

**UNDERGROUND STORAGE TANK CLOSURE
AND RELEASE RESPONSE REPORT**

**400 Keawe Street
Honolulu, Oahu, Hawaii
HEER Case No. 20150218-1515**

Prepared for:
Castle & Cooke Homes Hawaii, Inc.
680 Iwilei Road, Box 510
Honolulu, Hawaii 96817

Prepared by:
ENVIROSERVICES & TRAINING CENTER, LLC
505 Ward Avenue, Suite 202
Honolulu, Hawaii 96814

tel: (808) 839-7222

ETC Project No. 14-2021

May 2015

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1.0 CERTIFICATIONS AND LIMITATIONS

EnviroServices & Training Center, LLC (ETC) has completed this Underground Storage Tank (UST) Closure and Release Response Report for the project site. ETC's findings and conclusions presented in this report are professional opinions based solely upon visual observations of the project site, government regulations, and upon interpretation of the laboratory data and field measurements gathered at the time and location of the study.

This report is intended for the sole use of ETC's Client, exclusively for the project site indicated. The scope of services performed in execution of this project may not be appropriate for satisfying the needs of other users, and any use or reuse of this report or the findings and conclusions presented herein is unauthorized and at the sole risk of said user.

ETC makes no guarantee or warranty; either expressed or implied, except that our services are consistent with good commercial or customary practices designed to conform to acceptable industry standards and governmental regulations. No warranty or representation, expressed or implied, is included or intended in its proposal, contracts, or reports. Opinions stated in this report apply only to the site as outlined and apply to the conditions present at the time of UST closure activities. Moreover, these opinions do not apply to site changes that occur after the completion of this project.

Prepared By: 
Sharla Nakashima
Project Manager

Date: May 2015

2.0 EXECUTIVE SUMMARY

EnviroServices & Training Center, LLC (ETC) was contracted by Castle & Cooke Homes Hawaii, Inc. (CCHHI) to coordinate and document the closure of a single underground storage tank (UST) that had been discovered during a recent environmental site investigation at the 400 Keawe Street property in Honolulu, Hawaii. CCHHI had recently purchased the property and was unaware of the UST and/or its potential contents.

CJ Peterson Services was the excavation contractor on-site responsible for all earthwork activities. ETC subcontracted Hawaii Industrial Services, Ltd. (HIS) to decommission the UST and to transported the tank shell and piping for metal reclamation.

On February 18, 2015, CJ Peterson Services commenced closure activities by excavating soil above the UST to expose the top of the tank at a depth of approximately 2.5 feet below ground surface (bgs). Piping was discovered connected to the UST and extended approximately 5 feet beyond the tank footprint, where it appeared to have previously been cut. Measurements of the tank indicated a 3.5-foot diameter and a length of 7 feet, with a total capacity of 500 gallons.

Observations made during excavation of the 500-gallon UST indicated the presence of a petroleum release. Petroleum stained soil was noted at the depths of approximately 5.5 feet bgs and a slight petroleum sheen was observed on the groundwater seeping into the UST excavation at a depth of approximately 6 feet bgs. A petroleum odor could also be detected emanating from the stained soils. The bottom of the UST appeared to be heavily corroded and during removal, it was confirmed that the tank bottom was completely corroded.

During excavation of the 500-gallon UST, second UST was discovered in the excavation side wall. The top of the second UST was located at a depth of 2 feet bgs and the tank was situated at a perpendicular angle to the first UST. Measurements of the tank indicated a 3.33-foot diameter and a 3.75-foot length, with a total approximate capacity of 245 gallons. Visual observations indicated that the 245-gallon UST was in good condition, with no corrosion holes or perforations, and there were no indications that a release had occurred from the UST.

After removal, the two USTs were transported to HIS' warehouse for decommissioning. HIS personnel wiped down the interior of the tanks using petroleum absorbent pads and the used absorbent pads were disposed as solid waste. The tanks were then transported to Schnitzer Steel Hawaii Corporation in Kapolei for metal reclamation.

After the USTs were removed, CJ Peterson Services started excavating petroleum contaminated soil observed in the surrounding soil. In general, soil from ground surface to approximately 5 feet bgs was removed and placed next to the excavation for future use as clean fill since there were no indications of petroleum impacts. Soil from approximately 5 feet bgs to 6.5 feet bgs was excavated and placed on 10-mil polyethylene sheeting in an area designated for temporary staging of petroleum contaminated soil. Excavation activities were ceased once field screening indicated that sufficient quantities of petroleum contaminated soils had been removed. The final excavation had approximate measurements of 30-feet by 40-feet by 6.5-feet deep. An estimated 80 cubic yards of petroleum contaminated soil was generated and stockpiled on-site.

On the same day, ETC personnel collected a total of eight confirmation soil samples from the side walls of the excavation at depths of approximately 6 feet bgs (two samples per excavation side wall). The samples were submitted to Advanced Analytical Laboratory, Inc. (AAL) in Honolulu, Hawaii for analysis of total petroleum hydrocarbons (TPH) as gasoline (TPH-G), TPH as diesel (TPH-D) and TPH as oil (TPH-O) via EPA Method 8015 Modified, volatile organic compounds (VOCs) via EPA Method 5035/8260B, polynuclear aromatic hydrocarbons (PAHs) via EPA Method 8270SIM, polychlorinated biphenyls (PCBs) via EPA Method 8082, and total lead/cadmium via EPA Method 7010/7471.

On February 19, 2015, ETC personnel returned to the project site and collected one multi-incremental soil sample consisting of fifty increments from the approximate 80 cubic yard petroleum contaminated soil stockpile in order to prepare a waste profile for anticipated off-site disposal. The multi-incremental soil sample was submitted to AAL for multi-incremental sample processing and analysis of TPH-G, TPH-D and TPH-O via EPA Method 8015 Modified; VOCs via EPA Method 5035/8260; PAHs via EPA Method 8270 SIM; PCBs via EPA Method 8082; total cadmium and lead via EPA Method 6010 and Toxicity Characteristic Leaching Procedure (TCLP) cadmium/chromium/lead via EPA Method 1311/7010.

In order to assess potential petroleum impacts to the groundwater, three temporary monitoring wells were installed on February 26, 2015, one in the general vicinity of the former USTs and two downgradient of the USTs. Groundwater samples were collected from the monitoring wells using a submersible bladder pump at a flow rate of 0.14 liters per minute. The samples were submitted to AAL for analysis of TPH-G, TPH-D, TPH-O via EPA Method 8015 Modified, VOCs via EPA Method 8260, PAHs via EPA Method 8270, PCBs via EPA Method 8082 and total dissolved lead/cadmium via EPA Method 7010.

Resultant analytical data from confirmation soil samples indicated that petroleum contaminated soil had been sufficiently removed from the subsurface and residual constituent concentrations were below applicable DOH Environmental Action Levels (EALs) for unrestricted land use (with the exception of lead). Although lead concentrations in five of the eight samples exceeded the DOH EAL, such concentrations were anticipated based on the presence of a known debris layer in the subsurface soils and results from a recent environmental investigation. Such lead impacts are already being addressed under separate reporting and planning requirements.

Resultant analytical data from groundwater samples indicated that all results were below laboratory reporting limits and that the groundwater had not been significantly impacted by the petroleum release.

Analytical data from the multi-incremental soil sample collected from the approximate 80 cubic yard petroleum contaminated soil stockpile was used to prepare a soil profile for PVT Landfill in Nanakuli. A total of 149.54 tons of soil was subsequently transported to PVT Landfill by CJ Peterson Services for disposal on May 7, 2015.

Based on the data from confirmation soil samples and groundwater samples, petroleum contaminated soil has been sufficiently removed and no further action is recommended to address the UST release.

3.0 INTRODUCTION/PURPOSE

This report presents the results of EnviroServices & Training Center, LLC's (ETC's) findings during closure activities for one 500-gallon steel, single-walled underground storage tank (UST) and one 245-gallon steel, single-walled UST located at 400 Keawe Street, Honolulu, Hawaii. Castle & Cooke Homes Hawaii, Inc (CCHHI) contracted ETC to decommission the USTs, document closure activities, collect site assessment soil samples, and prepare this report. Hawaii Industrial Services (HIS) was subcontracted by ETC to conduct UST decommissioning and disposal activities.

The purpose of this investigation was to provide documentation of UST closure activities and to assess the subsurface soils with respect to the presence or absence of petroleum hydrocarbons. The activities were performed in general accordance with: 1) Title 40 of the Code of Federal Regulations Part 280.72; 2) Interim Final Technical Guidance Manual (TGM) for the Implementation of the Hawaii State Contingency Plan, Hawaii Department of Health (DOH) Hazard Evaluation and Emergency Response (HEER) Office, November 2009 (referred to herein as the DOH HEER TGM); and/or 3) Technical Guidance Manual for UST Closure and Release Response Activities, 2nd Edition, DOH, March 2000 (referred to herein as the DOH UST TGM). Specifically, ETC completed the following tasks:

- Observed excavation, decommissioning, and removal of one 500-gallon capacity, single-walled, steel UST and one 245-gallon capacity, single-walled, steel UST discovered during recent site investigation activities.
- Examined the condition and integrity of the USTs during decommissioning and removal.
- Examined the soils within the excavation for visual and olfactory signs of contamination.
- Conducted field screening of soil surrounding the USTs using visual/olfactory observations and a photoionization detector (PID) to perform soil vapor headspace measurements.
- Directed the excavation of suspect petroleum contaminated soil based on field screening data and stockpiled the soil on polyethylene sheeting pending profiling and off-site disposal.
- Collected eight discrete confirmation soil samples from the walls of the excavation at depths of approximately 6 feet below ground surface (bgs).

- Submitted the eight confirmation soil samples to Advanced Analytical Laboratory, Inc. (AAL) in Honolulu, Hawaii for analysis of total petroleum hydrocarbons (TPH) as gasoline (TPH-G), TPH as diesel (TPH-D) and TPH as oil (TPH-O) via EPA Method 8015 Modified, volatile organic compounds (VOCs) via EPA Method 5035/8260B, polynuclear aromatic hydrocarbons (PAHs) via EPA Method 8270SIM, polychlorinated biphenyls (PCBs) via EPA Method 8082, and total lead/cadmium via EPA Method 7010/7471.
- Observed the advancement of three 1.5-inch diameter temporary groundwater monitoring wells by GeoTek Hawaii (GTH).
- Developed the three wells and collected groundwater samples using a submersible bladder pump at a flow rate of 140 milliliters per minute.
- Submitted the three groundwater samples to AAL for analysis of TPH-G/TPH-D/TPH-O via EPA Method 8015 Modified, VOCs via EPA Method 8260B, PAHs via EPA Method 8270SIM, PCBs via EPA Method 8082, and dissolved lead/cadmium via EPA Method 7010/7471.
- Collected one multi-incremental soil sample consisting of fifty soil increments from the approximate 80 cubic yards of suspect petroleum contaminated soil for waste profiling.

4.0 BACKGROUND

4.1 Site Description

The project site, identified as TMK identification number (1) 2-1-54: Parcel 25, consists of approximately 1.52-acres of land located at 400 Keawe Street, Honolulu, Hawaii, on the southern portion of the island of Oahu. The Property is a rectangular lot, situated at the corner of Auahi Street and Keawe Street at an elevation of approximately 5 to 7 feet above mean sea level based on a topographic survey performed as part of the development plans. There are currently no structures and ground cover is bare soil. Surrounding properties are used for commercial activities and high-rise residential purposes. The nearest surface water body is the Pacific Ocean located approximately 1,500 feet north and west of the Property.

4.2 Tank History

The existence of the USTs was previously unknown prior to their discovery during recent site investigation activities. The USTs were not listed in the most recent version of the DOH UST Database and it was not known what type of petroleum was previously stored. Visual and olfactory observations indicated that the initial 500-gallon UST may have contained some type of diesel heating oil.

4.3 Geology and Hydrogeology

4.3.1 Regional Geology

Oahu is formed by the erosional remnants of two shield volcanoes. These are the Waianae range to the west and the Koolau range to the east. The Waianae volcano is estimated to have formed 2.4 to 3.6 million years before present. It consists of a tholeiitic lava shield with a thick cap of transitional to alkalic rock. Rejuvenation-stage volcanics of undifferentiated age occur in Kolekole Pass and on the south flank of the Waianae shield. Dike orientations define northwest and southwest rift zones (Macdonald, et al., 1983).

The Koolau volcano is estimated to have formed 1.8 to 2.6 million years before the present (Macdonald, et al., 1983). It consists of a tholeiitic lava shield and lacks an alkalic cap. It has a well defined major dike complex trending northwest-southwest. A third, minor rift zone referred to as the Kaau rift trends southward from Kaau crater, near the upland crest of the Koolau Ridge. After a long dormant period and periods of deep erosion, the Koolau volcano developed abundant and scattered rejuvenation-stage vents, typically aligned on northeast-striking fissures (Macdonald, et al., 1983).

4.3.2 Site Geology

The soil at the project site is mapped as fill land, mixed (F1). F1 consists of areas filled with material dredged from the ocean or hauled from nearby areas, garbage, and general material from other sources. This land type is typically used for urban development including airports, housing areas, and industrial facilities (USDA, 1972). During the course of excavation for UST

and contaminated soil removal, a consolidated coral shelf was encountered at a depth of approximately 6.5 feet bgs.

4.3.3 Regional Hydrogeology

Basal groundwater is formed by rainwater percolating down through the residual soils and permeable volcanic rock. The base of the island situated below sea level, except within rift zones of the volcanoes, is saturated with ocean salt water and thus forms a basal lens called the “Ghyben-Herzberg” lens. A zone of transition between the fresh groundwater and the ocean salt water occurs due to the constant movement of the interface as a result of tidal fluctuations, seasonal fluctuations in recharge and discharge and aquifer development (Macdonald, et al., 1983).

Downward percolation of rainwater may be stopped by impermeable layers such as dense lava flows, alluvial clay layers and volcanic ash. The groundwater then forms a perched or high level aquifer, which is not in contact with salt water. Recharge of the aquifer occurs in areas of high rainfall, which are the interior mountainous areas. The groundwater flows from the recharge areas to the areas of discharge along the shoreline. Frictional resistance to groundwater flow causes it to pile up within the island until it attains sufficient hydraulic head to overcome friction. Thus, basal groundwater tends to slope toward the shoreline.

4.3.4 Site Hydrogeology

The project site is underlain by the Nuuanu Aquifer System, which is part of the Honolulu Aquifer Sector on the island of Oahu. The aquifer is classified by Mink and Lau, 1990, with the system identification number 30102116 (13321). This system includes an unconfined basal aquifer in sedimentary (nonvolcanic) lithology. The groundwater in this aquifer is described as being currently in use and containing groundwater with a moderate salinity (1,000 to 5,000 mg/l Cl⁻). The groundwater is neither a drinking water source or of ecological importance, and is also described as replaceable with a high vulnerability to contamination (Mink and Lau, 1990). The project site is further underlain by a second aquifer of the same system. The aquifer is a confined, basal aquifer in flank compartments, and is classified with the system identification number 30102121 (11113). The aquifer is described as being a currently used drinking water source containing groundwater with a fresh salinity (<250 mg/l Cl⁻). The groundwater is described as being irreplaceable with a low vulnerability to contamination (Mink and Lau, 1990).

Since groundwater beneath the site is not considered to be a current or potential drinking water source and the project site is located makai of the Underground Injection Control (UIC) line, the analytical data were compared to the DOH Environmental Action Levels (EALs) for soil and groundwater in areas where groundwater is not a current or potential drinking water source and where the nearest surface water body is greater than 150 meters from the site.

5.0 UST CLOSURE ACTIVITIES

5.1 UST Closure

On February 18, 2015, ETC mobilized to the project site with HIS personnel. UST closure activities commenced with CJ Peterson Services personnel removing soil surrounding the 500-gallon UST with a track excavator. Soil from the top of the UST was stockpiled adjacent to the excavation area. The top of the UST was observed at a depth of approximately 2.5 feet bgs and the orientation of the UST was east-west. Ancillary piping was observed connected to the apparent UST fill pipe directly above the UST and ran approximately 5 feet west of the UST where it appeared to have been previously cut. The piping was disconnected from the UST and placed on HIS's trailer for disposal.

While excavating soil on the sides of the UST, indications of a petroleum release were observed. A strong petroleum odor and gray stained soil were noted near the bottom of the UST. Closer examination of the UST indicated that the bottom of the tank was heavily corroded and that groundwater encountered in the excavation had a slight petroleum sheen. Removal of the tank from the excavation confirmed that the bottom of the UST was completely corroded through. Measurements from the 500-gallon UST indicated a diameter of approximately 3.5 feet and a length of approximately 7 feet. The tank shell was placed on HIS's trailer pending transportation off-site.

During excavation of the first UST, a second UST, approximately 245-gallons in capacity, was discovered in the northern wall of the excavation. The top of the tank was located at a depth of approximately 2 feet bgs and was situated at an angle perpendicular to the 500-gallon UST. The second tank was excavated and removed from the ground. This UST appeared to be in good condition, with no corrosion holes or perforations. There was no apparent piping associated with this UST and the tank had an approximate diameter of 3.33 feet and an approximate length of 3.75 feet. The tank shell was placed on HIS' trailer pending transportation off-site.

5.2 UST Decommissioning

HIS personnel transported the two USTs to their warehouse in Honolulu. The interior of the tanks were inspected and it was noted that there were no visual indications of petroleum or any petroleum odors. The interior of the tanks were wiped down using petroleum absorbent pads and the used absorbent pads were disposed as solid waste. The tanks were then transported to Schnitzer Steel Hawaii Corporation in Kapolei for metal reclamation.

6.0 RELEASE RESPONSE ACTIVITIES

Following removal of the two USTs, observations indicated that the petroleum release occurred solely from the 500 gallon UST. Field screening of the soil within the UST excavation indicated that soil at depths of approximately 5.5 feet and deeper had been impacted by the petroleum release. Therefore, ETC contacted the DOH Hazard Evaluation and Emergency Response (HEER) Office by telephone on February 18, 2015 to report the release. The release was assigned the HEER Office Case No. 20150218-1515. ETC also contacted the DOH Solid and Hazardous Waste Branch (SHWB) UST Section to report the release. ETC was told that the release would be handled by the DOH HEER Office based on the suspected UST history and the fact that DOH oversight for the project site was already being provided by the DOH HEER Office.

ETC personnel directed CJ Peterson Services operator to start over-excavation of petroleum-impacted soil. In general, the top 5 feet of soil was placed adjacent to the excavation area as “clean” soil since visual and olfactory observations did not indicate the presence of petroleum impacts. Soil from a depth of approximately 5 feet to 6.5 feet bgs was excavated and designated as petroleum contaminated soil. Excavation to depths greater than 6.5 feet bgs was not feasible due to the presence of a consolidated coral “shelf” that could not be readily removed by the excavator. Groundwater was present at a depth of approximately 6- to 6.5-feet bgs.

Over-excavation of petroleum contaminated soil was performed until field screening data indicated that petroleum impacted soils had been sufficiently removed. The final excavation pit had dimensions of 30 feet wide by 40 feet long by 6.5 feet deep. Approximately 80 cubic yards of suspect petroleum contaminated soil was removed and placed in a designated petroleum contaminated soil stockpile area lined with 10-mil polyethylene sheeting. After completion of petroleum contaminated soil removal, the stockpile was covered with additional polyethylene sheeting and the edges of the stockpile were secured by rolling the edges of the bottom liner with the edges of the cover liner. The excavation was subsequently backfilled with the “clean” soil removed from the top 5 feet and with imported fill material.

In order to assess potential petroleum impacts to the groundwater, ETC contracted GTH to install three temporary, 1.5-inch diameter PVC monitoring wells. On February 26, 2015, GTH installed one monitoring well (MW1) in the general area where the 500-gallon UST was located. The two remaining monitoring wells (MW2 and MW3) were installed at the downgradient limits of the final excavation. Each monitoring well was set at 13 feet bgs and was constructed of 10 feet of screen and 3 feet of solid riser. Sand was placed around each well to ground surface.

7.0 SAMPLING AND LABORATORY ANALYSIS

7.1 Field Screening Results

A RAE Systems MiniRAE Lite PID equipped with a 10.6 electron volt (eV) ultraviolet lamp was used during field activities. The PID was calibrated prior to use each day using 100-ppm isobutylene span gas. ETC used the PID to monitor volatile organic compound (VOC) concentrations in the ambient air and in soil vapor headspace samples. ETC personnel followed the standard operating procedures (SOP) for headspace analysis recommended by the DOH UST TGM. Field screening results are included in Table 1.

Table 1: Field Screening Results – Soil

Location	Depth (ft)	PID Readings (ppm)	Notes
East Wall	5.0	0.2	No Visual/Olfactory observations of petroleum release
	5.5	0.2	No Visual/Olfactory observations of petroleum release
	6.0	0.3	No Visual/Olfactory observations of petroleum release
	6.0	0.3	No Visual/Olfactory observations of petroleum release
West Wall	5.0	0.2	Slight petroleum odor/stained soil
	5.5	70.4	Slight petroleum odor/stained soil
	6.0	14.7	Slight petroleum odor/stained soil
	6.0	1.7	Very slight petroleum odor/discolored soil
South Wall	5.0	0.2	No Visual/Olfactory observations of petroleum release
	5.5	0.4	No Visual/Olfactory observations of petroleum release
	6.0	0.3	No Visual/Olfactory observations of petroleum release
	6.0	0.3	No Visual/Olfactory observations of petroleum release
North Wall	5.0	0.2	No Visual/Olfactory observations of petroleum release
	5.5	0.2	No Visual/Olfactory observations of petroleum release
	6.0	0.2	No Visual/Olfactory observations of petroleum release
	6.0	0.2	No Visual/Olfactory observations of petroleum release

7.2 Soil Confirmation Sampling and Laboratory Analysis

Since a release was immediately discovered during excavation of the USTs, UST closure assessment samples were not collected. Apparent petroleum impacted soils were excavated and confirmation soil samples were collected to verify that petroleum impacted soils were sufficiently removed. Two discrete soil samples were collected from each of the four walls of the excavation pit at a depth of approximately 6 feet bgs. Sample locations are shown in Appendix I, Figure 2. Note that a soil sample was not collected from beneath the piping since soil beneath the piping had been removed as part of the over-excavation activities.

All soil samples were collected directly from the bucket of the excavator using new, laboratory-provided Terra Core samplers and 4-ounce glass jars. Cores collected in the samplers were placed into pre-weighed 40-milliliter glass vials with deionized water. The sample containers were then sealed with plastic caps, labeled with the client name, sample ID number, date/time of sampling, and analyses, and then stored in a cooler with ice pending delivery to the laboratory. Samples were hand delivered to AAL along with completed chain-of-custody documentation.

The eight soil samples were analyzed for TPH-G, TPH-D, and TPH-O via EPA Method 8015 Modified; VOCs via EPA Method 5035/8260, PAHs via EPA Method 8270 SIM, PCBs, via EPA Method 8082, and total lead/cadmium via EPA Method 7010/7471. Results of the analyses are presented in Table 2 below and the chain-of-custody together with the corresponding laboratory reports are presented in Appendix VI.

Table 2: Confirmation Soil Sample Data

Analyte	North Wall 1-6	North Wall 2-6	South Wall 1-6	South Wall 2-6	East Wall 1-6	East Wall 2-6	West Wall 1-6	West Wall 2-6	DOH EALs
TPH-G	nd<0.10	nd<0.10	nd<0.10	nd<0.10	nd<0.10	nd<0.10	nd<0.10	nd<0.10	100
TPH-D	nd<20	nd<20	nd<20	nd<20	nd<20	nd<20	nd<20	nd<20	500
TPH-O	nd<35	nd<35	nd<35	nd<35	nd<35	nd<35	130	nd<35	500
VOCs	nd<0.02-0.05	nd<0.02-0.05	nd<0.02-0.05	nd<0.02-0.05	nd<0.02-0.05	nd<0.02-0.05	nd<0.02-0.05	nd<0.02-0.05	Varies
PAHs	nd<0.10	nd<0.10	nd<0.10	nd<0.10	nd<0.10	nd<0.10	nd<0.10	nd<0.10	Varies
PCBs	nd<0.2	nd<0.2	nd<0.2	nd<0.2	nd<0.2	nd<0.2	nd<0.2	nd<0.2	1.1
Cadmium	nd<1.0	nd<1.0	nd<1.0	nd<1.0	nd<1.0	nd<1.0	1.1	nd<1.0	14
Lead	490	510	790	340	91	2.3	700	11	200

All values in milligrams per kilogram (mg/kg)

nd = not detected at the method detection limit (MDL) or laboratory reporting limit (RL), MDL or RL listed

DOH EAL = DOH Environmental Action Level for unrestricted land use for sites where groundwater is not a current or potential drinking water source and where the nearest surface water body is greater than 150 meters from the site

Boldfaced, shaded values exceed DOH EAL

7.3 Groundwater Sampling and Laboratory Analysis

On the same day as well installation (February 26, 2015), ETC personnel commenced well development and sampling using a submersible bladder pump. A water level indicator was used in conjunction with the submersible bladder pump to perform low-flow purging (i.e., flow rates of approximately 0.14 liters per minute). The pump intake was placed near the upper-middle portion of the water column in order to ensure sufficient communication with the surrounding groundwater formation and to minimize the introduction of suspended solids that may have accumulated at the bottom of the well.

A Horiba U-52 Multi-parameter water quality meter was used to ensure stabilization of water quality parameters (pH, temperature, conductivity, turbidity, and dissolved oxygen) during purging activities. Stabilization of water quality parameters indicated that groundwater in the monitoring well was representative of the groundwater in the surrounding aquifer formation. Water quality data are presented in Table 3.

Table 3: Physical Observations/Water Quality Data – Groundwater

Well ID	Depth to GW (ft bgs)	Well Depth (ft bgs)	Volume Purged (L)	Temp. (°F)	pH	Conductivity (µS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Notes
MW1	5.5	13	0.7	81.2	5.53	4210	>800	5.33	No visual/olfactory observations of petroleum release. Initially high turbidity/purge water cloudy brownish gray
			1.4	81.1	5.81	4110	>800	5.07	
			2.1	81.1	5.82	4080	432.0	5.06	
			2.8	81.1	5.82	4080	137.0	5.06	
			3.5	81.1	5.82	4080	122.0	5.03	
MW2	5.5	13	2.8	81.4	5.78	4200	>800	7.72	No visual/olfactory observations of petroleum release. Initially high turbidity/purge water cloudy brownish gray
			3.5	80.9	5.99	7200	760	5.67	
			4.2	80.1	6.07	6100	43.7	4.71	
			4.9	80.1	6.09	5700	36.9	3.73	
			5.6	80.1	6.11	5300	31.4	2.75	
7	80.0	6.17	4900	25.4	2.67				
MW3	5.8	13	2.8	81.4	5.67	4200	>800	4.70	No visual/olfactory observations of petroleum release. Initially high turbidity/purge water cloudy brownish gray
			3.5	82	5.76	4540	627	4.73	
			4.2	81.4	5.69	4420	598	4.42	
			10.5	81.4	5.71	4390	588	4.41	

Notes: L= Liters

°F = degrees Fahrenheit.

µS/cm = microSiemens per centimeter

NTU = Nephelometric Turbidity Units

mg/L = milligrams per Liter

Following stabilization of water quality parameters, groundwater samples were collected using the submersible bladder pump at the same flow rate of 0.14 liters per minute. Personnel collecting the groundwater samples donned a new pair of disposable latex gloves prior to sample collection. Only new or laboratory-cleaned sample containers were used to collect groundwater samples. The sample containers were labeled with the client name, sample ID number, date/time of sampling, and analyses, and then stored in a cooler with ice pending delivery to the laboratory. The groundwater samples were hand-delivered to AAL along with completed chain-of-custody documentation.

The three groundwater samples were analyzed for TPH-G, TPH-D, TPH-O via EPA Method 8015 Modified, VOCs via EPA Method 8260, PAHs via EPA Method 8270, PCBs via EPA Method 8082 and total dissolved lead/cadmium via EPA Method 7010. Results of the analyses are presented in Table 4 below and the chain-of-custody together with the corresponding laboratory reports are presented in Appendix VI.

Table 4: Groundwater Sample Data

Analyte	MW-1	MW-2	MW-3	DOH EALs
TPH-G	nd<0.10	nd<0.10	nd<0.10	5
TPH-D	nd<0.010	nd<0.010	nd<0.010	2.5
TPH-O	nd<0.032	nd<0.032	nd<0.032	2.5
VOCs	nd<0.0002-0.005	nd<0.0002-0.005	nd<0.0002-0.005	Varies
PAHs	nd<0.0001-0.0005	nd<0.0001-0.0005	nd<0.0001-0.0005	Varies
PCBs	nd<0.0001	nd<0.0001	nd<0.0001	0.002
Cadmium	nd<0.005	nd<0.005	nd<0.005	0.003
Lead	nd<0.002	nd<0.002	nd<0.002	0.029

All values in milligrams per liter (mg/l)

nd = not detected at the method detection limit (MDL) or laboratory reporting limit (RL), MDL or RL listed

DOH EAL = DOH Environmental Action Level for unrestricted land use for sites where groundwater is not a current or potential drinking water source and where the nearest surface water body is greater than 150 meters from the site

7.4 Petroleum Contaminated Soil Stockpile

On February 19, 2015, ETC personnel collected one multi-incremental soil sample consisting of fifty increments from the approximate 80 cubic yard petroleum contaminated soil stockpile in order to prepare a waste profile for anticipated off-site disposal. Each of the fifty soil increments was collected using a Terra Core sampler and the increments were placed into a laboratory-provided bottle containing a pre-weighed quantity of methanol as preservative for analysis of volatile constituents. In addition, an aliquot of each increment was also placed into a new, re-sealable polyethylene bag for semi-volatile and non-volatile constituents.

The multi-incremental soil sample was hand-delivered to AAL with chain of custody documentation. ETC instructed AAL to perform multi-incremental subsample processing in accordance with the DOH HEER TGM. AAL was also instructed to analyze the processed sample for TPH-G, TPH-D and TPH-O via EPA Method 8015 Modified; VOCs via EPA Method 5035/8260; PAHs via EPA Method 8270 SIM; PCBs via EPA Method 8082; total cadmium and lead via EPA Method 6010 and Toxicity Characteristic Leaching Procedure (TCLP) cadmium/chromium/lead via EPA Method 1311/7010.

Analytical data from the petroleum contaminated soil stockpile sample was used to prepare a waste profile for PVT Landfill in Nanakuli. On May 7, 2015, CJ Peterson Services hauled 149.54 tons of petroleum contaminated soil to PVT Landfill for disposal. Documentation of waste disposal has been included in Appendix IV.

8.0 SITE RESTORATION

The 30-foot wide by 40-foot long by 6.5-foot deep excavation was backfilled immediately following sample collection using on-site fill and clean, imported fill material in preparation for site development.

On March 2, 2015, the three temporary monitoring wells were removed from the ground and disposed as solid waste. During the removal of MW-1, the well broke right at the connection between the screen and the riser. Although efforts were made to remove the below grade section, the 10 feet of well screen could not be dislodged and therefore was left in the ground. ETC personnel thoroughly filled the remaining screen with wetted bentonite and filled the remainder of the boring with on-site fill. Temporary monitoring wells MW-2 and MW-3 were removed in their entirety and the borings were backfilled with bentonite chips and on-site fill in preparation for upcoming site development.

9.0 CONCLUSIONS AND RECOMMENDATIONS

During a recent site investigation at the property, a suspect 500-gallon capacity UST was discovered. Therefore, the property owner, CCHHI, contracted ETC to conduct UST closure activities in preparation for planned site development. While performing UST closure activities for the 500-gallon capacity UST, a 245-gallon capacity UST was discovered in the excavation side wall and therefore was removed. Both USTs appeared very old and were constructed of single-wall steel. The 500-gallon UST was observed to be highly degraded, with the bottom of the tank completely corroded. The 245-gallon UST appeared to be in good condition with no holes or perforations noted. Neither UST contained residual product. The interior of the two USTs were wiped with petroleum absorbent pads and transported along with ancillary piping to Schnitzer Steel Corporation Hawaii for metal reclamation.

Visual observations made during UST closure activities indicated that a petroleum release had occurred from the 500-gallon UST. Release response activities were immediately implemented, starting with the over-excavation of petroleum contaminated soil. A total of approximately 80 cubic yards of petroleum contaminated soil was stockpiled in a designated area on 10-mil polyethylene sheeting pending profiling and disposal. The final excavation measured approximately 30-feet wide by 40-feet long by 6.5 feet deep and groundwater was encountered at a depth of approximately 6 feet bgs.

A total of eight confirmation soil samples were collected from the walls of the excavation at a depth of approximately 6 feet bgs (two samples per excavation wall). Resultant analytical data indicated that petroleum contaminated soil had been sufficiently removed from the subsurface and residual constituent concentrations were below applicable DOH Environmental Action Levels (EALs) for unrestricted land use (with the exception of lead). Although lead concentrations in five of the eight samples exceeded the DOH EAL, such concentrations were anticipated based on the presence of a known debris layer in the subsurface soils and results from a recent environmental investigation. Such lead impacts are already being addressed under separate reporting and planning requirements.

Three temporary monitoring wells were installed using a direct-push rig to determine whether the underlying groundwater had been significantly impacted by the petroleum release. One monitoring well was installed in the general vicinity of the former 500-gallon UST location and the two remaining monitoring wells were installed at the downgradient boundaries of the excavation. Groundwater samples were collected from each well and submitted for analyses. Resultant analytical data indicated that all results were below laboratory reporting limits and that the groundwater had not been significantly impacted by the petroleum release.

The approximate 80 cubic yards of petroleum contaminated soil generated during release response activities was sampled and profiled for disposal at PVT Landfill in Nanakuli. The 149.54 tons of petroleum contaminated soil was subsequently transported to PVT Landfill on May 7, 2015.

Based on the data from confirmation soil samples and groundwater samples, petroleum contaminated soil has been sufficiently removed and no further action is recommended to address the UST release.

10.0 REFERENCES

- EnviroServices & Training Center, LLC. *Draft Environmental Hazard Management Plan, 400 Keawe Street, Honolulu, Oahu, Hawaii, TMK (1) 2-1-054: Parcel 25*. January 2015.
- Macdonald, G.A., A.T. Abbot, and F.L. Peterson. *Volcanoes and the Sea, University of Hawaii Press*, 1983.
- Mink, John F. and Stephen L. Lau. *Aquifer Identification and Classification for Oahu: Groundwater Protection Strategy for Hawaii*, February 1990.
- State of Hawaii Department of Health. *Technical Guidance Manual for Underground Storage Tank Closure and Release Response, 2nd Edition*. March 2000.
- State of Hawaii Department of Health. *Interim Final Technical Guidance Manual for the Implementation of the Hawaii State Contingency Plan*. November 2009.
- US Department of Agriculture Soil Conservation Service. *Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii*. 1972.
- US Department of Interior Geological Survey. Honolulu, Hawaii Quadrangle, Island of Oahu, 7.5 Minute Series (Topographic Map). 1998.
- US Environmental Protection Agency. Title 40 Code of Federal Regulations Part 280. *Underground Storage Tank Regulations*. July 1, 1996.

APPENDIX I
FIGURES

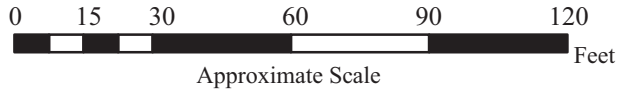
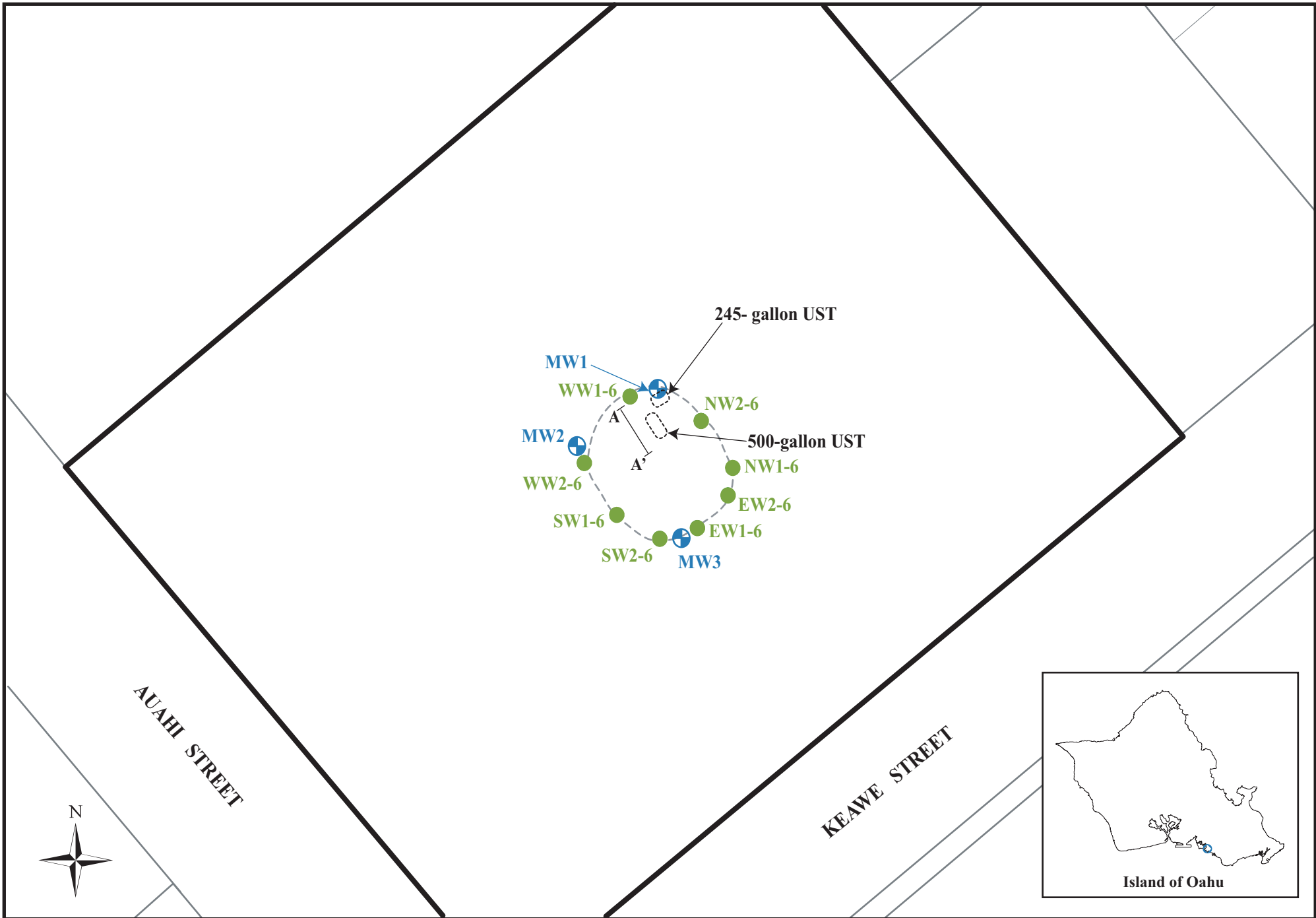


Figure 1 - Site Location Map
 UST Closure and Release Response Report
 400 Keawe Street
 Honolulu, Oahu, Hawaii



Project No. 14-2021

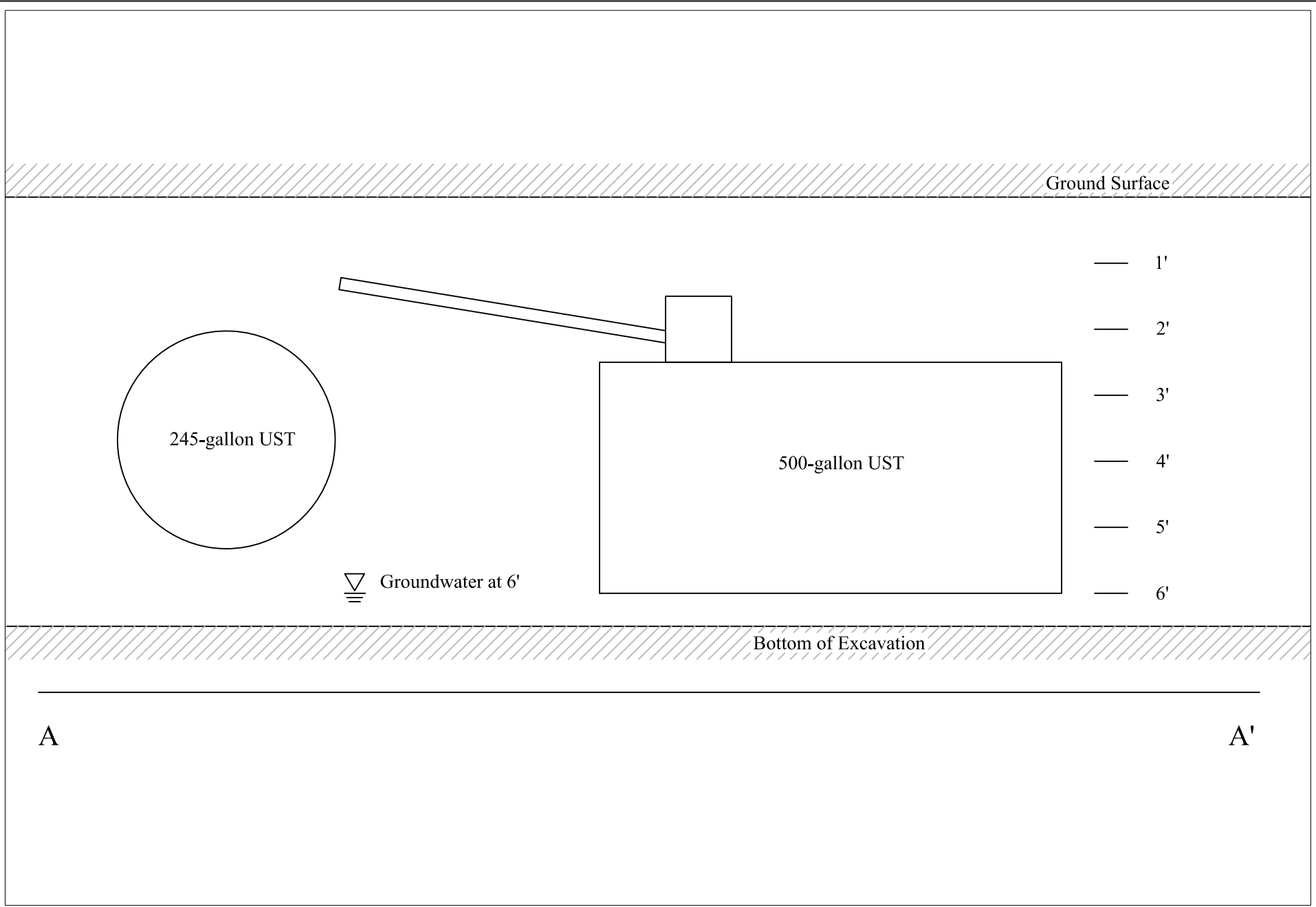
February 2015



Project No. 14-2021

February 2015

Figure 2 - Site Plan
UST Closure and Release Reponse Report
 400 Keawe Street
 Honolulu, Oahu, Hawaii



Project No. 14-2021
 Not to Scale
 February 2015

Figure 3 - Cross Section View of A-A'
 UST Closure and Release Response Report
 400 Keawe Street
 Honolulu, Oahu, Hawaii

APPENDIX II
PHOTOGRAPHIC DOCUMENTATION



Photograph 1: Initial excavation activities of 500-gallon UST.



Photograph 2: View of 245-gallon UST discovered in the excavation wall.



Photograph 3: View of the 500-gallon UST prior to removal.



Photograph 4: 245-gallon UST being removed from excavation.



Photograph 5: Bottom of 500-gallon UST following removal - completely corroded.



Photograph 6: View of 245-gallon UST being placed on HIS' trailer.



Photograph 7: View of the eastern excavation wall following UST removal.



Photograph 8: View of existing soil at beginning of over-excavation activities.



Photograph 9: View of south and east walls.



Photograph 10: 500-gallon UST in poor condition.

Photograph 11: Access way cut into 245-gallon UST for cleaning activities.





Photograph 12: Installation of temporary monitoring wells.

Photograph 13: Temporary monitoring well MW2.



Photograph 14: Collecting groundwater samples from temporary monitoring well MW3.

APPENDIX III
NOTICE OF INTENT TO CLOSE USTs

Notice of Intent to Close Underground Storage Tanks

Mail this form to:

Solid and Hazardous Waste Branch
 Hawai'i Department of Health
 919 Ala Moana Boulevard #212
 Honolulu, Hawai'i 96814

or fax it to: (808) 586-7509

Notice of intent to close a UST must be provided to the Department of Health at least 30 days prior to the actual date of closure. If you have any questions regarding this notice, call our office at (808) 586-4226.

UST Facility Description - Provide a description of the UST facility.

Facility ID	Facility Name	Facility Address
9-103947	Kaakako Block B	400 Keawe Street, Honolulu, Hawaii

UST System Description - Provide a description of the UST(s) to be closed. Use additional sheets as needed.

Tank ID	Tank Capacity (gallons)	Substance Stored (gasoline, diesel, etc.)	Material of Tank Construction (steel, FRP, etc.)	Projected Date of Closure
NA	~550-gallon	Unknown	Steel	2/18/2015

Contact Information - Provide information on the UST owner, UST operator or authorized representative; i.e. a person legally responsible for the UST(s). We will send official correspondence regarding the UST closure to this person.

Name / Title	Troy Fukuhara, Esq.
Company Name	Castle & Cooke Homes Hawaii, Inc.
Mailing Address	680 Iwilei Road, Suite 510, Honolulu, Hawaii 96817
Phone / Fax Numbers	808-548-4811

Contractor Information - Provide information on the contractors and consultants who will close the UST(s). Use additional sheets as needed.

Contact Name / Title	Sharla Nakashima
Company Name	EnviroServices & Training Center, LLC
Mailing Address	505 Ward Avenue, Suite 202, Honolulu, Hawaii 96814
Phone / Fax Numbers	

Notice Provided By:

Sharla Nakashims
 Name

EnviroServices & Training Center, LLC
 Company

Signature



2/17/15
 Date

APPENDIX IV
DISPOSAL DOCUMENTS



Hawaii Industrial Services, Ltd.

Corporate Office
3049 Ualena Street, Suite 709
Honolulu, HI 96819
Phone 808.836.8652
Fax 808.836.8653

Contractor's License

Remove and Dispose of 500 gal Gasoline UST
Located at 400 Keawe Street
Work completed February 18, 2015





Hawaii Industrial Services, Ltd.

Corporate Office

3049 Ualena Street, Suite 709

Honolulu, HI 96819

Phone 808.836.8652

Fax 808.836.8653

Contractor's License

500 Gal Tank



Delivery to Schnitzer Steel Hawaii Corp
On February 24, 2015



SCHNITZER STEEL HAWAII CORP. 91-056 Hanua St. Kapolei, HI 96707 (808) 682-5810

HAWAI'I INDUSTRIAL
Vendor # CP007P

Date: 02/24/15
Check No: 07147655

TICKET#	SHP DATE	COMMODITY	GROSS	TARE	NET	VEHICLE ID	PRICE UM	FRT EXT	TOTAL AMT
TKVYEA	02/24/15	#1 & #2 HMS UNPREPARED	9420	8520	900	TRUCK	20.0000 NT	0.00	9.00
VENDOR CP007P TOTALS (Pounds):					900	TOTAL DUE: \$		9.00	

THIS CHECK HAS A GREEN AND BLUE BACKGROUND AND IS PRINTED ON WATERMARKED PAPER. THE BORDER IS MICROPRINTED AS A SAFETY PRECAUTION.



SCHNITZER STEEL HAWAII CORP.

91-056 Hanua Street
Kapolei, HI 96707
(808) 682-5810

FIRST HAWAIIAN BANK
59-101/1213

No. 07147655

DATE
02/24/15

PAY EXACTLY Nine and 00/100 Dollars

*****9.00

PAY TO THE
ORDER OF

HAWAI'I INDUSTRIAL
SERVICES LTD.
3049 UALENA ST. SUITE 709
HONOLULU, HI 96819

Authorized Signature
Void After 180 Days

⑈07147655⑈ ⑆121301015001184369⑈

①

PVT LAND COMPANY LTD.
87-2020 FARRINGTON HWY.
WAIANAE, HI 96792

Ticket #: 828803

Bill To: CREDIT CARD CUSTOMERS
Haul Acct/Veh #: CJPETE /CJPET-05
PO/Job #:
Date: 05/07/15 Time I/O:11:21 /11:35
Clr #: 96215 - Keawe St. 400 Honolulu

Material: 1030 - Rock/Dirt
Gross: 77600 Tare: 38660 Net:38940 lbs
19.47 Tons @ \$45.00/tn \$ 876.15
Fees: 0.00

Tax 41.28

TOTAL \$917.43

COD Customer: 1 - 1 Not Specified
Notes:

STATE OF HAWAII CERTIFICATE OF MEASURES
DIVISION OF MEASUREMENT STANDARDS

This certifies to the accuracy and
identity of the quantity & commodity
shown, is suitable for all deliveries
when sealed by a measuremaster.

STATE OF HAWAII MEASUREMASTER
NO.3348 Registered Intls MD

Pmnt Type: 5 - Credit Card (VISA/MC)
Fee codes:

<<< COVER YOUR LOAD >>>

PVT LAND COMPANY LTD.
87-2020 FARRINGTON HWY.
WAIANAE, HI 96792

Ticket #: 828758

Bill To: CREDIT CARD CUSTOMERS
Haul Acct/Veh #: CJPETE /CJPET-T04
PO/Job #:
Date: 05/07/15 Time I/O:09:33 /10:09
Clr #: 96215 - Keawe St. 400 Honolulu

Material: 1030 - Rock/Dirt
Gross: 70680 Tare: 38700 Net:31980 lbs
15.99 Tons @ \$45.00/tn \$ 719.55
Fees: 0.00

Tax 33.91

TOTAL \$753.46

COD Customer: 1 - 1 Not Specified
Notes: CJ PETERSON

STATE OF HAWAII CERTIFICATE OF MEASURES
DIVISION OF MEASUREMENT STANDARDS

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identity of the quantity & commodity
shown, is suitable for all deliveries
when sealed by a measuremaster.

STATE OF HAWAII MEASUREMASTER
NO.3348 Registered Intls MD

Pmnt Type: 5 - Credit Card (VISA/MC)
Fee codes:

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PVT LAND COMPANY LTD.
87-2020 FARRINGTON HWY.
WAIANAE, HI 96792

Ticket #: 828742

Bill To: CREDIT CARD CUSTOMERS
Haul Acct/Veh #: CJPETE /CJPET-05
PO/Job #:
Date: 05/07/15 Time I/O:09:23 /09:45
Clr #: 96215 - Keawe St. 400 Honolulu

Material: 1030 - Rock/Dirt
Gross: 72180 Tare: 38760 Net:33420 lbs
16.71 Tons @ \$45.00/tn \$ 751.95
Fees: 0.00

Tax 35.43

TOTAL \$787.38

COD Customer: 1 - 1 Not Specified
Notes: CJ Peterson

STATE OF HAWAII CERTIFICATE OF MEASURES
DIVISION OF MEASUREMENT STANDARDS

This certifies to the accuracy and
identity of the quantity & commodity
shown, is suitable for all deliveries
when sealed by a measuremaster.

STATE OF HAWAII MEASUREMASTER
NO.3348 Registered Intls MD

Pmnt Type: 5 - Credit Card (VISA/MC)
Fee codes:

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2

PVT LAND COMPANY LTD.
87-2020 FARRINGTON HWY.
WAIANAE, HI 96792

Ticket #: 828864

Bill To: CREDIT CARD CUSTOMERS
Haul Acct/Veh #: CJPETE /CJPET-05
PO/Job #:
Date: 05/07/15 Time I/O:13:10 /13:28
Clr #: 96215 - Keawe St. 400 Honolulu

Material: 1030 - Rock/Dirt
Gross: 88060 Tare: 38600 Net:49460 lbs
24.73 Tons @ \$45.00/tn \$ 1112.85
Fees: 0.00

Tax 52.44

TOTAL \$1165.29

COD Customer: 1 - 1 Not Specified
Notes:

STATE OF HAWAII CERTIFICATE OF MEASURES
DIVISION OF MEASUREMENT STANDARDS

This certifies to the accuracy and
identity of the quantity & commodity
shown, is suitable for all deliveries
when sealed by a measuremaster.

STATE OF HAWAII MEASUREMASTER
NO.3348 Registered Intls MD

Pmnt Type: 5 - Credit Card (VISA/MC)
Fee codes:

<<< COVER YOUR LOAD >>>

PVT LAND COMPANY LTD.
87-2020 FARRINGTON HWY.
WAIANAE, HI 96792

Ticket #: 828818

Bill To: CREDIT CARD CUSTOMERS
Haul Acct/Veh #: CJPETE /CJPET-T04
PO/Job #:
Date: 05/07/15 Time I/O:11:48 /12:11
Clr #: 96215 - Keawe St. 400 Honolulu

Material: 1030 - Rock/Dirt
Gross: 80860 Tare: 38600 Net:42260 lbs
21.13 Tons @ \$45.00/tn \$ 950.85
Fees: 0.00

Tax 44.80

TOTAL \$995.65

COD Customer: 1 - 1 Not Specified
Notes:

STATE OF HAWAII CERTIFICATE OF MEASURES
DIVISION OF MEASUREMENT STANDARDS

This certifies to the accuracy and
identity of the quantity & commodity
shown, is suitable for all deliveries
when sealed by a measuremaster.

STATE OF HAWAII MEASUREMASTER
NO.3348 Registered Intls MD

Pmnt Type: 5 - Credit Card (VISA/MC)
Fee codes:

<<< COVER YOUR LOAD >>>

PVT LAND COMPANY LTD.
87-2020 FARRINGTON HWY.
WAIANAE, HI 96792

Ticket #: 828804

Bill To: CREDIT CARD CUSTOMERS
Haul Acct/Veh #: CJPETE /CJPET-T09
PO/Job #:
Date: 05/07/15 Time I/O:11:20 /11:38
Clr #: 96215 - Keawe St. 400 Honolulu

Material: 1030 - Rock/Dirt
Gross: 69320 Tare: 35080 Net:34240 lbs
17.12 Tons @ \$45.00/tn \$ 770.40
Fees: 0.00

Tax 36.30

TOTAL \$806.70

COD Customer: 1 - 1 Not Specified
Notes: CJ PETERSON

STATE OF HAWAII CERTIFICATE OF MEASURES
DIVISION OF MEASUREMENT STANDARDS

This certifies to the accuracy and
identity of the quantity & commodity
shown, is suitable for all deliveries
when sealed by a measuremaster.

STATE OF HAWAII MEASUREMASTER
NO.3348 Registered Intls MD

Pmnt Type: 5 - Credit Card (VISA/MC)
Fee codes:

<<< COVER YOUR LOAD >>>

3

PVT LAND COMPANY LTD.
87-2020 FARRINGTON HWY.
WAIANAE, HI 96792

Ticket #: 828877

Bill To: CREDIT CARD CUSTOMERS
Haul Acct/Veh #: CJPETE /CJPET-T04
PO/Job #:
Date: 05/07/15 Time I/O:13:54 /14:11
Clr #: 96215 - Keawe St. 400 Honolulu

Material: 1030 - Rock/Dirt
Gross: 107280 Tare: 38480 Net:68800 lbs
34.40 Tons @ \$45.00/tn \$ 1548.00
Fees: 0.00

Tax 72.94

TOTAL \$1620.94

COD Customer: 1 - 1 Not Specified
Notes:

STATE OF HAWAII CERTIFICATE OF MEASURES
DIVISION OF MEASUREMENT STANDARDS

This certifies to the accuracy and
identity of the quantity & commodity
shown, is suitable for all deliveries
when sealed by a measuremaster.

STATE OF HAWAII MEASUREMASTER
NO.3348 Registered Intls MD

Pmnt Type: 5 - Credit Card (VISA/MC)
Fee codes:

<<< COVER YOUR LOAD >>>

APPENDIX V
STANDARD OPERATING PROCEDURES FOR SOIL HEADSPACE ANALYSIS

Soil Headspace Analysis

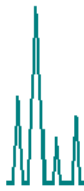
Field screening is performed using either a Thermo Environmental Instruments, Inc. Model 580B photoionization detector (PID), a Photovac, Inc. 2020PRO PID, or a MiniRae 2000 Model PGM-7600 Portable Volatile Organic Compounds (VOC) Monitor. These detectors are calibrated with isobutylene and are used for the relative quantification of volatile organic compounds. As a guideline, the following response chart may be used to determine the sensitivity of the PID's response to various chemicals:

Decreasing PID Response: Aromatic Compounds
 Unsaturated Compounds
 Saturated Compounds
 Ketones
 Alcohols
 Compounds with Sub Groups

The basic method for field screening of a soil sample is listed below:

- 1) Approximately 1-2 cubic inches of soil sample is removed from the ground or retrieval device. The sample is placed in a polyethylene, sealable bag with an approximately 500 ml capacity.
- 2) The sample is hand-crushed to increase surface area for off-gassing.
- 3) The detector probe is inserted into the bag and allowed to draw out the vapors. The probe should not be in direct contact with the sample.
- 4) The readings will be observed and the sustained value will be recorded unless there is moisture interference. The initial peak reading will be recorded before moisture interference causes the readings to diminish.
- 5) The detector probe is removed from the bag. The probe is cleaned and ambient air is passed through the system until zero or background level is attained.
- 6) Readings are recorded with the sample number and depth of the sample in the field log.

APPENDIX VI
LABORATORY REPORTS AND CHAIN-OF-CUSTODY



AAL Project #P71

EnviroServices & Training Center

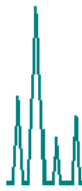
Client Project #: 14-2021 Method: 8015M
Client Project Name: 400 Keave Street Matrix: Soil

CLIENT SAMPLE ID	TPH-GASOLINE [mg/kg]	SURROGATE RECOVERY	FLAGS	DATE ANALYZED
Blank	nd	104%		2/19/2015
North Wall 1-6	nd	92%		2/19/2015
North Wall 2-6	nd	102%		2/19/2015
South Wall 1-6	nd	86%		2/19/2015
South Wall 2-6	nd	81%		2/19/2015
East Wall 1-6	nd	105%		2/19/2015
East Wall 2-6	nd	94%		2/19/2015
West Wall 1-6	nd	86%		2/19/2015
West Wall 2-6	nd	96%		2/19/2015
PQL	0.20	Acceptable Range		
MDL	0.10	70%-130%		

QA/QC DATA

	TPH-GASOLINE [mg/kg]	Acceptable Range
QC BATCH # 021915		
Lab Control Spike (LCS)	7.6	7.0-13.0
Matrix Spike (MS)	8.6	7.0-13.0
Matrix Spike Dup (MSD)	9.4	7.0-13.0
Recovery LCS	76%	70%-130%
Recovery MS	86%	70%-130%
Recovery MSD	94%	70%-130%
RPD of MS/MSD	9.5%	20%

Analyst: E. Young
Data review: U. Baumgartner, Ph.D.



AAL Project #P71

EnviroServices & Training Center

Client Project #: 14-2021
 Client Project Name: 400 Keave Street

Method: 8015M
 Matrix: Soil

CLIENT SAMPLE ID	TPH-DIESEL [mg/kg]	TPH-OIL [mg/kg]	SURROGATE RECOVERY	FLAGS	DATE ANALYZED
Blank	nd	nd	109%		2/18/2015
North Wall 1-6	nd	nd	117%		2/18/2015
North Wall 2-6	nd	nd	109%		2/18/2015
South Wall 1-6	nd	nd	119%		2/18/2015
South Wall 2-6	nd	nd	112%		2/18/2015
East Wall 1-6	nd	nd	120%		2/18/2015
East Wall 2-6	nd	nd	108%		2/18/2015
West Wall 1-6	nd	130	113%		2/18/2015
West Wall 2-6	nd	nd	108%		2/18/2015
PQL	50	100	Acceptable Range		
MDL	20	35	70%-130%		

QA/QC DATA

QC BATCH #	TPH-DIESEL [mg/kg]	TPH-OIL [mg/kg]	Acceptable Range
021815			
Lab Control Spike (LCS)	531	502	350-650
Matrix Spike (MS)	463	534	350-650
Matrix Spike Dup (MSD)	483	530	350-650
Recovery LCS	106%	100%	70%-130%
Recovery MS	93%	107%	70%-130%
Recovery MSD	97%	106%	70%-130%
RPD of MS/MSD	4.2%	0.8%	20%

Analyst: U. Baumgartner, Ph.D.
 Data review: E. Young

AAL Job Number: B50220-1
Client: Advanced Analytical Lab
Project Manager: Uwe Baumgartner
Client Project Name: 400 Keave Street
Client Project Number: P71
Date received: 02/20/15

AAL Job Number: B50220-1
 Client: Advanced Analytical Lab
 Project Manager: Uwe Baumgartner
 Client Project Name: 400 Keave Street
 Client Project Number: P71
 Date received: 02/20/15

Analytical Results				North Wall		North Wall		South Wall		South Wall	
8082 (PCBs), mg/kg		MTH BLK	LCS	1-6	2-6	1-6	2-6	1-6	2-6	1-6	2-6
Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Date extracted	Reporting	02/20/15	02/20/15	02/20/15	02/20/15	02/20/15	02/20/15	02/20/15	02/20/15	02/20/15	02/20/15
Date analyzed	Limits	02/20/15	02/20/15	02/20/15	02/20/15	02/20/15	02/20/15	02/20/15	02/20/15	02/20/15	02/20/15
A1221	0.2	nd		nd	nd	nd	nd	nd	nd	nd	nd
A1232	0.2	nd		nd	nd	nd	nd	nd	nd	nd	nd
A1242 (A1016)	0.2	nd		nd	nd	nd	nd	nd	nd	nd	nd
A1248	0.2	nd		nd	nd	nd	nd	nd	nd	nd	nd
A1254	0.2	nd		nd	nd	nd	nd	nd	nd	nd	nd
A1260	0.2	nd	96%	nd	nd	nd	nd	nd	nd	nd	nd

Surrogate recoveries:

Tetrachloro-m-xylene	109%	113%	111%	111%	111%	113%
Decachlorobiphenyl	99%	106%	103%	102%	103%	104%

Data Qualifiers and Analytical Comments

nd - not detected at listed reporting limits

na - not analyzed

M - matrix interference

Acceptable Recovery limits: 70% TO 130%

Acceptable RPD limit: 30%

AAL Job Number: B50220-1
 Client: Advanced Analytical Lab
 Project Manager: Uwe Baumgartner
 Client Project Name: 400 Keave Street
 Client Project Number: P71
 Date received: 02/20/15

Analytical Results		East Wall	East Wall	West Wall	West Wall				
8082 (PCBs), mg/kg		1-6	2-6	1-6	2-6	MS	MSD	RPD	
Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Date extracted	Reporting	02/20/15	02/20/15	02/20/15	02/20/15	02/20/15	02/20/15	02/20/15	02/20/15
Date analyzed	Limits	02/20/15	02/20/15	02/20/15	02/20/15	02/20/15	02/20/15	02/20/15	02/20/15
A1221	0.2	nd	nd	nd	nd				
A1232	0.2	nd	nd	nd	nd				
A1242 (A1016)	0.2	nd	nd	nd	nd				
A1248	0.2	nd	nd	nd	nd				
A1254	0.2	nd	nd	nd	nd				
A1260	0.2	nd	nd	nd	nd	113%	112%		1%

Surrogate recoveries:

Tetrachloro-m-xylene	112%	115%	112%	110%	122%	121%
Decachlorobiphenyl	105%	101%	103%	106%	119%	120%

Data Qualifiers and Analytical Comments

nd - not detected at listed reporting limits

na - not analyzed

M - matrix interference

Acceptable Recovery limits: 70% TO 130%

Acceptable RPD limit: 30%

AAL Job Number: B50220-1
Client: Advanced Analytical Lab
Project Manager: Uwe Baumgartner
Client Project Name: 400 Keave Street
Client Project Number: P71
Date received: 02/20/15

Analytical Results				North Wall	North Wall	South Wall
8260B, µg/kg		MTH BLK	LCS	1-6	2-6	1-6
Matrix	Soil	Soil	Soil	Soil	Soil	Soil
Date extracted	Reporting	02/23/15	02/23/15	02/23/15	02/23/15	02/23/15
Date analyzed	Limits	02/23/15	02/23/15	02/23/15	02/23/15	02/23/15
MTBE	50	nd		nd	nd	nd
Chloromethane	50	nd		nd	nd	nd
Vinyl chloride	50	nd		nd	nd	nd
Bromomethane	50	nd		nd	nd	nd
Chloroethane	50	nd		nd	nd	nd
Trichlorofluoromethane	50	nd		nd	nd	nd
1,1-Dichloroethene	50	nd		nd	nd	nd
Methylene chloride	20	nd		nd	nd	nd
trans-1,2-Dichloroethene	50	nd		nd	nd	nd
1,1-Dichloroethane	50	nd		nd	nd	nd
2,2-Dichloropropane	50	nd		nd	nd	nd
cis-1,2-Dichloroethene	50	nd		nd	nd	nd
Chloroform	50	nd		nd	nd	nd
1,1,1-Trichloroethane	50	nd		nd	nd	nd
Carbontetrachloride	50	nd		nd	nd	nd
1,1-Dichloropropene	50	nd		nd	nd	nd
Benzene	20	nd	103%	nd	nd	nd
1,2-Dichloroethane(EDC)	50	nd		nd	nd	nd
Trichloroethene	20	nd	97%	nd	nd	nd
1,2-Dichloropropane	50	nd		nd	nd	nd
Dibromomethane	50	nd		nd	nd	nd
Bromodichloromethane	50	nd		nd	nd	nd
cis-1,3-Dichloropropene	50	nd		nd	nd	nd
Toluene	50	nd	89%	nd	nd	nd
trans-1,3-Dichloropropene	50	nd		nd	nd	nd
1,1,2-Trichloroethane	50	nd		nd	nd	nd
Tetrachloroethene	50	nd		nd	nd	nd
1,3-Dichloropropane	50	nd		nd	nd	nd
Dibromochloromethane	50	nd		nd	nd	nd
1,2-Dibromoethane (EDB)*	5	nd		nd	nd	nd
Chlorobenzene	50	nd	100%	nd	nd	nd
1,1,1,2-Tetrachloroethane	50	nd		nd	nd	nd
Ethylbenzene	50	nd		nd	nd	nd
Xylenes	50	nd		nd	nd	nd
Styrene	50	nd		nd	nd	nd
Bromoform	50	nd		nd	nd	nd
Isopropylbenzene	50	nd		nd	nd	nd
1,2,3-Trichloropropane	50	nd		nd	nd	nd
Bromobenzene	50	nd		nd	nd	nd
1,1,2,2-Tetrachloroethane	50	nd		nd	nd	nd
n-Propylbenzene	50	nd		nd	nd	nd
2-Chlorotoluene	50	nd		nd	nd	nd
4-Chlorotoluene	50	nd		nd	nd	nd
1,3,5-Trimethylbenzene	50	nd		nd	nd	nd
tert-Butylbenzene	50	nd		nd	nd	nd
1,2,4-Trimethylbenzene	50	nd		nd	nd	nd
sec-Butylbenzene	50	nd		nd	nd	nd

AAL Job Number: B50220-1
Client: Advanced Analytical Lab
Project Manager: Uwe Baumgartner
Client Project Name: 400 Keave Street
Client Project Number: P71
Date received: 02/20/15

Analytical Results				North Wall	North Wall	South Wall
8260B, µg/kg		MTH BLK	LCS	1-6	2-6	1-6
Matrix	Soil	Soil	Soil	Soil	Soil	Soil
Date extracted	Reporting	02/23/15	02/23/15	02/23/15	02/23/15	02/23/15
Date analyzed	Limits	02/23/15	02/23/15	02/23/15	02/23/15	02/23/15
1,3-Dichlorobenzene	50	nd		nd	nd	nd
Isopropyltoluene	50	nd		nd	nd	nd
1,4-Dichlorobenzene	50	nd		nd	nd	nd
1,2-Dichlorobenzene	50	nd		nd	nd	nd
n-Butylbenzene	50	nd		nd	nd	nd
1,2-Dibromo-3-Chloropropane	50	nd		nd	nd	nd
1,2,4-Trichlorobenzene	50	nd		nd	nd	nd
Hexachloro-1,3-butadiene	50	nd		nd	nd	nd
1,2,3-Trichlorobenzene	50	nd		nd	nd	nd
*-instrument detection limits						
Surrogate recoveries						
Dibromofluoromethane		123%	114%	112%	110%	113%
Toluene-d8		123%	114%	118%	115%	117%
1,2-Dichloroethane-d4		92%	95%	95%	93%	93%
4-Bromofluorobenzene		96%	94%	97%	94%	95%

Data Qualifiers and Analytical Comments

nd - not detected at listed reporting limits
Results reported on dry-weight basis
M - matrix interference
Acceptable Recovery limits: 70% TO 130%
Acceptable RPD limit: 30%

AAL Job Number: B50220-1
 Client: Advanced Analytical Lab
 Project Manager: Uwe Baumgartner
 Client Project Name: 400 Keave Street
 Client Project Number: P71
 Date received: 02/20/15

Analytical Results		South Wall	East Wall	East Wall	West Wall	West Wall
8260B, µg/kg		2-6	1-6	2-6	1-6	2-6
Matrix	Soil	Soil	Soil	Soil	Soil	Soil
Date extracted	Reporting	02/23/15	02/23/15	02/23/15	02/23/15	02/23/15
Date analyzed	Limits	02/23/15	02/23/15	02/23/15	02/23/15	02/23/15
MTBE	50	nd	nd	nd	nd	nd
Chloromethane	50	nd	nd	nd	nd	nd
Vinyl chloride	50	nd	nd	nd	nd	nd
Bromomethane	50	nd	nd	nd	nd	nd
Chloroethane	50	nd	nd	nd	nd	nd
Trichlorofluoromethane	50	nd	nd	nd	nd	nd
1,1-Dichloroethene	50	nd	nd	nd	nd	nd
Methylene chloride	20	nd	nd	nd	nd	nd
trans-1,2-Dichloroethene	50	nd	nd	nd	nd	nd
1,1-Dichloroethane	50	nd	nd	nd	nd	nd
2,2-Dichloropropane	50	nd	nd	nd	nd	nd
cis-1,2-Dichloroethene	50	nd	nd	nd	nd	nd
Chloroform	50	nd	nd	nd	nd	nd
1,1,1-Trichloroethane	50	nd	nd	nd	nd	nd
Carbontetrachloride	50	nd	nd	nd	nd	nd
1,1-Dichloropropene	50	nd	nd	nd	nd	nd
Benzene	20	nd	nd	nd	110	nd
1,2-Dichloroethane(EDC)	50	nd	nd	nd	nd	nd
Trichloroethene	20	nd	nd	nd	nd	nd
1,2-Dichloropropane	50	nd	nd	nd	nd	nd
Dibromomethane	50	nd	nd	nd	nd	nd
Bromodichloromethane	50	nd	nd	nd	nd	nd
cis-1,3-Dichloropropene	50	nd	nd	nd	nd	nd
Toluene	50	nd	nd	nd	280	nd
trans-1,3-Dichloropropene	50	nd	nd	nd	nd	nd
1,1,2-Trichloroethane	50	nd	nd	nd	nd	nd
Tetrachloroethene	50	nd	nd	nd	nd	nd
1,3-Dichloropropane	50	nd	nd	nd	nd	nd
Dibromochloromethane	50	nd	nd	nd	nd	nd
1,2-Dibromoethane (EDB)*	5	nd	nd	nd	nd	nd
Chlorobenzene	50	nd	nd	nd	nd	nd
1,1,1,2-Tetrachloroethane	50	nd	nd	nd	nd	nd
Ethylbenzene	50	nd	nd	nd	130	nd
Xylenes	50	nd	nd	nd	750	nd
Styrene	50	nd	nd	nd	nd	nd
Bromoform	50	nd	nd	nd	nd	nd
Isopropylbenzene	50	nd	nd	nd	nd	nd
1,2,3-Trichloropropane	50	nd	nd	nd	nd	nd
Bromobenzene	50	nd	nd	nd	nd	nd
1,1,2,2-Tetrachloroethane	50	nd	nd	nd	nd	nd
n-Propylbenzene	50	nd	nd	nd	69	nd
2-Chlorotoluene	50	nd	nd	nd	nd	nd
4-Chlorotoluene	50	nd	nd	nd	nd	nd
1,3,5-Trimethylbenzene	50	nd	nd	nd	120	nd
tert-Butylbenzene	50	nd	nd	nd	67	nd
1,2,4-Trimethylbenzene	50	nd	nd	nd	320	nd
sec-Butylbenzene	50	nd	nd	nd	nd	nd

AAL Job Number: B50220-1
Client: Advanced Analytical Lab
Project Manager: Uwe Baumgartner
Client Project Name: 400 Keave Street
Client Project Number: P71
Date received: 02/20/15

Analytical Results		South Wall	East Wall	East Wall	West Wall	West Wall
8260B, µg/kg		2-6	1-6	2-6	1-6	2-6
Matrix	Soil	Soil	Soil	Soil	Soil	Soil
Date extracted	Reporting	02/23/15	02/23/15	02/23/15	02/23/15	02/23/15
Date analyzed	Limits	02/23/15	02/23/15	02/23/15	02/23/15	02/23/15
1,3-Dichlorobenzene	50	nd	nd	nd	nd	nd
Isopropyltoluene	50	nd	nd	nd	nd	nd
1,4-Dichlorobenzene	50	nd	nd	nd	nd	nd
1,2-Dichlorobenzene	50	nd	nd	nd	nd	nd
n-Butylbenzene	50	nd	nd	nd	nd	nd
1,2-Dibromo-3-Chloropropane	50	nd	nd	nd	nd	nd
1,2,4-Trichlorobenzene	50	nd	nd	nd	nd	nd
Hexachloro-1,3-butadiene	50	nd	nd	nd	nd	nd
1,2,3-Trichlorobenzene	50	nd	nd	nd	nd	nd
*-instrument detection limits						
Surrogate recoveries						
Dibromofluoromethane		115%	114%	115%	117%	112%
Toluene-d8		117%	121%	128%	125%	119%
1,2-Dichloroethane-d4		97%	99%	95%	95%	103%
4-Bromofluorobenzene		100%	93%	97%	108%	103%

Data Qualifiers and Analytical Comments

nd - not detected at listed reporting limits
Results reported on dry-weight basis
M - matrix interference
Acceptable Recovery limits: 70% TO 130%
Acceptable RPD limit: 30%

AAL Job Number: B50220-1
Client: Advanced Analytical Lab
Project Manager: Uwe Baumgartner
Client Project Name: 400 Keave Street
Client Project Number: P71
Date received: 02/20/15

Analytical Results

8260B, µg/kg		MS	MSD	RPD
Matrix	Soil	Soil	Soil	Soil
Date extracted	Reporting	02/23/15	02/23/15	02/23/15
Date analyzed	Limits	02/23/15	02/23/15	02/23/15
MTBE	50			
Chloromethane	50			
Vinyl chloride	50			
Bromomethane	50			
Chloroethane	50			
Trichlorofluoromethane	50			
1,1-Dichloroethene	50			
Methylene chloride	20			
trans-1,2-Dichloroethene	50			
1,1-Dichloroethane	50			
2,2-Dichloropropane	50			
cis-1,2-Dichloroethene	50			
Chloroform	50			
1,1,1-Trichloroethane	50			
Carbontetrachloride	50			
1,1-Dichloropropene	50			
Benzene	20	104%	117%	11%
1,2-Dichloroethane(EDC)	50			
Trichloroethene	20	105%	115%	9%
1,2-Dichloropropane	50			
Dibromomethane	50			
Bromodichloromethane	50			
cis-1,3-Dichloropropene	50			
Toluene	50	95%	105%	10%
trans-1,3-Dichloropropene	50			
1,1,2-Trichloroethane	50			
Tetrachloroethene	50			
1,3-Dichloropropane	50			
Dibromochloromethane	50			
1,2-Dibromoethane (EDB)*	5			
Chlorobenzene	50	101%	117%	14%
1,1,1,2-Tetrachloroethane	50			
Ethylbenzene	50			
Xylenes	50			
Styrene	50			
Bromoform	50			
Isopropylbenzene	50			
1,2,3-Trichloropropane	50			
Bromobenzene	50			
1,1,2,2-Tetrachloroethane	50			
n-Propylbenzene	50			
2-Chlorotoluene	50			
4-Chlorotoluene	50			
1,3,5-Trimethylbenzene	50			
tert-Butylbenzene	50			
1,2,4-Trimethylbenzene	50			
sec-Butylbenzene	50			

AAL Job Number: B50220-1
 Client: Advanced Analytical Lab
 Project Manager: Uwe Baumgartner
 Client Project Name: 400 Keave Street
 Client Project Number: P71
 Date received: 02/20/15

Analytical Results

8260B, µg/kg		MS	MSD	RPD
Matrix	Soil	Soil	Soil	Soil
Date extracted	Reporting	02/23/15	02/23/15	02/23/15
Date analyzed	Limits	02/23/15	02/23/15	02/23/15

1,3-Dichlorobenzene	50
Isopropyltoluene	50
1,4-Dichlorobenzene	50
1,2-Dichlorobenzene	50
n-Butylbenzene	50
1,2-Dibromo-3-Chloropropane	50
1,2,4-Trichlorobenzene	50
Hexachloro-1,3-butadiene	50
1,2,3-Trichlorobenzene	50

*-instrument detection limits

Surrogate recoveries

Dibromofluoromethane	116%	117%
Toluene-d8	116%	114%
1,2-Dichloroethane-d4	102%	99%
4-Bromofluorobenzene	96%	104%

Data Qualifiers and Analytical Comments

nd - not detected at listed reporting limits
 Results reported on dry-weight basis
 M - matrix interference
 Acceptable Recovery limits: 70% TO 130%
 Acceptable RPD limit: 30%

AAL Job Number: B50220-1
 Client: Advanced Analytical Lab
 Project Manager: Uwe Baumgartner
 Client Project Name: 400 Keave Street
 Client Project Number: P71
 Date received: 02/20/15

Analytical Results		North Wall		North Wall		South Wall		South Wall	
PAH (8270 sim), mg/kg		MTH BLK	LCS	1-6	2-6	1-6	2-6	1-6	2-6
Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Date extracted	Reporting	02/23/15	02/23/15	02/23/15	02/23/15	02/23/15	02/23/15	02/23/15	02/23/15
Date analyzed	Limits	02/23/15	02/23/15	02/23/15	02/23/15	02/23/15	02/23/15	02/23/15	02/23/15
1-Methylnaphthalene	0.10	nd		nd	nd	nd	nd	nd	nd
2-Methylnaphthalene	0.10	nd		nd	nd	nd	nd	nd	nd
Naphthalene	0.10	nd		nd	nd	nd	nd	nd	nd
Acenaphthylene	0.10	nd		nd	nd	nd	nd	nd	nd
Acenaphthene	0.10	nd	99%	nd	nd	nd	nd	nd	nd
Fluorene	0.10	nd		nd	nd	nd	nd	nd	nd
Phenanthrene	0.10	nd		nd	nd	nd	nd	nd	nd
Anthracene	0.10	nd		nd	nd	nd	nd	nd	nd
Fluoranthene	0.10	nd		nd	nd	nd	nd	nd	nd
Pyrene	0.10	nd	65%	nd	nd	nd	nd	nd	nd
Benzo(a)anthracene	0.10	nd		nd	nd	nd	nd	nd	nd
Chrysene	0.10	nd		nd	nd	nd	nd	nd	nd
Benzo(b)fluoranthene	0.10	nd		nd	nd	nd	nd	nd	nd
Benzo(k)fluoranthene	0.10	nd		nd	nd	nd	nd	nd	nd
Benzo(a)pyrene	0.10	nd		nd	nd	nd	nd	nd	nd
Indeno(1,2,3-cd)pyrene	0.10	nd		nd	nd	nd	nd	nd	nd
Dibenzo(ah)anthracene	0.10	nd		nd	nd	nd	nd	nd	nd
Benzo(ghi)perylene	0.10	nd		nd	nd	nd	nd	nd	nd

Surrogate recoveries:

2-Fluorobiphenyl	111%	93%	108%	103%	106%	110%
o-Terphenyl	101%	102%	103%	102%	102%	101%

Data Qualifiers and Analytical Comments

nd - not detected at listed reporting limits

na - not analyzed

Results reported on dry-weight basis

Acceptable Recovery limits: 50% TO 150%

Acceptable RPD limit: 50%

AAL Job Number: B50220-1
 Client: Advanced Analytical Lab
 Project Manager: Uwe Baumgartner
 Client Project Name: 400 Keave Street
 Client Project Number: P71
 Date received: 02/20/15

Analytical Results		East Wall	East Wall	West Wall	West Wall				
PAH (8270 sim), mg/kg		1-6	2-6	1-6	2-6	MS	MSD	RPD	
Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Date extracted	Reporting	02/23/15	02/23/15	02/23/15	02/23/15	02/23/15	02/23/15	02/23/15	02/23/15
Date analyzed	Limits	02/23/15	02/23/15	02/23/15	02/23/15	02/23/15	02/23/15	02/23/15	02/23/15
1-Methylnaphthalene	0.10	nd	nd	nd	nd				
2-Methylnaphthalene	0.10	nd	nd	nd	nd				
Naphthalene	0.10	nd	nd	nd	nd				
Acenaphthylene	0.10	nd	nd	nd	nd				
Acenaphthene	0.10	nd	nd	nd	nd	99%	98%	1%	
Fluorene	0.10	nd	nd	nd	nd				
Phenanthrene	0.10	nd	nd	nd	nd				
Anthracene	0.10	nd	nd	nd	nd				
Fluoranthene	0.10	nd	nd	nd	nd				
Pyrene	0.10	nd	nd	nd	nd	75%	66%	13%	
Benzo(a)anthracene	0.10	nd	nd	nd	nd				
Chrysene	0.10	nd	nd	nd	nd				
Benzo(b)fluoranthene	0.10	nd	nd	nd	nd				
Benzo(k)fluoranthene	0.10	nd	nd	nd	nd				
Benzo(a)pyrene	0.10	nd	nd	nd	nd				
Indeno(1,2,3-cd)pyrene	0.10	nd	nd	nd	nd				
Dibenzo(ah)anthracene	0.10	nd	nd	nd	nd				
Benzo(ghi)perylene	0.10	nd	nd	nd	nd				

Surrogate recoveries:

2-Fluorobiphenyl	108%	109%	105%	108%	88%	85%
o-Terphenyl	101%	104%	100%	101%	103%	102%

Data Qualifiers and Analytical Comments

nd - not detected at listed reporting limits

na - not analyzed

Results reported on dry-weight basis

Acceptable Recovery limits: 50% TO 150%

Acceptable RPD limit: 50%

AAL Job Number: B50220-1
 Client: Advanced Analytical Lab
 Project Manager: Uwe Baumgartner
 Client Project Name: 400 Keave Street
 Client Project Number: P71
 Date received: 02/20/15

Analytical Results				North Wall	North Wall	South Wall
Metals (7010/7471), mg/kg		MTH BLK	LCS	1-6	2-6	1-6
Matrix	Soil	Soil	Soil	Soil	Soil	Soil
Date extracted	Reporting	02/20/15	02/20/15	02/20/15	02/20/15	02/20/15
Date analyzed	Limits	02/20/15	02/20/15	02/20/15	02/20/15	02/20/15
Lead (Pb)	1.0	nd	96%	490	510	790
Cadmium (Cd)	1.0	nd	91%	nd	nd	nd

Data Qualifiers and Analytical Comments

nd - not detected at listed reporting limits
 na - not analyzed
 M - matrix interference
 Results reported on dry-weight basis
 Acceptable Recovery limits: 65% TO 135%
 Acceptable RPD limit: 30%

AAL Job Number: B50220-1
 Client: Advanced Analytical Lab
 Project Manager: Uwe Baumgartner
 Client Project Name: 400 Keave Street
 Client Project Number: P71
 Date received: 02/20/15

Analytical Results		South Wall	East Wall	East Wall	West Wall
Metals (7010/7471), mg/kg		2-6	1-6	2-6	1-6
Matrix	Soil	Soil	Soil	Soil	Soil
Date extracted	Reporting	02/20/15	02/20/15	02/20/15	02/20/15
Date analyzed	Limits	02/20/15	02/20/15	02/20/15	02/20/15
Lead (Pb)	1.0	340	91	2.3	700
Cadmium (Cd)	1.0	nd	nd	nd	1.1

Data Qualifiers and Analytical Comments

nd - not detected at listed reporting limits

na - not analyzed

M - matrix interference

Results reported on dry-weight basis

Acceptable Recovery limits: 65% TO 135%

Acceptable RPD limit: 30%

AAL Job Number: B50220-1
 Client: Advanced Analytical Lab
 Project Manager: Uwe Baumgartner
 Client Project Name: 400 Keave Street
 Client Project Number: P71
 Date received: 02/20/15

Analytical Results		West Wall			
Metals (7010/7471), mg/kg		2-6	MS	MSD	RPD
Matrix	Soil	Soil	Soil	Soil	Soil
Date extracted	Reporting	02/20/15	02/20/15	02/20/15	02/20/15
Date analyzed	Limits	02/20/15	02/20/15	02/20/15	02/20/15
Lead (Pb)	1.0	11	77%	78%	1%
Cadmium (Cd)	1.0	nd	93%	98%	6%

Data Qualifiers and Analytical Comments

nd - not detected at listed reporting limits

na - not analyzed

M - matrix interference

Results reported on dry-weight basis

Acceptable Recovery limits: 65% TO 135%

Acceptable RPD limit: 30%

ADVANCED ANALYTICAL LABORATORY-CHAIN OF CUSTODY RECORD

Phone: (808) 836 2252 Fax: (808) 836 2250

Address: 3210 Koapaka Street #A, Honolulu, HI 96819

TURNAROUND TIME: stand by

AAL PROJECT#: P71

CLIENT: Environmental Services & Training Center LLC
 ADDRESS: 505 Ward Avenue
 PHONE: 839-7222 EMAIL: lbastr@gofoto.com
 CLIENT PROJECT#: 14-2021

PROJECT NAME: 400 Keave Street
 COLLECTOR: LISA BASTA
 DATE OF COLLECTION: 2/18/15
 PROJECT MANAGER: Shirley Nakagawa

Sample Number	Time	Sample type	Container Type	Multi-Incremental Volatile	8015M TPH Ethyl Scan	8015M TPH Gasoline	8015M TPH Oil	8021B BTEX	8021B MIBF	8100 PAH DOH 4	8270 PAH 17 Analyses	8082 PCB	8081 Organochlorine Pesticides	8081 Technical Chloride	Total Lead	Total Cadmium	Total RCBRA & Metals	Number of containers	Number containers received	Field Notes
North Wall 1-6	1300	soil	Jars & vial	X	X	X	X	X	X	X	X	X	X	X	X	X	X	3	3	
North Wall 2-6	1315	soil	Jars & vial	X	X	X	X	X	X	X	X	X	X	X	X	X	X	3	3	
South Wall 1-6	1355	soil	Jars & vial	X	X	X	X	X	X	X	X	X	X	X	X	X	X	3	3	
South Wall 2-6	1400	soil	Jars & vial	X	X	X	X	X	X	X	X	X	X	X	X	X	X	3	3	
East Wall 1-6	1410	soil	Jars & vial	X	X	X	X	X	X	X	X	X	X	X	X	X	X	3	3	
East Wall 2-6	1420	soil	Jars & vial	X	X	X	X	X	X	X	X	X	X	X	X	X	X	3	3	
West Wall 1-6	1330	soil	Jars & vial	X	X	X	X	X	X	X	X	X	X	X	X	X	X	3	3	
West Wall 2-6	1340	soil	Jars & vial	X	X	X	X	X	X	X	X	X	X	X	X	X	X	3	3	

RELINQUISHED BY (Signature) _____ DATE/TIME _____ RECEIVED BY (Signature) _____ DATE/TIME _____

RELINQUISHED BY (Signature) _____ DATE/TIME _____ RECEIVED BY (Signature) _____ DATE/TIME _____

LABORATORY NOTES:

TOTAL NUMBER OF CONTAINERS	27
CHAIN OF CUSTODY SEALS INTACT	Y
RECEIVED IN GOOD CONDITION	Y
TEMPERATURE	37°C
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