHONE NUMBERS

Fire and Police..... 911

Ambulance..... 911

Hospital:

SUMMIT MEDICAL CENTER..... 510/655-4000
350 Hawthorne
Oakland, CA 94609

Directions to Hospital: From Port of Oakland, take 7 th Street to a left on Martin Luther, to Grove Shafter Feeway US980, to Hiwy 680 & 980 interchange first off ramp on US 680 will be 34th Street /Merrit, take Webster one block to Hawthorne.

Additional Contingency Telephone Numbers

Poison Control Center..... (800) 523-2222

Envirotox..... (916) 920-0864

CHEMTREC..... (800) 424-9300

Note; Only call CHEMTREC in an emergency. CHEMTREC stands for Chemical Transportation Emergency Center, a public service of the Chemical Manufacturer's Association. CHEMTREC can usually provide hazard information warnings, and guidance when given the identification number or the name of the product and the nature of the problem, CHEMTREC can also contact the appropriate experts.

This Site Safety Plan has been reviewed by the following persons:

Field Superintendant: Vern L. Peden

Health and Safety Coordinator: Leroy M. Gordon

RECEIVED
APR 14 1992

CITY OF OAKLAND
Permit to Excavate and Install, Repair, or Remove Inflammable Liquid Tanks, No. 9560

Original Amount: APR 13 1992

PERMISSION IS HEREBY GRANTED TO ENVIRONMENTAL TECHNOLOGIES, INC. EXCAVATE INSTALL REPAIR REMOVE INFLAMMABLE LIQUID TANKS NO. 9560 FOR FULL PROPERTY

City of Oakland, Office of the City Engineer, 530 WATER STREET, OAKLAND, CALIF. 94607

Address: 1336 DIXIE AVE. SACRAMENTO, CALIF. 95815 Phone: 916-920-0664

Number of Tanks: 1 1 Capacity: 3,000 Gallons each

Location: TRACTIVE WASTE LOCATED ADJACENT TO SEVENTH ST. AT BERTH 30 OILER HARBOR TERMINAL

This Permit is granted in accordance with existing City Ordinances. Order hereby given to remove tanks on discontinuance of use or when notified by the City Authorities.
When handling, removing or replacing tanks, no open flames to be on or near premises.

Approved: The Mayor

Drainage Division Engineering Dept.

EXCAVATING PERMIT

Issued in accordance with Ord. No. 128 GEN. Sess. 6-1-80

Special deposit to be made as follows:

The amount of \$ 160.00 GENERAL DEPOSIT.

REBURY OF PERMITS AND LICENSES

Permit No. 160.00 EX/9820 REG/66553

Issued by: G. N. JOHNSON

FILE PERMITS DIVISION

CERTIFICATE OF TANK AND EQUIPMENT INSPECTION

Inspected and found OK

The Mayor

NOTICE

Before Commencing Work, Allow Certificate to be Inspected.

When ready for inspection notify the Providence Bureau, 275-2651

THIS PERMIT MUST BE LEFT ON THE WORK AS AUTHORITY THEREOF.

Form No. 10-871

Please print or type. Form designed for use on elite (12-pitch typewriter).

18345

91489016
GENERATOR
IN CASE OF EMERGENCY OR SPILL, CALL THE NATIONAL RESPONSE CENTER 1-800-424-8802; WITHIN CALIFORNIA, CALL 1-800-852-7550

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No. CA1000707408	Manifest Document No. 010101011	2. Page 1 of	Information in the shaded areas is not required by Federal law.
3. Generator's Name and Mailing Address PORT OF OAKLAND P.O. BOX 2064 530 WATER ST. OAKLAND, CA			A. State Manifest Document Number 91489016		B. State Generator's ID 204344
4. Generator's Phone (510) 2721100		6. US EPA ID Number CA10982484370		C. State Transporter's ID	
5. Transporter 1 Company Name TRIDENT TRUCK LINE, INC.		8. US EPA ID Number		D. Transporter's Phone (510) 783-2881	
7. Transporter 2 Company Name		10. US EPA ID Number		E. State Transporter's ID	
9. Designated Facility Name and Site Address ERICKSON INCORPORATED 255 PARR BLVD. RICHMOND, CA 94801		10. US EPA ID Number CA1009466392		G. State Facility's ID CA1009466392	
				H. Facility's Phone (510) 235-1393	
11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID Number)		12. Containers No. Type	13. Total Quantity	14. Unit WT/Vol	1. Waste Number State EPA/Other
a. EMPTY TANK NON-RCRA HAZARDOUS WASTE SOLID		0 03 TP	12000	P	State 512 EPA/Other NONE
b.					State EPA/Other
c.					State EPA/Other
d.					State EPA/Other
J. Additional Descriptions for Materials Listed Above QUANTITY 3 EMPTY STORAGE TANK(S) 8478 2479 2480 HAVE BEEN INERTED WITH 15 LBS. DRY ICE PER 1,000 GAL. CAPACITY			K. Handling Codes for Wastes Listed Above a. b. c. d.		
15. Special Handling Instructions and Additional Information KEEP AWAY FROM SOURCES OF IGNITION. ALWAYS WEAR HARDHATS AND GLASSES WHEN WORKING AROUND UNDERGROUND STORAGE TANKS. 24 HR. CONTACT NAME: JOHN STEWART AND PHONE: 510-2721100					
16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations. If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.					
Printed/Typed Name X JOHN STEWART		Signature <i>[Signature]</i>		Month Day Year 04 11 1992	
17. Transporter 1 Acknowledgement of Receipt of Materials Printed/Typed Name MIKE VERNAZZA		Signature <i>[Signature]</i>		Month Day Year 04 11 1992	
18. Transporter 2 Acknowledgement of Receipt of Materials Printed/Typed Name		Signature		Month Day Year	
19. Discrepancy Indication Space					
20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in item 19					
Printed/Typed Name DONALD A ROSEN		Signature <i>[Signature]</i>		Month Day Year 04 11 1992	

DO NOT WRITE BELOW THIS LINE.

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No. CA101010710121401277R14		Manifest Document No. 77R14		2. Page 1 of 1		Information in the shaded areas is not required by Federal law.							
3. Generator's Name and Mailing Address Port of Oakland Benth #30 of 7TH ST - Oakland # 1501						A. State Manifest Document Number 90648169									
4. Generator's Phone (510) 272-1100						B. State Generator's ID									
5. Transporter 1 Company Name Erickson, Inc.				US EPA ID Number 10A0009486392		C. State Transporter's ID 205157		D. Transporter's Phone (510) 235-1393							
7. Transporter 2 Company Name						8. US EPA ID Number		E. State Transporter's ID							
9. Designated Facility Name and Site Address Gibson Oil / Pilot Petroleum 475 Sea Port Blvd. Redwood City, Ca. 94604						10. US EPA ID Number 10A0043360102		G. State Facility's ID CA101013126017012							
						H. Facility's Phone (415) 368-5511									
11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)						12. Containers No. Type		13. Total Quantity		14. Unit Wt/Vol		15. Waste No.			
a. RQ Hazardous Waste Liquids NOS ORM E NA9189 D018						0 10 11 TIT		1 131010 G				State 223 EPA/Other D018			
b.												State EPA/Other			
												State EPA/Other			
												State EPA/Other			
16. Additional Descriptions for Materials Listed Above Hydrocarbon Mixture With Water (99% Water, 1% Hydrocarbons)						ACT GAL REC 922.19 60208281		K. Handling Codes for Wastes Listed Above a. 01		b.		c.		d.	
15. Special Handling Instructions and Additional Information Gibson Oil Waste Stream Profile # 1001 ERG 31 24 Hr. Contact STEWART 24 Hr. Phone # 272-1100															
18. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations. If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.															
Printed/Typed Name John STEWART				Signature <i>[Signature]</i>				Month Day Year 10/11/1992							
17. Transporter 1 Acknowledgement of Receipt of Materials															
Printed/Typed Name Robert NOLA				Signature <i>[Signature]</i>				Month Day Year 10/11/1992							
18. Transporter 2 Acknowledgement of Receipt of Materials															
Printed/Typed Name				Signature				Month Day Year							
19. Discrepancy Indication Space															
20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.															
Printed/Typed Name Bill LEDIN				Signature <i>[Signature]</i>				Month Day Year 10/11/1992							

IN CASE OF AN EMERGENCY OR SPILL, CALL THE NATIONAL RESPONSE CENTER 1-800-424-8802; WITHIN CALIFORNIA CALL 1-800-852-7550
 GENERATOR
 TRANSPORTER
 FACILITY

APPENDIX B

Chain-of-Custody Records
and Analytical Laboratory Reports

1252 Quarry Lane
P.O. Box 9019
Pleasanton, CA 94566
(510) 426-2600
Fax (510) 426-0106

Clayton
ENVIRONMENTAL
CONSULTANTS

April 17, 1992

Ms. Elizabeth Wells
GEOMATRIX CONSULTANTS
100 Pine St., 10th Floor
San Francisco, CA 94111

Client Ref. 2026.01B
Clayton Project No. 92041.79

Dear Ms. Wells:

Attached is our analytical laboratory report for the samples received on April 15, 1992. A copy of the Chain-of-Custody form acknowledging receipt of these samples is attached.

Please note that any unused portion of the samples will be disposed of 30 days after the date of this report, unless you have requested otherwise.

We appreciate the opportunity to be of assistance to you. If you have any questions, please contact Maryann Gambino, Client Services Supervisor, at (510) 426-2657.

Sincerely,

Michael Lynch for

Ronald H. Peters, CIH
Director, Laboratory Services
Western Operations

RHP/tb
Attachments

Results of Analysis
for
Geomatrix Consultants

Client Reference: 2026.01B
Clayton Project No. 92041.79

Sample Identification:	POK-EX-1	Date Sampled:	04/15/92
Lab Number:	9204179-01A	Date Received:	04/15/92
Sample Matrix/Media:	SOIL	Date Prepared:	04/16/92
Preparation Method:	EPA 5030	Date Analyzed:	04/16/92
Analytical Method:	EPA 8015/8020		

Analyte	CAS #	Concentration (mg/kg)	Limit of Detection (mg/kg)
<u>BTEX/Gasoline</u>			
Benzene	71-43-2	ND	0.005
Toluene	108-88-3	ND	0.005
Ethylbenzene	100-41-4	ND	0.005
p,m-Xylenes	---	ND	0.005
o-Xylene	95-47-6	ND	0.005
Gasoline	---	ND	0.3
<u>Surrogates</u>		<u>Recovery (%)</u>	<u>QC Limits (%)</u> LCL UCL
a,a,a-Trifluorotoluene	98-08-8	95	50 - 150

ND Not detected at or above limit of detection
 -- Information not available or not applicable
 Results are reported on a wet weight basis, as received

Results of Analysis
for
Geomatrix Consultants

Client Reference: 2026.01B
Clayton Project No. 92041.79

Sample Identification:	POK-EX-2	Date Sampled:	04/15/92
Lab Number:	9204179-02A	Date Received:	04/15/92
Sample Matrix/Media:	SOIL	Date Prepared:	04/16/92
Preparation Method:	EPA 5030	Date Analyzed:	04/16/92
Analytical Method:	EPA 8015/8020		

Analyte	CAS #	Concentration (mg/kg)	Limit of Detection (mg/kg)
<u>BTEX/Gasoline</u>			
Benzene	71-43-2	ND	0.005
Toluene	108-88-3	ND	0.005
Ethylbenzene	100-41-4	ND	0.005
p,m-Xylenes	---	ND	0.005
o-Xylene	95-47-6	ND	0.005
Gasoline	---	ND	0.3
<u>Surrogates</u>		<u>Recovery (%)</u>	<u>QC Limits (%)</u> LCL UCL
a,a,a-Trifluorotoluene	98-08-8	85	50 - 150

ND Not detected at or above limit of detection
-- Information not available or not applicable
Results are reported on a wet weight basis, as received

Results of Analysis
for
Geomatrix Consultants

Client Reference: 2026.01B
Clayton Project No. 92041.79

Sample Identification:	POK-EX-3	Date Sampled:	04/15/92
Lab Number:	9204179-03A	Date Received:	04/15/92
Sample Matrix/Media:	SOIL	Date Prepared:	04/16/92
Preparation Method:	EPA 5030	Date Analyzed:	04/16/92
Analytical Method:	EPA 8015/8020		

Analyte	CAS #	Concentration (mg/kg)	Limit of Detection (mg/kg)
<u>BTEX/Gasoline</u>			
Benzene	71-43-2	ND	0.005
Toluene	108-88-3	ND	0.005
Ethylbenzene	100-41-4	ND	0.005
p,m-Xylenes	---	ND	0.005
o-Xylene	95-47-6	ND	0.005
Gasoline	---	ND	0.3
<u>Surrogates</u>		<u>Recovery (%)</u>	<u>QC Limits (%)</u> LCL UCL
a,a,a-Trifluorotoluene	98-08-8	95	50 - 150

ND Not detected at or above limit of detection
 -- Information not available or not applicable
 Results are reported on a wet weight basis, as received

Results of Analysis
for
Geomatrix Consultants

Client Reference: 2026.01B
Clayton Project No. 92041.79

Sample Identification:	POK-EX-4	Date Sampled:	04/15/92
Lab Number:	9204179-04A	Date Received:	04/15/92
Sample Matrix/Media:	SOIL	Date Prepared:	04/16/92
Preparation Method:	EPA 5030	Date Analyzed:	04/16/92
Analytical Method:	EPA 8015/8020		

Analyte	CAS #	Concentration (mg/kg)	Limit of Detection (mg/kg)
<u>BTEX/Gasoline</u>			
Benzene	71-43-2	ND	0.005
Toluene	108-88-3	ND	0.005
Ethylbenzene	100-41-4	ND	0.005
p,m-Xylenes	---	ND	0.005
o-Xylene	95-47-6	ND	0.005
Gasoline	---	ND	0.3
<u>Surrogates</u>		<u>Recovery (%)</u>	<u>QC Limits (%)</u> LCL UCL
a,a,a-Trifluorotoluene	98-08-8	101	50 - 150

ND Not detected at or above limit of detection
-- Information not available or not applicable
Results are reported on a wet weight basis, as received

Results of Analysis
for
Geomatrix Consultants

Client Reference: 2026.01B
Clayton Project No. 92041.79

Sample Identification:	POK-EX-5	Date Sampled:	04/15/92
Lab Number:	9204179-05A	Date Received:	04/15/92
Sample Matrix/Media:	SOIL	Date Prepared:	04/16/92
Preparation Method:	EPA 5030	Date Analyzed:	04/16/92
Analytical Method:	EPA 8015/8020		

Analyte	CAS #	Concentration (mg/kg)	Limit of Detection (mg/kg)
<u>BTEX/Gasoline</u>			
Benzene	71-43-2	ND	0.005
Toluene	108-88-3	ND	0.005
Ethylbenzene	100-41-4	ND	0.005
p,m-Xylenes	---	ND	0.005
o-Xylene	95-47-6	ND	0.005
Gasoline	---	ND	0.3
<u>Surrogates</u>		<u>Recovery (%)</u>	<u>QC Limits (%)</u> LCL UCL
a,a,a-Trifluorotoluene	98-08-8	92	50 - 150

ND Not detected at or above limit of detection
 -- Information not available or not applicable
 Results are reported on a wet weight basis, as received

Results of Analysis
for
Geomatrix Consultants

Client Reference: 2026.01B
Clayton Project No. 92041.79

Sample Identification:	POK-EX-6	Date Sampled:	04/15/92
Lab Number:	9204179-06A	Date Received:	04/15/92
Sample Matrix/Media:	SOIL	Date Prepared:	04/16/92
Preparation Method:	EPA 5030	Date Analyzed:	04/16/92
Analytical Method:	EPA 8015/8020		

Analyte	CAS #	Concentration (mg/kg)	Limit of Detection (mg/kg)
<u>BTEX/Gasoline</u>			
Benzene	71-43-2	ND	0.005
Toluene	108-88-3	ND	0.005
Ethylbenzene	100-41-4	ND	0.005
p,m-Xylenes	---	ND	0.005
o-Xylene	95-47-6	ND	0.005
Gasoline	---	ND	0.3
<u>Surrogates</u>		<u>Recovery (%)</u>	<u>QC Limits (%)</u> LCL UCL
a,a,a-Trifluorotoluene	98-08-8	106	50 - 150

ND Not detected at or above limit of detection
 -- Information not available or not applicable
 Results are reported on a wet weight basis, as received

Results of Analysis
for
Geomatrix Consultants

Client Reference: 2026.01B
Clayton Project No. 92041.79

Sample Identification: COMP OF POK-SP-1, 2, 3 & 4 Date Sampled: 04/15/92
Lab Number: 9204179-11A Date Received: 04/15/92
Sample Matrix/Media: SOIL Date Prepared: 04/16/92
Preparation Method: EPA 5030 Date Analyzed: 04/16/92
Analytical Method: EPA 8015/8020

Analyte	CAS #	Concentration (mg/kg)	Limit of Detection (mg/kg)
<u>BTEX/Gasoline</u>			
Benzene	71-43-2	ND	0.005
Toluene	108-88-3	0.033	0.005
Ethylbenzene	100-41-4	0.007	0.005
p,m-Xylenes	---	0.033	0.005
o-Xylene	95-47-6	0.011	0.005
Gasoline	---	0.5 a	0.3
<u>Surrogates</u>		<u>Recovery (%)</u>	<u>QC Limits (%)</u> LCL UCL
a,a,a-Trifluorotoluene	98-08-8	97	50 - 150

ND Not detected at or above limit of detection
-- Information not available or not applicable
Results are reported on a wet weight basis, as received

^a Purgeable hydrocarbons quantitated as gasoline do not match typical gasoline pattern

Results of Analysis
for
Geomatrix Consultants

Client Reference: 2026.01B
Clayton Project No. 92041.79

Sample Identification: COMP OF POK-SP-5, 6, 7 & 8 Date Sampled: 04/15/92
Lab Number: 9204179-16A Date Received: 04/15/92
Sample Matrix/Media: SOIL Date Prepared: 04/16/92
Preparation Method: EPA 5030 Date Analyzed: 04/16/92
Analytical Method: EPA 8015/8020

Analyte	CAS #	Concentration (mg/kg)	Limit of Detection (mg/kg)
<u>BTEX/Gasoline</u>			
Benzene	71-43-2	ND	0.005
Toluene	108-88-3	ND	0.005
Ethylbenzene	100-41-4	ND	0.005
p,m-Xylenes	---	ND	0.005
o-Xylene	95-47-6	ND	0.005
Gasoline	---	ND	0.3
<u>Surrogates</u>		<u>Recovery (%)</u>	<u>QC Limits (%)</u> LCL UCL
a,a,a-Trifluorotoluene	98-08-8	103	50 - 150

ND Not detected at or above limit of detection
-- Information not available or not applicable
Results are reported on a wet weight basis, as received

Results of Analysis
for
Geomatrix Consultants

Client Reference: 2026.01B
Clayton Project No. 92041.79

Sample Identification:	METHOD BLANK	Date Sampled:	--
Lab Number:	9204179-17A	Date Received:	--
Sample Matrix/Media:	SOIL	Date Prepared:	04/16/92
Preparation Method:	EPA 5030	Date Analyzed:	04/16/92
Analytical Method:	EPA 8015/8020		

Analyte	CAS #	Concentration (mg/kg)	Limit of Detection (mg/kg)
<u>BTEX/Gasoline</u>			
Benzene	71-43-2	ND	0.005
Toluene	108-88-3	ND	0.005
Ethylbenzene	100-41-4	ND	0.005
p,m-Xylenes	---	ND	0.005
o-Xylene	95-47-6	ND	0.005
Gasoline	---	ND	0.3
<u>Surrogates</u>		<u>Recovery (%)</u>	<u>QC Limits (%)</u> LCL UCL
a,a,a-Trifluorotoluene	98-08-8	103	50 - 150

ND Not detected at or above limit of detection
 -- Information not available or not applicable
 Results are reported on a wet weight basis, as received

Results of Analysis
for
Geomatrix Consultants

Client Reference: 2026.01B
Clayton Project No. 92041.79

Sample Matrix/Media: SOIL	Date Received: 04/15/92
Preparation Method: EPA 3550	Date Prepared: 04/16/92
Analysis Method: EPA 8015	Date Analyzed: 04/16/92

Lab No.	Sample ID	Date Sampled	Diesel (mg/kg)
01A	POK-EX-1	04/15/92	ND
02A	POK-EX-2	04/15/92	ND
03A	POK-EX-3	04/15/92	ND
04A	POK-EX-4	04/15/92	ND
05A	POK-EX-5	04/15/92	NDa
06A	POK-EX-6	04/15/92	NDb
11A	COMP OF POK-SP-1, 2, 3 & 4	04/15/92	NDb
16A	COMP OF POK-SP-5, 6, 7 & 8	04/15/92	NDb
17A	METHOD BLANK	--	ND

Detection Limit:

1

ND Not detected at or above limit of detection
< Not detected at or above limit of detection
-- Information not available or not applicable

Results are reported on a wet weight basis, as received
a Detection limit increased to 5 mg/kg due to presence of heavier hydrocarbons
b Detection limit increased to 2 mg/kg due to presence of heavier hydrocarbons

Results of Analysis
 for
 Geomatrix Consultants

Client Reference: 2026.01B
 Clayton Project No. 92041.79

Sample Matrix/Media: SOIL Date Received: 04/15/92
 Preparation Method: EPA 3050 Date Prepared: 04/16/92
 Analysis Method: EPA 6010 Date Analyzed: 04/16/92

Lab No.	Sample ID	Date Sampled	Lead (mg/kg)
01A	POK-EX-1	04/15/92	2
02A	POK-EX-2	04/15/92	9
03A	POK-EX-3	04/15/92	2
04A	POK-EX-4	04/15/92	8
11A	COMP OF POK-SP-1, 2, 3 & 4	04/15/92	10
16A	COMP OF POK-SP-5, 6, 7 & 8	04/15/92	17
17A	METHOD BLANK	--	<1
Detection Limit:			1

ND Not detected at or above limit of detection
 < Not detected at or above limit of detection
 -- Information not available or not applicable

Results are reported on a wet weight basis, as received

Chain-of-Custody Record

No. 0623

Date: 4-15-97

Page 1 of 1

Project No. ~~2026-01 B~~

Samplers (Signatures):

Stacy Anich

ANALYSES

Date	Time	Sample Number	EPA Method 8010	EPA Method 8020	EPA Method 8240	EPA Method 8270	TPH as gasoline	TPH as diesel	TPH as BTEX	TOXIC PB (M)	Number of containers
4/15	1600	POK-EX-1					X	X	X		1
4/15	1555	POK-EX-2					X	X	X		1
4/15	1540	POK-EX-3					X	X	X		1
4/15	1545	POK-EX-4					X	X	X		1
4/15	1530	POK-EX-5					X	X	X		1
4/15	1550	POK-EX-6					X	X	X		1
		POK-SP-1					X	X	X		4
		POK-SP-4					X	X	X		4
		POK-SP-5					X	X	X		4
		POK-SP-6					X	X	X		4

comparative samples

Additional comments

RUSH 48-HR TAT

Phase I emergency samples before analyzing for lead

Total No. of containers: 14

Turnaround time: 48-HR TAT

Results to: ELIZABETH WEIS

Relinquished by:

Signature: *Stacy Anich*

Printed name: STACY ANICH

Company: *Geomatrix*

Received by:

Signature: *Jim Mitchell*

Printed name: JIM MITCHELL

Company: CLAYTON ENV.

Date: 4-15-97

Relinquished by: *Jim Mitchell*

Signature: JIM MITCHELL

Printed name: CLAYTON ENV.

Company: CLAYTON ENV.

Time: 1640

Received by: *Rebecca Charelto*

Signature: REBECCA CHARELTO

Printed name: REBECCA CHARELLO

Company: CLAYTON

Method of shipment: Pick-up

Date:

Signature:

Printed name:

Company:

Received by:

Signature:

Printed name:

Company:

Received by:

Signature:

Printed name:

Company:

Received by:

Signature:

Printed name:

Company:

Time:

1735

Laboratory comments and Log No.:

920141223

OK



Geomatrix Consultants
100 Pine St. 10th Floor
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(415) 434-9400

1252 Quarry Lane
P.O. Box 9019
Pleasanton, CA 94566
(510) 426-2600
Fax (510) 426-0106

Clayton
ENVIRONMENTAL
CONSULTANTS

April 20, 1992

Ms. Elizabeth Wells
GEOMATRIX CONSULTANTS
100 Pine St., 10th Floor
San Francisco, CA 94111

Client Ref. 2026.01B/201532
Clayton Project No. 92041.92

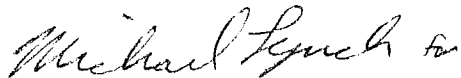
Dear Ms. Wells:

Attached is our analytical laboratory report for the samples received on April 16, 1992. A copy of the Chain-of-Custody form acknowledging receipt of these samples is attached.

Please note that any unused portion of the samples will be disposed of 30 days after the date of this report, unless you have requested otherwise.

We appreciate the opportunity to be of assistance to you. If you have any questions, please contact Maryann Gambino, Client Services Supervisor, at (510) 426-2657.

Sincerely,



Ronald H. Peters, CIH
Director, Laboratory Services
Western Operations

RHP/tb
Attachments

Results of Analysis
for
Geomatrix Consultants

Client Reference: 2026.01B/201532
Clayton Project No. 92041.92

Sample Identification:	POK-GW-1	Date Sampled:	04/16/92
Lab Number:	9204192-01A	Date Received:	04/16/92
Sample Matrix/Media:	WATER	Date Prepared:	04/17/92
Preparation Method:	EPA 5030	Date Analyzed:	04/17/92
Analytical Method:	EPA 8015/8020		

Analyte	CAS #	Concentration (ug/L)	Limit of Detection (ug/L)
<u>BTEX/Gasoline</u>			
Benzene	71-43-2	3.4	0.4
Toluene	108-88-3	1.4	0.3
Ethylbenzene	100-41-4	62	0.3
p,m-Xylenes	---	690	0.4
o-Xylene	95-47-6	170	0.4
Gasoline	---	4,100	50
<u>SURROGATE</u>		<u>RECOVERY (%)</u>	<u>LIMITS (%)</u>
a,a,a-Trifluorotoluene	98-08-8	108	50 - 150

ND Not detected at or above limit of detection
-- Information not available or not applicable

Results of Analysis
for
Geomatrix Consultants

Client Reference: 2026.01B/201532
Clayton Project No. 92041.92

Sample Identification:	METHOD BLANK	Date Sampled:	--
Lab Number:	9204192-02A	Date Received:	--
Sample Matrix/Media:	WATER	Date Prepared:	04/17/92
Preparation Method:	EPA 5030	Date Analyzed:	04/17/92
Analytical Method:	EPA 8015/8020		

Analyte	CAS #	Concentration (ug/L)	Limit of Detection (ug/L)
<u>BTEX/Gasoline</u>			
Benzene	71-43-2	ND	0.4
Toluene	108-88-3	ND	0.3
Ethylbenzene	100-41-4	ND	0.3
p,m-Xylenes	---	ND	0.4
o-Xylene	95-47-6	ND	0.4
Gasoline	---	ND	50
<u>SURROGATE</u>		<u>RECOVERY (%)</u>	<u>LIMITS (%)</u>
a,a,a-Trifluorotoluene	98-08-8	101	50 - 150

ND Not detected at or above limit of detection
-- Information not available or not applicable

Results of Analysis
 for
 Geomatrix Consultants

Client Reference: 2026.01B/201532
 Clayton Project No. 92041.92

Sample Identification: POK-GW-1
 Lab Number: 9204192-01
 Sample Matrix/Media: WATER

Date Sampled: 04/16/92
 Date Received: 04/16/92

Analyte	Concentration	Detection Limit	Units	Date Prepared	Date Analyzed	Prep Method	Analysis Method
Diesel	ND	200a	ug/L	04/16/92	04/16/92	EPA 3510	EPA 8015
Lead	<0.05	0.05	mg/L	04/16/92	04/16/92	EPA 200.7	EPA 200.7

ND Not detected at or above limit of detection
 < Not detected at or above limit of detection
 -- Information not available or not applicable

a Detection limit increased due to presence of gasoline

Results of Analysis
for
Geomatrix Consultants

Client Reference: 2026.01B/201532
Clayton Project No. 92041.92

Sample Identification: METHOD BLANK
Lab Number: 9204192-02
Sample Matrix/Media: WATER

Date Sampled: --
Date Received: --

Analyte	Concentration	Detection Limit	Units	Date Prepared	Date Analyzed	Prep Method	Analysis Method
Diesel	ND	50	ug/L	04/16/92	04/16/92	EPA 3510	EPA 8015
Lead	<0.05	0.05	mg/L	04/16/92	04/16/92	EPA 200.7	EPA 200.7

ND Not detected at or above limit of detection
< Not detected at or above limit of detection
-- Information not available or not applicable

